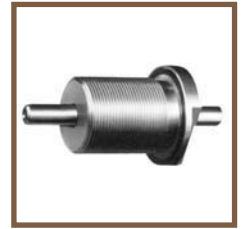


Mechanical Feedthroughs

Rotary Feedthroughs with
Magnetofluid Sealing



Rotary Feedthroughs with
Magnetically Linked Drive



Port Aligners



Translators



Rotary Linear Feedthroughs



UHV Manipulators



Rotary Feedthroughs with Magnetofluid Sealing

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Introduction

VACOM's rotary feedthroughs with magnetofluid sealing are delivered by RIGAKU, a leading manufacturer of these products. They stand out especially due to the following properties:

- Large transmission torque
- No backlash
- Appropriate for rough, fine and high vacuum
- High pressure capacity
- High reliability due to leak-free operation
- Very low magnetic leakage
- Maintenance-free construction
- Long-term maintenance
- Up to 15,000 revolutions / minute
- Manufacturing of customised solutions

Functional principle

Unlike the conventional rotary feedthroughs with elastomer or bellow seal, a magnetic fluid is used as the dynamic seal that fills the gap between the moving shaft and its stationary housing. These liquid o-ring seal is held in place by powerful ring magnets without causing friction. This will result in no wearing or minimal heat generation so that long service life and high reliability are assured. The feedthroughs withstand differential pressures of above 2.5 bar. They have very low leak rates of up to 10^{-11} mbar l / s (He) or less and are absolutely vacuum suitable. They reach a rotational speed up to several thousand revolutions per minute. RIGAKU's rotary feedthroughs have already proven long life and reliability by its use as components of high power x-ray generators and semiconductor process equipment. Besides standard examples customised solutions are available.

Magnet configuration RMS series

The standard feedthroughs of the RMS Series include 4 antipole ring magnets with the pole position: NS-SN-NS-SN. This alignment creates an especially strong field strength at the pole shoes which generate low external stray fields. Milled circular grooves are located at the pole shoes' inside, facing the shaft. The shaft itself is not weakened by grooves or the like. A strong magnetic field is concentrated in the gap between the magnet and the shaft, forming the magnetofluid into liquid o-rings between the grooves (see figure below) due to this construction. A pressure stage is created between every two of these o-rings (see figure 1). Besides the very good leakage properties this construction has another advantage, to withstand high differential pressures with few stages. Furthermore there evolves only minimal frictional heat due to the relatively big gap between magnet and shaft, as well as the low persistent forces of the magnetofluid. This also results in minimal maintenance requirements.

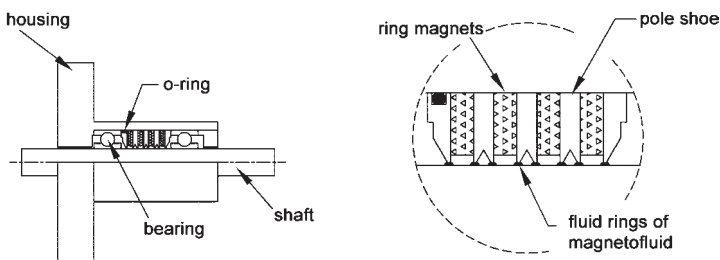


Figure 1

Introduction

Magnet alignment SUPERSEAL series

The SUPERSEAL series has also an antipole alignment of the ring magnets. But there are only two ring magnets applied. The shaft itself serves as a pole shoe to support the ring magnets and the grooves for the sealing magnetofluid. The shaft's diameter is enlarged at the sealing area and designed to serve this purpose (see figure 2). This construction is simpler and cheaper. However, it still has the same advantages concerning pressure capacity, leakage and service life as the RMS series. Furthermore, it is possible to do set static o-ring seals aside.

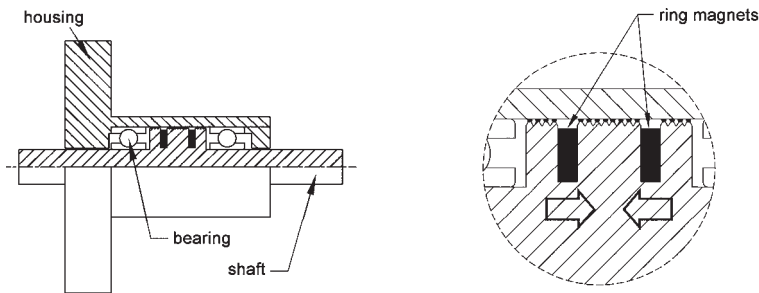


Figure 2

Temperature dependency

Because the magnetofluid is a liquid, the operating temperature is an important parameter for the usage of rotary feedthroughs.

7

A non-stop operation is possible up to a temperature of 60 °C. The use of water-cooled feedthroughs is recommended at higher temperatures. Furthermore the usage of temperature resistant carrier oils for the magnetofluid, such as PFPE, becomes necessary. Figure 3 allows a rough estimation of the point, when water cooling is recommended. Please contact your customer adviser for further information.

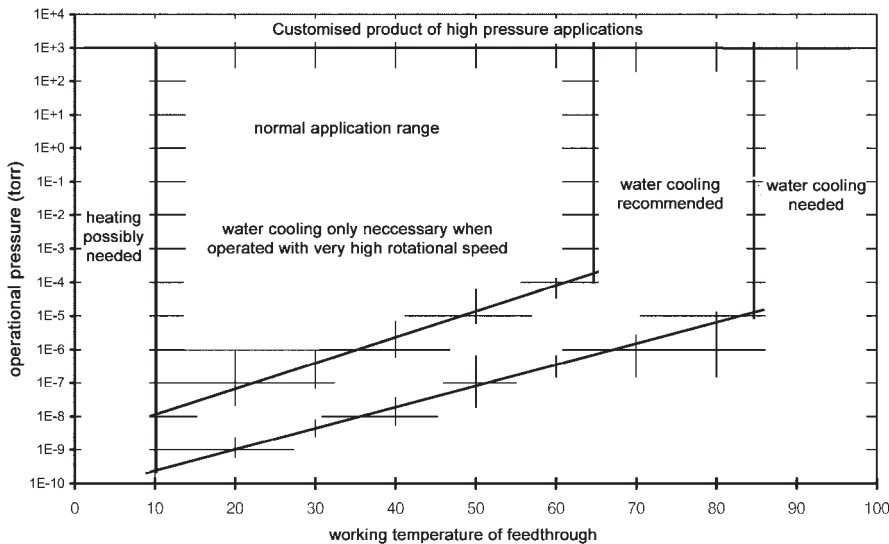
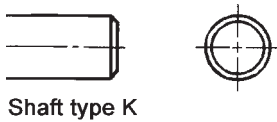


Figure 3

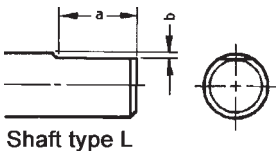
Rotary Feedthroughs with Magnetofluid Sealing

RMS Series

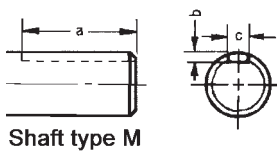
Standard feedthroughs for a large range of applications in production, as well as in research and development.



Shaft type K



Shaft type L



Shaft type M

- Shaft ball bearings on both sides of the magnetofluid sealing
- Transmission of large torques
- Very high revolutions
- Various vacuum connections
- Robust and long-lasting
- Construction with water cooling (optional)
- Construction with a hollow shaft (optional)

Technical data

- | | |
|----------------------------|--|
| ■ Vacuum range | < 10 ⁻⁸ mbar |
| ■ Operating temperature | 0 to 100 °C (without cooling max. 60 °C) |
| ■ Differential pressure | > 2.5 bar |
| ■ He-leakage rate | < 10 ⁻¹¹ mbar l / s |
| ■ Material housing | stainless steel type 303 |
| ■ Material shaft | stainless steel type 630 |
| ■ Material pole shoes | stainless steel type 630 |
| ■ Ball bearing greasing | |
| exposed to vacuum | high vacuum grease |
| exposed to atmosphere | grease with added anticorrosive |
| ■ Magnetofluid bearing oil | |
| standard | synthetic oil |
| reactive gases | PFPE |
| high temperature | PFPE |
| ■ Material o-rings | FPM (included in shipment) |
| ■ Water cooling | |
| flow | 1 to 4 l / min |
| pressure | 3 bar |
| water temperature | 25 °C |
| connection | thread Rc 1/8" (2x or 4x) |

Option hollow shaft (HS)

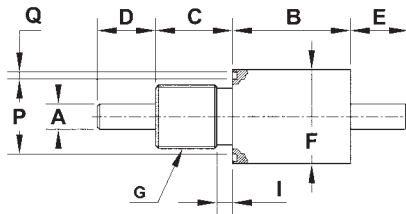
The models of the RMS series with a hollow shaft (HS) can be assembled with shafts of non-magnetic materials and special shafts (tubes, drive shafts or the like). The magnetofluid sealed area of the RMS-HS series is situated between a cylindrical hull (called hollow shaft) and the external housing. The hollow shaft and the housing can be turned in the opposite direction. The shaft that is actually going to be turned, is inserted accurately through the hollow shaft. Two static o-ring seals inside of the hollow shaft connect it with the shaft and seal the gap vacuum tight. If the shaft is turned, the hollow shaft turns as well. You can protect the shaft and the hollow shaft from distortions or displacements by means of a clamp (optional).

Rotary Feedthroughs with Magnetofluid Sealing

RMS-BS / RMS-LS Series

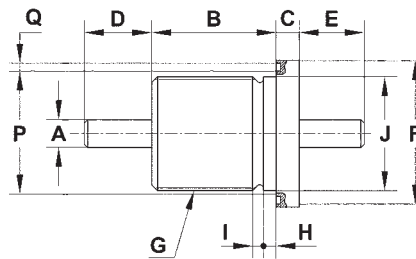
- RMS-BS series with housing exposed to atmosphere
- RMS-LS series with housing exposed to vacuum
- O-ring groove on the front of the housing
- Including o-ring seal, screw nut and washer

Rotary feedthroughs for wall fastening



Model no.	Order code	A	Tolerance to A	B	C	D	E	F	G	I	P	Q	Shaft shape*	a	b	c	Tolerance to C	Max. revolution (RPM)
BS-5	10C-9020-G010	5	-0.010 -0.022	32	6	12.5	15	16	M8 x 1	1.5	10	2.1	K	-	-	-	-	15,000
BS-6	10C-9020-G020	6	-0.010 -0.022	42	10	15	15	28	M12 x 1.75	2	18	2.1	L	10	0.5	-	-	15,000
BS-10	10C-9020-G030	10	-0.013 -0.028	52	30	23	23	38	M25 x 1.5	3	30	2.7	M	20	1.8	3	+0.025 0	12,000
BS-20	10C-9020-G040	20	-0.020 -0.041	60	34	36	36	54	M40 x 1.5	3	42	2.7	M	32	3.5	6	+0.030 0	7,000

*For further information for each individual shaft shape please see page 7-5.



Model no.	Order code	A	Tolerance to A	B	C	D	E	F	G	H	I	J	Tolerance to J	P	Q	Shaft shape*	a	b	c	Tolerance to C	Max. revolution (RPM)
LS-5	10C-9020-M010	5	-0.010 -0.022	26	6	15	15	28	M18 x 1.5	4	1	8	0 -0.2	20	2.1	K	-	-	-	-	15,000
LS-6	10C-9020-M020	6	-0.010 -0.022	40	8	15	15	42	M28 x 2	6	3	8	0 -0.2	32	2.7	L	10	0.5	-	-	15,000
LS-10	10C-9020-M030	10	-0.013 -0.028	44	8	23	23	48	M36 x 1.5	6	3	6	0 -0.2	40	2.7	M	20	1.8	3	+0.025 0	12,000
LS-20	10C-9020-M040	12	-0.016 -0.034	54	10	30	30	58	M45 x 1.5	6	3	5	0 -0.2	50	2.7	M	20	2.5	4	+0.030 0	7,000

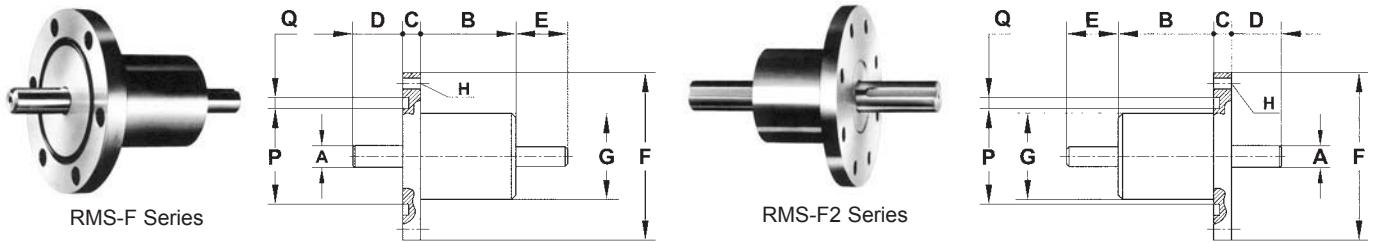
*For further information for each individual shaft shape please see page 7-5.

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1 / RMS-F2 Series

- RMS-F1 series with housing exposed to atmosphere
- RMS-F2 series with housing exposed to vacuum
- Flange with through holes and o-ring groove
- Including o-ring seal

Rotary feedthroughs with flange



Model no.	Order code	A	Tolerance to A	B	C	D	E	F	G	H	P	Q	Max. torque (Nm)	Shaft shape *	a	b	c	Tolerance to C	Max. revolution (RPM)
F1-5	10C-9020-N020	5	-0.010 -0.022	26	6	15	15	36	16	6 - Ø4.3 PD28	18	2.1	1	K	-	-	-	-	15,000
F1-6	10C-9020-J020	6	-0.010 -0.022	40	8	15	15	52	28	6 - Ø4.5 PD40	24	2.7	1.6	L	10	0.5	-	-	15,000
F1-10	10C-9020-J030	10	-0.013 -0.028	44	8	23	23	70	36	6 - Ø6.7 PD58.7	42	2.7	8	M	20	1.8	3	+0.025	12,000
F1-12	10C-9020-J040	12	-0.016 -0.034	54	10	40	30	80	40	6 - Ø7.0 PD65	45	2.7	13	M	25	2.5	4	+0.030	10,000
F1-20	10C-9020-J050	20	-0.020 -0.041	52	10	36	36	114	60	8 - Ø8.5 PD92.2	70	2.7	60	M	32	3.5	6	+0.030	7,000
F1-30	10C-9020-J060	30	-0.020 -0.041	68	12	50	50	114	68	8 - Ø8.5 PD92.2	70	2.7	210	M	35	4	8	+0.036	6,000
F1-40	10C-9020-J070	40	-0.025 -0.050	75	15	60	60	140	84	8 - Ø11 PD115	90	2.7	500	M	40	5	12	+0.043	4,000

* For further information about individual shaft forms please see page 7-5.

Model no.	Order code	A	Tolerance to A	B	C	D	E	F	G*	H	P	Q	Max. torque (Nm)	Shaft shape*	a	b	c	Tolerance to C	Max. revolution (RPM)
F2-5	10C-9020-K010	5	-0.010 -0.022	26	6	15	15	36	16	6 - Ø4.3 PD28	18	2.1	1	K	-	-	-	-	15,000
F2-6	10C-9020-K020	6	-0.010 -0.022	40	8	15	15	52	28	6 - Ø4.5 PD43	30	2.7	1.6	L	10	0.5	-	-	15,000
F2-10	10C-9020-K030	10	-0.013 -0.028	44	8	23	23	70	36	6 - Ø6.7 PD58.7	42	2.7	8	M	20	1.8	3	+0.025	12,000
F2-12	10C-9020-K040	12	-0.016 -0.034	54	40	30	30	80	40	6 - Ø7.0 PD65	45	2.7	13	M	25	2.5	4	+0.030	10,000
F2-20	10C-9020-K050	20	-0.020 -0.041	52	10	36	36	114	60	8 - Ø8.5 PD92.2	70	2.7	60	M	32	3.5	6	+0.030	7,000
F2-30	10C-9020-K060	30	-0.020 -0.041	68	12	50	50	114	68	8 - Ø8.5 PD92.2	70	2.7	210	M	35	4	8	+0.036	6,000
F2-40	10C-9020-K070	40	-0.025 -0.050	75	15	60	60	140	84	8 - Ø11 PD115	90	2.7	500	M	40	5	12	+0.043	4,000

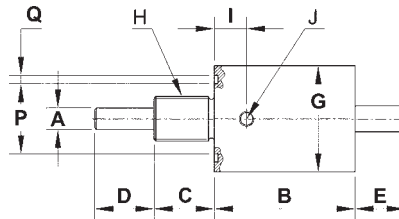
*For further information for each individual shaft shape please see page 7-5.

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1-W / RMS-BS-W Series

- Housing exposed to atmosphere
- RMS-F1-W series with flange and through boring and o-ring grooves
- RMS-BS-W series with thread for wall fastening and o-ring grooves at the front, including screw nut and washer
- Including o-ring seal

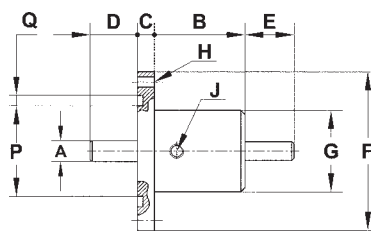
Rotary feedthroughs with water cooling and connection for wall fastening or with flange



Model no.	Order code	A	Tolerance to A	B	C	D	E	G	H	I	J	P	Q	Max. torque (Nm)	Shaft shape*	a	b	c	max. revolution (RPM)
BS-12-W	10C-9020-H010	12	-0.016 -0.034	90	38	33	38	60	M25 P1.5	29	2 -Rc1/8	40	5.0	13	M	30	2.5	4	10,000
Bs-20-W	10C-9020-H020	20	-0.020 -0.040	90	38	36	36	62	M40 P1.5	32	2 -Rc1/8	50	4.1	60	M	32	3.5	6	7,000

Tolerance to C: +0.03/0

*For further information for each individual shaft shape please see page 7-5.



Model no.	Order code	A	Tolerance to A	B	C	D	E	F	G	H	I	J	P	Q	Max. torque (Nm)	Shaft shape*	a	b	c	Max. revolution (RPM)
F1-6-W	10C-9020-L020	6	-0.010 -0.022	48	6	30	20	60	36	4 - Ø5.4 PD50	15	2 -Rc1/8	30	2.7	1.6	L	10	0.5	-	15,000
F1-10-W	10C-9020-L030	10	-0.013 -0.028	62	8	50	50	70	46	6 - Ø6.7 PD58.7	18	2 -Rc1/8	40	5.0	8	M	20	1.8	3	12,000
F1-12-W	10C-9020-L040	12	-0.016 -0.034	82	8	71	37	88	60	4 - Ø6.5 PD74	21	2 -Rc1/8	40	5.0	13	M	30	2.5	4	10,000
F1-20-W	10C-9020-L050	20	-0.020 -0.041	78	10	59	36	114	62	8 - Ø8.5 PD92.2	24	2 -Rc1/8	70	5.0	60	M	32	3.5	6	7,000

Tolerance to C: +0.03/0

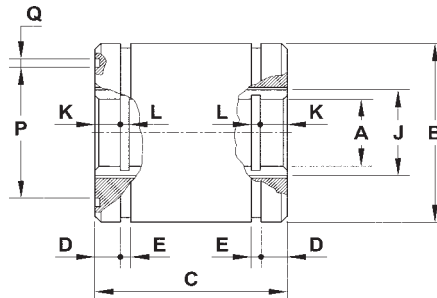
*For further information for each individual shaft shape please see page 7-5.

Rotary Feedthroughs with Magnetofluid Sealing

RMS-HS / RMS-HS-C Series

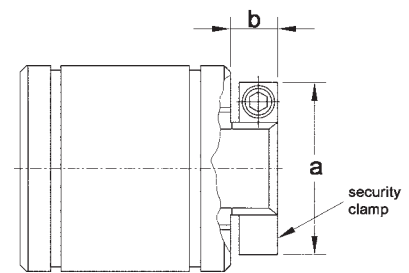
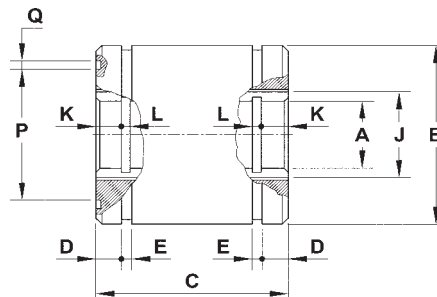
- Housing exposed to atmosphere
- O-ring groove on the front, exposed to vacuum
- Construction with or without safety clamp
- Including o-ring seal

Rotary feedthroughs with hollow shaft



Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	J	K	L	P	Q	Max. revolution (RPM)
HS-10	10C-9020-A010	10	+0.015	40	-0.009, -0.025	50	7.5	2.7	17	7,5	2.1	24	2.7	6,000
HS-12	10C-9020-A020	12	+0.018	40	-0.009, -0.025	50	7.5	2.7	17	7,5	2.1	24	2.7	6,000
HS-20	10C-9020-A030	20	+0.021	60	-0.010, -0.029	64	9	2.7	28	10	2.1	44	2.7	4,500
HS-24	10C-9020-A040	24	+0.021	63	-0.010, -0.029	64	9	2.7	30	9	2.7	46	2.7	4,500
HS-32	10C-9020-A050	32	+0.025	73	-0.010, -0.029	64	9	2.7	40	9	2.7	50	2.7	3,600
HS-38	10C-9020-A060	38	+0.025	83	-0.012, -0.034	64	9	2.7	50	9	2.7	60	2.7	3,000
HS-40	10C-9020-A070	40	+0.025	90	-0.012, -0.034	64	9	2.7	50	9	2.7	60	2.7	3,000
HS-50	10C-9020-A080	50	+0.025	95	-0.012, -0.034	82	10	2.7	60	10	2.7	80	2.7	2,500
HS-75	10C-9020-A090	75	+0.030	126	-0.014, -0.039	92	10	2.7	90	10	2.7	100	2.7	1,800

Rotary feedthroughs with hollow shafts and safety clamp



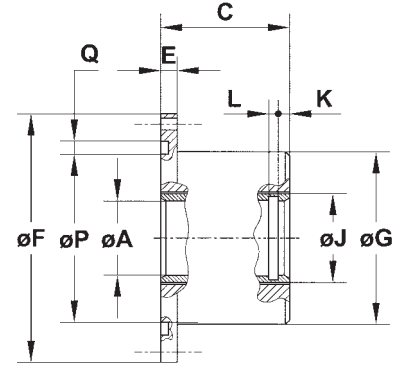
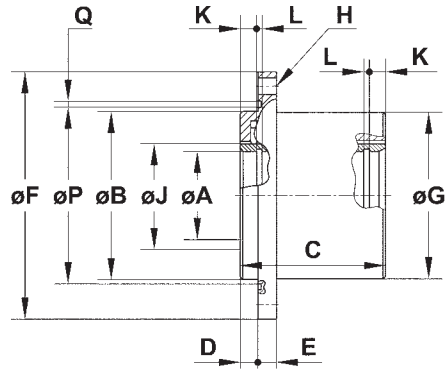
Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	J	K	L	P	Q	Max. revolution (RPM)	a	b
HS-10-C	10C-9020-B010	10	+0.015	40	-0.009, -0.025	50	7.5	2.7	17	7,5	2.1	24	2.7	6,000	36	12
HS-12-C	10C-9020-B020	12	+0.018	40	-0.009, -0.025	50	7.5	2.7	17	7,5	2.1	24	2.7	6,000	38	12
HS-20-C	10C-9020-B030	20	+0.021	60	-0.010, -0.029	64	9	2.7	28	10	2.1	44	2.7	4,500	48	15
HS-24-C	10C-9020-B040	24	+0.021	63	-0.010, -0.029	64	9	2.7	30	9	2.7	46	2.7	4,500	52	15
HS-32-C	10C-9020-B050	32	+0.025	73	-0.010, -0.029	64	9	2.7	40	9	2.7	50	2.7	3,600	58	15
HS-38-C	10C-9020-B060	38	+0.025	83	-0.012, -0.034	64	9	2.7	50	9	2.7	60	2.7	3,000	66	15
HS-40-C	10C-9020-B070	40	+0.025	90	-0.012, -0.034	64	9	2.7	50	9	2.7	60	2.7	3,000	68	15
HS-50-C	10C-9020-B080	50	+0.025	95	-0.012, -0.034	82	10	2.7	60	10	2.7	80	2.7	2,500	86	18
HS-75-C	10C-9020-B090	75	+0.030	126	-0.014, -0.039	92	10	2.7	90	10	2.7	100	2.7	1,800	118	21

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1-HS / RMS-F1-HS-C Series

- Housing exposed to atmosphere
- Flange with through holes and o-ring groove
- Construction with or without safety clamp
- Including o-ring seal

Rotary feedthroughs with hollow shaft and flange

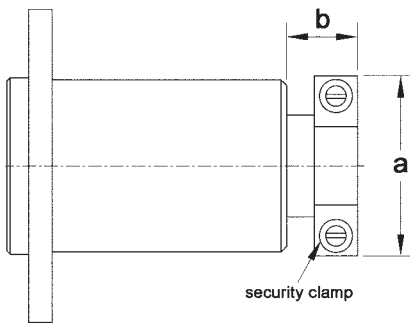


Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	P	Q	Max. revolution (RPM)
F1-HS-10	10C-9020-C010	10	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000
F1-HS-12	10C-9020-C020	12	+0.18 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000
F1-HS-20	10C-9020-C030	20	+0.021 0	62	-0.010 -0.029	64	10	10	106	62	6-Ø7 PD90	28	10	2.1	70	2.7	4,500
F1-HS-24	10C-9020-C040	24	+0.021 0	63	-0.010 -0.029	64	10	10	106	63	6-Ø7 PD90	30	9	2.7	70	2.7	4,500
F1-HS-26	10C-9020-C050	26	+0.021 0	70	-0.010 -0.029	64	10	10	120	70	6-Ø9 PD100	32	9	2.7	75	4.1	4,000
F1-HS-32	10C-9020-C060	32	+0.025 0	73	-0.010 -0.029	64	10	10	130	73	6-Ø9 PD110	40	9	2.7	85	4.1	3,000
F1-HS-38	10C-9020-C070	38	+0.025 0	83	-0.036 -0.071	64	10	10	136	83	6-Ø9 PD114	50	9	2.7	90	2.7	3,000
F1-HS-40	10C-9020-C080	40	+0.025 0	83	-0.036 -0.071	64	10	10	136	83	6-Ø9 PD114	50	9	2.7	90	2.7	3,000
F1-HS-50	10C-9020-C090	50	+0.025 0	95	-0.012 -0.034	82	10	10	140	95	6-Ø9 PD124	60	10	2.7	100	2.7	2,500
F1-HS-75	10C-9020-C100	75	+0.025 0	126	-0.014 -0.039	92	10	15	180	126	6-Ø11 PD160	90	10	2.7	135	2.7	1,800

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1-HS / RMS-F1-HS-C Series

Rotary feedthroughs with hollow shaft, flange and safety clamp



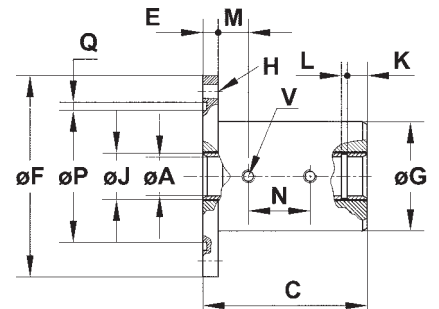
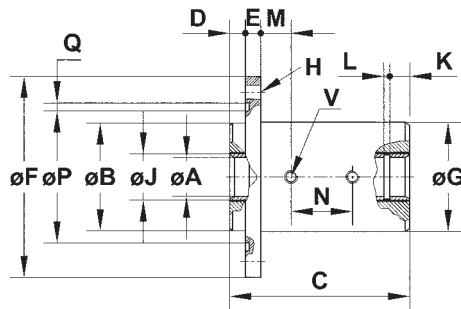
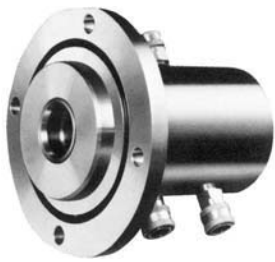
Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	P	Q	Max. revolution (RPM)	a	b
F1-HS-10-C	10C-9020-D010	10	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000	38	12
F1-HS-12-C	10C-9020-D020	12	+0.18 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000	38	15
F1-HS-20-C	10C-9020-D030	20	+0.021 0	62	-0.010 -0.029	64	10	10	106	62	6-Ø7 PD90	28	10	2.1	70	2.7	4,500	48	15
F1-HS-24-C	10C-9020-D040	24	+0.021 0	63	-0.010 -0.029	64	10	10	106	63	6-Ø7 PD90	30	9	2.7	70	2.7	4,500	52	15
F1-HS-26-C	10C-9020-D050	26	+0.021 0	70	-0.010 -0.029	64	10	10	120	70	6-Ø9 PD100	32	9	2.7	75	4.1	4,000	52	15
F1-HS-32-C	10C-9020-D060	32	+0.025 0	73	-0.010 -0.029	64	10	10	130	73	6-Ø9 PD110	40	9	2.7	85	4.1	3,000	58	15
F1-HS-38-C	10C-9020-D070	38	+0.025 0	83	-0.036 -0.071	64	10	10	136	83	6-Ø9 PD114	50	9	2.7	90	2.7	3,000	66	15
F1-HS-40-C	10C-9020-D080	40	+0.025 0	83	-0.036 -0.071	64	10	10	136	83	6-Ø9 PD114	50	9	2.7	90	2.7	3,000	68	15
F1-HS-50-C	10C-9020-D090	50	+0.025 0	95	-0.012 -0.034	82	10	10	140	95	6-Ø9 PD124	60	10	2.7	100	2.7	2,500	86	18
F1-HS-75-C	10C-9020-D100	75	+0.025 0	126	-0.014 -0.039	92	10	15	180	126	6-Ø11 PD160	90	10	2.7	135	2.7	1,800	118	21

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1-HS-W / RMS-F1-HS-W-C Series

- Housing exposed to atmosphere
- Flange with through hole and o-ring groove
- Construction with or without safety clamp
- Including o-ring seal

Rotary feedthrough with hollow shaft, flange and water cooling

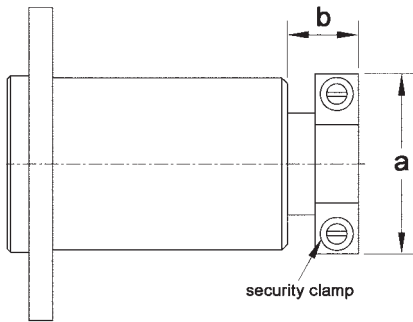


Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	M	N	P	Q	V	Max. revolut. (RPM)
F1-HS-10-W	10C-9020-E010	10	+0.015 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2- Rc1/8	6,000
F1-HS-12-W	10C-9020-E020	12	+0.018 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2- Rc1/8	6,000
F1-HS-20-W	10C-9020-E030	20	+0.021 0	64	-0.010 -0.029	10 5	10	10	116	64	4-Ø9 PD96	28	11	2.1	18	-	70	4.1	2- Rc1/8	6,000
F1-HS-24-W	10C-9020-E040	24	+0.021 0	70	-0.010 -0.029	10 5	10	10	120	76	4-Ø9 PD96	30	10	2.7	16	38	75	4.1	4- Rc1/8	4,000
F1-HS-26-W	10C-9020-E050	26	+0.021 0	70	-0.010 -0.029	116	10	10	130	76	4-Ø9 PD110	32	10	2.7	20	40	85	4.1	4- Rc1/8	4,000
F1-HS-32-W	10C-9020-E060	32	+0.025 0	73	-0.010 -0.029	116	10	10	130	80	6-Ø9 PD110	40	10	2.7	20	38	85	4.1	4- Rc1/8	3,600
F1-HS-38-W	10C-9020-E070	38	+0.025 0	-	-	10 2	-	10	135	90	6-Ø8.5 PD114	50	10	2.7	23	37	80	4.1	4- Rc1/8	3,000
F1-HS-40-W	10C-9020-E080	40	+0.025 0	-	-	10 2	-	10	135	90	6-Ø8.5 PD114	50	10	2.7	23	37	80	4.1	4- Rc1/8	3,000
F1-HS-50-W	10C-9020-E090	50	+0.025 0	105	-0.012 -0.034	110	10	10	155	105	6-Ø9 PD135	60	14	2.7	18	38	110	4.1	4- Rc1/8	2,500
F1-HS-75-W	10C-9020-E100	75	+0.030 0	130	-0.014 -0.039	110	10	12	178	130	6-Ø9 PD160	90	10	2.7	17	36	135	4.1	4- Rc1/8	1,800

Rotary Feedthroughs with Magnetofluid Sealing

RMS-F1-HS-W / RMS-F1-HS-W-C Series

Rotary feedthrough with hollow shaft, flange and water cooling



Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	M	N	P	Q	V	a	b
F1-HS-10-W-C	10C-9020-F010	10	+0.015 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2-Rc1/8	36	12
F1-HS-12-W-C	10C-9020-F020	12	+0.018 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2-Rc1/8	38	12
F1-HS-20-W-C	10C-9020-F030	20	+0.021 0	64	-0.010 -0.029	105	10	10	116	64	4-Ø9 PD96	28	11	2.1	18	-	70	4.1	2-Rc1/8	48	15
F1-HS-24-W-C	10C-9020-F040	24	+0.021 0	70	-0.010 -0.029	105	10	10	120	76	4-Ø9 PD96	30	10	2.7	16	38	75	4.1	4-Rc1/8	52	15
F1-HS-26-W-C	10C-9020-F050	26	+0.021 0	70	-0.010 -0.029	116	10	10	130	76	4-Ø9 PD110	32	10	2.7	20	40	85	4.1	4-Rc1/8	52	15
F1-HS-32-W-C	10C-9020-F060	32	+0.025 0	73	-0.010 -0.029	116	10	10	130	80	6-Ø9 PD110	40	10	2.7	20	38	85	4.1	4-Rc1/8	58	15
F1-HS-38-W-C	10C-9020-F070	38	+0.025 0	-	-	102	-	10	135	90	6-Ø8.5 PD114	50	10	2.7	23	37	80	4.1	4-Rc1/8	66	15
F1-HS-40-W-C	10C-9020-F080	40	+0.025 0	-	-	102	-	10	135	90	6-Ø8.5 PD114	50	10	2.7	23	37	80	4.1	4-Rc1/8	68	18
F1-HS-50-W-C	10C-9020-F090	50	+0.025 0	105	-0.012 -0.034	110	10	10	155	105	6-Ø9 PD135	60	14	2.7	18	38	110	4.1	4-Rc1/8	86	18
F1-HS-75-W-C	10C-9020-F100	75	+0.030 0	130	-0.014 -0.039	110	10	12	178	130	6-Ø9 PD160	90	10	2.7	17	36	135	4.1	4-Rc1/8	118	21

Rotary Feedthroughs with Magnetofluid Sealing

SUPERSEAL Series

Simple rotary feedthrough with bulkhead fitting for wall fastening, with KF or CF flange.



- No internal o-ring seals
- Very low magnetic stray fields
- No magnets inside vacuum
- Rugged stainless steel shafts Ø 6 mm or Ø 8 mm
- Revolution 5000 RPM without load
- Pressure-resistant up to 2.5 bar differential pressure
- Insensitive to external magnetic fields (> 500 Gauss)
- Magnetofluid: synthetic oil or PFPE

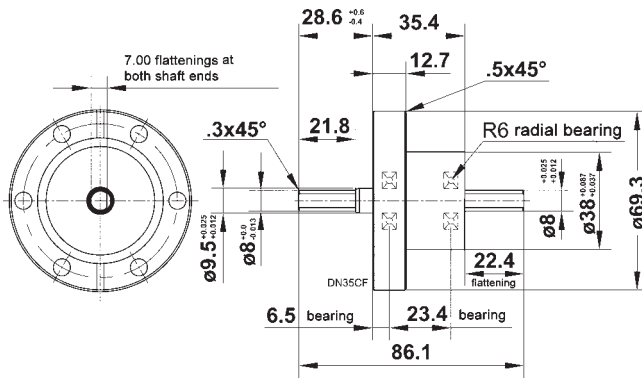
Technical Data

- Transmittable torque
 - shaft Ø 6 mm 5.65 Nm
 - shaft Ø 8 mm 18 Nm
- Max. revolution (loadfree)
 - synthetic oil 5000 RPM
 - PFPE 2500 RPM
- Static friction resistance
 - synthetic oil 7.8 Ncm
 - PFPE 14.2 Ncm
- Rotary friction resistance (100 RPM)
 - synthetic oil 4.3 Ncm
 - PFPE 15.6 Ncm
- Vacuum area
 - synthetic oil up to 10⁻⁸ mbar
 - PFPE up to 10⁻⁹ mbar
- Max. operating temperature
 - synthetic oil 60 °C
 - PFPE 100 °C
- Vapour pressure magnetofluid
 - synthetic oil 10⁻¹⁰ mbar
 - PFPE 10⁻¹² mbar
- Max. pressure difference 2.5 bar
- Helium leakage rate < 5 x 10⁻⁹ mbar l / s
- Material
 - housing/shaft stainless steel 17-4 PH
 - bearing grease Fomblin / Krytox blend
- Vapour pressure grease lubricant 10⁻¹³ mbar
- Max. bearing load (static) 138 kg
- Vacuum side arbitrarily

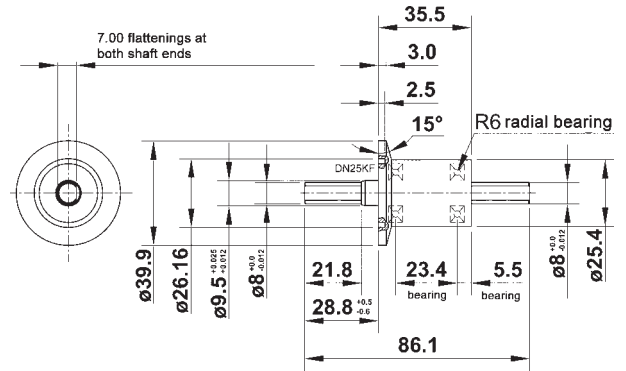
Order code	Vacuum connection	Shaft diameter (mm)	Magnetofluid bearing oil
10C-26100900	DN35CF	8	synthetic oil
10C-26101100	DN25KF	8	synthetic oil
10C-26101400	DN35CF	6	synthetic oil
10C-26101300	DN25KF	6	synthetic oil
10C-26101000	M26	8	synthetic oil
10C-26101200	M26	6	synthetic oil
10C-26100902	DN35CF	8	PFPE
10C-26101102	DN25KF	8	PFPE
10C-26101402	DN35CF	6	PFPE
10C-26101302	DN25KF	6	PFPE
10C-26101002	M26	8	PFPE
10C-26101202	M26	6	PFPE

Rotary Feedthroughs with Magnetofluid Sealing

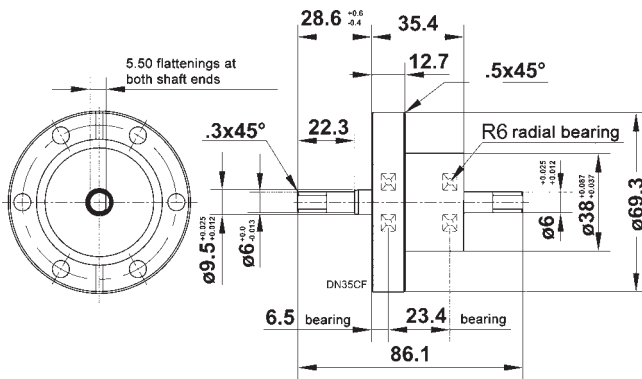
SUPERSEAL Series



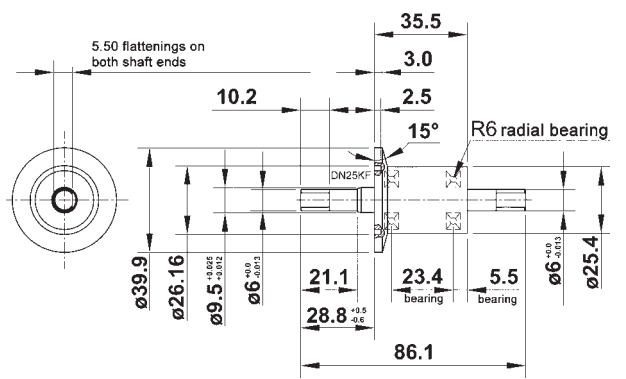
10C-2610090 and 10C-2600902



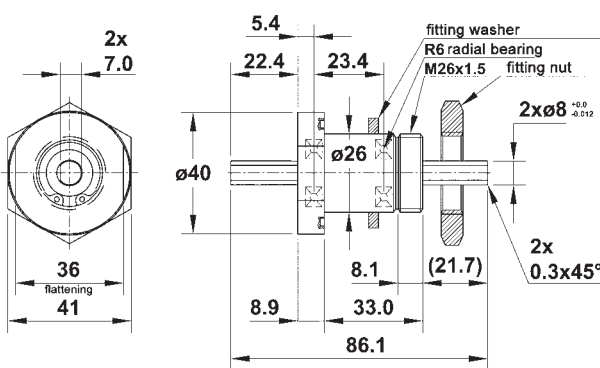
10C-2610110 and 10C-26101102



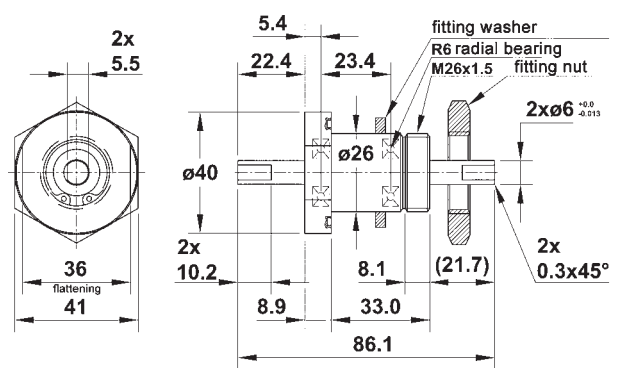
10C-26101400 and 10C-2601402



10C-26101300 and 10C-26101302



10C-26101000 and 10C-2601002



10C-26101200 and 10C-26101202

VACOM offers repair service for magnetofluid feedthroughs of all manufacturers.

Feedthroughs with Magnetically Linked Drive

MagiDrive Series



- Magnets of high-performance materials
- Strong magnetic coupling through the wall of the drive housing
- Housing machined from one piece
- No bellows
- No o-rings
- Complete UHV applicable
- Bakeable
- Low backlash and high precision at low loading or acceleration
- Magnetically protected as standard
- Various options
- Special construction on customer's request

Overview MagiDrive models

Model	Vacuum connection	Max. torque
MD10	DN10CF	0.18 Nm
MD16	DN16CF	0.45 Nm
MD19	DN16CF	0.56 Nm
MD20	DN35CF	0.45 Nm
MD21	DN35CF	0.56 Nm
MD25	DN35CF	2.4 Nm
MD35, MD35H	DN35CF	4.5 Nm
MD64, MD64H	DN65CF	10 Nm
MD100, MD100H	DN100CF	25 Nm



Manual or automated drives

- T = manual with hand wheel
- F = friction brake for manual drive
- B = retaining screw for manual drive
- C = hand wheels with degree scaling (5° alternatively 1° deviation) for manual drives
- RA = pneumatic drive, adjustable 30° - 170°, with air flow regulating valves
- RAI = pneumatic drive similar to RA, with visual position indicator
- P = annulus for toothed belt connection
- IS = stepper motor mounted axially
- SS = stepper motor mounted sideways
- ID = servo motor mounted axially
- SD = servo motor mounted sideways

Feedthroughs with Magnetically Linked Drive

MagiDrive Series



Shaft drives

- **X000** = stub shaft or tubular shaft with mounted flange depending on construction)
- **X030** = extended shaft, fixed, length 30 mm
- **MX000** = exchangeable shaft extension
- **XD** = double sided shaft
- **H** = hollow shafts for coaxial rotations or supplies



Ball bearings

- **Z** = standard bearing (stainless steel, MoS₂ coated)
- **CE** = ceramic, ultra clean, for UHV high temperature applications
- **SE** = special bearing for semiconductor and cryo applications



Order instructions

The MagiDrive order codes consist of 4 parts:

- **Model**
- **Drive**
- **Shaft type**
- **Ball bearing**

There exist different options concerning the drive, the shaft and the ball bearing. The complete order code is created in connection with the model type. Please see possible options in the following table:

MagiDrive model	Drive											Shaft type				Ball bearing		
	manual					automated						X 000	X 030	MX 000	XD	Z	CE	SE
Options	T	F	B	C	P	RA	RAI	IS	SS	ID	SD	X 000	X 030	MX 000	XD	Z	CE	SE
MD10	X											X				X		
MD16	X											X				X		
MD19	X											X				X		
MD20	X											X				X		
MD21	X											X				X		
MD25	X											X				X		
MD35	X											X				X		
MD35H	X											X				X		
MD64	X											X				X		
MD64H	X											X				X		
MD100	X											X				X		
MD100H	X											X				X		

X	= Standard
	= Option
	= not available

Feedthroughs with Magnetically Linked Drive

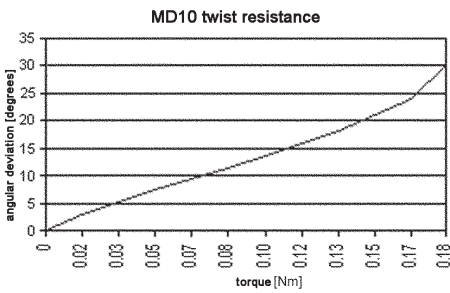
MagiDrive Series with DN10CF Flange Connection



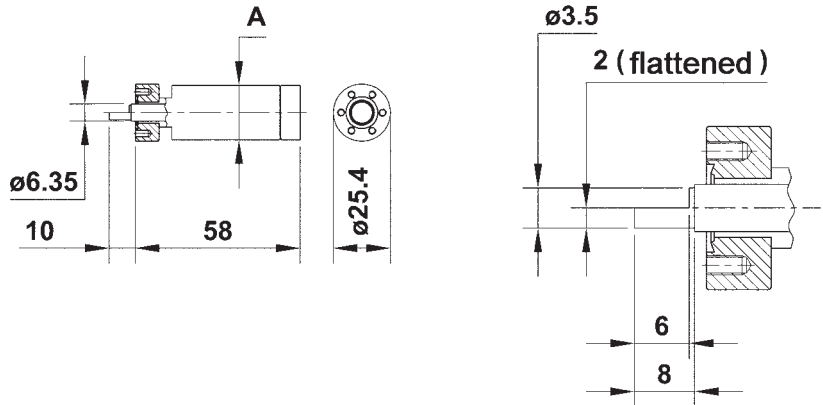
- Smallest possible UHV applicable rotary feedthrough
- Large torque
- Very compact

Technical data

- | | |
|---------------------------|---|
| ■ Model description | MD10 |
| ■ Flange connection | DN10CF |
| ■ Construction | machined from one piece, stainless steel 316L |
| ■ Shaft style | stump, \varnothing 3.5 mm, with flattening |
| ■ Break-away torque | 0.18 Nm |
| ■ Max. no load spin speed | 200 RPM |
| ■ Max. shaft axial thrust | 20 N |
| ■ Bakeout temperature | 250 °C |



Order code	Description
MD10TX000Z	MD10 rotary feedthrough, manual, standard bearing



Feedthroughs with Magnetically Linked Drive

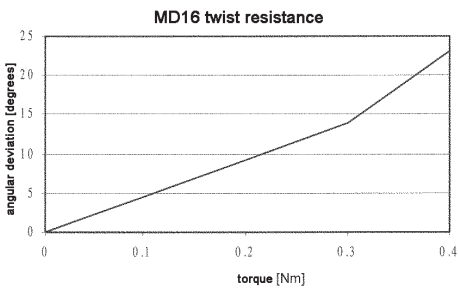
MagiDrive Series with DN16CF Flange Connection



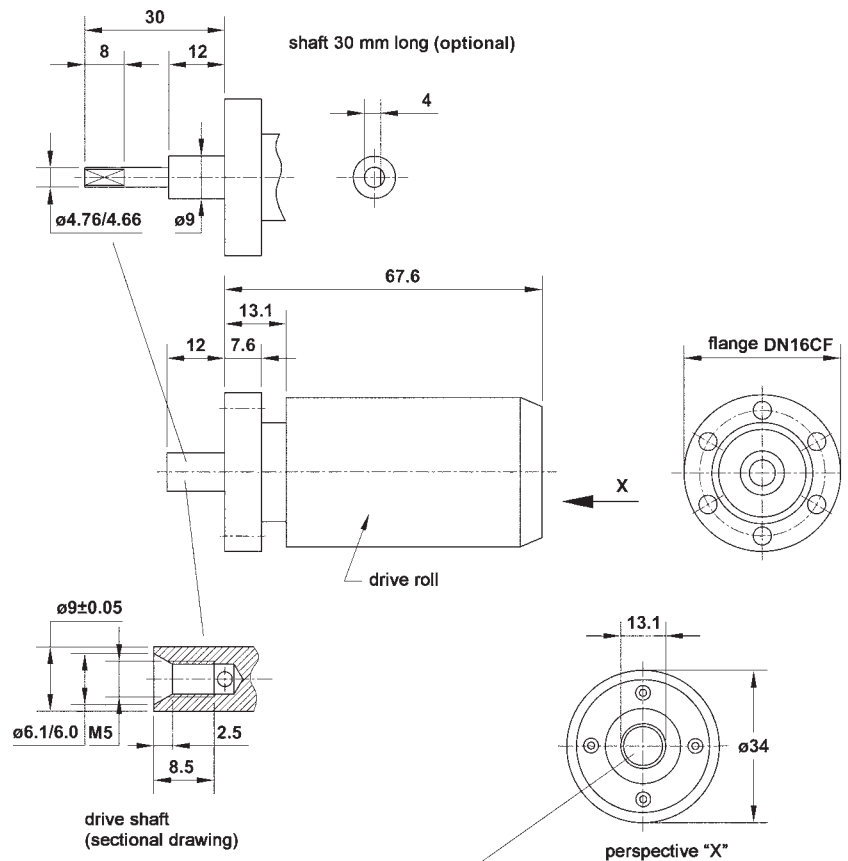
- Two model types MD16 and MD19 with different magnetic forces
- Established and variable usable construction
- Robust and powerful

Technical data

- Flange connection: DN16CF
- Construction: machined from one piece, stainless steel 316L
- Shaft style: stump, Ø 9 mm, with female thread M5
- Break-away torque:
 - Model MD16: 0.45 Nm
 - Model MD19: 0.56 Nm
- Max. no load spin speed: 1000 RPM
- Max. shaft axial thrust: 66 N
- Bakeout temperature: 250 °C



Order code	Description
MD16TX000Z	MD16 rotary feedthroughs, manual, standard bearing
MD19TX000Z	MD19 rotary feedthroughs, manual, standard bearing



You can get access to the screw holes of the flange by loosening the security screw (M3) and removing the drive roll.

Feedthroughs with Magnetically Linked Drive

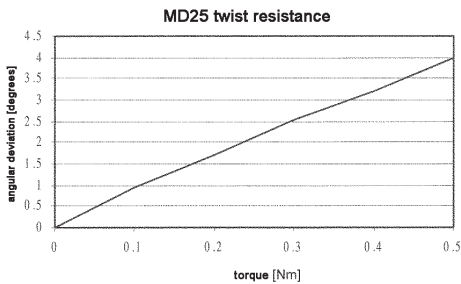
MagiDrive Series with DN35CF Flange Connection



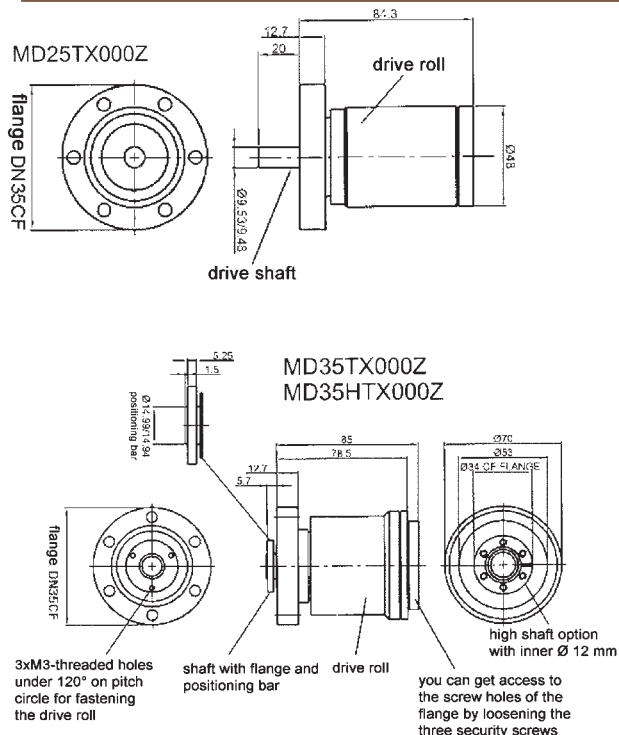
- 5 model types with 4 magnetic forces
- 3 shaft types and axial loadings
- Robust and powerful
- Various options for drives and ball bearings
- Model MD35 optional with back side flange and hollow shaft
- Optionally 2 stepped with 2 coaxial axes of rotation

Technical data

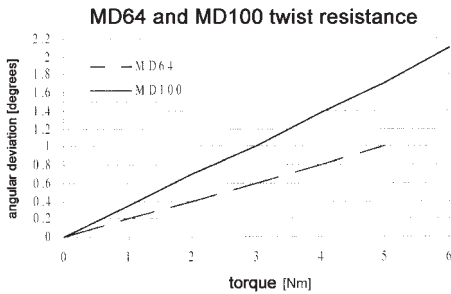
- Flange connection DN35CF
- Rear flange DN16CF (only with MD35H)
- Construction machined from one piece, stainless steel 316L
- Shaft style
 - model MD20/MD21 Ø 9 mm, with female thread M5
 - model MD25 Ø 9.53 mm, solid
 - model MD35/MD35H tubular shaft with mounted flange and 3 x M3 threaded holes
- Break-away torque
 - model MD20 0.45 Nm
 - model MD21 0.56 Nm
 - model MD25 2.4 Nm
 - model MD35/MD35H 4.5 Nm
- Max. no load spin speed 500 RPM
- Max. shaft axial thrust
 - model MD20/MD21 66 N
 - model MD25 100N
 - model MD35/MD35H 200 N
- Bakeout temperature 250 °C



Order code	Description
MD20TX000Z	MD20 , manual, standard bearing
MD21TX000Z	MD21 rotary feedthrough, manual, standard bearing
MD25TX000Z	MD25 rotary feedthrough, manual, standard bearing
MD35TX000Z	MD35 rotary feedthrough, manual, standard bearing
MD35HTX000Z	MD35H rotary feedthrough, manual, with hollow shaft, standard bearing



MagiDrive Series with DN63CF and DN100CF Flange Connection

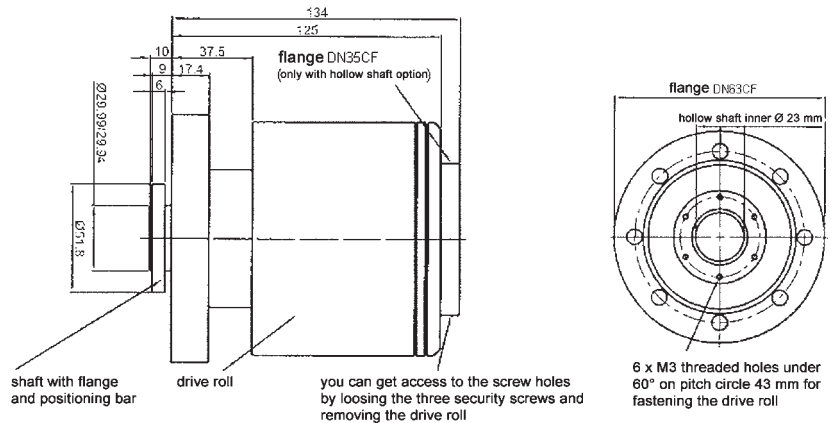


- 2 model types with or without rear flange
- Very large torques
- Optional 2 or 3 stage with 2 or 3 coaxial axis
- Constructed for big loadings

Technical data

- Flange connection
 - model MD64/MD64H DN63 CF
 - model MD100/MD100H DN100CF
- Rear flange DN35CF (MD64H / MD100H only)
- Construction
 - model MD64/MD64H machined from one piece, stainless steel 316L
 - model MD100/MD100H welded housing, stainless steel 316L
- Shaft style tube with mounted flange and 6 x M3 threaded holes
- Break-away torque
 - model MD64/MD64H 10 Nm
 - model MD100/MD100H 25 Nm
- Max. no load spin speed
 - model MD64/MD64H 500 RPM
 - model MD100/MD100H 200 RPM
- Max. shaft axial thrust 400 Nm
- Bakeout temperature 250 °C

Order code	Description
MD64TX000Z	MD64 rotary feedthrough, manual, standard bearing
MD64HTX000Z	MD64 rotary feedthrough, manual, with hollow shaft, standard bearing
MD100TX000Z	MD100 rotary feedthrough, manual, standard bearing
MD100HTX000Z	MD100 rotary feedthrough, manual, with hollow shaft, standard bearing



UHV Rotary Feedthroughs for the Switching between two Definite End Positions



- Pneumatic drive
- Compact
- Robust and reliable
- Powerful
- Adjustable sweep
- Variable speed of actuation

Technical data

- | | |
|------------------------------|--|
| ■ Connection | CF flange |
| ■ Driving principle | pneumatic, double-acting |
| ■ Sweep | 30° - 170°, adjustable end positions |
| ■ Mechanic shaft connection | Ø 9 mm shaft stump with M5 female thread or tube with mounted flange (see MagiDrive) |
| ■ Max. compressed air supply | 6.8 bar |
| ■ Compressed air connection | M5 x 0.8 mm |
| ■ Flow rate regulating valve | 2 pieces |
| ■ Limit switches | 2 Reed switches (optional) |
| ■ Option | baffles and holding fixtures on request |

Order code	Flange connection	Max. torque	End position switch	MagiDrive model
MD10RAX000Z	DN10CF	0.18 Nm	no	MD10
MD10RAIX000Z	DN10CF	0.18 Nm	yes	MD10
MD16RAX000Z	DN16CF	0.45 Nm	no	MD16
MD16RAIX000Z	DN16CF	0.45 Nm	yes	MD16
MD19RAX000Z	DN16CF	0.45 Nm	no	MD19
MD19RAIX000Z	DN16CF	0.45 Nm	yes	MD19
MD20RAX000Z	DN35CF	0.45 Nm	no	MD20
MD20RAIX000Z	DN35CF	0.45 Nm	yes	MD20
MD21RAX000Z	DN35CF	0.45 Nm	no	MD21
MD21RAIX000Z	DN35CF	0.45 Nm	yes	MD21
MD25RAX000Z	DN35CF	1 Nm	no	MD25
MD25RAIX000Z	DN35CF	1 Nm	yes	MD25
MD35RAX000Z	DN35CF	2.5 Nm	no	MD35
MD35RAIX000Z	DN35CF	2.5 Nm	yes	MD35
MD64RAX000Z	DN64CF	10 Nm	no	MD64
MD64RAIX000Z	DN64CF	10 Nm	yes	MD64

Port Aligners

with Diaphragm Bellows for Length and Angle Compensation



- Robust
- Compact
- Highly stressable

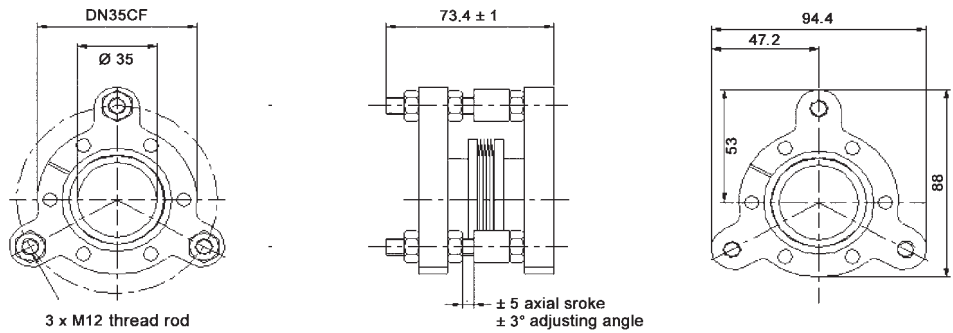
Technical data

- Axial stroke ±5 mm
- Adjustment angle ±3°
- Material bellows stainless steel 316L
- Material flange stainless steel 316L
- Bakeout temperature 250 °C

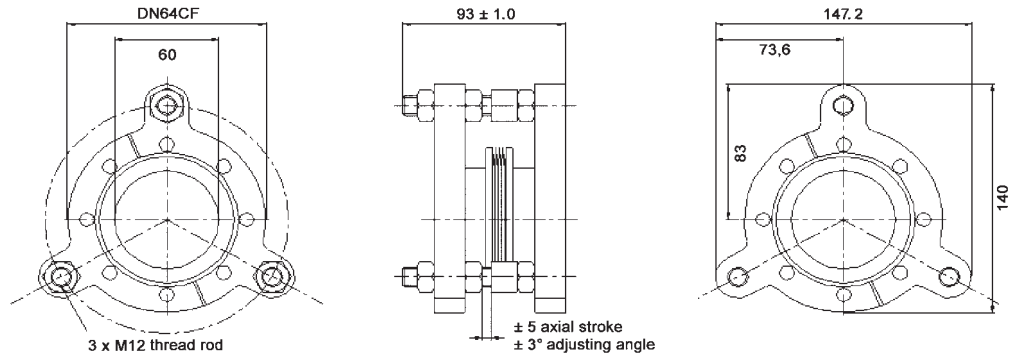
Order code	Mounting flange	Screws / holes	Clear inner diameter
PA-35	DN35CF	Ø 6.4 mm	38 mm
PA-35T	DN35CF	M6	38 mm
PA-64	DN63CF	Ø 8.4 mm	65 mm
PA-64T	DN63CF	M8	65 mm
PA-100	DN100CF	Ø 8.4 mm	102 mm
PA-100T	DN100CF	M8	102 mm

Further dimensions on request.

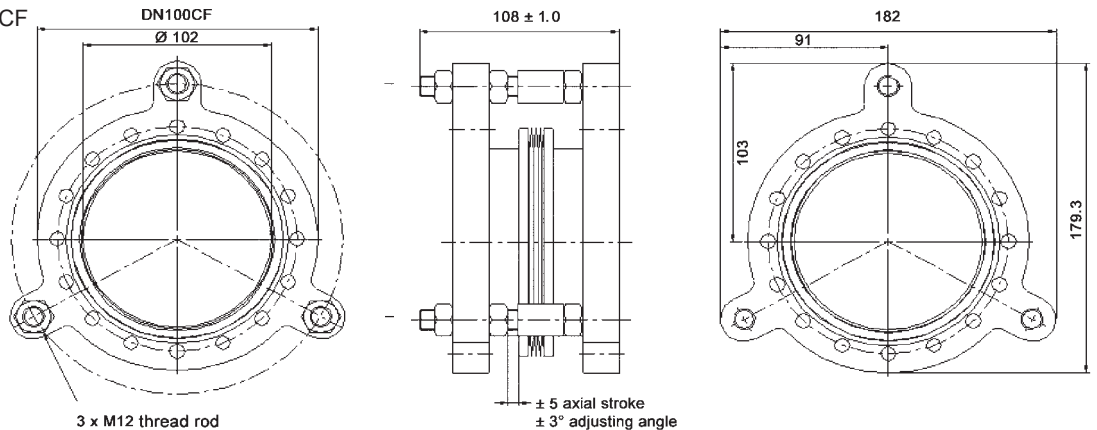
Mounting flange: DN35CF



Mounting flange: DN63CF



Mounting flange: DN100CF



Shifts for Motion along the Z Axis



- Diaphragm bellow seal
- Robust
- Precise and smooth-running
- Reproducible
- Completely UHV applicable
- Various driving possibilities
- 5 model series

Technical data

- Material diaphragm bellow
- Bakeout temperature
- Life cycle (diaphragm bellow)
- Z stroke

- Drives

- Accuracy

stainless steel 316L
 250°C (without motor or pneumatic)
 10,000 cycles (optional to 1 mio.)
 25 mm to 1000 mm (depending on series)
 manual, pneumatic, stepper or servo motor
 10 µm (optional)

Model Series

7

Model LSM



- Standard construction for all applications
- Largest number of flange connections, DN10 to DN150
- Largest number of actuation options
- Up to 350 mm standard stroke
- Flange with threaded holes

Model HLSM



- Mostly identical in construction with model LSM
- Nominal width DN63 to DN150 (nominal width DN63 with 60 mm or 65 mm pass)
- Up to 350 mm standard stroke
- Flange exposed to installation with through bolt holes

Model LSMT



- Complies with model LSM, but with adjusting bellow (tilt) on the travelling flange
- Nominal width DN35 and DN63
- Up to 100 mm standard stroke
- Flanges with threaded hole

Linear Shifts

Shifts for Motion along the Z Axis

Model CLSM



- Compact construction with short mounting length
- Nominal width DN 38 and DN63
- Up to 100 mm standard stroke
- Flanges with threaded holes

Model LSML



- Construction for long movements
- Strengthened frame structure
- Nominal width DN35 and DN63
- 250 mm to 1000 mm standard stroke
- Flanges with threaded holes

Drive Types

Manual Drive:



- For all series
- Hand wheel
- From nominal width DN100 with gear ratio

Pneumatic Drive:



- For LSM, LSMT and LSMX series
- For nominal width DN16, DN35 and DN63 (LSMT only DN35)

Shifts for Movements along the Z Axis

Servo or stepper motor:



- For all model series
- Motor side-mounted with toothed belt
- From nominal width DN35
- Including 2 limit switches
- Controllers optional

Order instructions

The order number consists of 4 parts:

- Model
- Flange codes
- Axial stroke in mm
- Drive codes

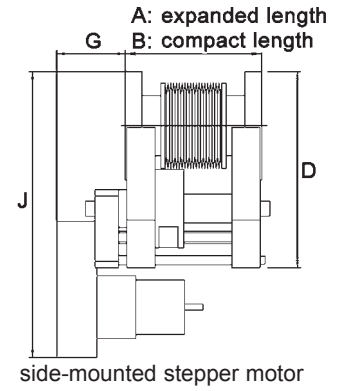
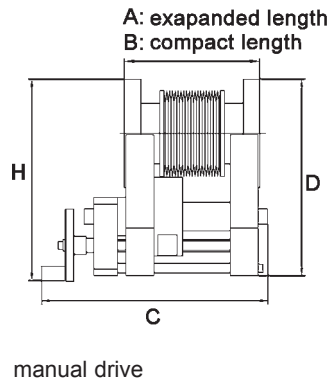
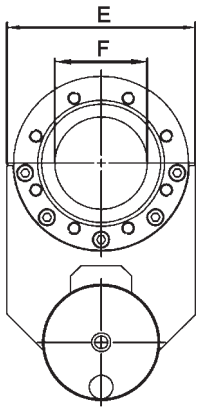
Model	Flange codes	Clear inner Ø (mm)	Axial stroke (mm)	Drive codes
LSM	10	8	25	H
	16	16	25, 50, 100	H, P
	38	38	25, 50, 100, 150, 200, 300, 350	H, P, SD, SS
	64	65	25, 50, 100, 150, 200, 300, 350	H, SD, SS, P
	100	102		GH, SD, SS
	150	149		
HLSM	38	38	25, 50, 100, 150, 200	H, SD, SS, P
	64	63		
	100	102		
	150	149		
LSMT	39	38	50, 100	H, P, SD, SS
	64	65		H, SD, SS, P
CLSM	38	39	25, 50, 75, 100	H, SD, SS
	64	65		
LSML	38	38	250 to 1000	H, SD, SS
	64	65	250 to 1000	

Flange codes	Flange
10	DN10CF
16	DN16CF
38	DN35CF
60	DN63CF
64	DN63CF
100	DN100CF
150	DN150CF

Drive codes	Drive
H	manual with hand wheel
GH	hand wheel with gear ratio 5:1
P	pneumatic
SD	side-mounted 24 V DC servo motor
SS	side-mounted stepper motor

Dimensions

LSM dimensions

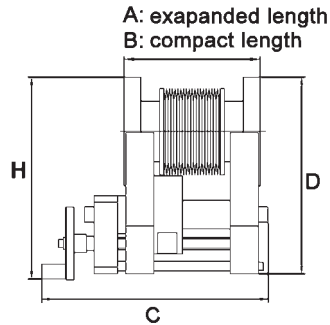
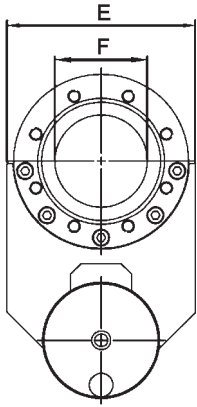


Order code	A	B	C	D	E	F	G	H	J
LSM10-25	77.3	52.3	95	65.2	25.4	8	-	-	60.7
LSM16-25	55	30	89.7	82.3	35	16	-	-	77.8
LSM38-25	98.7	73,7	180	155.2	75	38	74.3	249	163.4
LSM38-50	123.7	73,7	205	155.2	75	38	74.3	249	163.4
LSM38-100	187	87	268	155.2	75	38	74.3	249	163.4
LSM38-150	250	100	331	155.2	75	38	74.3	249	163.4
LSM38-200	312.5	112.5	394	155.2	75	38	74.3	249	163.4
LSM38-300	440	140	521	155.2	75	38	74.3	249	163.4
LSM38-350	500	150	584	155.2	75	38	74.3	249	163.4
LSM64-25	136	111	232	203	122.5	60	72	298	212
LSM64-50	161	111	257	203	122.5	60	72	298	212
LSM64-100	211	111	306	203	122.5	60	72	298	212
LSM64-200	261	111	358	203	122.5	60	72	298	212
LSM64-150	325.3	125.3	412.6	203	122.5	60	72	298	212
LSM100-25	175	150	287.5	266.5	177	102	on request	on request	273
LSM100-50	200	150	312.5	266.5	177	102	on request	on request	273
LSM100-100	250	150	362.5	266.5	177	102	on request	on request	273
LSM100-150	313	163	425.5	266.5	177	102	on request	on request	273
LSM100-200	384	184	497	266.5	177	102	on request	on request	273
LSM150-25	176	151	288	305	229	149	on request	on request	311
LSM150-50	201	151	313	305	229	149	on request	on request	311
LSM150-100	251	151	363	305	229	149	on request	on request	311
LSM150-150	301	151	413	305	229	149	on request	on request	311
LSM150-200	362	162	474	305	229	149	on request	on request	311

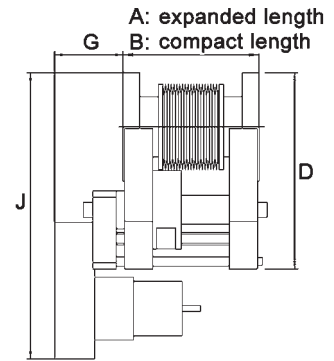
all dimensions in mm

Dimensions

HLSM dimensions



manual drive



side-mounted stepper motor

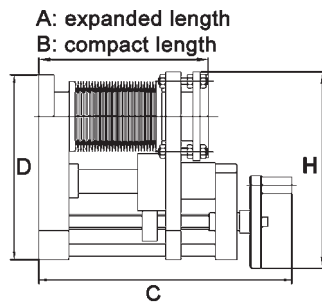
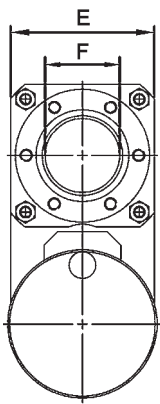
Order Code	A	B	C	D	E	F	G	H	J
HLSM60-25	136	111	232	203	122.5	60	72	298	212
HLSM60-50	161	111	258	203	122.5	60	72	298	212
HLSM60-100	211	111	308	203	122.5	60	72	298	212
HLSM60-150	261	111	358	203	122.5	60	72	298	212
HLSM60-200	325.3	125.3	421.6	203	122.5	60	72	298	212
HLSM64-25	136	111	232	203	122.5	65	72	298	212
HLSM64-50	161	111	258	203	122.5	65	72	298	212
HLSM64-100	211	111	308	203	122.5	65	72	298	212
HLSM64-150	274	124	370	203	122.5	65	72	298	212
HLSM64-200	336	136	432.5	203	122.5	65	72	298	212
HLSM100-25	175	150	287.5	266.5	177	102	on request	on request	273
HLSM100-50	200	150	312.5	266.5	177	102	on request	on request	273
HLSM100-100	250	150	362.5	266.5	177	102	on request	on request	273
HLSM100-150	313	163	425.5	266.5	177	102	on request	on request	273
HLSM100-200	384	184	497	266.5	177	102	on request	on request	273
HLSM150-25	176	151	288	305	229	149	on request	on request.	311
HLSM150-50	201	151	313	305	229	149	on request	on request	311
HLSM150-100	251	151	363	305	229	149	on request	on request	311
HLSM150-200	365	165	477	305	229	149	on request	on request	311

all dimensions in mm

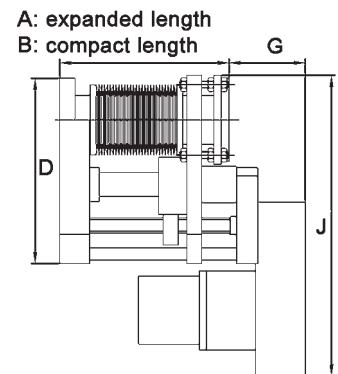
Linear Shifts

Dimensions

LSMT dimensions



manual drive

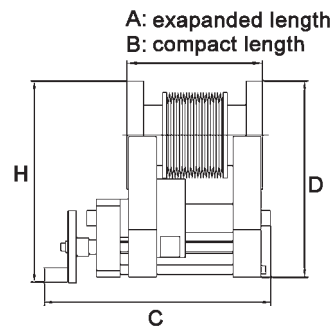
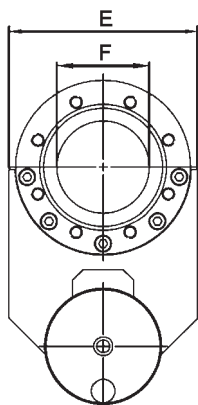


side-mounted stepper motor

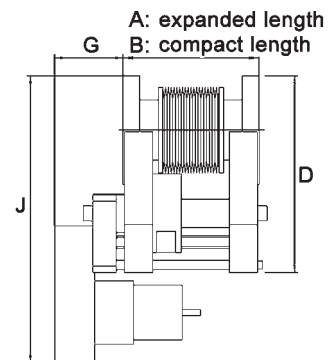
Order code	A	B	C	D	E	F	G	H	J
LSMT40-50	142	92	212.4	155.2	75	38.8	55.7	215	166

all dimensions in mm

CLSM dimensions



manual drive



side-mounted stepper motor

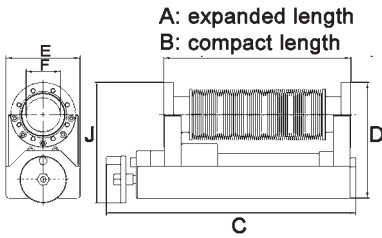
Order code	A	B	C	D	E	F	G	H	J
CLSM64-25	106	81	220	206	122.5	60	72	298	215
CLSM64-50	131	81	245	206	122.5	60	72	298	215
CLSM64-75	156	81	270	206	122.5	60	72	298	215

all dimensions in mm

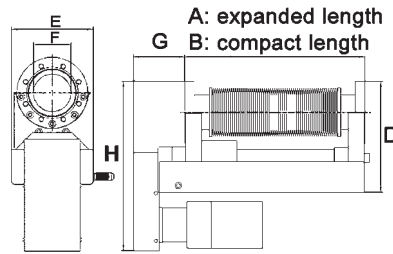
Linear Shifts

Dimensions

LSML38 dimensions



manual drive



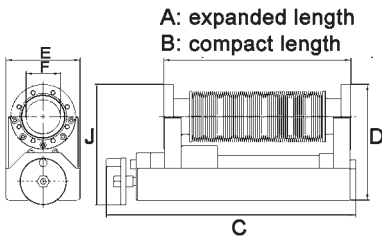
side-mounted stepper motor

Order Code	A	B	C	D	E	F	G	H	J
LSML38-250	390	140	470.4	161	97	35.7	71.3	266	163.4
LSML38-400	577.5	177.5	658	161	97	35.7	71.3	266	163.4
LSML38-500	702.5	202.5	783	161	97	35.7	71.3	266	163.4

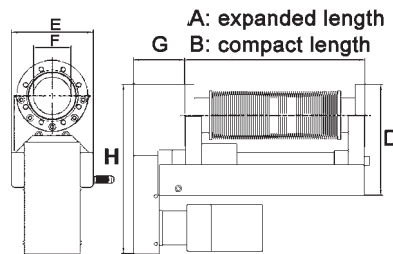
all dimensions in mm

7

LSML64 dimensions



manual drive



side-mounted stepper motor

Order code	A	B	C	D	E	F	G	H	J
LSML64-250	401	151	497.3	204	131	65	60	311	212
LSML64-400	384	184	680.3	204	131	65	60	311	212
LSML64-600	843.5	243.5	922.4	204	131	65	60	311	212

all dimensions in mm

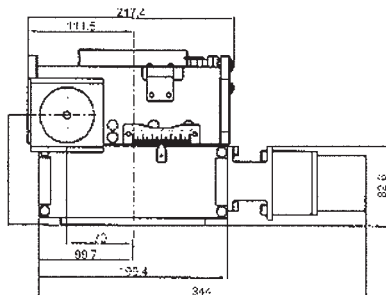
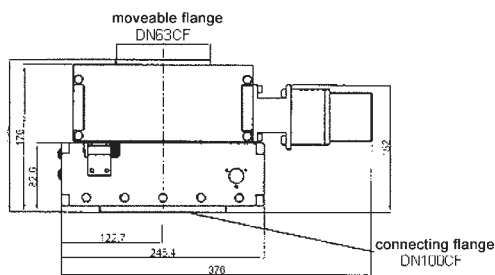
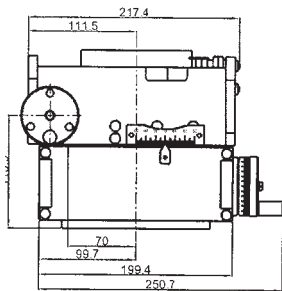
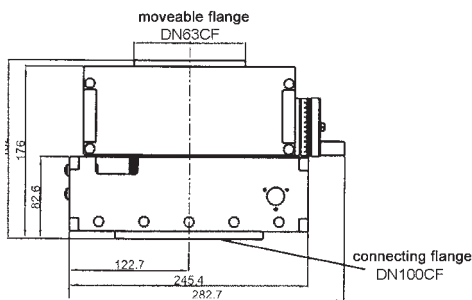
Translators for 2-axle Linear Motion in a Plane



- Mounting flange DN63CF or DN100CF
- Diaphragm bellow sealed
- Robust
- Precise and smooth-running
- Reproducible
- Complete UHV applicable
- Hand or stepper motor drive

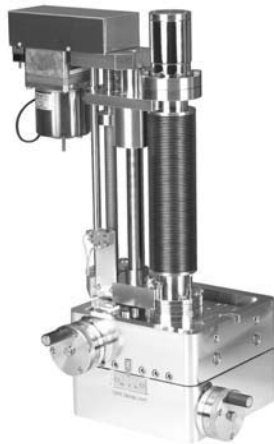
Technical data

- XY stroke
 - model XY64/35 ±10 mm (±14 mm vectorial)
 - model XY100/64 ±22 mm (±31 mm vectorial)
- Fixed flange
 - model XY64/35 DN63CF (screw orientation shifted; M8 threaded holes)
 - model XY100/64 DN100CF (screw orientation shifted; M8 threaded holes)
- Travelling flange
 - model XY64/35 DN35CF (screw orientation shifted; M6 threaded holes)
 - model XY100/64 DN63CF (screw holes shifted; M8 threaded holes)
- Maximal loading
 - model XY64/35 10 N (horizontal mounting), 50 N (perpendicular mounting)
 - model XY100/64 20 N (horizontal mounting), 100 N (perpendicular mounting)
- Inner diameter
 - model XY64/35 bellow 51 mm, flange 38 mm
 - model XY100/64 bellow 90 mm, flange 60 mm
- Diaphragm bellow
 - stainless steel 316L
- Angular deviation under load
 - model XY64/35 < 0.1°
 - model XY100/64 < 0.06°
- XY resolution
 - 0.01 mm with manual drive
 - 0.005 mm with stepper motor
- XY accuracy
 - ±0.01 mm
- Compression under vacuum
 - < 0.2 mm
- Bakeout temperature
 - 250 °C (motor drive dismantled)
- Driving options
 - hand wheel with micrometer scala
 - stepper motor with gear



Order code	Fixed flange	Drive
XY64/35-H	DN63CF	hand wheel
XY64/35-IS	DN63CF	stepper motor
XY100/64-H	DN100CF	hand wheel
XY100/64-IS	DN100CF	stepper motor

Modular Translators for Generating Linear Motion along all 3 Axes



- Combination of Z linear stage and XY stages
- 2 XY stage models
- Up to 1000 mm Z stroke
- Highly stressable
- Separate diaphragm bellows for motion in XY and Z (exchangeable)
- Optionally manual or motor drive

Technical data

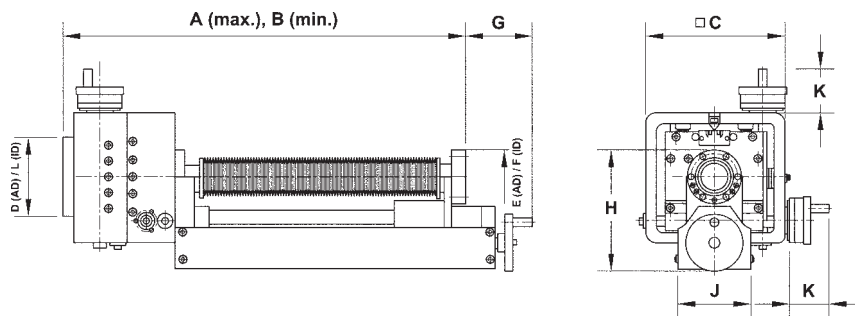
- XY stroke
 - model XYZ14 ±14 mm, vectorial added (±10 mm X and Y)
 - model XYZ31 ±31 mm, vectorial added (±22 mm X and Y)
- XY stroke resolution
 - manual drive 5 µm
 - stepper motor 2.5 µm (semi step mode)
- XY stroke accuracy ±10 µm
- Z stroke 50 mm to 1000 mm
- Z stroke resolution
 - manual drive 1mm (optional 10 µm with digital linear scale)
 - stepper motor 2.5 µm (semi step mode)
- Z stroke accuracy ±10 µm (optional)
- Material diaphragm bellows stainless steel 316L
- Mounting position any, without fixture
- Bakeout temperature 250 °C

7

Order code	Z stroke	Fixed flange	Travelling flange	Drive
XY14H-Z50H	50 mm	DN63CF with M8 threaded holes, shifted orientation	DN35CF with M6 threaded holes, shifted orientation	manual
XY14H-Z100H	100 mm			
XY14H-Z200H	200 mm			
XY14H-Z400H	400 mm			
XY14H-Z600H	600 mm			
XY14H-Z1000H	1000 mm			
XY31H-Z50H	50 mm	DN150CF with M8 threaded holes, shifted orientation	DN63CF with M8 threaded holes, shifted orientation	
XY31H-Z100H	100 mm			
XY31H-Z200H	200 mm			
XY31H-Z400H	400 mm			
XY31H-Z600H	600 mm			
XY31H-Z1000H	1000 mm			

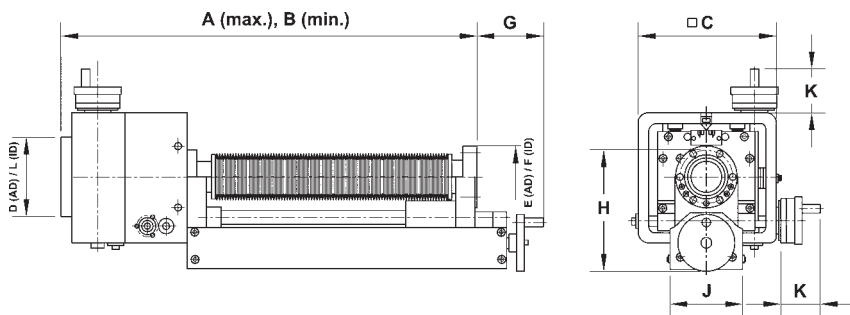
XYZ Translators

Modular Translators for Generating Linear Motion along all 3 Axes



Order code	A	B	C	D	E	F	G	H	J	K	L
XY14H-Z50H	270.7	220.7	178.6	Ø114	Ø70	35	81	163	75	57.5	38
XY14H-Z100H	334	234	178.6	Ø114	Ø70	35	81	163	75	57.5	38
XY14H-Z200H	489.5	259.5	178.6	Ø114	Ø70	35	81	163	75	57.5	38
XY14H-Z400H	704.5	304.5	178.6	Ø114	Ø70	35	81	161	102.5	57.5	38
XY14H-Z600H	950.5	350.5	178.6	Ø114	Ø70	35	81	161	102.5	57.5	38
XY14H-Z1000H	1442.5	442.5	178.6	Ø114	Ø70	35	81	161	102.5	57.5	38

all dimensions in mm



Order code	A	B	C	D	E	F	G	H	J	K	L	M	N
XY31H-Z50H	343	293	231.4	Ø152.4	Ø114	60	88	212	122.5	70,5	60	57.5	213.4
XY31H-Z100H	393	293	231.4	Ø152.4	Ø114	60	88	212	122.5	70,5	60	57.5	213.4
XY31H-Z200H	505	305	231.4	Ø152.4	Ø114	60	88	212	122.5	70,5	60	57.5	213.4
XY31H-Z400H	745	345	231.4	Ø152.4	Ø114	60	88	212	131	70,5	60	57.5	213.4
XY31H-Z600H	981	381	231.4	Ø152.4	Ø114	60	88	212	131	70,5	60	57.5	213.4
XY31H-Z1000H	1454	454	231.4	Ø152.4	Ø114	60	88	212	131	70,5	60	57.5	213.4

all dimensions in mm

Rotary Linear Feedthroughs

Wobble-Stick Feedthroughs for Linear and Rotary Motion with Magnetically Linked Drive

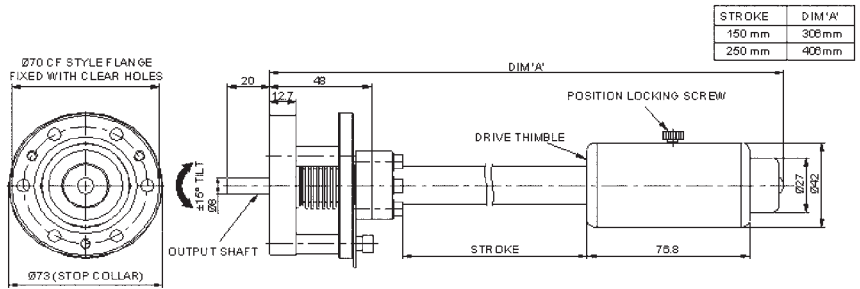


- Small and compact
- UHV applicable
- Bakeable
- Linear travel 150 mm or 250 mm

Technical data

- | | |
|---------------------------------|---------------------|
| ■ Mounting flange | DN35CF |
| ■ Driveshafts | hollow shaft Ø 8 mm |
| ■ Axial force | 65 N |
| ■ Torque | 0.45 Nm |
| ■ Suggested maximum sample mass | 260 g |
| ■ Maximum bakeout temperature | 250 °C |
| ■ Tilt | ±15° |

Order code	Mounting flange	Stroke
WSLR-150-H	DN35CF	150 mm
WSLR-250-H	DN35CF	250 mm



Rotary Linear Feedthroughs

Feedthroughs for Linear and Rotary Motion with Magnetically Linked Drive



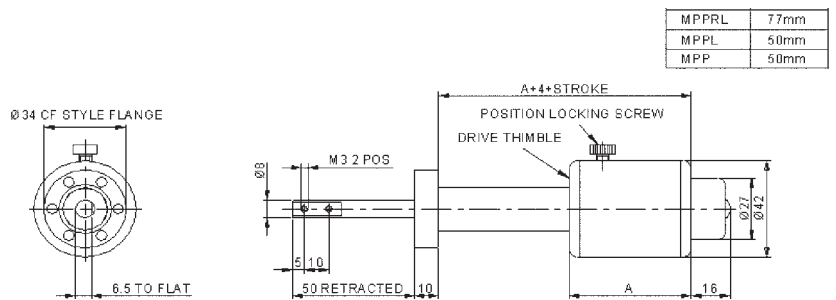
- Three types
 - Model MPPRL linear and rotary motion
 - Model MPPL linear motion - vacuum shaft guided internally
 - Model MPP linear motion - unguided vacuum shaft
- Small and compact
- UHV applicable
- Smooth operation
- Bellow-free construction
- Bakeable
- Linear travel 50 mm to 250 mm

Technical data

- Mounting flange DN16CF
- Driveshafts hollow shaft \varnothing 8 mm, with flat area and 2 x M3 tapped holes
- Axial force 98 N
- Torque 0.45 Nm
- Position fixing locking screw for linear motion only (free rotating shaft)
- Maximum bakeout temperature 250 °C
- Options mounting flange DN35, DC motor or stepper motor

Order code	Mounting flange	Stroke
MPPRL-50-H	DN16CF	50 mm
MPPRL-100-H	DN16CF	100 mm
MPPRL-150-H	DN16CF	150 mm
MPPRL-200-H	DN16CF	200 mm
MPPL-50-H	DN16CF	50 mm
MPPL-100-H	DN16CF	100 mm
MPPL-150-H	DN16CF	150 mm
MPPL-200-H	DN16CF	200 mm
MPP-50-H	DN1CF	50 mm
MPP-100-H	DN16CF	100 mm
MPP-150-H	DN16CF	150 mm
MPP-200-H	DN16CF	200 mm

7



Rotary Linear Feedthroughs

Model GMVT

Light transfer rod with constructively separated combination of linear translation and rotation

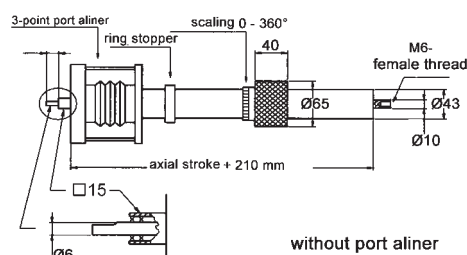
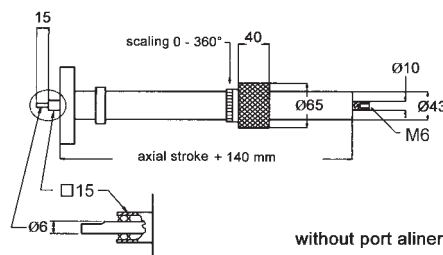


- Especially suited for light samples and small loadings
- Absolutely UHV applicable
- Rotation constructively separated from the linear translation
- SmCo magnets
- 360° degree scale for rotations
- Adjustable stop rings
- Optional with 3 point aligner

Technical data

- Stroke 300 - 900 mm
- Materials
 - flange, housing and shafts stainless steel 1.4301
 - magnets SmCo
- Bakeout temperature max. 250 °C
- Axial force max. 61 N (static)
(stronger force on request)
- Torque max. 1.6 Nm (static)
(higher torque on request)
- Mounting flange DN40CF alternatively DN63CF
- Driveshafts round shaft Ø 6.0 mm in
square pipe 15.0 x 15.0 mm²
- Total length axial stroke (mm) +120 mm

Order code	Axial stroke	Mounting flange	Aligner
GMVT-T40-300	300 mm	DN40CF	no
GMVT-T40-500	500 mm	DN40CF	no
GMVT-T40-700	700 mm	DN40CF	no
GMVT-T63-700	700 mm	DN63CF	no
GMVT-T63-900	900 mm	DN63CF	no
GMVT-J-T40-300	300 mm	DN40CF	yes
GMVT-J-T40-500	500 mm	DN40CF	yes
GMVT-J-T40-700	700 mm	DN40CF	yes
GMVT-J-T63-700	700 mm	DN63CF	yes
GMVT-J-T63-900	900 mm	DN63CF	yes



Rotary Linear Feedthroughs

Feedthroughs for Linear and Rotary Motion with Magnetically Linked Drive



- Linear motion with or without rotation
- Heavy construction, useful for heavy loadings
- Completely UHV applicable
- Round stainless steel shaft
- Large axial force (180 N standard)
- Optionally 2 further sizes selectable (70 N or 310 N)
- Very high torque
- Small deflection
- Robust, precise and reproducible
- Suitable to horizontal and vertical mounting
- Retaining screw for position fixing
- Bakeable

Model Series

Model LPP



- Linear motion only
- Stroke up to 1219 mm
- Mounting flange DN35CF
- Driveshaft \varnothing 15 mm with M8 inner thread and guidance for linear motion
- Optional drive with servo or stepper motor

Model PP35 and PP64



- Linear and rotational motion combined
- Stroke up to 1219 mm with PP35
- Stroke 1524 mm with PP64
- Mounting flange DN35CF alternatively DN63CF
- Large torque of 4 Nm
- Driveshaft \varnothing 15 mm with M8 inner thread

Model ASPP



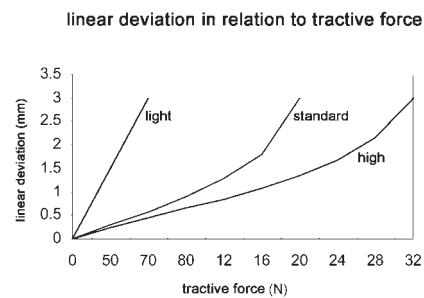
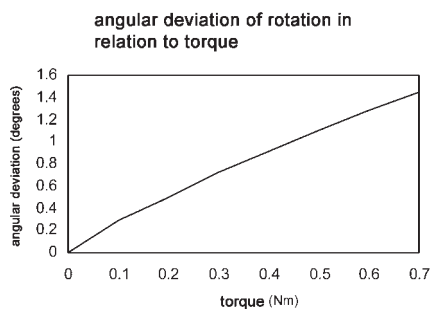
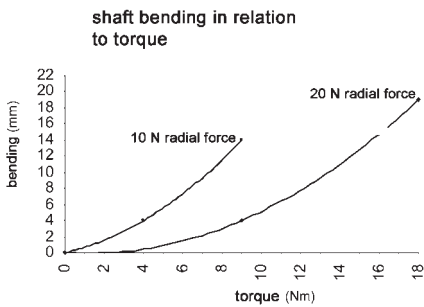
- As PP35, but with two fixing possibilities for rotation and/or linear motion. Either linear motion, rotation or both combined.

Model EPP



- Linear motion only, but equipped with additional mechanics at the end of the shaft to lift and lower samples (± 5 mm stroke).

Feedthroughs for Linear and Rotational Motion with Magnetically Linked Drive



Driving options

- Manual (all model series) = "H"
- Manual with 2 bakeable limit switches (series LPP and PP35) = "HR"
- Servo motor 24 VDC with 2 bakeable limit switches (series LPP) = "SD"
- Stepper motor with 2 bakeable limit switches (series LPP) = "SS"

Technical data

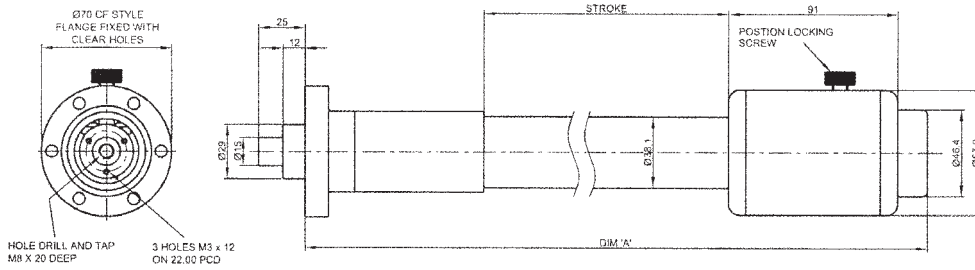
- Function
 - model LPPL, LPP, LPPH linear motion
 - model PPL35, PP35, PP35H, PP64 linear motion and rotation
- Mounting flange
 - DN35CF (besides model PP64)
 - DN63CF (model PP64)
- Axial force
 - model LPPL, PPL35 70 N
 - model LPP, PP35, PP64 180 N
 - model LPPH, PP35H 310 N
- Torque
 - 4 Nm (only models PP**)
- Maximal torque with horizontal fixing
 - see figures
- Maximal loading with perpendicular fixing
 - model LPPL, PPL35 not recommended
 - model LPP, PP35, PP64 36 N
 - model LPPH, PPH35 62 N
- Driving options
 - model LPPL, LPP, LPPH H, HR, SD, SS
 - model PPL35, PP35, PP35H H, HR
 - model PP64 H
- Bakeout temperatures
 - 250 °C
- Position fixing
 - thumbscrew
- Standard construction
 - hand wheel "H", axial force 180 N (other models on request)

Order code	Axial stroke	Mounting flange
LPP-250-H	254 mm (10")	DN35CF
LPP-304-H	304 mm (12")	DN35CF
LPP-457-H	457 mm (18")	DN35CF
LPP-609-H	609 mm (24")	DN35CF
LPP-914-H	914 mm (36")	DN35CF
LPP-1219-H	1219 mm (48")	DN35CF
PP35-304-H	304 mm (12")	DN35CF
PP35-457-H	457 mm (18")	DN35CF
PP35-609-H	609 mm (24")	DN35CF
PP35-914-H	914 mm (36")	DN35CF
PP35-1219-H	1219 mm (48")	DN35CF
PP64-1524-H	1524 mm (60")	DN63CF

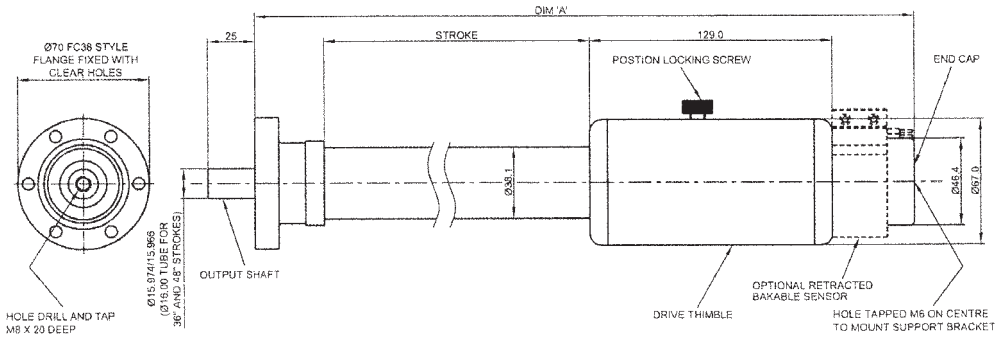
Rotary Linear Feedthroughs

Feedthroughs for Linear and Rotary Motion with Magnetically Linked Drive

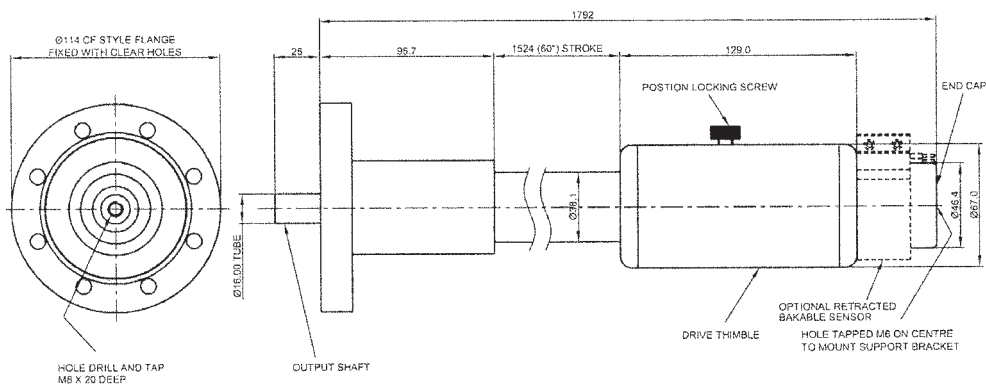
Linear Transfer Rod Model LPPL



Transfer Rod Models PPL35, PP35 and PPH35



Transfer Rod Model PP64



MultiCentre UHV Manipulators for Research and Development



- Sample heating using PgG heating units
- LN₂ sample cooling without capillar supplies
- Sample holder electrically isolable
- Translation in all 3 dimensions
- Up to 3 rotation axes
- High resolution and precision
- Manual or motor drive
- Sample transfer possible
- Individual customised solutions

Technical data

- | | |
|------------------------------|---|
| ■ XY stroke | ±14 mm, vectorial added (±10 mm X and Y) or
±31 mm, vectorial added (±22 mm X and Y) |
| ■ XY stroke resolution | |
| - manual drive | 5 µm |
| - stepper motor | 2.5 µm (semi stepped mode) |
| ■ XY stroke accuracy | ±10 µm |
| ■ Z stroke | 50 mm to 1000 mm |
| ■ Z stroke resolution | |
| - manual drive | 1 mm (optional 10 µm with digital linear scale) |
| - stepper motor | 2.5 µm (semi stage mode) |
| ■ Z stroke accuracy | ±10 µm (optional) |
| ■ Material diaphragm bellows | stainless steel 316L |
| ■ Mounting position | any, without support |
| ■ Bakeout temperature | 250 °C |
| ■ Sample rotation | max. 2 rotation axis
(manual or motor-driven) |
| ■ Sample heating (optional) | 1000 °C max. |
| ■ Sample cooling (optional) | liquid nitrogen (LN ₂) |

7



EpiCentre Heater Manipulators for Coating Processes

Manipulators for sample heating in MBE, CVD and sputter processes or other applications with heated samples.



- 3 model series - EpiCentre Model 100, Model 342 and Model 282
- Sample heating up to 1200°C
- Sample size up to Ø 300 mm
- PgG and PBNG graphite heating units
- Homogeneous temperature distribution
- Heat-proof mechanical construction and bearing
- Suited for corrosive processes
- Simultaneous sample rotation and heating
- Manual or motor drives



Sample holder
individually manufactured



PBN heating unit with
heat-proof housing



MagiGear rotary feedthrough
for sample rotation



Independently pumped fused
quartz capsule for heating units

EpiCentre Model 346

Simple manipulator for sample heating and rotation.



- Adjustable distance between heater and sample with linear translator
- DC servo motor for sample rotation
- Optional fused quartz encapsulation of the heater to protect against corrosive gases
- Customised sample holder
- Fixed total length according to customer's specification

Technical data

- Sample Ø
 - Ø 25 mm - 300 mm (1" - 12")
- Standard heating units
 - PgG and PBNG (others on request)
- Maximal temperature
 - 1200 °C with standard heater,
 - 1000 °C with fused quartz encapsulation
(based on test with a molybdenum block)
- Temperature distribution
 - nominal +/-2.5 °C over 90 % of the central
surface of a silicon wafer
- Rotational speed
 - up to 80 RPM
- Thermal elements
 - Type C (tungsten-rhenium) or
 - Type K (Chromel/Alumel)
- Sample Ø / flange size/
rotary feedthrough
 - Ø 25 - 75 mm (1 - 3") / DN200CF / -stage
 - Ø 100 mm (4") / DN250CF / 1- or 2-stage
 - Ø 125 - 150 mm (5 - 6") / DN250CF / 2-stage
- Options
 - independently pumped fused quartz capsule
for heating units
 - motor drive for linear motion
 - specialised construction of sample holder

EpiCentre Model 100

Modular constructed heater manipulator with various options.



- Individually configurable due to modular construction
- Discrete linear motion of sample holder and complete system
- Adjustable distance between heater and sample
- Adjustable distance towards coating source
- DC servo motor for sample rotation
- Optional fused quartz encapsulation of heaters for protection against corrosive gases
- Customised sample holder
- BIAS up to 2 kV DC or 80 W HF
- Can be completely motor driven
- Adjusted to the process

Technical data

- | | |
|---|--|
| ■ Sample Ø | Ø 25 mm - 300 mm (1" - 12") |
| ■ Standard heating units | PgG and PBNG (others on request) |
| ■ Maximal temperature | 1200 °C with standard heater,
1000 °C with fused quartz encapsulation
(based on test with a molybdenum block) |
| ■ Temperature distribution | nominal +/-2.5 °C over 90 % of the central
surface of a silicon wafer |
| ■ Rotational speed | up to 80 RPM |
| ■ Thermal elements | type C (tungsten-rhenium) or
type K (Chromel/Alumel) |
| ■ BIAS voltage | 2 kV DC isolated or 80 W HF potential |
| ■ Sample Ø / flange size/
rotary feedthrough | - Ø 25 - 50 mm (1 - 2") / DN100 - 150CF/1-stage
- Ø 75 mm (3") / DN150CF / 1-stage
- Ø 100 mm (4") / DN200CF / 1- or 2-stage
- Ø 125 mm (5") / DN200CF / 2-stage
- Ø 150 mm (6") / DN250CF / 2-stage |
| ■ Options | - independently pumped fused quartz capsule
for heating units
- motor drive for linear motion
- specialised construction of sample holder |

EpiCentre Model 282

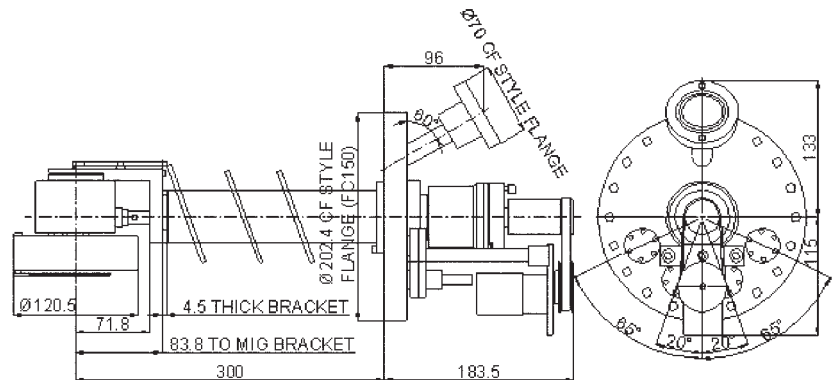
Heater manipulator with 90° sample holder - compatible with VG V80H-MBE Systems.



- Square edged sample holder
- Mounting dimensions compatible to VG V80H
- Azimuthal rotation with DC servo motor
- Manual polar rotation
- Fixture for beam flux monitor
- Low-maintenance heating elements
- Constant heating
- High temperature resistant mechanical construction with shielded bearings and long service life
- Optional stepper motor drive for positioning

Technical Data

- | | |
|--------------------------|---|
| ■ Sample Ø | Ø 75 mm (3") |
| ■ Standard heating units | PgG and PBNG (others on request) |
| ■ Maximal temperature | 850 °C max. (based on test with a molybdenum block) |
| ■ Heating current | < 12 A at 650 W |
| ■ Rotational speed | up to 65 RPM (temperature-dependent) |
| ■ Thermal elements | Type C (tungsten-rhenium) |
| ■ Sample holder | molybdenum fasteners for Ø 75 mm samples |
| ■ Flange Size | DN150CF with CF ports for all necessary connections (current, thermal elements, beam flux monitor etc.) |
| ■ Options | - quartz wafer for protection of heating elements
- stepper motor for polar positioning |



Mounting dimensions EpiCentre Model 282