

Mechanical Feedthroughs

Rotary Feedthroughs with
Magnetofluid Sealing



Rotary Feedthroughs with
Magnetically Linked Drive



Rotary-Linear Feedthroughs
and Transfer Systems



Linear Translators
and Aligners



Y, XY and XYZ Translators



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. This 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.

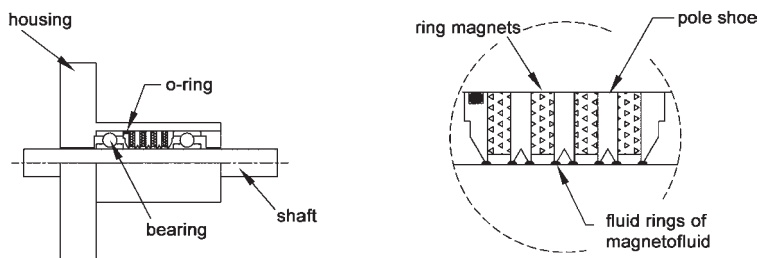


Figure 1

All dimensions in mm, when nothing else is indicated.

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.

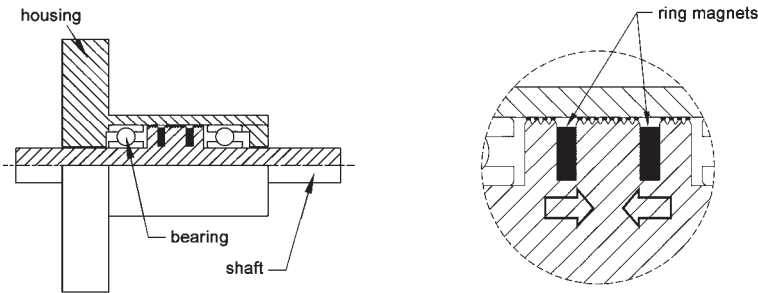


Figure 2

Temperature dependency

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

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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.

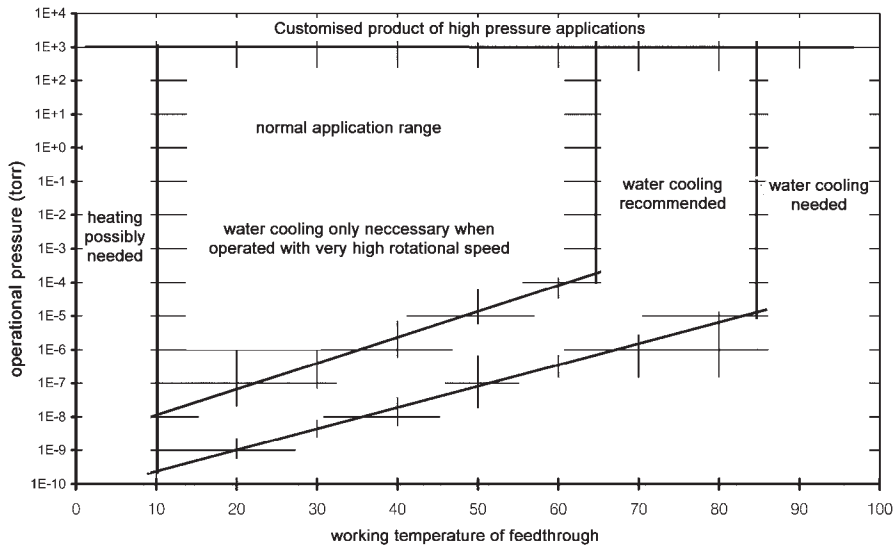


Figure 3

Rotary Feedthroughs with Magnetofluid Sealing

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

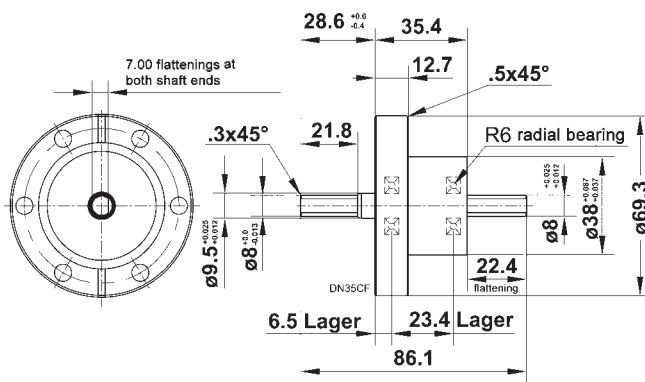
Technical Data

- 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

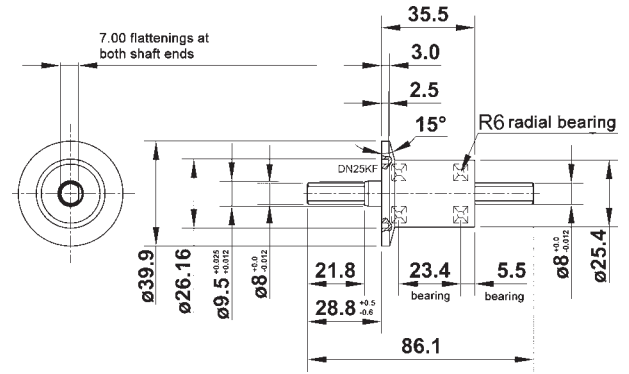
Order code	Vacuum connection	Shaft diameter (mm)	Magnetofluid bearing oil
10C-26100900	DN35CF	8	synthetic oil
10C-26101100	DN25KF	8	synthetic oil
10C-26101400	DN35CF	6	synthetic oil
10C-26101300	DN25KF	6	synthetic oil
10C-26101000	M26	8	synthetic oil
10C-26101200	M26	6	synthetic oil
10C-26100902	DN35CF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

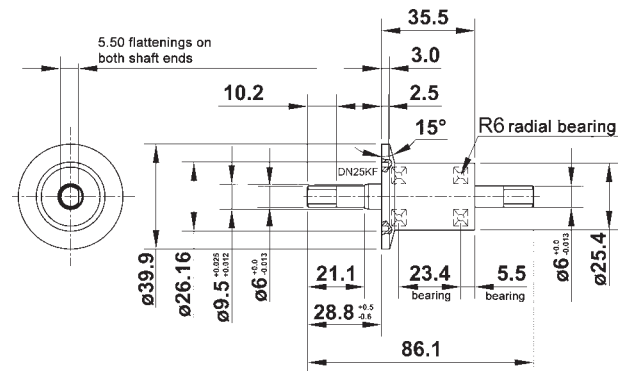
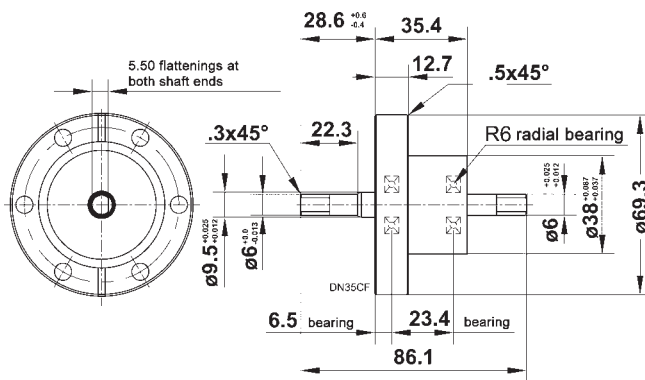
SUPERSEAL Series



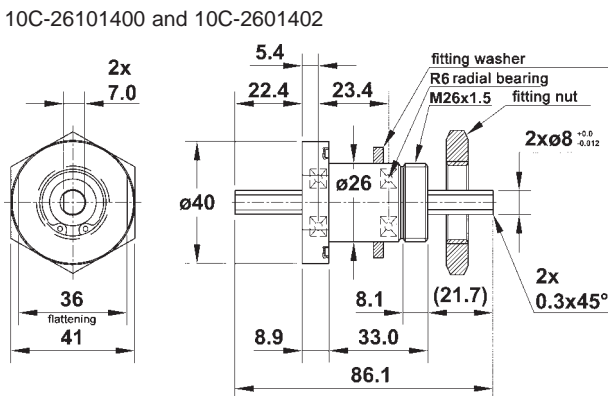
10C-2610090 and 10C-2610092



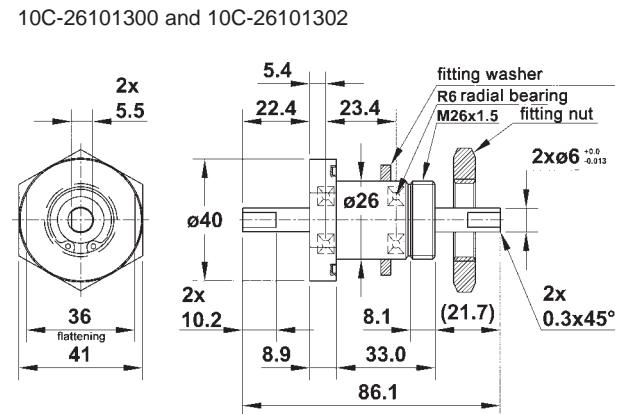
10C-26101100 and 10C-26101102



10C-26101300 and 10C-26101302



10C-26101000 and 10C-26101002



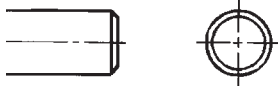
10C-26101200 and 10C-26101202

VACOM offers repair service for magnetofluid feedthroughs of all manufacturers.

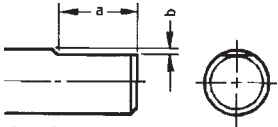
Rotary Feedthroughs with Magnetofluid Sealing

RMS Series

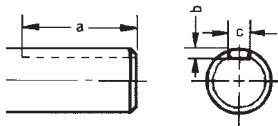
Standard feedthroughs for a large range of applications in production, as well as in research and development.



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 <math>< 10^{-8}</math> mbar
- Operating temperature 0 to 100 °C (without cooling max. 60 °C)
- Differential pressure > 2.5 bar
- He-leakage rate <math>< 10^{-11}</math> 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)

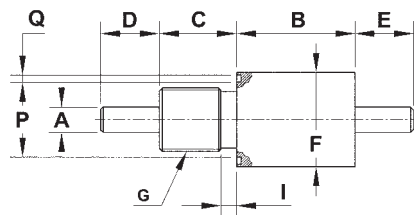
The models of the RMS series with a hollow shaft (HS) can be assembled with shafts of non-magnetic materials and special shafts (tubes, drive shafts or the like). The magnetofluid sealed area of the RMS-HS series is situated between a cylindrical hull (called hollow shaft) and the external housing. The 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

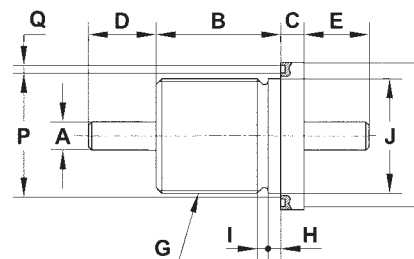
- RMS-BS series with housing exposed to atmosphere
- RMS-LS series with housing exposed to vacuum
- O-ring groove on the front of the housing
- Including O-ring seal, screw nut and washer

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 8-7.



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

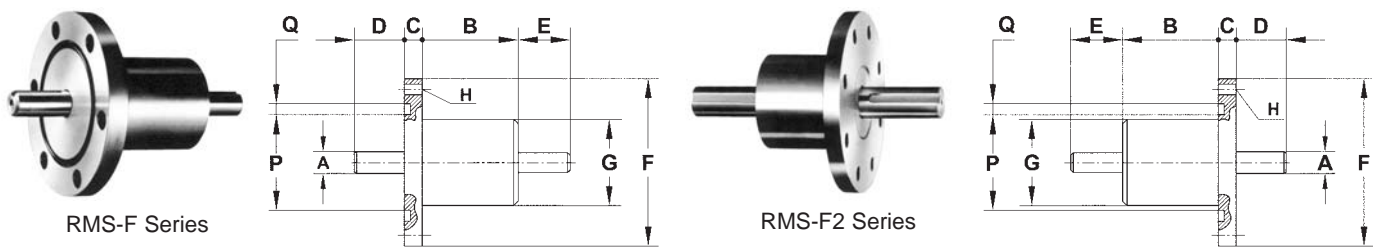
*For further information for each individual shaft shape please see page 8-7.

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 8-7

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

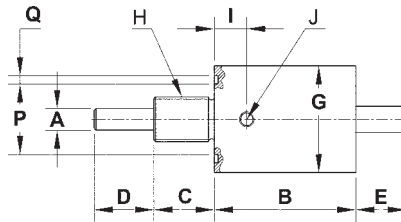
*For further information for each individual shaft shape please see page 8-7.

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

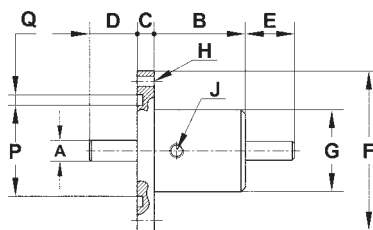
Rotary feedthroughs with water cooling and connection for wall fastening or with flange



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 8-7.



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

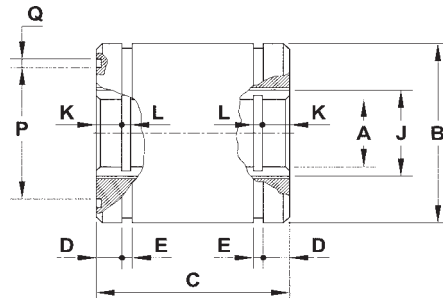
*For further information for each individual shaft shape please see page 8-7.

Rotary Feedthroughs with Magnetofluid Sealing

RMS-HS / RMS-HS-C Series

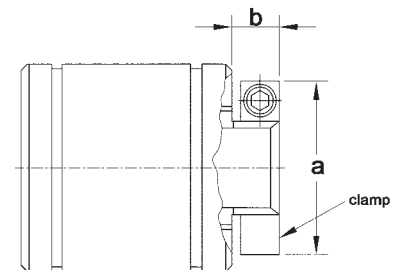
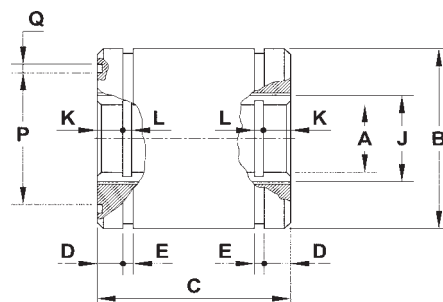
- Housing exposed to atmosphere
- O-ring groove on the front, exposed to vacuum
- Construction with or without safety clamp
- Including O-ring seal

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 shaft and safety clamp



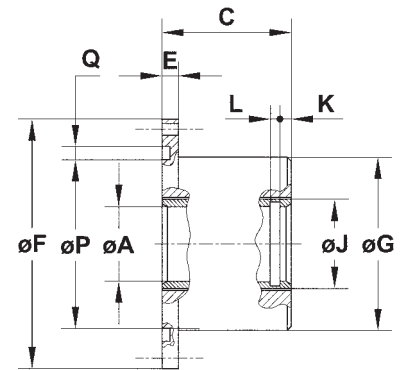
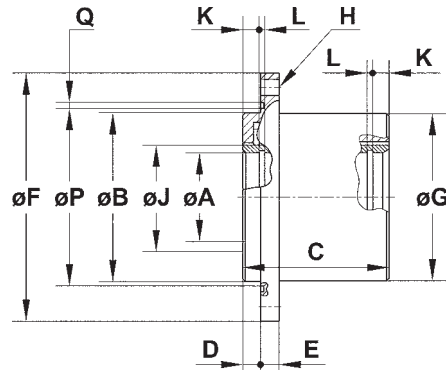
Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	J	K	L	P	Q	Max. revolution (RPM)	a	b
HS-10-C	10C-9020-B010	10	+0.015	40	-0.009 / -0.025	50	7.5	2.7	17	7.5	2.1	24	2.7	6,000	36	12
HS-12-C	10C-9020-B020	12	+0.018	40	-0.009 / -0.025	50	7.5	2.7	17	7.5	2.1	24	2.7	6,000	38	12
HS-20-C	10C-9020-B030	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

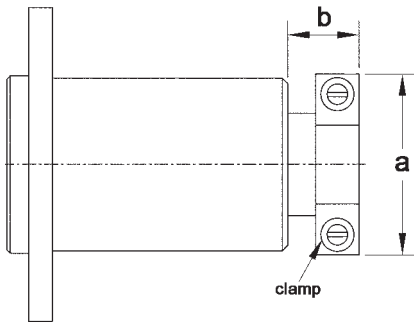


Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	P	Q	Max. revolution (RPM)
F1-HS-10	10C-9020-C010	10	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000
F1-HS-12	10C-9020-C020	12	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000
F1-HS-20	10C-9020-C030	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



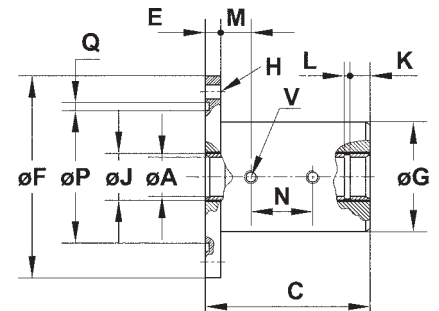
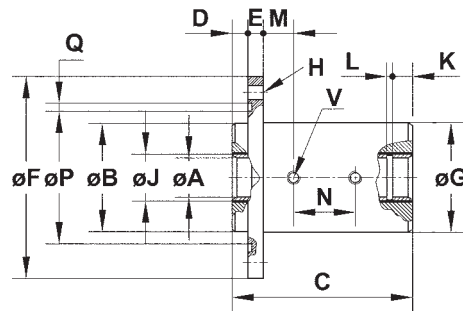
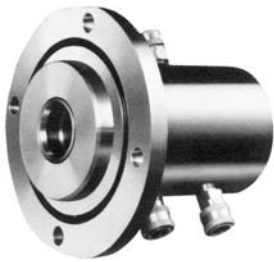
Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	P	Q	Max. revolution (RPM)	a	b
F1-HS-10-C	10C-9020-D010	10	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000	38	12
F1-HS-12-C	10C-9020-D020	12	+0.018 0	-	-	50	-	8	70	42	6-Ø6.7 PD59.8	17	7.5	2.1	42	2.7	6,000	38	15
F1-HS-20-C	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

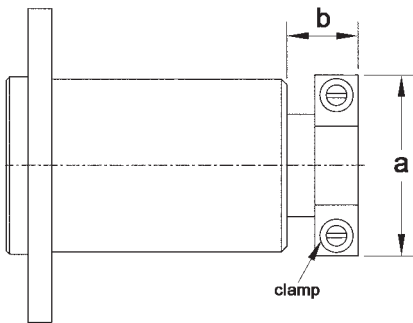


Model no.	Order code	A	Tolerance to A	B	Tolerance to B	C	D	E	F	G	H	J	K	L	M	N	P	Q	V	Max. revolut. (RPM)
F1-HS-10-W	10C-9020-E010	10	+0.015 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2- Rc1/8	6,000
F1-HS-12-W	10C-9020-E020	12	+0.018 0	-	-	70	-	8	84	52	6-Ø6.5 PD70	17	7	2.1	19	-	50	2.7	2- Rc1/8	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

MagiDrive Series

Introduction

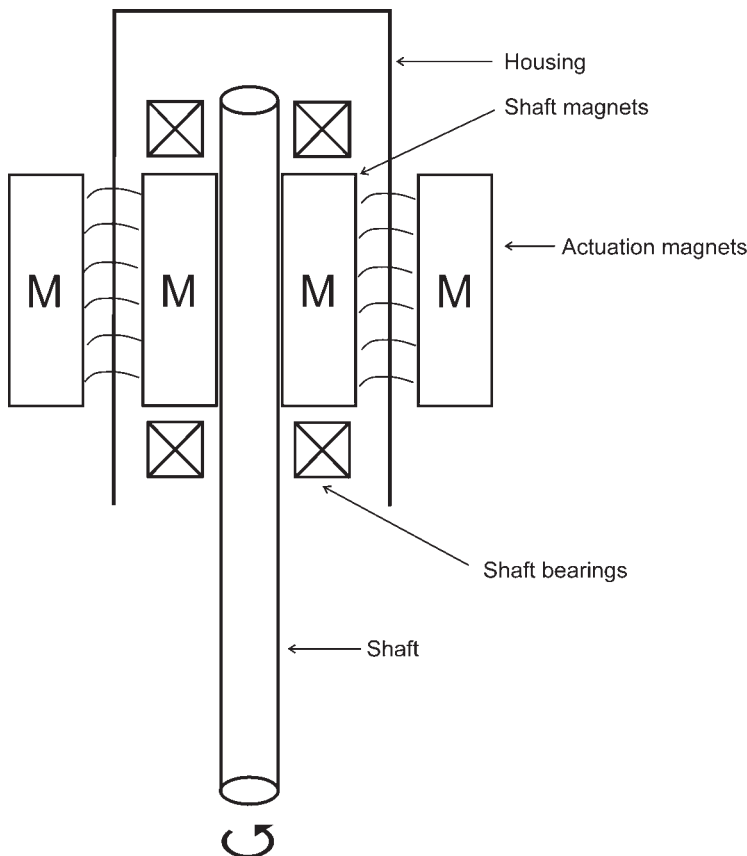
Rotary feedthroughs with magnetically linked drive are the optimal solution to transfer rotations into UHV systems. VACOM offers MagiDrive feedthroughs from the British expert UHV Design.

A rotary feedthrough with magnetically linked drive enables rotation to be transferred into a vacuum system without the need for mechanical connections. The actuated shaft is placed in a totally closed housing and is connected to the vacuum side only. The drive is placed outside of the housing and includes magnets. The magnetic field of the drive couples to the shaft through the wall of the housing. If the drive is moved, the shaft will be rotated too due to the magnetic coupling (see the schematic diagram).

MagiDrive Rotary feedthroughs have many advantages compared to other feedthroughs of similar construction. High power magnets of the latest materials are used for the feedthroughs. This causes very strong magnetic coupling with a very small torsion during rotation. The rotary feedthroughs are bakeable up to 250 °C with installed magnets. Only high-alloyed special steel is used for housings and shafts. The magnetic stray fields are very small. Due to the fact that the drive and the shaft are not mechanically connected there is no need for bellows and other flexible elements as for seals. Leakage at the actuator due to wear of connections or of gaskets is impossible.

Different bearing types are available for the vacuum side shaft bearing for special applications such as freedom in article or semiconductor processes. Numerous drive options - such as manual, pneumatic, motorized - are possible. For further information please see the following pages.

Schematic diagram



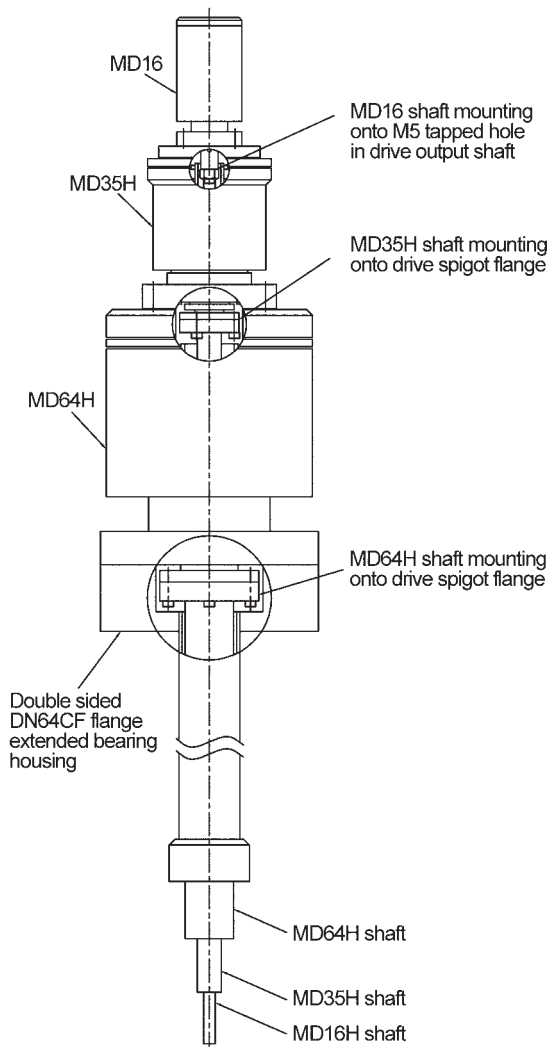
MagiDrive Series

MagiDrive with hollow shaft

MagiDrive feedthroughs of the types MD35H, MD64H and MD100H have an additional CF adapter on the drive end (rear of drive gear). This flange is fixed and does not rotate. The driving shafts of these rotary feedthroughs consist of a tube. Resulting in free passageway from the rear of the feedthrough to the vacuum side. This enables feedthroughs to be passed axially through the tube of the rotating shaft.

A further important feature is the stacking of up to four MagiDrive rotary feedthroughs. This enables to create up to four independently rotating axes. The stacking allows a simple solution for multi-motion requirements.

The free inner diameters of the shafts are \varnothing 12 mm for MD35H with a DN16CF rear flange, \varnothing 26mm for MD64H with DN35CF and for \varnothing 65 mm at MD100H with DN63CF mounted to the rear.



MagiDrive Series



- Magnets of high-performance materials
- Strong magnetic coupling through the wall of the actuator 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 shielded (standard)
- Numerous options
- Special constructions on 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



8

Manual actuation

- T = manual with hand wheel (standard)
- F = friction brake for manual actuation
- B = retaining screw for manual actuation
- BF = retaining screw and friction control for manual actuation
- BF = retaining screw and friction control for manual actuation
- CF = hand wheel with degree scaling (5° alternatively 1° graduation) and friction control for manual actuation
- CB = hand wheel with degree scaling (5° alternatively 1° graduation) and retaining screw for manual actuation
- K = annulus with knurled end cap
- P = annulus with timing pulley for individual motor installation

Pneumatic actuation

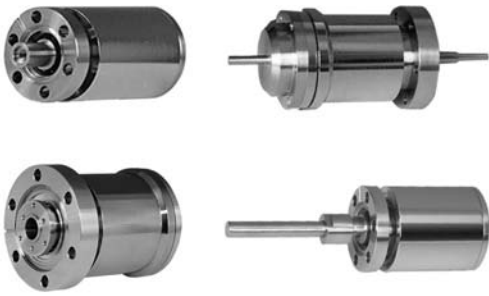
- RA = pneumatic drive, adjustable 30° - 170°, with air flow regulating valves
- RAI = pneumatic actuator similar to RA, with visual position indicator

Electric actuation

- IS = stepper motor axially mounted
- SS = stepper motor sideways mounted
- ISS = stepper motor axially mounted, with visual position indicator
- SSS = stepper motor sideways mounted, with visual position indicator
- ID = DC motor axially mounted
- SD = DC motor sideways mounted

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 cryogenic applications

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

MagiDrive type	Actuation															Shaft type					Ball bearing			
	manual							pneumatic			electric					X000	X030	MX000	D	H	Z	CE	SE	
Options	T	F	B	BF	CF	CB	K	P	RA	RAI	IS	ISS	SS	SSS	ID	SD	X000	X030	MX000	D	H	Z	CE	SE
MD10																								
MD16																								
MD19																								
MD20																								
MD21																								
MD25																								
MD35																								
MD35H																								
MD64																								
MD64H																								
MD100																								
MD100H																								

= Standard
 = Option
 = not available

MagiDrive Series with DN10CF Flange Connection

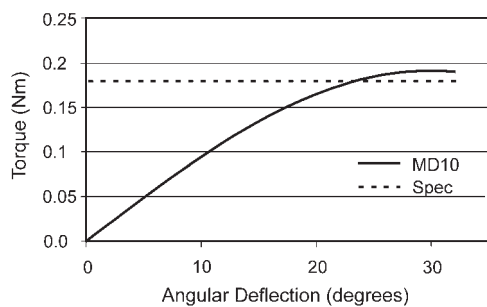


- Smallest possible UHV compatible rotary feedthrough
- Large torque
- Very compact

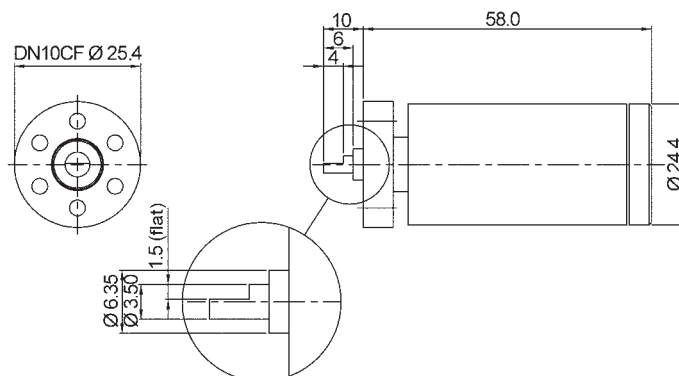
Technical data

- | | |
|---------------------------|---|
| ■ Type description | MD10 |
| ■ Flange connection | DN10CF |
| ■ Construction | machined from one piece, stainless steel 316L |
| ■ Shaft style | stub, \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 |

Torsional Stiffness



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



Feedthroughs with Magnetically Linked Drive

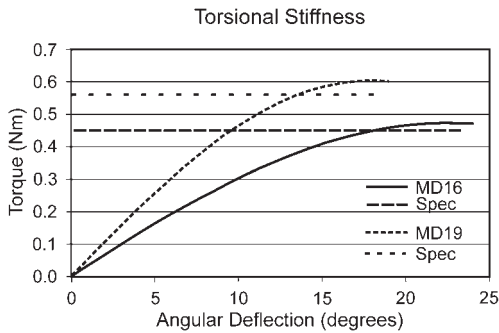
MagiDrive Series with DN16CF Flange Connection



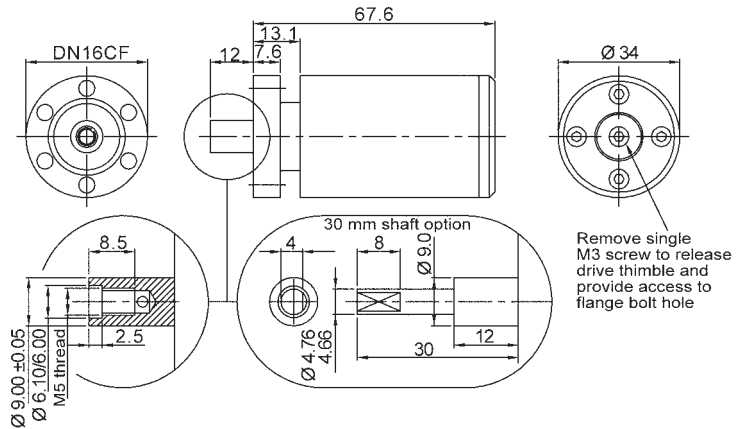
- Two types MD16 and MD19 with different magnetic force
- Established and variable usable construction
- Robust and powerful

Technical data

- Flange connection DN16CF
- Construction machined from one piece, stainless steel 316L stump, Ø 9 mm, with female thread M5
- Shaft style
- Break-away torque
 - MD16 0.45 Nm
 - 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



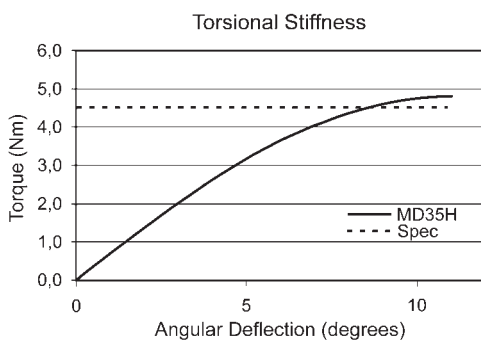
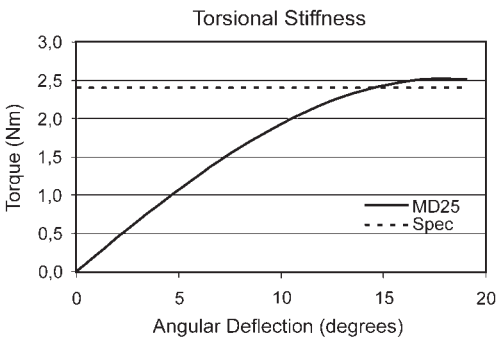
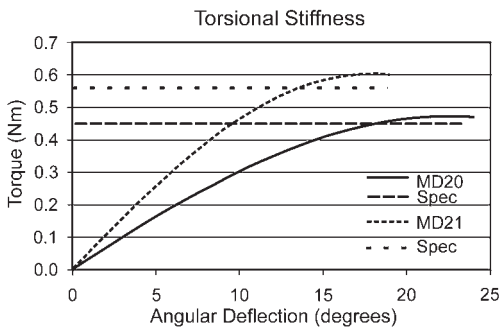
MagiDrive Series with DN35CF Flange Connection



- 5 models with 4 magnetic forces
- 3 shaft types and axial loadings
- Robust and powerful
- Numerous options for actuation and ball bearings
- Model MD35 optional with rear side flange and hollow shaft
- Optionally 2 stage with 2 coaxial rotation axes

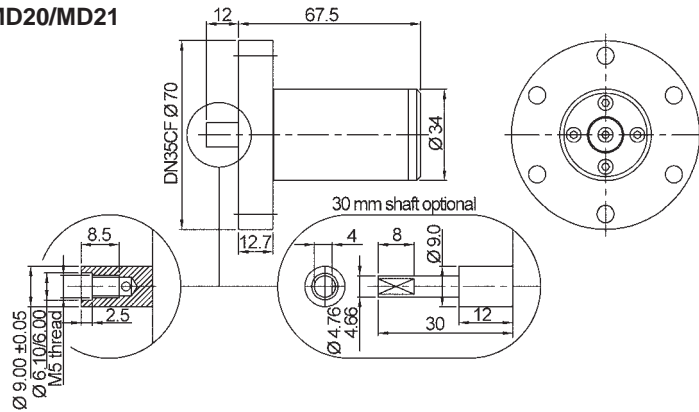
Technical data

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

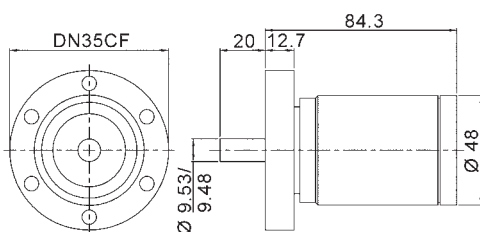


Order code	Description
MD20TX000Z	MD20 , manual, standard bearing
MD21TX000Z	MD21 rotary feedthrough, manual, standard bearing
MD25TX000Z	MD25 rotary feedthrough, manual, standard bearing
MD35TX000Z	MD35 rotary feedthrough, manual, standard bearing
MD35HTX000Z	MD35H rotary feedthrough, manual, with hollow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

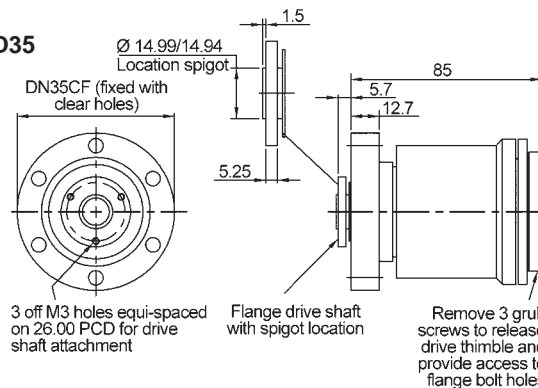
MD20/MD21



MD25



MD35



Feedthroughs with Magnetically Linked Drive

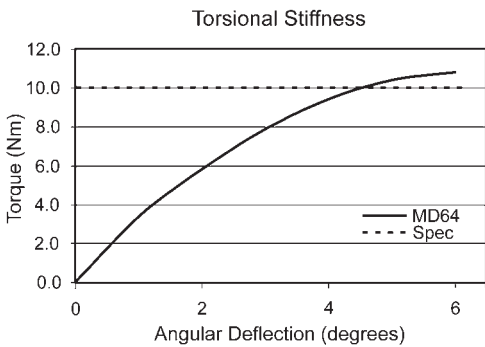
MagiDrive Series with DN63CF Flange Connection



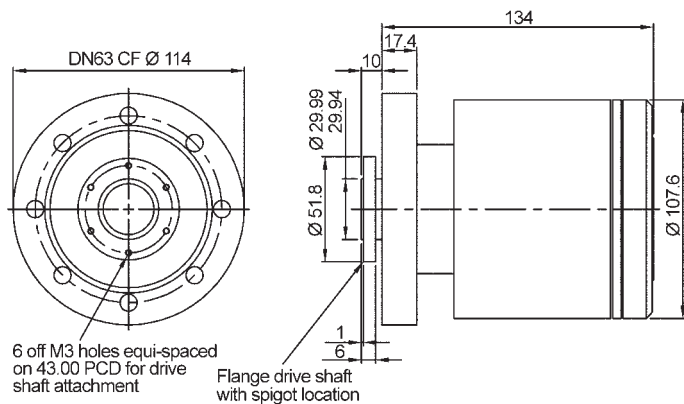
- 2 models with or without rear flange
- Very large torque
- Optionally 2 stage with 2 coaxial rotation axes
- Constructed for high loadings

Technical data

- Flange connection DN63CF
- Rear flange DN35CF (MD64H only)
- Construction machined from one piece, stainless steel 316L
- Shaft style tubular shaft with mounted flange and 6 x M3 threaded holes
- Break-away torque 10 Nm
- Max. no load spin speed 500 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



Feedthroughs with Magnetically Linked Drive

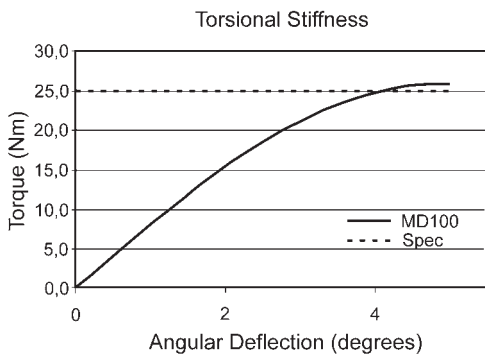
MagiDrive Series with DN100CF Flange Connection



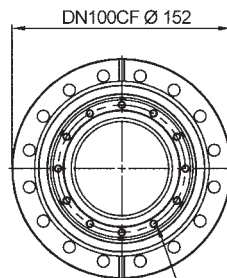
- 2 models with or without rear flange
- Very large torques
- Optionally 3 stage with 3 coaxial rotation axes
- Constructed for high loadings

Technical data

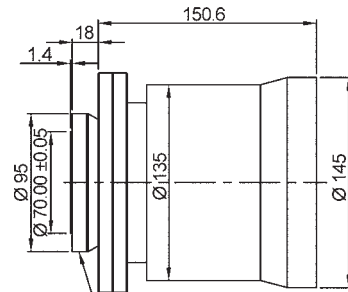
- | | |
|---------------------------|--|
| ■ Flange connection | DN100CF |
| ■ Rear flange | DN35CF (MD100H only) |
| ■ Construction | welded housing, stainless steel 316L |
| ■ Shaft style | tube with mounted flange and 6 x M5 threaded holes |
| ■ Break-away torque | 25 Nm |
| ■ Max. no load spin speed | 200 rpm |
| ■ Max. shaft axial thrust | 400 Nm |
| ■ Bakeout temperature | 250 °C |



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



6 off M5 holes equi-spaced on 88.00 PCD for drive shaft attachment



Flange drive shaft with spigot location

UHV Rotary Source Shutters



- Switching between to fixed end positions
- Pneumatic actuation
- Compact
- Robust and reliable
- Powerful
- Adjustable tilt
- Variable speed of actuation

Technical data

- Connection CF flanges
- Actuation pneumatic, double-acting
- Tilt 30° - 170°, adjustable end positions
- Mechanic shaft connection Ø 9 mm shaft stub 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 type
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

MPP / MPPL / MPPRL Series

Push pull feedthroughs for linear and rotary motion with magnetically linked drive

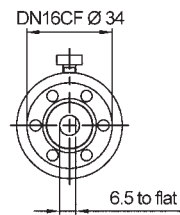


- Three models
 - MPPRL linear and rotary motion
 - MPPL linear motion - guided vacuum shaft
 - MPP linear motion - unguided vacuum shaft
- Small and compact
- UHV compatible
- Smooth operation
- Bellows-free construction
- Bakeable
- Standard stroke 50 to 250 mm

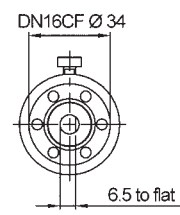
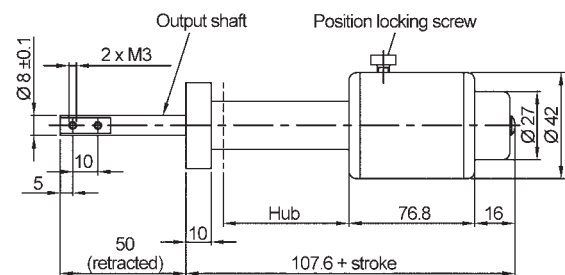
Technical Data

- Mounting flange DN16CF
- Driveshafts hollow shaft \varnothing 8 mm, with flat area and 2 x M3 tapped holes
- Axial force 98 N
- Max. torque 0.45 Nm
- Position fixing locking screw for linear motion only (for model MPP not available)
- Maximum bakeout temperature 250 °C
- Options pneumatic actuation, stepper or DC motor

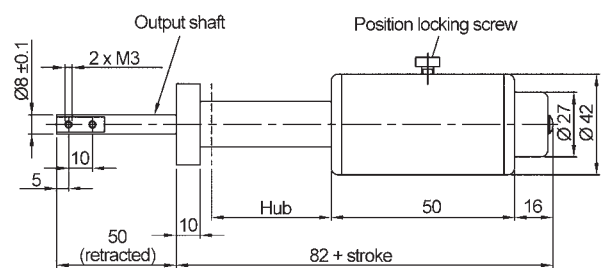
Order code	Mounting flange	Stroke
MPPRL-50-H	DN16CF	50
MPPRL-100-H	DN16CF	100
MPPRL-150-H	DN16CF	150
MPPRL-200-H	DN16CF	200
MPPL-50-H	DN16CF	50
MPPL-100-H	DN16CF	100
MPPL-150-H	DN16CF	150
MPPL-200-H	DN16CF	200
MPP-50-H	DN16CF	50
MPP-100-H	DN16CF	100
MPP-150-H	DN16CF	150
MPP-200-H	DN16CF	200



MPPRL

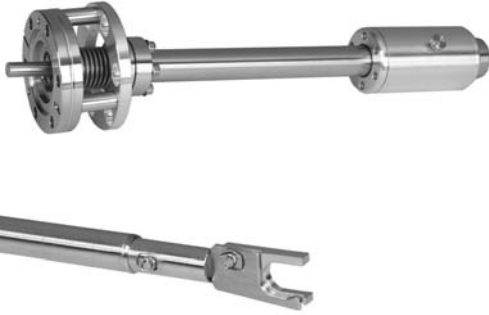


MPPL u. MPP



WSL / WSLR Series

Wobble stick feedthroughs for linear and rotary motion with magnetically linked drive



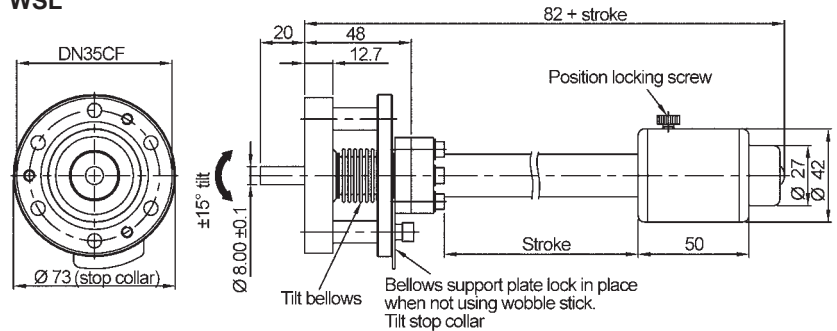
- Two types with 3 or 4 axes of motion
 - WSL linear and tilt motion
 - WSLR linear, rotary and tilt motion
- UHV compatible
- Bakeable
- Standard stroke 150 or 250 mm
- Optional with gripper or pincer

Technical Data

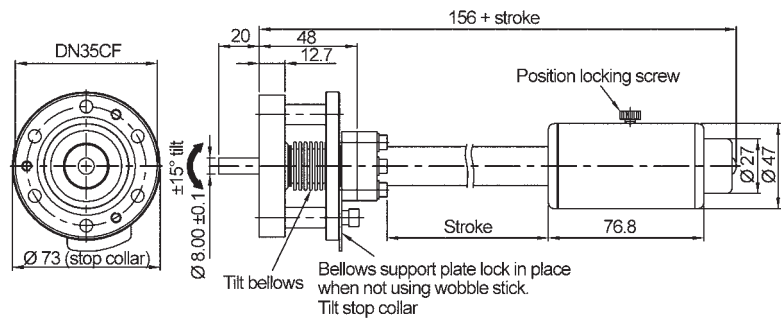
- Mounting flange DN35CF
- Drive shaft round shaft Ø 8 mm
- Max. break-away force 95 N
- Max. angular break-away torque 0.45 Nm
- Suggested maximum sample mass 260 g
- Max. bakeout temperature 250 °C
- Max. tilt ±15°

Order Code	Mounting flange	Stroke
WSL-150-H	DN35CF	150
WSL-250-H	DN35CF	250
WSLR-150-H	DN35CF	150
WSLR-250-H	DN35CF	250

WSL



WSLR



Model GMVT

Light transfer rod with separately constructed linear translation and rotation

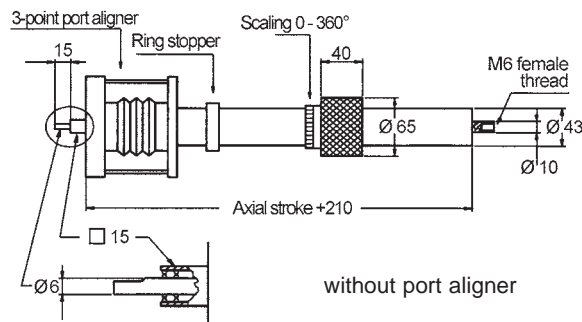
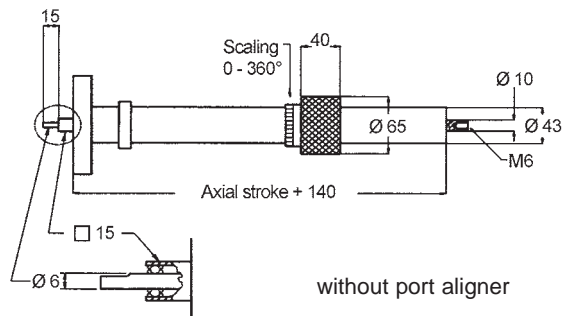


- Especially applicable to light samples and small loadings
- Absolutely UHV applicable
- SmCo magnets
- 360° degree graduation for rotation
- Adjustable stop rings
- Optional with 3 point aligner

Technical data

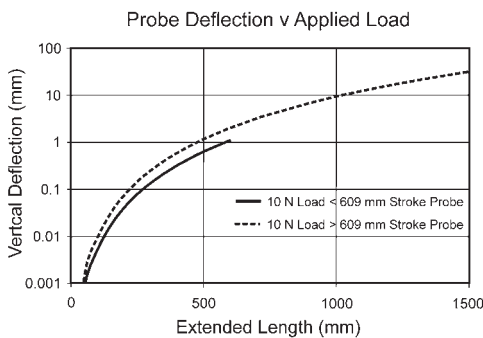
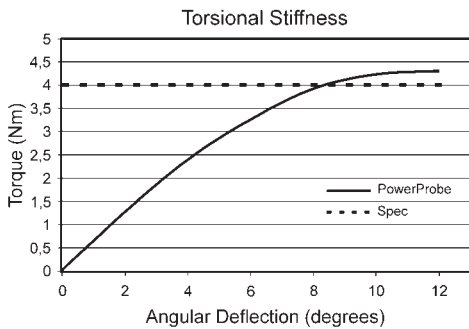
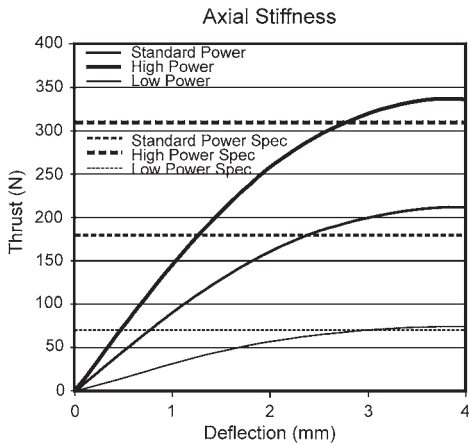
- Stroke 300 - 900 mm
- Materials
 - flange, housing and shafts stainless steel 1.4301
 - magnets SmCo
- Bakeout temperature max. 250 °C
- Axial force max. 61 N (static)
(higher force on request)
- Torque max. 1.6 Nm (static)
(higher torque on request)
- Mounting flange DN40CF or DN63CF
- Drive shafts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

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



PP Series

Transfer rod useable for all application - also for big loads



- 5 model series
- Linear motion with and without rotation
- Applicable also for big loads
- UHV applicable
- Round shafts of stainless steel
- Huge axial force (180 N standard)
- Optional 2 further forces (70 N or 310 N)
- Very high torque
- Low deflection
- Robust, precise and repeatable
- Suitable for horizontal and vertical mounting
- Locking screw for position fixing
- Bakeable

Model	Description	Stroke mm
LPP	Linear motion only	1219
PP	Linear and rotary motion	1524
ASP	Linear, rotary or combined linear and rotary motion	914
EPP	Linear motion with vertical lift mechanism for sample transfer at the shaft cone point	1219
DAP	Linear and separate rotary motion, 2 coaxial round shafts, outer shaft only with linear motion	1219

Technical data

- Mounting flange
 - DN35CF
 - DN63CF (at 1524 mm stroke only)
- Axial force
 - standard: 180 N
 - high: 310 N (LPP, PP only)
 - low: 70 N (LPP, PP only)
- Torque: see chart
- Max. torque with horizontal mounting: see chart
- Max. load with vertical mounting: see chart
- Actuation options: see table
- Bakeout temperature: 250 °C
- Position fixing: locking screw

Actuation options

- H = hand wheel
- HR = hand wheel with 2 bakeable limit switches for retracted position
- E = hand wheel with extension
- SD = side mounted 24 V DC motor with 2 bakeable limit switches
- SS = side mounted stepper motor with 2 bakeable limit switches

MagiDrive type	Coupling			Actuation				
	Low	Standard	High	H	HR	E	SS	SD
LPP	Standard	Standard	Standard	Option	Option	Option	Option	Option
PP	Standard	Standard	Standard	Option	Option	Option	Option	Option
ASP	Standard	Standard	Standard	Option	Option	Option	Option	Option
EPP	Standard	Standard	Standard	Option	Option	Option	Option	Option
DAP	Standard	Standard	Standard	Option	Option	Option	Option	Option

- = Standard
- = Option
- = not available

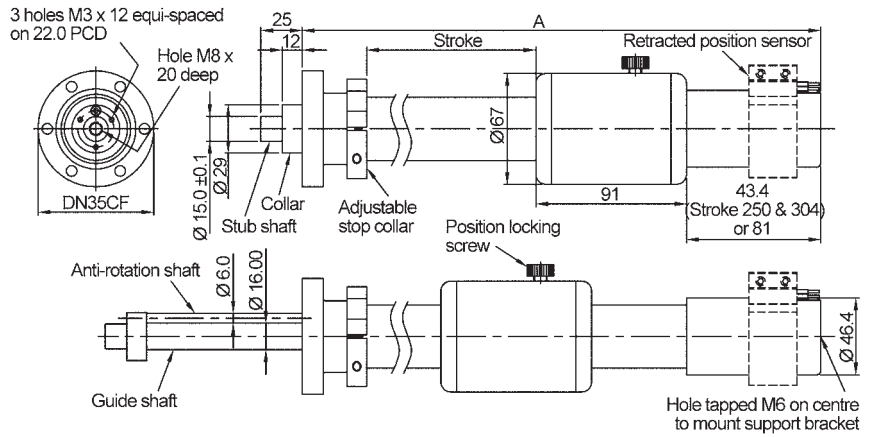
Rotary-Linear Feedthroughs / Transfer Systems

PP Series

Model LPP



- Stroke 250 to 1219 mm
- Drive shaft \varnothing 15 mm with M8 inner thread and guidance for linear motion



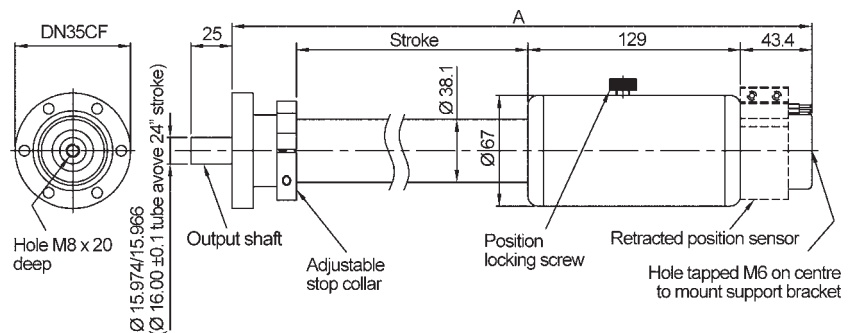
Stroke	250	304	457	609	914	1219
A	461	515	668.4	821	1125	1529.6

Model PP35

8



- Stroke 304 to 1524 mm
- Stroke up to 1219 mm with flange DN35CF, stroke 1524 mm with flange DN63CF
- Drive shaft \varnothing 15 mm with M8 inner thread

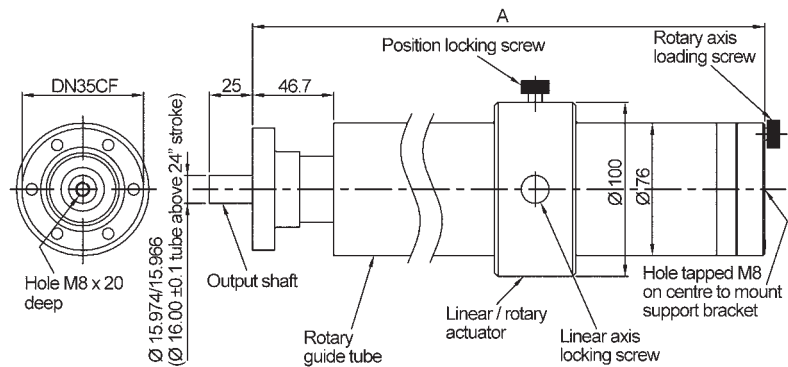


Stroke	304	457	609	914	1219
A	515	668.4	821	1125	1529.6

Model ASPP



- Stroke 304 to 914 mm
- Drive shaft \varnothing 15 mm with M8 inner thread
- Separate fixing for rotation and/or linear motion



Stroke	304	457	609	914
A	558	711	862	1168

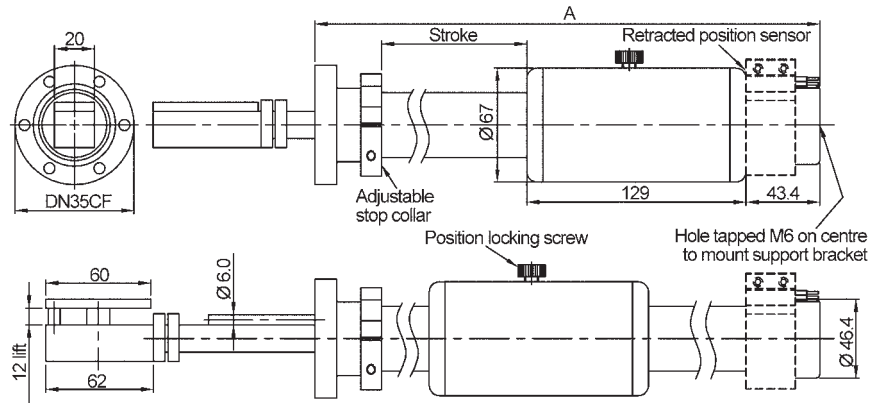
Rotary-Linear Feedthroughs / Transfer Systems

PP Series

Model EPP



- Stroke 250 to 1219 mm
- Drive shaft with lift mechanism in front (plate 20 x 60 mm, stroke 12 mm)

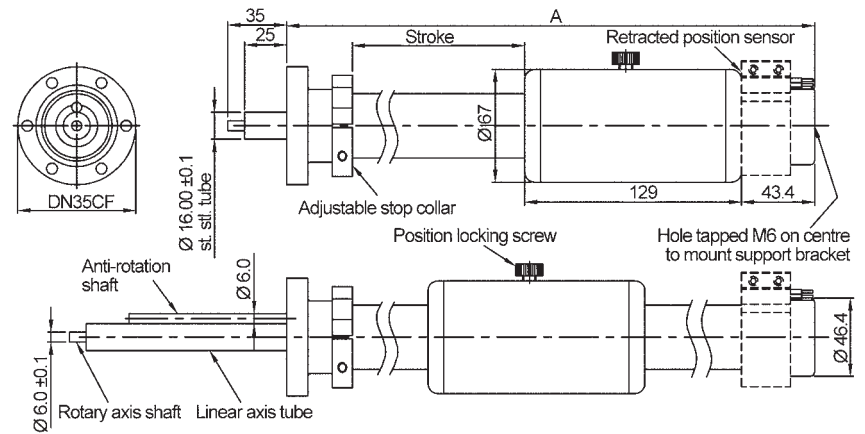


Stroke	250	304	457	609	914	1219
A	461	515	668.4	821	1125	1529.6

Model DAP



- Stroke 250 to 1219 mm
- Drive shaft $\varnothing 15$ mm with M8 inner thread and guidance for linear motion



Stroke	250	304	457	609	914	1219
A	461	515	668.4	821	1125	1529.6

Rotary-Linear Feedthroughs / Transfer Systems

PP Series

Model LPP



Order code	Mounting flange	Axial stroke
LPP-250-H	DN35CF	250
LPP-304-H	DN35CF	304
LPP-457-H	DN35CF	457
LPP-609-H	DN35CF	609
LPP-914-H	DN35CF	914
LPP-1219-H	DN35CF	1219

Model PP35



PP35-304-H	DN35CF	304
PP35-457-H	DN35CF	457
PP35-609-H	DN35CF	609
PP35-914-H	DN35CF	914
PP35-1219-H	DN35CF	1219
PP64-1524-H	DN63CF	1524

Model ASPP



ASPP35-304-H	DN35CF	304
ASPP35-457-H	DN35CF	457
ASPP35-609-H	DN35CF	609
ASPP35-914-H	DN35CF	914

Model EPP



EPP-250-H	DN35CF	250
EPP-304-H	DN35CF	304
EPP-457-H	DN35CF	457
EPP-609-H	DN35CF	609
EPP-914-H	DN35CF	914
EPP-1219-H	DN35CF	1219

Model DAP



DAP-250-H	DN35CF	250
DAP-304-H	DN35CF	304
DAP-457-H	DN35CF	457
DAP-609-H	DN35CF	609
DAP-914-H	DN35CF	914
DAP-1219-H	DN35CF	1219

Shifts for Motion along the Z Axis



- Bellows sealed
- Robust
- Precise and smooth-running
- Repeatable
- Totally UHV compatible
- Various actuation possibilities
- 7 model series

Technical data

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

stainless steel 316L
 250 °C (without motor or pneumatic)
 10,000 cycles (optional to 1 m)
 25 mm to 1000 mm (depending on series)

- Actuation
- Accuracy

manual, pneumatic, stepper or DC motor
 10 µm (optional)

Type Series

Model LSM



Model HLSM



Model LSML



- 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 with through bolt holes (from DN35)

- Construction for big strokes
- Strengthened frame structure
- Nominal width DN35 and DN63
- 200 mm to 1000 mm standard stroke
- Flange with threaded holes (LSML with through bolt holes in mounting flange)

Model CLSM



- Compact construction with short mounting length
- DN38 to DN63
- Up to 100 mm standard stroke
- Flanges with threaded holes

Shifts for Motion along the Z Axis

Model LSMT



- Complies with model LSM, but with adjusting bellows (tilt $\pm 2^\circ$) for the travelling flange
- Nominal width DN35 and DN63
- Up to 100 mm standard stroke
- Flanges with threaded holes

Model LSMX



- Complies with Model LSM, but with adjustment device (X axis ± 5 mm) on the travelling flange
- Nominal width DN35 and DN100
- Up to 100 mm standard stroke
- Flanges with threaded holes

Actuation

- H = manual with hand wheel (with gear ratio for big dimensions)
- P = pneumatic
- SD = side mounted DC motor
- SS = side mounted stepper motor

Manual actuation



Pneumatic actuation



Motorised actuation



Graduations

- ES = engraved scale (resolution 1 mm)
- DLA = digital scale with LCD display (resolution 0.01 mm)
- LP = linear potentiometer (resolution 2 μ m)

DLA



LP



Model	Actuation				Scale		
	H	P	SS	SD	ES	DLA	LP
LSM10	Standard	Option	Option	Option	Option	Option	Option
LSM16	Standard	Option	Option	Option	Option	Option	Option
LSM38. . .	Standard	Option	Option	Option	Option	Option	Option
LSML	Standard	Option	Option	Option	Option	Option	Option
CLSM	Standard	Option	Option	Option	Option	Option	Option
LSMT	Standard	Option	Option	Option	Option	Option	Option
LSMX	Standard	Option	Option	Option	Option	Option	Option

- = Standard
- = Option
- = not available

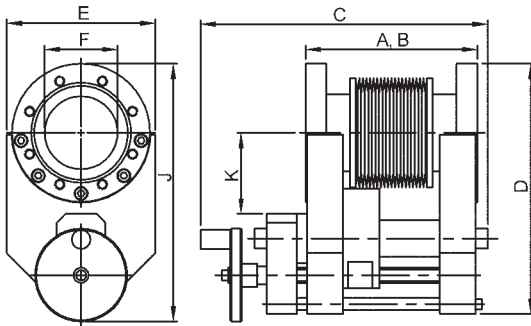
Linear Translators and Aligners

Shifts for Motion along the Z Axis

Model	Flange	Free inner Ø	Axial stroke	Actuation
LSM	DN10CF	8	25	H
	DN16CF	16	25 to 100	H, P
LSM HLSM	DN38CF	38	25 to 350	H, P, SD, SS
	DN63CF	65 (63)		
	DN100CF	102		
	DN150CF	149		
LSML HLSML	DN38CF	38	200 to 1000	H, P, SD, SS
	DN63CF	65		
CLSM	DN38CF	38	25 to 100	H, P, SD, SS
	DN63CF	65		
LSMT	DN38CF	38	25 to 100	H, P, SD, SS
	DN63CF	65		
LSMX	DN38CF	38	50 to 100	H, P, SD, SS
	DN63CF	65		
	DN100CF	102		

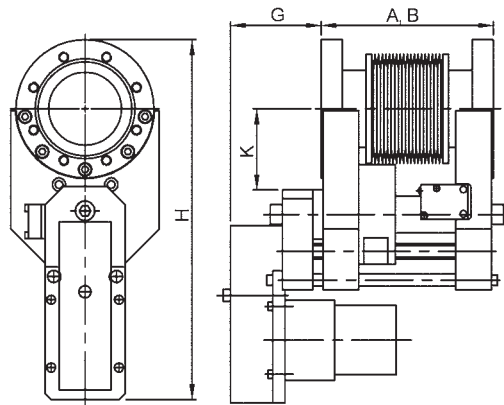
Shifts for Motion along the Z Axis

LSM / HLSM dimensions



A: expanded length
B: compact length

manual actuation



side mounted stepper motor

Order code	A	B	C	D	E	F	G	H	J	K
LSM10										
LSM10-25	77.3	52.3	95	130.4	25.4	8	-	-	60.7	27
LSM16										
LSM16-25	55	30	90	82.3	34	16	-	-	78	25.8
LSM16-50	94.2	44.2	129	82.3	34	16	-	-	78	25.8
LSM38										
LSM38-25	98.7	73.7	180	155.2	75	38	72	257	163.5	39
LSM38-50	123.7	73.7	204	155.2	75	38	72	257	163.5	39
LSM38-75	162	87	243	155.2	75	38	72	257	163.5	39
LSM38-100	187	87	268	155.2	75	38	72	257	163.5	39
LSM38-150	250	100	331	155.2	75	38	72	257	163.5	39
LSM38-175	281	106	363	155.2	75	38	72	257	163.5	39
LSM38-200	312.5	112.5	394	155.2	75	38	72	257	163.5	39
LSM38-250	377.5	127.5	459	155.2	75	38	72	257	163.5	39
LSM38-300	446.5	146.5	531	155.2	75	38	72	257	163.5	39
LSM38-350	509	159	594	155.2	75	38	72	257	163.5	39
HLSM38										
HLSM38-25	98.7	73.7	180	155.2	75	38	72	257	163.5	39
HLSM38-50	131.7	81.7	212	155.2	75	38	72	257	163.5	39
HLSM38-75	170	95	251	155.2	75	38	72	257	163.5	39
HLSM38-100	194.5	94.5	275.5	155.2	75	38	72	257	163.5	39
HLSM38-150	260	110	341	155.2	75	38	72	257	163.5	39
HLSM38-175	291	116	373	155.2	75	38	72	257	163.5	39
HLSM38-200	322.5	122.5	404	155.2	75	38	72	257	163.5	39
HLSM38-250	387.5	137.5	469	155.2	75	38	72	257	163.5	39
HLSM38-300	456.5	156.5	541	155.2	75	38	72	257	163.5	39
HLSM38-350	519.5	169.5	604	155.2	75	38	72	257	163.5	39

Linear Translators and Aligners

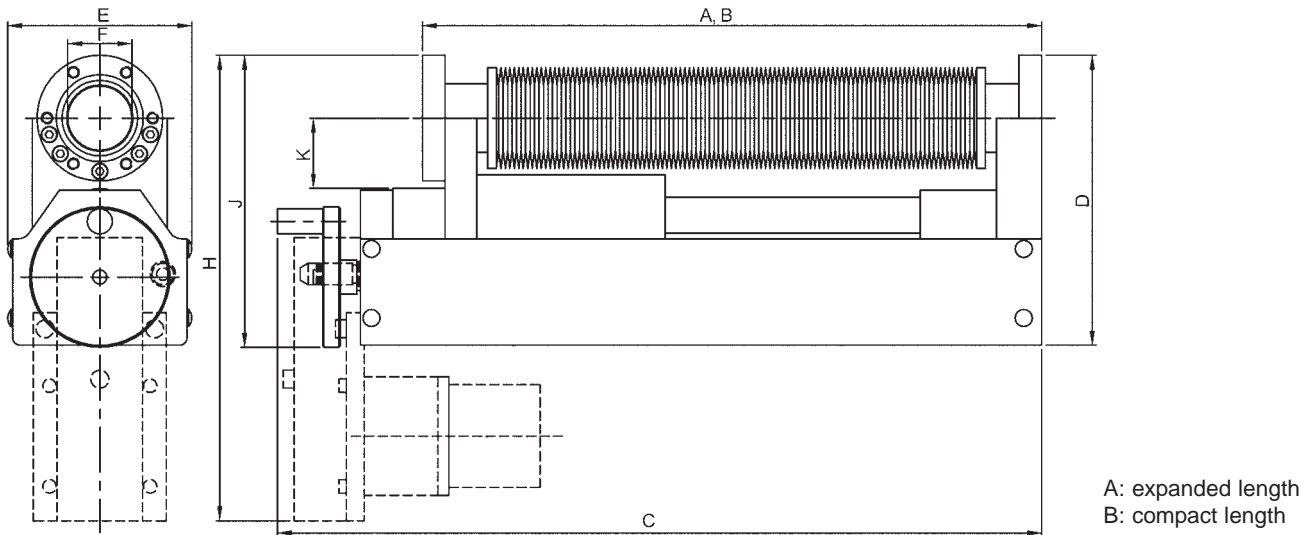
Shifts for Motion along the Z Axis

LSM / HLSM dimensions

Order code	A	B	C	D	E	F	G	H	J	K
LSM64										
LSM64-25	136	111	232	203	122.5	65	72	297	212	64
LSM64-50	161	111	258	203	122.5	65	72	297	212	64
LSM64-75	186	111	283	203	122.5	65	72	297	212	64
LSM64-100	211	111	308	203	122.5	65	72	297	212	64
LSM64-150	261	111	358	203	122.5	65	72	297	212	64
LSM64-200	317	117	415	203	122.5	65	72	297	212	64
LSM64-250	378	118	475	203	122.5	65	72	297	212	64
LSM64-300	448	118	535	203	122.5	65	72	297	212	64
HLSM64										
HLSM64-25	136	111	232	203	122.5	63	72	297	212	64
HLSM64-50	161	111	258	203	122.5	63	72	297	212	64
HLSM64-75	186	111	283	203	122.5	63	72	297	212	64
HLSM64-100	211	111	308	203	122.5	63	72	297	212	64
HLSM64-150	274	124	370	203	122.5	63	72	297	212	64
HLSM64-200	336	136	433	203	122.5	63	72	297	212	64
HLSM64-250	404	154	500	203	122.5	63	72	297	212	64
HLSM64-300	467.3	167.3	564	203	122.5	63	72	297	212	64
LSM100										
LSM100-25	175	150	289	266.5	177	102	105	376	273	92
LSM100-50	200	150	314	266.5	177	102	105	376	273	92
LSM100-75	225	150	339	266.5	177	102	105	376	273	92
LSM100-100	250	150	364	266.5	177	102	105	376	273	92
LSM100-150	300	150	414	266.5	177	102	105	376	273	92
LSM100-200	350	150	464	266.5	177	102	105	376	273	92
HLSM100										
HLSM100-25	175	150	289	266.5	177	102	105	376	273	92
HLSM100-50	200	150	314	266.5	177	102	105	376	273	92
HLSM100-75	225	150	339	266.5	177	102	105	376	273	92
HLSM100-100	250	150	364	266.5	177	102	105	376	273	92
HLSM100-150	300	150	414	266.5	177	102	105	376	273	92
HLSM100-200	358	150	472	266.5	177	102	105	376	273	92
LSM150										
LSM150-25	176	151	288	305	229	149	104	414	313	105
LSM150-50	201	151	317	305	229	149	104	414	313	105
LSM150-75	226	151	338	305	229	149	104	414	313	105
LSM150-100	251	151	367	305	229	149	104	414	313	105
LSM150-150	276	151	388	305	229	149	104	414	313	105
LSM150-200	365	165	479	305	229	149	104	414	313	105
HLSM150										
HLSM150-25	176	151	288	305	229	149	104	414	313	105
HLSM150-50	201	151	317	305	229	149	104	414	313	105
HLSM150-75	226	151	338	305	229	149	104	414	313	105
HLSM150-100	251	151	367	305	229	149	104	414	313	105
HLSM150-150	276	151	388	305	229	149	104	414	313	105
HLSM150-200	372	172	486	305	229	149	104	414	313	105

Shifts for Motion along the Z Axis

LSML / HLSML dimensions



A: expanded length
B: compact length

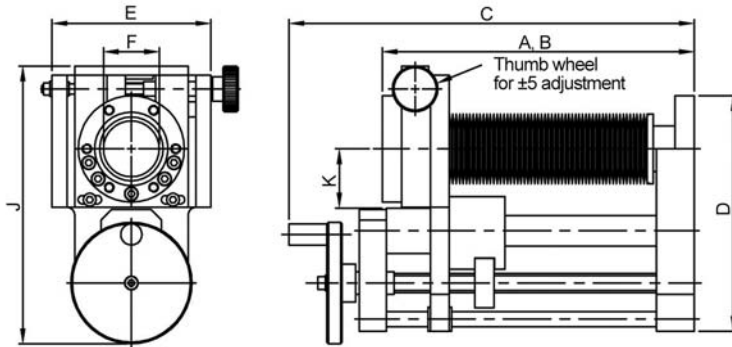
actuation: manual/motor

8

Order code	A	B	C	D	E	F	G	H	J	K
LSML38										
LSML38-200	322	122	402	161	102.5	38	72	259	163.5	39
LSML38-300	452.5	152.5	534	161	102.5	38	72	259	163.5	39
LSML38-400	576	176	657	161	102.5	38	72	259	163.5	39
LSML38-500	707	207	788	161	102.5	38	72	259	163.5	39
HLSML38										
HLSML38-200	335	135	416	161	102.5	38	72	259	163.5	39
HLSML38-300	462.5	162.5	533	161	102.5	38	72	259	163.5	39
HLSML38-400	586	186	667	161	102.5	38	72	259	163.5	39
HLSML38-500	717	217	798	161	102.5	38	72	259	163.5	39
LSML64										
LSML64-200	311	111	399	204	161	65	41,2	314	163.5	64
LSML64-300	446	146	534	204	161	65	41,2	314	163.5	64
LSML64-400	592	192	663	204	161	65	41,2	314	163.5	64
LSML64-500	700	200	771	204	161	65	41,2	314	163.5	64
LSML64-600	860	260	1009	204	161	65	41,2	314	163.5	64
LSML64-800	1111	311	1181	204	161	65	41,2	314	163.5	64
HLSML64										
HLSML64-200	325	125	413	204	161	65	41,2	314	163.5	64
HLSML64-300	459	159	547	204	161	65	41,2	314	163.5	64
HLSML64-300	602	202	673	204	161	65	41,2	314	163.5	64
HLSML64-500	700	200	771	204	161	65	41,2	314	163.5	64
HLSML64-600	860	260	1009	204	161	65	41,2	314	163.5	64
HLSML64-800	1111	311	1181	204	161	65	41,2	314	163.5	64

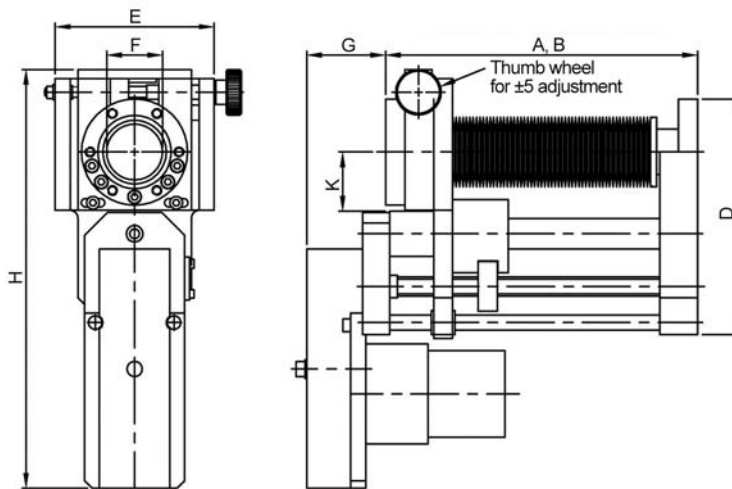
Shifts for Motion along the Z Axis

LSMX dimensions



manual actuation

A: expanded length
B: compact length

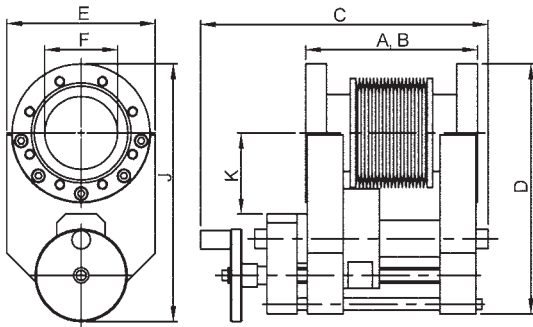


side mounted stepper motor

Order code	A	B	C	D	E	F	G	H	J	K
LSMX38										
LSMX38-50	143	93	205	155	105	26	52	257	183	39
LSMX38-100	206	106	267	155	105	26	52	257	183	39

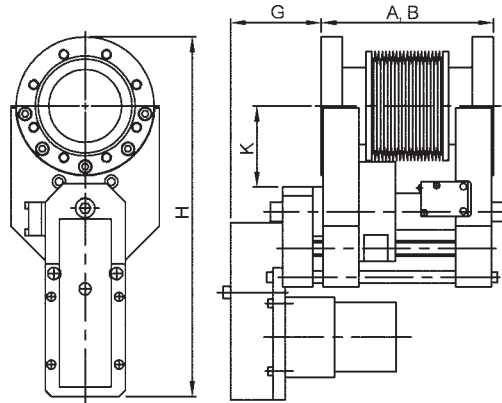
Shifts for Motion along the Z Axis

CLSM dimensions



A: expanded length
B: compact length

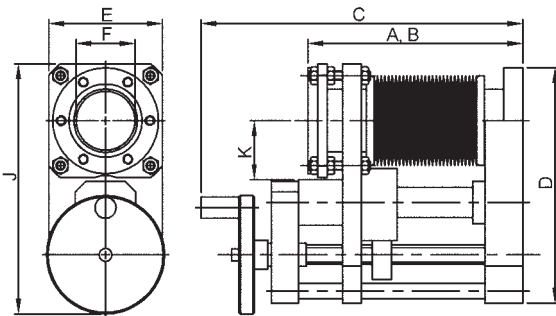
manual actuation



side mounted stepper motor

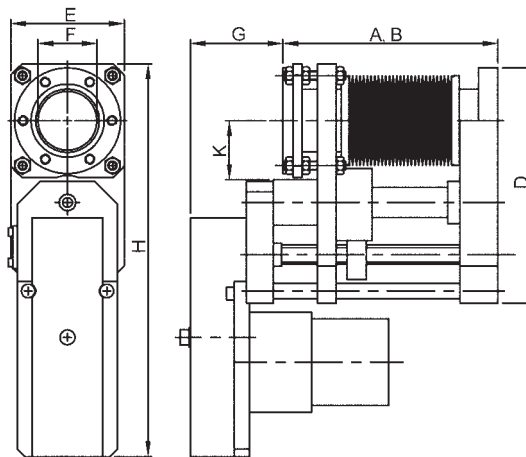
Order code	A	B	C	D	E	F	G	H	J	K
CLSM38										
CLSM38-25	63	38	173	142	75	39	102	247	152	39
CLSM38-50	92	42	202	142	75	39	102	247	152	39
CLSM38-75	125	50	235	142	75	39	102	247	152	39
CLSM38-100	163	63	273	142	75	39	102	247	152	39
CLSM64										
CLSM64-25	106	81	221	206	122.5	65	73	259	215	67
CLSM64-50	131	81	221	206	122.5	65	73	259	215	67
CLSM64-75	156	81	221	206	122.5	65	73	259	215	67
CLSM64-100	188	88	221	206	122.5	65	73	259	215	67

LSMT dimensions



A: expanded length
B: compact length

manual actuation



side mounted stepper motor

Order code	A	B	C	D	E	F	G	H	J	K
LSMT38										
LSMT38-50	142	92	213	155	75	38	89	259	165	39
LSMT38-100	199.5	99.5	270.5	155	75	38	89	259	165	39
LSMT64										
LSMT64-25	180.5	130.5	307	203	122.5	65	55.5	298	213	64
LSMT64-50	230.5	130.5	307	203	122.5	65	55.5	298	213	64

Port Aligners Diaphragm Bellows for Length and Angle Compensation



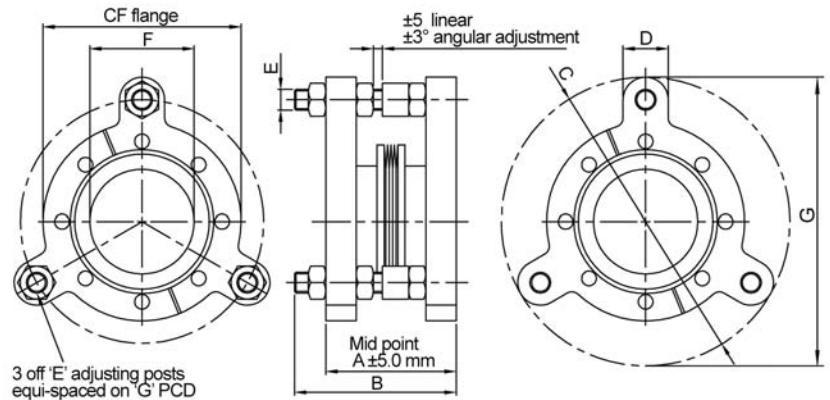
- Robust
- Compact
- Highly stressable

Technical data

- Axial stroke ± 5 mm
- Adjustment angle $\pm 3^\circ$
- Bellow material stainless steel 316L
- Flange material stainless steel 316L
- Bakeout temperature 250°C

	Mounting flange	A	B	C	D	E	F	G
PA-35	DN35CF	59	73,4	106	20	M8	38	88
PA-64	DN63CF	75	93	166	26	M12	65	140
PA-100	DN100CF	90	108	206	26	M12	102	180
PA-150	DN150CF	100	125	279.4	45	M16	127*	238.4
PA-150	DN150CF	100	125	329.4	45	M16	127*	290

* Options available



Order code	Through holes (H)	Tapped holes (T)
PA-35H	M6	
PA-35T		Ø 6.4
PA-64H	M8	
PA-64T		Ø 8.4
PA-100H	M8	
PA-100T		Ø 8.4
PA-150H	M8	
PA-150T		Ø 8.4

Y Translators for 1 Axis Linear Motion



- Mounting flange DN63CF or DN100CF
- Diaphragm bellows sealed
- Robust
- Precise and smooth-running
- Repeatable
- Totally UHV compatible
- Various actuation possibilities

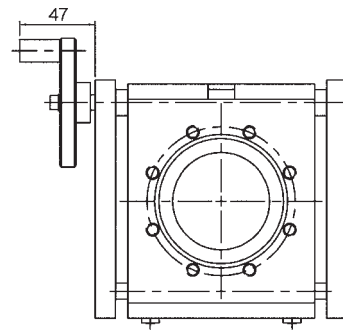
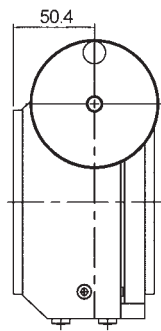
Technical data

- Mounting flange CF flanges, screw orientation shifted, M8 threaded holes
- Diaphragm bellows stainless steel 316L
- Bellows durability 10,000 cycles
- Bakeout temperature 250 °C (motor demounted)
- Actuation options manual with hand wheel, stepper or DC motor

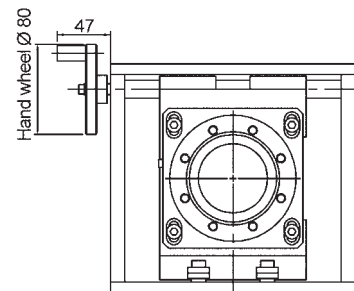
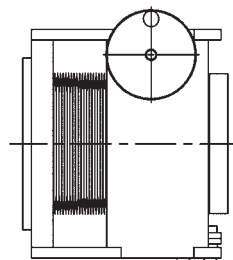
Model	LDM64/38	LDM64/64	LDM100/38	LDM100/64
Main flange	DN63CF	DN63CF	DN100CF	DN100CF
Trav. flange	DN38CF	DN63CF	DN38CF	DN63CF
Stroke	±7.5	±7.5	±31	±31
Bellows ID	60	60	90	90
Free ID	38	60	38	60
Mounting height	87.5	87.5	182	182

Order code	Main flange	Trav. flange	Actuation
LDM-64-38-H	DN63CF	DN38CF	manual
LDM-64-64-H	DN63CF	DN63CF	manual
LDM-100-38-H	DN100CF	DN38CF	manual
LDM-100-64-H	DN100CF	DN63CF	manual

LDM64-64-H



LDM100-64-H



Translators for 2 Axes Linear Motion

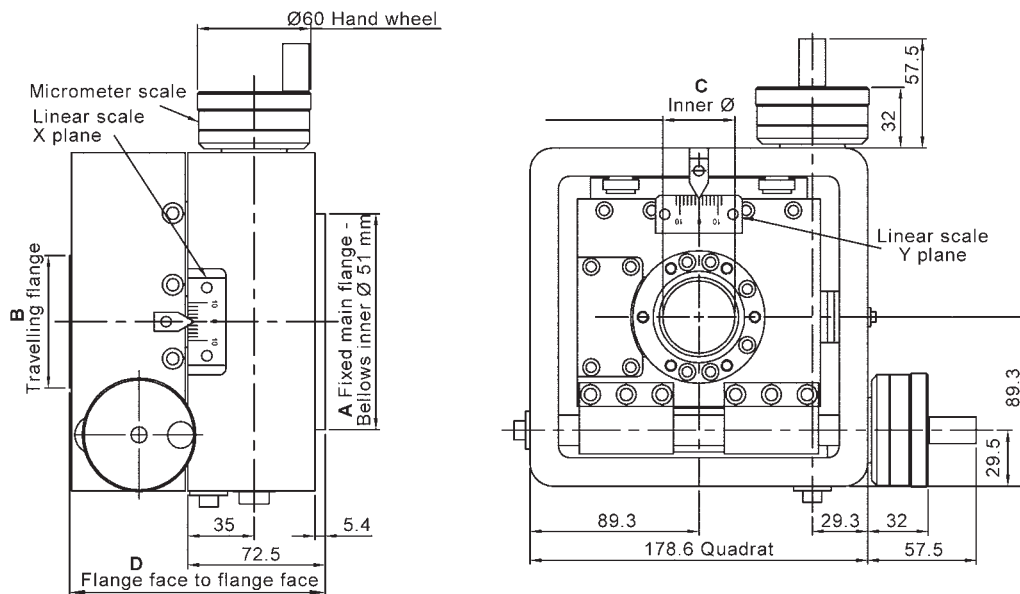


- Mounting flange DN63CF, DN100CF or DN150CF
- Max. stroke ± 14 mm or ± 31 mm
- Diaphragm bellows sealed
- Robust
- Precise and smooth-running
- Repeatable
- Totally UHV compatible
- Hand or stepper motor actuation

Technical data

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ Connection ■ Bellows material ■ Bellows durability ■ XY resolution ■ Bakeout temperature ■ Actuation options | <p>CF flanges, screw orientation shifted, M8 threaded holes</p> <p>stainless steel 316L</p> <p>10,000 cycles</p> <p>± 0.01 mm with manual drive</p> <p>± 0.0005 mm with stepper motor</p> <p>250 °C (motor demounted)</p> <p>hand wheel with micrometer scale, stepper motor with gear</p> |
|---|--|

XY14 (manual actuation)



Scale drawing for XY31 on page 8-44

Order code	A fixed mounting flange	B travelling flange	C Inner Ø	D flange to flange	XY stroke	Sample Ø	Drive	
XY14-64-38-H	DN63CF	DN40CF	38	135	± 14 mm (vector)	max. 22 mm	hand wheel	
XY14-100-38-H	DN100CF	DN40CF	38	147	± 10 mm (per axis)	(for full stroke)		
XY31-100-38-H	DN100CF	DN40CF	38	165.5	± 31 mm (vector)	max. 28 mm		
XY31-100-64-H	DN100CF	DN63CF	60	165.5				± 22 mm (per axis)
XY31-150-64-H	DN150CF	DN63CF	60	180				

Modular Translators for Linear Motion along all 3 Axes

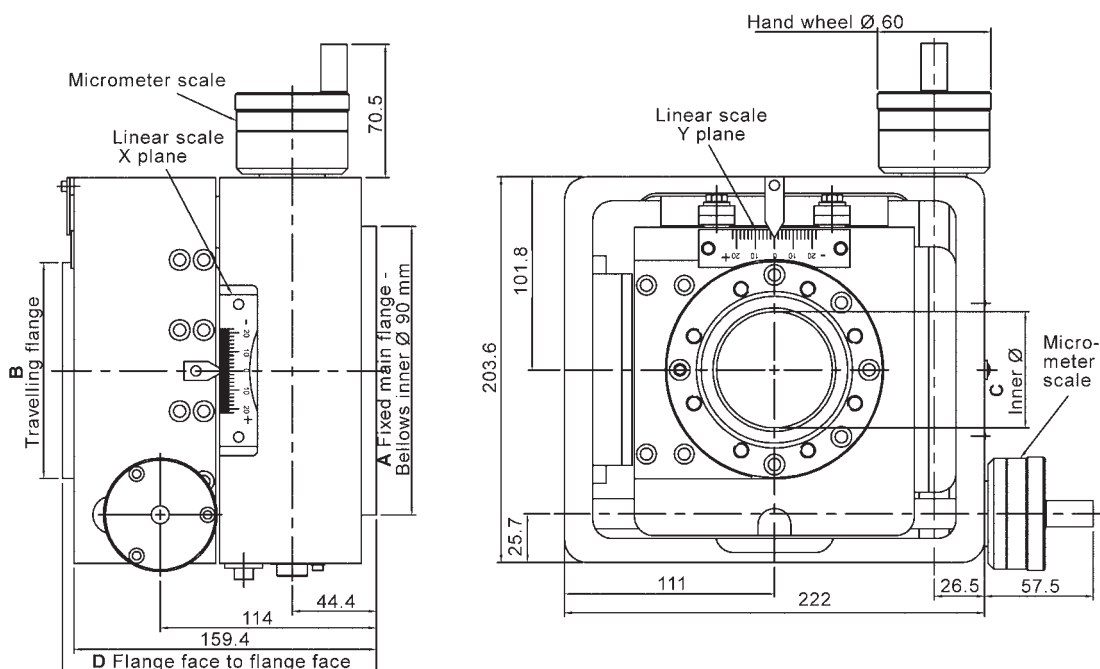


- Combination of Z linear translator and XY translator
- 5 XY translator models
- Up to 1000 mm Z stroke
- Highly stressable
- Separate diaphragm bellows for motion in XY and Z (exchangeable)
- Optional manual or motor actuation

Technical data

- | | |
|--|--|
| <ul style="list-style-type: none"> ■ Main flange ■ Travelling flange ■ XY resolution ■ Bakeout temperature ■ Actuation options ■ Z stroke ■ Z stroke resolution ■ Diaphragm bellows material ■ Mounting position ■ Actuation options | <p>DN63CF, DN100CF or DN150CF
(screw orientation shifted,
M8 threaded holes)</p> <p>DN35CF or DN63CF,
(screw orientation shifted,
M6 or M8 threaded holes)</p> <p>±0.01 mm with manual actuation
±0.0005 mm with stepper motor</p> <p>250 °C (motor demounted)</p> <p>hand wheel with micrometer scale,
stepper motor with gear</p> <p>25 to 1000 mm</p> <p>±0.25 mm with manual drive
±0.01 mm with digital linear scale
±0.0005 mm (semi step mode)</p> <p>stainless steel 316L</p> <p>any, without support</p> <p>manual, stepper or DC motor</p> |
|--|--|

XY31 (manual drive)



Dimension table on page 8-43

XYZ Translators

Modular Translators for Linear Motion along all 3 Axes

Order code	Z stroke	Mounting flange	Travelling flange	Actuation
XY14-64-38-H-Z-25-H	25	DN63CF	DN40CF	manual
XY14-64-38-H-Z-50-H	50			
XY14-64-38-H-Z-100-H	100			
XY14-64-38-H-Z-200-H	200			
XY14-64-38-H-Z-400-H	400			
XY14-64-38-H-Z-600-H	600			
XY14-100-38-H-Z-25-H	25	DN100CF	DN40CF	manual
XY14-100-38-H-Z-50-H	50			
XY14-100-38-H-Z-100-H	100			
XY14-100-38-H-Z-200-H	200			
XY14-100-38-H-Z-400-H	400			
XY14-100-38-H-Z-600-H	600			
XY31-100-38-H-Z-25-H	25	DN100CF	DN40CF	manual
XY31-100-38-H-Z-50-H	50			
XY31-100-38-H-Z-100-H	100			
XY31-100-38-H-Z-200-H	200			
XY31-100-38-H-Z-400-H	400			
XY31-100-38-H-Z-600-H	600			
XY31-100-38-H-Z-1000-H	1000			
XY31-100-64-H-Z-25-H	25	DN100CF	DN63CF	manual
XY31-100-64-H-Z-50-H	50			
XY31-100-64-H-Z-100-H	100			
XY31-100-64-H-Z-200-H	200			
XY31-100-64-H-Z-400-H	400			
XY31-100-64-H-Z-600-H	600			
XY31-100-64-H-Z-1000-H	1000			
XY31-150-64-H-Z-25-H	25	DN150CF	DN63CF	manual
XY31-150-64-H-Z-50-H	50			
XY31-150-64-H-Z-100-H	100			
XY31-150-64-H-Z-200-H	200			
XY31-150-64-H-Z-400-H	400			
XY31-150-64-H-Z-600-H	600			
XY31-150-64-H-Z-1000-H	1000			