

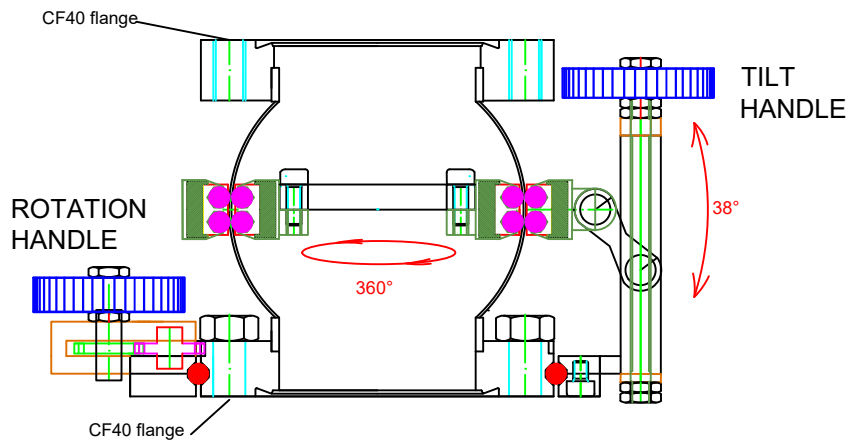
REP NEWSLETTER

Volume 01, No. 01

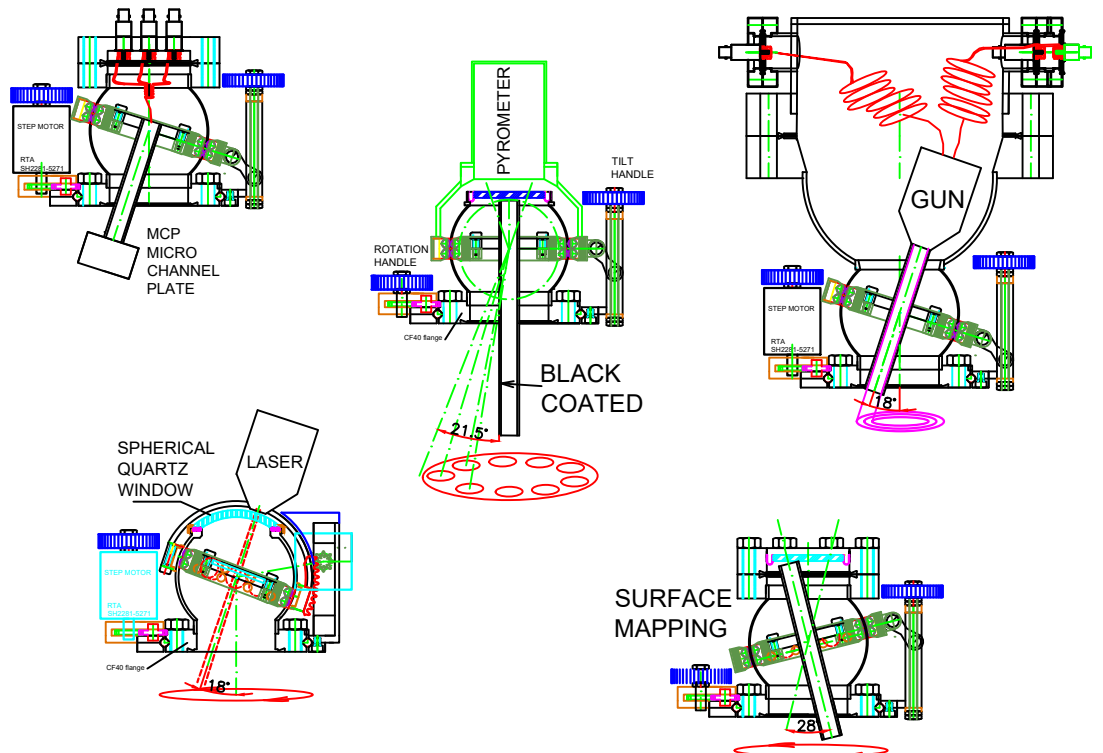
Jan 12, 2017

MAGNETIC VIEWER

Designed for application in Ultra High Vacuum, OV22 Optical Viewer is a manipulator manually operated on a 22° solid angle by two handles : one handle rotates continuously 360° the bearing all around the CF40; the second one shifts an oscillation into the spherical body on an inside bearing. In this way you have two high precision motions into the UHV spherical chamber without exploitation of membrane bellows.



This new manipulator allows new applications in ultra high vacuum : we show only some exploitations of these two movements



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PRECISION SHUTTER

Inside the vacuum system movable shields are suitable to protect viewports, vary the conductance of a pumping line, insert optical filters, to shut down particle beams. To overcome this problem a series of shutters has been designed as a double face flange with threaded holes, exploiting the new rotary magnetic driver.

The chosen materials are suitable for UHV and are bakeable up to 300°C without dismantling the magnets.

Sliding motion is driven by rotary magnetic manipulator with strong magnetic couple so the shutter can be mounted in any attitude with high precision.

The main advantage is that you can install these shutters below the window you have on your UHV chamber, without any modification.

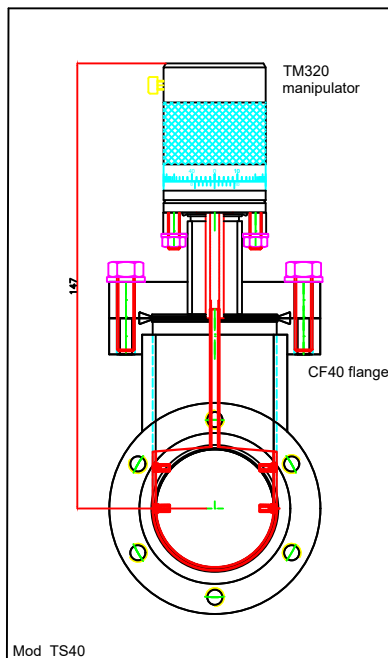
In flag and venetian blind shutters, some parts remain in the field of view all of the time : in our case, when opened, the viewport section is totally free.

The thin shutters are manually operated and can be stopped in any position of the travel with a lock screw.

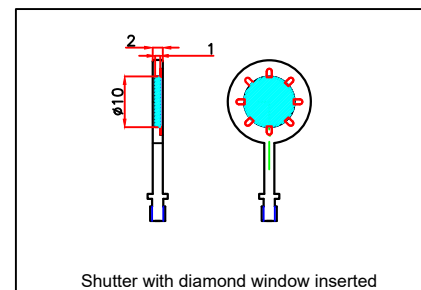
On request special models are available with step motor.

The shutter terminal is dismountable, so different materials are insertable as molybdenum, tungsten, inconel or optical filter settled into the shutter.

Exploiting the use of magnetic rotating driver has eliminated the introduction of bellows in the motion system, so you have lower cost and longer life.



Mod TS40	
flange	CF40 double face, tapped holes M6 h=22mm
sliding stroke	41 mm
precision	<0.01 mm
ultimate vacuum	1.10*-11mbar
bake out	300 °C



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REP NEWSLETTER

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UHV GATE VALVE

VACUO UHV gate valves have been designed for best conductance and minimum size for easy installation in any attitude.

Well suited for system requiring high reliability and low outgassing in ultra high vacuum applications, these valves are realized in stainless steel with high density o-ring seal.

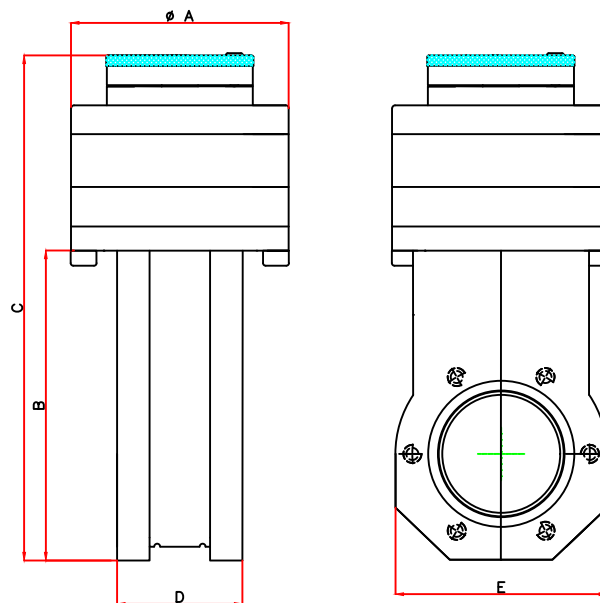
Standard features include welded magnetic rotary feedthrough and UHV surface treatment to achieve very low outgassing.

These lines of valves are manually operated and are flanged CF40 and CF63.

Membrane bellows have been excluded, improving life time and outgassing.

The valves open against pressure of 2 bar both sides.

A new o-ring of the pad allows a bakeout at 300°C



DIMENSIONS

DN (nominal ID)	CF flanges	A	B	C	D	E
39	CF40	72	102	189	44	70
63	CF63	100	148	242	55	114

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LINEAR ROTATING DRIVER (LRM)

LRM are manipulators composed by two modules:

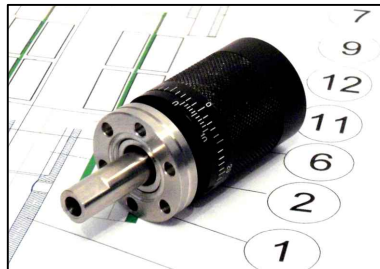
- linear translator
- rotary drive

Each module is moved independently by an all metal magnetic rotary drive mod TM133. Low backlash drive provides continuous slipping and rotation of the 15mm square shaft.

Linear travel can be chosen from 50mm to 300mm. A position lock is fitted.

Accessories and services, such as DC motor, step motor, encoder, microswitches are frequently comprised in the manipulator's configuration.

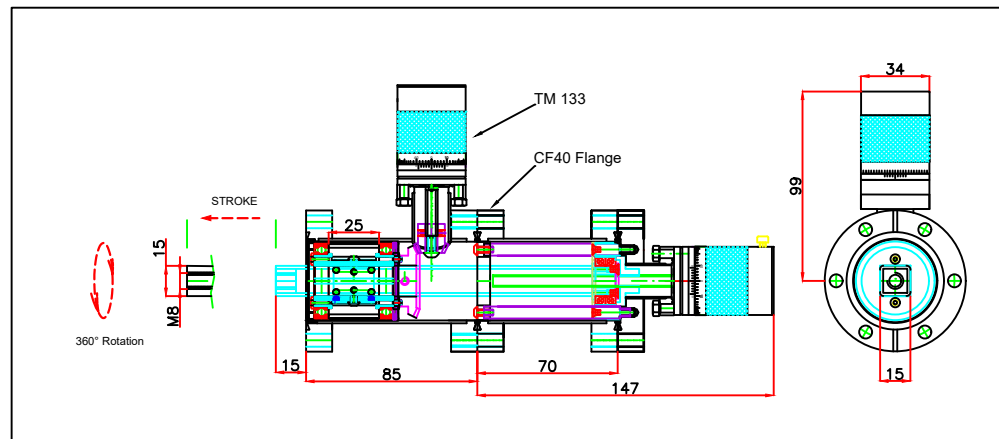
No bellows are used, so the life is about 24 000 hour without service.



TM133-CF16 Magnetic Rotary Drive



L-50M Magnetic Linear Driver



L50RM Manually operated

Break-away torque	8Nm	Stroke	50mm
Maximum speed	100rpm	Rotation	360° continuously
Maximum shaft axial thrust	30N	Nonius	1mm/36 x 0.1
Bakeout	300°C	Zero-backlash under low load	

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MAGNETIC ROTARY DRIVE (MRD)

VACUO magnetic rotary drives are designed to use in ultra high vacuum (UHV). These magnetic-drive feedthroughs have solved the problems of vulnerable bellows or dynamic seals, providing an intrinsically safe solution for the life of rotation in UHV.

The unique design of magnetic coupling circuit has evolved the range of rotary feedthroughs over the last decade.

With the application of the new magnetic materials the torque level has been increased together the bake out temperature : so the high torque to designed size ratios are the result of a unique magnetic coupling ,which focuses the multiple magnetic fields.

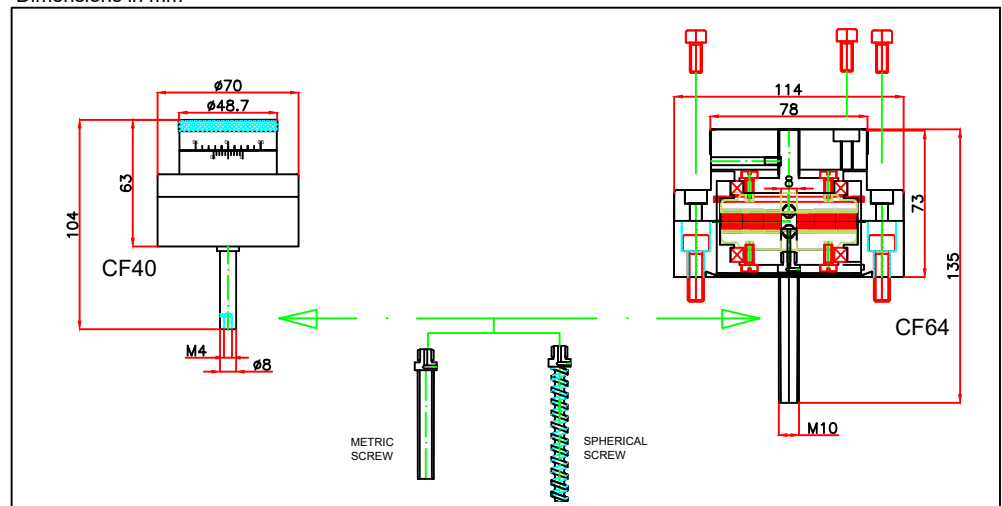
Drive shaft is dismountable so it is possible to have different applications.

Two models have been adopted as standard version: CF40 and CF64 flanged



Model MRD	OD mounting CF flange	Type of operation	Resolution	Max speed rpm	Torque Nm		Axial Thrust N	Code
					150RPM	5RPM		
MRD40	70 mm	manual	0.5	200	0.3	1.0	20	TM 134
MRD114	114 mm	manual	0.5	200	1	3	50	TM 135

Dimensions in mm



Bakeout 300°C
 Break-away torque 8Nm
 Maximum speed 200rpm

Rotation 360° continuously
 Nonius 1mm/36 x 0.1
 Zero-backlash under low load

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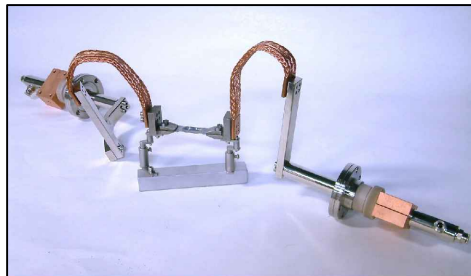
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HIGH TEMPERATURE GRID

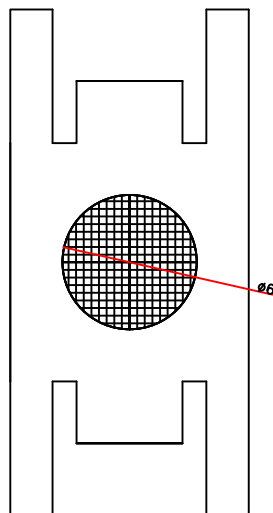
Chemical Vapour Deposition (CVD) is a method by which diamond can be grown from a hydrocarbon mixture. The advantage of CVD diamond growth includes the ability to grow diamond over large areas and on various substrates, and the fine control over the chemical impurities and thus properties of the produced diamond.

The CVD growth involves substrate preparation, feeding varying amounts of gases into a chamber and energizing them. The gases always include a carbon source, typically methane, and hydrogen with a typical ratio 1:99. Hydrogen is essential because it selectively etched-off non-diamond carbon. The gases are ionized into chemical active radicals in the growth chamber using a hot movable Mo boat at 1000°C.



Movable Joule effect source

To control the methane flux a micrometric stainless steel needle is adopted ; to drive the expansion flux an Inconel mesh has been designed using different wire diameters.



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