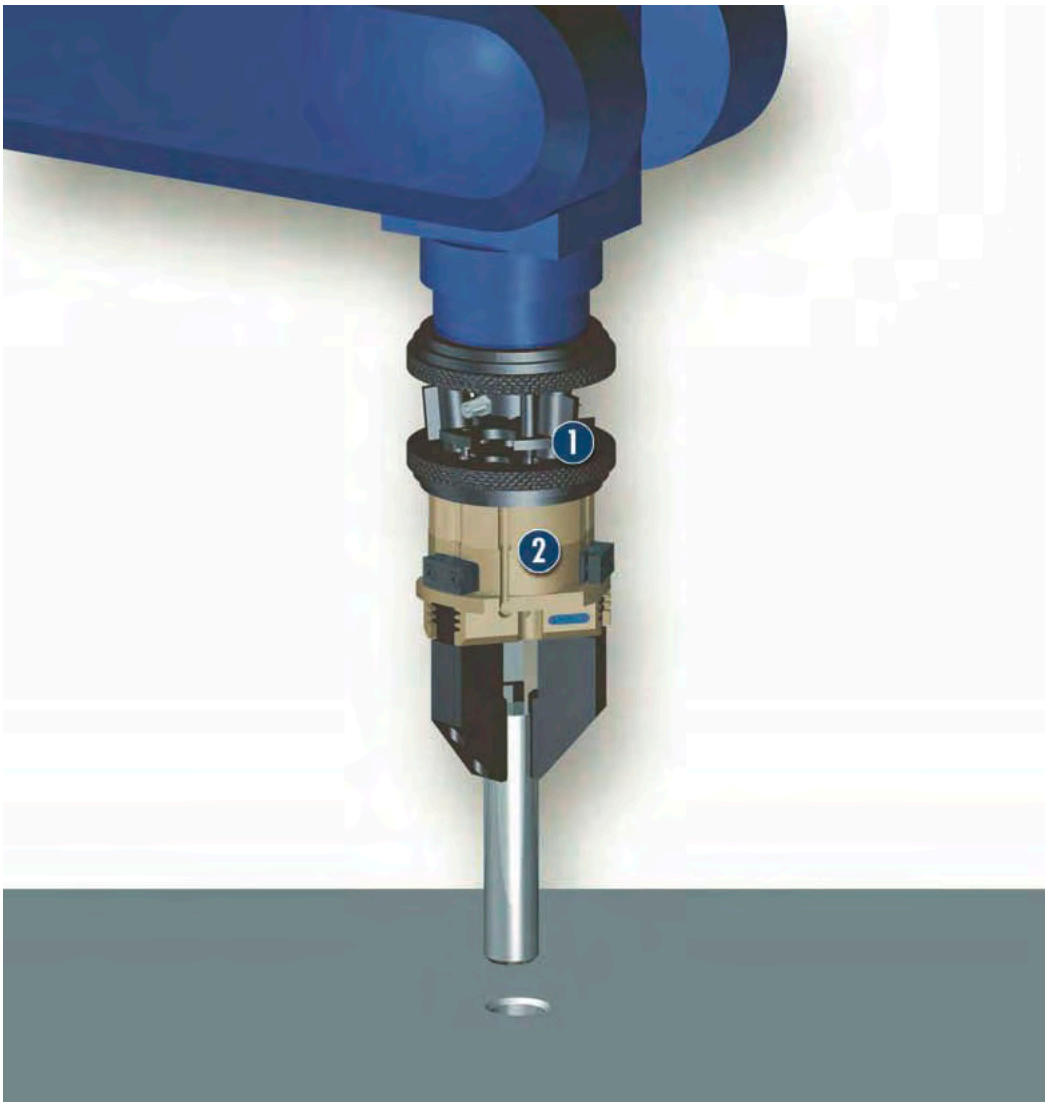
Sizes
01-30 .. 400

Payload
up to 20 kg

Compensation path XY
± 2.2 mm

Compensation bend
1°

Application example



Inserting a bolt into a bore

1 FUS-113B Insertion Unit

2 PZN-plus 80 2-Finger Centric Gripper

Insertion Unit

Symmetrical insertion unit with centric locking and monitoring

Area of application

Assembly tasks with very little play for the parts to be aligned

Your advantages and benefits

Pneumatic, centric locking
resets the unit to a defined zero position and protects the elastomers

Elastomers with layered structure
soft and flexible on insertion and rigid when compressed

Compensates for misalignment
and therefore reduces the risk of jamming

General information on the series

Material
Aluminum, elastomer materials

Maintenance
Maintenance-free

Position during insertion
Vertical

Scope of delivery
Operating manual, maintenance instructions, manufacturer's declaration

Actuation
Pneumatic, dry or lubricated filtered compressed air (10 µm)

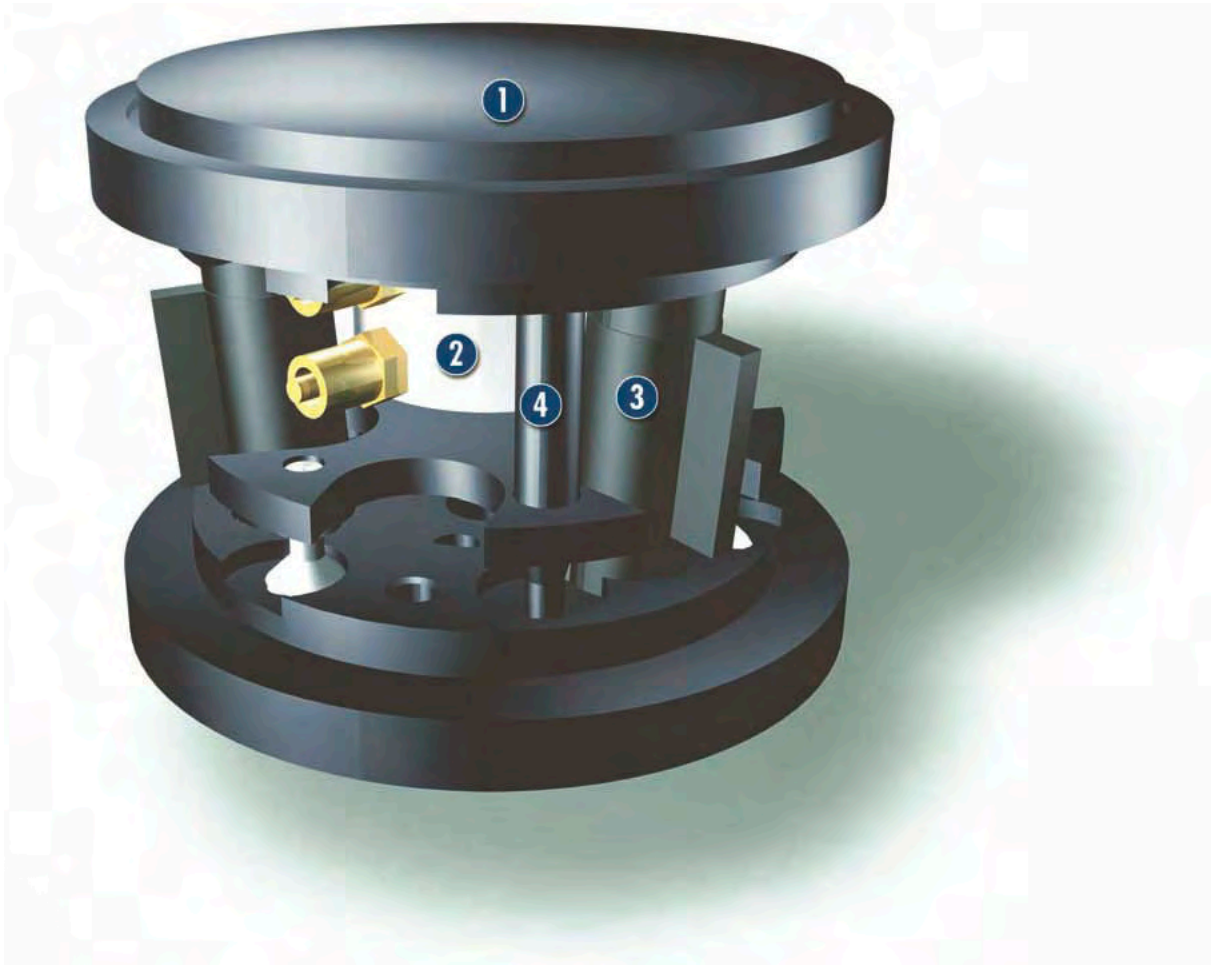
Operating pressure
From 5 bar to 6 bar

Connections
Two plug connections for hose with 4.0 mm diameter

Force maintained in the event of a drop in pressure
Possible via SDV-P pressure maintenance valve

Warranty
24 months

Sectional diagram



1 Adapter Flange
individual screw connection diagrams can be easily integrated

2 Pneumatic Locking
for a secure connection from the machine and tool sides

3 Elastomers
facilitate the compensation movement

4 Overload Bolt
to protect the elastomers

Accessories

Accessories from SCHUNK – the suitable supplement for maximum functionality, reliability and performance of all automation modules.

IN inductive proximity switches

Fittings

ⓘ For the exact size of the accessories, the availability for this size and the designation and ID, please refer to the additional views at the end of the size in question. You can find more detailed information on our accessory range in the "Accessories" catalog section.

General information on the series

Material properties of the shearing cushion

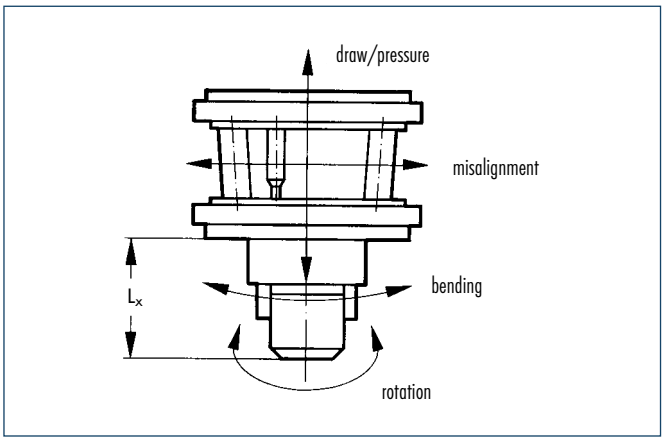
	001-30	001 A	111 B	112 B	113 B	211 A	211 B	211 C	212 A	212 B	212 C	213 A	213 B	213 C	413 C	413 D
ID	320280	320518	320519	320522	320525	320527	320528	320529	320530	320531	320532	320533	320534	320535	320336	320337
ID															320338	320339
Material	CR	CR	CR	CR	NBR	CR	CR	CR	CR	CR	CR	NBR	NBR	NBR	NBR	NBR
Operating temperature	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60	5-60
Oil resistance	0	0	0	0	++	0	0	0	0	0	0	++	++	++	++	++
Resistance to coolant	0	0	0	0	++	0	0	0	0	0	0	++	++	++	++	++
Resistance to ozone	+	+	+	+	-	+	+	+	+	+	+	-	-	-	-	-

++ = very good + = well-suited 0 = suitable to a limited extent

Checklist for selection of FUS insertion unit to fax no. +49-7133-103-2189

Customer: _____

Order number: _____
Department: _____
Contact: _____
Date: _____
Telephone: _____
Fax: _____



1. Distance of the center of compliance to the FUS in mm: _____

2. Max. offset of the parts to be aligned
   Displacement: _____ mm
   Tilting: _____ °
   Rotation: _____ °

3. Size of the insert chamfer (chamfer is mandatory)
   Bolt: _____
   Bore: _____

4. Insertion diameter with tolerance
   Bolt: _____ mm
   Bore: _____ mm

5. Materials of the parts to be aligned
   Bolt: _____
   Bore: _____

6. Insertion direction ☐ vertical ☐ horizontal _____

7. FUS load (tool and workpiece): _____ kg

8. Insertion speed and acceleration: _____

9. Maximum insertion force available: _____ N

10. Environment conditions (coolant, temperature, lubrication of the parts to be aligned, etc.)

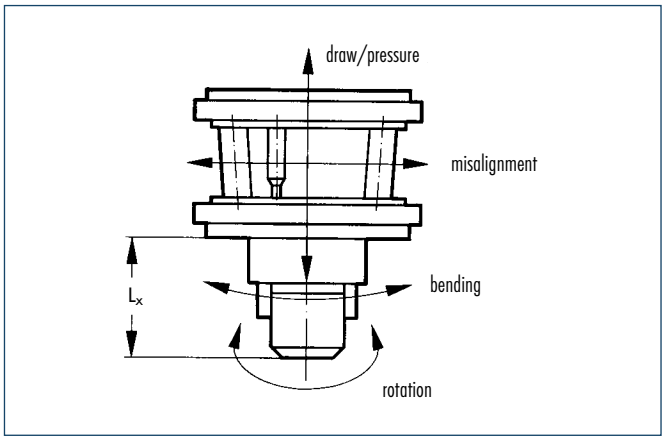
    _____

    _____

11. Pneumatic locking ☐ Yes ☐ No

Mode of operation of the FUS

The coaxial insertion unit function is based on a set of three to six shearing cushions made from an elastomer material which project an assumed rotation point outside of the system which is also intended to be the compensation point. The compensation center is the center of the rotation and translation movements within the space.
If the compensation center is positioned in the mating surface of the workpiece, the workpiece to be inserted can move and rotate around this center. This reduces the required assembly forces as well as the risk that the parts will jam. Compensation of this kind for positioning errors in transverse and angular direction reduces wear on robots and robotic equipment as well as the need for high-precision machines and devices. The insertion unit is to be aligned vertically. Horizontal use is possible if the load bearing capacity and accuracy are limited.



Advantages

- Compensated positioning error sideways, in the axle angle and angle of rotation
- Rigid in the direction of compression for insertion movements
- Flexible in the compensation direction
- Shearing cushions made from elastomer material facilitate intrinsic damping and self centering
- Mechanical overload bolts protect from overload in all directions
- Various different compensation center distances available for parts of differing size
- Various different elastomer materials for the shearing cushions available for a range of rigidities
- Maintenance-free

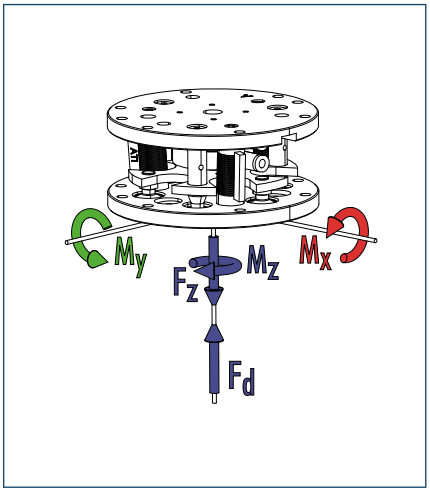
Pneumatic locking option

All FUS models are equipped with pneumatic locking.
Operating pressure: 5 bar - 6 bar
Pressure connection: Two plug connections for hose Ø 4.0 mm

Advantages

- Shorter cycle times as vibration is prevented
- Improved repeat accuracy
- Centering of tool and machine side
- Increased shearing cushion life span
- Flexibility can be deactivated
- Locking system does not require additional unit height

Moment load

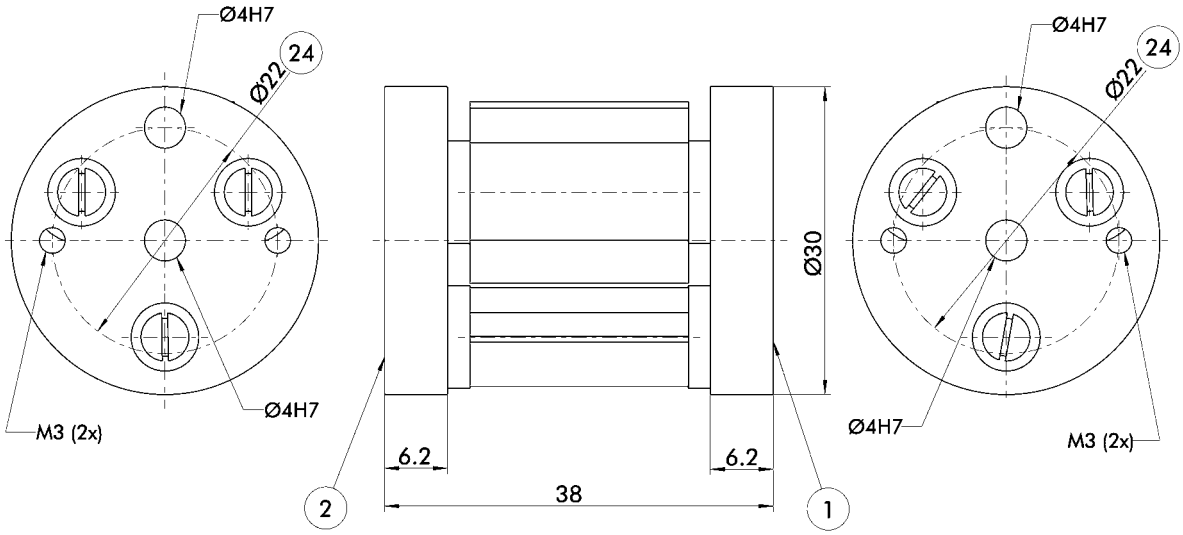


Traction	[N]	9
Pressure	[N]	160
Displacement	[N]	3
Bending	[Nm]	1.1
Rotation	[Nm]	0.1

Technical data

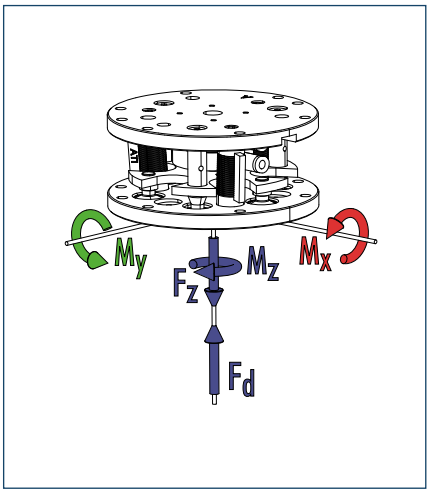
Designation		FUS-001-30
Without locking	**ID**	**0320280**
Tension/pressure	[mm]	0.4/0.4
Max. compensation - Displacement	[mm]	± 1.7
Max. compensation - Bending	[°]	1
Rotation	[°]	4.5
Repeat accuracy without locking	[mm]	± 0.05
Rigidity		
Tension/pressure	[N/mm]	385
Displacement	[N/mm]	7.5
Bending	[Nm/rad]	57
Rotation	[Nm/rad]	0.8
Weight without lock	[kg]	0.05

Main views



① Robot-side connection
② Tool-side connection
㉔ Bolt pitch circle

Moment load

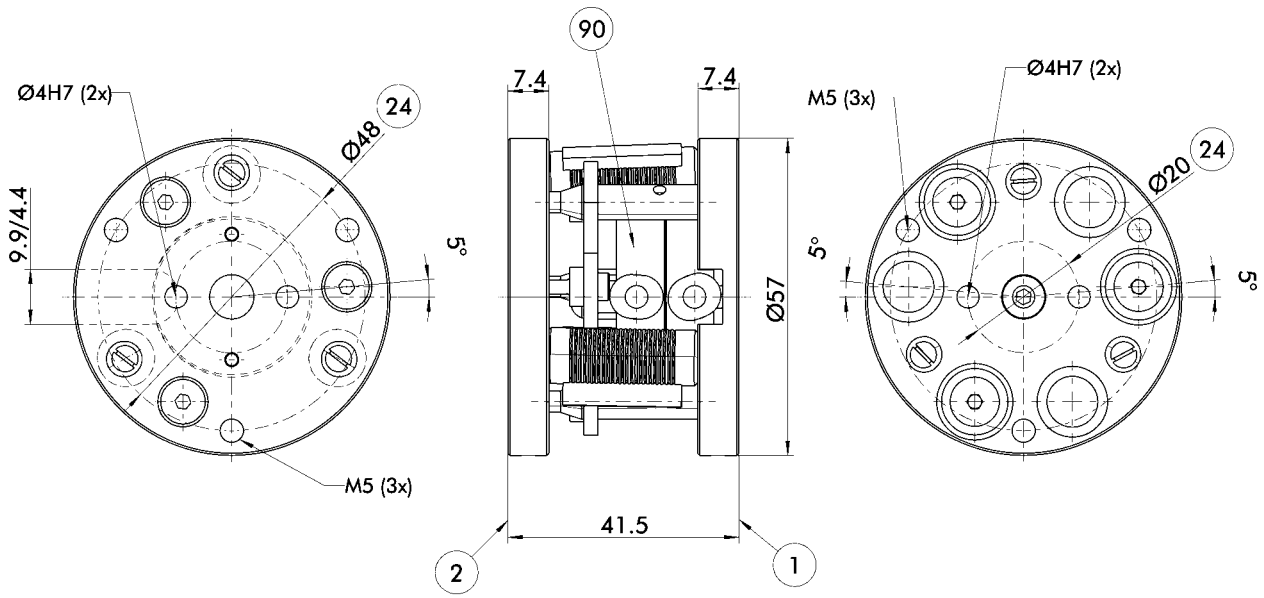


Traction	[N]	22
Pressure	[N]	355
Displacement	[N]	6.5
Bending	[Nm]	3.4

Technical data

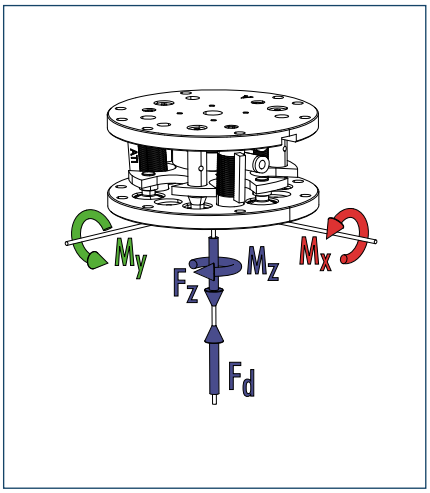
Designation		FUS-001
With locking mechanism	**ID**	**0320518**
Max. compensation - Displacement	[mm]	± 1.7
Max. compensation - Bending	[°]	1
Rotation	[°]	4.5
Rigidity		
Displacement	[N/mm]	1.7
Bending	[Nm/rad]	180
Compensation center clearance L_0	[mm]	23
Weight with lock	[kg]	0.18

Main views dimensions



① Robot-side connection
② Tool-side connection
㉔ Bolt pitch circle
㉚ Pneumatic locking

Moment load

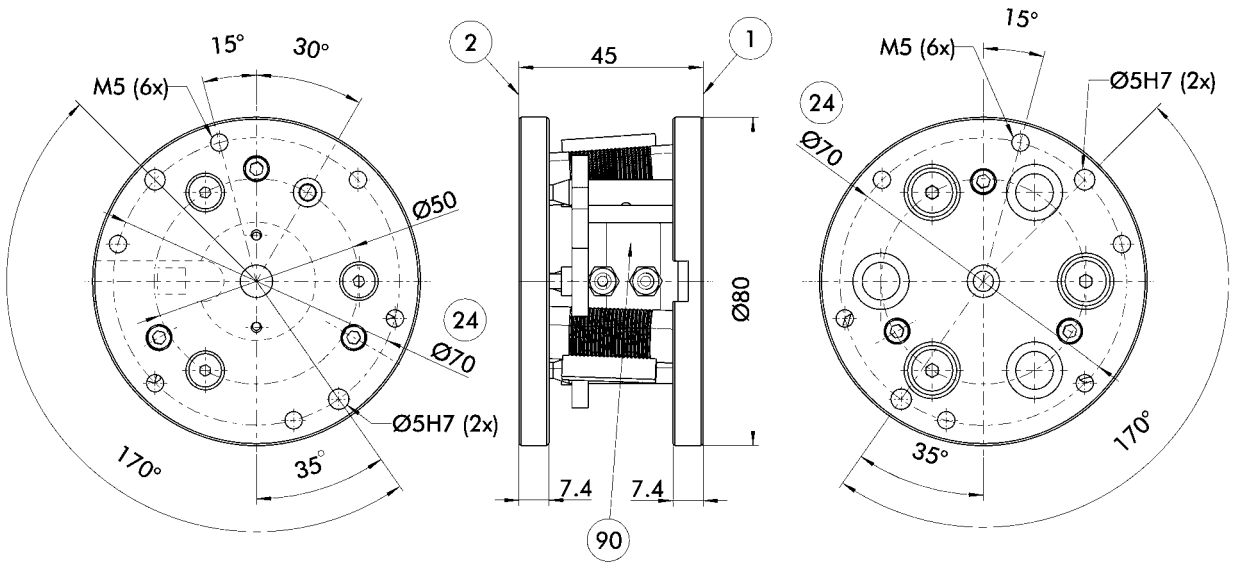


Designation		FUS-111B	FUS-112B	FUS-113B
Traction	[N]	45	45	82
Pressure	[N]	1290	540	1290
Displacement	[N]	9	9	27
Bending	[Nm]	5.2	5.2	8

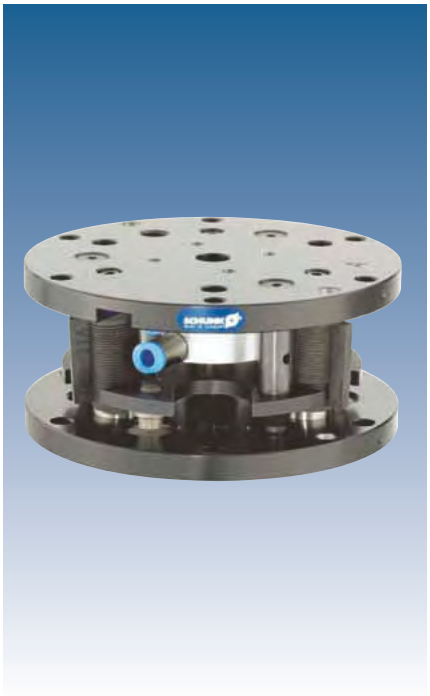
Technical data

Designation		FUS-111 B	FUS-112 B	FUS-113 B
With locking mechanism	**ID**	**0320519**	**0320522**	**0320525**
Max. compensation - Displacement	[mm]	± 2.2	± 2.2	± 2.2
Max. compensation - Bending	[°]	1.1	1.1	1.1
Rotation	[°]	5	5	5
Rigidity				
Displacement	[N/mm]	11	7	27
Bending	[Nm/rad]	380	180	640
Compensation center clearance L_0	[mm]	118	64	57
Weight with lock	[kg]	0.31	0.31	0.31

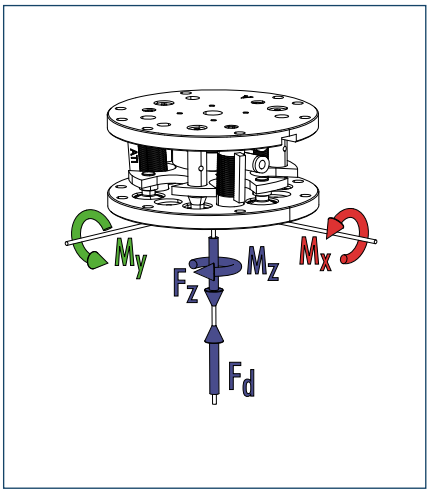
Main views



① Robot-side connection
② Tool-side connection
㉔ Bolt pitch circle
㉚ Pneumatic locking



Moment load



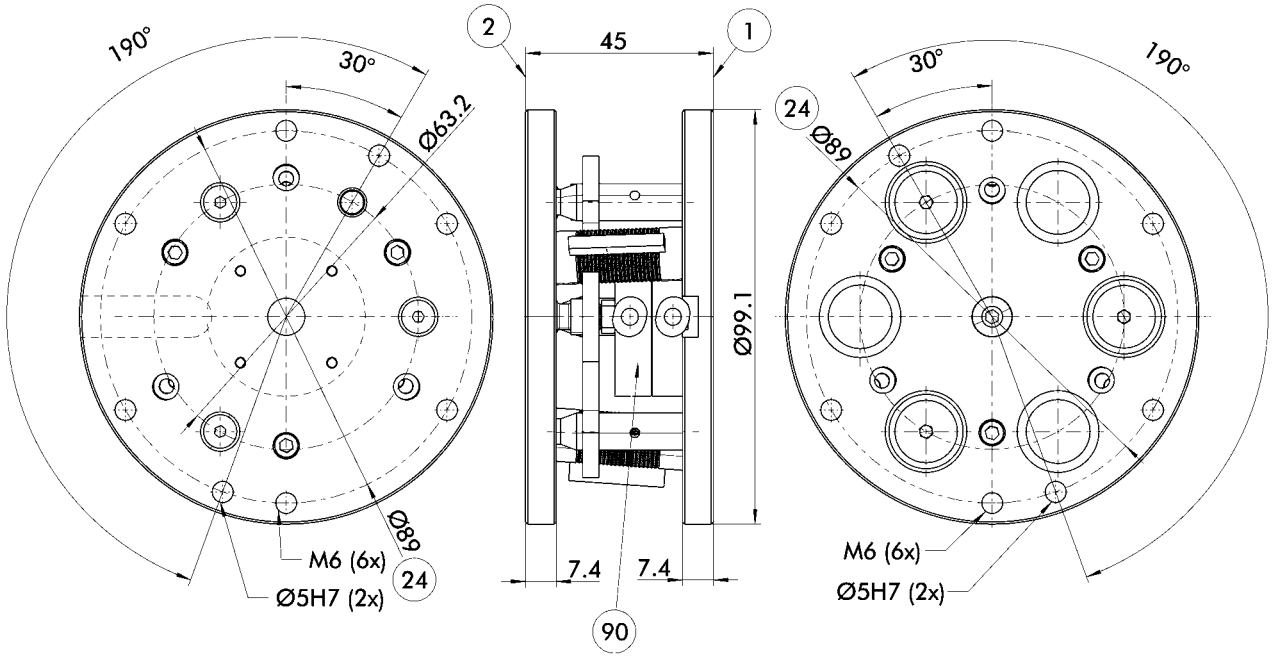
Designation		FUS-211A	FUS-211B	FUS-211C	FUS-212A	FUS-212B	FUS-212C	FUS-213A	FUS-213B	FUS-213C
Traction	[N]	53	53	106	62	62	124	98	98	196
Pressure	[N]	1360	1410	2770	640	730	1360	1360	1400	2770
Displacement	[N]	9	9	18	9	9	18	27	27	54
Bending	[Nm]	6.8	7.3	14.1	6.8	7.3	14.1	8.5	9	17.5

Technical data

Designation		FUS-211A	FUS-211B	FUS-211C	FUS-212A	FUS-212B	FUS-212C	FUS-213A	FUS-213B	FUS-213C
With locking mechanism	**ID**	**0320527**	**0320528**	**0320529**	**0320530**	**0320531**	**0320532**	**0320533**	**0320534**	**0320535**
Max. compensation - Displacement	[mm]	± 2.2	± 2.2	± 2.2	± 2.2	± 2.2	± 2.2	± 2.2	± 2.2	± 2.2
Max. compensation - Bending	[°]	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Rotation	[°]	4	4	4	4	4	4	4	4	4
Rigidity										
Displacement	[N/mm]	11	11	23	7	7	14	26	26	52
Bending	[Nm/rad]	474	552	1025	225	270	495	790	945	1735
Compensation center clearance L_0	[mm]	140	155	148	82	92	87	74	82	79
Weight with lock	[kg]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

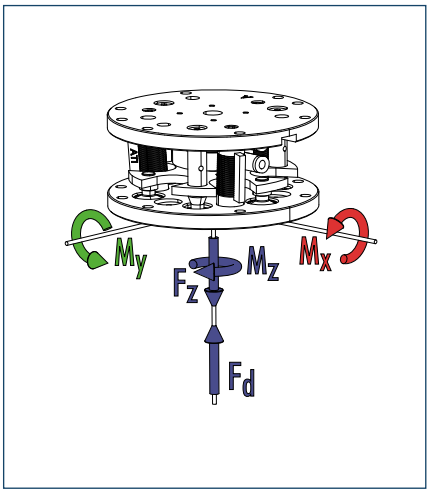
A = 3 elastomers on inner graduated circle B = 3 elastomers on outer graduated circle C = 6 elastomers

Main views



① Robot-side connection
② Tool-side connection
㉔ Bolt pitch circle
㊿ Pneumatic locking

Moment load

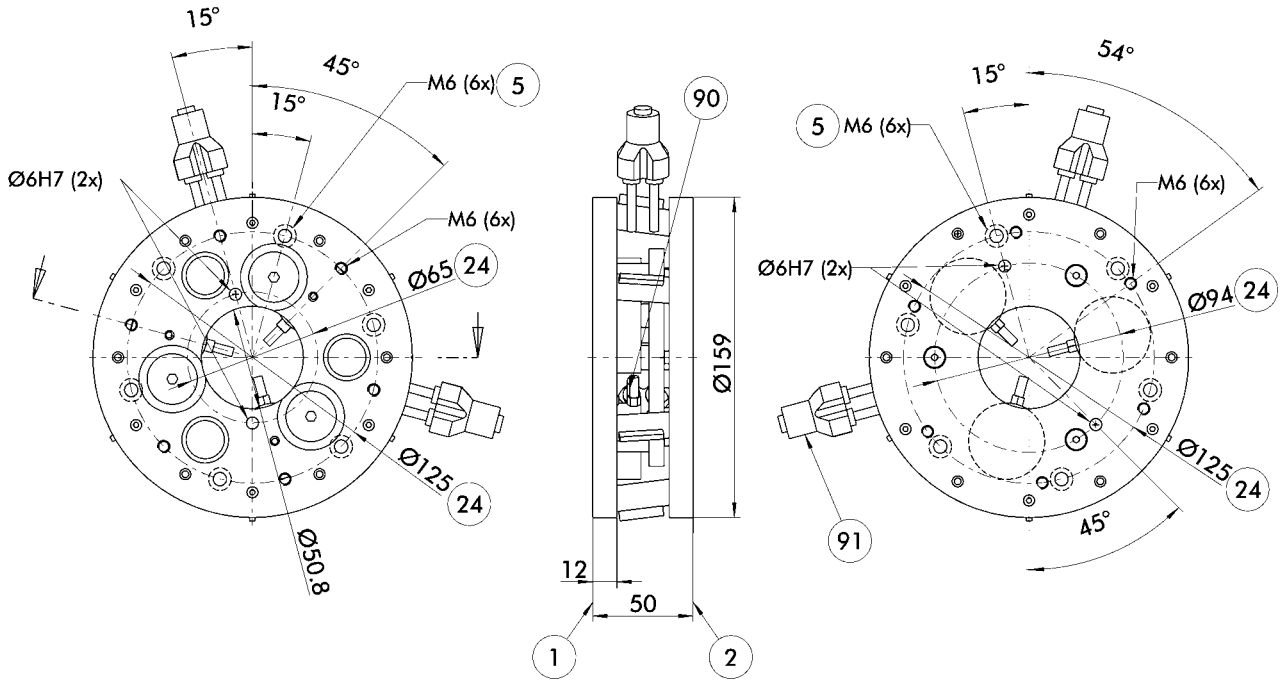


Designation		FUS-413 C	FUS-413 D
Traction	[N]	200	395
Pressure	[N]	2750	5490
Displacement	[N]	27	54
Bending	[Nm]	22.6	45.2
Rotation	[Nm]	33	66

Technical data

Designation		FUS-413 C	FUS-413 D
With locking mechanism	**ID**	**0320338**	**0320339**
Tension/pressure	[mm]	1.1/1.3	1.1/1.3
Max. compensation - Displacement	[mm]	± 2.2	± 2.2
Max. compensation - Bending	[°]	1	1
Rotation	[°]	2.5	2.5
Repeat accuracy without locking	[mm]	± 0.05	± 0.05
Repeat accuracy with locking	[mm]	± 0.01	± 0.01
Rigidity			
Tension/pressure	[N/mm]	6300	12600
Displacement	[N/mm]	60	120
Bending	[N/rad]	9000	1800
Rotation	[N/rad]	330	660
Compensation center clearance L_0	[mm]	225	225
Weight without lock	[kg]	1.1	1.3
Weight with lock	[kg]	1.6	1.8

Main views dimensions with locking mechanism



① Robot-side connection
② Tool-side connection
⑤ Through-bore for screw connection with screw (enclosed)
㉔ Bolt pitch circle
㉚ "Lock" and "Unlock" connections
㉛ Plug connection for hose Ø 4 (2x) supplied as standard