SCHMIDT-KUPPLUNG GmbH

Servoflex

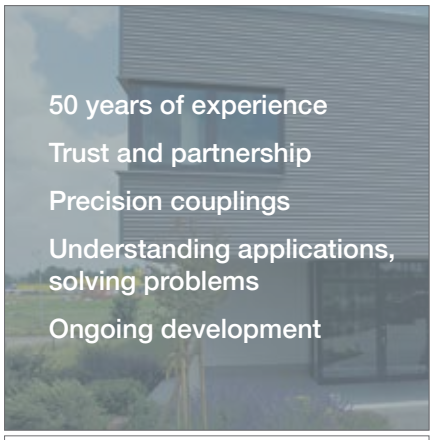
About us

Many years of experience

For 50 years, we have been advising machine manufacturers as partners for compact coupling systems. Our experience in power transmission has given us extensive know-how in many industries, as we know and understand the most varied applications, and this allows us to optimally support you. Our products are always a safe choice. No matter if it is a standard product, a coupling tailored to a specific industry, or a coupling solution designed for a specific application.

Products with high technical functionality

Our product range includes torsionally stiff couplings which stand out due to their compactness and high functionality. Their unique technical features offer technical users a variety of practice-oriented advantages. Renowned OEMs from all areas of machinery manufacturing are among our partners.



Industry-specific versions

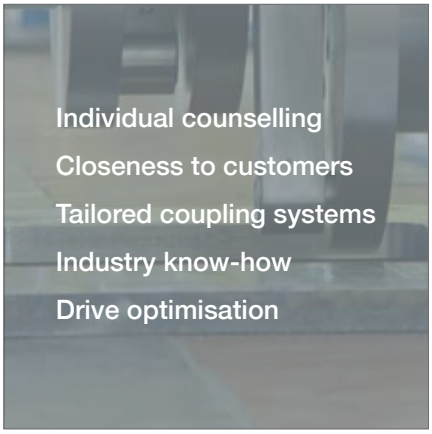
Being familiar with the applications of a variety of industries, we can design tailored coupling versions. No matter if in the food, vacuum, packaging or printing industry, or in sensor or medical technology - we feel at home anywhere.

Your drive optimisation

Close cooperation with our customers in the design and implementation of a project results in coupling solutions precisely tailored to application-specific requirements. Comprehensive counselling, FEM analyses, prototype definition and production of Rapid Prototyping Models, as well as confirmation of the calculated design data on modern test benches - all this ensures the optimisation of your drive train.

Continuous development work

Your wishes are our motivation - With us, new impulses from the market stream into the ongoing further development of our products.



Introduction Servoflex

The perfect servo coupling

The Servoflex coupling has been designed to meet the most demanding requirements of modern servo motors. It combines highest precision requirements with minimised mass inertia. Dynamic drive tasks with frequent starting, stopping and reversing, where absolute positioning accuracy is paramount, are its specialty.

Servoflex – in cooperation with

Technique

High-precision
The disk pack design is perfectly tailored to today's servo motors requirements. Layered, flexible disks made of high-quality stainless steel 1.4301 result in a disk pack with distinct torsional stiffness for high-precision drive tasks.

Lowest inertia
The clamp hubs made of high-strength aluminium are also anodised. Designed with extremely low inertia, they are perfect for highly dynamic positioning and feeding tasks.

FEM-optimised disk
The plate performance is also calculated and optimised on the basis of FEM analyses. The focus is placed on high torsional stiffness and torque transmission. Flexible disks continue to reliably compensate for shaft displacements.

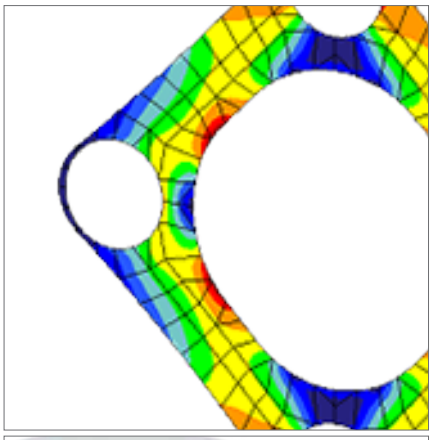
Broad performance spectrum
The Servoflex line includes 14 coupling sizes in a 0.25 to 250-Nm torque range. The spectrum of precision servo couplings ranges from miniature applications to printing and packaging machines.

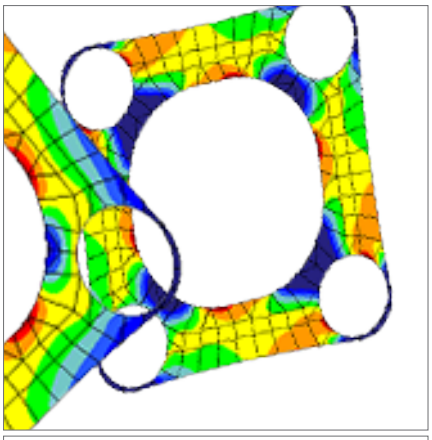
Backlash-free

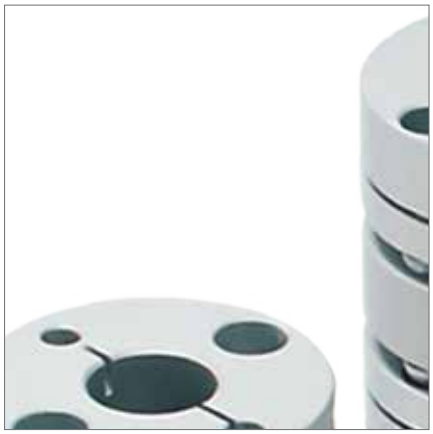
High torsional stiffness

Lowest inertia

FEM-optimised







Product line-up

Type A

Type B

Type C

Lowest inertia

Servoflex couplings are made of high strength aluminium and offer, as a result, very low mass inertia - which is essential for highly dynamic servo drives.
In some coupling sizes, the line includes 3 different variants. Depending on the selected bore diameters, the Servoflex coupling is delivered ex works with offset hub (type A), as mixed form (type B), or with large bore diameters on both sides as type C. By selecting the appropriate bore diameter, the mass inertia is reduced to the minimum.

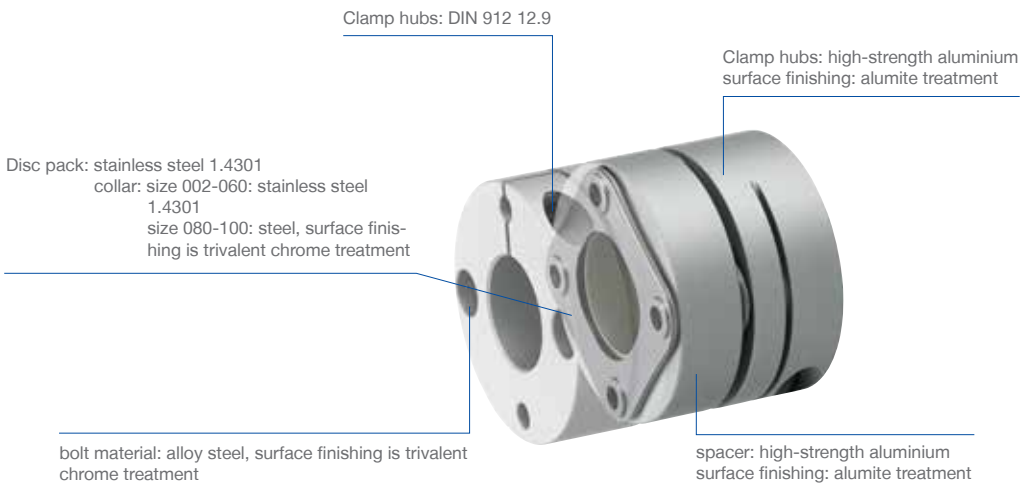
Servoflex Single Flex

The simple cardanic Servoflex SFC-S offers maximum torsional stiffness combined with very compact design. In addition, it ensures the compensation of axial and angular shaft displacements. Also, two single cardanic Servoflex offer the ideal combination possibility of intermediate shaft coupling for highly precise, synchronised processes in multi-axis systems.

Servoflex Double Flex

In addition to high torsional stiffness, the double cardanic Servoflex SFC-D coupling also compensates for axial, radial and angular shaft displacements. It is perfect for dynamic applications where the focus is on high-precision motion sequence along with the compensation of shaft displacements.

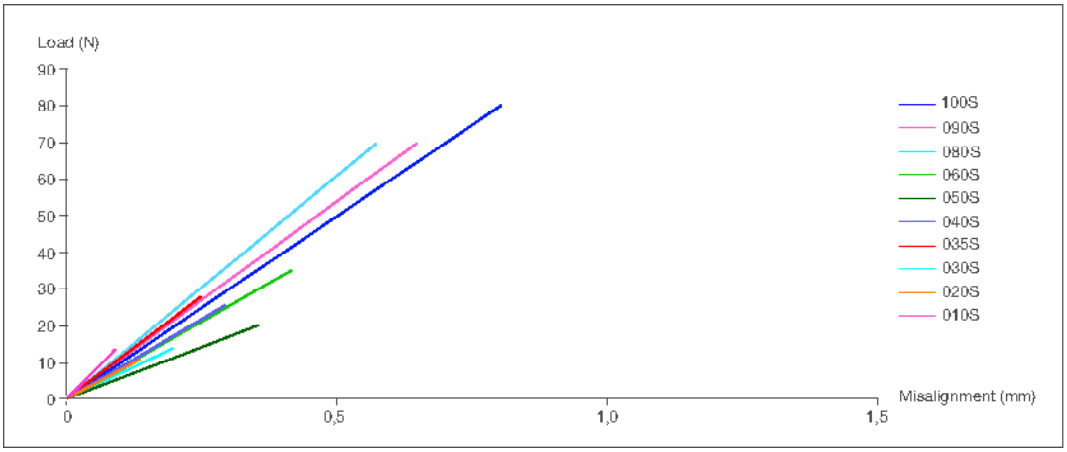
Material



Low restoring forces

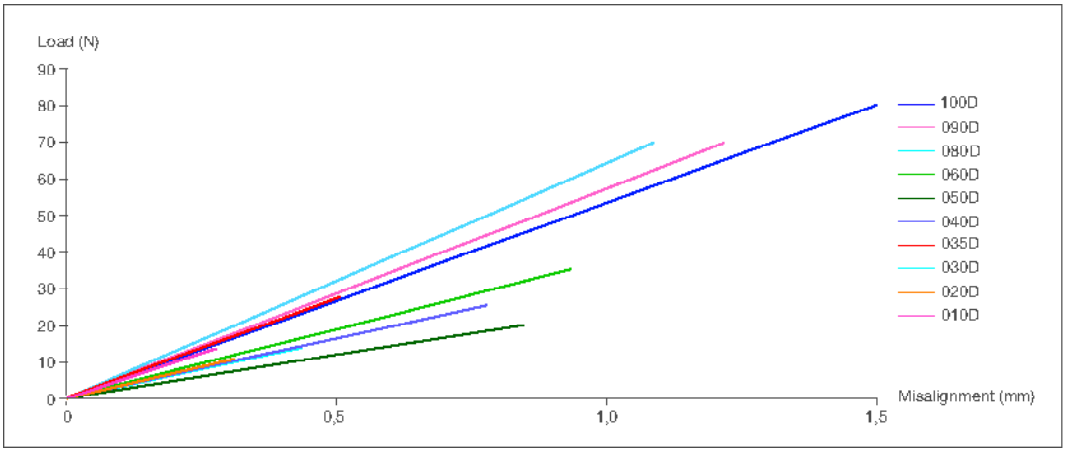
Servoflex Single Flex

Axial load and amount of misalignment



Servoflex Double Flex

Axial load and amount of misalignment

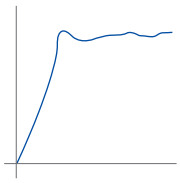
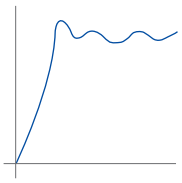
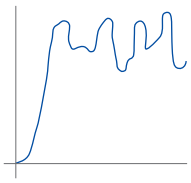
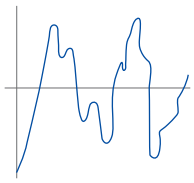


Selection sequence

When selecting your Servoflex, the various technical parameters play a crucial role. Parameters such as maximum speed values, occurring shaft displacements and driving torque must be considered.

1. Servoflex main fields of application are dynamic servo motors. The Servoflex design is performed by multiplying the servo motor highest peak torque T_{AS}, to be regularly transmitted, by the impact or load factor K.

$T_{KN} \geq T_{AS} \times K$ (Nm)

Load factor K			
Constant	Vibrations: Small	Vibrations: Medium	Vibrations: Large
			
1,0	1,25	1,75	2,25

In practice, the following formula has been proven:

$T_{KN} \geq T_{AS} \times (1{,}2 – 1{,}5)$ (Nm)

2. For each selected coupling size, please observe the maximum permissible bore diameters and the corresponding displacement capacity. For these values, please refer to the table of the relevant coupling size. The shaft displacement values specified in the catalogue are maximum values. In case of combined displacements, they must be adjusted in such a way that the sum of the actual displacement percentages does not exceed 100%.

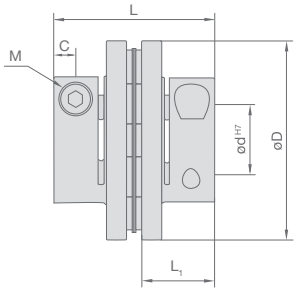
3. Other factors can be taken into account in the Servoflex design process, such as resonance frequency or specific operating and environmental conditions. With regard to this, please ask our application engineers.

Temperature range

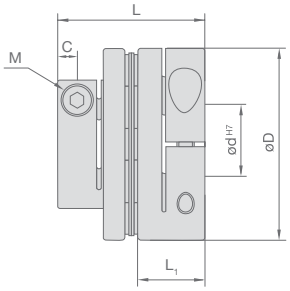
-30°C to +100°C

Single Flex

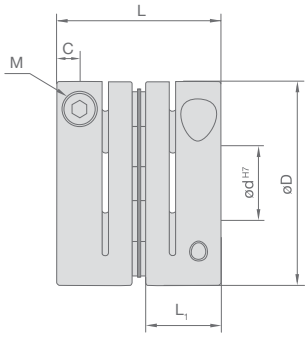
Type A



Type B



Type C



Specifications

Size	D mm	L mm	L_1 mm	C mm	M	M_A Nm	Type*	m g	J kgm^2x10^{-6}	T_{KN} Nm	C_T Nm/rad	max rpm min^{-1}	Misalignment angular °	Misalignment axial mm
SFC-002S	12	12,35	5,9	1,9	M1,6	0,25	C	3	0,06	0,25	190	10.000	0,5	0,04
SFC-005S	16	16,7	7,85	2,5	M2	0,5	C	7	0,25	0,6	500	10.000	0,5	0,05
SFC-010S	19	19,35	9,15	3,15	M2,5	1	C	11	0,58	1	1.400	10.000	1	0,1
SFC-020S	26	23,15	10,75	3,3	M2,5	1	C	25	2,36	2	3.700	10.000	1	0,15
SFC-025S	29	23,4	10,75	3,3	M2,5	1	C	29	3,67	4	5.600	10.000	1	0,19
SFC-030S	34	27,3	12,4	3,75	M3	1,7	A B C	33 41 49	4,00 6,06 8,12	5	8.000	10.000	1	0,2
SFC-035S	39	34	15,5	4,5	M4	3,8	C	84	18,43	8	18.000	10.000	1	0,25
SFC-040S	44	34	15,5	4,5	M4	3,8	A B C	76 90 105	16,42 22,98 29,53	10	20.000	10.000	1	0,3

* Three different types of hub designs are available depending of the combination of bore diameters you use. For further information please have look into following table “bore diameters”. Torsional stiffness values given are measured for the element only; The moment of inertia and mass are measured for the maximum bore diameter
M = Size of screw, M_A = Tightening torque, T_{KN} = Nominal torque, C_T = Torsional stiffness, m = Mass, J = Moment of inertia

Bore diameters

Size	d mm																						
	3	4	5	6	8	9	10	11	12	14	16	18	19	20	22	24	25	30	32	35	40	42	45
SFC-002S	■	■	■																				
SFC-005S	■	■	■	■																			
SFC-010S	■	■	■	■	■																		
SFC-020S		■	■	■	■	■	■																
SFC-025S				■	■	■	■	■	■	■													
SFC-030S					□	□	□	■	■	■													
SFC-035S					■	■	■	■	■	■	■												
SFC-040S						□	□	□	□	□	■	■	■										

□ Choosing a coupling with these bore diameters the coupling is equipped with offset hubs for smallest possible moment of inertia (Type A);
■ Choosing d1 and/or d2 with larger bore diameters than the ones marked with □, the Servoflex is equipped partially (Type B) or on both sides with solid hubs (Type C)

Combinations of different bore diameters are possible. Additionally bore diameters are available on request.

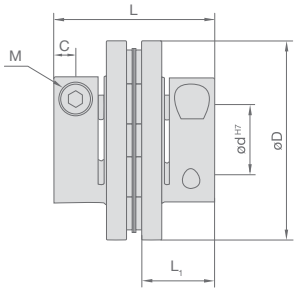
Ordering example:

SFC-030S Ø10 Ø12

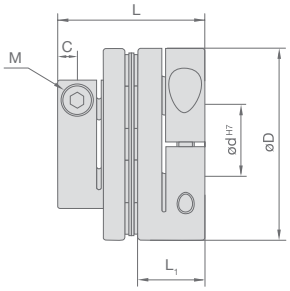
Servoflex size 030 Single Flex, bore 10 mm (offset clamp hub), 12 mm (solid clamp hub); Servoflex Type B

Single Flex

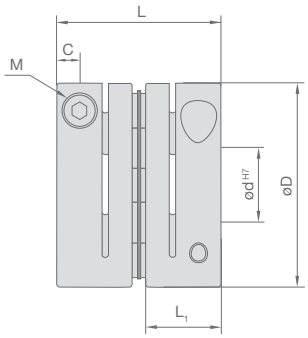
Type A



Type B



Type C



Specifications

Size	D mm	L mm	L_1 mm	C mm	M	M_A Nm	Type*	m g	J kgm^2x10^{-6}	T_{KN} Nm	C_T Nm/rad	max rpm min^{-1}	Misalignment angular °	Misalignment axial mm
SFC-050S	56	43,4	20,5	6	M5	8	A B C	156 185 214	54,88 77,10 99,33	25	32.000	10.000	1	0,4
SFC-055S	63	50,6	24	7,75	M6	14	C	314	188	40	50.000	10.000	1	0,42
SFC-060S	68	53,6	25,2	7,75	M6	14	A B C	279 337 396	143,70 206,10 268,50	60	70.000	10.000	1	0,45
SFC-080S	82	68	30	9	M8	28	C	727	709,30	100	140.000	10.000	1	0,55
SFC-090S	94	68,3	30	9	M8	28	C	959	1.227	180	100.000	10.000	1	0,65
SFC-100S	104	69,8	30	9	M8	28	C	1.181	1.858	250	120.000	10.000	1	0,74

* Three different types of hub designs are available depending of the combination of bore diameters you use. For further information please have look into following table “bore diameters”. Torsional stiffness values given are measured for the element only; The moment of inertia and mass are measured for the maximum bore diameter
M = Size of screw, M_A = Tightening torque, T_{KN} = Nominal torque, C_T = Torsional stiffness, m = Mass, J = Moment of inertia

Bore diameters

Size	d mm																						
	3	4	5	6	8	9	10	11	12	14	16	18	19	20	22	24	25	30	32	35	40	42	45
SFC-050S								□	□	□	□	□	□	■	■	■	■						
SFC-055S										■	■	■	■	■	■	■	■	■					
SFC-060S										□	□	□	□	□	□	□	■	■					
SFC-080S														■	■	■	■	■	■	■			
SFC-090S																	■	■	■	■	■		
SFC-100S																				■	■	■	■

□ Choosing a coupling with these bore diameters the coupling is equipped with offset hubs for smallest possible moment of inertia (Type A);
■ Choosing d1 and/or d2 with larger bore diameters than the ones marked with □, the Servoflex is equipped partially (Type B) or on both sides with solid hubs (Type C)

Combinations of different bore diameters are possible. Additionally bore diameters are available on request.

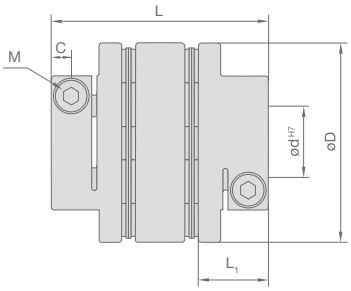
Ordering example:

SFC-050S Ø16 Ø20

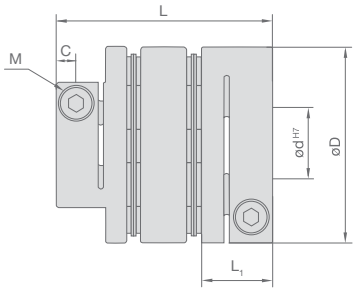
Servoflex size 050 Single Flex, bore 16 mm (offset clamp hub), 20 mm (solid clamp hub); Servoflex Type B

Double Flex

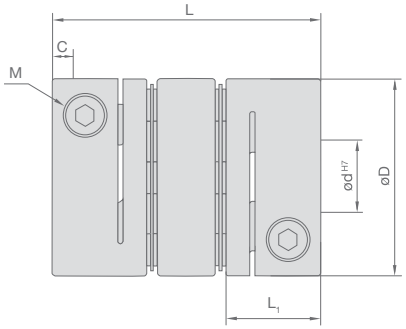
Type A



Type B



Type C



Specifications

Size	D mm	L mm	L_1 mm	C mm	M	M_A Nm	Type*	m g	J kgm^2x10^{-6}	T_{KN} Nm	C_T Nm/rad	max rpm min^{-1}	Misalignment angular[1] °	radial mm	axial mm
SFC-002D	12	15,7	5,9	1,9	M1,6	0,25	C	4	0,07	0,25	95	10.000	0,5	0,03	0,08
SFC-005D	16	23,2	7,85	2,5	M2	0,5	C	10	0,36	0,6	250	10.000	0,5	0,05	0,1
SFC-010D	19	25,9	9,15	3,15	M2,5	1	C	15	0,79	1	700	10.000	1	0,11	0,2
SFC-020D	26	32,3	10,75	3,3	M2,5	1	C	35	3,40	2	1.850	10.000	1	0,15	0,33
SFC-025D	29	32,8	10,75	3,3	M2,5	1	C	40	5,26	4	2.800	10.000	1	0,16	0,38
SFC-030D	34	37,8	12,4	3,75	M3	1,7	A B C	53 61 69	7,33 9,39 11,45	5	4.000	10.000	1	0,18	0,4
SFC-035D	39	48	15,5	4,5	M4	3,8	C	123	26,78	8	9.000	10.000	1	0,24	0,5
SFC-040D	44	48	15,5	4,5	M4	3,8	A B C	122 136 151	29,49 36,05 42,61	10	10.000	10.000	1	0,24	0,6

* Three different types of hub designs are available depending of the combination of bore diameters you use. For further information please have look into following table “bore diameters”. Torsional stiffness values given are measured for the element only; The moment of inertia and mass are measured for the maximum bore diameter
M = Size of screw, M_A = Tightening torque, T_{KN} = Nominal torque, C_T = Torsional stiffness, m = Mass, J = Moment of inertia

Bore diameters

Size	d mm																						
	3	4	5	6	8	9	10	11	12	14	16	18	19	20	22	24	25	30	32	35	40	42	45
SFC-002D	■	■	■																				
SFC-005D	■	■	■	■																			
SFC-010D	■	■	■	■	■																		
SFC-020D		■	■	■	■	■	■																
SFC-025D				■	■	■	■	■	■	■													
SFC-030D					□	□	□	■	■	■													
SFC-035D					■	■	■	■	■	■	■												
SFC-040D						□	□	□	□	□	■	■	■										

□ Choosing a coupling with these bore diameters the coupling is equipped with offset hubs for smallest possible moment of inertia (Type A);
■ Choosing d1 and/or d2 with larger bore diameters than the ones marked with □, the Servoflex is equipped partially (Type B) or on both sides with solid hubs (Type C)

Combinations of different bore diameters are possible. Additionally bore diameters are available on request.

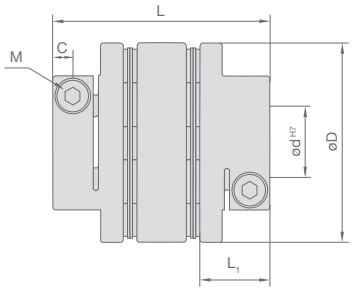
Ordering example:

SFC-030D Ø10 Ø12

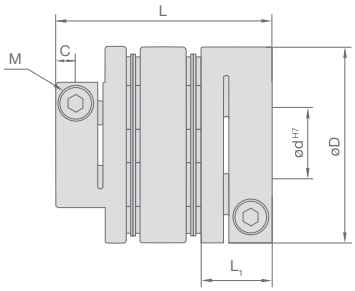
Servoflex size 030 Double Flex, bore 10 mm (offset clamp hub), 12 mm (solid clamp hub); Servoflex Type B

Double Flex

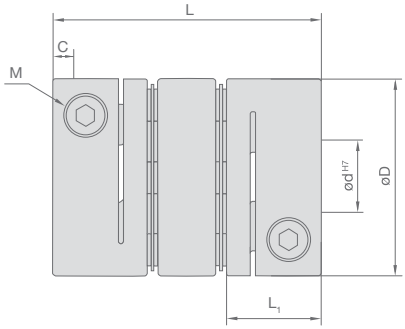
Type A



Type B



Type C



Specifications

Size	D mm	L mm	L_1 mm	C mm	M	M_A Nm	Type*	m g	J kgm^2x10^{-6}	T_{KN} Nm	C_T Nm/rad	max rpm min^{-1}	Misalignment angular[1] °	Misalignment radial mm	Misalignment axial mm
SFC-050D	56	59,8	20,5	6	M5	8	A B C	246 275 304	96,94 119,20 141,40	25	16.000	10.000	1	0,28	0,8
SFC-055D	63	68,7	24	7,75	M6	14	C	459	265,00	40	25.000	10.000	1	0,31	0,84
SFC-060D	68	73,3	25,2	7,75	M6	14	A B C	440 498 556	252,40 314,80 377,30	60	35.000	10.000	1	0,34	0,9
SFC-080D	82	98	30	9	M8	28	C	1.051	1034,00	100	70.000	10.000	1	0,52	1,1
SFC-090D	94	98,6	30	9	M8	28	C	1.373	1776,00	180	50.000	10.000	1	0,52	1,3
SFC-100D	104	101,6	30	9	M8	28	C	1.707	2704,00	250	60.000	10.000	1	0,55	1,48

* Three different types of hub designs are available depending of the combination of bore diameters you use. For further information please have look into following table “bore diameters”. Torsional stiffness values given are measured for the element only; The moment of inertia and mass are measured for the maximum bore diameter
M = Size of screw, M_A = Tightening torque, T_{KN} = Nominal torque, C_T = Torsional stiffness, m = Mass, J = Moment of inertia

Bore diameters

Size	d mm																						
	3	4	5	6	8	9	10	11	12	14	16	18	19	20	22	24	25	30	32	35	40	42	45
SFC-050D								□	□	□	□	□	□	■	■	■	■						
SFC-055D										■	■	■	■	■	■	■	■	■					
SFC-060D										□	□	□	□	□	□	□	■	■					
SFC-080D														■	■	■	■	■	■	■			
SFC-090D																	■	■	■	■	■		
SFC-100D																				■	■	■	■

□ Choosing a coupling with these bore diameters the coupling is equipped with offset hubs for smallest possible moment of inertia (Type A);
■ Choosing d1 and/or d2 with larger bore diameters than the ones marked with □, the Servoflex is equipped partially (Type B) or on both sides with solid hubs (Type C)

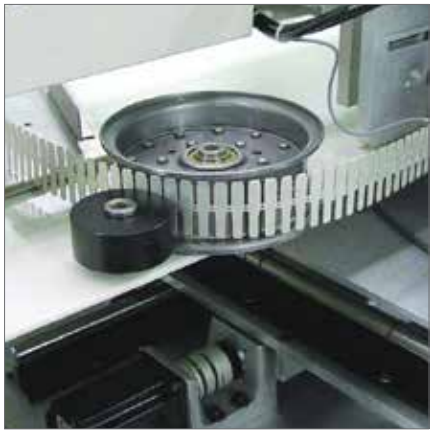
Combinations of different bore diameters are possible. Additionally bore diameters are available on request.

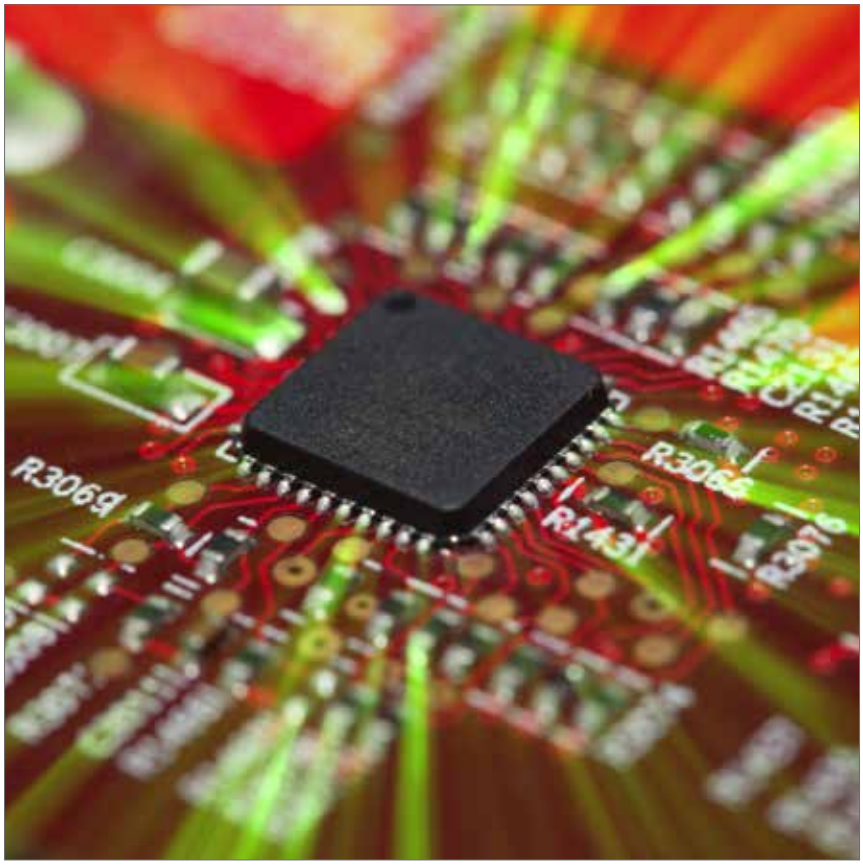
Ordering example:

SFC-050D Ø16 Ø20

Servoflex size 050 Double Flex, bore 16 mm (offset clamp hub), 20 mm (solid clamp hub); Servoflex Type B

Applications




Handling and automation systems

Industrial robots

Assembly systems

Machine tools

Printing machines and much more

We speak your language

Every industry has its own peculiarities. Understanding this is a key task for the successful implementation of industry-specific applications.

For 50 years, the release of countless applications in various industries has given us the experience and know-how to implement, jointly with our customers, the most suitable and efficient coupling solution for each application. No matter whether you deal with assembly or exposure systems for PCB production, medical technology or process engineering, forming or machine tools: We speak your language!

The optimal solution for every application

Handling and automation systems

Automatic assembly machines are of major importance in the rational mass production of small and tiny parts. Typical installation tasks regard, for instance, components for mobile phones, micro-switches, central locking systems and door locks and controllers. According to the extremely high productivity of these systems, absolute accuracy of the drive systems is required. Servoflex couplings operate both in the precise conveying process of components to the various processing stations, and in actual assembly and installation processes in the respective stations.
As intermediate shaft couplings, Servoflex couplings are used in gantry and portal robots.

Packaging machines

Servoflex couplings operate in the servo systems of modern tubular and flat bag packaging machines, most of which run as universal shaping, filling and sealing machines. Powdered or granulated products are filled via a variety of dosing devices, adapted to each product requirements, in thermoplastic wrapping materials and then heat sealed.
A highly dynamic, intermittent work process regarding packaging material preference, automatic shaping, filling as well as heat sealing stations, is essential for the high production performance of these systems.

Printing machines

Due to their technical features, Servoflex couplings are used in high-speed chain printers. Machines of this type print, punch and finish ready-to-use labels at high speed. What is crucial here, is the utmost precision of the punching station operation.
The combination of modern servo technology with Servoflex couplings ensures to optimally tune the true-to-register printing process when powering the printing and punching station, providing the intermittently running punching process with high output and a considerable increase in productivity.

Assembly systems

Generally, chips, wire bonds or other components on PCBs are completely or partially covered and thus protected from mechanical influences or environmental conditions. This process is called encapsulation.
Various cover sizes and formats can be processed flexibly and with a high number of cycles in systems and then fitted on PCBs. On an automatically convertible device, the covers of vacuum-assisted pick and place grippers are removed and placed with high positioning accuracy on the corresponding components to be encapsulated. In these high-precision assembly tasks, Servoflex couplings show their strength in the XY-axis, with the accuracy and minimised mass inertia which characterise them, through a drive system consisting of a servo motor and a ball screw.

Machine tools

High demands are placed on the dynamic behaviour of feed drives in modern CNC lathes.
On the one hand, the accurate positioning of the feeding movement is crucial. This required high positioning accuracy calls for the entire drive unit high stiffness. The Servoflex coupling supports this through its very high torsional stiffness and backlash-free work.
On the other hand, in feeding tasks, high dynamics is required to meet high productivity demands. Thanks to their mass inertia, Servoflex couplings offer the perfect solution.

Pouching Systems
Pick-and-place machines
High-speed label printers
Positioning units
Assembly systems
and much more

Mounting

Servoflex are assembled at high accuracy using a special mounting jig to ensure accurate concentricity of left an right internal diameters. The recommended processing tolerance for mounting shafts is the h7 class.

1. Confirm the clamping bolts are loosened. Remove the rust, dust and oil content on the inside diameter surface of the shaft and coupling. (Wipe off the oil content completely with a waste cloth, etc.)

2. Insert the coupling into the shaft. At this time, do not apply more than necessary force such as compression or pulling to the element part of the coupling. After the coupling is mounted into the motor, do not apply excessive compression when inserting the coupling into the mating shaft. Confirm the two clamping bolts are loosened and the coupling is movable to the axial and rotative directions (illustration 1). If it does not move smoothly, adjust centering of both shafts again. If the concentricity can not be confirmed with the method described above, confirm the mounting accuracy by other measures.

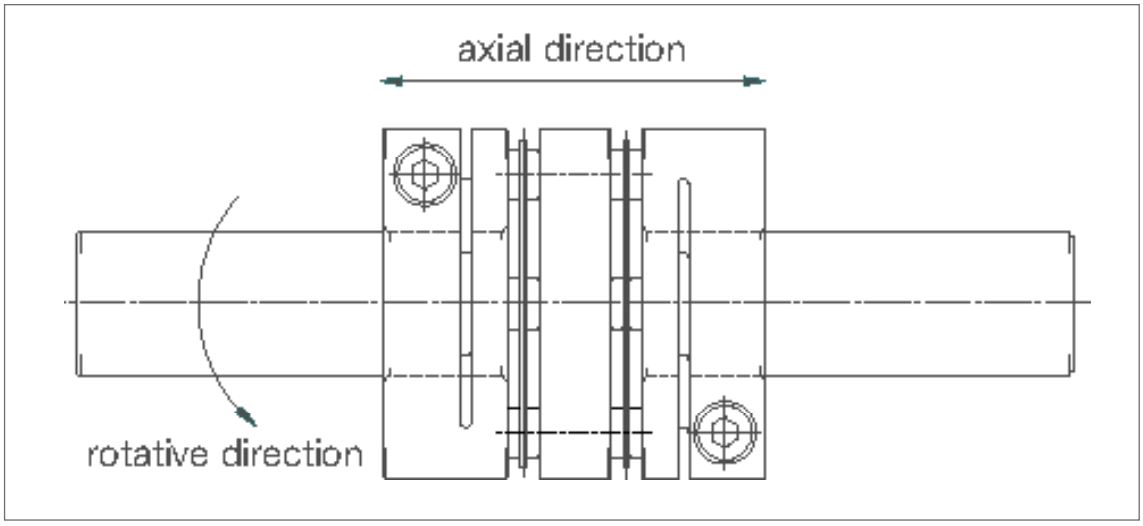


Illustration 1

3. Make sure that the insertion length of the coupling into the shaft is kept in the position so that the target shaft is in contact with the entire length of the flange (L1 dimension) as shown in illustration 2.

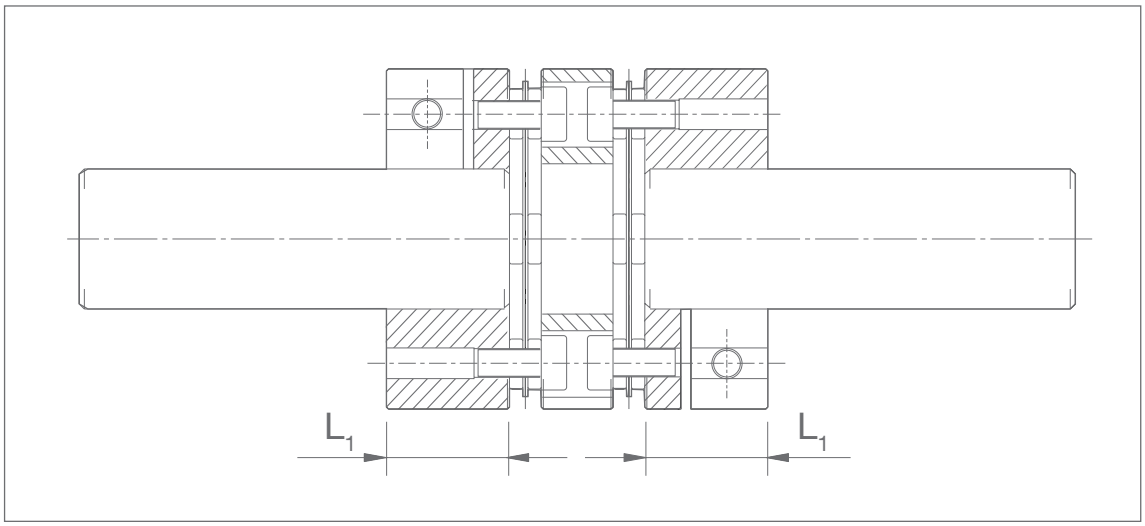


Illustration 2

4. Tighten up clamp screws with full tightening torque.

SCHMIDT-KUPPLUNG GmbH

Product Overview

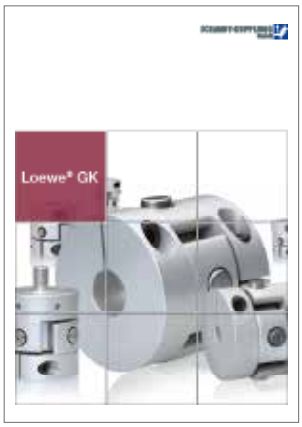
Catalogue Spinplus

Catalogue Controlflex

Catalogue Semiflex

Catalogue Schmidt-Kupplung

Catalogue Servoflex



Catalogue Loewe GK

Catalogue Omniflex

Overview Industries

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