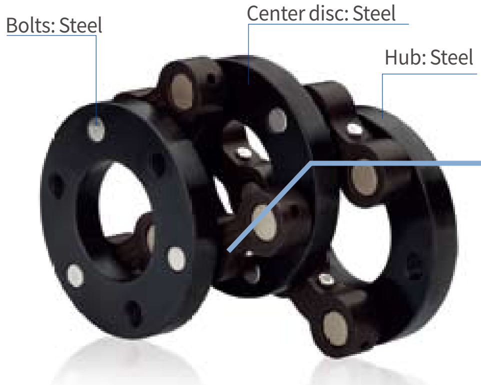
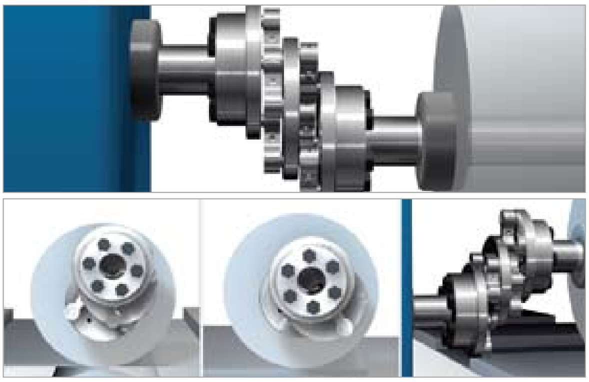
SK SERIES

Schmidt-Kupplung Coupling

Structure and Material

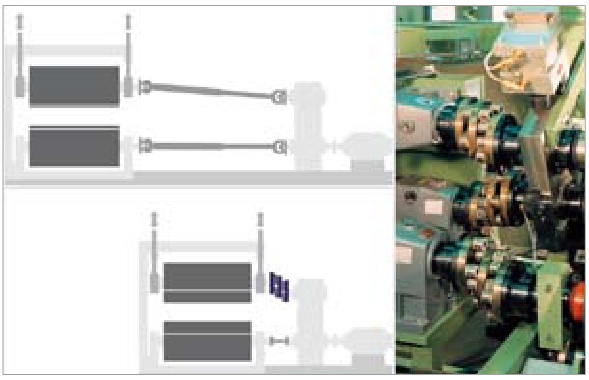


Product Features & Application



The most appropriate solution for big misalignment absorption

- Large offset with absolute angle synchronization.
- Precise and compact.
- High torsional stiffness, no restoring forces.



The optimal solution for every application

- Packaging machines
  - -Cartoner modules
  - -Box folding machines
  - -Thermoforming machines
- Forming industry
  - -Metal sheet transport
  - -Edge trimming shears
  - -Embossing rollers
- Paper machines
  - -Breast rollers
  - -Paper cutters
  - -Rotary cutter systems
- Printing machines
  - -Paint rollers
  - -Duct rollers
  - -Tampon printing machines
- Wood working industry
  - -Lamination machines
  - -Deburrers
  - -Edge processing

HOW TO ORDER

SK	-	10	5	12	/	3
Model		Length	Offset	∅D		Numbers of links

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Schmidt-Kupplung Coupling

Radial offset

The Schmidt-Kupplung coupling can be radially offset within the relevant pivoting range. Please note the limits specified in the tables of values for maximum allowable offset, maximum displacement and minimum required offset. Compliance with these values ensures that the shafts of the coupling do not run in an inadmissible alignment or in extended position.

▪ Minimal Radial Offset $\triangle K_{r\,min}$

The coupling may not operate in alignment position K_r=0. In alignment position, the center disc would have no definite position in space but would be stimulated to its own movement. Therefore, a minimal required radial offset $\Delta K_{r\,min}$ must be provided for both shafts to be connected. To this end, the output shaft must be moved horizontally (Figure 1) or vertically to achieve this minimum offset.

The figure below illustrates the installation position of the coupling when selecting $\Delta K_{r\,min}$ in the lateral, horizontal direction. The center disc can be located above (Figure 2a) or below (Figure 2b).

For the relevant value of the minimum required radial offset $\Delta K_{r\,min}$ for a coupling size, please refer to the technical data.

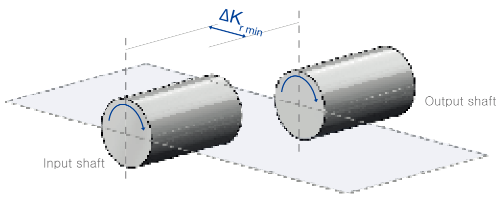


Figure 1. Output shaft moved in the lateral, horizontal direction to achieve the minimum required radial offset

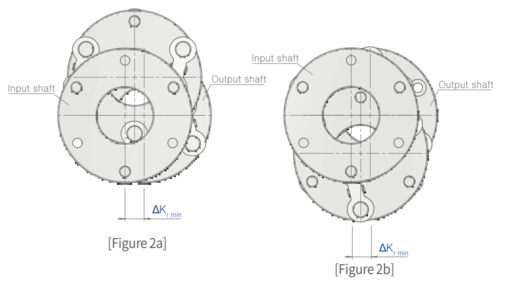


Figure 2. Alternative location of the center disc when selecting $\Delta K_{r\,min}$ in horizontal direction

▪ Maximum Radial Offset $\triangle K_{r\,min}$

The Schmidt-Kupplung coupling is a compactly built coupling for precise torque transmission of extremely radially offset shafts. The height of the maximum permissible radial displacement is dependent on the length/depth gauge of the coupling elements used for the relevant coupling size.

The maximum permissible radial offset results from the sum $\Delta K_{r\,min}$ and the adjustment range (Figure 3). For the relevant value of the maximum permissible radial offset ΔK_r for a coupling size, please refer to the technical data.

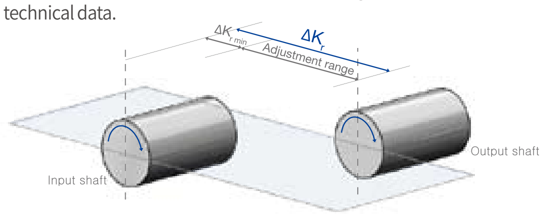


Figure 3. Maximum radial offset

Figure 4 shows the path of the centre disc of the Schmidt-Kupplung coupling with adjusting movements starting at $\Delta K_{r\,min}$ to ΔK_r. Here, the center disc moves on a circular portion defined by the length/pitches of the coupling elements and thus always has a definite position.

To determine the exact position of the center disc for required installation space our application engineers will be pleased to assist you.

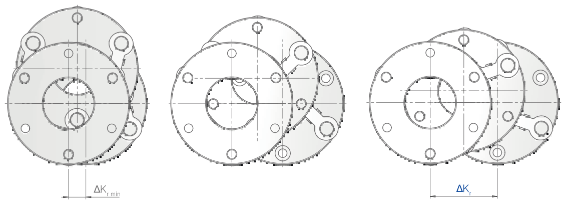
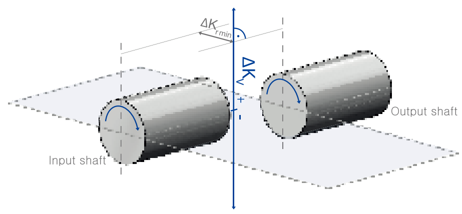


Figure 4. path of the center disc with adjusting movements starting at $\Delta K_{r\,min}$ to ΔK_r

▪ Maximum Linear Range of Coupling $\triangle K_v$



▪ Two installation situations are not permitted

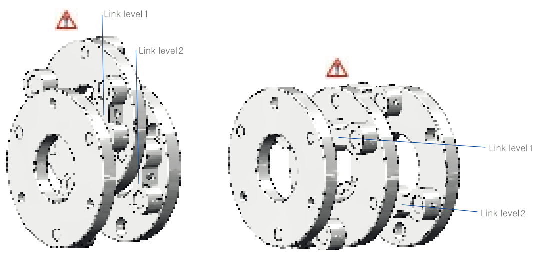
1. Inadmissible alignment

The coupling may not operate in alignment position K_r=0 (recognizable in that the coupling elements of link level 1 are parallel to the coupling elements in level 2). In alignment position, the center disc would have no definite position in space but would be stimulated to its own movement. For this reason, the aforementioned

minimum required radial offset must be provided for every Schmidt-Kupplung coupling.

2. Inadmissible extended position

The coupling may not operate in extended position (recognizable in that the coupling elements of link level 1 are parallel to the coupling elements in level 2).



SK SERIES

Schmidt-Kupplung Coupling

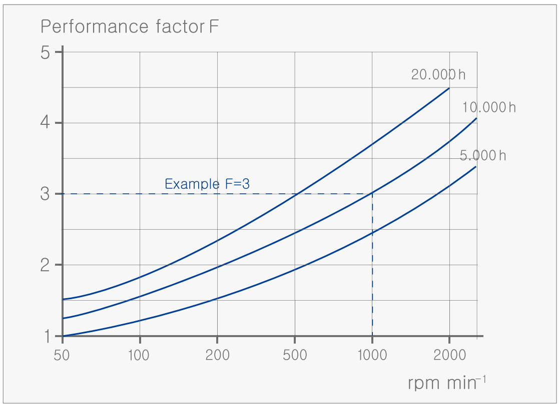
Selection sequence

The selection of the Schmidt coupling is determined by the various performance parameters. These include torque, speed and occurring displacement.
The influences of these parameters are described below :

Selection according to torque

To calculate the dimensioning moment T_D, please multiply your drive torque T_A with the corresponding performance factor F and the expected load factor K.

$T_D = T_A \times F \times K$

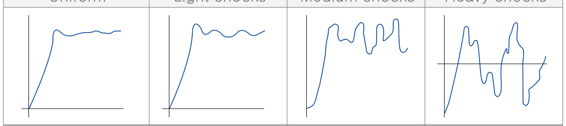


Select the anticipated operating speed of your application combined with the desired service life in hour.

Example: Anticipated operating speed: 1,000 rpm
Desired service life: 10,000 h

Performance factor F: 3

Load factor K			
Uniform	Light shocks	Medium shocks	Heavy shocks
1,0	1,25	1,75	2,25



$T_{KN} > T_D$ Select a coupling whose rated torque T_{KN} is larger than the calculated dimensioning torque T_D

※ Make sure that the maximum torque of coupling T_{Kmax} is not exceeded.

Selection example (Application: Roller drive in automatic lamination machine)

Required conditions

- Requested maximum radial offset $\triangle K_r$: 40mm
- Drive torque T_A : 50N · m
- Operating speed : 200 rpm
- Desired service life : 10,000 h
- Expected load factor K : 1.25 (light shocks)

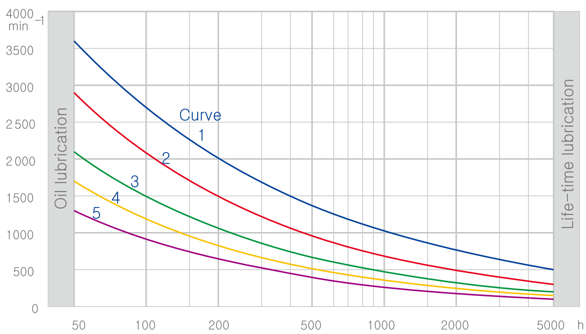
Selection

- Performance factor F : 2
- Dimensional torque T_D = 50N · m x 2 x 1.25 = 125 N · m
- Select a coupling whose rated torque T_{KN} is larger than the calculated dimensioning torque 125 N · m

Appropriate size: SK 7.7.9/3 (TKN: 150 N · m / TKmax: 290 N · m)

Lubrication period

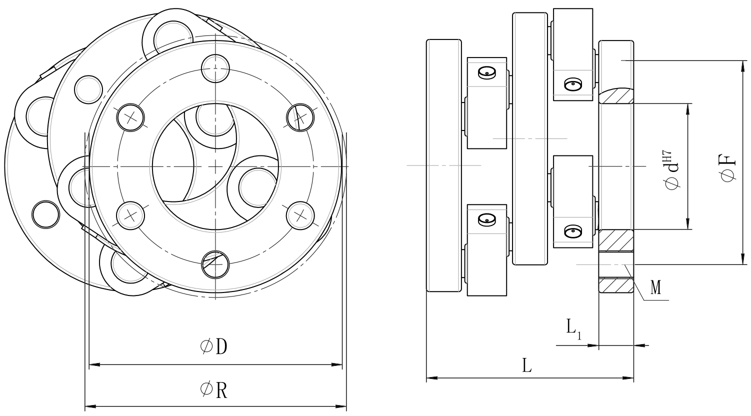
The Schmidt-Kupplung, except for size SK 4.2.6/3, SK 4.2.8/5, SK 4.5.6/3 and SK 4.5.8/5, has a lubrication fitting for regreasing. Adequate lubrication is required for full operating life. The Schmidt-Kupplung, should be regreased exclusively with Klüber Staburags NBU 12-300 KP. Mixing lubrication is not recommended and will reduce coupling operating life.



Standard				
Curve 1	Curve 2	Curve 3	Curve 4	Curve 5
SK 7.3.7/3	SK 10.5.12/3	SK 13.6.14/3	SK 16.7.16/3	SK 20.9.20/3
SK 7.3.9/3	SK 10.5.12/4	SK 13.6.16/4	SK 16.10.16/3	SK 20.15.20/3
SK 7.7.9/3	SK 10.9.12/3	SK 13.9.14/3	SK 16.7.18/4	SK 20.9.25/4
SK 7.7.12/4	SK 10.9.14/4	SK 13.9.16/4	SK 16.10.18/4	SK 20.15.25/4

SK SERIES

Schmidt-Kupplung Coupling



Dimensions / Performance (Technical Data)

SIZE	Performance							C_T	Dimensions								
	$\Delta K_{r\,min}$ mm	ΔK_r mm	ΔK_V mm	ΔK_W °	T_{KN} Nm	T_{Kmax} Nm	min^{-1}	kNm/rad	D mm	R mm	J kg cm²	m kg	L mm	L_1 mm	F mm	d mm	M
SK 4.2.6/3	6	23	45	0.8	45	85	2800	10	60	62	2.8	0.5	44	8	45	25	3xM6
SK 4.2.8/5				0.5	110	210	1800	24	82	84	8.9	0.8			67	40	5xM6
SK 4.5.6/3	13	50	95	0.8	45	85	1900	10	60	62	3.1	0.6			45	25	3xM6
SK 4.5.8/5				0.5	110	210	1600	24	82	84	9.1	1.1			67	40	5xM6
SK 7.3.7/3	9	34	64	0.8	110	210	3500	24	70	74	7.5	1.1	74	12.5	48	25	3xM10
SK 7.3.9/3				0.8	150	290	3100	33	90	94	21.5	1.7			70	45	3xM10
SK 7.7.9/3	17	66	126	0.8	150	290	2200	33	90	94	24	1.9			70	45	3xM10
SK 7.7.12/4				0.5	280	550	1900	63	120	124	63	3			98	50	4xM10
SK 10.5.12/3	14	53	100	0.5	360	710	2300	81	120	120	95	4.5	101	17	90	50	3xM12
SK 10.5.12/4				0.5	480	945	2300	108	120	120	105	5			90	50	4xM12
SK 10.9.12/3	22	85	162	0.5	360	710	1700	81	120	120	107	5.1			90	50	3xM12
SK 10.9.14/4				0.5	590	1155	1800	132	140	140	187	6.8			110	50	4xM12
SK 13.6.14/3	17	64	122	0.5	630	1240	1700	142	140	143	275	9.8	134	26	100	55	3xM16
SK 13.6.16/4				0.5	1010	1980	1600	227	158	164	475	13			120	60	4xM16
SK 13.9.14/3	22	85	162	0.5	630	1240	1500	142	140	143	285	10			100	55	3xM16
SK 13.9.16/4				0.5	1010	1980	1400	227	158	164	480	13.2			120	60	4xM16
SK 16.7.16/3	18	68	129	0.5	1130	2200	1500	252	158	164	550	15	155	31	115	60	3xM16
SK 16.7.18/4				0.5	1760	3440	1400	395	180	184	680	17			135	70	4xM16
SK 16.10.16/3	25	95	180	0.5	1130	2200	1200	252	158	164	585	16			115	60	3xM16
SK 16.10.18/4				0.5	1760	3440	1200	395	180	180	910	20			135	70	4xM16
SK 20.9.20/3	22	85	162	0.3	2160	4220	1200	484	200	202	1500	26	196	33	150	80	3xM20
SK 20.9.25/4				0.3	3830	7500	1000	860	250	252	3700	41			200	100	4xM20
SK 20.15.20/3	37	142	270	0.3	2160	4220	900	484	200	202	1850	32			150	80	3xM20
SK 20.15.25/4				0.3	3830	7500	800	860	250	252	4100	44			200	100	4xM20

- T_{KN}= rated torque, T_{Kmax}= Maximum torque capacity, min^{-1} = Max. rpm, ΔK_V= Maximum linear range of the coupling, ΔK_r= Maximum radial offset capacity, $\Delta K_{r\,min}$= Min. required radial offset
- ΔK_W= Max. angular misalignment capacity, C_T= Torsional stiffness, J= Moment of inertia, m= Mass, L= Coupling length, M= Numbers of threaded bores x bolt size, F= Bolt circle diameter
- Size SK 4.2.6/3 – SK 16.10.18/4 allows an axial misalignment up to 1mm; Size SK 20.9.20/3 – SK 20.15.25/4 up to 2mm.