

US
09|2010

Magnetic Couplings



Partner for performance
www.gerwah.com

GERWAH®



A Global Presence For You

The RINGFEDER POWER TRANSMISSION GMBH was founded in 1922 in Krefeld, Germany to fabricate and promote Friction Spring technology. Today we have expanded our offerings to top power transmission and damping products. Innovative thinking sets us apart and allows us to develop progressive and economical solutions to support our customers.





Special applications require special solutions

Our extensive range of RINGFEDER POWER TRANSMISSION products can be applied to solve most applications. We don't just sell, but by understanding the individual requirements of our customers (e.g. loads on the components, easy installation/removal capability and reduction of production costs) assist you in every step with innovative engineering to plan efficient and technically mature solutions.



Batcher



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RINGFEDER POWER TRANSMISSION

All technical details and information are non-binding and cannot be used as a basis for legal claims. The user is obligated to determine whether the represented products meet his requirements. We reserve the right at all times to carry out modifications

in the interests of technical progress. Upon the issue of this catalogue all previous brochures and questionnaires on the products displayed are no longer valid.

High-tech torque transmission

GERWAH-Magnetic Clutches do not transmit torques through mechanical connections like their mechanical counterparts but by using magnetic forces. We offer our magnetic clutches in a synchronous and a hysteresis version.

The synchronous clutch

Synchronous clutches transmit torque using magnetic forces which are generated by precise orientation of permanent magnets around a rotor, separated by an air gap. Depending on the size of the clutch, torques up to 9000 lb-in can be transmitted (higher torques upon request). When the rated torque setting is exceeded, it means the magnetic forces are exceeded and the clutch then slips, transmitting only a small residual torque. True to its name, the synchronous clutch only transmits torque when in synchronous running of the machine.

The hysteresis clutch

Similar to the synchronous clutch in function, this clutch has one half coated with a hysteresis lining instead of permanent magnets, allowing for simple polarity changes. When the clutch is overloaded and begins to slip, the hysteresis coating absorbs the constant changes in polarity due to the passing permanent magnets. This energy is then converted to heat which is subsequently released into the environment.

Magnetic Clutches – Advantages at a glance



Precise Torque Limiting

Up to 9000 lb-in (synchronous clutch)
Higher torques upon request

- Easy and quickly adjustable torque infinitely adaptable to your requirements
- Even for extremely high rotational speeds
- Independent of age and operation

Unlimited number of overload cycles

- Absolutely wear-free
- Nominal torque always remains constant
- Maintenance free

Superior hygiene requirements

- No abrasion
- No equipment or external supplies necessary
- Also available in stainless steel

Superior transmission with application of hysteresis clutches

- Constant and soft slipping during torque limiting action
- "Soft starts" – smooth starting torques
- The shafts to be connected can be operated with different torques
- Contact-free power transmission

Bottling plant



Applications

Selected fields of application suitable for GERWAH Magnetic Clutches

As safety coupling

GERWAH Magnetic Clutches offer excellent protection against overload. Wear-free and precise, they protect even sensitive applications and systems.

In bottle capping systems

Due to the technical superiority and elegant functionality compared to all other solutions, hysteresis clutches have established themselves world-wide in this field of application. Precise torque limiting, wear free operation, constant and jerk free behavior within the overload range as well being rust proof and not needing external power, are significant advantages. Especially our two series HSV and HLV have proven themselves as excellent for the use in bottling machines.

In wind-up and unwind applications

Within this field of application exact and constant torque limiting are crucial, which is fulfilled optimally by GERWAH Hysteresis Clutches.

As brakes

Gerwah Magnetic Clutches have proven themselves to be very suitable in braking applications such as a load for an engine test bench. Due to the no-contact design, the Gerwah hysteresis clutches offer fundamental advantages over friction based clutch designs.

Within the process technology

Due to their ability to transmit torque even by going through magnetic non-conducting materials, GERWAH Magnetic Clutches offer unique possibilities for sealing, e.g. in pumps.

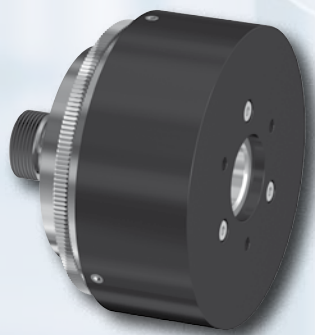
Applications

- Bottle capping machines
- Wind-up and unwind systems
- Brakes
- Test procedures
- Packaging technology
- As safety clutch in e.g. extrusion plants, shredders, or similar
- Pump drives
- For “soft starts”
- As safety clutch with “smooth” overload transition behavior
- Food industry
- Cosmetic production
- Medical engineering

Bottling plant



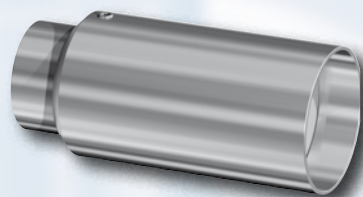
Magnetic Hysteresis Clutches



Series HSV

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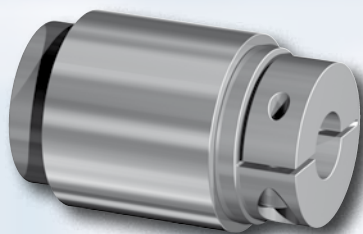
- Compact construction
- Easy adjustable torque
- Completely stainless steel version possible
- Flexible attachment possibilities



Series HLV

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- Narrow design
- Easy adjustable torque
- Completely stainless steel version possible
- Flexible attachment possibilities



Series HKD

Page 16

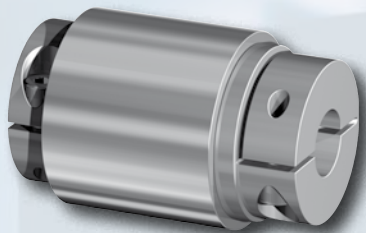
- Flexible application
- Torque adjustable by hub submergence

This clutch consists of two halves and is not bearing-mounted!

Magnetic Synchronous Clutches

Series MKD

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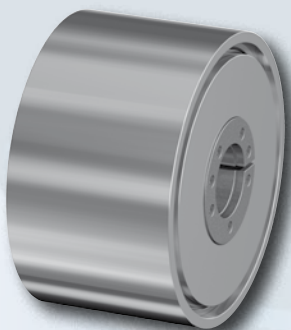


- Low construction volume
- Flexible application
- Torque adjustable by hub submergence

This clutch consists of two halves and is not bearing-mounted!

Series MK/SV

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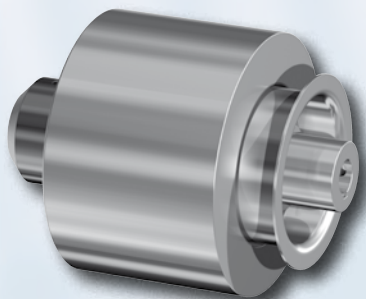
- Short length
- Plug-in type
- Absolutely free of wear

This clutch consists of two halves and is not bearing-mounted!

Special version of hysteresis and synchronous clutches

Series MKS

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We design magnetic clutches according to your special requirements and are pleased to offer you our advice!

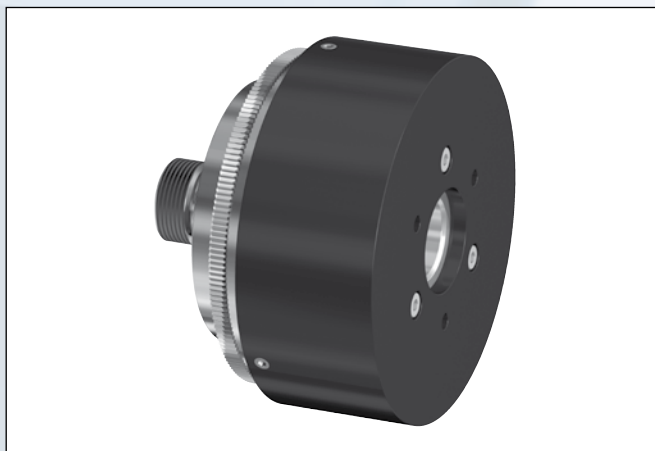
An example : Barrier can clutch MKS

Torque transmission into hermetically sealed containers is possible. A potential field of application would be pump drives.

Standard version with aluminum housing, with stainless steel bearings, rare earth magnets, sintered hysteresis material

Dimensions

- ØA** = Outer diameter
ØB = Center diameter
ØC = Mounting bolt diameter
ØD = Thread diameter - internal
ØE = Thread diameter - external
ØF = Center diameter
ØT = Pitch circle diameter
L = Total length
Cb, Cf = Tolerances



Dimensions

Size	L	Ø B	Cb	Ø A	Ø E	Ø F	Cf	Ø D	Ø C	Ø T	
	Inch	Inch	Inch	Inch	mm	Inch	Inch	mm	mm	Inch	
1	2.756	0.709	$+0$ -0.0007	2.874	M16 x 1.5	0.787		M16 x 1.5	M3	0.984	
2	3.346	0.984	$+0$ -0.0010	3.110	M18 x 1.5	0.984	$+0$ -0.0010	M18 x 1.5	M4	1.299	
4	3.346	1.181		4.134	M24 x 1.5	1.181		M24 x 1.5	M4	1.890	

Other dimensions on request

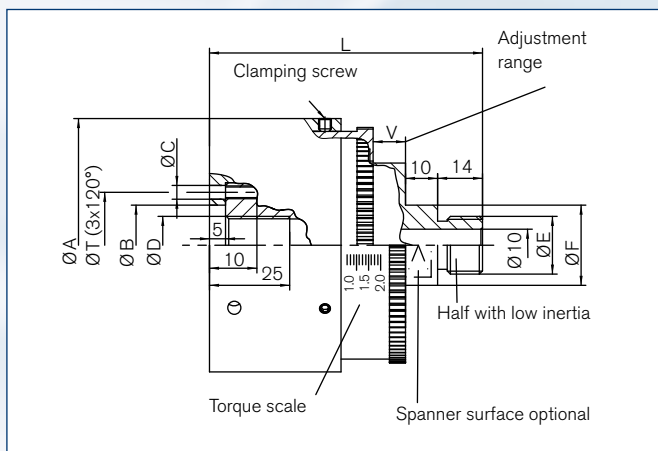
Ordering example:

HSV 2a

Series	Size	Version	Further details*
HSV	2	a	XX

*e.g. stainless, modified torque

Series HSV



Sectional view

Technical Data

Technical Data

- ME** = Torque (adjustable); other torque values on request; specified torque $\pm 5\%$ tolerance
- Pv** = Max. power dissipation (thermally limited); power loss when using high temperature permanent magnets
- n_{max}** = Max. mechanical rotating speed; depending on overload ratio and torque through max. dissipatable thermal power loss
- T** = Operation temperature
- J** = Moment of inertia
- F_{rad}** = Max. allowed forces radial
- F_{ax}** = Max. allowed forces axial
- V** = Adjustment range

Size	V	ME Version a	ME Version b	Pv	T	n _{max}	F _{rad}	F _{ax}	J _{outer}	J _{inner}	Weight
	Inch	lb-in	lb-in	W	°F	rpm	lbs	lbs	lb-in ²	lb-in ²	lbs
1	0.315	3.5-8.9	1.8-4.4	15 (20)	32-104	4000	45	34	1.23	0.44	1.8
2	0.394	7.1-17.7	0.9-11.5	23 (30)		3500	67	45	2.12	0.85	2.6
4	0.394	14.2-35.4	1.8-23	30 (40)		3000	90	56	5.54	2.70	4.2

Range of applications

- Bottle capping machines
- Wind up and unwind systems
- Brakes
- Test engineering

Standard version with aluminum housing, with stainless steel bearings, rare earth magnets, sintered hysteresis material

Dimensions

ØA	= Outer diameter
ØB	= Centering diameter
ØC	= Counterbore diameter
ØD	= Through bore diameter
ØE	= Mounting bolt diameter
ØF	= Centering diameter
ØG	= Basic dimension
H	= Centering bore depth
L	= Total length; for the assembly the total length (with L + V) must be considered
M	= Counterbore depth
N	= Max. thread engagement
Cb, Cf	= Tolerances



Dimensions

Size	L	Ø B	Cb	Ø G	M	N	Ø A	H	Ø E	Ø F	Cf	Ø D	Ø C	
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	mm	Inch	Inch	Inch	mm	
1	3.543	1.181		1.969	0.787	0.787	2.165	0.315	M27 x 1.5	1.181		0.394	M27 x 1.5	
2	4.449	1.378	+0.001 -0	2.165	0.984	0.984	2.362	0.394	M32 x 1.5	1.378	+0.001 -0	0.591	M32 x 1.5	
4	5.354	1.575		2.933	1.142	1.575	3.150	0.472	M38 x 1.5	2.165		0.787	M38 x 1.5	

Other dimensions on request

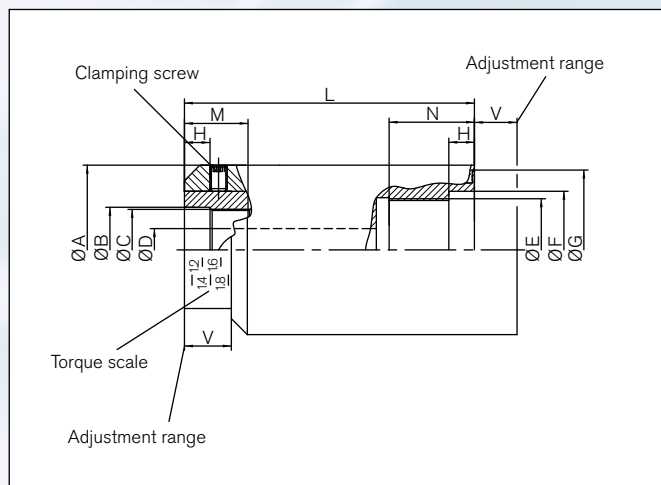
Ordering example:

HLV 2

Series	Size	Further details*
HLV	2	XX

* e.g. stainless, modified torque

Series HLV



Sectional view

Technical Data

- ME** = Torque (adjustable); other torque values on request; specified torque $\pm 5\%$ tolerance
- Pv** = Max. power dissipation (thermally limited); power loss using high temperature permanent magnets
- n_{max}** = Max. mechanical rotating speed; depending on overload ratio and torque through max. dissipatable thermal power loss
- T** = Operation temperature
- J** = Moment of inertia
- F_{rad}** = Max. allowed forces radial; F_{rad} applied in max. 40 mm (1.58 in) from clutch end
- F_{ax}** = Max. allowed forces axial
- V** = Adjustment range

Technical Data

Size	V	ME	Pv	T	n _{max}	F _{rad}	F _{ax}	J _{Outer rotor}	J _{Inner rotor}	Weight
	Inch	lb-in	W	°F	rpm	lbs	lbs	lb-in ²	lb-in ²	lbs
1	0.591	3.5-8.9	18 (25)	32-104	4000	34	22	1.47	0.31	2.6
2	0.709	6.2-17.7	25 (35)		3500	45	34	2.97	0.72	3.5
4	0.787	13.3-35.4	40 (55)		3000	56	45	9.16	1.88	7.1

Range of applications

- *Bottle capping machines*
- *Packaging technology*

Standard version with rare earth magnets and sintered hysteresis material

Dimensions

- øA** = Outer diameter
øB = Clamp collar OD
øD1 = Bore diameter
øD2 = Bore diameter
C = Clamp collar width
K = Clamp screw centerline
I = Clamping screw
L = Minimum coupling length
 (will vary with adjustment range V)
C1, C2 = Tolerances



Dimensions

Size	L	ø B	I	K	ø A	ø D1	C1	ø D2	C2	C	
	Inch	Inch	mm	Inch	Inch	Inch	Inch	Inch	Inch	Inch	
2	2.165	0.984	M3	0.354	1.220	0.1181-0.3937	+0.0005 -0	0.1181-0.3937	+0.0005 -0	0.323	
4	2.283	1.260	M4	0.453	1.496	0.2362-0.6299	+0.0006 -0	0.2362-0.6299	+0.0006 -0	0.394	
10	2.283	1.575	M4	0.610	1.811	0.2362-0.7480	+0.0006 -0	0.2362-0.7480	+0.0006 -0	0.394	
18	3.071	1.772	M5	0.689	2.008	0.3937-0.7874	+0.0007 -0	0.3937-0.7874	+0.0007 -0	0.472	
30	3.465	1.850	M6	0.630	2.205	0.3937-0.7874	+0.0007 -0	0.3937-0.7874	+0.0007 -0	0.591	
60	4.213	2.244	M8	0.787	2.717	0.5511-0.9055	+0.0007 -0	0.5511-0.9055	+0.0007 -0	0.768	
150	5.118	2.677	M10	0.945	3.307	0.787-1.102	+0.001 -0	0.787-1.102	+0.001 -0	0.846	

Other dimensions on request

Ordering example:

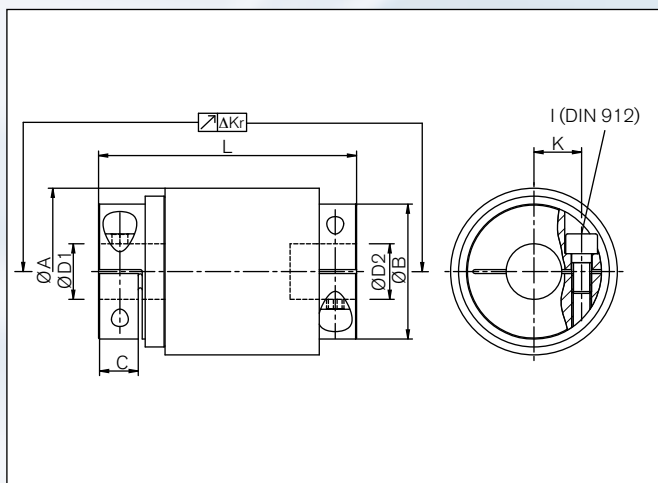
HKD 30

Series	Size	ø D1	ø D2	Further details*
HKD	30	15	12	XX

*e.g. stainless, modified torque

Series HKD

This coupling consists of two separate halves and must be supported by the customer!



Sectional view

Technical Data

- M_{max}** = Torque: Other torque values on request; torque adjustable by hub submergence; specified torque $\pm 5\%$ tolerance
- P_v** = Max. power dissipation (thermally limited)
- J** = Moment of inertia
- ΔK_r** = Max. approved misalignment radial; higher misalignments on request
- n_{max}** = Max. mechanical rotating speed; max. permanent slip speed limit depends on frequency and duration of slipping
- MA** = Tightening torque of clamping screws
- V** = Adjustment range

Technical Data

Size	V	Δ K _r	M _{max}	MA	n _{max}	P _v	Outer rotor Weight	Inner rotor Weight	J _{outer}	J _{inner}
	Inch	Inch	lb-in	lb-in	rpm	W	lbs	lbs	lb-in ²	lb-in ²
2	0.787	0.008	0.9	18	10000	4	0.3	0.2	0.062	0.017
4	0.787	0.008	1.8	27	9000	5	0.3	0.2	0.137	0.068
10	0.787	0.008	3.5	27	8000	7	0.4	0.4	0.239	0.137
18	1.181	0.008	8.0	53	7000	12	0.6	0.6	0.478	0.273
30	1.181	0.008	11	106	6000	14	0.7	0.6	0.683	0.376
60	1.575	0.008	22	266	5000	20	1.5	1.1	2.973	1.948
150	1.969	0.008	44	443	4000	30	3.7	3.5	6.150	4.442

Range of applications

- As brake for “soft starts”
- As safety clutch with “smooth” overload transition behavior

Standard version made with rare earth magnets

Dimensions

- øA** = Outer diameter
øB = Clamp collar OD
øD1 = Bore diameter
øD2 = Bore diameter
C = Clamp collar width
K = Clamp screw centerline
I = Clamping screw
L = Minimum coupling length
 (will vary with adjustment range V)
C1, C2 = Tolerances



Dimensions

Size	L	ø B	I	K	ø A	ø D1	C1	ø D2	C2	C	
	Inch	Inch	mm	Inch	Inch	Inch	Inch	Inch	Inch	Inch	
2	2.165	0.945	M3	0.354	1.220	0.1181-0.3937	+0.0005 -0	0.1181-0.3937	+0.0005 -0	0.323	
4	2.283	1.260	M4	0.453	1.496	0.2362-0.6299	+0.0006 -0	0.2362-0.6299	+0.0006 -0	0.394	
10	2.283	1.575	M4	0.610	1.811	0.2362-0.7480	+0.0006 -0	0.2362-0.7480	+0.0006 -0	0.394	
18	3.071	1.772	M5	0.689	2.008	0.3937-0.7874	+0.0007 -0	0.3937-0.7874	+0.0007 -0	0.472	
30	3.465	1.850	M6	0.630	2.205	0.3937-0.7874	+0.0007 -0	0.3937-0.7874	+0.0007 -0	0.591	
60	4.213	2.244	M8	0.787	2.638	0.5511-0.9055	+0.0007 -0	0.5511-0.9055	+0.0007 -0	0.768	
150	5.118	2.677	M10	0.945	3.307	0.787-1.102	+0.001 -0	0.787-1.102	+0.001 -0	0.846	
300	5.748	3.780	M12	1.260	4.528	1.260-1.575	+0.001 -0	1.260-1.575	+0.001 -0	1.024	

Other dimensions on request

Ordering Example:

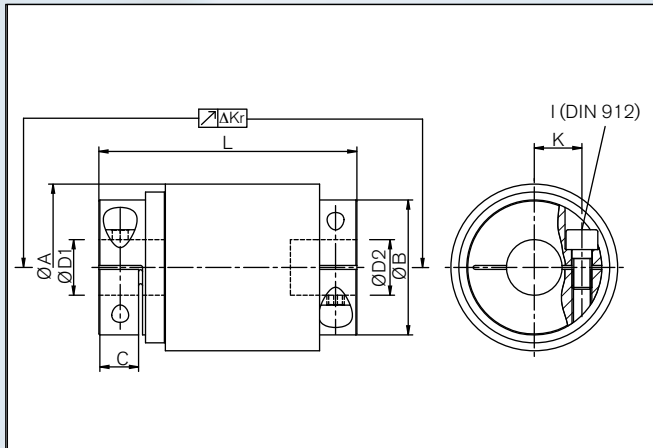
MKD 30

Series	Size	ø D1	ø D2	Further details*
MKD	30	15	12	XX

* e.g. stainless, modified torque

Series MKD

This coupling consists of two separate halves and must be supported by the customer!



Sectional view

Technical Data

M_{max} = Torque; other torque values on request;
torque adjustable by extending hub;
specified torque $\pm 5\%$ tolerance

C_{Tdyn} = Dynamic torsional stiffness

J = Moment of inertia

ΔK_r = Max. approved misalignment radial;
Higher misalignments on request

n_{max} = Max. mechanical rotating speed

MA = Tightening torque of clamping screws

V = Adjustment range

Technical Data

Size	V	Δ K _r	C _{Tdyn}	M _{max}	MA	n _{max}	Outer rotor Weight	Inner rotor Weight	J _{outer}	J _{inner}
	Inch	Inch	lb-in/rad	lb-in	lb-in	rpm	lbs	lbs	lb-in ²	lb-in ²
2	0.787	0.016	27	11	18	10000	0.2	0.2	0.06	0.017
4	0.787	0.016	89	22	27	9000	0.3	0.2	0.13	0.048
10	0.787	0.016	221	44	27	8000	0.4	0.4	0.27	0.14
18	1.181	0.016	398	80	53	7000	0.6	0.5	0.48	0.24
30	1.181	0.016	735	115	106	6000	0.8	0.6	0.72	0.34
60	1.575	0.016	2213	266	266	5000	1.5	1.2	2.05	1.03
150	1.969	0.016	5399	531	443	4000	4.2	3.1	6.15	5.47
300	2.362	0.016	20355	1328	797	3000	7.5	6.8	22.89	17.08

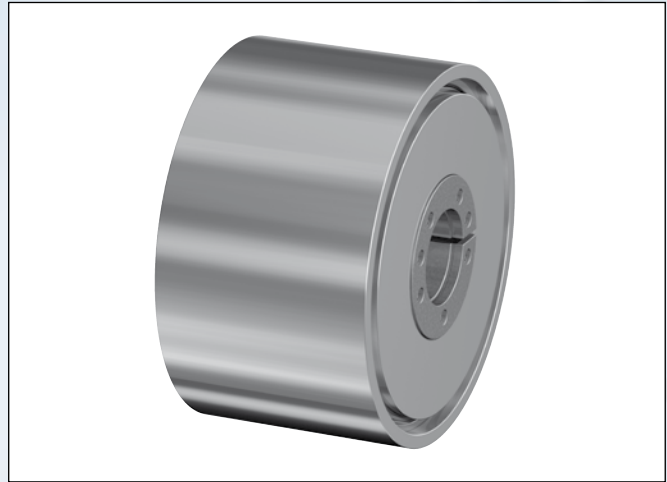
Range of applications

- As safety clutch
- Other applications that require high torque demands and limited dimensions

This coupling consists of two separate halves and must be supported by the customer!

Dimensions

- øA** = Outer diameter
øD1 = Bore diameter
øD2 = Bore diameter
C = Max. shaft insertion length
L = Minimum coupling length
 (will vary with adjustment range V)



Dimensions

Size	L ±1	ø A	Standard ø D1; D2	ø D1	ø D2	C	
	Inch	Inch	Inch	Inch	Inch	Inch	
100 a	2.953	3.701	0.787	0.787-0.984	0.787-0.984	1.220	
100 b	4.528	3.701	0.787	0.787-0.984	0.787-0.984	1.220	
200 a	2.953	5.079	1.181	0.787-1.575	0.787-1.575	1.220	
200 b	4.528	5.079	1.181	0.787-1.575	0.787-1.575	1.220	
500 a	2.953	7.441	1.378	0.787-1.575	0.787-1.575	1.220	
500 b	4.528	7.441	1.378	0.787-1.575	0.787-1.575	1.220	

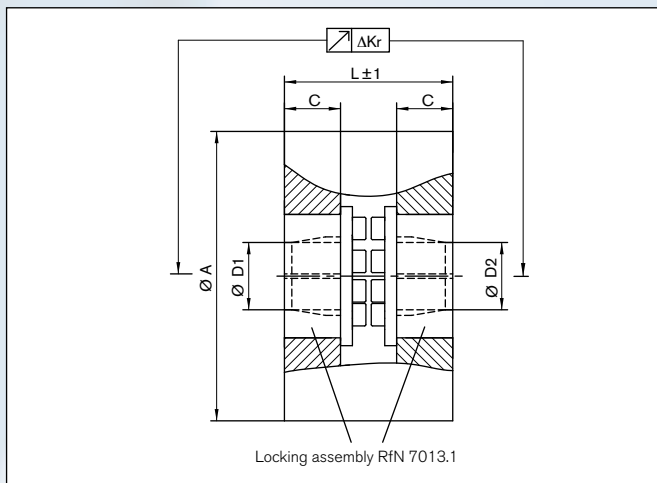
Other dimensions on request

Ordering Example: MK/SV 200b

Series	Size	Version	Further details*
MK/SV	200	b	XX

* e.g. stainless, modified torque

Series MK/SV



Sectional view

Technical Data

- M** = Torque linearly adjustable by using rotor insertion depth; specified torque $\pm 5\%$ tolerance
- n_{max}** = Max. mechanical rotating speed
- T** = Operation temperature
- ΔKr** = Max. approved radial misalignment
- J** = Moment of inertia
- MA** = Tightening torque of clamping screws
- V** = Adjustment range

Technical Data

	Size	V	T	Δ Kr	M _{max}	MA	n _{max}	J _{outer}	J _{inner}	Weight
		Inch	°F	Inch	lb-in	lb-in	rpm	lb-in ²	lb-in ²	lbs
	100 a	1.575	32-140	0.016	443	159	6000	9.2	3.4	6.8
	100 b	3.150		0.016	885	159	6000	12.6	5.5	8.8
	200 a	1.575		0.016	885	159	4000	31.1	14.0	13
	200 b	3.150		0.016	1770	159	4000	41.7	21.2	16
	500 a	1.575		0.016	2213	159	3000	127.1	72.8	26
	500 b	3.150		0.016	4425	159	3000	161.6	101.5	32

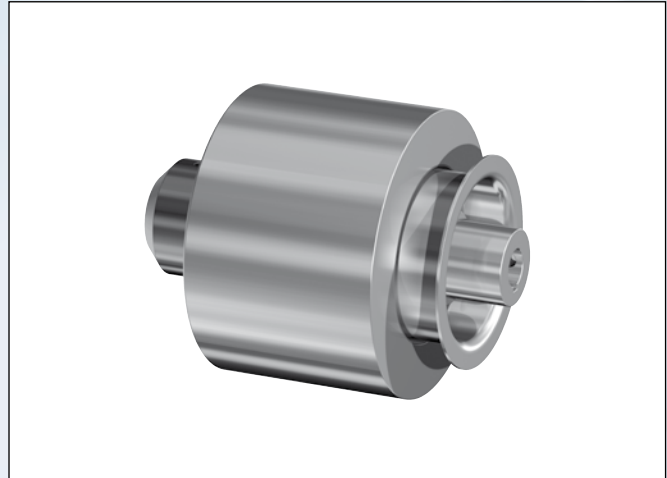
Range of applications

- As safety clutch in extrusion plants, shredders, or similar

**Inner and outer rotor have to be supported by the customer.
Separate barrier can on request!**

Dimensions

- ØA1** = Outer diameter inner rotor
- ØA2** = Outer diameter outer rotor
- ØB** = Inner diameter outer rotor
- L1** = Length inner rotor
- L2** = Length outer rotor
- S** = Air gap; Other air gap dimensions on request



Dimensions

Size	L1	L2	Ø A2	Ø A1	Ø B	S	
	Inch	Inch	Inch	Inch	Inch	Inch	
12	2.913	3.937	3.858	1.811	2.362	0.276	
20	2.283	2.362	4.331	2.795	3.150	0.177	
24	3.071	3.661	3.858	2.047	2.362	0.157	
50	2.953	2.953	5.709	4.094	4.606	0.256	
180	3.937	4.331	6.693	5.098	5.531	0.217	

Listed versions are examples for customized solutions.

We can design your MKS coupling according to your requirements and will be happy to advise you.

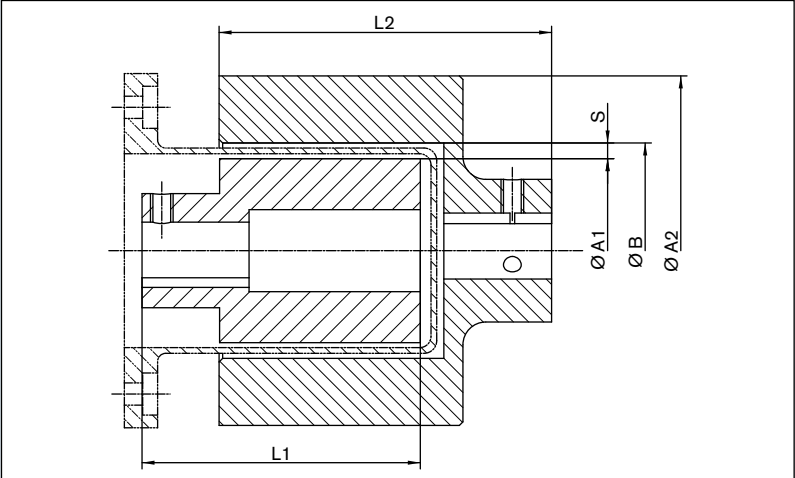
Ordering example:

MKS

Series	Size	Further details*
MKS	50	XX

* e.g. stainless, modified torque

Series MKS



Sectional view

Technical Data

- M_{max}** = Torque; other torque values on request; torque linearly adjustable by rotor insertion depth; specified torque $\pm 5\%$ tolerance
- T** = Operation temperature
- T_{max}** = Max. operation temperature, higher temperatures on request
- V** = Adjustment range

Technical Data

Size	V	M _{max}	T	T _{max} temporary	Weight Outer rotor	Weight Inner rotor
	Inch	lb-in	°F	°F	lbs	lbs
12	1.575	106	32-248	302	6.0	1.1
20	1.772	177			4.0	3.1
24	1.969	212			6.0	1.5
50	2.362	443			6.4	4.6
180	3.543	1593			11.5	12.1



Range of applications

- As torque transmission in hermetically sealed containers
- Application as a pump drive

Technical Information

Magnetic clutches explanation

At overload status the hysteresis clutches and brakes slip. The losses (from slip rotation speed and torque) are transformed into heat. If the dissipation power exceeds the quantity of heat which can be conducted to the environment, the clutch (brake) will overheat. With the formula on the right side it is possible to check if the chosen max. power loss of the clutch (brake) is sufficient for the desired operation.

Example 1:

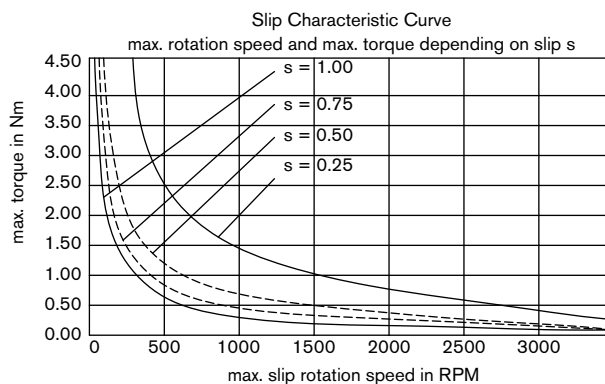
A hysteresis brake series HSV 2 ($P_{vmax} = 23 \text{ W}$) is applied as a winder brake ($s = 1$). The applied torque shall be 1.5 Nm . Which rotation speed is allowed continuously without overheating the brake? The brake can slip continuously at a rotation speed of 146 RPM . Starting out from this result the average paper speed (dependent on the diameter of the paper roll) can now be calculated.

Conversion factors:

- English Unit Watts = $M \text{ (lb-in)} \times n \times 0.0118$
- Metric Unit Watts = $M \text{ (Nm)} \times n \times 0.104$
- $1 \text{ Nm} = 8.85 \text{ lb-in}$

Example 2:

A hysteresis clutch series HSV 4a is applied in a bottle capping machine. One working cycle lasts 8 seconds. 6 seconds of this the clutch is engaged. 2 seconds the inner and the outer part are rotating relative to each other. These 2 seconds are the actual load cycle of the clutch – the clutch is slipping.



P_v : max. power loss (W)

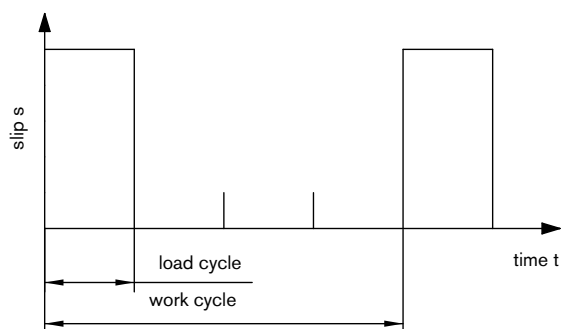
$$P_v = \frac{M \times n_s}{9.55} \times s$$

M : applied torque (Nm)

n_s : slip rotation speed RPM

s : slip (-)

$$\text{slip } s = \frac{\text{load cycle}}{\text{work cycle}} = \frac{2 \text{ sec}}{8 \text{ sec}}$$



With an applied torque of $M = 4 \text{ Nm}$ and a slipping rate of 25% ($s = 0.25$) the continuously allowed rotation speed is $n = 287 \text{ RPM}$ (see formula and diagram)!

$$P_v = \frac{M \times n_s}{9.55} \times s \rightarrow n_s = \frac{9.55 \times P_v}{M \times s} \rightarrow n_s = \frac{9.55 \times 23 \text{ W}}{1.5 \text{ Nm} \times 1} = 146 \text{ RPM}$$

Fax Inquiry

On this page you can explain the application of a magnetic clutch and we will propose our solution.
Please send this page to:

USA and Mexico: **RINGFEDER POWER TRANSMISSION USA CORPORATION · FAX:+1 (201) 664-6053**

1. Application

Planned use of the coupling (machine, machine group or plant):

2. Type of Attachment (please check)

☐ Key ☐ Thread ☐ Shrink Disc ☐ Locking Assembly ☐ Clamping Hub ☐ Other (please enclose drawing)

3. Dimensions

Length (inch) Bore size D₁ (inch) Ø (inch) Bore size D₂ (inch)

4. Drive

Drive power **P =** **HP** Nominal torque of the drive **Mt_{nom} =** **LB-IN**

Input speed **n =** **RPM** Peak torque of the drive **Mt_{max} =** **LB-IN**

5. Mass Moment of Inertia

On the drive side **JA =** **LB-IN²** On the driven side **J_L =** **LB-IN²**

6. Environmental Influences

Temperature in the area of the coupling **Temp =** **°F** Special materials (e.g. stainless steel)

Are there any impacts on the load side? ☐ no ☐ slight ☐ medium ☐ heavy

other, special influences

7. Expected Quantities

☐ Production ☐ Project ☐ Repair ☐ Number of items/p.a. **\$/each**

8. Target Price

Please send your offer to:

Company Attention
Address
Phone Fax
E-mail

Notes



Locking Devices



Locking Assemblies



Locking Elements



Shrink Disc®



Smart-Lock

Damping Technology



Friction Springs



DEFORM plus®
DEFORM plus® R

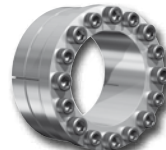


Fluid Elastomeric Damper

Special Solutions



Shaft Couplings



Locking Assemblies



Flange Couplings



Couplings



Magnetic Couplings



Metal Bellows Couplings



Servo-Insert Couplings



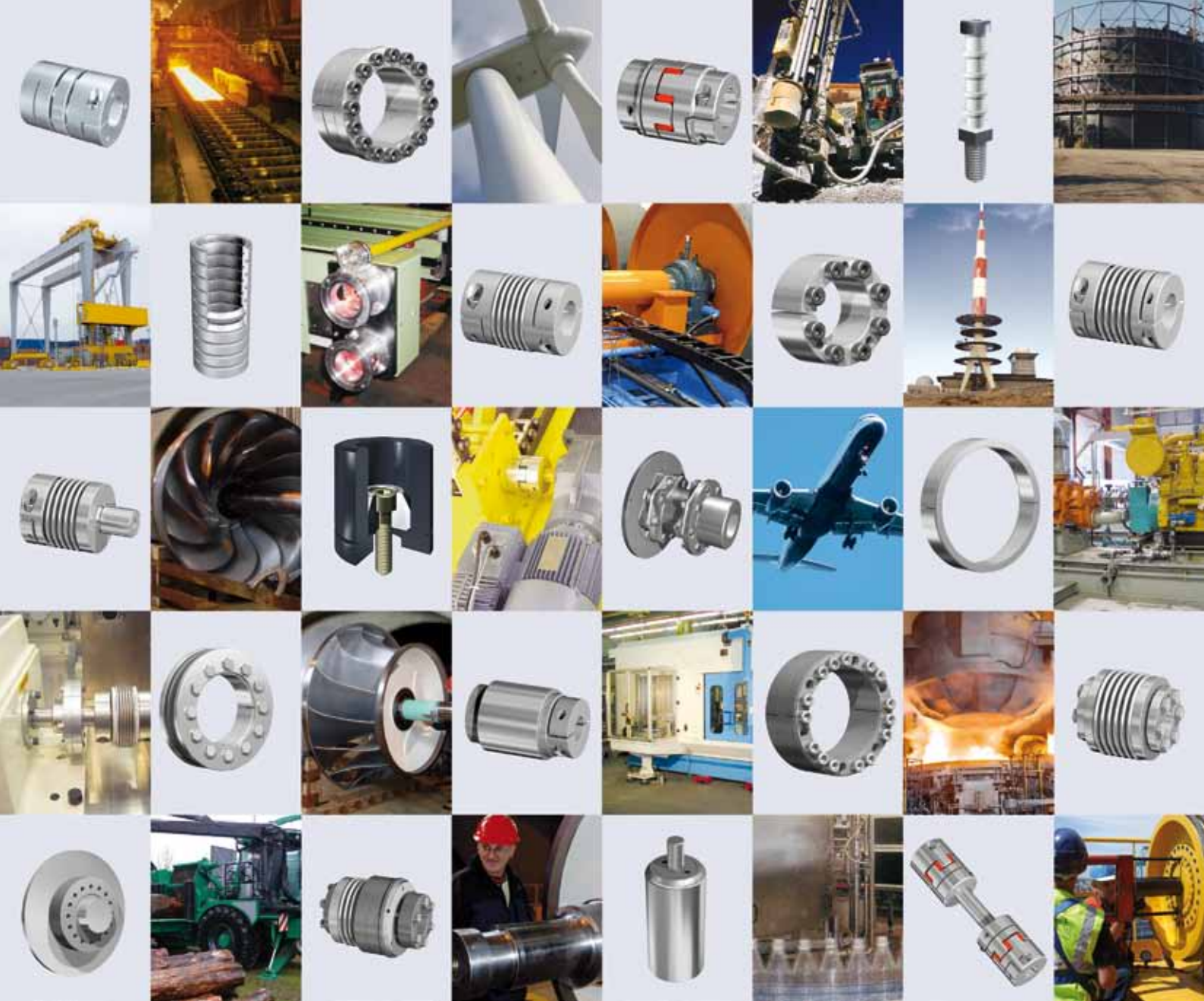
RING-flex® – torsionally
rigid Disc Couplings



Safety Couplings



Line Shafts



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