

Friction Spring RINGFEDER® can also be supplied as complete industrial buffers. A range of approved smaller buffer types are shown in the table at page 22. Customized versions as well variation of the flange and plunger and also water-cooled versions are possible. Units in push-pull design are feasible.



Cross section of industrial buffer



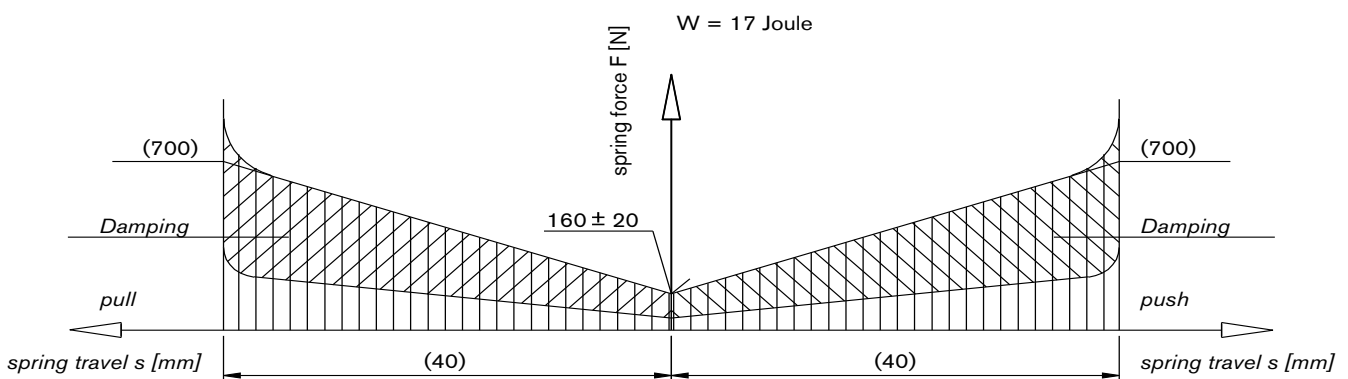
Overload clutch



Oscillation damper

damping diagram

damping work



Force - Stroke - diagram from a Oscillation damper

## Aerial mast



*Under the influence of strong breezes, tall structures – like here the TV/radio aerial of Brocken mountain, Germany – can get into transverse vibrations which endanger the complete construction. For prevention, Oscillation Dampers RINGFEDER® have been installed in combination with a pendular suspended mass, which safely protect aerials or smoke pipes under all temperature conditions.*

Size	Type	Diagram				Buffer Dimensions									Weight	Fitting			
		$F_v$	F	s	W	L	l	D	d	C	T	K	a	b		$d_1$	$D_1$	t	
		kN	kN	mm	Joule	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm
1				27	820	202	107							10					
2				37	1.100	262	156							12					
3	06300	6	54	55	1.640	374	225	102	80	112	150	27	145	17	100	18	104	15	
4				64	1.900	434	293							19					
5				74	2.200	494	293							20					
6				33	1.500	230	125							13					
7				46	2.050	306	170							16					
8	08000	7	83	66	2.950	428	258	114	96	122	200	27	160	23	110	18	117	15	
9				79	3.550	505	355							26					
10				92	4.150	582	360							28					
11				45	3.000	300	165							22					
12				61	4.100	397	230							26					
13	10000	10	125	89	6.000	571	350	133	114	142	250	31	185	37	130	23	135	20	
14				105	7.050	667	470							42					
15				121	8.150	763	470							45					
16				51	5.600	366	216							39					
17				65	7.150	454	275							45					
18	12400	20	200	102	11.200	696	456	165	142	178	250	34	215	64	155	23	167	20	
19				116	12.800	784	574							75					
20				130	14.300	872	550							78					
21				75	13.900	500	328							85					
22				95	17.500	630	450							105					
23	16600	10	350	140	25.900	880	657	219	184	235	370	46	270	145	200	27	222	25	
24				165	30.500	1.040	690							160					
25				190	35.000	1.200	850							165					

Extract of proven buffer types, further design after request

Explanations to table

- $F_v$  = pretensioning force
- F = spring force
- s = spring travel
- W = spring work
- L = total length
- l = dimple length
- D = Outer diameter
- d = plunger diameter
- C = case diameter
- T = baffle diameter
- K = flange thickness
- a = flange dimension
- b = hole size
- $d_1$  = flange bore
- $D_1$  = installation diameter
- t = wall thickness



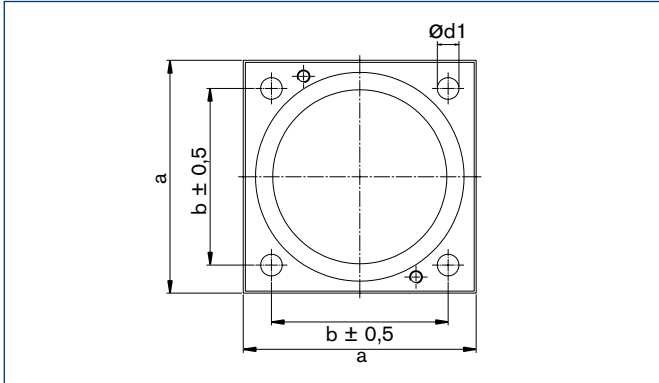
Buffer for Gas tank

## Gas tank

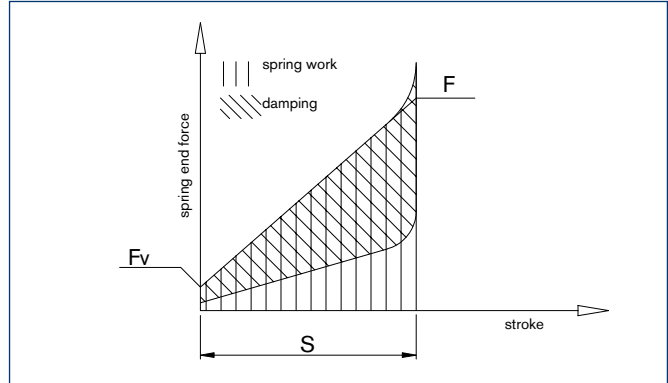


Not only with high velocities, but also with high masses and very slow loading rates, do we offer solutions for Friction Springs RINGFEDER®.

Also, like here at a 50,000 m<sup>3</sup> gasometer of Thyssen Germany, buffers from RINGFEDER are used to protect the steel casing against cracks. The longevity of our buffers make us stand out in contrast to other shock absorbing methods .



Fitting dimensions

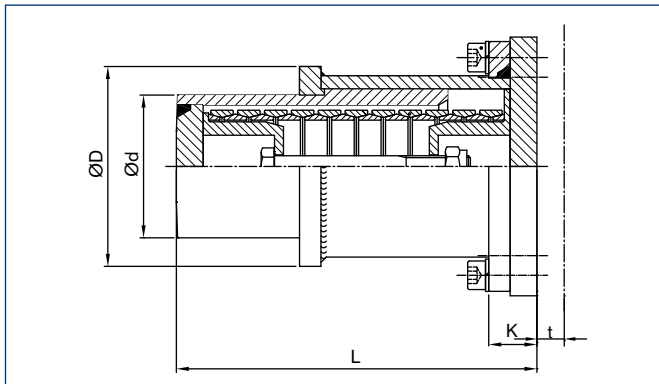


Typical Friction spring diagram

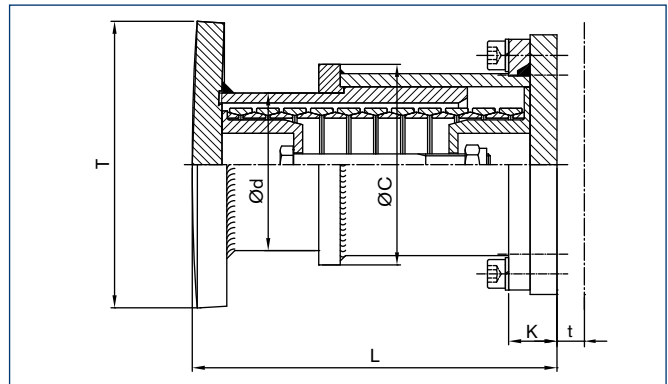
## Buffer with Friction Springs RINGFEDER®

The buffer types shown in extracts on the previous page are standard in one of the following 4 designs. These buffers are suitable for operation temperatures from  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ . Above

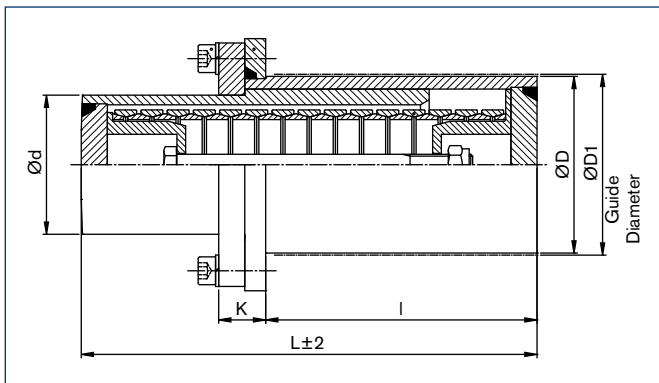
that, modifications allow an extended temperature range from  $-73^{\circ}\text{C}$  to  $+200^{\circ}\text{C}$ . Customized requirements with respect to geometrical and technical special solutions on request.



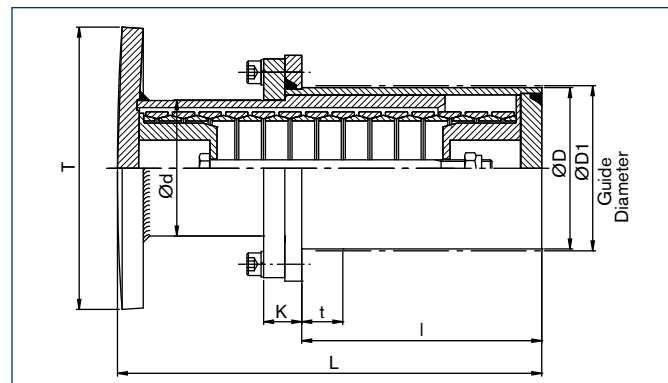
design 1



design 2



design 3



design 4



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**RINGFEDER POWER TRANSMISSION GMBH**

Werner-Heisenberg-Straße 18, D-64823 Groß-Umstadt, Germany · Phone: +49 (0) 6078 9385-0 · Fax: +49 (0) 6078 9385-100  
E-mail: sales.international@ringfeder.com · E-mail: sales.international@gerwah.com

**RINGFEDER POWER TRANSMISSION USA CORPORATION**

165 Carver Avenue, P.O. Box 691 Westwood, NJ 07675, USA · Toll Free: +1 888 746-4333 · Phone: +1 201 666 3320  
Fax: +1 201 664 6053 · E-mail: sales.usa@ringfeder.com · E-mail: sales.usa@gerwah.com

**RINGFEDER POWER TRANSMISSION INDIA PRIVATE LIMITED**

Plot No. 4, Door No. 220, Mount - Poonamallee Road, Kattupakkam, Chennai – 600 056, India  
Phone: +91 (0) 44-2679-1411 · Fax: +91 (0) 44-2679-1422 · E-mail: sales.india@ringfeder.com · E-mail: sales.india@gerwah.com

**KUNSHAN RINGFEDER POWER TRANSMISSION COMPANY LIMITED**

German Industry Park, No. 508 Hengguanjiang Road, Zhangpu Town 215321, Kunshan City, P.R. China  
Phone: +86 (0) 512-5745-3960 · Fax: +86 (0) 512-5745-3961 · E-mail sales.china@ringfeder.com