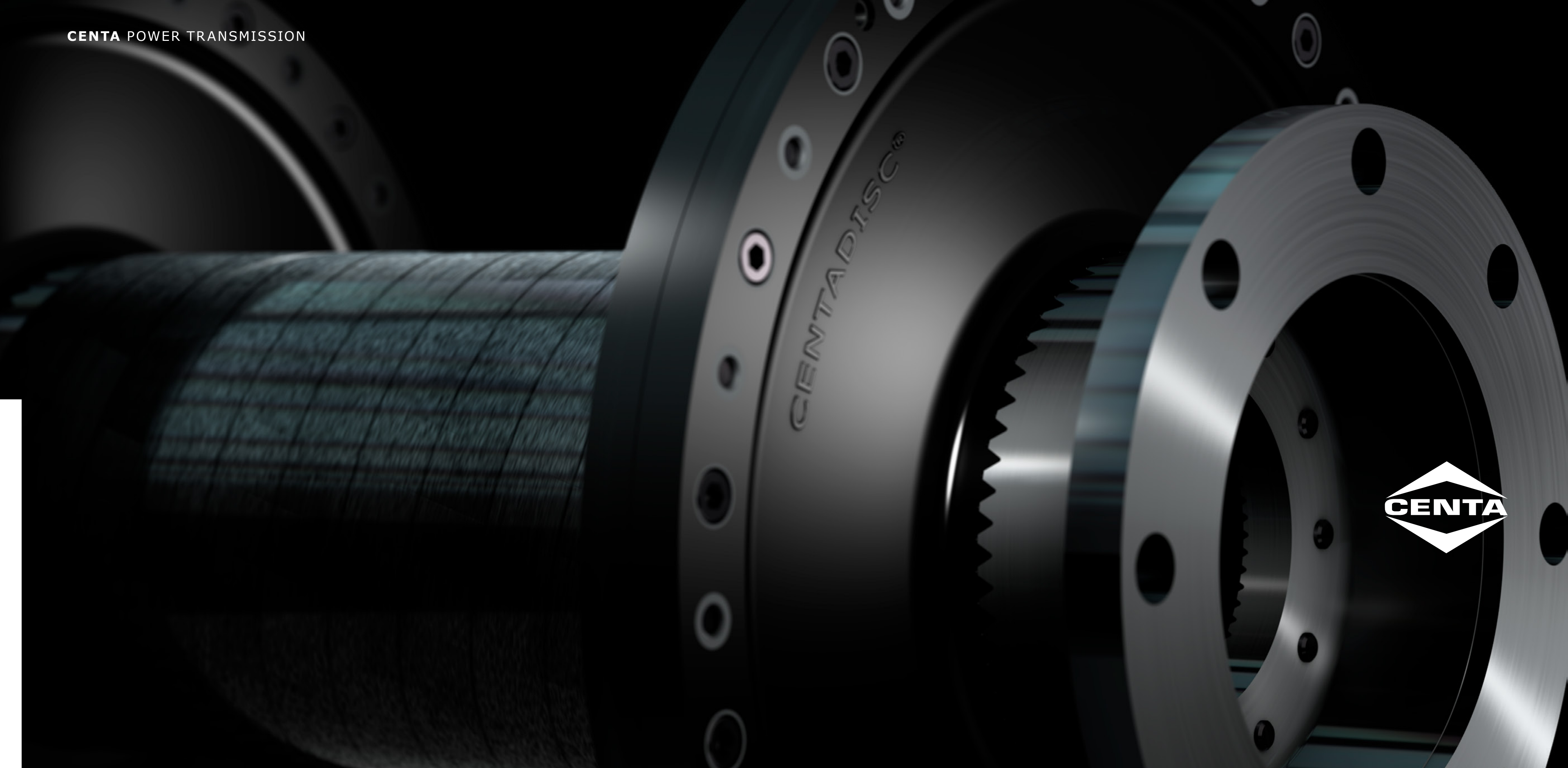

CENTADISC-C

CD-C-09-16

ENGLISH

CENTADISC-C

OUR LIGHTWEIGHT

SYSTEM

At a glance
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Product selection: Which coupling for which purpose?
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Is this PDF up to date?
click here for an update check!

CENTADISC-C
AT A GLANCE

CENTADISC-C – a torsionally stiff light weight membrane coupling for the application in vessels, ferries and in wind energy applications where weight and alignment are of high importance. Two membranes arranged in series and combined with a fibre reinforced tube function as kinematic joint with optimum operating characteristics. The combi-nation with further CENTA products, cardanshafts, homokinetic joints or couplings on the other shaft end guarantees optimal adaption.

Stiff and lightweight tubes allow high bending speeds thus longer driveshafts are possible with substantially reduced bearings.

Positive fit of all components by standardized, shaft-end toothing between coupling element and tube or power unit. Easy handling and assembly due to modular design and standardization.

Features

high bending speeds

low weight

maximum mounting ease

resistant to corrosion

Areas of application

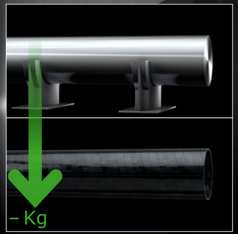
 

Torque range

up to 45 kNm

The optimum where lightwight is a must

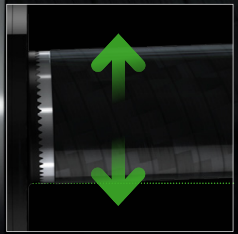
LEADING BY INNOVATION



LIGHTWEIGHT

Lightweight solutions often are subject to comprise in regard of torsional stiffness. The use of light materials on CENTADISC-C though make it possible and ensure safe transmission of high speeds up to 45 kNm.

The CENTADISC-C results in a cost effective solution for reduction of vibration and noise damping.



COMPENSATION OF MISALIGNMENTS

The couplings of the CENTADISC series compensate for significant misalignments in axial, radial and angular directions.

They are the ideal solution for applications with demanding misalignments.

MODULARITY

The combination with further CENTA products, cardanshafts, homokinetic joints or couplings on the other shaft end guarantee for optimal adaption and appropriate design solutions for practically any application where light weight is a must with very little effort. The CENTADISC-C is available as homokinematic shaft (in Carbon or glasfibre design).

ASSEMBLY

The maintenance effort is very low and upon intended use there is no abrasion.

The coupling is ready for radial exchange.

Furthermore a specific shaft-end toothing ensures axial division of the flange mounting and membrane joint as well as tubes or spacers.

QUALITY

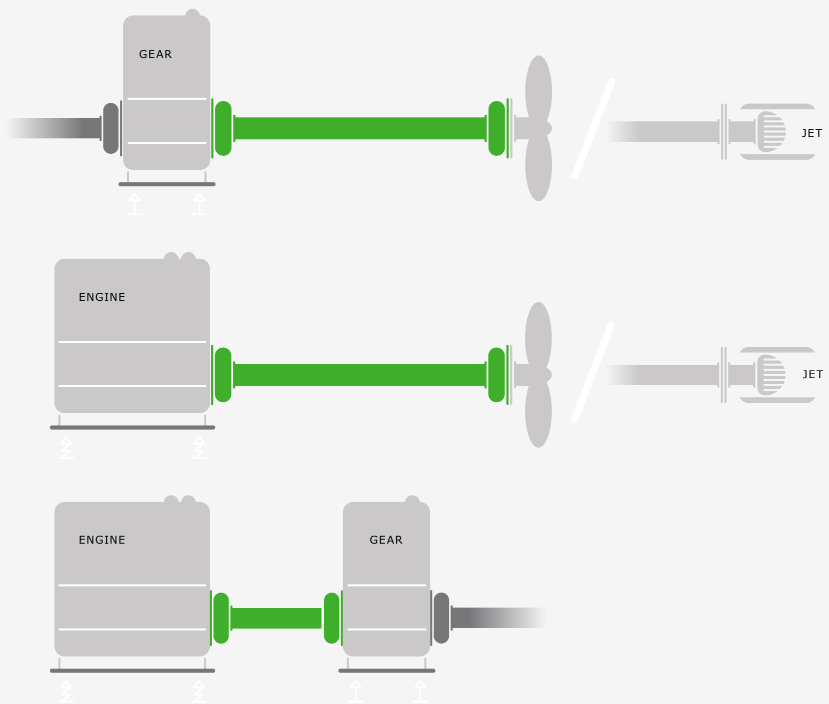
When the going gets tough, quality is priceless. With an exemplary Quality Management, CENTA ensures products that withstand the roughest assignments. CENTA's coupling systems are more than the sum of their parts. CENTA entertains the vision of intelligent products that meet the highest requirements in terms of design and quality.

CENTADISC-C

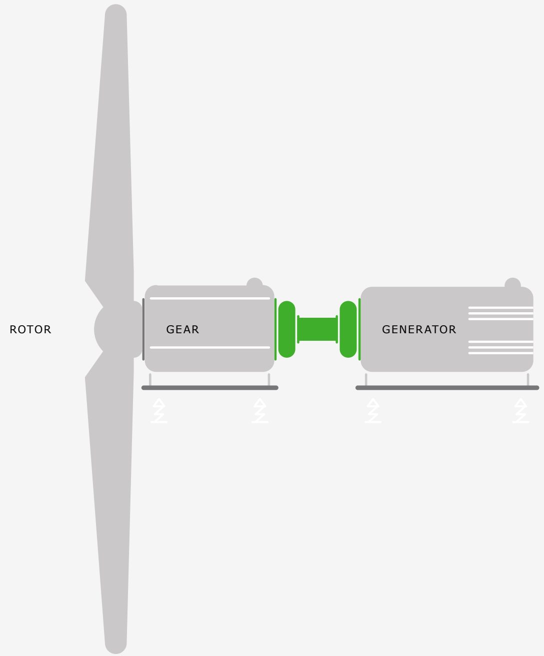
APPLICATIONS

CENTADISC-C
APPLICATIONS

MARINE APPLICATIONS



WIND APPLICATION



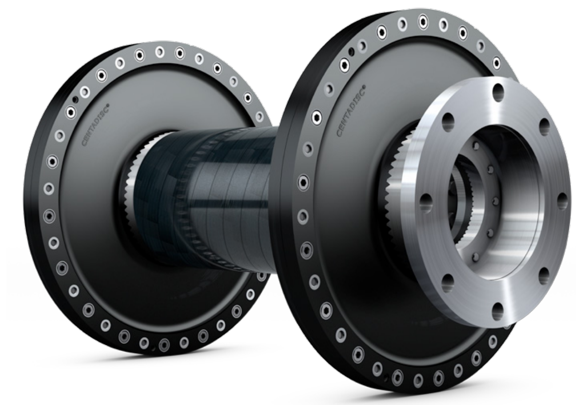
Which product for your purpose?
We will gladly assist → www.centa.info/contact

CENTADISC-C

TECHNICAL DATA

TECHNICAL DATA		DIMENSIONS	
Sizes 0–5	Page 08	**Sizes 0–5**	Page 09
Sizes 0G–4G	Page 10	**Sizes 0G–4G**	Page 11

CENTADISC-C
TYPE 0

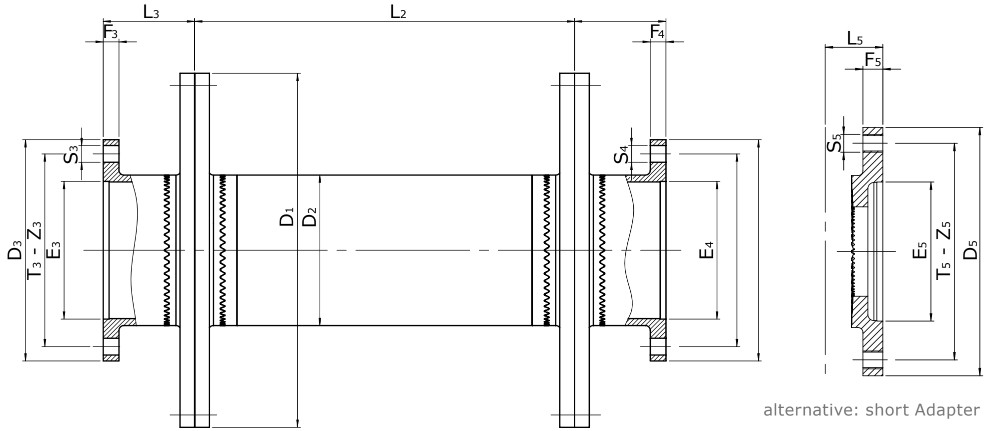


TECHNICAL DATA ↓ **SIZE 0–5**

1	3	4	5	7*	9	10*	11*	14*	15*
Size	Nominal torque T_{KN} [kNm]	Maximum torque T_{Kmax} [kNm]	Continous vibratory torque T_{KW} [kNm]	Dynamic torsional stiffness C_{Tdyn} [kNm/rad]	Speed n_{max} [min^{-1}]	Permissible axial displacement ΔK_a [mm]	Axial stiffness C_a [kN/mm]	Permissible angular stiffness ΔK_W [°]	Angular stiffness C_W [kNm/°]
0	2,1	4,2	0,6	90	4.000	2	2,1	2,2	0,14
1	4,0	8,0	1,0	110	3.500	3	1,1	2,0	0,13
2	8,0	16,0	2,3	420	2.900	3	1,4	1,6	0,29
3	14,0	28,0	3,8	780	2.500	3	1,6	1,5	0,44
4	25,0	50,0	7,5	1350	2.200	3	4,9	1,1	1,76
5	45,0	90,0	12,5	2700	1.800	3	5,2	0,8	2,85

* per membrane set

CENTADISC-C
TYPE 0

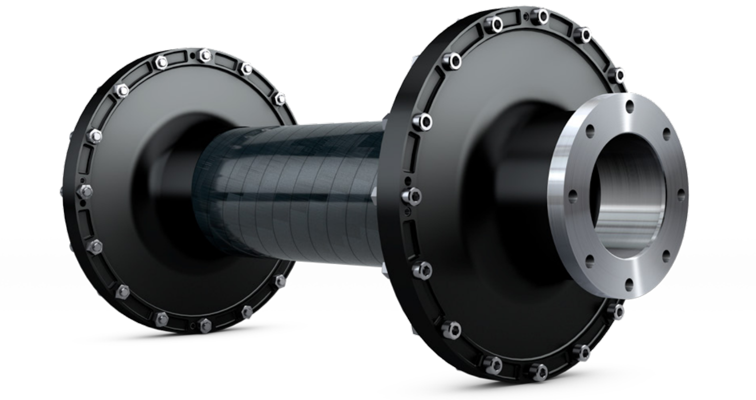


alternative: short Adapter

DIMENSIONS ↓ **SIZE 0–5**

Size	D_1	D_2	D_3/D_4	D_5	E_3/E_4 [H7]	E_5 [H7]	F_3/F_4	F_5	L_2 min	L_2 max	L_3/L_4	L_5	S_3/S_4	S_5	T_3/T_4 ±0,2	T_5 ±0,2	Z_3/Z_4	Z_5
0	280	112	180	180	110	110	16	16	230	3680	93	58	15	M14	155,5	155,5	8	8
1	360	155	225	250	140	140	16	20	250	4200	91	58	17	M18	196	218	8	8
2	430	212	315	285	175	175	20	20	250	5900	100	65	23	M20	280	245	8	8
3	500	266	350	350	220	220	22	22	260	4000	110	65	23	M22	310	310	10	10
4	580	312	435	435	280	280	27	27	300	9500	125	75	28	M27	385	385	10	10
5	700	414	550	550	400	400	27	27	400	9100	130	75	28	M27	500	500	10	10

CENTADISC-C
TYPE G



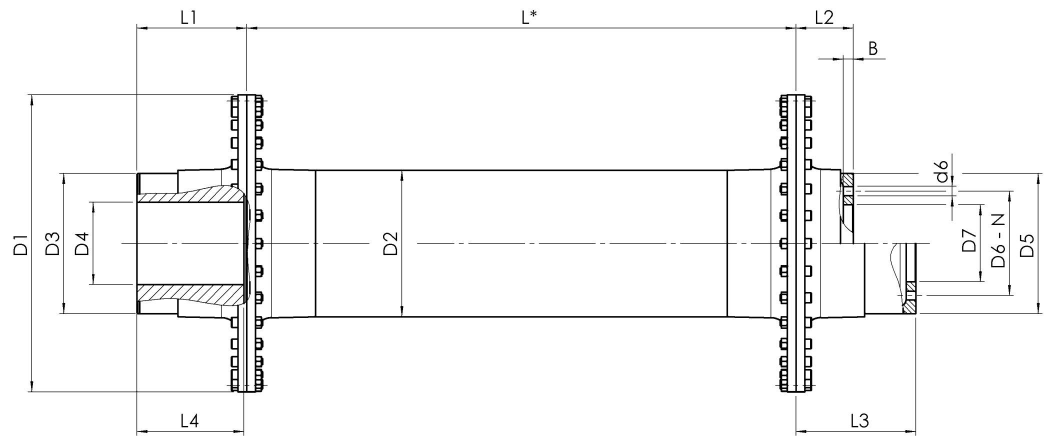
TECHNICAL DATA | ↓ **SIZE 0G–4G**

1	3	4	5	7*	10		14	
Size	Nominal torque T_{KN} [kNm]	Maximum torque T_{Kmax} [kNm]	Continous vibratory torque T_{KW} [kNm]	Dynamic torsional stiffness membrane $C_{membrane}$ [kNm/rad]	Permissible axial displacement ΔK_a [mm]		Permissible angular stiffness ΔK_W [°]	
					short termed	continuous	short termed	continuous**
0G	1,6	3,2	0,40	120	± 3	± 2,0	2	1,3
1G	3,0	6,0	0,75	140	± 4	± 2,6	2	1,3
2G	6,0	12,0	1,50	490	± 5	± 3,3	2	1,3
3G	12,0	24,0	3,00	900	± 6	± 3,9	2	1,3
4G	20,0	40,0	5,00	1500	± 7	± 4,6	2	1,3

* per membrane set
** continuous allowable value for DNV classification is 1°

CENTADISC-C

TYPE G



DIMENSIONS | **↓ SIZE 0G–4G**

Size	D_1 [mm]	$D_2=D_3$ max. [mm]	D_4 [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	L_4 [mm]	D_5 [mm]	D_6 ± 0,1 [mm]	D_7 [mm]	N	d_6 [mm]	B [mm]	Mass moments of inertia and masses J_1 [kgm²]	$J_2=J_3$ [kgm²]	J_4 [kgm²]	m_1 [kg]	$m_2=m_3$ [kg]	m_4 [kg]
0G	280	112	65	95	77	102	90	143	120,65	95,25	4	Ø 13	12	0,0158	0,0145	0,0116	5,8	2,6	1,7
1G	350	153	90	105	85	160	100	180	155,5	110	8	M 14	20	0,0523	0,0431	0,0435	11,8	4,5	4,8
2G	450	212	135	169	70	169	160	212	155,5	110	8	M 14	14	0,2434	0,1159	0,0957	37,0	6,5	6,0
3G	540	266	170	200	104	200	195	266	218	140	8	M 18	23	0,7097	0,2998	0,2910	69,9	10,8	13,3
4G	600	312	200	225	97	225	220	312	245	175	8	M 20	20	1,439	0,465	0,444	104,8	13,0	15,6

Dimension L* is produced according customers requirements, but is nevertheless dependant upon speed. We are at your service for consultation.
The dimensions of the connecting flanges (D5, D6, D7, d6) comply with our company standards.
Deviating tailored flanges are possible. Each side of the universal joint shaft can either be equipped with hubs or connecting flanges.
The flanges are available with dimension L2 in short version or with dimension L3 in long version. The materials available for hubs and flanges are steel, aluminium or titanium.

EXPLANATION OF THE TECHNICAL DATA

This appendix shows all explanations of the technical data for all CENTA products.

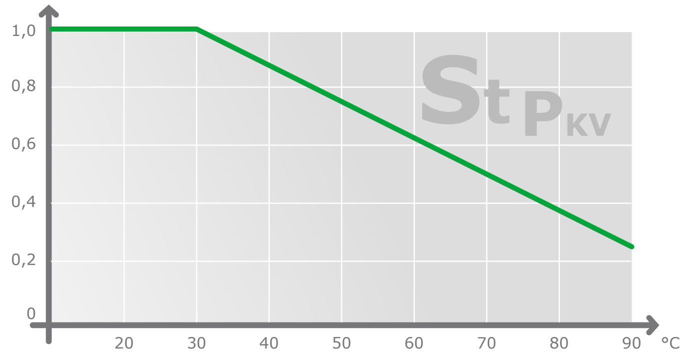
the green marked explanations are relevant for this catalog:

1	Size	Page APP-2
2	Rubber quality	Page APP-2
3	Nominal torque	Page APP-2
4	Maximum torque	Page APP-2
5	Continuous vibratory torque	Page APP-2
6	Permissible power loss	Page APP-2
7	Dynamic torsional stiffness	Page APP-3
8	Relative damping	Page APP-3
9	Speed	Page APP-3
10	Permissible axial displacement	Page APP-3
11	Axial stiffness	Page APP-4
12	Permissible radial displacement	Page APP-4
13	Radial stiffness	Page APP-4
14	Permissible angular displacement	Page APP-4
15	Angular stiffness	Page APP-4

Are these technical explanations up to date?
click here for an update check!

CENTADISC-C

EXPLANATION OF THE TECHNICAL DATA



1

Size

This spontaneously selected figure designates the size of the coupling.

2

Rubber quality
Shore A

This figure indicates the nominal shore hardness of the elastic element.

The nominal value and the effective value may deviate within given tolerance ranges.

3

Nominal torque
T_{KN} [kNm]

Average torque which can be transmitted continuously over the entire speed range.

4

Maximum torque
[kNm]

T_{Kmax}	This is the torque that may occur occasionally and for a short period up to 1.000 times and may not lead to a substantial temperature rise in the rubber element.

In addition the following maximum torques may occur:

ΔT_{Kmax} = 1,8xT_{KN}	Peak torque range (peak to peak) between maximum and minimum torque, e.g. switching operation.
T_{Kmax1} = 1,5xT_{KN}	Temporary peak torque (e.g. passing through resonances). ΔT_{Kmax} or T_{Kmax1} may occur 50.000 times alternating or 100.000 times swelling.
T_{Kmax2} = 4,5xT_{KN}	Transient torque rating for very rare, extraordinary conditions (e.g. short circuits).

5

Continuous vibratory torque
T_{KW} [kNm]

Amplitude of the continuously permissible periodic torque fluctuation with a basic load up to the value T_{KN}.

The frequency of the amplitude has no influence on the permissible continuous vibratory torque. Its main influence on the coupling temperature is taken into consideration in the calculation of the power loss.

Operating torque
T_{Bmax} [kNm]

The maximum operating torque results of T_{KN} and T_{KW}.

6

Permissible Power Loss
P_{KV} [kW] or [W]

Damping of vibrations and displacement results in power loss within the rubber element.

The permissible power loss is the maximum heat (converted damping work into heat), which the rubber element can dissipate continuously to the environment (i.e. without time limit) without the maximum permissible temperature being exceeded.

The given permissible power loss refers to an ambient temperature of 30° C. If the coupling is to be operated at a higher ambient temperature, the temperature factor St_{PKV} has to be taken into consideration in the calculation.

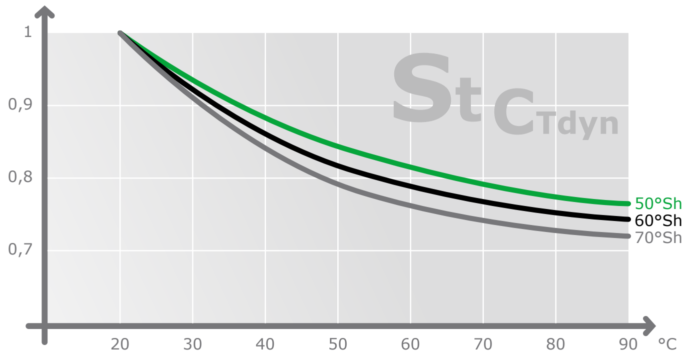
The coupling can momentarily withstand an increase of the permissible power loss for a short period under certain operation modes (e.g. misfiring).

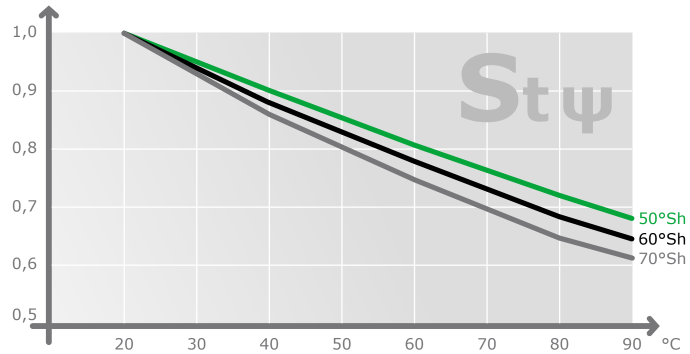
P_{KV30} [kW] or [W]

For a maximum period of 30 minutes the double power loss P_{KV30} is permissible. CENTA keeps record of exact parameters for further operation modes.

CENTADISC-C

EXPLANATION OF THE TECHNICAL DATA





7
Dynamic torsional stiffness
C_{Tdyn} [kNm/rad]

The dynamic torsional stiffness is the relation of the torque to the torsional angle under dynamic loading.

The torsional stiffness may be linear or progressive depending on the coupling design and material.

The value given for couplings with linear torsional stiffness considers following terms:

- Pre-load: 50% of T_{KN}
- Amplitude of vibratory torque: 25% of T_{KN}
- Ambient temperature: 20°C
- Frequency: 10 Hz

For couplings with progressive torsional stiffness only the pre-load value changes as stated.

The tolerance of the torsional stiffness is ±15% if not stated otherwise.

The following influences need to be considered if the torsional stiffness is required for other operating modes:

- Temperature
  Higher temperature reduces the dynamic torsional stiffness.
  Temperature factor $S_{t\,C_{Tdyn}}$ has to be taken into consideration in the calculation.
- Frequency of vibration
  Higher frequencies increase the torsional stiffness.
  By experience the dynamic torsional stiffness is 30% higher than the static stiffness. CENTA keeps record of exact parameters.
- Amplitude of vibratory torque
  Higher amplitudes reduce the torsional stiffness, therefore small amplitudes result in higher dynamic stiffness. CENTA keeps record of exact parameters.

8
Relative damping
ψ

The relative damping is the relationship of the damping work to the elastic deformation during a cycle of vibration.

The larger this value [ψ], the lower is the increase of the continuous vibratory torque within or close to resonance.

The tolerance of the relative damping is ±20%, if not otherwise stated.

The relative damping is reduced at higher temperatures.

Temperature factor $S_{t\psi}$ has to be taken into consideration in the calculation.

The vibration amplitude and frequency only have marginal effect on the relative damping.

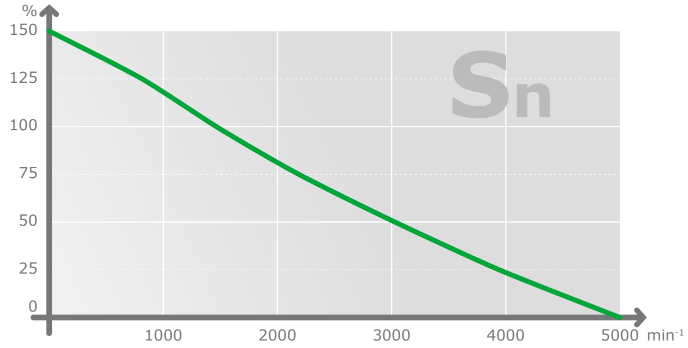
9
Speed
[min^{-1}]

n_{max}	The maximum speed of the coupling element, which may occur occasionally and for a short period (e.g. overspeed). The characteristics of mounted parts may require a reduction of the maximum speed (e.g. outer diameter or material of brake discs).
n_d	The maximum permissible speed of highly flexible coupling elements is normally 90% thereof.

10
Permissible axial displacement
[mm]

ΔK_a	The continuous permissible axial displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation.
$\Delta K_{a\,max}$	The maximum axial displacement of the coupling, which may occur occasionally for a short period (e.g. extreme load). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

CENTADISC-C



EXPLANATION OF THE TECHNICAL DATA

11	
Axial stiffness [kN/mm]	
C_a	The axial stiffness determines the axial reaction force on the input and output sides upon axial displacement.
$C_{a\,dyn}$	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

12	
Permissible radial displacement [mm]	
ΔK_r	The continuous permissible radial displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation. The continuous permissible radial displacement depends on the operation speed and may require adjustment (see diagrams S_n of the coupling series).
$\Delta K_{r\,max}$	The maximum radial displacement of the coupling, which may occur occasionally and for a short period without consideration of the operation speed (e.g. extreme overload). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

13	
Radial stiffness [kN/mm]	
C_r	The radial stiffness determines the radial reaction force on the input and output sides upon radial displacement.
C_{rdyn}	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

14	
Permissible angular displacement [∡°]	
ΔK_w	The continuous permissible angular displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation. The continuous permissible angular displacement depends on the operation speed and may require adjustment (see diagrams S_n of the coupling series).
$\Delta K_{w\,max}$	The maximum angular displacement of the coupling, which may occur occasionally and for a short period without consideration of the operation speed (e.g. extreme overload). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

15	
Angular stiffness [kNm/°]	
C_w	The angular stiffness determines the restoring bending moment on the input and output sides upon angular displacement.
C_{wdyn}	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

1. This catalog supersedes previous editions.

   This catalog shows the extent of our CENTAX®-SEC coupling range at the time of printing. This program is still being extended with further sizes and series. Any changes due to technological progress are reserved.

   We reserve the right to amend any dimensions or detail specified or illustrated in this publication without notice and without incurring any obligation to provide such modification to such couplings previously delivered. Please ask for an application drawing and current data before making a detailed coupling selection.

2. We would like to draw your attention to the need of preventing accidents or injury. No safety guards are included in our supply.

3. TRADEMARKS

   CENTA, the CENTA logo, Centacone, CENTADISC, CENTAFIT, Centaflex, CENTALINK, Centalock, Centaloc, Centamax, Centastart, CENTAX, HYFLEX and CENTAWAVE are registered trademarks of CENTA Antriebe Kirschey GmbH in Germany and other countries.

   Other product and company names mentioned herein may be trademarks of their respective companies.

4. Torsional responsibility

   The responsibility for ensuring the torsional vibration compatibility of the complete drive train, rests with the final assembler. As a component supplier CENTA is not responsible for such calculations, and cannot accept any liability for gear noise/-damage or coupling damage caused by torsional vibrations.

   CENTA recommends that a torsional vibration analysis (TVA) is carried out on the complete drive train prior to start up of the machinery. In general torsional vibration analysis can be undertaken by engine manufacturers, consultants or classicfication societies. CENTA can assist with such calculations using broad experience in coupling applications and torsional vibration analysis.

5. Copyright to this technical dokument is held by CENTA Antriebe Kirschey GmbH.

6. The dimensions on the flywheel side of the couplings are based on the specifications given by the purchaser. The responsibility for ensuring dimensional compatibility rests with the assembler of the drive train. CENTA cannot accept liability for interference between the coupling and the flywheel or gearbox or for damage caused by such interference.

7. All technical data in this catalog are according to the metric SI system. All dimensions are in mm. All hub dimensions (N, N_1 and N_2) may vary, depending on the required finished bore. All dimensions for masses (m), inertias (J) and centres of gravity (S) refer to the maximum bore diameter.

CENTA is the leading producer of flexible couplings for rail, industrial, marine and power generating applications. Worldwide.

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