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FLENDER couplings

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FLENDER couplings
Standard Couplings

Catalog MD 10.1 · 2015

The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certified Registration No. 01 100 000708). The certificate is recognized by all IQNet countries.

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The products contained in this catalog can also be found in the e-Catalog CA 01.
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E86060-D4001-A510-D4-7600

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IA/DT Industry En 12.12.14

Introduction

Overview

The mechanical drive train comprises individual units such as motor, gear unit and driven machine. The coupling connects these component assemblies.

As well as the transmission of rotary motion and torque, other requirements may be made of the coupling.

- Compensation for shaft misalignment with low restorative forces
- Control of characteristic angular vibration frequency and
- damping
- Interruption or limitation of torque
- Noise insulation, electrical insulation

Couplings are frequently chosen after the machines to be connected have already been selected. Thanks to a large number of different coupling assembly options, specified marginal conditions for clearance and connection geometry can be met from the standard range. The coupling also performs secondary functions, e.g. providing a brake disk or brake drum for operating or blocking brakes, devices to record speed or the attachment of sprockets or pulleys.

Couplings are divided into two main groups, couplings and clutches.

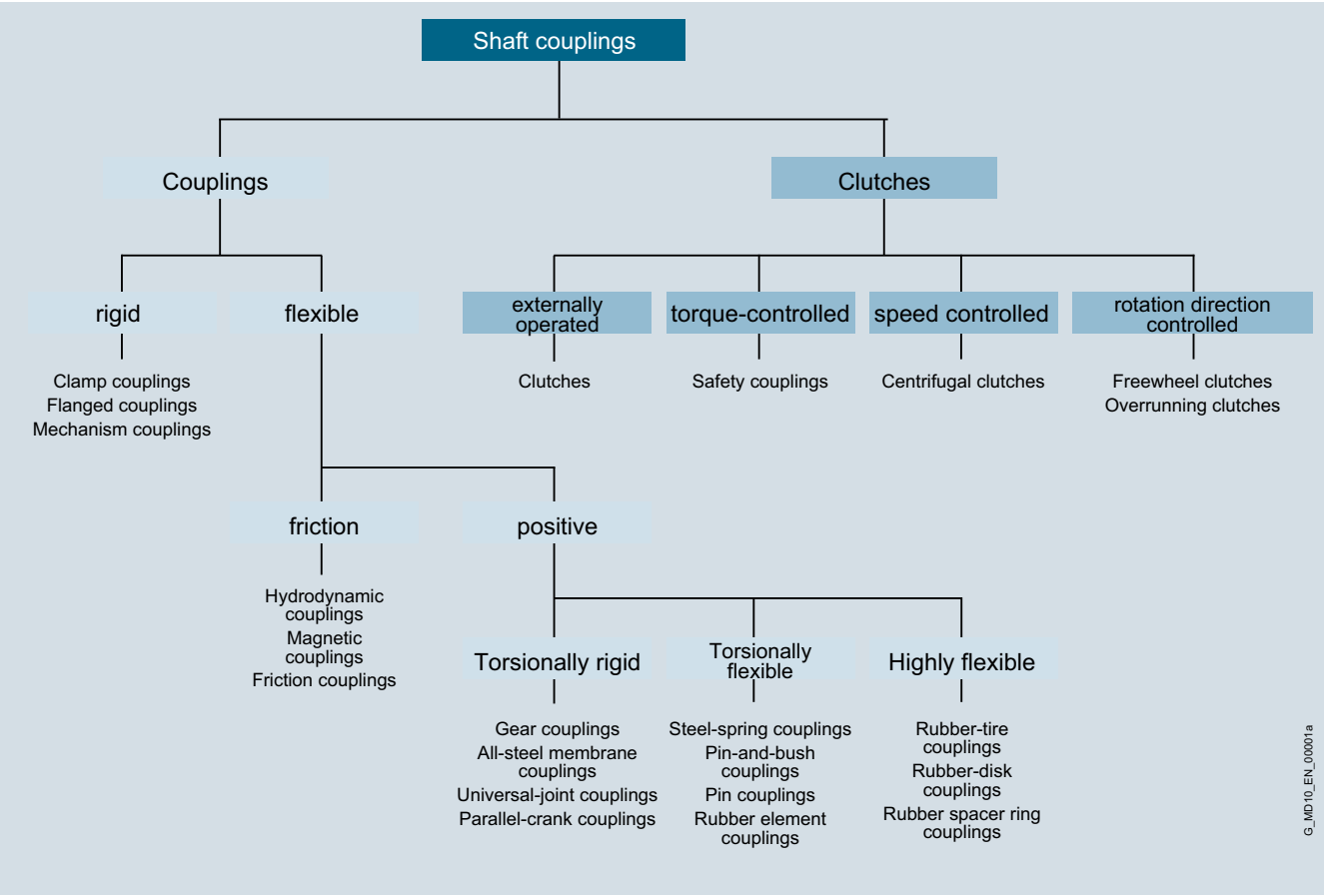
Clutches interrupt or limited the transmissible torque. The engaging and disengaging forces on externally operated clutches are introduced via a mechanically, electrically, hydraulically or pneumatically operating mechanism. Overload, centrifugal or freewheel clutches draw their engaging energy from the transmitted output.

Rigid couplings, designed as clamp, flanged or mechanism couplings, connect machines which must not undergo any shaft misalignment. Hydrodynamic couplings, often also called fluid or Föttinger couplings, are used as starting couplings in drives with high mass moments of inertia of the driven machine. In drive technology very often flexible, positive couplings, which may be designed to be torsionally rigid, torsionally flexible or highly flexible, are used.

Torsionally rigid couplings are designed to be rigid in a peripheral direction and flexible in radial and axial directions. The angle of rotation and torque are conducted through the coupling without a phase shift.

Torsionally flexible couplings have resilient elements usually manufactured from elastomer materials. Using an elastomer material with a suitable ShoreA hardness provides the most advantageous torsional stiffness and damping for the application. Shaft misalignment causes the resilient elements to deform.

Highly flexible couplings have large-volume (elastomer) resilient elements of low stiffness. The angle of rotation and torque are conducted through the coupling with a considerable phase shift.



Technical Information

2

Overview

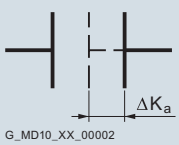
Shaft misalignment

Shaft misalignment is the result of displacement during assembly and operation and, where machines constructed with two radial bearings each are rigidly coupled, will cause high loads being placed on the bearings. Elastic deformation of base frame, foundation and machine housing will lead to shaft misalignment which cannot be prevented, even by precise alignment.

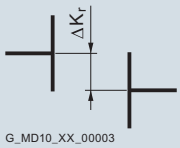
Furthermore, because individual components of the drive train heat up differently during operation, heat expansion of the machine housings causes shaft misalignment.

Poorly aligned drives are often the cause of seal, rolling bearing or coupling failure. Alignment should be carried out by specialist personnel in accordance with Siemens operating instructions.

Depending on the direction of the effective shaft misalignment a distinction is made between:



Axial misalignment



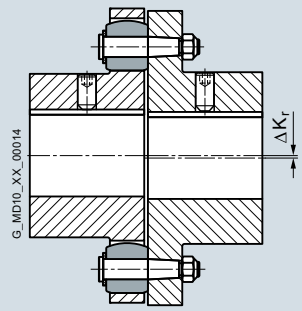
Radial misalignment

Angular misalignment

Couplings can be categorized into one of the following groups:

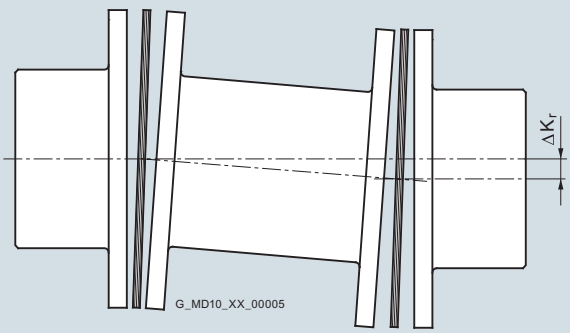
- **Single-joint couplings**
  Couplings with flexible elements mainly made of elastomer materials. Shaft misalignment results in deformation of the elastomer elements. The elastomer elements can absorb shaft misalignment as deformations in an axial, radial and angular direction. The degree of permissible misalignment depends on the coupling size, the speed and the type of elastomer element.
  Single-joint couplings do not require an adapter and are therefore short versions.

- Example:
  In the case of a RUPEX RWN 198 coupling with an outer diameter of 198 mm and a speed of 1500 rpm, the permitted radial misalignment is ΔK_r = 0.3 mm.



- **Two-joint couplings**
  Two-joint couplings are always designed with an adapter. The two joint levels are able to absorb axial and angular misalignment. Radial misalignment occurs via the gap between the two joint levels and the angular displacement of the joint levels. The permitted angular misalignment per joint level is frequently about 0.5°. The permitted shaft misalignment of the coupling can be adjusted via the length of the adapter. If there are more than two joint levels, it is not possible to define the position of the coupling parts relative to the axis of rotation. (The less frequently used parallel-crank couplings are an exception).

- Example:
  ARPEX ARS-6 NEN 210-6 coupling with a shaft distance of 160 mm with a permitted radial misalignment of ΔK_r = 1.77 mm (angle per joint level 0.7°).



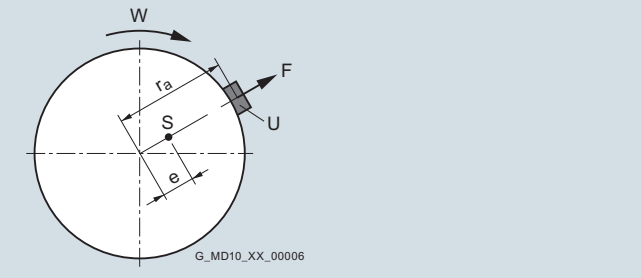
Restorative forces

Shaft misalignment causes restorative forces to act on the coupled shafts which are determined by the displacement stiffness of the coupling. These restorative forces are frequently comparatively weak and can usually be disregarded. Where bearings or shafts are under heavy loads, the restorative forces should be taken into account.

Balancing

Because of primary shaping processes and machining, the coupling components are manufactured with a mass distribution about the axis of rotation of the motor, gear unit or driven machine which is not always ideal.

Balancing means improving the mass distribution of a rotating body so that it rotates on its bearings with a sufficiently limited effect of free centrifugal forces.



The imbalance force increases linearly with the distance between the center of gravity of the body and the axis of rotation, the weight of the body and the rotor speed squared.

F = imbalance force
S = center of gravity of the body
e = distance of center of gravity of body from the pivot axis

In the case of rotating unbalanced coupling parts rotary, imbalance forces develop which impose loads on the bearings of the machine shafts and excite vibration. High vibration values on drives are frequently detected as early as initial start-up if the balance of the machine shafts or the mounted coupling parts is insufficient or the balancing specifications are incompatible. The balance condition of the coupling can be measured on balancing machines. By adding or drilling away material, a balance condition which meets the requirements can be achieved.

Balance quality levels

The so-called quality level G to DIN ISO 1940 indicates a range of permitted residual imbalance from zero up to an upper limit. Applications can be grouped on the basis of similarity analysis. For many applications a coupling balance quality of G 16 is sufficient. On drives susceptible to vibration the balance quality should be G 6.3. Only in special cases is a better balance quality required.

Single- and two-level balancing

For discoid bodies (such as brake disks, coupling hubs) so-called single-level balancing is carried out. The mass compensation for the imbalance is undertaken at a single level only. For historical reasons single-level balancing is also known as static balancing. On long bodies such as adapters mass compensation must be implemented at two levels to reduce the couple imbalance. Two-level balancing is carried out while the rotor body is rotating. Historically, this is known as dynamic balancing.

Balancing standard in accordance with DIN ISO 21940-32

Besides the required balance quality, it is necessary to set standards which define how the mass of the parallel key is to be taken into consideration when balancing. In the past, motor rotors have frequently been balanced in accordance with the full parallel key standard. The "appropriate" balance condition of the coupling hub was described as "balancing with open keyway" or "balancing after keyseating". Today it is usual for the motor rotor, as well as the gear unit and driven machine shaft, to be balanced in accordance with the half parallel key standard.

Full parallel key standard
The parallel key is inserted in the shaft keyway, then balancing is carried out. The coupling hub must be balanced without parallel key after keyseating. Marking of shaft and hub with "F" (for "full").

Half parallel key standard
The balancing standard normally applied today. Before balancing, a half parallel key is inserted in the shaft and another in the coupling hub. Alternatively, balancing can be carried out before cutting the keyway. The balanced parts must be marked with an "H". This marking can be dispensed with if it is absolutely clear which parallel key standard has been applied.

No parallel key standard
Balancing of shaft and coupling hub after keyseating, but without parallel key. Not used in practice. Marking of shaft and hub with "N" (for "no").

The length of the parallel key is determined by the shaft keyway. Coupling hubs may be designed considerably shorter than the shaft. To prevent imbalance forces caused by projecting parallel key factors when balancing in accordance with the half parallel key standard in the case of applications with high balancing quality requirements, grooved spacer rings can be fitted or stepped parallel keys used.

Siemens Balancing Standard

The balancing quality level, together with the operating speed, results in the maximum permissible eccentricity of the center of gravity of the coupling or the coupling subassembly. In the Siemens article number the balancing quality can be preset with the help of the order code. Additionally, also the balance quality level to DIN ISO 1940 can be preset together with the operating speed belonging to it, which then be taken as priority.

The procedure to determine the Siemens balancing quality is as follows:
Operating speed and required balancing quality level are known from the application. Using these values, the required eccentricity of the center of gravity can be calculated using the specified formula context or the following graph. The eccentricity of the center of gravity of the coupling must be less than the required eccentricity of the center of gravity to achieve the required balancing quality. The associated article number must be stated in the order; only if standard balancing has been selected is the article number to be dispensed with

$$e_{perm} = 9600 \cdot \frac{G}{n}$$

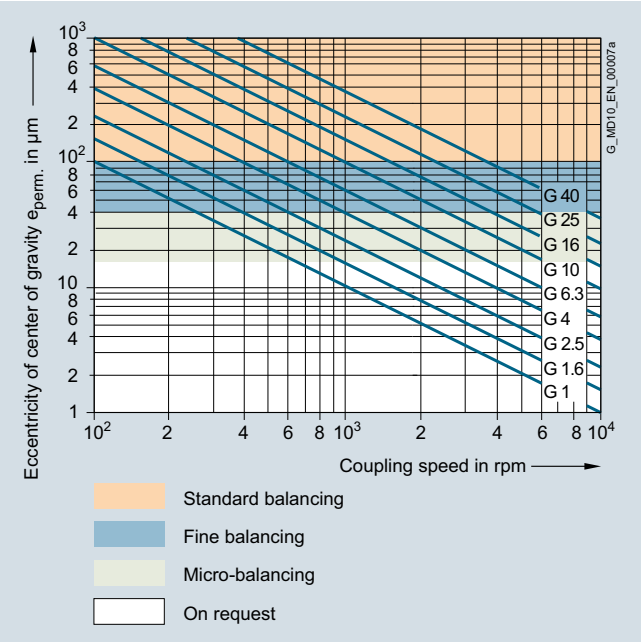
$$e_{coupl} \leq e_{perm.}$$

permitted:

Eccentricity of center of gravity	$e_{perm.}$	in µm
Eccentricity of center of gravity of the coupling	e_{coupl}	in µm
Balancing quality level	G	in mm/s
Coupling speed	*n*	in rpm

Eccentricity of center of gravity of coupling e_{coupl}	Siemens balancing quality	Order code
maximum 100 µm	standard balancing	without specification
maximum 40 µm	fine balancing	W02
maximum 16 µm	micro-balancing	W03
better than 16 µm	special balancing	on request

Order code to determine the balance quality level to DIN ISO 1940 and the operating speed:
Y95 {G = __; n = __rpm}.



Example:
Coupling speed = 1450 rpm
required balancing quality level G 6.3

$$e_{perm.} = 9600 \cdot \frac{G}{n} = 9600 \cdot \frac{6.3}{1450}\ \mu m$$

Thus, the required eccentricity of center of gravity is 41.7 µm. The fine balancing with a maximum eccentricity of center of gravity of 40 µm fulfills this requirement; therefore, the order code W02 has to be specified when ordering.

For many applications the following balancing quality recommendation applies:

	Standard balancing	Fine balancing
Coupling	v = DA · n/19100	
Short version with LG ≤ 3 x DA	$v \leq 30$ m/s	$v > 30$ m/s
Long version with LG > 3 x DA	$v \leq 15$ m/s	$v > 15$ m/s

Peripheral speed	v	in m/s
Coupling outer diameter	DA	in mm
Coupling speed	n	in rpm
Coupling length	LG	in mm

The following standards on balancing must be observed:

- couplings are balanced in subassemblies.
- hub parts without finished bore are unbalanced.
- the number of balancing levels (one- or two-level balancing) is specified by Siemens.
- without special specification balancing is done in accordance with the half-parallel-key standard. Balancing in accordance with the full-parallel-key standard must be specified in the order number.
- for FLUDEX couplings special balancing standards specified in Section 13 apply.
- ARPEX couplings in standard balancing quality are unbalanced. Thanks to steel components machined all over and precisely guided adapters the balancing quality of standard balancing is nearly always adhered to.

Shaft-hub connections

The bore and the shaft-hub connection of the coupling are determined by the design of the machine shaft. In the case of IEC standard motors, the shaft diameters and parallel key connections are specified in accordance with DIN EN 50347. For diesel motors, the flywheel connections are frequently specified in accordance with SAE J620d or DIN 6288. Besides the very widely used connection of shaft and hub with parallel keys to DIN 6885 and cylindrically bored hubs, couplings with Taper clamping bushes, clamping sets, shrink-fit connections and splines to DIN 5480 are common.

The form stability of the shaft/hub connection can only be demonstrated when shaft dimensions and details of the connection are available. The coupling torques specified in the tables of power ratings of the coupling series do not apply to the shaft-hub connection unrestrictedly.

In the case of the shaft-hub connection with parallel key, the coupling hub must be axially secured, e.g. with a set screw or end washer. The parallel key must be secured against axial displacement in the machine shaft.

All Siemens couplings with a finished bore and parallel keyway are designed with a set screw. Exceptions are some couplings of the FLUDEX series, in which end washers are used. During assembly, Taper clamping bushes are frictionally connected to the machine shaft.

Assembly

Assembly, start-up, maintenance and servicing of the coupling are described in the operating instructions.

Contact protection

Couplings are rotating components which can pose a risk to the environment. Siemens prescribes fitting couplings with a suitable contact guard, also called a coupling guard in the operating instructions. The contact guard, must provide a firm cover to protect against contact with the rotating coupling. The coupling must also be protected against blows from objects striking it. The coupling guard must enable the coupling to be adequately ventilated. The following guidelines give information on designing the contact guard: 2006/42/EC EC Machinery Directive; EN 13463-1 Section 13.3.2.1; EN 13463-1 Section 7.4; EN 13463-1 Section 8.1.

Maintenance

All-steel membrane couplings of the ARPEX series require no maintenance. If the operating and mounting conditions have been adhered to, only regular visual inspection is required.

Elastomer elements, elastomer seals and lubricants are subject to wear through ageing and loads. To avoid damage to the coupling or failure of the drive, the ZAPEX, N-EUPEX, N-EUPEX DS, RUPEX, N-BIPEX, ELPEX, ELPEX-S, ELPEX-B and FLUDEX series must be maintained in accordance with the operating instructions.
On gear couplings, the lubricant must be changed at regular intervals.

On flexible or highly flexible couplings, the torsional backlash or the torsion angle must be checked at regular intervals under load. If a limit value is exceeded, the elastomer element must be replaced. It is very important to maintain couplings which are operated in a potentially explosive environment, as couplings which are not maintained can become ignition sources.

Corrosion protection

Depending on the environmental conditions, suitable corrosion protection must be specified for the coupling. Unless otherwise specified in the order, steel and cast iron surfaces are shipped with a simple preservative.

Ambient conditions

Because of the environment, the coupling has to meet a large number of additional requirements. Couplings must be as suitable for use in a potentially explosive environment as for use at a high or low ambient temperature. The environment may be defined as chemically aggressive or be subject to laboratory conditions or requirements of food manufacture.

ATEX and EC Machinery Directive

Wherever a potentially explosive environment cannot be ruled out, the machinery used must meet special conditions in order to prevent the outbreak of fire as far as possible. Within the European Union, Directive 94/9/EC applies to these applications. This directive, harmonizes the individual states' legal requirements for explosion prevention and clearly defines the procedure for checking and circulating machines and parts. Whether or not a machine is used in a potentially explosive atmospheres, the manufacturer is required under EC Machinery Directive 2006/42/EC to assess and as far as possible prevent hazards which may arise from his product.

The operator has an obligation to ascertain whether an environment is potentially explosive. Details of this are laid down in Directive 1999/92/EC.

The manufacturer is responsible for ensuring that the product is safe as defined in the EC Machinery Directive and conforms to Directive 94/9/EC if the EX requirement is specified by the operator.

The drive train mostly comprises individual pieces of equipment which are put together to form a subassembly. If the individual pieces of equipment, such as motor, coupling, gear unit or driven machine conform to Directive 94/9/EC, the manufacturer of the overall unit can limit the risk assessment to the additional hazards which arise from the combination of different individual pieces of equipment. The hazards which can arise from the individual pieces of equipment are assessed by the relevant suppliers.

The Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres will supersede the Directive 94/9/EC of 23 March 1994 with effect from 20 April 2016.

The following applies to the products shown in this brochure with a suitable for intended use in potentially explosive atmospheres:

- Products placed on the market before 20 April 2016 meet the requirements of Directive 94/9/EC.
- Products placed on the market from 20 April 2016 meet the requirements of Directive 2014/34/EC.

The coupling series suitable for use in potentially explosive environments are marked with EX in the catalog.

FLENDER couplings are to be rated as components according to the new EC Machinery Directive 2006/42/EC. Therefore, Siemens do not issue a declaration of incorporation for this products.

Overload conditions

Overload conditions are operating conditions that go beyond the limit loads of the coupling.
Overload conditions may occur under abnormal operating conditions, e.g. drive blockage, short circuit or supply deviations, as well as under normal operating conditions, e.g. during starting or breaking. Particularly in the case of high mass moments of inertia of the driven machine, torques that are a multiple of the motor starting torque may become effective during direct starting or star-delta starting.

Overload conditions may damage not only the coupling but also the entire drive train.

Overload conditions can frequently be prevent with special design measures. SIRIUS soft starters or SINAMICS frequency converters are suitable for considerably reducing starting torques of asynchronous motors. If drive blockages and overloads of the driven machine cannot be ruled out, torque limiting SECUREX couplings can prevent damage to the drive train.

Coupling behavior under overload conditions

Coupling behavior under overload where the torque is considerably above the limits of use of the coupling concerned is determined by the engineering design of the coupling series.

The ZAPEX, ARPEX, N-EUPEX, RUPEX and N-BIPEX coupling series can withstand overloads until the breakage of metal parts. These coupling series are designated as fail-safe. Coupling types which can withstand overload, i.e. fail-safe types, are used e.g. in crane systems. In case of coupling breakage due to overloads, the splintering metall parts may cause injury to persons and property damages.

The N-EUPEX DS, ELPEX-B, ELPEX-S and ELPEX coupling series throw overload. The elastomer element of these couplings is irreparably damaged without damage to metal parts when subjected to excessive overload. These coupling series are designated as non-fail-safe. The types that fail can be fitted with a fail-safe device. This component enables emergency operation, even after the rubber element of the coupling has been irreparably damaged.

The fluid couplings of the FLUDEX series withstand a load for a short time. Persistent overload causes the FLUDEX coupling to heat up beyond limits, causing the fuse to operate and so emptying the coupling and interrupting the torque transmission.

Torsional and bending vibrations

On drives which are prone to torsional and bending vibrations, measurements or calculations such as natural frequency calculations, torsional vibration simulations or bending vibration calculations are necessary.

The drive train may, depending on complexity, be regarded as a two-mass vibration-generating system or N-mass vibration-generating system. The vibration-generating masses are defined by the rotating bodies and the couplings by the coupling stiffnesses and shaft stiffnesses. The effect of torsional vibration excitations on the behavior of the system is calculated.
Torsional vibration excitations may occur during the starting of an asynchronous motor, during a motor short circuit or in diesel engine drives. Bending vibrations may be critical if the coupling is insufficiently balanced and/or at an operating speed close to the critical speed.

The details needed for calculating torsional vibration are specified in the coupling catalog:

- Dynamic torsional stiffness
- Damping (specification of the damping coefficient ψ or Lehr's damping $D = \psi/4\pi$).
- Mass moment of inertia of the coupling halves.

Standards

Machines

2006/42/EC	EC Machinery Directive
94/9/EC	ATEX Directive – Manufacturer – and ATEX Guideline to Directive 94/9/EC
2014/34/EU	ATEX Directive – Manufacturer
1999/92/EC	ATEX Directive – Operator – and ATEX Guideline to Directive 1999/92/EC
DIN EN 13463	Non-electrical equipment for use in potentially explosive atmospheres
DIN EN 1127	Explosive atmospheres, explosion prevention and protection
DIN EN 50347	General-purpose three-phase induction motors having standard dimensions and outputs

Couplings

DIN 740	Flexible shaft couplings Part 1 and Part 2
VDI Guideline 2240	Shaft couplings - Systematic subdivision according to their properties VDI Technical Group Engineering Design 1971
API 610	Centrifugal Pumps for Petroleum, Chemical and Gas Industry Services
API 670	Machinery Protection System
API 671	Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services
ISO 10441	Petroleum, petrochemical and natural gas industries – Flexible couplings for mechanical power transmission-special-purpose applications

Balancing

DIN ISO 1940	Requirements for the balancing quality of rigid rotors
DIN ISO 21940-32	Mechanical vibrations; standard governing the type of parallel key during balancing of shafts and composite parts

Shaft-hub connections

DIN 6885	Driver connections without taper action – parallel keys – keyways
SAE J620d	Flywheels for industrial engines ...
DIN 6288	Internal-combustion piston engines Connection dimensions and requirements for flywheels and flexible coupling
ASME B17.1	Keys and keyseats
DIN EN 50347	General-purpose three-phase induction motors with standard dimensions and output data
BS 46-1:1958	Keys and keyways and taper pins Specification

Formula symbols

Key to the formula symbols

Name	Symbol	Unit	Explanation
Torsional stiffness, dynamic	C_{Tdyn}	Nm/rad	For calculating torsional vibration
Excitation frequency	f_{err}	Hz	Excitation frequency of motor or driven machine
Moment of inertia	J	kgm^2	Moment of inertia of coupling sides 1 and 2
Axial misalignment	ΔK_a	mm	Axial misalignment of the coupling halves
Radial misalignment	ΔK_r	mm	Radial misalignment of the coupling halves
Angular misalignment	ΔK_w	°	Angular misalignment of the coupling halves
Service factor	FB		Factor expressing the real coupling load as a ratio of the nominal coupling load
Frequency factor	FF		Factor expressing the frequency dependence of the fatigue torque load
Temperature factor	FT		Factor taking into account the reduction in strength of flexible rubber materials at a higher temperature
Weight	m	kg	Weight of the coupling
Rated speed	n_N	rpm	Coupling speed
Maximum coupling speed	n_{Kmax}	rpm	Maximum permissible coupling speed
Rated power	P_N	kW	Rated output on the coupling, usually the output of the driven machine
Rated torque	T_N	Nm	Rated torque as nominal load on the coupling
Fatigue torque	T_W	Nm	Amplitude of the dynamic coupling load
Maximum torque	T_{max}	Nm	More frequently occurring maximum load, e.g. during starting
Overload torque	T_{OL}	Nm	Very infrequently occurring maximum load, e.g. during short circuit or blocking conditions
Rated coupling torque	T_{KN}	Nm	Torque which can be transmitted as static torque by the coupling over the period of use.
Maximum coupling torque	T_{Kmax}	Nm	Torque which can be frequently transmitted (up to 25 times an hour) as maximum torque by the coupling.
Coupling overload torque	T_{KOL}	Nm	Torque which can very infrequently be transmitted as maximum torque by the coupling.
Fatigue coupling torque	T_{KW}	Nm	Torque amplitude which can be transmitted by the coupling as dynamic torque at a frequency of 10 Hz over the period of use.
Resonance factor	V_R		Factor specifying the torque increase at resonance
Temperature	T_a	°C	Ambient temperature of the coupling in operation
Damping coefficient	ψ	Psi	Damping parameter

Coupling Preselection and Options

3

Selection of the coupling series

Selection and ordering data

The coupling series is frequently determined by the driven machine and the design of the drive train. Common selection criteria are listed below and assigned to coupling properties, which are used to select the coupling series. Additionally, the price of the coupling and availability are important criteria for determining the coupling series to be used.

The FLUDEX series operates positively and transmits the torque with the aid of a flowing oil or water filling. FLUDEX couplings are used to reduce starting and/or overload torques. During starting, the motor may, for example, run up within a very short time; because of the FLUDEX coupling, the drive train with the driven machine may accelerate after a delay and without increased torque load.

The FLUDEX coupling cannot compensate for shaft misalignment and is therefore designed in combination with a displacement coupling, a cardan shaft or a belt drive. The displacement coupling may be selected in accordance with the criteria described below.

Selection criterion		ZAPEX	ARPEX	N-EUPEX	N-EUPEX DS	RUPEX	N-BIPEX	ELPEX-B	ELPEX-S	ELPEX
Torque range	Rated coupling torque T_{KN} in Nm	850 ... 7200000	92 ... 1450000	19 ... 62000	19 ... 21200	200 ... 1300000	12 ... 4650	24 ... 14500	330 ... 63000	1600 ... 90000
Speed range	Peripheral speed $v_{max} = DA \cdot n_{max}/19100$	60	100	36	36	60	45	35	66	60
Torque load	uniform	■	■	■	■	■	■	■	■	■
	non uniform	■	■	■	■	■	■	■	■	■
	rough	■	■	–	–	■	■	■	■	■
	very rough	■	■	–	–	–	–	■	■	■
Installation and alignment	Rigid installation, well aligned	■	■	■	■	■	■	■	■	■
	Rigid installation, roughly aligned	■	■	–	–	–	–	■	–	■
	Flexible installation	■	■	–	–	–	–	■	–	□
Torsional stiffness	Torsionally rigid	■	■	–	–	–	–	–	–	–
	Torsionally flexible	–	□	■	■	■	■	–	–	–
	Highly flexible	–	–	–	–	–	–	■	■	■
Torque transmission	Free of torsional backlash	–	■	–	–	□	–	■	–	■
	Low torsional backlash	■	–	–	–	■	■	–	■	–
	Overload withstand capability	■	■	■	–	■	■	–	□	■
Assembly	Plug-in assembly	□	–	■	■	■	■	–	■	–
	with Taper clamping bushes	–	□	□	–	–	–	■	■	–
Maintenance	Wear parts easily dismountable	■	■	■	■	■	–	■	■	■
	Maintenance-free	–	■	–	□	–	–	–	–	–
	Low-maintenance - interval 1 year	■	–	■	■	■	■	■	■	■
Environment	ATEX Approval	■	■	■	■	■	■	–	■	–
	Operating temperature range	-20 ... +80 °C	-40 ... +280 °C	-50 ... +100 °C	-30 ... +80 °C	-50 ... +100 °C	-50 ... +100 °C	-50 ... +70 °C	-40 ... +120 °C	-40 ... +80 °C
	Chemically aggressive	□	□	□	□	□	□	□	□	□
Coupling material	Cast iron	–	–	■	■	■	■	■	■	■
	Steel	■	■	–	–	■	–	■	■	■
	Stainless steel	–	□	–	–	□	–	□	–	–
Add-on parts / types	Adapter	■	■	■	■	□	–	■	□	□
	Brake disk	■	□	■	–	■	–	□	□	□
	Brake drum	■	□	■	–	■	–	□	□	□
	Axial backlash limiter	■	■	–	–	□	–	–	□	□
	Shiftgear	■	□	–	–	□	–	–	□	□
	Flange type	□	■	■	–	■	–	□	■	■
	Flange to SAE J620d	□	□	□	–	□	–	□	■	■

■ Standard
□ On request
– Not possible

Typical coupling solutions for different example applications

The specified application factors are recommendations; regulations, rules and practical experience take priority as assessment criteria.

No application factor need be taken into account with FLUDEX couplings. In the case of highly flexible couplings of the ELPEX, ELPEX-S and ELPEX-B series, deviating application factors are stated in the product descriptions.

Example applications	Application factor FB	FLUDEX	ZAPEX	ARPEX	N-EUPEX	RUPEX	N-BIPEX	ELPEX-B	ELPEX-S	ELPEX
Electric motor without gear unit										
Centrifugal pumps	1.0 ... 1.5								–	–
Piston pumps	1.5 ... 2.0				–					
Vacuum pumps	1.5 ... 1.75									
Fans with T_N less than 75 Nm	1.5 ... 1.75									
Fans with T_N from 75 to 750 Nm	1.75 ... 2.0									
Fans with T_N larger than 750 Nm	1.75 ... 2.0						–			
Blowers	1.5 ... 2.0									
Frequency converters / generators	1.25 ... 1.75								–	
Reciprocating compressors	1.75 ... 2.5				–					
Screw-type compressors	1.5 ... 1.75									
Internal-combustion engine without gear unit										
Generators	1.75 ... 2.5		–	–						
Pumps	1.5 ... 1.75		–							
Fans	1.75 ... 2.5		–		–					
Hydraulic pumps, excavators, construction machines	1.5 ... 1.75									–
Compressors / screw-type compressors	1.5 ... 1.75									
Agricultural machinery	1.75 ... 2.5									
Other										
Turbine gear units	1.5 ... 1.75				–	–	–	–	–	–
Hydraulic motor - gear unit	1.25 ... 1.5	–								
Electric motor with gear unit										
Chemical industry										
Extruders	1.5 ... 2.0	–								–
Pumps - centrifugal pumps	1.0 ... 1.5								–	–
Pumps - piston pumps	1.75 ... 2.5									
Pumps - plunger pumps	1.5 ... 1.75									
Reciprocating compressors	1.75 ... 2.5									
Calenders	1.5 ... 1.75									–
Kneaders	1.75 ... 2.5									
Cooling drums	1.25 ... 1.5							–	–	–
Mixers	1.25 ... 1.5							–	–	–
Stirrers	1.25 ... 1.5								–	–
Toasters	1.25 ... 1.5	–							–	–
Drying drums	1.25 ... 1.5								–	–
Centrifuges	1.25 ... 1.5								–	–
Crushers	1.5 ... 2.5								–	
Power generation and conversion										
Compressed air, reciprocating compressors	1.75 ... 2.5				–					
Compressed air, screw-type compressors	1.25 ... 1.5	–						–		
Air - Blowers	1.5 ... 1.75									
Air - Cooling tower fans	1.5 ... 1.75						–			
Air - Turbine blowers	1.5 ... 1.75	–			–		–	–	–	–
Generators, converters	1.25 ... 1.5				–			–	–	–
Welding generators	1.25 ... 1.5	–			–			–	–	–
Metal production, iron and steel works										
Plate tilters	1.5 ... 2.0	–			–		–		–	
Ingot pushers	1.75 ... 2.5	–			–		–		–	
Slabbing mill	1.75 ... 2.5	–			–		–		–	
Coiling machines	1.5 ... 2.0	–			–		–		–	
Roller straightening machines	1.5 ... 2.0	–			–				–	
Roller tables	1.75 ... 2.5	–			–				–	
Shears	1.75 ... 2.0	–			–		–		–	
Rollers	1.75 ... 2.0	–			–				–	

Preferred solution
Possible, less common
– Uncommon

Coupling Preselection and Options

Selection of the coupling series

Example applications	Application factor FB	FLUDEX	ZAPEX	ARPEX	N-EUPEX	RUPEX	N-BIPEX	ELPEX-B	ELPEX-S	ELPEX
Metal working machines										
Plate bending machines	1.5 ... 2.0	–			–		–		–	
Plate straightening machines	1.5 ... 2.0	–			–		–		–	
Hammers	1.75 ... 2.5	–			–		–		–	
Planing machines	1.75 ... 2.5	–			–		–		–	
Presses, forging presses	1.75 ... 2.0	–			–		–		–	
Shears	1.5 ... 2.0	–			–		–		–	
Grinding machines	1.25 ... 1.75	–			–				–	
Punches	1.5 ... 2.0	–			–		–		–	
Machine tools: Main drives	1.5 ... 1.75	–			–	–	–	–	–	–
Machine tools: Auxiliary drives	1.25 ... 1.5	–			–	–		–	–	–
Food industry										
Filling machines	1.25 ... 1.5	–			–	–		–	–	–
Kneading machines	1.5 ... 2.0				–			–	–	–
Mashers	1.5 ... 2.0				–			–	–	–
Sugar cane production	1.5 ... 2.0						–	–	–	–
Production machines										
Construction machines, hydraulic pumps	1.25 ... 1.5	–			–			–	–	–
Construction machines, traversing gears	1.5 ... 1.75									
Construction machines, suction pumps	1.5 ... 1.75	–							–	–
Construction machines, concrete mixers	1.5 ... 1.75			–	–		–			
Printing machines	1.25 ... 1.5	–						–	–	–
Woodworking - barking drums	1.5 ... 2.0									
Woodworking - planing machines	1.5 ... 2.0	–								
Woodworking - reciprocating saws	1.5 ... 1.75	–					–			
Grinding machines	1.5 ... 1.75	–							–	–
Textile machines - winders	1.5 ... 1.75	–							–	–
Textile machines - printing machines	1.5 ... 1.75	–							–	–
Textile machines - tanning vats	1.5 ... 1.75	–							–	–
Textile machines - shredders	1.5 ... 1.75	–			–		–		–	
Textile machines - looms	1.5 ... 1.75	–			–		–	–	–	–
Packaging machines	1.5 ... 1.75	–						–	–	–
Brick molding machines	1.75 ... 2.0	–			–		–		–	
Transport and logistics										
Passenger transport - elevators	1.5 ... 2.0	–			–		–	–	–	–
Passenger transport - escalators	1.5 ... 2.0	–			–		–	–	–	–
Conveyor systems - bucket elevators	1.5 ... 2.0							–	–	–
Conveyor systems - hauling winches	1.5 ... 2.0							–	–	–
Conveyor systems - belt conveyors	1.5 ... 2.0							–	–	–
Conveyor systems - endless-chain conveyors	1.5 ... 2.0				–			–	–	–
Conveyor systems - circular conveyors	1.5 ... 2.0							–	–	–
Conveyor systems - screw conveyors	1.5 ... 2.0							–	–	–
Conveyor systems - inclined hoists	1.5 ... 2.0				–			–	–	–
Crane traversing gear	1.5 ... 2.0	–					–	–	–	–
Hoisting gear	1.5 ... 2.0	–			–		–	–	–	–
Crane lifting gear	2.0 ... 2.5	–			–		–	–	–	–
Crane traveling gear	1.5 ... 1.75	–						–	–	–
Crane slewing gear	1.5 ... 1.75	–						–	–	–
Crane fly jib hoists	1.5 ... 2.0	–			–		–	–	–	–
Cable railways	1.5 ... 2.0	–			–		–	–	–	–
Drag lifts	1.5 ... 2.0	–			–		–	–	–	–
Winches	1.5 ... 2.0	–			–		–	–	–	–
Cellulose and paper										
Paper-making machines, all	1.5 ... 1.75	–					–	–	–	–
Pulper drives	1.5 ... 1.75						–	–	–	–

Preferred solution

Possible, less common

– Uncommon

Example applications	Application factor FB	FLUDEX	ZAPEX	ARPEX	N-EUPEX	RUPEX	N-BIPEX	ELPEX-B	ELPEX-S	ELPEX
Cement industry										
Crushers	1.75 ... 2.5						–		–	–
Rotary furnaces	1.5 ... 2.0				–		–		–	
Hammer mills	1.75 ... 2.5				–		–	–	–	
Ball mills	1.75 ... 2.0						–		–	
Pug mills	1.75 ... 2.0						–		–	–
Mixers	1.5 ... 1.75						–		–	–
Pipe mills	1.5 ... 1.75						–		–	–
Beater mills	1.75 ... 2.5						–		–	–
Separators	1.5 ... 1.75								–	–
Roller presses	1.75 ... 2.5						–	–	–	–

Preferred solution
Possible, less common
– Uncommon

FLUDEX couplings are mostly mounted on the high-speed gear shaft.

Selection of the coupling size

Selection and ordering data

The torque load of the coupling must be determined from the output of the driven machine and the coupling speed.

Rated coupling load $T_N = 9550 \cdot P_N / n_N$
(T_N in Nm; P_N in kW; n_N in rpm)

The rated coupling load obtained in this way must be multiplied by factors and compared with the rated coupling torque. An ideal but expensive method is to measure the torque characteristic on the coupling. For this, Siemens offers special adapters fitted with torque measuring devices.

The rated coupling torque T_{KN} is the torque which can be transmitted by the coupling over an appropriate period of use if the load is applied to the coupling purely statically at room temperature.

Application factors are to express the deviation of the real coupling load from the "ideal" load condition.

Coupling load in continuous operation

The operating principles of the driving and driven machines are divided into categories and the application factor FB derived from these in accordance with DIN 3990-1.

Examples of torque characteristic of driving machines:

- uniform: Electric motors with soft starting, steam turbines
- uniform with moderate shock loads: Electric motors without soft starting, hydraulic motors, gas and water turbines
- non uniform: Internal-combustion engines

Examples of torque characteristic in driven machines:

- uniform: Generators, centrifugal pumps for light fluids
- uniform with moderate shock loads: Centrifugal pumps for viscous fluids, elevators, machine tool drives, centrifuges, extruders, blowers, crane drives
- non uniform: Excavators, kneaders, conveyor systems, presses, mills
- very rough: Crushers, excavators, shredders, iron/smelting machinery

Application factor FB	Torque characteristic of the driven machine			
Torque characteristic of the driving machine	uniform	uniform with moderate shock loads	non uniform	very rough
uniform	1.0	1.25	1.5	1.75
uniform with moderate shock loads	1.25	1.5	1.75	2.0
non uniform	1.5	1.75	2.0	2.5

Temperature factor FT			Temperature T_a on the coupling								
Coupling	Elastomer material	Low temperature °C	under -30 °C	-30 °C to 50 °C	to 60 °C	to 70 °C	to 80 °C	to 90 °C	to 100 °C	to 110 °C	to 120 °C
N-EUPEX	**NBR**	-30	–	1.0	1.0	1.0	1.0	–	–	–	–
N-EUPEX	NR	-50	1.1[1)]	1.0	–	–	–	–	–	–	–
N-EUPEX	HNBR	-30	–	1.0	1.0	1.0	1.0	1.25	1.25	–	–
N-EUPEX DS	**NBR**	-30	–	1.0	1.0	1.0	1.0	–	–	–	–
RUPEX	**NBR**	-30	–	1.0	1.0	1.0	1.0	–	–	–	–
RUPEX	NR	-50	1.1	1.0	1.0	–	–	–	–	–	–
RUPEX	HNBR	-30	–	1.0	1.0	1.0	1.0	1.25	1.25	–	–
N-BIPEX	**TPU**	-50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	–	–
ELPEX	**NR**	-40	1.1	1.0	1.25	1.40	1.60	–	–	–	–
ELPEX-B	**NR**	-50	1.1	1.0	–	–	–	–	–	–	–
ELPEX-B	CR	-15	–	1.0	1.0	1.0	–	–	–	–	–
ELPEX-S SN, NN, WN	**NR**	-40	1.1	1.0	1.25	1.40	1.60	–	–	–	–
ELPEX-S NX	VMQ	-40	1.1	1.0	1.0	1.0	1.0	1.1	1.25	1.4	1.6

NR = natural rubber, natural-synthetic rubber mixture
NBR = nitril-butadiene-rubber (Perbunan)
HNBR = hydrated acrylonitrile butadiene rubber
CR = chloroprene rubber (FRAS fire-resistant and anti-static)
VMQ = silicone
TPU = polyurethane

In the case of ARPEX and ZAPEX coupling types, no temperature factor (FT = 1.0) need be taken into account.

Coupling size $T_{KN} \geq T_N \cdot FB \cdot FT$

[1)] The N-EUPEX coupling is not suitable for shock loads when used at low temperatures.

Coupling load under maximum and overload conditions

The maximum torque is the highest load acting on the coupling in normal operation.
Maximum torques at a frequency of up to 25 times an hour are permitted and must be lower than the maximum coupling torque. Examples of maximum torque conditions are: Starting operations, stopping operations or usual operating conditions with maximum load.

$$T_{Kmax} \geq T_{max} \cdot FT$$

Overload torques are maximum loads which occur only in combination with special, infrequent operating conditions.
Examples of overload torque conditions are: Motor short circuit, emergency stop or blocking because of component breakage. Overload torques at a frequency of once a month are permitted and must be lower than the overload torque of the coupling. The overload condition may last only a short while, i.e. fractions of a second.

$$T_{KOL} \geq T_{OL} \cdot FT$$

Coupling load due to dynamic torque load

Applying the frequency factor, the dynamic torque load must be lower than the coupling fatigue torque.

Dynamic torque load

$$T_{KW} \geq T_W \cdot FF \cdot \frac{1.5}{FB - 1.0}$$

Frequency of the dynamic torque load
$f_{err} \leq 10$ Hz frequency factor FF = 1.0

Frequency of the dynamic torque load
$f_{err} > 10$ Hz frequency factor FF = $\sqrt{(f_{err}/10\ Hz)}$

For the ZAPEX and ARPEX series, the frequency factor is always FF = 1.0.

Checking the maximum speed

For all load situations $n_{Kmax} \geq n_{max}$

Checking permitted shaft misalignment

For all load situations, the actual shaft misalignment must be less than the permitted shaft misalignment.

Checking bore diameter, mounting geometry and coupling design

The check must be made on the basis of the dimension tables. The maximum bore diameter applies to parallel keyways to DIN 6885. For other keyway geometries, the maximum bore diameter can be reduced. On request, couplings with adapted geometry can be provided.

Coupling behavior under overload conditions

The ZAPEX, ARPEX, N-EUPEX, RUPEX and N-BIPEX coupling series can withstand overloads until the breakage of metal parts. These coupling series are designated as fail-safe.

The N-EUPEX DS, ELPEX-B, ELPEX-S and ELPEX coupling series throw overload. The elastomer element of these couplings is irreparably damaged without damage to metal parts when subjected to excessive overload. These coupling series are designated as non-fail-safe. These types that fail can be fitted with a so-called fail-safe device. This additional component enables emergency operation, even after the rubber element of the coupling has been irreparably damaged.

Checking shaft-hub connection

The torques specified in the tables of power ratings data of the coupling series do not necessarily apply to the shaft-hub connection. Depending on the shaft-hub connection, proof of form stability is required. Siemens recommends obtaining proof of form strength by using calculation methods in accordance with the current state of the art.

Shaft-hub connection	Suggestion for calculation method
Keyway connection to DIN 6885-1	DIN 6892
Shrink fit	DIN 7190
Spline to DIN 5480	
Bolted flange connection	VDI 2230
Flange connection with close-fitting bolts	

Fitting recommendations for the shaft-hub connection are given in catalog section 15.

The coupling hub is frequently fitted flush with the shaft end face. If the shaft projects, the risk of collision with other coupling parts must be checked. If the shaft is set back, in addition to the load-bearing capacity of the shaft-hub connection, the correct positioning of the hub must be ensured as well. If the bearing hub length is insufficient, restorative forces may cause tilting movements and so wear to and impairment of the axial retention. Also, the position of the set screw to be positioned on sufficient shaft or parallel key material must be noted.

Checking low temperature and chemically aggressive environment

The minimum permitted coupling temperature is specified in the Temperature factor FT table. In the case of chemically aggressive environments, please consult the manufacturer.

Article number key

Overview

The article number consists of a combination of digits and letters and is divided into three blocks linked by hyphens for better clarity. In blocks 1 and 2 the coupling series, the type and the size are encoded. Block 3 contains information applying only to the coupling specified in blocks 1 and 2. The three blocks of the article number are supplemented by information on the bore of the coupling hub parts and information on "Special types".

The bore details with the code letter L always refer to the bore diameter D1 of the hub part shown on the left on the dimension drawing. The order code beginning with M always refers to the bore diameter D2 of the hub part shown on the right on the dimension drawing.

"Special types" are linked to the 3rd block of the article number by appending the code "-Z". Special order requirements are, for example, fine balancing G6.3 or the ATEX design of the coupling.

With this article number key, the couplings shown in the catalog can be completely specified. No further textual details are required, they should be avoided. Couplings in special variants are specified with the digit 9 in the 4th place in the article number (block 1) and additionally with 00-0AA0 in positions 11 to 16. Series, type and size should, as far as possible, be specified in accordance with the coding for the standard coupling. By appending "-Z Y99", plain text information can be included. The plain text information can then clearly specify the features of the special coupling.

Structure of the article number	Position	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
FLENDER Standard Couplings																			
Positions 1 to 3 digit, letter, letter	Type	**2**	**L**	**C**															
Position 4 digit	Coupling design				**0 ... 9**														
Positions 5 to 6 digits	Series																		
Positions 7 to 8 digits	Size																		
Positions 9 and 10 letters	Type, subassembly or component part																		
Position 11 digit	Shaft-hub connection, flange connection																		
Position 12 digit	Shaft-hub connection, flange connection, V-belt pulley																		
Positions 13 to 16 digit, letter, letter, digit	Various details																		
Bore specifications	Additional order codes for bores finished in delivery condition ∅D1 and ∅D2 Specification of a **9** in the 11th position of the article number (article number **without "-Z"**) with order codes **L..** for ∅D1 and/or specification of a **9** in the 12th position of the article number (article number **without "-Z"**) with order codes **M..** for ∅D2 **Selection of order codes for diameter and tolerance in the following tables under "Bore specifications".**																		
Special types	Additional order codes (article number **with "-Z"**) and, if required, plain text **Selection of order codes in this catalog section and in catalog section 13 under "Special types".**																		**- Z**

Features of the standard type

Couplings	Features of the standard type
All coupling series except ARPEX clamping hubs and FLUDEX with keyway to ASME B17.1	Bore tolerance H7
ARPEX clamping hubs	Bore tolerance H6
FLUDEX couplings with keyway to ASME B17.1	Hollow shafts: Bore tolerance K7 Other parts Bore tolerance M7
All coupling series with bore diameter - imperial	Parallel keyway to ASME B17.1
Bore diameter metric in the case of ZAPEX and ARPEX coupling series as well as coupling hubs with applied brake disks or brake drums of the N-EUPEX and RUPEX series	Parallel keyway to DIN 6885-1 keyway width P9
Bore diameter metric in the case of the N-EUPEX, RUPEX, N-BIPEX, ELPEX-S, ELPEX-B, ELPEX, FLUDEX coupling series	Parallel keyway to DIN 6885-1 keyway width JS9
All coupling series except FLUDEX	Axial locking by means of set screw
FLUDEX coupling series	Axial lock by means of set screw or end washer
All coupling series	Balancing in accordance with half parallel key standard
ZAPEX, ARPEX, N-EUPEX, RUPEX, N-BIPEX, ELPEX-S, ELPEX-B and ELPEX coupling series	Balancing quality G16
FLUDEX coupling series	Balancing quality G6.3
All series	Unpainted
All series	Preservation with cleaning emulsion
FLUDEX couplings	Fuse 140 °C

Ordering examples

- ZAPEX ZWN 230 Variant A, prebored, unbalanced
  Article No.:
  2LC0300-5AA11-0AA0

- N-EUPEX A 280 prebored, unbalanced
  Article No.:
  2LC0101-3AB11-0AA0

- N-EUPEX A 280
  finished bores, keyway to DIN 6885-1 and set screw
  ⌀D1 = 60H7 mm,
  ⌀D2 = 80H7 mm,
  balanced G16 in accordance with half parallel key standard
  Article No.:
  2LC0101-3AB99-0AA0
  L1E +M1J

- N-EUPEX A 280
  finished bore, keyway to DIN 6885-1 and set screw
  ⌀D1 = 60H7 mm,
  ⌀D2 = 80H7 mm,
  in ATEX variant
  Article No.:
  2LC0101-3AB99-0AA0-Z
  L1E +M1J +X99

- N-EUPEX A 280
  finished bore
  ⌀D1 = 78P6 mm, with keyway to DIN 6885-1 keyway width JS9,
  ⌀D2 = 3 inch M7 with keyway to ASME B17.1
  Article No.:
  2LC0101-3AB99-0AA0-Z
  L9Y+M7A+L40+L28+M14
  plain text info for L9Y: **78 mm**

The article number can be obtained with the help of PC software **X.CAT NG**. The coupling can be selected in a product configurator and specified using selection menus.

X.CAT NG is available for free downloading at www.siemens.com/couplings

The installation CD is also available through your Siemens AG contact.

Bore specifications

Options

Additional order codes for bore specifications (**without "-Z"** specification)

Order codes have been specified for the bore specifications. Finished bores can be ordered by specifying code digit **9** in the 11th and/or 12th position of the article number and additionally the supplementary order code for ∅D1 and/or ∅D2 from the following table.

H7 is selected for all metric bore diameters where no bore tolerance is specified.

Bore diameters deviating from the table values must be ordered by stating the code number **9** in the 11th and/or 12th position of the article number, adding **"-Z"** to the article number and the order code **L9Y** with plain text for the left-hand hub and order code **M9Y** with plain text for the right-hand hub.

Bore diameter - metric in mm

Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter	
	∅D1	∅D2		∅D1	∅D2		∅D1	∅D2
6	**L0A**	**M0A**	60	**L1E**	**M1E**	190	**L2C**	**M2C**
7	**L0B**	**M0B**	65	**L1F**	**M1F**	195	**L3F**	**M3F**
8	**L0C**	**M0C**	70	**L1G**	**M1G**	200	**L2D**	**M2D**
9	**L0D**	**M0D**	75	**L1H**	**M1H**	210	**L3G**	**M3G**
10	**L0E**	**M0E**	80	**L1J**	**M1J**	220	**L2E**	**M2E**
11	**L0F**	**M0F**	85	**L1K**	**M1K**	230	**L3H**	**M3H**
12	**L0G**	**M0G**	90	**L1L**	**M1L**	240	**L2F**	**M2F**
14	**L0H**	**M0H**	95	**L1M**	**M1M**	250	**L2G**	**M2G**
16	**L0J**	**M0J**	100	**L1N**	**M1N**	260	**L2H**	**M2H**
18	**L0K**	**M0K**	105	**L1P**	**M1P**	270	**L3J**	**M3J**
19	**L0L**	**M0L**	110	**L1Q**	**M1Q**	280	**L2J**	**M2J**
20	**L0M**	**M0M**	115	**L1R**	**M1R**	290	**L3K**	**M3K**
22	**L0N**	**M0N**	120	**L1S**	**M1S**	300	**L2K**	**M2K**
24	**L0P**	**M0P**	125	**L1T**	**M1T**	320	**L2L**	**M2L**
25	**L0Q**	**M0Q**	130	**L1U**	**M1U**	340	**L2M**	**M2M**
28	**L0R**	**M0R**	135	**L2X**	**M2X**	360	**L2N**	**M2N**
30	**L0S**	**M0S**	140	**L1V**	**M1V**	380	**L2P**	**M2P**
32	**L0T**	**M0T**	145	**L3A**	**M3A**	400	**L2Q**	**M2Q**
35	**L0U**	**M0U**	150	**L1W**	**M1W**	420	**L2R**	**M2R**
38	**L0V**	**M0V**	155	**L3B**	**M3B**	440	**L2S**	**M2S**
40	**L0W**	**M0W**	160	**L1X**	**M1X**	450	**L2T**	**M2T**
42	**L0X**	**M0X**	165	**L3C**	**M3C**	460	**L2U**	**M2U**
45	**L1A**	**M1A**	170	**L2A**	**M2A**	480	**L2V**	**M2V**
48	**L1B**	**M1B**	175	**L3D**	**M3D**	500	**L2W**	**M2W**
50	**L1C**	**M1C**	180	**L2B**	**M2B**			
55	**L1D**	**M1D**	185	**L3E**	**M3E**			

Bore tolerance to DIN ISO 286

Tolerance specification	Order code for specifying bore tolerance		Tolerance specification	Order code for specifying bore tolerance		Tolerance specification	Order code for specifying bore tolerance	
	∅D1	∅D2		∅D1	∅D2		∅D1	∅D2
H7	**L10**	**M10**	N7	**L15**	**M15**	J6	**L24**	**M24**
F7	**L11**	**M11**	P7	**L16**	**M16**	K6	**L25**	**M25**
J7	**L12**	**M12**	E7	**L18**	**M18**	M6	**L26**	**M26**
K7	**L13**	**M13**	F6	**L21**	**M21**	N6	**L27**	**M27**
M7	**L14**	**M14**	H6	**L22**	**M22**	P6	**L28**	**M28**
G7	**L17**	**M17**	G6	**L23**	**M23**			

H7 is selected for all imperial bore diameters where no bore tolerance is specified.

Exception:
FLUDEX hollow shaft K7.
FLUDEX other hubs M7.

Bore diameter - imperial in inches

Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter	
	∅D1	∅D2		∅D1	∅D2		∅D1	∅D2
0.1875	**L5A**	**M5A**	2.1875	**L6K**	**M6K**	4.1875	**L7T**	**M7T**
0.25	**L5B**	**M5B**	2.25	**L6L**	**M6L**	4.25	**L7U**	**M7U**
0.3215	**L5C**	**M5C**	2.3125	**L6M**	**M6M**	4.375	**L7V**	**M7V**
0.375	**L5D**	**M5D**	2.375	**L6N**	**M6N**	4.4375	**L7W**	**M7W**
0.5	**L5E**	**M5E**	2.4375	**L6P**	**M6P**	4.5	**L7X**	**M7X**
0.5625	**L5F**	**M5F**	2.5	**L6Q**	**M6Q**	4.75	**L8A**	**M8A**
0.625	**L5G**	**M5G**	2.5625	**L6R**	**M6R**	4.875	**L8B**	**M8B**
0.6875	**L5H**	**M5H**	2.625	**L6S**	**M6S**	4.9375	**L8C**	**M8C**
0.75	**L5J**	**M5J**	2.6875	**L6T**	**M6T**	5	**L8D**	**M8D**
0.8125	**L5K**	**M5K**	2.75	**L6U**	**M6U**	5.1875	**L8E**	**M8E**
0.875	**L5L**	**M5L**	2.8125	**L6V**	**M6V**	5.25	**L8F**	**M8F**
0.9375	**L5M**	**M5M**	2.875	**L6W**	**M6W**	5.4375	**L8G**	**M8G**
1	**L5N**	**M5N**	2.9375	**L6X**	**M6X**	5.5	**L8H**	**M8H**
1.0625	**L5P**	**M5P**	3	**L7A**	**M7A**	5.75	**L8J**	**M8J**
1.125	**L5Q**	**M5Q**	3.0625	**L7B**	**M7B**	5.9375	**L8K**	**M8K**
1.1875	**L5R**	**M5R**	3.125	**L7C**	**M7C**	6	**L8L**	**M8L**
1.25	**L5S**	**M5S**	3.1875	**L7D**	**M7D**	6.25	**L8M**	**M8M**
1.3125	**L5T**	**M5T**	3.25	**L7E**	**M7E**	6.5	**L8N**	**M8N**
1.375	**L5U**	**M5U**	3.3125	**L7F**	**M7F**	6.75	**L8P**	**M8P**
1.4375	**L5V**	**M5V**	3.375	**L7G**	**M7G**	7	**L8Q**	**M8Q**
1.5	**L5W**	**M5W**	3.4375	**L7H**	**M7H**	7.25	**L8R**	**M8R**
1.5625	**L5X**	**M5X**	3.5	**L7J**	**M7J**	7.5	**L8S**	**M8S**
1.625	**L6A**	**M6A**	3.5625	**L7K**	**M7K**	7.75	**L8T**	**M8T**
1.6875	**L6B**	**M6B**	3.625	**L7L**	**M7L**	8	**L8U**	**M8U**
1.75	**L6C**	**M6C**	3.6875	**L7M**	**M7M**	9	**L8V**	**M8V**
1.8125	**L6D**	**M6D**	3.75	**L7N**	**M7N**	10	**L8W**	**M8W**
1.875	**L6E**	**M6E**	3.8125	**L7P**	**M7P**	11	**L8X**	**M8X**
1.9375	**L6F**	**M6F**	3.875	**L7Q**	**M7Q**	12	**L9A**	**M9A**
2	**L6G**	**M6G**	3.9375	**L7R**	**M7R**	13	**L9B**	**M9B**
2.0625	**L6H**	**M6H**	4	**L7S**	**M7S**	14	**L9C**	**M9C**
2.125	**L6J**	**M6J**	4.125	**L9E**	**M9E**	15	**L9D**	**M9D**

Special types

Options

Special types or order codes (code **"-Z"** must be appended to article number)

Special types	Order code for coupling half 1	2	Comment
Shaft-hub connection			
Parallel keyway to DIN 6885[1] keyway width JS9 for metric bore diameters	**L40**	**M40**	
Parallel keyway to DIN 6885[1] keyway width P9 for metric bore diameters	**L41**	**M41**	
Parallel keyway to ASME B17.1 for imperial bore diameters	**L43**	**M43**	
Two parallel keyways spaced 180° apart	**L46**	**M46**	
Two parallel keyways spaced 120° apart	**L47**	**M47**	
Shrink fit for oil-hydraulic removal	**L44**	**M44**	
Clamp connection with shaft without parallel keyway	**L45**	**M45**	
Shaft journal length as stated in order	**Y28**	**Y29**	and as stated in order
Bore diameters deviating from standard values (11th and/or 12th position in article number - code number **9**)	**L9Y**	**M9Y**	and as stated in order
Balancing - balancing principle			
Balancing in accordance with half parallel key standard to DIN ISO 21940-32	**Standard**	**Standard**	before keyseating
Balancing in accordance with full parallel key standard to DIN ISO 21940-32	**L52**	**M52**	after keyseating
Balancing - balance quality			
For standard balancing, see page 2/3.	**Standard**		
For fine balancing, see page 2/3.	**W02**		
For micro-balancing, see page 2/3.	**W03**		
Balancing quality level to DIN ISO 1940 and operating speed	**Y95 {G = __; n = __ rpm}**		
Documentation, test certificates and acceptances			
Operating instructions			
With declaration of compliance with the order acc. to DIN 10204-2.1	**D99**		
With test report acc. to DIN EN 10204-2.2	**D98**		
With inspection certificate for leakage test acc. to DIN EN 10204-3.1	**E36**		
With inspection certificate for fitting dimensions acc. to DIN EN 10204-3.1	**E37**		
With inspection certificate for balancing test acc. to DIN EN 10204-3.1	**E38**		
With inspection certificate for surface crack detection acc. to DIN EN 10204-3.1	**E39**		
With inspection certificate for ultrasonic examination acc. to DIN EN 10204-3.1/3.2	**E40**		
With inspection certificate for coating layer - thickness measurement acc. to DIN EN 10204-3.1	**E41**		
With inspection certificate for chemical analysis, mechanical parameters acc. to DIN EN 10204-3.1/3.2	**E42**		
Acceptance by classification society			On request
Special ambient conditions			
ATEX variant with CE marking in accordance with the current ATEX Directive	**X99**		

Surface coat

Preservation

Preservative	Properties	Durability Indoor storage	Outdoor storage	Depreservatives	Order code
Cleaning emulsion	Simple preservation	up to 3 months	–	Aqueous cleaners	**Standard**
Spray oil	Anti-corrosion agent	up to 12 months	up to 3 months	Aqueous cleaners, solvents	**B31**
Tectyl 846 or similar	Long-term preservation, wax-based	up to 36 months	up to 12 months	White spirit, special solvents	**B28**
Cleaning emulsion + VCI film[2]	Active system, reusable	up to 5 years	up to 5 years	Aqueous cleaners	**B34**

1) The hub keyways are designed to DIN 6885 Sheet 1 "High Form". On some sizes, which are marked in the dimension tables, the keyway is designed to DIN 6885 Sheet 3 "Low Form".

2) Parts which are not able to be packed into VCI films, will be preserved with Tectyl.

Torsionally Rigid Gear Couplings
ZAPEX ZW Series

4

Torsionally Rigid Gear Couplings – ZAPEX ZW Series

General information

Overview

Coupling suitable for use in potentially explosive atmospheres.
Complies with the current ATEX Directive for:

II 2 GD c 120 °C (T4)
-20 °C ≤ T_a ≤ +80 °C

I M2

Benefits

ZAPEX gear couplings link machine shafts and compensate for shaft misalignment with weak restorative forces. High transmissible torque combined with compactness and light weight are characteristic of ZAPEX couplings. ZAPEX coupling types are constructed on a modular principle.

This means that application-specific solutions can be delivered quickly. ZAPEX couplings require very little maintenance. Regular grease or oil changes at the prescribed intervals prolongs the service life of the coupling.

Application

ZAPEX couplings are especially suited for operation in harsh operating conditions, such as drives in the iron smelting or cement industry. ZAPEX couplings are suitable for reverse operation and horizontal mounting positions and, in the case of type ZWNV, for vertical mounting positions.

Design

A ZAPEX coupling comprises two hub sections with external teeth which are mounted on the machine shafts. Each set of external teeth engages in a flanged socket with mating internal teeth. The flanged sleeves are connected via two flanges with close-fitting bolts.

The teeth are lubricated with oil or grease. On the ZAPEX type ZW, DUO sealing rings are used to seal the tooth space. The DUO sealing rings prevent the lubricant from escaping and dirt from entering the tooth space. The parallel keyways must be sealed during assembly to prevent lubricant from escaping.

Customized hub designs are described after the types.

ZAPEX ZW gear coupling types

Type	Description
ZWN	Standard type
ZZS	with adapter
ZZW	with intermediate shaft
ZWH	with coupling sleeve
ZWBT	with offset brake disk
ZWBG	with straight brake disk
ZWB	with brake drum
ZWTR	for rope drums
ZBR	with shear pins
ZWS	Clutch
ZWNV	Vertical type
ZWSE	Simple clutch-coupling combination

Further application-related coupling types are available. Dimension sheets for and information on these are available on request.

Function

The torque is transmitted through the coupling teeth. The teeth are crowned, so angular displacement per tooth plane is possible. Radial displacement can be compensated for via the space VA between the tooth planes. The internal teeth of the flanged sleeves are significantly wider than the external teeth of the hub parts, permitting a relatively high axial misalignment.

A small angular misalignment on the coupling teeth results in an advantageous distribution of the lubricant film and a very low wear rate. This favorable condition can be deliberately set by aligning the drive with the machine shafts with a slight radial misalignment.

Technical data

Power ratings

Size	Rated torque	Maximum torque	Overload torque	Fatigue torque	Torsional stiffness	Permitted axial shaft misalignment
					ZW	
	T_{KN}	T_{Kmax}	T_{KOL}	T_{KW}	C_{Tdyn}	ΔK_a
	Nm	Nm	Nm	Nm	kNm/rad	mm
112	1300	2600	5200	520	2000	1.0
128	2500	5000	10000	1000	3600	1.0
146	4300	8600	17200	1720	6900	1.0
175	7000	14000	28000	2800	9360	1.0
198	11600	23200	46400	4640	15600	1.0
230	19000	38000	76000	7600	26300	1.0
255	27000	54000	108000	10800	33400	1.5
290	39000	78000	156000	15600	44000	1.5
315	54000	108000	216000	21600	64100	1.5
342	69000	138000	276000	27600	81600	1.5
375	98000	196000	392000	39200	115600	1.5
415	130000	260000	520000	52000	106000	1.5
465	180000	360000	720000	72000	134600	2.0
505	250000	500000	1000000	100000	168700	2.0
545	320000	640000	1280000	128000	216900	2.0
585	400000	800000	1600000	160000	263200	2.0
640	510000	1020000	2040000	204000	356000	2.0
690	660000	1320000	2640000	264000	431000	2.0
730	790000	1580000	3160000	316000	538000	2.0
780	1000000	2000000	4000000	400000	696000	3.0
852	1200000	2400000	4800000	480000	926000	3.0
910	1600000	3200000	6400000	640000	1118000	3.0
1020	1900000	3800000	7600000	760000	1339000	3.0
1080	2200000	4400000	8800000	880000	1605000	3.0
1150	2700000	5400000	10800000	1080000	2120000	3.0
1160	3350000	6700000	13400000	1340000	2474000	3.0
1240	3800000	7600000	15200000	1520000	3079000	3.0
1310	4600000	9200000	18400000	1840000	3693000	4.0
1380	5300000	10600000	21200000	2120000	4383000	4.0
1440	6250000	12500000	25000000	2500000	5056000	4.0
1540	7200000	14400000	28800000	2880000	6115000	4.0

In the case of type ZWTR, the rated torques which deviate from the above are specified in the dimension table.

The stated torsional stiffness „ZW“ applies to coupling types ZWN and ZWNV.
Torsional stiffness of the remaining types on request.

The axial misalignment ΔK_a must be understood as the maximum permitted enlargement of the hub distance S of the coupling.

The axial misalignment for the types ZWBT, ZWBG and ZWNV is $½ \times \Delta K_a$.

Angular misalignment ΔK_w

- Types ZWN, ZZS, ZZW, ZWH, ZWB, ZBR, ZWS: $\Delta K_w = 1°$
- Types ZWBT and ZWBG: $\Delta K_w = 0.2°$
- Type ZWSE: $\Delta K_w = 0.4°$

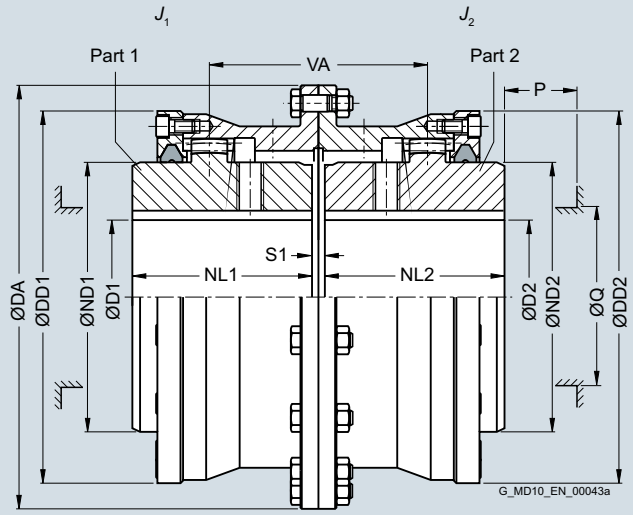
Radial misalignment ΔK_r

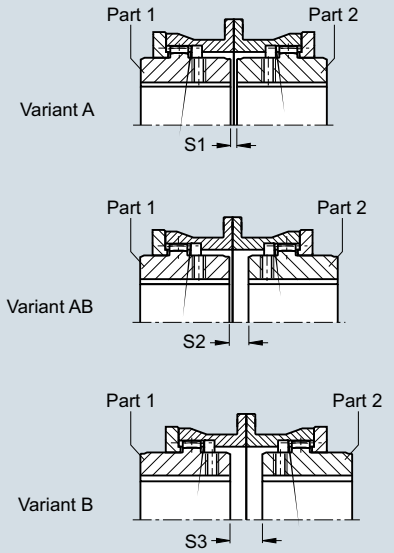
- Types ZWN, ZZS, ZZW, ZWH, ZWB, ZBR, ZWS: $\Delta K_r \leq VA \cdot \tan 1°$
- Types ZWBT and ZWBG: $\Delta K_r \leq VA \cdot \tan 0.2°$
- Type ZWSE: $\Delta K_r \leq VA \cdot \tan 0.4°$

For the tooth distance VA, see the relevant table for the subassembly.

Type ZWN

Selection and ordering data





Size	Rated torque	Maximum speed	Dimensions in mm												Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S1	S2	S3	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.											kgm^2		kg
112	1300	9400	0	49	143	65	50	110	6	–	–	56	50	35	0.007	**2LC0300-0A ■■■ -0AA0**	5.8
128	2500	8300	0	61	157	80	60	128	6	13	20	73	65	45	0.014	**2LC0300-1A ■■■ -0AA0**	7.9
146	4300	7300	0	72	177	95	75	146	6	13	20	88	75	45	0.021	**2LC0300-2A ■■■ -0AA0**	11.5
175	7000	6400	0	85	215	112	90	175	8	14	20	104	85	50	0.049	**2LC0300-3A ■■■ -0AA0**	19
198	11600	5500	0	100	237	135	100	198	8	19	30	119	110	50	0.086	**2LC0300-4A ■■■ -0AA0**	26.5
230	19000	4700	0	120	265	160	110	230	8	20	32	130	135	50	0.16	**2LC0300-5A ■■■ -0AA0**	37
255	27000	4100	0	140	294	185	125	255	10	25	40	150	160	50	0.26	**2LC0300-6A ■■■ -0AA0**	49
290	39000	3700	70	160	330	210	140	290	10	30	50	170	180	60	0.51	**2LC0300-7A ■■■ -0AA0**	72
315	54000	3300	80	175	366	230	160	315	10	30	50	190	200	60	0.81	**2LC0300-8A ■■■ -0AA0**	99
342	69000	3000	90	195	392	255	180	340	12	42	72	222	225	60	1.2	**2LC0301-0A ■■■ -0AA0**	125
375	98000	2700	100	220	430	290	200	375	12	42	72	242	260	60	2	**2LC0301-1A ■■■ -0AA0**	170
415	130000	2500	120	240	478	320	220	415	12	74	136	294	285	80	3.1	**2LC0301-2A ■■■ -0AA0**	225
465	180000	2200	140	270	528	360	240	465	16	96	176	336	325	80	5.2	**2LC0301-3A ■■■ -0AA0**	300
505	250000	2000	160	300	568	400	260	505	16	106	196	366	365	80	7.7	**2LC0301-4A ■■■ -0AA0**	380
545	320000	1800	180	330	620	440	280	545	16	126	236	406	405	80	12	**2LC0301-5A ■■■ -0AA0**	490
585	400000	1700	210	360	660	480	310	585	20	150	280	460	445	80	17	**2LC0301-6A ■■■ -0AA0**	620
640	510000	1600	230	360	738	480	330	640	20	149	278	479	445	90	25	**2LC0301-7A ■■■ -0AA0**	780
			>330	390		520							475		27		800
690	660000	1450	250	390	788	520	350	690	20	166	312	516	475	90	35	**2LC0301-8A ■■■ -0AA0**	950
			>360	420		560							515		38		980
730	790000	1350	275	420	834	560	380	730	20	180	340	560	515	90	48	**2LC0302-0A ■■■ -0AA0**	1150
			>390	450		600							555		52		1200
780	1000000	1250	300	450	900	600	400	780	25	176	327	576	555	110	68	**2LC0302-1A ■■■ -0AA0**	1450
			>415	490		650							595		77		1450
852	1200000	1150	325	490	970	650	420	850	25	185	345	605	595	110	100	**2LC0302-2A ■■■ -0AA0**	1750
			>450	535		710							655		110		1800

Variant:	• A	**A**	
	• B	**B**	
	• AB	**C**	
∅D1:	• Without finished bore – Without order codes		**1**
	• Without finished bore from size 640 for 2nd diameter range D1 – Without order codes		**2**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")		**9**
∅D2:	• Without finished bore – Without order codes		**1**
	• Without finished bore from size 640 for 2nd diameter range D2 – Without order codes		**2**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")		**9**

Type ZWN

Size	Rated torque	Maxi-mum speed	Dimensions in mm												Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S1	S2	S3	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.											kgm^2		kg
910	1600000	1050	350	535	1030	710	450	910	25	215	405	665	655	110	140	**2LC0302-3A ■■■ -0AA0**	2100
			>490	570		750							695		145		2150
1020	1900000	1000	375	570	1112	750	480	1020	25	213	401	693	695	130	200	**2LC0302-4A ■■■ -0AA0**	2600
			>520	600		800							735		220		2800
1080	2200000	950	400	600	1162	800	500	1080	30	226	422	726	735	135	255	**2LC0302-5A ■■■ -0AA0**	3100
			>550	650		860							795		285		3200
1150	2700000	900	425	650	1222	860	520	1150	30	238	446	758	795	135	330	**2LC0302-6A ■■■ -0AA0**	3600
			>600	705		930							865		380		3700
1160	3350000	850	450	650	1292	860	550	1160	30	260	490	810	795	135	420	**2LC0302-7A ■■■ -0AA0**	4000
			>600	705		930		1160					865		450		4100
			>650	750		990		1210					910		500		4300
1240	3800000	800	475	705	1400	930	580	1240	30	250	470	830	865	155	580	**2LC0302-8A ■■■ -0AA0**	4900
			>650	750		990		1240					910		620		5000
			>690	800		1055		1290					975		700		5300
1310	4600000	750	500	705	1470	930	610	1310	35	265	495	875	865	155	730	**2LC0303-0A ■■■ -0AA0**	5600
			>650	750		990		1310					910		770		5700
			>690	800		1055		1310					975		840		5900
			>730	850		1120		1370					1030		930		6200
1380	5300000	700	525	750	1540	990	640	1380	35	275	515	915	910	155	930	**2LC0303-1A ■■■ -0AA0**	6500
			>690	800		1055		1380					975		1000		6800
			>730	850		1120		1380					1030		1050		6900
			>780	890		1170		1430					1080		1150		7100
1440	6250000	670	550	800	1600	1055	670	1440	35	295	555	965	975	155	1200	**2LC0303-2A ■■■ -0AA0**	7500
			>730	850		1120		1440					1030		1250		7600
			>780	890		1170		1440					1080		1300		7700
			>810	940		1240		1510					1150		1450		8200
1540	7200000	630	575	850	1710	1120	700	1540	35	275	515	975	1030	175	1550	**2LC0303-3A ■■■ -0AA0**	8800
			>780	890		1170		1540					1080		1600		8900
			>810	940		1240		1540					1150		1700		9200
			>860	995		1310		1610					1220		1900		9600

Variant:	• A	**A**
	• B	**B**
	• AB	**C**
∅D1:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D1 – Without order codes	**2**
	• Without finished bore from size 1160 for 3rd diameter range D1 – Without order codes	**3**
	• Without finished bore from size 1310 for 4th diameter range D1 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D2 – Without order codes	**2**
	• Without finished bore from size 1160 for 3rd diameter range D2 – Without order codes	**3**
	• Without finished bore from size 1310 for 4th diameter range D2 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia apply to a coupling half with maximum bore diameter.

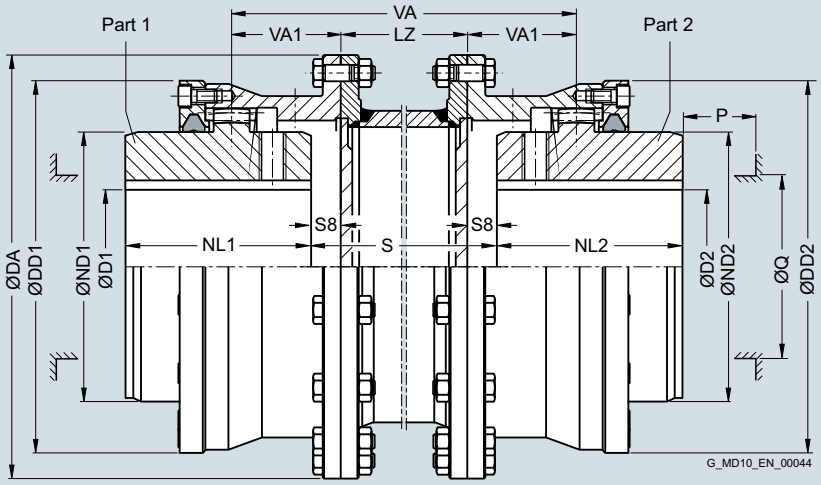
Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZWN coupling, size 146, variant A,
Part 1: Bore 40H7mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

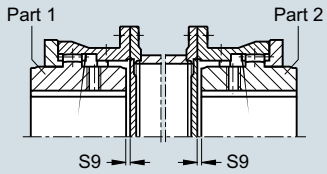
Article No.:
2LC0300-2AA99-0AA0-Z
L0W+M1A+M13

Type ZZS

Selection and ordering data



Variant B



Variant A

Size	Rated torque	Dimensions in mm												Article No. Plain text required for dimension S Order codes for bore diameters and tolerances are specified in catalog section 3	Weight	
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S8	S9	VA1	Q	P	LZ min.		*m* each 100 mm pipe	*m*
	Nm	min.	max.												kg	kg
112	1300	0	49	143	65	50	110	3	3	28	50	35	120	**2LC0300-0A ■■■ -0AZ0 Q0Y**	0.8	9.4
128	2500	0	61	157	80	60	128	10	3	36.5	65	45	120	**2LC0300-1A ■■■ -0AZ0 Q0Y**	1.3	12.5
146	4300	0	72	177	95	75	146	10	3	44	75	45	120	**2LC0300-2A ■■■ -0AZ0 Q0Y**	1.8	17
175	7000	0	85	215	112	90	175	10	4	52	85	50	130	**2LC0300-3A ■■■ -0AZ0 Q0Y**	2.3	27.5
198	11600	0	100	237	135	100	198	15	4	59.5	110	50	130	**2LC0300-4A ■■■ -0AZ0 Q0Y**	3.5	37
230	19000	0	120	265	160	110	230	16	4	65	135	50	130	**2LC0300-5A ■■■ -0AZ0 Q0Y**	4.5	50
255	27000	0	140	294	185	125	255	20	5	75	160	50	140	**2LC0300-6A ■■■ -0AZ0 Q0Y**	6.3	68
290	39000	70	160	330	210	140	290	25	5	85	180	60	140	**2LC0300-7A ■■■ -0AZ0 Q0Y**	7.2	93
315	54000	80	175	366	230	160	315	25	5	95	200	60	180	**2LC0300-8A ■■■ -0AZ0 Q0Y**	9.1	135
342	69000	90	195	392	255	180	340	36	6	111	225	60	180	**2LC0301-0A ■■■ -0AZ0 Q0Y**	12	170
375	98000	100	220	430	290	200	375	36	6	121	260	60	180	**2LC0301-1A ■■■ -0AZ0 Q0Y**	15	220
415	130000	120	240	478	320	220	415	68	6	147	285	80	200	**2LC0301-2A ■■■ -0AZ0 Q0Y**	17	295
465	180000	140	270	528	360	240	465	88	8	168	325	80	200	**2LC0301-3A ■■■ -0AZ0 Q0Y**	19	380
505	250000	160	300	568	400	260	505	98	8	183	365	80	200	**2LC0301-4A ■■■ -0AZ0 Q0Y**	24	470
545	320000	180	330	620	440	280	545	118	8	203	405	80	220	**2LC0301-5A ■■■ -0AZ0 Q0Y**	30	640
585	400000	210	360	660	480	310	585	140	10	230	445	80	220	**2LC0301-6A ■■■ -0AZ0 Q0Y**	33	780

Variant	• A	**D**	
	• B	**E**	
∅D1:	• Without finished bore – Without order codes	**1**	
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**	
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**

Size	Rated torque	Dimensions in mm												Article No. Plain text required for dimension S Order codes for bore diameters and tolerances are specified in catalog section 3	Weight	
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S8	S9	VA1	Q	P	LZ min.		*m* each 100 mm pipe	*m*
	Nm	min.	max.												kg	kg
640	510000	230	360	738	480	330	640	139	10	239.5	445	90	250	**2LC0301-7A ■■■ -0AZ0 Q0Y**	39	1010
		>330	390		520						475					1050
690	660000	250	390	788	520	350	690	156	10	258	475	90	250	**2LC0301-8A ■■■ -0AZ0 Q0Y**	48	1200
		>360	420		560						515					1250
730	790000	275	420	834	560	380	730	170	10	280	515	90	250	**2LC0302-0A ■■■ -0AZ0 Q0Y**	51	1450
		>390	450		600						555					1500
780	1000000	300	450	900	600	400	780	163	12.5	288	555	110	280	**2LC0302-1A ■■■ -0AZ0 Q0Y**	55	1850
		>415	490		650						595					1900
852	1200000	325	490	970	650	420	850	172	12.5	302.5	595	110	280	**2LC0302-2A ■■■ -0AZ0 Q0Y**	68	2300
		>450	535		710						655					2400
910	1600000	350	535	1030	710	450	910	202	12.5	332.5	655	110	280	**2LC0302-3A ■■■ -0AZ0 Q0Y**	94	2800
		>490	570		750						695					2850
1020	1900000	375	570	1112	750	480	1020	200	12.5	346.5	695	130	380	**2LC0302-4A ■■■ -0AZ0 Q0Y**		
		>520	600		800						735					
1080	2200000	400	600	1162	800	500	1080	211	15	363	735	135	380	**2LC0302-5A ■■■ -0AZ0 Q0Y**		
		>550	650		860						795					
1150	2700000	425	650	1222	860	520	1150	223	15	379	795	135	380	**2LC0302-6A ■■■ -0AZ0 Q0Y**		
		>600	705		930						865					
1160	3350000	450	650	1292	860	550	1160	245	15	405	795	135	380	**2LC0302-7A ■■■ -0AZ0 Q0Y**		
		>600	705		930		1160				865					
		>650	750		990		1210				910					
1240	3800000	475	705	1400	930	580	1240	235	15	415	865	155	400	**2LC0302-8A ■■■ -0AZ0 Q0Y**		
		>650	750		990		1240				910					
		>690	800		1055		1290				975					
1310	4600000	500	705	1470	930	610	1310	247	17.5	437.5	865	155	400	**2LC0303-0A ■■■ -0AZ0 Q0Y**		
		>650	750		990		1310				910					
		>690	800		1055		1310				975					
		>730	850		1120		1370				1030					
1380	5300000	525	750	1540	990	640	1380	257	17.5	457.5	910	155	400	**2LC0303-1A ■■■ -0AZ0 Q0Y**		
		>690	800		1055		1380				975					
		>730	850		1120		1380				1030					
		>780	890		1170		1430				1080					
1440	6250000	550	800	1600	1055	670	1440	277	17.5	482.5	975	155	400	**2LC0303-2A ■■■ -0AZ0 Q0Y**		
		>730	850		1120		1440				1030					
		>780	890		1170		1440				1080					
		>810	940		1240		1510				1150					
1540	7200000	575	850	1710	1120	700	1540	257	17.5	487.5	1030	175	600	**2LC0303-3A ■■■ -0AZ0 Q0Y**		
		>780	890		1170		1540				1080					
		>810	940		1240		1540				1150					
		>860	995		1310		1610				1220					

Variant	• A	**D**
	• B	**E**
∅D1:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D1 – Without order codes	**2**
	• Without finished bore from size 1160 for 3rd diameter range D1 – Without order codes	**3**
	• Without finished bore from size 1310 for 4th diameter range D1 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D2 – Without order codes	**2**
	• Without finished bore from size 1160 for 3rd diameter range D2 – Without order codes	**3**
	• Without finished bore from size 1310 for 4th diameter range D2 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Weights from size 1020 on request.

VA = 2 · VA1 + LZ

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia on request.

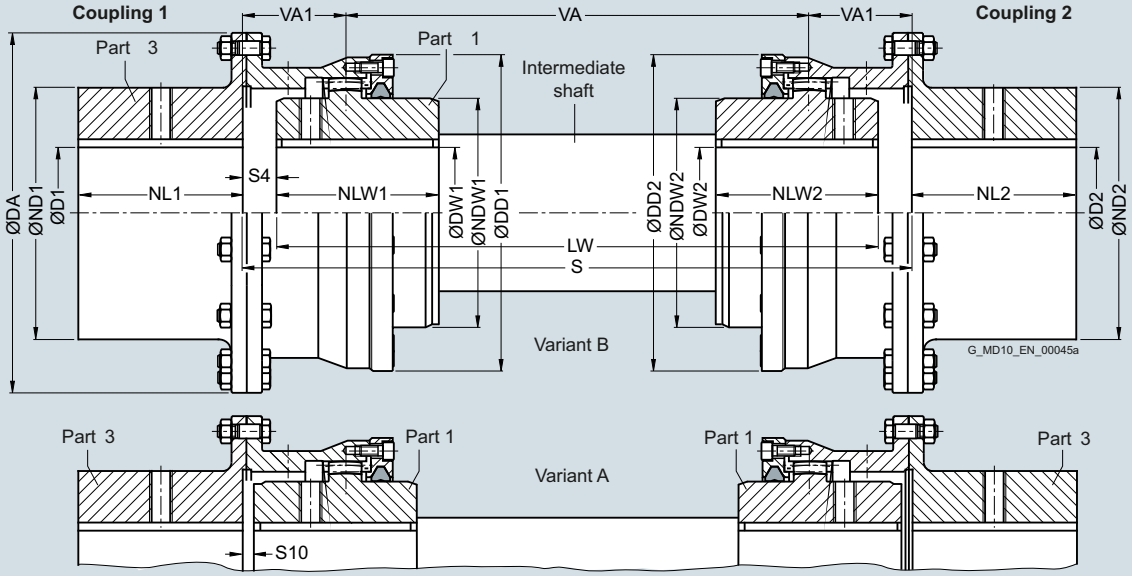
Weights apply to maximum bores and an adapter length of LZ min.

Maximum speed, limited by weight and critical adapter speed, on request.

Ordering example:
Article No.:
2LC0300-2AE99-0AZ0-Z
L0W+M1A+Q0Y+M13
Plain text to Q0Y: **250 mm (dimension S)**

Type ZZW

Selection and ordering data



Size	Rated torque	Dimensions in mm												Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2/ NLW1/ NLW2	DW1, DW2 Keyway DIN 6885-1		NDW1/ NDW2	DD1/ DD2	S4	S10	VA1		*m*
	Nm	min.	max.				min.	max.							kg
112	1300	20	61	143	80	50	0	49	65	110	12.5	12.5	37.5	**2LC0300-0B ■■■ -0AA0**	5.1
128	2500	25	72	157	95	60	0	61	80	128	12.5	5.5	39	**2LC0300-1B ■■■ -0AA0**	6.8
146	4300	30	85	177	112	75	0	72	95	146	12.5	5.5	46.5	**2LC0300-2B ■■■ -0AA0**	9.8
175	7000	35	100	215	135	90	0	85	112	175	12.5	6.5	54.5	**2LC0300-3B ■■■ -0AA0**	16.5
198	11600	40	120	237	160	100	0	100	135	198	17.5	6.5	62	**2LC0300-4B ■■■ -0AA0**	23
230	19000	50	140	265	185	110	0	120	160	230	18.5	6.5	67.5	**2LC0300-5B ■■■ -0AA0**	32
255	27000	60	160	294	210	125	0	140	185	255	23.5	8.5	78.5	**2LC0300-6B ■■■ -0AA0**	43
290	39000	70	175	330	230	140	70	160	210	290	28.5	8.5	88.5	**2LC0300-7B ■■■ -0AA0**	61
315	54000	80	195	366	255	160	80	175	230	315	28.5	8.5	98.5	**2LC0300-8B ■■■ -0AA0**	86
342	69000	90	220	392	290	180	90	195	255	340	39.5	9.5	114.5	**2LC0301-0B ■■■ -0AA0**	115
375	98000	100	240	430	320	200	100	220	290	375	39.5	9.5	124.5	**2LC0301-1B ■■■ -0AA0**	150
415	130000	120	270	478	360	220	120	240	320	415	71.5	9.5	150.5	**2LC0301-2B ■■■ -0AA0**	205
465	180000	140	300	528	400	240	140	270	360	465	91.5	11.5	171.5	**2LC0301-3B ■■■ -0AA0**	275
505	250000	160	330	568	440	260	160	300	400	505	102.5	12.5	187.5	**2LC0301-4B ■■■ -0AA0**	350
545	320000	180	360	620	480	280	180	330	440	545	122.5	12.5	207.5	**2LC0301-5B ■■■ -0AA0**	450
585	400000	210	360	660	480	310	210	360	480	585	144.5	14.5	234.5	**2LC0301-6B ■■■ -0AA0**	540
		>330	390		520			360							570
640	510000	230	390	738	520	330	230	360	480	640	143.5	14.5	244	**2LC0301-7B ■■■ -0AA0**	700
		>360	420		560		>330	390	520						740
690	660000	250	420	788	560	350	250	390	520	690	160.5	14.5	262.5	**2LC0301-8B ■■■ -0AA0**	850
		>390	450		600		>360	420	560						900
730	790000	275	450	834	600	380	275	420	560	730	176	16	286	**2LC0302-0B ■■■ -0AA0**	1050
		>415	490		650		>390	450	600						1100
780	1000000	300	490	900	650	400	300	450	600	780	171	20.5	296	**2LC0302-1B ■■■ -0AA0**	1300
		>450	535		710		>415	490	650						1350
852	1200000	325	535	970	710	420	325	490	650	850	180	20.5	310.5	**2LC0302-2B ■■■ -0AA0**	1550
		>490	570		750		>450	535	710						1650

Variant:	• A	**D**
	• B	**E**
∅D1:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 585 for 2nd diameter range D1 – Without order codes	**2**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 585 for 2nd diameter range D2 – Without order codes	**2**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Type ZZW

Size	Rated torque	Dimensions in mm												Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2/ NLW1/ NLW2	DW1, DW2 Keyway DIN 6885-1		NDW1/ NDW2	DD1/ DD2	S4	S10	VA1		m
	Nm	min.	max.				min.	max.							kg
910	1600000	350	570	1030	750	450	350	535	710	910	210	20.5	340.5	**2LC0302-3B ■■■ -0AA0**	1900
		>520	600		800		>490	570	750						2000
1020	1900000	375	600	1112	800	480	375	570	750	1020	210	22.5	356.5	**2LC0302-4B ■■■ -0AA0**	2300
		>550	650		860		>520	600	800						2500
1080	2200000	400	650	1162	860	500	400	600	800	1080	221	25	373	**2LC0302-5B ■■■ -0AA0**	2750
		>600	705		930		>550	650	860						2900
1150	2700000	425	650	1222	860	520	425	650	860	1150	233	25	389	**2LC0302-6B ■■■ -0AA0**	3100
		>600	705		930		>425	650	860						3200
		>650	750		990		>600	705	930						3400
1160	3350000	450	705	1292	930	550	450	650	860	1160	255	25	415	**2LC0302-7B ■■■ -0AA0**	3600
		>650	750		990		>600	705	930	1160					3700
		>690	800		1055		>650	750	990	1210					4000
1240	3800000	475	705	1400	930	580	475	705	930	1240	245	25	425	**2LC0302-8B ■■■ -0AA0**	4200
		>650	750		990		475	705	930	1240					4400
		>690	800		1055		>650	750	990	1240					4600
		>730	850		1120		>690	800	1055	1290					4900
1310	4600000	500	750	1470	990	610	500	705	930	1310	258	28.5	448.5	**2LC0303-0B ■■■ -0AA0**	4900
		>690	800		1055		>650	750	990	1310					5100
		>730	850		1120		>690	800	1055	1310					5300
		>780	890		1170		>730	850	1120	1370					5600
1380	5300000	525	800	1540	1055	640	525	750	990	1380	268	28.5	468.5	**2LC0303-1B ■■■ -0AA0**	5700
		>730	850		1120		>690	800	1055	1380					5900
		>780	890		1170		>730	850	1120	1380					6100
		>810	940		1240		>780	890	1170	1430					6500
1440	6250000	550	850	1600	1120	670	550	800	1055	1440	288	28.5	493.5	**2LC0303-2B ■■■ -0AA0**	6500
		>780	890		1170		>730	850	1120	1440					6700
		>810	940		1240		>780	890	1170	1440					7000
		>860	995		1310		>810	940	1240	1510					7400
1540	7200000	575	890	1710	1170	700	575	850	1120	1540	268	28.5	498.5	**2LC0303-3B ■■■ -0AA0**	7700
		575	890		1170		>780	890	1170	1540					7700
		>810	940		1240		>810	940	1240	1540					8100
		>860	1040		1390		>860	995	1310	1610					8900

Variant:	• A	**D**
	• B	**E**
∅D1:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 585 for 2nd diameter range D1 – Without order codes	**2**
	• Without finished bore from size 1150 for 3rd diameter range D1 – Without order codes	**3**
	• Without finished bore from size 1240 for 4th diameter range D1 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 585 for 2nd diameter range D2 – Without order codes	**2**
	• Without finished bore from size 1150 for 3rd diameter range D2 – Without order codes	**3**
	• Without finished bore from size 1240 for 4th diameter range D2 – Without order codes	**4**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

VA = S – 2 · VA1

Mass moments of inertia on request.

Weights apply to either coupling 1 or 2 with maximum bore diameter, without intermediate shaft.

Maximum speed, limited by weight and critical speed of intermediate shaft, on request.

Ordering example:
Coupling ZZW consisting of coupling 1, intermediate shaft, coupling 2

Coupling 1:
ZAPEX ZZW coupling, size 146, variant B,
Part 3: Bore D1 = 45K7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 1: Bore DW1 = 45H7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2BE99-0AA0-Z
L1A+M1A+M13

Intermediate shaft:
Intermediate shaft for ZAPEX coupling ZZW, size 146, length LW = 570 mm, for shaft distance S = 595 mm shaft journal ∅45p6 x 75 long; keyway DIN 6885-1.

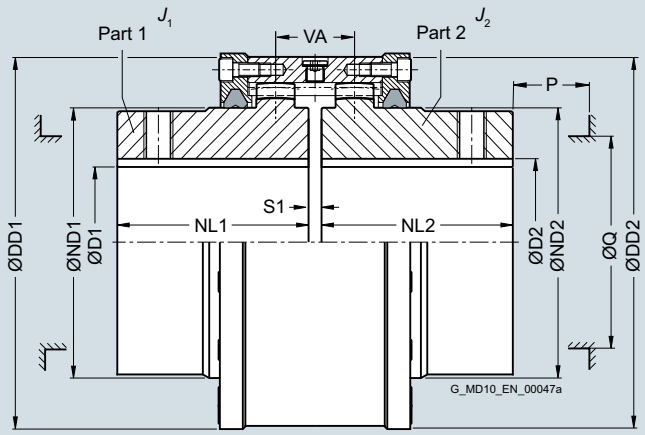
Article No.:
2LC0308-8XX00-0AA0-Z
Y99
Plain text to Y99: **DW1 = 45p6 mm, NLW1 = 75 mm, DW2 = 45p6 mm, NLW2 = 75 mm, LW = 570 mm**

Coupling 2:
ZAPEX ZZW coupling, size 146, variant B,
Part 1: Bore DW2 = 45H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 3: Bore D2 = 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2BE99-0AA0-Z
L1A+M1A+M13

Type ZWH

Selection and ordering data



Size	Rated torque	Maximum speed	Dimensions in mm									Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		ND1/ND2	NL1/NL2	DD1/DD2	S1	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.								kgm²		kg
112	1300	9400	0	49	65	50	110	6	28	50	35	0.003	**2LC0300-0BB ■■ -0AA0**	3.5
128	2500	8300	0	61	80	60	128	6	30	65	45	0.007	**2LC0300-1BB ■■ -0AA0**	5.1
146	4300	7300	0	72	95	75	146	6	33	75	45	0.012	**2LC0300-2BB ■■ -0AA0**	7.8
175	7000	6400	0	85	112	90	175	8	46	85	50	0.031	**2LC0300-3BB ■■ -0AA0**	13.5
198	11600	5500	0	100	135	100	198	8	48	110	50	0.056	**2LC0300-4BB ■■ -0AA0**	20
230	19000	4700	0	120	160	110	230	8	50	135	50	0.11	**2LC0300-5BB ■■ -0AA0**	28.5
255	27000	4100	0	140	185	125	255	10	55	160	50	0.18	**2LC0300-6BB ■■ -0AA0**	38
290	39000	3700	70	160	210	140	290	10	58	180	60	0.35	**2LC0300-7BB ■■ -0AA0**	56
315	54000	3300	80	175	230	160	315	10	62	200	60	0.55	**2LC0300-8BB ■■ -0AA0**	74
342	69000	3000	90	195	255	180	340	12	70	225	60	0.82	**2LC0301-0BB ■■ -0AA0**	95
375	98000	2700	100	220	290	200	375	12	72	260	60	1.3	**2LC0301-1BB ■■ -0AA0**	130
415	130000	2500	120	240	320	220	415	12	76	285	80	2.3	**2LC0301-2BB ■■ -0AA0**	175
465	180000	2200	140	270	360	240	465	16	90	325	80	4	**2LC0301-3BB ■■ -0AA0**	245
505	250000	2000	160	300	400	260	505	16	92	365	80	6	**2LC0301-4BB ■■ -0AA0**	310
545	320000	1800	180	330	440	280	545	16	96	405	80	8.8	**2LC0301-5BB ■■ -0AA0**	390
585	400000	1700	210	360	480	310	585	20	102	445	80	13	**2LC0301-6BB ■■ -0AA0**	500
640	510000	1600	230	360	480	330	640	20	105	445	90	18	**2LC0301-7BB ■■ -0AA0**	620
			>330	390	520					475		19.5		650
690	660000	1450	250	390	520	350	690	20	108	475	90	25.5	**2LC0301-8BB ■■ -0AA0**	760
			>360	420	560					515		28		790
730	790000	1350	275	420	560	380	730	20	112	515	90	35	**2LC0302-0BB ■■ -0AA0**	920
			>390	450	600					555		39		950
780	1000000	1250	300	450	600	400	780	25	120	555	110	48	**2LC0302-1BB ■■ -0AA0**	1150
			>415	490	650					595		57		1150

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**

Larger size couplings on request.

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

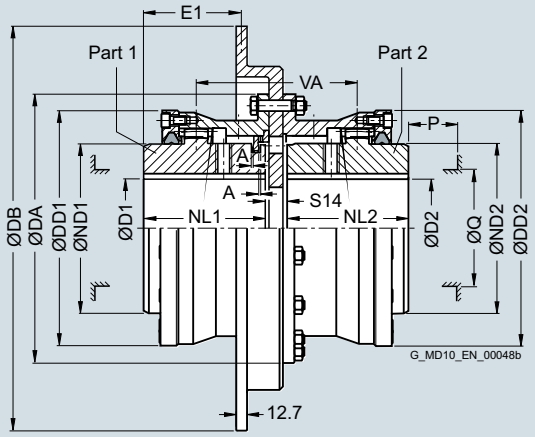
Mass moments of inertia apply to a coupling half with maximum bore diameter.

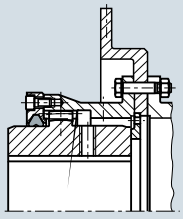
Weights apply to the entire coupling with maximum bores.

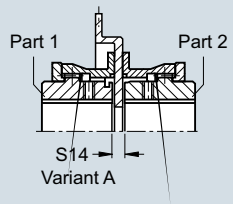
Ordering example:
ZAPEX ZWH coupling, size 146,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

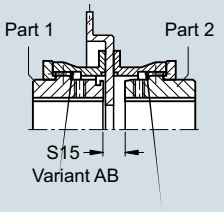
Article No.:
2LC0300-2BB99-0AA0-Z
L0W+M1A+M13

Selection and ordering data









Variant limited in displacement and axial movement. Max. displacement 0.2°.

Size	Rated torque	Maximum speed	Dimensions in mm																Brake disk		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1 Keyway DIN 6885-1		D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S14	S15	A	VA	Q	P	DB	E1		*m*
	Nm	rpm	min.	max.	min.	max.														kg
112	1300	3800	0	49	0	49	143	65	50	110	20	–	0.5	70	50	35	300	32.35	**2LC0300-0A ■■■ -0AA0**	13
		3200									23	–		73			356	22.35	**2LC0300-0A ■■■ -0BA0**	16.5
128	2500	3200	0	61	0	61	157	80	60	128	23.5	30.5	0.5	90.5	65	45	356	32.85	**2LC0300-1A ■■■ -0AA0**	19
		2800									20.5	27.5		87.5			406	29.85	**2LC0300-1A ■■■ -0BA0**	21.5
146	4300	2800	0	65	0	72	177	95	75	146	19	26	0.5	101	75	45	406	43.35	**2LC0300-2A ■■■ -0AA0**	25
		2500									22	29		104			457	46.35	**2LC0300-2A ■■■ -0BA0**	30
175	7000	2800	0	80	0	85	215	112	90	175	21	27	0.5	117	85	50	406	59.35	**2LC0300-3A ■■■ -0AA0**	33
		2500									24	30		120			457	62.35	**2LC0300-3A ■■■ -0BA0**	38
		2200									24	30		120			514	62.35	**2LC0300-3A ■■■ -0CA0**	43
198	11600	2500	0	95	0	100	237	135	100	198	24	35	0.5	135	110	50	457	72.35	**2LC0300-4A ■■■ -0AA0**	46
		2200									24	35		135			514	72.35	**2LC0300-4A ■■■ -0BA0**	51
230	19000	2200	0	117	0	120	265	160	110	230	24	36	0.5	146	135	50	514	82.35	**2LC0300-5A ■■■ -0AA0**	62
		1850									24	36		146			610	82.35	**2LC0300-5A ■■■ -0BA0**	73
255	27000	2200	0	140	0	140	294	185	125	255	26	41	1	166	160	50	514	98.35	**2LC0300-6A ■■■ -0AA0**	73
		1850									26	41		166			610	98.35	**2LC0300-6A ■■■ -0BA0**	84
290	39000	1850	70	155	70	160	330	210	140	290	26	46	1	186	180	60	610	113.35	**2LC0300-7A ■■■ -0AA0**	110
		1600									29	49		189			711	116.35	**2LC0300-7A ■■■ -0BA0**	125
315	54000	1850	80	175	80	175	366	230	160	315	26	46	1	206	200	60	610	133.35	**2LC0300-8A ■■■ -0AA0**	135
		1600									29	49		209			711	136.35	**2LC0300-8A ■■■ -0BA0**	150
342	69000	1600	90	195	90	195	392	255	180	340	31	61	1	241	225	60	711	157.35	**2LC0301-0A ■■■ -0AA0**	180
375	98000	1600	100	220	100	220	430	290	200	375	31	61	1	261	260	60	711	177.35	**2LC0301-1A ■■■ -0AA0**	220
415	130000	1400	120	240	120	240	478	320	220	415	37	99	1	319	285	80	812	203.35	**2LC0301-2A ■■■ -0AA0**	320
465	180000	1400	140	270	140	270	528	360	240	465	41	121	1	361	325	80	812	225.35	**2LC0301-3A ■■■ -0AA0**	400

Variant:	• A	**S**
	• AB	**T**
∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia on request.

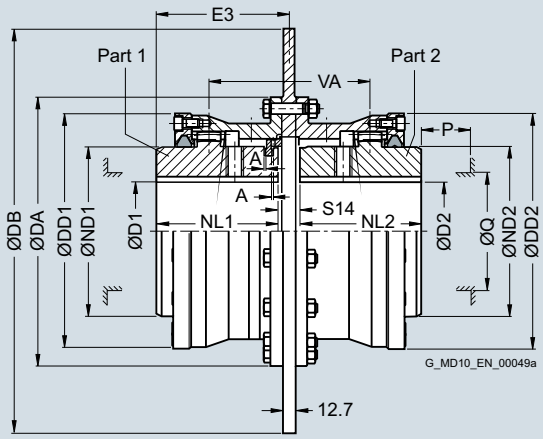
Weights apply to maximum bores.

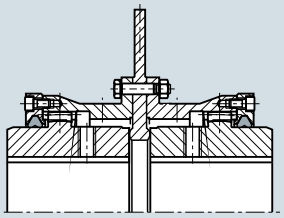
Ordering example:
ZAPEX ZWBT coupling, size 146, variant A, brake disk diameter DB = 457 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

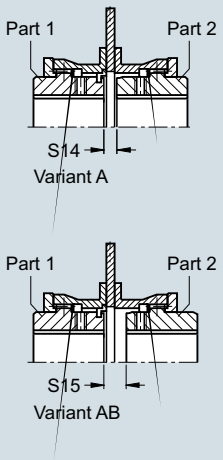
Article No.:
2LC0300-2AS99-0BA0-Z
L0W+M1A+M13

Type ZWBG

Selection and ordering data







Variant limited in displacement and axial movement. Max. displacement 0.2°.

Modified brake disk dimensions on request

Size	Rated torque	Maxi-mum speed	Dimensions in mm															Brake disk		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1 Keyway DIN 6885-1		D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S14	S15	A	VA	Q	P	DB	E3		m
	Nm	rpm	min.	max.	min.	max.															kg
112	1300	3800	0	49	0	49	143	65	50	110	19	–	0.5	69	50	35	300	59.5	**2LC0300-0A ■■■ -0AA0**	13
		3200									22	–		72			356	61	**2LC0300-0A ■■■ -0BA0**	16
128	2500	3200	0	61	0	61	157	80	60	128	22	29	0.5	89	65	45	356	71	**2LC0300-1A ■■■ -0AA0**	18
		2800									19	26		86			406	69.5	**2LC0300-1A ■■■ -0BA0**	20.5
146	4300	2800	0	65	0	72	177	95	75	146	19	26	0.5	101	75	45	406	84.5	**2LC0300-2A ■■■ -0AA0**	24
		2500									22	29		104			457	86	**2LC0300-2A ■■■ -0BA0**	28.5
175	7000	2800	0	80	0	85	215	112	90	175	21	27	0.5	117	85	50	406	100.5	**2LC0300-3A ■■■ -0AA0**	31
		2500									24	30		120			457	102	**2LC0300-3A ■■■ -0BA0**	35
		2200									24	30		120			514	102	**2LC0300-3A ■■■ -0CA0**	40
198	11600	2500	0	95	0	100	237	135	100	198	24	35	0.5	135	110	50	457	112	**2LC0300-4A ■■■ -0AA0**	43
		2200									24	35		135			514	112	**2LC0300-4A ■■■ -0BA0**	47
230	19000	2200	0	117	0	120	265	160	110	230	24	36	0.5	146	135	50	514	122	**2LC0300-5A ■■■ -0AA0**	58
		1850									24	36		146			610	122	**2LC0300-5A ■■■ -0BA0**	66
255	27000	2200	0	140	0	140	294	185	125	255	26	41	1	166	160	50	514	138	**2LC0300-6A ■■■ -0AA0**	69
		1850									26	41		166			610	138	**2LC0300-6A ■■■ -0BA0**	77
290	39000	1850	70	155	70	160	330	210	140	290	26	46	1	186	180	60	610	153	**2LC0300-7A ■■■ -0AA0**	100
		1600									29	49		189			711	154.5	**2LC0300-7A ■■■ -0BA0**	110
315	54000	1850	80	175	80	175	366	230	160	315	26	46	1	206	200	60	610	173	**2LC0300-8A ■■■ -0AA0**	130
		1600									29	49		209			711	174.5	**2LC0300-8A ■■■ -0BA0**	140
342	69000	1600	90	195	90	195	392	255	180	340	31	61	1	241	225	60	711	195.5	**2LC0301-0A ■■■ -0AA0**	165
375	98000	1600	100	220	100	220	430	290	200	375	31	61	1	261	260	60	711	215.5	**2LC0301-1A ■■■ -0AA0**	205
415	130000	1400	120	240	120	240	478	320	220	415	37	99	1	319	285	80	812	238.5	**2LC0301-2A ■■■ -0AA0**	280
465	180000	1400	140	270	140	270	528	360	240	465	41	121	1	361	325	80	812	260.5	**2LC0301-3A ■■■ -0AA0**	360

Variant:	• A	**U**	
	• AB	**V**	
ØD1:	• Without finished bore – Without order codes	**1**	
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**	
ØD2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

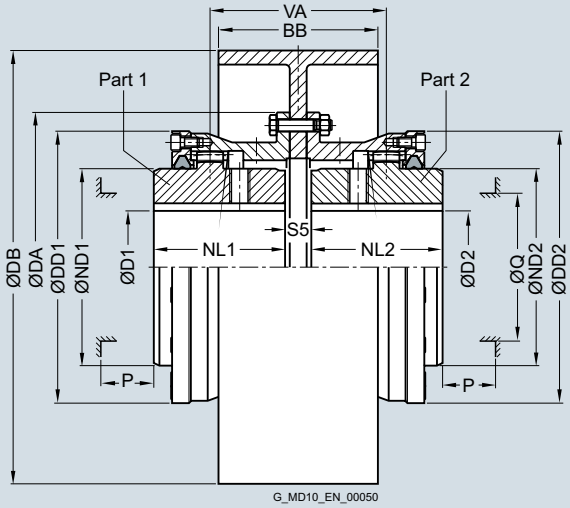
Mass moments of inertia on request.

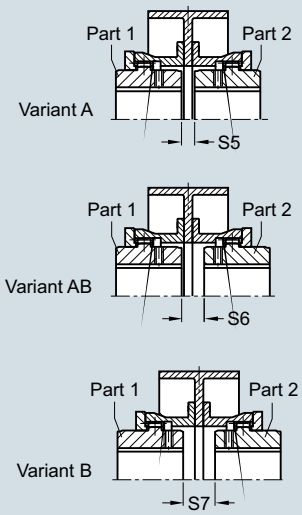
Weights apply to maximum bores.

Ordering example:
ZAPEX ZWBG coupling, size 146, variant A, brake disk diameter DB = 457 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2AU99-0BA0-Z
L0W+M1A+M13

Selection and ordering data





Size	Rated torque	Maximum speed	Dimensions in mm												Brake disk		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S5	S6	S7	VA	Q	P	DB	BB		m
	Nm	rpm	min.	max.														kg
128	2500	2500	0	61	157	80	60	128	16	23	30	83	60	45	200	75	**2LC0300-1 ■■■■ -0AA0**	12.5
		2000							16	23	30	83			250	95	**2LC0300-1 ■■■■ -0BA0**	15.5
146	4300	2000	0	72	177	95	75	146	16	23	30	98	75	45	250	95	**2LC0300-2 ■■■■ -0AA0**	19
		1600							18	25	32	100			315	118	**2LC0300-2 ■■■■ -0BA0**	26.5
175	7000	1600	0	85	215	112	90	175	20	26	32	116	85	50	315	118	**2LC0300-3 ■■■■ -0AA0**	33
		1250							22	28	34	118			400	150	**2LC0300-3 ■■■■ -0BA0**	47
198	11600	1600	0	100	237	135	100	198	20	31	42	131	110	50	315	118	**2LC0300-4 ■■■■ -0AA0**	41
		1250							22	33	44	133			400	150	**2LC0300-4 ■■■■ -0BA0**	54
230	19000	1250	0	120	265	160	110	230	22	34	46	144	135	50	400	150	**2LC0300-5 ■■■■ -0AA0**	64
		1000							23	35	47	145			500	190	**2LC0300-5 ■■■■ -0BA0**	85
255	27000	1000	0	140	294	185	125	255	25	40	55	165	160	50	500	190	**2LC0300-6 ■■■■ -0AA0**	95
		1000							28	43	58	168			630	236	**2LC0300-6 ■■■■ -0BA0**	140
290	39000	1000	70	160	330	210	140	290	28	48	68	188	180	60	630	236	**2LC0300-7 ■■■■ -0AA0**	160
		750							28	48	68	188			710	265	**2LC0300-7 ■■■■ -0BA0**	195

Variant:	• A	**A W**
	• B	**A X**
	• AB	**B A**
∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia on request.

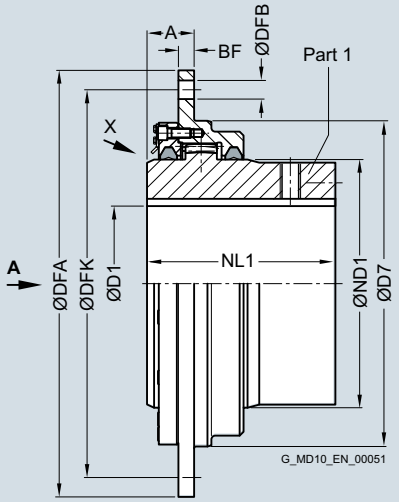
Weights apply to maximum bores.

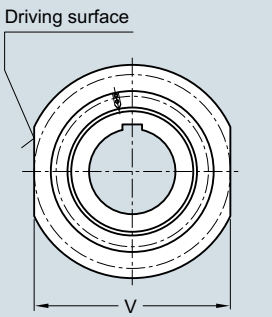
Ordering example:
ZAPEX ZWB coupling, size 146, variant A, brake disk diameter DB = 315 mm, BB = 118 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

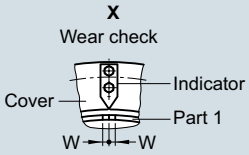
Article No.:
2LC0300-2AW99-0BA0-Z
L0W+M1A+M13

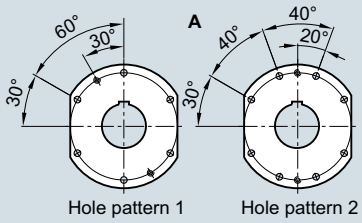
Type ZWTR

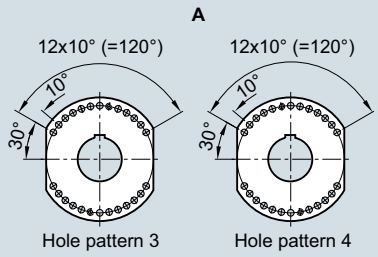
Selection and ordering data











Size	Rated torque	Perm. radial load	Dimensions in mm													Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}		D1 Keyway DIN 6885-1		ND1	NL1	DFA	D7	V	A	BF	DFK	DFB	Hole pattern	Perm. wear		*m*
		max.	min.	max.				h6	h9						W		
	Nm	N															kg
198	14500	32500	0	95	135	125	340	220	300	45	15	300	15	1	2	**2LC0300-4BN ■ 0-0AA0**	25
230	17500	36500	0	110	160	130	360	240	320	45	15	320	15	1	2	**2LC0300-5BN ■ 0-0AA0**	30
255	24000	45500	0	125	185	145	380	260	340	45	15	340	19	1	2	**2LC0300-6BN ■ 0-0AA0**	35
290[1)]	31500	50000	0	145	210	170	400	280	360	45	15	360	19	1	3	**2LC0300-7BN ■ 0-0AA0**	45
315	42000	70000	0	160	230	175	420	310	380	60	20	380	24	1	3	**2LC0300-8BN ■ 0-0AA0**	60
342[1)]	55000	90000	0	180	255	185	450	340	400	60	20	400	24	1	3	**2LC0301-0BN ■ 0-0AA0**	70
375	78000	110000	0	200	290	220	510	400	460	60	20	460	24	1	3	**2LC0301-1BN ■ 0-0AA0**	100
415[1)]	104000	150000	0	220	320	240	550	420	500	60	20	500	24	1	3	**2LC0301-2BN ■ 0-0AA0**	130
465[1)]	155000	165000	0	250	360	260	580	450	530	60	20	530	24	2	4	**2LC0301-3BN ■ 0-0AA0**	160
505[1)]	235000	200000	0	275	400	315	650	530	580	65	25	600	24	2	4	**2LC0301-4BN ■ 0-0AA0**	240
545[1)]	390000	325000	0	300	440	350	680	560	600	65	25	630	24	3	4	**2LC0301-5BN ■ 0-0AA0**	320
585[1)]	460000	380000	0	330	480	380	710	600	640	81	35	660	28	4	4	**2LC0301-6BN ■ 0-0AA0**	400
640[1)]	600000	420000	0	360	520	410	780	670	700	81	35	730	28	4	4	**2LC0301-7BN ■ 0-0AA0**	510
730[1)]	880000	500000	0	415	600	450	850	730	760	81	35	800	28	4	5	**2LC0302-0BN ■ 0-0AA0**	690

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**

Total wear must not exceed 1 x W.

Mass moments of inertia on request.

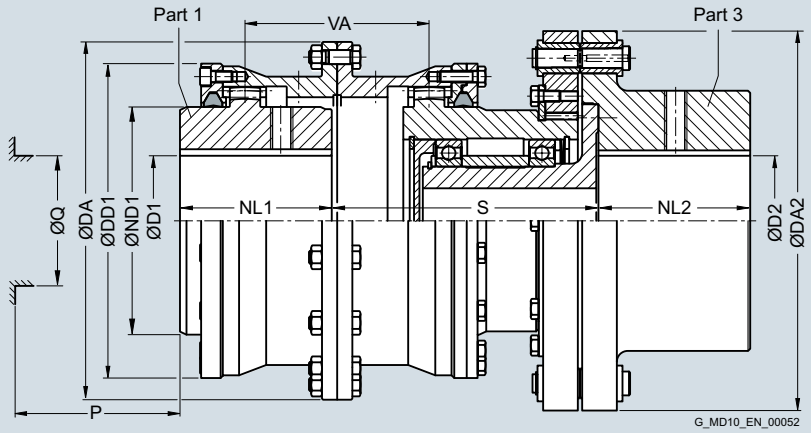
Weights apply to maximum bores.

Ordering example:
ZAPEX ZWTR coupling, size 198, bore 80H7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-4BN90-0AA0
L1J

[1)] These sizes have connection dimensions to SEB 666 212.

Selection and ordering data



Size	Rated torque	Max. shear torque	Maximum speed	Dimensions in mm D1 Keyway DIN 6885-1		D2 Keyway DIN 6885-1		DA	ND1	NL1/ NL2	DA2	DD1	S	VA	Q	P	Article No. Plain text required for shear torque. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight *m*
	T_{KN}	T_{BR}	n_{Kmax}															
	Nm	Nm	rpm	min.	max.	min.	max.											kg
112	1300	1690	9400	0	49	0	60	143	65	50	170	110	115	56	50	35	**2LC0300-0BH ■■ -0AA0-Z Y99**	14.5
128	2500	3250	8300	0	61	0	75	157	80	60	190	128	125	73	65	45	**2LC0300-1BH ■■ -0AA0-Z Y99**	19
146	4300	5590	7300	0	72	0	90	177	95	75	205	146	140	88	75	45	**2LC0300-2BH ■■ -0AA0-Z Y99**	27.5
175	7000	9100	6400	0	85	0	105	215	112	90	235	175	170	104	85	50	**2LC0300-3BH ■■ -0AA0-Z Y99**	43
198	11600	15080	5500	0	100	0	120	237	135	100	285	198	185	119	110	50	**2LC0300-4BH ■■ -0AA0-Z Y99**	67
230	19000	24700	4700	0	120	0	135	265	160	110	300	230	200	130	135	50	**2LC0300-5BH ■■ -0AA0-Z Y99**	91
255	27000	35100	4100	0	140	0	155	294	185	125	335	255	215	150	160	50	**2LC0300-6BH ■■ -0AA0-Z Y99**	120
290	39000	50700	3700	70	160	70	185	330	210	140	390	290	240	170	180	60	**2LC0300-7BH ■■ -0AA0-Z Y99**	170
315	54000	70200	3300	80	175	80	200	366	230	160	415	315	257	190	200	60	**2LC0300-8BH ■■ -0AA0-Z Y99**	215
342	69000	89700	3000	90	195	90	235	392	255	180	460	340	290	222	225	60	**2LC0301-0BH ■■ -0AA0-Z Y99**	295
375	98000	127400	2700	100	220	100	240	430	290	200	495	375	300	242	260	60	**2LC0301-1BH ■■ -0AA0-Z Y99**	380
415	130000	169000	2500	120	240	120	255	478	320	220	540	415	370	294	285	80	**2LC0301-2BH ■■ -0AA0-Z Y99**	520
465	180000	234000	2200	140	270	140	285	528	360	240	635	465	400	336	325	80	**2LC0301-3BH ■■ -0AA0-Z Y99**	720
505	250000	325000	2000	160	300	160	320	568	400	260	710	505	420	366	365	80	**2LC0301-4BH ■■ -0AA0-Z Y99**	970
545	320000	416000	1800	180	330	180	370	620	440	280	800	545	460	406	405	80	**2LC0301-5BH ■■ -0AA0-Z Y99**	1250
585	400000	520000	1700	210	360	210	390	660	480	310	860	585	500	460	445	80	**2LC0301-6BH ■■ -0AA0-Z Y99**	1600
640	510000	663000	1600	230	360	230	425	738	480	330	900	640	530	479	445	90	**2LC0301-7BH ■■ -0AA0-Z Y99**	1850
				>330	390				520						475			1850
690	660000	858000	1450	250	390	250	450	788	520	350	1020	690	580	516	475	90	**2LC0301-8BH ■■ -0AA0-Z Y99**	2600
				>360	420				560						515			2650
730	790000	1027000	1350	275	420	275	485	834	560	380	1080	730	620	560	515	90	**2LC0302-0BH ■■ -0AA0-Z Y99**	3200
				>390	450				600						555			3200

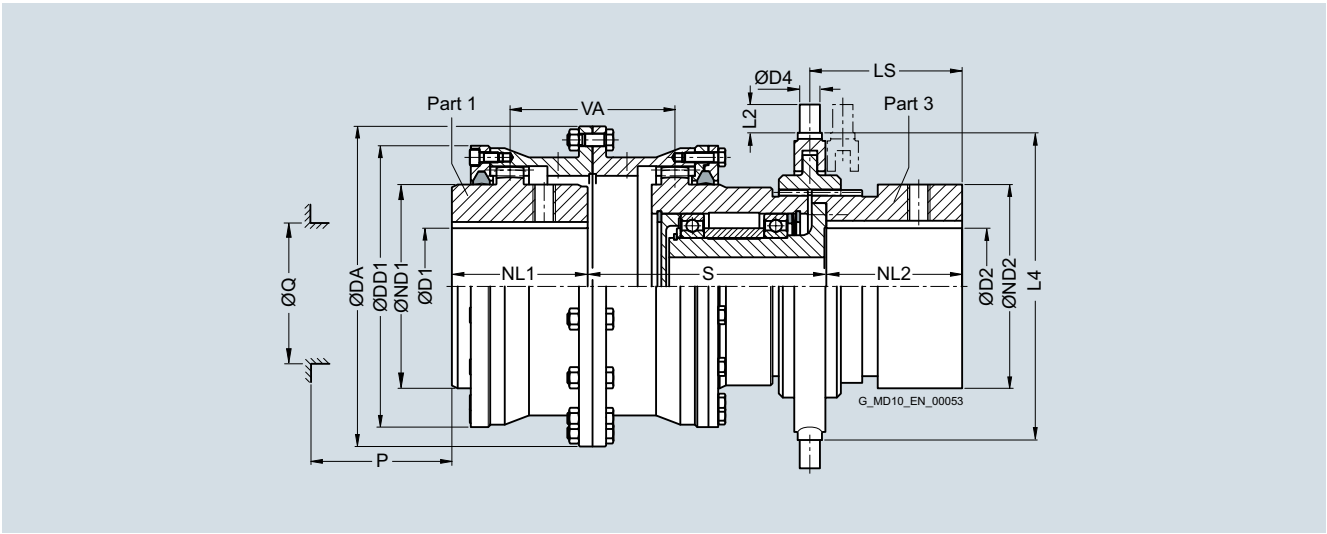
∅D1:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D1 – Without order codes	**2**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• Without finished bore from size 640 for 2nd diameter range D2 – Without order codes	**2**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia on request.
Weights apply to maximum bores.

Type ZWS

Selection and ordering data



For engaging/disengaging during standstill.

Part 3 should be mounted on the shaft while the shaft is disconnected and not being driven.

Size	Rated torque	Maximum speed	Dimensions in mm														Shift ring			Switch		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1 Keyway DIN 6885-1		D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1	S	VA	Q	P	LS	L4	D4	L2	KSHN	KSZH		*m*
	Nm	rpm	min.	max.	min.	max.																	kg
128	2500	1500	0	61	0	50	157	80	60	128	135	73	65	45	70	150	15	14	14/11	–	**2LC0300-1BK ■■ -0AA0**	16
146	4300	1300	0	72	0	50	177	95	75	146	131	88	75	45	86	180	16	16	16/12	–	**2LC0300-2BK ■■ -0AA0**	22
175	7000	1100	0	85	0	70	215	112	90	175	165	104	85	50	101	180	16	16	16/12	–	**2LC0300-3BK ■■ -0AA0**	35
198	11600	960	0	100	0	80	237	135	100	198	182	119	110	50	116	210	20	18	18/13	–	**2LC0300-4BK ■■ -0AA0**	52
230	19000	830	0	120	0	90	265	160	110	230	198	130	135	50	126	260	22	20	18/15	14/14	**2LC0300-5BK ■■ -0AA0**	77
255	27000	750	0	140	0	115	294	185	125	255	215	150	160	50	142	300	25	22	21/17	16/17	**2LC0300-6BK ■■ -0AA0**	98
290	39000	660	70	160	70	130	330	210	140	290	236	170	180	60	157	315	25	35	–	16/211	**2LC0300-7BK ■■ -0AA0**	140
315	54000	600	80	175	80	140	366	230	160	315	257	190	200	60	182	360	30	24	–	18/18	**2LC0300-8BK ■■ -0AA0**	200
342	69000	560	90	195	90	160	392	255	180	340	280	222	225	60	202	360	30	24	–	18/18	**2LC0301-0BK ■■ -0AA0**	230
375	98000	510	100	220	100	180	430	290	200	375	292	242	260	60	222	430	34	26	–	24/20	**2LC0301-1BK ■■ -0AA0**	340
415	130000	460	120	240	120	210	478	320	220	415	349	294	285	80	247	430	34	26	–	24/20	**2LC0301-2BK ■■ -0AA0**	430
465	180000	410	140	270	140	230	528	360	240	465	380	336	325	80	267	–	–	–	–	–	**2LC0301-3BK ■■ -0AA0**	570
505	250000	380	160	300	160	260	568	400	260	505	395	366	365	80	287	–	–	–	–	–	**2LC0301-4BK ■■ -0AA0**	740
545	320000	350	180	330	180	270	620	440	280	545	460	406	405	80	315	–	–	–	–	–	**2LC0301-5BK ■■ -0AA0**	1000

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia on request.
Weights apply to maximum bores.

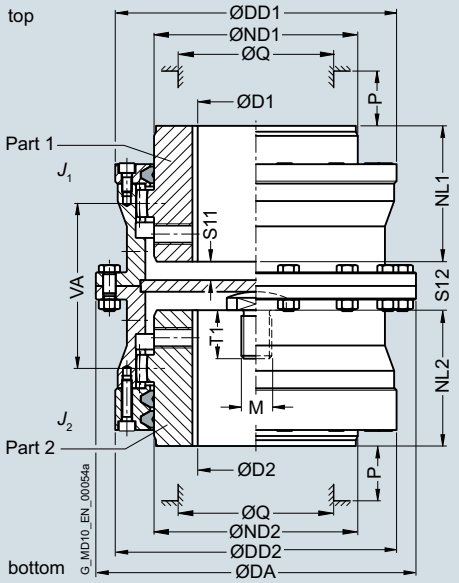
KSHN: Manual lever switch type KSHN to M4218
KSZH: Toothed rack type KSZH to M4215

Pneumatically or hydraulically actuated switches also available.

Ordering example:
ZAPEX ZWS coupling, size 146,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 3: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2BK99-0AA0-Z
L0W+M1A+M13

Selection and ordering data



When ordering, state thread size M and thread length T1 of the thrust piece.

Size	Rated torque	Maximum speed	Dimensions in mm											Mass moment of inertia	Article No. Plain text for thread size M and thread length T1 necessary. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	DD1/ DD2	S11	S12	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.										kgm^2		kg
128	2500	8300	0	61	157	80	60	128	6.5	26	73	65	45	0.015	**2LC0300-1AH ■■ -0AA0-Z Y99**	9.1
146	4300	7300	0	72	177	95	75	146	6	28	88	75	45	0.023	**2LC0300-2AH ■■ -0AA0-Z Y99**	13
175	7000	6400	0	85	215	112	90	175	5.5	33	104	85	50	0.055	**2LC0300-3AH ■■ -0AA0-Z Y99**	22
198	11600	5500	0	100	237	135	100	198	10	40	119	110	50	0.095	**2LC0300-4AH ■■ -0AA0-Z Y99**	31
230	19000	4700	0	120	265	160	110	230	11	32	130	135	50	0.18	**2LC0300-5AH ■■ -0AA0-Z Y99**	43
255	27000	4100	0	140	294	185	125	255	14	40	150	160	50	0.28	**2LC0300-6AH ■■ -0AA0-Z Y99**	56
290	39000	3700	70	160	330	210	140	290	19	50	170	180	60	0.55	**2LC0300-7AH ■■ -0AA0-Z Y99**	81
315	54000	3300	80	175	366	230	160	315	18	50	190	200	60	0.88	**2LC0300-8AH ■■ -0AA0-Z Y99**	110
342	69000	3000	90	195	392	255	180	340	29	72	222	225	60	1.3	**2LC0301-0AH ■■ -0AA0-Z Y99**	140
375	98000	2700	100	220	430	290	200	375	29	72	242	260	60	2.1	**2LC0301-1AH ■■ -0AA0-Z Y99**	185
415	130000	2500	120	240	478	320	220	415	60	136	294	285	80	3.4	**2LC0301-2AH ■■ -0AA0-Z Y99**	250
465	180000	2200	140	270	528	360	240	465	80	176	336	325	80	5.6	**2LC0301-3AH ■■ -0AA0-Z Y99**	340
505	250000	2000	160	300	568	400	260	505	89	196	366	365	80	8.2	**2LC0301-4AH ■■ -0AA0-Z Y99**	420

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.
P Length required for renewing the sealing rings.

Mass moments of inertia apply to a coupling half with maximum bore diameter.

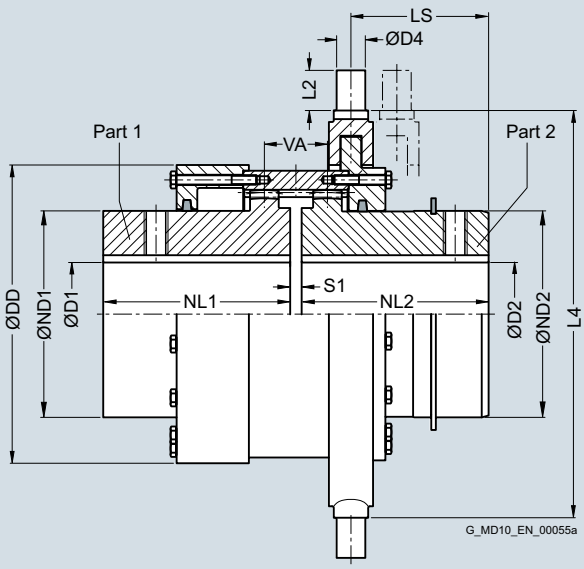
Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZWNV coupling, size 146, thread M 10 x 20 deep,
Part 1: Bore 40H7mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2AH99-0AA0-Z
L0W+M1A+M13+Y99
Plain text to Y99: **Thread M10 x 20 mm**

Type ZWSE

Selection and ordering data



For engaging/disengaging during standstill. Protect sliding surfaces from dirt and corrosion; sprayed with adhesive grease.

Part 2 should be mounted on the shaft while the shaft is disconnected and not being driven.

Size	Rated torque	Maximum speed	Dimensions in mm												Shift ring			Switch		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1 Keyway DIN 6885-1		D2 Keyway DIN 6885-1		ND1	ND2	NL1	NL2	DD	S1	VA	LS	L4	D4	L2	KSHN	KSZH		m
	Nm	rpm	min.	max.	min.	max.												Size	Size		kg
128	2500	730	0	55	0	55	76.5	75	60	60	130	6	30	36.5	180	16	16	16	–	**2LC0300-1BM ■■ -0AA0**	8.8
146	4300	630	0	69	0	65	91.5	90	75	75	150	6	33	50	210	20	18	18	–	**2LC0300-2BM ■■ -0AA0**	13.5
175	7000	530	0	80	0	75	108	105	90	90	180	8	46	56.5	250	20	30	18	–	**2LC0300-3BM ■■ -0AA0**	23
198	11600	470	0	95	0	95	130	130	100	100	204	8	48	64.5	260	22	20	18	–	**2LC0300-4BM ■■ -0AA0**	32
230	19000	410	0	115	0	110	155	155	110	110	236	8	50	73	300	25	22	21	–	**2LC0300-5BM ■■ -0AA0**	44
255	27000	370	0	135	0	130	180	180	125	125	260	10	55	82	355	25	35	24	–	**2LC0300-6BM ■■ -0AA0**	63
290	39000	330	70	155	70	145	210	210	140	140	295	10	38	68.5	355	25	35	24	–	**2LC0300-7BM ■■ -0AA0**	82
315	54000	300	80	170	80	165	230	230	160	160	325	10	42	76	355	25	35	24	–	**2LC0300-8BM ■■ -0AA0**	105
342	69000	280	90	190	90	175	255	255	180	180	345	12	46	72	430	34	26	–	24	**2LC0301-0BM ■■ -0AA0**	145
375	98000	250	100	210	100	200	280	280	200	200	378	12	48	97	430	34	26	–	24	**2LC0301-1BM ■■ -0AA0**	180
415	130000	220	120	240	120	225	320	320	220	240	425	12	52	120	580	40	40	–	24	**2LC0301-2BM ■■ -0AA0**	295
465	180000	200	140	270	140	250	360	360	240	260	470	16	60	150	580	40	40	–	24	**2LC0301-3BM ■■ -0AA0**	350
505	250000	180	160	300	160	270	400	400	260	280	510	16	62	161	–	–	–		24	**2LC0301-4BM ■■ -0AA0**	400

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Weights apply to the entire coupling with maximum bores.

Mass moment of inertia on request.

Ordering example:
ZAPEX ZWSE coupling, size 146,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0300-2BM99-0AA0-Z
L0W+M1A+M13

Selection and ordering data

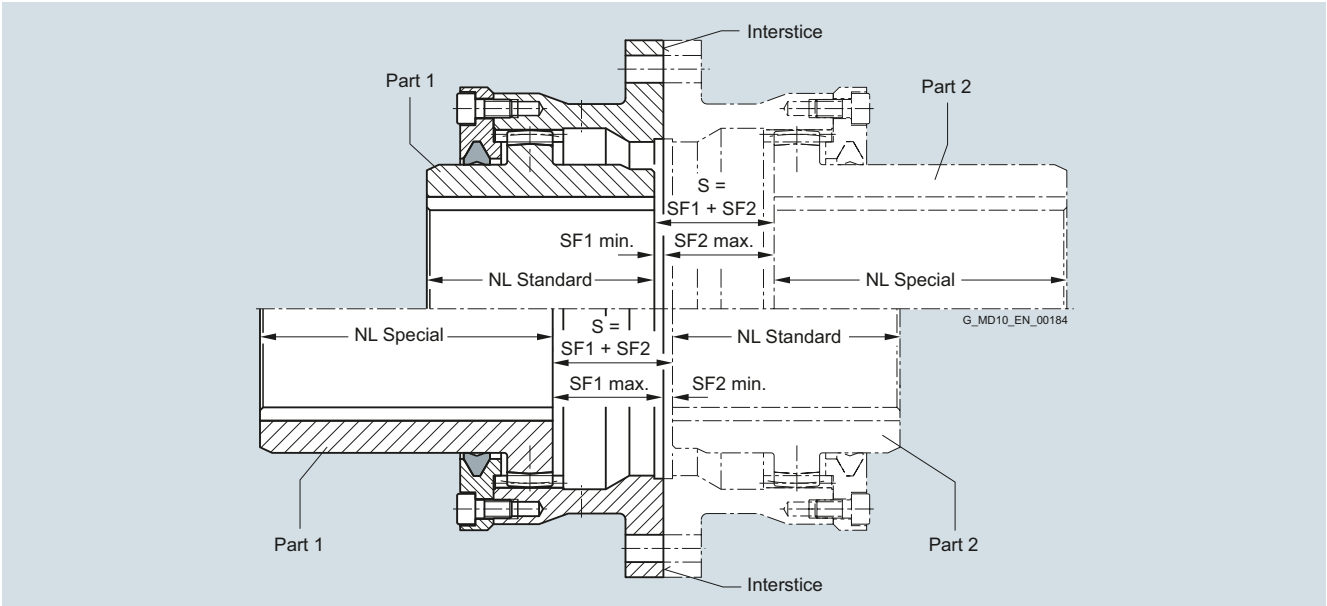
ZAPEX couplings can be provided with customized S-dimensions and hub lengths.

The entire dimension S results from the sum of the individual measurements SF1 and SF2. SF1 and SF2 are the measurements from the interstice of the coupling ring flange up to the beginning of the respective hub. As standard SF1 and SF2 are identical to each other and the entire S-dimension arises in accordance with them.

SF1 and SF2 can be chosen different on customer request, however the minimal and maximum values of the following table have to be observed. Within these limits the measurements SF1 and SF2 may be chosen freely.

The distance VA of the coupling teeth, the permitted bore diameter and the hub diameter remain unchanged.

By stating the hub S-dimension and both hub lengths the coupling is completely described.



Geometric data

Size	Standard hub length NL Standard	Minimal dimension SF1 or SF2 min.	Maximum dimension SF1 or SF2 max.
	mm	mm	mm
112	50	3	23
128	60	3	30.5
146	75	3	36.5
175	90	4	43
198	100	4	49.5
230	110	4	54
255	125	5	62.5
290	140	5	71
315	160	5	79
342	180	6	94
375	200	6	103
415	220	6	127
465	240	8	146
505	260	8	160

The minimal hub lengths are not to fall below the standard hub lengths. If there's no other possibility, at the hub lengths smaller than standard hub length the order codes **"Y50"** for part 1 and **"Y51"** for part 2 must be stated in plain text.

Article number

The Article number of the respective ZAPEX coupling type must be supplemented with **"-Z"** and order codes for no standard SF-dimensions (order code **"Y38"** for part 1 and **"Y39"** for part 2). For no standard hub lengths the order codes **"Y40"** to **"Y49"** must be specified (see the table below).

Ordering example:
ZAPEX coupling ZWN 175, variant A
Hub left: bore D1 = 70H7 mm, keyway to DIN 6885-1 P9 and set screw; NL1 = 160 mm; SF1 = 10 mm
Hub right: bore D2 = 75H7 mm, keyway to DIN 6885-1 P9 and set screw; NL2 = 100 mm; SF2 = 25 mm

Article No.:
2LC0300-3AA99-0AA0-Z
L1G M1H Y38 Y39 Y41 Y46
Plain text to **Y38**: **SF1 = 10 mm**
Plain text to **Y39**: **SF2 = 25 mm**
Plain text to **Y46**: **NL1 = 160 mm**
Plain text to **Y41**: **NL2 = 100 mm**

Order code for hub prolongations (Y4.); Std-NL = Standard hub length

Part 1 Selected (special) hub length order code		
min.	max.	
> Std-NL	≤ 1.25 · Std-NL	**Y40** (specification of hub length in plain text)
> 1.25 · Std-NL	≤ 1.5 · Std-NL	**Y42** (specification of hub length in plain text)
> 1.5 · Std-NL	≤ 1.75 · Std-NL	**Y44** (specification of hub length in plain text)
> 1.75 · Std-NL	≤ 2 · Std-NL	**Y46** (specification of hub length in plain text)
> 2 · Std-NL		**Y48** (specification of hub length in plain text)

Part 2 Selected (special) hub length order code		
min.	max.	
> Std-NL	≤ 1.25 · Std-NL	**Y41** (specification of hub length in plain text)
> 1.25 · Std-NL	≤ 1.5 · Std-NL	**Y43** (specification of hub length in plain text)
> 1.5 · Std-NL	≤ 1.75 · Std-NL	**Y45** (specification of hub length in plain text)
> 1.75 · Std-NL	≤ 2 · Std-NL	**Y47** (specification of hub length in plain text)
> 2 · Std-NL		**Y49** (specification of hub length in plain text)

Spare and wear parts

Selection and ordering data

DUO sealing rings

The DUO sealing rings are wear parts and must be replaced in accordance with the operating instructions.

Size	Hub diameter ND1/ND2 mm	Article No.
112	65	**2LC0300-0XG00-0AA0**
128	80	**2LC0300-1XG00-0AA0**
146	95	**2LC0300-2XG00-0AA0**
175	112	**2LC0300-3XG00-0AA0**
198	135	**2LC0300-4XG00-0AA0**
230	160	**2LC0300-5XG00-0AA0**
255	185	**2LC0300-6XG00-0AA0**
290	210	**2LC0300-7XG00-0AA0**
315	230	**2LC0300-8XG00-0AA0**
342	255	**2LC0301-0XG00-0AA0**
375	290	**2LC0301-1XG00-0AA0**
415	320	**2LC0301-2XG00-0AA0**
465	360	**2LC0301-3XG00-0AA0**
505	400	**2LC0301-4XG00-0AA0**
545	440	**2LC0301-5XG00-0AA0**
585	480	**2LC0301-6XG00-0AA0**
640	480 520	**2LC0301-7XG10-0AA0** **2LC0301-7XG20-0AA0**
690	520 560	**2LC0301-8XG10-0AA0** **2LC0301-8XG20-0AA0**
730	560 600	**2LC0302-0XG10-0AA0** **2LC0302-0XG20-0AA0**
780	600 650	**2LC0302-1XG10-0AA0** **2LC0302-1XG20-0AA0**
852	650 710	**2LC0302-2XG10-0AA0** **2LC0302-2XG20-0AA0**
910	710 750	**2LC0302-3XG10-0AA0** **2LC0302-3XG20-0AA0**
1020	750 800	**2LC0302-4XG10-0AA0** **2LC0302-4XG20-0AA0**
1080	800 860	**2LC0302-5XG10-0AA0** **2LC0302-5XG20-0AA0**
1150	860 930	**2LC0302-6XG10-0AA0** **2LC0302-6XG20-0AA0**
1160	860 930 990	**2LC0302-7XG10-0AA0** **2LC0302-7XG20-0AA0** **2LC0302-7XG30-0AA0**
1240	930 990 1055	**2LC0302-8XG10-0AA0** **2LC0302-8XG20-0AA0** **2LC0302-8XG30-0AA0**
1310	930 990 1055 1120	**2LC0303-0XG10-0AA0** **2LC0303-0XG20-0AA0** **2LC0303-0XG30-0AA0** **2LC0303-0XG40-0AA0**
1380	990 1055 1120 1170	**2LC0303-1XG10-0AA0** **2LC0303-1XG20-0AA0** **2LC0303-1XG30-0AA0** **2LC0303-1XG40-0AA0**
1440	1055 1120 1170 1240	**2LC0303-2XG10-0AA0** **2LC0303-2XG20-0AA0** **2LC0303-2XG30-0AA0** **2LC0303-2XG40-0AA0**
1540	1120 1170 1240 1310	**2LC0303-3XG10-0AA0** **2LC0303-3XG20-0AA0** **2LC0303-3XG30-0AA0** **2LC0303-3XG40-0AA0**

Siemens high-performance grease (cartridge 300 g)
FFA:000000501027

Sealing compound (tube 60 ml)
FFA:000001443780

Torsionally Rigid Gear Couplings
ZAPEX ZN Series

5

Torsionally Rigid Gear Couplings – ZAPEX ZN Series

General information

Overview

Coupling suitable for use in potentially explosive atmospheres.
Complies with the current ATEX Directive for:

CE Ex II 2 GD c 120 °C (T4)
-20 °C ≤ T_a ≤ +80 °C

CE Ex I M2

Materials

- Hubs and flanged sleeves: Steel
- O ring: Perbunan
- Lubricant: Grease filling

Benefits

ZAPEX gear couplings link machine shafts and compensate for shaft misalignment with weak restorative forces.
High transmissible torque combined with compactness and light weight are characteristic of ZAPEX couplings.
ZAPEX coupling types are constructed on a modular principle, so application-related solutions can be delivered quickly.

This coupling requires very little maintenance. Regular grease changes at the prescribed intervals prolong the service life of the coupling.

Application

ZAPEX couplings are especially suited for operation in harsh operating conditions, such as drives in the iron smelting or cement industry. ZAPEX couplings are suitable for reverse operation and horizontal mounting positions and, in the case of type ZNNV, for vertical mounting positions.

Design

A ZAPEX coupling comprises two hub sections with external teeth which are mounted on the machine shafts. The external teeth engage with a flanged sleeve with corresponding internal teeth. The flanged sleeves are connected via two flanges with close-fitting bolts.

The teeth are lubricated with grease. On the ZAPEX type ZN, O-rings are used to seal the tooth space. The O-rings prevent the lubricant from escaping and dirt from entering the tooth space. The parallel keyways must be sealed during assembly to prevent lubricant from escaping.

Customized hub designs are described after the types.

ZAPEX ZN gear coupling types

Type	Description
ZNN	Standard type
ZNZS	With adapter
ZNW	With intermediate shaft
ZNBG	With straight brake disk
ZNNA	With axial backlash limiter
ZNZA	With adapter and axial backlash limiter
ZNNV	Vertical type
ZNN	For axial displacement

Further application-related coupling types are available. Dimension sheets for and information on these are available on request.

Function

The torque is transmitted through the coupling teeth. The teeth are crowned, so angular displacement per tooth plane is possible. Radial misalignment can be compensated for via the space VA between the tooth planes. The internal teeth of the flanged sleeves are significantly wider than the external teeth of the hub parts, permitting a relatively high axial misalignment.

A small angular misalignment on the coupling teeth results in an advantageous distribution of the lubricant film in contact with the teeth and a very low wear rate. This favorable condition can be deliberately set by aligning the drive with the machine shafts with a slight radial misalignment.

Technical data

Power ratings

Size	Rated torque	Maximum torque	Overload torque	Fatigue torque	Torsional stiffness	Permitted axial shaft misalignment
					ZN	
	T_{KN}	T_{Kmax}	T_{KOL}	T_{KW}	C_{Tdyn}	ΔK_a
	Nm	Nm	Nm		kNm/rad	mm
83	1020	2040	4080	408	500	1
107	2210	4420	8840	884	1400	1
130	4020	8040	16080	1600	2500	1
156	6600	13200	26400	2640	5800	1
181	11000	22000	44000	4400	9200	1
211	19200	38400	76800	7680	16600	1
250	30680	61360	122720	12270	27300	1
274	43550	87100	174200	17400	41500	1.5
307	61750	123500	247000	24700	61000	1.5
333	87100	174200	348400	34800	79000	1.5
364	117000	234000	468000	46800	99000	1.5
424	162500	325000	650000	64800	156000	1.5

The specified torsional stiffness "ZN" applies to coupling types ZNN, ZNNA, ZNNV and ZNN for axial displacement.

Torsional stiffness of types ZNZS, ZNW, ZNBG and ZNZA on request.

The axial misalignment ΔK_a must be understood as the maximum permitted enlargement of the hub distance S of the coupling.

The axial misalignment ΔK_a does not apply to the types ZNNA, ZNNV, ZNBG and ZNZA.

Angular misalignment ΔK_w

- Types ZNN, ZNZS, ZNW, ZNNV, ZNN for axial displacement: $\Delta K_w = 0.5°$
- Types ZNBG, ZNNA, ZNZA: $\Delta K_w = 0.2°$

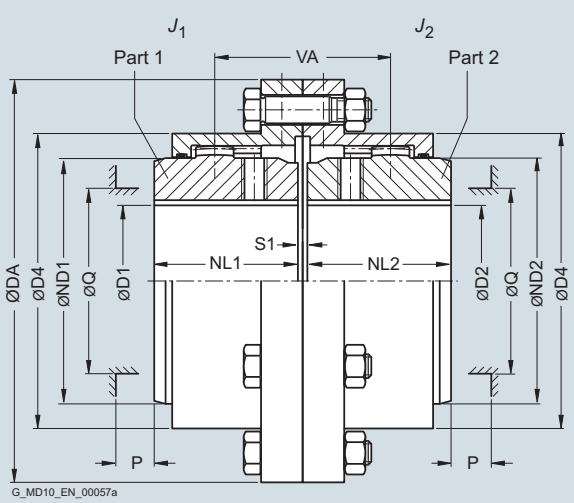
Radial misalignment ΔK_r

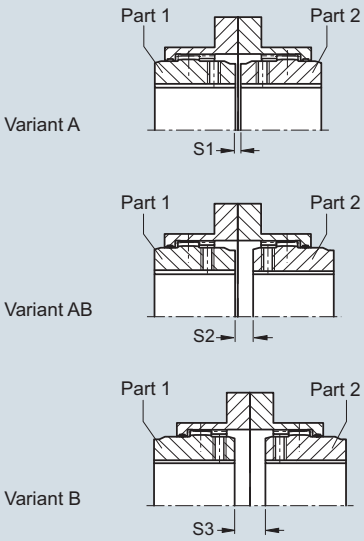
- Types ZNN, ZNZS, ZNW, ZNNV, ZNN for axial displacement: $\Delta K_r \leq VA \cdot \tan 0.5°$
- Types ZNBG, ZNNA, ZNZA: $\Delta K_r \leq VA \cdot \tan 0.2°$

For the tooth distance VA, see the relevant table for the subassembly.

Type ZNN

Selection and ordering data





Size	Rated torque	Maxi-mum speed	Dimensions in mm												Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S1	S2	S3	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.											kgm^2		kg
83	1020	8500	0	50	117	67	43	83	3	12	21	55	52	31	0.003	**2LC0330-0A ■ ■ ■ -0AA0**	3.2
107	2210	7700	0	65	152	87	50	107	3	9	15	59	68	34	0.009	**2LC0330-1A ■ ■ ■ -0AA0**	6.5
130	4020	6900	0	82	178	108	62	129.5	3	17	31	79	85	42	0.02	**2LC0330-2A ■ ■ ■ -0AA0**	9.8
156	6600	6200	0	100	213	130	76	156	5	17	29	93	110	47	0.05	**2LC0330-3A ■ ■ ■ -0AA0**	17.5
181	11000	5800	0	116	240	153	90	181	5	19	33	109	130	58	0.09	**2LC0330-4A ■ ■ ■ -0AA0**	25.5
211	19200	5100	0	137	280	180	105	211	6	23	40	128	150	67	0.21	**2LC0330-5A ■ ■ ■ -0AA0**	43
250	30680	4500	0	164	318	214	120	249.5	6	24	42	144	175	72	0.39	**2LC0330-6A ■ ■ ■ -0AA0**	60
274	43550	4000	80	178	347	233	135	274	8	29	50	164	190	81	0.59	**2LC0330-7A ■ ■ ■ -0AA0**	82
307	61750	3750	90	198	390	260	150	307	8	32	56	182	220	91	1.1	**2LC0330-8A ■ ■ ■ -0AA0**	115
333	87100	3550	100	216	425.5	283	175	332.5	8	39	70	214	250	104	1.8	**2LC0331-0A ■ ■ ■ -0AA0**	155
364	117000	3400	120	242	457	312	190	364	8	46	84	236	265	126	2.3	**2LC0331-1A ■ ■ ■ -0AA0**	180
424	162500	3200	150	288	527	371	220	423.5	10	43	76	263	300	140	4.9	**2LC0331-2A ■ ■ ■ -0AA0**	275

Variant:	• A	**A**	
	• B	**B**	
	• AB	**C**	
∅D1:	• Without finished bore – Without order codes	**1**	
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**	
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")		**9**

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

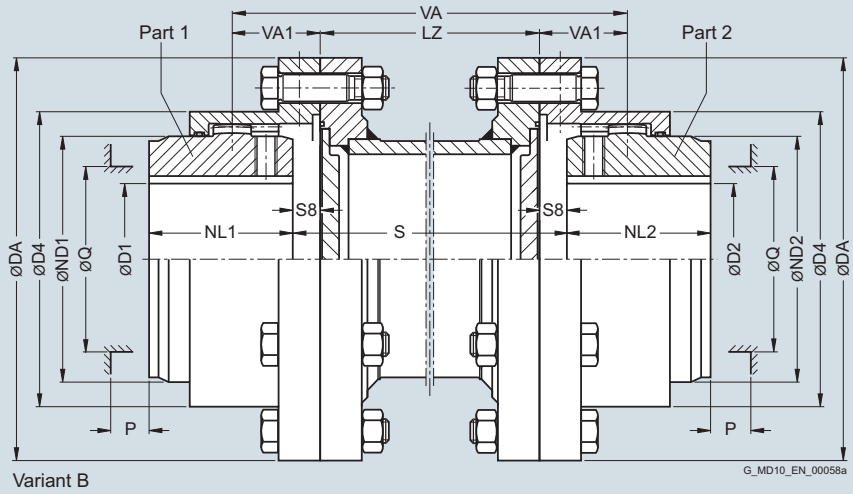
Mass moments of inertia apply to a coupling half with maximum bore diameter.

Weights apply to the entire coupling with maximum bores.

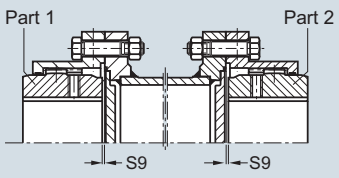
Ordering example:
ZAPEX ZNN coupling, size 107, variant A,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-1AA99-0AA0-Z
L0W+M1A+M13

Selection and ordering data



Variant B



Variant A

Size	Rated torque	Dimensions in mm												Article No. Plain text required for dimension S Order codes for bore diameters and tolerances are specified in catalog section 3	Weight	
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S8	S9	VA1	Q	P	LZ		*m* each 100 mm pipe	*m*
	Nm	min.	max.										min.		kg	kg
83	1020	0	50	117	67	43	83	10.5	1.5	27.5	52	31	75	**2LC0330-0A ■ ■ ■ -0AZ0 Q0Y**	0.9	5.5
107	2210	0	65	152	87	50	107	7.5	1.5	29.5	68	34	85	**2LC0330-1A ■ ■ ■ -0AZ0 Q0Y**	0.8	12
130	4020	0	82	178	108	62	129.5	15.5	1.5	39.5	85	42	95	**2LC0330-2A ■ ■ ■ -0AZ0 Q0Y**	1.2	16
156	6600	0	100	213	130	76	156	14.5	2.5	46.5	110	47	110	**2LC0330-3A ■ ■ ■ -0AZ0 Q0Y**	2.3	28
181	11000	0	116	240	153	90	181	16.5	2.5	54.5	130	58	110	**2LC0330-4A ■ ■ ■ -0AZ0 Q0Y**	3.5	40
211	19200	0	137	280	180	105	211	20	3	64	150	67	125	**2LC0330-5A ■ ■ ■ -0AZ0 Q0Y**	4.5	64
250	30680	0	164	318	214	120	249.5	21	3	72	175	72	125	**2LC0330-6A ■ ■ ■ -0AZ0 Q0Y**	6.3	91
274	43550	80	178	347	233	135	274	25	4	82	190	81	125	**2LC0330-7A ■ ■ ■ -0AZ0 Q0Y**	7.2	115
307	61750	90	198	390	260	150	307	28	4	91	220	91	145	**2LC0330-8A ■ ■ ■ -0AZ0 Q0Y**	9.1	175
333	87100	100	216	425.5	283	175	332.5	35	4	107	250	104	145	**2LC0331-0A ■ ■ ■ -0AZ0 Q0Y**	12	220
364	117000	120	242	457	312	190	364	42	4	118	265	126	145	**2LC0331-1A ■ ■ ■ -0AZ0 Q0Y**	15	245
424	162500	150	288	527	371	220	423.5	38	5	131.5	300	140	145	**2LC0331-2A ■ ■ ■ -0AZ0 Q0Y**	16	360

Variant:	• A	**D**	
	• B	**E**	
∅D1:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**

VA = 2 · VA1 + LZ

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

Mass moments of inertia on request.

Weights apply to the entire coupling with maximum bores and an adapter length of LZ min.

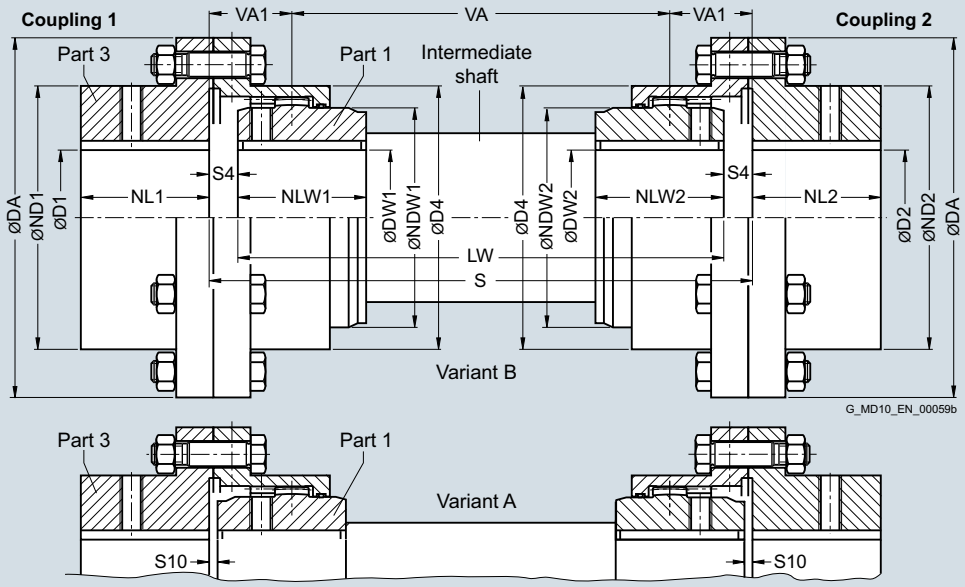
Maximum speed, limited by weight and critical adapter speed, on request.

Ordering example:
ZAPEX ZNZS coupling, size 107, variant B,
adapter for S = 250 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-1AE99-0AZ0-Z
L0W+M1A+Q0Y+M13
Plain text to Q0Y: **S = 250 mm**

Type ZNW

Selection and ordering data



Size	Rated torque	Dimensions in mm												Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2/ NLW1/ NLW2	DW1, DW2 Keyway DIN 6885		NDW1/ NDW2	D4	S4	S10	VA1		m
	Nm	min.	max.				min.	max.							kg
83	1020	0	61	117	83	43	0	50	67	83	12	3	29	**2LC0330-0A ■ ■ ■ -0AA0**	3.1
107	2210	0	79	152	107	50	0	65	87	107	9	3	31	**2LC0330-1A ■ ■ ■ -0AA0**	6.2
130	4020	0	96	178	129.5	62	0	82	108	129.5	17	3	41	**2LC0330-2A ■ ■ ■ -0AA0**	9.5
156	6600	0	116	213	156	76	0	100	130	156	17	5	49	**2LC0330-3A ■ ■ ■ -0AA0**	17
181	11000	0	134	240	181	90	0	116	153	181	19	5	57	**2LC0330-4A ■ ■ ■ -0AA0**	24.5
211	19200	0	156	280	211	105	0	137	180	211	23	6	67	**2LC0330-5A ■ ■ ■ -0AA0**	41
250	30680	0	184	318	249.5	120	0	164	214	249.5	24	6	75	**2LC0330-6A ■ ■ ■ -0AA0**	58
274	43550	80	202	347	274	135	80	178	233	274	29	8	86	**2LC0330-7A ■ ■ ■ -0AA0**	76
307	61750	90	228	390	307	150	90	198	260	307	32	8	95	**2LC0330-8A ■ ■ ■ -0AA0**	110
333	87100	100	247	425.5	332.5	175	100	216	283	332.5	39	8	111	**2LC0331-0A ■ ■ ■ -0AA0**	150
364	117000	120	270	457	364	190	120	242	312	364	46	8	122	**2LC0331-1A ■ ■ ■ -0AA0**	170
424	162500	150	313	527	423.5	220	150	288	371	423.5	43	10	136.5	**2LC0331-2A ■ ■ ■ -0AA0**	270

Variant:	• A	**V**	
	• B	**W**	
∅D1:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**

VA = S – 2 · VA1

Mass moments of inertia on request.

Weights apply to either coupling 1 or 2 with maximum bores, without intermediate shaft.
Maximum speed, limited by weight and critical speed of intermediate shaft, on request.

Ordering example:
Coupling 1:
ZAPEX ZNW coupling, size 107, variant B,
Part 3: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 1: Bore 45H7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-1AW99-0AA0-Z
L1A+L13+M1A

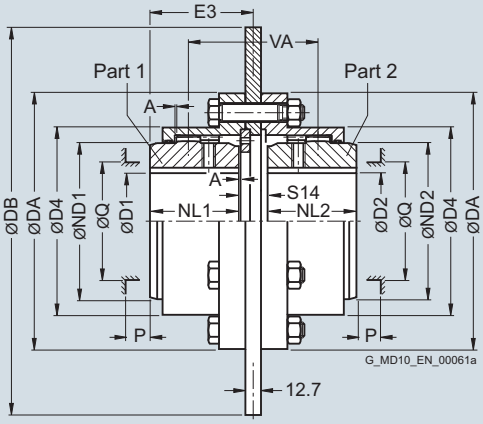
Intermediate shaft:
Intermediate shaft to ZAPEX ZNW coupling, size 107, length LW = 570 mm, shaft journal ∅45p6 x 50 long; keyway DIN 6885-1.

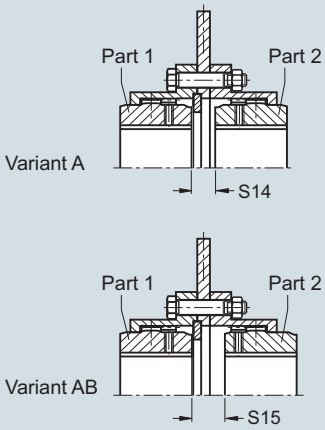
Article No.:
2LC9330-0XH00-0AA0-Z
Y99
Plain text to Y99: **DW1 = 45p6 mm, NLW1 = 50 mm, DW2 = 45p6 mm, NLW2 = 50 mm, LW = 570 mm**

Coupling 2:
ZAPEX ZNW coupling, size 107, variant B,
Part 1: Bore 45H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 3: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-0AW99-0AA0-Z
L1A+M1A+M13

Selection and ordering data





Variant limited in displacement and axial movement. Max. displacement 0.2°.

Size	Rated torque	Maxi-mum speed	Dimensions in mm												Brake disk		Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S14	S15	A	VA	Q	P	DB	E3		m
	Nm	rpm	min.	max.														kg
83	1020	3800	0	50	117	67	43	83	17	26	0.5	69	52	31	300	52	**2LC0330-0A ■ ■ ■ -0AA0**	10
107	2210	3200	0	65	152	87	50	107	20.5	26.5	0.5	76.5	68	34	356	61	**2LC0330-1A ■ ■ ■ -0AA0**	16
130	4020	3200	0	82	178	108	62	129.5	20.5	34.5	0.5	96.5	85	42	356	73	**2LC0330-2A ■ ■ ■ -0AA0**	16.5
		2800							17.5	31.5		93.5			406	71.5	**2LC0330-2A ■ ■ ■ -0BA0**	19.5
156	6600	2800	0	100	213	130	76	156	20	32	0.5	108	110	47	406	87	**2LC0330-3A ■ ■ ■ -0AA0**	29
		2500							23	35		111			457	88.5	**2LC0330-3A ■ ■ ■ -0BA0**	33
181	11000	2800	0	116	240	153	90	181	20	34	0.5	124	130	58	406	101	**2LC0330-4A ■ ■ ■ -0AA0**	38
		2500							23	37		127			457	102.5	**2LC0330-4A ■ ■ ■ -0BA0**	42
		2200							23	37		127			514	102.5	**2LC0330-4A ■ ■ ■ -0CA0**	46
211	19200	2500	0	137	280	180	105	211	24.5	41.5	0.5	146.5	150	67	457	118.5	**2LC0330-5A ■ ■ ■ -0AA0**	58
		2200							24.5	41.5		146.5			514	118.5	**2LC0330-5A ■ ■ ■ -0BA0**	63
		1850							24.5	41.5		146.5			610	118.5	**2LC0330-5A ■ ■ ■ -0CA0**	71
250	30680	2200	0	164	318	214	120	249.5	24	42	1.0	162	175	72	514	133	**2LC0330-6A ■ ■ ■ -0AA0**	77
		1850							24	42		162			610	133	**2LC0330-6A ■ ■ ■ -0BA0**	87
		1600							27	45		165			711	134.5	**2LC0330-6A ■ ■ ■ -0CA0**	97
274	43550	2200	80	178	347	233	135	274	26.5	47.5	1.0	182.5	190	81	514	149.5	**2LC0330-7A ■ ■ ■ -0AA0**	97
		1850							26.5	47.5		182.5			610	149.5	**2LC0330-7A ■ ■ ■ -0BA0**	105
		1600							29.5	50.5		185.5			711	151	**2LC0330-7A ■ ■ ■ -0CA0**	115
		1400							35.5	56.5		191.5			812	154	**2LC0330-7A ■ ■ ■ -0DA0**	130
307	61750	1850	90	198	390	260	150	307	27	51	1.0	201	220	91	610	165	**2LC0330-8A ■ ■ ■ -0AA0**	140
		1600							30	54		204			711	166.5	**2LC0330-8A ■ ■ ■ -0BA0**	155
		1400							36	60		210			812	169.5	**2LC0330-8A ■ ■ ■ -0CA0**	170
333	87100	1600	100	216	425.5	283	175	332.5	30	61	1.0	236	250	104	711	191.5	**2LC0331-0A ■ ■ ■ -0AA0**	190
		1400							36	67		242			812	194.5	**2LC0331-0A ■ ■ ■ -0BA0**	205
364	117000	1400	120	242	457	312	190	364	36	74	1.0	264	265	126	812	209.5	**2LC0331-1A ■ ■ ■ -0AA0**	235

Variant:	• A	**Q**	
	• AB	**R**	
∅D1:	• Without finished bore – Without order codes	**1**	
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**	
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)		**9**

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

Mass moments of inertia on request.

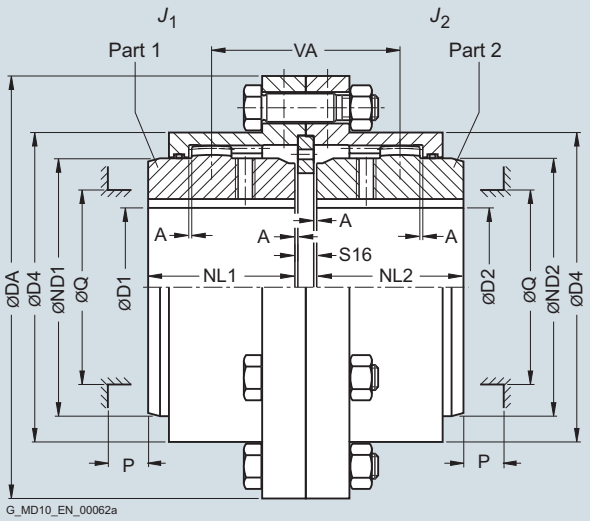
Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZNBG coupling, size 107, variant A,
brake disk diameter DB = 356 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-1AQ99-0AA0-Z
L0W+M1A+M13

Type ZNNA

Selection and ordering data



Variant limited in displacement and axial movement. Max. displacement 0.2°.

Size	Rated torque	Maximum speed	Dimensions in mm											Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S16	A	VA	Q	P	J1/J2		m
	Nm	rpm	min.	max.										kgm^2		kg
83	1020	8500	0	50	117	67	43	83	5	0.5	57	52	31	0.003	**2LC0330-0AF ■ ■ -0AA0**	3.3
107	2210	7700	0	65	152	87	50	107	6	0.5	62	68	34	0.010	**2LC0330-1AF ■ ■ -0AA0**	6.7
130	4020	6900	0	82	178	108	62	129.5	6	0.5	82	85	42	0.021	**2LC0330-2AF ■ ■ -0AA0**	10.5
156	6600	6200	0	100	213	130	76	156	9	0.5	97	110	47	0.050	**2LC0330-3AF ■ ■ -0AA0**	18
181	11000	5800	0	116	240	153	90	181	9	0.5	113	130	58	0.095	**2LC0330-4AF ■ ■ -0AA0**	26.5
211	19200	5100	0	137	280	180	105	211	11	0.5	133	150	67	0.22	**2LC0330-5AF ■ ■ -0AA0**	44
250	30680	4500	0	164	318	214	120	249.5	10	1	148	175	72	0.40	**2LC0330-6AF ■ ■ -0AA0**	62
274	43550	4000	80	178	347	233	135	274	13	1	169	190	81	0.64	**2LC0330-7AF ■ ■ -0AA0**	82
307	61750	3750	90	198	390	260	150	307	14	1	188	220	91	1.1	**2LC0330-8AF ■ ■ -0AA0**	115
333	87100	3550	100	216	425.5	283	175	332.5	14	1	220	250	104	1.8	**2LC0331-0AF ■ ■ -0AA0**	155
364	117000	3400	120	242	457	312	190	364	14	1	242	265	126	2.4	**2LC0331-1AF ■ ■ -0AA0**	185
424	162500	3200	150	288	527	371	220	423.5	18	1	271	300	140	4.9	**2LC0331-2AF ■ ■ -0AA0**	285

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

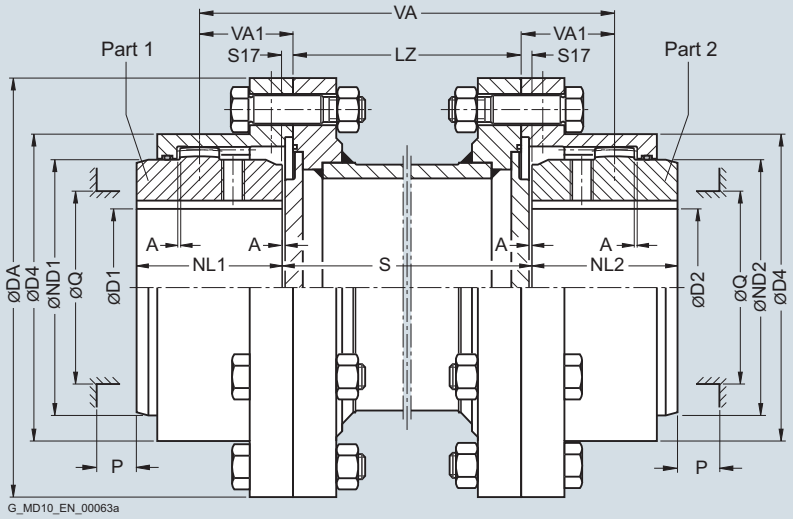
Mass moments of inertia apply to a coupling half with maximum bore diameter.

Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZNNA coupling, size 107,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article number:
2LC0330-1AF99-0AA0-Z
L0W+M1A+M13

Selection and ordering data



Variant limited in displacement and axial movement. Max. displacement 0.2°.

Size	Rated torque	Dimensions in mm												Article No. Plain text required for dimension S Order codes for bore diameters and tolerances are specified in catalog section 3	Weight	
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S17	A	VA1	Q	P	LZ		*m* each 100 mm pipe	*m*
	Nm	min.	max.										min.		kg	kg
83	1020	0	50	117	67	43	83	2.5	0.5	28.5	52	31	75	**2LC0330-0AG ■ ■ -0AZ0 Q0Y**	0.9	5.5
107	2210	0	65	152	87	50	107	3	0.5	31	68	34	85	**2LC0330-1AG ■ ■ -0AZ0 Q0Y**	0.8	12
130	4020	0	82	178	108	62	129.5	3	0.5	41	85	42	95	**2LC0330-2AG ■ ■ -0AZ0 Q0Y**	1.2	16
156	6600	0	100	213	130	76	156	4.5	0.5	48.5	110	47	110	**2LC0330-3AG ■ ■ -0AZ0 Q0Y**	2.3	28
181	11000	0	116	240	153	90	181	4.5	0.5	56.5	130	58	110	**2LC0330-4AG ■ ■ -0AZ0 Q0Y**	3.5	40
211	19200	0	137	280	180	105	211	5.5	0.5	66.5	150	67	125	**2LC0330-5AG ■ ■ -0AZ0 Q0Y**	4.5	64
250	30680	0	164	318	214	120	249.5	5	1	74	175	72	125	**2LC0330-6AG ■ ■ -0AZ0 Q0Y**	6.3	91
274	43550	80	178	347	233	135	274	6.5	1	84.5	190	81	125	**2LC0330-7AG ■ ■ -0AZ0 Q0Y**	7.2	115
307	61750	90	198	390	260	150	307	7	1	94	220	91	145	**2LC0330-8AG ■ ■ -0AZ0 Q0Y**	9.1	175
333	87100	100	216	425.5	283	175	332.5	7	1	110	250	104	145	**2LC0331-0AG ■ ■ -0AZ0 Q0Y**	12	220
364	117000	120	242	457	312	190	364	7	1	121	265	126	145	**2LC0331-1AG ■ ■ -0AZ0 Q0Y**	15	245
424	162500	150	288	527	371	220	423.5	9	1	135.5	300	140	145	**2LC0331-2AG ■ ■ -0AZ0 Q0Y**	16	360

∅D1:	• Without finished bore – Without order codes	**1**	
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")	**9**	
∅D2:	• Without finished bore – Without order codes		**1**
	• With finished bore – With order codes for diameter and tolerance (article number without "**-Z**")		**9**

VA = 2 · VA1 + LZ

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

Mass moments of inertia on request.

Weights apply to the entire coupling with maximum bores and an adapter length of LZ min.

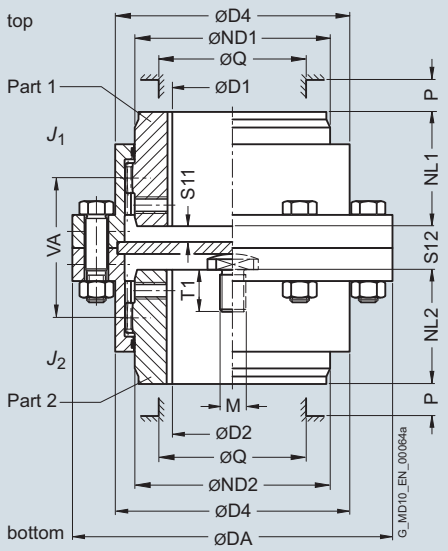
Maximum speed, limited by weight and critical adapter speed, on request.

Ordering example:
ZAPEX ZNZA coupling, size 107,
adapter for S = 250 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-1AG99-0AZ0-Z
L0W+M1A+Q0Y+M13
Plain text to Q0Y: **S = 250 mm**

Type ZNNV

Selection and ordering data



When ordering, state thread size M and thread length T1 of the thrust piece.

Size	Rated torque	Maximum speed	Dimensions in mm											Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S11	S12	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.										kgm^2		kg
83	1020	8500	0	50	117	67	43	83	8	21	55	52	31	0.003	**2LC0330-0AH ■ ■ -0AA0-Z Y99**	3.5
107	2210	7700	0	65	152	87	50	107	4.5	15	59	68	34	0.009	**2LC0330-1AH ■ ■ -0AA0-Z Y99**	6.6
130	4020	6900	0	82	178	108	62	129.5	12.5	31	79	85	42	0.023	**2LC0330-2AH ■ ■ -0AA0-Z Y99**	10.5
156	6600	6200	0	100	213	130	76	156	10.5	29	93	110	47	0.055	**2LC0330-3AH ■ ■ -0AA0-Z Y99**	17
181	11000	5800	0	116	240	153	90	181	12.5	33	109	130	58	0.10	**2LC0330-4AH ■ ■ -0AA0-Z Y99**	25.5
211	19200	5100	0	137	280	180	105	211	15	40	128	150	67	0.22	**2LC0330-5AH ■ ■ -0AA0-Z Y99**	40
250	30680	4500	0	164	318	214	120	249.5	17	42	144	175	72	0.37	**2LC0330-6AH ■ ■ -0AA0-Z Y99**	54
274	43550	4000	80	178	347	233	135	274	19.5	50	164	190	81	0.64	**2LC0330-7AH ■ ■ -0AA0-Z Y99**	87
307	61750	3750	90	198	390	260	150	307	22	56	182	220	91	1.2	**2LC0330-8AH ■ ■ -0AA0-Z Y99**	130
333	87100	3550	100	216	425.5	283	175	332.5	29	70	214	250	104	1.8	**2LC0331-0AH ■ ■ -0AA0-Z Y99**	160
364	117000	3400	120	242	457	312	190	364	36	84	236	265	126	2.6	**2LC0331-1AH ■ ■ -0AA0-Z Y99**	190
424	162500	3200	150	288	527	371	220	423.5	30	76	263	300	140	5.4	**2LC0331-2AH ■ ■ -0AA0-Z Y99**	270

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

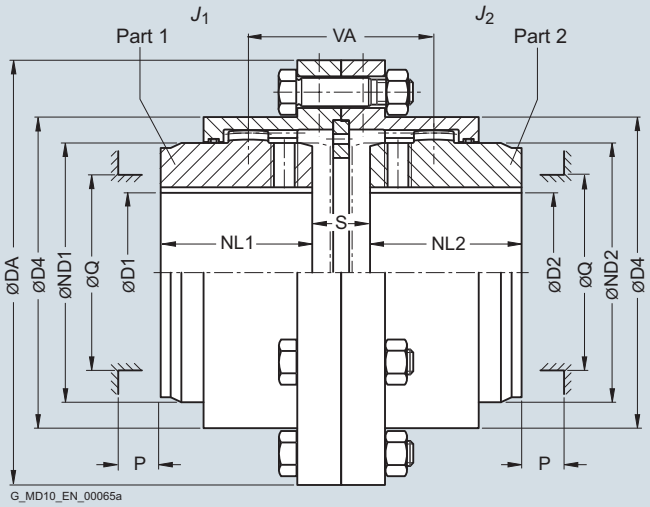
Mass moments of inertia apply to a coupling half with maximum bore diameter.

Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZNNV coupling, size 107,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw, thread M10 x 20 deep.

Article No.:
2LC0330-1AH99-0AA0-Z
L0W +M1A +M13+Y99
Plain text to Y99: **Thread M10 x 20**

Selection and ordering data



Size	Rated torque	Maximum speed	Dimensions in mm											Mass moment of inertia	Article No. Order codes for bore diameters and tolerances are specified in catalog section 3	Weight
	T_{KN}	n_{Kmax}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D4	S	S	VA	Q	P	J_1/J_2		m
	Nm	rpm	min.	max.					min.	max.				kgm^2		kg
83	1020	8500	0	50	117	67	43	83	6	21	55	52	31	0.003	**2LC0330-0AY ■ ■ -0AA0**	3.3
107	2210	7700	0	65	152	87	50	107	7	15	59	68	34	0.010	**2LC0330-1AY ■ ■ -0AA0**	6.7
130	4020	6900	0	82	178	108	62	129.5	16	31	79	85	42	0.021	**2LC0330-2AY ■ ■ -0AA0**	10.5
156	6600	6200	0	100	213	130	76	156	11	29	93	110	47	0.050	**2LC0330-3AY ■ ■ -0AA0**	18
181	11000	5800	0	116	240	153	90	181	11	33	109	130	58	0.095	**2LC0330-4AY ■ ■ -0AA0**	26.5
211	19200	5100	0	137	280	180	105	211	14	40	128	150	67	0.22	**2LC0330-5AY ■ ■ -0AA0**	44
250	30680	4500	0	164	318	214	120	249.5	12	42	144	175	72	0.40	**2LC0330-6AY ■ ■ -0AA0**	62
274	43550	4000	80	178	347	233	135	274	16	50	164	190	81	0.64	**2LC0330-7AY ■ ■ -0AA0**	82
307	61750	3750	90	198	390	260	150	307	17	56	182	220	91	1.1	**2LC0330-8AY ■ ■ -0AA0**	115
333	87100	3550	100	216	425.5	283	175	332.5	17	70	214	250	104	1.8	**2LC0331-0AY ■ ■ -0AA0**	155
364	117000	3400	120	242	457	312	190	364	17	84	236	265	126	2.4	**2LC0331-1AY ■ ■ -0AA0**	185
424	162500	3200	150	288	527	371	220	423.5	23	76	263	300	140	4.9	**2LC0331-2AY ■ ■ -0AA0**	285

∅D1:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**
∅D2:	• Without finished bore – Without order codes	**1**
	• With finished bore – With order codes for diameter and tolerance (article number without **"-Z"**)	**9**

VA Valid at S max.

Q Diameter required for renewing the sealing rings.

P Length required for renewing the sealing rings, aligning the coupling parts and tightening the set screw.

Mass moments of inertia apply to a coupling half with maximum bore diameter.

Weights apply to the entire coupling with maximum bores.

Ordering example:
ZAPEX ZNN coupling for axial displacement, size 107,
S min. = 7 mm, S max. = 15 mm,
Part 1: Bore 40H7 mm, keyway to DIN 6885-1 P9 and set screw,
Part 2: Bore 45K7 mm, keyway to DIN 6885-1 P9 and set screw.

Article No.:
2LC0330-0AY99-0AA0-Z
L0W +M1A +M13

Customized hub design for ZAPEX ZN Series

Selection and ordering data

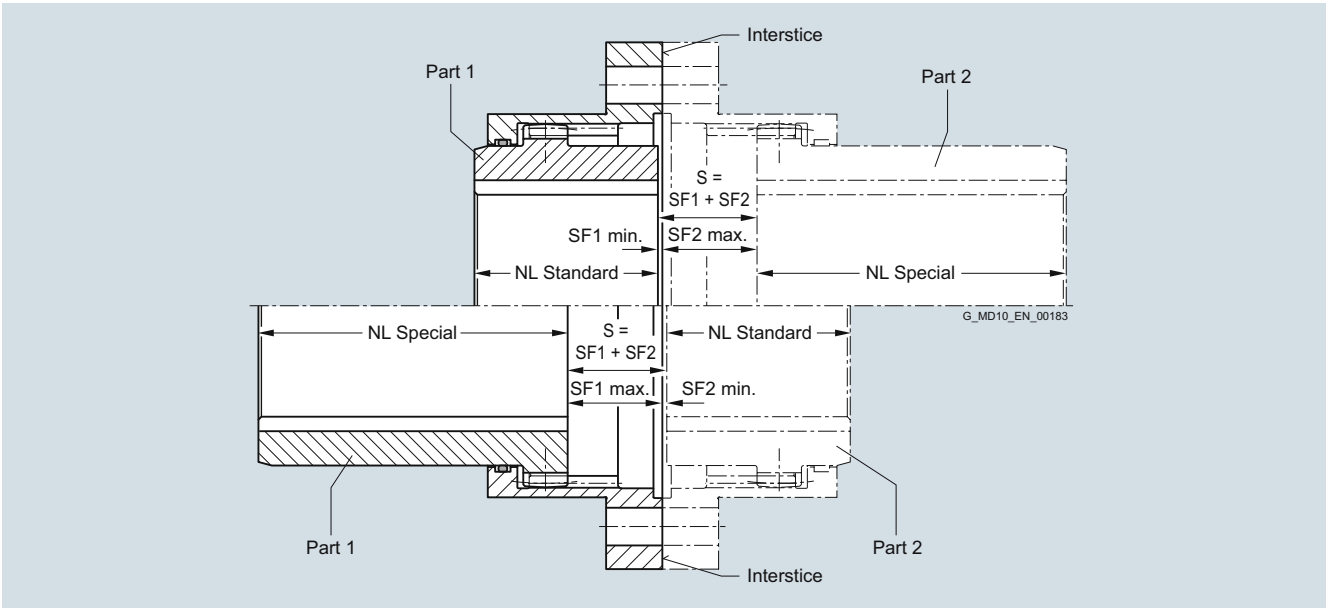
ZAPEX couplings can be provided with customized S-dimensions and hub lengths.

The entire dimension S results from the sum of the individual measurements SF1 and SF2. SF1 and SF2 are the measurements from the interstice of the coupling ring flange up to the beginning of the respective hub. As standard SF1 and SF2 are identical to each other and the entire S-dimension arises in accordance with them.

SF1 and SF2 can be chosen different on customer request, however the minimal and maximum values of the following table have to be observed. Within these limits the measurements SF1 and SF2 may be chosen freely.

The distance VA of the coupling teeth, the permitted bore diameter and the hub diameter remain unchanged.

By stating the hub S-dimension and both hub lengths the coupling is completely described.



Geometric data

Size	Standard hub lenght NL Standard mm	Minimal dimension SF1 or SF2 min. mm	Maximum dimension SF1 or SF2 max. mm
83	43	1.5	22
107	50	1.5	23.5
130	62	1.5	32
156	76	2.5	36.5
181	90	2.5	43.5
211	105	3	51
250	120	3	59
274	135	4	64.5
307	150	4	72
333	175	4	85
364	190	4	92
424	220	5	100

The minimal hub lengths are not to fall below the standard hub lengths.
If there's no other possibility, for hub lengths smaller than standard hub lengths the order codes **"Y50"** for part 1 and **"Y51"** for part 2 must be stated in plain text.

Article number

The article number of the respective ZAPEX coupling type must be supplemented with **"-Z"** and order codes for no standard SF-dimensions (order code **"Y38"** for part 1 and **"Y39"** for part 2). For no standard hub lengths the order codes **"Y40"** to **"Y49"** must be specified (see the table below).

Ordering example:
ZAPEX coupling ZNN 130, variant A
Hub left: bore D1 = 70H7 mm, keyway to DIN 6885-1 P9 and set screw; NL1 = 110 mm; SF1 = 10 mm
Hub right: bore D2 = 75H7 mm, keyway to DIN 6885-1 P9 and set screw; NL2 = 75 mm; SF2 = 25 mm

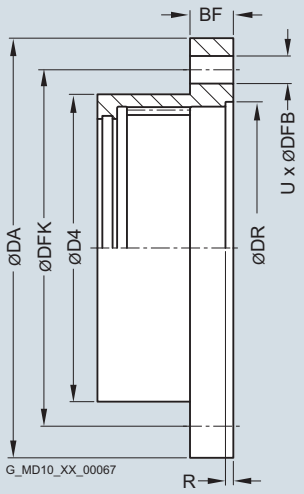
Article No.:
2LC0330-2AA99-0AA0-Z
L1G M1H Y38 Y39 Y41 Y46
Plain text to **Y38**: **SF1 = 10 mm**
Plain text to **Y39**: **SF2 = 25 mm**
Plain text to **Y46**: **NL1 = 110 mm**
Plain text to **Y41**: **NL2 = 75 mm**

Order code for hub prolongations (Y4.); Std-NL = Standard hub length

Part 1 Selected (special) hub length min.	max.	Order code
> Std-NL	≤ 1.25 · Std-NL	**Y40** (specification of hub length in plain text)
> 1.25 · Std-NL	≤ 1.5 · Std-NL	**Y42** (specification of hub length in plain text)
> 1.5 · Std-NL	≤ 1.75 · Std-NL	**Y44** (specification of hub length in plain text)
> 1.75 · Std-NL	≤ 2 · Std-NL	**Y46** (specification of hub length in plain text)
> 2 · Std-NL		**Y48** (specification of hub length in plain text)

Part 2 Selected (special) hub length min.	max.	Order code
> Std-NL	≤ 1.25 · Std-NL	**Y41** (specification of hub length in plain text)
> 1.25 · Std-NL	≤ 1.5 · Std-NL	**Y43** (specification of hub length in plain text)
> 1.5 · Std-NL	≤ 1.75 · Std-NL	**Y45** (specification of hub length in plain text)
> 1.75 · Std-NL	≤ 2 · Std-NL	**Y47** (specification of hub length in plain text)
> 2 · Std-NL		**Y49** (specification of hub length in plain text)

Selection and ordering data



Size	Dimensions in mm							
	DA	BF	D4	DFK	DFB	U Number	DR	R
83	117	14	83	100	9	6	82	2.5
107	152	19	107	131	11	6	105	3
130	178	19	129.5	157	11	8	130	3
156	213	22	156	188	13	6	153	4
181	240	22	181	213	13	10	178	4
211	280	28.5	211	249	17	8	205	5
250	318	28.5	249.5	287	17	10	243	4
274	347	28.5	274	315	17	12	265	5.5
307	390	38	307	352	21	12	302	6
333	425.5	38	332.5	385	21	14	320	6
364	457	26	364	416	21	16	353	6
424	527	28.5	423.5	482	25	16	412	8

Spare and wear parts

Selection and ordering data

Sealing rings

The sealing rings are wear parts and must be replaced in accordance with the operating instructions.

Size	Hub diameter ND1/ND2 mm	Article No.
83	67	**2LC0330-0XE00-0AA0**
107	87	**2LC0330-1XE00-0AA0**
130	108	**2LC0330-2XE00-0AA0**
156	130	**2LC0330-3XE00-0AA0**
181	153	**2LC0330-4XE00-0AA0**
211	180	**2LC0330-5XE00-0AA0**
250	214	**2LC0330-6XE00-0AA0**
274	233	**2LC0330-7XE00-0AA0**
307	260	**2LC0330-8XE00-0AA0**
333	283	**2LC0331-0XE00-0AA0**
364	312	**2LC0331-1XE00-0AA0**
424	371	**2LC0331-2XE00-0AA0**

Siemens high-performance grease (cartridge 300 g)
FFA:000000501027

Sealing compound (tube 60 ml)
FFA:000001443780

Appendix

Fits

Overview

Fitting recommendations

Description	Application	Shaft tolerance	Bore tolerance
Sliding fit with parallel key connection not suitable for reversing operation	For steel and cast hubs	j6	H7
		h6	J7
Press fit with parallel key connection not suitable for reversing operation	For steel and cast hubs	h6	K7
		k6	H7
Interference fit with parallel key connection suitable for reversing operation	For steel and cast hubs	**m6**	**H7**
		n6	H7
		h6	M7
Interference fit with parallel key connection suitable for reversing operation	Only for steel hubs Preferred for ZAPEX and ARPEX coupling series.	h6	P7
		k6	M7
		m6	K7
		n6	J7
		p6	H7
		s6	F7
Shrink fit connection without parallel key	Only for steel hubs The permitted hub tension must be urgently checked.	u6	H6
		v6	H6
		x6	H6

For many applications, the fit assignment m6/H7 is especially suitable.

Deviation table to DIN ISO 286 for above-mentioned fits for bore diameters from 10 mm to 250 mm

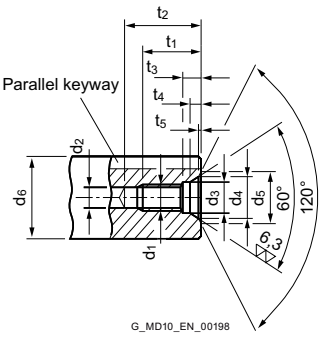
Diameter		Bore						Shaft					
		F7	**H7**	**J7**	**K7**	**M7**	**P7**	**h6**	**j6**	**k6**	**m6**	**n6**	**p6**
over	to	Deviations in µm											
10	**18**	+34	+18	+10	+6	0	-11	0	+8	+12	+18	+23	+29
		+16	0	–8	–12	–18	–29	–11	–3	+1	+7	+12	+18
18	**30**	+41	+21	+12	+6	0	–14	0	+9	+15	+21	+28	+35
		+20	0	–9	–15	–21	–35	–13	–4	+2	+8	+15	+22
30	**50**	+50	+25	+14	+7	0	–17	0	+11	+18	+25	+33	+42
		+25	0	–11	–18	–25	–42	–16	–5	+2	+9	+17	+26
50	**80**	+60	+30	+18	+9	0	–21	0	+12	+21	+30	+39	+51
		+30	0	–12	–21	–30	–51	–19	–7	+2	+11	+20	+32
80	**120**	+71	+35	+22	+10	0	–24	0	+13	+25	+35	+45	+59
		+36	0	–13	–25	–35	–59	–22	–9	+3	+13	+23	+37
120	**180**	+83	+40	+26	+12	0	–28	0	+14	+28	+40	+52	+68
		+43	0	–14	–28	–40	–68	–25	–11	+3	+15	+27	+43
180	**250**	+96	+46	+30	+13	0	–33	0	+16	+33	+46	+60	+79
		+50	0	–16	–33	–46	–79	–29	–13	+4	+17	+31	+50

Cylindrical shaft ends, extract from DIN 748 Part 1 (long)

	Diameter in mm																				
	24	**25**	**28**	**30**	**32**	**35**	**38**	**40**	**42**	**45**	**48**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
ISO tolerance zone	**k6**												**m6**									
End length in mm	50	60		80				110					140				170					210

Central holes according to DIN 332 Part 2

Recommended diameter ranges d_6 [1]		Form DS									
		d_1	**d_2** [2]	**d_3**	**d_4**	**d_5**	**t_1**	**t_2**	**t_3**	**t_4**	**t_5**
over	to						+2	min.	+1	ca.	ca.
7	**10**	M3	2.5	3.2	5.3	5.8	9	12	2.6	1.8	0.2
10	**13**	M4	3.3	4.3	6.7	7.4	10	14	3.2	2.1	0.3
13	**16**	M5	4.2	5.3	8.1	8.8	12.5	17	4	2.4	0.3
16	**21**	M6	5	6.4	9.6	10.5	16	21	5	2.8	0.4
21	**24**	M8	6.8	8.4	12.2	13.2	19	25	6	3.3	0.4
24	**30**	M10	8.5	10.5	14.9	16.3	22	30	7.5	3.8	0.6
30	**38**	M12	10.2	13	18.1	19.8	28	37	9.5	4.4	0.7
38	**50**	M16	14	17	23	25.3	36	45	12	5.2	1.0
50	**85**	M20	17.5	21	28.4	31.3	42	53	15	6.4	1.3
85	**130**	M24	21	25	34.2	38	50	63	18	8	1.6
130	**225**	M30 *)	26.5	31	40.2	44.6	60	77	22	8	1.9
225	**320**	M36 *)	32	37	49.7	55	74	93	22	11	2.3
320	**500**	M42 *)	37.5	43	60.3	66.6	84	105	26	15	2.7

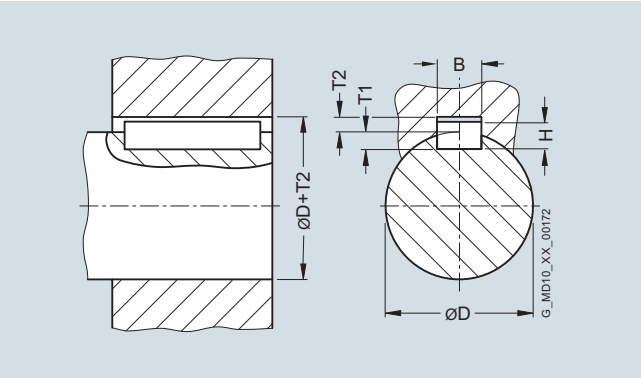


Form DS (with thread) DIN 332/2

*) Dimensions not acc. to DIN 332 Part 2.
1) Diameter refers to the finished workpiece.
2) Tap hole drill diameter according to DIN 336 Part 1.

Overview

Parallel key connections to DIN 6885-1



For moderate operating conditions, the hub keyway tolerance JS9 is recommended.

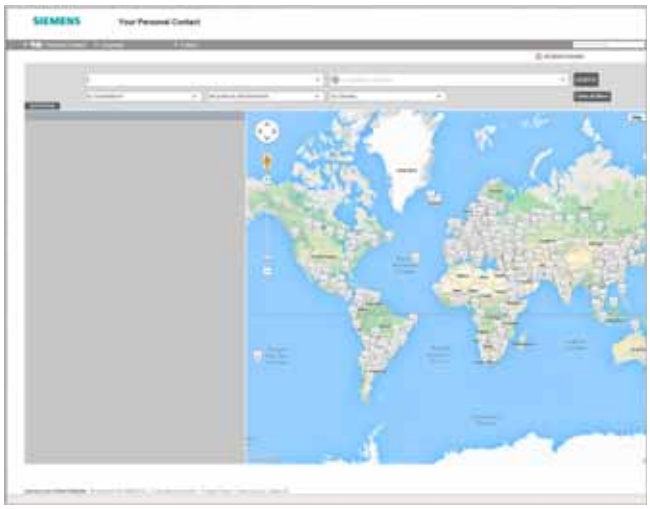
In harsh operating conditions or during reversing operation, the keyway width tolerance P9 must be preferred.

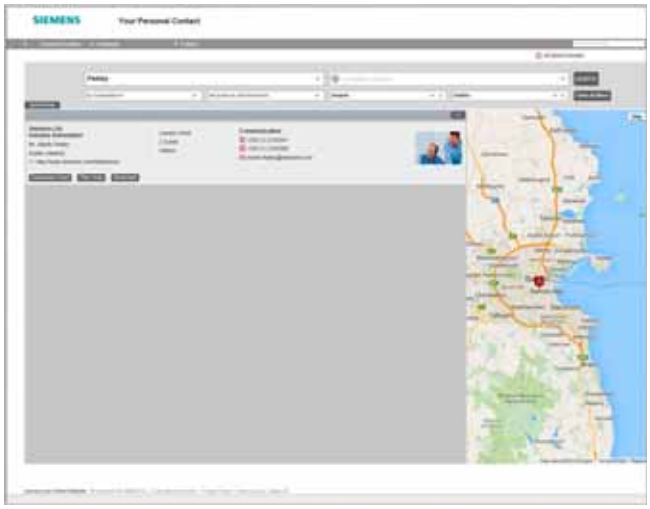
With two parallel keyways, the keyway width tolerance JS9 should be specified in order to simplify the assembly.

The shaft keyway width has to be specified with the tolerance N9.

Diameter		Keyway width	Parallel key height	Shaft keyway depth	Hub keyway depth	Deviation for shaft and hub keyway depth	Deviation table for keyway width B	
over	to							
D		B	H	T1	T2		JS9	P9
mm	mm	mm	mm	mm	mm	mm	µm	µm
	10	3	3	1.8	1.4	+0.1	+12.5	–6
							–12.5	–31
10	**12**	4	4	2.5	1.8	+0.1	+15	–12
							–15	–42
12	**17**	5	5	3	2.3	+0.1	+15	–12
							–15	–42
17	**22**	6	6	3.5	2.8	+0.1	+15	–12
							–15	–42
22	**30**	8	7	4	3.3	+0.2	+18	–15
							–18	–51
30	**38**	10	8	5	3.3	+0.2	+18	–15
							–18	–51
38	**44**	12	8	5	3.3	+0.2	+21.5	–18
							–21.5	–61
44	**50**	14	9	5.5	3.8	+0.2	+21.5	–18
							–21.5	–61
50	**58**	16	10	6	4.3	+0.2	+21.5	–18
							–21.5	–61
58	**65**	18	11	7	4.4	+0.2	+21.5	–18
							–21.5	–61
65	**75**	20	12	7.5	4.9	+0.2	+26	–22
							–26	–74
75	**85**	22	14	9	5.4	+0.2	+26	–22
							–26	–74
85	**95**	25	14	9	5.4	+0.2	+26	–22
							–26	–74
95	**110**	28	16	10	6.4	+0.2	+26	–22
							–26	–74
110	**130**	32	18	11	7.4	+0.2	+31	–26
							–31	–88
130	**150**	36	20	12	8.4	+0.3	+31	–26
							–31	–88
150	**170**	40	22	13	9.4	+0.3	+31	–26
							–31	–88
170	**200**	45	25	15	10.4	+0.3	+31	–26
							–31	–88
200	**230**	50	28	17	11.4	+0.3	+31	–26
							–31	–88
230	**260**	56	32	20	12.4	+0.3	+37	–32
							–37	–106
260	**290**	63	32	20	12.4	+0.3	+37	–32
							–37	–106
290	**330**	70	36	22	14.4	+0.3	+37	–32
							–37	–106
330	**380**	80	40	25	15.4	+0.3	+37	–32
							–37	–106
380	**440**	90	45	28	17.4	+0.3	+43.5	–37
							–43.5	–124
440	**500**	100	50	31	19.4	+0.3	+43.5	–37
							–43.5	–124

Partner at Siemens





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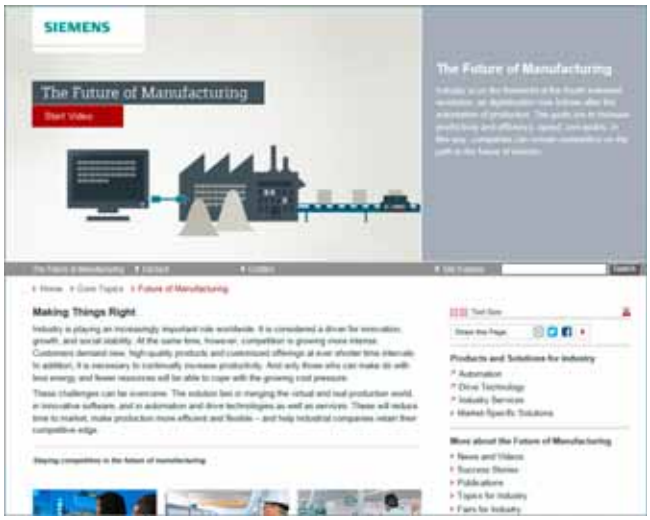

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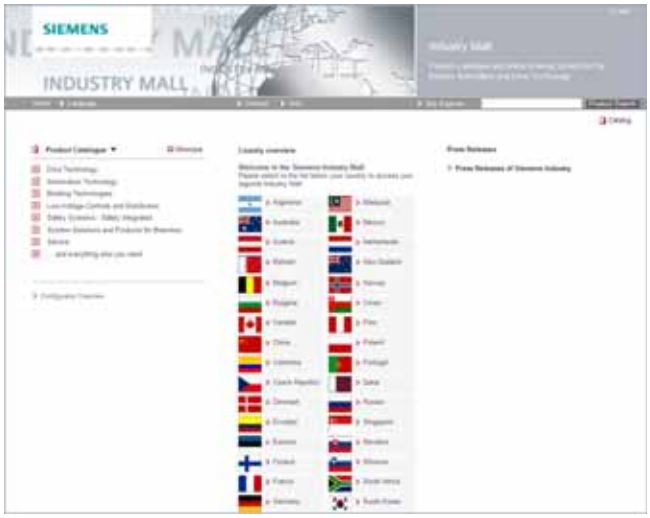

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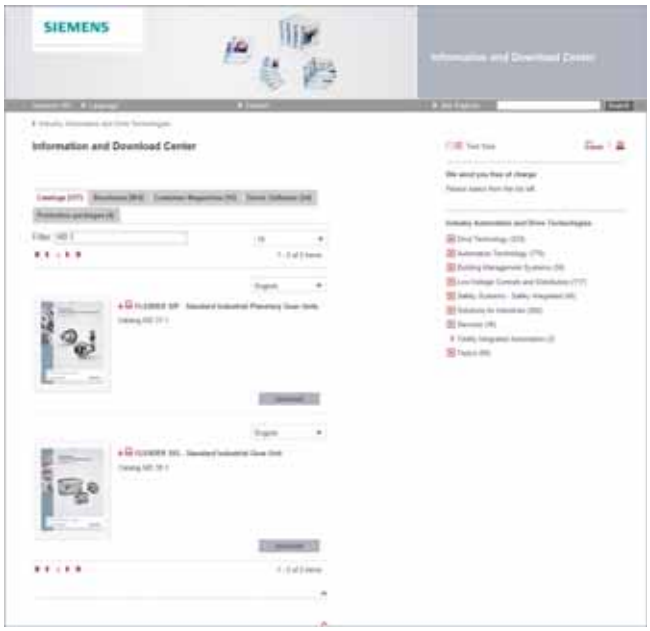

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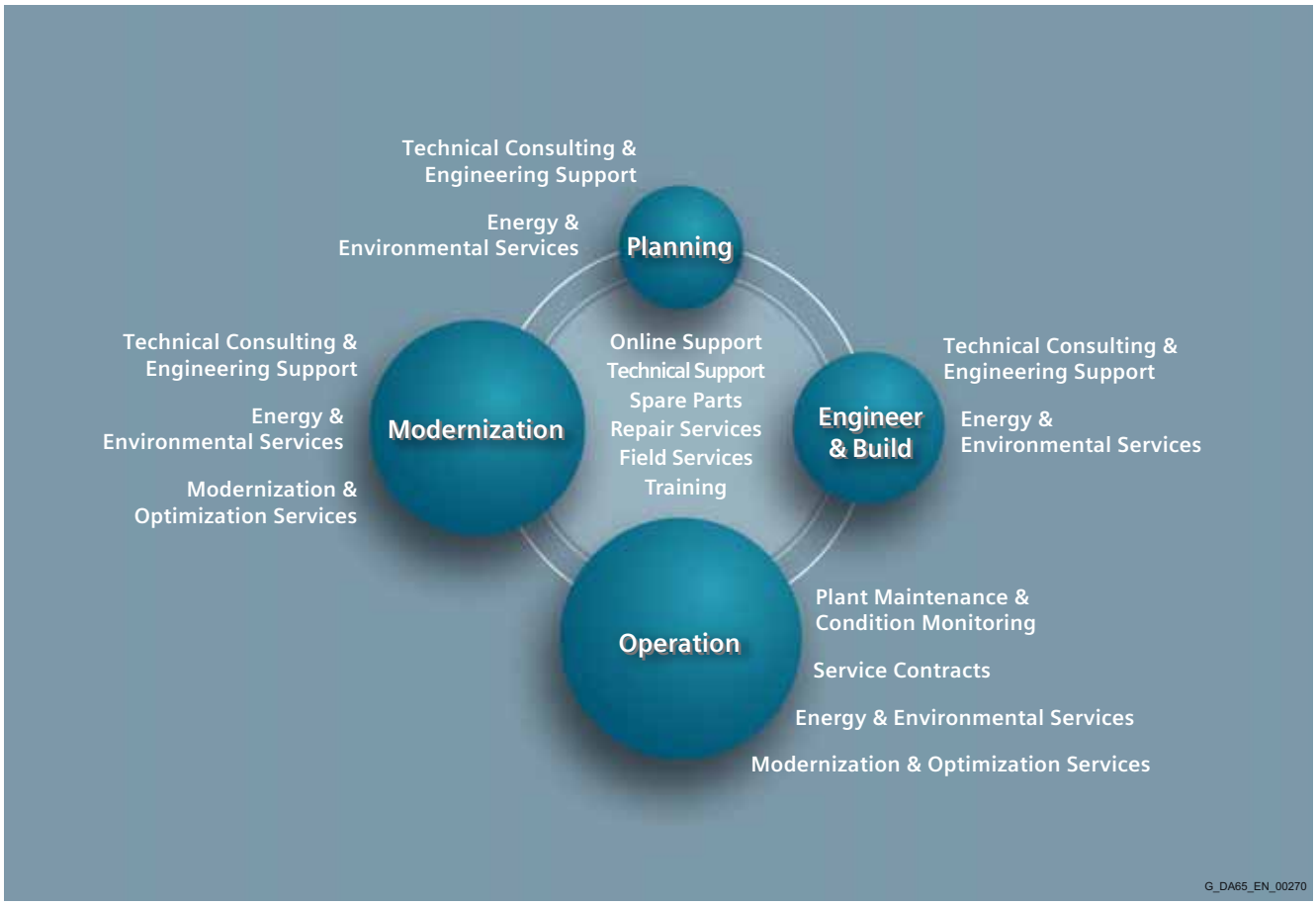

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SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1
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Digital: *SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units*	*DA 22*
SIMOVERT PM Modular Converter Systems	DA 45
SIEMOSYN Motors	DA 48
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Note: Additional catalogs on the SINAMICS drive system and SIMOTICS motors with SINUMERIK and SIMOTION can be found under Motion Control	
Low-Voltage Three-Phase-Motors	
SIMOTICS Low-Voltage Motors	D 81.1
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SIMOGEAR Geared Motors	MD 50.1
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Mechanical Driving Machines	
FLENDER Standard Couplings	MD 10.1
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Products for Weighing Technology	WT 10
Digital: *Process Analytical Instruments*	*AP 01*
Digital: *Process Analytics, Components for the System Integration*	*PA 11*

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Digital: *TÜV-certified Power Monitoring System*	*LV 14*
Components for Industrial Control Panels according to UL Standards	LV 16
3WT Air Circuit Breakers up to 4000 A	LV 35
3VT Molded Case Circuit Breakers up to 1600 A	LV 36
Digital: *SIVACON System Cubicles, System Lighting and System Air-Conditioning*	*LV 50*
Digital: *ALPHA Distribution Systems*	*LV 51*
ALPHA FIX Terminal Blocks	LV 52
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SIVACON 8PS Busbar Trunking Systems	LV 70
Digital: *DELTA Switches and Socket Outlets*	*ET D1*
Motion Control	
SINUMERIK 840D sl Type 1B Equipment for Machine Tools	NC 62
SINUMERIK 808 Equipment for Machine Tools	NC 81.1
SINUMERIK 828 Equipment for Machine Tools	NC 82
SIMOTION, SINAMICS S120 & SIMOTICS Equipment for Production Machines	PM 21
Drive and Control Components for Cranes	CR 1
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SITOP Power supply	KT 10.1
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