SELFLUBRICATING GEAR COUPLINGS



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MAIN FEATURES

The selflubricating gear couplings are an advanced technological development for this family of couplings.
The coupling is composed by a gear hub and a gear ring hub, where drag elements are interchangeable cylinders made with very high resistant selflubricating material.
The couplings may work in both rotation directions as well for reversible operation and absorb the impact generated by irregular and alternate loads.
The couplings grant the compensation of incidental little misalignments between the driving and the driven machines due to, for instance, possible unproper assembling, thermal expansion effects, the main structure elasticity, small foundation settling etc.
The particular configuration of the coupling assures to the half coupling an unlimited life because in case of breakage of drag elements no metallic parts come in contact.
The standard version of couplings are made in carbon steel C 45 UNI EN 10083/1; upon request are also available in stainless steel.
The cylindric drag elements are made in special selflubricating material and are in condition to support high working loads allowing besides axial sliding under, wich assure to the couplings a telescopic function. The couplings withstand operating temperatures from -20° a +80°C.

TYPOLOGY

The selflubricating gear couplings are designed and manufactured in different ranges to meet the requirements of the different end users applications:
- The series DNSA in 2 pieces is suggested for all application with medium low torque, but where there is the possibility of axial machines displacement for the replacement of the cylindric drag elements.
- The series DNS in 3 pieces (if the shaft lenght permits it) allows the replacement of the cylindric drag elements without displacement of the coupled machines.
The couplings shown in this catalogue represent the standard manufacturing program of , for which is granted a prompt delivery ex store.
manufactures on regular base also special version of couplings under customers specifications for particular applications. Some of these realizations are shown at pages 8÷9 of this catalogue.

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SELECTION

The proper size selection of couplings depends by several factors. First of all the choice have to be done for a coupling suitable to transmit the maximum torque necessary to suit the nominal power (installed power) of the driving machine assuming that it will be higher than the driven machine power (absorbed power). After having determined the power (HP or KW) to be transmitted as well as the related operating speed (RPM) and the suitable service factor (Fs) it is possible to select the coupling with the use of the formulas here below.
It is also necessary to check that the shaft diameters of the driving and driven machines are lower than the max allowed bore of the coupling (see Table A).

Selection of coupling based on power:

$$\text{Power} = \frac{\text{HP o KW}}{\text{RPM}} \text{ x service factor}$$

Selection of coupling based on torque:

$$\text{Torque in Nm} = \frac{\text{HP or (KW x 1.36) x 7026}}{\text{RPM}} \text{ x service factor}$$

The couplings included in this catalogue withstand a start up, or occasional overload torque, equal to 1,5 times the nominal torque and a short circuit torque equal to 3 times the nominal torque. For all applications it is foreseen a service factor as shown on the table C (table D gives service factor approximate values corresponding to the main applications).

Fs = Service factor
Fsp = Primary service factor
Ft = Thermal Factor

Fs = Fsp x Ft

Table D gives all Thermal service factor for every interval time in coupling proximity.

BALANCING

For couplings with finished bores it is carried out upon request the dinamic balancing, grade G 6.3 ISO 1940 unless otherwise specified. It is advisable to specify if the balancing has to be carried out with or without the key way. For applications with medium speed, the elastic couplings do not require the balancing operation, unless of very heavy weight.
As standard rule the elastic couplings with diameter till 100 mm at 4500 RPM, with diameter from 100 to 200 mm at 3000 RPM and with diameter of 500 mm to 1500 RPM, are delivered without the balancing operation.

SAFETY ADVICE

The couplings are manufactured according to the up to date technical know-how and supplied for safe operation. Modifications non authorised by manufacturer that can compromise the working safety, are not permitted.
The couplings must be employed only within the limit condition of the technical supply specifications and respecting the safety running rules.

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QUALITY

All products are manufactured and supplied subject to Quality Assurance procedure certified by Lloyd Register according to international standards UNI EN ISO 9001:2000. Couplings can be also manufactured according to the directive ATEX 94/9/CE.

TAB. C

Primary Service Factors	***Steam or gas turbine***	***Steam engines or water turbines***	***Diesel Engines***
Constant Torque *Centrifugal pumps* *Light conveyors* *Alternators* *Light fans*	**1,0**	**1,5**	**3,0**
Slight torque fluctuations *Machine tools* *Screw compressors* *Screw pumps* *Liquid ring compressors* *Rotary dryers*	**1,5**	**2,0**	**3,0**
Substantial torque fluctuation *Reciprocating pumps* *Low viscosity mixers* *Cranes* *Winches*	**2,0**	**2,5**	**4,0**
Exceptionally high torque fluctuations *Rotary presses* *Reciprocating compressors* *High viscosity mixers* *Marine propellers*	**3,0**	**3,5**	**5,0**

TAB. D

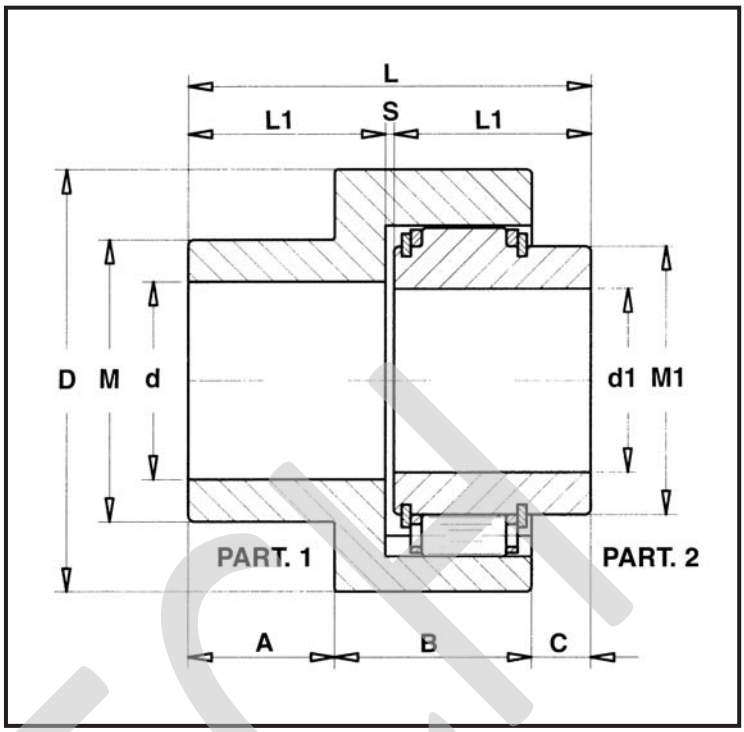
Δt Temperature range in the coupling proximity	***From -20° up to +40°***	***From +40° up to +60°***	***From +60° up to +80°***
Ft Thermal factor	**1,0**	**1,4**	**1,8**

ATTENTION! For a correct working, the couplings have to be chosen according to the data given on the above tables with a service factor suitable for the application and the working surroundings. In case of working condition modification (i.e. power, RPM, start-up frequency, modification to the driving and driven machines, coupling proximity temperature) it is necessary to verify the coupling choice.

FISATECH

Ranges DNSA

IN 2 PIECES
From ***HP 0,023*** *to* ***HP 0,28*** *at* ***1 RPM***



TAB. A

SIZE	*Nominal rating transmissible at 1 RPM*		*Nominal Torque*	D	d÷d1 min	d max	d1 max	L	L1	S	A	B	C	M	M1	PIN	
	HP/n	KW/n	Nm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	*Type*	n°
10	0,023	0,017	160	68	10	38	25	82	40	2	32	38	12	55	35	10 X 15	6
15	0,028	0,021	200	72	10	42	25	82	40	2	30	40	12	62	36	12 X 15	6
20	0,043	0,031	300	80	10	48	30	92	45	2	35	42	15	70	42	12 X 15	8
25	0,054	0,040	380	90	15	55	35	102	50	2	40	46	16	80	50	12 X 20	8
30	0,075	0,055	530	100	15	60	42	102	50	2	40	48	14	90	60	12 X 20	8
40	0,142	0,105	1000	125	15	75	50	123	60	3	48	57	18	110	75	15 X 25	8
55	0,285	0,209	2000	150	15	90	65	143	70	3	52	70	21	135	95	15 X 30	12

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Technical features

Ranges DNSA

TAB. B

COUPLING SIZE	WEIGHT IN KG. PART. 1	WEIGHT IN KG. PART. 2	INERTIA PART. 1	INERTIA PART. 2	TORSIONAL STIFFNESS Nm/rad x 10^4	AXIAL SHIFTING mm	PARALLEL MISALIGNMENT mm.	ANGULAR MISALIGNMENT	MAX SPEED RPM
10	1,3	0,4	0,0031	0,0002	0,44537	- 0 + 5	0,2	0° 30’	14000
15	1,5	0,4	0,0041	0,0003	0,56996	- 0 + 5	0,2	0° 30’	13000
20	2,0	0,6	0,0068	0,0006	1,03103	- 0 + 5	0,2	0° 30’	12000
25	2,8	0,8	0,0122	0,0012	1,83937	- 0 + 5	0,2	0° 30’	10500
30	3,5	1,2	0,0170	0,0024	2,46623	- 0 + 5	0,2	0° 30’	9500
40	6,1	2,0	0,0526	0,0066	5,86932	- 1 + 5	0,2	0° 30’	7500
55	11,0	3,8	0,1330	0,0195	15,7754	- 1 + 5	0,2	0° 30’	6300

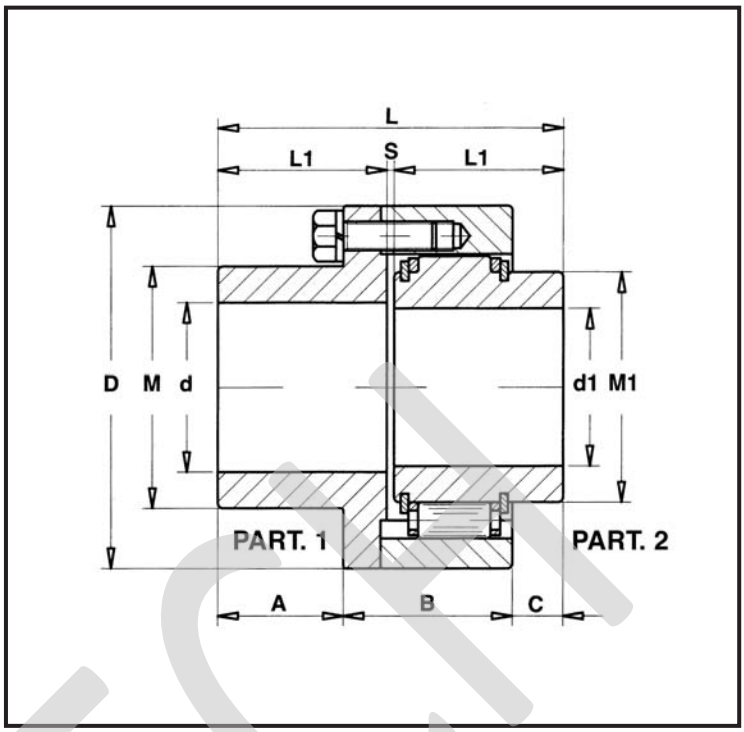
NOTES:
A - Weights are calculated with minimum bores “d ÷ d1”.
B - Inertias are calculated with solid hubs.

Figures and dimensions given in this catalogue may be varied without prior advice.

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Ranges DNS

IN 3 PIECES
*From **HP 0,023** to **HP 251,35** at **1 RPM***



TAB. A

SIZE	*Nominal rating transmissible at 1 RPM*		*Nominal Torque*	D	d÷d1 min	d max	d1 max	L	L1	S	A	B	C	M	M1	PIN	
	HP/n	KW/n	Nm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	*Type*	n°
10	0,023	0,017	160	68	10	28	25	82	40	2	32	38	12	40	35	10 X 15	6
15	0,028	0,021	200	72	10	30	25	82	40	2	30	40	12	42	36	12 X 15	6
20	0,043	0,031	300	80	10	35	30	92	45	2	35	42	15	50	42	12 X 15	8
25	0,054	0,040	380	90	15	40	35	102	50	2	40	46	16	58	50	12 X 20	8
30	0,075	0,055	530	100	15	45	42	102	50	2	40	48	14	65	60	12 X 20	8
40	0,142	0,105	1000	125	15	60	50	123	60	3	48	57	18	85	75	15 X 25	8
55	0,285	0,209	2000	150	15	70	65	143	70	3	52	70	21	100	95	15 X 30	12
65	0,569	0,418	4000	200	35	90	85	165	80	5	60	80	25	130	120	25 X 30	12
80	0,783	0,576	5500	225	35	110	100	205	100	5	75	87	43	155	140	25 X 30	12
95	1,352	0,994	9500	265	35	135	120	228	110	8	80	100	48	190	170	30 X 35	12
110	2,206	1,622	15500	290	35	150	135	258	125	8	95	108	55	215	195	30 X 40	16
120	2,775	2,041	19500	320	75	165	155	290	140	10	105	125	60	235	220	30 X 45	16
140	3,914	2,878	27500	360	75	180	170	330	160	10	120	135	75	255	240	35 X 50	16
160	6,974	5,128	49000	410	75	220	200	415	200	15	150	180	85	310	280	40 X 70	16
180	11,173	8,215	78500	455	75	240	225	475	230	15	180	190	105	340	315	45 X 80	16
200	15,371	11,302	108000	505	75	275	250	515	250	15	200	200	115	390	350	50 X 90	16
220	23,769	17,477	167000	600	100	335	290	615	300	15	245	210	160	470	410	55 X 95	18
240	39,140	28,780	275000	680	100	385	340	720	350	20	285	250	185	540	480	65 X 110	18
260	58,639	43,117	412000	800	100	440	390	820	400	20	330	270	220	620	550	70 X 120	20
280	80,985	59,548	569000	910	100	510	450	920	450	20	380	275	265	720	630	80 X 125	20
300	119,98	88,223	843000	1040	100	590	515	1025	500	25	415	300	310	830	725	85 X 130	24
320	167,52	123,17	1177000	1150	100	650	585	1125	550	25	455	345	325	920	820	90 X 150	24
340	251,35	184,82	1766000	1440	100	820	740	1225	600	25	490	365	370	1150	1040	110 X 150	24

FISATECH

Technical features

Ranges DNS

TAB. B

COUPLING SIZE	WEIGHT IN KG. PART. 1	WEIGHT IN KG. PART. 2	INERTIA PART. 1	INERTIA PART. 2	TORSIONAL STIFFNESS Nm/rad x 10^4	AXIAL SHIFTING mm	PARALLEL MISALIGNMENT mm.	ANGULAR MISALIGNMENT	MAX SPEED RPM
10	1,0	0,4	0,0024	0,0002	0,44537	- 0 + 5	0,2	0° 30’	14000
15	1,1	0,4	0,0030	0,0003	0,56996	- 0 + 5	0,2	0° 30’	13000
20	1,5	0,6	0,0049	0,0006	1,03103	- 0 + 5	0,2	0° 30’	12000
25	2,1	0,8	0,0085	0,0012	1,83937	- 0 + 5	0,2	0° 30’	10500
30	2,6	1,2	0,0110	0,0024	2,46623	- 0 + 5	0,2	0° 30’	9500
40	4,7	2,0	0,0385	0,0066	5,86932	- 1 + 5	0,2	0° 30’	7500
55	8,3	3,8	0,0953	0,0195	15,7754	- 1 + 5	0,2	0° 30’	6300
65	16,7	7,2	0,3498	0,0432	44,5197	- 3 + 8	0,3	0° 30’	4750
80	26,0	12,2	0,6571	0,1368	62,9262	- 3 + 8	0,3	0° 30’	4300
95	41,8	20,2	1,4422	0,3324	123,419	- 6 + 8	0,4	0° 30’	3600
110	55,5	30,2	2,2720	0,6414	237,970	- 6 + 8	0,4	0° 30’	3300
120	72,1	39,2	3,8018	1,4667	326,123	- 8 + 10	0,4	0° 30’	3000
140	103	54,5	6,6700	1,8656	523,108	- 8 + 10	0,5	0° 30’	2650
160	174	98,4	14,570	4,6236	1400,20	- 10 + 15	0,5	0° 30’	2300
180	228	144	21,630	8,2397	2011,59	- 10 + 15	0,5	0° 30’	2100
200	325	197	39,600	14,077	3055,44	- 10 + 15	0,5	0° 30’	1800
220	544	318	92,486	31,280	5637,27	- 10 + 15	0,6	0° 30’	1600
240	817	514	177,41	67,975	10379,1	- 15 + 20	0,6	0° 30’	1400
260	1225	784	383,60	136,20	17101,7	- 15 + 20	0,6	0° 30’	1200
280	1827	1173	674,70	258,51	26901,3	- 15 + 20	0,6	0° 30’	1050
300	2705	1702	1309,6	500,45	47240,4	- 20 + 30	0,7	0° 30’	900
320	3666	2397	2178,6	893,72	73189,6	- 20 + 30	0,7	0° 30’	800
340	6146	4202	5706,6	2490,9	138493	- 20 + 30	0,7	0° 30’	600

NOTES:
A - Weights are calculated with minimum bores “d ÷ d1”.
B - Inertias are calculated with solid hubs.

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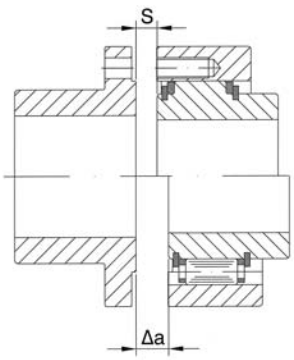
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Installation and alignment instructions of selflubricating gear couplings

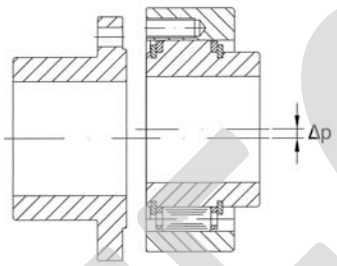
ALIGNMENT PROCEDURE

The alignment procedure will vary based on machines type. It is not expected to enter here in detail about the alignment method, but mainly to suggest the misalignment limits and to indicate the mode to control them.

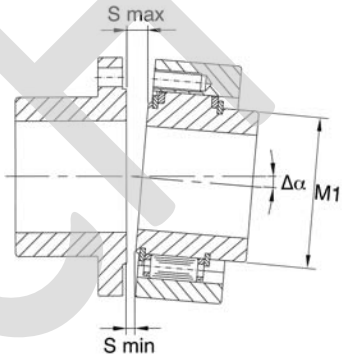
AXIAL ALIGNMENT



PARALLEL ALIGNMENT



ANGULAR ALIGNMENT



$\Delta\alpha\ (mm) = S\ max - S\ min$

$$\Delta\alpha\ (rad) = \frac{S\ max - S\ min}{M1}$$

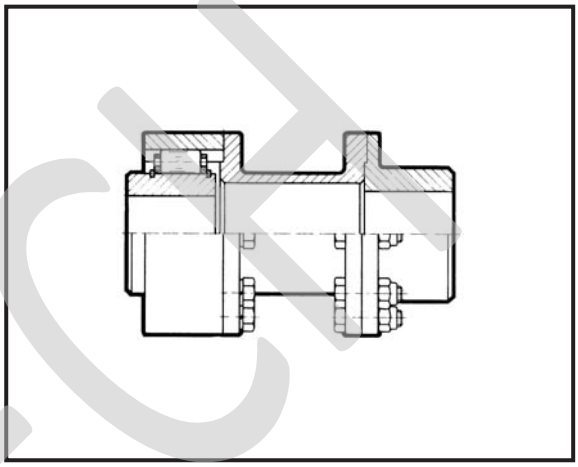
Coupling type	***Axial alignment*** **Δa mm**	***Parallel alignment*** **Δp mm**	***Angular alignment*** **Δα mm**
10	2 ⟷ 3	0,1	0,1
15			
20			
25			
30			
40	3 ⟷ 5		0,15
55			0,2
65	5 ⟷ 7	0,15	0,25
80			0,3
95	8 ⟷ 10	0,2	0,35
110			0,4
120	10 ⟷ 12		0,45
140		0,25	0,5
160	15 ⟷ 18		0,55
180			0,65
200			0,7
220		0,3	0,8
240	20 ⟷ 23		0,95
260			1,1
280			1,25
300	25 ⟷ 28	0,35	1,45
320			1,65
340			2,1

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Special applications of selflubricating gear couplings

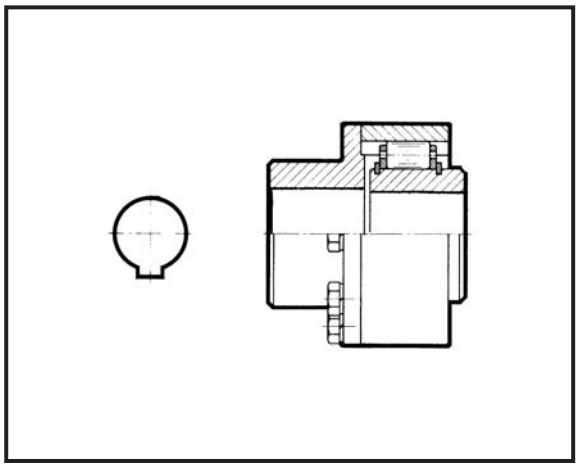
Ranges DNP

WITH SPACER FOR PUMPS



Ranges D.MEC

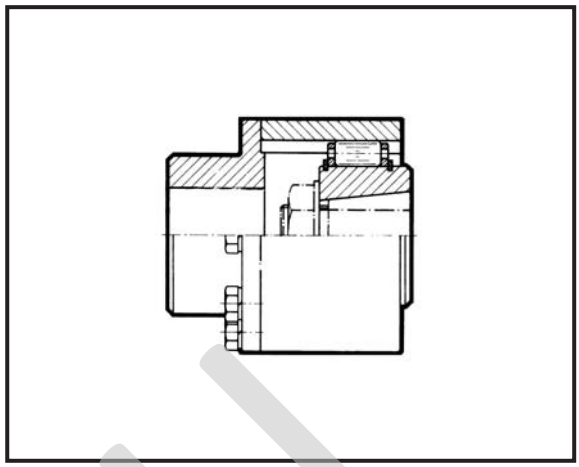
FOR "MEC"MOTORS



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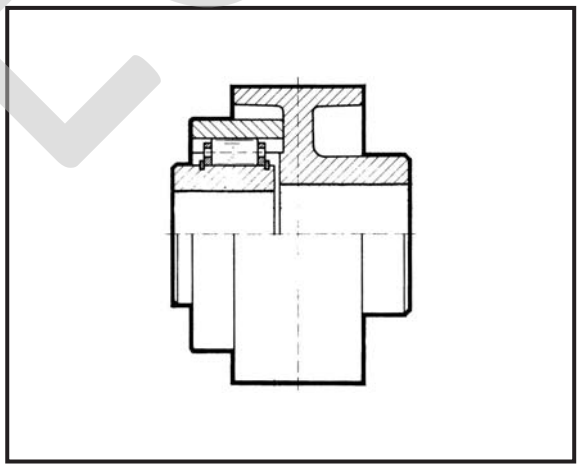
Ranges D.MILL

FOR"MILL" MOTORS



Ranges D.FF

WITH BRAKE BAND AT DIN STANDARD



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