DHSU - GHS

escosdisc High Speed disc couplings

Esco Transmissions N.V., a major European coupling manufacturer, has accumulated more than 35 years expertise in the design and manufacturing of high speed couplings, mainly for turbine and compressor drives.

In house Engineering, R & D and Manufacturing facilities are the keys to high flexibility in giving customers full satisfaction for their specific requirements.

Up to now, 4000 Esco High Speed couplings have been installed on site and our latest ESCODISC dry coupling concept opens the doors for a new era of market developments.

Specific advantage of Escodisc high speed couplings

Infinite life disc design

Disc shape optimised by Finite Element calculation (see fig. 1).

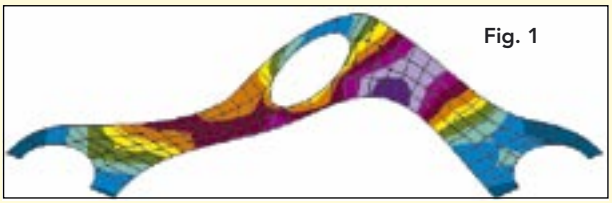


Fig. 1

All stress levels occurring at nominal or peak conditions are calculated with high safety factors (see Goodman diagram).

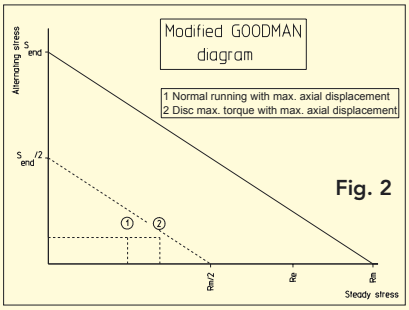


Fig. 2

Endurance stress limit based on 10^8 cycles no break tests. Disc in AISI 301 full hard steel with special surface treatment increasing the fatigue limit and the stress corrosion resistance.

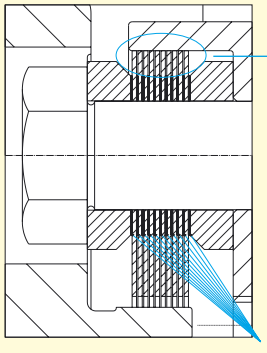


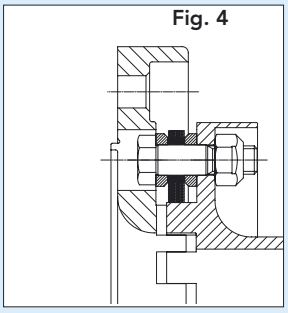
Fig. 3

Disc centering

The discs are centered by spigots to obtain a better centering of the disc-packs even after a high peak torque has been applied (see fig. 3).

No contact between discs in bending conditions (which occurs when the coupling is misaligned) to avoid fretting corrosion (see fig. 3).

Fig. 4

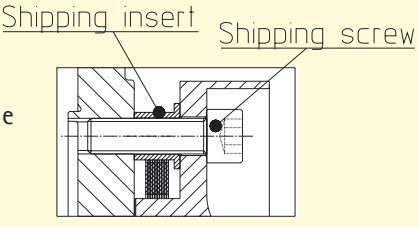


Protecting gear

For applications with very high accidental torques (short circuit of generators), the discs are protected with a special gearing allowing a better flexibility in normal conditions with a total protection in accidental conditions (see fig.4)

Shipping screws

The shipping screws and shipping inserts are used for balancing, shipment and assembly. The disc-packs are protected against plastic deformation (see fig. 5).



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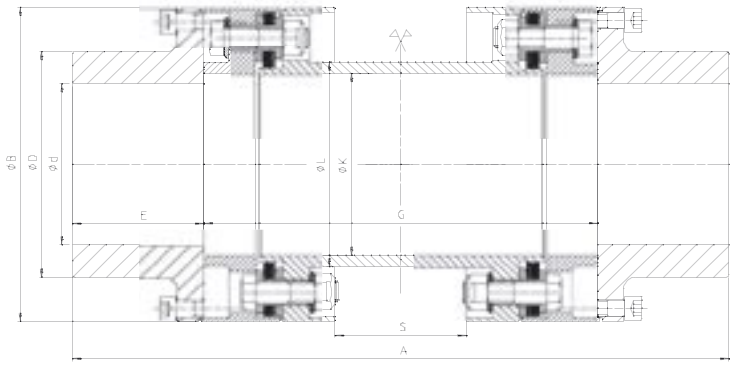
escospeed

DHSUHH 65 ⇨ 140 - STANDARD SERIE



				Type DHSUHH						
←A105				65	75	85	95	110	125	140
d Ø max		1	mm	85	95	110	125	140	160	180
1m Nm	Tn	2.1	Nm	6500	10000	14500	20000	26500	36000	55000
	Tp			8500	13000	19000	25500	38000	48000	72000
min.max.		3	tr/min omw/min rpm min^{-1}	21000	19000	17000	15000	14000	12000	10000
ΔK_w ΔK_w		12	degré graad degree grad	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25
ΔK_a		12	mm: ±	3,6	3,6	3,6	4	4	4	8
J (WR^2)	J_G	4	kgm^2	0,090	0,168	0,328	0,509	0,919	1,6	2,8
	je		kgm^2 (per m)	0,026	0,033	0,072	0,119	0,162	0,259	0,455
	P_G	5	kg	21,2	30,2	46,4	57,4	84,5	115	164
	pe		kg (per m)	11	14	17	22	24	30	41
	Rg_G		Nm/rad	1206700	1986000	2552900	3886100	5002500	6847400	10433600
	Re		$Nm/rad_{(per\ m)}$	274000	496000	742000	1237000	1683000	2680000	4711000
mm: ±	A	11	mm	340	370	420	470	550	600	650
	B		mm	170	196	222	248	273	307	344
	D		mm	119	133	154	175	196	224	252
	E		mm	60	75	85	95	110	125	140
	G	11	mm	220	220	250	280	330	350	370
	K		mm	94	111	123	142	158	180	202
	L		mm	103	121	134	154	170	193	218

J_G, P_G and Rg_G are respectively the coupling inertia, weight and torsional stiffness for minimum D.B.S.E. : G.
For others D.B.S.E.s : J_e, P_e and Rg_e are additional spacer tube inertia, weight and torsional stiffness per meter.

If D.B.S.E. > G:

$$\Rightarrow Rg = \frac{Rg_G \cdot R_e \cdot 1000}{1 \cdot Rg_G + R_e \cdot 1000}$$

$$\Rightarrow J = J_G + je \cdot \frac{\ell}{1000}$$

$$\Rightarrow P = P_G + pe \cdot \frac{\ell}{1000}$$

with ℓ = DBSE-G (DBSE) = (mm)

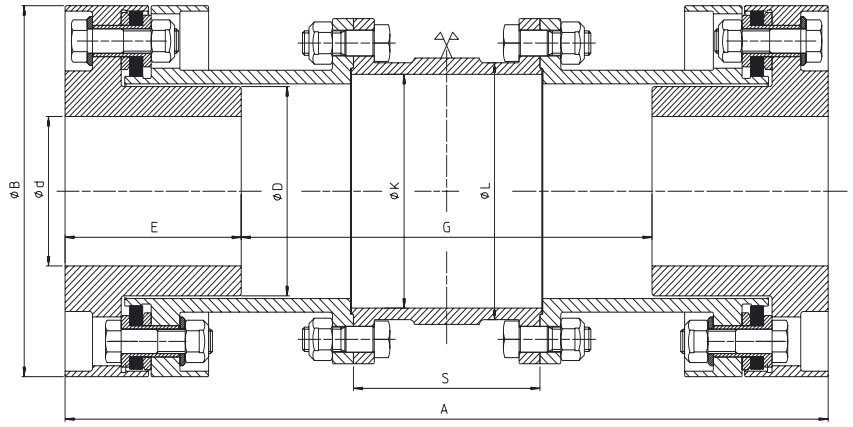
Example: DHSUHH 95, D.B.S.E. = 350 mm

$\Rightarrow \ell = 70$ mm

$$\Rightarrow Rg = \frac{3886100 \cdot 1237000 \cdot 1000}{70 \cdot 3886100 + 1237000 \cdot 1000} = 3185566 \text{ Nm/rad}$$

$$\Rightarrow J = 0{,}509 + 0{,}119 \cdot \frac{70}{1000} = 0{,}517 \text{ kgm}^2$$

$$\Rightarrow P = 57{,}4 + 22 \cdot \frac{70}{1000} = 58{,}9 \text{ kg}$$



				Type DHSURR						
←A105				65	75	85	95	110	125	140
d Ø max		1	mm	65	75	85	95	110	125	140
1m Nm	Tn	2.1	Nm	6500	10000	14500	20000	26500	36000	55000
	Tp			8500	13000	19000	25500	38000	48000	72000
min.max.		3	tr/min omw/min rpm min^{-1}	21000	19000	17000	15000	14000	12000	10000
ΔK_w ΔK_w		12	degré graad degree grad	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25	2x0,25
ΔK_a		12	mm: ±	3,6	3,6	3,6	4	4	4	8
J (WR^2)	J_G	4	kgm^2	0,075	0,137	0,270	0,418	0,767	1,257	2,133
	je		kgm^2 (per m)	0,027	0,051	0,079	0,130	0,190	0,284	0,487
	P_G	5	kg	22	28	43	55	78	102	143
	pe		kg (per m)	9	12	15	20	23	26	37
	Rg_G		Nm/rad	848600	1218100	1642800	2250000	3795700	5204800	7315000
	Re		$Nm/rad_{(per\ m)}$	455000	871000	1358000	2155000	3180000	4800000	7975000
mm: ±	A	11	mm	360	470	540	575	585	620	700
	B		mm	170	196	222	248	273	307	344
	D		mm	91	105	119	133	154	175	196
	E		mm	75	100	120	130	135	150	175
	G	11	mm	210	270	300	315	315	320	350
	K		mm	105	124	144	157	179	198	223
	L		mm	112	132	152	167	189	209	236
	S		mm	80	106	128	135	143	160	190

J_G, P_G and Rg_G are respectively the coupling inertia, weight and torsional stiffness for minimum D.B.S.E. : G.
For others D.B.S.E.s : J_e, P_e and Rg_e are additional spacer tube inertia, weight and torsional stiffness per meter.

If D.B.S.E. > G:

$$\Rightarrow Rg = \frac{Rg_G \cdot R_e \cdot 1000}{1 \cdot Rg_G + R_e \cdot 1000}$$

$$\Rightarrow J = J_G + je \cdot \frac{\ell}{1000}$$

$$\Rightarrow P = P_G + pe \cdot \frac{\ell}{1000}$$

with ℓ = DBSE-G (DBSE) = (mm)

Example: DHSURR 95, D.B.S.E. = 385 mm

$\Rightarrow \ell = 70$ mm

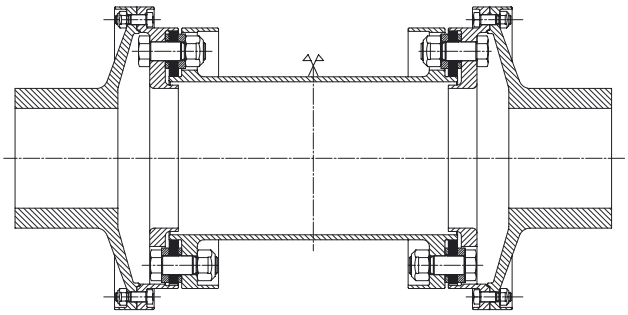
$$\Rightarrow Rg = \frac{2250000 \cdot 2155000 \cdot 1000}{70 \cdot 2250000 + 2155000 \cdot 1000} = 2096757 \text{ Nm/rad}$$

$$\Rightarrow J = 0{,}418 + 0{,}13 \cdot \frac{70}{1000} = 0{,}427 \text{ kgm}^2$$

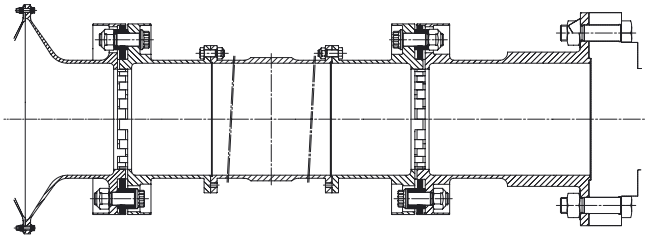
$$\Rightarrow P = 55 + 20 \cdot \frac{70}{1000} = 56{,}4 \text{ kg}$$

SPECIAL DESIGNS AVAILABLE

Enlarged bore capacity

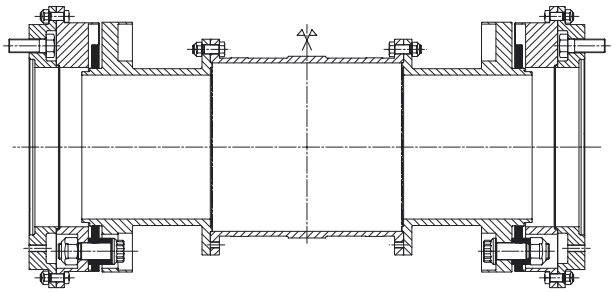


with protecting gear



G.E. LM 2500 Turbine - Load coupling

without protecting gear



G.E. 5002 Turbine - Load coupling

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escogear High Speed gear couplings

For many years, gear coupling has been the most used coupling in the gas turbine market.

The main reason was its very attractive power/weight ratio.

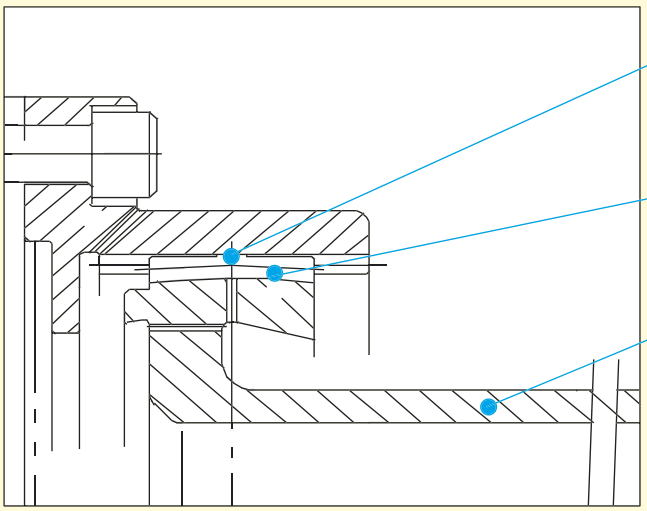
However, the last years registred technical developments in the field of all steel membrane couplings (disc and diaphragm) represent a major challenge to the gear equivalent product.

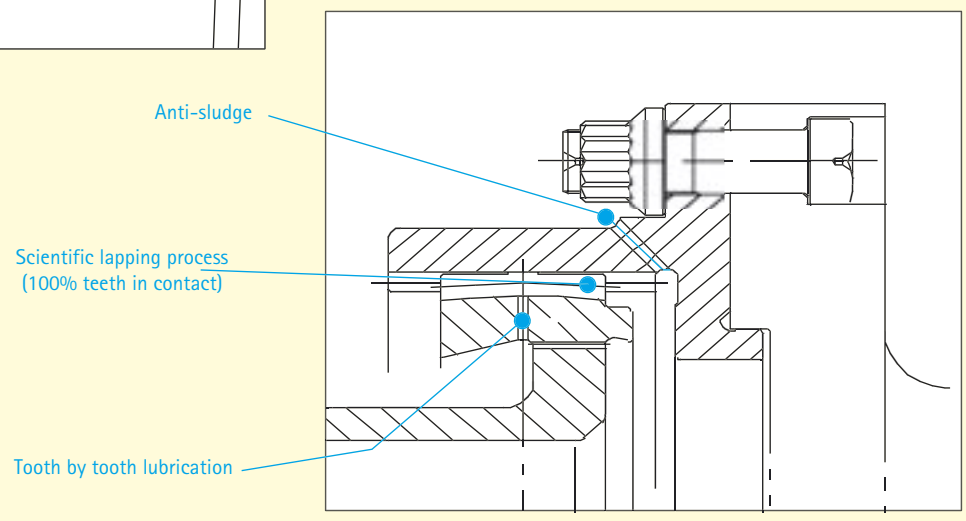
Nevertheless, gear coupling remain an unbeatable product when focusing on torque performances associated with the physical size of the product.

Esco Transmissions never stopped to invest in:

- NEW GEAR TECHNOLOGY
- NEW MATERIALS
- NEW MANUFACTURING PROCESS

And may certainly be considered as the innovative leader in high speed gear couplings





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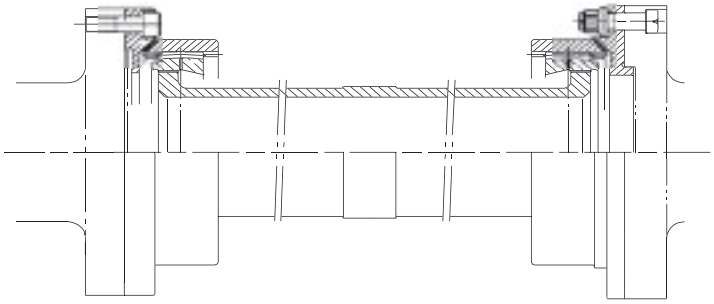
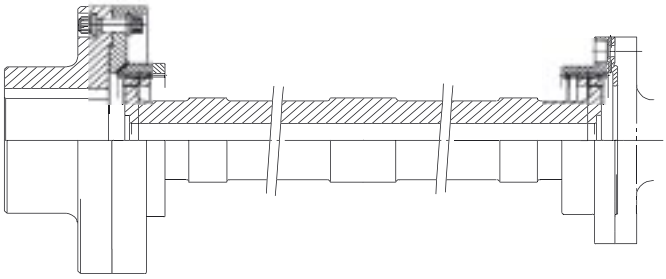
SPECIAL DESIGNS AVAILABLE

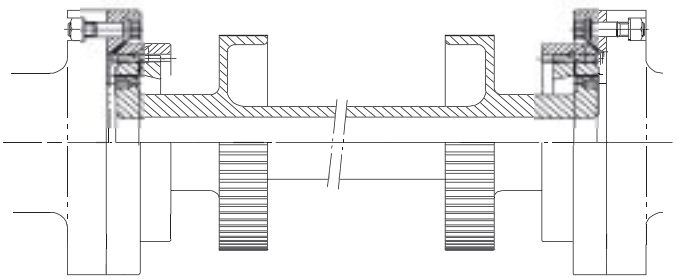
Load coupling

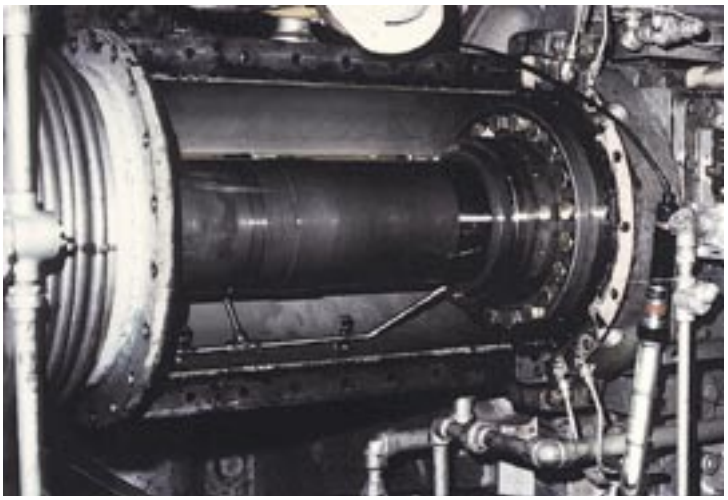


Auxiliary coupling



Torquemeter version





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High Speed Couplings

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Alstom
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Kvaerner John Brown
Ingersoll Rand
General Electric
Man
Thomassen
Turbomeca
Turbomach
Phillips Petroleum
Shell International
Arco Dubaï, etc ...

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