CST - CST...M

escogear

FLEXIBLE GEAR COUPLINGS

Index

On the Industrial World Market, there are many different kinds of couplings for rotating equipment available.
These couplings can be divided into two major categories: the **lubricated** and the **non lubricated** types; Gear type couplings, which are of course of the lubricated type, are still dominating the Industrial market.

The reasons why gear type couplings still have a leading market position are directly related to the specific requirement of the various rotating machines in the medium to heavy industries such as the steel, pulp & paper and the cement industry.

Following these requirement, a coupling must:

PRESENT: the lowest torque/weight ratio the highest available torque/max. bore ratio.

ALLOW: the combination of important angular, radial and axial misalignment, at the same time.

BE ABLE: to rotate at high rotating speeds, without vibrations. to accept the largest possible assembly options to suit the design of the driver and the driven machine.

In this case, a gear type coupling is the ideal solution.

Series NST
Torque: up to 2000 Nm
Bore: up to 65 mm

Series CST / ...M
Torque: up to 174000 Nm
Bore: up to 290 mm

Series FST
Torque: up to 5040000 Nm
Bore: up to 1130 mm

Why Escogear ?

High Torque and Misalignment capacity
Thanks to the patented escogear **Multicrown** profile (used on the C and F series), the optimised coupling design and the standard use of 12.9 quality bolts, the Escogear couplings offer the user a **very high torque capacity.**
This means that for a given torque a smaller coupling can be used which results in more efficient machine design and performance. Furthermore, this high torque is available at **important angular misalignment.**

Transparent coupling selection
The torque capacity of a gear type coupling strongly depends on the angular misalignment to which it is subjected: the higher the misalignment, the lower the torque capacity. It is clear that this relationship can and will cause problems in coupling selection because misalignment during operation is almost impossible to predict. Escogear couplings of the F and C...M type are equipped with Esco **Multicrown tooth form.** Thanks to this quite unique design, the escogear has a torque capacity that is practically independent of the angular misalignment. Therefore, coupling selection is **easy** and mistakes are avoided : long coupling life is guaranteed.

High precision Gearing
Pitch error in the gearing of coupling can strongly affect, the load distribution between the teeth can be strongly influenced. In some cases, the maximum load applied on the teeth can be twice the value of the load calculated. The consequence will be higher surface and root stresses and coupling failure might be the result. Thanks to the high precision manufacturing process and equipment on which all escogear couplings are manufactured, and the sophisticated quality control, pitch error is minimized and the best possible gear quality level and life time can be guaranteed.

Reduced backlash
One of the consequences of the **Multicrown** design is that the necessary backlash between the teeth can be reduced to an absolute minimum. This will reduce the impact loads in start/stop and reversing torque applications. As a result, the teeth can be designed with a larger section and the root stresses will be reduced. Thanks to this feature the escogear couplings are ideal for use in presses, mills, punching machines, portal cranes etc...

Perfect gear top centring
Gear type couplings require, in order to operate, a "clearance" between the top of each hub tooth and the root of the sleeve teeth. Due to this clearance, the sleeve cannot be perfectly centred on the hubs. This will create vibrations in applications where the load constantly changes from no load to full load (e.g. portal cranes). These vibrations will of course influence the operation of the connected equipment. Thanks to special design and machining techniques, Esco is able to pilot the top of each hub tooth into the root of the sleeve teeth. By doing so, the sleeve will remain perfectly centred on the hub and vibrations will be avoided. This specific feature is standard on all F and C...M couplings.

Excellent protection of components
In order to guarantee optimum operation, all escogear couplings are protected with special surface treatment or coating. All bolts are coated with Dacromet and the nuts are zinc plated which gives an excellent corrosion resistance and makes disassembly possible, even after numerous years of service life. Furthermore, all the steel components are protected with a special coating to improve their corrosion resistance.

SERIES C and C... M

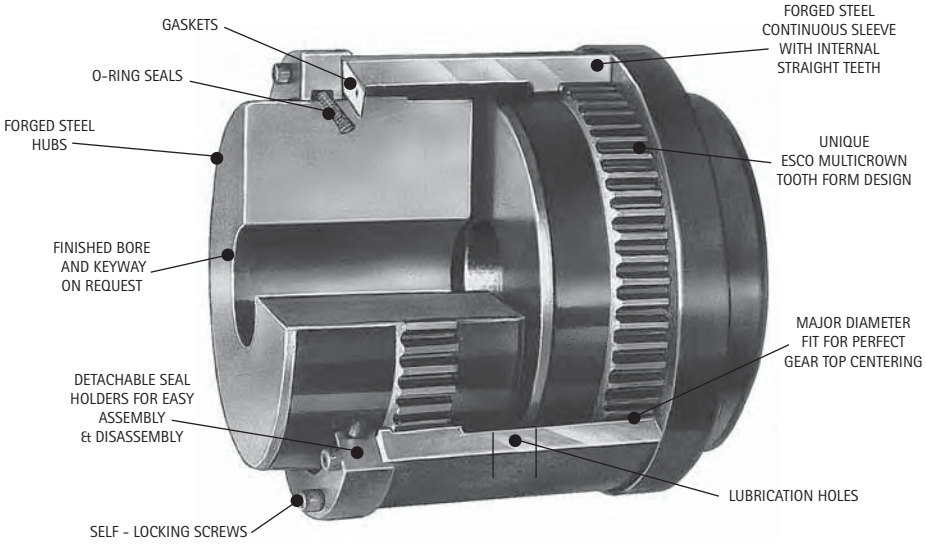
The most compact solution

Maximum torque: up to 174 000 Nm
Bores: up to 290 mm

COMPACT

SIMPLE AND ROBUST

EASY TO ASSEMBLE



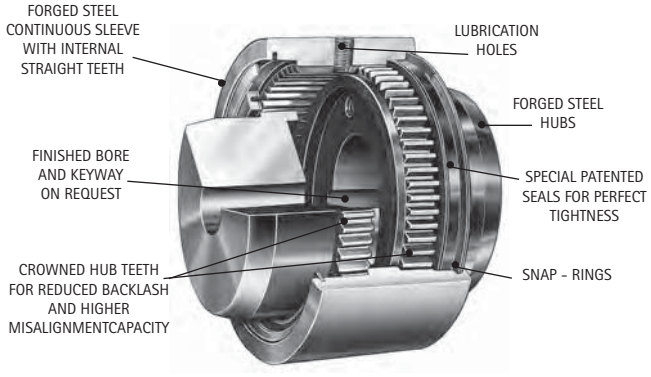
Maximum torque: up to 8 500 Nm
Bores: up to 110 mm

COMPACT

SIMPLE AND ROBUST

ONLY 7 PARTS:

Two snap rings
Two hubs and one sleeve
Two seals

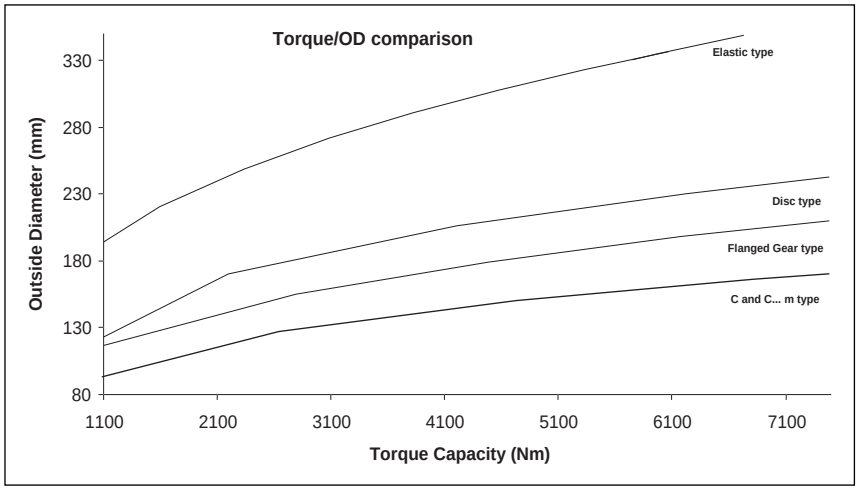


Most compact solution

Thanks to the high torque capacity and the continuous sleeve design, the escogear C and C... M couplings are the most compact answer to any transmission applications. In comparison to other types of couplings and for a given torque they have a substantly lower weight and reduced outside diameter:

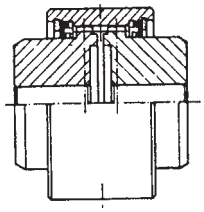
<-> Flanged Gear type : 17% smaller O.D.
<-> Disc type : 30% smaller O.D.
<-> Elastic type : 52% smaller O.D.

This compactness makes the escogear C series ideal for use in applications where space is limited and weight important

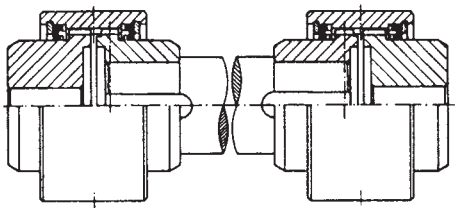


AVAILABILITIES

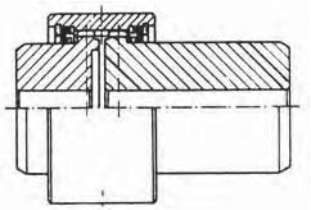
CST ← A310 STANDARD



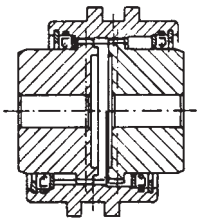
CFS - CFS... M ← A311 FLOATING SHAFT



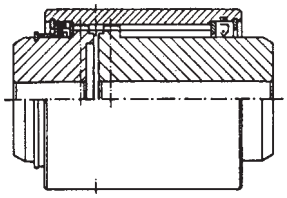
CMM ← A312 MILL MOTOR



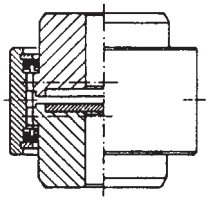
CCO ← A314 CUT-OUT



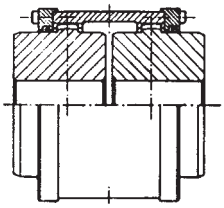
CSH ← A315 SLIDING HUB



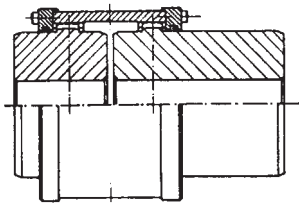
CSV ← A316 STANDARD VERTICAL



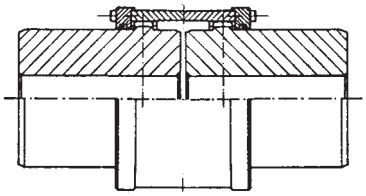
CST... M ← B310 STANDARD



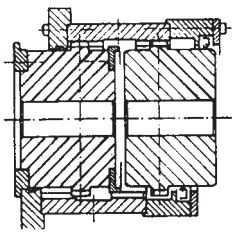
CMM... M ← B312 MILL MOTOR



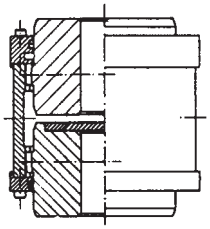
CDMM... M ← B313 MILL-MOTOR



CCO... M ← B314 CUT-OUT



CSV... M ← B316 STANDARD VERTICAL



HOW TO SELECT THE RIGHT COUPLING SIZE

A. Select the size of ESCOGEAR coupling that will accommodate the largest shaft diameter.

B. Make sure this coupling has the required torque capacity according to following formula:

$$\text{torque in Nm} = \frac{9550 \times P \times F_u \times F\,Ex}{n}$$

P = power in kW; n = speed in rpm; F_u = service factor according to tabulation 1.
F Ex = 2 in case of use in potentionally explosive atmospheres Ex , European Directive 94/9/EC. In normal atmospheres, F Ex = 1.

The coupling selected per **(A)** must have an equal or greater torque capacity than the result of the formula **(B)**. If not select a larger size coupling.
Check if application peak torque does not exceed tabulated peak torque Tp indicated planographs A310 to B317.
Check also max. allowable misalignment using the graph of tabulations 2 and 3.

C. Check if shaft/hub connection will transmit the torque. If necessary, select a longer hub.

D. Read carefully assembly and maintenance instructions IM/A300 and IM/B300.

TABULATION 1

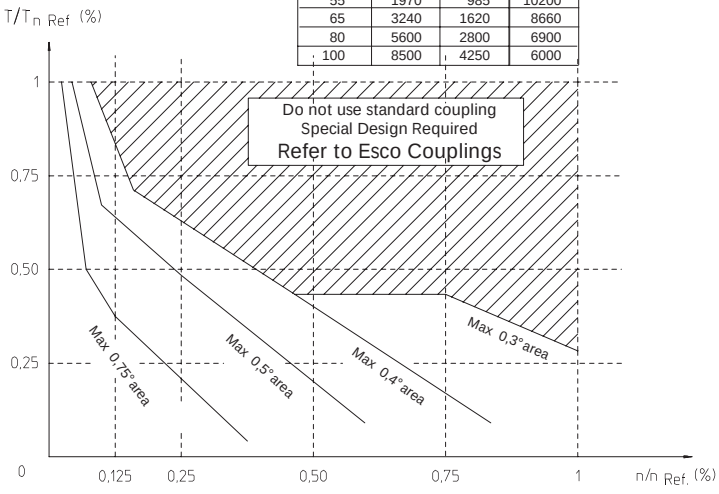
		APPLICATIONS	DRIVER MACHINE: Electric motors Turbines	DRIVER MACHINE: Hydraulic motors Gears drivers	DRIVER MACHINE: Reciprocating engine Electric motors frequent starts
			Service factor F_u		
DRIVEN MACHINE	UNIFORM	Generators - Blowers: centrifugal vane, fans - Centrifugal pumps and compressors - Machine tools: auxiliary drives - Conveyors: belt and chain, uniformly loaded, escalators - Can filling machines and bottling machinery - Agitators: pure liquids.	0,8 to 1,25	1 to 1,5	1,25 to 1,75
		Propeller - Waterjet pumps	1,25	1,5	1,75
	MODERATE SHOCKS	Blowers: lobe - Pumps: gear and lobe types - Vane compressors - Machine tools: main drives - Conveyors: belt and chain not uniformly fed bucket and screw - Elevators, cranes, tackles and winches - Wire winding machines, reels, winders (paper industry) - Agitators liquids and solids, liquids variable density.	1,25 to 1,5	1,5 to 1,75	1,75 to 2
	HEAVY SHOCKS	Generators (welding) - Reciprocating pumps and compressors - Laundry washers - Bending roll, punch press, tapping machines - Barkers, calanders, paper presses - Briquetter machines, cement furnace - Crushers: ore and stone, hammer mill, rubber mill - Metal mills: forming machines, table conveyors - Draw Bench, wire drawing and flattening machines - Road & railroad equipment.	1,5 to 2	1,75 to 2,25	2 to 2,5

1) MAXIMUM MISALIGNMENT

TABULATION 2

CST

CST Size	Tn Nm	Tn Ex Nm	n Ref min-1
30	550	275	16000
40	1100	550	13800
55	1970	985	10200
65	3240	1620	8660
80	5600	2800	6900
100	8500	4250	6000

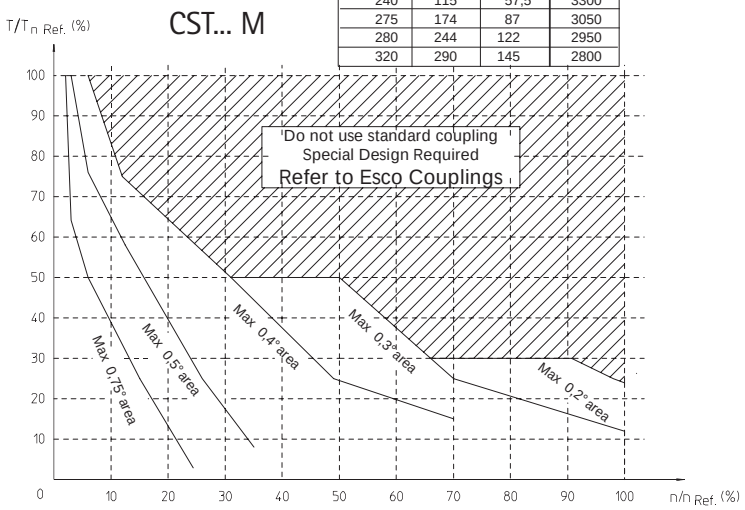


TABULATION 3

GRAPH (T, n)

CST... M

CST...M Size	Tn kNm	Tn Ex kNm	n Ref min-1
110	16	8	6050
130	22	11	5150
155	32	16	4300
175	45	22,5	3950
195	62	31	3600
215	84	42	3450
240	115	57,5	3300
275	174	87	3050
280	244	122	2950
320	290	145	2800



HOW TO USE THE GRAPH ?
Maximum torque, maximum speed and maximum misalignment may not occur simultaneously.
Graph must be used as follows:

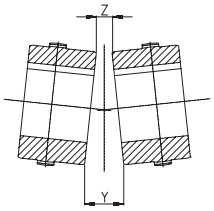
1. Calculate Tn and Tp and select coupling size as usual. Tn = nominal torque; Tp = peak torque
2. Calculate Tn/TnRef and n/nRef and plot the resulting point in the graph.
3. If the resulting point is located in the white area, a standard coupling may be used as far as maximum misalignment doesn't exceed the maximum misalignment indicated in the graph.
4. If the resulting point is located in the shaded area, refer to ESCO
5. In case of use in potentionally explosive atmospheres Ex , proceed the same way but using Tn Ref Ex for the calculation. Max misalignement may not exceed 0,5° per gear mesh.

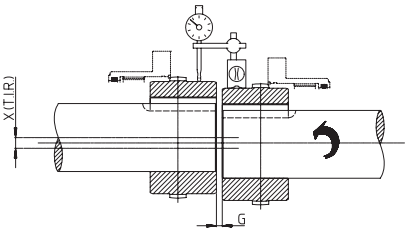
2) MINIMUM MISALIGNMENT = $\Delta K_w min = 0,1°$

3) MISALIGNMENT CONTROL

1- Measure X (TIR) - 2- Measure Y-Z - 3- Verify the relationship for the misalignment control: $\Delta K_W min \leq \frac{X}{Kx} + \frac{Y-Z}{Ky} \leq 0,75 \times \Delta K_W max$

CST...M	Kx	Ky
110	3,80	5,27
130	4,47	6,21
155	5,03	7,44
175	5,72	8,20
195	6,35	9,18
215	7,47	9,98
240	8,24	11,00
275	9,18	12,99





4) EXAMPLES:

Calculation

T/Tn ref = 30%
n/n ref = 30%
} $\Delta K_W max = 0,4°$

CST...M 175: Kx = 5,72 Ky = 8,2

Measurement

X (TIR) = 0,9 mm Y-Z = 0,4 mm

Control

Formule:

$$\Delta K_W min \leq \frac{X}{Kx} + \frac{Y-Z}{Ky} \leq 0,75 \times \Delta K_W max$$

Calculation : $0,1° \leq \frac{0,9}{5,7} + \frac{0,4}{8,2} \leq 0,75 \times 0,4$

LEGEND OF USED PICTOGRAMS	
d Ø nominal max.	MAXIMUM NOMINAL BORE (mm)
d Ø min.	MINIMUM BORE (mm)
d Ø max.	MAXIMUM BORE (mm)
Nm, 1m, Tn	MAXIMUM NOMINAL TORQUE (Nm)
Tp	MAXIMUM PEAK TORQUE (Nm)
min.max.	MAXIMUM SPEED (rpm)
	MAXIMUM OFFSET (mm)
α	MAXIMUM ANGULAR MISALIGNMENT (degree)
J (WR²)	INERTIA (kgm²)
	WEIGHT (kg)
Grease	GREASE QUANTITY (dm³)

Notes for series C / CST...M

1 For key according to ISO R 773.

2 Gear maximum continuous transmissible torque for the tabulated misalignment. The effective transmissible torque depends on the bore and shaft/hub connection.

3 Higher speed on special request.

3.1 For grease withstanding centrifugal acceleration of 1.000g. See installation and maintenance manual IM.

3.2 For grease withstanding centrifugal acceleration of 2.000g. See installation and maintenance manual IM.

3.3 Depends on S.

3.4 For long operation in disconnected position contact us.

4 For solid bore.

4.1 Depends on S.

4.2 For solid bore and S minimum.

4.3 Per 100 mm spacer length.

4.4 Depends on L and R.

5 For pilot bored hubs.

5.1 Depends on S.

5.2 For pilot bored hubs and S minimum.

5.3 Per 100 mm spacer length.

5.4 Depends on L and R.

6 See installation and maintenance manual IM.

6.1 Depends on S. Values given for S maximum.

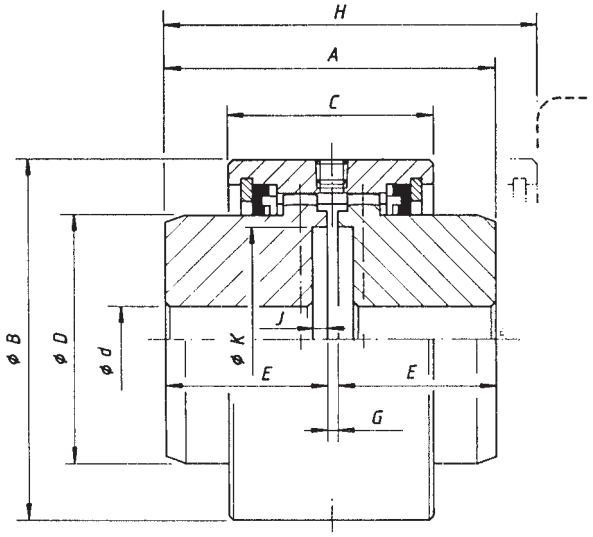
7 On request. For larger S contact us.

8 Values for S minimum. S maximum depends on torque and speed.

9 G must remain constant during operation.

10 Needed to control the alignment and inspect the gears.

* *Max. torque, speed and misalignment tabulated values may not be cumulated. See IM/A300, IM/B300.*

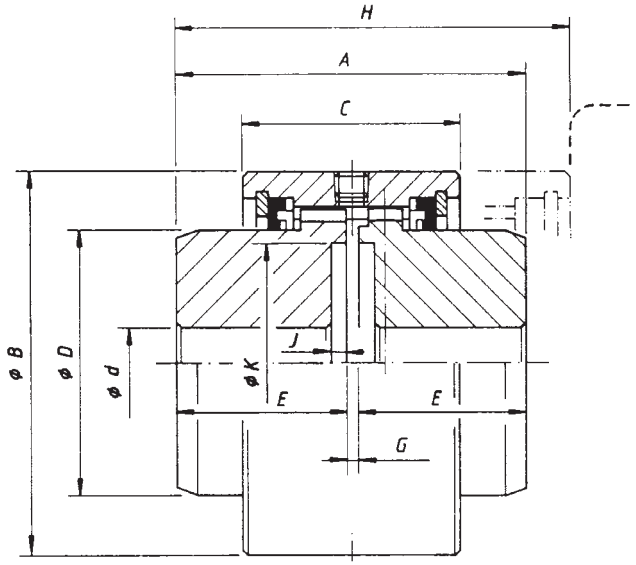


max. 1,5°

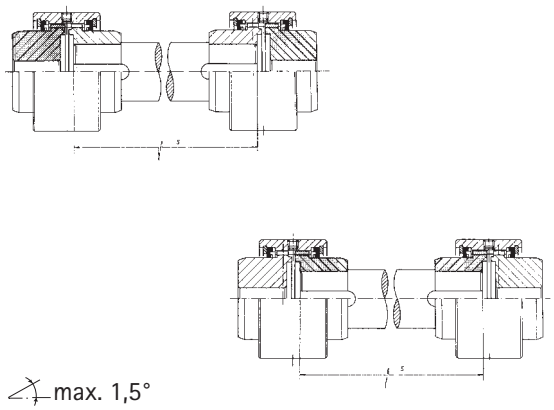
←A150				Type CST 30	40	55	65	80	100
d Ø nominal max.		1	mm	32	42	57	70	85	100
d Ø min.		1	mm	0	0	22	25	38	38
* d Ø max.		1	mm	35	42	63	75	90	110
1m Nm	Tn	2	Nm	550	1100	1970	3240	5600	8500
	Tp	2	Nm	1100	2200	3940	6480	11200	17000
min.max.		3.1	tr/min omw/min rpm min^{-1}	5500	5100	4400	4000	3600	3400
		3.2	tr/min omw/min rpm min^{-1}	7750	7200	6200	5600	5100	4800
α α		–	degré graad degree Grad	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75
		–	mm	0,1	0,14	0,14	0,19	0,22	0,23
J (WR^2)		4	kgm^2	0,002	0,004	0,010	0,022	0,052	0,122
		5	kg	2	3,4	6	9,1	15	29
Grease		6	dm^3	0,022	0,036	0,063	0,114	0,201	0,270
mm: ±	A		mm	80	95	110	120	140	222
	B		mm	84	95	120	140	168	190
	C		mm	50	65	68	80	95	102
	D		mm	50,9	60,4	82,6	100	121	143
	E		mm	38,5	46	53,5	57	67	108
	G		mm	3	3	3	6	6	6
	H		mm	96	117	124	146	175	223
	J		mm	3	5	5	6	6	6
	K		mm	49	57	76	95	121	140

* Consult us

FLEX - RIGID



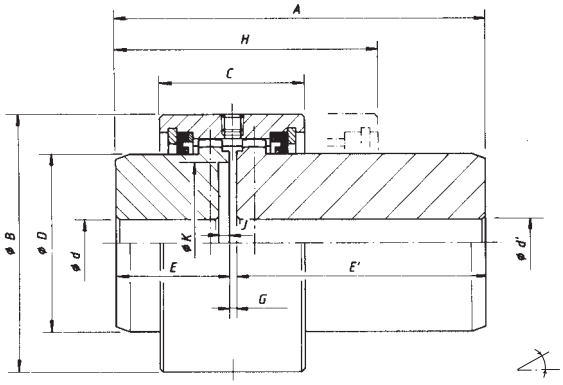
SET FLOATING SHAFT



Shaft can be supplied at demands

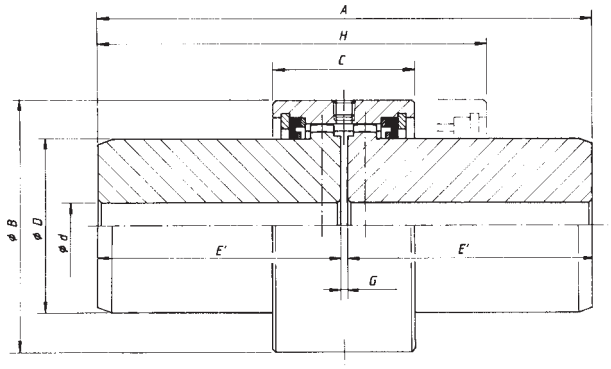
←A150				Type CFS 30	40	55	65	80	100
d Ø nominal max.		1	mm	32	42	57	70	85	100
d Ø min.		1	mm	0	0	22	25	38	38
* d Ø max.		1	mm	35	42	63	75	90	110
1m Nm	Tn	2	Nm	550	1100	1970	3240	5600	8500
1m Nm	Tp	2	Nm	1100	2200	3940	6480	11200	17000
min.max.		3.3	tr/min omw/min rpm min^{-1}						
α α		–	degré graad degree Grad	0,75	0,75	0,75	0,75	0,75	0,75
J (WR^2)		4	kgm^2	0,002	0,004	0,010	0,022	0,052	0,122
		5	kg	2	3,4	6	9,1	15	29
Grease		6	dm^3	0,022	0,036	0,063	0,114	0,201	0,270
	A		mm	80	95	110	120	140	222
	B		mm	84	95	120	140	168	190
	C		mm	50	65	68	80	95	102
	D		mm	50,9	60,4	82,6	100	121	143
	E		mm	38,5	46	53,5	57	67	108
mm: ±	G		mm	3	3	3	6	6	6
	H	10	mm	96	117	124	146	175	223
	J		mm	3	5	5	6	6	6
	K		mm	49	57	76	95	121	140
min.	S	8	mm	76	92	105	114	133	204

* Consult us



				Type CMM					
←A150				30	40	55	65	80	100
d Ø nominal max.			mm	32	42	57	70	85	100
d Ø min.		1	mm	0	0	22	25	38	38
* d Ø max.			mm	35	42	63	75	90	110
d' Ø nominal max.			mm	32	42	57	70	85	100
d' Ø min.		1	mm	0	0	0	0	40	40
* d' Ø max.			mm	35	42	63	75	90	110
Nm 1m	Tn	2	Nm	550	1100	1970	3240	5600	8500
	Tp			1100	2200	3940	6480	1120	17000
min.max.		3.1	tr/min omw/min rpm min^{-1}	5500	5100	4400	4000	3600	3400
		3.2		7750	7200	6200	5600	5100	4800
α α		–	degré graad degree Grad	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75
		–	mm	0,1	0,14	0,14	0,19	0,22	0,23
J (WR^2)		4	kgm^2	0,002	0,004	0,012	0,028	0,065	0,140
		5	kg	2,8	4,5	8,5	13,3	21,4	35,7
Grease		6	dm^3	0,022	0,036	0,063	0,114	0,201	0,270
	A		mm	136,7	150	174	193	219	279
	B		mm	84	95	120	140	168	190
	C		mm	50	65	68	80	95	102
	D		mm	50,9	60,4	82,6	100	121	143
	E		mm	38,5	46	53,5	57	67	108
	E'		mm	95,2	101	117,5	130	146	165
mm: ±	G		mm	3	3	3	6	6	6
	H	10	mm	96	117	124	146	175	223
	J		mm	3	5	5	6	6	6
	K		mm	49	57	76	95	121	140

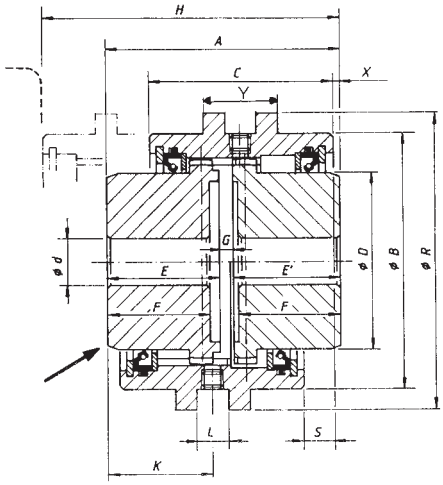
* Consult us



max. 1,5°

←A150				Type CDMM 30	40	55	65	80	100
d Ø nominal max.		1	mm	32	42	57	70	85	100
d Ø min.			mm	0	0	0	0	40	40
* d Ø max.			mm	35	42	63	75	90	110
1m Nm	Tn	2	Nm	550	1100	1970	3240	5600	8500
	Tp			1100	2200	3940	6480	11200	17000
min.max.		3.1	tr/min omw/min rpm min^{-1}	5500	5100	4400	4000	3600	3400
		3.2		7750	7200	6200	5600	5100	4800
α α		–	degré graad degree Grad	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75
		–	mm	0,1	0,14	0,14	0,19	0,22	0,23
J (WR^2)		4	kgm^2	0,003	0,005	0,015	0,033	0,078	0,158
		5	kg	3,8	8,5	11,4	18	27,6	42,2
Grease		6	dm^3	0,022	0,036	0,063	0,114	0,201	0,270
mm: ±	A		mm	193,4	205	238	266	298	336
	B		mm	84	95	120	140	168	190
	C		mm	50	65	68	80	95	102
	D		mm	50,9	60,4	82,6	100	121	143
	E'		mm	95,2	101	117,5	130	146	165
	G		mm	3	3	3	6	6	6
	H	10	mm	152	172	188	219	254	280

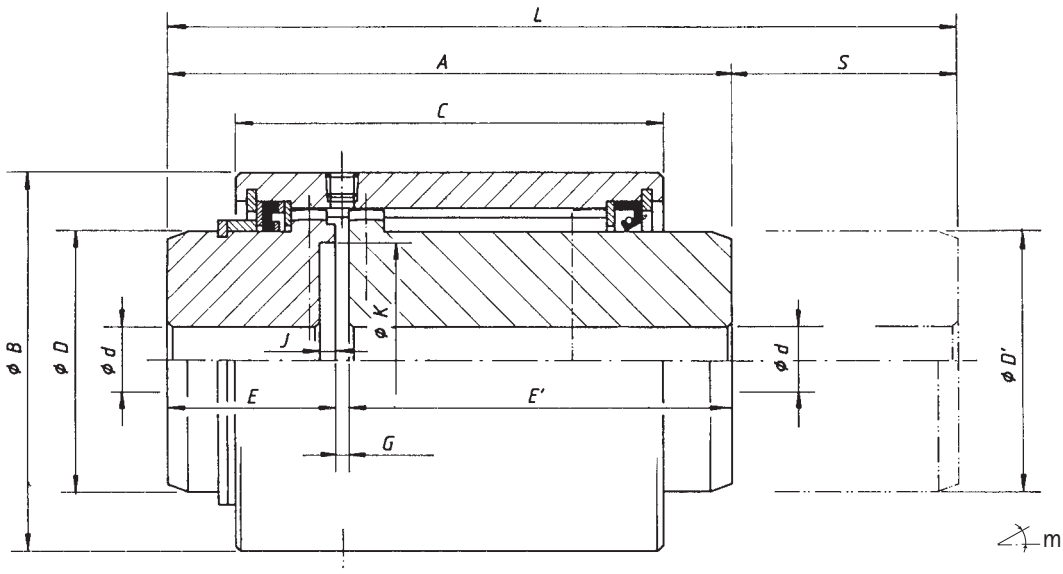
* Consult us



CE MOYEU A L'ARRET EN CONDITION DEBRAYEE
WANNEER UITGESCHAKELD STAAT DEZE NAAF STIL
THIS HUB IN STAND STILL WHEN DISCONNECTED
Im ausgeschalteten Zustand steht die Nabe still

max. 1°

				Type CCO					
←A150				30	40	55	65	80	100
d Ø max.		1	mm	32	42	57	70	85	100
Ø min.			mm	0	0	22	25	38	38
1m Nm	Tn	2	Nm	550	1100	1970	3240	5600	8500
	Tp			1100	2200	3940	6480	11200	17000
min.max.		3.4	tr/min omw/min rpm min^{-1}	4500	3800	2750	2200	1850	1600
α α		–	degré graad degree Grad	2x0,5	2x0,5	2x0,5	2x0,5	2x0,5	2x0,5
J (WR^2)		4.4	kgm^2	0,004	0,009	0,022	0,035	0,08	0,17
		5.4	kg	3,0	5,0	8,5	11,4	18,5	33
Grease		6	dm^3	0,035	0,058	0,094	0,172	0,295	0,435
	A		mm	80	94,8	110	117	139	222,5
	B		mm	84	95	120	140	168	190
	C		mm	68	87	93,5	101	111	125,5
	D		mm	50	60	82	100	120	140
	E		mm	38,5	46	53,5	57	67	108
	E'		mm	35,5	42,8	50,5	53	61	102
	F		mm	35,5	41	48,5	51	61	102
mm: ±	G		mm	6	6	6	7	11	12,5
	H		mm	125	140	155	165	195	250
	K		mm	35,5	39,5	47,5	50,5	60	101,5
max.	R		mm	120	135	170	180	215	240
max.	L		mm	30	35	40	45	45	50
	S		mm	9,5	16	14	17,5	19	20,5
	X		mm	0,9	-4,1	1,4	-1,5	4,3	37,5
	Y		mm	45	55	60	65	70	75



				Type CSH					
←A150				30	40	55	65	80	100
d Ø max.		1	mm	32	42	57	70	85	100
Ø min.			mm	0	0	22	25	38	38
1m Nm	Tn	2	Nm	550	1100	1970	3240	5600	8500
	Tp			1100	2200	3940	6480	11200	17000
min.max.		3.3	tr/min omw/min rpm min^{-1}						
α α		–	degré graad degree Grad	2x0,5	2x0,5	2x0,5	2x0,5	2x0,5	2x0,5
J (WR^2)		4.1	kgm^2						
		5.1	kg						
Grease		6.1	dm^3						
mm: ±	A	6.1	mm	109,2	117	179,5	186,2	216,2	263
	B		mm	84	95	120	140	168	190
	C	6.1	mm	83	90,5	142,5	143,5	166,5	169,5
	D		mm	50,9	60,4	82,6	100	121	143
	D'		mm	50	60	82	100	120	140
	E		mm	38,5	46	53,5	57	67	108
	E'	6.1	mm	67	67	122	125	145	150
	G		mm	3,7	4	4	4,2	4,2	5
	J		mm	3	5	5	6	6	6
	K		mm	49	57	76	95	121	140
	L	6.1	mm	139,7	141	250,9	253,5	297,2	342
max.	S	7	mm	30,5	24	71,4	67,3	81	79

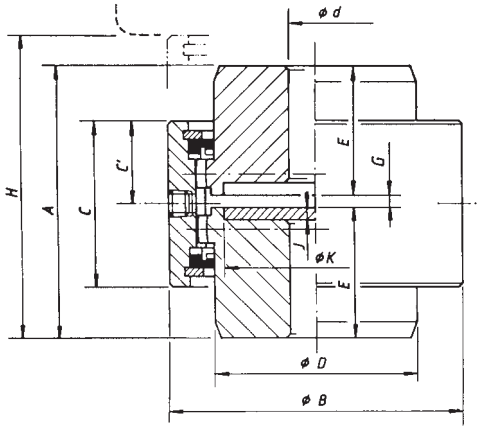
* Consult us

TAILLES SUPERIEURES A LA DEMANDE

GROTERE MODELLEN OP AANVRAAG

LARGER SIZES ON REQUEST

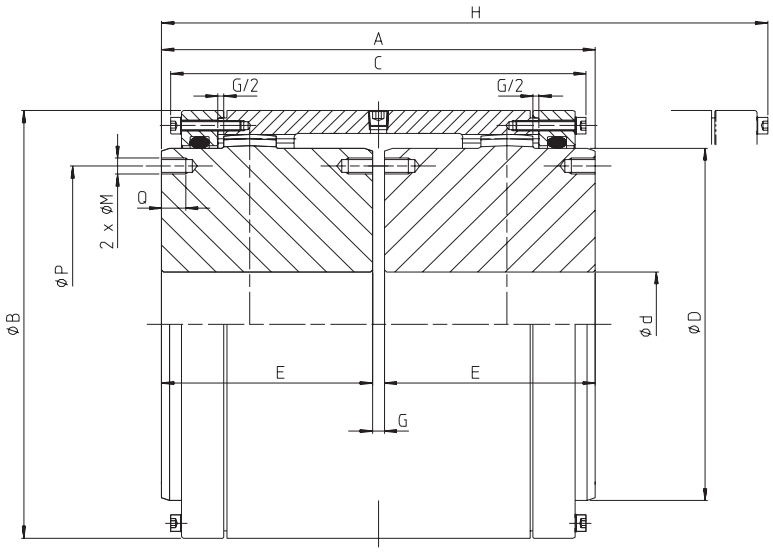
GROESSERE ABMESSUNGEN AUF ANFRAGE



max. 1°

←A150				Type CSV 30	40	55	65	80	100
d Ø nominal max.	1		mm	32	42	57	70	85	100
d Ø min.			mm	0	0	22	25	38	38
* d Ø max.			mm	35	42	63	75	90	110
Nm 1m Tn	2	Nm		550	1100	1970	3240	5600	8500
Tp				1100	2200	3940	6480	11200	17000
min.max.	3	tr/min omw/min rpm min^{-1}		5500	5100	4400	4000	3600	3400
α α	–	degré graad degree Grad		2x0,5	2x0,5	2x0,5	2x0,5	2x0,5	2x0,5
	–	mm		0,07	0,09	0,09	0,12	0,14	0,15
J (WR^2)	4	kgm^2		0,002	0,004	0,010	0,022	0,052	0,122
	5	kg		2	3,4	6	9,1	15	29
Grease	6	dm^3		0,022	0,036	0,063	0,120	0,201	0,273
	A		mm	80	95	110	120	140	222
	B		mm	84	95	120	140	168	190
	C		mm	50	65	68	80	95	102
	C'		mm	25	32,5	34	40	47,5	51
	D		mm	50,9	60,4	82,6	100	121	143
	E		mm	38,5	46	53,5	57	67	108
mm: ±	G	9	mm	3	3	3	6	6	6
	H		mm	96	117	124	146	175	223
	J		mm	3	5	5	6	6	6
	K		mm	49	57	76	95	121	140

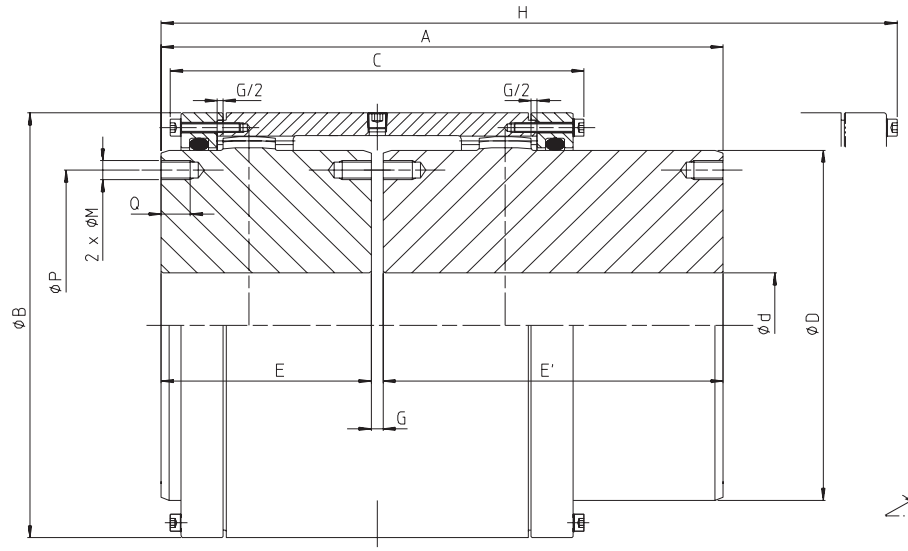
* Consult us



max. 1,5°°

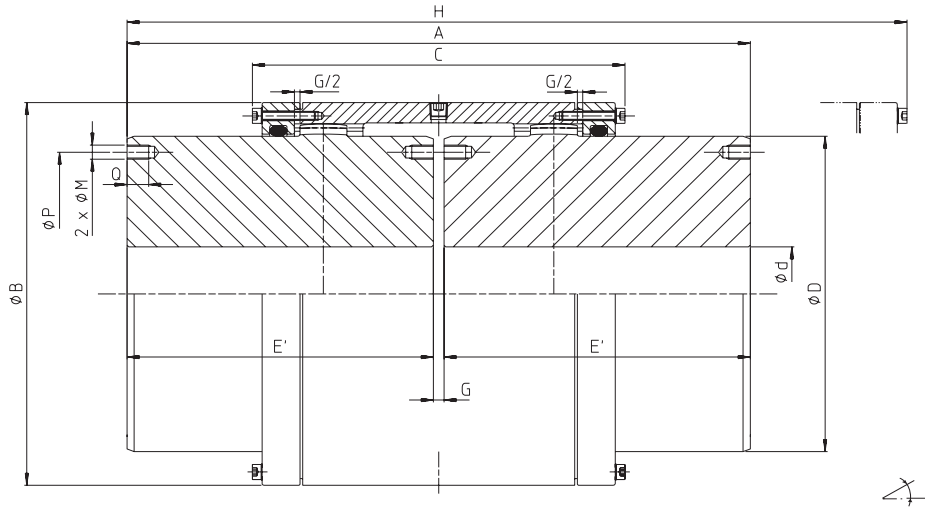
←A150				Type CST ... M							
				110	130	155	175	195	215	240	275
d Ø nominal max.			mm	110	130	155	175	195	215	240	275
d Ø min.	1		mm	0	55	65	80	90	100	120	150
* d Ø max.			mm	112	132	158	175	198	217	244	290
1m Nm Tn	2	Nm		16000	22000	32000	45000	62000	84000	115000	174000
Tp				32000	44000	64000	90000	124000	168000	230000	348000
min.max.	3.1	tr/min omw/min		3350	3100	2800	2700	2550	2450	2300	2150
	3.2	rpm min^{-1}		4700	4350	4000	3800	3600	3450	3300	3050
α α	–	degré graad degree Grad		2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75
	–	mm		0,7	0,9	1	1,1	1,2	1,4	1,5	1,7
J (WR^2)	4	kgm^2		0,159	0,340	0,735	1,25	2,19	3,49	5,33	10,90
	5	kg		35	51	81	111	153	207	262	398
Grease	6	dm^3		0,36	0,52	0,80	0,98	1,51	2,02	2,43	3,29
	A		mm	185	216	246	278	308	358	388	450
	B		mm	186	216	254	282	317	346	376	436
	C		mm	174	206	227	254	276	319	346	383
	D		mm	151	178	213	235	263	286	316	372
	E		mm	90	105	120	135	150	175	190	220
mm: ±	G		mm	5	6	6	8	8	8	8	10
	H	10	mm	313	368	415	468	516	602	657	743
	M		mm				M12	M16	M16	M16	M20
	P		mm				205	226	250	276	330
	Q		mm				18	24	24	24	30

* Consult us



←A150				Type CMM ... M							
				110	130	155	175	195	215	240	275
d Ø nominal max.			mm	110	130	155	175	195	215	240	275
d Ø min.	1		mm	0	55	65	80	90	100	120	150
* d Ø max.			mm	112	132	158	175	198	217	244	290
Tn	2	Nm		16000	22000	32000	45000	62000	84000	115000	174000
Tp				32000	44000	64000	90000	124000	168000	230000	348000
min.max.	3.1	tr/min omw/min rpm min^{-1}		3350	3100	2800	2700	2550	2450	2300	2150
	3.2			4700	4350	4000	3800	3600	3450	3300	3050
α α	–	degré graad degree Grad		2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75
	–	mm		0,7	0,9	1	1,1	1,2	1,4	1,5	1,7
J (WR^2)	4	kgm^2		0,189	0,390	0,845	1,40	2,45	3,88	6,02	12,82
	5	kg		45	63	99	130	180	240	310	491
Grease	6	dm^3		0,36	0,52	0,80	0,98	1,51	2,02	2,43	3,29
A		mm		260	281	316	343	378	433	478	580
B		mm		186	216	254	282	317	346	376	436
C		mm		174	206	227	254	276	319	346	383
D		mm		151	178	213	235	263	286	316	372
E		mm		90	105	120	135	150	175	190	220
E'		mm		165	170	190	200	220	250	280	350
mm: ± G		mm		5	6	6	8	8	8	8	10
H	10	mm		313	368	415	468	516	602	657	743
M		mm					M12	M16	M16	M16	M20
P		mm					205	226	250	276	330
Q		mm					18	24	24	24	30

* Consult us



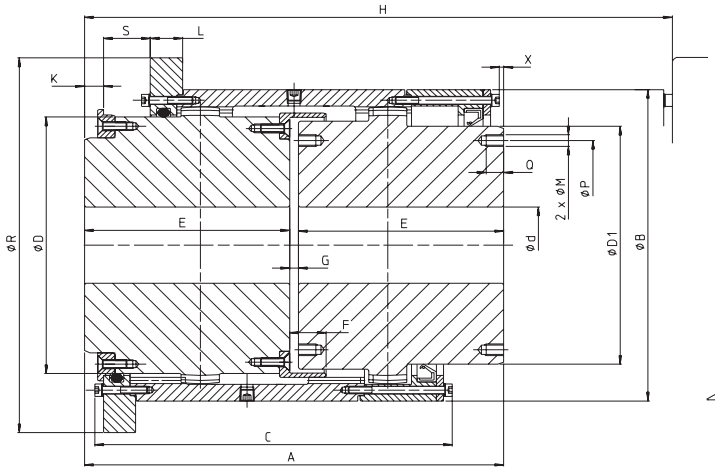
max. 1,5°

←A150				Type CDMM ... M							
				110	130	155	175	195	215	240	275
d Ø nominal max.		1	mm	110	130	155	175	195	215	240	275
d Ø min.			mm	0	55	65	80	90	100	120	150
* d Ø max.			mm	112	132	158	175	198	217	244	290
1m Nm	Tn	2	Nm	16000	22000	32000	45000	62000	84000	115000	174000
	Tp			32000	44000	64000	90000	124000	168000	232000	348000
min.max.		3.1	tr/min omw/min rpm min^{-1}	3350	3100	2800	2700	2550	2450	2300	2150
		3.2		4700	4350	4000	3800	3600	3450	3300	3050
α α		–	degré graad degree Grad	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75
		–	mm	0,7	0,9	1	1,1	1,2	1,4	1,5	1,7
J (WR^2)		4	kgm^2	0,219	0,440	0,956	1,55	2,71	4,27	6,71	14,73
		5	kg	55,7	74,4	116	150	206	273	357	584
Grease		6	dm^3	0,36	0,52	0,80	0,98	1,51	2,02	2,43	3,29
mm: ±	A		mm	335	346	386	408	448	508	568	710
	B		mm	186	216	254	282	317	346	376	436
	C		mm	174	206	227	254	276	319	346	383
	D		mm	151	178	213	235	263	286	316	372
	E'		mm	165	170	190	200	220	250	280	350
	G		mm	5	6	6	8	8	8	8	10
	H	10	mm	313	368	415	468	516	602	657	743
	M		mm				M12	M16	M16	M16	M20
	P		mm				205	226	250	276	330
	Q		mm				18	24	24	24	30

* Consult us

escogear

CCO ...M 120M ⇨ 270M

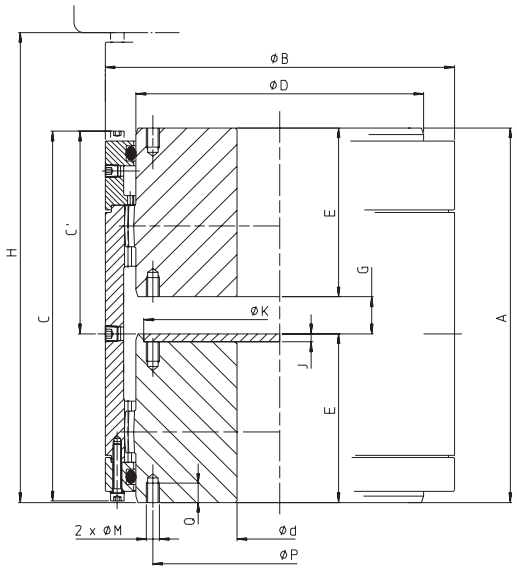


max. 1,5°

				Type CCO...M						
←A150				120	150	165	185	210	230	270
d Ø max.		1	mm	120	150	165	185	210	230	270
Ø min.			mm	55	65	80	90	100	120	150
Nm 1m	Tn	2	Nm	22000	32000	45000	62000	84000	115000	174000
	Tp			44000	64000	90000	124000	168000	230000	348000
min.max.		3.4	tr/min omw/min rpm min^{-1}	1300	1100	1000	900	800	750	620
α α		–	degré graad degree Grad	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75	2x0,75
		–	mm	0,9	1	1,1	1,2	0,9	1	1,1
J (WR^2)		4.4	kgm^2	0,433	0,924	1,59	2,69	4,28	6,42	13,22
		5.4	kg	67,2	103,6	143	193	263	328	494
Grease		6	dm^3	0,62	0,96	1,18	1,82	2,44	2,94	4,02
mm: ±	A		mm	286	316	358	388	448	488	550
	B		mm	216	254	282	317	346	376	436
	C		mm	247	272	306	332	382	417	468
	D		mm	178	213	235	263	286	316	372
	D1		mm	165	200	224	250	280	300	360
	E		mm	140	155	175	190	220	240	270
	F		mm	22	22,5	27	30	35,5	39	39,5
	G		mm	6	6	8	8	8	8	10
	H	10	mm	404	445	503	547	633	691	768
	K		mm	12	12,5	16	16	19,5	21	23,5
	R		mm	260	300	330	365	390	420	480
	L		mm	22	25	25	25	25	25	30
	M		mm			M12	M16	M16	M16	M20
	P		mm			205	226	250	276	330
	Q		mm			18	24	24	24	30
	S		mm	32	37	42	46	53	58	68
	X		mm	0,45	1	1	1	3	1	-1

escogear

CSV...M 110M ⇨ 275M



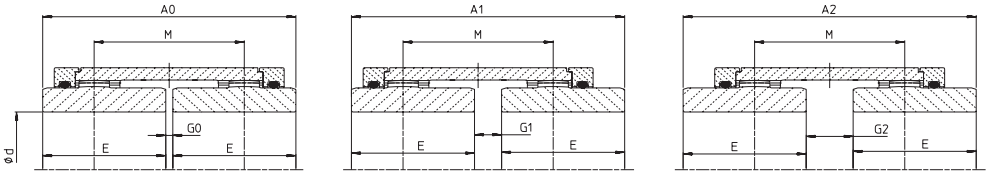
max. 1,5°

←A150				Type CSV ... M							
				110	130	155	175	195	215	240	275
d Ø nominal max.		1	mm	110	130	155	175	195	215	240	275
d Ø min.			mm	0	55	65	80	90	100	120	150
* d Ø max.			mm	112	132	158	175	198	217	244	290
1m Nm	Tn	2	Nm	16000	22000	32000	45000	62000	84000	115000	174000
	Tp			32000	44000	64000	90000	124000	168000	230000	348000
min.max.		3.1	tr/min omw/min rpm min^{-1}	3350	3100	2800	2700	2550	2450	2300	2150
		3.2		4700	4350	4000	3800	3600	3450	3300	3050
α α		–	degré graad degree Grad	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,75	2 x 0,5	2 x 0,5
		–	mm	0,7	0,9	1	1,1	1,2	0,9	1	1,1
J (WR^2)		4	kgm^2	0,159	0,340	0,735	1,25	2,19	3,49	5,33	10,90
		5	kg	35	51	81	111	153	207	262	398
Grease		6	dm^3	0,45	0,67	1,01	1,32	1,95	2,53	3,06	4,37
mm ±	A		mm	199	233	264	299	332	389	426	483
	B		mm	186	216	254	282	317	346	376	436
	C		mm	196	228	249	276	298	341	368	408
	C'		mm	109	125	135,5	149	160	181,5	195	216,5
	D		mm	151	178	213	235	263	286	316	372
	E		mm	90	105	120	135	150	175	190	220
	G	9	mm	19	23	24	29	32	39	46	43
	H	10	mm	349	408	455	508	556	642	697	786
	J		mm	5	6	6	6	6	6	6	6
	K		mm	140	165	195	224	250	274	302	356
	M		mm				M12	M16	M16	M16	M20
	P		mm				205	226	250	276	330
	Q		mm				18	24	24	24	30

* Consult us

Caractéristiques principales –Voornaamste karakteristieken – Main features – Viktiga fördelar
Charakteristische Hauptmerkmale – Caracteristicas principales – Caratteristiche principali

3 POSITIONS MOYEUX
3 NAVENPOSITIES
3 HUBS POSITIONS
3 EINBAUMÖGLICHKEITEN
3 NAVKOMBINATIONER
3 POSICIONES CUBO
3 POSIZIONI DEI MOZZI

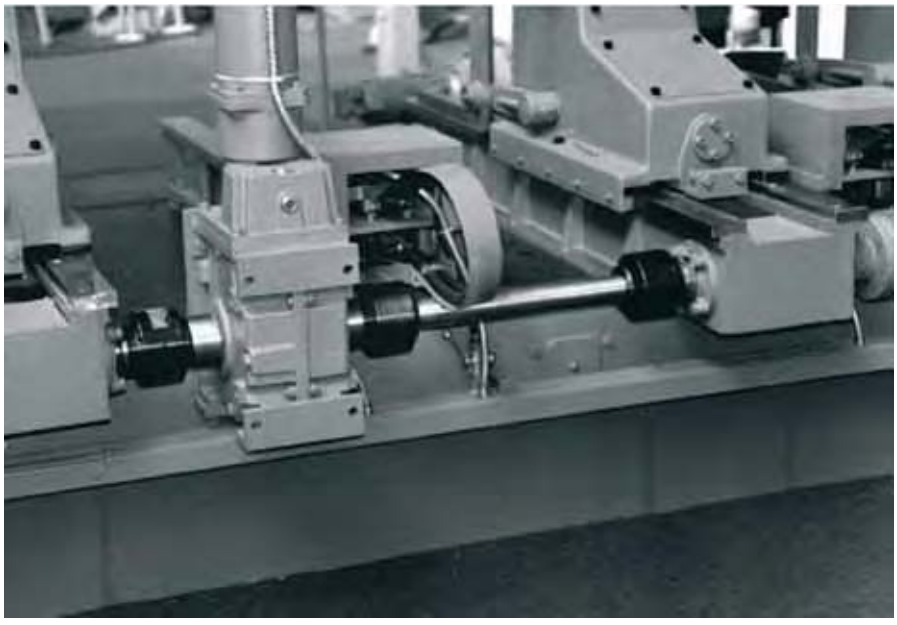


←A150

			Type CST... M							
			110	130	155	175	195	215	240	275
d Ø nominal max.		mm	110	130	155	175	195	215	240	275
d Ø min.		mm	0	55	65	80	90	100	120	150
* d Ø max.		mm	112	132	158	175	198	212	244	290
	A_0	mm	185	216	246	278	308	358	388	450
	A_1	mm	199	233	264	299	332	389	426	483
	A_2	mm	213	250	282	320	356	420	464	516
	E	mm	90	105	120	135	150	175	190	220
	G_0	mm	5	6	6	8	8	8	8	10
	G_1	mm	19	23	24	29	32	39	46	43
	G_2	mm	33	40	42	50	56	70	84	76
	M	mm	109	128	144	164	182	214	236	263

* Consult us

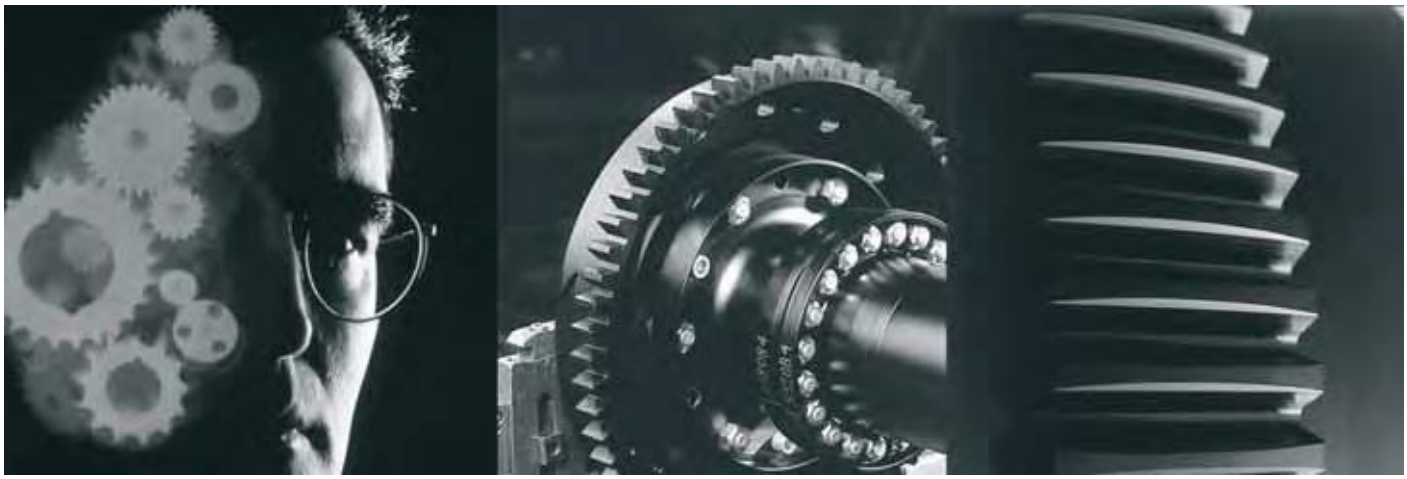
4 ALTERNATIVES – 4 ALTERNATIEVEN – 4 ALTERNATIV – 4 AUSFUEHRUNGEN – 4 ALTERNATIVAS – 4 ALTERNATIVE



Escogear References

Since 1966 escogear standard, as well as special couplings have been in use in various industries such as the steel, pulp & paper, cement, textile and general machine building industry to full customer satisfaction.
The field of application is various going from rolling mills, galvanizing lines, rubber mixers, wood chippers and debarking drums, compactors and briquetting machines to presses, heavy lifting equipment, industrial ovens, turbines, compressors, fans and gearboxes...
Thanks to this, esco has built up a level of expertise and knowledge from which our customers can benefit.

ABB Alstom
Andritz
China Steel
CMI Cockerill
Corus Steel
Dow Chemicals
Hüttenwerke Krupp Mannesman
Ingersoll Rand
Iscor
Montalev Levage
SMS
Solvay
Stora Enso
Sunds Defibrator
Thermo Black Clawson
Voest Alpine Industrieanlagebau
Voest Alpine Stahl



SERIE C

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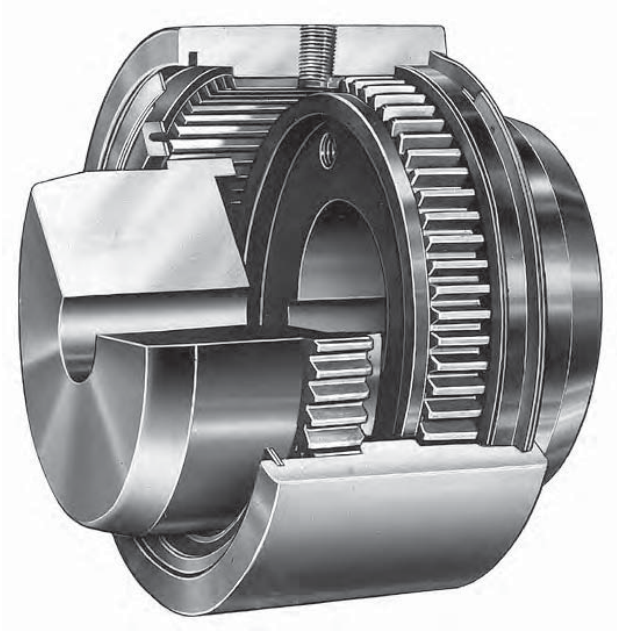
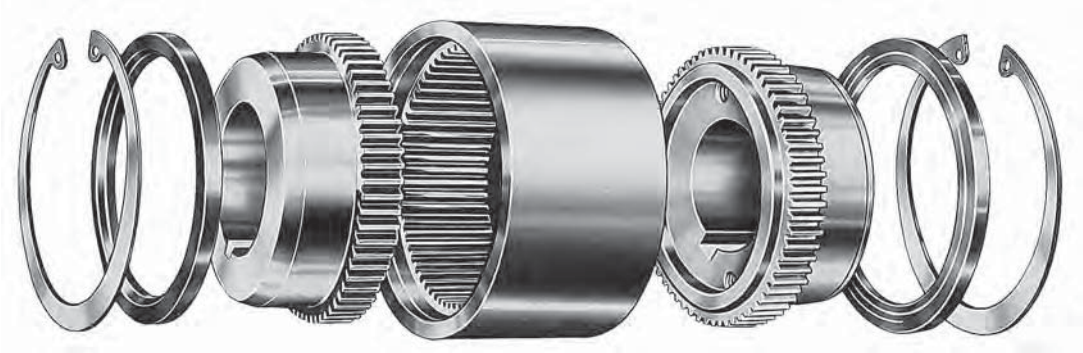


INSTALLATION & MAINTENANCE



1. INTRODUCTION

Coupling must be selected properly according to selection chart A 150 and corresponding charts. These documents are available in coupling catalogue ESCOGEAR CST or on our web site « www.escocoupling.com ». Maximum misalignment figures at assembly are given is this document (see point 4: assembly). Max misalignment figures in operation are given in ESCOGEAR CST catalogue. Max misalignment, max speed and max torque may not be applied simultaneously as mentioned in selection chart A 150. In case of any change or adaptation not performed by ESCO on the coupling, it is customer responsibility to size and manufacture it properly to guarantee safe torque transmission and absence of unbalance that could affect the life of the coupling and the connected machines. It is customer responsibility to make sure that shaft and key material, size and tolerance suit the application. Maximum bore capacity is given in the catalogue. If key assembly is not calculated and machined by ESCO, it is customer responsibility to make sure that hub length, bore size and machining tolerances will transmit the torque. If interference fit is not calculated and machined by ESCO, it is customer responsibility to make sure that interference and machining tolerances will transmit the torque and not exceed hub materiel permissible stress. The hubs must be axially secured on the shaft by means of a setscrew, an end plate or a sufficient interference. In case of spacer or floating shaft not supplied by ESCO, it is customer responsibility to size and manufacture it properly to guarantee safe torque transmission and absence of unbalance that could affect the life of the gearing. It is customer responsibility to protect the coupling by p.ex. a coupling guard and to comply with the local safety rules regarding the protection of rotating parts.

2. PREPARATION

Ensure the conformity of the supplied equipment:

--- Verify coupling size and conformity (see catalogue or web site).

--- Identify any damaged and/or missing parts.

--- Verify conformity of the coupling/machine interfaces.

Coupling original protection allows for storage indoors dry 18 months, indoors humid 12 months, outdoors covered: 9 months and outdoors open: 3 months. For longer periods, it is customer responsibility to protect the parts properly. Instructions are a part of the supply of the coupling. Be sure valid and complete assembly, operation and maintenance instructions are available. Make sure they are well understood. In case of doubt, refer to ESCO. Assembly, disassembly and maintenance must be performed by qualified, trained and competent fitters. Before starting with assembly, disassembly and maintenance, verify the availability of the tooling necessary

--- To manipulate the parts --- To assemble the interfaces

--- To align the coupling --- To tighten the screws and nuts.

3. WARNINGS

Before removing the coupling guard and proceeding with any assembly, operation or maintenance operation of the coupling, make sure the complete system is completely shut down and definitively disengaged from any possible source of rotation, such as, for example:

--- Electrical power supply. --- Any loss of braking effect.

Make sure everyone attending the equipment area will be properly informed (for example by means of warnings properly located) about the maintenance or assembly situation.

In case of use in explosive atmospheres ⟨εx⟩ specific protective measures must be considered. They are described in an extra attachment (IM/A200-Ex) to the actual instructions with the couplings marked ⟨εx⟩.

4. ASSEMBLY

4.1 Ensure all parts are clean.

4.2 Place a snap ring A and a seal B on each shaft.

4.3 Install the hubs C on their respective shafts. For the assembly of the type CFS, see fig. 1 or 2. If needed, for keyway assembly, uniformly heat hubs C (max 120°C) to install them easily on the shaft, in this case, avoid any contact between the hub C and seal B. Hub faces have to be flush with shaft end. In case of doubt, please consult us. Introduce setscrew on key with Loctite and tighten properly. In case of interference fit, refer to ESCO for proper instructions.

4.4 Engage the sleeve F on the longest shaft.

4.5 Install units to be connected in place and check the spacing G between hubs. See tabulation 1 or approved drawing for correct hub spacing G, according to coupling size. In case of doubt, please consult us.

4.6 Align the two shafts, check alignment using an indicator. Alignment precision depends on running speed (see tabulation 3).

4.7 Coat hub and sleeve gearings with grease (see tabulation 2) and fill up with grease lubricant reservoir K. Lightly coat the aerofoil of both seals with grease and slide sleeves B over hubs

4.8 Slide the sleeve F over the hubs. Insert the seals B using a blunt tool. Insert the snap rings A in the grooves J.

4.9 Remove both lube plugs H and force grease into bottom hole until clean grease flows out of top hole, holding the coupling to position lube holes at 45° to horizontal. For the type CFS, repeat this operation for the second sleeve. For quantity and quality of grease, see tabulation 2. Re-install the 2 plugs H. Tightening torque: 10 Nm, key size: s=5mm.

5.INSPECTION and MAINTENANCE

5.1 Inspection

Regular inspection (audio-visual) must occur for leakage, noise, vibration and loss of parts.

5.2 Maintenance

5.2.1 Every 4.000 hours or every year

--- Remove the 2 plugs H. --- Hold the coupling to position lube holes at 45° to horizontal

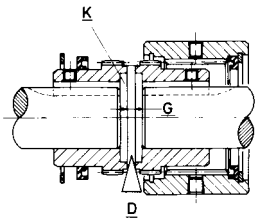
--- Force grease into bottom hole until clean grease flows out of top hole. --- Re-install the 2 plugs H. Tightening torque: 10 Nm.

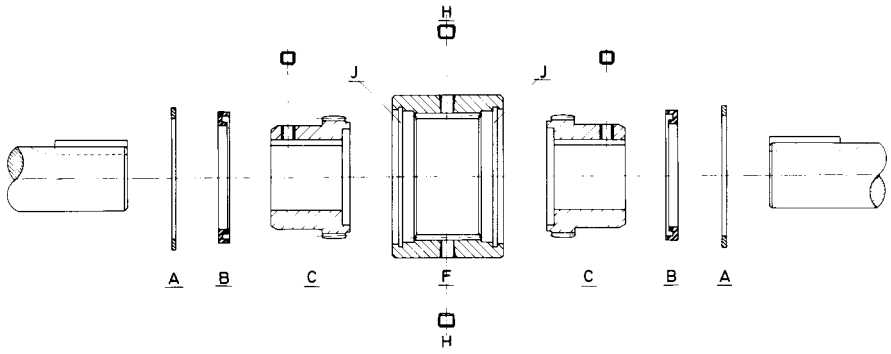
5.2.2 Every 8.000 hours or every 2 years.

--- Remove the snap rings A with tongs. --- Clean and control gearing and sealing.

--- Control alignment See Point 4.6. --- Reassemble coupling as per Point 4.

TABULATION 1			
Type CST - CFS CMM	G mm	Type CCO	G mm
30	3	30	6
40	3	40	6
55	3	55	6
65	6	65	7
80	6	80	11
100	6	100	12,5

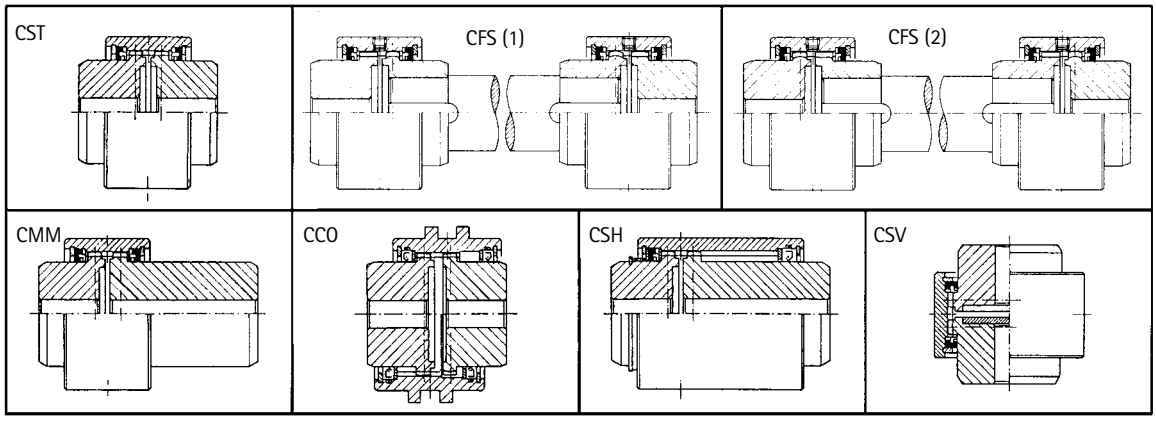


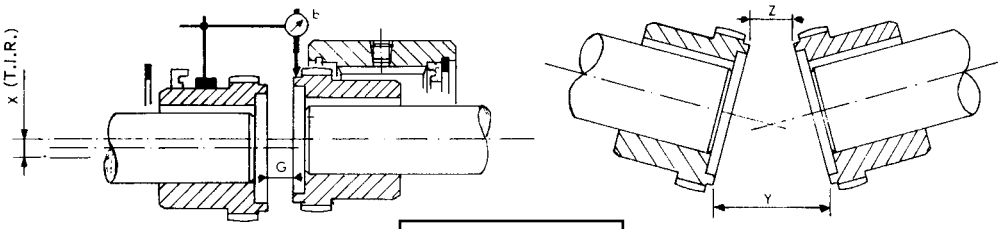


TABULATION 2 - RECOMMENDED LUBRICANTS AND QUANTITY

NORMAL SPEED AND DUTY			HIGH SPEED, HEAVY DUTY AND ATEX	
Agip	Agip GR MV/EP 1		Caltex	Coupling Grease
Caltex	Coupling Grease		Klüber	Klüberplex GE 11-680
Castrol	Impervia MDX		Mobil	Mobilgrease XTC
Chevron	Polyurea grease EP0		Shell	Albida GC1
Esso	Fibrax 370		Texaco	Coupling Grease
Fina	Marson EPL 1	Lical EPL 1		
Kübler	Klüberplex GE 11-680			
Mobil	Mobilux EP0	Mobilgrease XTC		
Q 8	Rembrandt EP0			
Shell	Alvania grease EP R-0 or EP 1	Albida GC		
Texaco	Coupling Grease			
Total	Specis EPG			

Type	CST CSV dm^3	CMM dm^3	CFS dm^3	CCO dm3	CSH dm^3
30	0,022	0,022	2 x 0,022	0,035	Dépend de la course - Hangt af van de slag Depends on travel - Beroende på den axiella rörelsen Ist von Schub abhängig - Dipende della corsa Depende del desplazamiento - Pyydä lisätietoja
40	0,036	0,036	2 x 0,036	0,058	
55	0,063	0,063	2 x 0,063	0,094	
65	0,114	0,114	2 x 0,114	0,172	
80	0,201	0,201	2 x 0,201	0,295	
100	0,270	0,270	2 x 0,270	0,435	





TABULATION 3

Types CST - CMM CFS - CCO CSV - CSH	VITESSE tr/min	SNELHEID omw/min	SPEED rpm		VARVTAL min^{-1}	DREHZAHL min^{-1}	VELOCIDAD rpm		VELOCITA g/min	NOPEUS 1/min
	0 - 250		250 - 500		500 - 1000		1000 - 2000		2000 - 4000	
	X max. mm	(Y - Z) mm	X max. mm	(Y - Z) mm	X max. mm	(Y - Z) mm	X max. mm	(Y - Z) mm	X max. mm	(Y - Z) mm
30 ⇨100	0,10	0,25	0,10	0,25	0,075	0,25	0,05	0,20	0,025	0,10
105 ⇨170	0,15	0,60	0,15	0,60	0,075	0,35	0,05	0,20	0,025	0,10
190 ⇨ 290	0,25	1,00	0,15	0,75	0,075	0,35	0,05	0,20	–	–

Attachment ⟨Ex⟩: Specific Protective Measures Taken for ESCOGEAR Couplings in case of use in explosive atmospheres.

0 Introduction - English

General assembly and maintenance instructions (called IM in this attachment), are established for standard ESCOGEAR couplings according to the following list:
IM/A200 for ESCOGEAR NST couplings - IM/A300 for ESCOGEAR CST couplings
IM/B300 for ESCOGEAR CST-M couplings - IM/B400 for ESCOGEAR FST couplings
In case of use in potentially explosive atmospheres , further to the general assembly and maintenance instructions (IM/...), the specific measures described in this attachment must be taken.

1 Coupling Selection

The coupling must be selected according to the general assembly and maintenance instructions IM/... .
In explosive atmosphere ⟨Ex⟩, the following specific rules must apply:

- A Service Factor of 2 must be applied on the max torque values given in the charts in catalogue (see Selection chart A 150).
- A Service Factor of 2 must be applied on the reference torque values given on the selection chart A150 for the calculation of max misalignment in operation.
- Max misalignment (combination of angular and offset) may not exceed 0.5° per gear mesh.

2. Use of the coupling

The coupling is dedicated for use in potentially explosive atmospheres according to European Directive 94/9/EC (Atex 100A). Coupling is classified in equipment group II, equipment category 2 and 3, intended for use in areas in which explosive atmospheres caused by gases, vapours, mists of air/dust mixtures are likely to occur. In function of the ambient temperature in the coupling proximity (65, 55, 40°C), the temperature classes have been defined (T4, T5, T6). This is based on a temperature increase of the machine shafts (in regard of the ambient temperature) that will not exceed 40°C in operation.

The coupling is marked as follows: CE ⟨Ex⟩ II 2 G T4/T5/T6 D 105°C -20°C ≤ Ta ≤ 65°C / 55°C / 40°C

This marking covers the T3 temperature category.
This marking covers all gas categories: G IIA, G IIB and G IIC

3. Warnings

The warnings mentioned in the general assembly and maintenance instructions IM/... must apply in any case.
In explosive atmosphere , the following specific warnings must apply:

- Complete machining of the coupling parts (bores, keyways, spacers, floating shafts etc…) must be performed by ESCO Couplings N.V. No modification shall be made on the supplied and marked product without the agreement of ESCO Couplings N.V.
- In case of supply by ESCO Couplings of couplings with a rough bore or a solid bore, the sole allowed operation that may be performed by the customer is the boring and keywaying of the coupling hubs. When machining the bore and the keyway, the following instructions must be followed:
  - This job must be performed by an authorised and adequately trained and informed operator.
  - The bore and keyway tolerances must be selected to insure the proper fit between shaft and bore. In case of loose fit, a set screw must be foreseen to locate the hub axially.
  - The max bore may not exceed the value stated in the catalogue. The tabulated values in the catalogue are based on key dimensions according to ISO R 773.
  - The reference used to centre the piece when boring, is the one referenced D in the figures of the catalogue.
- Before proceeding with any assembly, operation or maintenance operation on the coupling, make sure that the necessary measures have been taken to ensure safety, such as but not limited to:
  - Proper ventilation of the area - Proper lightening and electrical tools.
- If hub must be heated for assembly on the shaft, make sure heating source and surface temperature will not affect the safety of the working area.
- It is recommended to have a strong coupling guard, preferably in stainless steel with openings (if any) smaller than the smallest centrifugable part (plug is 6 mm dia). The coupling guard is intended to protect the environment from the centrifugation of any rotating part and the rotating coupling from any falling part. To limit ventilation effects, distance between cover and coupling outside surface should be at least 10 mm.

4. Assembly

The general assembly and maintenance instructions IM/... must apply in any case.
In explosive atmosphere , the following specific instructions must apply:

- Alignment of the machine in cold condition must take into account the possible heat expansion to make sure that in continuous running conditions, max misalignment calculated in point 1 will not be exceeded.
- Max misalignment may never exceed 0.5° per gear mesh.
- To improve the coefficient of friction and the leakage resistance, use following lubricants dedicated for gear couplings:
  - TEXACO Coupling Grease - CALTEX Coupling Grease - KLÜBER Klüberplex GE 11-680 - SHELL Albida GC1

5. Operation

The general assembly and maintenance instructions IM/... must apply in any case.
In explosive atmosphere , the following specific instructions must apply:

- Before Start-up
  - Make sure coupling is perfectly aligned and clean. - Make sure, screws, nuts and plugs are properly tightened.
  - Coupling guard must be properly installed and fixed. - Monitoring system, if any, must be tested to verify its effectiveness.
- During start up
  - Check for any leakage. In case of abnormal leakage, immediate stop is recommended.
  - Check for any abnormal noise and/or vibration. If any, immediate stop is recommended.
- Checking intervals during operation
  - After the first 2000 hours or 6 months: check
    - for leakage, noise, vibration and loss of parts. - for free axial movement of the sleeves in regard of the hubs.
  - After 4000 hours or one year
    - for leakage, noise, vibration and loss of parts. - for free axial movement of the sleeves in regard of the hubs.
- Continuous checking
  - Immediately stop the machine if noise, vibrations or other abnormal phenomena are detected during operation.
  - Further more, if direct check is not possible for access or safety reasons, proper monitoring system has to be installed to follow up couplings behaviour

6. Maintenance

The general assembly and maintenance instructions IM/... must apply in any case.

In explosive atmosphere ⟨Ex⟩, the following specific instructions must apply:

- Every 6.000 hours or 1.5 year:
  - Dismount the coupling and inspect. - Proceed as indicated in point 4.

SERIE C... M

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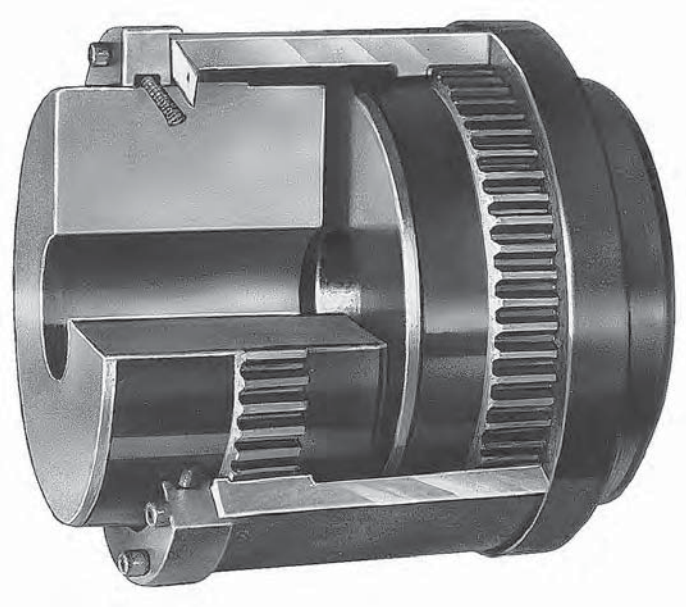


INSTALLATION & MAINTENANCE

1. INTRODUCTION

Coupling must be selected properly according to selection chart A 150 and corresponding charts. These documents are available in coupling catalogue ESCOGEAR CST…M or on our web site « www.escocoupling.com ». Maximum misalignment figures at assembly are given is this document (see point 4: assembly). Max misalignment figures in operation are given in ESCOGEAR CST…M catalogue. Max misalignment, max speed and max torque may not be applied simultaneously as mentioned in selection chart A 150. In case of any change or adaptation not performed by ESCO on the coupling, it is customer responsibility to size and manufacture it properly to guarantee safe torque transmission and absence of unbalance that could affect the life of the coupling and the connected machines. It is customer responsibility to make sure that shaft and key material, size and tolerance suit the application. Maximum bore capacity is given in the catalogue. If key assembly is not calculated and machined by ESCO, it is customer responsibility to make sure that hub length, bore size and machining tolerances will transmit the torque. If interference fit is not calculated and machined by ESCO, it is customer responsibility to make sure that interference and machining tolerances will transmit the torque and not exceed hub materiel permissible stress. The hubs must be axially secured on the shaft by means of a setscrew, an end plate or a sufficient interference. In case of spacer or floating shaft not supplied by ESCO, it is customer responsibility to size and manufacture it properly to guarantee safe torque transmission and absence of unbalance that could affect the life of the gearing. It is customer responsibility to protect the coupling by p.ex. a coupling guard and to comply with the local safety rules regarding the protection of rotating parts.

2. PREPARATION

Ensure the conformity of the supplied equipment:

--- *Verify coupling size and conformity (see catalogue or web site).*

--- *Identify any damaged and/or missing parts.*

--- *Verify conformity of the coupling/machine interfaces.*

Coupling original protection allows for storage indoors dry 18 months, indoors humid 12 months, outdoors covered: 9 months and outdoors open: 3 months. For longer periods, it is customer responsibility to protect the parts properly. Instructions are a part of the supply of the coupling. Be sure valid and complete assembly, operation and maintenance instructions are available. Make sure they are well understood. In case of doubt, refer to ESCO. Assembly, disassembly and maintenance must be performed by qualified, trained and competent fitters. Before starting with assembly, disassembly and maintenance, verify the availability of the tooling necessary

--- To manipulate the parts --- To assemble the interfaces --- To align the coupling --- To tighten the screws and nuts.

3. WARNINGS

Before removing the coupling guard and proceeding with any assembly, operation or maintenance operation of the coupling, make sure the complete system is completely shut down and definitively disengaged from any possible source of rotation, such as, for example:

--- Electrical power supply. --- Any loss of braking effect.

Make sure everyone attending the equipment area will be properly informed (for example by means of warnings properly located) about the maintenance or assembly situation.

In case of use in explosive atmospheres ⟨εx⟩, specific protective measures must be considered. They are described in an extra attachment (IM/A200-Ex) to the actual instructions with the couplings marked ⟨εx⟩.

4. ASSEMBLY

4.1 Ensure all parts are clean.

4.2 Apply a light coat of grease to the O- Rings A and insert O-Rings into grooves J of end caps B.

4.3 Place gaskets K and end caps B over both shafts. Care should be taken not to damage O-Rings A.

4.4 Install hubs C on their respective shafts with the longest hub end towards shaft end or towards machine bearing depending on the type (see fig. 1 and 2). If needed, uniformly heat hubs C (max 120°C) to install them easily on the shaft, in this case, avoid any contact between the hub C and O-Ring A. Hub faces have to be flush with shaft ends. In case of doubt, please consult us. Introduce setscrew on key with Loctite and tighten properly. In case of interference fit, refer to ESCO for proper instructions.

4.5 Engage the sleeve F on the hub C on the longest shaft side.

4.6 Install units to be connected in place and check if the spacing G between hubs is the same as mentioned in tabulation 1 or in the approved drawing. In case of doubt, please consult us.

4.7 Align the two shafts, check alignment using an indicator. Alignment precision depends on running speed and torque (see tabulation 3).

4.8 Coat hub and sleeve gearings with grease (see tabulation 2) and slide the sleeve F over the hubs C.

4.9 Coat with grease both ends of sleeve F and assemble end caps B with the gaskets K on sleeve F. Tighten screws uniformly. See tabulation 1 for correct tightening torque (T1 Nm) and key size (s mm). Make sure that sleeve is freely sliding above hubs by axially displacing it to a value equal to G.

4.10 Remove both lube plugs H of sleeve F and add grease in sufficient amount to overflow with lubricant holes in horizontal position. For quantity and quality of grease, see tabulation 2. For the type CSV ...M, please consult us. Re-install the 2 plugs H; see tabulation 1 for correct tightening torque (T2 Nm) and key size (s mm).

5. INSPECTION and MAINTENANCE

5.1 Inspection

Regular inspection (audio-visual) must occur for leakage, noise, vibration and loss of parts.

5.2 Maintenance

5.2.1 Every 4.000 hours or every year

--- Check that sleeve is freely moving axially: follow instructions as indicated in Point 4.9.

--- Fill up grease level: Proceed as mentioned under 4.10.

5.2.2 Every 8.000 hours or every 2 years.

--- Remove screws and end caps B. --- Clean and control gearing and sealing.

--- Control alignment See Point 4.7. --- Reassemble coupling as per Point 4.

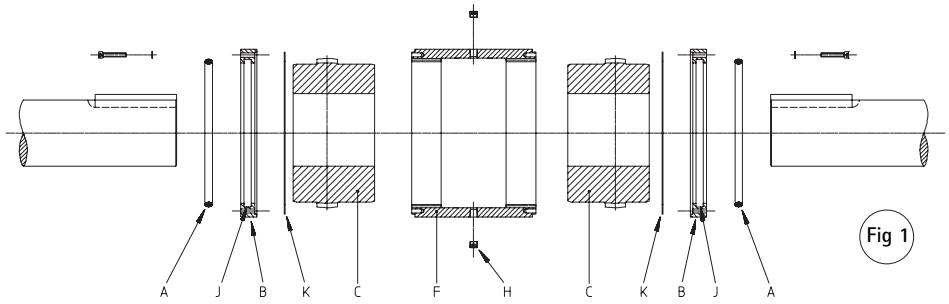
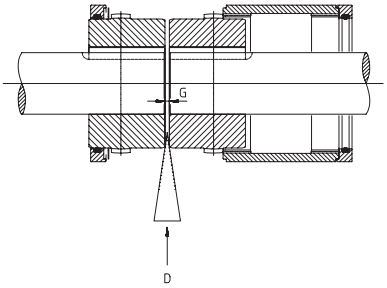


Fig 1



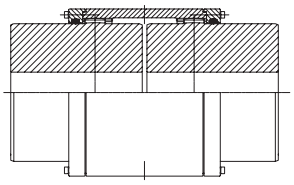
TABULATION 1

Size	G mm	End-Cap T1 Nm	hexagonal socket head screw M	s	Plug T2 Nm	s mm
110	5	8	5	4	10	5
130	6	8	5	4	10	5
155	6	8	5	4	10	5
175	8	13	6	5	10	5
195	8	13	6	5	10	5
215	8	33	8	6	29	8
240	8	33	8	6	29	8
275	10	33	8	6	29	8
280	10	65	10	8	29	8
320	13	65	10	8	29	8

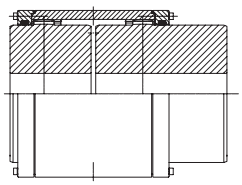
TABULATION 2

NORMAL SPEED AND DUTY			Type	CST...M dm³	CMM..M CDMM...M dm³	CSV...M dm³	CCO...M dm³
Agip	Agip GR MV/EP 1						
Caltex	Coupling Grease						
Castrol	Impervia MDX						
Chevron	Polyurea grease EP0		110	0,36	0,36	0,45	0,62
Esso	Fibrax 370						
Fina	Marson EPL 1	Lical EPL 1	130	0,52	0,52	0,67	0,96
Kübler	Klüberplex GE 11-680						
Mobil	Mobilux EP0	Mobilgrease XTC	155	0,80	0,80	1,01	1,18
Q 8	Rembrandt EP0						
Shell	Alvania grease EP R-0 or EP 1	Albida GC	175	0,98	0,98	1,32	1,82
Texaco	Coupling Grease						
Total	Specis EPG		195	0,51	1,51	1,95	2,44
HIGH SPEED, HEAVY DUTY AND ATEX			215	2,02	2,02	2,53	2,94
Caltex	Coupling Grease		240	2,43	2,43	3,06	4,02
Klüber	Klüberplex GE 11-680						
Mobil	Mobilgrease XTC		275	3,29	3,29	4,37	
Shell	Albida GC1						

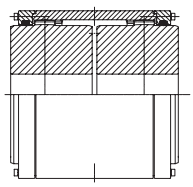
FIG 2



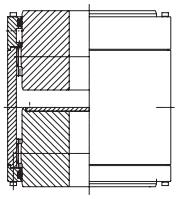
CDMM ...M



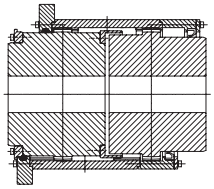
CMM ...M



CSTM ...M



CSV ...M



CCO ...M

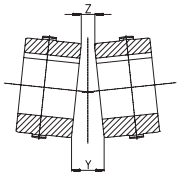
TABULATION 3 : ALIGNMENT PRECISION

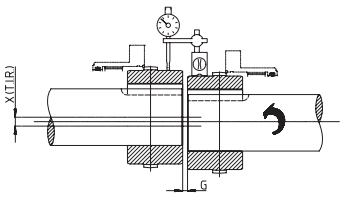
CST...M	Kx	Ky
110	3,80	5,27
130	4,47	6,21
155	5,03	7,44
175	5,72	8,20
195	6,35	9,18
215	7,47	9,98
240	8,24	11,00
275	9,18	12,99

Alignment is measured as shown on the figure (Y - Z) for angular and X for offset.
Combination of angular and offset misalignment must comply with the following formulation:

$$\Delta K_W min \leq \frac{X}{Kx} + \frac{Y-Z}{Ky} \leq 0,75 \times \Delta K_W max$$

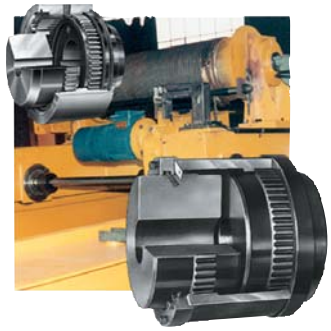
ΔK_W min = 0,1°
ΔK_W max depends on speed and torque as shown on graph (T, n) in coupling catalogue on page A150 E (a).





Other coupling types available

Escogear CST / CST...M



Escogear FST

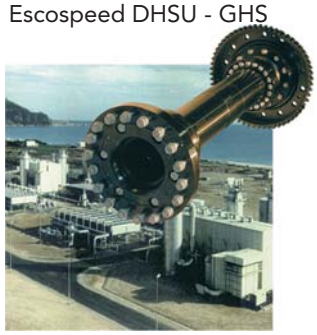
Escodisc DLC / DMU / DPU

Escogear NST

Escoflex A-R-S-T
Esconyl A-B-C

Escorail FTRN /FTRNO

Escospeed DHSU - GHS



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