



gosan

mechanical components for lifting,
hoisting, transport and storage machinery



barrel couplings for drums,
model **AGBS**

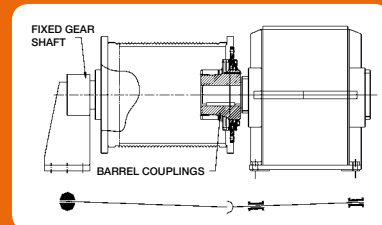
APPLICATION:

The AGBS barrel couplings for drums, designed by GOSAN, are used in hoisting gear of cranes to join the wire drum and the output shaft of the gearbox.

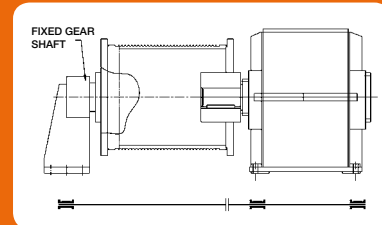
When the output shaft of the gearbox is rigidly fixed to the cable drum a statically indeterminate situation is produced, thus making it difficult to obtain perfect alignment and levelling in assembly. Assemblies of this type require to carry out major adjustments, since the lack of alignment would induce the transmission elements to malfunction. Possible errors and inaccuracies in the assembly and balancing of the coupling,

as well as the distortions in the structure, wear in the bearings etc, all create additional forces which, jointly with alternating forces, produce breakages due to fatigue and damage in the bearings and gears.

The barrel couplings for drums are designed to avoid the presence of high bending moments and to compensate for misalignments, and also to absorb axial displacement. It is equipped with a self-aligning bearing on the other end of the drum shaft which is fitted to withstand the axial forces.



ASSEMBLY USING BARREL COUPLINGS



RIGID ASSEMBLY BETWEEN THE GEARBOX DRUM

DESCRIPTION AND CHARACTERISTICS:

The AGBS barrel coupling must be supplied as an entire set, the sleeve and hub cannot be supplied separately.

The AGBS barrel coupling is delivered fully assembled (unless specified to the contrary the holes and keyways are completely machined).

The AGBS barrel couplings are supplied without grease although delivered with sufficient protection against corrosion under normal storage conditions.

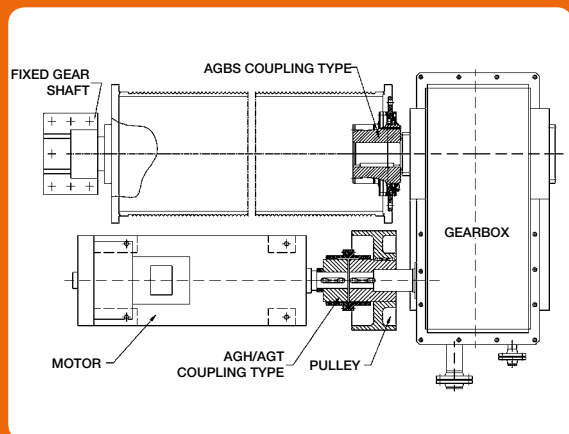
The barrel coupling consists of a sleeve and hub fitted with semi-circular cogs, with a series of cylindrical hardened steel barrels sandwiched into the cog housings.

The covers with their respective special retainers and spring lock washers are useful in obtaining perfect airtight integrity inside the coupling, thus preventing foreign bodies from getting in and ensuring the continuity of the necessary lubrication. Spring lock washers axially guide the barrels within the coupling. The re-greasing can be carried out without removing the sealing elements.

The barrel couplings have a crown, which allows the hub to oscillate with respect to the sleeve, compensating angular misalignments of $\pm 1^\circ$. Depending on the size of the selected coupling, axial displacements can be absorbed from $\pm 3\text{mm}$ up to $\pm 8\text{mm}$. Such couplings are not suitable for the absorption and transmission of axial forces.

The torque moment in the coupling is transmitted through the two drag faces of the sleeve which are housed in the drum and a series of bolts which at the same time serve as fixing to the drum. The fastening screws of the AGBS barrel couplings for drums, which should be of a high wear resistance class (10.9) are not included in the supply.

The following figure shows the assembly of a barrel coupling in a hoisting gear. The coupling's hub is positioned on the end of the driveshaft of the wire drum. The bearing bracket must be configured as a fixed bracket.



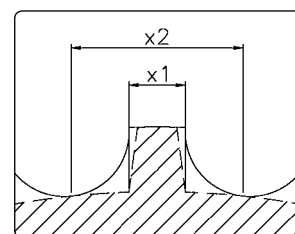
There is an indicator on the outer cover of the coupling allowing the regulation of the wear and axial positioning of the sleeve with respect to the hub, without disassembling the coupling. The same indicator regulates the axial position of the sleeve with respect to the hub.

The barrels are elements for the transmission of forces and due to their large supporting area they absorb the stresses caused by the torque moment and the radial load.

The use of this construction will exclude the risk of breakage of the teeth caused by bending stresses.

The barrel coupling has several advantages as compared to toothed couplings, such as:

- Due to the profile of the barrels and teeth, the barrel couplings are subjected to much lower bending stresses at the bottom of the teeth. Reason why a greater safety factor is obtained against bending and the maximum radial loads.
- The larger contact surface between the barrels and teeth allows a better distribution of the radial load, thus significantly increasing the useful life of the coupling. The radial load is even better distributed with the wear of the coupling.
- The transmission of forces produces a hardening by tooling of the barrels in their housings, thus causing an increase in the wear resistance of the barrels.



DETERMINATION OF THE SIZE OF THE COUPLING:

The coupling size required depends on the turning moment of the drum (M), the diameter of the shaft and the radial load acting on the coupling:

1. Turning moment in the coupling:

The formulae used are:

$$M = \frac{N (Kw)}{n (rpm)} \times 955 \times k$$

Where:

M max: Max. turning moment in the coupling (daNm).

N (Kw): Max. coupling power (Kw).

n: N°. drum r.p.m.

K: Service factor.

Table N°. 1 Service factor K.

DIN GROUP	1Bm	1AM	2m	3m	4m	5m
FEM GROUP	M3	M4	M5	M6	M7	M8
K	1,25	1,25	1,4	1,6	1,8	2

Having determined the Mmax. data of the maximum turning moment that the coupling must withstand, one must then select the required coupling from Table N° 4.

Having determined the size of the coupling by its maximum turning moment, it can be checked as to whether the radial load is lower than that specified in Table N°. 4.

2. Verification of the radial load:

When preselecting the coupling size by its maximum turning moment (Mmax), the radial load obtained in the calculations shall be verified as to whether they are lower than those shown in Table N°. 4 for the selection of the couplings.

In the event that the radial load is greater than the admissible load and turning moment is lower than the capacity of the chosen coupling, a higher radial load than that specified in the catalogue may be admitted, according to the formulae:

$$F_{adm} = Fr + \left(\frac{M - M_{max}}{k} \right)$$

Where:

Fadm.= Corrected radial load.

Fr= Permissible radial force according to coupling chosen from Table N°. 4.

M= Turning moment according to coupling chosen from Table N°. 4.

Mmax.= Turning moment in the coupling.

K= value from Table N°. 1

Reverse processing cannot be carried out to increase the maximum admissible torque if the radial load is not used.

3. Verification of the gear box shaft/hub coupling union:

Finally, it must be verified that the diameter of the gear box shaft is less than the maximum admissible diameter that may be carried out for the coupling chosen from Table N°. 4.

Calculation example:

Preliminary data:

N = 56.1 Kw (Engine power)

n = 9 (rpm)

Radial load= 9750 daN

k = 1.6 (service factor)

d = 220 mm (output shaft of the gearbox)

1.1. Calculation of the turning moment in the coupling:

$$M = \frac{N}{n} \times 955 \times k = \frac{56,1}{9} \times 955 \times 1,6 = 9525 \text{ daNm}$$

The AGBS-230 couplings chosen in terms of the shaft diameter.

$$AGBS = M_{max} = 17850 > 9525$$

1.2. Verification of the radial load:

The coupling chosen by calculating the turning moment (AGBS-230) withstands a maximum radial load of 14,700 daN according to Table N°. 4 reason why the choice would be correct.

$$AGBS F_{max} = 14700 \text{ daNm} > 9750 \text{ daNm}$$

In the event that the calculated Fmax. were greater (e.g. 15000 daN) than the data in the coupling data, it must be verified as to whether the size of the coupling chosen would be sufficient with the corrected radial load.

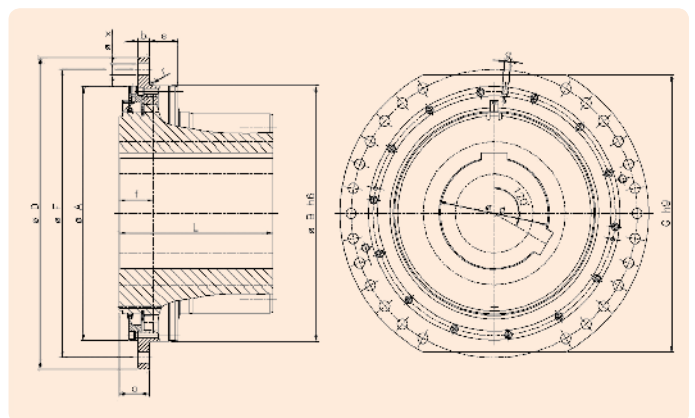
$$F_{adm} = 15000 + \left(\frac{17850 - 9525}{1,6} \right) = 20203,13 \text{ daN}$$

Therefore, it would be sufficient given that the

$$F_{adm} = 20203,13 \text{ daN} > 15000 \text{ daN}$$

1.3. Geometric verification of the gear box shaft:

According to Table N°. 4 on the selection of couplings, the $d_{max.} = 245 \text{ mm} > 220 \text{ mm}$ (shaft diameter).



DIMENSIONAL DRAWINGS FOR AGBS BARREL COUPLINGS:

Diam. ϕ	Size	Mmax. daNm	Radial load Fr daN	ϕ d H7 min. (mm)	ϕ d H7 max. (mm)	D	L max.	L min.	A	B h6	F	G h9	a	b	e	f	g	x	r	Axial displ. max	Wgt kg. (**)	J kgm2 (**)
65	640	1750	40	65	65	250	95	85	159	160	220	220	42	12	31	44	1/8	15	2,5	3	10	0,06
75	800	1950	50	75	75	280	100	85	179	180	250	250	42	12	31	44	1/8	15	2,5	3	13	0,09
85	950	2100	60	85	85	320	110	95	199	200	280	280	45	15	32	46	1/8	19	2,5	4	18	0,18
95	1600	2600	60	95	95	340	125	95	219	220	300	300	45	15	32	46	1/8	19	2,5	4	24	0,25
105	2050	3700	80	110	110	360	130	95	239	240	320	320	45	15	34	47	1/8	19	2,5	4	28	0,33
120	2550	4050	80	125	125	380	145	95	259	260	340	340	45	15	34	47	1/8	19	2,5	4	33	0,45
135	3000	4400	100	140	140	400	170	95	279	280	360	360	45	15	34	47	1/8	19	2,5	4	42	0,65
145	4050	5150	100	155	155	420	175	95	309	310	380	380	45	15	34	47	1/8	19	2,5	4	54	0,89
175	5300	7350	100	180	180	450	185	120	339	340	400	400	60	20	40	61	1/4	24	2,5	4	72	1,5
190	7700	11500	120	210	210	510	220	125	399	400	460	460	60	20	48	65	1/4	24	2,5	6	112	3,1
205	11700	12600	120	215	215	550	240	125	419	420	500	500	60	20	48	65	1/4	24	2,5	6	139	4
230	17850	14700	140	245	245	580	260	130	449	450	530	530	60	20	48	65	1/4	24	2,5	6	158	5,6
280	23950	17850	160	290	290	650	315	140	529	530	600	580	65	25	48	67,5	1/4	24	2,5	6	270	11,8
290	32250	26500	170	300	300	665	330	145	542	545	615	590	65	25	61	74	1/4	24	4	6	291	14,3
300	40550	31500	170	310	310	680	350	145	559	560	630	600	65	25	61	74	1/4	24	4	6	320	16,8
315	52000	35700	200	330	330	710	380	165	599	600	660	640	81	35	64	87,5	1/4	28	4	8	424	24,3
355	65000	39900	230	370	370	780	410	165	669	670	730	700	81	35	64	87,5	1/4	28	4	8	542	39,8
400	76750	46500	260	420	420	850	450	165	729	730	800	760	81	35	64	87,5	1/4	28	4	8	717	61,4
425	92700	50500	290	450	450	940	500	175	800	800	875	830	86	40	64	92	1/4	28	4	10	988	99,3
450	108150	52500	330	470	470	1025	500	175	860	860	945	900	86	40	64	92	1/4	34	4	10	1115	128

Table N°. 4

**Weight and J with maximum diameter d.

DIMENSIONAL DRAWINGS FOR AGBS DRUMS:

The running of the winding drum flange is carried out according to the following table and drawings. The quality of the flange material shall be as a minimum S355. Fastening bolts strength class 10.9 according to the DIN 931, DIN 933 and DIN 6914 and washers according to the DIN 6916 Standards.

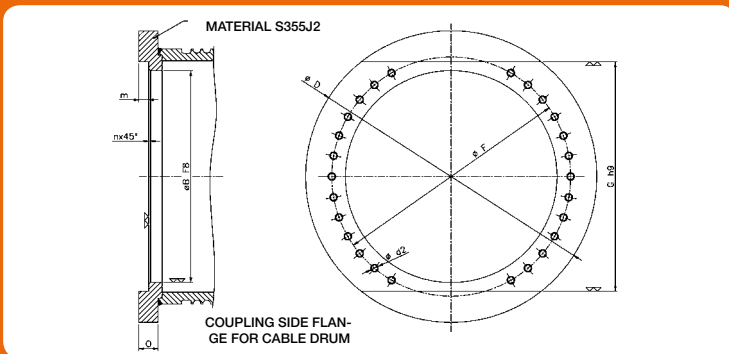
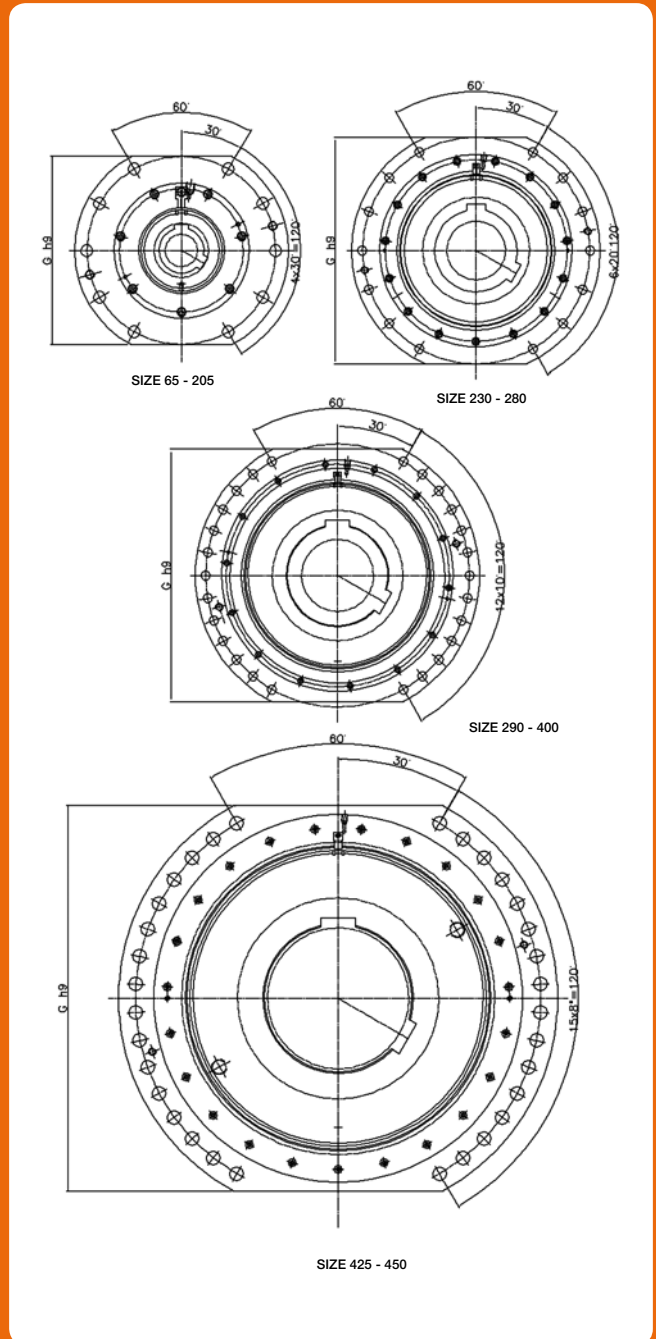


Table N°. 5

Type AGBS Size	D	F	G h9/F8	X	Thread d2	B h6/F8	N°. of holes	m min.	n	O min.
65	250	220	220	15	M12	160	10	12	3	27
75	280	250	250	15	M12	180	10	12	5	27
85	320	280	280	19	M16	200	10	15	3	30
95	340	300	300	19	M16	220	10	15	3	30
105	360	320	320	19	M16	240	10	15	3	30
120	380	340	340	19	M16	260	10	15	3	30
135	400	360	360	19	M16	280	10	15	3	30
145	420	380	380	19	M16	310	10	15	3	30
175	450	400	400	24	M20	340	10	20	3	40
190	510	460	460	24	M20	400	10	20	3	40
205	550	500	500	24	M20	420	10	20	3	40
230	580	530	530	24	M20	450	14	20	3	40
280	650	600	580	24	M20	530	14	25	3	50
290	665	615	590	24	M20	545	26	25	5	50
300	680	630	600	24	M20	560	26	25	5	50
315	710	660	640	28	M24	600	26	35	5	60
355	780	730	700	28	M24	670	26	35	5	60
400	850	800	760	28	M24	730	26	35	5	60
425	940	875	830	28	M24	800	32	40	5	70
450	1025	945	900	34	M30	860	32	40	5	70

The X value corresponds to the diameter of the holes in the coupling for its fastening to the drum.



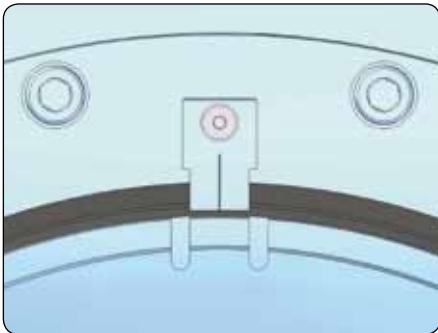
Examples of use:

WEAR INDICATOR:

- So as to verify wear, the position of the wear indicator relative to the slots in the hub should be noted, since the relative position between both parts indicates the wear of the coupling. This coupling is originally supplied with the indicator centred relative to the slots (Position A). When the indicator mark reaches the limit of one of the slots, it is necessary to replace the entire coupling (Position B).

- When the coupling is being used in two load directions, the maximum admissible wear values must be divided by two $m/2$. It should be specified when making the purchase order, so as to have the corresponding wear notch.

Position A



Coupling without wear.

Position B



Maximun wear.

Coupling size	Max. permissible wear $m/2$
65 - 95	4 mm
105 - 190	6 mm
205 - 450	8 mm



1- Rubber tired gantry crane, RTG.



2- AGBS Couplings.



3- Ladle crane.



4- Heavy duty crane.



5- Mobile harbour crane.



6- Slewing crane.



7- Rail mounted gantry crane, RMG.



8- Container portal crane.



9- Ship to shore, STS.



10- Goliath crane for shipyard.



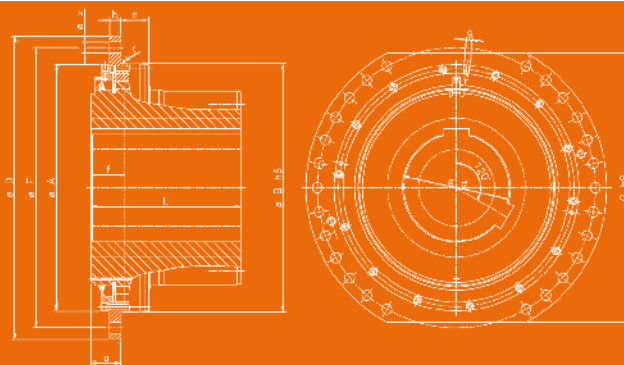
11- Shipyard gantry crane.



12- Offshore deck crane.

RFQ (Request For Quote) Form for barrel couplings:

*barrel couplings
for drums,
model **AGBS***



CUSTOMER INFORMATION:

Company:

Mr/Ms:

Address:

Post code:

Country:

Telephone:

Fax:

Email:

INFORMATION TO BE FILLED IN (necessary information to prepare an offer):

1- Nominal torque (daNm).....

2- Radial load (daN).....

3- Working group (FEM/DIN).....

4- \varnothing d diameter (mm).....

5- L dimension (mm).....

Other requirements:

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The AGBS barrel couplings for drums, designed by **gosan**, are used in hoisting gear of cranes to join the cable drum and the output shaft of the gearbox.

