



Limitadores de par Torque Limiters

FRICION-FREE TORQUE LIMITERS

RULISA Friction-free torque limiters have been designed keeping in mind the safety level required by modern facilities and machines, which are more automatized and sophisticated every day.



Faults and lack of productivity, and the subsequent operation costs, caused by handling or programming errors, are dramatically reduced when using these safeties de vices.

These are simple and safe mechanical elements which additionally can activate a signal to stop the operation of a plant.

He have also developed solutions satisfactory for our customers, with designs specific to meet their requirements. Some examples are listed in this catalogue.

Our technical staff is at your entire disposal to consider any special application.

Giving complete satisfaction to our customers is our prime target.

MAIN CHARACTERISTICS

- Quick disconnection within milliseconds.
- Repeatability of rated torque lower than 2%
- Residual torque virtually null
- Maintains the synchronism
- Automatic reset at 360°
- Detection of disconnection through a proximity sensor or microswitch
- Compact elements with a mass of reduced inertia
- Operation in any position
- Lubricated for life, with possibility of operating in an oil bath
- High number or operations with no wear
- Maintenance free

USES

These devices have many applications in fields such as: machine-tools, robotics, packing machines, food processing machinery, graphic arts machines, rolling machines, quarry machinery, papermaking machines, textile machinery, belt conveyors, bottling machines, industrial furnaces, indexing tables, assembly and screwing stations, gears and gearboxes, etc.

They are designed to transmit the required torque through pinions, gears, pulleys of any type, elastic, semi-elastic and rigid compensating torque couplings, cardan outputs, etc.

PRINCIPLE OF OPERATION

As shown in the cover page, the torque limiter operates in the following way:

1.-In this position, the torque limiter is engaged, with the balls pressed into their corresponding housings by the springs.

2.- When an overload occurs, the ball tends to go out from the housing, going up the slope and applying a greater force on disc springs, thus the torque transmitted being increased.

3.-When the ball reaches the housing outlet, an electric signal is generated by the proximity sensor and the torque is sharply reduced.

The disconnection time is the time required by the ball to go out from the housing, rotating by 2° to 3°, which corresponds to 0.3 milliseconds if the assembly rotates at 1500 rpm.

4.-When out from their corresponding housings, the balls will rotate freely like in a bearing until one tour is completed. This is because the angular arrangement of these housings.

In this moment the torque limiter is reset.

Torque limiters must be adjusted above both the Rated Torque and the Starting Torque, as otherwise the plant could not be started.

WORKING LIFE AND SPEED

The working life of this type of devices will be affected by the fatigue of resetting and triggering disc springs, as well as by the hammering action produced at high speeds, thus we recommend to install a proximity sensor actuating on the stop relay of the plant, according to the electric diagram enclosed

ELECTRIC DIAGRAM

Figure 1 shows the electric diagram commonly used, with the proximity sensor or microswitch (A) connected in parallel to the START push-button (1) and in series to the STOP push-button (2). This arrangement permits to start the unit after the overload condition is removed even if the torque limiter is actuating the proximity sensor or microswitch in the open position.

Figures 2 and 3 shows how to connect an alarm or relay for multiple signals.

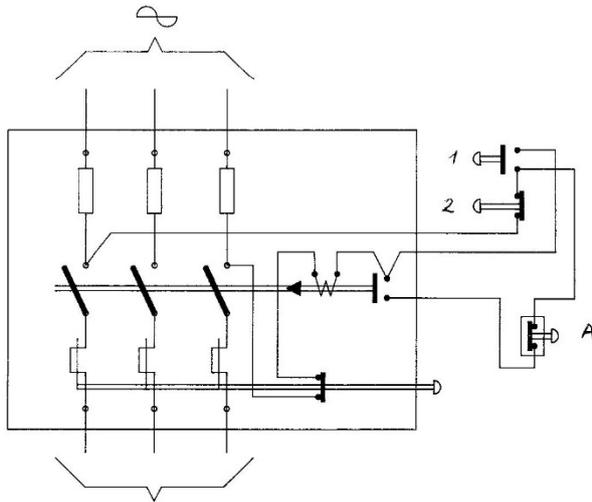


Fig. 1

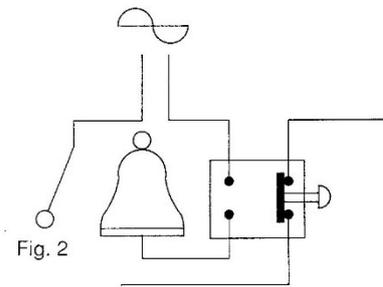


Fig. 2

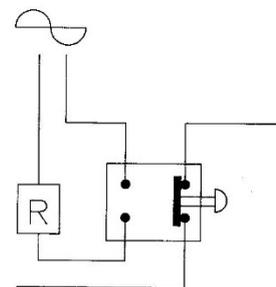
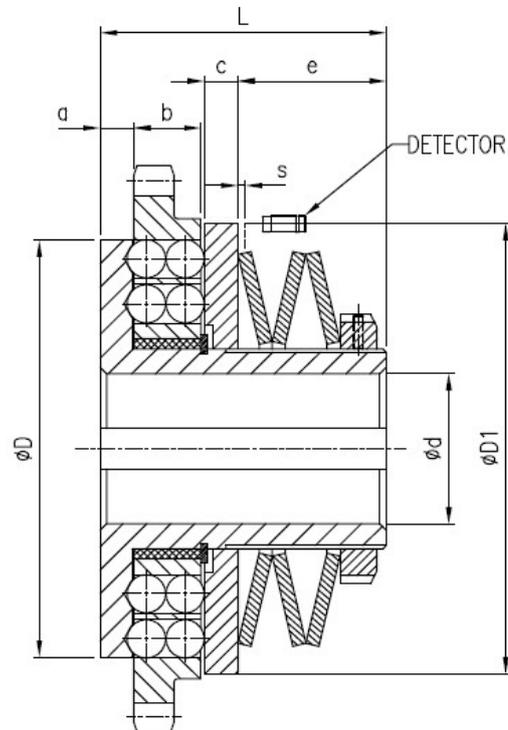


Fig. 3

RA TYPE BALL TORQUE LIMITERS

Limiters prepared for outputs pinions, gears, pulleys



SIZE	Torque Nm		ϕdH_7 Max*	ϕdH_7 Max**	ϕD	ϕD_1	L	a	b	c	e	s
	Min	Max										
1	5	125	18	22	65	70	50	5	10,5	7	27	1
2	15	350	30	35	100	105	70	10	17	7	35	2
3	40	700	45	50	125	135	85	10	20	10	44	3
4	90	2.400	60	65	160	170	105	15	20	15	54	3
5	200	4.000	75	85	200	210	120	15	26	15	63	3
6	300	7.500	100	115	250	260	135	15	26	18	75	3

* Keeway as per DIN 6885 in Page. 1

** Keeway as per DIN 6885 in Page. 3

Minimum number of teeth

Pitch Size	1	2	3	4	5	6
1/2"	20	27	35	45	57	75
5/8"	16	23	28	35	45	55
3/4"	14	20	24	29	36	50
1"	11	15	19	23	28	34
1 1/4"	10	13	16	19	23	28
1 1/2"	8	11	13	16	20	24

The limiters are delivered according to the customer's needs.

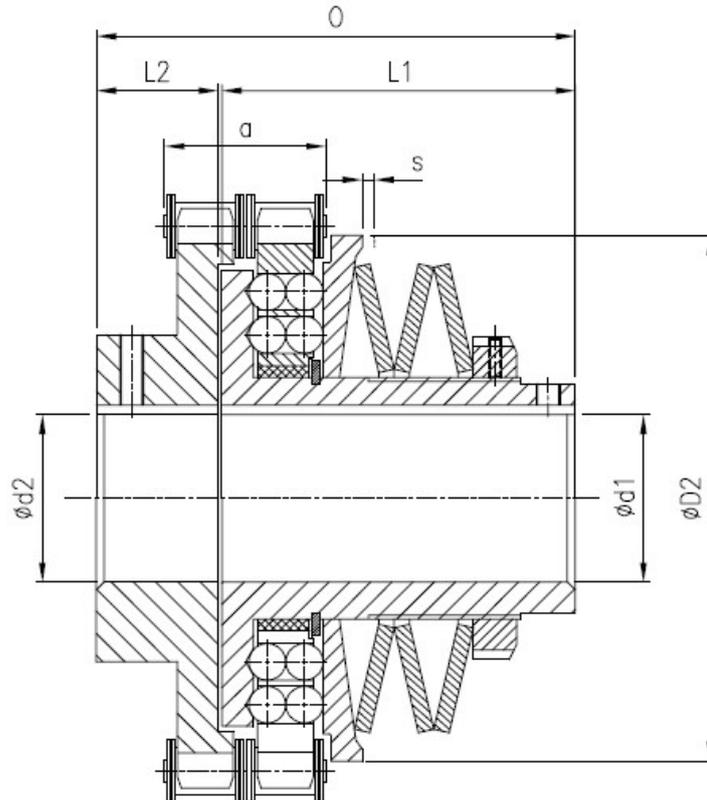
They can be varied with the positioning of the nut according to a table that is delivered with the report of your tare.

On demand we can supply other sizes of Limiters for smaller torques and much higher than those in the table.

We reserve the right to make modifications to improve the product.

RAM TYPE BALL TORQUE LIMITERS

This type of limiters allows the union of two axes through a chain coupling, which allows a good degree of torsional rigidity, while facilitating the compensation of certain misalignments.



SIZE	Torque Nm		Ød ₁ H ₇	Ød ₁ H ₇	Ød ₂ H ₇	Ø D ₁	Ø D ₂	L ₁	L ₂	O	a	s
	Min	Max	Max*	Max**	Max							
1	5	125	18	22	50	97	70	50	28	80	32	1
2	15	350	30	35	60	131,28	105	70	27	98	38	2
3	40	700	45	50	70	156,48	135	90	31	122	38	3
4	90	2.400	60	65	75	198,25	170	105	34	139	44	3
5	200	4.000	75	85	95	247,85	210	120	50	171	69	3
6	300	7.500	100	115	95	304,36	260	135	50	186	69	3

* Keeway as per DIN 6885 in Page. 1

** Keeway as per DIN 6885 in Page. 3

STANDARDIZED PINIONS

Pitch size	1	2	3	4	5	6
Pitch	1/2"	5/8"	5/8"	3/4"	1"	1"
Z	21	23	28	30	28	35

The limiters are delivered according to the customer's needs.

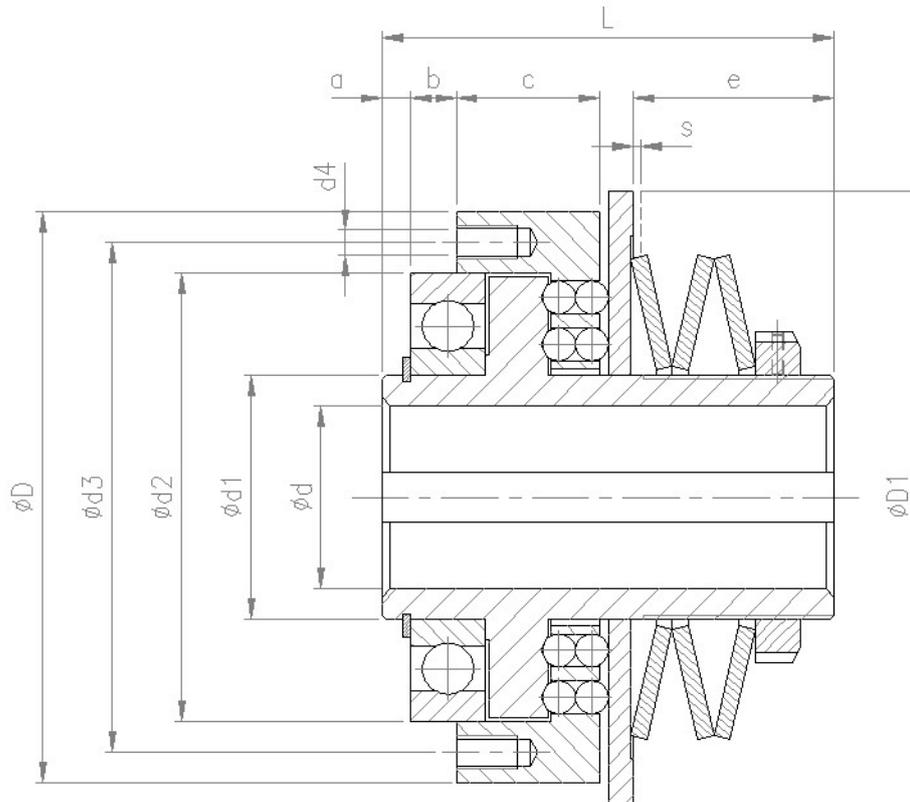
They can be varied with the positioning of the nut according to a table that is delivered with the report of your tare.

On demand we can supply other sizes of Limiters for smaller torques and much higher than those in the table.

We reserve the right to make modifications to improve the product.

RB TYPE BALL TORQUE LIMITERS

This series of limiters is designed to **place laterally on the support of the bearing all kinds of transmission elements, such as: chain discs, gears, toothed pulleys, etc.**



Tamaño	Par Nm Mín Máx	$\varnothing d_{H7}$ Máx*	$\varnothing d_{H7}$ Máx**	$\varnothing d_1$	$\varnothing d_2$	$\varnothing d_3$	d_4	$\varnothing D$	$\varnothing D_1$	a	b	c	e	L	s
1	5 100	22	25	35	62	75	4M5x15	85	95	4	7	23	25	65	1
2	10 250	30	35	45	85	100	4M6x15	110	120	6	9	31	36	90	2
3	30 500	45	50	60	110	125	4M8x15	140	150	7	11	35	49	110	2
4	50 1000	55	65	75	130	145	8M8x15	160	170	7	12	41	52	120	2
5	75 2000	70	75	90	160	182	8M10x20	200	210	9	15	49	59	140	3
6	90 3500	80	90	105	190	215	8M10x30	240	250	10	15	61	58	155	3
7	100 6000	110	120	140	210	230	8M10x30	250	260	10	15	58	71	165	3

* Keeway as per DIN 6885 in Page. 1

** Keeway as per DIN 6885 in Page. 3

It is essential when placing the piece to make the front stop in the bearing and maintain the "b" dimension so as not to axially block the assembly.

The limiters are delivered according to the customer's needs.

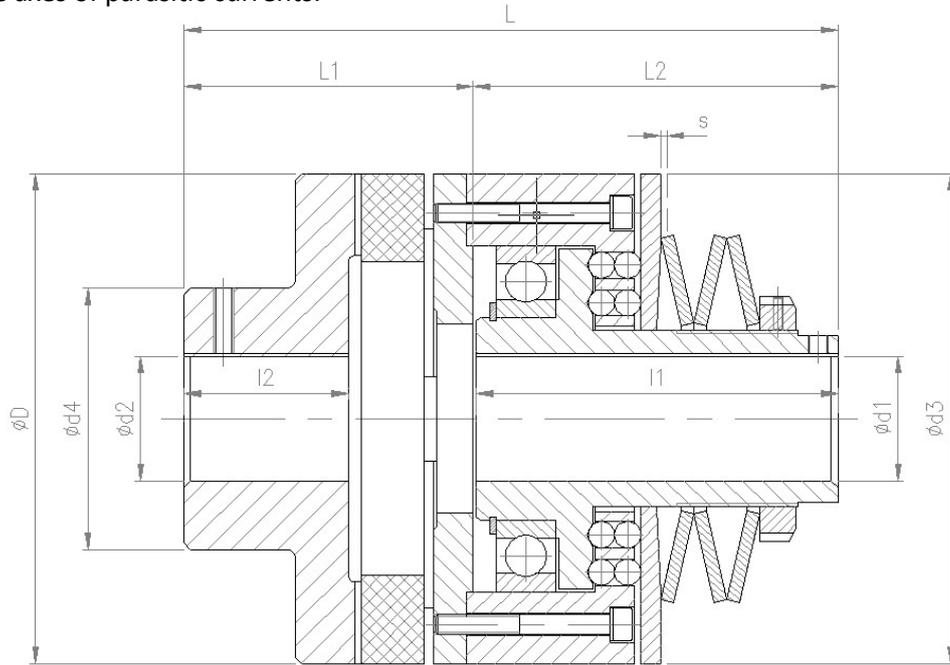
They can be varied with the positioning of the nut according to a table that is delivered with the report of your tare.

On demand we can supply other sizes of Limiters for smaller torques and much higher than those in the table.

We reserve the right to make modifications to improve the product.

RD TYPE BALL TORQUE LIMITERS

This type of limiter with output to elastic coupling allows the union of axes, compensating misalignments and dampening vibrations and torque tips when large inertial masses are driven. They isolate the axes of parasitic currents.



Size	Torque Nm Min Max	Ød _{1H} , Max*	Ød _{1H} , Max**	Ød ₂ Max	Ød ₃	Ød ₄	ØD	l ₁	l ₂	L ₁	L ₂	L	s
1	5 100	22	25	45	95	60	90	65	34	60	66	126	1
2	10 250	30	35	50	120	70	120	90	40	69	91	160	2
3	30 500	45	50	60	150	80	150	110	50	88	111	199	2
4	50 1.000	55	65	75	170	95	175	120	58	102	121	223	2
5	75 2.000	70	75	85	210	110	200	140	67	115	141	256	3
6	90 3.500	80	90	135	250	170	245	155	110	170	156	326	3
7	100 6.000	110	120	135	260	200	300	165	170	246	166	412	3

* Keeway as per DIN 6885 in Page. 1

** Keeway as per DIN 6885 in Page.

Maximum displacement		
Axial	Radial	Angular
1,5	0,5	1° 10'
1,7	0,7	1° 10'
2,2	0,8	1° 10'
2,5	0,8	1° 10'
3	0,8	1° 10'
4	1	1° 10'
5	1,2	1° 10'

The limiters are delivered according to the customer's needs.

They can be varied with the positioning of the nut according to a table that is delivered with the report of your tare.

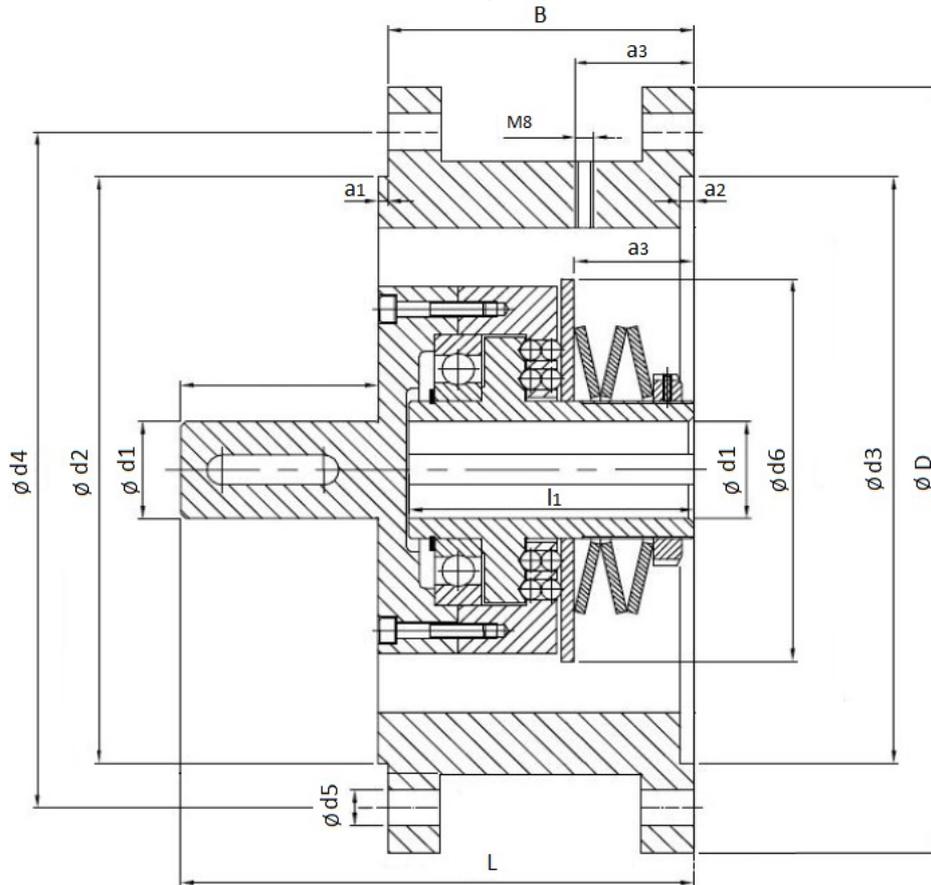
On demand we can supply other sizes of Limiters for smaller torques and much higher than those of the table and with larger hub of the coupling.

They can be delivered with longer reinforced sleeves

We reserve the right to make modifications to improve the product.

MOTOR TORQUE LIMITERS RM

Limiters to be placed with extension housing as continuation of the motor.



Size	Motor	LP	a ₁	a ₂	a ₃	l	l ₁	L	B	d ₁	d ₂	d ₃	d ₄	d ₅	d ₆	D
1	63	RB-1	3	4	25	20	65	96	73	11	95	95	115	9,5	95	140
2	71	RB-1	3	4	25	27	65	103	73	14	110	110	130	9,5	95	160
3	80	RB-1	3,5	4,5	25	36,5	65	112,5	72,5	19	130	130	165	11,5	95	200
4	90	RB-2	3,5	4,5	36	46,5	90	147,5	97,5	24	130	130	165	11,5	120	200
5	100	RB-2	4	5	36	56	90	157	97	28	180	180	215	14	120	250
6	112	RB-2	4	5	36	56	90	157	97	28	180	180	215	14	120	250
7	132	RB-3	4	5	46	76	110	198	118	38	230	230	265	14	150	300
8	160	RB-3	5	6	46	105	110	227	117	42	250	250	300	18,5	150	350
9	180	RB-4	5	6	49	105	120	237	127	48	250	250	300	18,5	170	350

Due to the speed of its operation, it is essential to place a proximity detector in the groove placed on the hood so that the engine stops when it receives the jump signal from the Limiter as it is reset on each turn.

The torque to which it is delivered is 2.5 times the rating of the motor so that it does not act on the starting points.

The housing is adapted to place an inductive detector which metric to be specified, when ordering, with 1.5 or 3 mm pickup. IT IS IMPERATIVE TO IMPLEMENT IT.

We reserve the right to make modifications to improve the product.

TORQUE LIMITERS (ESPECIAL DESINGS)

Our technical office is at your disposal to design the element that best suits your needs.

As an example, we will list some successfully customized applications for very diverse applications and sectors:

IRREVERSIBLE SYSTEM WITH MECHANICAL SAFETY FUSE IN PHOTOVOLTAIC ENERGY

In the field of solar trackers, one of the big problems is, without a doubt, the great winds or the thermal shocks. Through a completely mechanical solution, we provide the best safety tool in the market to a leader in the sector.

A bidirectional clutch pack with ball torque limiter with double function. Thus, the exact position of the tracker is guaranteed, and at the same time, in the presence of large wind loads, it is allowed to uncover it automatically.

The limiter's tare is adjusted by calculating the torque from which we want to protect the installation.

In addition, thanks to these equipments, a great part of the vibrations of the system are avoided



With this system we provide the end customer with double savings. The position brake become unnecessary, as well as the expensive systems of zenital movement, which only serve in many cases to put the installation in flag before the existence of strong winds.

Our own set provides both solutions with an infinitely lower cost, and all this, providing simplicity and robustness to the system.

In addition, the advantage that our system assumes is that having an irreversible system, it is no longer necessary to go to solutions with expensive worm gearboxes with very low efficiency that the consumption of each installation becomes very low. For example, for "candles" of 120 m2 consumables equivalent to motors of only 5-6 watts are achieved

HIGH SENSITIVITY TORQUE LIMITER FOR PACKAGING

This is a high quality application in the adjustment of the torque of regulation, for this application, our technique was decided for the limit of coil springs of high sensitivity, part of a standard limiter.



SPINNING UNIT POWERED BY CAMS

It is a ball torque limiter that is specially designed to hold the very demanding state of loads of a turning unit driven by cams with torques of up to 5,000 Nm.

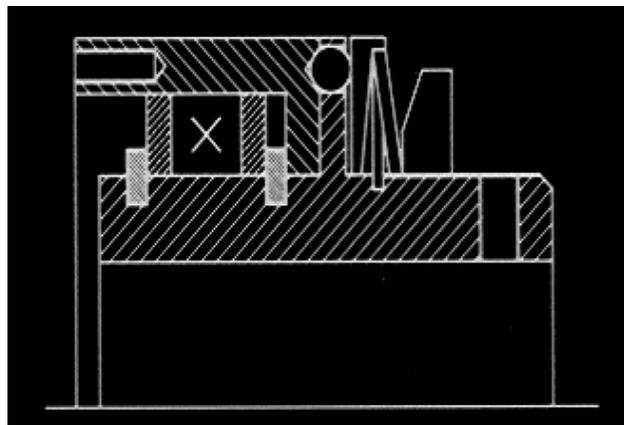
The torque limiter should be able to work with axial loads greater than 10,000 kg.

SPECIAL SCREWDRIVER

The challenge was to configure a very special industrial screwdriver that was in an area of large electromagnetic disturbances due to the adjacent welding robot.

By means of a 100% mechanical solution, the mechanism was equipped with a ball torque limiter combined with a freewheel.

In this way we allowed the regulated drive to the tightening torque in one direction and in the opposite direction transmitting the torque through the free wheel being able to exert a much higher torquer.

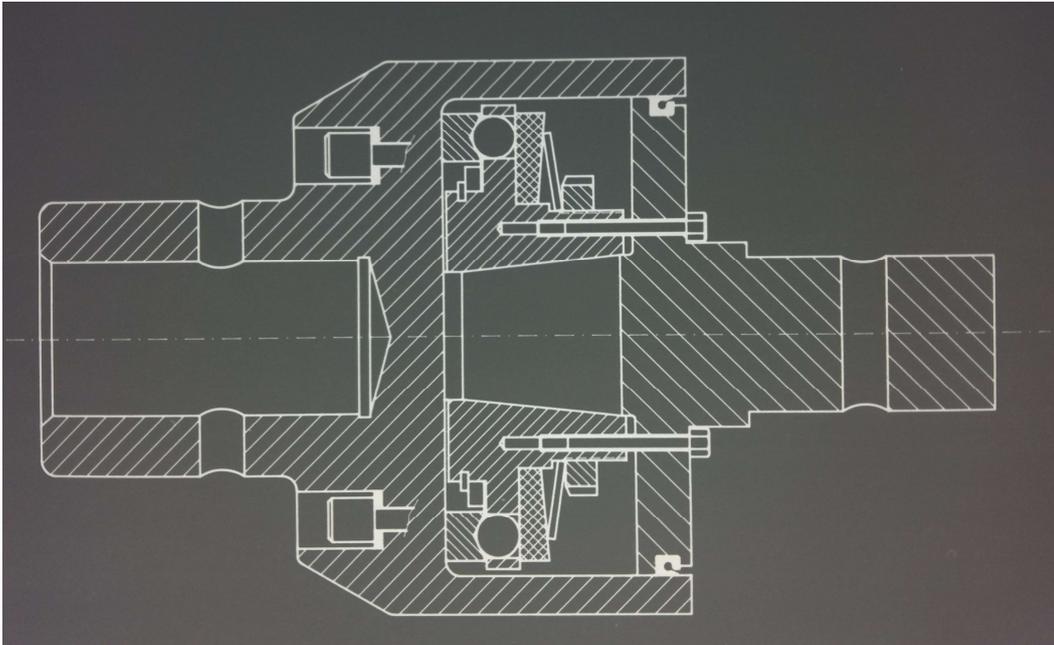


This solution is also adopted in handling loads, for example claw closure.

POSITIONING GRAPHITE BARS IN NUCLEAR CENTRAL

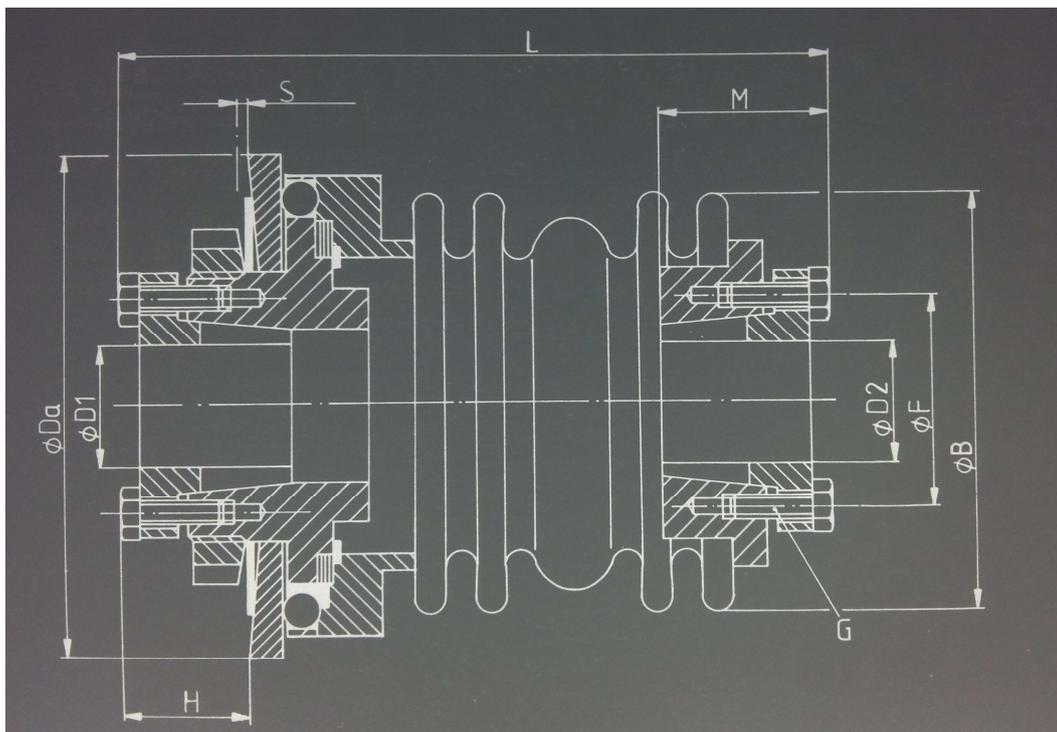
Being a nuclear power plant and an extreme security process, it meant a greater demand and responsibility.

The joint solution offered a ball torque limiter made of stainless steel that also had to be able to withstand an extreme pressure of up to 20 bar



DCC MACHINE-TOOL

The solution of our client was to use a torque limiter combined with a rigid compensation coupling.





AUTOMATIZACIONES INDUSTRIALES

- Ingeniería de diseño
- Proyectos llave en mano
- Talleres de mecanización

ESPECIALISTAS EN LA TRANSMISIÓN

- Ruedas libres
- Limitadores de par
- Embragues bidireccionales tipo IR
- Embragues y frenos
- Elementos cónicos de fijación
- Células de carga
- Variadores de velocidad
- Tarjetas maniobras eléctricas
- Acoplamientos elásticos

Andrés Cortina 2 A - 3
Algorta (Bizkaia) 48993
SPAIN
Tfno: +34 946567955
rulitrans@rulitrans.com

