

# HYDROMECHANIC COUPLINGS TURBOSTART JOLLY

from 0.37 to 2200 Kw



**NON SLIP - CONSTANT OUTPUT SPEED**

# TECHNICAL CATALOGUE

# HYDROMECHANIC COUPLINGS

# JOLLY



**New Turbostart s.r.l.** was born in 1958, its corporate purpose is the production and sale of mechanical and hydraulic drives; the company has always been renowned for their new products reliability and professional service offered to clientele. It is a compact structure, efficient and always ready to solve the most varied problems of customers, succeeding in realizing even personalized products, guaranteeing, at the same time, rapidity and prompt deliveries. Over the years, it has always followed quality objectives, **officially recognized on several occasions all over the world.**

New Turbostart is in continual development, both in Italy and abroad (all continents) where it is selling hydrodynamic and hydromechanic couplings without slip at continuous running and 100% efficiency, couplings in cast iron for mines applications for powers ranging from 0,37 to 2.200 Kw, both for in line and pulley assembly, and also disk brake, drum brake, and all metal flexible couplings.

The administration and commercial offices are placed in Milan – Segrate, while production factory is located in Borgo Ticino – Novara, which is owned by New Turbostart and it covers 7.000 sq.m.

The factory is equipped with numerically controlled operating machines; processing of all particulars are carried out inside, as well as assembly and testing, whereas castings are made by skilled foundries in primary aluminium alloy

New Turbostart is certified, according to **UNI EN ISO 9001 – 2008** regulation, and it can supplies couplings in according ATEX Certification.



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The worldwide patented Jolly hydromechanic coupling is a fitting of outstanding importance, which is widely used in modern transmissions.

The Jolly coupling makes it possible to start high inertia loads gradually using three phase squirrel cage asynchronous motors, which demand constant continuous running however the load changes.

## PRINCIPLE OF OPERATION

At start up the Jolly hydromechanic coupling acts as a hydrodynamic coupling till a minimum operating speed of 800+900 rpm is reached. Unloaded motor shaft (5) accelerates easily and the inner impeller(pump) connected to it pivots both the outer impeller and the cover, which are linked to the driven machine, by oil circulation. The lock-up weights, thrust by triangular wedges, gradually accelerate and the rollers start sliding on the impeller friction lock up ring . Subsequently, centrifugal force acts on the internal mechanical clutch, making it engage and providing a positive 1:1 lock up at full motor speed.

## LOCK-UP WEIGHT POSITION FROM REST TO OPERATION

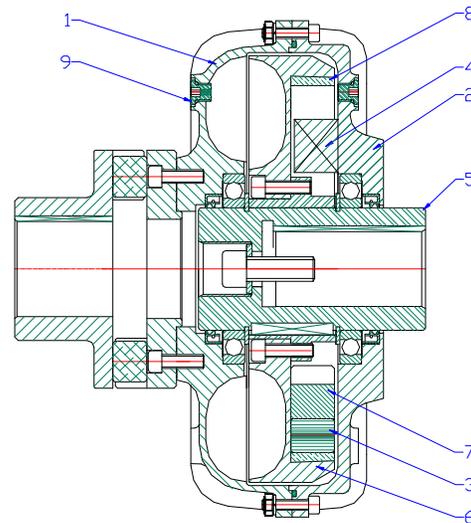
Whenever the resisting torque reaches twice the dragging torque, the mechanical part disengages and the hydraulic part comes into action, protecting both the motor and the driven machine.

When the overload or jam is removed, the operating speed is regained and the clutch re-engages for 1:1 lock up.

Varying the quantity of oil makes it easy to match the motor to drive requirements and provides optimum acceleration times. Optional reservoir permits to limit the starting torque and consequently to extend the start-up time and optional temperature limiting fusible plugs are a protection against prolonged slip at rated speed, which is caused by anomalous overloads.

The Jolly coupling can operate in both directions of rotation.

The input shaft must be keyed on the motor shaft. The Jolly coupling is normally used with horizontal axis. For different positions, please consult Turbostart distributor.

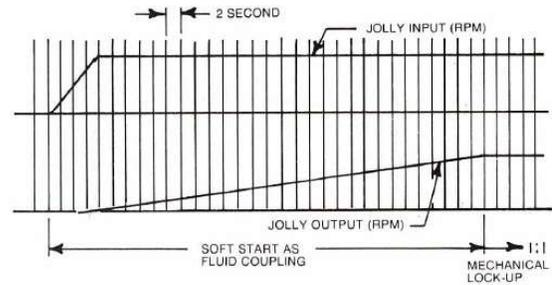


**Mechanical Lock-up Fluid Coupling**

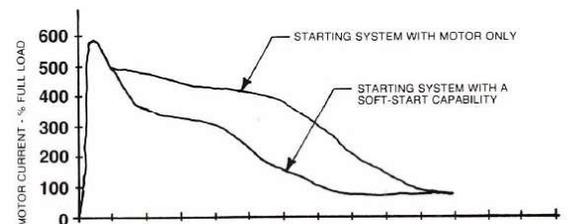
1. Turbine Housing Section
2. Cover
3. Lock-up Weight Roller
4. Triangular Wedge
5. Input
6. Inner impeller
7. Lock-up Weights
8. Friction Lock-up Ring
9. Filler Plug

- Soft starts (fig. C)
- Dampens shock loads.
- Energy savings by reducing initial starting current using a smaller motor according to the demand power at the rated speed (fig. D)
- Varying the quantity of fluid makes it easy to match motor to drive requirements and provides optimum acceleration times.
- Optional reservoir permits extended startup time.
- No slip at full speed and no heat generation.
- Optional temperature-limiting fusible plug provides protection in case of prolonged overloads.
- Output speed kept at a constant level and in any case the same as the motor.
- No wear and fatigue on mechanical lockup device.
- No maintenance required but periodic oil change.

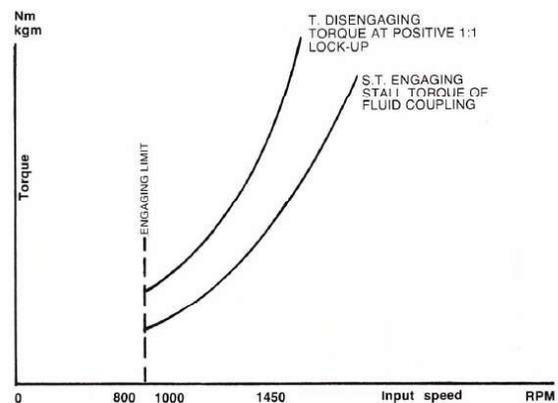
The Jolly Coupling is unique in combining the advantages of both fluid and mechanical device to provide full protection, yet save substantially on capital, maintenance and costs.



Actual trace showing coupling input and output startup time. Fig. C



Comparison of current VS starting time, with and without a fluid coupling. Fig.D

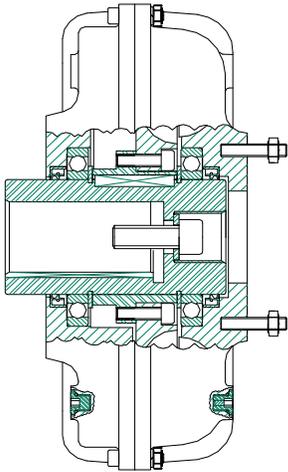


Curves of Jolly Coupling Fig.E

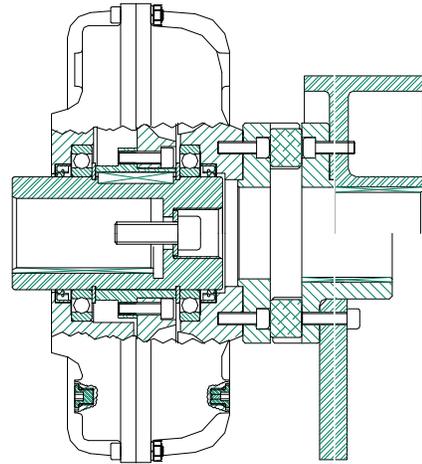
## USUAL APPLICATIONS

- |                        |                         |                            |
|------------------------|-------------------------|----------------------------|
| - Air separators       | - Carding machines      | - Paper machineries        |
| - Amusement Park rides | - Centrifugal pumps     | - Polverizers              |
| - Belts conveyors      | - Compressors           | - Rotating filters         |
| - Blowers              | - Fans                  | - Textile machines         |
| - Bottling machines    | - Machine tools         | - Wire machines            |
| - Bucket conveyors     | - Metalworking machines | - Wheel balancing machines |

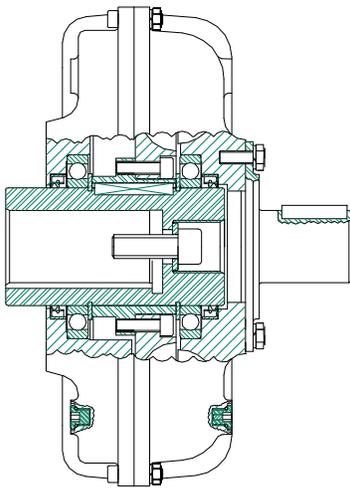
In line version



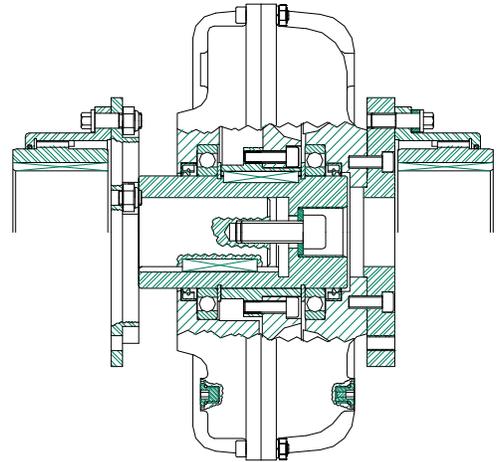
**L/S: with stud bolts**



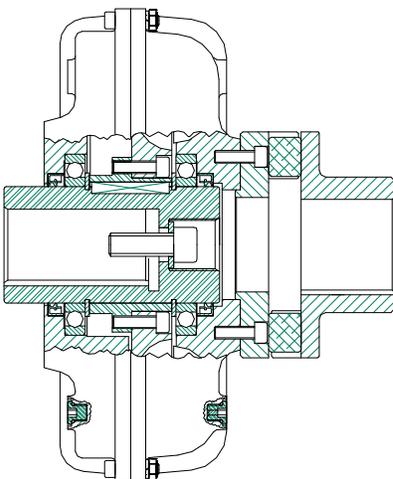
**LE-DF/FF: with flexible coupling and brake disk or brake drum**



**L/MU: with stub shaft**

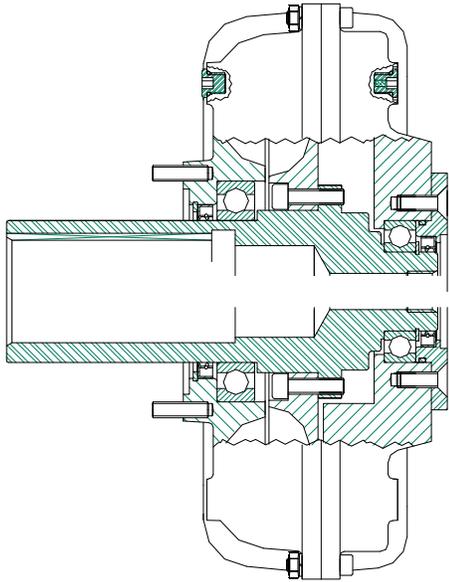


**CF: with input/output flanges for gear coupling**

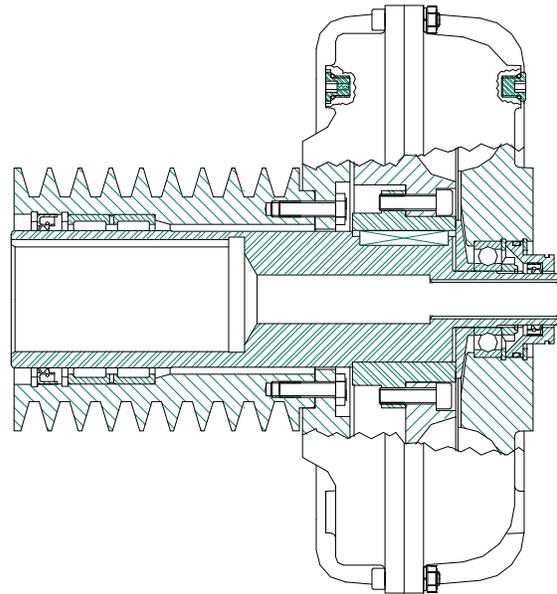


**L/E: with flexible coupling**

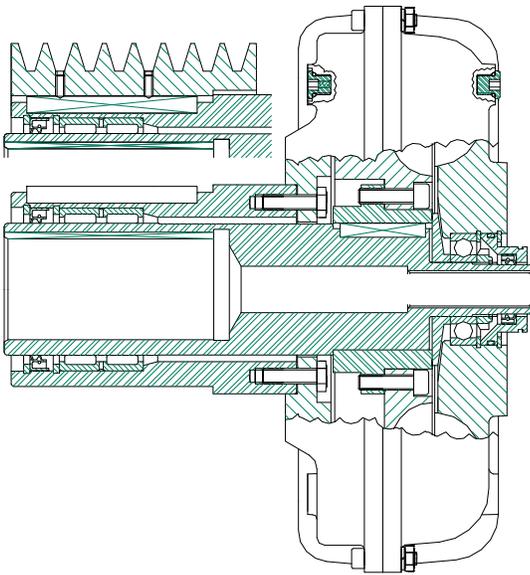
For pulley version



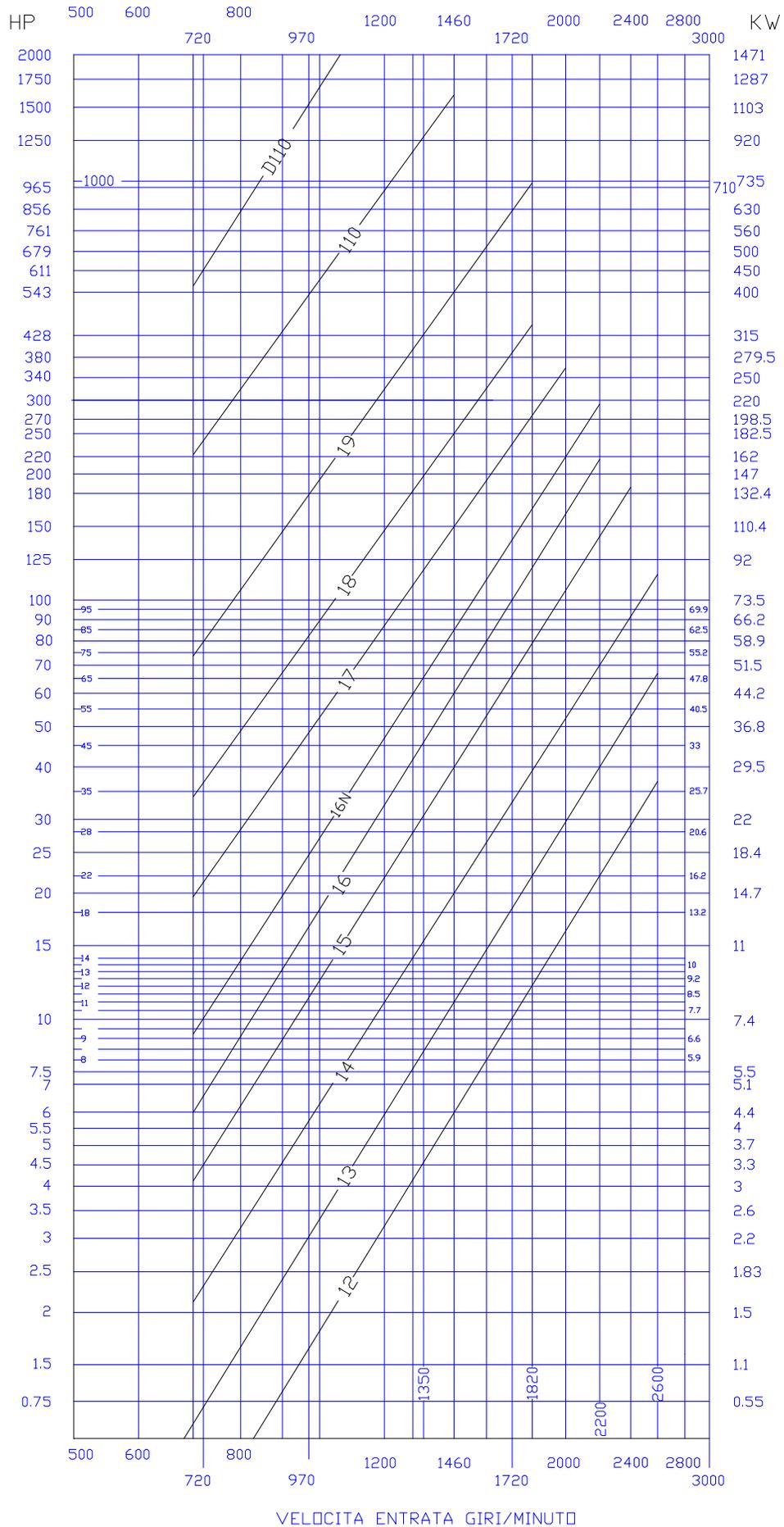
VERSION PF: FOR FLANGED PULLEY

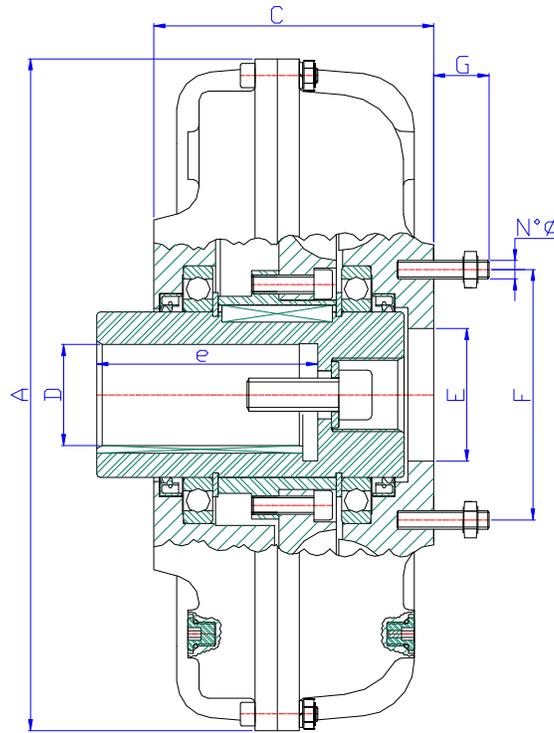


PI VERSION: WITH INCORPORATED PULLEY HAVING HIGH GROOVES NUMBER



PC VERSION: FOR KEYED PULLEY

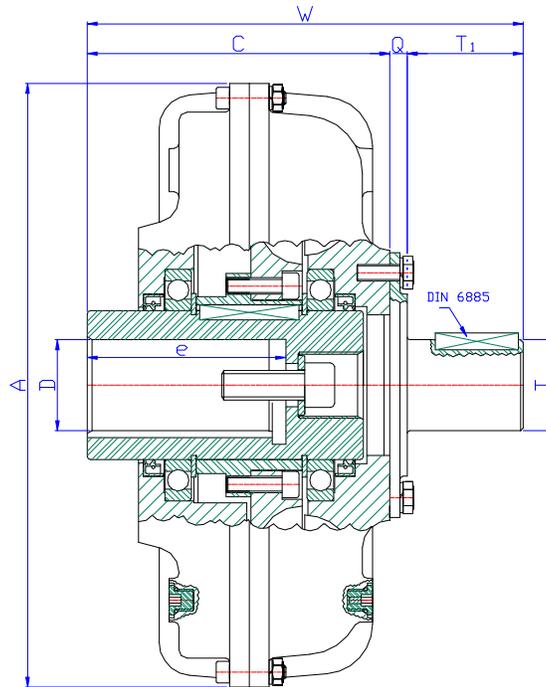




IN LINE VERSION TYPE L/S: WITH BOLTS

COUPLING TYPE	DIMENSIONS							
	A	C ±0,5	D G7 *	e min	E H7	F ±0,2	G ±1	Stud bolts
12	234	127	24 - 28 38	60 80	47	73	16	6 M6
13	260	146	28 38 42	60 80 110	47	73	16	6 M6
14	294	148	38 42 - 48	80 110	62	89	25	6 M8
15	325	154	42 48 - 55	110	62	89	25	6 M8
16	365	183	48 - 55 60 - 65	110 140	72	112	30	8 M10
16N	390	181	48 - 55 60 - 65	110 140	85	136	30	8 M10
17	430	216	55 60 - 65 - 75 80	110 140 170	85	136	30	8 M10
18	527	239	65 - 75 80 100	140 170 210	120	168	35	8 M10
19	626	259	80 100-110	170 210	140	196	45	10 M12
110	800	325	100 - 110 - 120 130	210 240	180	250	50	10 M14

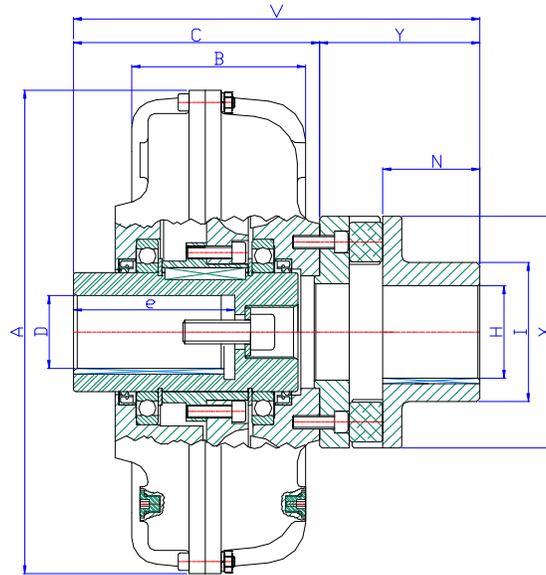
Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.



IN LINE VERSION TYPE L/MU WITH STUB SHAFT

COUPLING TYPE	DIMENSIONS							
	A	C ±0,5	D G7 *	e min	Q	T h6	T1	W
12	234	127	24 - 28 38	60 80	8	24	31	165
13	260	146	28 38 42	60 80 110	8	30	39	192
14	294	148	38 42 - 48	80 110	8	38	46	202
15	325	154	42 48 - 55	110	10	48	66	230
16	365	183	48 - 55 60 - 65	110 140	10	52	66	259
16N	390	181	48 - 55 60 - 65	110 140	10	55	70	261
17	430	216	55 60 - 65 - 75 80	110 140 170	10	55	70	296
18	527	239	65 - 75 80 100	140 170 210	12	70	85	336
19	626	259	80 100-110	170 210	25	80	100	484
110	800	325	100 - 110 - 120 130	210 240	28	110	160	513

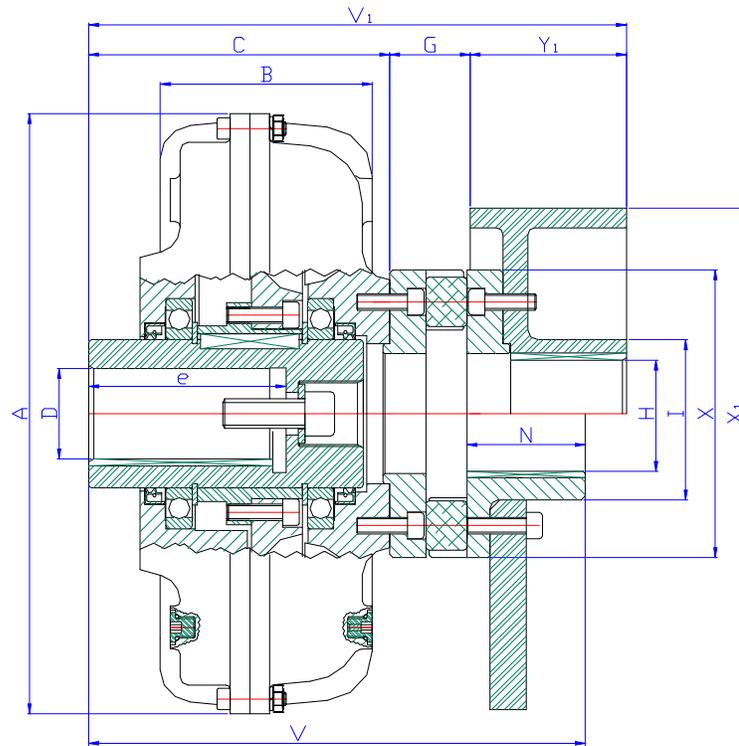
Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.



IN LINE VERSION TYPE L/E: WITH FLEXIBLE COUPLING

COUPLING TYPE	FLEXIBLE COUPLING	DIMENSIONS										
		A	B	C ±0,5	D G7 *	e min	H G7 max	I	N	X	Y	V
12	E 20	234	98	127	24 - 28 38	60 80	38	55	42	96	76	202
13	E 20	260	105	146	28 38 42	60 80 110	38	55	42	96	76	221
14	E 30	294	107	148	38 42 - 48	80 110	48	76	55	122	95	243
15	E 30	325	125	154	42 48 - 55	110	48	76	55	122	95	249
16	E 40	365	130	183	48 - 55 60 - 65	110 140	60	86	72	150	119	302
16N	E 50	390	145	181	48 - 55 60 - 65	110 140	70	105	72	175	119	300
17	E 50	430	160	216	55 60 - 65 - 75 80	110 140 170	70	105	72	175	119	335
18	E 60	527	195	239	65 - 75 80 100	140 170 210	80	124	88	220	142	381
19	E 70	626	225	259	80 100-110	170 210	100	150	111	250	181	440
110	E 80	800	320	325	100 - 110 - 120 130	210 240	110	200	141	320	226	551

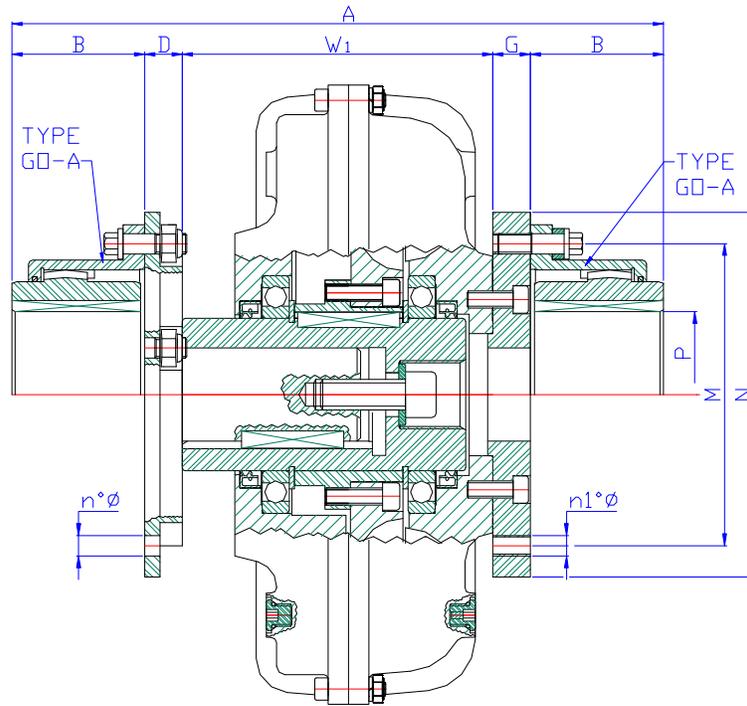
Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.



**IN LINE VERSION TYPE LE/FF WITH BRAKE DRUM  
AND VERSION LE/DF WITH BRAKE DISK**

COUPLING TYPE	DIMENSIONS													
	A	B	C ±0,5	D G7 *	e min	G ± 1	H G7 max	I	N	X	X1	Y	Y1	V1
12	234	98	127	24 - 28 38	60 80	16	38	55	42	96	160	76	60	202
13	260	105	146	28 38 42	60 80 110	16	38	55	42	96	160	76	60	221
14	294	107	148	38 42 - 48	80 110	25	48	76	55	122	160	95	60	243
15	325	125	154	42 48 - 55	110	25	48	76	55	122	160 200	95	60 75	249
16	365	130	183	48 - 55 60 - 65	110 140	30	60	86	72	150	160 200	119	60 75	302
16N	390	145	181	48 - 55 60 - 65	110 140	30	70	105	72	175	250 315	119	95 118	300
17	430	160	216	55 60 - 65 - 75 80	110 140 170	30	70	105	72	175	250 315	119	95 118	335
18	527	195	239	65 - 75 80 100	140 170 210	35	80	124	88	220	315 400	142	118 150	381
19	626	225	259	80 100-110	170 210	45	100	150	111	250	400 500	181	150 190	440
110	800	320	325	100 - 110 - 120 130	210 240	50	110	200	141	320	500	226	190	551

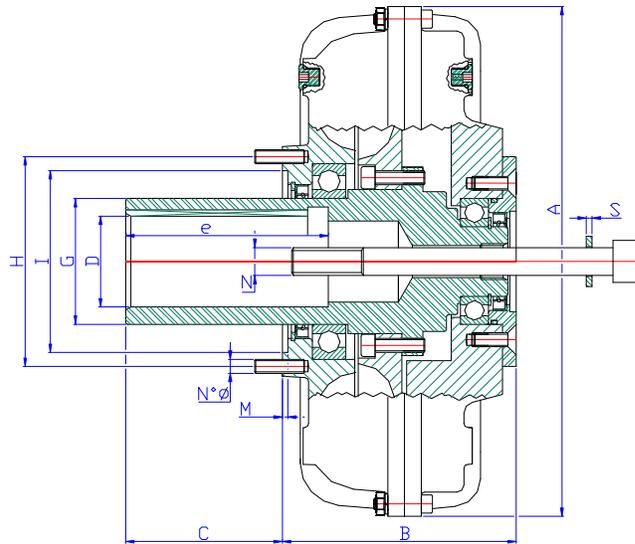
Keyways as per UNI 6604-69 DIN 6885/1  
Bolting screws diameters as per DIN 332  
Bolting screws and washers supplied on request.  
The weights and dimensions may be subject to change.



**IN LINE VERSION TYPE CF WITH INPUT/OUTPUT FLANGES  
FOR GEAR COUPLING**

COUPLING TYPE	DIMENSIONS									
	A	W1	B	D	G	M ±0,1	N	n° ∅	n1° ∅	P MAX ∅
12	369	126	51,5	19	19	122	152	8 10	8 M10	60
13	388	145	51,5	19	19	122	152	8 10	8 M10	60
14	419	152	63,5	19	19	148	180	10 10	10 M10	75
15	478	156	78,5	22	22	178	215	10 12	10 M12	75
16	523	183	78,5	22	22	178	215	10 12	10 M12	110
16N	533	181	78,5	22	22	178	215	10 12	10 M12	110
17	596	216	92,5	22	22	203	240	12 12	12 M12	110
18	753	265	108	28,5	28,5	236	280	12 16	12 M16	127
19	855	285	123	28,5	28,5	270	320	14 16	14 M16	150
110	948	352	123	28,5	28,5	270	320	14 16	14 M16	150

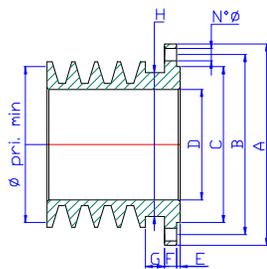
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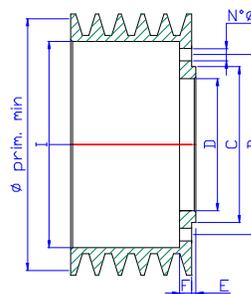
VERSION PF FOR FLANGED PULLEY AND PT FOR HOLLOWED PULLEY

COUPLING TYPE	DIMENSIONS										
	A	B	C	D	e min	G	H	I	M	N	N° Ø
14 PF	294	143	110	38 42 48	80 110	65	114	90	5,5	M 12 M 16	8 M8
15 PF	325	163	110	42 48 55	110	75	114	90	5,5	M 16 M 20	8 M8
16 PF	365	171	110 126	48 55 60 65	110 140	90	150	130	4	M 20	8 M10
16N PF	390	195	126	48 55 60 65	110 140	90	150	130	4	M 20	8 M10

Flanged pulley

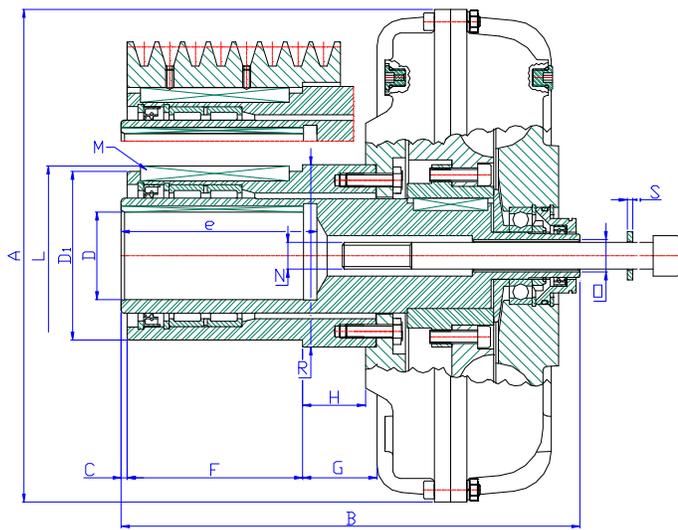


Hollowed pulley

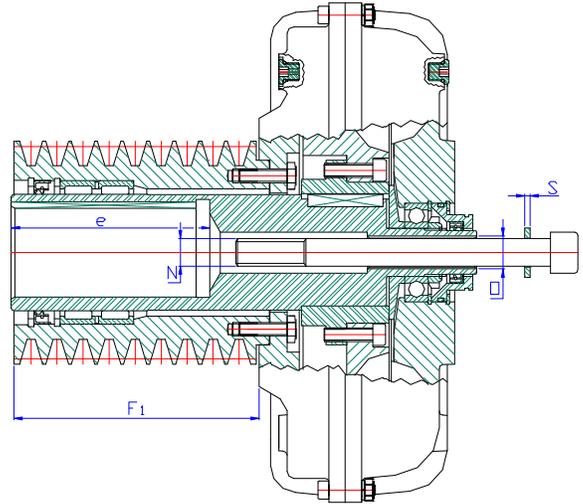


COUPLING TYPE	DIMENSIONS										PULLEY	
	A ±1	B ±0,2	Cg6	D min	E ±0,1	F	G	H	I min	N° Ø	FLANGED P.D min	HOLLOWED P.D. min
14 PF	130	114	80	72	3	10	15	90	130	8 8,5	SPB 110 SPC 120	SPB 170 SPC 180
15 PF	130	114	90	78	3	10	15	90	128	8 8,5	SPB 110 SPB 125	SPB 170 SPC 180
16 PF	168	150	130	94	3	10	16	120	166,5	8 10,5	SPB 130 SPC 140	SPB 210 SPC 220
16N PF	168	150	130	94	3	10	16	120	166,5	8 10,5	SPB 130 SPB 140	SPB 210 SPC 220

Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.



VERSION PC FOR KEYED PULLEY

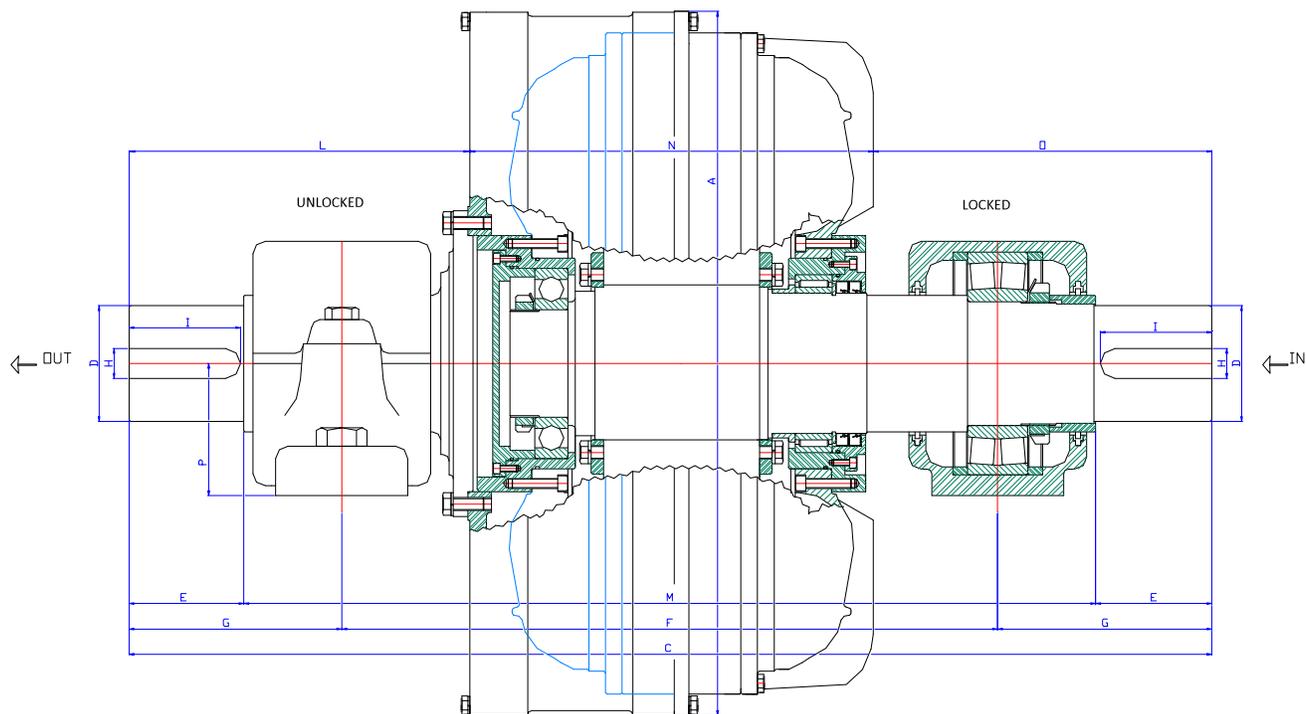


VERSION PI FOR INCORPORATED PULLEY

COUPLING TYPE	DIMENSIONS															
	A	B ± 1,5	C ± 1	D1 h6	D (G7)	e min	F	G ± 1,5	H	L	M	N Ø max screws	O Puller	F1	R	S
12	234	215	2,5	85	24 28 38	60 80	80	22	14	88,5	12 X 8	M12	M14	95	88	2,5
13	260	240	7	85	28 38	60 80	80	31	22	88,5	12 x 8	M12	M14	110	88	2,5
14	294	244	2,5	95	38 42 48	80 110	80	29	20	98,5	12 X 8	M16	M20	110	104	2,5
15	325	286	5	110	42 48 55	110	110	30	18	115	16 x 10	M16	M20	135	115	2,5
16	365	340	4	125	48 55 60 65	110 140	130	51	46	130	18 x 11	M20	M24	180	135	4
16N	390	340	3	125	48 55 60 65	110 140	130	42	34	130	18 x 11	M20	M24	180	135	4
17	430	451	3,5	150	55 60 65 75 80	110 140 170	150	109	100	156	20 x 12	M20	M24	255	160	4
18	527	488	4	150 160 170	75 80 90 95** 100**	140 170 170 230	150 230 230	121 40	101 20	156 166 176	20 x 12	M24	M30	255	160 175	4
19	626	560	5	190	80 90 100 110	170 210	280	43	25	195,5	25 x 14	M24	M30	310	215	6

Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.

DOUBLE CIRCUIT VERSION EQUIPPED WITH SUPPORTS AND INNER AND OUTPUT SHAFTS



COUPLING	DIMENSIONS													KG
	A ±2	C ±3	D m6	E	F	G	H	I	L	M	N	O	P	
D 110	852	1310	140	140	793,5	258,5	36	135	413,5	1030	488	409	160	880

Keyways as per UNI 6604-69 DIN 6885/1  
 Bolting screws diameters as per DIN 332  
 Bolting screws and washers supplied on request.  
 The weights and dimensions may be subject to change.

**INSTALLATION**

Check that the connection to the motor shaft is moderately loose; too much slack can cause dangerous vibrations.

**Mounting with Pulley**

- after having checked the correct balancing of the grooved pulley, mount it on the coupling
- lock assembly on motor shaft by bolting screw A(Fig. 1)
- check the alignment of pulleys, and make sure the belts tension is not too stretched to prevent fast wornout of bearings.

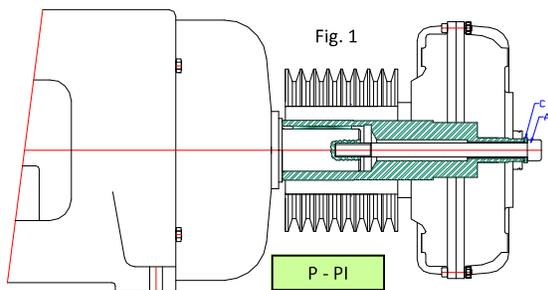


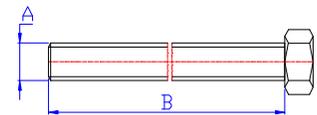
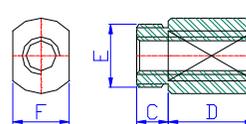
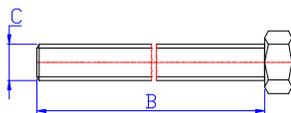
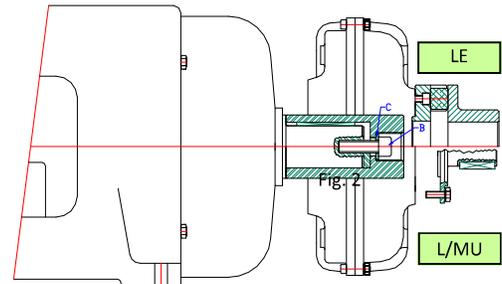
Fig. 1

**Mounting in line versionn**

Lock the Jolly coupling on motor shaft by bolting screw (B) and washer (C) (Fig. 2).

For type L/MU it is necessary to remove the output shaft.

For type L/E it is necessary to remove the half flexible coupling.



PULLER FOR COUPLINGS TYPE P - PI				
COUPLING	12 - 13	14 - 15	16 - 17	18 - 19
C	M 14	M 20	M 24	M30
B	300	350	600	650

PULLER FOR COUPLINGS TYPE L and PF						
COUPLING	A	B ± 10	D	C	E	F
13 - 17	M 24	280	55	15	M40p2 S.	42
18 - 110	M 24	450	55	15	M40p2 S.	42

**WEIGHTS**

Coupling Type	WEIGHTS OF COUPLINGS WITHOUT OIL Kgs.				
	L/S	L/E	L/MU	CF	P
12	11	12,8	11,1	16	14
13	13	14,8	13,2	18	16
14	22	26	22,5	29	23
15	26	30	27	38	33
16	39	45	40,7	51	48
16 N	41	50	44	55	61
17	51	60	53,8	68	87
18	100	116	107	132	147
19	155	181	167	190	205
110	340	410	365	375	

Weights are approximated in accordance with diameter of shaft.

**OIL FILLING**

The hydromechanic Jolly couplings are normally supplied complete with oil filling and ready to be put into operation.

To refill the oil during the maintenance this procedure shall be followed:

Coupling with horizontal axis.

Place the arrow marked on the casting at the 12 o'clock position (rotating towards top); the filler plug will be at an inclination in relation to vertical according to the angle indicated in the table below. Fill oil through one of the filler plugs until the oil begins running out of filler plug and paying attention that no air bubble is present. The couplings are never to be totally filled, to avoid damages to the seals, caused by inner pressure.

For the oil quantity required please refer to the table below.

A more gradual startup of the driven machine is achieved by reducing the oil quantity inside the coupling.

The coupling dragging torque and the power absorbed, at startup, by the electric motor progressively slow down. However, possible calibration shall be carefully made to prevent overheating of the coupling.

After calibration, the 12 o'clock position should be marked to have just the same refill during the maintenance operation.

Fusible plugs calibrated at 145°C or 175°C can be provided upon request for couplings with special sealing.

**MAINTENANCE AND CHECKING**

After few hours of operation check the tightness of bolts and screws.

From time to time check that no oil leakages are present.

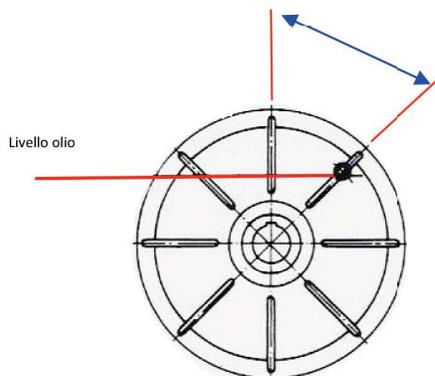
Check the oil level once a month.

The oil should be changed every 4000 hours of operation or every 12 months.

**GUARANTEE**

The couplings are guaranteed for 18 months of operation and in any case no more than 24 months from the date of invoice.

The guarantee is void if the installation and maintenance instructions are not complied with, if no balanced accessories are used, and if the connecting dimensions are out of tolerance.



Use oil SAE 10 W such as:

- AGIP OSO 32
- BP Energol HLP 32
- ESSO Nuto H 32
- FINA Hydran 32
- MOBIL DTE 32
- SHELL Tellus 32
- TOTAL Azolla 32
- CHEVRON Hydraulic 32

Coupling Type	Angle $\alpha$	Oil quantity	
		Litres	Kgs
12 L	30°	0,800	0,670
12 P	30°	0,900	0,780
13 L	30°	1,200	1,040
13 P	30°	1,360	1,180
14 L	30°	1,750	1,520
14 P	30°	1,900	1,650
15 L	30°	2,300	2,000
15 P	30°	2,500	2,180
16 L	0°	3,180	2,770
16 P	0°	3,500	3,050
16 NL	0°	3,600	3,130
16 NP	0°	4,000	3,480
17 L	0°	5,460	4,750
17 P	0°	5,750	5,000
18 L	45°	9,430	8,200
18 P	45°	9,600	8,350
19 L	45°	15,520	13,500
19 P	45°	15,850	13,780
110 L	50°	32,500	30,000