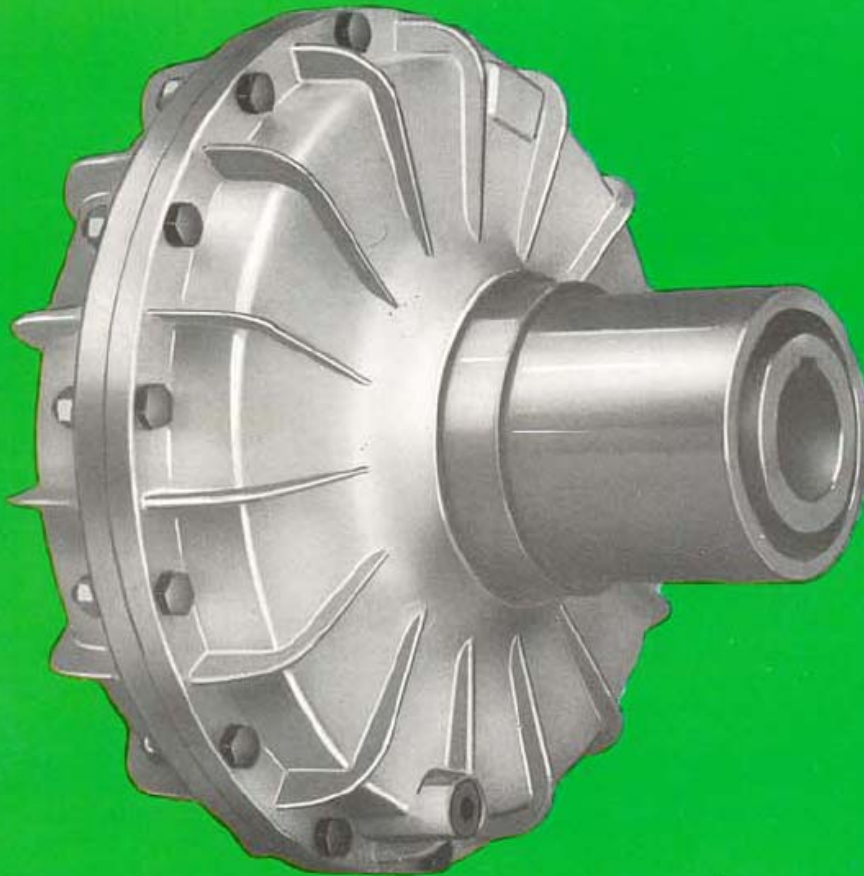


jolly TURBOSTART



HYDROMECHANIC COUPLINGS

**Non Slip - Constant output speed
1,5 tp 1,000 KW**

HYDROMECHANIC JOLLY COUPLING

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

It is a gradual starter of heavy-inertia machines, controlled by direct start triphase squirrel-cage motor, which requests a constant continuous running also if load changes.

PRINCIPLE OF OPERATION

The Turbostart hydromechanic coupling (fig. A) consists of:

- an outer impeller (turbine) (1) with internal finning closed by cover (2). The cover is provided with triangular wedges (4) to move the lock-up weights (7);
 - an inner impeller (pump) (6) with finning and lock-up ring (8);
 - lock-up weights (7) with rollers (3).
- These components are oil immersed.

At starting up the hydromechanic Jolly coupling acts like a hydrodynamic coupling till a minimum operating speed of $800 \div 900$ RPM is reached; unloaded motor shaft (5) accelerates easily, the inner impeller (pump) to it connected pivots the outer impeller and cover joined to driven machine by oil circulation; the lock up weights, thrust by triangular wedges, gradually accelerate and at the beginning their rollers slide on impeller friction lock up ring (fig. B). Subsequently centrifugal force acts on the integral mechanical clutch causing it to engage providing with a positive 1:1 lock up at full motor speed.

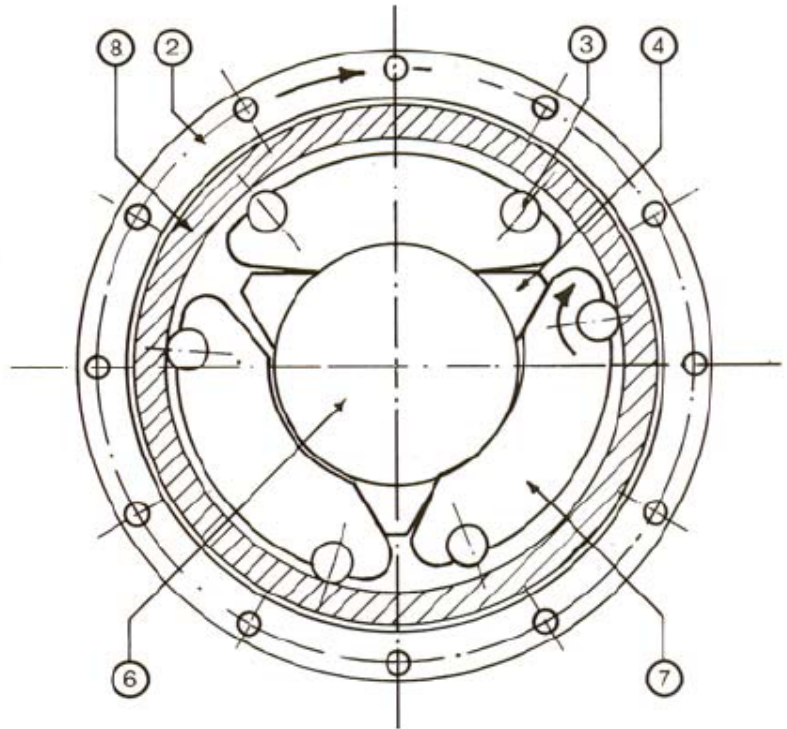


Fig. B

Lock-up Weight Position From Rest To Operation

Should the resisting torque reach twice the dragging torque, the mechanical part would disengage and the hydraulic part would restore protecting both motor and driven machine.

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

Varying amount of fluid makes it easy to match motor to drive requirements and provides optimum acceleration times. Optional reservoir permits to extend start up time and optional temperature limiting fusible plug protects against continuous overloads.

Jolly coupling can operate in each direction of rotation but the housing cannot be connected to motor shaft. The Jolly coupling is normally used with horizontal axis; for different positions, please consult Turbostart distributor.

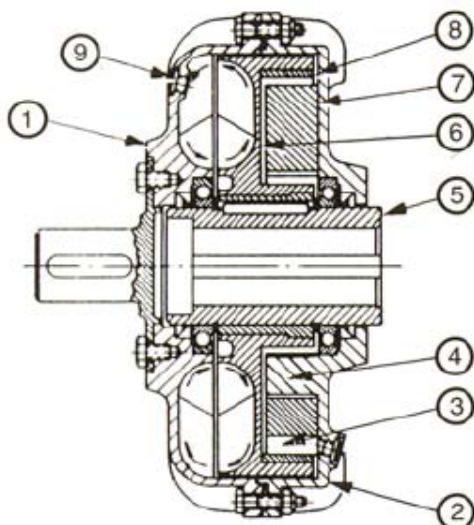


Fig. A

Schematic of 1:1 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

ADVANTAGES

- Soft starts (fig. C).
- Dumps shock loads during start up.
- Energy conservation by reducing initial starting currents and permitting use of a smaller motor according to the power required at rated speed (fig. D).
- Varying amount of fluid makes it easy to match motor to drive requirements optimum acceleration times.
- Optional reservoir permits extended start-up time.
- No slippage at full speed and generates no heat 1:1 lock up.
- Optional temperature-limiting fusible plug protects against anomalous overloads.
- Output speed is kept at a constant level and however like that of motor.
- No wear on mechanical lock-up device.
- No required maintenance other than periodic oil changes.
The Jolly Coupling is unique in providing the advantages of both fluid mechanical drive to give full protection, yet save substantially on capital, maintenance and costs.

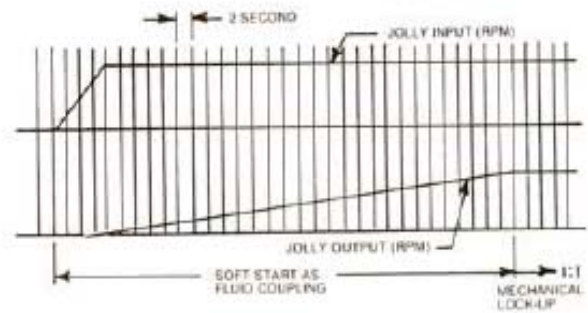


Fig. C

Actual Trace Showing Coupling
Input And Output Startup Time

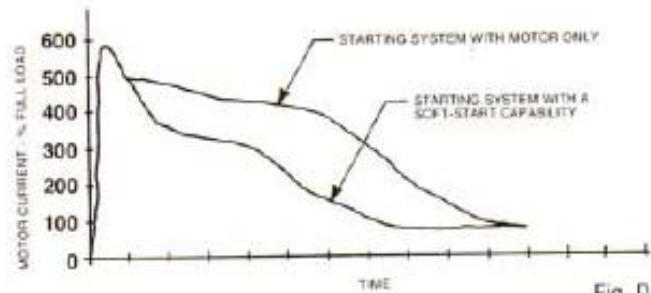
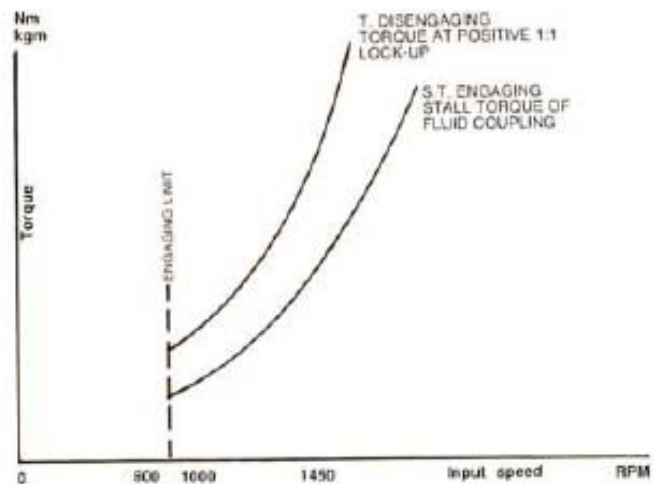


Fig. D

Comparison Of Current VS Starting Time,
With And Without A fluid Coupling



Curves of Jolly coupling

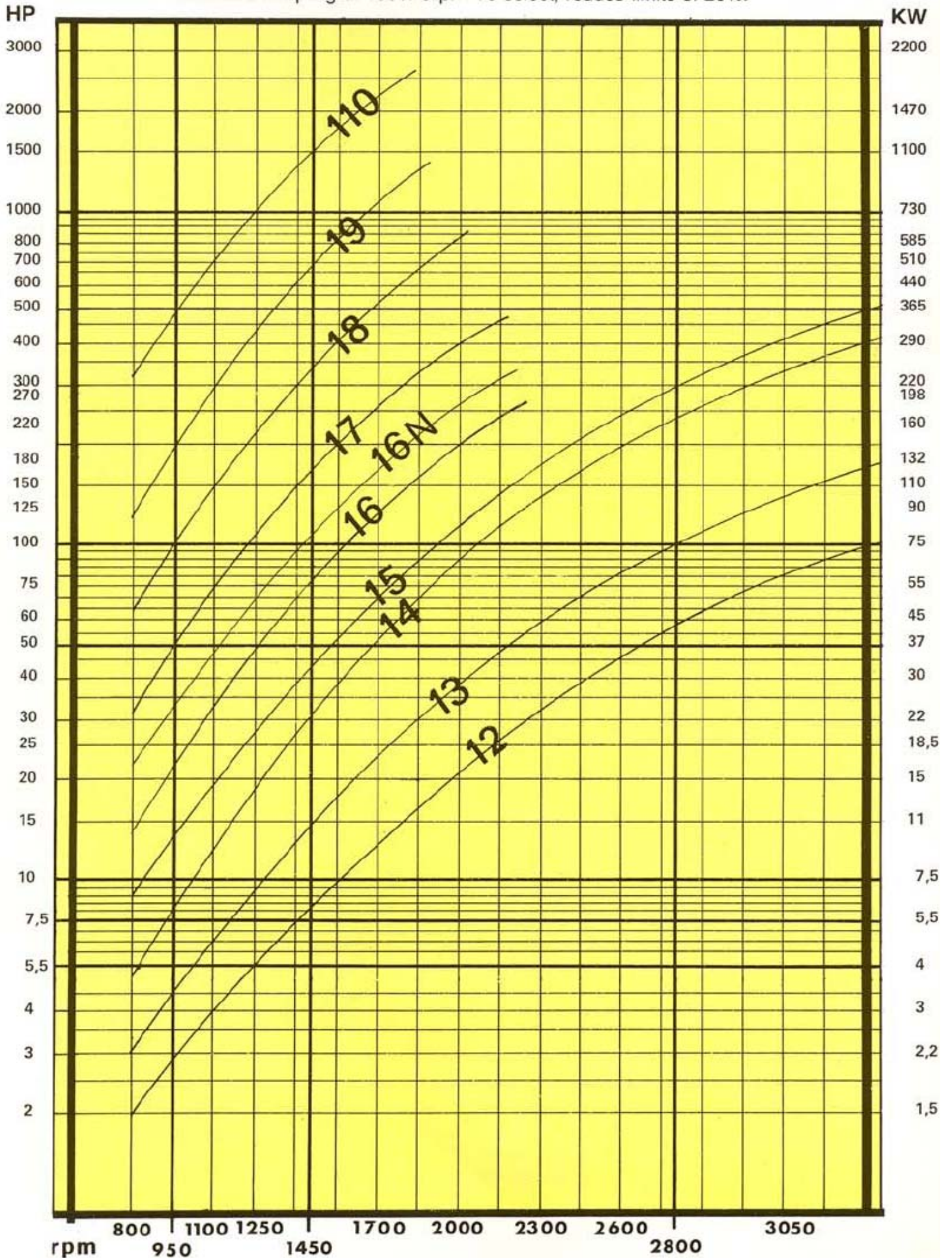
Fig. E

USUAL APPLICATIONS

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

MAXIMUM RATINGS

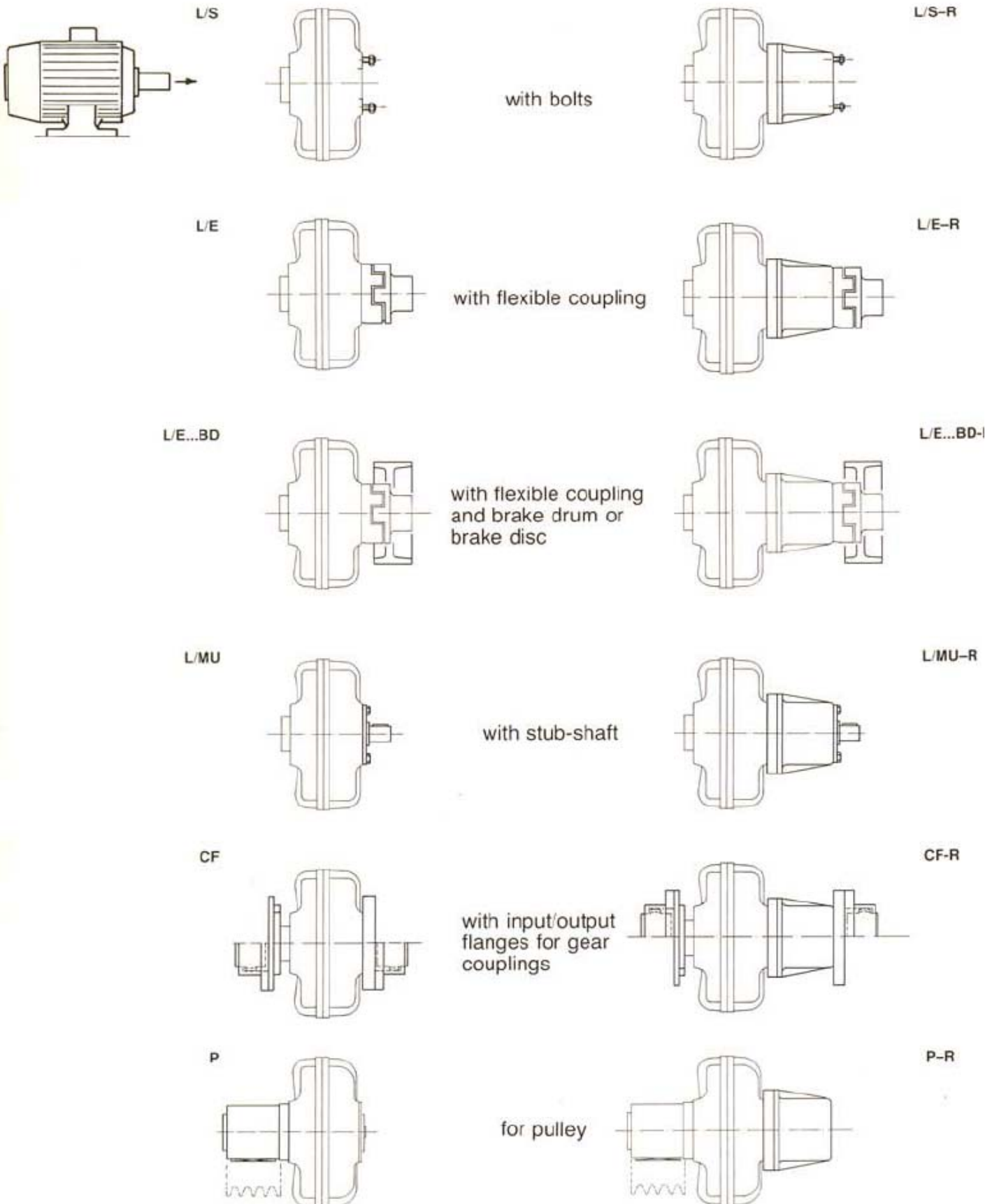
Curves show the maximum HP that each Jolly size can support at start-up for various output speeds as a fluid coupling at 100% slip. - To select, reduce limits of 20%.



PRODUCTION PROGRAMME

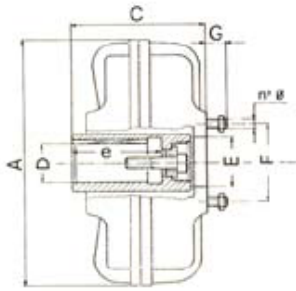
STANDARD TYPES

WITH PARTIAL DRAINING DEVICE

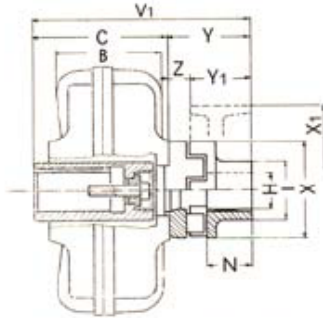


Horizontal fitting. For different positions please consult Turbostart distributor.

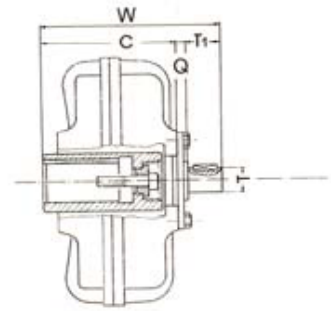
IN-LINE VERSIONS



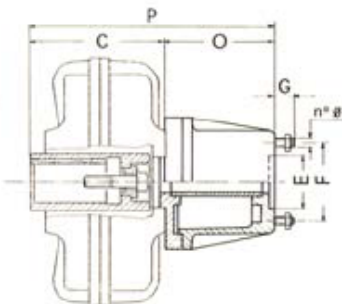
L/S
with bolts



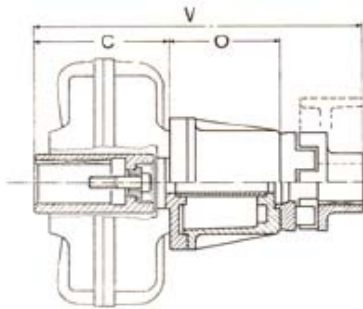
L/E **L/E...BD**
with flexible coupling
with flexible coupling
and brake drum or brake disc



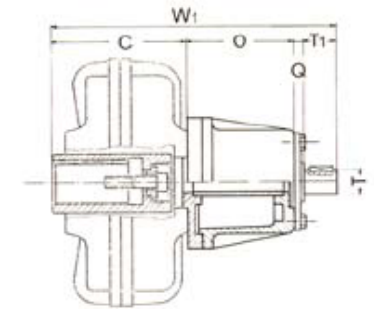
L/MU
with stub shaft



LS/R
with partial draining
device and bolts



L/E-R **L/E...BD-R**
with partial draining
device and flexible coupling
with partial draining device
and flexible coupling and brake drum



L/MU-R
with partial draining device
and stub shaft

Coupling type	Flexible coupling	DIMENSIONS																									
		A ±0.5	B ±1	C ±0.5	D G7	e min	E H7	F ±0.2	G ±1	H G7 max	I	N	O	P	Q	T h6	T1	V	V1	Z	X	X1	Y	Y1	W	W1	Stud bolts
12	E 20	234	98	127	24 28 38	60 60 80	47	73	16	38	55	42	102	229	8	24	31	305	202	34	96	160	76	60	165	268	6 M6
13	E 20	260	105	146	28 38 42	60 80 110	47	73	16	38	55	42	102	248	8	30	39	324	221	34	96	160	76	60	192	295	6 M6
14	E 30	294	107	148	38 42 48	80 110 110	62	89	25	48	76	55	102	250	8	38	46	345	247	40	122	160	95	60	206	304	6 M8
15	E 30	325	125	154	42 48 55	110 110 110	62	89	25	48	76	55	121	275	10	48	66	370	249	40	122	160 200	95	60 75	230	351	6 M8
16	E 40	365	130	183	48 55 60 65	110 110 140 140	72	112	30	60	86	72	139	322	10	52	66	441	302	46	150	160 200	119	60 75	259	398	8 M10
16 N	E 50	390	145	181	see 16		85	136	30	70	105	72	151	332	10	55	70	451	300	47	175	250 315	119	95 118	261	412	8 M10
17	E 50	430	160	216	55 60 65 75 80	110 140 140 140 170	85	136	30	70	105	72	151	367	10	55	70	486	335	47	175	250 315	119	95 118	296	447	8 M10
18	E 60	527	195	239	65 75 80 100	140 140 170 210	120	168	35	80	124	110	215	454	12	70	85	596	381	54	220	315 400	142	118 150	336	551	8 M10
19	E 70	626	225	295	80 100 110	170 210 210	140	196	45	100	150	135	267	562	25	80	100	743	476	70	250	400 500	181	150 190	420	687	10 M12
110	E 80	800	320	325	100 110 120 130	210 210 210 240	180	250	50	110	200	160	293	618	28	110	160	844	551	80	320	500	226	190	513	806	10 M14

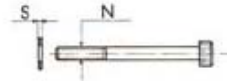
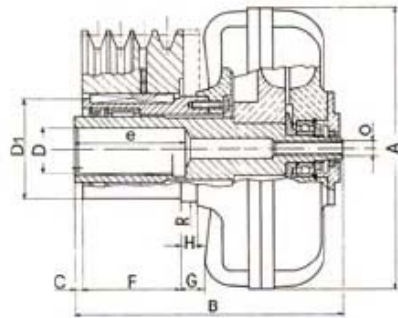
Keyways as per UNI 6604-69 DIN6885/1

Bolting screws diameters as per DIN332

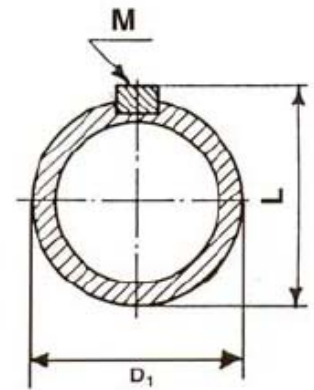
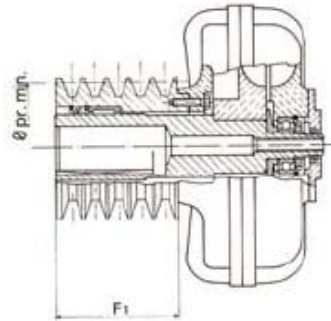
Bolting screws and washers supplied on request

PULLEY VERSIONS

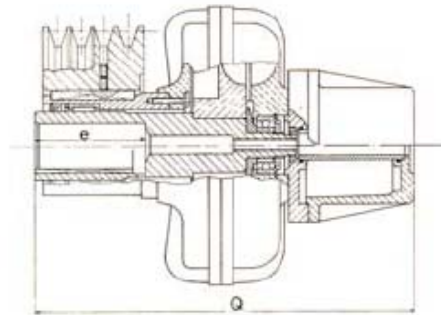
P for pulley



PI with pulley



P-R PI-R with partial draining device



Coupling type	DIMENSIONS																	
	A	B±1,5	C±1	D ₁ h6	D (G7)	c min	F	G±1,5	H	L	M	N Ø Max Screw	O Pulley	Q±1,5	F ₁	R	S	
12	234	215	2,5	85	24 28 38 42	60 60 80 110	80	22	14	88,5	12x8	M12	M14	308	95	88	2,5	
13	260	240	7	85	28 38 42	60 80 110	80	31	22	88,5	12x8	M12	M14	332	110	88	2,5	
14	294	244	2,5	95	38 42 48	80 110 110	80	29	20	98,5	12x8	M16	M20	330	110	104	2,5	
15	325	286	5	110	42 48 55	110 110 110	110	30	18	115	16x10	M16	M20	395	135	115	2,5	
16	365	340	4	125	48 55 60 65	110 110 140 140	130	51	46	130	18x11	M18	M22	463	180	135	4	
16 N	390	340	3	125	see 16		130	45	40	130	18x11	M18	M24	491	180	135	4	
17	430	451	3,5	150	55 60 65 75 80	110 140 140 140 170	150	109	100	156	20x12	M20	M24	590	255	160	4	
18	527	488	4	150 160	75 80 90 95* special	140 170 170 170*	150 250*	109 20	100 -	156 166	20x12 20x12	M24	M30	693	255	160 -	4	

Keyways as per UNI 6604-69 DIN6385/1

Bolting screws diameters as per DIN332

Bolting screws and washers supplied on request

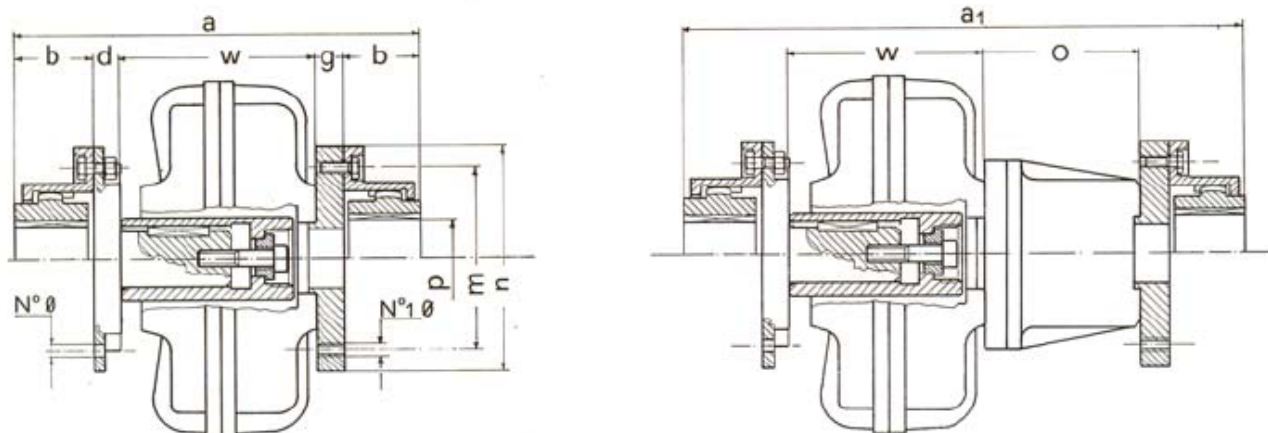
PULLEYS FOR TYPES P/PI-R

Coupling type	P version					PI version				
	Minimum Pitch Dia.	Max n° of grooves				Minimum Pitch Dia.	Max n° of grooves			
		A-SPA	B-SPB	C-SPC	D		A-SPA	B-SPB	C-SPC	D
12	115	5				100	6			
	123	6	4			110		5		
	125		5			118			4	
	130			2						
13	115	5				100	6			
	123	6	4			110		5		
	125		5			118			4	
	130			2						
14	125	5				108	6			
	132	6	4			118		5		
	140		5			128			4	
	142			2						
15	147	9				124	9			
	153		7			130		7		
	160			4		140			5	
	165			5						
16 16 N	168		6							
	175		9			145		9		
	180			4	3	155			6	
	186			5		165				4
	190				4					
17	193		8			173		13		
	200		12			185			10	
18	210				4	190				6
	215			9						
	230				6					

Pulleys supplied on request also with other dimensions

IN LINE VERSIONS CF

Disassembling without removing drive or driven shafts



Coupling type	DIMENSIONS											
	N° dia	N°, dia	a ± 1,5	a ₁ ± 1,5	b	w ± 1,5	d	g	m ± 0,1	n	o	p o max
12	8 10	8 M10	267	369	51,5	126	19	19	122	152	102	60
13	8 10	8 M10	286	388	51,5	145	19	19	122	152	102	60
14	10 10	10 M10	317	419	63,5	152	19	19	148	180	102	75
15	10 12	10 M12	357	478	78,5	156	22	22	178	215	121	75
16	10 12	10 M12	384	523	78,5	183	22	22	178	215	139	110
16 N	10 12	10 M12	382	533	78,5	181	22	22	178	215	151	110
17	12 12	12 M12	445	596	92,5	216	22	22	203	240	151	110
18	12 16	12 M16	538	753	108	265	28,5	28,5	236	280	215	127
19	14 16	14 M16	588	855	123	285	28,5	28,5	270	320	267	150
110	14 16	14 M16	655	948	123	352	28,5	28,5	270	320	293	150

Half gear couplings supplied on request

ACCESSORIES AND SAFETY DEVICES FOR OVERLOAD PROTECTIONS

PARTIAL DRAINING DEVICES

Turbostart Jolly couplings have low starting torque which normally does not exceed 200% nominal motor torque. It is possible to further limit the starting torque, without reducing oil quantity inside of circuit, using partial draining device bolted on the external circuit; a diaphragm with calibrated oil bleed-orifices separates circuit draining device.

In standstill conditions, the draining device part of the oil fill, reducing the oil quantity in the working circuit. At start, the coupling transmits very limited torque, allowing the motor to reach quickly the rated speed.

During starting the oil of draining device is called again in circuit from inner impeller.

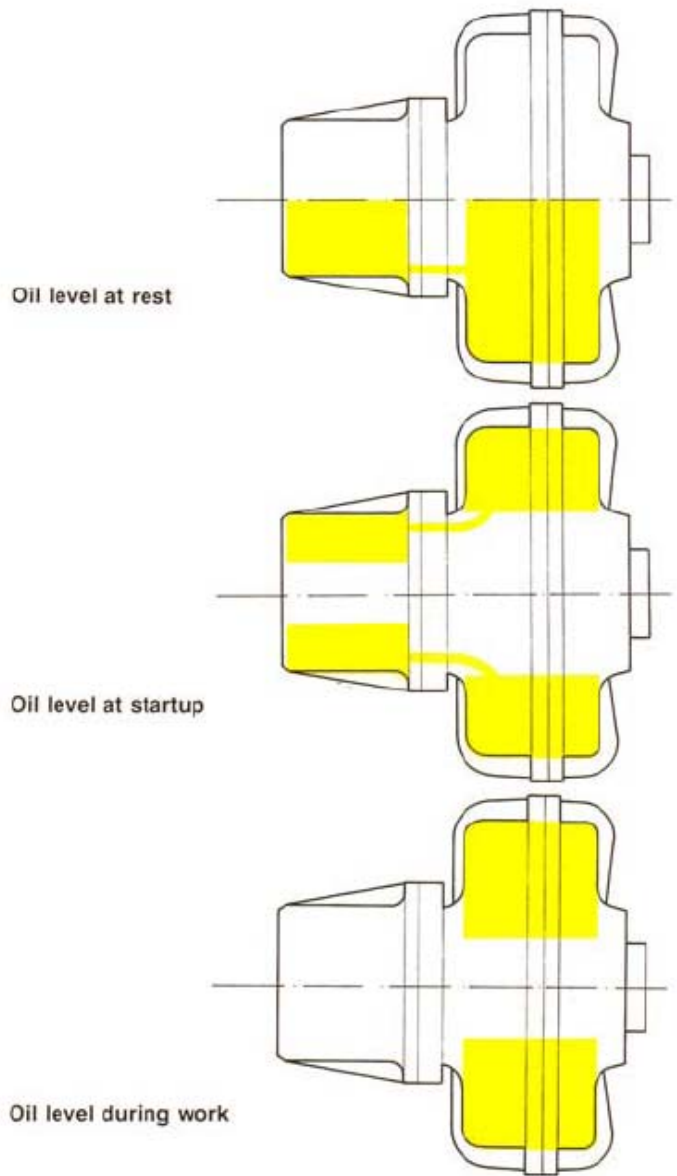
As by the draining device, starting torque can reach values from 160 to 140% of motor nominal torque. It is recommended the starting up of:

- high inertia machines
- machines driven by high speed motors
- machines for which is required a very slow start up.

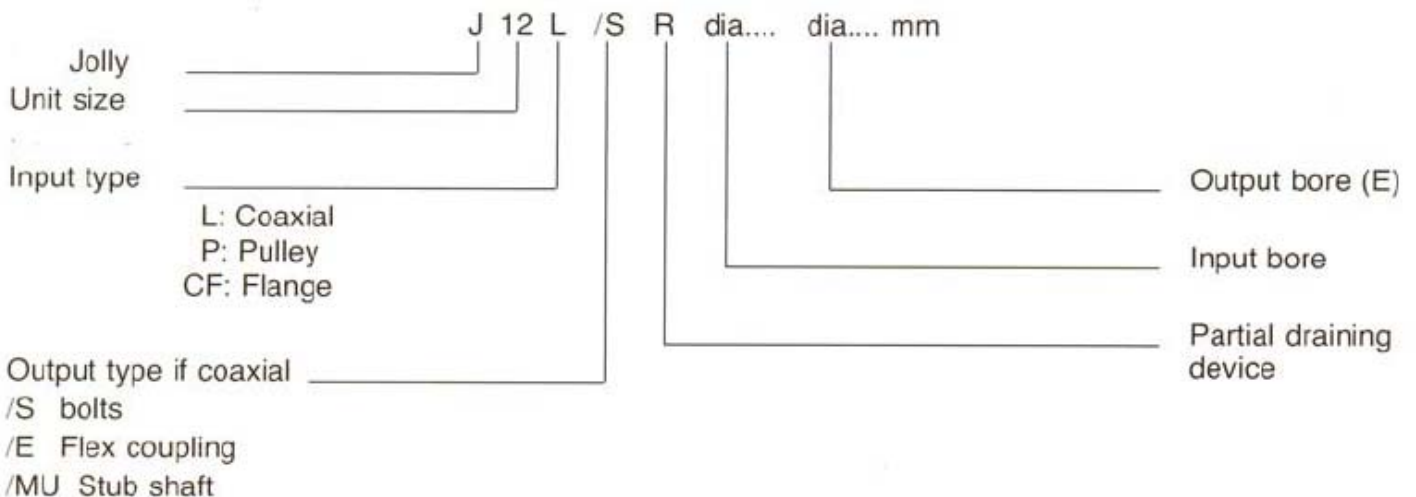
FUSIBLE PLUG

In anomalous overload conditions and with frequent or long starting time, the oil temperature can damage seals and allowing the oil leakage, it is advisable to fit a fusible plug instead of a standard plug.

Fusible plug 145°C or 175°C on request



Jolly part numbering system example part number



INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE

INSTALLATION

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

Mounting with Pulley

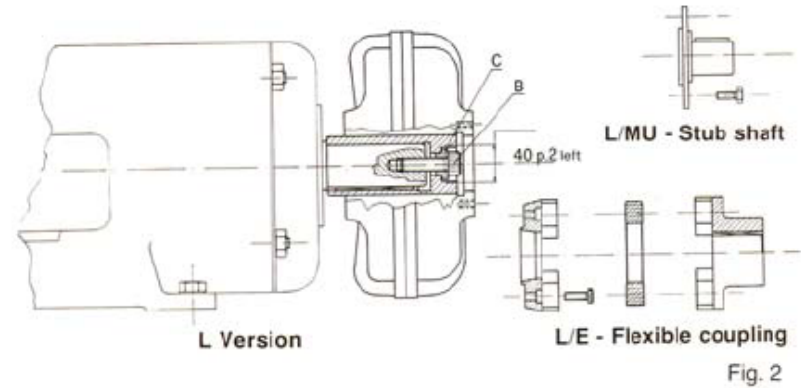
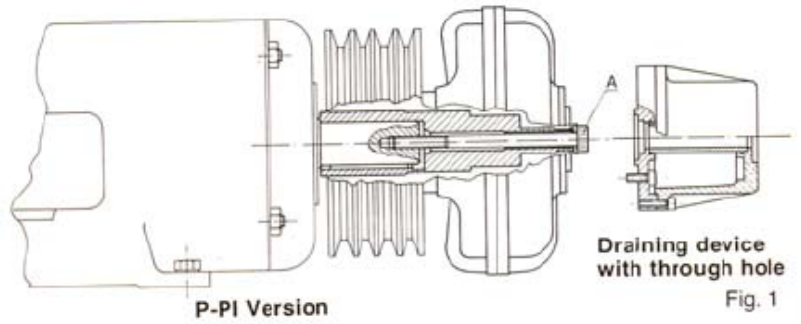
- after having checked the correct balancing of the grooved pulley, mount it on the coupling
- lock assembly on motor shaft by bolting screw A (Fig. 1)
- check the alignment of pulleys, and make sure the belts tension is not too stretched to prevent fast worn-out of bearings.

In-Line Mounting

Lock the Jolly coupling on motor shaft by bolting screw (B) and washer (C) (Fig. 2). For type L/MU before it is necessary to disassemble the output shaft. For type L/E it is necessary to disconnect the half flexible coupling.

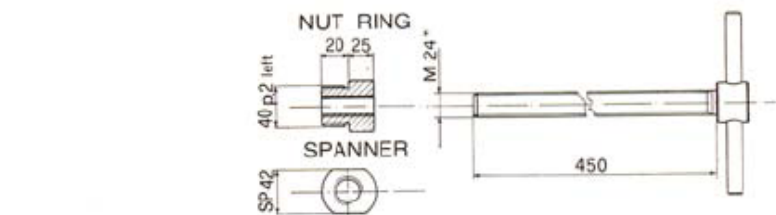
Version with Partial Draining Device

Proceed as per P or L versions inserting the bolting screw A or B through the hole of the R partial draining device.



DISASSEMBLING

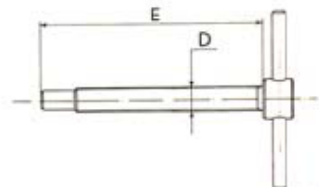
Remove the bolting screw, the washer and screw the puller into the threaded hole of the coupling shaft (type P) or into the threaded hole of the nut ring (type L) (Fig. 3). The nut ring will have to be firmly held by spanner.



PULLER L version from 12 to 110 model

* for 12 and 13 Ø 19 mm. is used M16

TYPE	12	13	14	15	16	17	18
D	M14	M14	M20	M20	M24	M24	M30
E	180	180	240	240	300	420	460



PULLER P version from 12 to 18 model

Fig. 3

Coupling type	WEIGHTS OF COUPLINGS WITHOUT OIL Kgs.					
	L/S	L/E	L/MU	CF	P	R*
12	11	12,8	11,1	16	14	0,6
13	13	14,8	13,2	18	16	0,6
14	22	26	22,5	29	23	1
15	26	30	27	38	33	1,5
16	39	45	40,7	51	48	4
16 N	38	47	41	52	48	6
17	51	60	53,8	68	87	6
18	100	116	107	132	147	10
19	155	181	167	190	–	15
110	340	410	365	375	–	25

Weights are approximated in accordance with diameters of shafts

* To add to the weight of coupling

OIL FILLING

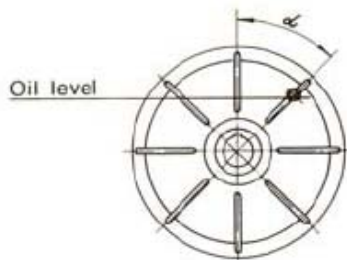
The hydromechanic Jolly couplings are normally supplied complete with oil filling and ready to be put into operation.

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 ports until the oil begins running out of filler port and paying attention that no air bubble is present. The couplings are never to be totally filled to avoid damages to the tightness rings due to inner pressure.

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



Use oil SAE 10W such as:

AGIP OSO 32	MOBIL DTE 24
BP Energol HLP 32	SHELL Tellus 32
ESSO Nuto H32	TOTAL Azolla 32
FINA Hydram 32	CHEVRON Hydraulic Oil EP 32

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 absorption during startup by the electric motor progressively slow down. However possible calibration shall be carefully made to prevent overheating of the coupling.

After having performed the calibration, the 12 o' clock position should be marked so as to enable 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 6 months of operation and in any case no more than 12 months from the date of invoice.

The guarantee is void if the installation and maintenance instructions are not complied with, if non-balanced accessories are used, and if the connecting dimensions are out of tolerance.

Oil Quantity Table

Coupling type	Angle α	Oil quantity		Versions with partial draining device		
		litrs	Kgs	Angle α	+ litrs	+ Kgs
12 L	30°	0,800	0,670	65°	0,040	0,034
12 P	30°	0,900	0,780			
13 L	30°	1,200	1,040	70°	0,040	0,034
13 P	30°	1,360	1,180			
14 L	30°	1,750	1,520	70°	0,050	0,043
14 P	30°	1,900	1,650			
15 L	30°	2,300	2,000	70°	0,050	0,043
15 P	30°	2,500	2,180			
16 L	0°	3,180	2,770	60°	0,060	0,052
16 P	0°	3,500	3,050			
16 NL	0°	3,600	3,130	60°	0,100	0,087
16 NP	0°	4,000	3,480			
17 L	0°	5,460	4,750	60°	0,100	0,087
17 P	0°	5,750	5,000			
18 L	45°	9,430	8,200	70°	0,200	0,174
18 P	45°	9,600	8,350			
19 L	45°	15,520	13,500	70°	1,000	0,870
110 L	50°	34,500	30,000	70°	1,600	1,390

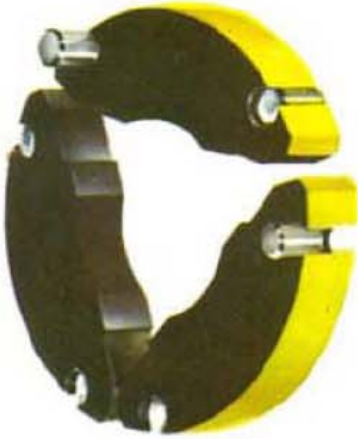
Angle α : inclination of filling plug in relation to vertical.

The technical data and dimensions herein contained are not binding for the manufacturer and can be modified according to updated designs without notice.

COVER



unique Zero-Slip
JOLLY® Coupling
combines no-load hydraulic starts
and full load mechanical 1:1
lock-ups
...without heat build-up



MECHANICAL
CLUTCH



PUMP



**COMPONENTS OF THE
HYDROMECHANIC JOLLY CUPLING**



TURBINE



A 無段變速機



B 中空軸蝸輪減速機



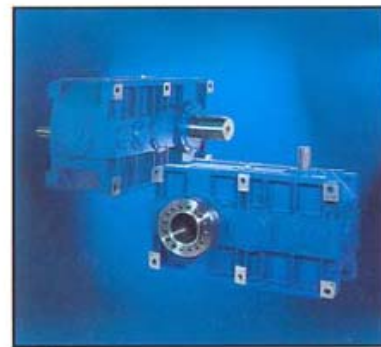
C 齒輪減速機



D 轉向器



E 平行軸 齒輪減速箱
交直軸



F 大型齒輪減速箱



G 擺線型減速機



H 緩衝起動液力聯軸器



I 剎車離合器



J 三相馬達 變頻馬達



K D2G4 耐壓防爆馬達



L MGM 剎車馬達
馬拉利剎車馬達



摩托迪克股份有限公司

公司：桃園縣龜山工業區興業路 27 號

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