

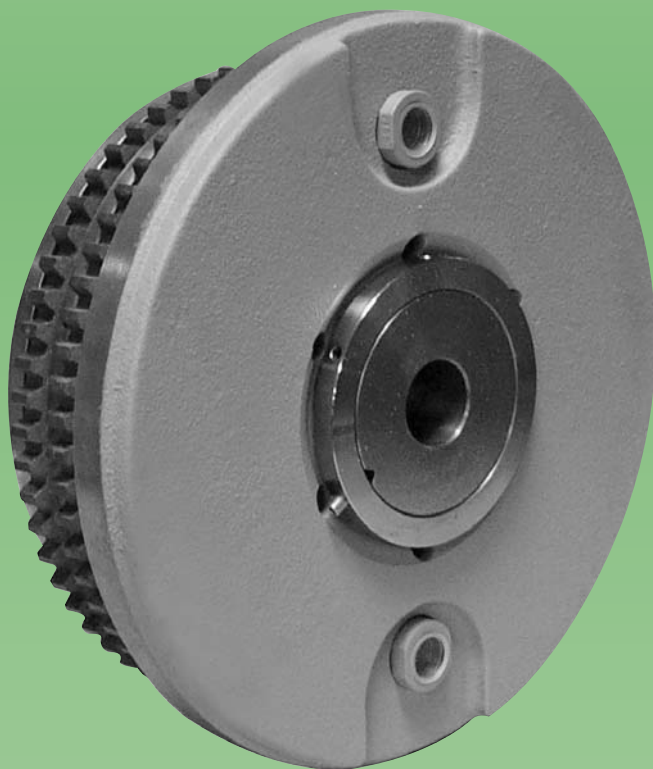
# TRANSFLUID

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TRANSFLUID

**drive with us**



**TPO**  
AIR CLUTCHES

# TPO AIR CLUTCHES

## - Main features

TRANSFLUID air clutches are very strong and reliable components. The technical development has been achieved with years of experience in the field of transmissions.

Their range of performance can fulfil many different applications, with transmittable torques up to 11390 Nm, remaining constant without requiring any further regulation. Their compressed air feeding system, while having the great advantage of being modulated with air pressure variation, can be remotely controlled and automatically self compensated for wear.

The main technical features are:

- 1) All the operating discs are made of a high quality cast iron, with large surfaces where heat generated with friction is easily dissipated without creating dangerous stresses.
- 2) The friction discs are made of a composite compound without asbestos, and are provided with external gear teeth to engage into the internal teeth of the driving ring.
- 3) The external dimensions are very small and for this reason the assembly phase is facilitated.
- 4) The wide dimensions of the bores allow shafts with large diameters to be mounted.

In normal and medium operating conditions, clutches with 2 or 3 discs can be used, transmitting a torque twice or three times more than the corresponding single disc, and leaving external dimensions unchanged.

## - Medium series

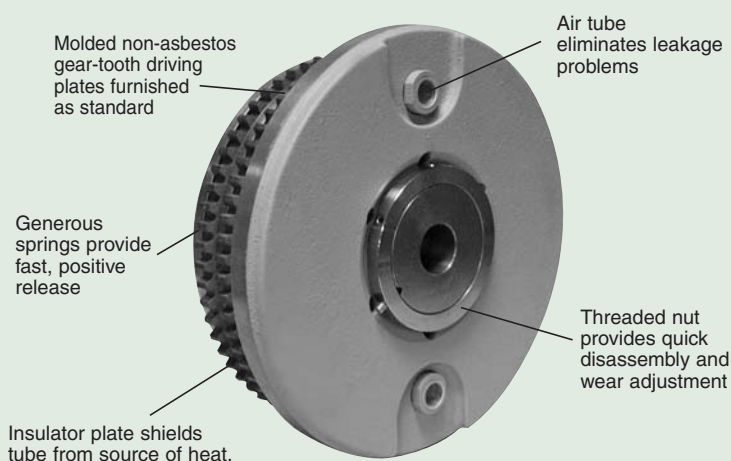
The TPO clutches sizes from 8" to 11" are provided with a vulcanized tube, made of a neoprene compound reinforced with nylon, eliminating the possibility of leakage and allowing a very long duration. They are perfectly interchangeable in all their components with the corresponding *Twin Disc* production.

## Heavy series

The core of 14" and 18" TPO clutches is an elastomeric diaphragm, obtained after a very in-depth phase of research and development, resulting in a longer lasting component than any other chamber or diaphragm now being used.

As the engagement of heavy clutches require a bigger air volume, they are supplied with an incorporated quick release valve.

Smaller clutches are not generally fitted with such a device, if the actuator is positioned very near to it.

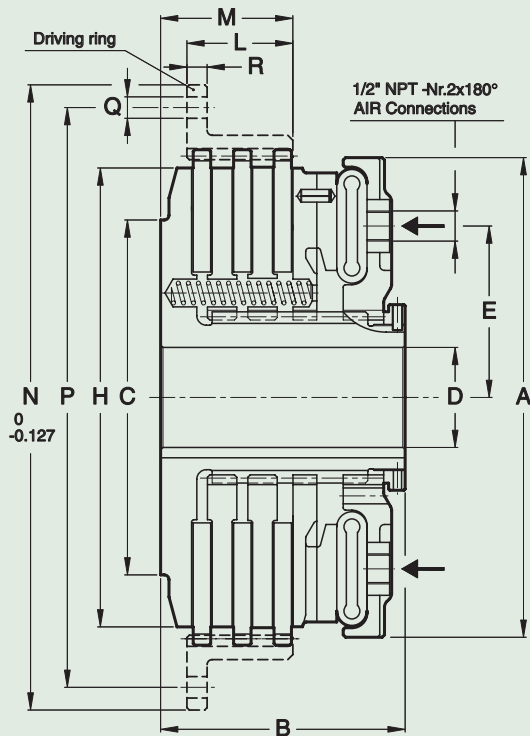


TAB. 1 - PERFORMANCES

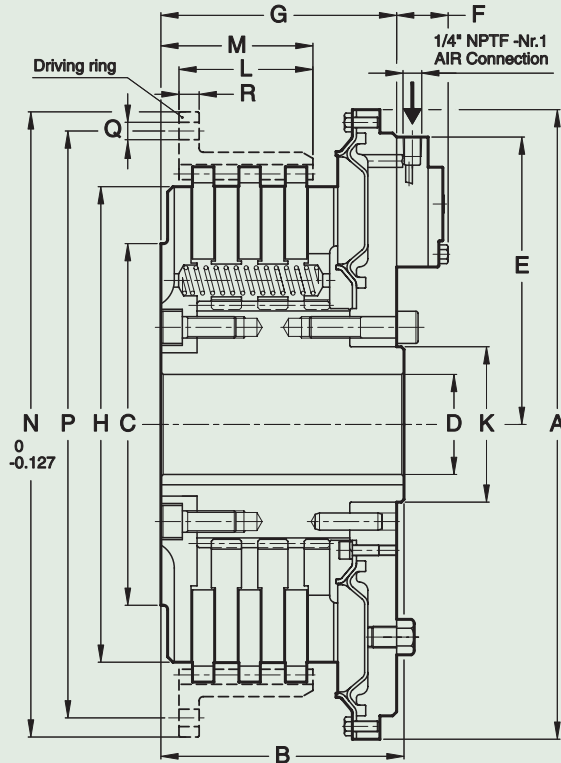
MODEL	Application Duty Classification				Slip Torque 7 bar (Nm)	Max oper. speed (rpm)		Air volume to engage (fully worn) C.C.
	CLASS I Operating Torque (Nm)	POWER (HP)				Solid plates*	Split plates	
		CLASS II	CLASS III	CLASS IV				
TPO-108	350	61	41	31	580	3600	3050	98
TPO-208	700	123	82	61	1160	4200	3650	180
TPO-308	1050	184	123	92	1740	4250	3650	213
TPO-110	900	96	64	48	1200	3100	2650	147
TPO-210	1800	192	128	96	2400	3600	2900	262
TPO-310	2700	288	192	144	3600	3650	2950	311
TPO-111	1100	124	82	62	1300	2850	2200	229
TPO-211	2200	247	165	124	2600	2850	2200	410
TPO-311	3300	371	247	186	3900	3250	2720	508
TPO-114	2920	188	125	94	3900	2400	1950	557
TPO-214	5840	376	251	188	7800	2500	1950	1082
TPO-314	8760	564	376	282	11700	2500	1920	1163
TPO-218	7590	489	326	244	10000	1950	1550	1720
TPO-318	11390	733	489	367	15000	2050		2573

\*Standard

TPO 108 ÷ TPO 311



TPO 114 ÷ TPO 318



MODEL	A	B	C	D <sub>max</sub>	E	H	L	M	N	P	Q		R	Weight (Kg)
											Nr.	Dia.		
108	245	89.9	152	63	84	203	15.8	27.7	263.52	244.5	6	10.3	-	14.5
208		111.5					36.5	49.5	285.75	260.3			9.5	15.8
308		133					60.3	71	314.32	295.3			-	19.5
110	307	98.8	159	63	108	254	22.2	34.5	314.32	295.3	8	10.3	-	23.6
210		120.4					47.6	56.4	336.55	317.5			9.5	28
310		142.2					60.3	78	352.42	333.4			-	32.7
111	307	104.4	155	63	108	289	22.2	40	352.42	333.4	8	10.3	-	31.6
211		129					47.6	65.3	303.70	365.1			-	38.5
311		154					66.7	88.4	303.70	365.1			13.5	12.7

MODEL	A	B	C	D <sub>max</sub>	E	F	G	H	K	L	M	N	P	Q		R	Weight (Kg)	
														Nr.	Dia.			
114	470	111.5	270	90	206	37.6	107.5	355.6	116	28.6	42.7	466.7	438.2	8	13.5	12.7	66	
214		146.5					60.3			78.5	101.6						113.3	84
314		181.5					101.6			113.3	-						-	100
118	470	122	385	110	206	37.6	121.5	457	144	28.6	50	571.5	542.9	6	16.7	-	118	
218		163					77.9			99	159							
318		204.5					107.9			129	191							

DIMENSIONS ARE SUBJECT TO ALTERATION WITHOUT NOTICE

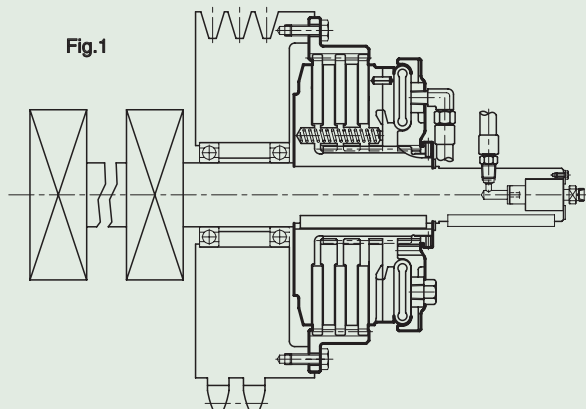


Fig.1

EXAMPLES OF ASSEMBLY

Fig. 1: TPO clutch having a pulley with races or bevel gear. The shaft end must be free to connect to the rotary union.

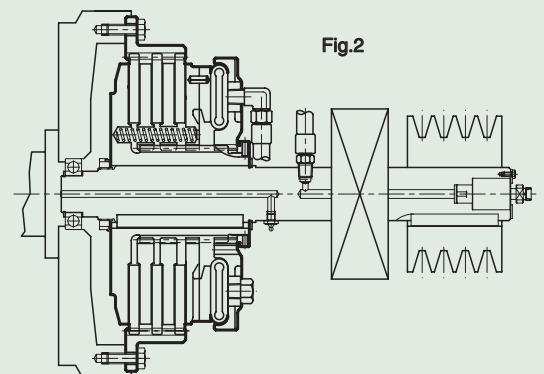


Fig.2

Fig. 2: The clutch is flanged onto the Diesel engine flywheel. Consider that the pilot bearing needs to be lubricated, as showed.

## CLUTCH SELECTION

The following selection procedure gives ample margin of capacity over actual requirements, which is the best assurance of a long and trouble-free life:

- 1) Determine the duty service, the maximum power requirements of the driven equipment, the type of prime mover, the approximate number of clutch engagements per hour, the clutch shaft speed and diameter.
- 2) Using the clutch shaft speed and maximum power, determine torque requirements with the formula:

$$Mt \text{ (Nm)} = \frac{P \text{ (kW)} \times 9550}{\text{rpm}}$$

When the load cannot accurately be determined, the prime mover continuous power can be used. Be sure to deduct all continuous parasitic loads (i.e. fans, alternator). Air compressors, hydraulic pumps or motors may be cyclic rather than continuous loads. Review the drive train carefully and completely before selection.

- 3) Choose the duty service classification (TAB. 2) which most closely describes the application. Note whether the clutch is selected on power or torque classification.

Attention is called to the fact that other application factors must be considered in the selection process in addition to duty service, such as the limits involving speed, side load and clutch torque.

- 4) If clutch is duty **Class I** (torque requirement) as shown in TAB. 2, refer to the capacity chart selecting a clutch with a working torque equal to or greater than the torque figure from step (2). If there is a length problem, a clutch of larger diameter and one plate is likely to be used (ex. **TPO 110**). A 2 or 3 plate clutch would be proper if diameter is the main concern (ex. **TPO 210** or **TPO 310**). In case of an electric motor prime mover, the peak motor torque must be lower than the slip torque of the selected clutch.
- 5) If the clutch is duty **Class II – III – IV** (power requirement), select the clutch model with a rating which is equal to or greater than the continuous power rating of the drive.
- 6) Check whether the bore size of the selected clutch is compatible with the shaft diameter.
- 7) Check that the maximum safe speed of the clutch is not exceeded by the drive.
- 8) Review and select the required accessories to complete the clutch installation.

TAB. 2

CLASS I (Disconnect)	CLASS II (Light Duty)	CLASSE III (Normal Duty)	CLASSE IV (Heavy Duty)
Centrifugal Pumps Hydraulic Pumps (w/o pre-charge) Disc type feeders Agitators (pure liquids) Irrigation Pumps Centrifugal Blowers/Fans	Bow Thruster Cooker (cereal) Bucket elevators, (uniformly loaded), all types Generators Brew Kettle Line Shafts (light duty) Machines, general, all types with uniform loads, non-reversing Textile machinery (most) Stokers	Agitators (solids or semi-solids) Batchers (textile) Blowers and Fans (lobe) Bottling machines Centrifugal Compressors Elevators, bucket (non-uniformly loaded or fed) Feeders (apron, belt, screw or vane) Filling machine (can type) Mixers (continuous) Pumps (two or more cylinder) Conveyors (uniformly loaded)	Cranes & Hoists (working clutch) Crushers (ore and stone) Barking Drums Compressors (lobe rotary plus three or more cylinder reciprocating type) Haulers (car puller and barge type) Machines (impact load types) Ball Mills Paper Mill machinery (except calenders and driers) Presses (brick and clay) Mud Pumps (reciprocating type)

**Duty Class I:** The clutch is used to disconnect the power from the load. When engaging, so little work is done that the clutch shows no temperature increase at the pressure plate outer surface. Use maximum input torque from TAB. 1 disregarding power. The device is operated 1 or more hours before disconnecting.

**Duty Class II:** The clutch is used primarily for disconnecting, but it works more heavily during engagement than in the previous case. The clutch will engage within 2 s, never heat the pressure plate more than 10°C above ambient temperature and once engaged, it is operated for 1 or more hours before disconnecting. The maximum power that the clutch can absorb is reported in TAB. 1 CLASS II.

**Duty Class III:** The clutch will engage within 3 s, never heat the pressure plate more than 38°C above ambient temperature and, once engaged, it is

operated for 1 or more hours before disconnecting. The maximum power the clutch can absorb is shown in the same TAB. 1 CLASS III.

**Duty Class IV:** The clutch will engage within 4 s, never heat the pressure plate more than 66°C above ambient temperature and, once engaged, it is operated for 1 or more hours before disconnecting. The maximum power the clutch can absorb is shown in the same TAB. 1 CLASS IV.

**Duty Class V:** The clutch is used to start large inertia loads which require the longest slip period per engagement not to exceed 10 s. The clutch is selected according to its power absorption capability. Applications in this duty class or those requiring frequent engagements need a review from the factory.