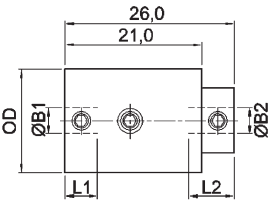


Materials & Finishes	
Housing, adjuster ring, adaptors:	*Al. Alloy 2014 T6 Irridite NCP finish*
Hub:	*Steel, heat treated*
Clutch plates:	*Size 25 Steel, heat treated Size 48 Brass*
Bearings	*Sintered bronze*
Fastener:	*Alloy steel, black oiled*

The adjustable friction clutches are rotary friction devices with adjustable drag or slip torque. Controlled slip takes place between the hub and housing whenever the load exceeds the set torque.

- **Three sizes - up to 3Nm torque capacity**
- **4 interface styles**
- **Set screw or clamp connection**
- **Compact proportions**
- **Use a torque limiter, tensioning, or overrun device**

The construction is simple and robust and comprises a series of steel clutch plates engaging a hub and a series of friction rings engaging a housing. Pressure is brought to bear on the plates and friction rings by an adjuster acting through a spring and pressure plate. The load can be connected to either the steel inner hub or the aluminum alloy housing.

As a torque limiter, the adjustable friction clutch interrupts continuity between power source and load when this reaches a pre-determined level.

As a tensioning device, the adjustable friction clutch typically maintains tension in a filament or tape winding operation by exerting drag on the feed spool.

As an overrun device, the adjustable friction clutch absorbs residual inertia of a motor when the load is braked or reaches a terminal stop.

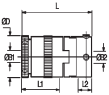
Size 25 Set Screw Shaft Fixing

Ref. HPC271 (2 plate) **HPC279** (6 plate)

Basic clutch (thro' bore)

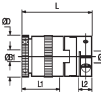
Ref. HPC273 (2 plate) **HPC281** (6 plate)

Basic clutch + sleeve adaptor



Ref. HPC277 (2 plate) **HPC285** (6 plate)

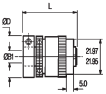
Basic clutch + Oldham (set screw) coupling



Ref. HPC267 (2 plate) **HPC269** (6 plate)

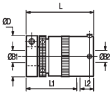
Basic clutch + Oldham (clamp) coupling

Size 25 Clamp Shaft Fixing



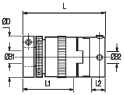
Ref. HPC401 (2 plate) **HPC409** (6 plate)

Basic clutch (thro' bore)



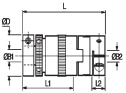
Ref. HPC403 (2 plate) **HPC411** (6 plate)

Basic clutch + sleeve adaptor



Ref. HPC407 (2 plate) **HPC415** (6 plate)

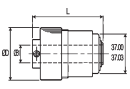
Basic clutch + Oldham (set screw) coupling



Ref. HPC397 (2 plate) **HPC399** (6 plate)

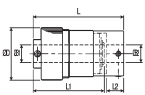
Basic clutch + Oldham (clamp) coupling

Size 48 Set Screw Shaft Fixing



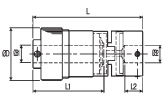
Ref. HPC279

Basic clutch (thro' bore)



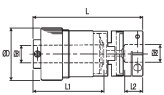
Ref. HPC281

Basic clutch + sleeve adaptor



Ref. HPC285

Basic clutch + Oldham (set screw) coupling



Ref. HPC269

Basic clutch + Oldham (clamp) coupling

Performance Data

Size	Size 16	Size 25	Size 48
Power dissipation at 20° C 2-PLATE 6-PLATE	0.5 watt	 7 watts 8.6 watts	 18 watts
Backlash	0° max	2° max	zero
Max surface temperature	80° C	80° C	80° C
Max speed continuous slip	1000 rpm	1000 rpm	600 rpm

Standard Bores

Coupling Size \ Bore Size		ØB1, ØB2 + 0.03 / - 0 mm							
		4	6	6.350	7.938	8	9.525	10	12
16	At B1 end	●							
	At B2 end	●							
25	At B1 end		●	●	●	●			
	At B2 end		●	●	●	●	●	●	●
48	At B1 end					●	●	●	●
	At B2 end						●	●	●
Bore ref.		22	22	24	27	28	31	32	35
Corresponding bore adaptor				253		255		257	

Diameters for which a bore adaptor is shown can be adapted to smaller shaft sizes. See page 3.90 for details.

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Coupling Size \ Bore Size		ØB1, ØB2 + 0.03 / - 0 mm							
		12.7	14	15.875	16	18	19	19.05	20
16	At B1 end								
	At B2 end								
25	At B1 end								
	At B2 end								
48	At B1 end	●	●	●	●				
	At B2 end	●	●	●	●	●	●	●	●
Bore ref.		36	38	41	42	45	46	47	48
Corresponding bore adaptor		259			260				261

Dimensions & Order Codes

PART NUMBER		Size & Model	ØD	L	❶ L1	❷ L2	ØB1 max	ØB2 max	Max drag torque Ncm
Set Screw Hub	Clamp Hub								
HPC311.16.----	-	16	16.0	26.0	5.0	7.0	4	4	0.5
HPC267.25.----	-	25 2-PLATE	25.8	46.5	25.0	8.6	8	12	53
HPC271.25.----	-			26.4	thro'	-		-	
HPC273.25.----	-			36.0	25.0	9.0		12	
HPC277.25.----	-			46.5	25.0	8.6		12	
-	HPC397.25.----		25.8	54.5	33.0	8.6	8	12	53
-	HPC401.25.----			34.4	thro'	-		-	
-	HPC403.25.----			44.0	33.0	9.0		12	
-	HPC407.25.----			54.5	33.0	8.6		12	
HPC269.25.----	-	25 6-PLATE	25.8	53.4	31.0	8.6	8	12	132
HPC279.25.----	-			32.4	thro'	-		-	
HPC281.25.----	-			42.5	31.0	9.0		12	
HPC285.25.----	-			53.4	31.0	8.6		12	
-	HPC399.25.----		25.8	60.8	39.0	8.6	8	12	132
-	HPC409.25.----			40.7	thro'	-		-	
-	HPC411.25.----			50.3	39.0	9.0		12	
-	HPC415.25.----			60.8	39.0	8.6		12	
HPC269.48.----	-	48 6-PLATE	48.0	102.0	65.0	16.7	16	20	300
HPC279.48.----	-			65.0	thro'	-		20	
HPC281.48.----	-			83.0	65.0	16.0		20	
HPC285.48.----	-			102.0	65.0	16.7		20	

Order codes: Please combine the coupling part number in the above table with the bore reference in the standard bores table (see pages 3.72 & 3.73).
Please identify both bores to complete the part number eg. HPC311.16. 22 22

Part Number ØB1 ØB2

DISCOUNTS	1 - 20	21-99	100-499	500 +
	List Price	-20%	-25%	-30%

Fasteners at B1 end			Fasteners at B2 end			Moment Of inertia ❸ kgm^2 $x10^{-8}$	❸ Mass kg $x10^{-3}$	PRICE EACH 1-20
Screw	❷ Torque Nm	Wrench mm	Screw	❷ Torque Nm	Wrench mm			
M3	0.94	1.5	M3	0.94	1.5	30	14	£87.99
M3	0.94	1.5	M3	2.43	2.5	416	58	£79.92
			-	-	-	242	37	£56.65
			M4	2.27	2	382	50	£68.44
			M4	2.27	2	425	58	£79.36
M3	2.43	2.5	M3	2.43	2.5	508	68	£87.99
			-	-	-	317	47	£63.86
			M4	2.27	2	441	60	£77.02
			M4	2.27	2	511	69	£88.83
M3	0.94	1.5	M3	2.43	2.5	529	68	£90.50
			-	-	-	312	48	£67.11
			M4	2.27	2	451	60	£78.97
			M4	2.27	2	516	69	£78.97
M3	2.43	2.5	M3	2.43	2.5	617	79	£88.83
			-	-	-	381	58	£73.47
			M4	2.27	2	530	71	£86.69
			M4	2.27	2	590	80	£98.41
M6	7.60	3.0	M4	5.66	3	8037	390	£132.14
			-	-	-	5548	278	£125.97
			M5	4.62	2.5	7135	350	£129.71
			M5	4.62	2.5	8037	390	£137.62

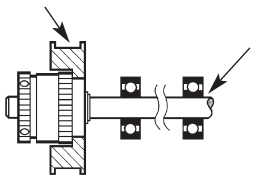
How to install

Basic Clutch - Refs. HPC271, HPC279, HPC401 & HPC409

Controlled slip occurs between pulley and shaft.

Pulley (or gear etc.) bonded to register. Press fits not permissible.

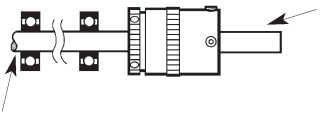
Motor, gearbox, or other externally supported shafts can pass thro' hollow hub. Please enquire for clutch/pulley assemblies.



Basic Clutch + Sleeve Adaptor - Refs. HPC273, HPC281, HPC403 & HPC411

Controlled slip occurs between LH & RH shafts. Clutch orientation not important, supported shaft may be entered either end.

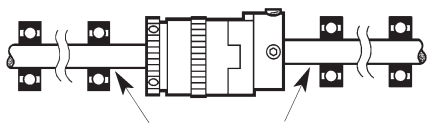
Small spools, paddles, knobs, etc. can be attached after fitting a suitable stub shaft. Side loads must be minimal. Avoid connecting both ends of this clutch to externally supported shafts.



Motor, gearbox, or other externally supported shaft

Basic Clutch + Flexible Coupling - Refs. HPC267, HPC269, HPC277, HPC285,HPC397, HPC399, HPC407 & HPC415

Controlled slip occurs between LH & RH shafts.



Motor, gearbox, or externally supported shafts

Characteristics

The characteristics of dry plate clutches favour those applications which can tolerate relatively imprecise drag torques. Three tendencies should be noted:

Breakaway Torque

After a period during which no slipping has taken place, the breakaway torque can be up to 2 1/2 times the set value.

Torque Decay

There is an inverse relationship between clutch temperature and slipping torque. The slipping torque reduces from the set value as the power being dissipated causes the clutch temperature to rise. When slipping continuously, torque settles at approximately 70% of the value set on a new clutch and at approximately 80% of the value set on a used clutch. This characteristic is not speed dependent.

Speed Related Torque Fluctuations

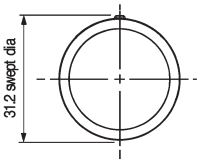
Variations in slipping speed cause a momentary increase in the prevailing output torque. The clutches behave more consistently at high speed/low torque than at low speed/high torque. High speed in this instance starts at approximately 500 rpm.
Where applications call for sustained slipping, the housing temperature should be maintained below 80° C. Clutches mounted concentrically within pulleys, gear wheels, etc. will be more effective at dissipating heat generated during slipping.

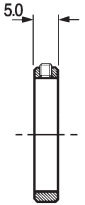
Calculating For Power Dissipation

Given the slipping speed in rpm and the drag torque in Nm, the following equation can be used for calculating the power dissipation in watts (W).

$$W = \frac{Nm \bullet rpm}{9.55}$$

Locking Ring

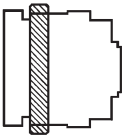




Order ref.

HPC294.25

Size 25 only



Fit locking ring flush with end of housing as shown. Lightly tension locking screw to secure the adjuster. Wrench size 1.5

Locking Ring

In some circumstances it is possible for the adjuster ring to unscrew during operation. The adjuster ring can be secured by fitting locking ring ref. **HPC294.25**.

Removing The Adjuster Ring

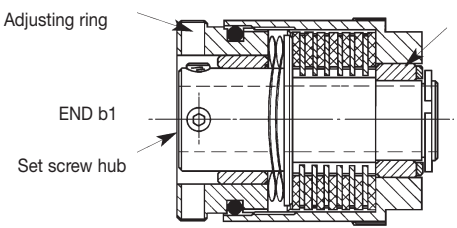
1) If this should be necessary, be sure to replace the pressure plate first, then the spring washers. Ensure that the top most friction ring is fully engaged with the splines. *A disengaged friction ring will cause the clutch to malfunction*.

2) To remove the adjuster ring, first remove the clamp. With set screw hubs the adjuster ring cannot be removed if the set screws protrude above the hub diameter. Flatting or dimpling of shafts is recommended and may be necessary with shafts larger than Ø6.35 to avoid the screws fouling the adjuster ring.

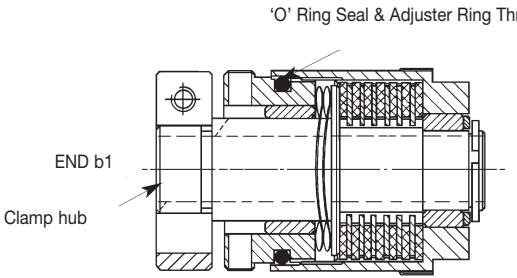
Waved Washers

Two waved washers are fitted to these clutches. In some instances, better torque control may result from removing one of them, particularly when working in the lower torque ranges.

Construction - Size 25 Adjustable Friction Clutch



Sectional view of 6-plate clutch Ref.-HPC279.25 Shafts are secured by set screws accessed through radial holes in the adjuster ring.



Sectional view of 6-plate clutch Ref. HPC409.25 Shafts are secured by a split hub and ring clamp method which does not score the shafts.