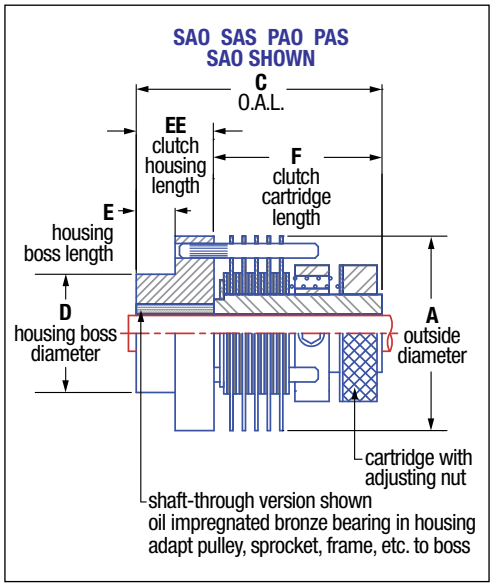
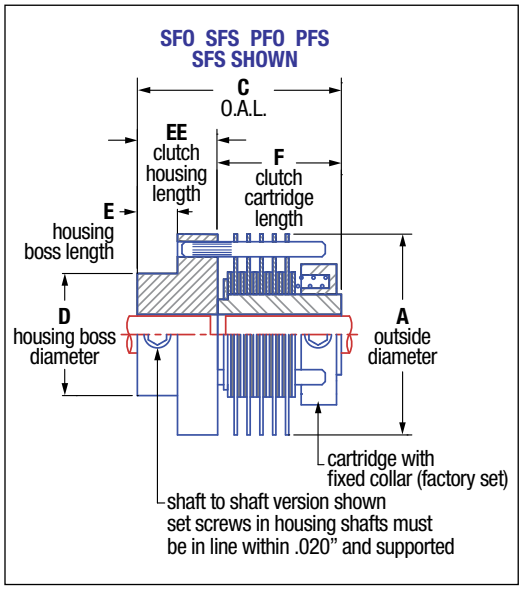
SLIPPER | MECHANICAL SLIP CLUTCHES

The Polyclutch slipper controls torque for intermittent, continuous or overload slip. It contains a number of brass plates interfaced with long life friction material. Soft springs maintain pressure on the friction plates, assuring constant torque. An adjacent component of your mechanism can often be used as the clutch housing reducing overall cost or space concerns. Torque control in one direction can be achieved by combining with our one-way clutch.

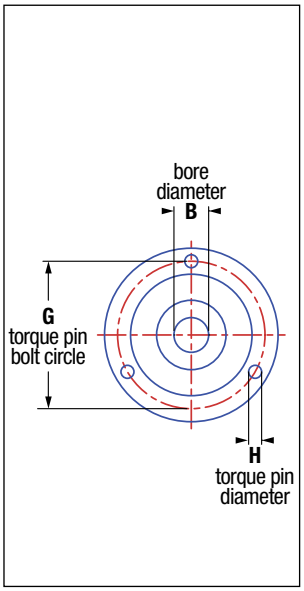
ADJUSTABLE



FIXED FACTORY SET – NON ADJUSTABLE



END VIEW TYPICAL



NOTE: Multi-plate clutches shown. Single-plate clutch supplied with one set of friction plates and pads.

PART NUMBER EXAMPLE

See page 200 for part number identification.

S A O 32 - 10 - 10

1. Multi-Plate Slipper
2. Adjustable torque
3. Shaft-through installation type
4. Size 32 = 32/16 (2-inch outside dia.)
5. 10/16 = .625-inch bore dia. in clutch cartridge
6. 10/16 = .625-inch bore dia. in clutch housing

P F S 44 - 12mm - 14mm T*

1. Single-Plate Slipper
2. Fixed torque (factory preset)
3. Shaft to shaft installation type
4. Size 44 = 44/16 (2.75-inch outside dia.)
5. 12 mm bore dia. in clutch cartridge
6. 14 mm bore dia. in housing

*T = Preset Torque Value, customer-specified

QUOTE REQUEST FORMS: SEE PAGE 201.

SLIPPER | SPECIFICATIONS

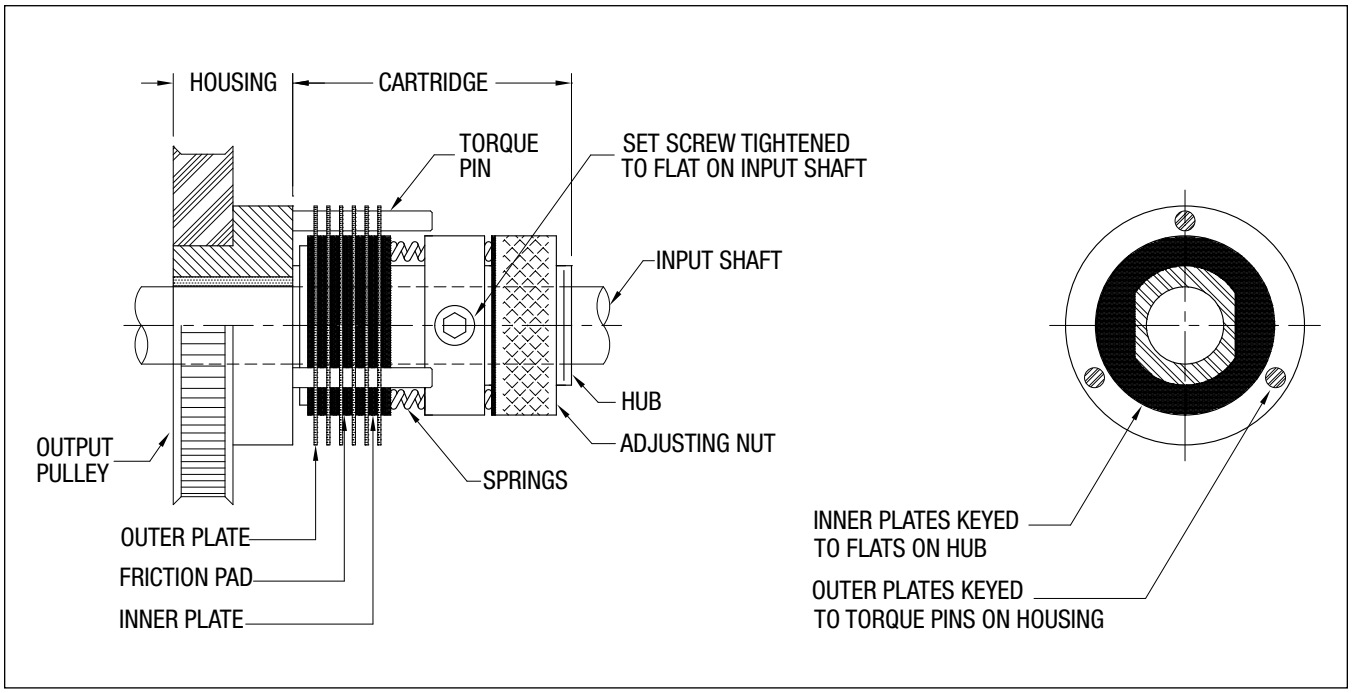
See pages 198-199 for slip clutch operation (construction, installation, capacity) and mounting options.

MODEL NO.	A inches (mm)	B* STD. inches (mm)	B MAX. inches (mm)	C inches (mm)	D inches (mm)	E inches (mm)	EE inches (mm)	F inches (mm)	G inches (mm)	H inches (mm)	CAPACITY @ 50 RPM		FRICTION SURFACES
		+.002 / -.000 inches (+.05 / -.00 mm)									lb-in (Nm)	Watts	
SFS 20 & SFO 20	1.25 (31.75)	.250 (8)	.375 (10)	1.19 (30.2)	.760 (19.30)	.25 (6.35)	.50 (12.70)	.69 (17.50)	1.062 (26.97)	.094 (2.38)	12 (1.35)	6	8
SAS 20 & SAO 20	1.25 (31.75)	.250 (8)	.375 (10)	1.50 (38.1)	.760 (19.30)	.25 (6.35)	.50 (12.70)	1.00 (25.40)	1.062 (26.97)	.094 (2.38)	12 (1.35)	6	8
SFS 24 & SFO 24	1.50 (38.10)	.375 (10)	.500 (13)	2.00 (50.08)	1.010 (25.65)	.38 (9.65)	.75 (19.05)	1.25 (31.75)	1.312 (33.32)	.125 (3.18)	25 (2.82)	15	12
SAS 24 & SAO 24	1.50 (38.10)	.375 (10)	.500 (13)	2.50 (63.5)	1.010 (25.65)	.38 (9.65)	.75 (19.05)	1.75 (44.50)	1.312 (33.32)	.125 (3.18)	25 (2.82)	15	12
SFS 32 & SFO 32	2.00 (50.80)	.500 (12)	.625 (16)	2.31 (58.7)	1.385 (35.18)	.50 (12.70)	1.00 (25.40)	1.31 (33.30)	1.672 (42.47)	.188 (4.78)	50 (5.65)	30	12
SAS 32 & SAO 32	2.00 (50.80)	.500 (12)	.625 (16)	2.87 (72.9)	1.385 (35.18)	.50 (12.70)	1.00 (25.40)	1.88 (47.80)	1.672 (42.47)	.188 (4.78)	50 (5.65)	30	12
SFS 44 & SFO 44	2.75 (69.85)	.500 (12)	.625 (16)	2.31 (58.7)	1.635 (41.53)	.50 (12.70)	1.00 (25.40)	1.31 (33.30)	2.375 (60.33)	.188 (4.78)	75 (8.47)	43	12
SAS 44 & SAO 44	2.75 (69.85)	.500 (12)	.625 (16)	2.87 (72.9)	1.635 (41.53)	.50 (12.70)	1.00 (25.40)	1.88 (47.80)	2.375 (60.33)	.188 (4.78)	75 (8.47)	43	12
SFS 48 & SFO 48	3.00 (76.20)	.625 (16)	1.00 (25)	3.00 (76.2)	1.760 (44.70)	.50 (12.70)	1.00 (25.40)	2.00 (50.80)	2.625 (66.80)	.250 (6.35)	100 (11.29)	55	12
SAS 48 & SAO 48	3.00 (76.20)	.625 (16)	1.00 (25)	3.50 (88.9)	1.760 (44.70)	.50 (12.70)	1.00 (25.40)	2.50 (63.50)	2.625 (66.80)	.250 (6.35)	100 (11.29)	55	12
PFS 20 & PFO 20	1.25 (31.75)	.250 (8)	.375 (10)	.78 (19.8)	.760 (19.30)	.19 (4.83)	.31 (7.87)	.47 (11.90)	1.062 (26.97)	.094 (2.38)	2.5 (0.28)	1	2
PAS 20 & PAO 20	1.25 (31.75)	.250 (8)	.375 (10)	1.06 (26.9)	.760 (19.30)	.19 (4.83)	.31 (7.87)	.75 (19.10)	1.062 (26.97)	.094 (2.38)	2.5 (0.28)	1	2
PFS 24 & PFO 24	1.50 (38.80)	.375 (10)	.500 (13)	1.07 (27.0)	1.010 (25.65)	.19 (4.83)	.38 (9.65)	.69 (17.50)	1.312 (33.32)	.125 (3.18)	4 (0.45)	2	2
PAS 24 & PAO 24	1.50 (38.80)	.375 (10)	.500 (13)	1.32 (33.5)	1.010 (25.65)	.19 (4.83)	.38 (9.65)	.94 (23.90)	1.312 (33.32)	.125 (3.18)	4 (0.45)	2	2
PFS 32 & PFO 32	2.00 (50.80)	.500 (12)	.625 (16)	1.22 (31.0)	1.385 (35.18)	.25 (6.35)	.50 (12.70)	.72 (18.30)	1.672 (42.47)	.188 (4.78)	8 (0.90)	5	2
PAS 32 & PAO 32	2.00 (50.80)	.500 (12)	.625 (16)	1.72 (43.7)	1.385 (35.18)	.25 (6.35)	.50 (12.70)	1.22 (31.00)	1.672 (42.47)	.188 (4.78)	8 (0.90)	5	2
PFS 44 & PFO 44	2.75 (69.85)	.500 (12)	.625 (16)	1.22 (31.0)	1.635 (41.53)	.25 (6.35)	.50 (12.70)	.72 (18.30)	2.375 (60.33)	.188 (4.78)	12 (1.35)	7	2
PAS 44 & PAO 44	2.75 (69.85)	.500 (12)	.625 (16)	1.72 (43.7)	1.635 (41.53)	.25 (6.35)	.50 (12.70)	1.22 (31.00)	2.375 (60.33)	.188 (4.78)	12 (1.35)	7	2
PFS 48 & PFO 48	3.00 (76.10)	.625 (16)	1.00 (25)	2.25 (57.15)	1.760 (44.70)	.50 (12.70)	1.0 (25.40)	1.25 (31.75)	2.625 (66.80)	.250 (6.35)	20 (2.26)	13	2
PAS 48 & PAO 48	3.00 (76.10)	.625 (16)	1.00 (25)	2.75 (69.85)	1.760 (44.70)	.50 (12.70)	1.0 (25.40)	1.75 (44.45)	2.625 (66.80)	.250 (6.35)	20 (2.26)	13	2

*Bore diameters (Dimension B) other than standards shown are available up to the maximum diameter.
Please note that torque capacities are only guidelines. Higher torques and speeds are possible depending on operating conditions. Consult factory for details.

QUOTE REQUEST FORMS: SEE PAGE 201.

SLIP CLUTCH | CONSTRUCTION, INSTALLATION & CAPACITY



CONSTRUCTION

A Polyclutch consists of two parts: a cartridge and a housing (see above).

The cartridge is set screwed or keyed to the input shaft.

- The cartridge includes the clutch pack: outer plates, friction pads, inner plates
- Plates are brass with a proprietary finish
- Inner plates are keyed to the cartridge hub
- Outer plates are keyed to the cartridge housing
- Friction pads are a proprietary plastic-based composite (no asbestos)

The housing is either set screwed or keyed to the output shaft, or (as shown), attached to the output gear or pulley, with a bronze bearing to allow relative motion between the input shaft and the output gear/pulley.

Torque is controlled by changing the pressure applied to the clutch pack. In an adjustable style clutch, the torque level is controlled by compressing the springs with the adjusting nut. In a fixed style clutch, a collar is attached to the hub in a fixed position, and the torque level is set by pushing and locking the spring collar to a calibrated position.

All slip clutch torques are calibrated to +/- 20% but can be held to closer tolerances.

Backlash of 6° is standard for Slipper models and 2° for the Slip-Ease models. Slipper models can be held to 2° if required.

Our proprietary burn-in process ensures that all Polyclutch slippers will perform consistently right out of the box, with no break-in period required.

INSTALLATION (see page 199 for mounting options)

Shaft-through versions: Insert input shaft into cartridge and tighten set screws. Insert housing around input shaft, with torque pins engaging holes in outer plates. Input shaft will keep the cartridge and housing aligned.

Shaft to Shaft versions: Insert input shaft into cartridge and tighten set screws. Insert output shaft into housing and tighten set screws. Input and output shafts must be properly journaled with centerlines within +/- .010 T.I.R.

Do not lubricate the clutch. Friction materials are designed to run without additional lubrication. Lubrication will cause a change in torque and erratic behavior. The inherent axial loaded design will keep dirt and dust out of the friction surfaces.

CAPACITY

The clutch capacity is based on continuous operation at 50 RPM for over 25 million cycles. Torque, RPM, duty cycle and life are interdependent. A reduction of any of these will allow an increase in any other. (Running at 25 RPM will allow twice the torque, or running for only 10% of the cycle will allow higher RPM, etc.). The limit is based on heat buildup measured in watts per:

Watts = Torque (lb-in) x RPM x Duty Cycle* x 0.011

Please consult our factory for high torque, high RPM and rapid cycling applications.

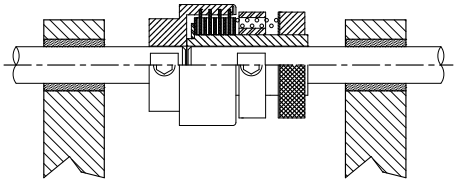
*Percent of the time the clutch is slipping, expressed as a decimal. For example, 0.5 = 50% of the time the clutch is slipping.

SLIP CLUTCH | TYPICAL MOUNTING FOR MECHANICAL & PNEUMATIC SLIP CLUTCHES

All Polyclutch slip clutches perform the basic function of controlling the torque between two elements. They can be supplied as a shaft-to-shaft coupling or a shaft to pulley, gear, or sprocket model. Polyclutch custom slip clutches can be provided with non-standard bore sizes, keyways, low backlash or higher torque, minus housings and with pulley, gear or sprocket.

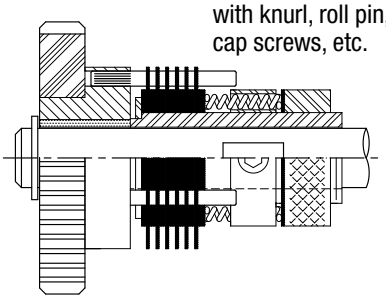
EXAMPLE 1

Shaft to Shaft
Shafts must be supported and aligned within .010-.015



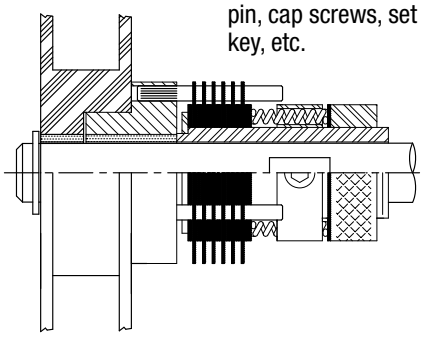
EXAMPLE 2

Gear/Pulley/Sprocket adapted to housing with knurl, roll pin, cap screws, etc.



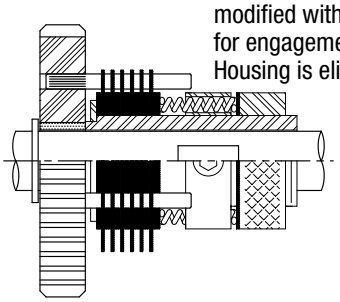
EXAMPLE 3

Supply or rewind spool adapted to housing with knurl, pin, cap screws, set screw, key, etc.



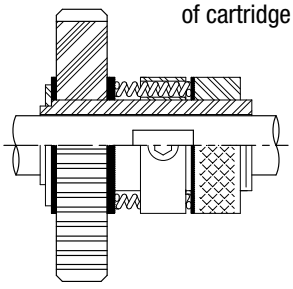
EXAMPLE 4

Gear/Pulley/Sprocket modified with pins for engagement
Housing is eliminated



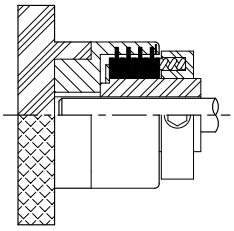
EXAMPLE 5

Gear/Pulley/Sprocket integrated as part of cartridge



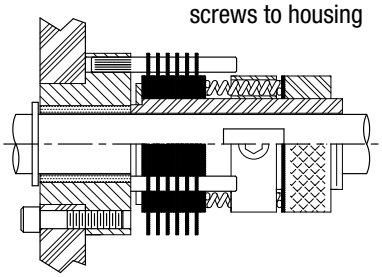
EXAMPLE 6

Knob adapted to housing knurl, set screw, pin, etc.



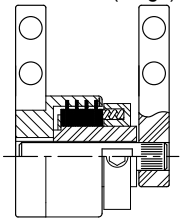
EXAMPLE 7

Machine frame adapted with cap screws to housing



EXAMPLE 8

Rotary position holder (hinge)



SLIP CLUTCH | HOW TO CREATE A PART NUMBER

S A S 24 - 4 - 6

1 2 3 4 5 6

HOUSING BORE SIZE:
Generally represented in sixteenths of an inch. For metric, add MM after bore sizes. (e.g., SAS24-4MM-6MM).

CARTRIDGE BORE SIZE:
Generally represented in sixteenths of an inch. For metric, add MM after bore size (e.g., SAS24-4MM).

OUTER DIAMETER:
Generally represented in sixteenths of an inch, please see specifications for exact dimensions.

INSTALLATION TYPE:
"S" is shaft to shaft
"O" is shaft-through for mounting to pulley, gear, sprocket, etc.
"Y" is cartridge only

TORQUE SETTING:
"A" is adjustable torque
"F" is factory preset (fixed) torque*

TYPE OF SLIP CLUTCH:

S = Multi-Plate Slipper	P = Single-Plate Slipper	V = V-Series Slipper
E = Slip-Ease	A = Slip-Aire (air-actuated)	

*Please indicate torque value if fixed - 'T' =

STANDARD OPTIONS

Polyclutch slip clutches are designed to cover a wide range of solutions. To help better fit the clutch to your specific application, here is a list of standard options:

- Bore size changes – English (inches) and metric (mm)
- High torque option, accomplished by extra springs – "H" part no. suffix
  - Will increase capacity of standard adjustable slip clutches by 50% (note: removing springs will lower capacity, increase sensitivity)
- Keyways – English and metric – "K" part no. suffix
- Low backlash in Slipper clutch – "UL" part no. suffix
- Heavy inner plates for extra cooling – "D" part no. suffix
- 303/304 stainless steel construction – "Q" part no. prefix
- Two-plate Slipper clutch – "R" version (part no. begins with "R")
- Plastic cover for Slipper and Slip-Aire clutches

CUSTOM CLUTCHES

If you are looking for something outside of our standard options, our engineers will work with you to help design a clutch for your specific application.