PT Tech®

SGK CLUTCH COUPLING

SGK Concept

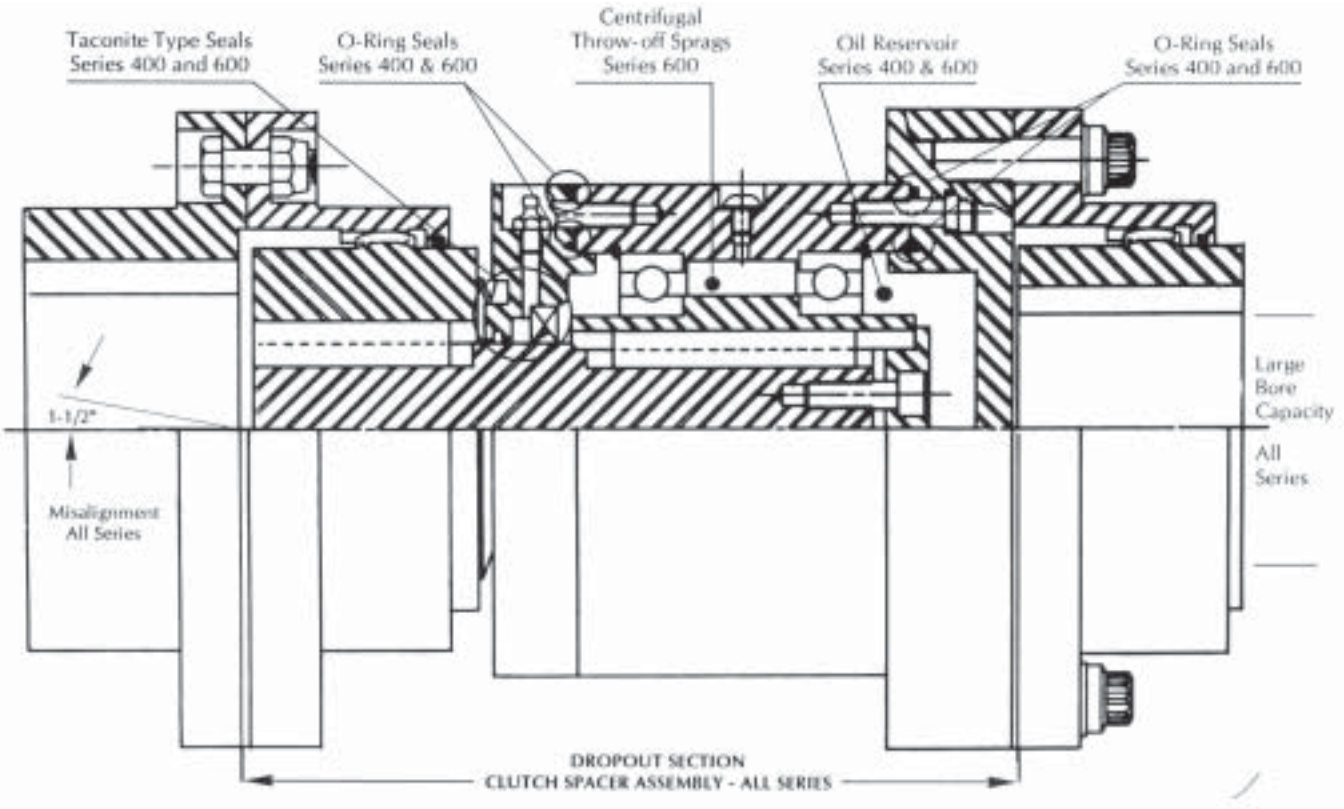
The quality, dependability, and performance of sprag type over-running clutches and gear couplings have made them standards for heavy industry. PT Tech combines these two proven products into a unique clutch coupling package... the SGK Over-running Clutch Coupling.

Over-running clutch couplings are widely used in the industry to automatically disengage auxiliary drives such as:

- *stand-by drives*
- *inching drives*
- *turning gear drives*
- *creeper drives*
- *Sunday drives, etc.*

The SGK product line is distinguished by its dropout center section. Removing the gear coupling bolts allows the clutch center section to be dropped out without disturbing the driver or driven unit. This provides for ease of service or rebuild.

By combining sprag type over-running clutches to gear couplings, the result is the best combination of torque capability to bore capacity of any over-running clutch coupling available to industry. Often, the SGK product line is the most economical over-running clutch coupling because the unit does not have to be oversized to accommodate the bore requirements.



SGK Series 400

The Series 400 Over-running Clutch Coupling is intended for use in adverse environments. The clutch is oil lubricated and is suitable for operation in temperatures down to -40°F. (-40°C.) with proper lubricant. An expanded oil reservoir allows the clutch to operate up to one full year without relubrication. A regreasable taconite-type seal protects the oil seal. A V-ring face seal extends the intervals between seal regreasing. The gear coupling half at the driver end, is an exposed bolt-type. The gear coupling half at the over-running end, is a shrouded bolt-type on SGK sizes 10, 15, and 20. This prevents the clutch from being installed backwards. On larger units, the gear couplings are different sizes on each end.

The Series 600 Over-running Clutch Coupling utilizes certrifugal throwout (C/T) sprags that completely eliminate sprag wear at high over-running speeds. It can only be used in applications where the over-running speed is significantly higher than the drive speed such as start-up drives, turning-gear drives, inching drives, Sunday drives, etc. The clutch is oil lubricated and is suitable for operation in temperatures down to -40°F. (-40°C). with proper lubricant. An expanded oil reservoir allows the clutch to operate up to one full year without relubrication. A regreasable taconite-type seal protects the oil seal. A V-ring face seal extends the intervals between seal regreasing. The gear coupling half at the over-running end is an exposed bolt-type. The gear coupling half at the driver end is a shrouded bolt-type on SGK sizes 10 and 15. This prevents the clutch from being installed backwards. On larger units, the gear couplings are different sizes on each end.

SGK Applications

1) AUXILIARY DRIVE WITH SPEEDS THE **SAME AS OR HIGHER** THAN THE MAIN DRIVE. *See Figure A*

Depending on temperature conditions, space restrictions, and environment, the SGK Series 400 is generally used for these applications:

Dual Drives - Large drives often have two different sources of power for reliability or economy. An example is steam boiler fans which often have electric motor and steam turbine drives. The steam turbines are used to drive when there is an excess of steam.

Stand-By Drives - Critical applications such as automotive assembly conveyors have two complete identical drives to minimize costly downtime due to drive malfunctions.

Speed-Up Drives - Equipment may have a need for faster speed during part of the cycle. Packaging equipment often utilizes this.

Figure A

2) AUXILIARY DRIVE WITH SPEEDS **SIGNIFICANTLY SLOWER** THAN MAIN DRIVES. *See Figure B*

These drives are used in many different industries for many different applications. Their names are usually descriptive of their function. The SGK Series 600 is usually ideal for these drives.

Start-Up Drives - To start equipment and allow the main drive to reach a self-sustaining speed such as large diesel or gas turbine starting drives.

Turning Gear Drives - To provide emergency drive for large equipment that would be damaged in the event of a sudden failure of the main drive. This application is used extensively in gas turbines, hot gas fans, rotary kilns, and furnaces where heat could cause distortion of the machinery if it were to remain at rest during a drive failure.

Inching Drives - To provide precise positioning of heavy equipment such as batch mills.

Sunday Drives - To provide slow rotation of equipment on off days such as paper mill machinery.

Creeper Drives - To keep outdoor conveyors creeping slowly in cold weather, thus preventing freeze up of belts and idlers.

Inspection Drives - To provide a slow speed for visual inspection of machinery such as long belt conveyors.

Feed-up Drives - To feed metal strip into coil processing equipment such as slitters.

Figure B

NOTE: Reversing of the main drive, improper direction of rotation of the clutch coupling, or clutch coupling malfunction can cause back driving of the auxiliary drive. On slow speed auxiliary drives, this may result in dangerous overspeeding of the auxiliary drive and should be adequately protected against by the equipment designer.

SGK Selection

The selection of the PT Tech SGK Clutch Coupling should be based on the following considerations. (An Application Data Sheet is provided upon request to ensure that all selection factors are considered.)

To properly select a SGK Clutch-Coupling:

First determine which series is best suited for your application.

If the driving speed is close to being the same as the over-running speed, use a Series 400. If the over-running speed is significantly higher than the drive speed and is above the "Sprag Lift-Off Speed" (Page 7), consider a Series 600. The centrifugal throw-out sprags can extend life by eliminating sprag wear. See Page 3 for a more detailed description on each series.

Second, calculate design torque, because it determines model size within a series.

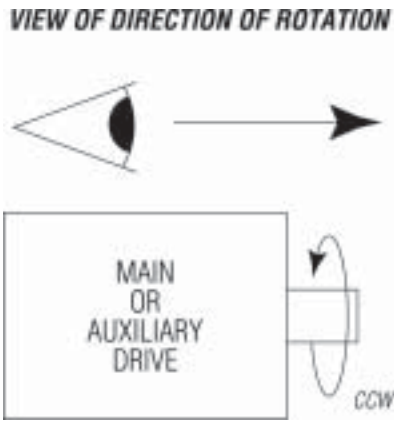
$$\text{Design Torque (lb. - ft.)} = \frac{\text{HP x 5250}}{\text{RPM}} \text{ x } \text{Service Factor}$$

Below is a list of suggested service factors for common over-running clutch couplings driven by electric motors and turbines. *A fluid coupling or other suitable vibration dampening device must be used in conjunction with the SGK for applications involving internal combustion engine driven equipment. Consult PT Tech.* The service factors are given as a range. Judgement should be used with consideration for load, shock, vibration, and consequences of clutch coupling malfunction. The torque capacity should always exceed the maximum torque expected durning start-up or running.

TYPE OF DRIVE	SERVICE FACTOR
Dual Drives and Standby Drives	
Light duty fans and blowers	1.00 - 1.25
Forced draft fans	1.25 - 1.50
Induced draft fans	1.50 - 2.00
Mine ventilation fans	2.00 - 3.00
Centrifugal pumps and compressors	1.00 - 1.50
Conveyors	1.00 - 1.50
Start-up Drives	
for diesels and gas turbines	1.50 - 2.50
Turning Gear Drives	
for fans, kilns and furnaces	1.50 - 2.50
Inching Drives and Sunday Drives	
for heavy equipment	1.50 - 2.50
Creeper Drives and Inspection Drives	
for conveyors	1.00 - 1.50
Feed Updrives	
for steel slitters	1.50 - 2.00

Third, after selecting a model size, check the maximum allowable bore capacity against shaft size requirements. If shaft size is greater than bore capacity, then select next larger model size.

Forth, determine direction of drive rotation, specify as clockwise(cw) or counter-clockwise (ccw) as seen from the driver end. See below.



Fifth, check shaft misalignment (including axial travel). Standard gear couplings can accommodate 1-1/2° per gear mesh.

Sixth, check clutch-coupling dimensions to make certain the selected unit will fit into available space.

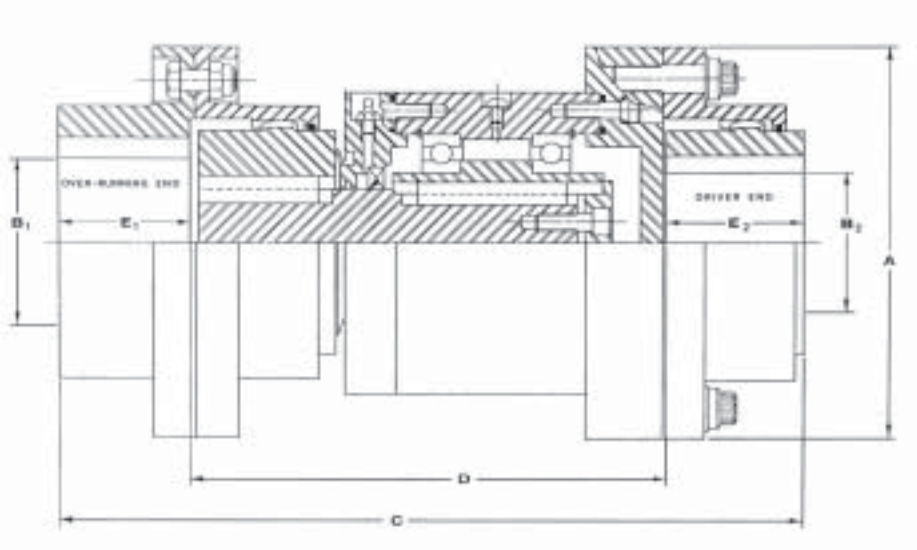
Seventh, check maximum over-running speed. Consult PT Tech if higher over-running speeds are required.

If Series 600 is being selected, check that the drive speed is below the "Maximum Driver Speed." (See Page 7).

REMEMBER, WHEN ORDERING, PLEASE SPECIFY:

SERIES ..... 400 or 600
SIZE ..... 10 through 45
BORE AND KEYWAY SIZES
DIRECTION OF DRIVE ROTATION

SGK Series 400



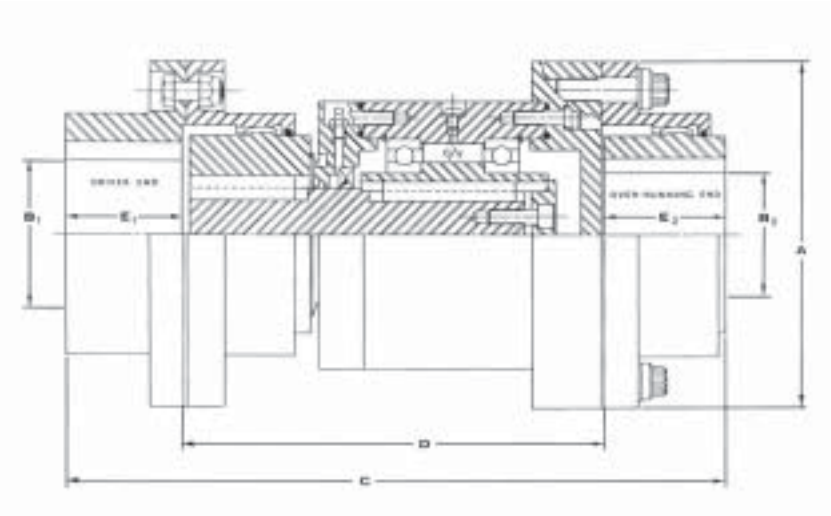
- **Oil lubricated**
- **Oil reservoir allows one year maintenance intervals.**
- **Outdoor/adverse environments**
- **Taconite - type protective seals**
- **Temperatures down to -40°F (-40°C)**

SGK MODEL NUMBER	10	15	25	30	35	40	45
SELECTION DATA							
Torque rating (lb. - ft.)	200	600	1.500	4.000	6.800	11.500	18.000
Max. over-running speed (rpm)*	3,600	3,000	2,400	2,000	1,800	1,500	1,350
Max. bores B1 O/R end (sq key)	2.250	2.750	3.625	4.375	5.125	5.875	6.760
Max. bores B2 driver end (sq key)	1.875	2.375	3.625	4.125	4.875	5.750	6.500
Resistance after run in (lb.-ft.)	.20	.23	.46	1.15	3.75	5.25	6.25
Axial end float (inches)**	1/4	1/4	5/16	3/8	7/16	1/2	9/16
DIMENSIONS (Inches)							
(A) Coupling diameter	4.56	6.00	8.38	9.44	11.00	12.50	13.62
(C) Overall length	9.48	11.46	13.79	16.97	20.26	22.05	24.23
(D) Distance between shaft ends	6.23	7.68	8.48	10.47	12.66	13.33	14.48
(E1) Length thru bore - O/R end	1.56	1.84	2.28	2.91	3.41	3.97	4.44
(E2) Length thru bore - driver end	1.69	1.94	3.03	3.59	4.19	4.75	5.31
SHIPPING WEIGHT (lbs)	30	52	125	210	330	460	625

** Maximum over-running speeds can be increased by modifications. Consult PT Tech.*
*** Axial end float listed is the maximum total travel. Dimension "D" is based on the midpoint of the travel. Longer axial travel can be provided by reversing the gear coupling hubs or by utilizing slide-type gear couplings. Consult PT Tech.*

NOTE: Dimensions subject to change. Use certified prints for design purposes.

SGK Series 600



- **High speed over-running with low drive speed**
- **Centrifugal throw-out sprags**
- **Oil lubricated**
- **Oil reservoir allows yearly maintenance intervals**
- **Outdoor/adverse environments**
- **Taconite-type seals**
- **Temperatures down to -40° F (-40° C)**

SGK MODEL NUMBER	10	15	25	30	35	40	45
SELECTION DATA							
Torque rating (lb.-ft.)	200	600	1500	4000	6800	11,500	18,000
Max. over-running speed (rpm)*	5000	4000	3600	2500	1800	1500	1350
Max. driver speed (rpm)*	1100	1000	1000	800	650	525	500
Sprag lift-off speed (rpm)*	1200	1200	1200	1000	800	675	650
Max. bores B1 driver end (sq key)	2.250	2.750	3.625	4.375	5.125	5.875	6.760
Max. bores B2 O/R end (sq key)	1.875	2.375	3.625	4.125	4.875	5.750	6.500
Resistance after run in (lb.-ft.)	.20	.23	.46	1.15	3.75	5.25	6.25
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SHIPPING WEIGHT (lbs)	30	52	125	210	330	460	625

** If higher driver speeds are required or if long periods of over-running are expected at speeds below the sprag lift-off speed, consult PT Tech.*

*** Axial end float listed is the maximum total travel. Dimension "D" is based on the midpoint of the travel. Longer axial travel can be provided by reversing the gear coupling hubs or by utilizing slide-type gear couplings. Consult PT Tech.*

NOTE: Dimensions subject to change. Use certified prints for design purposes.