PDC SERIES

FEATURES

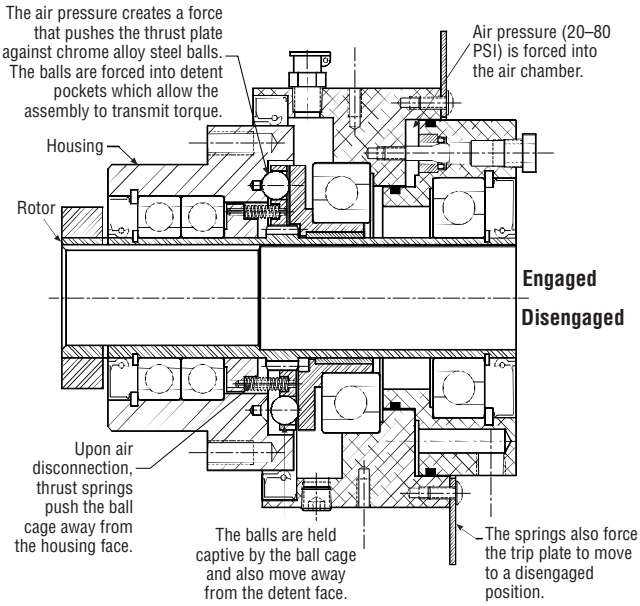
- **"In-Flight" torque control offers precise pneumatic torque control**
- **Nickel plated and stainless steel exterior for superior corrosion resistance**
- **Completely sealed design**
- **Remotely adjustable for starting and overrunning loads**
- **Accurate and dependable disconnection, +/- 10% of torque setting**
- **Single position ball detent**
- **Instant disengagement**
- **Oil lubricated**
- **Dual radial ball bearings**
- **Internal valve**
- **Through shaft design**
- **Bi-directional operation**
- **Single position indexing**
- **Automatic reset**
- **Limit switch actuation mechanism**
- **Clamp collar for secure mounting**
- **Hardened parts for long clutch life**
- **Sealed from environmental contamination**

The Boston Gear PDC Series Pneumatic Torque Limiting Disconnect Clutch is unique from other pneumatic clutches on the market today. Along with providing the expected protection from overloads in your equipment, it also allows the rotation of the two halves when the air is off and exhausted from the clutch.

The PDC clutches are completely sealed from the atmosphere and other harmful contaminants and all exterior surfaces are nickel plated for corrosion resistance and wash down service. Angular contact ball bearings are used in the units to provide added thrust capacity. Since many of these clutches are used with timing belt pulleys or sprockets, we have designed the unit with two radial ball bearings to provide support to the pulley or sprocket.

OPERATING PRINCIPLES

The Boston Gear PDC Series Pneumatic Disconnect Clutch is a ball detent air actuated device. It has been designed to provide accurate and dependable torque overload protection for mechanical power transmission equipment. It has also been designed to provide a remote disconnection of the drive when the air supply is removed. The following diagram demonstrates the engaged and disengaged functions.



The top half of the view shows the unit in an engaged condition. 20 to 80 psi of shop air is forced into the air chamber. That air pressure exerts a force on a hardened thrust plate that pushes against six chrome alloy steel balls. The balls are forced into detent pockets, which allow the assembly to transmit torque. Increasing or decreasing the air pressure remotely controls precision "in flight" torque adjustment. The machinery can still be in operation when the torque rating is being adjusted. When a torque overload occurs, the housing and rotor rotate independently of each other. The balls roll out of their detents and a limit switch actuating plate moves forward to trip a limit switch and signal a torque overload condition. The drive should be shut down immediately and the source of the overload determined and cleared. To re-engage the clutch, re-apply the air pressure and jog the drive until the clutch engages. The PDC Series is a single position device. The unit will re-engage every 360° in the same location every time.

The bottom half of the view shows the unit in a disengaged condition. When air is disconnected, internal springs push the ball cage away from detent face of the housing. The balls are held captive by the ball cage so they also move away from the detent face. At this point, the unit is free to rotate in a disengaged condition. The main components that transmit torque are not in contact with each other.

SELECTION

1. Determine overload release torque by one of these methods:
   a. Use the torque formula with horsepower and RPM specific to the selected clutch location. A service factor may be required for high inertia starts, reversing or peak load conditions, (refer to Page 80 for service factor information):

$$\text{Torque (Lb. In.)} = \frac{\text{HP x 63025}}{\text{RPM}}$$

   b. Determine the "weak link" in the drive train, (i.e. chain, reducer, belt or shaft). Select an overload release torque that is below the "weak link's" maximum torque rating.
   c. Physically measure the drive torque with a torque wrench and size accordingly.
2. Determine the bore size:
   a. Shaft size at the clutch location determines the clutch bore.
3. Refer to the Basic Selection Chart for the appropriate clutch size. Determine the approzimate start-up and running air pressures for the application.
4. Refer to Pages 64 and 65 for ratings, dimensions and types.
5. Refer to Page 81 for recommended mounting locations.

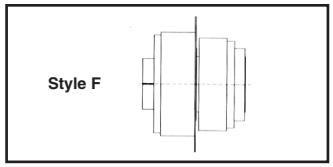
*Larger bores may require reduced keys (supplied with unit)

BASIC SELECTION CHART

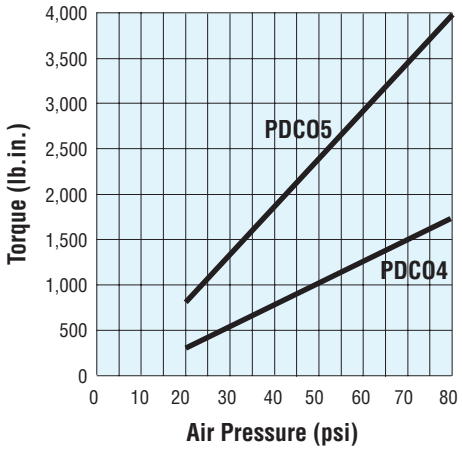
Clutch Size	Max.* Bore (In.)	Torque Code	Torque Range (Lb.-In.)	Max. RPM
04	1.1875	H	300-1,700	1,800
05	1.7500	H	820-4,000	1,800

*Larger bores may require flat keys (supplied with unit)

Style F is used where full shaft length is available.



PDC Torque Curves



PDC SERIES PART NUMBERING SYSTEM

PDC — **Series**
Pneumatic Overload Disconnect Clutch

04 — **Size**
04
05

F — **Style**
F= Full Available Shaft Length

B — **Style**
B= Basic
R= Reduced Hub (Size 04 only)

-

H — **Cylinder Torque Range**
H= Large

P16 — **Unit Bore**
P = Bored to Size (in 1/16")
M = Metric Bored to Size (in mm)

HOW TO ORDER

When ordering a PDC Series Overload Clutch, please include code letters/numbers for series, size, type, torque range, and unit bore.

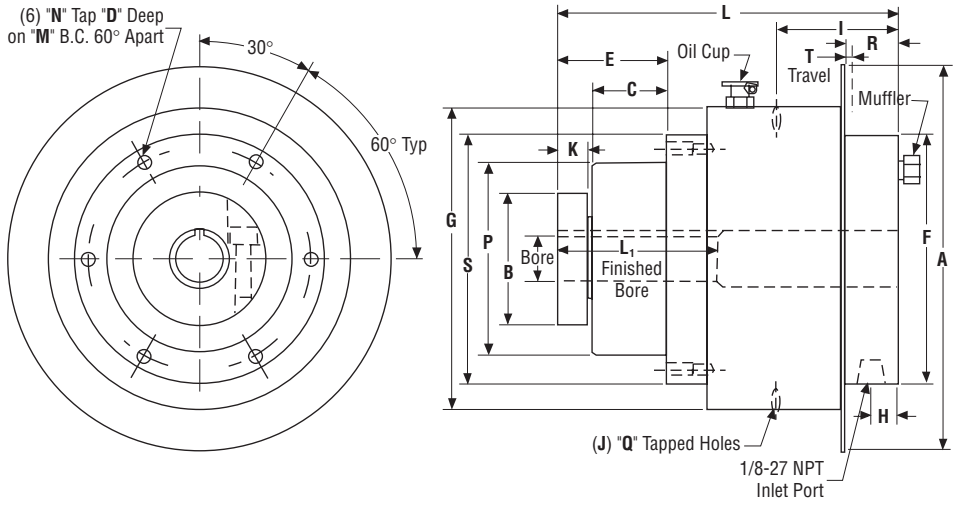
Example:

Required Size 04 PDC series Overload Clutch, full available shaft length, basic mount, large torque range with a one inch bore.

PDC | 04 | F | B – H | P16

PDC SERIES
STYLE F

TYPE B
BASIC DESIGN



ALL DIMENSIONS IN INCHES

Clutch Size	A	B	C	D	E	F	G	H	I	J	K
04	7.00	2.38	1.36	.63	2.00	4.67	5.50	.34	2.20	3	.56
05	8.00	3.38	1.14	.94	1.98	5.92	6.58	.50	2.20	4	.75

Clutch Size	L	L1	M	N	P +.000/-.002	Q	R	S	T
04	6.20	2.70	4.062	5/16-18	3.500	1/4-20	.95	4.53	.13
05	7.18	3.22	4.750	3/8-16	4.125	10-24	1.16	5.25	.15

CLUTCH BORES

Clutch Size	Bores (inch)	
	Max. (1)	Max. (2)
04	1.1250	1.1875
05	1.6250	1.7500

Refer to Page 80 for a complete list of bore codes.
(1) Square Key
(2) Flat Key

Refer to Page 63 for ordering information