ENGINEERING
TOMORROW

Product selection and program brochure

Airflex®
Industrial Clutch and Brake Products

Your choice for **industrial clutches and brakes**

Early interest by Thomas L. Fawick in the use of elastomers to solve industrial problems led to the development of the Airflex clutch and the founding, in 1938, of the Fawick Company.

The Airflex clutch is a unique drum type design which transfers torque through the sidewalls of a rubber-and-cord air actuating tube. Besides transmitting torque, the tube serves as a flexible member between the driving and driven shafts. Simplicity in design and operation are its other outstanding features.

During the early 1940's, after many applications on tugs and tow boats, the U.S. Navy incorporated the clutch on reversing reduction drives for various types of military vessels. Thus the Airflex clutch was proven in severe Naval service.

During this same period, installations were made on oil field equipment and metal forming machinery. All of these successful applications generated worldwide interest and resulted in rapid company growth during the '50's and '60's.

Continuous refinements in design and construction of the original Fawick clutch resulted in the current line of Airflex clutches and brakes, which are now included in the portfolio of products managed by the Industrial division of Danfoss Corporation. As a pioneer in the design, development and use of pneumatic clutches and brakes, the Airflex team is proud that its products are so extensively used on all types of industrial machinery — from equipment to locate and mine raw materials to machines to produce consumer goods.

For over 80 years, Airflex has been dedicated to solving mechanical power transmission problems. We will continue to do so.

Product Categories

Airflex Clutches and Brakes

Airflex products are designed for demanding applications that require high torque and horsepower absorption as well as precise controllability.

Constricting Clutches and Brakes

Drum-style products that when pressurized, expand radially inward forcing their friction shoes against an outer cylindrical drum surface. Use CB for power transmission applications, CM for marine, and VC for heavy duty equipment. The new High Energy Ventilated Clutch features metallic friction linings to sustain more torque and extend slip times for improved efficiency and extended driveline component life.


HEVC


CB

TYPE	TORQUE RANGE (lb-in)	SPEED RANGE (RPM)*
Type CB	360 - 520,000	2,000 - 670
Type VC	27,000 - 9,300,000	1,800 - 275
Type CM	132,000 - 613,500	1,030 - 900
Type HEVC	697,000 - 10,220,000	1,100 - 275

*Speed decreases as torque increases due to increasing inertia

Water-Cooled Brakes

There are 3 Water-Cooled brake models: WCB, an air-applied brake; WCS, a spring-applied clutch or brake; and WCSB, a combination water-cooled and air-cooled brake that provides both high energy absorption for tensioning and fail-safe braking for holding and e-stop.


WCB


WCBD/3

TYPE	TORQUE RANGE (lb-in)	THERMAL CAPACITY (HP)	MAX SLIP SPEED (RPM)*	MAX FREEWHEEL SPEED (RPM)*
Type WCB2	5,700 - 2,744,000	5,200	2,150 - 360	3,400 - 600
Type WCBD/3	5,700 - 2,744,000	5,200	2,150 - 360	3,400 - 600
Type WCS	5,600 - 1,030,000	2,600	2,150 - 475	3,400 - 700
Type WCSB	161,000 - 2,830,000	3,900	715 - 360	1,200 - 600

*Speed decreases as torque increases due to increasing inertia

Air-Cooled Disc Clutches and Brakes

Featuring favorable torque-to-size ratios and low-inertia friction disc assemblies. The DB and FHB brake types are spring-applied, pressure-released multiple disc units. The DC type is a pressure-applied multiple disc unit that can be used as a clutch or brake.


FHB


DBBS

TYPE	TORQUE RANGE (lb-in)	SPEED RANGE (RPM)*
Type DBA	29,000 - 339,000	2,000 - 900
Type DBB	7,500 - 1,470,000	3,000 - 950
Type DBBS	80,000 - 5,578,000	2,200 - 600
Type FHB	288,000 - 432,900	960 - 950
Type DC	10,000 - 2,240,000	1,600 - 450

*Speed decreases as torque increases due to increasing inertia

Airflex **Clutches and Brakes**

Product Categories

Combination Clutch/Brake Packages

The DCB lines feature an air-actuated disc clutch and a spring-applied disc brake.


DCB

TYPE	TORQUE RANGE (lb-in)	SPEED RANGE (RPM)*
Type DCB	55,000 - 160,000	1,000 - 750

*Speed decreases as torque increases due to increasing inertia

Torque Limiting Couplings

Designed to withstand the torque spikes found in the most demanding applications of Variable Frequency Drives. The TLC is engaged through air pressure at 0 RPM and continuously monitored by electronic controls. When a system overload is detected, the TLC automatically disengages.


TLC

TYPE	TORQUE RANGE (lb-in)	STATIC TORQUE (lb-in)	SPEED RANGE (RPM)*
Type TLC	1,610,000 - 4,650,000	2,515,625 - 7,265,625	550 - 275

*Speed decreases as torque increases due to increasing inertia

Expanding Clutches and Breaks

Drum style products that when pressurized, expand radially outward forcing their friction shoes against an inner cylindrical drum surface.


E

TYPE	TORQUE RANGE (lb-in)	SPEED RANGE (RPM)*
Type E	11,300 - 225,000	1,800 - 525
Type EB	390 - 2,220	1,800 - 1,800
Type ER	440 - 3,550	1,800 - 1,800

*Speed decreases as torque increases due to increasing inertia

Electronic Controls – Slip Detection Controls

Aborts the start if excessive slip is detected.
It also detects slippage during operation.

Spring-Applied Drum Brakes

Spring-applied and air-released. Their design and construction are ideal for moderate speed, high torque, cyclic applications.


CTE


CS

	Dynamic Torque Range (lb-in)		Static Torque Range (lb-in)	
TYPE	FORWARD	REVERSE	FORWARD	REVERSE
Type CS	3,000 - 27,000	500 - 4,000	2,000 - 18,000	500 - 4,000
Type CSA	6,000 - 18,000	1,500 - 3,000	4,000 - 12,000	1,500 - 3,000
Type CTE	28,800 - 111,200	28,800 - 100,800	21,000 - 98,500	21,000 - 85,500

Pneumatic Controls – Quick Release Valves (QRV)

Engineered to automatically close upon pressurization and open when a pressure drop occurs – reducing lag time to exhaust the system. Four valve sizes are available.


QRV

	Flow Rate (ft^3/m)	
TYPE	INLET TO CYLINDER	CYLINDER TO EXHAUST
QRV	287	376

Pneumatic Controls – Rotorseals

Allow passage of pressurized fluids from a stationary inlet to a rotating shaft end. Available with single and dual passages.


Single


Dual

TYPE	MAX PRESSURE (PSI)	MAX SPEED (RPM)*
Single		
Type AA2	1,000	1,000
Type B3	1,000	600
Type C2	1,000	400
Dual		
Type AD	150	1,200
Type ADP	150	1,200
Type BD	150	1,200
Type FDA	150	1,000

*Speed at Maximum Torque

Airflex **Clutches and Brakes**

Engineering Resources, Replacement Parts Program, Warranty, Literature and Reference Material

Airflex Direct Support Information

For price, delivery, product specification and application questions, please call or email Danfoss's Airflex Customer Service Team.

Email: *(best and preferred method)*
AirflexCustomerService@danfoss.com

Phone: (800) 247-3539, press 2

Website for product support:
www.danfoss.com/en/products/dps/clutches-and-brakes/

Airflex Application Engineering Resources

Airflex product line is used in a wide variety of applications found in almost every industry. To reach the application engineering team, please contact:

Email: *(best and preferred method)*
AirflexAE@Danfoss.com

Website for product support:
www.danfoss.com/en/products/dps/clutches-and-brakes/

Airflex Replacement Parts Program

When you purchase a Danfoss product, you expect a quality solution that will keep your application running at peak performance under the harshest operating conditions. Danfoss continuously strives to produce the highest quality product available because that is what customers require.

There are various choices in the market for friction material and other replacement parts, but why risk performance? Genuine Airflex® replacement parts are an exact fit and will ensure your clutch or brake will continue to perform to original specifications for its entire operating life.

To find out more about genuine Airflex® replacement parts, contact your Danfoss representative or an Airflex authorized distributor.

Two Year Warranty

Airflex products proudly carry a two year warranty on all components. Airflex quality has been proven with over 80 years of field experience, across multiple markets and countless applications. This warranty serves to provide even further confidence and value in the Airflex brand.

Literature and Reference Material

For more information:

- Go to PowerSource, www.DanfossPowerSource.com, Products, Clutches and Brakes
- Online at www.danfoss.com/en/products/dps/clutches-and-brakes/

Airflex **Clutches and Brakes**

Product Nomenclature

Airflex® clutches and brakes embody the principles of classic design: superior performance, long life, and high quality. For over 80 years, we've been providing superior drivetrain products by continuously adapting and innovating our products to meet industry requirements. With global operations—including manufacturing, sales, and distribution—spanning multiple continents worldwide, our dedicated team can help you select or develop customized solutions for your individual needs.

Product Sizing Interpretation

Constricting
Type CB, Type CM, Type VC

These elements are identified by the drum diameter in inches on which they constrict and the width in inches of their friction lining. For instance, a size 26CM475 is designed to constrict on a 26 inch diameter drum and has a friction lining width of 4.75 inches.

Expanding
Type E, Type EB, Type ER

These elements are identified by the inside drum diameter in inches to which they expand and the width in inches of their friction lining. For instance, a size 16E475 is designed to expand to a 16 inch diameter drum and has a friction lining width of 4.75 inches.

Air-Cooled
Type DBA, Type DBB, Type DBBS, Type DC

These elements' sizes are indicated by the number of brake/friction discs and the disc diameter in inches. For instance, a size 229DBA has two discs 29 inches in diameter.

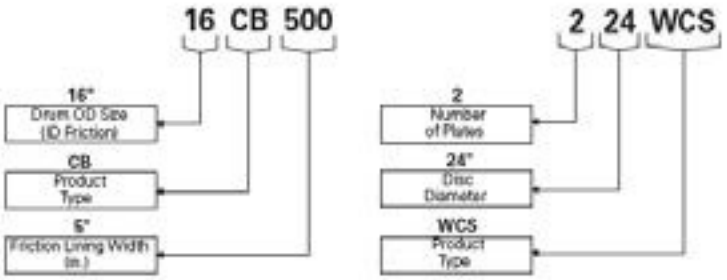
Spring Applied
Type CS, Type CSA, Type CTE

For these elements, sizes are identified by the outside drum diameter in inches on which the brake works and the width in inches of their friction lining. For instance, a size 9CSA200 is designed to operate on a 9 inch diameter drum and has a friction lining width of 2 inches.

Water-Cooled
Type WCB2/WCBD, Type WCS, Type WCSB

For these elements, sizes are indicated by the number of friction discs and the disc diameter in inches. For instance, size 224WCB has two friction discs 24 inches in diameter.

Product Nomenclature



Market **Application**

		Drum Product								
		Constricting			Expanding			Coupling	Spring Applied	
Market	**Application**	**CB**	**VC**	**CM**	**E**	**EB**	**ER**	**TLC**	**CS**	**CTE**
Oil/Gas/Water Drilling Systems	Cat Head	•								
	Compound	•	•							
	Drawworks	•	•							
	Offshore Pipe Laying				•					
	Mooring Systems		•							
	Power Take Off	•	•							
	Pumps	•	•							
	Rotary Table	•	•		•					
	Sand Reel	•	•							
	Top Drive		•							
Mining and Cement	Conveyors	•	•							
	Crushers	•	•							
	Draglines	•	•							
	Grinding Mills		•					•		
	Shovels	•	•							
Marine	Anchor Winch/Windlass									
	Bow Thruster	•	•	•						
	Dredges	•	•					•		
	Generator	•	•	•						
	Main Propulsion	•	•	•				•		
	Pipe Laying Equipment	•			•					
	Power Take Off	•	•	•						
	Propeller Shaft Break		•							
	Pumps	•	•							
Can Making	Bodymaker	•	•						•	•
	Cupper	•	•						•	•
Pulp and Paper	Calendar	•	•							
	Converters									
	Conveyors	•	•							
	Couch	•					•			
	Dryer	•	•							
	Presses	•	•							
	Pulpers	•	•							
	Reel	•	•							
	Rewind Stand				•					
	Slitters	•								
	Unwind Stand				•					
	Yankee Dryer	•	•							
Metalworking	Alligator Sheers	•	•						•	
	Car Shredders	•	•	•						
	Coining Press	•							•	•
	Draw Benches		•							
	Expanders	•	•							•
	Forging Presses	•	•						•	•
	Headers/Upsetters	•	•						•	•
	Machine Tools	•	•							
	Multi-Slide	•							•	
	Powder Metal Presses	•							•	•
	Press Brakes	•	•						•	•
	Rebar Shear	•							•	•
	Rewind Stands				•	•	•			
	Roll Forming	•	•							
	Roller Leveler	•							•	•
	Shears	•	•						•	•
	Slitters	•	•							
	Spring Coiling									
	Stamping, Punching, Forming	•	•						•	•
	Unwind Stands				•	•				
	Wire Cage	•								
Dynamometer	Absorber									
	Holding Brake	•	•							
Engines	Generator Set	•	•							
	Power Take Off	•	•							
Logging	Skidders									
	Yarders				•					

Market **Application**

		Disc Product						Combination Product	Controls		
		Water-Cooled			Air-Cooled						
Market	**Application**	**WCB**	**WCS**	**WCSB**	**DB**	**DC**	**FHB**	**DCB**	**R/S**	**QRV**	**Panel**
Oil/Gas/Water Drilling Systems	Cat Head								•	•	
	Compound								•	•	
	Drawworks	•	•	•					•	•	
	Offshore Pipe Laying	•	•	•					•	•	
	Mooring Systems	•	•	•	•				•	•	
	Power Take Off								•	•	
	Pumps								•	•	
	Rotary Table								•	•	
	Sand Reel	•	•	•					•	•	
	Top Drive								•	•	
Mining and Cement	Conveyors	•	•	•	•	•			•	•	
	Crushers								•	•	
	Draglines				•		•		•	•	
	Grinding Mills								•	•	•
	Shovels				•				•	•	
Marine	Anchor Winch/Windlass	•	•	•	•						
	Bow Thruster								•	•	
	Dredges	•	•	•					•	•	
	Generator								•	•	
	Main Propulsion								•	•	
	Pipe Laying Equipment	•	•	•					•	•	
	Power Take Off								•	•	
	Propeller Shaft Break								•	•	
	Pumps								•	•	
Can Making	Bodymaker				•			•	•	•	
	Cupper				•			•	•	•	
Pulp and Paper	Calendar								•	•	
	Converters	•	•	•							
	Conveyors	•	•	•	•	•			•	•	
	Couch								•	•	
	Dryer								•	•	
	Presses								•	•	
	Pulpers								•	•	
	Reel								•	•	
	Rewind Stand	•	•	•							
	Slitters								•	•	
	Unwind Stand	•	•	•	•						
	Yankee Dryer								•	•	
Metalworking	Alligator Sheers				•	•			•	•	
	Car Shredders								•	•	
	Coining Press							•	•	•	
	Draw Benches				•						
	Expanders								•	•	
	Forging Presses				•	•		•	•	•	
	Headers/Upsetters				•	•		•	•	•	
	Machine Tools								•	•	
	Multi-Slide								•	•	
	Powder Metal Presses								•	•	
	Press Brakes				•	•		•	•	•	
	Rebar Shear				•	•			•	•	
	Rewind Stands	•	•	•							
	Roll Forming								•	•	
	Roller Leveler	•	•	•					•	•	
	Shears				•	•	•	•	•	•	
	Slitters	•	•	•					•	•	
	Spring Coiling										
	Stamping, Punching, Forming				•	•		•	•	•	
	Unwind Stands	•	•	•							
	Wire Cage								•	•	
Dynamometer	Absorber	•	•	•							
	Holding Brake								•		
Engines	Generator Set										
	Power Take Off										
Logging	Skidders				•						
	Yarders	•	•	•							

Airflex **Clutches and Brakes**

Market application

Gas, Oil, Water and Well Drilling

Markets	Airflex Product
Drawworks Offshore Pipe Laying Mooring Systems Power Take Off Rotary Table Sand Reel Top Drive Winch Systems	Constricting Drum: CB, VC Air-Cooled, Disc: DB Water-Cooled, Disc: WC Expanding Drum: E Caliper: DP

CB/VC

Drawworks: Designed and built to provide dependable clutch or brake service in the most severe industrial applications. The CB is best suited to high speed, cyclic operations, as well as for coupling and general power transmission. The VC is best suited for applications where large inertia loads and sustained slippage would normally result in loss of torque and reduced operating life.

DBB/DBBS

Drawworks / Winch Systems: Spring applied, pressure released, disc style brakes designed with high torque and thermal capacities allowing the brakes to be used in the most demanding applications. These brakes provide high braking capability with low inertia and variable torque ratings based on the numbers of springs used in the assembly. Typically used as a "fail safe" brake (parking and e-stop).

WCSB

Drawworks: Designed for direct mounting and to be the only mechanical brake needed. The water cooled portion of the brake offers energy absorption (HP) capacity, while the spring set function accommodates "fail safe" braking (for parking and e-stop).

E

Winch Systems: Designed to be rigid and rugged, making these elements ideal for moderate to heavy duty clutch and brake service. Best suited for medium speed cyclic applications which are subject to large thermal loads. When used with an air agitating ventilated drum, these elements can provide excellent slip clutch and tension brake service.

Mining and Cement

Markets	Airflex Product
Conveyors Crushers Dragline Grinding Mills Shovels	Constricting Drum: CB, VC Air-Cooled, Disc: DB Water-Cooled, Disc: WCB Coupling: TLC

CB/VC

Crushers: Designed and built to provide dependable clutch or brake service in the most severe industrial applications. The CB is best suited to high speed, cyclic operations, as well as for coupling and general power transmission. The VC is best suited for applications where large inertia loads and sustained slippage would normally result in loss of torque and reduced operating life.

DBB/DBBS

Shovels: Spring applied, pressure released, disc style brakes designed with high torque and thermal capacities allowing the brakes to be used in the most demanding applications. These brakes provide high braking capability with low inertia and variable torque ratings based on the numbers of springs used in the assembly. Typically used as a "fail safe" brake (parking and e-stop).

TLC

Grinding Mill: Engages at startup and monitors the system using slip detection control. When a system overload is detected, the TLC disengages automatically, avoiding damage to driveline components. Resetting the system is instantaneous by simply reapplying the required air pressure to the system. This simple design can be used as a mechanical disconnect between the motor and pinion and delivers long-term durability.

FHB

Dragline: The FHB is an air-cooled spring applied brake with exceptional friction life and the capability to quickly make friction changes. It is supplied with long wearing, organic friction material and a rugged solid cast, rotating disc that provides lower intertia than typical caliper brakes.

Airflex **Clutches and Brakes**

Market application

Marine

Markets

Anchor Winch
Bow Thruster
Dredges
Generator
Main Propulsion
Pipe Laying Equipment
Propeller Shaft Brake

Airflex Product

Constricting Drum: CB, VC, CM
Air Cooled, Disc: DB
Water Cooled, Disc: WC
Expanding Drum: E
Coupling: TLC

CB/VC

Rudder Propeller: Used to improve vessel maneuverability by stopping the propeller shaft as fast as possible, to prevent engine stalling during hard reversing maneuvers and to reduce the thermal load on the reversing clutch.

DBB/DBBS

Pipe Laying Equipment: Spring applied, pressure released disc style brakes designed with high torque and thermal capacities allowing the brakes to be used in the most demanding applications. These brakes provide high braking capability with low inertia and variable torque ratings based on the numbers of springs used in the assembly. Typically used as a "fail safe" brake (parking and e-stop).

CM

Main Propulsion: Specifically engineered for the marine industry on diesel-driven, reverse-reduction gears. They feature ventilated friction shoes to permit clutch slippage at low-energy rates during vessel maneuvering, as well as at high-energy rates for cycling engagements.

WCB/WCS

Anchor Winch / Windlass: WCB elements are disc type, externally cooled units designed to absorb and dissipate the thermal loads associated with the most severe clutch and brake applications. The WCB friction couple was developed specifically for continuous slip service and has a dynamic coefficient of friction that is greater than its static coefficient of friction.

Can Making

Markets

Bodymaker
Cupper

Airflex Product

Combination: DCB
Constricting Drum: CB

DCB

Body Maker / Cupper: Specifically designed for the can making industry to withstand the cyclic impact loads associated with high speed can extruding machinery. It's ideally suited for high speed continuously running machinery. A patented quick release air manifold provides fast clutch/ brake response; stopping the ram to prevent die damage due to material misfeed.

CB

Body Maker / Cupper: Designed and built to provide dependable clutch or brake service in the most severe industrial applications. The CB is best suited to high speed, cyclic operations, as well as for coupling and general power transmission.

Airflex **Clutches and Brakes**

Market application

Pulp and Paper

Markets

Calendar
Converters
Couch
Dryer
Presses
Pulpers
Rewind Stand
Slitters

Airflex Product

Constricting Drum: CB, VC
Air-Cooled, Disc: DB
Water-Cooled, Disc: WC
Expanding Drum: E, ER

CB/VC

Calendar: Designed and built to provide dependable clutch or brake service in the most severe industrial applications. The CB is best suited to high speed, cyclic operations, as well as for coupling and general power transmission. The VC is best suited for applications where large inertia loads and sustained slippage would normally result in loss of torque and reduced operating life.

DBB/DBBS

Conveyors: Spring applied, pressure released, disc style brakes designed with high torque and thermal capacities allowing the brakes to be used in the most demanding applications. These brakes provide high braking capability with low inertia and variable torque ratings based on the numbers of springs used in the assembly. Typically used as a "fail safe" brake (parking and e-stop).

WC/WCB

Rewind, Unwind Stand: Used to maintain a constant tension or pull on the material. Improper tensioning while winding can result in roll dishing or telescoping. It could also cause clutter, affecting the reprocessing operation.

Metalworking

Markets

Alligator Shear
Car Shredders
Flywheel Brakes
Forging Presses
Machine Tools
Roll Forming
Spring Coiling
Stamping, Punching

Airflex Product

Combination: DCB
Spring Applied: CS, CTE
Air-Cooled, Disc: DB, DC
Constricting Drum: CB, CM, VC
Expanding Drum: E, EB, ER
Water-Cooled, Disc: WC

CS

WC/WCB

Stamping and Punching: CS and CTE brakes automatically engage in the event of an air or electrical power loss making it suitable for conveyors, draglines, hoists, power shovels and stamping presses. CS brakes are unidirectional that develop less torque in the reverse direction of the drum rotation. CTE delivers greater torque than the CS brake and is bidirectional providing the same torque in either direction.

WC/WCB

Forging Press: Designed and built to provide dependable clutch or brake service in the most severe industrial applications. The CB is best suited to high speed, cyclic operations, as well as for coupling and general power transmission.

EB/ER

Rewind, Unwind Stand: EB elements are suited to slow speed applications having moderate starting and stopping loads. They are used as slip clutches and tension brakes for lighter torque and horsepower applications. ER elements are used as shaft couplings or holding brakes where engagement occurs at zero speed differential between element and drum. Ideal for applications in which a disconnect is required without stopping the prime mover.

Notes

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