Airflex® Constricting Features

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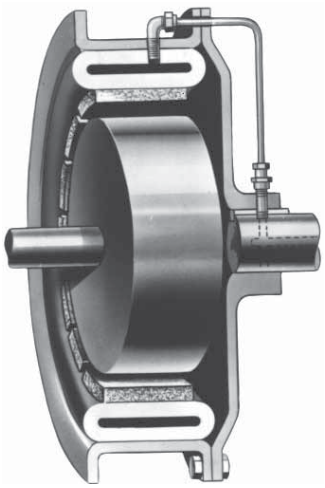
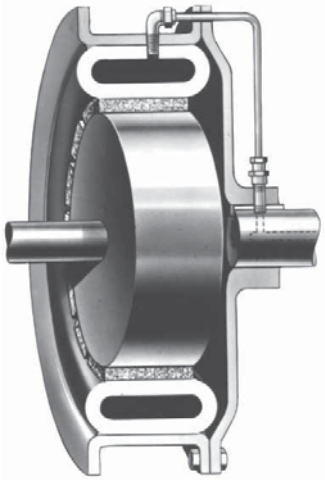




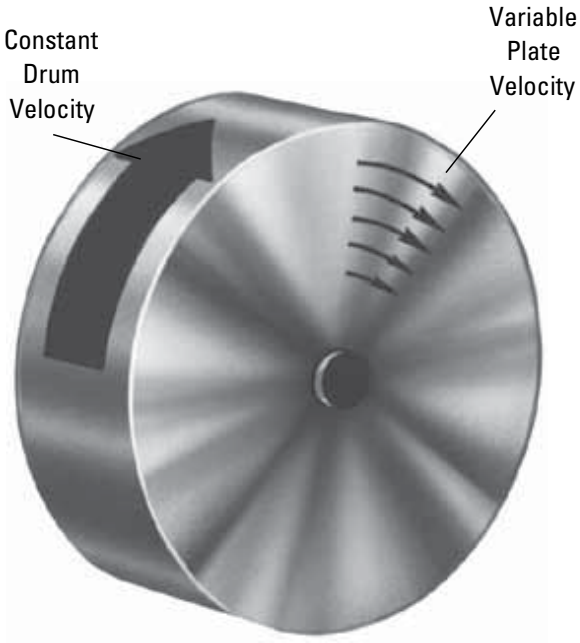
How They Work

CB, CM and VC elements utilize a rugged tire-like neoprene and cord tube that expands radially inward when pressurized. The constricting tube forces friction shoes against an outer cylindrical drum surface. The rate at which the tube is pressurized determines the rate at which element torque increases. Final tube pressure determines the element torque capacity.

Design Features

- **Force applied at maximum radius from axis**

Airflex constricting elements concentrates the frictional force on the outside drum diameter thereby achieving maximum torque. The torque lever arm is the drum radius, not a reduced radius as occurs in plate clutches. Not only is the force generated at the optimum radius, it is also applied Uniformly around the drum circumference.



- **Uniform contact velocity**

Friction shoe contact occurs across the cylindrical surface of the drum where the contact velocity is constant unlike plate types where the contact velocity varies across the friction plate face.

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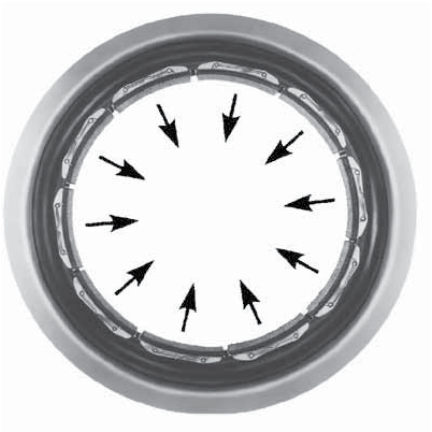
• Self-adjustment

As friction surfaces wear, the tube constricts further and compensates for the wear. Normal wear will not reduce torque capacity.

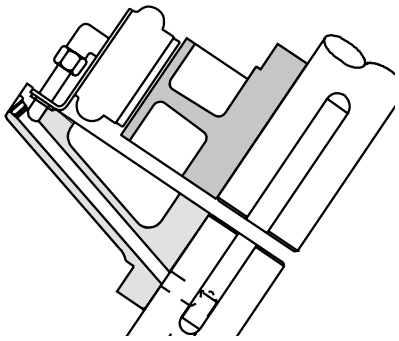


• No lubrication

There are no close fitting sliding components which require lubrication.

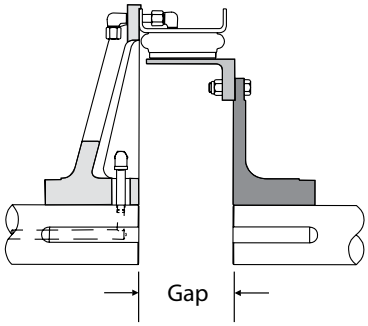
• Centrifugal force assists clutch disengagement

Upon release of tube pressure, centrifugal force, acting on the friction shoes at the rotating element, helps retract the shoes away from the drum surface. The centrifugal effect expels the tube pressurizing media and minimizes the possibility of disengaged friction shoe drag.



• Operates in any plane

The constricting design combined with centrifugal effects permits clutch operation in any plane. A plate clutch operates best in a vertical plane.



• Gap mounting

The constricting drum design allows a gap between the ends of the driving and driven shafts. This gap provides a space through which the element and drum can be removed to permit shaft alignment, clutch maintenance without disturbing existing shaft alignment and the removal of driving or driven components.

Airflex® VC Construction

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The type VC element assembly is specifically designed and built for severe clutch or brake applications in which large inertia loads and sustained slippage would normally result in loss of torque and reduced operating life.

VC design and construction is different from the CB and CM elements in that the torque is transmitted by torque bars rather than the sidewalls of the actuating tube. The loose actuating tube is contained within a housing formed by a rim and two side plates, and is replaceable. The torque bars, which are held in position by the side plates, pass through cavities in the backing plates of the friction shoes. Pressurizing the actuating tube forces the friction shoes to engage around a cylindrical drum. Leaf springs in the torque bar cavities of the backing plates retract the friction shoes when the actuating tube pressure is released. Element torque capacity is dependent upon the applied pressure and rotating speed. Catalog ratings are given at 75 psi (5,2 bar) and zero rpm. Maximum recommended pressure is 125 psi (8,6 bar). Adjustment for pressure and speed is explained under Selection Procedure.

VC elements are available in 24 sizes which are identified by the drum diameter in inches on which they constrict and the width in inches of its friction lining. For a given drum diameter it is possible to have two different lining widths. For this reason, the elements are grouped by lining width into a narrow series and a wide series. As an example, the narrow series 20VC600 and the wide series 20VC1000 both constrict on a 20 inch diameter drum. But, the narrow unit has a lining width of 6 inches, and the wide unit has a lining width of 10 inches. The smallest VC element will constrict on a 11.5 inch (292 mm) diameter drum and the largest on a 76 inch (1930 mm) diameter drum.

Two elements of a narrow series can be bolted together to form a dual element having twice the torque capacity of a single element. With the exception of the 14VC1000 element, the wide series elements can also be dualed. The large drum hub diameter and small drum diameter restricts the radial space available for mechanically connecting the drums to the hub and makes dualing the 14VC1000 elements impractical.

The VC design offers the following features in addition to the constricting features described earlier in this section.

Airflex® VC Features

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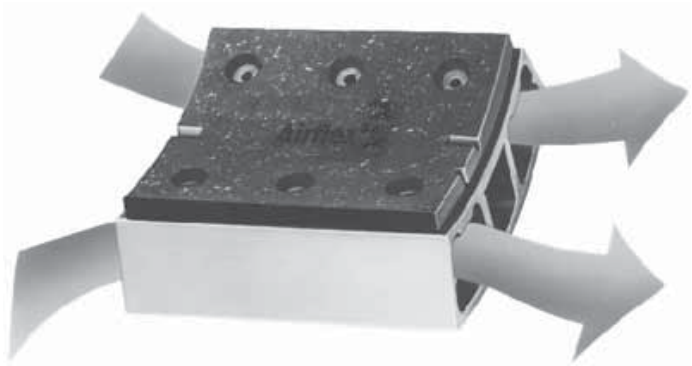
Ventilated Construction

Friction shoe backing plates have large air passages through their entire length. This construction coupled with scalloped side plates allows cooling air to flow through the element. In addition, the large exposed inside diameter assures the coolest possible operation. None of the heat is generated deep in the element's internal parts where it can be trapped. The open construction assures rapid heat dissipation.

Serviceability

The VC clutch can be dismantled on the shaft to gain access to its component parts. All parts are available as replacement parts.

A limited number of element sizes are available in a split configuration. They are used in applications having limited axial access for element maintenance. The following pages give additional descriptive information, selection procedures and common clutch and brake arrangements for the complete VC product line.



Where Used:

- Grinding Mills
- Marine Propulsion
- Metal Forming Machinery
- Oil Field Machinery

Narrow Sizes	Torque Rating	
	lb · in @ 75 psi	N · m @5, 2 bar
11.5VC500	27000	3050
14VC500	39200	4430
16VC600	65000	7350
20VC600	93000	10500
24VC650	135000	15300
28VC650	182000	20600
33VC650	255000	28800
37VC650	320000	36200
42VC650	380000	42900

Wide Sizes	Torque Rating	
	lb · in @ 75 psi	N · m @5, 2 bar
14VC1000	85000	9610
16VC1000	114000	12900
20VC1000	161000	18200
24VC1000	219000	24700
28VC1000	296000	33400
32VC1000	415000	46900
38VC1200	680000	76800
42VC1200	819000	92500
46VC1200	950000	107000
52VC1200	1215000	137000
51VC1600	1610000	182000
60VC1600	2183000	247000
66VC1600	2800000	316000
76VC1600	3660000	413057
76VC2000	Consult Factory	

Airflex® VC Component Descriptions

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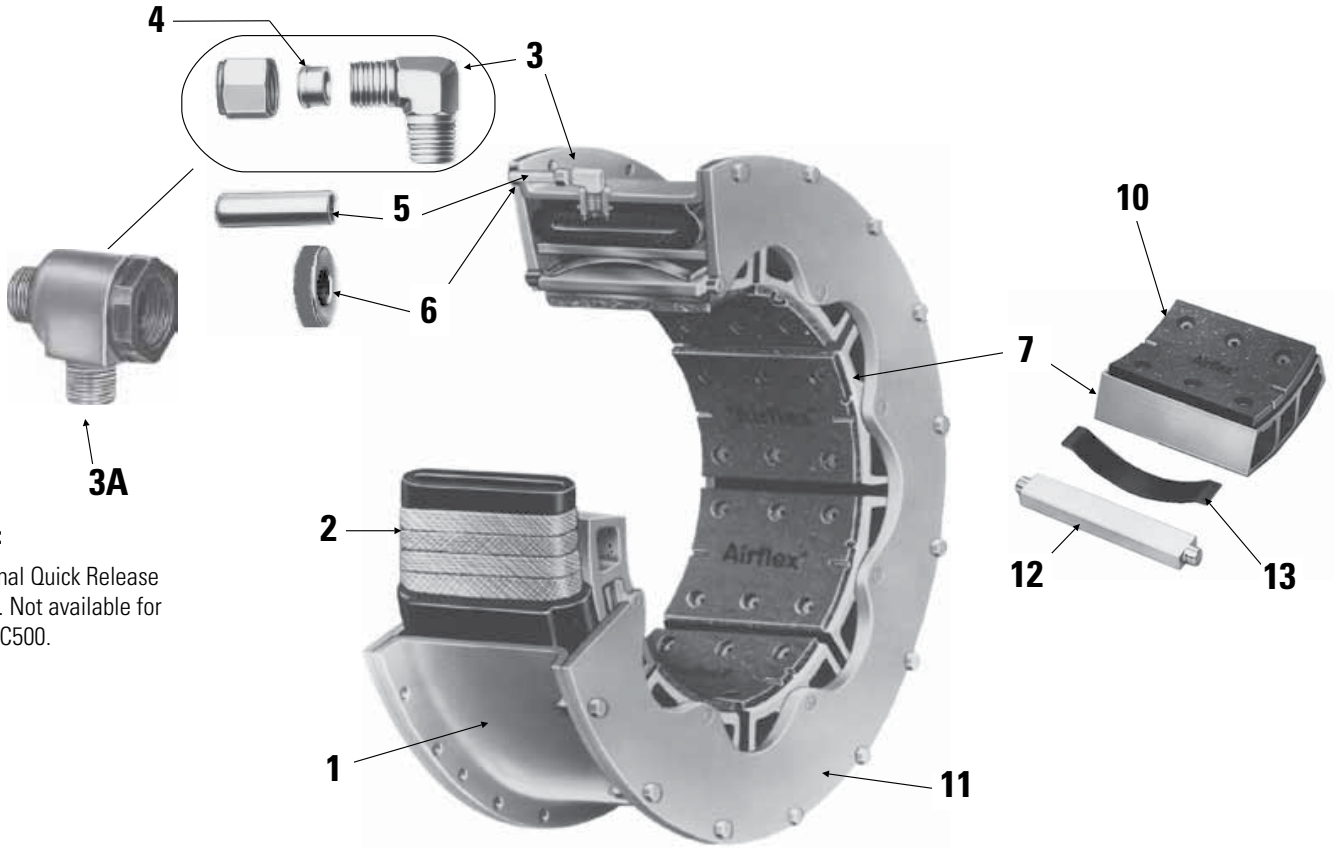
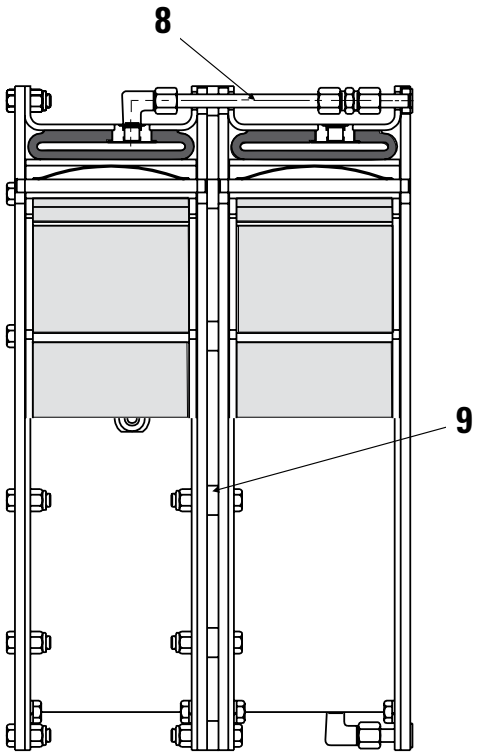


Note:

Optional Quick Release Valve. Not available for 11.5VC500.



Item	Component Description
1	Rim
2	Tube (with valve stem snap rings where required)
3	Elbow Assembly
3A	Optional -Quick Release Valve Assembly
4	Compression Ring (included with items3&3A)
5	Air Connection Tube
6	Air Connection Gasket
7	Friction Shoe Assembly
8	Air Tube Group (Dual Mounted)
9	Spacer Group (Dual Mounted)
10	Replacement Friction Lining & Fastener Kit
11	Side Plate (2 required)
12	Torque Bar
13	Release Spring
7, 12, & 13	Friction Shoe, Torque Bar & Spring Kit

Airflex® VC Element Part Numbers

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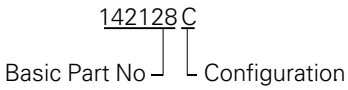
An alpha suffix is added to the basic element part number to completely describe the element configuration.



The basic element part number is shown on the element catalog pages. Alphas for the more common element configurations are shown on this page. The element part number used in the above example identifies a dual 42VC1200 element equipped with standard friction linings and four side connections.

Alpha Suffixes for Single VC Elements

Number of Valves, Side Connections or QRV's	Type of Lining	Alpha Suffixes		
		Valves Only	With Side Connections	With QRV's
1	Standard	-	HJ	HM
1	Cork	-	LR	MR
2	Standard	HA	HP	HN
2	Cork	HB	HS	HK
4	Standard	HA	HC	HE
4	Cork	HB	HD	HF

Alpha Suffixes for Dual VC Elements

Number of Valves, Side Connections or QRV's	Type of Lining	Alpha Suffixes		
		Valves Only	With Side Connections	With QRV's
2	Standard	-	none	E
2	Cork	AA	A	AK
4	Standard	F	C	D
4	Cork	AA	X	J