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“Air Champ” is a Nexen Group, Inc., trademark registered with the U.S. patent office.

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## ◀ FAMILY OF PRODUCTS

### ▶ AIR CHAMP® FEATURES AND BENEFITS

For nearly one-half century, Nexen has been designing and manufacturing Clutches, Brakes and other products to support your motion control requirements. Each product is a result of years of innovative design and engineering, precise manufacturing and most importantly - understanding the requirements of motion control applications.

Whether your application requirements are simple or extensive, you will find our Air Champ® product family will service your motion control needs time and time again. You will find specific product features, benefits and specifications for every Air Champ® product in this catalog. However, there is a common thread of features and benefits throughout the Air Champ® product line.

Simple design, durability, efficiency and economy make Air Champ® products the best choice for your motion control applications.

### “Air Champ”

#### Simple Design

Easy to understand • Easy to install

#### Air Activated

Increased efficiency and productivity • Inexpensive to operate

#### High Thermal Dissipation

Less torque fade • High cyclic rates • Long product life

#### Self Adjusting

Automatic torque maintenance • Worry-free operation

#### Low Maintenance

Long product life • Less down time • Easily serviced

#### Wide Selection

Application and Operational versatility • Mounting flexibility  
Versatile product characteristics • Imperial & Metric designs

#### Ready to Ship

Readily available stock • Quick service

Nexen Group, Inc.



**metric**

## “AIR CHAMP”<sup>®</sup> FAMILY OF PRODUCTS

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nexen™

## ◀ FAMILY OF PRODUCTS

## “Air Champ”®

### Color Codes:

Clutches, Brakes, & Clutch/Brakes:  
Indicates not rotating in mode:

Indicates rotating in mode:

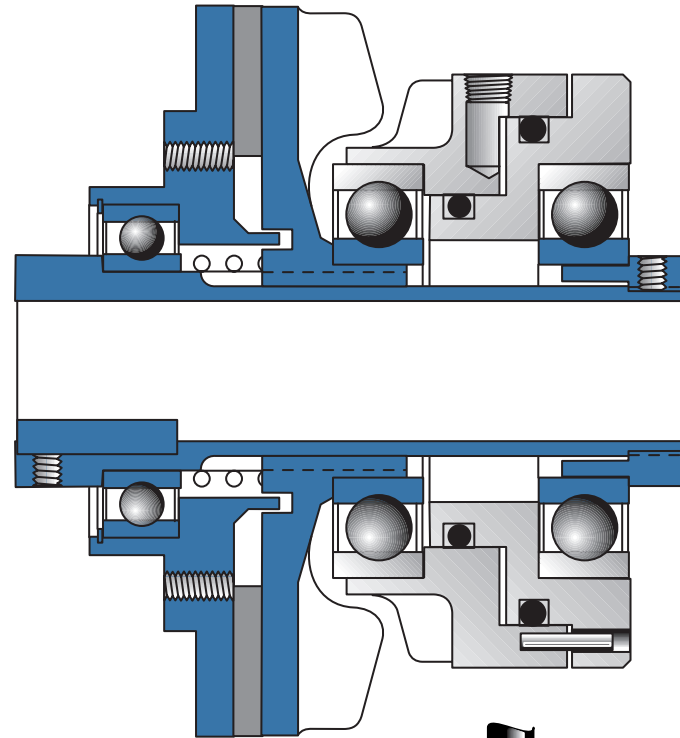
*Power input through shaft, unless noted.*

Drum Brake & Caliper Brakes:  
Parts that cause clamping action:

Disc:

Nexen manufactures and markets over twenty different types of clutches, brakes and clutch/brakes for both standard and metric applications—with many model sizes of each. Nexen also provides many accessories and controls to fit your needs. All are of the highest quality, simply designed, well engineered and ruggedly built. Nexen has a standard clutch or brake to solve every motion control need you can imagine.

The illustrations of the “Air Champ” Family of Products on the following pages are intended to show a representation of the product line and to express only their basic function using typical cross sections. Please refer to specific product pages for application, specification and product information. Designs shown are subject to change without notice.



ENGAGED

### ▶ FRICTION CLUTCHES

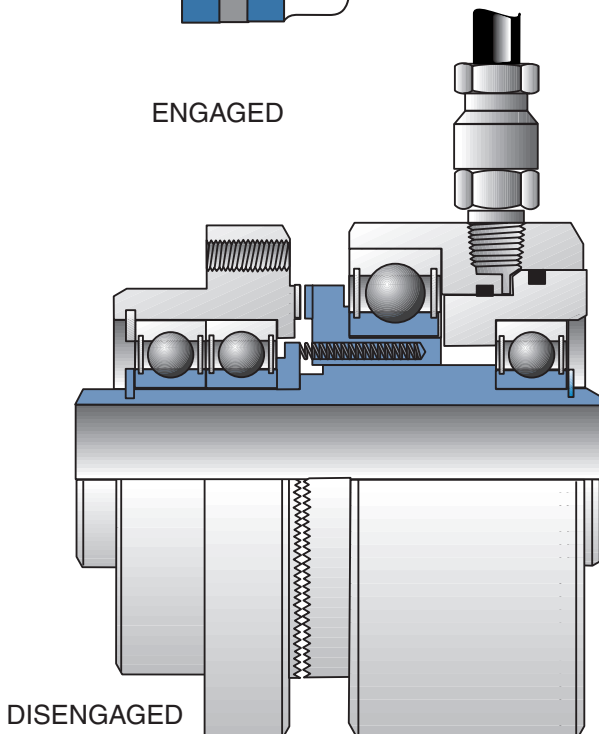
Single-disc, self-adjusting Clutches mount on a driving or driven shaft. Torque ratings to 330 Nm with Heat Sink capacities to 312000 joules and maximum operating speeds to 3600 rpm. Most are available in Sheave, Pilot or Coupling Mount versions. 5 Models address these product functions:

- ▶ Controlled Acceleration
- ▶ Jogging
- ▶ Rapid Cycling/Indexing
- ▶ Positioning
- ▶ Reversing/Multiple Speed
- ▶ Tension Control
- ▶ Overload Protection
- ▶ Disconnect
- ▶ Torque Limiting

### ▶ TOOTH CLUTCHES

Available in a variety of Single or Multiple Position Models, there are 36 Models in all. Most can be used with a Single or Double Flex Coupling Assembly for in-line coupling applications.

Multiple Position Clutches are available in either an Open (5H, 5HP) or Enclosed (5HP-E) design, as well as Flange (5H) or Pilot Mount (5HP, 5HP-E) options. They cover torque ratings up to 3705 Nm, and operational speeds up to 4000 rpm in 15 different Bore sizes. The Open-Flange Mount design is available in 7 Metric Models; the Open-Pilot Mount design is available in 8 Metric Models; the Enclosed-Pilot Mount design is available in 6 Metric Models.



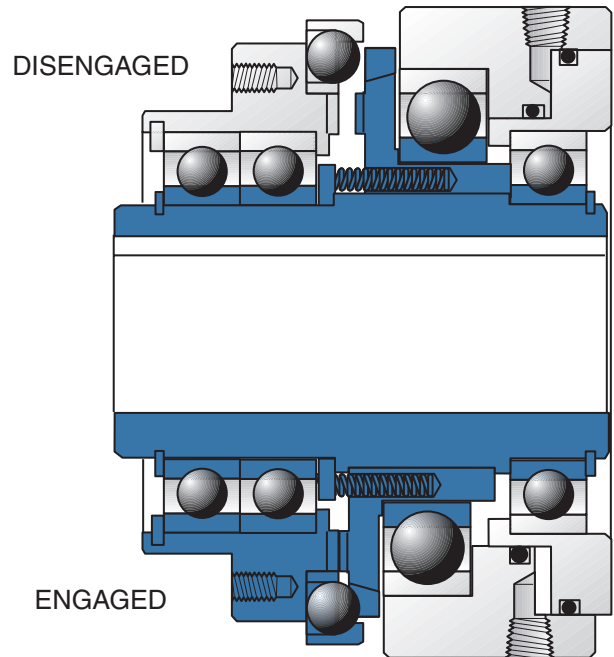
DISENGAGED

▶ **TOOTH CLUTCHES CONT.**

Single Position Clutches are available in an Open (5H-SP) Pilot Mount design. They cover torque ratings up to 3705 Nm, and operational speeds up to 3700 rpm in 16 different Bore sizes. The 5H-SP design is available in 8 Metric Models.

Tooth Clutches address these types of functions:

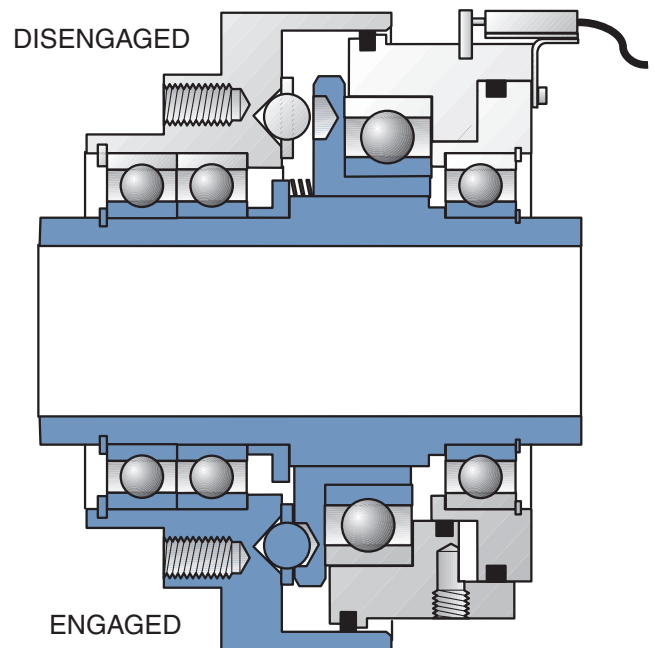
- ▶ Positioning
- ▶ Reversing/Multiple Speed
- ▶ Disconnect
- ▶ Positive Drive

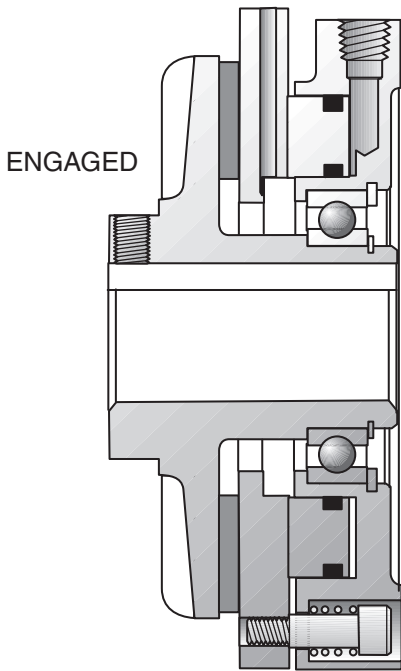


▶ **OVERLOAD PROTECTION DEVICES**

Torque Limiters are pneumatic overload devices designed to instantly disengage at a pre-set torque level. The torque output is easily changed by adjusting the air pressure setting. The Single Position design assures re-engagement of the drive, from a complete stop, in the same position every time, thus providing exact timing of both components. A limit Switch Assembly senses electrical problems and interrupts power prior to damage occurring. Torque limiters are available in either Open or Enclosed designs in two mounting styles—Set Collar and Set Screw. Single or Double Flex Coupling Adapters can be added for vibration and shock protection, and in-line coupling applications. Air Pressure Control Systems are available in 2 styles to provide remote adjustment of torque settings. There are 10 Metric Models to choose from, each with a wide range of Bore sizes and operating specifications. Torque Limiters address these functions:

- ▶ Positioning
- ▶ Overload Protection
- ▶ Disconnect
- ▶ Positive Drive

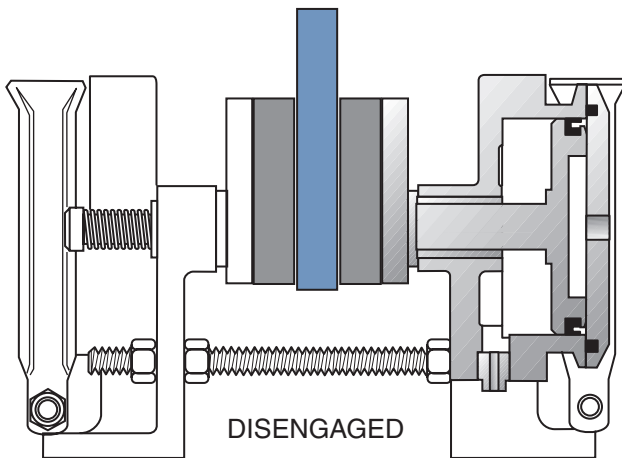




▶ **FRICION BRAKES**

Low inertia, high thermal dissipation and self-adjusting facings make these ideal for many applications. Choose between Straight or Tapered Bore units in a wide range of operational specifications. Each Model comes in a Standard Bore size, with customization possible through the use of Bushings. You'll find 8 Metric Models from which to choose. Friction Brakes address these functions:

- ▶ Controlled Deceleration
- ▶ Rapid Cycling/Indexing
- ▶ Positioning
- ▶ Tension Control
- ▶ Stopping/Holding



▶ **CALIPER BRAKES**

10 Standard Models address a wide range of Caliper Brake requirements. Choose between Spring or Air Actuation, 10 Disc diameters and a variety of design styles. Caliper spacing is movable and shoes are adjustable on many Models. Caliper Brakes address these functions:

- ▶ Controlled Deceleration
- ▶ Tension Control
- ▶ Stopping/Holding

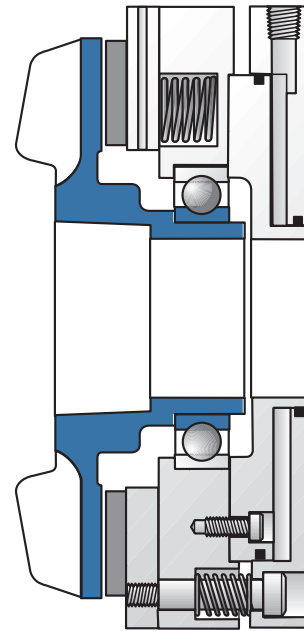


▶ **SPRING ENGAGED BRAKES**

Spring Engaged Brakes are available in 12 Metric Models with a Straight Bore. A variety of Standard Bore sizes are available, some Models provide bore size customization. Product specifications cover a broad range of operational criteria.

Spring Engaged Brakes address these functions:

- ▶ Stopping/Holding



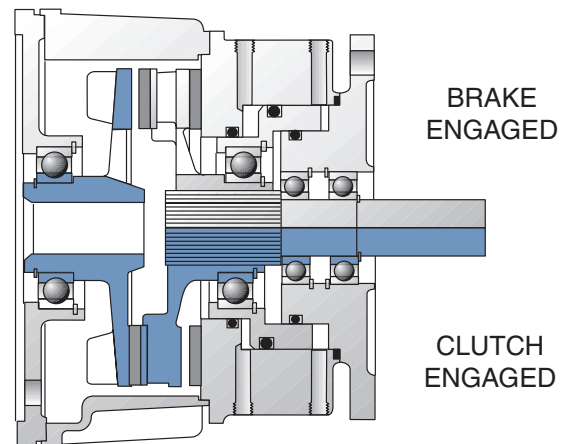
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▶ **FLANGE MOUNTED CLUTCH-BRAKES**

Designed to mount directly to motors and reducers to provide absolute control. There are 6 Metric Models in an Open design, 7 Metric Models in an Enclosed Design, and 7 Metric Models in an Enclosed Spring Engaged design. Additional options include Mounting Feet and an Input Unit, for use in mounting a pulley.

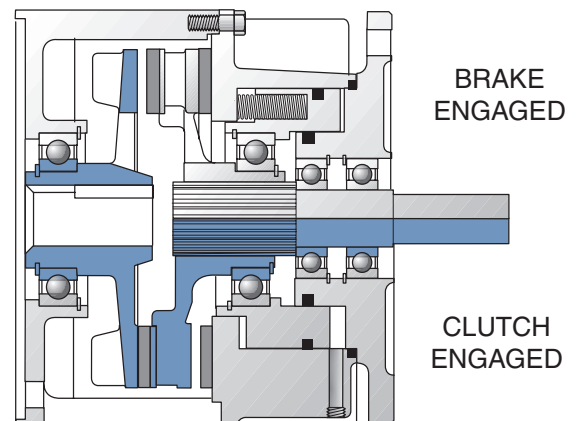
Finish options include black or electroless nickel coating for most models. Flange Mounted Clutch-Brakes address these functions:

- ▶ Controlled Acceleration
- ▶ Controlled Deceleration
- ▶ Inching/Jogging
- ▶ Stopping/Holding



BRAKE  
ENGAGED

CLUTCH  
ENGAGED



BRAKE  
ENGAGED

CLUTCH  
ENGAGED

CLUTCHES

PRODUCT FUNCTION/SELECTION CHART

Product Groups	Friction Clutches	Tooth Clutches
<b>General Features</b>		
Number of Model Options	5 Metric	35 Metric
<b>Functions</b>		
Controlled Acceleration	Yes	
Inching/Jogging	Yes	
Cycling/Indexing	Yes	
Positioning	Yes	Yes
Reversing/Multiple Speed	Yes	Yes
Tension Control	Yes	
Overload Protection	Yes	Yes
Disconnect/Connect	Yes	Yes
Positive Drive		Yes

FRICITION CLUTCH SELECTION CHART

Friction clutch recommendation is based upon air pressure of 4 bar, transmitted power and speed.

		RPM																						
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	2200	2600	3000	3600	
TRANSMITTED POWER KW	0,18	L-600	F-450	F-450	F-450	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	M	M	M	M	M	M	M	M	M	M	
	0,25	L-600	F-450	F-450	F-450	F-450	F-450	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	M	M	M	M	M
	0,37	M-800	L-600	L-600	F-450	F-450	F-450	F-450	F-450	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275	M	M	M	
	0,75	H-1000	H-1000	L-600	L-600	L-600	L-600	F-450	F-450	F-450	F-450	F-450	F-450	F-450	F-450	F-450	F-450	F-450	F-450	BW/B-275	BW/B-275	BW/B-275	BW/B-275	BW/B-275
	1,50	H-1000	H-1000	M-800	M-800	M-800	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	F-450	F-450	F-450	F-450	F-450
	2,20	H-1000	H-1000	H-1000	M-800	M-800	M-800	M-800	M-800	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	L-600	F-450	F-450	F-450	F-450
	4,00		H-1000	H-1000	H-1000	H-1000	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	L-600	L-600	L-600	L-600	L-600	L-600	L-600	F-450
	5,50			H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	M-800	L-600	L-600	L-600	L-600
	7,50				H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	M-800	M-800	M-800	M-800	M-800	M-800	M-800					
	11,00					H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000					
15,00						H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000						
18,50								H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000	H-1000						



## CLUTCHES

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## CLUTCHES

“Air Champ”

### METRIC SERIES FRICTION CLUTCHES

The Metric Model Friction Clutch Series provides:

- ▶ Static Torque capacity up to 330 Nm
- ▶ Maximum Operating Speed up to 3600 rpm
- ▶ Heat Sink capacity of 312000 Joules.

This clutch comes in **6 Models** for design flexibility:

- ▶ **6 Pilot Mount** units with different standard bore sizes
- ▶ **5 Standard Bore** sizes ranging from 15 to 50 millimeters
- ▶ **4 Minimum Bore** sizes ranging from 0 to 19 millimeters—you machine and assemble
- ▶ BW is equipped with thrust bearings and a single key splined hub.
- ▶ B-275 is equipped with sealed, radial bearings and a multi-tooth involute splined hub.

### ▶ METRIC SERIES FRICTION CLUTCHES, PILOT MOUNT ONLY Standard Bore Clutch:

Model	Product Number	Speeds Up to RPM	Bore (mm)	Key Size	MIN. Shaft Insertion into Hub from Pilot Side	Heat Sink Capacity (Joules)	Shipping Wt. (kg)
BW	950700	3600	15	5 x 5	38	7660	1,8
B-275	950705	3600	15	5 x 5	38	7660	1,8
F-450	950050	3600	20	6 x 6	51	41000	4,7
L-600	950150	3600	25	7 x 8	64	81000	7,8
M-800	950250	1800	40	8 x 12	95	149000	17
H-1000	950350	1800	50	9 x 14	102	312000	28

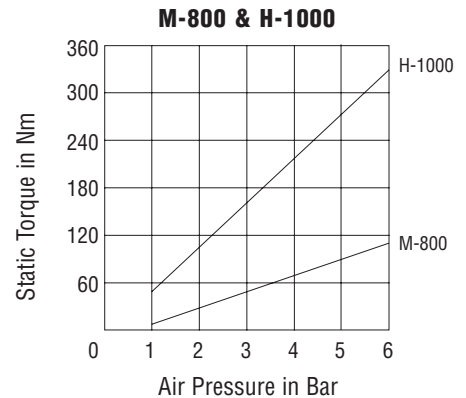
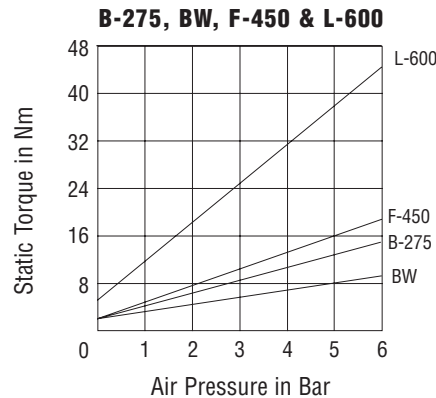
Keys are included.

### Minimum Bore Clutch:

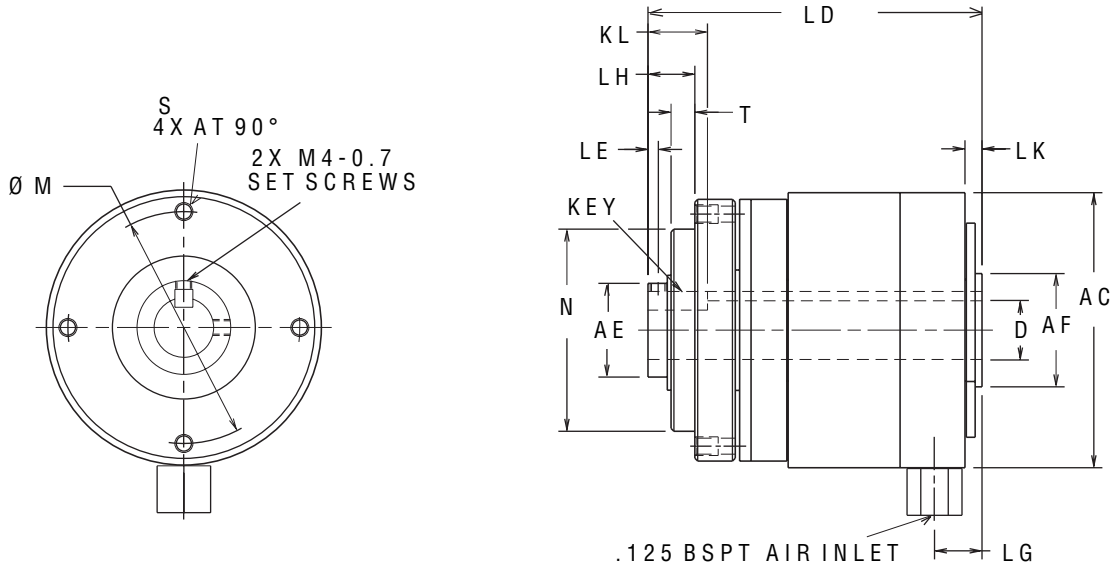
Minimum bore clutches are supplied unassembled with machinable hubs.

Model	Product Number	Speeds up to RPM	MIN. Bore (mm)	MIN. Shaft Insertion into Hub from Pilot Side	Heat Sink Capacity (Joules)	Shipping Wt. (kg)
F-450	950061	3600	0	51	41000	4,7
L-600	950161	3600	13	64	81000	7,8
M-800	950261	1800	18	95	149000	17
H-1000	950361	1800	19	102	312000	28

### ▶ TORQUE VS. AIR PRESSURE

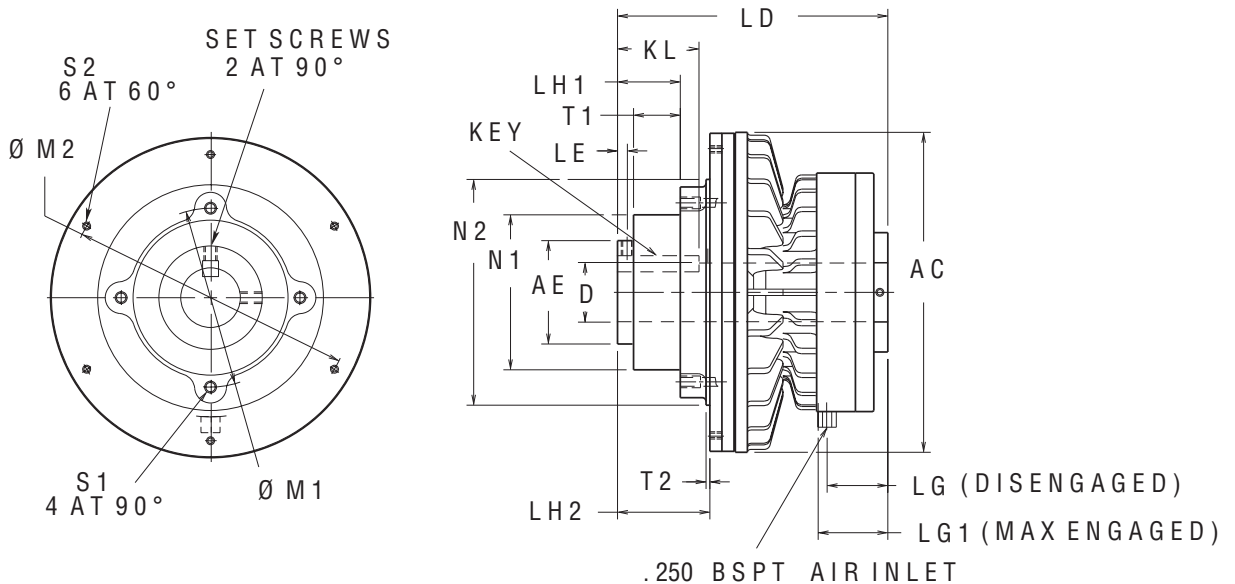


**BW, B-275 PILOT MOUNT - APPROXIMATE DIMENSIONS (MILLIMETERS)**



PRODUCT NUMBER	AC	AE	AF	D <sup>H7</sup>	KEY (SQ)	KL	LD	LE	LG	LH	LK	M	S	T	N <sup>h8</sup>
950700	73	25	30	15	5	16	89	3	13	13	5	63	M5	6	54
950705	73	25	30	15	5	16	89	3	13	13	5	63	M5	6	54

**F-450, L600, M-800 & H-1000 PILOT MOUNT - APPROXIMATE DIMENSIONS (MILLIMETERS)**



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	KEY	KL	LD	LE	LG	LG1	LH1	LH2	M1	M2	N1 <sup>h8</sup>	N2 <sup>h8</sup>	S1	S2	T1	T2	SET SCREWS
F-450	950050	116	35	20	6 SQ	27	121	6	34	36	26	31	78,00	101,60	62	88,87	M6	M5	15	5	M6
L-600	950150	154	47	25	8 x 7	35	141	6	41	43	31	39	90,00	139,70	75	114,27	M6	M5	16	2	M6
M-800	950250	205	67	40	12 x 8	43	186	10	46	50	42	58	120,00	165,10	100	139,67	M8	M6	19	16	M10
H-1000	950350	256	83	50	14 x 9	65	216	9	49	54	50	73	144,00	228,60	120	180,31	M10	M6	37	3	M10

NOTE: Drawings are expressed in third angle projection.

### METRIC 5H SERIES, FLANGE MOUNT TOOTH CLUTCHES

The Metric 5H Series provides:

- ▶ Instantaneous Torque up to 2000 Nm
  - ▶ Maximum Operating Speed up to 3700 rpm
  - ▶ **7 Standard Bore** sizes ranging from 20 to 55 millimeters
  - ▶ **7 Minimum Bore** sizes ranging from 13 to 48 millimeters— you machine and assemble
  - ▶ Positive engagement in multiple positions
  - ▶ Immediate start-up with no slippage
  - ▶ Versatile Mounting Capability for bearing supported pulley, sprocket or gear.
- 7 Models** offer design flexibility:
- ▶ Sealed, radial ball bearings
  - ▶ **Flange Mount** design with tapped mounting holes
  - ▶ Thru-shaft mounting design uses a full-length keyway
  - ▶ 222 millimeter hose included.

### ▶ METRIC 5H SERIES, FLANGE MOUNT TOOTH CLUTCHES—MULTIPOSITION Standard Bore Clutch:

Model	Product Number	Speeds Up to RPM	Bore (mm)	KEYWAY WD x DP	# of Teeth	Shipping Wt. (kg)
5H30	906703	3700	20	6 x 2,8	91	3,2
5H35	906802	3200	25	8 x 3,3	106	4,1
5H40	906902	3000	30	8 x 3,3	122	5
5H45	907002	3000	35	10 x 3,3	137	7
5H50	907103	3000	40	12 x 3,3	152	8,1
5H60	907202	2400	45	14 x 3,8	183	13
5H70	907302	2000	55	16 x 4,3	214	18

Keys are customer furnished and must be full-length.  
Bearing life is optimized at lower speeds and air pressure.

### Minimum Bore Clutch:

Minimum bore clutches are supplied unassembled with machinable hubs.

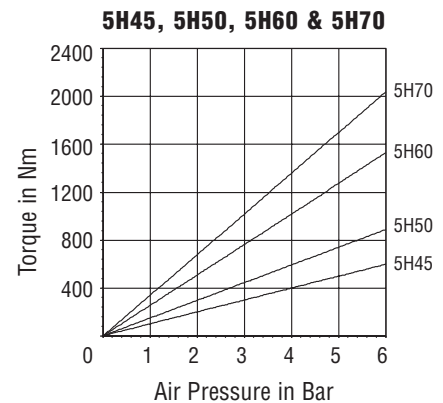
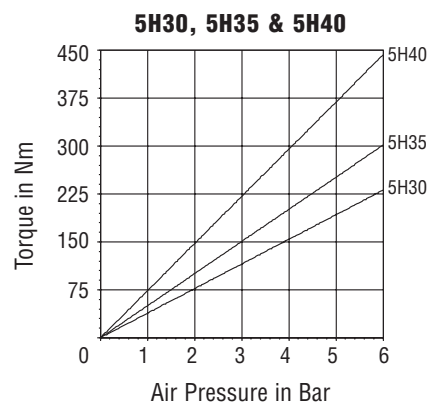
Model	Product Number	Speeds Up to RPM	Bore (mm)	# of Teeth	Shipping Wt. (kg)
5H30	906704	3700	13	91	3,2
5H35	906803	3200	16	106	4,1
5H40	906903	3000	19	122	5
5H45	907003	3000	22	137	7
5H50	907104	3000	25	152	8,1
5H60	907203	2400	32	183	13
5H70	907303	2000	48	214	18

Keys are customer furnished and must be full-length.

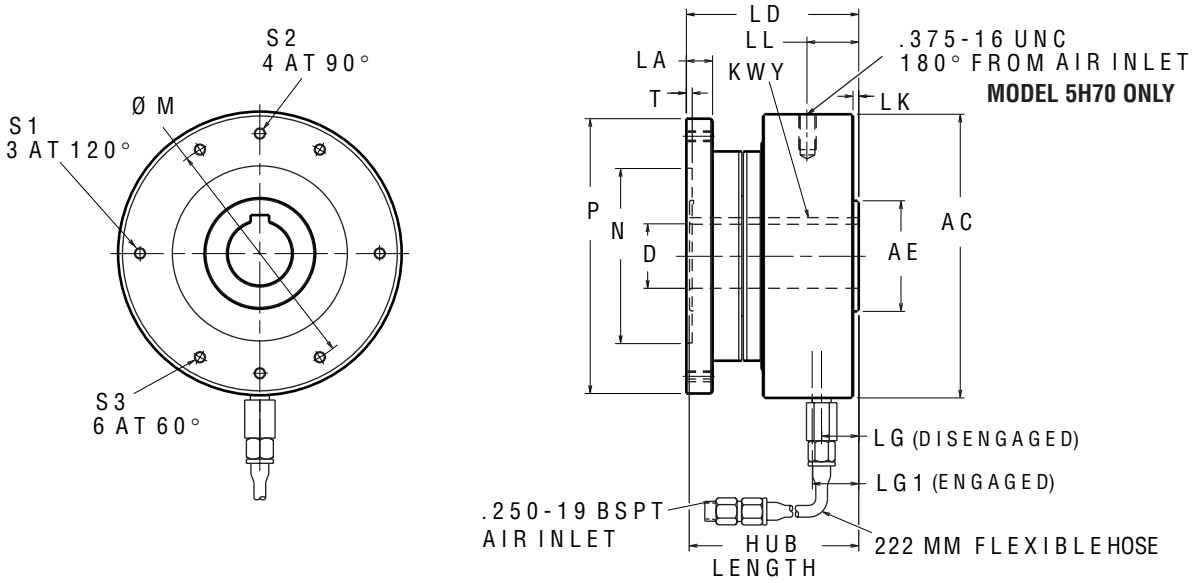
### CAUTION!

Tooth clutches are normally engaged when stationary. They are not intended for use in most cyclic applications or high speed engagement. In certain circumstances, tooth clutches can be engaged at differential speeds. Please consult Nexen if you are considering an application involving engagement at differential speeds.

### ▶ TORQUE VS. AIR PRESSURE



**METRIC 5H SERIES, FLANGE MOUNT CLUTCH - APPROXIMATE DIMENSIONS (MILLIMETERS)**



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	LA	LD	LG	LG1	LK	LL	M	N <sup>H6</sup>	P <sup>h8</sup>	S1	S2	S3	T	HUB LENGTH	$\frac{KWY}{WD \times DP}$
5H30	906703	116	35	20	13	79	17	19	0	--	90	62	111	M6	M6	--	3,4	77	6 x 2,8
5H35	906802	129	45	25	14	83	18	20	1,5	--	110	75	124	M6	M6	--	2,8	81	8 x 3,3
5H40	906902	135	45	30	14	85	17	19	0,3	--	120	75	136	M6	M6	--	3,2	83	8 x 3,3
5H45	907002	154	60	35	14	94	20	22	3,0	--	130	95	149	--	M6	M6	3,2	92	10 x 3,3
5H50	907103	167	65	40	18	96	22	24	5,0	--	140	100	162	--	M8	M8	3,5	94	12 x 3,3
5H60	907202	192	75	45	18	108	26	28	6,0	--	170	115	194	--	M8	M8	4,4	106	14 x 3,8
5H70	907302	211	85	55	21	124	28	30	8,1	28	190	130	213	--	M10	M10	9,4	122	16 x 4,3

NOTE: Drawings are expressed in third angle projection.

## CLUTCHES

“Air Champ”

### METRIC 5HP SERIES, PILOT MOUNT TOOTH CLUTCHES

The Metric 5HP Series provides:

- ▶ Instantaneous Torque up to 3705 Nm
  - ▶ Maximum Operating Speed up to 3700 rpm
  - ▶ **8 Standard Bore** sizes ranging from 20 to 75 millimeters
  - ▶ **8 Minimum Bore** sizes ranging from 13 to 48 millimeters— you machine and assemble
  - ▶ Positive engagement in random positions.
- 8 Models** offer design flexibility:
- ▶ Sealed, radial ball bearings
  - ▶ **Pilot Mount** design with tapped mounting holes
  - ▶ Thru-shaft mounting design uses a full-length keyway
  - ▶ Ability to mount a pulley, sprocket or gear on the clutch
  - ▶ 222 millimeter hose included.

#### CAUTION!

Tooth clutches are normally engaged when stationary. They are not intended for use in most cyclic applications or high speed engagement. In certain circumstances, tooth clutches can be engaged at differential speeds. Please consult Nexen if you are considering an application involving engagement at differential speeds.

### ▶ METRIC 5HP SERIES, PILOT MOUNT TOOTH CLUTCHES—MULTIPOSITION Standard Bore Clutch:

Model	Product Number	Speeds Up to RPM	Bore (mm)	KEYWAY WD x DP	# of Teeth	Shipping Wt. (kg)
5H30-P	909902	3700	20	6 x 2,8	91	3,2
5H35-P	910002	3200	25	8 x 3,3	106	4,5
5H40-P	910102	3000	30	8 x 3,3	122	5,6
5H45-P	910202	3000	35	10 x 3,3	137	7,1
5H50-P	910302	3000	40	12 x 3,3	152	8,8
5H60-P	910402	2400	45	14 x 3,8	183	13,5
5H70-P	910503	2000	55	16 x 4,3	214	21
5H80-P	911702	2000	75	20 x 4,9	244	32

Keys are customer furnished and must be full-length.

### Minimum Bore Clutch:

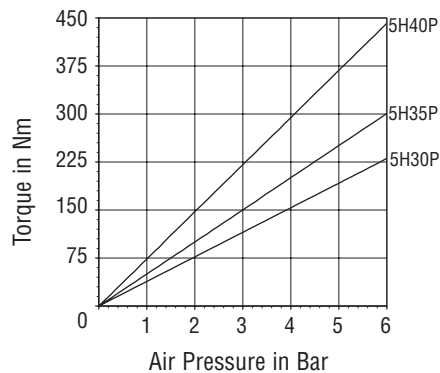
Minimum bore clutches are supplied unassembled with machinable hubs.

Model	Product Number	Speeds Up to RPM	Bore (mm)	# of Teeth	Shipping Wt. (kg)
5H30-P	909903	3700	13	91	3,2
5H35-P	910003	3200	16	106	4,5
5H40-P	910103	3000	19	122	5,6
5H45-P	910203	3000	22	137	7,1
5H50-P	910303	3000	25	152	8,8
5H60-P	910403	2400	32	183	13,5
5H70-P	910504	2000	38	214	21
5H80-P	911703	2000	48	244	32

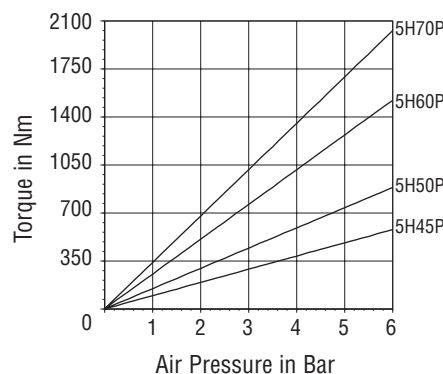
Keys are customer furnished and must be full-length.

### ▶ TORQUE VS. AIR PRESSURE

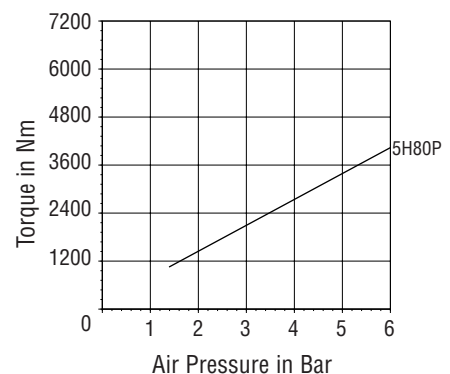
#### 5H30P, 5H35P & 5H40P



#### 5H45P, 5H50P, 5H60P & 5H70P

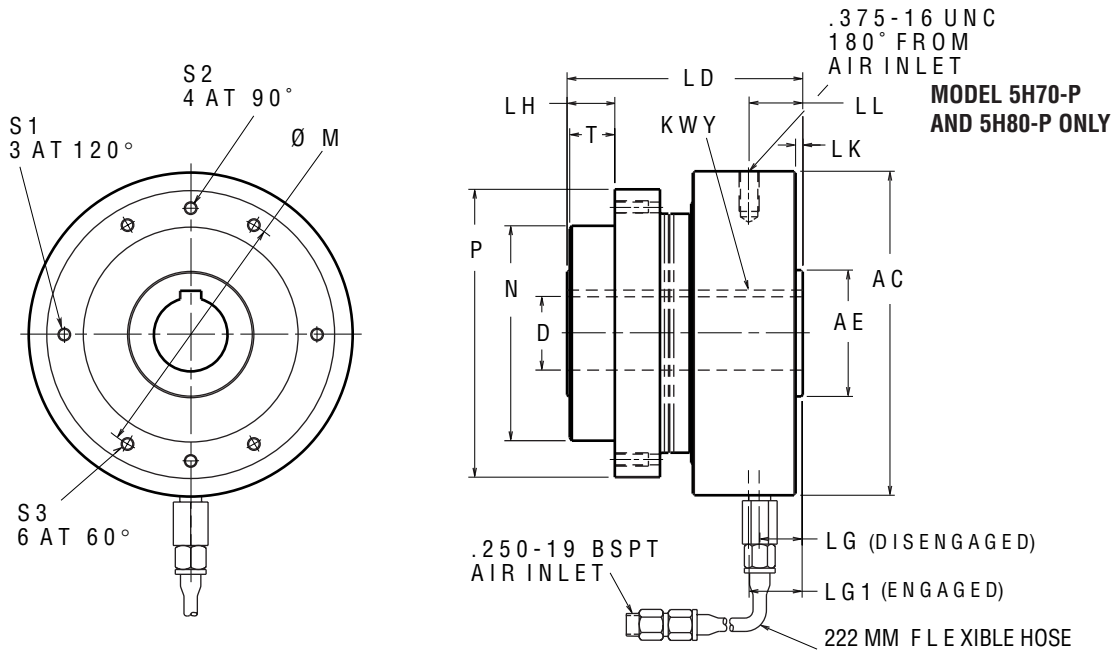


#### 5H80P





**METRIC 5HP PILOT MOUNT CLUTCH - APPROXIMATE DIMENSIONS (MILLIMETERS)**



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	LD	LG	LG1	LH	LK	LL	M	N <sup>h8</sup>	P	S1	S2	S3	T	KWY WD x DP
5H30-P	909902	116	35	20	93	18	20	18	1	--	88	73	98	M6	M6	--	17,5	6 x 2,8
5H35-P	910002	129	45	25	98	18	20	18	1	--	102	88	114	M6	M6	--	17,5	8 x 3,3
5H40-P	910102	135	45	30	101	18	20	19	1	--	108	88	124	M6	M6	--	17,5	8 x 3,3
5H45-P	910202	154	60	35	112	20	22	23	3	--	120	102	137	--	M6	M6	21,4	10 x 3,3
5H50-P	910302	167	65	40	113	21	23	22	4	--	135	112	152	--	M8	M8	19,8	12 x 3,3
5H60-P	910402	192	75	45	129	25	27	24	5	--	155	132	178	--	M8	M8	22,2	14 x 3,8
5H70-P	910503	211	85	55	151	25	27	40	5	30	180	145	210	--	M10	M10	30,2	16 x 4,3
5H80-P	911702	235	95	75	191	38	61	46	8	38	216	187	241	--	--	M12	47,6	20 x 4,9

NOTE: Drawings are expressed in third angle projection.

### METRIC 5HP-E SERIES, ENCLOSED PILOT MOUNT TOOTH CLUTCHES

The Metric 5HP-E Series provides:

- ▶ Nickel plated exterior
- ▶ Instantaneous Torque up to 1300 Nm
- ▶ Maximum Operating Speed up to 1650 rpm
- ▶ **6 Standard Bore** sizes ranging from 20 to 45 millimeters
- ▶ Positive engagement in random positions.
- 6 Models** offer design flexibility:
  - ▶ Sealed, radial ball bearings
  - ▶ Pilot mount design with tapped mounting holes
  - ▶ Thru-shaft mounting design uses a full-length keyway
  - ▶ Ability to mount a pulley, sprocket or gear on the clutch
  - ▶ Operates in wet or dry environments
  - ▶ 222 millimeter hose included.

### ▶ METRIC 5HP-E SERIES, ENCLOSED PILOT MOUNT TOOTH CLUTCHES—MULTIPOSITION

#### Standard Bore Units:

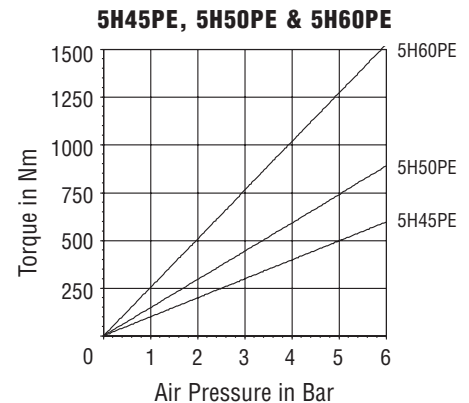
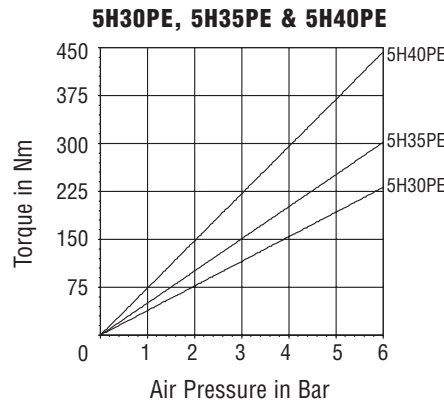
Model	Product Number	Speeds Up to RPM	Bore (mm)	KEYWAY WD x DP	# of Teeth	Shipping Wt. (kg)
5H30P-E	913005	1650	20	6 x 2,8	91	3,3
5H35P-E	913015	1350	25	8 x 3,3	106	4,6
5H40P-E	913025	1350	30	8 x 3,3	122	5,5
5H45P-E	913035	1200	35	10 x 3,3	137	7,4
5H50P-E	913045	1100	40	12 x 3,3	152	9
5H60P-E	913055	1000	45	14 x 3,8	183	13,5

Keys are customer furnished and must be full-length.

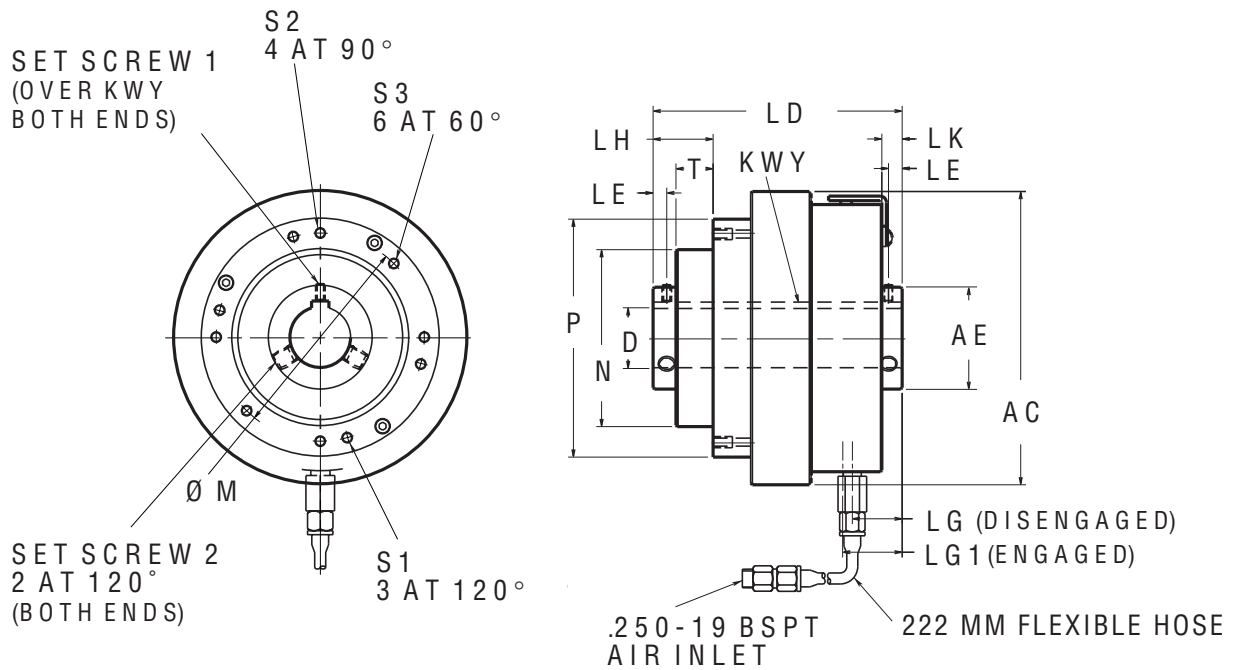
#### CAUTION!

Tooth clutches are normally engaged when stationary. They are not intended for use in most cyclic applications or high speed engagement. In certain circumstances, tooth clutches can be engaged at differential speeds. Please consult Nexen if you are considering an application involving engagement at differential speeds.

#### ▶ TORQUE VS. AIR PRESSURE



**METRIC 5HP-E ENCLOSED PILOT MOUNT CLUTCH - APPROXIMATE DIMENSIONS (MILLIMETERS)**



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	LD	LE	LG	LG1	LH	LK	M	N <sup>h8</sup>	P	S1	S2	S3	T	SET SCREW		K W Y WD x DP
																		1	2	
5H30P-E	913005	128	34	20	123	6	27	29	26	10	88	72	105	M6	M6	--	17,5	M5	M6	6 x 2,8
5H35P-E	913015	156	44	25	129	6	27	29	29	10	102	88	114	M6	M6	--	17,5	M5	M6	8 x 3,3
5H40P-E	913025	156	44	30	126	7	28	30	29	11	108	88	124	M6	M6	--	17,5	M5	M6	8 x 3,3
5H45P-E	913035	169	59	35	144	8	29	31	35	12	120	102	137	--	M6	M6	21,4	M5	M10	10 x 3,3
5H50P-E	913045	195	64	40	152	8	31	34	32	13	135	112	155	--	M8	M8	19,8	M6	M10	12 x 3,3
5H60P-E	913055	214	73	45	163	9	37	39	37	17	155	132	178	--	M8	M8	22,2	M6	M12	14 x 3,8

NOTE: Drawings are expressed in third angle projection.

## CLUTCHES

“Air Champ”

### METRIC 5HP-SP SERIES, PILOT MOUNT TOOTH CLUTCHES

The Metric 5HP-SP Series provides:

- ▶ Instantaneous Torque up to 3705 Nm
- ▶ Maximum Operating Speed up to 3700 rpm
- ▶ **8 Standard Bore** sizes ranging from 20 to 75 millimeters
- ▶ **8 Minimum Bore** sizes ranging from 13 to 48 millimeters—your machine and assemble
- ▶ Positive engagement for accurate positions and perfect registration
- ▶ Accurate timing between two shafts

**8 Models** offer design flexibility:

- ▶ Sealed, radial ball bearings
- ▶ **Pilot Mount** design with tapped mounting holes
- ▶ Thru-shaft mounting design uses a full-length keyway
- ▶ Ability to mount a pulley, sprocket or gear on the clutch
- ▶ 222 millimeter hose included.

#### CAUTION!

Tooth clutches are normally engaged when stationary. They are not intended for use in most cyclic applications or high speed engagement. In certain circumstances, tooth clutches can be engaged at differential speeds. Please consult Nexen if you are considering an application involving engagement at differential speeds.

**NOTE:** Proper Single Position Tooth Clutch engagement depends upon 1) the allowable engagement speed with specific inertia loads and air pressure, and 2) the acceptable speed and air pressure which allow the clutch to engage in one position.

### ▶ METRIC 5HP-SP SERIES, PILOT MOUNT TOOTH CLUTCHES - SINGLE POSITION Standard Bore Clutch:

Model	Product Number	Speeds Up to RPM	Bore (mm)	KEYWAY WD x DP	# of Teeth	Shipping Wt. (kg)
5H30P-SP	912102	3700	20	6 x 2,8	91	3,2
5H35P-SP	912202	3200	25	8 x 3,3	106	4,5
5H40P-SP	912302	3000	30	8 x 3,3	122	5,6
5H45P-SP	912402	3000	35	10 x 3,3	137	7,1
5H50P-SP	912502	3000	40	12 x 3,3	152	9
5H60P-SP	912703	2400	45	14 x 3,8	183	13,5
5H70P-SP	912802	2000	55	16 x 4,3	214	21
5H80P-SP	912902	2000	75	20 x 4,9	244	32

Keys are customer furnished and must be full-length.

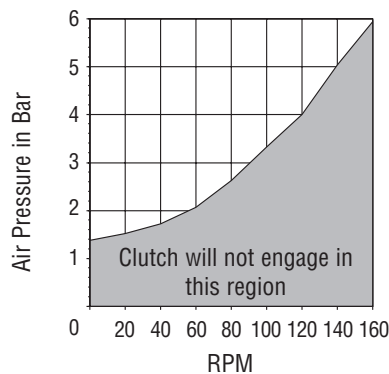
#### Minimum Bore Clutch:

Minimum bore clutches are supplied unassembled with machinable hubs.

Model	Product Number	Speeds Up to RPM	Bore (mm)	# of Teeth	Shipping Wt. (kg)
5H30P-SP	912103	3700	13	91	3,2
5H35P-SP	912203	3200	16	106	4,5
5H40P-SP	912303	3000	19	122	5,6
5H45P-SP	912403	3000	22	137	7,1
5H50P-SP	912503	3000	25	152	9
5H60P-SP	912704	2400	32	183	13,5
5H70P-SP	912803	2000	38	214	21
5H80P-SP	912903	2000	48	244	32

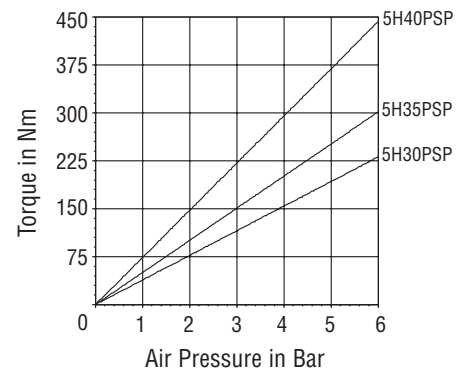
Keys are customer furnished and must be full-length.

### ▶ MIN. STATIC AIR PRESSURE FOR ENGAGEMENT Vs. RPM



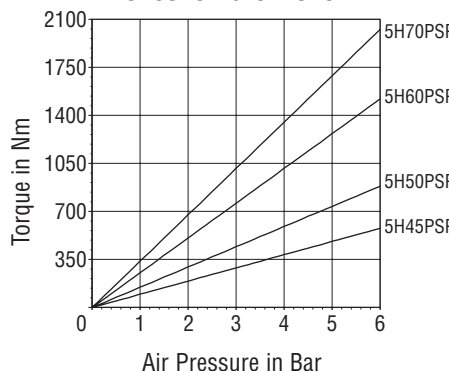
### ▶ TORQUE Vs. AIR PRESSURE

#### 5H30PSP, 5H35PSP & 5H40PSP

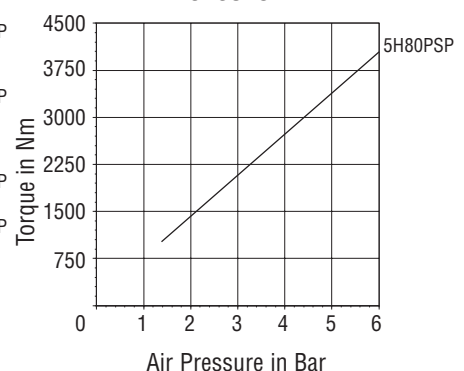


### ▶ TORQUE Vs. AIR PRESSURE

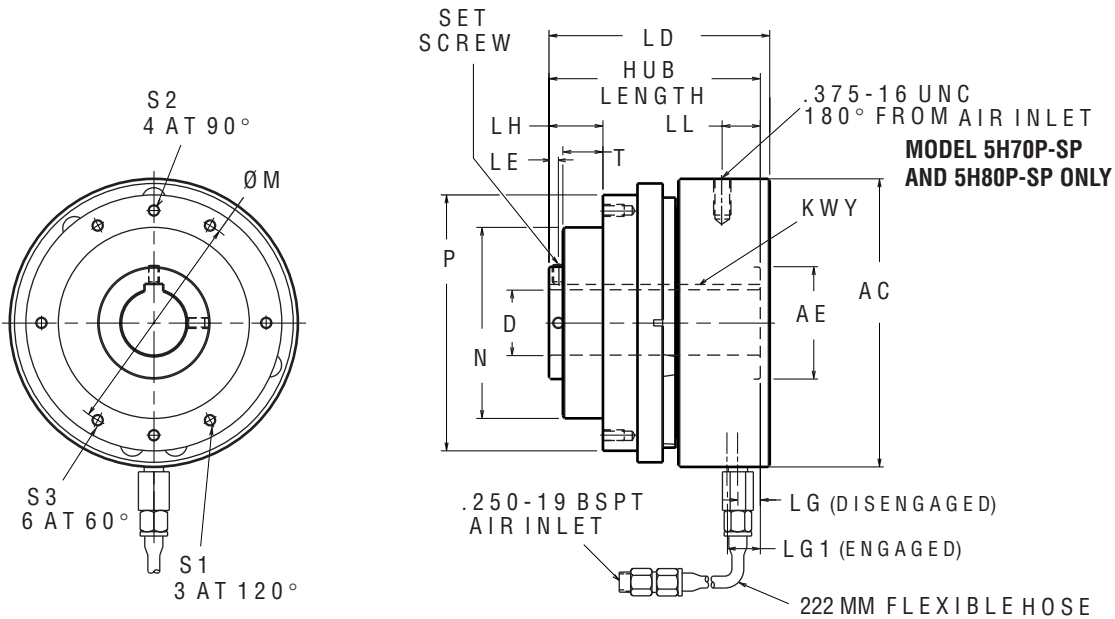
#### 5H45PSP, 5H50PSP, 5H60PSP & 5H70PSP



#### 5H80PSP



**METRIC 5HP-SP PILOT MOUNT CLUTCH - APPROXIMATE DIMENSIONS (MILLIMETERS)**



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	LD	LE	LG	LG1	LH	LL	M	N <sup>H8</sup>	P	S1	S2	S3	T	HUB LENGTH	KWY WD x DP
5H30P-SP	912102	116	35	20	102	5	14	20	23	--	88	72	98	M6	M6	--	17,5	99	6 x 2,8
5H35P-SP	912202	129	45	25	107	5	14	20	25	--	102	88	114	M6	M6	--	17,5	105	8 x 3,3
5H40P-SP	912302	135	45	30	110	5	14	20	25	--	108	88	124	M6	M6	--	17,5	107	8 x 3,3
5H45P-SP	912402	154	60	35	118	5	17	22	29	--	120	102	137	--	M6	M6	21,4	118	10 x 3,3
5H50P-SP	912502	167	65	40	121	6	17	22	29	--	135	112	152	--	M8	M8	19,8	121	12 x 3,3
5H60P-SP	912703	192	75	45	136	7,5	21	27	32	--	155	132	178	--	M8	M8	22,2	137	14 x 3,8
5H70P-SP	912802	211	85	55	149	10	22	28	36	30	180	145	210	--	--	M10	25,4	151	16 x 4,3
5H80P-SP	912902	235	95	75	219	16	55	61	73	55	216	187	241	--	--	M12	47,6	219	20 x 4,9

MODEL	SET SCREW
5H30P-SP	M6, 2 @ 90°
5H35P-SP	M6, 2 @ 90°
5H40P-SP	M6, 2 @ 90°
5H45P-SP	M6, 2 @ 90°
5H50P-SP	M8, 2 @ 90°
5H60P-SP	M10, 2 @ 90°
5H70P-2P	M12, 2 @ 90°
5H80P-SP	M20, 3 @ 120°

NOTE: Drawings are expressed in third angle projection.

### METRIC 5HP-SP-E SERIES, ENCLOSED PILOT MOUNT TOOTH CLUTCHES

The Metric 5HP-SP-E Series provides:

- ▶ Nickel-plated exterior
- ▶ Instantaneous Torque up to 1,300 Nm
- ▶ Maximum Operating Speed up to 1650 rpm
- ▶ **6 Standard Bore** sizes ranging from 20 to 45 millimeters
- ▶ Positive engagement for accurate position and registration
- ▶ Accurate timing between two shafts.

**6 Models** offer design flexibility:

- ▶ Sealed, radial ball bearings
- ▶ Pilot mount design with tapped mounting holes
- ▶ Thru-shaft mounting design uses a full-length keyway
- ▶ Ability to mount a pulley, sprocket or gear on the clutch
- ▶ 222 millimeter hose included.

### ▶ METRIC 5HP-SP-E SERIES, ENCLOSED PILOT MOUNT TOOTH CLUTCHES— SINGLE POSITION

Standard Bore Units:

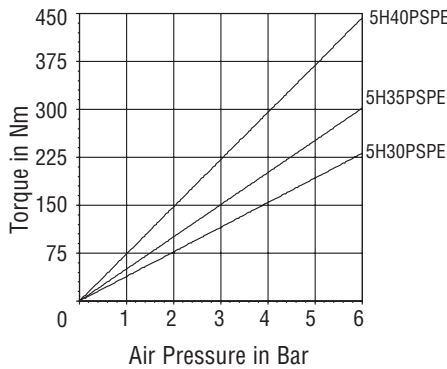
Model	Product Number	Speeds Up to RPM	Bore (mm)	KEYWAY WD x DP	# of Teeth	Shipping Wt. (kg)
5H30P-SP-E	913004	1650	20	6 x 2,8	91	3,3
5H35P-SP-E	913014	1350	25	8 x 3,3	106	4,7
5H40P-SP-E	913024	1350	30	8 x 3,3	122	5,4
5H45P-SP-E	913034	1200	35	10 x 3,3	137	7,4
5H50P-SP-E	913044	1100	40	12 x 3,3	152	9
5H60P-SP-E	913054	1000	45	14 x 3,8	183	13,5

Keys are customer furnished and must be full-length.

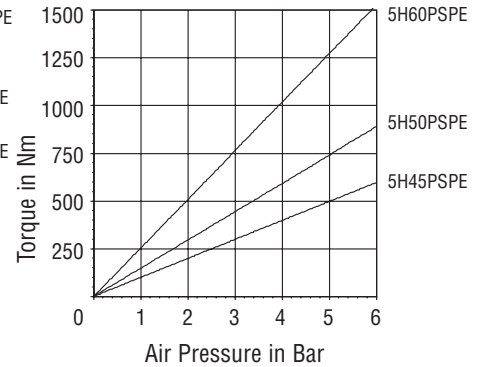
**CAUTION!** Tooth clutches are normally engaged when stationary. They are not intended for use in most cyclic applications or high speed engagement. In certain circumstances, tooth clutches can be engaged at differential speeds. Please consult Nexen if you are considering an application involving engagement at differential speeds.

### ▶ TORQUE VS. AIR PRESSURE

5H30PSPE, 5H35PSPE & 5H40PSPE



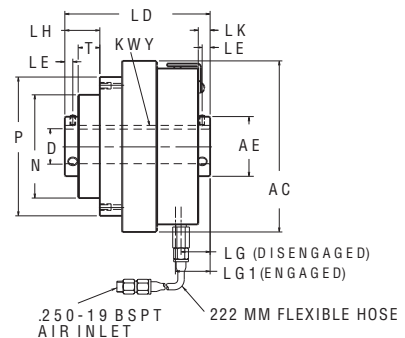
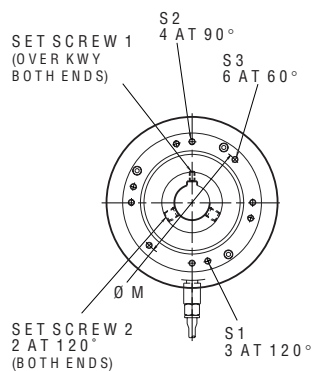
5H45PSPE, 5H50PSPE & 5H60PSPE



Torque (In. Lbs.) = Nm x 8.849, PSI = Bar ÷ .0689

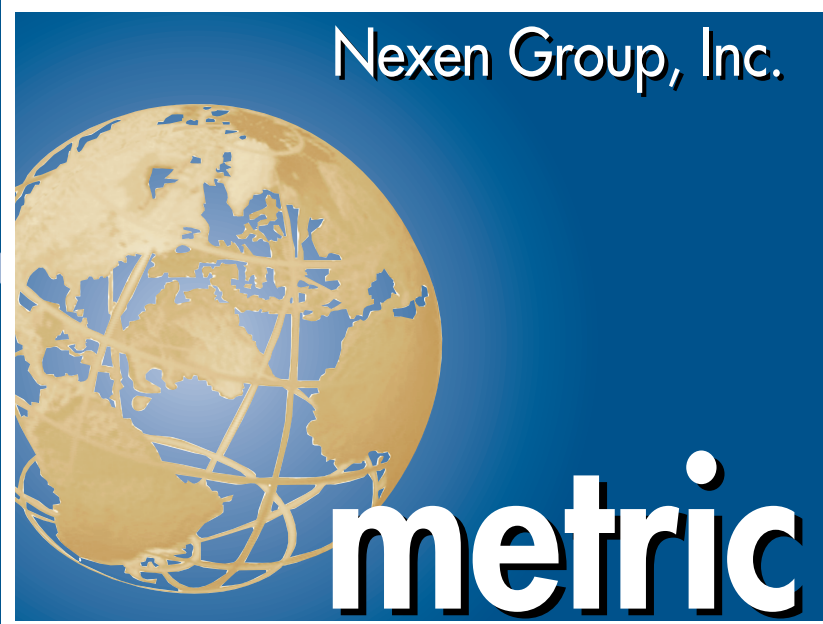
### ▶ MIN. STATIC AIR PRESSURE FOR ENGAGEMENT VS. RPM, SEE PAGE 20

### ▶ APPROXIMATE DIMENSIONS (MILLIMETERS)



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	LD	LE	LG	LG1	LH	LK	M	N <sup>h8</sup>	P	S1	S2	S3	T	SET SCREW 1	SET SCREW 2	KWY WD x DP
5H30P-SP-E	913004	128	34	20	123	6	27	32	26	10	88	72	105	M6	M6	--	17,5	M5	M6	6 x 2,8
5H35P-SP-E	913014	156	44	25	129	6	27	32	29	10	102	88	114	M6	M6	--	17,5	M5	M6	8 x 3,3
5H40P-SP-E	913024	156	44	30	126	7	28	34	29	11	108	88	124	M6	M6	--	17,5	M5	M6	8 x 3,3
5H45P-SP-E	913034	169	59	35	144	8	29	34	35	12	120	102	137	--	M6	M6	21,4	M5	M10	10 x 3,3
5H50P-SP-E	913044	195	64	40	152	8	31	38	32	13	135	112	155	--	M8	M8	19,8	M6	M10	12 x 3,3
5H60P-SP-E	913054	214	73	45	163	9	37	43	37	17	155	132	178	--	M8	M8	22,2	M6	M12	14 x 3,8

NOTE: Drawings are expressed in third angle projection.



## OVERLOAD PROTECTION DEVICES

**This Section Contains:**      **Page**

**TORQUE LIMITERS**

Features, Benefits & Functions .....24  
Control Systems, SmartValve .....25

**METRIC TORQUE LIMITERS**

TL-A & TL-AE Set Screw Mounts .....26-27



**TORQUE LIMITERS**

Nexen's line of **Torque Limiters** is designed to protect your equipment by immediately disengaging the drive shaft when excessive torque occurs:

- ▶ Single position, ball detent design assures re-engagement of the drive from a complete stop in the same position every time, providing exact timing of both components

Nexen's **Air Pressure Circuits** complete the package for total overall protection:

- ▶ **Single Air Pressure** circuit allows for remote adjustment of the torque setting
- ▶ **Dual Air Pressure** circuit permits remote adjustment of torque while allowing a higher pressure for startup (high inertia loads) and a lower pressure for running torque requirements

When used with Torque Limiters, Nexen **Single or Double Flexible Couplings** allow:

- ▶ High shaft misalignment
- ▶ Zero backlash
- ▶ Excellent torsional stiffness

▶ **HOW A TORQUE LIMITER SYSTEM WORKS:**

1. Install Torque Limiter, Limit Switch and the Air Pressure Control System;
2. Set the air pressure for the desired overload torque;
3. If an overload occurs, the Torque Limiter interface separates, moving the cylinder to the disengaged position;
4. The Limit Switch detects the cylinder movement and interrupts electrical power. Interruption of electrical power de-energizes the 3-way N.C. solenoid valve, which exhausts air pressure from the Torque Limiter, causing it to disengage.
5. When the machinery comes to a **complete stop**, re-engage the Torque Limiter by jogging the drive, thus allowing machine operation to continue.

The following pages detail your Torque Limiter System options. You'll find information on Air Pressure Control Systems, Torque Limiter designs and Flexible Couplings. Once you have determined your total system requirements, order each item separately.

▶ **AIR PRESSURE CONTROL SYSTEMS:**

Choose from 2 Air Pressure Control Systems—Single or Dual:

The **Single Air Pressure System** provides basic protection:

- ▶ A constant bleed type Air Regulator is set to an air pressure that will allow the machine to operate, but low enough for Torque Limiter disengagement in the event of machine overload
- ▶ The Air Regulator also provides a constant bleed to eliminate back pressure in the air line while precisely maintaining pressure within 0.003 BAR
- ▶ Torque setting can be changed while the machine is running via the Air Regulator.

The **Dual Air Pressure System** provides ultimate protection, allowing higher startup pressure (high inertia load) and lower pressure for running with overload protection:

- ▶ Regulator #1 is set to an air pressure high enough to allow machine startup
- ▶ After a pre-set period of time, the Time Delay Control de-energizes the 3-way inline mount solenoid valve, allowing only the lower running air pressure to operate the Torque Limiter
- ▶ Regulator #2 is set to an air pressure that will allow the machine to operate, but low enough for Torque Limiter disengagement in the event of a machine overload
- ▶ Regulator #2 also provides a constant bleed to eliminate back pressure in the air line during overload

▶ **SMARTVALVE CONTROLLER**

The **Nexen SmartValve Controller** is a microprocessor based pressure controller that is ideally suited for use with Nexen torque limiters, brakes and clutches. The SmartValve replaces much of the valves, regulators, air lines and plumbing needed to provide multiple pressures to Nexen's pneumatic products.

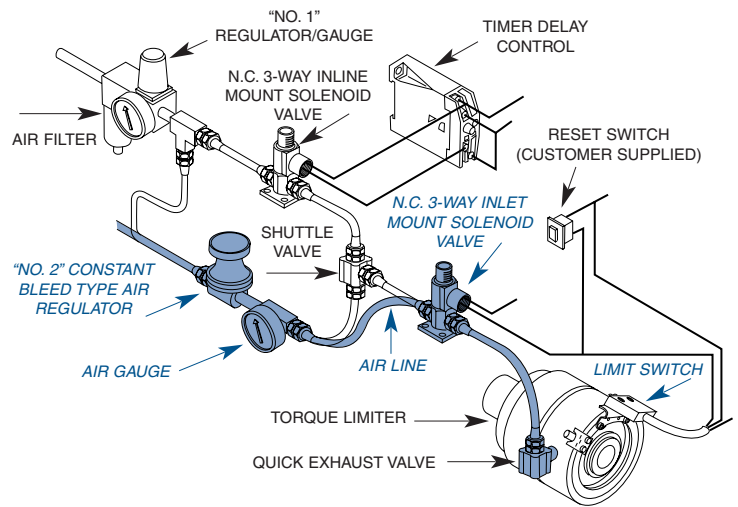
- ▶ The SmartValve accepts pressure set points in two ways: analog and digital. A 0-10 V signal caused the SmartValve to output a proportional 0-5,5 BAR
- ▶ Four digital inputs allow the SmartValve to output 16 different pressures that correspond to one of the standard or custom pressure tables stored onboard.
- ▶ Another input is used to sense a switch closure that signals the SmartValve to exhaust the air pressure, such as in the case of a torque limiter overload.
- ▶ A solid state relay output provides alarm indication during overload situations.



## ▶ AIR PRESSURE CONTROL SYSTEMS

Control Systems Style	Product Number
Dual System Consists of:	801579 (1) Air Regulator Air Gauge - Constant Bleed Type, 0-7 BAR, 125 NPT (2) Quick Exhaust Valve (2) Tee Fittings, .125 NPTF (1) Air Filter, regular duty, .250 NPT (1) Air Regulator/Gauge, 0-9 BAR, 250 NPT (2) 3-Way Inline Mount Solenoid Valve, N.C. (1) Adjustable Time Delay Control
Single System Consists of:	801578 (1) Air Regulator Air Gauge - Constant Bleed Type, 0-7 BAR, 125 NPT (1) 3-Way Inline Mount Solenoid Valve N.C. (1) Quick Exhaust Valve (1) Tee Fitting, .125 NPTF

## ▶ RECOMMENDED AIR LINE CONNECTIONS



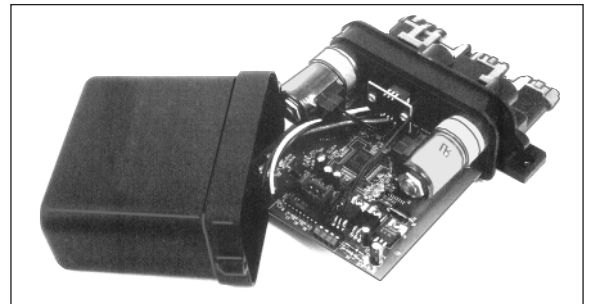
NOTE: Italicized blue type and arrows indicate “single air pressure system” installation only. “Dual air pressure system” requires all components.

## ▶ SMARTVALVE CONTROLLER

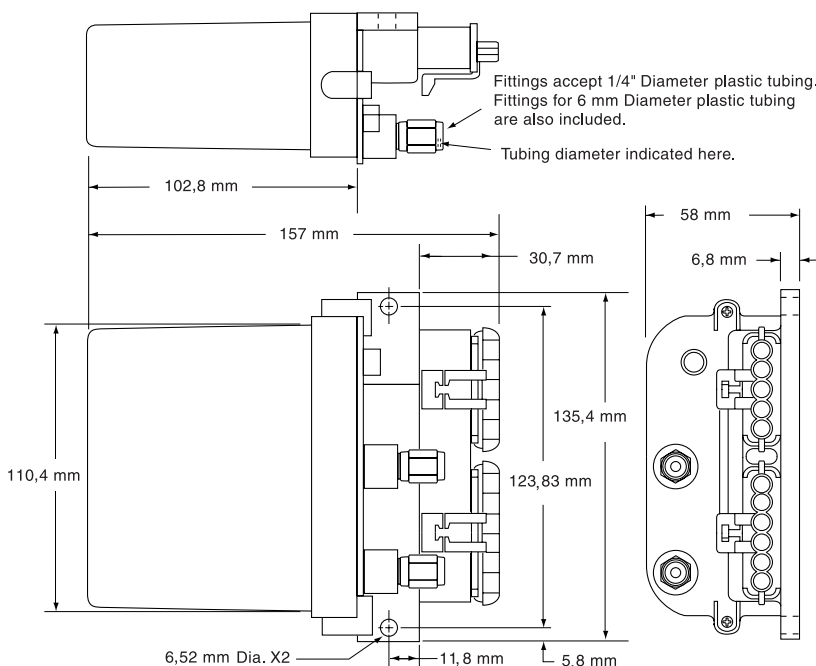
Control Systems Style	Product Number
SmartValve Controller	964508
115/230 VAC Power Supply	964509

Specifications:

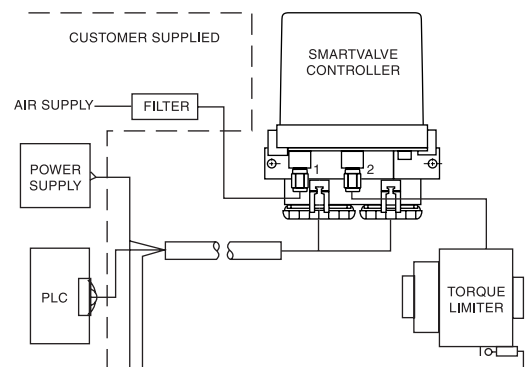
- DC Power, 24 VDC @ 500mA
- (Optional 24VDC CE, UL, CSA approved 115/230 VAC power supply available)
- Input Pressure Range, 6–10 bar
- Output Pressure Range, 0–5.5 bar
- Accuracy, .25% full scale @ 25°C
- Cable, 2m cable included



## ▶ APPROXIMATE DIMENSIONS



## ▶ CIRCUIT DIAGRAM



## ▶ TORQUE LIMITERS

“Air Champ”

### METRIC TL-A AND TL-AE SERIES TORQUE LIMITERS, SET SCREW MOUNTED

Metric TL-A and TL-AE Series Torque Limiters provide:

- ▶ **12 STD Models** to choose from
- ▶ Torque up to 1350 Nm
- ▶ Operating Speed up to 2000 rpm
- ▶ Standard bore sizes ranging from 15 to 75 millimeters
- ▶ Minimum bore sizes ranging from 12,7 to 45 millimeters—you assemble and machine
- ▶ Limit Switch Assembly with 0,91 meters long cord and hardware included on all models

### ▶ TL-AE METRIC SERIES TORQUE LIMITERS, SET SCREW MOUNT

Model	Product Number	Speeds Up to RPM	Torque Up to (Nm)	Bore (mm)	Shipping Wt. (kg)
TL20-AE	802904	1800	100	20	3,2
TL30-AE	802914	1650	260	25	4,5
TL40-AE	802924	1350	500	35	7,1
TL50-AE	802934	1200	750	40	9
TL60-AE	802944	1050	1300	45	13,5

Minimum Shaft insertion halfway through Hub. Keys are customer furnished.

Operating Speed: Disengaging speeds are limited to the maximum allowable speed rating of the rotary seal between the drive flange and drive ring. Torque Limiters are engaged when stationary.

**NOTE:** For higher speeds-consult Nexen.

### ▶ TL-A TORQUE LIMITERS ARE NOT TOTALLY ENCLOSED

Model	Product Number	Speeds Up to RPM	Torque Up to (Nm)	Bore (mm)	Key Size (WD X DP)	Shipping Wt. (kg)
TL10-A	951302	2000	21	15	5 X 2,3	2,3
TL15-A	951312	2000	41	15	5 X 2,3	2,3
TL20-A	951202	1800	100	20	6 X 2,8	3,2
TL30-A	951212	1650	260	25	8 X 3,3	4,5
TL40-A	951222	1350	500	35	10 X 3,3	7,1
TL50-A	951232	1200	750	40	12 X 3,3	9
TL60-A	951242	1050	1300	45	14 X 3,8	13,5

Minimum Shaft insertion halfway through Hub. Keys are customer furnished.

Operating Speed: Disengaging speeds are limited to the maximum allowable speed rating of the rotary seal between the drive flange and drive ring. Torque Limiters are engaged when stationary.

**NOTE:** For higher speeds-consult Nexen.

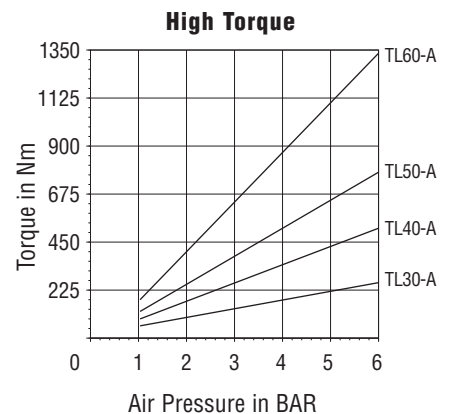
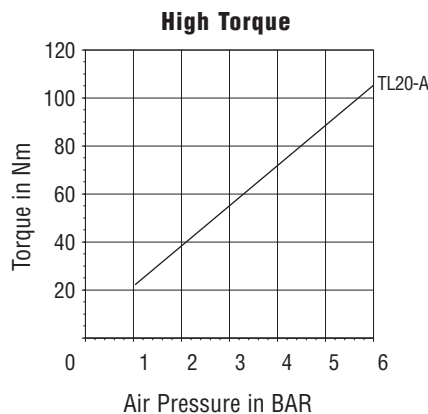
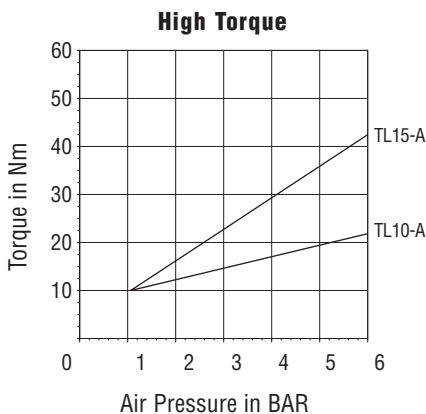
Minimum bore models are supplied unassembled with machinable hubs.

### ▶ ATTACHMENT OPTIONS

#### Pulleys, Sprockets, Gears

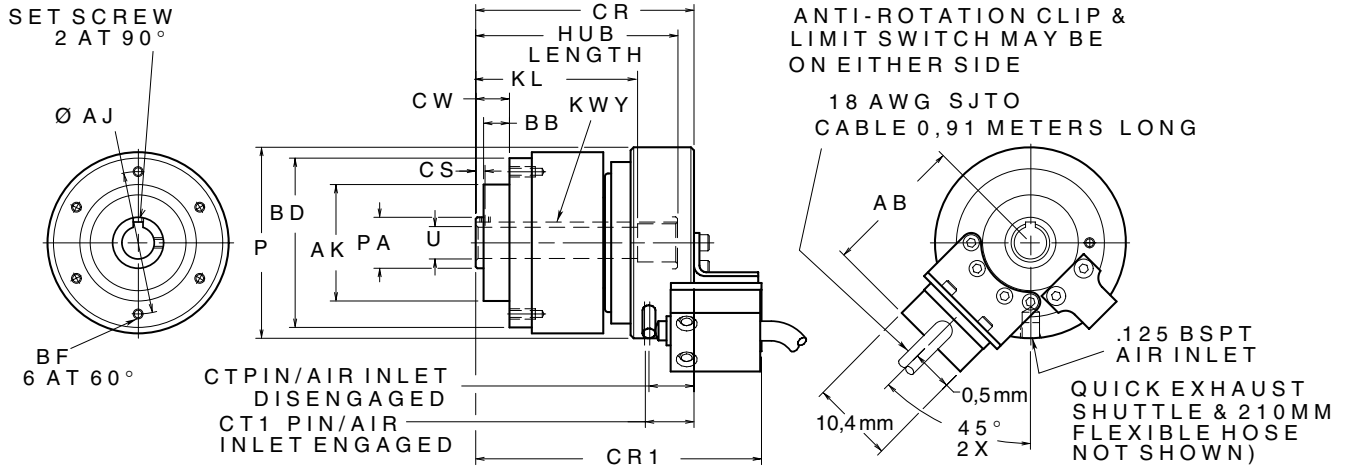
These can be attached to the clutch for offset shaft applications. Tapped holes are provided for ease of mounting. Nexen does not furnish these items. For minimum sprocket requirements, see page 93.

### ▶ TORQUE VS. AIR PRESSURE



**TL-A METRIC SERIES TORQUE LIMITERS, SET SCREW MOUNTED - APPROXIMATE DIMENSIONS (MILLIMETERS)**

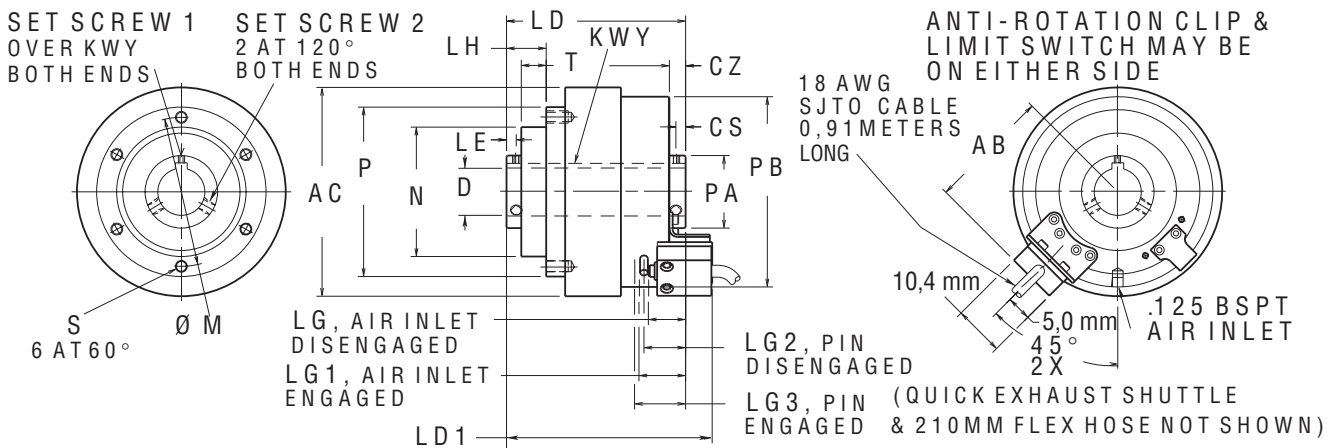
**TL10-A, TL15-A, TL20-A, TL 30-A, TL 40-A, TL 50-A & TL 60-A**



MODEL	PRODUCT NUMBER	AB	AJ	AK <sup>h8</sup>	BB	BD	BF	CR	CR1	CS	CT	CT1	CW	KL	KEYWAY		P	PA	U <sup>h7</sup>	HUB LENGTH	SET SCREW
															WD	DP					
TL10-A	951302	69	70	57	13	83	M6	107	140	5	22	24	17	80	5	2,3	94	25	15	100	M5
TL15-A	951312	69	70	57	13	83	M6	107	140	5	22	24	17	80	5	2,3	94	25	15	100	M5
TL 20-A	951202	79	90	72	18	104	M8	124	158	6	28	34	26	80	6	2,8	116	35	20	134	M6
TL 30-A	951212	87	103	88	19	114	M8	125	160	7	29	35	29	80	8	3,3	129	45	25	136	M6
TL 40-A	951222	99	122	104	24	137	M10	145	180	8	28	34	36	80	10	3,3	154	60	35	155	M10
TL 50-A	951232	106	136	114	21	156	M12	149	184	8	29	35	33	80	12	3,3	167	65	40	164	M10
TL 60-A	951242	119	160	133	22	174	M12	160	190	10	35	41	37	80	14	3,8	192	75	45	175	M12

NOTE: Drawings are expressed in third angle projection.

**TL20-AE, TL30-AE, TL40-AE, TL50-AE & TL60-AE**

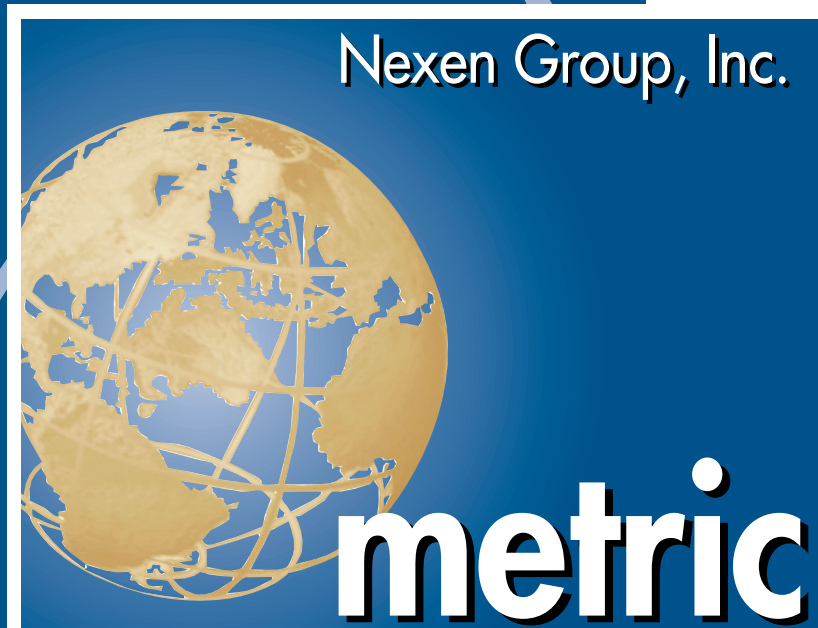


MODEL	PRODUCT NUMBER	AC	AD	AE	D <sup>h7</sup>	LK	LD	LD1	LE	LG	LG1	LH	M	N <sup>h8</sup>	KEYWAY		P	S	T	SET SCREW 1	SET SCREW 2
															WD	DP					
TL20-AE	802904	128	79	34	20	10	123	148	6	27	31	26	90	72	6	2,8	105	M8	18	M5	M6
TL30-AE	802914	156	81	44	25	10	129	154	6	27	32	29	103	88	8	3,3	114	M8	19	M5	M6
TL40-AE	802924	169	99	59	35	13	145	167	8	30	35	32	122	104	10	3,3	137	M10	20	M5	M10
TL50-AE	802934	194	106	64	40	13	152	173	8	31	35	35	136	114	12	3,3	155	M12	22	M6	M10
TL60-AE	802944	214	119	73	45	17	163	176	9	37	42	36	160	133	14	3,8	178	M12	20	M6	M12

NOTE: Drawings are expressed in third angle projection.

**PRODUCT FUNCTION/SELECTION CHART**

Product Groups	Friction Brakes	Spring Engaged Brakes
<b>General Features</b>		
Number of Model Options	4 Metric	4 Metric
<b>Functions</b>		
Controlled Deceleration	Yes	
Cycling/Indexing	Yes	
Tension Control	Yes	
Stopping/Holding	Yes	Yes



## BRAKES

**This Section Contains:** **Page**

**BRAKES**

Function/Selection Chart .....28

**CALIPER BRAKES**

Single Puck Drag Brakes .....30-31

DB Model Disc Caliper .....32-33

BC Model Air Actuated Caliper .....34-35

BC Model Spring Actuated Caliper .....36-37

BD Model Air Actuated Caliper .....38-39

BD Model Spring Actuated Caliper .....40-41

SPC Air Actuated Single Post Caliper...42-43

SPC Spring Actuated Post Caliper.....44-45

Caliper Brake Discs & QD Bushings.....46-47

**METRIC BRAKES**

Straight Bore, S-450, S-600, and  
S-800 & S-1000 .....48-49

Spring Engaged St. Bore,  
SSE-450 & SSE-600.....50-51

Spring Engaged St. Bore,  
SSE-800 & SSE-1000.....52-53

## BRAKES

“Air Champ”

### SINGLE PUCK BRAKES

These light duty drag brakes are perfect for custom applications where space is limited and which do not require a full caliper:

#### Models 625 & 1000

- ▶ **2 Piston** sizes
- ▶ “O” ring sealed, simple design for light duty tension control applications
- TC Models**
- ▶ **3 coefficients** of friction facings
- ▶ Diaphragm actuated, spring returned brake for tension control or low cyclic duty applications

### ▶ SINGLE PUCK BRAKES

Model	Product Number	Torque Factor (f) 6 bar	Shipping WT. (Kg)
625 Brake*	837100	0,03	0,12
1000 Brake	837000	0,08	0,22
TC-L (LOCO)	835131	0,18	0,87
TC-S (Standard)	835132	0,31	0,87
TC-H (HICO)	835133	0,40	0,87

\*625 Air Hose must be ordered separately; Product Number 857000

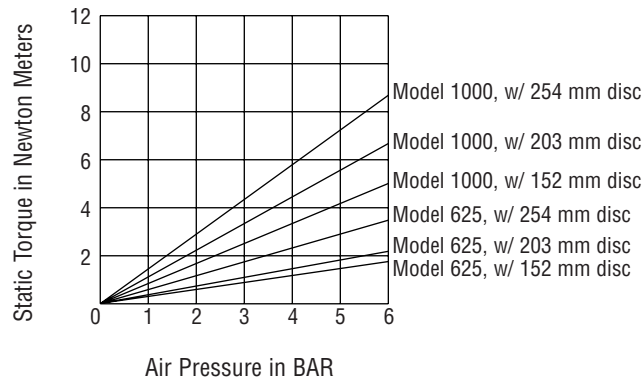
### ▶ DISC DIAMETER/WORKING RADIUS

Calculated Torque (T) = fR (Working Radius)

	152	203	254	305	356	406
Disc Diameter (mm)	152	203	254	305	356	406
Working Radius (mm)	64	89	102	114	140	165

Note: > 0.5 Round up, < 0.5 Round down.

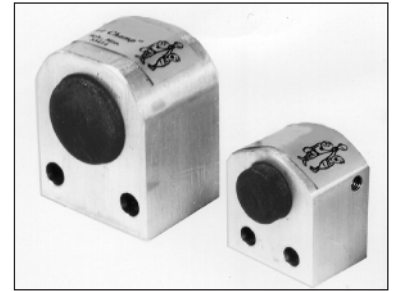
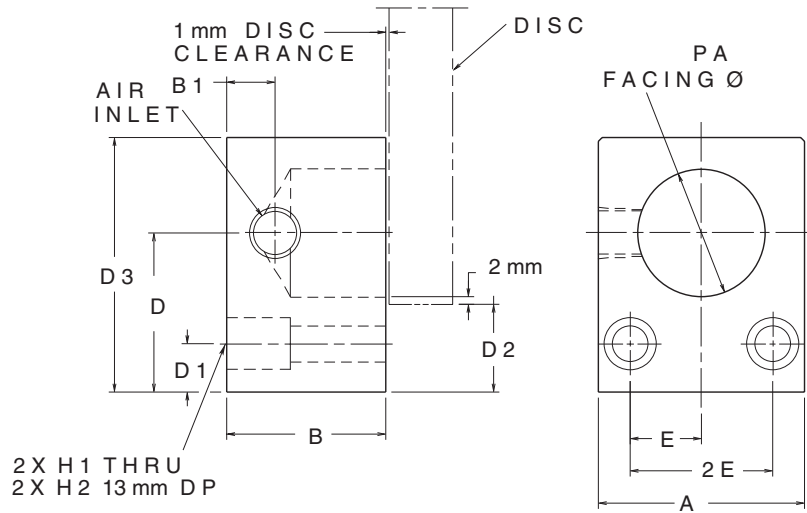
### ▶ TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

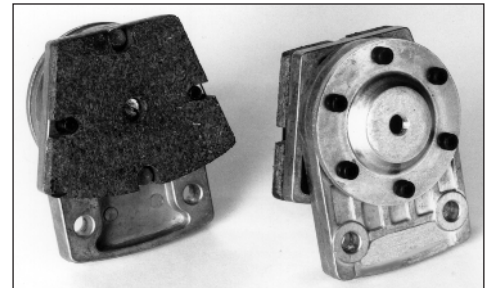
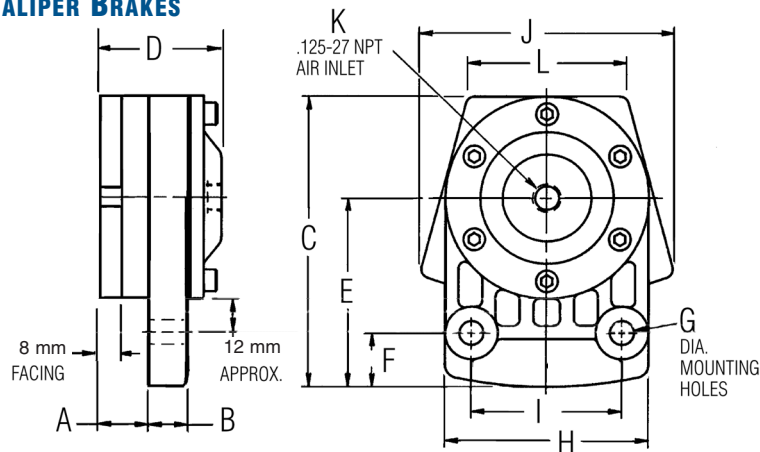
## SINGLE PUCK BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ SINGLE PUCK CALIPER BRAKES



MODEL	PRODUCT NUMBER	A	B	B1	D	D1	D2	D3	E	2E	H1	H2	PA	AIR INLET
625	837100	32	25	6	25	8	16	38	8	16	6	9	16	.190-32 UNC
1000	837000	41	32	10	32	10	18	51	14	28	7	10	25	.125-27 NPT

### ▶ TC CALIPER BRAKES



PRODUCT NUMBER	A	B	C	D	E	F	G	H	I	J	K	L
835131	14	18	105	43	49	20	9	73	54	92	.125-27 NPT	57
835132	14	18	105	43	49	20	9	73	54	92	.125-27 NPT	57
835133	14	18	105	43	49	20	9	73	54	92	.125-27 NPT	57

## BRAKES

### “Air Champ”

#### DB MODEL DISC CALIPER BRAKES

The design of this brake offers many features not found in other brakes of this type:

- ▶ Static Torque capacity up to 102 Nm @ 6 bar w/406 Disk
- ▶ Brake Torque may be doubled or tripled by adding brake calipers
- ▶ Air Actuated
- ▶ Arc contoured shoe provides large friction area, for greater facing life and stability
- ▶ Easily mounted in any position with T Bracket
- ▶ Disc Speeds up to 4500 rpm
- ▶ Disc Hubs use **QD Bushing** “SK” for shaft sizes up to 55 millimeters.
- ▶ Spring return eliminates disc drag when disengaged
- ▶ Optional Air Hose Assembly comes with required fittings and hose for both air inlets

The Disc, Hub and Air Hose must be ordered separately. QD Bushing is customer furnished. Optional disc available from 254 to 406 mm diameter.

#### ▶ DB MODEL, DISC CALIPER BRAKES

Component	Product Number	MAX Bore (mm)	Torque Factor (f)	Shipping Wt. (Kg)
Brake w/ T Bracket	835000	63,5	0,55	3,6
Brake w/o T Bracket	835071	63,5	0,55	3,6
Air Hose Assembly	835400	—	—	0,4

Air Hose must be ordered separately.  
Calculated torque (T) = fR (Working Radius)

#### ▶ DISC & HUB OPTIONS

The matching Hub is listed below each Disc.

Component	Product Number	Speed Up to (RPM)	Inertia Value (kg.m <sup>2</sup> )	*Thermal Dissipation (kw)	Shipping Wt. (Kg)	Working Radius (mm)
Disc, 254 mm	855500	4500	0,015	0,37	1,4	108
Hub, 254 mm	856100		0,005		1,8	108
Disc, 305 mm	855600	3800	0,031	0,52	2,3	133
Hub, 305 mm	856200		0,008		2,3	133
Disc, 356 mm	855700	3200	0,057	0,82	3,2	159
Hub, 356 mm	856200		0,008		2,3	159
Disc, 406 mm	855800	2800	0,095	1,62	4,1	184
Hub, 406 mm	856300		0,027		4,5	184

Discs and Hubs must be ordered separately.

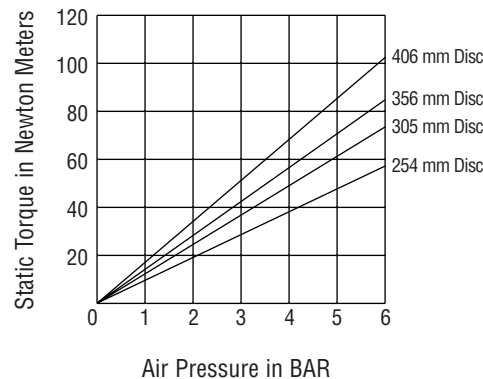
\* Continuous thermal dissipation at 450 RPM and ambient temperature 27°C. Minimize operation above 232°C for maximum friction facing wear life.

#### ▶ QD MOUNTING BUSHINGS

Quick Detachable “QD” Bushings are customer furnished. Bushings fit into the bore of the disc, changing the bore to the size indicated.

Caution: QD Bushings must be capable of carrying the torque produced by the brake. Check with the QD Bushing manufacturer for bushing for torque ratings.

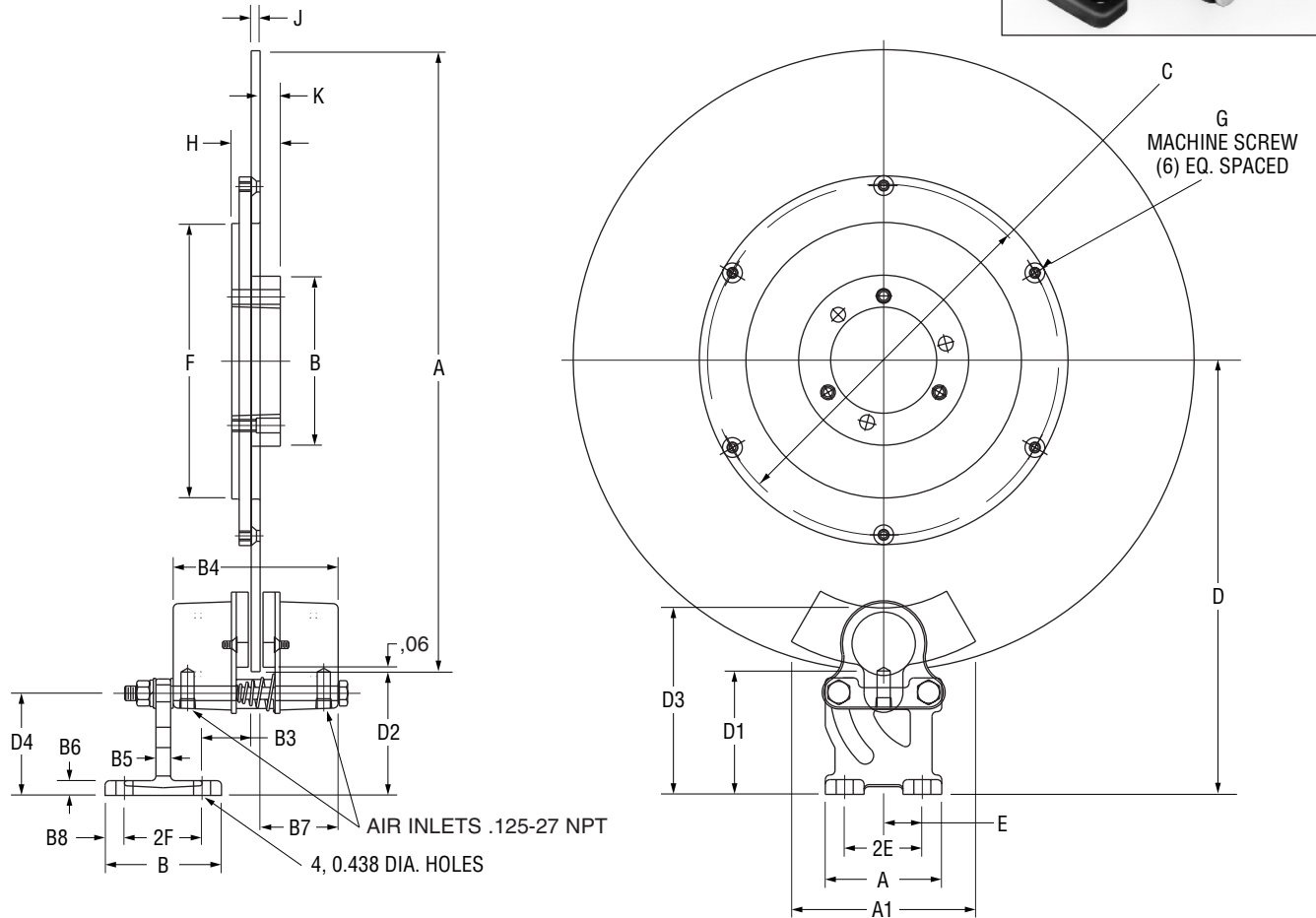
#### ▶ TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.



## ▶ DB MODEL DISC CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)



DISC (mm)	A	B	C	D	F	G (Inch)	H	J	K
254	254	114	140	208	114	.190-24 x .38	52	6	19
305	305	140	165	233	140	.250-20 x .50	52	6	19
356	356	140	165	259	140	.250-20 x .50	52	6	19
406	406	180	229	284	180	.250-20 x .50	52	6	19

BRAKE (mm)	A	2E	E	D1	D2	D3	D4	B	2F	B3	A1	B4	B5	B6	B7	B8
254	76	51	25	84	82	122	67	76	51	32	121	108	10	10	49	13
305	76	51	25	84	82	122	67	76	51	32	121	108	10	10	49	13
356	76	51	25	84	82	122	67	76	51	32	121	108	10	10	49	13
406	76	51	25	84	82	122	67	76	51	32	121	108	10	10	49	13

### BC MODEL AIR ACTUATED CALIPER BRAKES

BC Model Caliper Brakes provide:

- ▶ Static Torque capacity up to 490 Nm @ 6 bar with 610 mm disc
- ▶ Air Actuated
- ▶ Caliper spacing is adjustable to fit 5 to 38 mm wide rotating discs and linear traveling devices
- ▶ Optional discs available from 406 to 610 mm diameter
- ▶ Disc Speeds up to 2800 rpm
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm

The Disc must be ordered separately. QD Bushing is customer furnished.

### ▶ BC MODEL, AIR ACTUATED CALIPER BRAKES

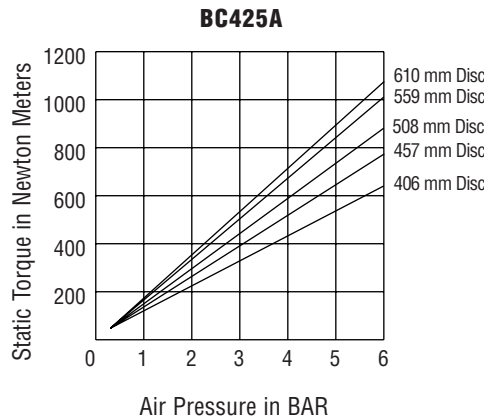
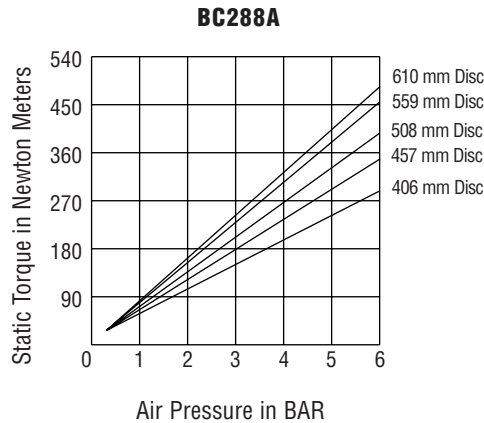
Model	Product Number	Shipping Wt. (Kg)
BC288A	835200	8,2
BC425A	835210	8,2

### ▶ Disc & QD BUSHING OPTIONS

Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

### ▶ TORQUE VS. AIR PRESSURE



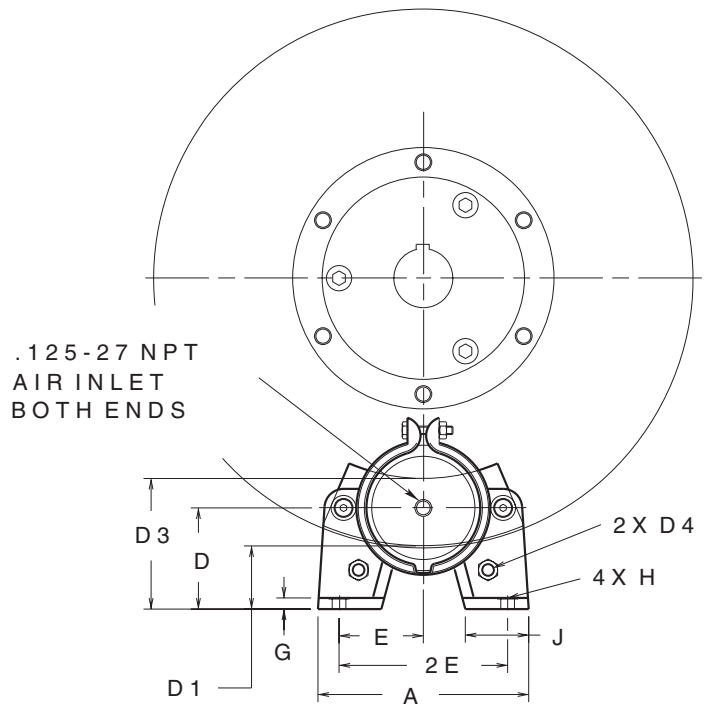
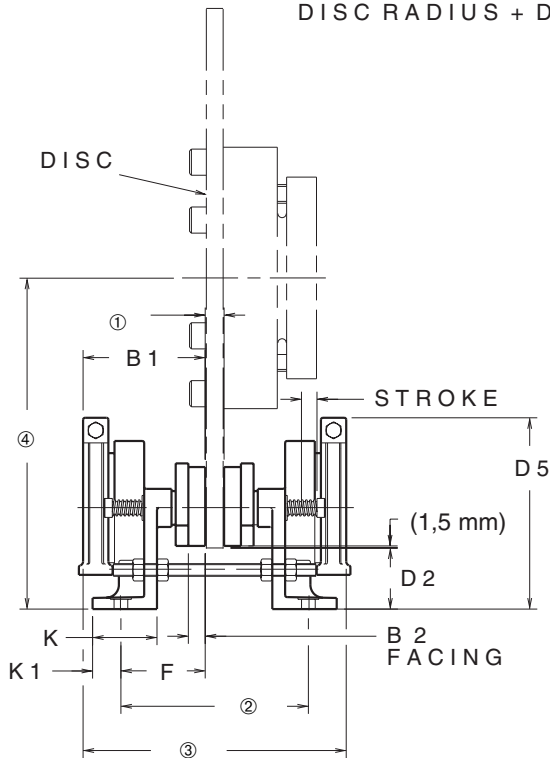
**NOTE:** Dynamic torque is approximately 85% of static torque.

## BC MODEL AIR ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ BC288A & BC425A



- ① = DISC THICKNESS + 1.5 mm (1 mm GAP EA SIDE)
- ② HOLE LOCATION = 2 (F) + ①
- ③ OVERALL LENGTH = 2 (B1) + ①
- ④ MOUNTING SURFACE TO DISC CENTER = DISC RADIUS + D2



MODEL	PRODUCT NUMBER	A	B1	B2	D	D1	D2	D3	D4 (Inch)	D5	E	2E	F	G	H	J	K	K1	STROKE
BC288A	835200	159	92	13	76	47	46	98	.375-16 x 6.00	146	64	127	64	8	10	48	49	21	11
BC425A	835210	203	100	13	97	65	64	116	.500-13 x 6.00	186	83	165	74	11	13	52	59	24	10

### BC MODEL SPRING ACTUATED CALIPER BRAKES

BC Model Caliper Brakes provide:

- ▶ Static Torque capacity up to 600 Nm with 610 mm disc
- ▶ Spring Actuated
- ▶ Caliper spacing is adjustable to fit 5 to 38 mm wide rotating discs and linear traveling devices
- ▶ Optional discs available from 406 to 610 mm diameter
- ▶ Disc Speeds up to 2800 rpm
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm
- ▶ Adjustable shoe provides greater facing life
- ▶ Spring engaged with manual release
- ▶ Facing adjustment allows full torque capacity throughout facing use

The Disc must be ordered separately. QD Bushing is customer furnished.

**NOTE:** Torque values for spring applied brakes will vary over the life of the brake as a function of spring force and the burnishing process of the lining. Over the life of the linings, torque values may exceed published values by up to 40%.

### ▶ BC MODEL, SPRING ACTUATED CALIPER BRAKE

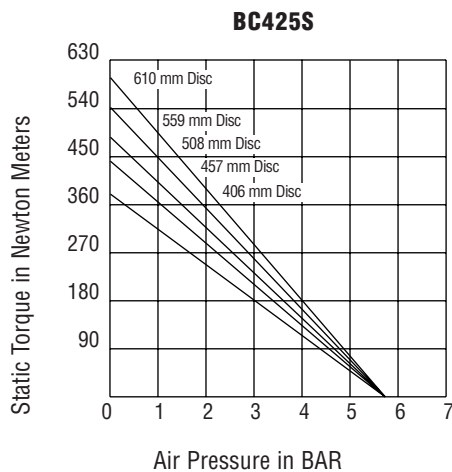
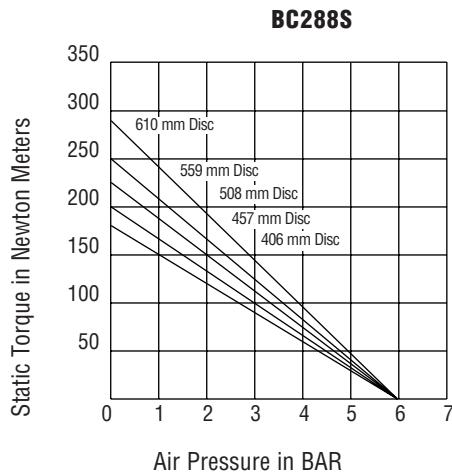
Model	Product Number	MIN Disengage Air Pressure	Shipping Wt. (Kg)
BC288S	835220	6 bar	8,6
BC425S	835230	6 bar	15,4

### ▶ Disc & QD BUSHING OPTIONS

Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

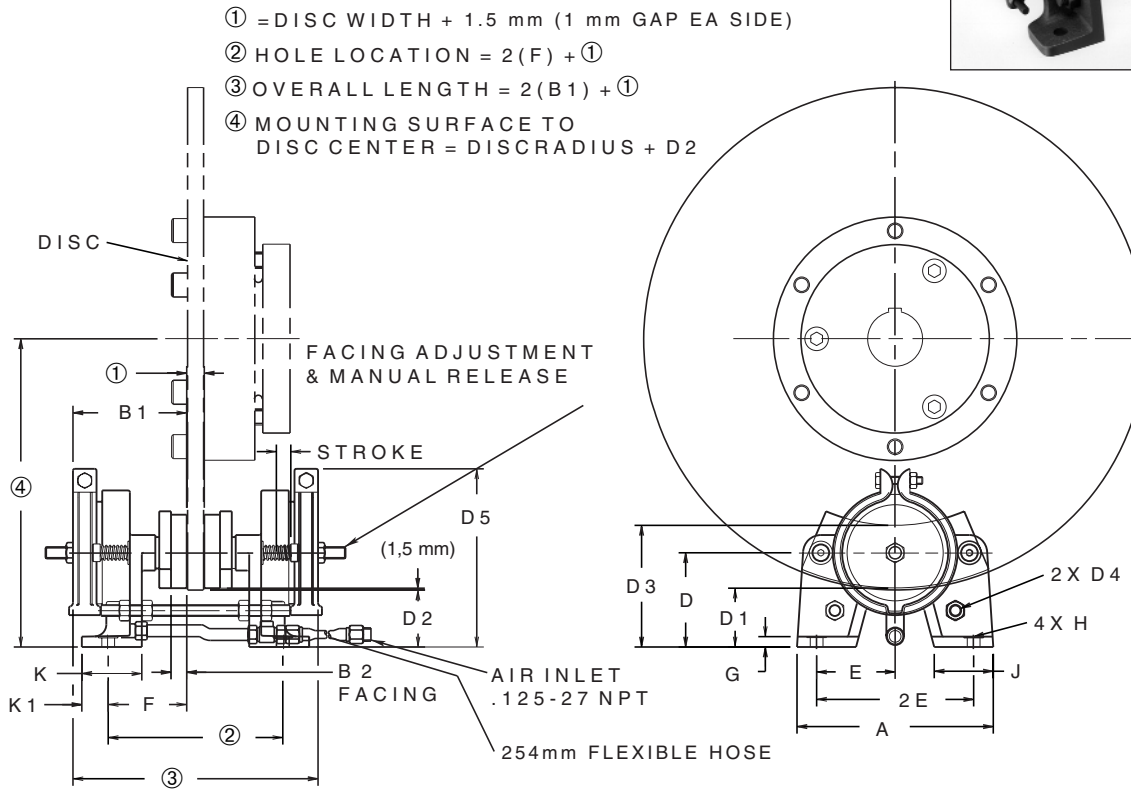
### ▶ TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

## BC MODEL SPRING ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ BC288S & BC425S



MODEL	PRODUCT NUMBER	A	B1	B2	D	D1	D2	D3	D4 (Inch)	D5	E	2E	F	G	H	J	K	K1	STROKE
BC288S	835220	159	114	13	76	47	46	98	.375-16 x 6.00	146	64	127	64	8	10	48	49	21	11
BC425S	835230	203	130	13	97	65	64	116	.500-13 x 6.00	186	83	165	74	11	13	52	59	24	10

### BD MODEL AIR ACTUATED CALIPER BRAKES

BD Model Air Actuated Caliper Brakes provide:

- ▶ Static Torque capacity up to 2300 Nm with 610 mm disc
- ▶ Air Actuated
- ▶ Actuators mount on either side of the brake
- ▶ Air connections can be rotated 360 degrees around actuator axis
- ▶ Multiply stopping power by installing more than one caliper brake per disc
- ▶ Shoes are mounted with detent pins for quick replacement
- ▶ Caliper spacing fits 13 mm wide discs
- ▶ SPC shoes fit on BD Model Caliper Brakes for longer life and higher peak input rate
- ▶ All pivot points have life-lubricated bearings
- ▶ Optional discs from 305 to 610 mm diameters
- ▶ Disc Speeds up to 3200 rpm with 356 mm discs
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm

The Disc, Air Regulator and Valve must be ordered separately. QD Bushing is customer furnished.

### BD MODEL, AIR ACTUATED CALIPER BRAKES

Model	Product Number	Torque Factor	Shipping Wt. (Kg)
BD, Air Actuated	933600	See Torque Chart for Values by Disc Size	15,9

Air Hose must be customer furnished.

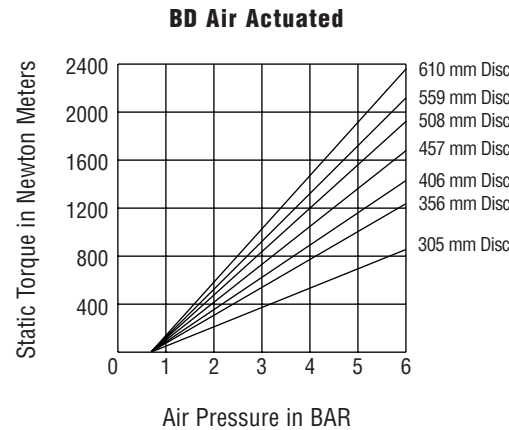
### DISC & QD BUSHING OPTIONS

Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

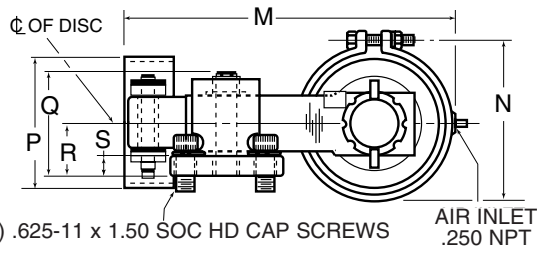
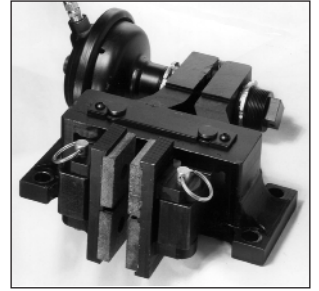
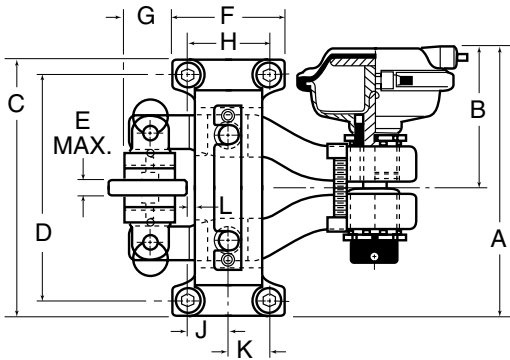
**NOTE:** Air Regulator and Valve requirements will depend upon your application. Consult Nexen for proper specifications.

### TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

## BD MODEL AIR ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)



PRODUCT NUMBER	A	B*	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
933600	249	146	236	208	19	105	44	76	32	38	6	321	145	122	95	48	19

\*with fully worn facings

### BD MODEL SPRING ACTUATED CALIPER BRAKES

BD Model Spring Actuated Caliper Brakes provide:

- ▶ Static Torque capacity up to 2150 Nm
- ▶ Spring Actuated
- ▶ Actuators mount on either side of the brake
- ▶ Air connections can be rotated 360 degrees around actuator axis
- ▶ Multiply stopping power by installing more than one caliper brake per disc
- ▶ Shoes are mounted with detent pins for quick replacement
- ▶ Caliper spacing fits 13 mm wide discs
- ▶ SPC shoes fit on BD Model Caliper Brakes for longer life and higher peak input rate
- ▶ All pivot points have life-lubricated bearings
- ▶ Optional discs from 305 to 610 mm diameters
- ▶ Disc Speeds up to 3200 rpm with 356 mm discs
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm

The Disc, Air Regulator and Valve must be ordered separately. QD Bushing is customer furnished.

### BD MODEL, SPRING ACTUATED CALIPER BRAKES

Model	Product Number	MIN Disengage Air Pressure	Shipping Wt. (Kg)
BD, Spring Actuated	933500	5 bar	19

### Disc & QD Bushing Options

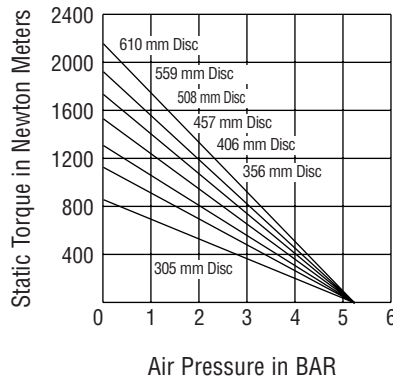
Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

**NOTE:** Air Regulator and Valve requirements will depend upon your application. Consult Nexen for proper specifications.

### TORQUE VS. AIR PRESSURE

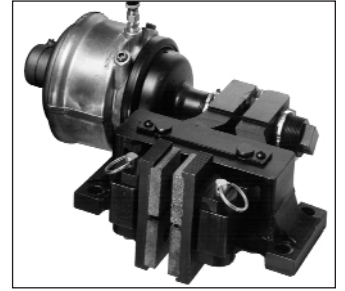
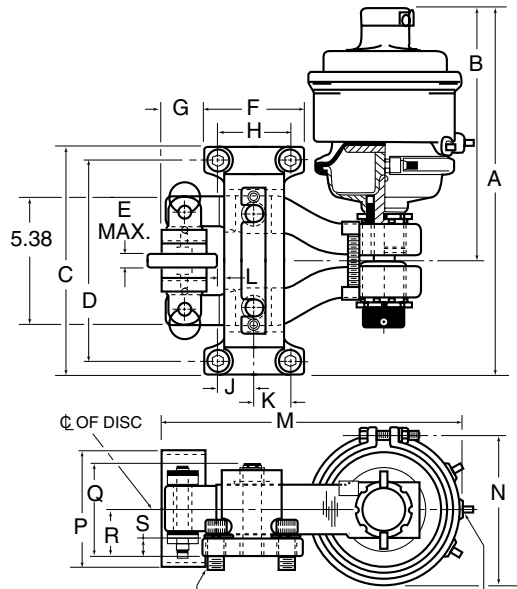
#### BD Spring Actuated



**NOTE:** Dynamic torque is approximately 85% of static torque.



## BD MODEL SPRING ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)



(4) .625-11 x 1.50 SOC HD CAP SCREWS      AIR INLET  
.250 NPT

PRODUCT NUMBER	A	B*	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
933500	381	279	236	208	19	105	44	76	32	38	6	329	160	122	95	48	19

\*with fully worn facings.

### SPC MODEL AIR ACTUATED CALIPER BRAKES

SPC Single Post Caliper, Air Actuated Brake provides:

- ▶ Air Actuation
- ▶ Static Torque capability up to 5650 Nm
- ▶ Brake actuator is moveable to permit a change in mechanical advantage which varies the torque range
- ▶ All models may be quickly and easily converted from one actuating system to another
- ▶ Arced brake shoes with quick removable pin mounting
- ▶ Pedestal style base is easily mounted in a small area
- ▶ Optional discs available from 406 to 610 mm diameter
- ▶ Disc Speeds up to 2800 rpm with 406 mm disc
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm

The Brake, Actuator and Disc must be ordered separately. QD Bushing and Air Hose are customer furnished.

### ▶ SPC MODEL, SINGLE POST CALIPER BRAKE

Ordering Information:

To achieve a complete brake assembly, you must order a Brake, the required number of Actuators and desired Disc. Performance values are dependent upon Actuator location, number of Actuators and Disc diameter. Determine performance required from the charts.

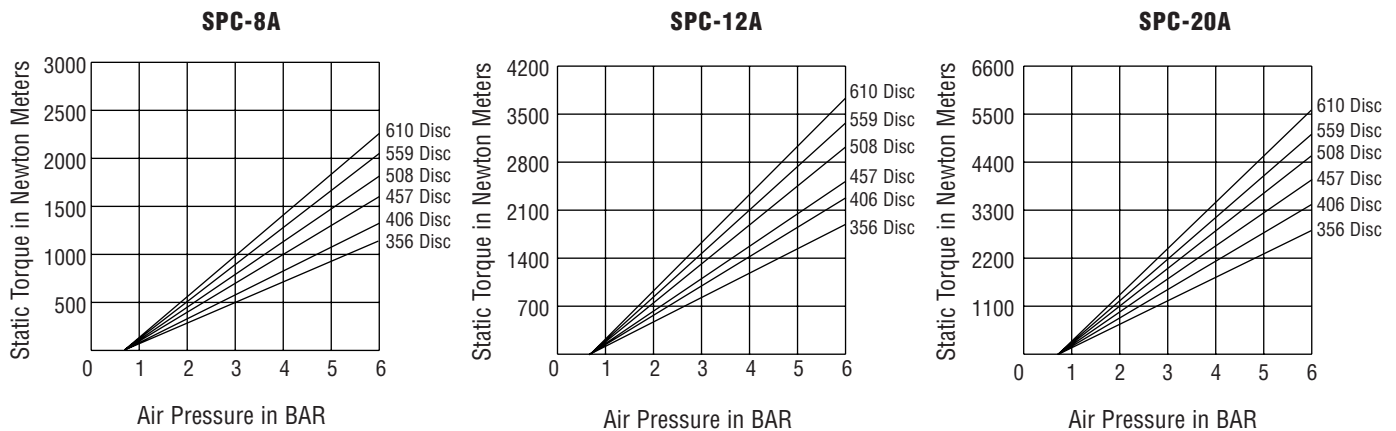
Model	Brake Product Number	# of Actuators Required	Actuator Product Number	Shipping Wt. (Kg)
SPC-8A	837400	1	837500	34,9
SPC-12A	837400	1	837500	34,9
SPC-20A	837400	2	837500	37,6

### ▶ Disc & QD BUSHING OPTIONS

Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

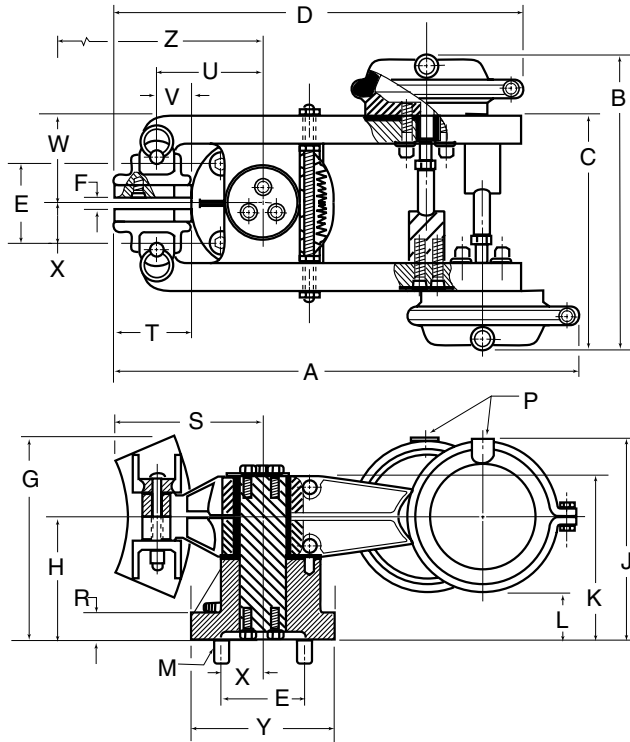
**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

### ▶ TORQUE VS. AIR PRESSURE



## SPC MODEL AIR ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ AIR ACTUATED



BRAKE PRODUCT NUMBER	ACTUATOR PRODUCT NUMBER	A	B†	C	D	E	F	G	H	J	K	L
837400	837500	500	351	287	440	90	14	214	132	216	175	49
	M (Inch)	P	R	S	T	U	V	W	X	Y	Z*	
	(4).625-11x 2.50	.375 NPT	28	160	81	114	35	92	45	155	76**	

† With fully worn friction facing \* disc center location \*\* + disc radius

### SPC MODEL SPRING ACTUATED CALIPER BRAKES

SPC Single Post Caliper Spring Actuated Caliper Brake provides:

- ▶ Spring Actuation
- ▶ Static Torque capability up to 5650 Nm
- ▶ Brake actuator is moveable to permit a change in mechanical advantage which varies the torque range
- ▶ All Models may be quickly and easily converted from one actuating system to another
- ▶ Arced brake shoes with quick removable pin mounting
- ▶ Pedestal style base is easily mounted in a small area
- ▶ Optional discs available from 406 to 610 mm diameter
- ▶ Disc Speeds up to 2800 rpm with 406 mm disc
- ▶ **QD Bushing** compatible, for shaft sizes up to 100 mm

The Brake, Actuator and Disc must be ordered separately. QD Bushing and Air Hose are customer furnished.

### ▶ SPC MODEL, SINGLE POST CALIPER BRAKE

Ordering Information:

To achieve a complete brake assembly, you must order a Brake, the required number of Actuators and desired Disc. Performance values are dependent upon Actuator location, number of Actuators and Disc diameter. Determine performance required from the charts.

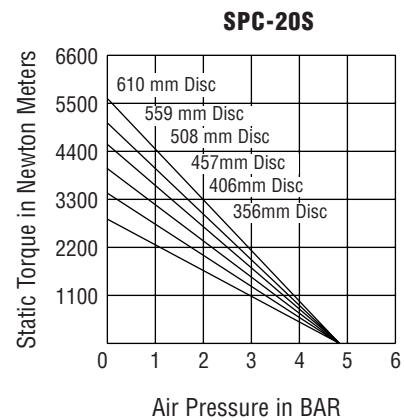
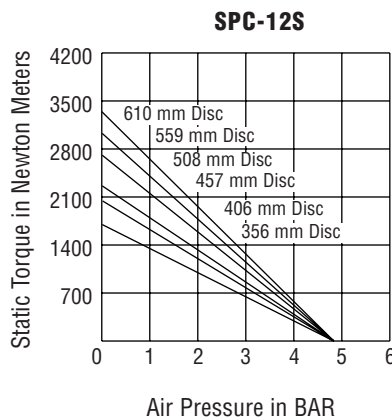
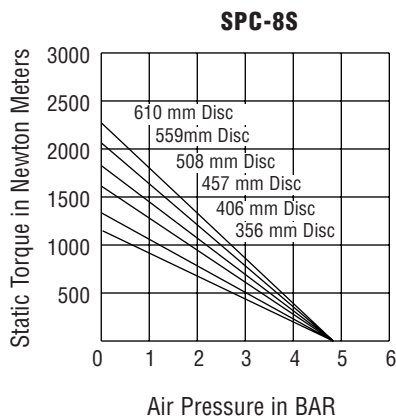
Model	Brake Product Number	# of Actuators Required	Actuator Product Number	Shipping Wt. (Kg)
SPC-8S	837400	1	837600	34,9
SPC-12S	837400	1	837600	34,9
SPC-20S	837400	2	837600	37,6

### ▶ Disc & QD BUSHING OPTIONS

Discs must be ordered separately. QD Bushings are customer furnished. For additional Disc details, see pages 46 and 47. Bushings fit into the bore of the brake disc hub, changing the bore to the size needed.

**Caution:** QD Bushings must be capable of carrying the torque produced by the caliper brake and disc selected. Check with the QD Bushing manufacturer for bushing torque ratings.

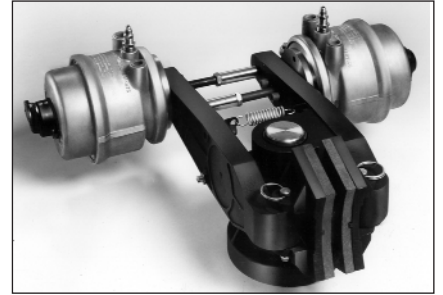
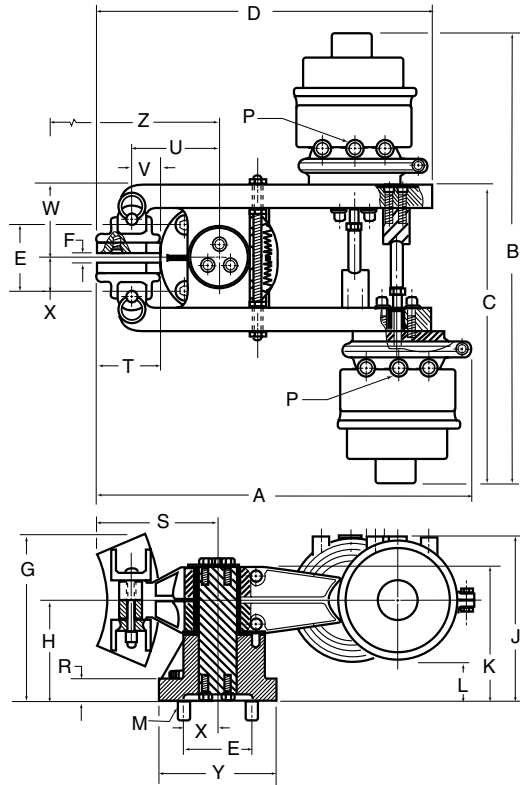
### ▶ TORQUE VS. AIR PRESSURE



**NOTE:** Torque values for spring applied brakes will vary over the life of the brake as a function of spring force and the burnishing process of the lining. Over the life of the linings, torque values may exceed published values by up to 40%.

## SPC MODEL SPRING ACTUATED CALIPER BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ SPRING ACTUATED



BRAKE PRODUCT NUMBER	ACTUATOR PRODUCT NUMBER	A	B†	C	D	E	F	G	H	J	K	L
837400	837600	487	611	418	440	90	14	214	132	216	175	52
M (Inch)	P	R	S	T	U	V	W	X	Y	Z*		
(4).625-11x 2.50	.375 NPT	28	160	81	114	35	92	45	155	76**		

† With fully worn friction facing \* disc center location \*\* + disc radius

## BRAKES

“Air Champ”

### CALIPER BRAKE DISCS

#### ▶ CALIPER BRAKE DISCS, NON-VENTILATED

- ▶ 305 to 610 mm diameter non-ventilated discs
- ▶ Discs fit shaft sizes to 100 mm
- ▶ Disc torque factors and working radius vary by type of brake used (see chart at right for specifics)
- ▶ Customer supplied QD Bushings are used for shaft attachment and vary by disc (see chart at right)
- ▶ Discs must be ordered separately from the Caliper Brake

#### ▶ CALIPER BRAKE DISCS, VENTILATED

- ▶ 469 to 610 mm diameter ventilated discs
- ▶ Design forces air across disc surfaces before heat sinks in
- ▶ Discs fit shaft sizes to 100 mm
- ▶ Thermal rating 1490 to 8950 W
- ▶ Disc torque factors and working radius vary by type of brake used (see chart at right for specifics)
- ▶ Customer supplied QD Bushings are used for shaft attachment and vary by disc (see charts at right)
- ▶ Discs must be ordered separately from the Caliper Brake

#### ▶ QD BUSHINGS

- ▶ Quick Detach “QD” Bushings are customer furnished
- ▶ Bushings should be used with specific disc (see charts at right)

*CAUTION: QD Bushings must be capable of carrying the torque produced by the brake. Check with the QD Bushing manufacturer for bushing torque ratings.*

#### ▶ CALIPER BRAKE DISCS, NON-VENTILATED

Disc Diameter	Product Number	Speed Up to (RPM)	Heat Capacity (Joule)	Inertia (Kgm <sup>2</sup> )	Shipping Wt. (Kg)
305 mm	934201	3800	359340	0,0805	11
356 mm	934202	3200	435005	0,1479	20
406 mm	934203	2800	510670	0,2512	27
457 mm	934204	2500	586334	0,4197	37
508 mm	934205	2200	717866	0,6292	42
559 mm	934206	2000	862552	0,9296	48
610 mm	934207	1900	953268	1,3004	55

#### ▶ CALIPER BRAKE DISCS, VENTILATED

Disc Diameter	Product Number	Speed Up to (RPM)	Heat Capacity (Joule)	Inertia (Kgm <sup>2</sup> )	Shipping Wt. (Kg)
464 mm	934200	1500	2034000	0,6730	34
533 mm	934300	1300	2847600	1,0232	41
610 mm	934400	1100	3661200	1,8032	50

#### ▶ CALIPER BRAKE DISCS, NON-VENTILATED

Disc Diameter Type	Compatible QD Bushing	QD Bushing Bore Range	Keyway
305 mm	SF	28 - 60 mm	Standard
356 mm	E	33 - 75 mm	Standard
406 mm	E	35 - 75 mm	Standard
457 mm	J	50 - 100 mm	Standard
508 mm	J	50 - 100 mm	Standard
559 mm	J	50 - 100 mm	Standard
610 mm	J	50 - 100 mm	Standard

#### ▶ CALIPER BRAKE DISCS, VENTILATED

Disc Diameter Type	Compatible QD Bushing	QD Bushing Bore Range	Keyway
464 mm	J	50 - 100 mm	Standard
533 mm	J	50 - 100 mm	Standard
610 mm	J	50 - 100 mm	Standard

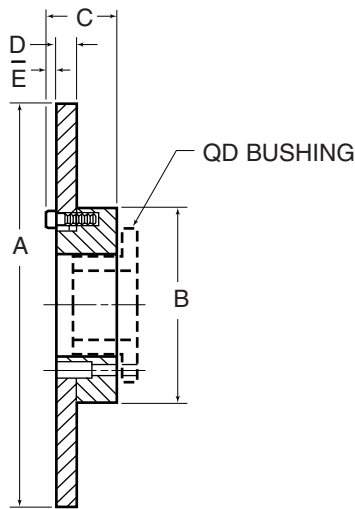
## DISC TORQUE CAPACITY & WORKING RADIUS BY BRAKE STYLE

Brake Model	Torque Factor (f)	Disc Diameter (mm):						
		305	356	406	457	508	559	610
		<i>Working Radius of Disc in millimeters (R)</i>						
BC288 (Air)	1.63	--	--	176	202	227	252	279
BC425 (Air)	3.56	--	--	176	202	227	252	279
BC288 (Spring)	1.00	--	--	176	202	227	252	279
BC425 (Spring)	2.16	--	--	176	202	227	252	279
BD	7.94	114	141	168	194	219	244	270
SPC8	8.43	107	137	165	192	218	243	268
SPC12	12.43	107	137	165	192	218	243	268
SPC20	20.86	107	137	165	192	218	243	268

Calculated torque = fR

## CALIPER BRAKE DISCS - APPROXIMATE DIMENSIONS (MILLIMETERS)

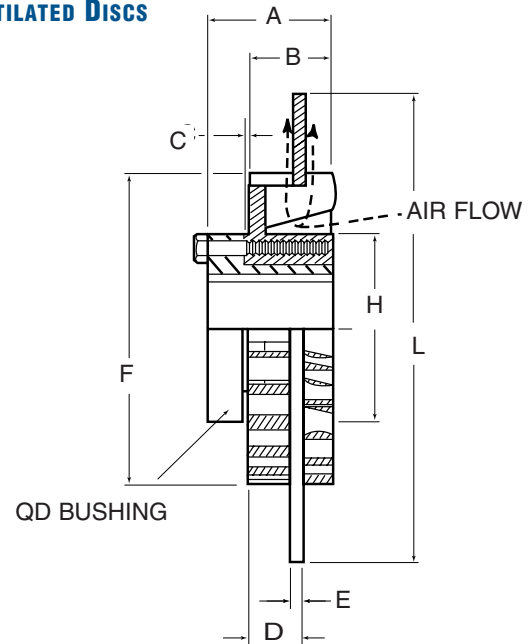
### NON-VENTILATED DISCS



PRODUCT NUMBER	A (DISC DIA)	B	C	D	E	QD BUSHING	MAX* BORE
934201	305	145	54	13	10	SF	60
934202	356	197	67	13	13	E	75
934203	406	197	67	13	13	E	75
934204	457	248	109	13	16	J	100
934205	508	248	109	13	16	J	100
934206	559	248	109	13	16	J	100
934207	610	248	109	13	16	J	100

\*With std. keyway

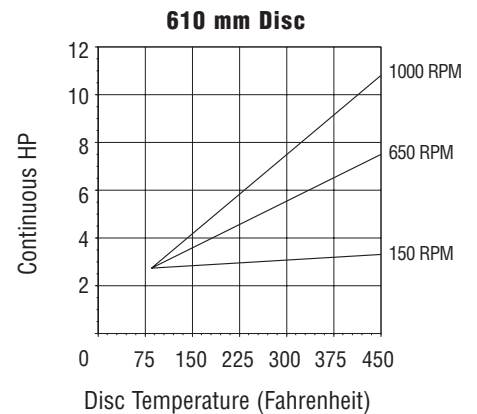
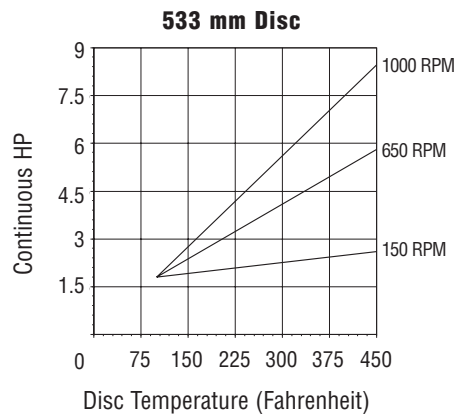
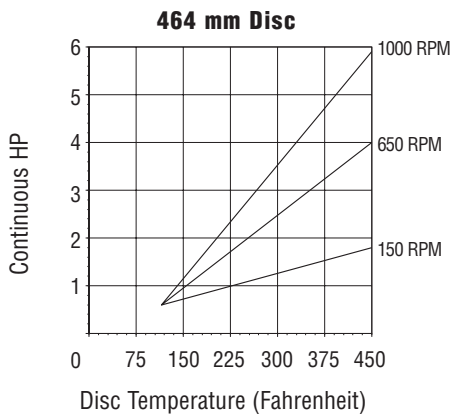
### VENTILATED DISCS



PRODUCT NUMBER	DISC DIA	A	B	C	D	E	F	H	QD BUSHING	MAX* BORE
934200	464	121	81	5	57	13	305	191	J	100
934300	533	121	81	5	57	13	305	191	J	100
934400	610	121	81	5	57	13	305	191	J	100

\*With std. keyway

### HEAT DISSIPATION - VENTILATED DISCS



Note: For maximum wear life of friction facings, operation above 233° C with standard facings should be minimized. Kw = HP(,7457). °C = (°F - 32) / 1,8

### METRIC S SERIES STRAIGHT BORE FRICTION BRAKES, S-450, S-600, S-800 & S-1000

► Static Torque capacity up to:

- S-450/50 Nm
- S-600/105 Nm
- S-800/195 Nm
- S-1000/420 Nm

► Maximum Operating Speed up to 1800 rpm

► Thermal capacity rating of:

- S-450/380W @ 1800 rpm
- S-600/970W @ 1800 rpm
- S-800/1660W @ 1800 rpm
- S-1000/2230W @ 1800 rpm

► Heat Sink capacity up to:

- S-450/31700 joules
- S-600/81000 joules
- S-800/210700 joules
- S-1000/271000 joules

These self-adjusting air cooled brakes mount easily and come with:

► **Standard Bore Sizes:**

- S-450/25 millimeters
- S-600/35 millimeters
- S-800/50 millimeters
- S-1000/75 millimeters

► **4 Minimum Bore Sizes** for custom machining

- Split friction facings for easy replacement without brake removal or disassembly
- Aluminum piston minimizes inertia for smoother response
- Thru-shaft design can be **flange mounted** or **shaft mounted** with a torque pin

Options and Accessories include:

- Torque Pin Bracket allows you to anchor the housing
- Brake Safety Guard for protection

### ► METRIC S-450, S-600, S-800 & S-1000 MODEL FRICTION BRAKES

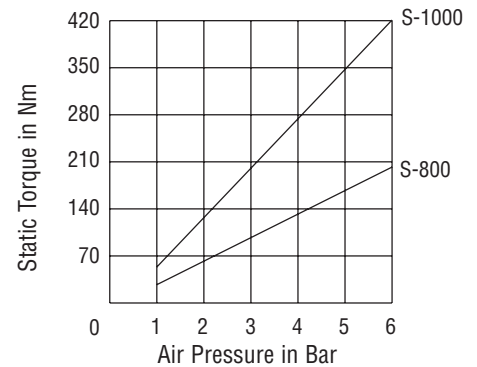
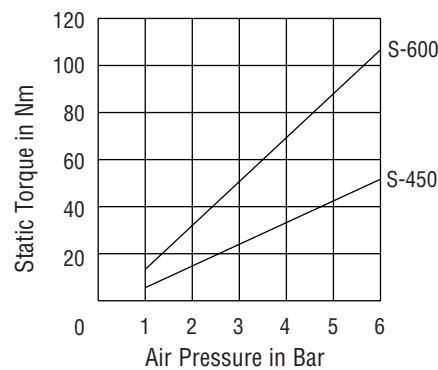
Model	Component	Product Number	Bore (mm)	Key Size	Shipping Wt. (kg)
S-450	Brake, Standard Bore	827810	25	8 x 7	6,2
S-450	Brake, Minimum Bore	827811	13	--	6,2
S-600	Brake, Standard Bore	827910	35	10 x 8	6,2
S-600	Brake, Minimum Bore	827911	17	--	6,2
S-800	Brake, Standard Bore	828010	50	14 x 9	11
S-800	Brake, Minimum Bore	828012	21	--	11
S-1000	Brake, Standard Bore	828110	75	20 x 12	20
S-1000	Brake, Minimum Bore	828111	25	--	20

Minimum bore units are supplied unassembled with machinable hub.

### ► ACCESSORIES

Model	Component	Product Number	Shipping Wt. (kg)
S-450	Torque Pin Bracket	819900	0,45
S-450	Brake Safety Guard	817700	0,90
S-600	Torque Pin Bracket	821400	0,90
S-600	Brake Safety Guard	818300	0,90
S-800	Torque Pin Bracket	823400	1,81
S-800	Brake Safety Guard	826300	1,36
S-1000	Torque Pin Bracket	825500	1,81
S-1000	Brake Safety Guard	828200	1,81

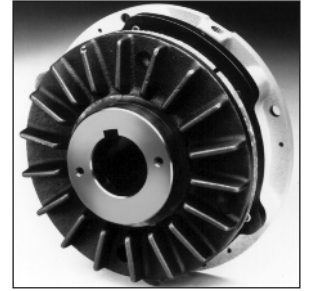
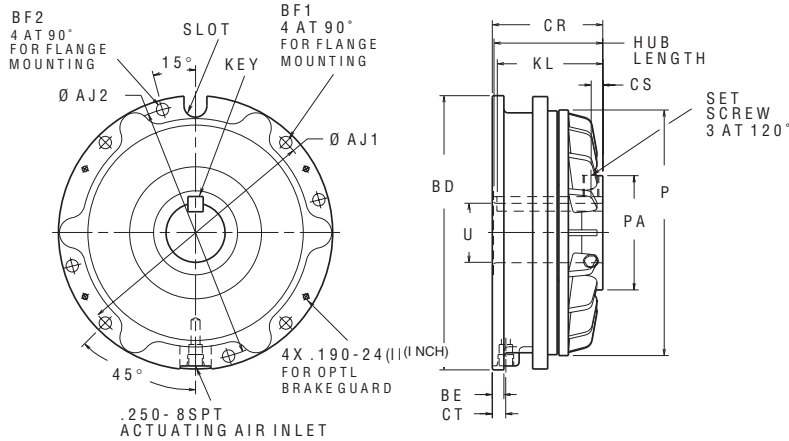
### ► TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

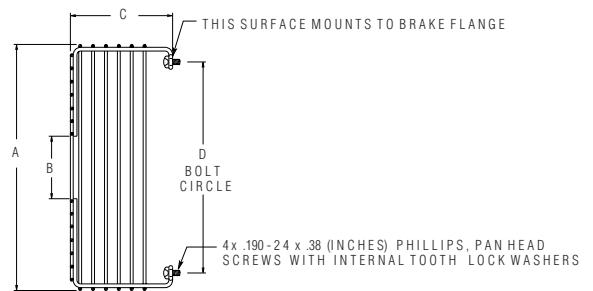
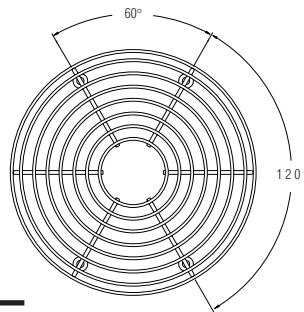


## METRIC SERIES STRAIGHT BORE FRICTION BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)



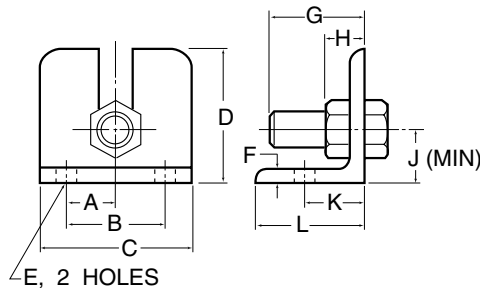
MODEL	PRODUCT NUMBER	P	PA	U <sup>H7</sup>	KL	BE	CR	CS	CT	AJ1	AJ2	BD	BF1	BF2	KEY	SET SCREWS	SLOT		HUB LENGTH
																	WD	DP	
S-450	827810	116	48	25	22	6	64	5	11	135	--	151	7	--	8 x 7	M5	10	16	64
S-600	827910	154	67	35	79	10	81	6	10	165	--	183	9	--	10 x 8	M6	16	17	79
S-800	828010	205	95	50	90	10	92	10	11	213	--	229	10	--	14 x 9	M6	20	18	91
S-1000	828110	256	127	75	100	13	103	10	18	278	279	302	13	13	20 x 12	M10	24	23	101

### ▶ BRAKE SAFETY GUARD



MODEL	PRODUCT NUMBER	A	B	C	D
S-450	817700	167	41	68	133
S-600	818300	200	51	83	171
S-800	826300	246	70	93	213
S-1000	828200	316	95	129	282

### ▶ TORQUE PIN BRACKET



MODEL	PRODUCT NUMBER	A	B	C	D	E	F	G	H	J	K	L
S-450	819900	19	38,1	57	51	10,3	6	38	13	19	25,4	51
S-600	821400	25	50,8	76	64	10,3	6	41	16	28	25,4	51
S-800	823400	28	57,2	89	76	11,9	8	51	19	30	35,1	64
S-1000	825500	32	63,5	102	102	13,5	10	64	22	35	41,1	76

NOTE: Drawings are expressed in third angle projection.

### METRIC SSE SERIES STRAIGHT BORE SPRING ENGAGED BRAKES, MODELS SSE-450 & SSE-600

- Static Torque capacity up to:  
SSE-450/50 Nm  
SSE-600/110 Nm
- Maximum Operating Speed up to 1800 rpm
- Standard Bore Sizes:**  
S-450/25 millimeters  
S-600/35 millimeters
- Thermal capacity rating of:  
S-450/380W @ 1800 rpm  
S-600/970W @ 1800 rpm
- Heat Sink capacity up to:  
S-450/40670 joules  
S-600/81000 joules

These spring engaged, air disengaged brakes mount easily and come with:

- Open spring sockets that allow you to add or remove springs to fit your torque needs
- Split friction facings for easy replacement without brake removal or disassembly
- Single plate, finned friction discs provide high heat dissipation
- High dynamic torque capacity insures fast load response
- Flow restrictor valve controls disengagement air to prevent shock load on brake components

Options include:

- Torque Pin Bracket Allows you to keep the housing from spinning
- Brake Safety Guard for protection

### METRIC SSE-450 & SSE-600 MODEL SPRING ENGAGED BRAKES

Model	Component	Product Number	Number of Springs	Torque Rating Nm ± 10%	MIN Disengagement Air Pressure ± 10% (Bar)	Bore (mm)	Shipping Wt. (kg)
SSE-450	Brake	818830	6	27	4	25	6
SSE-450	Brake	818865	8	40	5	25	6
SSE-450	Brake	818866	10	50	6	25	6
SSE-600	Brake	820330	6	60	4	35	9
SSE-600	Brake	820365	8	90	5	35	9
SSE-600	Brake	820366	10	110	6	35	9

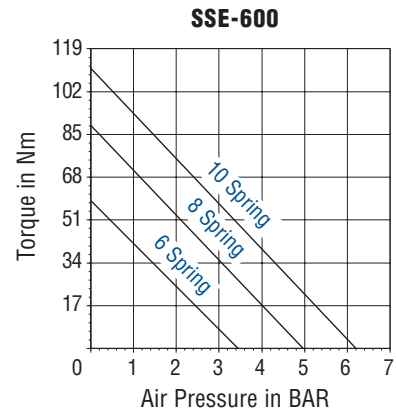
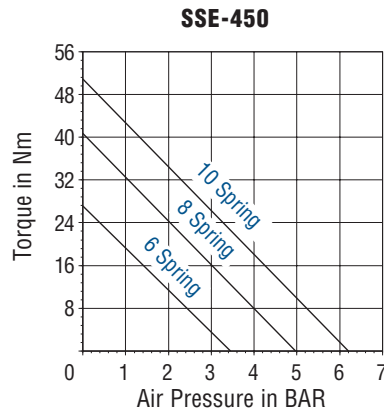
Torque values will exceed those shown after the brake has been burnished in.

Torque values for spring applied brakes will vary over the life of the brake as a function of spring force and the burnishing process of the lining. Over the life of the linings, torque values may exceed published values by up to 40%.

### ACCESSORIES

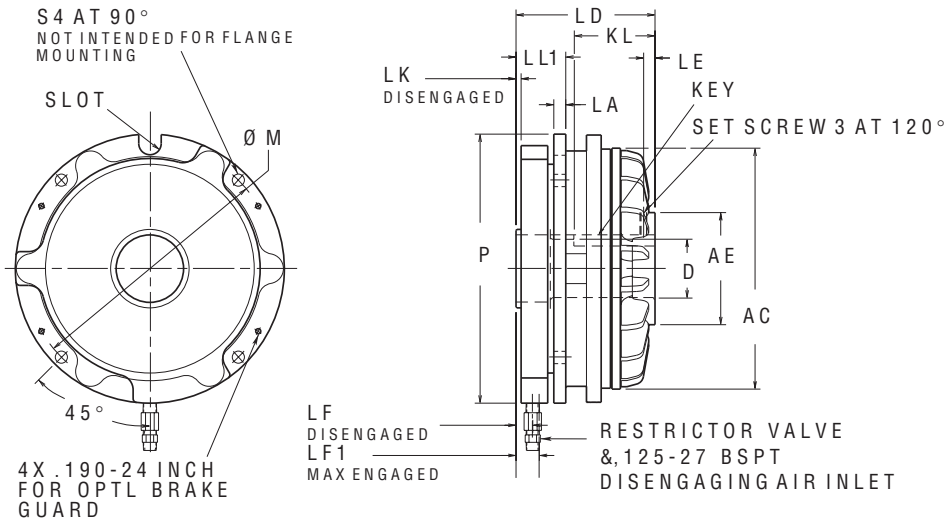
Model	Component	Product Number	Shipping Wt. (kg)
SSE-450	Torque Pin Bracket	819900	0,45
SSE-450	Brake Safety Guard	817700	0,90
SSE-600	Torque Pin Bracket	821400	0,90
SSE-600	Brake Safety Guard	818300	0,90

### TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

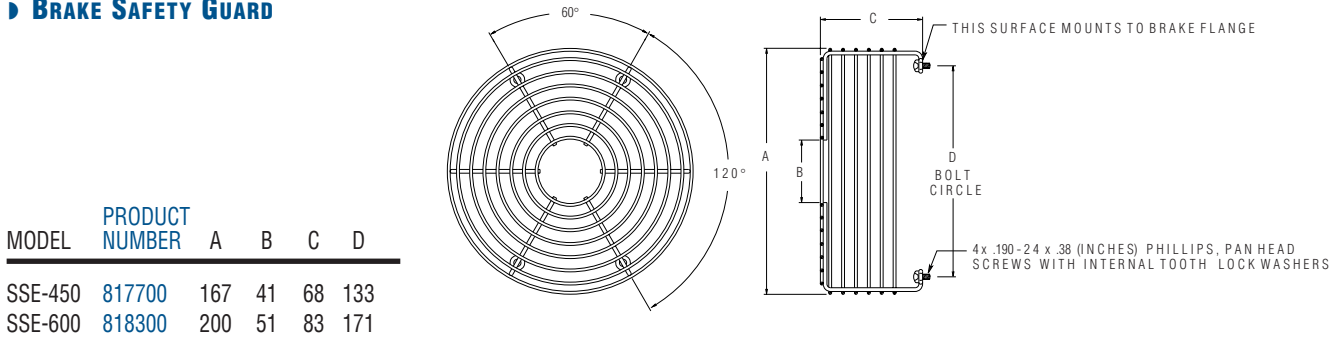
## SSE-450 & SSE-600 MODEL STRAIGHT BORE SPRING ENGAGED BRAKES- APPROXIMATE DIMENSIONS (MILLIMETERS)



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	KEY	KL	LA	LD	LE	LF	LF1	LK	LL1	M	P	S	SLOT		SET SCREW
																	WD	DP	
SSE-450	818830	116	48	25	7 x 8	22	7	90	5	9	12	0,3	34	135	151	7	10	17	M5
SSE-450	818865	116	48	25	7 x 8	22	7	90	5	9	12	0,3	34	135	151	7	10	17	M5
SSE-450	818866	116	48	25	7 x 8	22	7	90	5	9	12	0,3	34	135	151	7	10	17	M5
SSE-600	820330	154	67	35	8 x 10	79	10	108	6	8	12	-0,3	37	165	183	9	16	17	M6
SSE-600	820365	154	67	35	8 x 10	79	10	108	6	8	12	-0,3	37	165	183	9	16	17	M6
SSE-600	820366	154	67	35	8 x 10	79	10	108	6	8	12	-0,3	37	165	183	9	16	17	M6

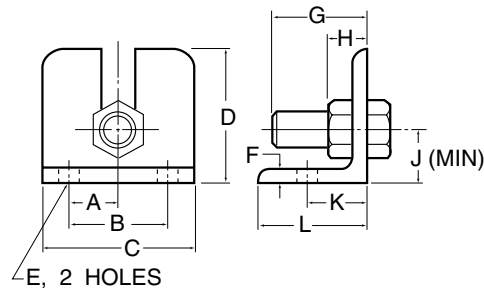
NOTE: Drawings are expressed in third angle projection.

### ▶ BRAKE SAFETY GUARD



MODEL	PRODUCT NUMBER	A	B	C	D
SSE-450	817700	167	41	68	133
SSE-600	818300	200	51	83	171

### ▶ TORQUE PIN BRACKET



MODEL	PRODUCT NUMBER	A	B	C	D	E	F	G	H	J	K	L
SSE-450	819900	19	38,1	57	51	10	6	38	13	19	25	51
SSE-600	821400	25	50,8	76	64	10,3	6	41	16	28	25,4	51

### METRIC SSE SERIES STRAIGHT BORE SPRING ENGAGED BRAKES, MODELS SSE-800 & SSE-1000

- Static Torque capacity up to:  
SSE-800/280 Nm  
SSE-1000/418 Nm
- Maximum Operating Speed up to 1800 rpm
- Standard Bore Sizes:**  
S-800/50 millimeters  
S-1000/75 millimeters
- Thermal capacity rating of:  
S-800/1660W @ 1800 rpm  
S-1000/2230W @ 1800 rpm
- Heat Sink capacity up to:  
S-800/169000 joules  
S-1000/271000 joules

These spring engaged, air disengaged brakes mount easily and come with:

- Open spring sockets that allow you to add or remove springs to fit your torque needs
- Split friction facings for easy replacement without brake removal or disassembly
- Single plate, finned friction discs provide high heat dissipation
- High dynamic torque capacity insures fast load response
- Flow restrictor valve controls disengagement air to prevent shock load on brake components

Options include:

- Torque Pin Bracket Allows you to keep the housing from spinning
- Brake Safety Guard for protection

### METRIC SSE-800 & SSE-1000 MODEL SPRING ENGAGED BRAKES

Model	Component	Product Number	Number of Springs	Torque Rating Nm ± 10%	MIN Disengagement Air Pressure ± 10% (Bar)	Bore (mm)	Shipping Wt. (kg)
SSE-800	Brake	822430	6	147	4	50	14
SSE-800	Brake	822465	8	226	5	50	14
SSE-800	Brake	822466	10	280	6	50	14
SSE-1000	Brake	822530	6	248	4	75	31
SSE-1000	Brake	822565	8	340	5	75	31
SSE-1000	Brake	822566	10	418	6	75	31

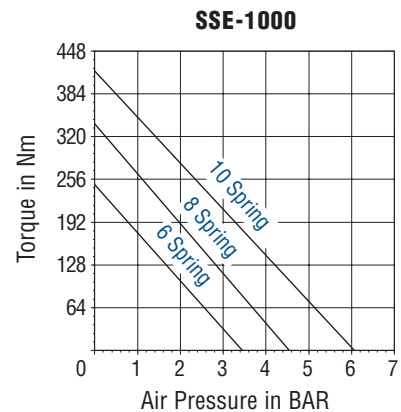
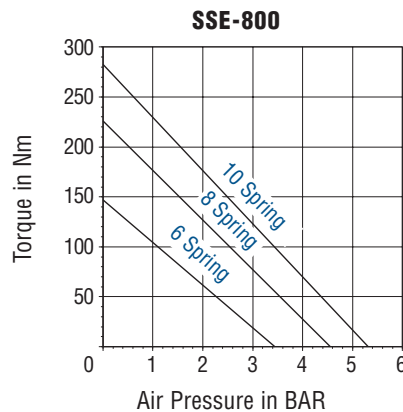
Torque values will exceed those shown after the brake has been burnished in.

Torque values for spring applied brakes will vary over the life of the brake as a function of spring force and the burnishing process of the lining. Over the life of the linings, torque values may exceed published values by up to 40%.

### ACCESSORIES

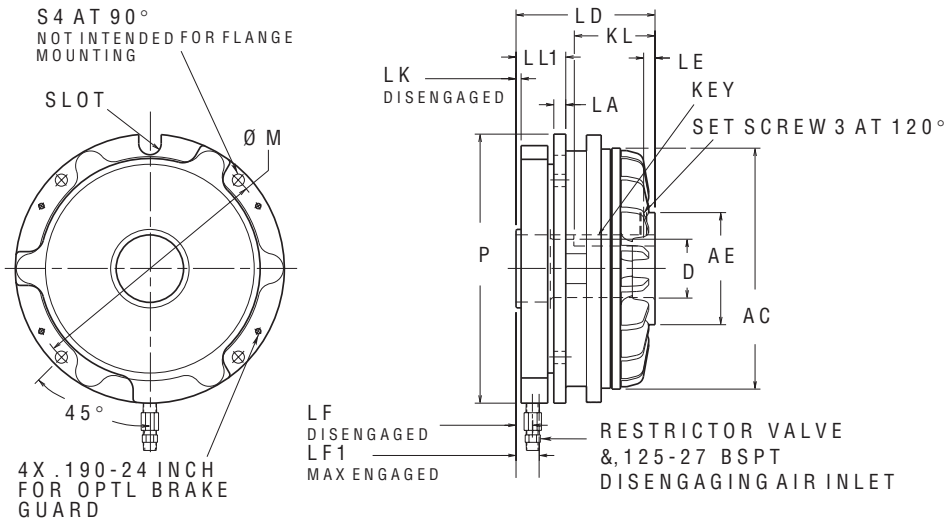
Model	Component	Product Number	Shipping Wt. (kg)
SSE-800	Torque Pin Bracket	823400	0,90
SSE-800	Brake Safety Guard	826300	1,36
SSE-1000	Torque Pin Bracket	825500	1,81
SSE-1000	Brake Safety Guard	828200	1,81

### TORQUE VS. AIR PRESSURE



**NOTE:** Dynamic torque is approximately 85% of static torque.

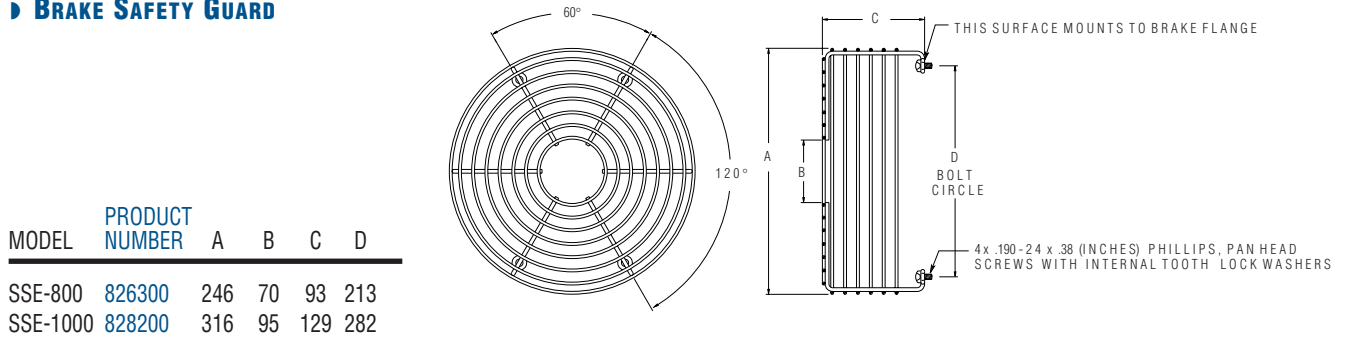
## SSE-800 & SSE-1000 MODEL STRAIGHT BORE SPRING ENGAGED BRAKES- APPROXIMATE DIMENSIONS (MILLIMETERS)



MODEL	PRODUCT NUMBER	AC	AE	D <sup>H7</sup>	KEY	KL	LA	LD	LE	LF	LF1	LK	LL1	M	P	S	SLOT		SET SCREW
																	WD	DP	
SSE-800	822430	205	95	50	10 x 14	90	10	118	10	15	20	5	42	213	229	10	19	18	M6
SSE-800	822465	205	95	50	10 x 14	90	10	118	10	15	20	5	42	213	229	10	19	18	M6
SSE-800	822466	205	95	50	10 x 14	90	10	118	10	15	20	5	42	213	229	10	19	18	M6
SSE-1000	822530	256	127	75	12 x 20	100	13	138	10	10	15	-5	43	278	302	13	22	23	M10
SSE-1000	822565	256	127	75	12 x 20	100	13	138	10	10	15	-5	43	278	302	13	22	23	M10
SSE-1000	822566	256	127	75	12 x 20	100	13	138	10	10	15	-5	43	278	302	13	2	23	M10

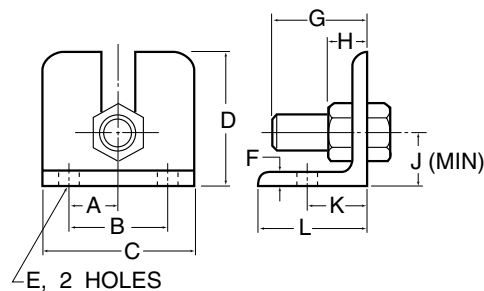
NOTE: Drawings are expressed in third angle projection.

### ▶ BRAKE SAFETY GUARD



MODEL	PRODUCT NUMBER	A	B	C	D
SSE-800	826300	246	70	93	213
SSE-1000	828200	316	95	129	282

### ▶ TORQUE PIN BRACKET



MODEL	PRODUCT NUMBER	A	B	C	D	E	F	G	H	J	K	L
SSE-800	823400	28	57,2	89	76	11,9	8	51	19	30	35,1	64
SSE-1000	825500	32	63,5	102	102	13,5	10	64	22	35	41,1	76

**CLUTCH-BRAKES**

**“Air Champ”**

**PRODUCT FUNCTION/SELECTION CHART**

Product Group	IEC Flange Open Design Clutch-Brake	IEC Flange Enclosed Design Clutch-Brake
<b>General Features</b>		
Number of Model Options	6 Metric	14 Metric
<b>Functions</b>		
Controlled Acceleration	Yes	Yes
Controlled Deceleration	Yes	Yes
Inching/Jogging	Yes	Yes
Rapid Cycling	Yes	Yes
Stopping/Holding	Yes	Yes
Overload Protection	Yes	Yes
Disconnect	Yes	Yes



## **CLUTCH/BRAKES**

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## CLUTCH-BRAKES

### METRIC FLANGE MOUNTED CLUTCH-BRAKES

Choose from **3 design options**:

**FMCB** basic open clutch-brake:

- ▶ Available in black oxide coating
- ▶ **Bore/Shaft** sizes from 19 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys and couplings

**FMCBE** basic enclosed clutch-brake:

- ▶ Available in either electroless nickel plating or black oxide coating
- ▶ **Bore/Shaft** sizes from 14 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys or couplings

**FMCES** enclosed, spring engaged clutch-brake:

- ▶ Spring engaged brake combined with air engaged clutch
- ▶ Double acting piston design prevents overlap of clutch and brake functions
- ▶ Available in either electroless nickel plating or black oxide coating
- ▶ **Bore/shaft sizes** from 14 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys or couplings

### METRIC FLANGE MOUNTED CLUTCH-BRAKES

Metric Flange Mounted Clutch-Brakes are available in both an Open and an Enclosed design. The Open Design promotes improved air circulation for longer life and greater operating efficiency. The Enclosed design keeps dirt, dust, moisture and other contaminants out and worn friction material from escaping

These clutch-brakes mount directly to IEC-Face motors and reducers and provide absolute control. These units fit IEC frame sizes 71A to 160M.

### DESIGN STYLE COMPARISONS

The tables below show performance comparisons between the design styles. This is an overview, to aid in selection. Please refer to the specific product catalog pages prior to final determination, to insure all features and benefits match your application.

#### THERMAL CAPACITIES

Thermal capacity is based upon 50% clutch and 50% brake usage. Operating speed is 1500 rpm for all data.

Model/Design Style	Watts rating by Model Size					
	14	19	24	28	38	42
FMCBE	104	134	134	246	328	328
FMCBES	104	134	134	246	328	328
FMCB	--	370	370	670	670	850

#### OVERHUNG LOAD DATA

Data is based upon 50% clutch and 50% brake usage. Operating speed is 1500 rpm for all data.

Model/Design Style	Weight (Kg) rating by Model Size					
	14	19	24	28	38	42
FMCBE	35	100	95	95	120	135
FMCBES	35	100	95	95	120	135
FMCB	--	100	95	95	120	135

#### STATIC TORQUE CAPACITY

Data is based upon maximum achieved at 6 Bars at psi.

Model/Design Style	Torque (Nm) rating by Model Size						
	14	19	24	28	7-38	8-38	42
FMCBE	25	33	33	85	125	167	270
FMCBES	10	18	18	32	46	74	107
FMCB	--	33	33	85	125	167	270
Clutch:							
FMCBE	22	33	33	77	110	151	240
FMCBES	18	27	27	44	64	72	105
FMCB	--	33	33	77	110	151	240

#### TYPICAL APPLICATIONS

Four typical mounting applications for these Clutch-Brakes are shown on page 76.



**METRIC FMCBE CLUTCH-BRAKES – MODELS 70-14**

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment.

- ▶ Compatible with IEC-B14 face motors up to KW-56
- ▶ Static Torque up to 10 Nm (brake) and 10 Nm (clutch)
- ▶ Overhung Load Capacity up to 32 kilograms
- ▶ Design Operating Speed up to 3600 R.P.M.
- ▶ Flange mounts directly to motors and reducers
- ▶ FMCBE with Integral Valve combines a Flange mounted, totally-enclosed clutch/brake with a single solenoid 4-way spool valve mounted directly to the clutch/brake air chamber. Air pressure is directed to the piston to perform either clutch or brake functions.
- ▶ Eliminates need for quick exhaust valves
- ▶ 24 Volt is standard on FMCBE
- ▶ The Integral Valve is available for 12, 24, 115 and 230 volt systems
- ▶ Available in black oxide coating
- ▶ Simplified; one product number for a clutch-brake combination control valve
- ▶ Reduced number of air line connections for quicker install

▶ **METRIC FMCBE CLUTCH-BRAKES, TOTALLY ENCLOSED**

Model Number	Product Number	Valve Voltage	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg) 1500 RPM	Shipping Wt. (kg)
FMCBE-70-14	801360	N/A	14	75W	32	5
FMCBE-70-14/IV	801361	115V	14	75W	32	5.4
FMCBE-70-14/IV	801363	24V	14	75W	32	5.4

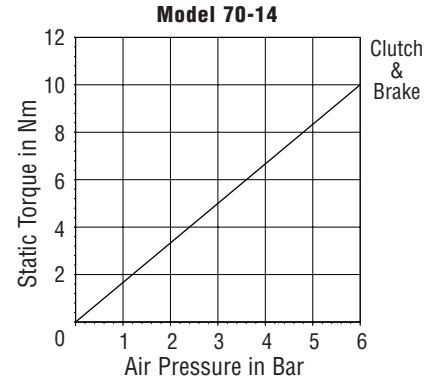
NOTE: Thermal Capacity (HP<sub>T</sub>) and Overhung Load data is based upon 50% clutch and 50% brake usage.

▶ **IEC MOTOR/FRAME SELECTION CHART**

Use this chart as specification and operational criteria for your application.

HP/KW of Motor	RPM	Frame Number	Motor Shaft (mm)
0,25/0,33	3450	D71C	14
0,25/0,33	1725	D71C	14
0,37/0,50	3450	D71C	14
0,37/0,50	1725	D71C	14
0,56/0,75	3450	D71C	14

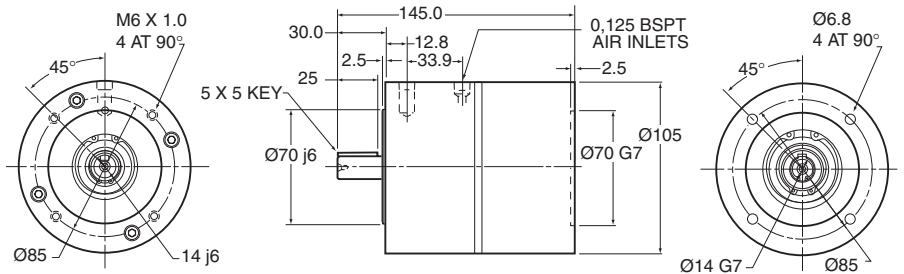
▶ **TORQUE VS. AIR PRESSURE**



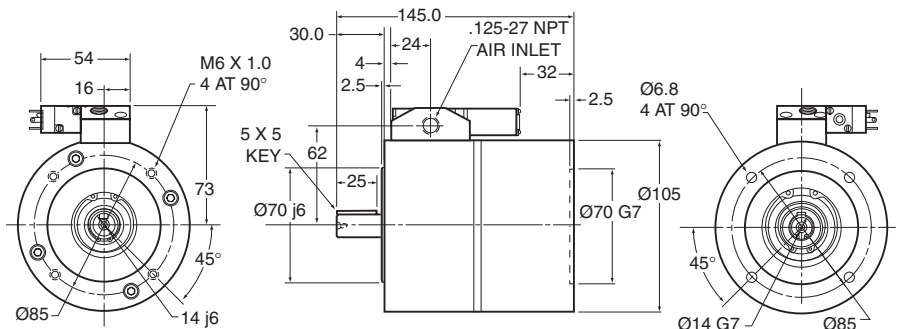
NOTE: Dynamic torque is approximately 85% of static torque.

Torque (In. Lbs.) = Nm x 8.849  
PSI = Bar ÷ .0689

▶ **METRIC FMCBE CLUTCH-BRAKES, APPROXIMATE DIMENSIONS**



▶ **METRIC FMCBE INTEGRAL VALVE CLUTCH-BRAKES, APPROXIMATE DIMENSIONS**



### METRIC FMCB CLUTCH-BRAKES – MODELS 130-19 & 130-24

FMCB Flange Mounted Clutch-Brakes with their open design, promote improved air circulation. Heat build-up and torque fade is reduced, providing longer life and greater operating efficiency. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 19 to 24 millimeters
- ▶ Available in black oxide coating
- ▶ Static Torque up to 33 Nm (brake) and 33 Nm (clutch)
- ▶ Overhung Load Capacity up to 150 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 1,5 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCB CLUTCH-BRAKES, OPEN DESIGN

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCB-130-19	801400	19	370 W	150	100	18
FMCB-130-24	801403	24	370 W	143	95	18

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

Model Number	Product Number	Foot Mount Set Product Number	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
Black Coating:					
FMCB-130-19	801400	801427	2,2	801424	3
FMCB-130-24	801403	801427	2,2	801425	3

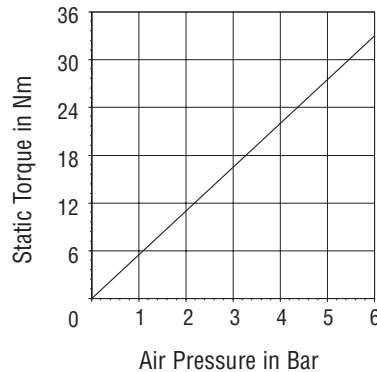
### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
0,37	1000	80	19	FMCB-130-19
0,55	1000	80	19	FMCB-130-19
0,75	1000	90S	24	FMCB-130-24
0,75	1500	80	19	FMCB-130-19
1,1	1000	90L	24	FMCB-130-24
1,1	1500	90S	24	FMCB-130-24
1,5	1500	90L	24	FMCB-130-24

### ▶ TORQUE VS. AIR PRESSURE

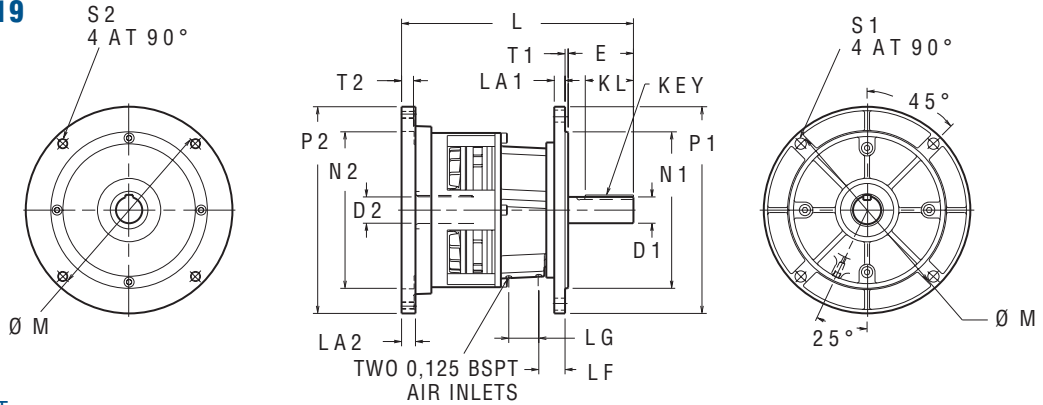
Models 130-19 & 130-24



NOTE: Dynamic torque is approximately 85% of static torque.

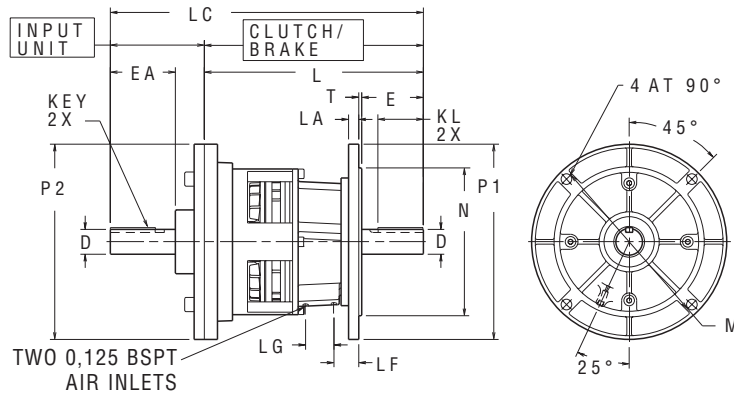
**METRIC FMCB MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)**

▶ **MODELS 130-19 & 130-24**



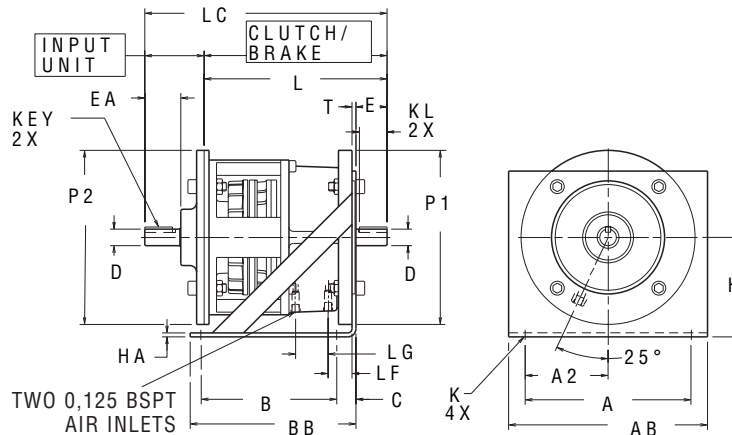
MODEL	PRODUCT NUMBER	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG	M	N1 <sup>i6</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
130-19	801400	19 <sup>i6</sup>	19 <sup>67</sup>	37	6X6	32	210,5	13	6	27	37	165	130	130	200	200	12	11	3,5	5
130-24	801403	24 <sup>i6</sup>	24 <sup>67</sup>	47	7X8	35	220,5	14	6	27	37	165	130	130	200	200	12	11	3,5	5

▶ **MODELS 130-19 & 130-24 WITH INPUT**



MODEL	PRODUCT NUMBER	INPUT NUMBER	D	E	EA	KEY	KL	L	LA	LC	LF	LG	M	N1 <sup>i6</sup>	P1	P2	S	T
130-19	801400	801424	19 <sup>i6</sup>	37	43	6X6	32	210,5	10	280,5	27	37	165	130	200	200	11	3,5
130-24	801403	801425	24 <sup>i6</sup>	47	55	7X8	35	220,5	10	302,5	27	37	165	130	200	200	11	3,5

▶ **MODELS 130-19 & 130-24 WITH INPUT & FOOT**



MODEL	PRODUCT NUMBER	INPUT NUMBER	FOOT NUMBER	A	AB	AZ	B	BB	C	D <sup>i6</sup>	E	EA	H	HA	K	KEY	KL	L	LC	LF	LG	P1	P2	T
130-19	801400	801424	801427	191	220	95	146	191	32	19 <sup>i6</sup>	37	43	114	5	11	6X6	32	210,5	280,5	27	37	200	200	3,5
130-24	801403	801425	801427	191	220	95	146	191	32	24 <sup>i6</sup>	47	55	114	5	11	7X8	35	220,5	302,5	27	37	200	200	3,5

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCB CLUTCH-BRAKES – MODELS 7-28 & 7-38

FMCB Flange Mounted Clutch-Brakes with their open design, promote improved air circulation. Heat build-up and torque fade is reduced, providing longer life and greater operating efficiency. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 28 to 38 millimeters
- ▶ Available in black oxide coating
- ▶ Static Torque up to 125 Nm (brake) and 110 Nm (clutch)
- ▶ Overhung Load Capacity up to 180 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 5,5 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCB CLUTCH-BRAKES, OPEN DESIGN

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCB-7-28	801610	28	670 W	143	95	27
FMCB-7-38	801613	38	670 W	180	120	27

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

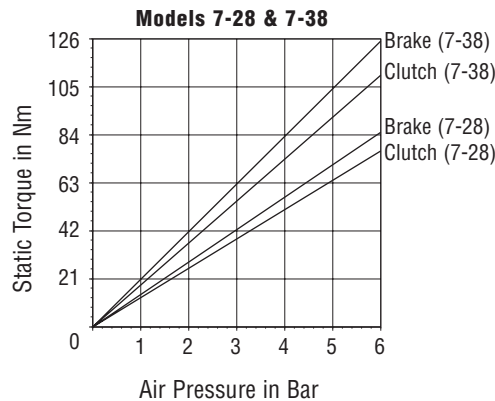
Model Number	Product Number	Foot Mount Set (2 Mounts)		Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
		Product Number	Product Number			
Black Coating:						
FMCB-7-28	801610	801632	801632	5	801627	5
FMCB-7-38	801613	801633	801633	5	801628	5

### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
1,5	1000	100L	28	FMCB-7-28
2,2	1000	112M	28	FMCB-7-28
2,2	1500	100L	28	FMCB-7-28
3,0	1000	132S	38	FMCB-7-38
3,0	1500	100L	28	FMCB-7-28
4,0	1500	112M	28	FMCB-7-28
5,5	1500	132S	38	FMCB-7-38

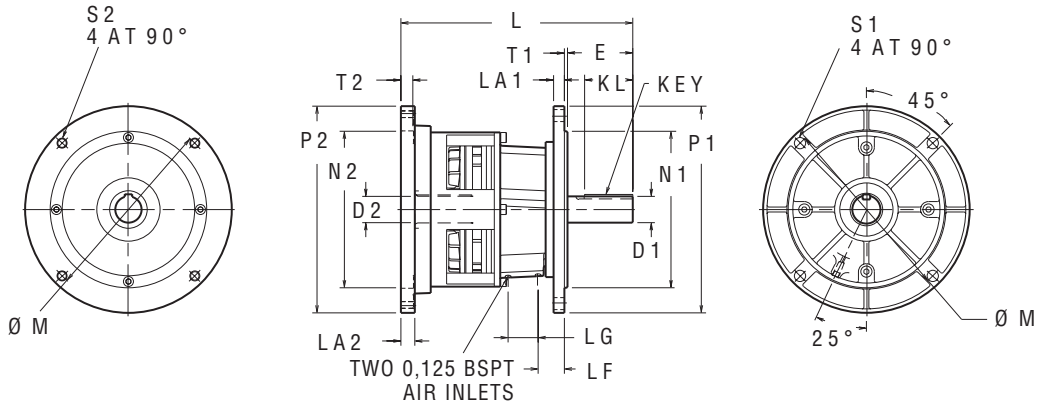
### ▶ TORQUE VS. AIR PRESSURE



NOTE: Dynamic torque is approximately 85% of static torque.

## METRIC FMCB MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

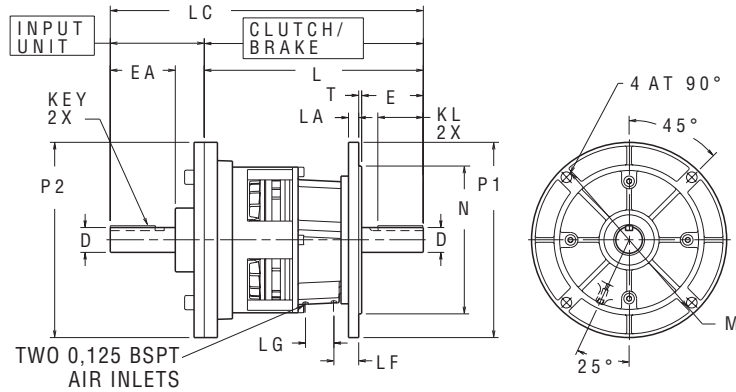
### ▶ MODELS 7-28 & 7-38



MODEL	PRODUCT NUMBER	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG*	M	N1 <sup>j6</sup>	N2 <sup>G7</sup>	P1	P2	S1	S2	T1	T2
7-28	801610	28 <sup>j6</sup>	28 <sup>G7</sup>	57	7X8	44	269	12	16	36	42	215	180	180	300	250	14	M12	4	4,8
7-38	801613	38 <sup>k6</sup>	38 <sup>F7</sup>	76	8X10	51	294	17	18	37	42	265	230	230	330	300	14	M12	4	4,8

\*Second pipe thread on FMCBE models only.

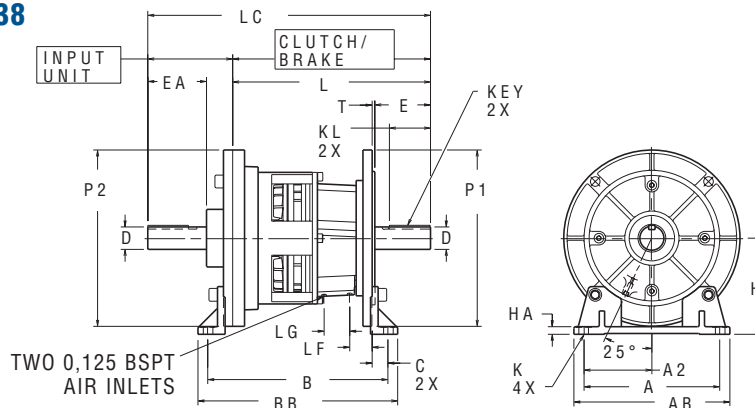
### ▶ MODELS 7-28 & 7-38 WITH INPUT



MODEL	PRODUCT NUMBER	INPUT NUMBER	D	E	EA	KEY	KL	L	LA	LC	LF	LG*	M	N <sup>j6</sup>	P1	P2	S	T
7-28	801610	801627	28 <sup>j6</sup>	57	59	7X8	44	269	13	371	36	42	215	180	250	250	14	4
7-38	801613	801628	38 <sup>k6</sup>	76	79	8X10	51	294	14	409	37	42	265	230	300	300	14	4

\*Second pipe thread on FMCBE models only.

### ▶ MODELS 7-28 & 7-38 WITH INPUT & FOOT



MODEL	PRODUCT NUMBER	INPUT NUMBER	FOOT NUMBER	A	AB	AZ	B	BB	C	D	E	EA	H	HA	K	KEY	KL	L	LC	LF	LG*	P1	P2	T
7-28	801610	801627	801632	254	292	127	271	303	26	28 <sup>j6</sup>	57	59	130	14	14	7X8	44	269	371	36	42	250	250	4
7-38	801613	801628	801633	254	292	127	280	312	26	38 <sup>k6</sup>	76	79	155	14	14	8X10	51	294	409	37	42	300	300	4

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCB CLUTCH-BRAKES – MODELS 8-38 & 8-42

FMCB Flange Mounted Clutch-Brakes with their open design, promote improved air circulation. Heat build-up and torque fade is reduced, providing longer life and greater operating efficiency. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 38 to 42 millimeters
- ▶ Available in black oxide coating
- ▶ Static Torque up to 240 Nm (brake) and 220 Nm (clutch)
- ▶ Overhung Load Capacity up to 200 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 11 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCB CLUTCH-BRAKES, OPEN DESIGN

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCB-8-38	801616	38	850 W	195	130	46
FMCB-8-42	801619	42	850 W	200	135	68

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

Model Number	Product Number	Foot Mount Set (2 Mounts) Product Number	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
FMCB-8-38	801616	801633	5	801629	6
FMCB-8-42	801619	801634	5	801630	6

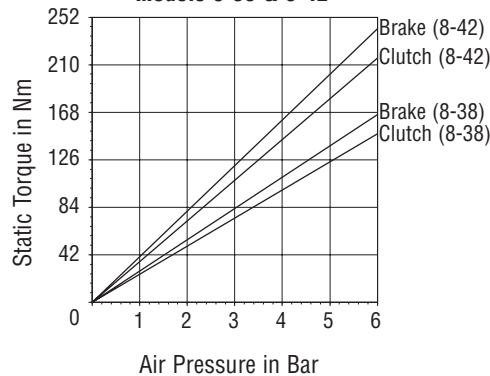
### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
4,0	1000	132M	38	FMCB-8-38
5,5	1000	132M	38	FMCB-8-38
7,5	1000	160M	42	FMCB-8-42
7,5	1500	132M	38	FMCB-8-38
11	1500	160M	42	FMCB-8-42

### ▶ TORQUE VS. AIR PRESSURE

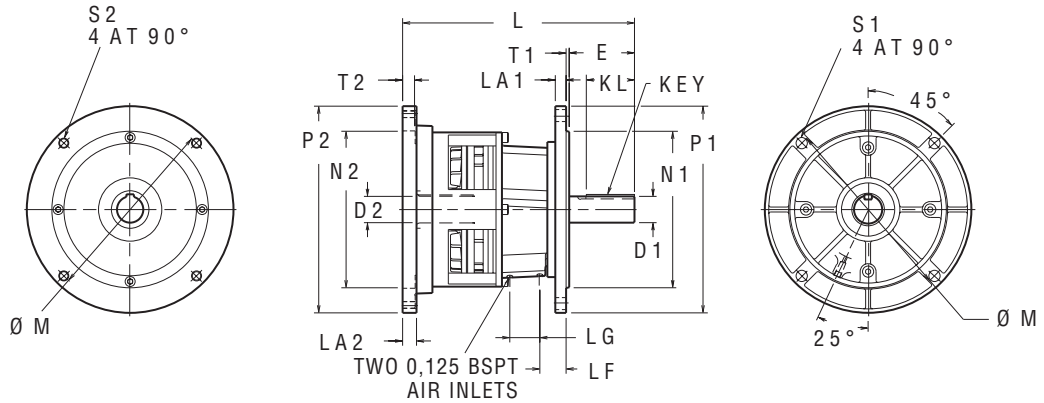
Models 8-38 & 8-42



NOTE: Dynamic torque is approximately 85% of static torque.

## METRIC FMCB MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

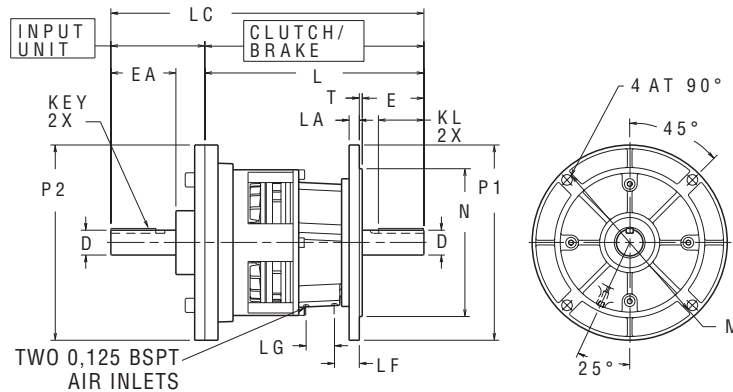
### ▶ MODELS 8-38 & 8-42



MODEL	PRODUCT NUMBER	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG*	M	N1 <sup>j6</sup>	N2 <sup>G7</sup>	P1	P2	S1	S2	T1	T2
8-38	801616	38 <sup>k6</sup>	38 <sup>F7</sup>	76	8X10	51	306	10	18	37	48	265	230	230	200	300	14	M12	4	4,8
8-42	801619	42 <sup>k6</sup>	42 <sup>F7</sup>	104	8X12	76	370	10	22	42	48	300	250	250	200	330	18	M16	5	19

\*Second pipe thread on FMCBE models only.

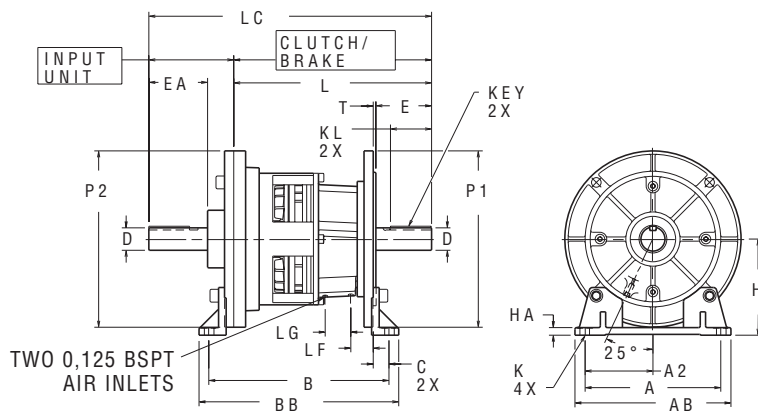
### ▶ MODELS 8-38 & 8-42 WITH INPUT



MODEL	PRODUCT NUMBER	INPUT NUMBER	D	E	EA	KEY	KL	L	LA	LC	LF	LG*	M	N1 <sup>j6</sup>	P1	P2	S	T
8-38	801616	801629	38 <sup>k6</sup>	76	79	8X10	51	306	12	435	37	48	265	230	300	300	14	4
8-42	801619	801630	42 <sup>k6</sup>	104	110	8X12	76	370	17	529	42	48	300	250	330	330	18	5

\*Second pipe thread on FMCBE models only.

### ▶ MODELS 8-38 & 8-42 WITH INPUT & FOOT



MODEL	PRODUCT NUMBER	INPUT NUMBER	FOOT NUMBER	A	AB	AZ	B	BB	C	D	E	EA	H	HA	K	KEY	KL	L	LC	LF	LG*	P1	P2	T
8-38	801616	801629	801633	254	292	127	289	320	26	38 <sup>k6</sup>	76	79	155	14	14	8X10	51	306	435	37	48	300	300	4
8-42	801619	801630	801634	254	292	127	337	374	29	42 <sup>k6</sup>	104	110	180	14	18	8X12	76	370	529	42	48	330	330	5

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCBE CLUTCH-BRAKES – MODELS 110-14, & 130-19 & 130-24

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 14 to 24 millimeters
- ▶ All units available in either electroless nickel plating or black oxide coating
- ▶ Static Torque up to 33 Nm (brake) and 33 Nm (clutch)
- ▶ Overhung Load Capacity up to 150 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 1,5 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCBE CLUTCH-BRAKES, TOTALLY ENCLOSED

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBE-110-14	801433	14	104 W	45	35	11
FMCBE-130-19	801660	19	134 W	150	100	18
FMCBE-130-24	801663	24	134 W	143	95	18
Nickel Plating:						
FMCBE-110-14	801444	14	104 W	45	35	12
FMCBE-130-19	801464	19	134 W	150	100	18
FMCBE-130-24	801484	24	134 W	150	95	18

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

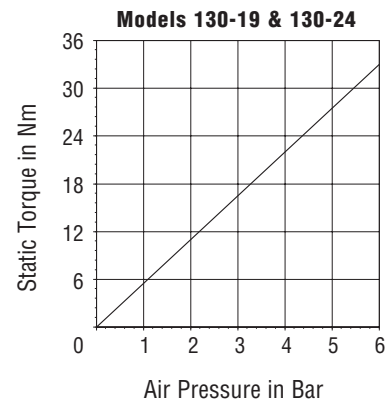
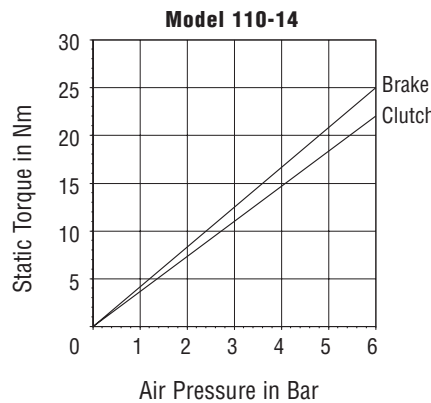
Model Number	Product Number	Foot Mount Set (2 Mounts) Product Number	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
Black Coating:					
FMCBE-110-14	801433	801435	2,2	801434	3
FMCBE-130-19	801660	801427	2,2	801424	3
FMCBE-130-24	801663	801427	2,2	801425	3
Nickel Plating:					
FMCBE-110-14	801444	801454	2,2	801445	3
FMCBE-130-19	801464	801455	2,2	801498	2,2
FMCBE-130-24	801484	801455	2,2	801499	2,2

### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
0,25	1500	71A	14	FMCBE-110-14
0,37	1000	80	19	FMCBE-130-19
0,37	1500	71B	14	FMCBE-110-14
0,55	1000	80	19	FMCBE-130-19
0,75	1000	90S	24	FMCBE-130-24
0,75	1500	80	19	FMCBE-130-19
1,1	1000	90L	24	FMCBE-130-24
1,1	1500	90S	24	FMCBE-130-24
1,5	1500	90L	24	FMCBE-130-24

### ▶ TORQUE VS. AIR PRESSURE

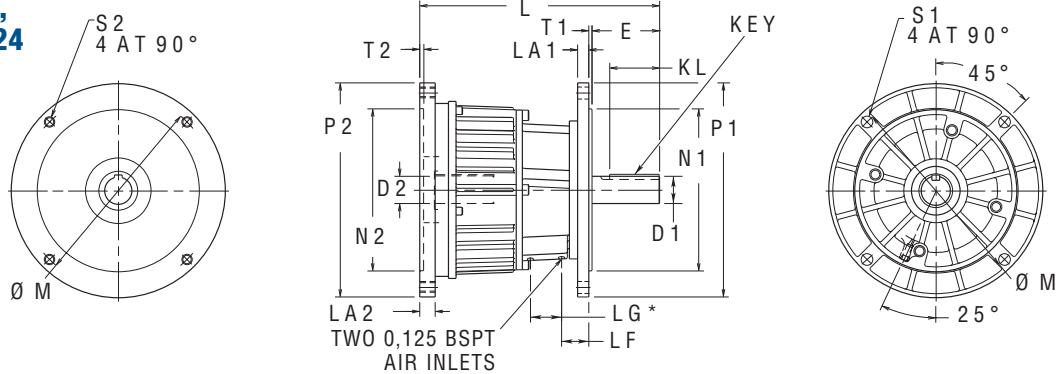


NOTE: Dynamic torque is approximately 85% of static torque.



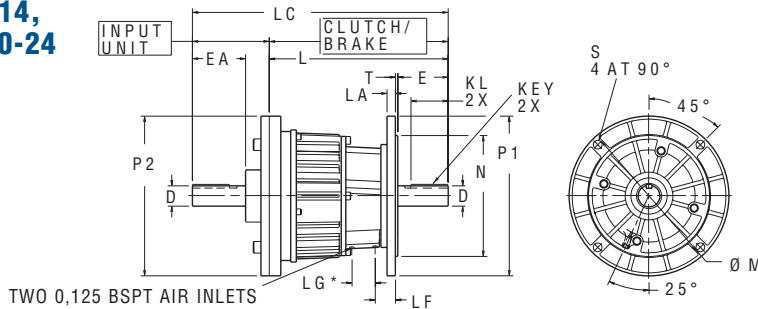
## METRIC FMCBE MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 110-14, 130-19 & 130-24



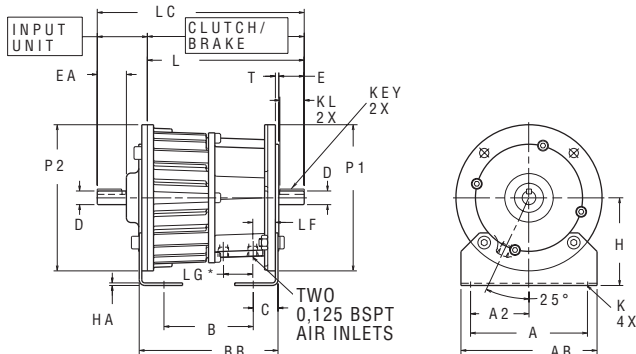
MODEL	FMCBE	FMCBE(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG	M	N1 <sup>16</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
110-14	801433	801444	14 <sup>16</sup>	14 <sup>67</sup>	27	5X5	25	161,5	8	6	23	30	130	110	110	150	150	10	M8	3,5	4
130-19	801660	801464	19 <sup>16</sup>	19 <sup>67</sup>	37	6X6	27	210,5	10	11	27	37	165	130	130	200	198	12	M10	3,5	5
130-24	801663	801484	24 <sup>16</sup>	24 <sup>67</sup>	47	7x8	35	220,5	10	11	27	37	165	130	130	200	198	12	M10	3,5	5

### ▶ MODELS 110-14, 130-19 & 130-24 WITH INPUT

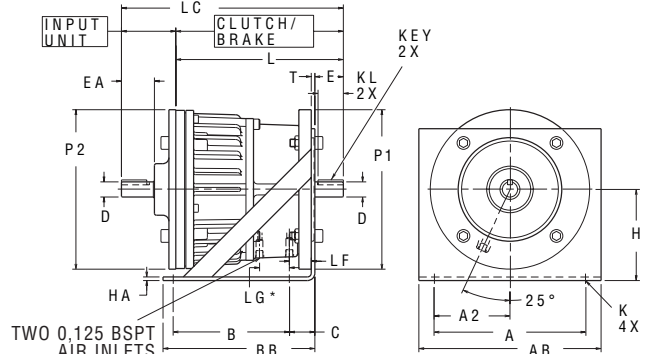


MODEL	FMCBE	FMCBE(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	LG	M	N1 <sup>16</sup>	P1	P2	S1	T
110-14	801433	801444	14 <sup>16</sup>	27	29	5X5	25	161,5	8	211,5	23	30	130	110	150	150	10	3,5
130-19	801660	801464	19 <sup>16</sup>	37	43	6X6	27	210,5	10	280,5	27	37	165	130	200	198	12	3,5
130-24	801663	801484	24 <sup>16</sup>	47	55	7x8	35	220,5	10	302,5	27	37	165	130	200	198	12	3,5

### ▶ MODELS 110-14 WITH INPUT & FOOT



### ▶ MODELS 130-19 & 130-24 WITH INPUT & FOOT



MODEL	FMCBE	FMCBE(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D1 <sup>16</sup>	E	EA	H
110-14	801433	801444	801434	801445	801435	801454	120	140	60	92	142	25	14	27	29	90
130-19	801660	801464	801424	801498	801427	801455	191	229	95	146	191	32	19	37	43	114
130-24	801663	801485	801425	801499	801427	801455	191	229	95	146	191	32	24	47	55	114

MODEL	HA	K	KEY	KL	L	LC	LF	LG	P1	P2	T
110-14	3	9X19	5X5	25	161,5	221,5	23	30	150	150	3,5
130-19	5	11	6X6	27	210,5	280,5	27	37	200	198	3,5
130-24	5	11	7x8	35	220,5	302,5	27	37	200	198	3,5

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCBE CLUTCH-BRAKES – MODELS 7-28 & 7-38

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment. Choose from

#### 2 Models:

- **Bore sizes** range from 28 to 38 millimeters
- All units available in either electroless nickel plating or black oxide coating
- Static Torque up to 125 Nm (brake) and 110 Nm (clutch)
- Overhung Load Capacity up to 180 kilograms
- Maximum Operating Speed up to 1500 rpm
- Flange mounts directly to motors and reducers
- Compatible with IEC-B5 face motors up to 5,5 KW
- Optional Foot Mount is available for belt drive applications
- Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ► METRIC FMCBE CLUTCH-BRAKES, TOTALLY ENCLOSED

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBE-7-28	801666	28	246 W	143	95	28
FMCBE-7-38	801669	38	246 W	180	120	28
Nickel Plating:						
FMCBE-7-28	801485	28	246 W	143	95	28
FMCBE-7-38	801495	38	246 W	180	120	28

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

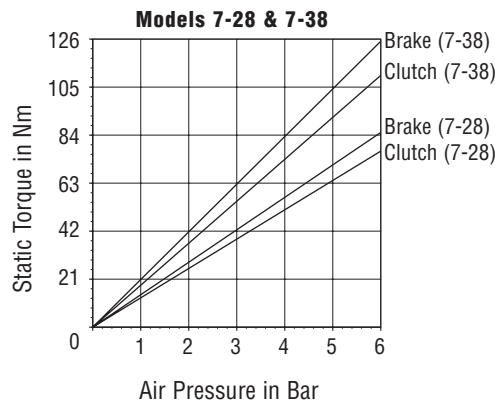
Model Number	Product Number	Foot Mount Set (2 Mounts)		Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
		Product Number	Product Number			
Black Coating:						
FMCBE-7-28	801666	801632		1,6	801627	2,2
FMCBE-7-38	801669	801633		1,6	801628	2,2
Nickel Plating:						
FMCBE-7-28	801485	801458		1,6	801575	2,2
FMCBE-7-38	801495	801460		1,6	801608	2,2

### ► IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
1,5	1000	100L	28	FMCBE-7-28
2,2	1000	112M	28	FMCBE-7-28
2,2	1500	100L	28	FMCBE-7-28
3,0	1000	132S	38	FMCBE-7-38
3,0	1500	100L	28	FMCBE-7-28
4,0	1500	112M	28	FMCBE-7-28
5,5	1500	132S	38	FMCBE-7-38

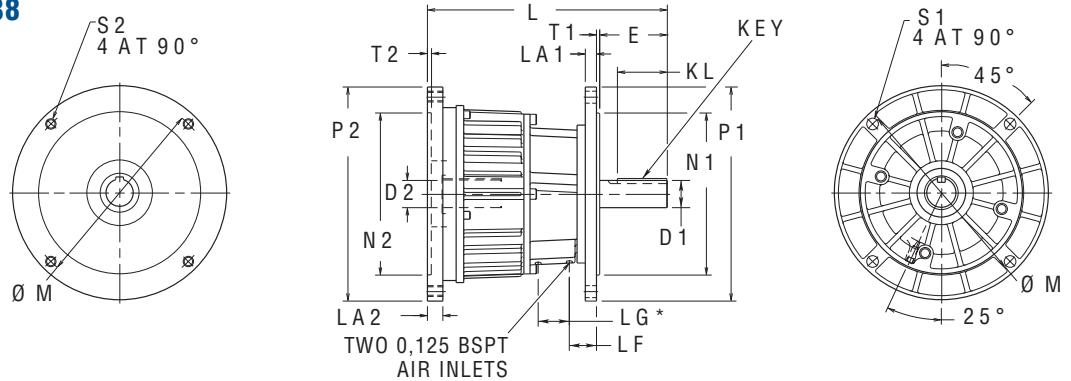
### ► TORQUE VS. AIR PRESSURE



NOTE: Dynamic torque is approximately 85% of static torque.

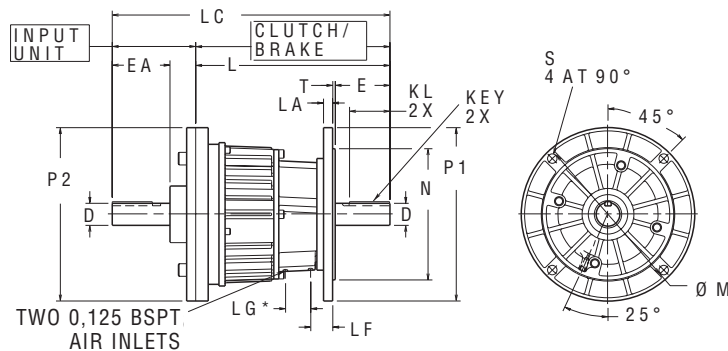
## METRIC FMCBE MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 7-28 & 7-38



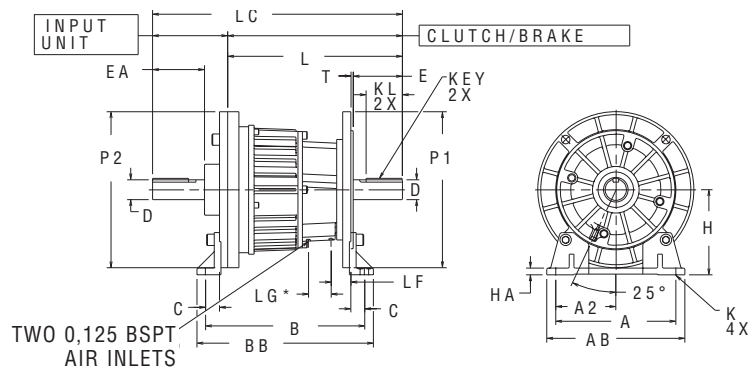
MODEL	FMCBE	FMCBE(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG	M	N1 <sup>i6</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
7-28	801666	801485	28 <sup>i6</sup>	28 <sup>67</sup>	57	7X8	44	273	13	16	36	42	215	180	180	250	244	14,5	M12	4	6
7-38	801669	801495	38 <sup>k6</sup>	38 <sup>F7</sup>	77	8X10	51	300	14	21	36	42	265	230	230	300	300	14,5	M12	4	5

### ▶ MODELS 7-28 & 7-38 WITH INPUT



MODEL	FMCBE	FMCBE(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	LG	M	N1 <sup>i6</sup>	P1	P2	S1	T
7-28	801666	801485	28 <sup>i6</sup>	57	60	7X8	44	273	13	375	36	42	215	180	200	198	12	4
7-38	801669	801495	38 <sup>k6</sup>	77	80	8X10	51	300	14	416	36	42	265	230	250	244	14,5	4

### ▶ MODELS 7-28 & 7-38 WITH INPUT & FOOT



MODEL	FMCBE	FMCBE(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D <sup>i6</sup>	E	EA	H
7-28	801666	801485	801627	801575	801632	801458	254	292	127	275	301	25	28	57	60	130
7-38	801669	801495	801628	801608	801633	801460	254	292	127	283	315	25	38	77	80	155

MODEL	HA	K	KEY	KL	L	LC	LF	LG	P1	P2	T
8-38	14	14	7X8	44	273	375	36	42	250	244	4
8-42	14	18	8X10	51	300	416	36	42	300	300	4

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCBE CLUTCH-BRAKES – MODELS 8-38 & 8-42

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 38 to 42 millimeters
- ▶ All units available in either electroless nickel plating or black oxide coating
- ▶ Static Torque up to 240 Nm (brake) and 220 Nm (clutch)
- ▶ Overhung Load Capacity up to 200 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 11 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCBE CLUTCH-BRAKES, TOTALLY ENCLOSED

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBE-8-38	801672	38	328 W	195	130	70
FMCBE-8-42	801675	42	328 W	200	135	70
Nickel Plating:						
FMCBE-8-38	801496	38	328 W	195	130	70
FMCBE-8-42	801497	42	328 W	200	135	70

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

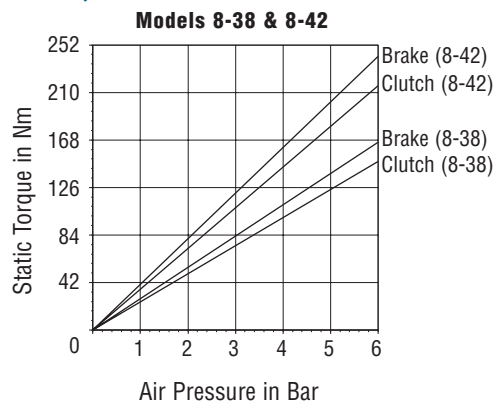
Model Number	Product Number	Foot Mount Set (2 Mounts)		Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
		Product Number	Product Number			
Black Coating:						
FMCBE-8-38	801672	801633	801629	5	801629	5
FMCBE-8-42	801675	801634	801630	5	801630	5
Nickel Plating:						
FMCBE-8-38	801496	801460	801601	5	801601	5
FMCBE-8-42	801497	801463	801602	5	801602	5

### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
4,0	1000	132M	38	FMCBE-8-38
5,5	1000	132M	38	FMCBE-8-38
7,5	1000	160M	42	FMCBE-8-42
7,5	1500	132M	38	FMCBE-8-38
11	1500	160M	42	FMCBE-8-42

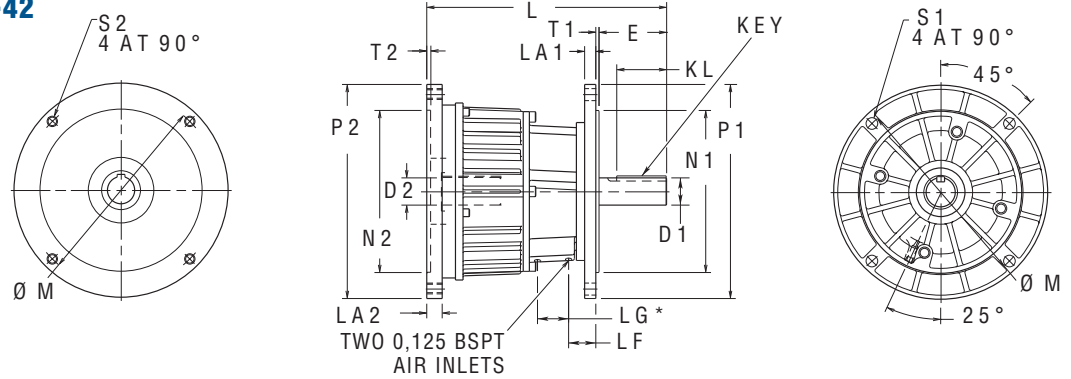
### ▶ TORQUE VS. AIR PRESSURE



NOTE: Dynamic torque is approximately 85% of static torque.

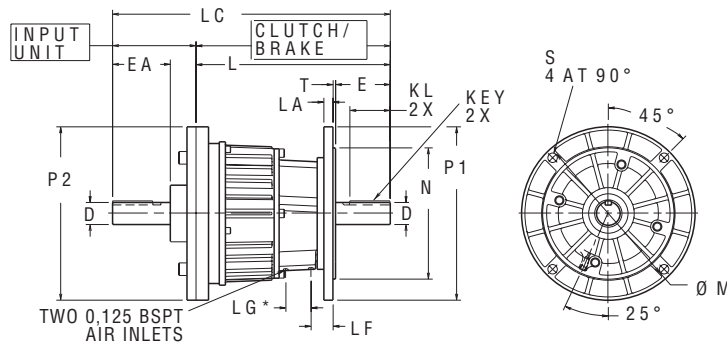
## METRIC FMCBE MODEL CLUTCH-BRAKES - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 8-38 & 8-42



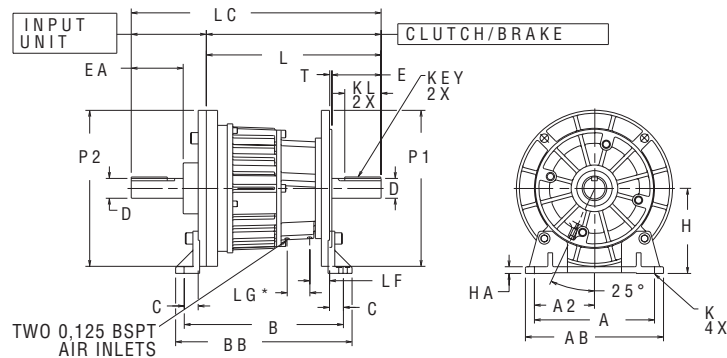
MODEL	FMCBE	FMCBE(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	LG	M	N1 <sup>16</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
8-38	801672	801496	11 <sup>k6</sup>	38 <sup>F7</sup>	77	8X10	51	314	12	21	36	48	265	230	230	300	300	14,5	M12	4	5
8-42	801675	801497	42 <sup>k6</sup>	42 <sup>F7</sup>	105	8X12	76	375	17	28	42	48	300	250	250	330	330	18,5	M16	5	5

### ▶ MODELS 8-38 & 8-42 WITH INPUT



MODEL	FMCBE	FMCBE(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	LG	M	N1 <sup>16</sup>	P1	P2	S1	T
8-38	801672	801496	11 <sup>k6</sup>	77	80	8X10	51	314	12	444	36	48	265	230	300	300	14,5	4
8-42	801675	801497	42 <sup>k6</sup>	105	110	8X12	76	375	17	534	42	48	300	250	330	330	18,5	5

### ▶ MODELS 8-38 & 8-42 WITH INPUT & FOOT



MODEL	FMCBE	FMCBE(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D <sup>16</sup>	E	EA	H
8-38	801672	801496	801629	801601	801833	801460	254	292	127	296	327	25	38	77	80	40
8-42	801675	801497	801630	801602	801634	801463	254	292	127	341	378	29	42	105	55	110

NOTE: Drawings are expressed in third angle projection.

MODEL	HA	K	KEY	KL	L	LC	LF	LG	P1	P2	T
8-38	14	14	8X10	51	314	444	36	48	300	300	4
8-42	14	18	8X12	75	375	534	42	48	330	330	5

### METRIC FMCBES CLUTCH-BRAKES – MODELS 110-14, 130-19 & 130-24

FMCBES Flange Mounted Clutch-Brakes come with a spring engaged brake and air engaged clutch, making overlap of functions impossible. For applications where safety is a concern, this unit will engage the brake in the event of air pressure loss. Choose from

#### 3 Models:

- ▶ **Bore sizes** range from 14 to 24 millimeters
- ▶ All units available in either electroless nickel plating or black oxide coating
- ▶ Static Torque up to 18 Nm (brake) and 27 Nm (clutch)
- ▶ Overhung Load Capacity up to 150 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 1,5 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

▶ **METRIC FMCBES CLUTCH-BRAKES, ENCLOSED DESIGN - SPRING ENGAGED BRAKE**  
Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBES-110-14	801451	14	104 W	45	35	11
FMCBES-130-19	801466	19	134 W	150	100	18
FMCBES-130-24	801469	24	134 W	143	95	18
Nickel Plating:						
FMCBES-110-14	801452	14	134 W	45	35	12
FMCBES-130-19	801467	19	134 W	150	100	18
FMCBES-130-24	801470	24	134 W	143	95	18

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

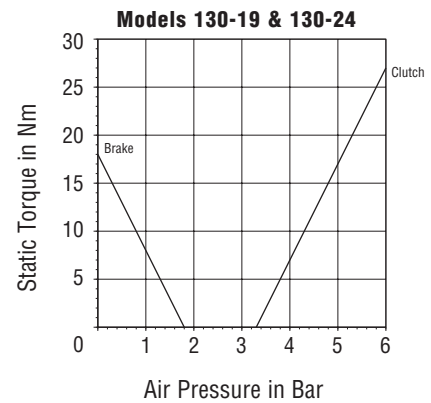
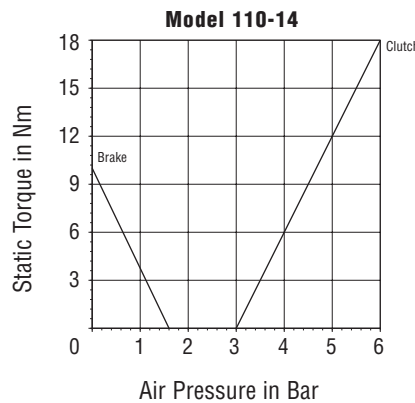
Model Number	Product Number	Foot Mount Set (2 Mounts) Product Number	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
FMCBES-110-14	801451	801435	2,2	801434	3
FMCBES-130-19	801466	801427	2,2	801424	3
FMCBES-130-24	801469	801427	2,2	801425	3
Nickel Plating:					
FMCBES-110-14	801452	801454	2,2	801445	3
FMCBES-130-19	801467	801455	2,2	801498	3
FMCBES-130-24	801470	801455	2,2	801499	3

#### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
0,25	1500	71A	14	FMCBES-110-14
0,37	1000	80	19	FMCBES-130-19
0,37	1500	71B	14	FMCBES-110-14
0,55	1000	80	19	FMCBES-130-19
0,75	1000	90S	24	FMCBES-130-24
0,75	1500	80	19	FMCBES-130-19
1,1	1000	90L	24	FMCBES-130-24
1,1	1500	90S	24	FMCBES-130-24
1,5	1500	90L	24	FMCBES-130-24

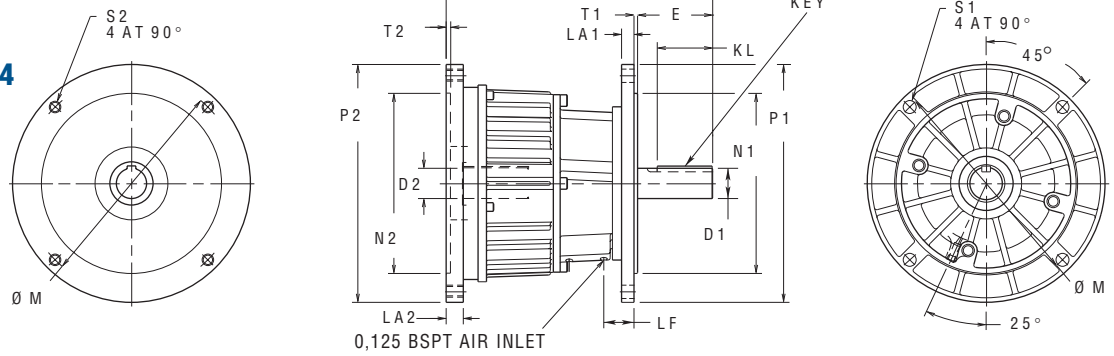
#### ▶ TORQUE VS. AIR PRESSURE



NOTE: Dynamic torque is approximately 85% of static torque.

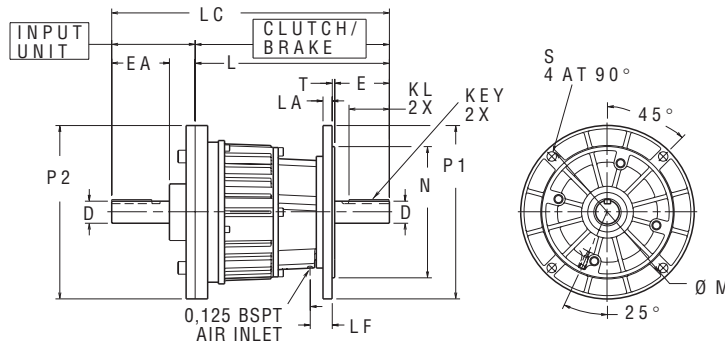
## METRIC FMCBES MODEL CLUTCH-BRAKES/SPRING ENGAGED BRAKE - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 110-14, 130-19 & 130-24



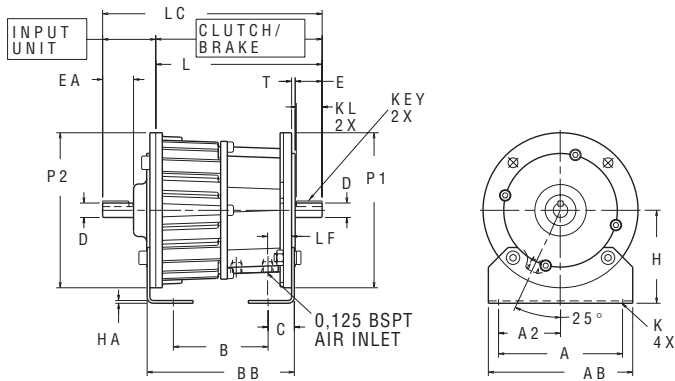
MODEL	FMCBES	FMCBES(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	M	N1 <sup>16</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
110-14	801451	801452	14 <sup>16</sup>	14 <sup>67</sup>	27	5X5	25	161,5	8	6	23	130	110	110	150	150	10	M8	3,5	4
130-19	801466	801467	19 <sup>16</sup>	19 <sup>67</sup>	37	6X6	27	210,5	10	11	27	165	130	130	200	198	12	M10	3,5	5
130-24	801469	801470	24 <sup>16</sup>	24 <sup>67</sup>	47	7x8	35	220,5	10	11	27	165	130	130	200	198	12	M10	3,5	5

### ▶ MODELS 110-14, 130-19 & 130-24 WITH INPUT

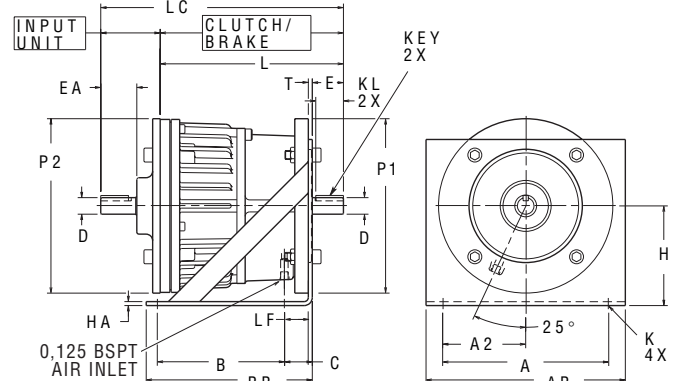


MODEL	FMCBES	FMCBES(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	M	N1 <sup>16</sup>	P1	P2	S1	T
110-14	801451	801452	14 <sup>16</sup>	27	29	5X5	25	161,5	8	211,5	23	130	110	150	150	10	3,5
130-19	801466	801467	19 <sup>16</sup>	37	43	6X6	27	210,5	10	280,5	27	165	130	200	198	12	3,5
130-24	801469	801470	24 <sup>16</sup>	47	55	7x8	35	220,5	10	302,5	27	165	130	200	198	12	3,5

### ▶ MODELS 110-14 WITH INPUT & FOOT



### ▶ MODELS 130-19 & 130-24 WITH INPUT & FOOT



MODEL	FMCBES	FMCBES(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D <sup>16</sup>	E	EA	H
110-14	801451	801452	801434	801445	801435	801454	120	140	60	92	142	25	14	27	29	90
130-19	801466	801467	801424	801498	801427	801455	191	229	95	146	191	32	19	37	43	114
130-24	801469	801470	801425	801499	801427	801455	191	229	95	146	191	32	24	47	55	114

MODEL	HA	K	KEY	KL	L	LC	LF	P1	P2	T
110-14	3	9X19	5X5	25	161,5	221,5	23	150	150	3,5
130-19	5	11	6X6	27	210,5	280,5	27	200	198	3,5
130-24	5	11	7x8	35	220,5	302,5	27	200	198	3,5

NOTE: Drawings are expressed in third angle projection.

### METRIC FMCBES CLUTCH-BRAKES – MODELS 7-28 & 7-38

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment. Choose from

#### 2 Models:

- ▶ **Bore sizes** range from 28 to 38 millimeters
- ▶ All units available in either electroless nickel plating or black oxide coating
- ▶ Static Torque up to 46 Nm (brake) and 64 Nm (clutch)
- ▶ Overhung Load Capacity up to 180 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 5,5 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

### ▶ METRIC FMCBES CLUTCH-BRAKES, ENCLOSED DESIGN - SPRING ENGAGED BRAKE

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBES-7-28	801472	28	246 W	143	95	28
FMCBES-7-38	801475	38	246 W	180	120	28
Nickel Plating:						
FMCBES-7-28	801473	28	246 W	143	95	28
FMCBES-7-38	801476	38	246 W	180	120	28

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

Model Number	Product Number	Foot Mount Set (2 Mounts) Product Number	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
FMCBES-7-28	801472	801432	1,5	801627	5
FMCBES-7-38	801475	801433	1,5	801628	5
Nickel Plating:					
FMCBES-7-28	801473	801458	1,5	801575	5
FMCBES-7-38	801476	801460	1,5	801608	5

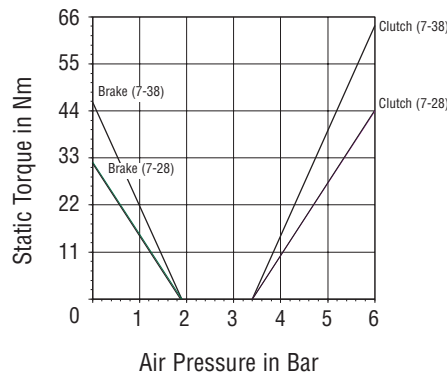
### ▶ IEC MOTOR/FRAME SELECTION CHART

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
1,5	1000	100L	28	FMCBES-7-28
2,2	1000	112M	28	FMCBES-7-28
2,2	1500	100L	28	FMCBES-7-28
3,0	1000	132S	38	FMCBES-7-38
3,0	1500	100L	28	FMCBES-7-28
4,0	1500	112M	28	FMCBES-7-28
5,5	1500	132S	38	FMCBES-7-38

### ▶ TORQUE VS. AIR PRESSURE

Models 7-28 & 7-38

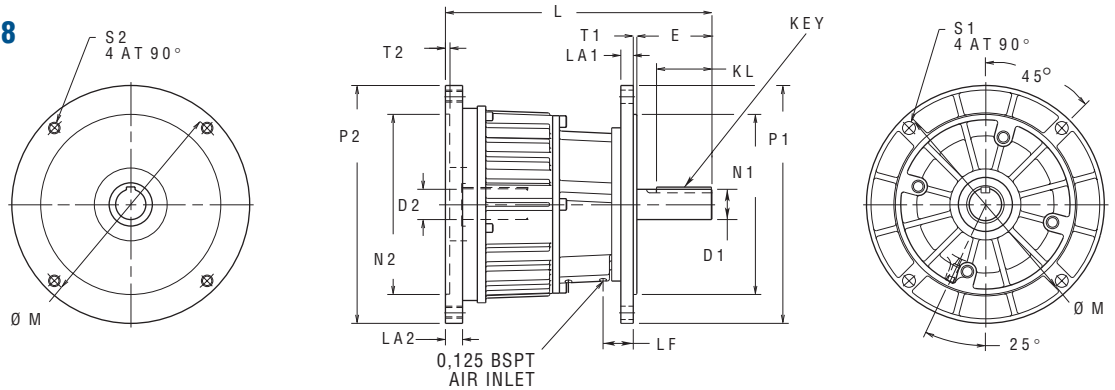


NOTE: Dynamic torque is approximately 85% of static torque.



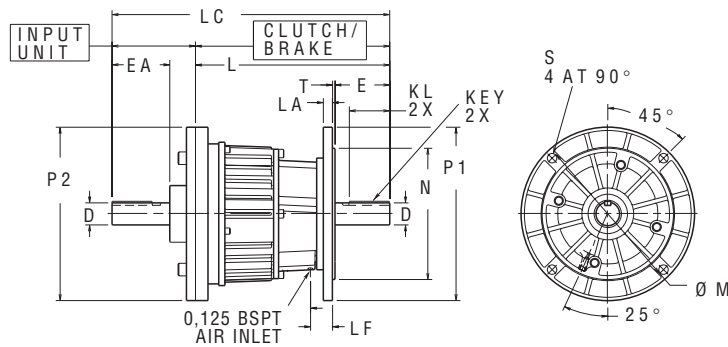
## METRIC FMCBES MODEL CLUTCH-BRAKES/SPRING ENGAGED BRAKE - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 7-28 & 7-38



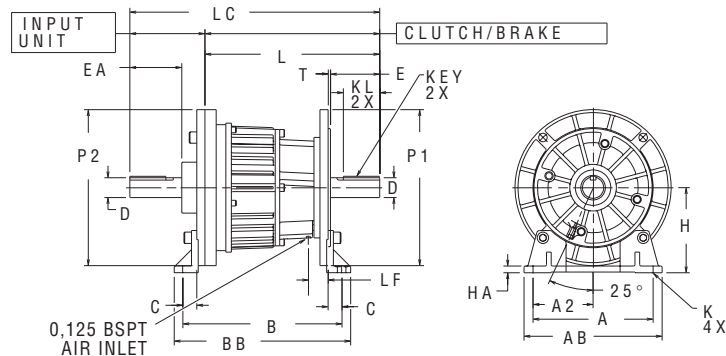
MODEL	FMCBES	FMCBES(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	M	N1 <sup>i6</sup>	N2 <sup>67</sup>	P1	P2	S1	S2	T1	T2
7-28	801472	801473	28 <sup>i6</sup>	28 <sup>67</sup>	57	7X8	44	273	13	16	36	215	180	180	250	244	14,5	M12	4	6
7-38	801475	801476	38 <sup>k6</sup>	38 <sup>F7</sup>	77	8X10	51	300	14	21	36	265	230	230	300	300	14,5	M12	4	5

### ▶ MODELS 7-28 & 7-38 WITH INPUT



MODEL	FMCBES	FMCBES(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	M	N1 <sup>i6</sup>	P1	P2	S1	T
7-28	801472	801473	28 <sup>i6</sup>	57	60	7X8	44	273	13	375	36	215	180	200	244	14,5	4
7-38	801475	801476	38 <sup>k6</sup>	77	80	8X10	51	300	14	416	36	265	230	250	300	14,5	4

### ▶ MODELS 7-28 & 7-38 WITH INPUT & FOOT



MODEL	FMCBES	FMCBES(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D1 <sup>i6</sup>	E	EA	H
7-28	801472	801473	801627	801575	801632	801458	254	292	127	275	301	25	28	57	60	130
7-38	801475	801476	801628	801608	801633	801460	254	292	127	283	315	25	38	77	80	155

MODEL	HA	K	KEY	KL	L	LC	LF	P1	P2	T
8-38	14	14	7X8	44	273	375	36	250	244	4
8-42	14	18	8X10	51	300	416	36	300	300	4

NOTE: Drawings are expressed in third angle projection.

**METRIC FMCBES CLUTCH-BRAKES – MODELS 8-38 & 8-42**

FMCBE Flange Mounted Clutch-Brakes are designed for controlled starts and stops in hostile, dirty environments. Totally enclosed design prevents contaminants from interfering with operation of the units while keeping worn friction material from escaping into the environment. Choose from

**2 Models:**

- ▶ **Bore sizes** range from 38 to 42 millimeters
- ▶ All units available in either electroless nickel plating or black oxide coating
- ▶ Static Torque up to 103 Nm (brake) and 104 Nm (clutch)
- ▶ Overhung Load Capacity up to 200 kilograms
- ▶ Maximum Operating Speed up to 1500 rpm
- ▶ Flange mounts directly to motors and reducers
- ▶ Compatible with IEC-B5 face motors up to 11 KW
- ▶ Optional Foot Mount is available for belt drive applications
- ▶ Optional Input Unit allows you to incorporate pulleys or coupling into your application

**▶ METRIC FMCBES CLUTCH-BRAKES, ENCLOSED DESIGN - SPRING ENGAGED BRAKE**

Standard Clutch-Brake is Flange Mounted. Order Foot Mount separately for belt drive applications. Order Input Unit to incorporate pulleys into your application.

Model Number	Product Number	Shaft/Bore (mm)	Thermal Capacity Up To	OVERHUNG LOAD CAPACITY (kg)		Shipping Wt. (kg)
				1000 RPM	1500 RPM	
Black Coating:						
FMCBES-8-38	801478	38	328 W	195	130	70
FMCBES-8-42	801481	42	328 W	200	135	70
Nickel Plating:						
FMCBES-8-38	801479	38	328 W	195	130	70
FMCBES-8-42	801482	42	328 W	200	135	70

NOTE: Thermal Capacity and Overhung Load data is based upon 50% clutch and 50% brake usage.

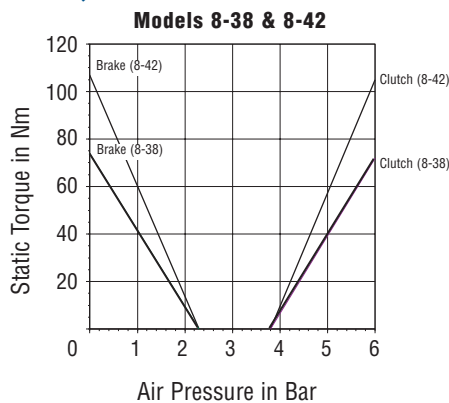
Model Number	Product Number	Foot Mount Set (2 Mounts)	Shipping Wt. (kg)	Input Unit Product Number	Shipping Wt. (kg)
		Product Number			
Black Coating:					
FMCBES-8-38	801478	801633	5	801629	6
FMCBES-8-42	801481	801634	5	801630	6
Nickel Plating:					
FMCBES-8-38	801479	801460	5	801601	6
FMCBES-8-42	801482	801463	5	801602	6

**▶ IEC MOTOR/FRAME SELECTION CHART**

Use this chart as specification and operational criteria for your application.

KW of Motor	RPM	Frame Number	Motor Shaft (mm)	Clutch-Brake Model Number
4,0	1000	132M	38	FMCBES-8-38
5,5	1000	132M	38	FMCBES-8-38
7,5	1000	160M	42	FMCBES-8-42
7,5	1500	132M	38	FMCBES-8-38
11	1500	160M	42	FMCBES-8-42

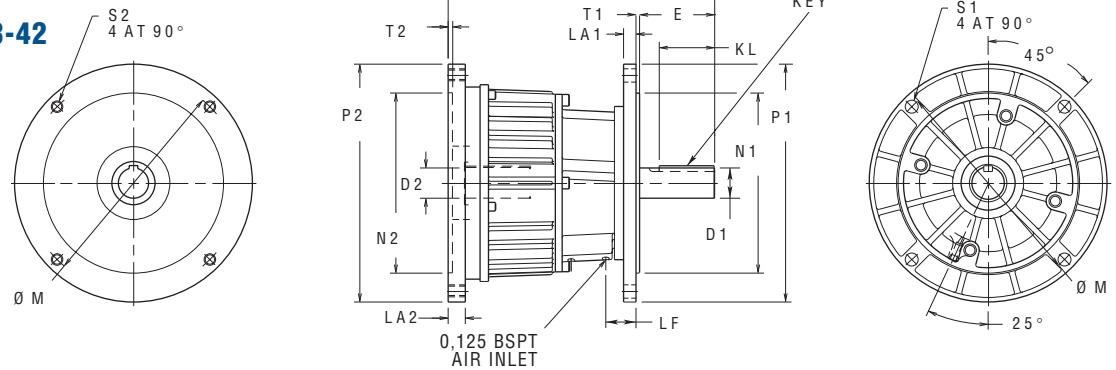
**▶ TORQUE VS. AIR PRESSURE**



NOTE: Dynamic torque is approximately 85% of static torque.

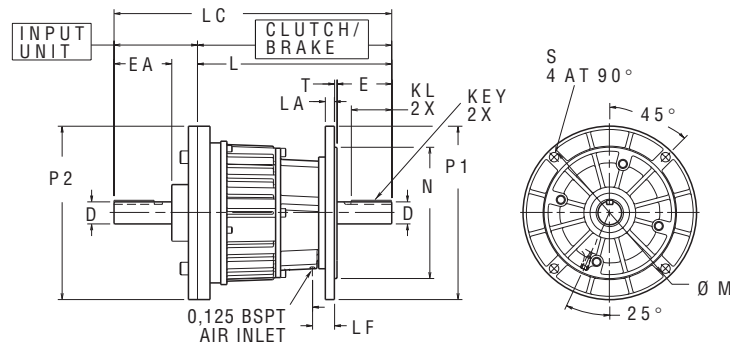
## METRIC FMCBES MODEL CLUTCH-BRAKES/SPRING ENGAGED BRAKE - APPROXIMATE DIMENSIONS (MILLIMETERS)

### ▶ MODELS 8-38 & 8-42



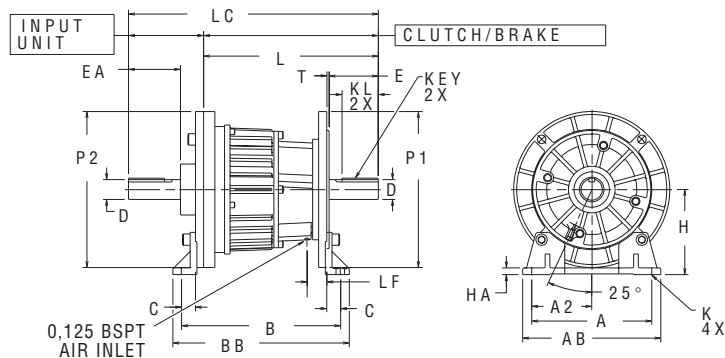
MODEL	FMCBES	FMCBES(NICKEL)	D1	D2	E	KEY	KL	L	LA1	LA2	LF	M	N1 <sup>i6</sup>	N2 <sup>G7</sup>	P1	P2	S1	S2	T1	T2
8-38	801478	801479	38 <sup>k6</sup>	38 <sup>F7</sup>	77	8X10	51	314	12	21	36	265	230	230	300	300	14,5	M12	4	5
8-42	801481	801482	42 <sup>k6</sup>	42 <sup>F7</sup>	105	8X12	76	375	17	28	42	300	250	250	330	330	18,5	M16	5	5

### ▶ MODELS 8-38 & 8-42 WITH INPUT



MODEL	FMCBES	FMCBES(NICKEL)	D1	E	EA	KEY	KL	L	LA	LC	LF	M	N1 <sup>i6</sup>	P1	P2	S1	T
8-38	801478	801479	11 <sup>k6</sup>	77	80	8X10	51	314	12	444	36	265	230	300	300	14,5	4
8-42	801481	801482	42 <sup>k6</sup>	105	110	8X12	76	375	17	534	42	300	250	330	330	18,5	5

### ▶ MODELS 8-38 & 8-42 WITH INPUT & FOOT



MODEL	FMCBES	FMCBES(NICKEL)	INPUT(BLK)	INPUT(NICKEL)	FOOT(BLK)	FOOT(NICKEL)	A	AB	AZ	B	BB	C	D <sup>i6</sup>	E	EA	H
8-38	801478	801479	801629	801601	801633	801460	254	292	127	296	327	25	38	77	80	40
8-42	801481	801482	801630	801602	801634	801463	254	292	127	341	378	29	42	105	55	110

MODEL	HA	K	KEY	KL	L	LC	LF	P1	P2	T
8-38	14	14	8X10	51	314	444	36	300	300	4
8-42	14	18	8X12	75	375	534	42	330	330	5

NOTE: Drawings are expressed in third angle projection.

**METRIC FLANGE MOUNTED CLUTCH-BRAKES**

Choose from **3 design options:**

**FMCB** basic open clutch-brake:

- ▶ Available in black oxide coating
- ▶ **Bore/Shaft** sizes from 19 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys and couplings

**FMCBE** basic enclosed clutch-brake:

- ▶ Available in either electroless nickel plating or black oxide coating
- ▶ **Bore/Shaft** sizes from 14 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys or couplings

**FMCBES** enclosed, spring engaged clutch-brake:

- ▶ Spring engaged brake combined with air engaged clutch
- ▶ Double acting piston design prevents overlap of clutch and brake functions
- ▶ Available in either electroless nickel plating or black oxide coating
- ▶ **Bore/shaft sizes** from 14 to 42 millimeters
- ▶ Flange or Foot mount capability
- ▶ Optional Input Unit for use with pulleys or couplings

**METRIC FLANGE MOUNTED CLUTCH-BRAKES**

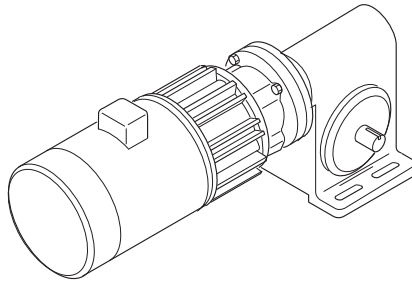
Metric Flange Mounted Clutch-Brakes are available in both an Open and an Enclosed design. The Open Design promotes improved air circulation for longer life and greater operating efficiency. The Enclosed design keeps dirt, dust, moisture and other contaminants out and worn friction material from escaping

These clutch-brakes mount directly to IEC-Face motors and reducers and provide absolute control. These units fit IEC frame sizes 71A to 160M.

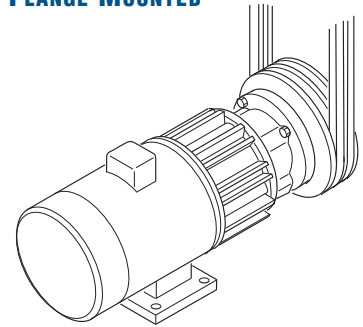
**TYPICAL APPLICATIONS**

Shown below are four typical mounting applications for these Clutch-Brakes. Any of the three design options (FMCBE, FMCBES or FMCB) can be mounted in any one of these configurations. You will find the specific product requirements listed on the catalog page for each design style.

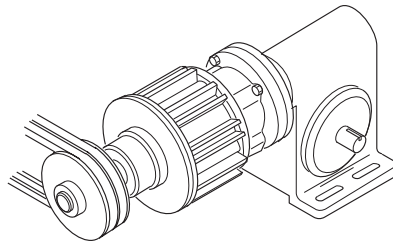
▶ **FLANGE MOUNTED**



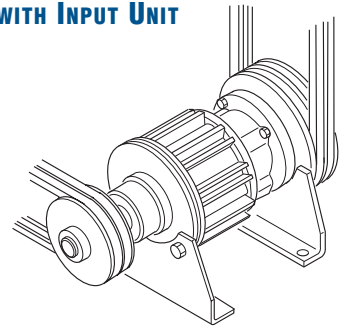
▶ **FLANGE MOUNTED**

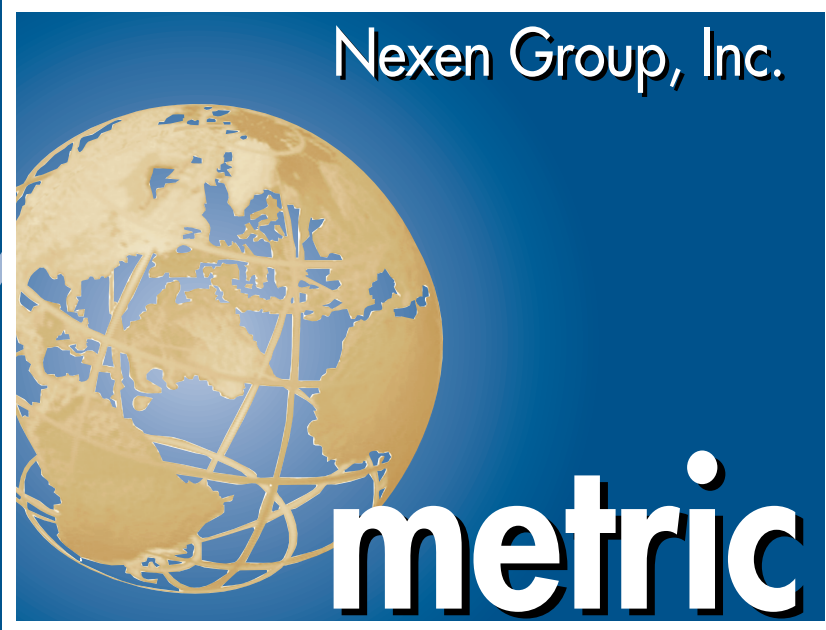


▶ **FLANGE MOUNTED WITH INPUT UNIT**



▶ **FOOT MOUNTED WITH INPUT UNIT**



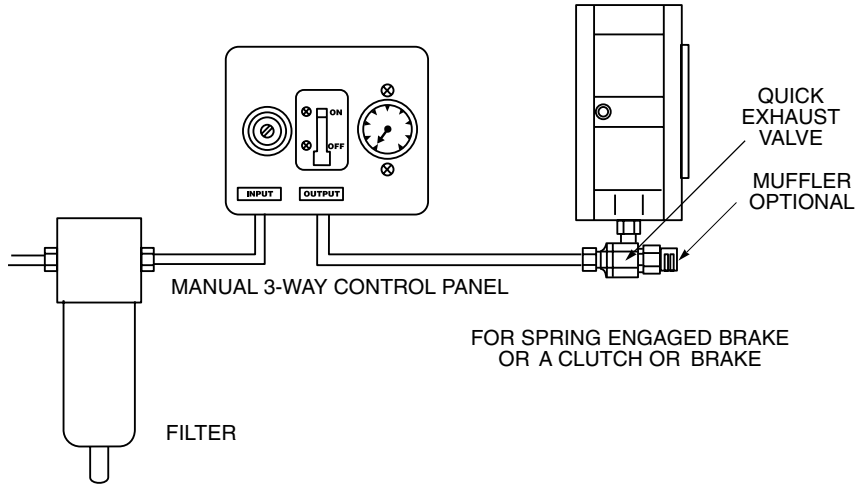


# CONTROLS

<b>This Section Contains:</b>	<b>Page</b>
Typical Circuit Diagrams .....	78-81

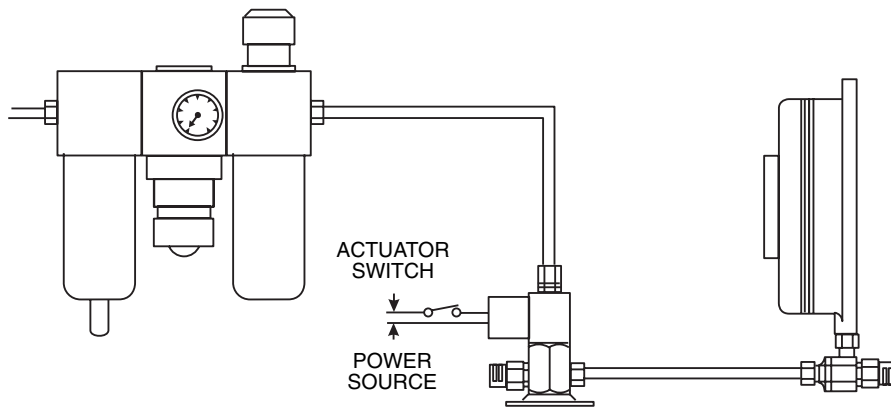


TYPICAL CIRCUIT DIAGRAMS



3-WAY CONTROL — N.O. — DISENGAGES CLUTCH OR BRAKE WHEN ACTUATOR SWITCH IS CLOSED

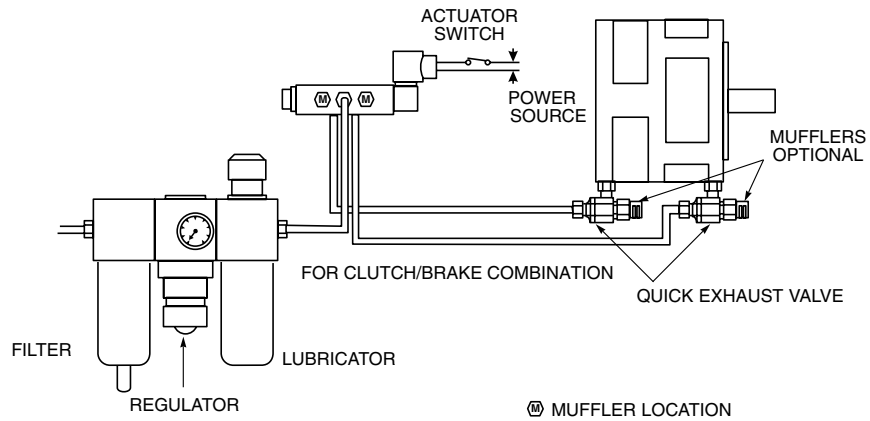
CONTROL KIT - SINGLE UNIT



▶ **TYPICAL CIRCUIT DIAGRAMS**

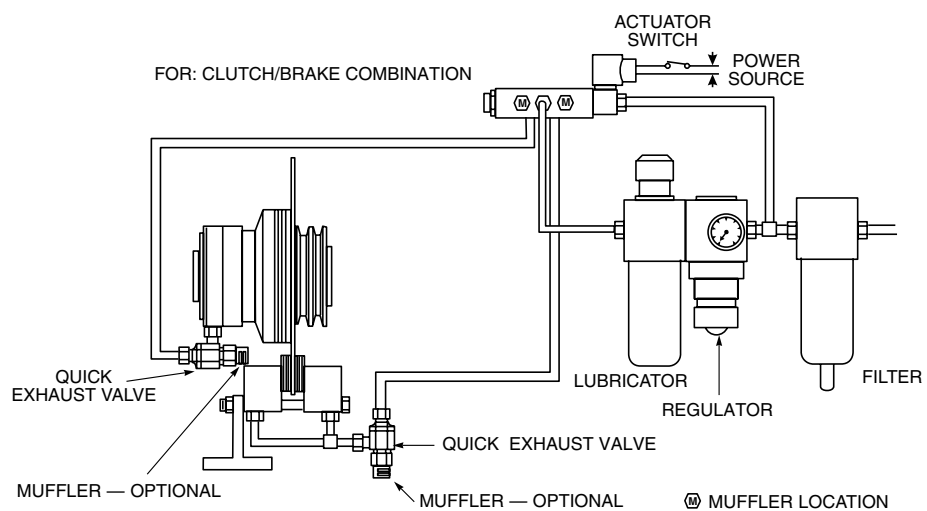
**4-WAY SINGLE SOLENOID SPOOL CONTROL — INTERNALLY PILOTED — N.C. FOR OPERATING CLUTCH AND BRAKE AT PRESSURES 1 TO 7 BAR**

**CONTROL KIT - 4-Way**



**4-WAY SINGLE SOLENOID SPOOL CONTROL — EXTERNALLY PILOTED — N.C. FOR OPERATING CLUTCH AND BRAKE AT PRESSURES 1 TO 7 BAR**

**CONTROL KIT - 4 or 5-Way**



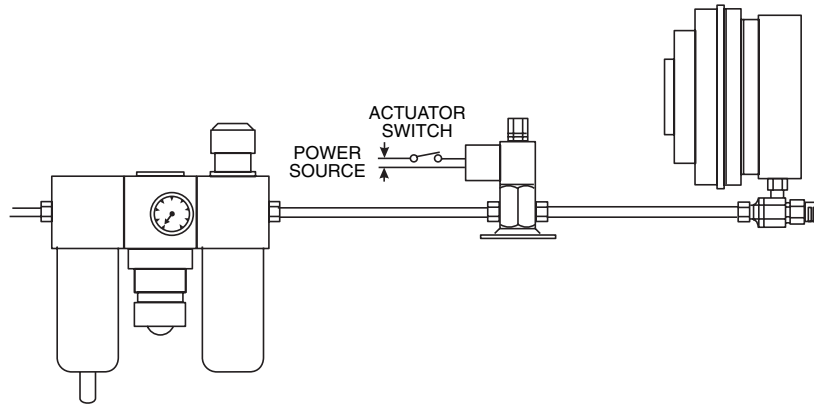
## CONTROLS

“Air Champ”

### TYPICAL CIRCUIT DIAGRAMS

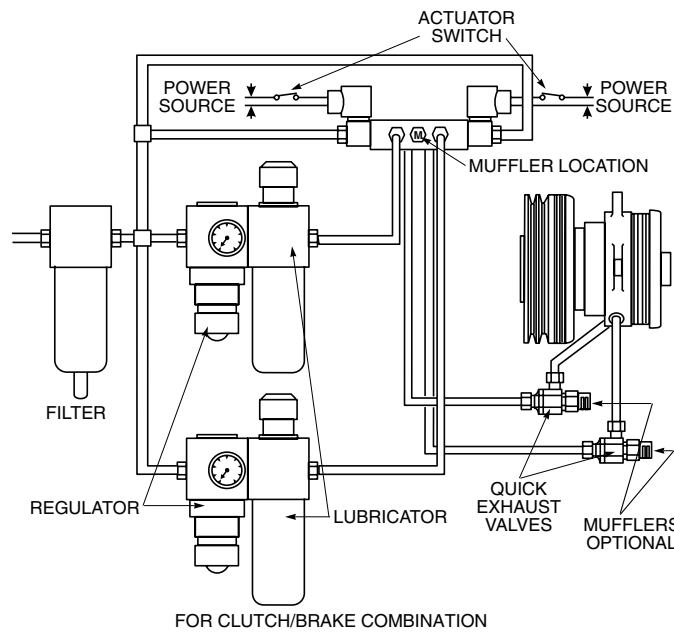
**3-WAY CONTROL — N.C. — ENGAGES CLUTCH OR BRAKE WHEN ACTUATOR SWITCH IS CLOSED**

**CONTROL KIT - SINGLE UNIT**



**5-WAY DOUBLE SOLENOID SPOOL CONTROL — EXTERNALLY PILOTED FOR OPERATING CLUTCH AND BRAKE AT DIFFERENT AIR PRESSURES USING ONE CONTROL — FROM 1 TO 7 BAR**

**CONTROL KIT - TWO UNITS**

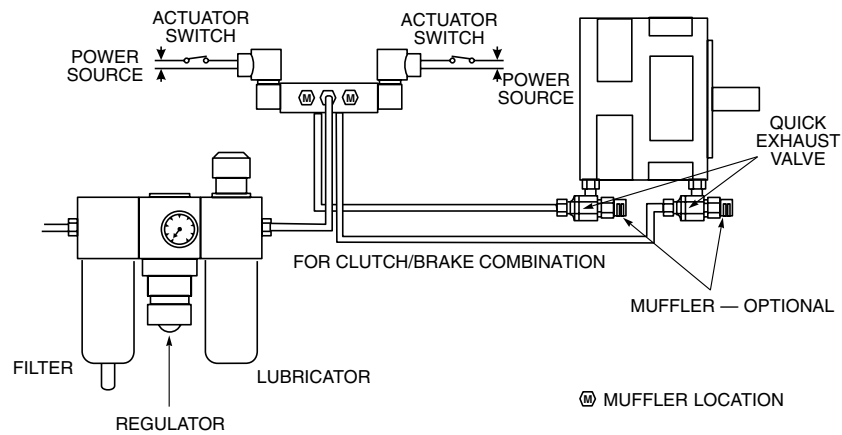




## ▶ TYPICAL CIRCUIT DIAGRAMS

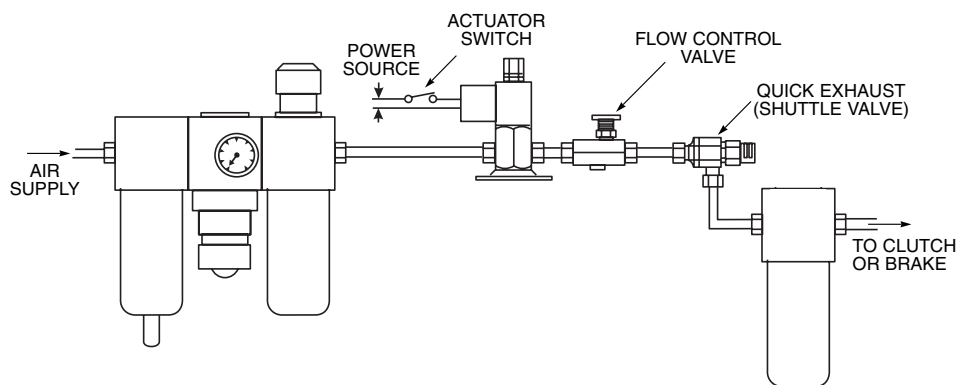
### 4-WAY DOUBLE SOLENOID CONTROL — INTERNALLY PILOTED FOR CLUTCH AND BRAKE OPERATING ABOVE 30 CPM — FROM 1 TO 7 BAR

#### CONTROL KIT - 4-Way



### SOFT START OR STOP CIRCUIT

#### CONTROL KIT - 3-Way

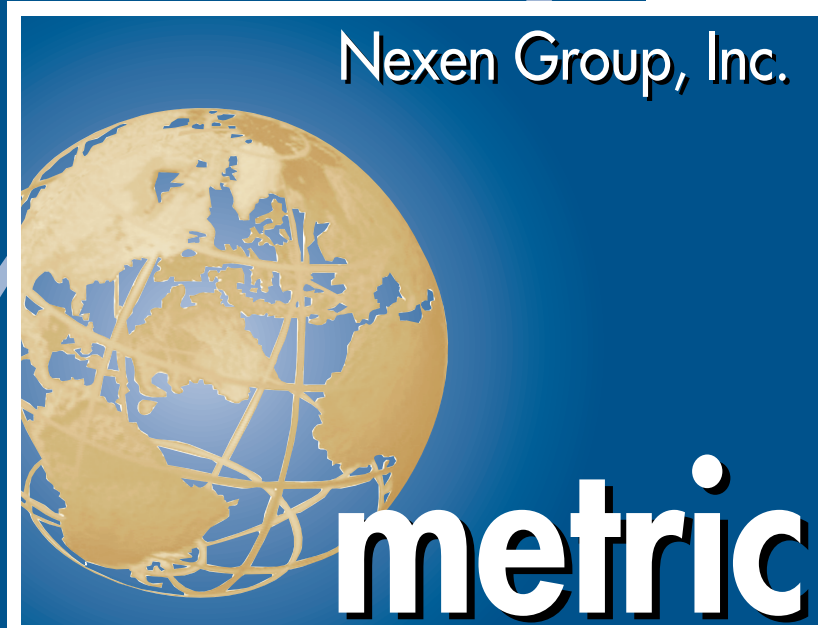


◀ **REPAIR KITS**

“Air Champ”<sup>®</sup>

▶ **PRODUCT SELECTION CHART**

Product Groups	Repair Kits Open Design	Repair Kits Enclosed Design	Facing Kits
Friction Clutch Models BW, B-275, F-450, L-600, M-800, H-1000, XHW, FW, LW, MW, HW	Yes		Yes
5H Series Tooth Clutches	Yes	Yes	
TL Series Torque Limiters	Yes	Yes	
Friction Brake Models S-450, S-600, S-800, S-1000, T-450, T-600, T-800, T-1000	Yes		Yes
Caliper Brakes Models DB, BC, BD, SPC	Yes		Yes
Spring Engaged Brake Models TSE, SE, MB, SSE	Yes		Yes
Clutch-Brake Flange Mounted Models FMC, FMCB, FMCBE, FMCBS	Yes	Yes	Yes



## REPAIR KITS

<b>This Section Contains:</b>	<b>Page</b>
Friction Clutch Models	
BW, B-275, F-450, L-600, M-800, H-1000 . . .	.84
5H Series Tooth Clutches . . . . .	.84
TL Series Torque Limiters . . . . .	.84
Friction Brake Models	
S-450, S-600, S-800, S-1000 . . . . .	.85
Caliper Brake Models DB, BC, BD, SPC . . . . .	.85
Metric Spring Engaged Straight	
Bore SSE Brakes . . . . .	.85
Models FMCB, FMCE, FMCBES . . . . .	.86



### REPAIR KITS & FACING KITS FOR FRICTION CLUTCHES

### REPAIR KITS FOR 5H SERIES TOOTH CLUTCHES

### REPAIR KITS FOR TL SERIES TORQUE LIMITERS

### REPAIR KITS & FACING KITS FOR FRICTION CLUTCH MODELS BW, B-275, F-450, L-600, M-800, H-1000

Repair Kits contain: Bearings, O-Rings and Return Springs.  
Facing Kits contain: Facings and Screws.

Models	Repair Kit Product Number	Standard Facing	Loco Facing	Hico Facing
BW Model	846800	846871	---	---
B-275 Model	802874	846871	---	---
F-450 Model	802880	950070	950071	950072
L-600 Model	805280	950170	950171	950172
M-800 Model	807680	950270	950271	950272
H-1000 Model	810080	950370	950371	950372

### REPAIR KITS FOR 5H SERIES TOOTH CLUTCHES

Open Design Repair Kits contain: Bearings, O-Rings and Springs  
Enclosed Design Repair Kits contain: Bearings, O-Rings, Springs and Back-up Rings.

Open Design Flange Mount Models	Repair Kit Product Number	Open Design Single Position Pilot Mount Models	Repair Kit Product Number	Open Design Pilot Mount Models	Repair Kit Product Number
5H30	916200	5H30P-SP	913300	5H30P	916900
5H35	916300	5H35P-SP	913400	5H35P	917000
5H40	916400	5H40P-SP	913500	5H40P	917100
5H45	916500	5H45P-SP	913600	5H45P	917200
5H50	916600	5H50P-SP	913700	5H50P	917300
5H60	916700	5H60P-SP	913800	5H60P	917400
5H70	916800	5H70P-SP	914000	5H70P	917500
		5H80P-SP	913900	5H80P	916100
		Enclosed Design Single Position Pilot Mount Models	Repair Kit Product Number	Enclosed Design Pilot Mount Models	Repair Kit Product Number
		5H30PSP-E	913009	5H30P-E	913008
		5H35PSP-E	913019	5H35P-E	913018
		5H40PSP-E	913029	5H40P-E	913028
		5H45PSP-E	913039	5H45P-E	913038
		5H50PSP-E	913049	5H50P-E	913048
		5H60PSP-E	913059	5H60P-E	913058

### REPAIR KITS FOR TL SERIES TORQUE LIMITERS

Repair Kits contain: Bearings, O-Rings, Springs and Back-up Rings  
Metric Models use same Repair Kits

Set Screw Mount Models	Repair Kit Product Number
TL-20A-E	802908
TL-30A-E	802918
TL-40A-E	802928
TL-50A-E	802938
TL-60A-E	802948

**REPAIR KITS & FACING KITS  
FOR FRICTION BRAKES**

**REPAIR KITS & FACING KITS  
FOR SPRING ENGAGED BRAKES**

**REPAIR KITS & FACING KITS  
FOR CALIPER BRAKES**

▶ **REPAIR KITS & FACING KITS FOR FRICTION BRAKE MODELS S-450, S-600, S-800, S-1000**

Repair Kits contain: Bearings, O-Rings and Return Springs.  
Facing Kits contain: Facings and Screws.

Models	Repair Kit Product Number	Standard Facing Kit Product Number	Loco Facing Kit Product Number	Hico Facing Kit Product Number
S-450 Models	818910	818975	818976	818977
S-600 Models	820510	820575	820576	820577
S-800 Models	827410	827475	827476	827477
S-1000 Models	827510	827575	827576	827577

▶ **REPAIR KITS & FACING KITS FOR CALIPER BRAKE MODELS DB, BC, BD, SPC**

Repair Kits contain: Sleeve Bearings, Return Springs, Seals, Facings and Screws  
Facing Kits contain: Facings and Screws.

Standard Models	Repair Kit Product Number	Standard Facing Kit Product Number	Loco Facing Kit Product Number	Hico Facing Kit Product Number
DB	---	835600	835601	835602
BC288A	835272	---	---	835271 (2 required)
BC425A	835274	---	---	835271 (3 required)
BC288S	835273	---	---	835271 (2 required)
BC425S	835275	---	---	835271 (3 required)
BD	933900	---	934001	934000
SPC-8A	837472	---	837473	837471
SPC-12A	837472	---	837473	837471
SPC-20A	837472	---	837473	837471
SPC-8S	837472	---	837473	837471
SPC-12S	837472	---	837473	837471
SPC-20S	837472	---	837473	837471

▶ **REPAIR KITS & FACING KITS FOR SPRING ENGAGED BRAKE MODEL SSE**

**Metric Spring Engaged Straight Bore Brakes**

Repair Kits contain: Bearings, O-Rings and Springs  
Facing Kits contain: Facings and Screws.

Standard Models	Repair Kit Product Number	Hico Facing Kit Product Number
SSE-450 Models	818870	818974
SSE-600 Models	820370	820574
SSE-800 Models	822470	827474
SSE-1000 Models	822570	827574

**REPAIR KITS & FACING KITS  
FLANGE CLUTCH-BRAKES**

**REPAIR KITS FOR THRU-SHAFT  
CLUTCH-BRAKES**

**REPAIR KITS & FACING KITS FOR IEC FLANGE CLUTCH-BRAKE MODELS  
FMCB, FMCBE, FMCBES**

**FMCB, Air Engaged**

Repair Kits contain: Bearings and O-Rings  
Facing Kits contain: Facings and Screws

Standard Models	Repair Kit Product Number	Clutch Facing Kit Product Number	Brake Facing Kit Product Number
FMCB-130-19	801428	801477	801430
FMCB-130-24	801428	801477	801430
FMCB-7-28	801637	801644	801605
FMCB-7-38	801638	801646	801645
FMCB-8-38	801639	801648	801647
FMCB-8-42	801640	801650	801649

**FMCBE, Air Engaged**

Repair Kits contain: Bearings and O-Rings  
Facing Kits contain: Facings and Screws

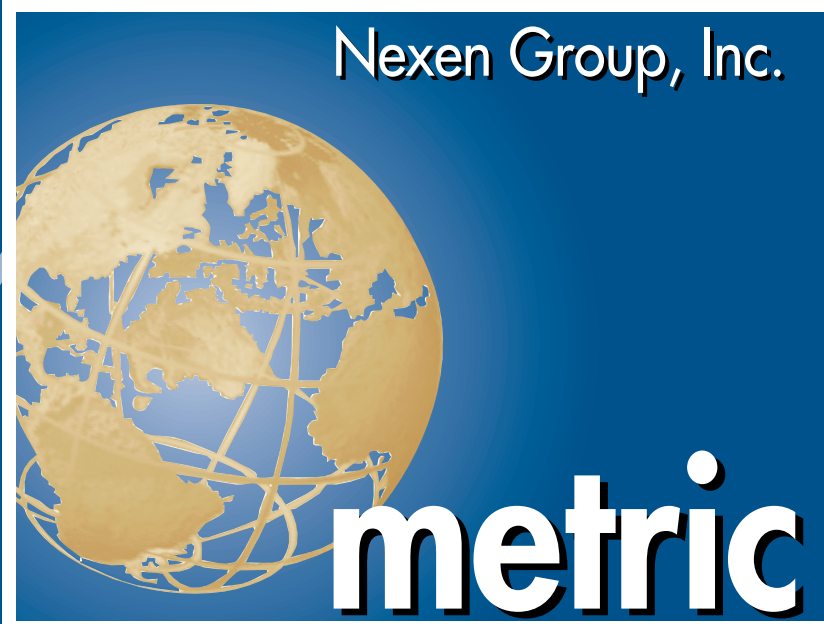
Standard Models	Repair Kit Product Number	Standard <sup>①</sup> Facing Kit Product Number
FMCBE-110-14	801436	801448
FMCBE-130-19	801428	801430
FMCBE-130-24	801428	801430
FMCBE-7-28	801637	801605
FMCBE-7-38	801638	801645
FMCBE-8-38	801639	801647
FMCBE-8-42	801640	801649

**FMCBES, Spring Engaged**

Repair Kits contain: Bearings and O-Rings  
Facing Kits contain: Facings and Screws

Standard Models	Repair Kit Product Number	Standard <sup>①</sup> Facing Kit Product Number
FMCBES-110-14	801401	801448
FMCBES-130-19	801402	801430
FMCBES-130-24	801402	801430
FMCBES-7-28	801662	801605
FMCBES-7-38	801661	801645
FMCBES-8-38	801664	801647
FMCBES-8-42	801405	801649

① Two Facing Kits are required for each Clutch-Brake



## ENGINEERING DATA

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Thermal Characteristics .....	89
Heat Sink Capacities .....	89
Inertia (WK2) .....	90
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Heat Dissipation Vs. RPM .....	91
Peak Input Rate .....	92
Sprocket Tables .....	93



CLUTCH AND BRAKE SELECTION

Clutch and brake selection is rather simple when the functions of the machine are clearly defined. Make sure that the location, shaft size, heat dissipation capacity and speed specifications are compatible with the clutch or brake selected. Match the machine requirements to a clutch or brake that is large enough to handle the load.

First, classify the application.

**Occasional start or stop:**

Applications where a clutch disconnects the prime mover (usually an electric motor) from the machine at cycle rates of less than four or five times a minute..

Torque and transmitted horsepower are important considerations of applications of this type.

**Cyclic start and stop:**

Applications where the clutch or brake cycles more than five per minute, fall into this classification. Inertia, torque, energy per cycle, heat sink capacity and response time all may require evaluation.

**High inertia start or stop:**

Applications of this type are identified by a requirement to start or stop heavy rotating rolls or flywheels in a specific length of time. Start or stop periods of more than 1.0 second are typical of this application type. Thermal characteristics and torque are very important considerations when high inertia loads are present.

**Continuous slip or constant tensioning:**

Applications of this type appear frequently in the paper or textile industries where material is pulled from a roll. A clutch or brake is connected to the shaft supporting the rolls to provided tension in the material. Heat dissipation is the primary concern for the clutch or brake.

**Many clutch and brake selections are successfully made on the basis of transmitted horsepower and speed only.**

For these applications it is a simple matter of solving the basic torque formulas and selecting a unit from the torque vs. air pressure graphs in the Air Champ catalog or Nexen’s various product brochures.

Nexen also provides selection charts that suggest specific models at various transmitted horsepower and speeds. These charts include an appropriate service factor for the selected model.

Motor frame charts showing models which fit IEC motors are provided for some models. A general rule-of-thumb for motor mounted applications is: if the unit fits the motor, it will do the job. Nexen units have adequate torque to handle what the motors deliver.

Applications where the clutch or brake do not fit the motor require an evaluation of inertia, torque and thermal characteristics. Thermal characteristics are very important for high inertia or high cyclic applications. Do not select a unit from the catalog selection charts if high inertia loads are present.

Location is one of the most important things to consider when making a clutch or brake selection. Since torque (Nm) =  $\frac{P \times 9545}{RPM}$  (Where P is transmitted power in kW),

the clutch or brake should be located on the highest speed shaft in the drive train. An ideal location is directly on the motor shaft. Mounting is easier and more convenient. Lower torque requirements mean smaller diameter units, which result in **considerable** cost savings.

Because Nexen “Air Champ” Clutches and Brakes are rugged and designed with high thermal horsepower ratings, we can use the following rule-of-thumb for selecting the proper size unit for your application:

**Ninety percent of the time you can make your clutch/brake selection based on the torque requirement alone.** It’s that simple. Sure it’s important to use a service factor, but for the most part the torque requirement is your prime consideration when choosing which size clutch to use.

For severe applications with high inertia loads and high cycle rates, you also need to consider the thermal horsepower requirement.

**CLUTCH & BRAKE SERVICE FACTOR**

A service factor of 1,2 to 2 should always be used when operating at any air pressure. The service factor is dependent on the severity of the application. It is not recommended that a clutch or brake be used in an application at its maximum designed torque.



## INERTIA VALUES OF VARIOUS COMPONENTS

Metric Clutches—All values are expressed in (kg - cm<sup>2</sup>).

### Metric Friction Clutches

MODEL	COMPONENTS	ROTATES WITH SHAFT	ROTATES WITH DRIVE
B-275	Pilot Mount w/Bearing Friction Disc, Hub	---- 2,864	2,500 ----
F-450	Pilot Mount w/Bearing & Lining Friction Disc, Hub	---- 14,000	15,807 ----
L-600	Pilot Mount w/Bearing & Lining Friction Disc, Hub	---- 47,168	80,350 ----
M-800	Pilot Mount w/Bearing & Lining Friction Disc, Hub	---- 185,070	372,350 ----
H-1000	Pilot Mount w/Bearing & Lining Friction Disc, Hub	---- 527,790	1254,150 ----

### Metric Tooth Clutches

MODEL	COMPONENTS	ROTATES WITH DRIVE	ROTATES WITH SHAFT
5H30	Ring, Plate, Hub, Flange	17,550	3,690
5H35	Ring, Plate, Hub, Flange	31,240	7,930
5H40	Ring, Plate, Hub, Flange	49,320	11,000
5H45	Ring, Plate, Hub, Flange	76,310	24,420
5H50	Ring, Plate, Hub, Flange	122,210	33,580
5H60	Ring, Plate, Hub, Flange	271,030	75,470
5H70	Ring, Plate, Hub, Flange	514,980	147,600
5H30P	Ring, Plate, Hub, Flange	15,030	3,830
5H35P	Ring, Plate, Hub, Flange	32,990	8,420
5H40P	Ring, Plate, Hub, Flange	46,130	11,410
5H45P	Ring, Plate, Hub, Flange	75,960	26,090
5H50P	Ring, Plate, Hub, Flange	125,280	35,660
5H60P	Ring, Plate, Hub, Flange	276,120	80,060
5H70P	Ring, Plate, Hub, Flange	544,140	154,590
5H80P	Ring, Plate, Hub, Flange	1016,730	214,840
5H30P-E	Ring, Plate, Hub, Flange	20,446	4,420
5H35P-E	Ring, Plate, Hub, Flange	37,148	9,360
5H40P-E	Ring, Plate, Hub, Flange	43,553	14,300
5H45P-E	Ring, Plate, Hub, Flange	84,913	29,280
5H50P-E	Ring, Plate, Hub, Flange	162,810	40,070
5H60P-E	Ring, Plate, Hub, Flange	295,250	89,360
5H30P-SP	Ring, Plate, Hub, Flange, Ball Carrier	24,510	6,200
5H35P-SP	Ring, Plate, Hub, Flange, Ball Carrier	46,890	12,690
5H40P-SP	Ring, Plate, Hub, Flange, Ball Carrier	66,190	17,780
5H45P-SP	Ring, Plate, Hub, Flange, Ball Carrier	104,100	36,360
5H50P-SP	Ring, Plate, Hub, Flange, Ball Carrier	161,340	48,610
5H60P-SP	Ring, Plate, Hub, Flange, Ball Carrier	338,950	107,110
5H70P-SP	Ring, Plate, Hub, Flange, Ball Carrier	677,550	140,690
5H80P-SP	Ring, Plate, Hub, Flange, Ball Carrier	1152,480	214,840
5H30PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	30,890	6,493
5H35PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	52,970	13,455
5H40PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	66,430	20,943
5H45PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	116,590	39,530
5H50PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	203,900	52,710
5H60PSP-E	Ring, Plate, Hub, Flange, Ball Carrier	366,064	115,220

### Clutch-Brakes

MODEL	COMPONENTS	ROTATES WITH DRIVE	ROTATES WITH SHAFT
FMCB-130	Drive Disc	6,20	
19 AND 24	Drvn. Disc, Fric. Lng., Out. Shaft		7,10
FMCB-7	Drive Disc	24,20	
28 AND 38	Drvn. Disc, Fric. Lng., Out. Shaft		30,30
FMCB-8	Drive Disc	61,60	
38 AND 42	Drvn. Disc, Fric. Lng., Out. Shaft		70,00

## THERMAL CHARACTERISTICS

Check the clutch or brake heat sink capacity for high inertia starts or stops and the continuous thermal horsepower dissipation requirement for cyclic starts and stops.

1. Calculate the energy per cycle ( $E_C$ ) absorbed by the clutch or brake each start or stop by the formula:

$$E_C = \frac{J (\Delta n)^2}{182,4}$$

$E_C$  = rotational energy in Joules when the clutch or brake is applied  
 $J$  = total inertia load in kgm<sup>2</sup>  
 $\Delta n$  = initial RPM – final RPM

Select a clutch or brake that has a heat sink capacity which exceeds the energy in Joules produced during each start or stop.

2. Determine the required continuous thermal in kw ( $P_{th}$ )

$$P_{th} = \frac{E_C/60 \text{ (CPM)}}{1000}$$

$E_C$  = rotational energy in Joules when the clutch or brake is applied.  
 CPM = the number of starts or stops per minute.

Select a clutch or brake that a continuous thermal dissipation rating at operation speed that exceeds the thermal dissipation requirement.

Permissible cycles per minute are estimated using the formula:

$$CPM = \frac{P_{th} 60}{E_C}$$

$P_{th}$  = Rated clutch or brake continuous thermal dissipation  
 $E_C$  = Rotational energy in Joules when the clutch is applied

Cycle duty theoretically can be as much as 100 CPM or more. However, the practical limit depends upon the ability of the clutch or brake to dissipate heat rather clutch or brake response time. Each time a machine starts or stops, heat is generated at the clutch or brake interface. This heat energy is equal to energy per cycle ( $E_C$ ) of the rotational inertia at operating speed.

## HEAT SINK CAPACITIES

Metric Clutches		Metric Brakes	
Model	Heat Sink Capacity	Model	Heat Sink Capacity
B-275	10000 Joules	S-450	41000 Joules
F-450	41000 Joules	S-600	81000 Joules
L-600	81000 Joules	S-800	170000 Joules
M-800	149000 Joules	S-1000	271000 Joules
H-1000	312000 Joules		

## APPLICATION ENGINEERING DATA

### “Air Champ”

#### INERTIA (J)

The value of inertia (J) is important for applications involving time, cyclic duty or when starting or stopping heavy loads. Use all of methods as shown here to estimate the inertia.

1. For solid cylinders of a given weight, J is estimated from the formula:

$$J = \frac{1}{2} mr^2 \quad \text{Where: } J = \text{inertia in kg.m}^2$$

$$r = \text{cylinder radius in meters}$$

$$m = \text{weight in kilograms}$$

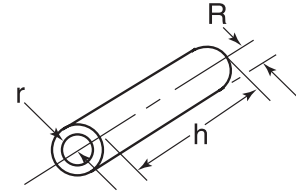
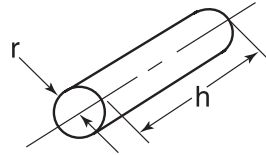
2. For solid or hollow cylinders, the inertia is calculated by the following equations:

Solid Cylinder

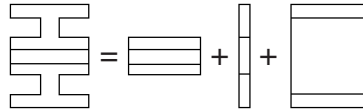
$$J = \frac{m}{12} (3r^2 + h^2)$$

Hollow Cylinder

$$J = \frac{m}{12} (3R^2 + 3r^2 + h^2)$$



Calculate the inertia of complex, concentric, rotating parts by breaking the part into simple cylinders, calculating their inertia and summing the values of each.



In applications where the speed of the load is different from the speed at the clutch or brake, the value of inertia J is referred to as reflected inertia.

#### TORQUE

$$T = \frac{P(9545)K}{n}$$

T = torque in Newton meters (Nm)  
P = transmitted power in kilowatts (kW)  
n = speed at clutch or brake

If the driven load has heavy rotating parts that must be started or stopped in a specific time, evaluate the torque from the formula.

$$T = \frac{(J)\Delta n}{t(9,55)}$$

T = average torque in Newton meters (Nm)  
J = total inertia load in kgm<sup>2</sup>  
 $\Delta n$  = initial RPM – final RPM  
t = time in seconds for  $\Delta n$

The time (t) in seconds required to accelerate or decelerate a rotating mechanism is estimated as follows:

$$t = \frac{(J) n}{(9,55)T}$$

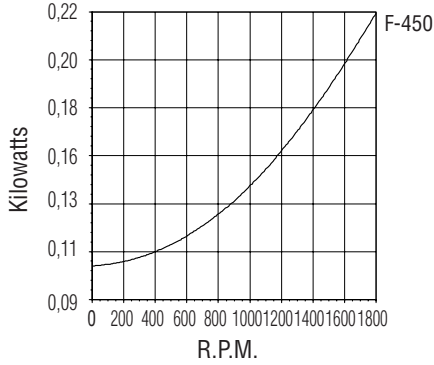
t = required starting or stopping time in seconds  
J = total inertia load in kgm<sup>2</sup>  
n = speed at the clutch or brake  
T = rated clutch or brake torque

**NOTE** — A service factor (K) is required to determine the actual torque that the clutch must deliver. For example, some electric motors will deliver three times their transmitted power for a short period of time. The clutch or brake must be capable of handling the maximum possible output.

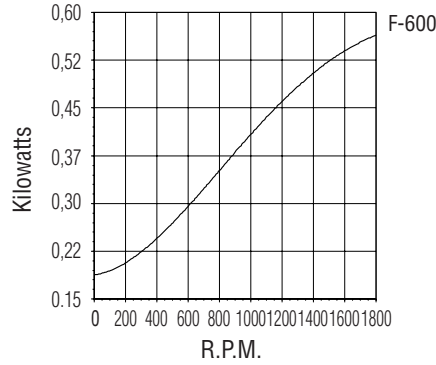
**NOTE** — Torque increases as the speed decreases. Mount the clutch on the highest speed shaft available.

HEAT DISSIPATION Vs. RPM

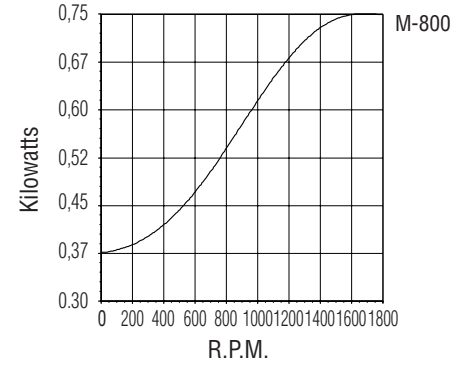
F-450 CLUTCHES



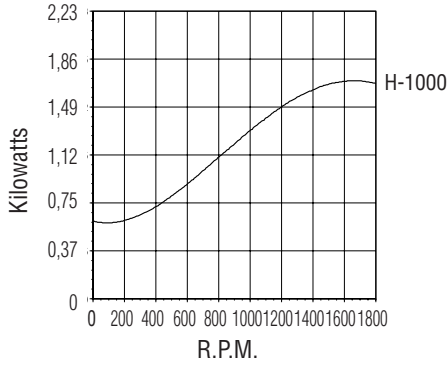
L-600 CLUTCHES



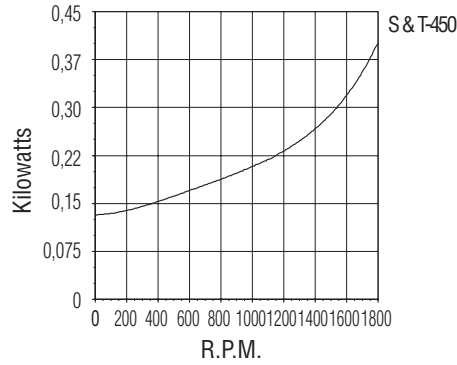
M-800 CLUTCHES



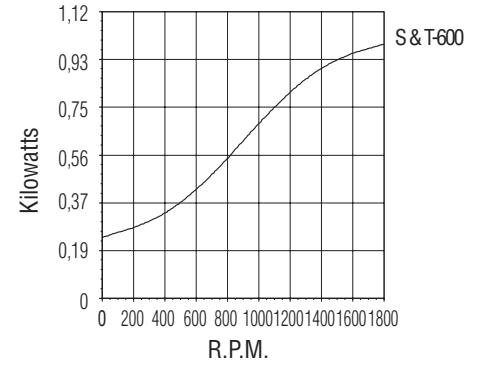
H-1000 CLUTCHES



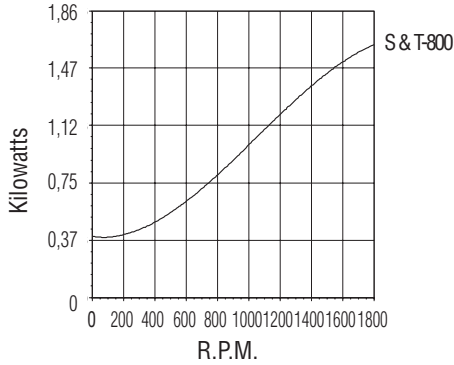
S-450 BRAKES



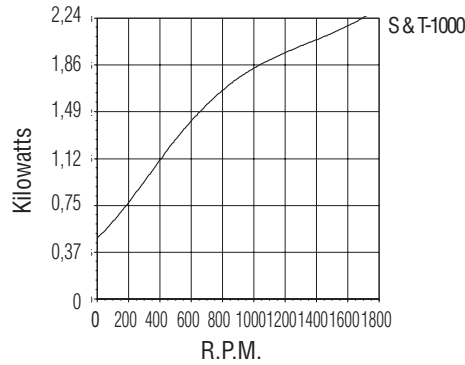
S-600 BRAKES



S-800 BRAKES



S-1000 BRAKES



▶ PEAK INPUT RATE

The Peak Input Rate Capacity is the limiting factor in high inertia starts and stops. It is the rate at which the clutch or brake absorbs heat (at friction interface) during the acceleration period, while the interfaces are slipping or until the load and the clutch are operating at the same speed. This heat will generally not or exceed the Peak Input Capacity unless the acceleration time exceeds clutch or brake transient time.

Transient time is the time required to reach the air pressure setting. The correct Input Rate occurs when the start-up time is greater than the response time of the clutch or the stopping time is greater than the response time of the brake. Increasing the response time (by using a control valve with a small orifice, or adding an air cavity

between the valve and the unit) increases the start-up time. This reduces the thermal peaks that create damaging thermal gradients with the friction plate.

The Peak Input Rate during such a start is evaluated from an estimate of the speed difference between the facing and the friction disc at the end of the transient period and the torque value expected at the air pressure setting. The safe Peak Input Rate of a clutch or brake with cast iron plates and organic friction linings is approximately 0,104 KW per square centimeter of interface area.

**Calculating Peak Input Rate Capacity:**

Calculate the speed change ( $\Delta N$ ) during the transient period. Assume 50% torque and a transient time of 0,1 second for most applications.

Formula:  $\Delta N = \frac{T (t)}{9,55 (J)}$

T = rated clutch or brake torque in Nm  
 t = required transient time in seconds  
 J = total inertia load in kgm<sup>2</sup>  
 $\Delta N$  = initial RPM – final RPM

The speed difference ( $\Delta N$ ) between the facing and friction disc at the end of the transient period is the difference between full speed (RPM) and the speed change ( $\hat{N}_1$ ).

Formula:  $\Delta N = \text{RPM} - \hat{N}_1$

$\Delta N$  = speed difference in RPM  
 RPM = rating of the clutch or brake  
 $\hat{N}_1$  = speed change in RPM

Calculate the Peak Thermal Input in kilowatts (kW) for your application.

Formula:  $P = \frac{\Delta N (T)}{9545}$

P = peak thermal input of application  
 $\Delta N$  = speed difference in RPM  
 T = torque in Nm at the set air pressure

Calculate the Peak Thermal Input of a clutch or brake.

Formula:  $P_{th} = A (0,9)$

$P_{th}$  = clutch or brake thermal input  
 A = effective interface area  
 (see catalog table for product)

Compare your applications Peak Thermal Input requirement with that of the clutch or brake. If the clutch or brake has a higher Peak Thermal Input calculation than your applications requirement, you are using the correct product.

## SPROCKET TABLES

The tables below indicate compatible Sprocket options for the applicable Clutch.

1. Find your specific Clutch Model Number.
2. Determine a Chain Size and minimum T Configuration from the table.

### Friction Clutches

Chain Size	35	41/40	50	60	80	100
B-275	28 T	22 T				
F-450	32 T	25 T	21 T			
L-600	40 T	30 T	25 T	21 T		
M-800		38 T	31 T	26 T	21 T	
H-1000		45 T	37 T	31 T	24 T	20 T

Depending on the application, some of the minimum sprockets will not provide load carrying capacity.

Refer to the Clutch drawing to obtain pilot diameter, bolt circle, hole size and location information. Some minimum sprockets may not provide sufficient load carrying capacity, due to the application. If in doubt, consult Nexen to insure suitability.

### Torque Limiters

Chain Size	35	40	50	60	80	100
TL20	40 T	30 T	24 T	21 T		
TL30	42 T	32 T	26 T	22 T	18 T	
TL40		40 T	30 T	26 T	20 T	
TL50		42 T	34 T	29 T	23 T	19 T
TL60		48 T	38 T	32 T	25 T	21 T

Depending on the application, some of the minimum sprockets will not provide load carrying capacity.  
This table applies to the TL/2 series also.

### Tooth Clutches

Chain Size	35	40	50	60	80	100	120	140	160	200
5H30	40 T	32 T	26 T	22 T	17 T					
5H35	40 T	32 T	26 T	22 T	17 T					
5H40	45 T	34 T	28 T	24 T	18 T					
5H45		36 T	30 T	26 T	20 T					
5H50	40 T	34 T	28 T	22 T	19 T					
5H60		38 T	32 T	25 T	21 T	19 T				
5H70			38 T	29 T	24 T	21 T	19 T			
5H80				33 T	27 T	23 T	21 T	19 T		
5H100						30 T	25 T	23 T	19 T	

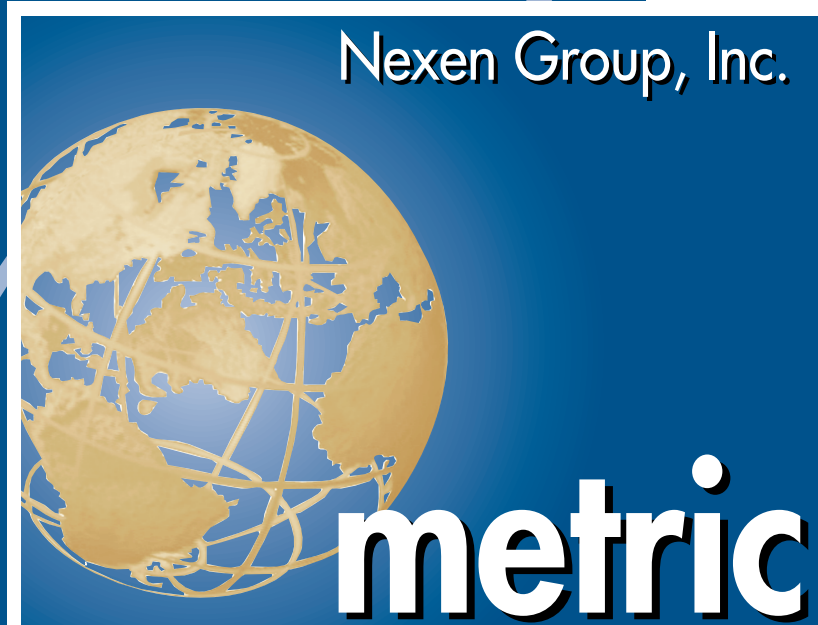
Depending on the application, some of the minimum sprockets will not provide load carrying capacity.

## FUNCTION EXAMPLES

“Air Champ”

### PRODUCT FUNCTION/SELECTION CHART

Functions	Disconnect	Holding	Reversing and Multiple Speed	Inching and Jogging	Accurate Positioning	Overload Protection	Controlled Acceleration (Soft Start)	Emergency Stopping	Cycling or Indexing	High Inertia Start or Stop
<b>Products</b>										
<b>Friction Clutch Models</b>										
B-275,	Yes		Yes	Yes	Yes	Yes	Yes		Yes	
F-450,	Yes		Yes	Yes	Yes	Yes	Yes		Yes	
L-600,	Yes		Yes	Yes	Yes	Yes	Yes		Yes	
M-800,	Yes		Yes	Yes	Yes	Yes	Yes		Yes	
H-1000,	Yes		Yes	Yes	Yes	Yes	Yes		Yes	
5H Series Tooth Clutches	Yes		Yes		Yes	Yes				Yes
TL Series Torque Limiters	Yes				Yes	Yes				
<b>Caliper Brakes Models</b>										
DB,		Yes							Yes	
BC,		Yes						Yes	Yes	
BD,		Yes						Yes	Yes	Yes
SPC		Yes						Yes	Yes	Yes
<b>Spring Engaged Brake Models</b>										
TSE,		Yes						Yes		
SE,		Yes						Yes		
MB,		Yes						Yes		
SSE		Yes						Yes		
<b>Clutch-Brake Flange Mounted Models</b>										
FMCB,				Yes		Yes	Yes		Yes	
FMCBE,				Yes		Yes	Yes		Yes	
FMCBES				Yes		Yes	Yes		Yes	



## FUNCTION EXAMPLES

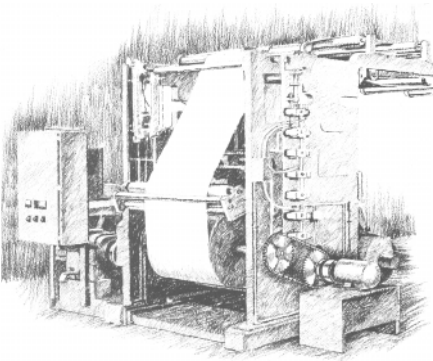
<b>This Section Contains:</b>	<b>Page</b>
Product Function/Selection Chart . . . . .	.94
Disconnect . . . . .	.96
Holding . . . . .	.97
Reversing & Multiple Speed . . . . .	.98
Jogging . . . . .	.99
Accurate Positioning . . . . .	.100
Overload Protection . . . . .	.101
Controlled Acceleration (Soft Start) . . . . .	.102
Emergency Stopping . . . . .	.103
Cycling (or Indexing) . . . . .	.104

## FUNCTION EXAMPLES

“Air Champ”

### DISCONNECT:

A simple clutch function that produces remote, automatic, occasional disconnection of one operation from the rest of the machine — or one machine from another. A 5HP-SP single position clutch is often used where exact registration or timing is required.



### SELECTION CONSIDERATIONS: Transmitted kilowatts Torque RPM

#### EXAMPLE

A clutch is required to disconnect the power of a 7,5 kW, 1500 RPM motor from the drive shaft of a printing press. Exact registry of the printing rolls is required when the clutch is engaged. The clutch is mounted on the driven shaft and is connected with a chain and sprockets at a speed ratio of 1:1.

This application is classified as an occasional start. Select a clutch based on the transmitted kW and RPM. Use a service factor of 2.

#### TORQUE CALCULATION:

$$\begin{aligned} \text{Torque} &= P \frac{(9545)}{\text{RPM}} \\ &= \frac{7,5 (9545)}{1500} = 96 \text{ Nm} \end{aligned}$$

#### UNIT SELECTED:

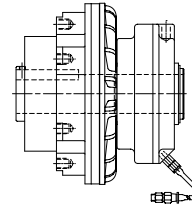
A 5H30P-SP, Single Position Tooth Clutch  
Product Number **912102**.

#### CONTROL CIRCUIT

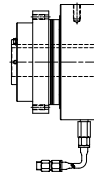
A cam switch, used for timing, energizes the clutch control circuit.

*3-WAY CONTROL — N.C. —  
ENGAGES CLUTCH OR BRAKE WHEN  
ACTUATOR SWITCH IS CLOSED*

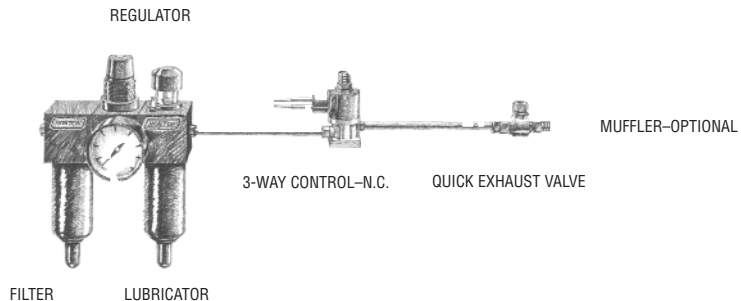
### “AIR CHAMP” PRODUCT CONSIDERATIONS:



F-450  
L-600  
M-800  
H-1000



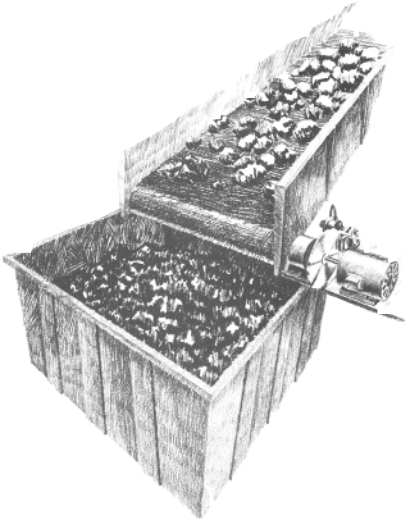
5H30-5H70  
5H30P-5H80P  
5H30SP-5H80SP





**HOLDING:**

A brake function to clamp (hold) a machine or mechanism in place. Often it's desirable to use a spring-engaged brake.



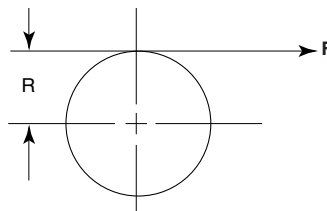
▶ **SELECTION CONSIDERATIONS:**  
Torque

▶ **EXAMPLE**

In the event of a power or air loss to the system, the spring set caliper brake engages and holds the incline conveyor at rest preventing it from “freewheeling” due to gravitational forces. This application is classified as an occasional stop.

▶ **TORQUE CALCULATION:**

Measure the required torque directly using the torque lever method:



Torque = P(R) SF

Where:

F = Force in newtons to turn the load

R = Radius of the conveyor drum in meters

SF = Service factor

▶ **EXAMPLE**

The measured pounds of pull it takes to start and keep turning the 0,3 meter radius drum is 2000 newtons.

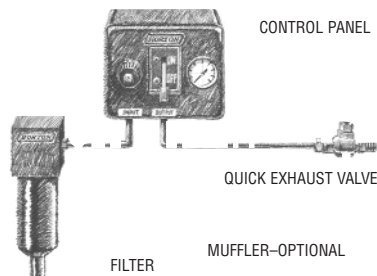
Torque = 2000(0,3)2 = 1200 Nm

▶ **UNIT SELECTED:**

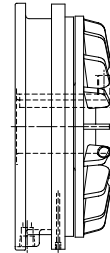
A Spring Actuated BD Caliper Brake, Product Number **933500** with an 464 mm diameter disc, Product Number **934200**.

▶ **CONTROL CIRCUIT**

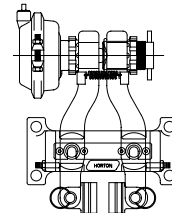
The brake is activated when the switch on the control panel is moved to the off position allowing air to be removed from the spring hold-off air canister.



▶ **“AIR CHAMP”**  
PRODUCT CONSIDERATIONS:



S, T, TSE  
450-1000



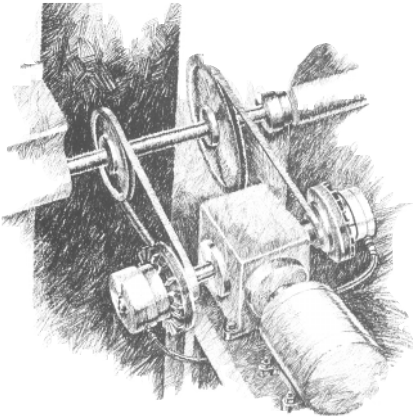
CALIPER BRAKES  
DB, BC, BD &  
SPC

## FUNCTION EXAMPLES

“Air Champ”

### REVERSING AND MULTIPLE SPEED:

Multiple clutches can change speed and/or direction — providing a reduced load on the motor and starter (the motor never stops), faster changes and higher cycling capabilities.



### SELECTION CONSIDERATIONS: Transmitted kilowatts Torque RPM

#### EXAMPLE

Two clutches are used a reversing drive. By alternating engagement from one clutch to the other, the line shaft reverses direction. Because the sprocket diameters vary from drive A to B, the speed of the drive changes each time it reverses direction. The clutches are mounted on the output shafts of a bevel gear box which are rotating at 383 RPM. The gear box is driven by a 0,37 kW motor.

#### TORQUE CALCULATION:

Torque =

$$\frac{P (9545)^2}{\text{RPM}} = \frac{0,37 (9545)^2}{383} = 13 \text{ Nm}$$

#### UNIT SELECTED:

Two L-600, Pilot Mount clutches,  
Product Number **950150**

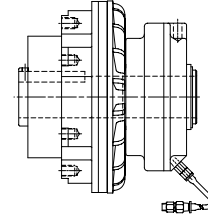
#### CONTROL CIRCUIT

Each clutch is cycled six times per minute. For this reason, a double solenoid, 4-way spool valve is selected.

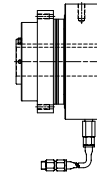
The double solenoid feature provides quick response in both spool shift directions.

*4-WAY DOUBLE SOLENOID SPOOL CONTROL INTERNALLY PILOTED FOR CLUTCH AND BRAKE OPERATING FROM 2 TO 7 BAR*

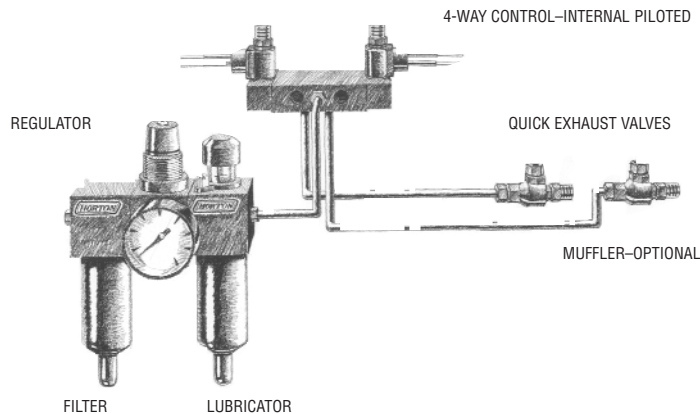
### “AIR CHAMP” PRODUCT CONSIDERATIONS:



F-450  
L-600  
M-800  
H-1000



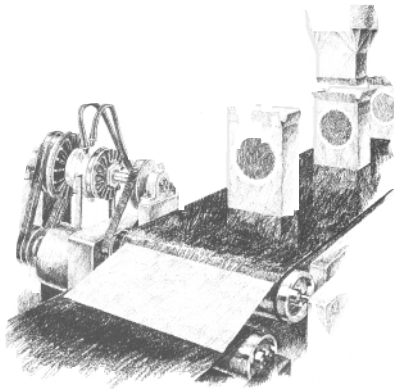
5H30P-5H80P



## JOGGING:

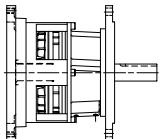
To position, set-up, thread or check out a machine. This motion is usually sudden and uncontrollable; hard on motors and starters.

A clutch or clutch/brake provides gentle jog function that is independent of the drive motor.



## ▸ “AIR CHAMP”

### PRODUCT CONSIDERATIONS:



FMCB-130-19 AND 24  
FMCB-7-28 AND 38  
FMCB-8-38 AND 42

### ▸ SELECTION CONSIDERATIONS:

- Linear inertia**
- Rotational inertia**
- Transmitted kilowatts**
- RPM**
- Torque**
- Cycle rate**
- Continuous thermal horsepower rating**

### ▸ EXAMPLE

A clutch-brake is placed in the drive system to position boxes, carried on a conveyor, under a hopper which fills the boxes with a product. A box is positioned under the hopper every second. This application is classified as a cyclic start-stop.

### ▸ CONVEYOR REFLECTED INERTIA:

$$WK_r^2 = W \left( \frac{V}{2\pi N} \right)^2$$

$$= 54 \left( \frac{58}{2\pi 180} \right)^2 = 0,141 \text{ kg.m}^2$$

Where:

- W = 54 kg (Conveyor load including belt)
- V = 58 meters per minute
- N = 180 RPM at the clutch brake

### ▸ DRUM AND PULLEY REFLECTED INERTIA:

$$WK_r^2 = WK^2 \left( \frac{N_1}{N_{cb}} \right)^2$$

$$= 1,054 \left( \frac{60}{180} \right)^2 = 0,117 \text{ kg.m}^2$$

Where:  $WK^2 = 1,054 \text{ kg.m}^2$

- $N_1$  = Speed of the load
- $N_{cb}$  = Speed at the clutch brake

Inertia of the pulley, shaft and clutch-brake = 0,037 kg.m<sup>2</sup>

Total inertia =

$$0,141 + 0,117 + 0,037 = 0,295 \text{ kg.m}^2$$

### ▸ TORQUE CALCULATION:

$$T = \frac{(WK^2)\Delta RPM}{t(9,55)} = \frac{,039(7)180}{1(9,55)} = 5,5 \text{ Nm}$$

Where:

- WK<sup>2</sup> = Total inertia kg.m<sup>2</sup>
- RPM = Speed at the clutch-brake
- t = Time in seconds
- T = Torque in Nm

### ▸ UNIT SELECTED:

An FMCB Clutch-Brake,  
Product Number **801400**.

### ▸ THERMAL CHARACTERISTICS:

Check the continuous thermal horsepower (Hpt) requirement based on the Total Inertia, RPM and cycle rate.

### ▸ ENERGY PER CYCLE:

$$E_c = \frac{WK^2(\Delta RPM)^2}{182,4} = \frac{0,295(180)^2}{182,4} = 52 \text{ Ws}$$

Where:  $E_c$  = Energy per cycle in Ws

$WK^2$  = Total inertia

RPM = Speed at the clutch-brake

### ▸ THERMAL HORSEPOWER DISSIPATION REQUIREMENT:

$$P_{th} = \frac{E_c/60(\text{CPM})}{1000} = \frac{52/60(60)}{1000} = 0,052 \text{ kw}$$

Where:

$E_c$  = Energy per cycle

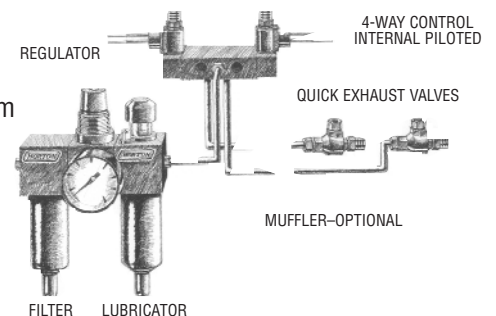
CPM = Cycles per minute

$P_{th}$  = Continuous thermal dissipation

### ▸ CONTROL CIRCUIT

A 4-way, double solenoid (with quick exhaust valves), control circuit is used because of the rapid cycle rate.

*4-WAY DOUBLE SOLENOID SPOOL CONTROL INTERNALLY PILOTED FOR CLUTCH AND BRAKE OPERATING ABOVE 30 CPM — FROM 2 TO 7 BAR.*



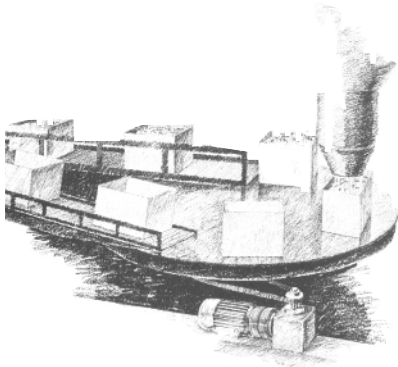
## FUNCTION EXAMPLES

## "Air Champ"

### ACCURATE POSITIONING:

A brake or clutch/brake provides very precise and repeatable stopping.

Tight tolerances are held in cut-to-length systems, filling operations, and machining cycles, with limit switches, photo electric cells or proximity switches accurately sense position.



- ▶ **SELECTION CONSIDERATIONS:**  
Transmitted kilowatts  
RPM  
Torque

### ▶ EXAMPLE

A clutch-brake is necessary to accurately position a turntable carrying bins which rotate under a feeder head. The feeder head dumps a predetermined amount of material into the bins at regular, timed intervals.

The motor is a 4 kW, 1800 RPM, 112M, IEC frame.

### ▶ UNIT SELECTED:

A FMCBE-7-28 based on the motor frame size only.

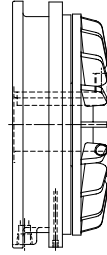
Product Number 801666.

### ▶ CONTROL CIRCUIT

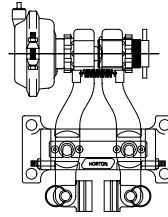
A proximity switch energizes the 4-way clutch-brake control circuit.

*4-WAY SINGLE SOLENOID SPOOL CONTROL INTERNAL PILOTED — N.C. FOR OPERATING CLUTCH AND BRAKE AT PRESSURES 3 TO 17 BAR.*

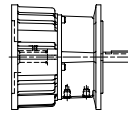
- ▶ **"AIR CHAMP"**  
PRODUCT CONSIDERATIONS:



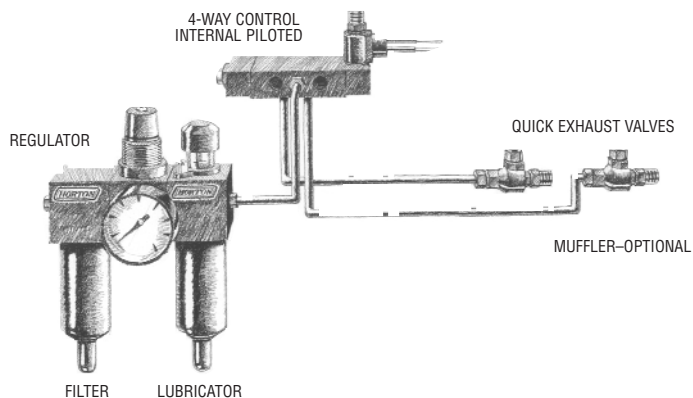
S, T, TSE  
450-1000



CALIPER BRAKES  
DB, BC, BD, SPC



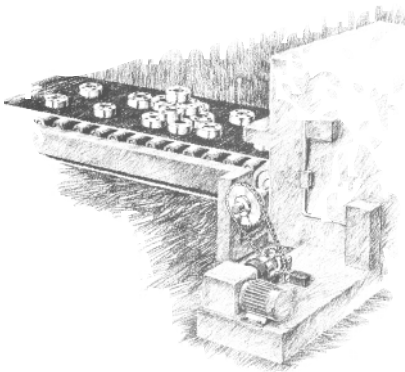
FMCBE



## OVERLOAD PROTECTION:

Protects expensive machinery or products from jam-ups and overloading.

Air clutches excel at this function because (1) torque level is easily and accurately set by air pressure, and (2) torque to start the load (often two to three times the desired protective torque) is compensated for a dual pressure control circuit.



### ▶ SELECTION CONSIDERATIONS: Transmitted kilowatts RPM at the clutch Torque

#### ▶ EXAMPLE

A device is required to provide overload protection for the drive components which include a 0,37 kW, 1500 RPM motor and a 100:1 reducer. This drive is powering a continually running conveyor which is feeding parts onto a heat treating oven.

The unit is mounted on the reducer output shaft which rotates at 15 RPM.

This application is classified as an occasional start. Select a Torque Limiter based on the transmitted horsepower and RPM.

$$\text{Torque} = \frac{0,37(9545)}{15} = 235 \text{ Nm}$$

#### ▶ UNIT SELECTED:

A TL40-AE, Torque Limiter, Product Number **802924**.

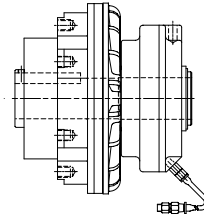
#### ▶ CONTROL CIRCUIT

A dual pressure circuit is used to provide 4 bar for starting the conveyor and 2 bar running pressure. See diagram on page 25.

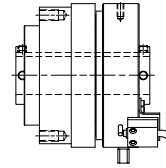
If an overload occurs, the Torque Limiter Interfaces separate, moving the cylinder to the outer position. This movement is detected by the limit Switch, which de-energizes the 3-way Air Inlet Mount Solenoid Valve, thus exhausting air to the Torque Limiter. Internal springs provide assistance for total Torque Limiter release.

All of the drive components down to the motor are protected from an overload.

### ▶ “AIR CHAMP” PRODUCT CONSIDERATIONS:



B-275  
F-450  
L-600  
M-800  
H-1000



TORQUE LIMITER

## FUNCTION EXAMPLES

## "Air Champ"

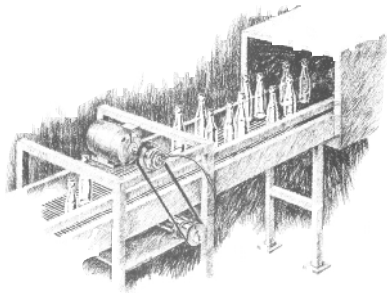
### CONTROLLED ACCELERATION ("SOFT START"):

A clutch function that gently accelerates delicate loads or starts very heavy loads — eliminating shock from "across-the-line" starts.

A clutch reduces the load on the motor by letting it run continuously (often permitting use of smaller drive motors). Completely adjustable — from fast engagement to slow gradual acceleration.

Control is achieved by control of air pressure or air flow — or both.

An air brake is used for controlled deceleration.



### SELECTION CONSIDERATIONS: Transmitted kilowatts RPM Torque

#### EXAMPLE

A clutch is needed to drive a bottle conveyor. A "soft start" is required to prevent the bottles from tipping and jamming on the conveyor. The clutch is mounted on a 5.5kW, 1500 RPM motor.

$$\begin{aligned} \text{Torque} &= \frac{P (9545)K}{\text{RPM}} \\ &= \frac{5.5 (9545)2}{1500} = 70 \text{ Nm} \end{aligned}$$

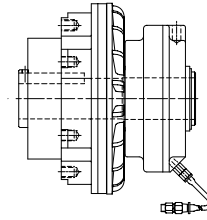
#### UNIT SELECTED:

An M-800 from the torque charts  
Product Number **950250**.

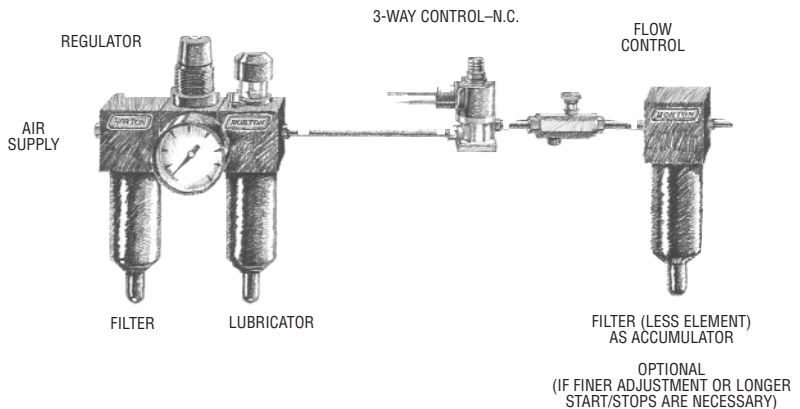
#### CONTROL CIRCUIT

The control circuit includes a Flow Control valve which causes the air pressure to the clutch to build up slowly, giving a soft start every time.

### "AIR CHAMP" PRODUCT CONSIDERATIONS:



B-275  
F-450  
L-600  
M-800  
H-1000

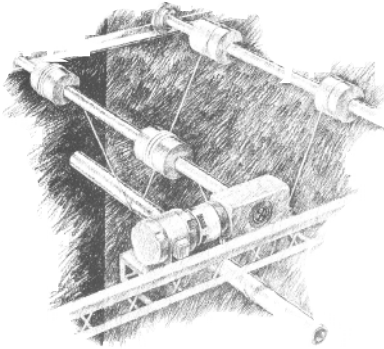


## “Air Champ”

## FUNCTION EXAMPLES ▶

### EMERGENCY STOPPING:

A brake (usually spring-engaged) used to instantly stop a machine in the event of a jam, malfunction, tripped safety or power loss — typically where operator safety, or vertical motion is involved.



### ▶ SELECTION CONSIDERATIONS:

**Transmitted kilowatts**  
**RPM**  
**Torque**

### ▶ EXAMPLE

A clutch-brake is required on a drive which is used to lift heavy pipe. The pipe is to be lifted across wire ropes and the clutch is engaged to lift it. A spring-engaged brake is required to prevent the pipe from falling in the event of a power or air pressure loss.

The motor is a 1,5 kW, 1500 RPM, 90S frame.

### ▶ UNIT SELECTED:

A FMCBES 130-24,  
Product Number **801469**.

Selection is based on the motor frame size only. The FMCBES 130-24 is an air engaged clutch combined with a spring engaged brake.

### ▶ CONTROL CIRCUIT

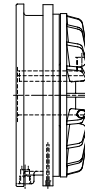
Controlled by a single 3-way valve. One air supply operates the combined clutch-brake.

The clutch begins to deliver torque at approximately 2,5 bar. Below 2 bar, the spring force of the brake overcomes the air cylinder thrust keeping the brake engaged.

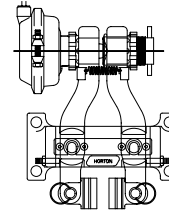
*3-WAY CONTROL — N.C. —  
ENGAGES CLUTCH OR BRAKE WHEN  
THE ACTUATOR SWITCH IS CLOSED.*

### ▶ “AIR CHAMP”

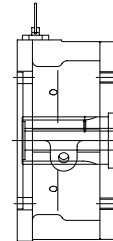
### PRODUCT CONSIDERATIONS:



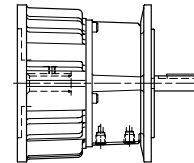
TSE  
450-1000



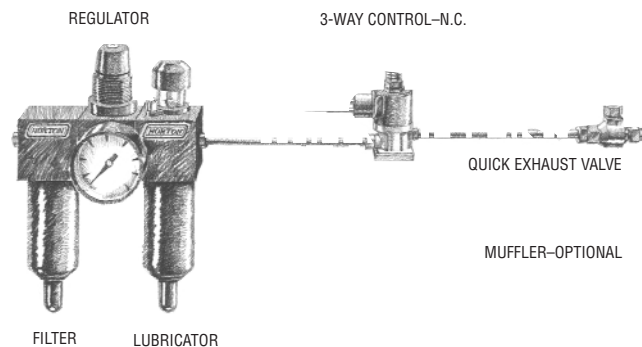
CALIPER BRAKES  
BC, BD, SPC



SE BRAKES  
100-1000



FMCBES



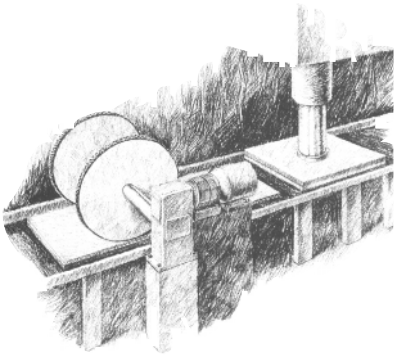
## FUNCTION EXAMPLES

“Air Champ”

### CYCLING (OR INDEXING):

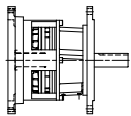
Continual starting and stopping is very hard on motors and starters. Motors must then be oversized and even then, they have limited cycling capability.

A clutch/brake reduces the load by letting the motor run continuously, permitting much faster cycling rates ... (often more than 100 times per minute) with only minimal power.

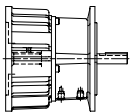


### “AIR CHAMP”

#### PRODUCT CONSIDERATIONS:



FMCB-130-19 AND 24  
FMCB-7-28 AND 38  
FMCB-8-38 AND 42



FMCBE AND  
FMCBES

#### SELECTION CONSIDERATIONS:

- Rotational inertial
- Cycle rate
- Transmitted kilowatts
- RPM
- Torque
- Continuous Thermal Dissipation

#### EXAMPLE

Select a clutch-brake for a drive in a machine that die cuts paper board into cartons. The clutch is used to drive rolls that feed lengths of paper board to the die cutting head at rates up to 46 times per minute. The brake stops the feed rolls every cycle.

#### UNIT SELECTED:

The drive consists of a 0,75 kilowatt, 1500 RPM motor going into a 10:1 worm gear reducer.

FMCB-130-19  
Product Number **801400**

This application is classified as a cycle start-stop and requires an evaluation of the continuous thermal dissipation capacity.

#### ROTATIONAL INERTIA:

The value of  $WK^2$  of the two 380 mm diameter, one inch wide feed rolls is taken from the Inertial of Steel Discs and Shafts chart on page 90.

$$WK^2 = 0,41 \times 2 = 0,82 \text{ kgm}^2$$

#### REFLECTED INERTIA ( $WK_r^2$ ):

$$WK_r^2 = WK^2 \left( \frac{N_1}{N_{cb}} \right)^2 =$$

$$0,82 \left( \frac{180}{1800} \right)^2 = 0,0082$$

Where:

- $WK_2$  = Feed roll inertia in Ws
- $N_1$  = Speed of the load
- $N_{cb}$  = Speed of the clutch-brake

#### THERMAL CHARACTERISTICS:

Calculate the continuous thermal dissipation ( $P_{th}$ ) requirement based on the reflected inertia, speed at the clutch-brake and the cycle rate.

#### ENERGY PER CYCLE:

$$E_c = \frac{(WK^2)(\Delta RPM)^2}{182,4}$$

$$= \frac{0,0082 (1800)^2}{182,4} = 145,6 \text{ Ws}$$

Where:  $E_c$  = Energy per cycle in Ws

$WK^2$  = Reflected inertia

RPM = Speed at the clutch-brake

#### THERMAL HORSEPOWER REQUIREMENTS:

$$P_{th} = \frac{E_c / 60 \text{ (CPM)}}{745,7} = \frac{145,6 / 60 (46)}{745,7} = 0,15$$

Where:

$P_{th}$  = Continuous Thermal dissipation

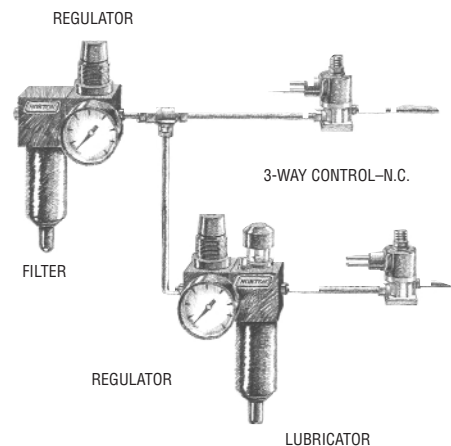
$E_c$  = Energy per cycle

CPM = Cycles per minute

#### CONTROL CIRCUIT

This application utilizes two 3-way normally closed valves.

One valve is used to cycle the clutch for the feed operation. The other 3-way valve is energized to apply the brake.





**The Benefits of Air Power**

The air-actuated clutch or brake is the most popular means of industrial control. Compared to their electrical counterparts, pneumatic clutches and brakes provide the following benefits:

- **Efficiency**

Air does not generate heat during extended clutch or brake engagement. As a result, air clutches and brakes provide greater torque transmission and thermal capacity.

- **Productivity**

Because of greater thermal capacity, air clutches and brakes have a longer operating life. Also, there is less chance of performance problems because of their simple design.

- **Cost Savings**

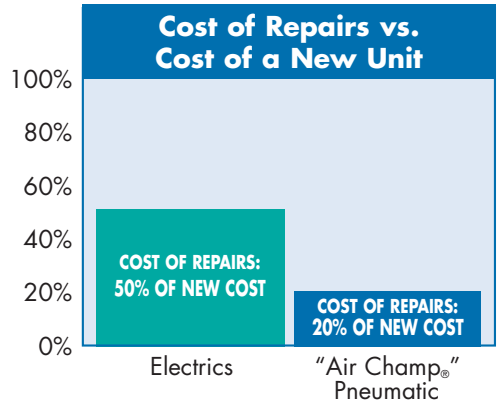
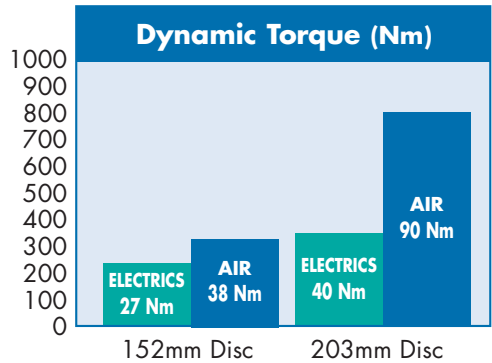
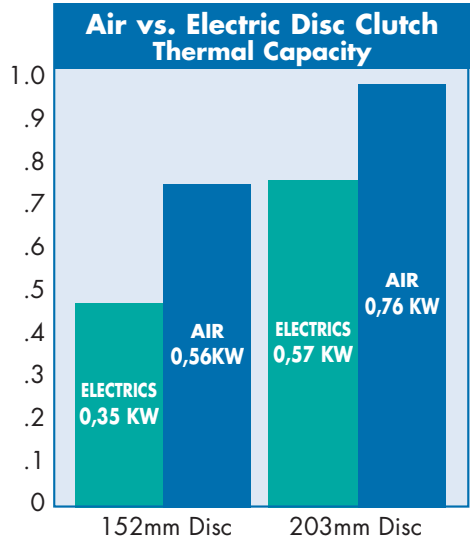
Air clutches and brakes are more cost-efficient because it takes less energy to run an air compressor. Air-powered components last longer, resulting in fewer repairs and replacements.

- **Environmental Safety**

All friction materials used in our "Air Champ" line are non-asbestos. Ozone-depleting chemicals are NOT used in the manufacturing of "Air Champ" products. All packaging materials are non-hazardous.

**SAFETY FIRST!**

All Power Transmission Products are potentially dangerous and should be guarded in accordance with applicable regulations. Photographs in this catalog show guards removed *only* for illustration and clarity purposes.



Size for size, "Air Champ" clutches and brakes can provide higher torque and thermal horsepower capacity than electrics. This means better efficiency, higher productivity and lower maintenance costs for your business.

## Manufacturing Facilities

---

"Air Champ®" Products are produced in Webster, Wisconsin, USA.

This 70,000 square foot facility manufactures pneumatic, hydraulic and electronic components. Continuous improvements to equipment and systems provide competitive efficiency.

A Nexen Group, Inc.  
ISO 9001 certified location.



## "Air Champ®"

---

For more than 40 years, "Air Champ®" products have solved the needs of the Industrial Motion Control market.

"Air Champ®" products are known for their quality and innovation throughout the world.



### Clutches for

---

- Controlled Acceleration
- Positive Drive
- Cycling
- Indexing
- Jogging
- Disconnecting/Connecting
- Positioning
- Overload Protection
- Torque Limiting
- Tension Control
- Reversing/Multiple Speed

### Overload Protection Devices for

---

- Disconnecting
- Positive Drive
- Positioning
- Overload Protection

### Brakes for

---

- Stopping
- Holding
- Cycling
- Indexing
- Controlled Deceleration
- Emergency Stops
- Positioning
- Tension Control

### Clutch/Brakes for

---

- Stopping
- Holding
- Cycling
- Indexing
- Jogging
- Disconnecting
- Positioning
- Controlled Acceleration
- Controlled Deceleration

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**NOTE:** This catalog contains brief descriptions, ratings, applications and approximate dimensions of the products, plus ordering information and selection tables designed to simplify product selection. For pricing, additional technical details, certified dimensional drawings or assistance in determining the most efficient model for your application, contact any of our representatives, or call our Application Hotline at 1-800-843-7445 or +32 2 461 04 60 from outside the USA.

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