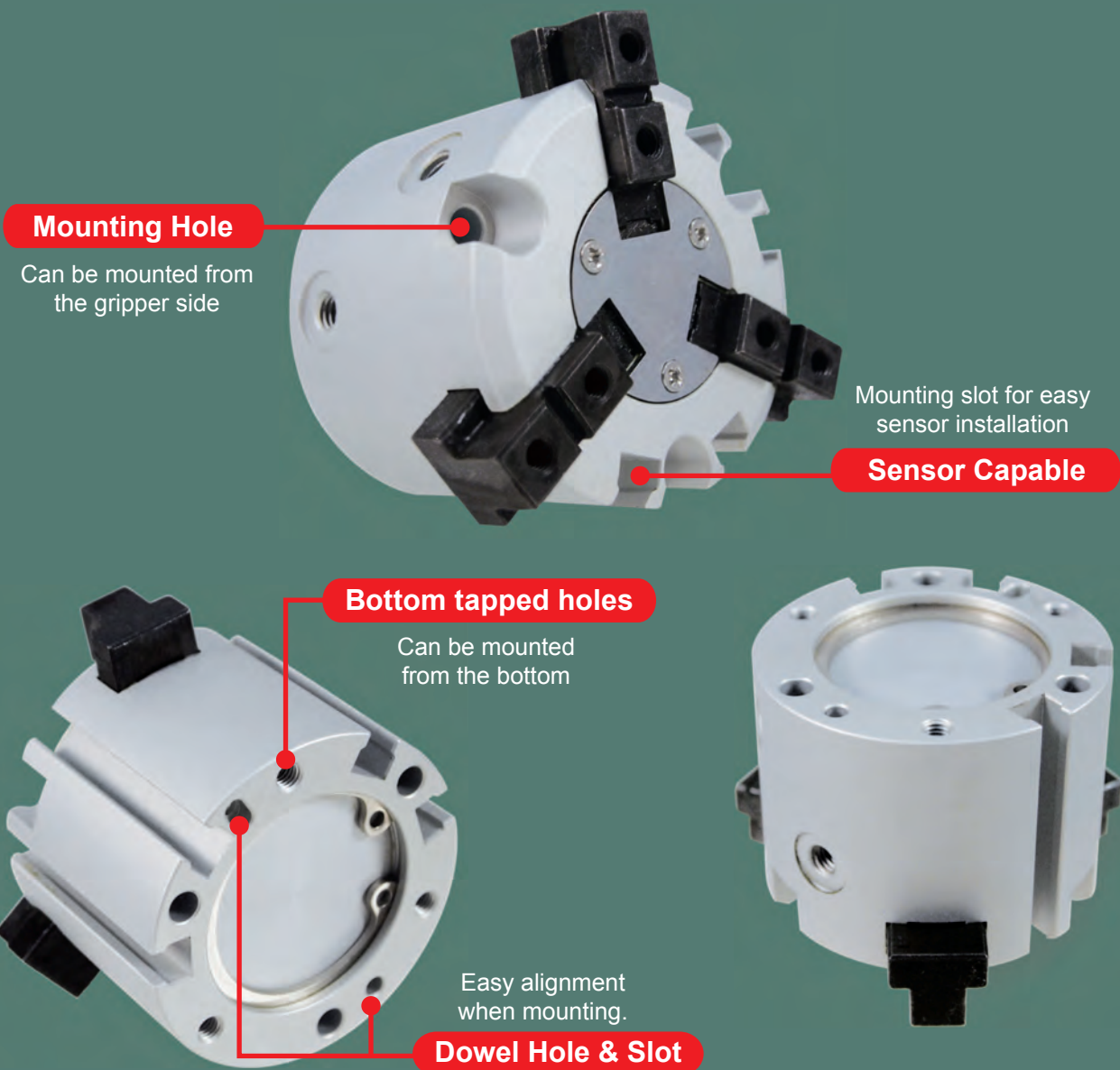


FABCO-AIR

FKHS Series *3 Jaw Parallel Motion Pneumatic Grippers*



Features

- Three (3) jaw gripping.
- Top & bottom mounting.
- Dowel pin hole and mounting slot registration.
- Reduced weight.
- Magnetic piston is standard feature.
- Adding optional sensors enables "open" and "close" position sensing.
- Compact design make grippers ideal for handling small parts in confined areas.

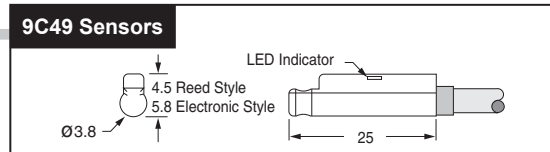


How to Order

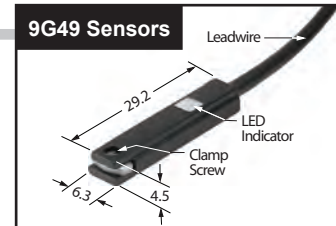
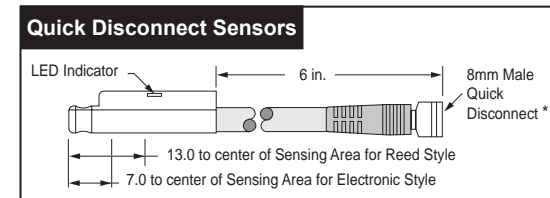
FKHS	-	50	D
Series	Bore	Action type	
	Ø25	D Double acting	
	Ø32		
	Ø40		
	Ø50		
	Ø63		
	Ø80		

Sensors

See specifications and pricing on pages 6 and 7.



All 9C49 sensors feature surge protection, polarity protection, LED indicator, and extremely fast switching speeds.



Female Cord Sets		
Length	Part No.	Price
1 Meter	CFC-1M	-
2 Meters	CFC-2M	-
5 Meters	CFC-5M	-

Specifications

Series		FKHS					
Action		Double acting					
Bore		Ø25	Ø32	Ø40	Ø50	Ø63	Ø80
Operating fluid		Compressed air					
Operating pressure		0.2~0.6MPa(2.0~6.1kgf/cm ²)		0.1~0.6MPa(1.0~6.1kgf/cm ²)			
Temperature range		-10°C (14°F) to 60°C (140°F)					
Lubrication		None required or use ISO VG32					
Repeatability		±0.01mm					
(Note 1) Effective grip force(N) at 0.5 MPa	External grip	42	74	118	187	335	500
	Internal grip	47	82	130	204	359	525
Max. operating frequency		120 C.P.M		60 C.P.M			30 C.P.M
Opening / Closing stroke (Diameter change)		6	8	8	12	16	20
Weight (g)		140	237	351	541	992	1850

(Note 1) Values for Ø25 are with gripping point L = 20 mm. • For Ø32 to Ø63 with gripping point L = 30 mm.

• For Ø80 mm with gripping point L = 50 mm. Refer to grip force charts on page 3.

Please visit <http://portal.fabco-air.com/configure.php> for current pricing.

Specifications and prices subject to change without notice or incurring obligation

Conversions

Grip force lbf = N x 0.224

0.1 MPa = 15 psi

0.4 MPa = 58 psi

0.2 MPa = 29 psi

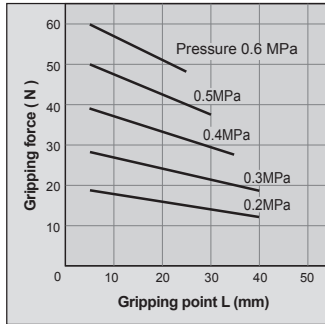
0.5 MPa = 72 psi

0.3 MPa = 43 psi

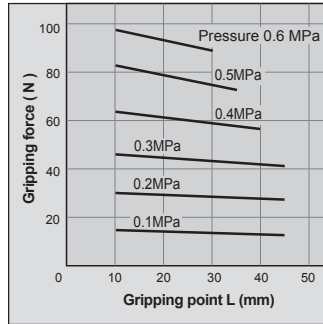
0.6 MPa = 87 psi

External Grip Forces

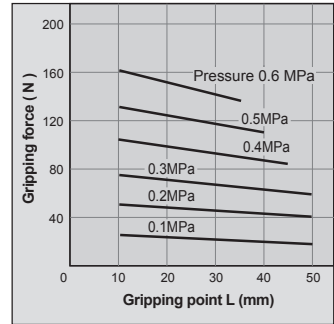
FKHS-25D



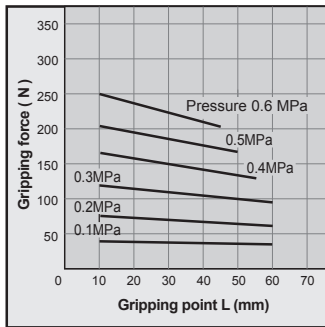
FKHS-32D



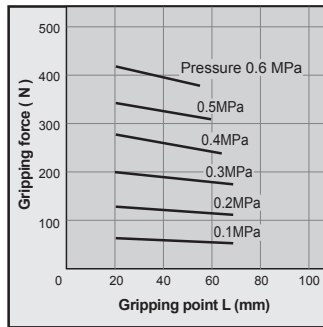
FKHS-40D



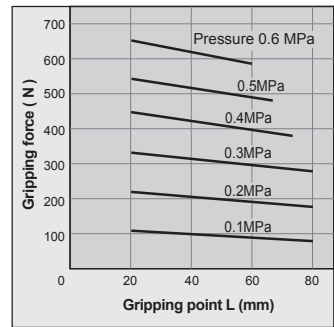
FKHS-50D



FKHS-63D

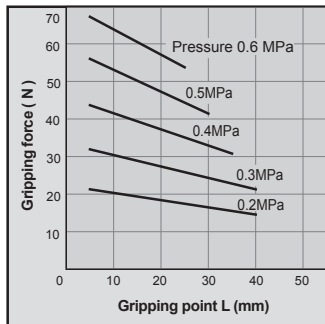


FKHS-80D

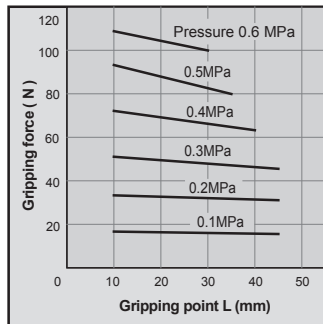


Internal Grip Forces

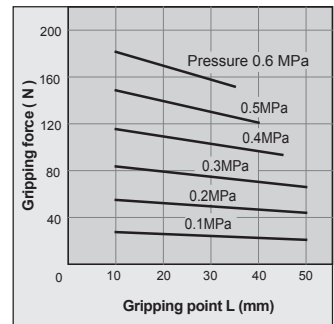
FKHS-25D



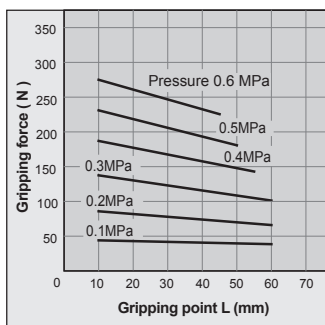
FKHS-32D



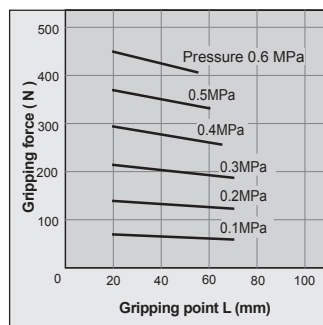
FKHS-40D



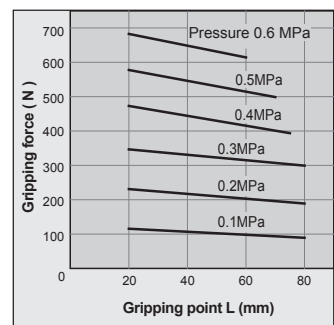
FKHS-50D



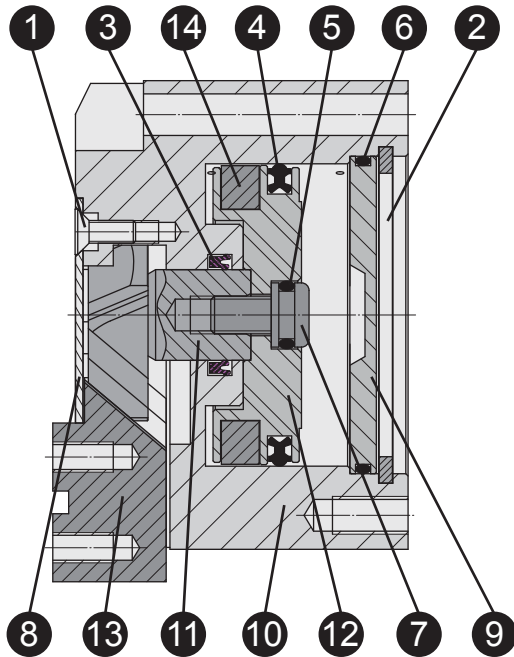
FKHS-63D



FKHS-80D



Construction



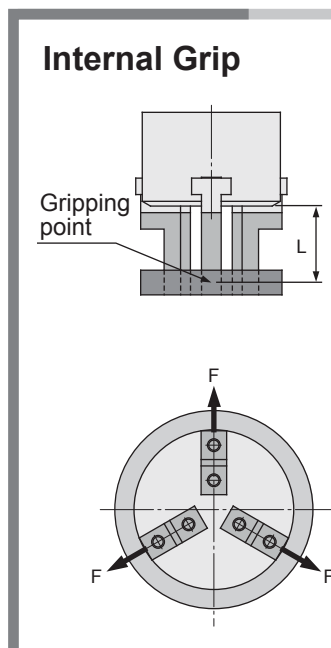
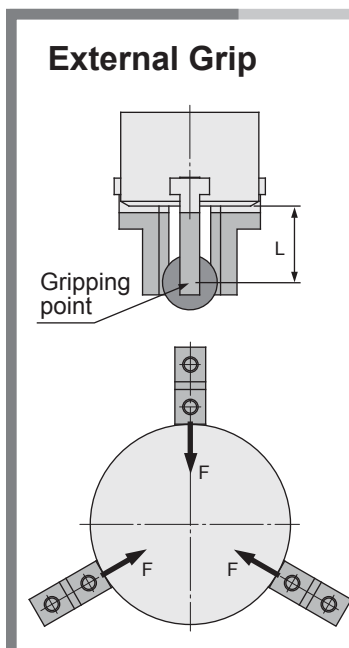
Parts List

NO.	Description	Material	Qty
1	Phillips screw	Carbon steel	3
2	Snap ring	Carbon steel	1
3	Piston seal	NBR	1
4	Piston seal	NBR	1
5	O-ring	NBR	1
6	O-ring	NBR	1
7	Piston bolt	Stainless steel	1
8	Front end cover	Stainless steel	1
9	Rear end cover	Aluminum alloy	1
10	Barrel	Aluminum alloy	1
11	Piston rod	Alloy steel	1
12	Piston	Aluminum alloy	1
13	Finger	Medium carbon steel	3
14	Magnet	Rubber bonded barium ferrite	1

Model Selection

Known Conditions:

- (a) Workpiece mass (b) External or internal grip (c) Gripping point (d) Operating pressure



Gripping point

The workpiece gripping point distance should be within the ranges given for each pressure in the effective gripping force graphs. See page 3.

If operated with the workpiece gripping point beyond the indicated ranges, an excessive offset load will be applied to the sliding section of the fingers, which can have an adverse effect on the service life of the product.

Effective gripping force

The effective gripping force shown in the graphs on page 3 is expressed as F, which is the thrust of one finger when all 3 of the fingers and attachments are in full contact with the workpiece as shown in the figures on the left.

Model Selection (continued)

As this figure shows, when gripping a workpiece,

n : Constant 3 (Number of fingers)
 F : Gripping force (N)
 μ : Coefficient of friction between attachments and workpiece
 m : Workpiece mass (kg)
 g : Gravitational acceleration (= 9.8 m/s²)
 mg : Workpiece weight (N),

The conditions under which the workpiece will not drop are

$$n \times \mu F > mg \Rightarrow F > \frac{mg}{3 \times \mu}$$

With "a" as the safety margin, F is determined as follows:

$$F = \frac{mg}{3 \times \mu} \times a$$

Guidelines for selection of the gripper with respect to workpiece weight.

Review the following calculations to consider acceleration and slight impacts which occur during normal transfer, etc., using a safety margin of **a = 4**.

7 x workpiece weight	13 x workpiece weight
When $\mu = 0.2$	When $\mu = 0.1$
$F = \frac{mg}{3 \times 0.2} \times 4$ $= 6.67 \times mg$ approx. $= 7 \times mg$	$F = \frac{mg}{3 \times 0.1} \times 4$ $= 13.3 \times mg$ approx. $= 13 \times mg$

- Even in cases where the coefficient of friction is greater than $\mu = 0.2$, for safety reasons, it is recommended to select a gripping force which is at least 7 to 13 times the workpiece weight.
- If high acceleration, deceleration or impact forces are encountered during motion, a greater margin of safety should be considered.

Example

Given

- Workpiece mass = 0.6 kg
- External grip method
- Gripping point = 40mm from face of gripper
- Operating pressure = 0.4MPa

Calculation

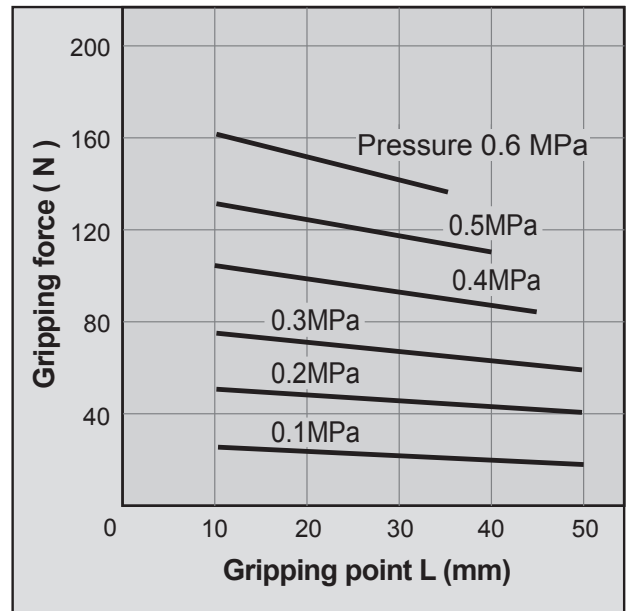
For a safety factor of 4 and setting the gripping force to be at least 13 times the workpiece weight;

$$\begin{aligned}
 \text{Required gripping force } F &= 13 \times mg \\
 &= 13 \times 0.6 \times 9.8 \text{ m/s}^2 \\
 &= 76.4\text{N minimum}
 \end{aligned}$$

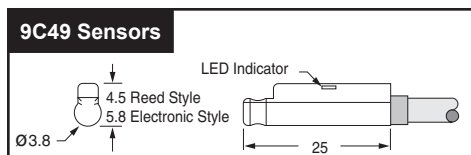
Using the External Grip Force graph for FKHS-40D from page 3, a gripping force of 87N is obtained from the intersection of the gripping point distance $L = 40\text{mm}$ and a pressure of 0.4MPa.

Select model #FKHS-40D because the graph value is greater than grip force required. The graph value for the smaller FKHS-32D is approximately 56N, less than required, therefore inadequate.

FKHS-40D



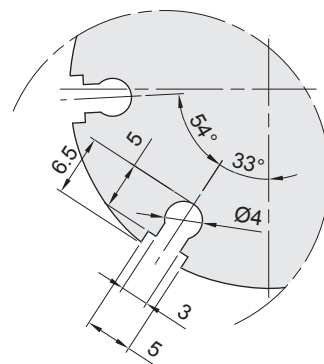
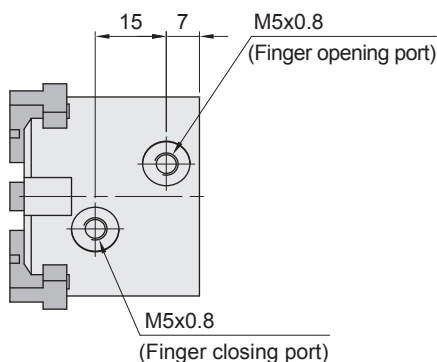
Sensor Specifications & Prices for FKHS-25D



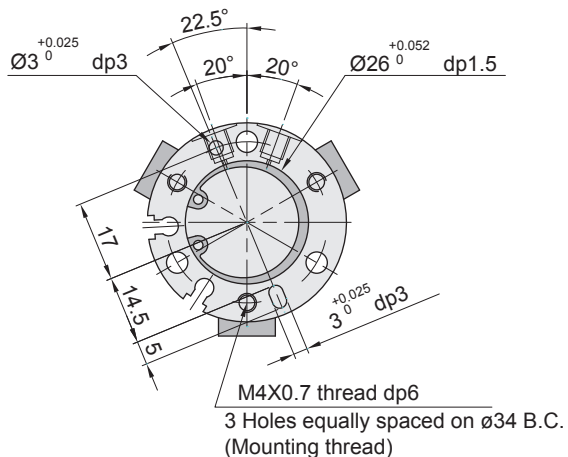
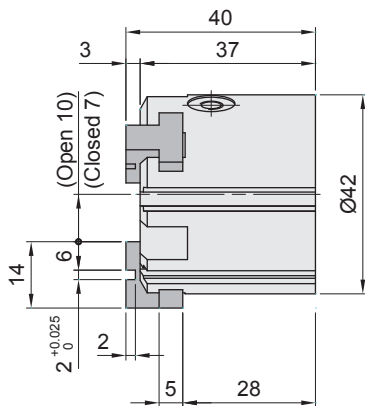
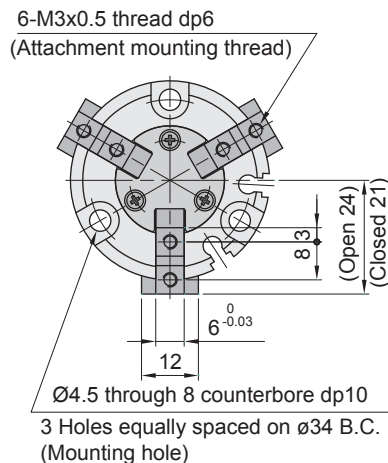
4 mm round	9C49 Sensor Selection Guide		Prewired 9 ft. Leadwire	Quick Disconnect*
	Sensor Type	Electrical Characteristics	Part No.	Part No.
	Reed (LED)	5-120 VDC/VAC, 0.04 Amp Max current, 4 Watt Max., 2.5 voltage drop	9C49-000-002	9C49-000-302
	Electronic (LED)	Sourcing PNP 6-30 VDC, 0.2 Amp Max current, 6 Watt max., 1.5 voltage drop	9C49-000-031	9C49-000-331
	Electronic (LED)	Sinking NPN 5-28 VDC, 0.2 Amp Max current, 6 Watt max., 1.5 voltage drop	9C49-000-032	9C49-000-332

Using 9C49 Sensors on $\phi 32$ or larger requires use of an adapter #TD11046 (included with 9C49-300-xxx sensors) which allows fitting these 4mm round sensors into any of the sensor slots. The adapter is also available separately at no charge. See page 7.

$\phi 25$ Dimensions (mm)



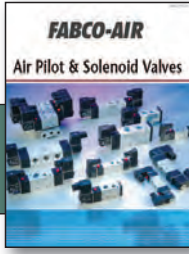
Sensor mounting slot dimensions for 9C49-000-xxx sensors



FABCO-AIR

Product Catalog Library

Air Pilot and Solenoid Valves Catalog #FVA.E-09



oem NFPA Air Cylinders Catalog #FCQN-OEM



Cylinders, Valves and Accessories Catalog #CV9



Pancake® II Air Cylinders Catalog #Pan2-2



Square Pancake® II Air Cylinders Catalog #SqPan2



ISO 6431 Cylinders Catalog #FAQ2R-09



Twin Rod, Non-Rotating Air Cylinders - Catalogs #FDX-09 & #FDXS-09



High Closing Force Angular Grippers Catalog #FKHC-10



Multi-Power® Air Presses Catalog #FP16



Swing Clamps Catalog #SC-DB04



Modular Air Prep System FRLs Catalog #FRL-06



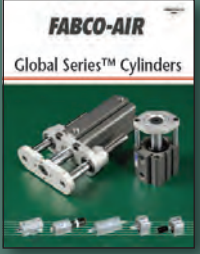
Compact Finger Slides Catalog #FDH-10



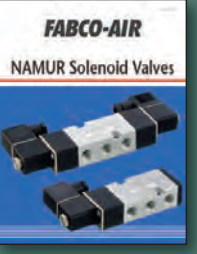
ISO 6432 Cylinders Catalog #FAE-09



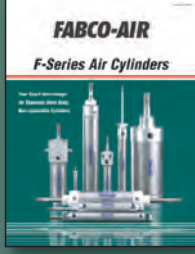
Stopper Cylinders Catalog #ST-SC



Global Series™ Metric Air Cylinders Catalog #GC-15



NAMUR Solenoid Valves Catalog #FVEN-10



Stainless Steel Body Air Cylinders Catalog #SSB-03



Air Table Slides Catalog #FGXS-10



Wide & Narrow Parallel Grippers - Catalogs #FKHZ-10 & #FKHQ-10



Toggle Type Angular Grippers Catalog #FKHT-10



Pneumatic Rotary Actuators Catalog #FRA.C-09



Guided Motion Air Cylinders Catalog #FGM-10



Pneumatic Rotary Actuators Catalog #FRB-14



Linear Slides - 6 Families Catalog #LS-03



Pneumatic & Hydraulic Swing Clamps Catalog #FML.H



Wide Opening Parallel Grippers Catalog #FKHL-10



Original Pancake® Air Cylinders Catalog #CV9



Pneumatic Crimping Tools Catalog #FCT-JY07



Magnetically Coupled Rodless Air Cylinders Catalog #FGYBR-11



Magnetically Coupled Rodless Slides Catalog #FGYS-11



Angular Grippers Catalog #FKA-09



3 Series of Angular & Parallel Motion Grippers Catalog #GR8

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