

KOR-LOK™

Side-Action Systems

EXPERIENCE THE EVOLUTION of Side-Action Molding

Frankly, we don't know how the pyramids were built, but the results are impressive. We want your molds to be equally impressive. Of course, we also want them to last as long as... well, our KOR-LOK™ Side-Action Systems!

KOR-LOK™
Side-Action
Systems



New Models

- ▲ Direct Wire Relay Sensors
- ▲ Multiple Sensor Locations
- ▲ Full Sensor Guards
- ▲ Enhanced Performance Design
- ▲ Large Bore Options

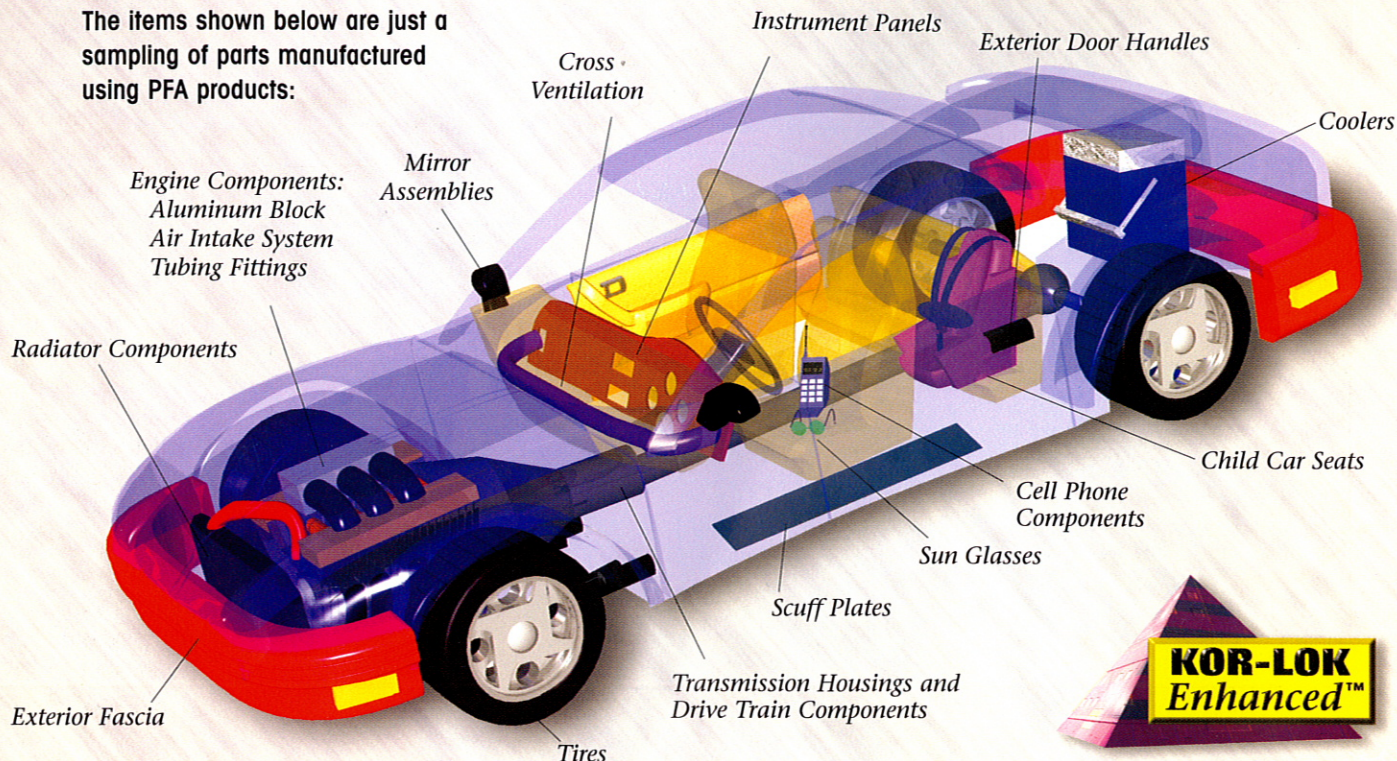
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www.pfa-inc.com

PFA
INCORPORATED

PFA KOR-LOK™ Side-Action Systems: Get You Where You Want to Go!

The items shown below are just a sampling of parts manufactured using PFA products:



**KOR-LOK
Enhanced™**

Through Mold Design, Build, and Production— We're with you every step of the way

1 PART DESIGN

Art to Part—PFA gives you the **design freedom** to do it all. Complex geometries, tight tolerances, perfect match lines and clean beautiful textures are now simple and easy. No limits. **Indulge yourself.**

2 MOLD DESIGN

More complex parts and increased demands on your time mean you don't have time to make mistakes. Use PFA's turn-key system and **get it right the first time, every time—faster than ever before!** Our application specialists are available to help you 24 hours a day and CAD files on the internet are **just a click away.**

3 MOLD BUILD

More...Better...Faster...For Less Money. KOR-LOK™ Enhanced™ molds make ideal parts. Immediate delivery, simplified geometry, and easy installation means a quicker mold build. Smaller mold bases, simpler slides, and reduced spotting time is **money in your pocket.**

4 PRODUCTION

PFA's KOR-LOK™ Side-Action Systems compensate for changes in molds due to wear, thermal gradients, pressure variations, and flex. Reduced maintenance, improved up-time, consistent quality, and reduced cost per part—**KOR-LOK™ is your answer.**



PFA Means REAL SERVICE™

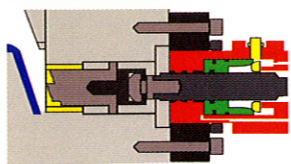
While KOR-LOK™ Side-Action Systems ensure you can do more, better, faster, for less money, even the best molding products in the industry mean nothing without **REAL SERVICE™**. With real-time information access, 24-hour technical support and expedited shipping, **we can have a KOR-LOK™ Side-Action System at your door—often before you've had your morning coffee. That's REAL SERVICE™.**

Phone: 262-250-4410

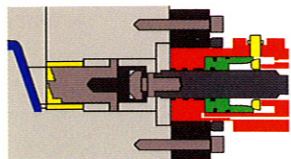
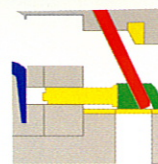
Fax: 262-250-4409

KOR-LOK™ Side-Action Systems

A Traditional Side-Action System

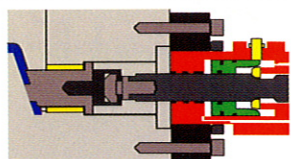


**Mold OPEN
Core OUT**

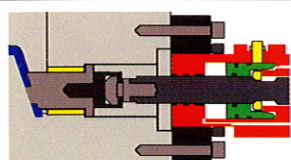
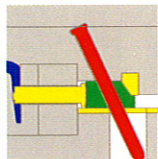


**Mold CLOSED
Core OUT**

CAN'T DO IT!



**Mold CLOSED
Core IN**



**Core PRE-LOADED
Against FULL
Injection Pressure**

CAN'T DO IT!

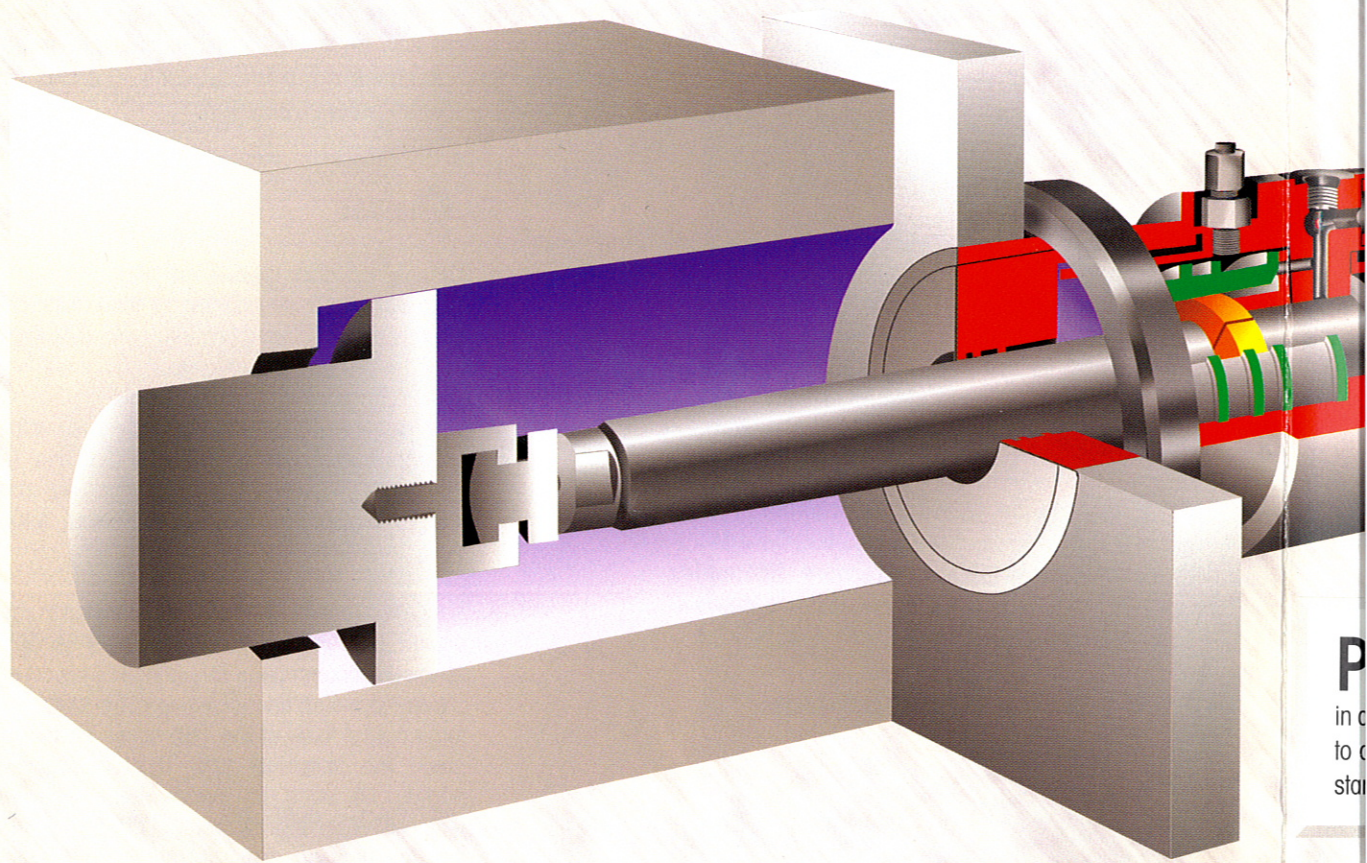
See the above illustration in action at www.pfa-inc.com

- ▲ KOR-LOK™ Side-Action Systems create an intense force on the core slide—traditional systems can't do it!
- ▲ KOR-LOK™ Side-Action Systems can be reused when current tool life expires—traditional systems can't do it!
- ▲ KOR-LOK™ Side-Action Systems take the load on-axis, virtually eliminating wear—traditional systems can't do it!
- ▲ KOR-LOK™ Side-Action Systems are available off-the-shelf for immediate installation—traditional systems can't do it!
- ▲ The only way to achieve consistent Zero Flash results, part after part, is with—KOR-LOK™ Side-Action Systems.

Do It All! Set, Lock, Preload, Pull, Sense and Adjust your core without Traditional Limits!

- Perfect Match Lines
- Consistent Part Quality
- Lower Mold Costs
- Reduced Cost-Per-Part
- Smaller Mold Bases
- Greatly Reduced Wear
- Reduced Spotting Time
- Quicker Mold Build
- Simplified Part Design
- Simplified Mold Design
- Proven Design Performance
- Unlimited Slide Travel
- Unrestricted Orientation
- Drop-in CAD Files
- Drop-in Installation

More than just outstanding performance
Side-Action Systems have “user-friendly”



New Models Feature

Direct Wire Relay Sensors

Sensor Guards & Multiple Sensor Locations Standard. Embedded relay sensors verify "set" and "pull" positions of the core. Most importantly, these switches act as standard dry contact relays making wiring simple and easy. **(Use of our former sensor interface has been eliminated.)** Simply connect the two sensor wires to the press wires and you're ready to go. Multiple sensor locations are machined in every unit, giving you more selection. As a bonus, we included sensor guards to protect your investment. Simple. Protected. Flexible. That's a **KOR-LOK™ Side-Action System.**

Multiple Ports Stand

With 5 SAE ports standard
meet your specific needs
you choose the 2 you need

Smooth High Force P

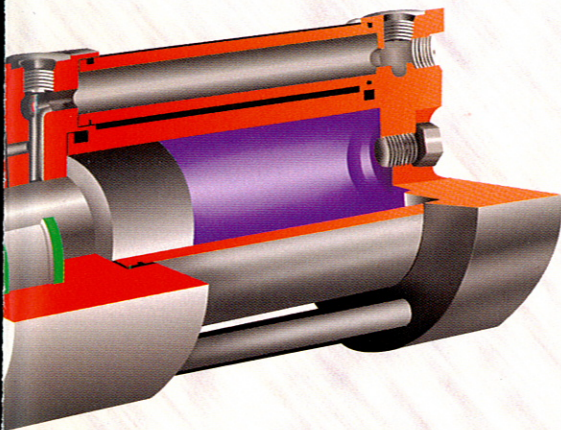
Hardened components
large mechanical adv
core compression/ther
performance design.

Phone: 262-250-4410

Fax: 262-250-4409

W

ance — **KOR-LOK™**
 endly" features.



PFa, Inc.'s **KOR-LOK™ Side-Action Systems** were developed in 1996 to replace standard locking cylinders in core-pull applications. Commonly (yet imprecisely) referred to as locking cylinders, these advanced systems out perform standard locking cylinders and other core pull methods.

uring . . .

Standard

standard, choose rear, side, or combination porting to meet your needs. All ports are machined in every unit - you need.

Force Preload

ponents and complimentary angles ensure a mechanical advantage, smooth operation, and excellent thermal compensation from this enhanced design.

Service Excellence

NEED IT RIGHT NOW?

Immediate delivery means **KOR-LOK™ Side-Action Systems** are ready as quickly as you need them. Need one shipped same day, overnight? We can do it!

HAVE AN EXISTING MOLD PROBLEM?

Made in the USA means you get the best service and applications assistance possible. We work with our customers to solve existing problems, and can design custom solutions to meet your needs.

NO DELAYS

Designed for long life and minimum maintenance, we do not expect repairs. If the need arises, however, our off-the-shelf parts, standard seals and dedicated staff ensure minimum downtime!

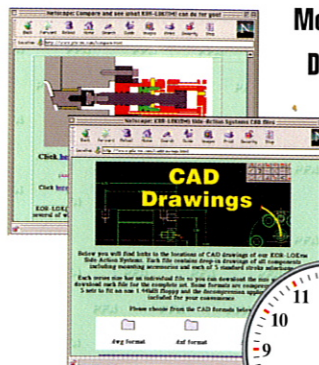
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 365 Days a Year

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 call you back like they do*



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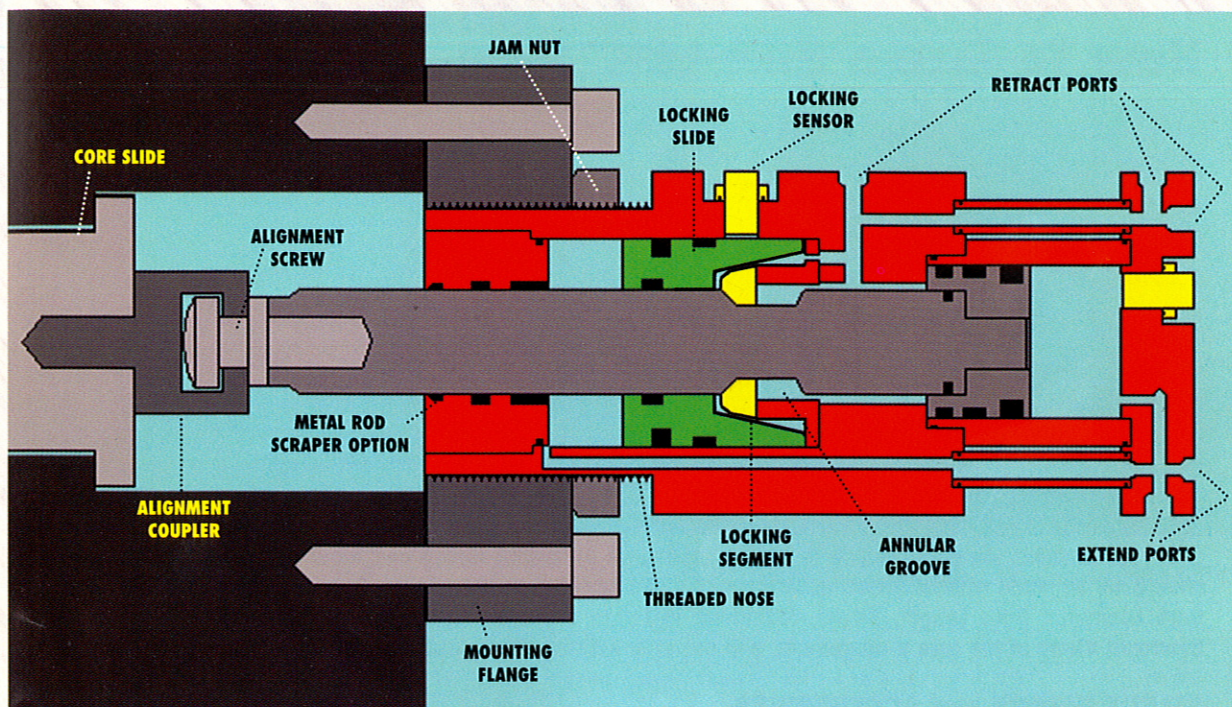
365 Days a Year!



**Same Day
 Service!**



**Designed & Made
 in the USA**



Series Size	Set Position* Output Force
75	12,000 lbs. (6 tons)
112	40,000 lbs. (20 tons)
150	60,000 lbs. (30 tons)
200	110,000 lbs. (55 tons)
300	210,000 lbs. (105 tons)

***Force ratings are at end of stroke only, based on assumed mold geometry. Ratings are for reference only. Actual performance will vary with application, setup and operating pressure.**

"What does it mean? . . ."

High output forces applied to the core ensure all flex and possible compression is removed prior to injection. Without flex and compression during injection, the core will not move. Automatic thermal compensation ensures this happens all the time.

"It means . . .

Zero Flash
Performance!

How it Works

KOR-LOK™ Side-Action Systems provide large pre-loads and thermal compensation to core slides by use of a dual action locking intensifier at end of stroke. The threaded housing supports the intensifier and integral cylinder mechanism and transfers the load between the mold base and core slide as follows:

SET The rod is extended using extend pressure. As the slide contacts the stop at end of stroke, the locking segments are forced into the rod groove by hydraulic pressure on the locking slide. As the segments are "squeezed," the rod and slide are compressed forward against the stop under very high forces, removing flex and thermal size variations. Final locking slide movement activates the set sensor.

PULL Retract pressure forces the locking slide clear of the segments, allowing them to disengage as the rod and slide are pulled. When fully retracted, the rear pull sensor is activated.

**See 2D and 3D
animated movies online at
www.pfa-inc.com**

See Back for Application Information

How To Size a KOR-LOK™ Side-Action System:

1. Determine forces on the core and any design limiting issues – SELECT SERIES SIZE.
2. Determine stroke requirements and final "E*" Dimension – SELECT STROKE.
3. Determine mounting method and core attachment – SELECT ACCESSORIES.
4. Determine operating temperature and environment – SELECT OPTIONS.
5. Place CAD layout into design and check clearance – PROOF DESIGN LAYOUT.
6. Request PFA review and quote to order – GET QUOTE AND ORDER SYSTEM.

SELECT SERIES SIZE

While there are many nuances to the design of a core/slide system, the primary indicator of KOR-LOK™ Side-Action System sizing is the force on the core in line with the main unit shaft. This force is a function of the projected core area and maximum injection pressure (nozzle/pack pressure) – contact PFA for details. Injection pressure generally ranges from 10,000 to 25,000 psi (hydraulic line pressure x 10). **FORCE (lbs) = AREA (sq. in.) X PRESSURE (psi)**. The KOR-LOK™ Side-Action System is chosen with a rating above this calculated force. Additional factors may affect performance. **As performance is highly dependent on actual forces and mold geometry, the selection should not be made without review of sizing with a PFA Applications Specialist. Providing Core Projected Area, Core Diameter, Core Length, Stroke, Maximum Injection Pressure, Hydraulic Pressure, Material Type, and Sectional Views of the core arrangement, will assist in KOR-LOK™ Side-Action System selection.**

SELECT STROKE and ACCESSORIES

Stroke is primarily determined by the need to clear the core from the part, but practical efforts should be made to simplify overall product selection, mounting, and adjustment. Once the core face detail is determined, and size is determined, select the CAD file image that best fits the application. Note that longer rods are available to make up the difference between the extended condition and desired mounting position (see custom CAD examples). Also note that for non-integer strokes, we employ a "Variable E*" dimension (rod projection when retracted - see dimensional data at right). For fractional strokes, a standard rod of the next longer integer stroke is used with the tubes cut to match the fractional stroke chosen. The difference between the next larger standard stroke rod and fractional stroke is added to the E dimension in the chart. [For example: A KL-H-112 with a stroke of 1", 2", 3" etc. stroke will have a standard E dimension of 0.50" (see chart). If a 1.75" stroke is required, a standard 2" stroke rod will be used, with the "extra" stroke rod material (2.0"-1.75" = 0.25") extending beyond the standard chart E dimension. The new E dimension would be 0.50"(chart) + 0.25"(extra) = 0.75". To determine extend rod dimension, add the stroke of 1.75" to the new 0.75" E to get 2.5".] Mounting can be done with counter bored mounting bolts in locations dictated by the design. Use of a Flange, Jam Nut and Alignment Screw is standard on nearly every order and allows for proper adjustment of the unit. A T slot in the core or use of our Alignment Coupler is also recommended for proper operation.

SELECT OPTIONS

Relay style pull and set sensors (switches) are included in each unit. Reading of the sensors assists in verification of proper operation during setup and adjustment. Sensors are a simple switch requiring no power or additional equipment. High Temperature Seals (VI) and Metal Rod Wiper (MW) options are available for very high temperature applications and die casting environments.

PROOF DESIGN LAYOUT

Check layout for **1)** proper core clearance when retracted, **2)** allowance for KL unit to extend through the flange during adjustment, **3)** clearance for sensors/guards during adjustment, **4)** non-interference for alternate sensor locations in the event final adjustment interferes with primary sensor location, and **5)** clearance to press or other items during mold installation in press.

GET QUOTE AND ORDER SYSTEM

Have a PFA Application Specialist review your selection criteria and method just to be certain nothing was missed. Request a quotation, including any special requirements. Place the order. (Note that PFA will confirm the order, ship date and any accounting requirements.)

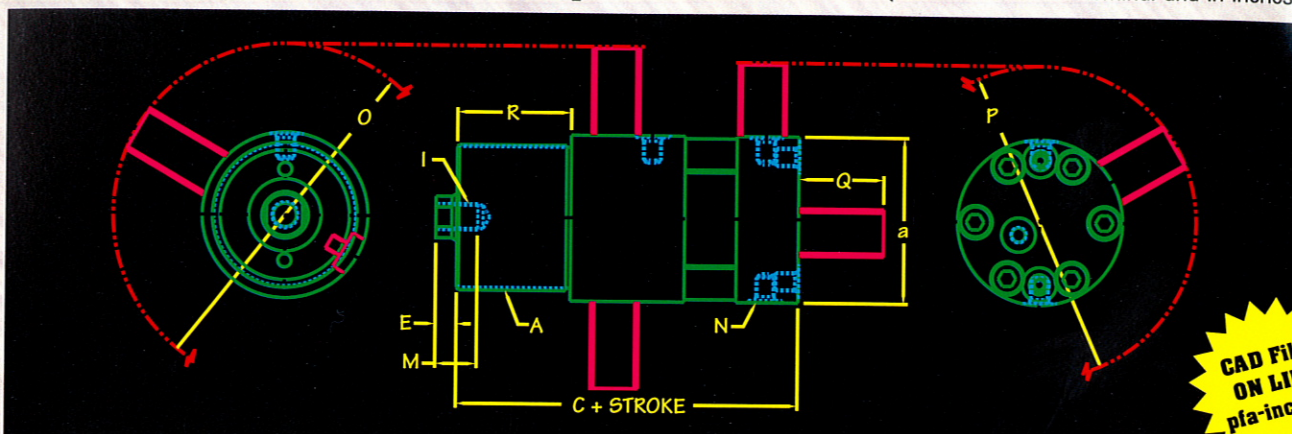
For the most detailed sizing information, product specifications, design suggestions, CAD files, and new product updates, visit us at www.pfa-inc.com.

* E Dimension - Integer stroke lengths (1", 2", 3", 4", 5" standard) are available with the E shown in chart. For non-integer fractional strokes, the E will vary from chart.

Dimensional Information:

Main Unit [KLH - ____ -(stroke) - options]

(All Dimensions are nominal and in inches)



Series Size	Bore/Rod	A	M	E*	R	I	C	a	N (SAE)	O**	P**	Q**	Output Intensifier Force (LBS.)***
75	1.25 / 0.750	2 3/4 - 16	0.75	0.50	2.25	3/8 - 24	6.22	3.00	#4	7.8	7.1	2.3	12,000
112	1.75 / 1.125	3 1/2 - 16	1.00	0.50	2.75	5/8 - 18	7.26	4.00	#4	8.4	7.7	2.3	40,000
150	2.00 / 1.500	4 - 6	1.25	0.75	3.38	7/8 - 16	8.93	4.50	#6	8.9	7.9	2.3	60,000
200	3.00 / 2.000	5 - 12	1.75	1.00	3.75	1 1/4 - 12	9.98	6.00	#6	9.9	8.9	2.3	110,000
300	4.00 / 3.000	6 3/4 - 8	2.00	1.25	5.00	1 3/4 - 12	12.08	7.50	#8	11.3	10.1	2.3	210,000

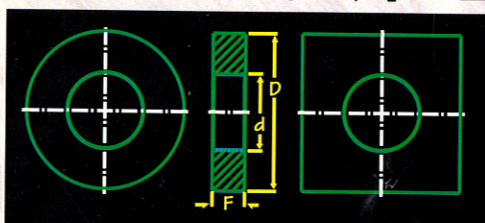
*KL units use a "Variable E" dimension. Integer stroke lengths (1", 2", 3", 4", 5" standard) are available with E shown in chart. For non-integer fractional strokes, the E will vary from chart—longer by unused fraction of stroke (see how to size section).

**Sensor Guard dimensions (for 75 series this is actual sensor height—no guards). O and P show swing arc clearance diameter during adjustment. Alternate front location included in the event that interference occurs at final adjustment position. Q is for alternate rear sensor location, if used in place of the rear side location (P).

***Output Mechanical Intensifier Ratings are for end of stroke (general reference only). Actual performance is dependent upon application geometry, setup and adjustment. Mid stroke and pull forces are less. Minimum operating pressure is 1,500psi. Call for details.

Flanges (Round or Square) [KL - ____ -RFC or -SFC]

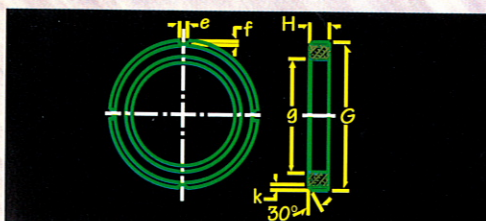
(All Dimensions are nominal and in inches)



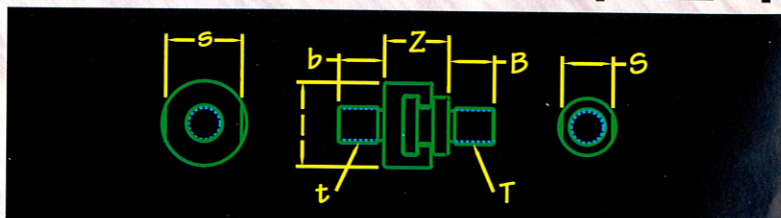
Series Size	d	D*	F*	Bolt Size/Quantity	Bolt Circle with C'Bore SHCS C'Bore Bolt Circle / Depth / Dia.	Bolt Circle No C'Bore
75	2 3/4 - 16	6.0	1.00	1/2 x 6	3.75 - 5.00 / .56 / .81	4.5 Ø - 5.25
112	3 1/2 - 16	7.2	1.50	5/8 x 6	4.75 - 6.00 / .69 / 1.00	5.75 - 6.25
150	4 - 16	8.0	1.50	5/8 x 6	5.25 - 6.75 / .69 / 1.00	6.50 - 7.00
200	5 - 12	10.0	2.00	3/4 x 6	6.50 - 8.50 / .81 / 1.19	8.00 - 8.75
300	6 3/4 - 8	14.0	2.50	1 x 12	8.75 - 12.25 / 1.06 / 1.56	10.50 - 12.50

*Flanges have no pre-drilled bolt holes for maximum design flexibility. Grade 8 bolts required. Since flange edges are flame cut and faces are machined flat, allow +.200/-.000" for edges and +.000/-.300" for faces (pilot off center thread only).

Jam Nuts [KL-____-JN]



Align Couplers [KL-____-AC]; Align Screws [KL-____-AS]



Series Size	T/t	B/b	S	s	I	Z (set)	Z (pull)	g	G	H	e	f/k
75	3/8 - 24	0.57	0.56	1.00	1.13	0.91	0.93	2 3/4 - 16	3.50	0.50	0.31	0.13
112	5/8 - 18	0.79	0.88	1.31	1.46	1.12	1.14	3 1/2 - 16	4.50	0.63	0.31	0.13
150	7/8 - 16	1.10	1.00	1.70	1.85	1.72	1.74	4 - 16	5.25	0.75	0.38	0.19
200	1 1/4 - 12	1.38	1.50	2.75	3.00	2.90	2.92	5 - 12	6.50	0.88	0.50	0.25
300	1 3/4 - 12	1.58	2.13	3.37	3.63	4.16	4.18	6 3/4 - 8	8.75	1.00	0.63	0.31

How To Order a KOR-LOK™ Side-Action System

KOR-LOK™ Side-Action Systems consist of a main unit and associated accessories. The standard main unit includes built in relay style sensors (multiple locations included) and multiple ports (all included). Optional High Temperature seals (VI) and metal rod wiper are also available for use in harsh environments. Mounting and interface accessories are critical to ensure simple installation, setup, and adjustment while installed. As final rotational adjustment tuning may be required during tryout, please use appropriate accessories and maintain clearance access, as practical. For more detailed descriptions, please review the "How to size" section, dimensional information, and online resources at www.pfa-inc.com. For questions on the product or specific design issues, please call and ask to speak with an Applications Specialist. We are happy to answer questions and routinely review applications. As customized solutions are often available (from prior customer applications), please use our application specialist service to ensure optimal product selection.

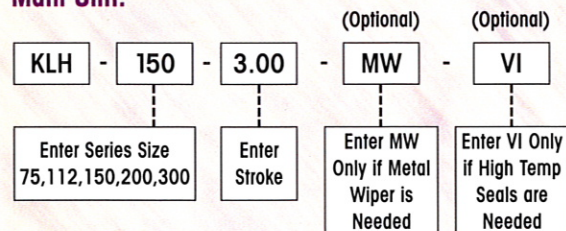
Complete the following steps prior to ordering:

1. SELECT SERIES SIZE.
2. SELECT STROKE.
3. SELECT ACCESSORIES.
4. SELECT OPTIONS.
5. PROOF DESIGN LAYOUT.
6. GET QUOTE AND ORDER SYSTEM.

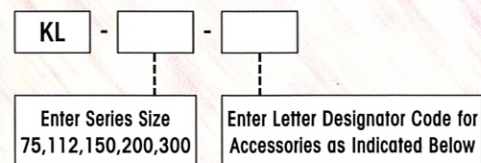
Please provide the following information:
Core Projected Area, Core Diameter, Core Length, Stroke, Maximum Injection Pressure, Hydraulic Pressure, Material Type, and Sectional Views of the core arrangement.

Part Number Selections:

Main Unit:



Mounting Accessories:



- RFC - Round Mounting Flange
- SFC - Square Mounting Flange
- JN - Jam Nut
- AS - Alignment Screw (Rod Interface)
- AC - Alignment Coupler (Core Interface)

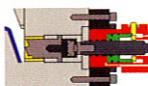

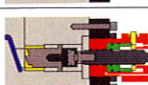
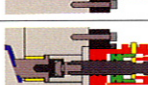

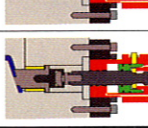
Example:

1. First the designer reviews the "How it works" section to refresh the understanding of the basics of system operation, force intensification, compression, and the need for proper product setup.
2. The application is a seal off core with stops. Movement is 30 degrees off the parting line. The main unit is sized correctly, based on core area, maximum injection pressure, and other parameters. A KLH-150-2.25 is selected.
3. A PFA Application Specialist is contacted to review the design and provide a quote. The PFA application specialist recommends elimination of the core taper to prevent jamming and widening of the stops due to the large output force of the 150 series on the indicated area. The specialist also recommends that rear porting be used to avoid interference with the clamping plate during rotational adjustment and notes that the drawing does not show an E* dimension correction for the fractional stroke of 2.25". A standoff for the mounting flange is recommended as the best alternative to adjust for the .75" difference. The standoff also corrects for the lack of space forward of the flange, which would have prevented adjustment.
4. The PFA specialist supplies a quote on the main unit and mounting accessories:

Quantity	Part Number	
1	KLH - 150 - 2.25	Main Unit
1	KL - 150 - SFC	Square Flange
1	KL - 150 - JN	Jam Nut
1	KL - 150 - AS	Align. Screw
1	KL - 150 - AC	Align. Coupler
5. The quote is sent to purchasing and the system ships within about 1 week of placing the order. PFA's 24 hour technical support line is available to assist with any setup or adjustment questions, if needed.

PFA KOR-LOK™ Side-Action Systems:

We're with you every step of the way!

KOR-LOK™ Side-Action Systems	vs.	A Traditional Side-Action System
		
		CAN'T DO IT!
		
		CAN'T DO IT!
Illustrated in action at pfa-inc.com		

Achieve "Zero Flash"

PFA's dual-action locking intensifier with integral cylinder ensures precompression of the core against the stop, above full injection pressure, when cores are set. **Subsequent injection has no effect on core position, resulting in zero movement.** Zero movement means **true Zero Flash performance!**

The Automatic Compensation Feature: Modular, Reusable, and Durable...

The automatic compensation feature allows the system to follow and compensate for changes in tools due to wear, thermal gradients, mold flex, and injection pressure variations, while continuing to maintain a positive pre-load on the core. Modular, reusable, and durable, KOR-LOK™ Side Action Systems allow you to **achieve improved performance** on current molds and **eliminate barriers to more innovative applications.**

More Complex Parts, Higher Injection Pressures...

More complex parts, higher injection pressures, larger core areas, improved quality requirements, and faster concept-to-production cycles are driving mold design to new heights. KOR-LOK™ Side-Action Systems **meet the industry's new higher performance, cost saving, support, and quality requirements** by reducing mold wear, improving cycle times, reducing scrap and secondary operations, lowering mold design and production costs, and improving delivery.

▲ PART DESIGN

Art to Part—PFA gives you the **design freedom** to do it all. Complex geometries, tight tolerances, perfect match lines and clean beautiful textures are now simple and easy. No limits. **Indulge yourself.**

▲ MOLD DESIGN

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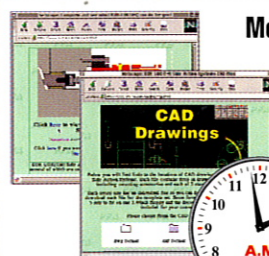
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▲ REAL SERVICE™

With real time information access, 24-hour technical support and expedited shipping, **we can have a KOR-LOK™ Side-Action System at your door—often before you've had your morning coffee. That's REAL SERVICE™.**

www.pfa-inc.com



Movies! Dimensions! Download CAD Files!

24/7/365 Support!



Designed & Made
in the USA



**Same Day
Service!**



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PFA
INCORPORATED

N118 W18251 Bunsen Drive
Germantown, WI 53022
262-250-4410 • Fax 262-250-4409
www.pfa-inc.com • korlok@pfa-inc.com