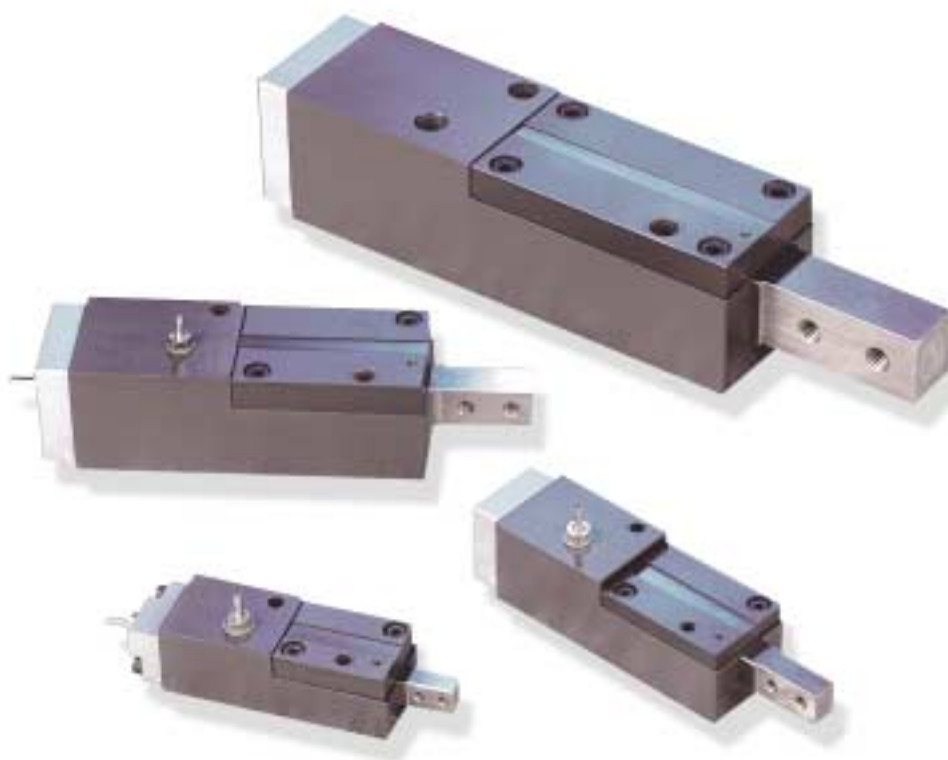


# ***SERIES LC SINGLE ROD ESCAPEMENTS***

***Ideal for part isolating, releasing, or as a conveyor stop.***

**See page 2B-11 for typical application examples.**



## **INDEX:**

### **Ordering Data**

Page 2B-2

### **Benefits**

Page 2B-3

### **Dimensions**

Page 2B-4

### **Engineering Data**

Page 2B-5

### **Options**

Pages 2B-6 and 2B-7

### **Sizing Guide**

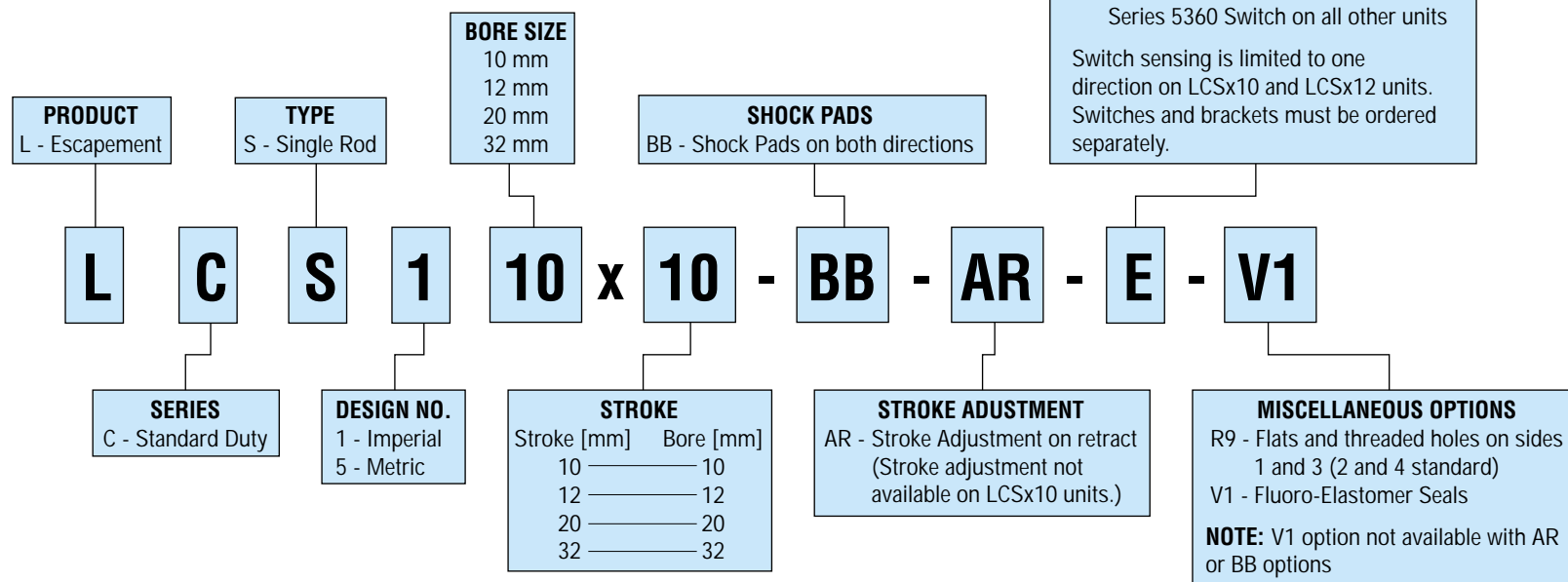
Pages 2B-8 to 2B-10

### **Application Ideas**

Page 2B-11

## TO ORDER SPECIFY:

Product, Series, Type, Design No.,  
Bore Size, Stroke, and Options.



### SERIES 5360 MINIATURE HALL EFFECT SWITCHES

PART NO.	DESCRIPTION
53603-1-02	NPN 4.5 - 24 VDC with 2 meter cable
53604-1-02	PNP 4.5 - 24 VDC with 2 meter cable
53623-1	NPN 4.5 - 24 VDC with quick connect
53624-1	PNP 4.5 - 24 VDC with quick connect

See Switches section of PHD's complete catalog for additional switch information and complete specifications.

### SERIES 5580 HALL EFFECT SWITCHES

PART NO.	DESCRIPTION
55803-1-02	NPN 4.5 - 24 VDC with 2 meter cable
55804-1-02	PNP 4.5 - 24 VDC with 2 meter cable
55823-1	NPN 4.5 - 24 VDC with quick connect
55824-1	PNP 4.5 - 24 VDC with quick connect

Mounting Kit Number - 57880

### 6mm SQUARE INDUCTIVE PROXIMITY SWITCHES

PART NO.	DESCRIPTION
18431-001-02	NPN (Sink) 10-30 VDC, 2 meter cable
18431-002-02	PNP (Source) 10-30 VDC, 2 meter cable

Mounting Kit Number - 57880

### 4mm ROUND INDUCTIVE PROXIMITY SWITCHES

PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 10-30 VDC, 2 meter cable
18430-002-02	PNP (Source) 10-30 VDC, 2 meter cable

Mounting Kit Number - 57879



CUSTOM ESCAPEMENTS ARE AVAILABLE. PLEASE CONSULT PHD.



Options may affect unit length.  
See unit dimension and options  
pages for adders.

# BENEFITS: SERIES LC SINGLE ROD ESCAPEMENTS

## BENEFITS

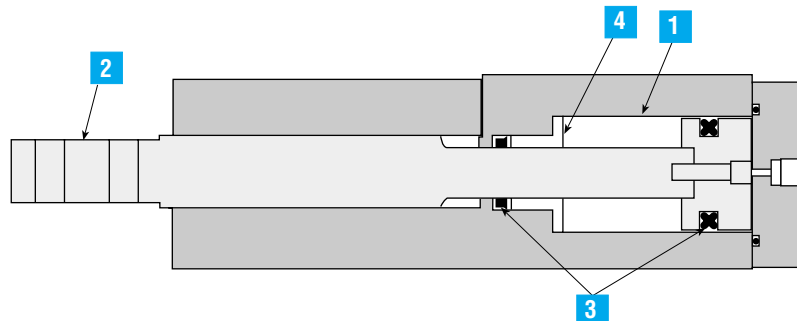
- Series LC Escapements are ideal for separating and releasing parts being presented from various feeding systems. Additionally, Series LC Escapements are well suited for use as conveyor stops. See page 2B-11.
- Threaded mounting holes on two sides of the rod allow simple attachment of tooling.
- Shoulders on two sides of the rod provide locations to prevent tooling movement.
- Both thru and dowel holes in the body are provided for quick setup and convenient, repeatable mounting.
- Inductive proximity switch ready is standard for all sizes.
- Large rod bearing area ensures high side load capacity. See equation on page 2B-9.
- Optional stroke adjustment for precise adjustment of the retracted rod position from 0" to full stroke. (Not available on 10 mm bore units.)
- Optional shock pads in each direction provide noise reduction and minimize end of stroke shock.
- Switch ready option allows the fitting of PHD Series 5360 and 5580 Hall Effect switches. Switches can be adjusted to give an output at any position in the stroke of the rod. See pages 2B-6 and 2B-7.
- Simple construction for easy field maintenance.



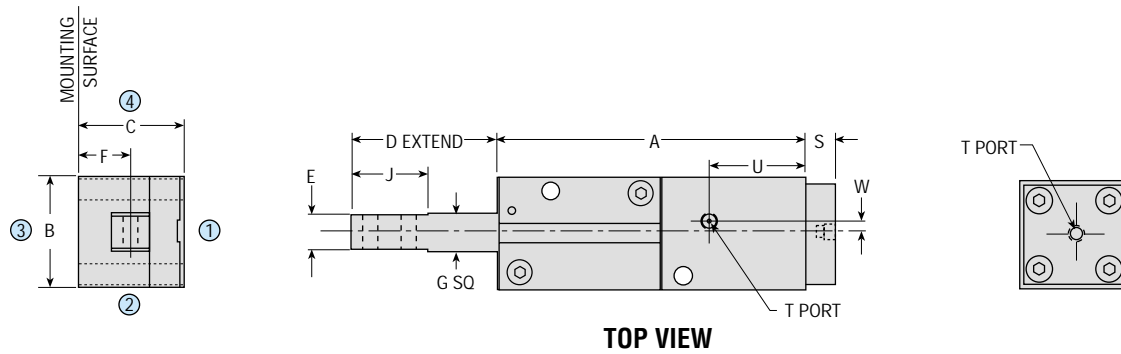
SPECIFICATIONS	SERIES LC
MINIMUM PRESSURE	30 psi [2 bar]
MAXIMUM PRESSURE	150 psi [10 bar]
LUBRICATION	Permanent for Non-Lube Air
OPTIONS	Shock Pads, Stroke Adjustment Switch Ready

## CONSTRUCTION

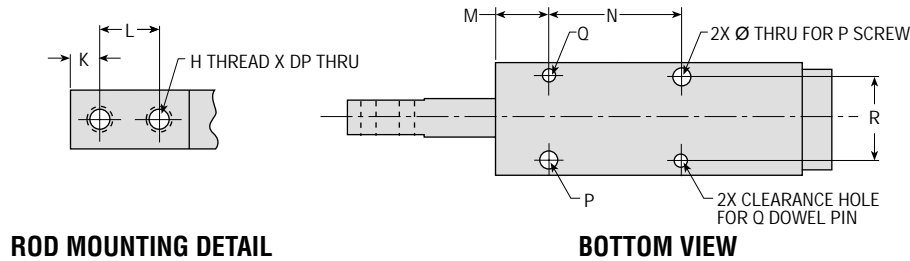
- 1 Piston bore and bearing surfaces are hardcoated with PTFE impregnation for long life.
- 2 Hardened and ground electroless nickel plated alloy steel rod provides maximum wear resistance and high side loading capacity.
- 3 Long life Nitrile piston and rod seals for low maintenance.
- 4 Acetal rod bushing gives excellent wear characteristics and accurately locates the rod seal.



# DIMENSIONS: SERIES LC SINGLE ROD ESCAPEMENTS

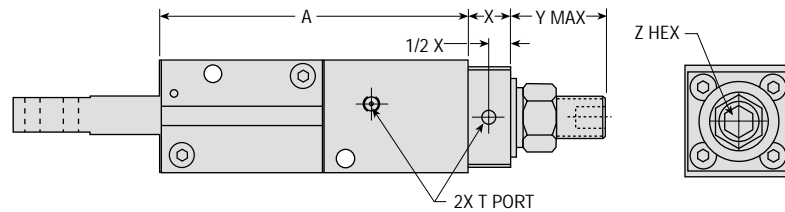


TOP VIEW



ROD MOUNTING DETAIL

BOTTOM VIEW



OPTIONAL STROKE ADJUSTMENT

(Not available on LCSx10 units)

LETTER DIM.	IMPERIAL MODEL NO.				METRIC MODEL NO.			
	LCS110x10	LCS112x12	LCS120x20	LCS132x32	LCS510x10	LCS512x12	LCS520x20	LCS532x32
PHD BORE	.394	.472	.787	1.260	10 mm	12 mm	20 mm	32 mm
A	2.480	3.012	3.937	6.142	63.0	76.5	100.0	156.0
B	.964	1.082	1.417	1.850	24.5	27.5	36.0	47.0
C	.807	1.024	1.339	1.811	20.5	26.0	34.0	46.0
D	1.043	1.358	1.890	3.406	26.5	34.5	48.0	86.5
E	.259	.310	.435	.768	6.6	7.9	11.0	19.5
F	.354	.512	.668	.904	9.0	13.0	17.0	23.0
G	.300	.364	.490	.860	7.6	9.2	12.4	21.8
H	4-40 UNC	6-32 UNC	10-32 UNC	5/16-18 UNC	M3 x 0.5	M3 x 0.5	M5 x 0.8	M8 x 1.25
J	.500	.750	1.000	2.000	12.7	19.0	25.4	50.8
K	.125	.187	.250	.500	3.2	4.7	6.4	12.7
L	.250	.375	.500	.875	6.4	9.5	12.7	22.2
M	.512	.512	.669	1.004	13.0	13.0	17.0	25.5
N	.984	1.339	1.713	2.874	25.0	34.0	43.5	73.0
P	#6	#6	#10	5/16	M3	M3	M5	M8
Q	3 mm	3 mm	4 mm	5 mm	3.0	3.0	4.0	5.0
R	.591	.748	1.063	1.338	15.0	19.0	27.0	34.0
S	.374	.374	.374	.472	9.5	9.5	9.5	12.0
T	10-32 THD	10-32 THD	10-32 THD	1/8 NPT	M5 x 0.8	M5 x 0.8	M5 x 0.8	1/8 BSP
U	.767	.787	1.220	1.792	19.5	20.0	31.0	45.5
W	.157	.157	.157	.472	4.0	4.0	4.0	12.0
X	—	.552	.552	.827	—	14.0	14.0	21.0
Y	—	.787	1.26	1.831	—	20.0	32.0	46.5
Z	—	4 mm	6 mm	8 mm	—	4 mm	6 mm	8 mm

**NOTES:**

- 1) METRIC DIMENSIONS ARE IN MILLIMETERS
- 2) ALL DIMENSIONS ARE ABOUT THE CENTERLINE UNLESS OTHERWISE SPECIFIED.

# ENGINEERING DATA: SERIES LC SINGLE ROD ESCAPEMENTS

## ESCAPEMENT FORCE TABLE

UNIT	BORE		ROD DIRECTION	EFFECTIVE AREA		CYLINDER FORCE													
						IMPERIAL [lb]							METRIC [N]						
	in	mm		in <sup>2</sup>	mm <sup>2</sup>	20	40	60	80	100	120	150	1.38	2.76	4.14	5.52	6.9	8.28	10.35
LCSx10	.394	10	EXTEND	.122	78.5	2.4	4.9	7.3	10	12	15	18	11	22	33	43	54	65	81
			RETRACT	.094	60.5	1.9	3.8	5.6	7.5	9.4	11	14	8.4	17	25	33	42	50	63
LCSx12	.472	12	EXTEND	.175	112.6	3.5	7.0	11	14	18	21	26	16	31	47	62	78	93	117
			RETRACT	.126	81.1	2.5	5.0	7.6	10	13	15	19	11	22	34	45	56	67	84
LCSx20	.787	20	EXTEND	.487	313.4	9.7	19	29	39	49	58	73	43	87	130	173	217	260	325
			RETRACT	.410	263.8	8.2	16	25	33	41	49	62	36	73	109	146	182	219	274
LCSx32	1.260	32	EXTEND	1.247	802.4	25	50	75	100	125	150	187	111	222	333	444	555	666	832
			RETRACT	1.050	675.6	21	46	63	84	105	126	158	93	187	280	374	467	560	701

## WEIGHT TABLE

UNIT	STANDARD		STROKE ADJUSTMENT	
	lb	kg	lb	kg
LCSx10	.22	.1	—	—
LCSx12	.45	.21	.51	.24
LCSx20	.90	.42	1.1	.51
LCSx32	2.80	1.3	3.4	1.6

## STROKE TABLE

OPTION	LCSx10	LCSx12	LCSx20	LCSx32
STANDARD UNIT	.394 [10]	.472 [12]	.787 [20]	1.26 [32]
SHOCK PAD (-BB)	.354 [9]	.433 [11]	.787 [20]	1.26 [32]
STROKE ADJ (-AR)	—	.413 [10.5]	.728 [18.5]	1.20 [30.5]
-AR -BB	—	.374 [9.5]	.728 [18.5]	1.20 [30.5]

### NOTES:

- 1) STANDARD STROKE LENGTH TOLERANCE IS -.000/+.031 [-.00/+.08].
- 2) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN MILLIMETERS.

## PRESSURE RATINGS

All Series LC Escapements have a maximum pressure rating of 150 psi [10 bar] air and are for pneumatic use only.

## BREAKAWAY

The breakaway pressure is 20 psi [1.5 bar] at zero load.

## OPERATING TEMPERATURES

Series LC Escapements are recommended for use in temperatures from -20° to +180°F [-29° to +82°C]. Consult PHD for temperatures beyond this range.

## LUBRICATION

All units are permanently lubricated at the factory and can be used with non-lubricated or lubricated air. Seals are compatible with standard petroleum-based oils used for lubrication.

## VELOCITY

Average minimum velocity is designed to be 20 in/sec [.5 m/sec] with zero load at 100 psi [7 bar].

## MAINTENANCE

As with most PHD products, the units are field repairable. Rebuild kits and main structural components are available as needed for extended service. See parts and repair kits in our Parts Lists catalog.

## LIFE EXPECTANCY

Series LC Escapements have been designed and tested for 5 million trouble-free cycles under normal conditions. Lubricated air may increase life of unit. Option -V1 may reduce life expectancy.

## MAXIMUM ROD TORQUE

See page 2B-8 for table and application.

# OPTIONS: SERIES LC SINGLE ROD ESCAPEMENTS

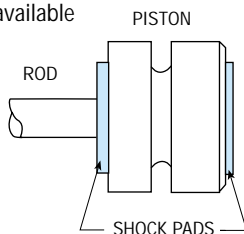
2B

**BB**

## SHOCK PADS INSTALLED BOTH DIRECTIONS

Polyurethane shock pads for noise reduction and absorption of shock at ends of stroke are available on each end of Series LC EscapeMENTS. Shock pads permit higher piston velocities for shorter cycle times. Noise reduction is beneficial for the working environment.

**NOTE:** Shock pads reduce standard stroke by .039 [1 mm] on LCSx10 and LCSx12 units.

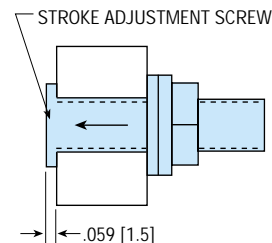


**AR**

## STROKE ADJUSTMENT ON RETRACT

Stroke adjustment screws can be set for precise adjustment of the retracted position from 0" to full stroke. Stroke adjustment option reduces the standard stroke by .059 [1.5 mm].

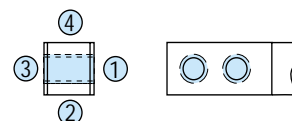
**NOTE:** Not available on LCSx10 unit.



**R9**

## ROD END OPTION

This option specifies flats and threaded holes on sides 1 and 3. Mounting holes and flats on sides 2 and 4 are standard.



**E**

## SWITCH READY

**Series 5580 on LCSx10 units**  
**Series 5360 on all other units**

Switch Ready option includes magnets on the rod for PHD solid state switches. Units are equipped to sense in two directions, both extend and retract. Switches must be ordered separately. See chart below.

**NOTE:** LCSx10 and LCSx12 units can only sense in one direction.

## BENEFITS

- Series 5360 or 5580 Hall Effect Switches provide an interface to a PLC or other controllers.
- Switches are easily adjusted to provide a signal at any point in the stroke of the rod. **NOTE:** 5580 switch may extend beyond body envelope.
- Hall Effect switches have no moving parts or mechanical contacts for long life and elimination of contact bounce.
- Low profile switch design requires little additional space for mounting the escapement.

### SERIES 5360 MINIATURE HALL EFFECT

SPECIFICATIONS	53603 & 53623	53604 & 53624
OPERATING PRINCIPLE	Hall Effect	
ACTUATED BY	Moving Magnet	
INPUT VOLTAGE	4.5 to 24 VDC	
OUTPUT TYPE	NPN (Sink)	PNP (Source)
CURRENT RATING	20 mA. Max.	100 mA. Max.
VOLTAGE DROP	.5 VDC Max.	
SWITCH BURDEN	12 mA. Max.	
ENVIRONMENTAL	IP67*	
OPERATING TEMP.	0° to 80°C	

\*When used with Quick Disconnects, the disconnect is rated at IP65.

PART NO.	DESCRIPTION
53603-1-02	NPN (Sink) 4.5-24 VDC, 2 meter cable
53604-1-02	PNP (Source) 4.5-24 VDC, 2 meter cable
53623-1	NPN (Sink) 4.5-24 VDC, Quick Connect
53624-1	PNP (Source) 4.5-24 VDC, Quick Connect

### SERIES 5580 MINIATURE HALL EFFECT

SPECIFICATIONS	55803 & 55823	55804 & 55824
OPERATING PRINCIPLE	Hall Effect	
ACTUATED BY	Target Magnet	
INPUT VOLTAGE	4.5 to 24 VDC	
OUTPUT TYPE	NPN (Sink)	PNP (Source)
CURRENT RATING	20 mA. Max.	100 mA. Max.
VOLTAGE DROP	.5 VDC Max.	
SWITCH BURDEN	12 mA. Max.	
ENVIRONMENTAL	IP67*	
OPERATING TEMP.	0° to 80°C	

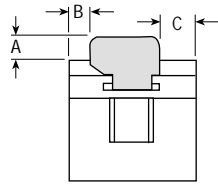
\*When used with Quick Disconnects, the disconnect is rated at IP65.

PART NO.	DESCRIPTION
55803-1-02	NPN (Sink) 4.5-24 VDC, 2 meter cable
55804-1-02	PNP (Source) 4.5-24 VDC, 2 meter cable
55823-1	NPN (Sink) 4.5-24 VDC, Quick Connect
55824-1	PNP (Source) 4.5-24 VDC, Quick Connect

Switch information is continued on page 2B-7.

# OPTIONS: SERIES LC SINGLE ROD ESCAPEMENTS

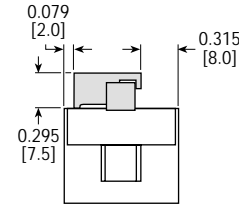
## SERIES 5360 HALL EFFECT DIMENSIONS



MODEL NO.	DIM A	DIM B	DIM C
LCSx12	0.322 [8.2]	0.188 [4.8]	0.315 [8.0]
LCSx20	0.177 [4.5]	0.354 [9.0]	0.486 [12.3]
LCSx32	0.217 [5.5]	0.571 [14.5]	0.692 [17.6]

NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN MILLIMETERS.

## SERIES 5580 HALL EFFECT DIMENSIONS



SWITCH BRACKET KIT  
(NUMBER 57880) MUST BE  
ORDERED SEPARATELY.

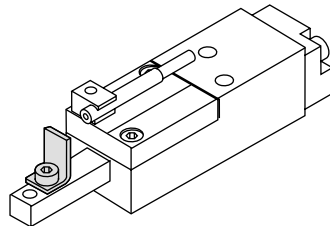
SERIES 5580 IS AVAILABLE ON LCSx10 UNITS ONLY.

## INDUCTIVE PROXIMITY SWITCH READY

All units are inductive proximity switch ready as standard. A threaded hole is provided in the body cover to allow attachment of PHD bracket kits for 4 mm round or 6 mm square inductive proximity switches.

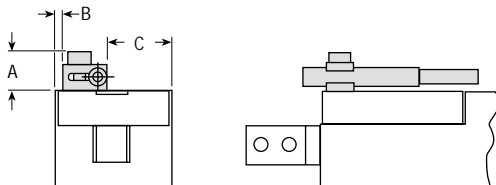
**NOTE:** Switch targets mounted on the rod end or on the rod tooling are to be provided by the end user. For more details, see Switches and Sensors section.

Illustrated below are examples (showing the extended rod position), of how 4 mm round and 6 mm square inductive proximity switches are installed. The suggested maximum gap between target and switch is .032 [0.8].

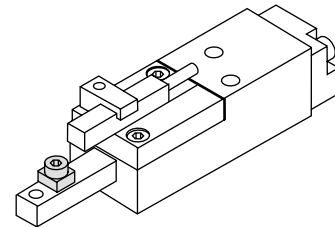


**4 mm ROUND  
INDUCTIVE PROXIMITY SWITCHES**

PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 10-30 VDC, 2 meter cable
18430-002-02	PNP (Source) 10-30 VDC, 2 meter cable

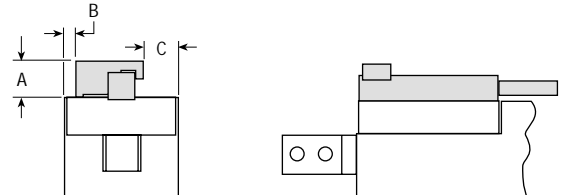


MODEL NO.	DIM A	DIM B	DIM C
LCSx10	0.335 [8.5]	0.059 [1.5]	0.524 [13.3]
LCSx12	0.21 [5.3]	0.118 [3.0]	0.583 [14.8]
LCSx20	0.315 [8.0]	0.283 [7.2]	0.748 [19.0]
LCSx32	0.315 [8.0]	0.500 [12.7]	0.966 [24.5]



**6 mm SQUARE  
INDUCTIVE PROXIMITY SWITCHES**

PART NO.	DESCRIPTION
18431-001-02	NPN (Sink) 10-30 VDC, 2 meter cable
18431-002-02	PNP (Source) 10-30 VDC, 2 meter cable



MODEL NO.	DIM A	DIM B	DIM C
LCSx10	0.295 [7.5]	0.079 [2.0]	0.315 [8.0]
LCSx12	0.177 [4.5]	0.138 [3.5]	0.374 [9.5]
LCSx20	0.268 [6.8]	0.305 [7.7]	0.541 [13.7]
LCSx32	0.268 [6.8]	0.522 [13.3]	0.757 [19.2]

# SIZING GUIDE: SERIES LC SINGLE ROD ESCAPEMENTS

## FOUR MAIN FACTORS TO CONSIDER WHEN SELECTING AN ESCAPEMENT

- 1 RESPONSE TIME** - The time it takes to extend or retract the piston rod.
- 2 MAXIMUM ROD TORQUE** - Torque applied to the rod by off-center parts and tooling.
- 3 STATIC SIDE LOAD (Q)** - Constant load on the rod applied by the parts being held back.
- 4 IMPACT LOAD (F)** - The load applied to the rod when a part or stack of parts impacts dynamically on the rod tooling or additional parts are added dynamically to an existing stack.

2B

## 1 RESPONSE TIME

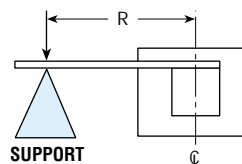
Following is a reference guide to response times of the piston rod for extend and retract based on a typical load at 87 psi [6 bar]. The response time for rod extension will be less than the response time for retraction. Varying the operating pressure, air line diameter, and the applied load will affect the response time. Response times shown do not include valve response time.

UNIT	TYPICAL LOAD		RETRACT TIME	EXTEND TIME
	lb	kg	sec	sec
LCSx10	1	.45	.03	.02
LCSx12	2	.91	.04	.03
LCSx20	5	2.3	.06	.04
LCSx32	10	4.5	.08	.06

## 2 MAXIMUM ROD TORQUE

MODEL NO.	STANDARD DUTY	
	in-lb	Nm
LCSx10	1.2	0.14
LCSx12	2.0	0.25
LCSx20	5.0	0.6
LCSx32	9.0	1.1

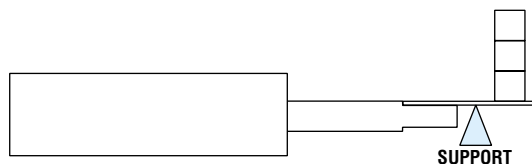
$$\text{MAX. ROD LOAD TORQUE} = (\text{LOAD}) \times R$$



For applications which exceed the maximum allowable rod torque, the tooling should be supported as shown. Calculation without the support:  
Max. Rod Load Torque = (Load) x R

## LOAD SUPPORT

For applications that exceed maximum allowable forces, support the tooling as shown.





# SIZING GUIDE: SERIES LC SINGLE ROD ESCAPEMENTS

## SYMBOL DEFINITIONS

- L - Distance from face of escapement to centerline of parts in inches [mm]  
 N - Number of parts backed up  
 For correct sizing calculation results, always divide "N" by the number of escapements that may be used. This must be done *PRIOR* to using "N" in a sizing calculation.  
 f - Friction coefficient between the conveyor belt and the part (use 0.5 [0.5] if unknown)

- P - Working pressure in psi [bar]  
 R - Offset distance between the rod centerline and the load which applies a moment to the rod.  
 Q - Maximum side load factor value the rod can support and still cycle (assumes zero friction between tooling and part)  
 V - Conveyor belt velocity in inches/sec [mm/sec]  
 W - Weight of each part in lb [N]

**NOTE:** W = 9.8 (mass in kg)

## CONSTANTS FOR USE IN PERFORMANCE CALCULATIONS

EQUATION	IMPERIAL					METRIC				
	CONSTANT	LCSx10	LCSx12	LCSx20	LCSx32	CONSTANT	LCSx10	LCSx12	LCSx20	LCSx32
STATIC LOAD	Q at 40 psi	1.74	3.5	10.4	52.2	Q at 3 bar	195	392	1160	5846
	Q at 60 psi	5.2	10.4	31.3	156.6	Q at 4 bar	582	1160	3500	17540
	Q at 80 psi	10.4	20.9	62.6	313.2	Q at 6 bar	1165	2340	7000	35080
	Q at 100 psi	15.7	31.3	94.0	469.8	Q at 7 bar	1758	3500	10500	52620
	A	.311	.392	.507	.802	A	7.9	10	12.9	20.4
	B	2.76	2.17	2.10	1.88	B	2.76	2.17	2.10	1.88
IMPACT LOAD	C	.611	.813	1.135	2.01	C	10.2	20.6	28.8	51.1
	D	0.0122	0.0217	0.0537	0.369	D	200	356	879	6050
	E	40200	80400	307000	2360000	E	1.165 E8	2.31 E8	8.81 E8	67.7 E8
	F	3440	3440	3440	3440	F	23.7	23.7	23.7	23.7
	G	52	104	397	3050	G	5940	11750	44900	345000

**NOTE:** A, B, C, D, E, F, & G ARE EMPIRICAL NUMBERS DETERMINED THROUGH TESTING.

## HORIZONTAL TRANSFER

### 3 STATIC LOAD

$$(f N W) (L + A + B \times R) \leq Q$$

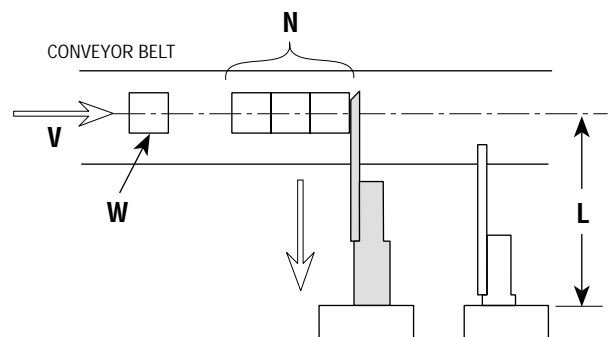
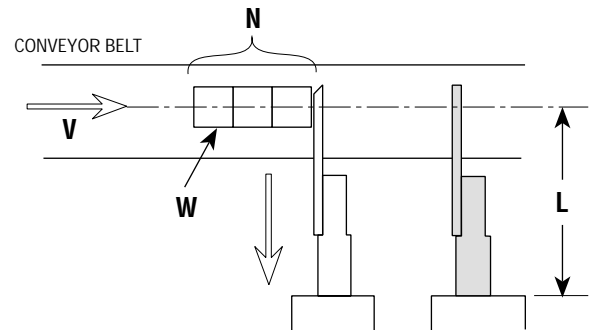
### 4 IMPACT LOAD - From the stack of parts transferring from one unit to the other.

$$\frac{(N W) (L - C)}{D} \left[ \sqrt{G \frac{V^2}{L^3 N W}} \right] \leq F$$

### 4 IMPACT LOAD - From additional part or parts being added onto the stack.

$$\frac{W (L - C)}{D} \left[ Nf + \sqrt{G \frac{V^2}{L^3 W}} \right] \leq F$$

**Note:** If the above equations do not yield an acceptable answer, either choose a larger escapement, shorten the "L" dimension, decrease the number of parts in the stack "N", or decrease the velocity "V".



# SIZING GUIDE: SERIES LC SINGLE ROD ESCAPEMENTS

## VERTICAL TRANSFER

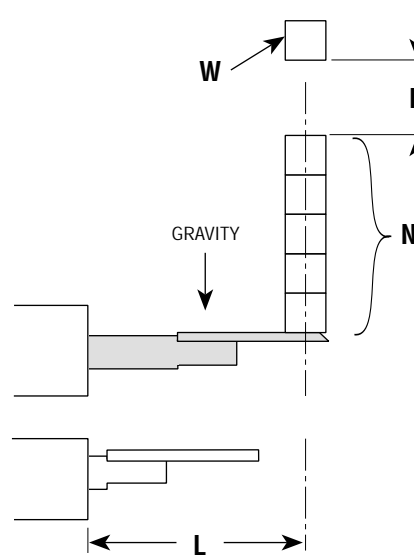
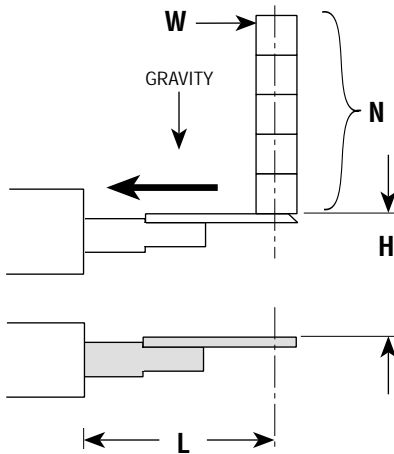
Example below shows two units being used to sequence parts.

### STATIC LOAD

$$(f N W) (L + A + B \times R) \leq Q$$

**IMPACT LOAD** - From the stack of parts transferring from the top unit to the bottom unit.

$$\frac{(N W) (L - C)}{D} \left[ \sqrt{E \frac{H}{L^3 N W}} \right] \leq F$$



**IMPACT LOAD** - From additional part or parts being added onto the stack.

$$\frac{W (L - C)}{D} \left[ N + \sqrt{E \frac{H}{L^3 W}} \right] \leq F$$

**Note:** If the above equations do not yield an acceptable answer, either choose a larger escapement, shorten the "L" dimension, decrease the number of parts in the stack "N", or decrease the distance "H".

## EXAMPLE - VERTICAL TRANSFER

Model = LCSx12

A = .392 [10]

B = 2.17 [2.17]

C = .813 [20.6]

D = .0217 [356]

E = 80400 [2.31 E8]

F = 3440 [23.7]

H = .5 in [13 mm]

L = 2 in [50 mm]

N = 15

Q = 20.9 at 80 psi [2340 at 6 bar]

R = 0

W = .03 lb [.13 N]

### 3 STATIC LOAD

#### IMPERIAL

$$(N W) (L + A + B \times R) \leq Q$$

$$(15 \times .03) (2 + .392 + 2.17 \times 0) \leq 20.9$$

$$1.1 \leq 20.9$$

#### METRIC

$$(N W) (L + A + B \times R) \leq Q$$

$$(15 \times .13) (50 + 10 + 2.17 \times 0) \leq 2340$$

$$117 \leq 2340$$

Therefore the Static Load is acceptable.

### 4 IMPACT LOAD

#### IMPERIAL

$$\frac{(N W) (L - C)}{D} \left[ \sqrt{E \frac{H}{L^3 N W}} \right] \leq F$$

$$\frac{(15 \times .03) (2 - .81)}{.0217} \left[ \sqrt{80400 \times \frac{.5}{2^3 \times 15 \times .03}} \right] \leq 3440$$

$$2608 \leq 3440$$

#### METRIC

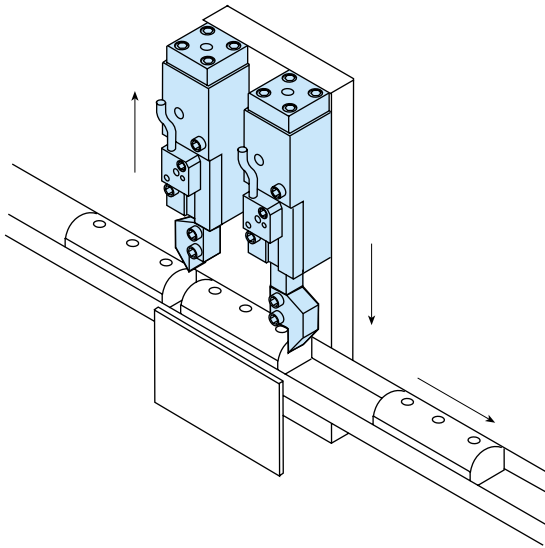
$$\frac{(N W) (L - C)}{D} \left[ \sqrt{E \frac{H}{L^3 N W}} \right] \leq F$$

$$\frac{(15 \times .13) (50 - 20)}{356} \left[ \sqrt{2.31 \text{ E}8 \times \frac{13}{50^3 \times 15 \times .13}} \right] \leq 23.7$$

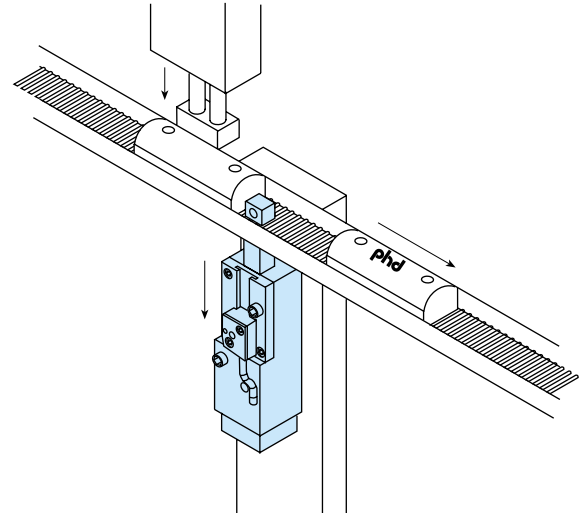
$$18.2 \leq 23.7$$

Therefore the Impact Load is acceptable.

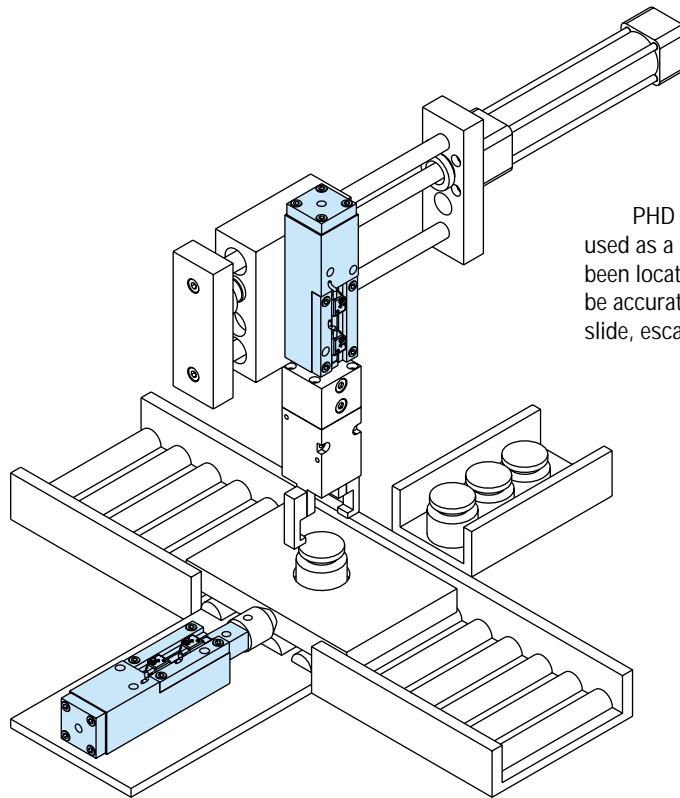
# APPLICATION IDEAS: SERIES LC SINGLE ROD ESCAPEMENTS



PHD Series LC Single Rod Escapements provide a simple, reliable means to isolate and release parts from various types of feeding mechanisms. This application demonstrates two escapements used in conjunction with each other over a gravity parts feeder. The distance between the escapements is determined to allow long parts to be sequenced while keeping the rod tooling as short as possible.



PHD Series LC Single Rod Escapements can be used as a conveyor stop to allow other operations to take place on the component. This application shows one escapement on a conveyor line which stops the part and allows the component to be stamped.



PHD Series Single Rod Escapements can be used as a short stroke slide. Once the pallet has been located, a part from the other conveyor will be accurately transferred onto the pallet using a slide, escapement, and gripper.

PHD Series LC Single Rod Escapements can be used as a shot pinning device. This application demonstrates one escapement with specialized nose tooling which will precisely locate the pallet which is moving down a conveyor.