

SERIES 160

DOUBLE ROD ESCAPEMENTS

Internal sequence mechanism ensures that both rods are extended before either rod can retract for positive part feeding.

See page 2A-11 for typical application examples.



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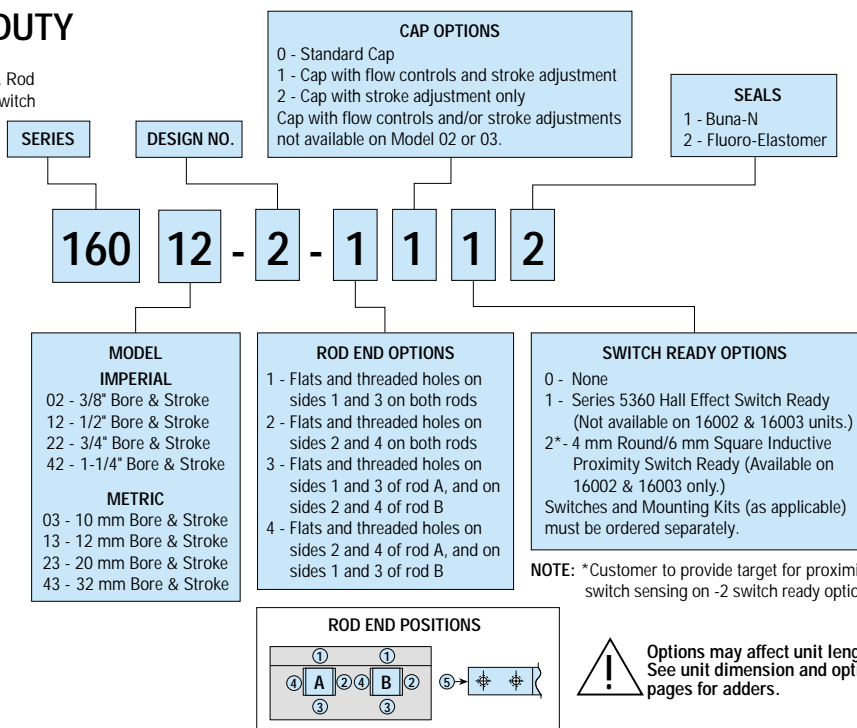
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ORDERING DATA: SERIES 160 DOUBLE ROD ESCAPEMENTS

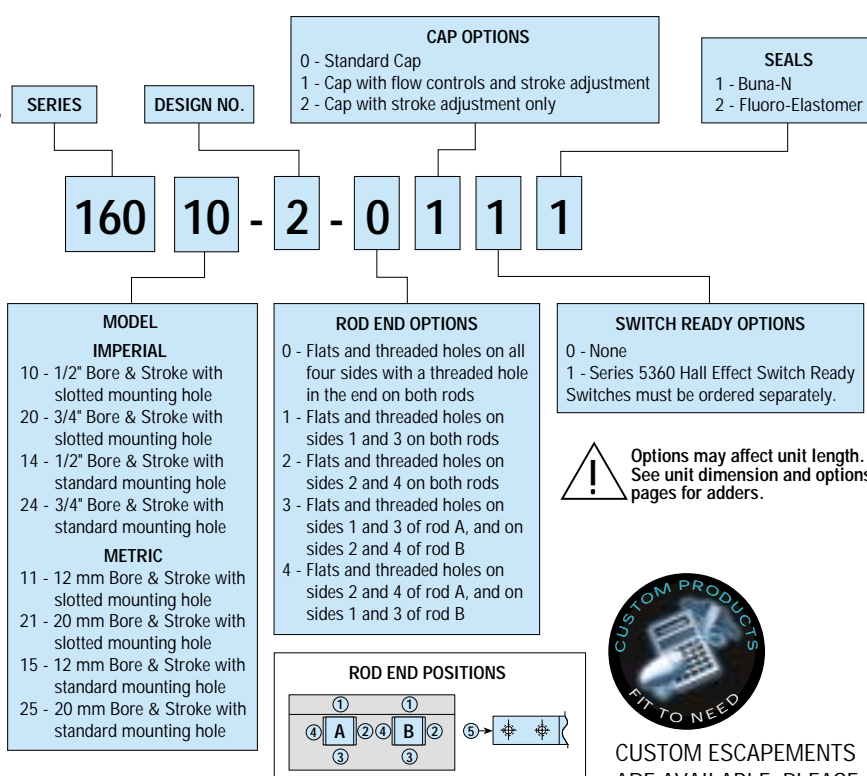
STANDARD DUTY

TO ORDER SPECIFY:
Series, Model, Design No., Rod
End Option, Cap Option, Switch
Ready Option, and Seals.



HEAVY DUTY

TO ORDER SPECIFY:
Series, Model, Design No.,
Rod End Option, Cap Option,
Switch Ready Option,
and Seals.



SERIES 5360

MINIATURE HALL EFFECT SWITCHES

PART NO.	DESCRIPTION
53603-1-02	NPN 4.5-24 VDC, 2 meter Cable
53604-1-02	PNP 4.5-24 VDC, 2 meter Cable
53623-1	NPN 4.5-24 VDC, Quick Connect
53624-1	PNP 4.5-24 VDC, Quick Connect

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

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

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



CUSTOM ESCAPEMENTS
ARE AVAILABLE. PLEASE
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BENEFITS: SERIES 160 DOUBLE ROD ESCAPEMENTS

BENEFITS

- Series 160 Escapements are ideal for isolating and feeding of individual parts from vibratory feeders, magazines, or hoppers.
- Internal sequence mechanism ensures that both rods are extended before either rod can retract for positive part feeding.
- Internally ported design requires only one 4-way air valve for convenience and cost savings.
- Threaded mounting holes on two sides or on all four faces and the end of each rod for easy attachment of tooling.
- Shoulders on two sides or on all four sides of each rod can be used to prevent tooling from slipping.
- Optional flow controls allow the speed of each rod to be independently and precisely adjusted (not available on 3/8" [10 mm] bore units, model sizes 02 and 03).
- Thru holes and optional slotted holes (Heavy Duty units only) are provided for quick setup and convenient mounting. See page 2A-11 for details.
- Optional stroke adjustment can be set for precise adjustment of the retracted position of each rod from 1/8" [3 mm] to full stroke. See page 2A-11 for details. (Not available on 3/8" [10 mm] bore units.)
- Switch ready option enables the fitting of PHD Series 5360 Hall Effect or Inductive Proximity Switches. Switches can be adjusted to provide a signal at any point in the stroke of the rod. See pages 2A-6 and 2A-7.



HEAVY DUTY VS. STANDARD DUTY

PHD Escapements are available in heavy and standard duty models. The heavy duty model is offered in two sizes and uses fluoropolymer composite rod bearings which allow higher static and impact loads on the stroke rods. The standard duty model is offered in four sizes. It utilizes PTFE impregnated hardcoat rod bearings for applications requiring moderate static and impact loads on the stroke rods. See pages 2A-8 to 2A-10 for specific load capabilities.

SPECIFICATIONS	STANDARD DUTY				HEAVY DUTY	
	SERIES				SERIES	
	1600x	1601x	1602x	1604x	1601x	1602x
UNIT WEIGHT	.35 lb [159 g]	.65 lb [290 g]	1.56 lb [710 g]	6.25 lb [2.8 kg]	.65 lb [290 g]	1.56 lb [710 g]
EXTEND FORCE	.122 lb/psi [7.8 N/bar]	.175 lb/psi [11.3 N/bar]	.487 lb/psi [31.4 N/bar]	1.247 lb/psi [80.4 N/bar]	.175 lb/psi [11.3 N/bar]	.487 lb/psi [31.4 N/bar]
RETRACT FORCE	.094 lb/psi [6.0 N/bar]	.126 lb/psi [8.1 N/bar]	.410 lb/psi [26.5 N/bar]	1.050 lb/psi [67.7 N/bar]	.126 lb/psi [8.1 N/bar]	.410 lb/psi [26.5 N/bar]
MAX. ROD MOMENT	1.2 in lb [0.14 Nm]	2 in lb [0.24 Nm]	5 in lb [0.6 Nm]	9 in lb [1.0 Nm]	2 in lb [0.25 Nm]	5 in lb [0.6 Nm]
OPERATING MEDIA	Lubricated* or Non-Lube Air				Lubricated* or Non-Lube Air	
MIN. PRESSURE	30 psi [2 bar] (Min. operating pressure-no load)				30 psi [2 bar] (Min. operating pressure-no load)	
MAX. PRESSURE	150 psi [10 bar]				150 psi [10 bar]	
BODY MATERIAL	Hardcoated Aluminum				Hardcoated Aluminum	
ROD MATERIAL	Hardened, Electroless Nickel Plated Steel				Hardened, Electroless Nickel Plated Steel	
BEARING MATERIAL	PTFE Impregnated Hardcoat				Fluoropolymer Composite	

Numbers in [] are for metric units.

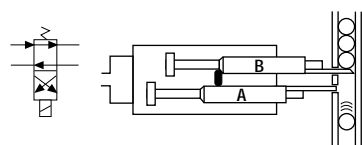
*Piston and rod seal life will be extended with the use of lubricated air.

TYPICAL OPERATION

WORKING PRINCIPLE

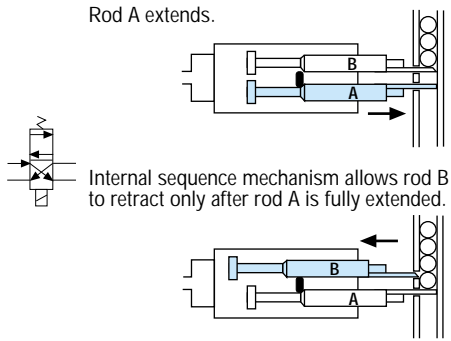
PHD Escapements are internally ported allowing both double acting stroke rods to be operated by a single 4 port, 2 position valve. The sequence of rod motions allows parts being fed continuously from a magazine or feeder to be separated or grouped for subsequent processing.

INITIAL VALVE POSITION



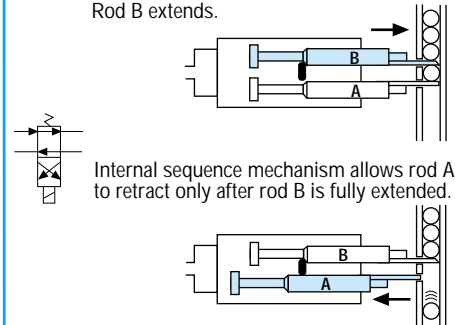
ACTIVATED VALVE POSITION

Rod A extends.

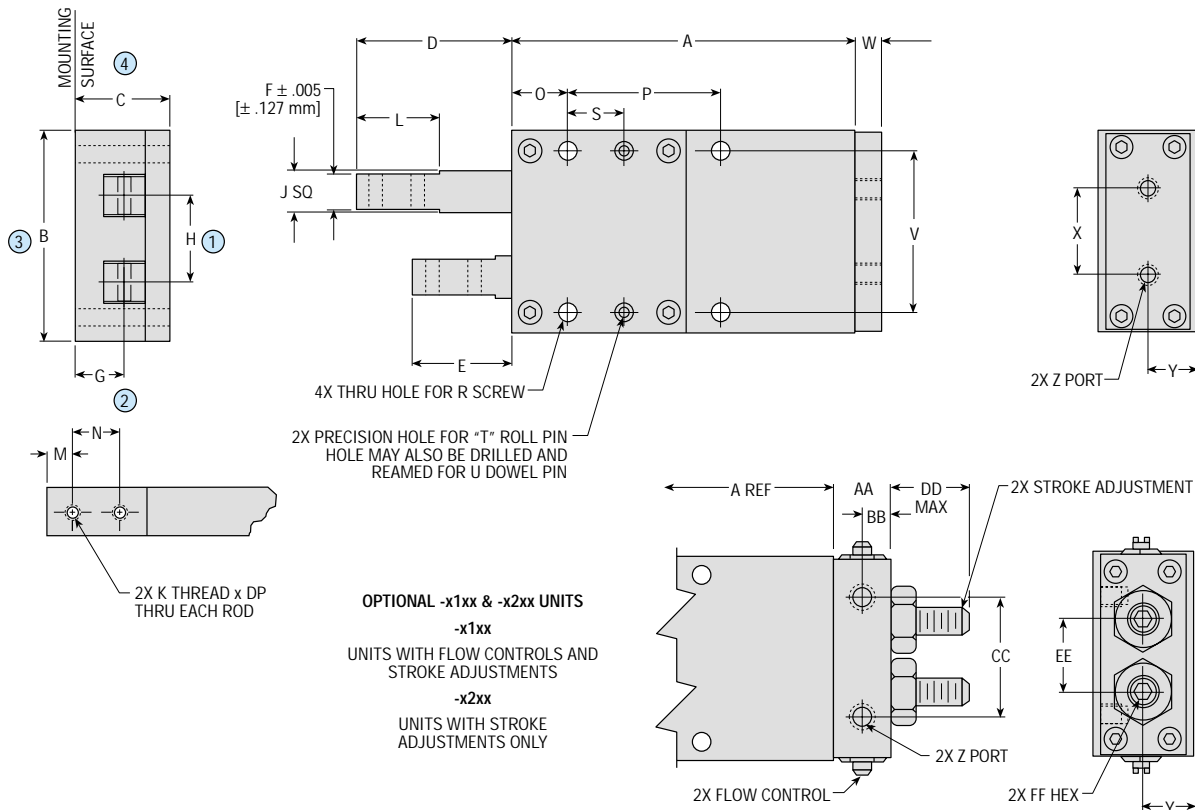


RETURN TO INITIAL VALVE POSITION

Rod B extends.



DIMENSIONS: SERIES 160 DOUBLE ROD ESCAPEMENTS STANDARD DUTY

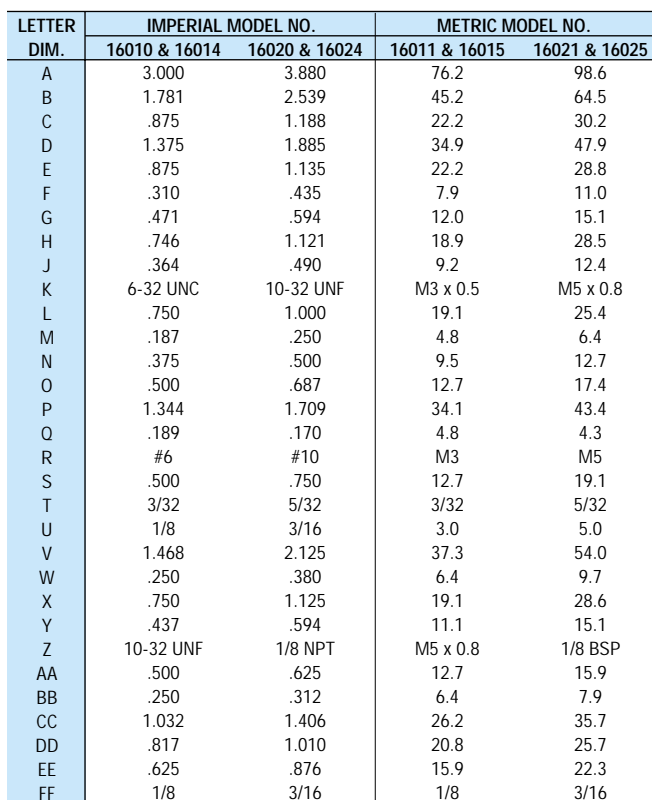


LETTER DIM.	IMPERIAL MODEL NO.				METRIC MODEL NO.			
	16002-2	16012-2	16022-2	16042-2	16003-2	16013-2	16023-2	16043-2
A	2.510	3.000	3.880	6.140	63.8	76.2	98.6	156.0
B	1.500	1.781	2.539	3.740	38.1	45.2	64.5	95.0
C	.750	.875	1.188	1.969	19.1	22.2	30.2	50.0
D	.986	1.375	1.885	3.385	25.0	34.9	47.9	86.0
E	.593	.875	1.135	2.125	15.1	22.2	28.8	54.0
F	.259	.310	.435	.768	6.6	7.9	11.0	19.5
G	.374	.438	.593	.983	9.5	11.1	15.1	25.0
H	.551	.748	1.123	1.752	14.0	19.0	28.5	44.5
J	.300	.364	.490	.860	7.6	9.2	12.4	21.8
K	4-40 UNC	6-32 UNC	10-32 UNF	5/16-18 UNC	M3 x 0.5	M3 x 0.5	M5 x 0.8	M8 x 1.25
L	.500	.750	1.000	2.000	12.7	19.1	25.4	50.8
M	.125	.187	.250	.500	3.2	4.7	6.4	12.7
N	.250	.375	.500	.875	6.4	9.5	12.7	22.2
O	.431	.500	.687	1.004	10.9	12.7	17.4	25.5
P	1.095	1.344	1.709	2.875	27.8	34.1	43.4	73.0
R	#6	#6	#10	5/16	M3	M3	M5	M8
S	.408	.500	.750	1.250	10.4	12.7	19.1	31.8
T	3/32	3/32	5/32	3/16	3/32	3/32	5/32	3/16
U	1/8	1/8	3/16	1/4	3.0	3.0	5.0	6.0
V	1.166	1.468	2.125	3.147	29.6	37.3	54.0	79.9
W	.250	.250	.380	.380	6.4	6.4	9.7	9.7
X	.551	.750	1.125	1.752	14.0	19.1	28.6	44.5
Y	.374	.438	.593	.983	9.5	11.1	15.1	25.0
Z	10-32 UNF	10-32 UNF	1/8 NPT	1/8 NPT	M5 x 0.8	M5 x 0.8	1/8 BSP	1/8 BSP
AA	—	.500	.625	.625	—	12.7	15.9	15.9
BB	—	.250	.312	.312	—	6.4	7.9	7.9
CC	—	1.032	1.406	2.276	—	26.2	35.7	57.8
DD	—	.817	1.010	2.020	—	20.8	25.7	51.3
EE	—	.625	.876	1.421	—	15.9	22.3	36.1
FF	—	1/8	3/16	8 mm	—	1/8	3/16	8 mm

NOTES:

- 1) METRIC DIMENSIONS ARE IN MILLIMETERS
- 2) ROD STROKES MAY BE LIMITED TO .125" [3.17 mm] BY USE OF OPTIONAL STROKE ADJUSTMENT SCREWS
- 3) FULLY EXTENDED ROD MAY RETRACT UP TO 0.025" [0.64 mm] UPON PRESSURIZATION OF RETRACTED ROD
- 4) ROD SHOWN WITH -2xxx OPTION

2A



- 1) METRIC DIMENSIONS ARE IN MILLIMETERS
- 2) ROD STROKES MAY BE LIMITED TO .125" [3.17 mm] BY USE OF OPTIONAL STROKE ADJUSTMENT SCREWS
- 3) FULLY EXTENDED ROD MAY RETRACT UP TO 0.025" [0.64 mm] UPON PRESSURIZATION OF RETRACTED ROD
- 4) ROD SHOWN WITH -0xxx OPTION (FOR -1, -2, -3, & -4 OPTION SEE PAGE 2A-4, K DIM= 2X)

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OPTIONS: SERIES 160 DOUBLE ROD ESCAPEMENTS

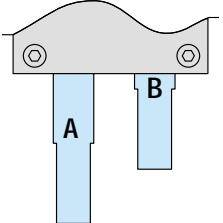
-Xxxx ROD END OPTIONS

PHD Escapements can be specified with a number of rod end options. The dimensioned drawing on page 2A-5 shows rod option -0 specifying flats and threaded holes on four sides with an additional threaded hole in the end of the rod.

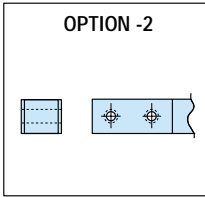
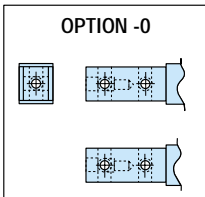
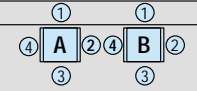
The most cost effective rod end options are -1, -2, -3, and -4. These options provide mounting holes and flats on two sides only of each rod.

- 0 - Flats and threaded holes on all four sides with a threaded hole in the end on both rods (heavy duty option only)
- 1 - Flats and threaded holes on sides 1 and 3 on both rods
- 2 - Flats and threaded holes on sides 2 and 4 on both rods
- 3 - Flats and threaded holes on sides 1 and 3 of rod A and on sides 2 and 4 of rod B
- 4 - Flats and threaded holes on sides 2 and 4 of rod A and on sides 1 and 3 of rod B

OPTIONS -1 THROUGH -4
REFERENCE DRAWING



SHOWN AS OPTION -2



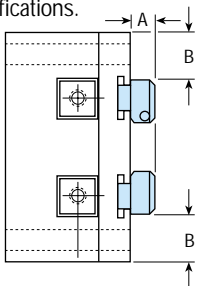
1 HALL EFFECTS SWITCH READY

This option equips the escapement with magnets on both rods for use with PHD Series 5360 Hall Effect Switches. These switches mount easily to the escapement using "T" slots in the body. Not available on 16002 and 16003 units. Switches must be ordered separately.

BENEFITS

- Series 5360 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.
- 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.

See page 2A-2 for option callouts. See Switches and Sensors section of PHD's main catalog for additional switch information and complete specifications.



STANDARD DUTY				HEAVY DUTY	
MODEL	DIM. A	DIM. B		DIM. A	DIM. B
1601x	.317 [8.1]	.275 [7.0]		.317 [8.1]	.275 [7.0]
1602x	.234 [6.0]	.475 [12.1]		.234 [6.0]	.475 [12.1]
1604x	.200 [5.1]	.752 [19.1]		—	—

Numbers shown in [] are mm.



SPECIFICATIONS	MODEL NUMBER	
	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	IEC IP67	
OPERATING TEMP.	0° to 80°C	

SERIES 5360 MINIATURE HALL EFFECT SWITCHES

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

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

OPTIONS: SERIES 160 DOUBLE ROD ESCAPEMENTS

2 SWITCH READY 16002 AND 16003 UNITS ONLY

This option equips the escapement with mounting holes for use with either 4 mm round or 6 mm square metal sensing proximity switches on the Series 16002 and 16003 Escapements. Proximity switches and mounting kits must be ordered separately. See Switches and Sensors section of PHD's main catalog for switch applications.

NOTE: Switch targets must be supplied by the end user (see below).

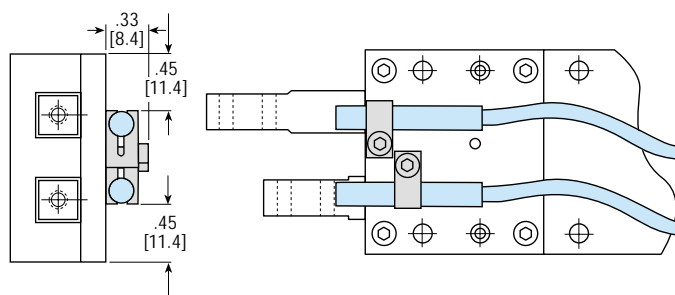
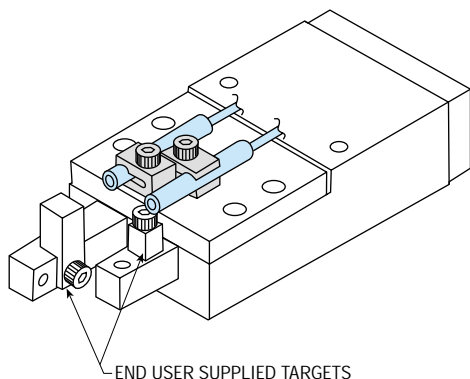
PROXIMITY SWITCH MOUNTING KITS

PROXIMITY SWITCH	KIT NUMBER
4 mm Round Inductive	57879
6 mm Square Inductive	57880

EACH PROXIMITY SWITCH MOUNTING KIT CONTAINS:
1 SWITCH BRACKET
1 BRACKET MOUNTING SCREW

4 mm ROUND

Illustrated below is a suggested method of installing switch targets for use with a 4 mm inductive proximity switch. Suggested maximum gap between target and switch is .032 inch [0.8 mm].

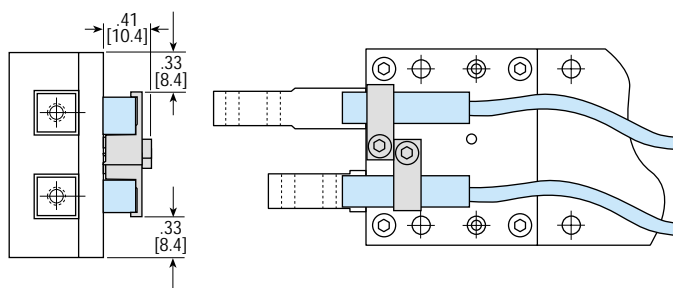
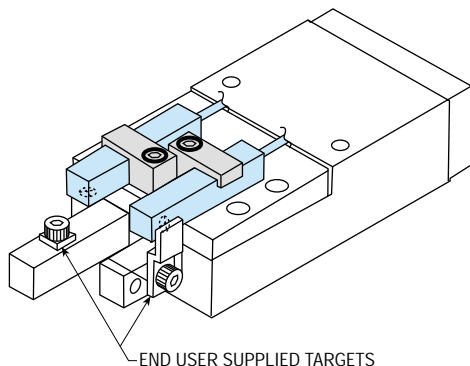


4 mm ROUND INDUCTIVE PROXIMITY SWITCHES

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

6 mm SQUARE

Illustrated below is a suggested method of installing switch targets for use with a 6 mm inductive proximity switch. Suggested maximum gap between target and switch is .032 inch [0.8 mm].



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

Numbers in [] are for metric units.

SIZING GUIDE: SERIES 160 DOUBLE ROD ESCAPEMENTS

THERE ARE FOUR MAJOR FACTORS TO CONSIDER WHEN SELECTING AN ESCAPEMENT.

- 1 RESPONSE TIME (T)** - The time it takes to extend one rod and retract the other rod.
- 2 MAXIMUM ROD TORQUE** - Torque applied to the rod by off-center parts and tooling.
- 3 STATIC SIDE LOAD (Q)** - The constant load on one rod from the weight or force exerted by parts being held back.
- 4 IMPACT LOAD (F)** - The load caused when the weight from the stack transfers from one rod to the other or when additional parts impact against the stack.

2A

1 RESPONSE TIME

$$T = U - \frac{P}{S} + \frac{W}{X}$$

TOTAL CYCLE TIME = 2T + DWELL TIMES

P - Working pressure in psi [bar]
T - Time in seconds to extend one rod and retract the other
W - Total weight applied to rod pounds [kg]

Imperial

1601x Example: P = 80 psi, W = 5 lb

$$T = .200 - \frac{80}{1250} + \frac{5}{750}$$

T = .143 sec

Metric

1601x Example: P = 5 bar, W = 2 kg

$$T = 0.200 - \frac{5}{86} + \frac{2}{340}$$

T = 0.148 sec

EQUATION	CONSTANT	STANDARD DUTY				HEAVY DUTY	
		1600x	1601x	1602x	1604x	1601x	1602x
RESPONSE TIME	U	0.125 [0.125]	0.200 [0.200]	0.250 [0.250]	0.350 [0.350]	0.200 [0.200]	0.250 [0.250]
	S	6500 [448]	1250 [86]	1000 [69]	1000 [69]	1250 [86]	1000 [69]
	X	1500 [580]	750 [340]	500 [227]	900 [408]	750 [340]	500 [227]

2 MAXIMUM ROD TORQUE

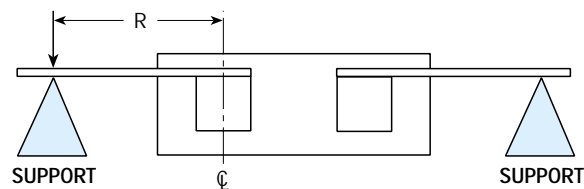
MODEL NO.	STANDARD DUTY		HEAVY DUTY	
	in-lb	[Nm]	in-lb	[Nm]
1600x	1.2	[0.14]	—	—
1601x	2.0	[0.25]	2.0	[0.25]
1602x	5.0	[0.6]	5.0	[0.6]
1604x	9.0	[1.1]	—	—

For applications which exceed the maximum allowable rod torque, the tooling should be supported as shown.

Calculation without the support:

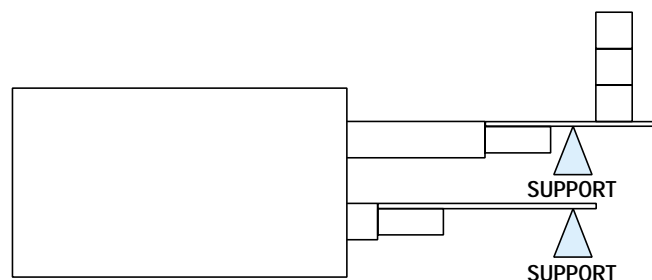
Max. Rod Load Torque = (Load) x R

MAX. ROD LOAD TORQUE = (LOAD) x R



LOAD SUPPORT

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



SIZING GUIDE: SERIES 160 DOUBLE ROD ESCAPEMENTS HORIZONTAL TRANSFER

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 load and the rod centerline
 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

IMPERIAL								METRIC						
EQUATION	CONSTANT	STANDARD DUTY				HEAVY DUTY		CONSTANT	STANDARD DUTY				HEAVY DUTY	
		10 mm	12 mm	20 mm	32 mm	12 mm	20 mm		10 mm	12 mm	20 mm	32 mm	12 mm	20 mm
STATIC LOAD	Q at 40 psi	1.74	3.5	10.4	52.2	3.5	10.4	Q at 3 bar	195	392	1160	5846	392	1160
	Q at 60 psi	5.2	10.4	31.3	156.6	10.4	31.3	Q at 4 bar	582	1160	3500	17540	1160	3500
	Q at 80 psi	10.4	20.9	62.6	313.2	20.9	62.6	Q at 6 bar	1165	2340	7000	35080	2340	7000
	Q at 100 psi	15.7	31.3	94.0	469.8	31.3	94.0	Q at 7 bar	1758	3500	10500	52620	3500	10500
	A	.311	.392	.507	.802	.392	.507	A	7.9	10	12.9	20.4	10	12.9
	B	2.76	2.17	2.10	1.88	2.17	2.10	B	2.76	2.17	2.10	1.88	2.17	2.10
IMPACT LOAD	C	.611	.813	1.135	2.01	.813	1.135	C	10.2	20.6	28.8	51.1	20.6	28.8
	D	0.0122	0.0217	0.0537	0.369	0.0217	0.0554	D	200	356	879	6050	356	908
	E	40200	80400	307000	2360000	53600	206000	E	1.165 E8	2.31 E8	8.81 E8	67.7 E8	1.538 E8	5.91 E8
	F	3440	3440	3440	3440	3440	3440	F	23.7	23.7	23.7	23.7	23.7	23.7
	G	52	104	397	3050	69	266	G	5940	11750	44900	345000	7800	30000

NOTE: A, B, C, D, E, F, & G are empirical numbers determined through testing.

HORIZONTAL TRANSFER

3 STATIC LOAD

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

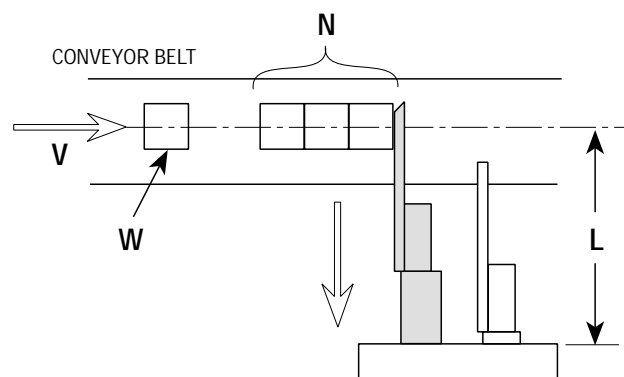
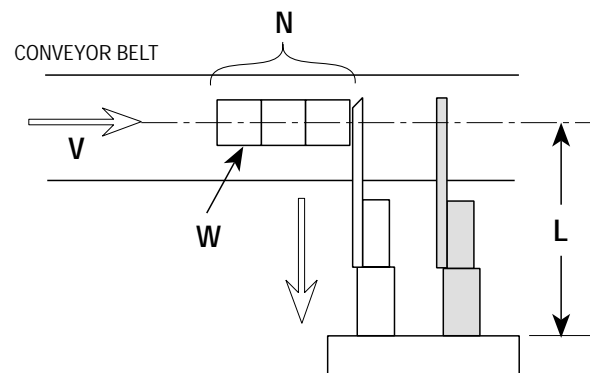
4 IMPACT LOAD - From the stack of parts transferring from one rod to the other.

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

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 160 DOUBLE ROD ESCAPEMENTS VERTICAL TRANSFER

VERTICAL TRANSFER

See example below.

STATIC LOAD

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

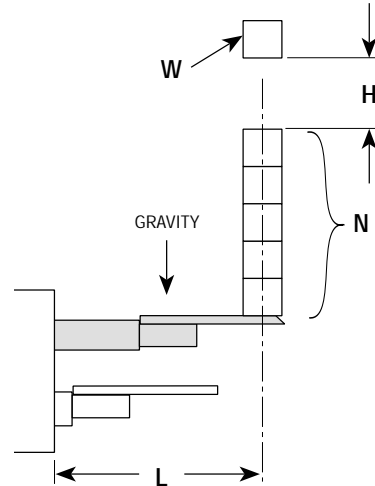
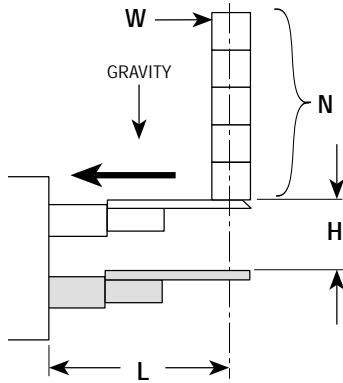
IMPACT LOAD - From the stack of parts transferring from the top rod to the bottom rod.

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

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 = 16010

A = .392 [10] B = 2.17 [2.17] C = .813 [20.6] D = .0217 [356] E = 53600 [1.538 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 [.13N]

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

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

$$\frac{(15 \times .03) (2 - .81)}{.0217} \left[\sqrt{53600 \times \frac{.5}{2^3 \times 15 \times .03}} \right] \leq 3440$$

$$2124 \leq 3440$$

METRIC

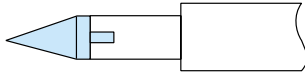
$$\frac{(N W) (L - C)}{D} \left[\sqrt{E \frac{H}{L^3 N W}} \right] \leq F$$

$$\frac{(15 \times .13) (50 - 20)}{356} \left[\sqrt{1.538 \text{ E}8 \times \frac{13}{50^3 \times 15 \times .13}} \right] \leq 23.7$$

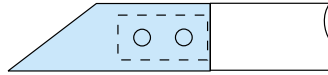
$$14.6 \leq 23.7$$

Therefore the Impact Load is acceptable.

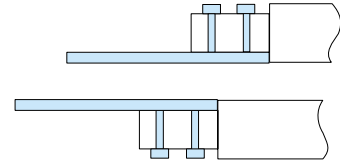
TOOLING IDEAS & MOUNTING INSTRUCTIONS



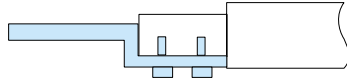
The threaded hole in the end of rod option -0 can be used to attach simple tooling made from turned bar stock.



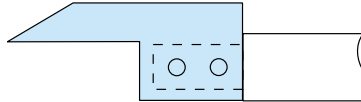
Tooling can have a knife edge to help separate parts coming down a track. It can also be located against the shoulder on the square rod to prevent slipping.



Thin pieces of flat stock can be attached to the inside of each arm for handling small parts.

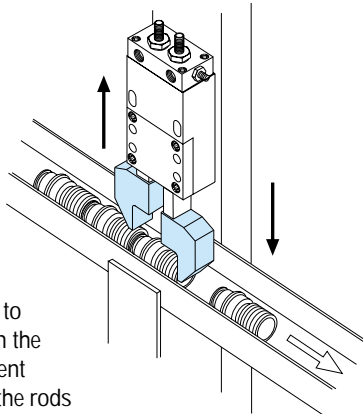


Flat stock can be attached to specified mounting surfaces in one of four positions.

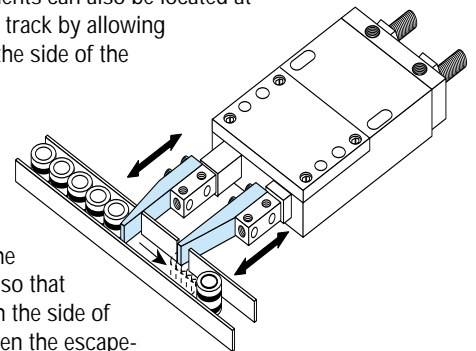


Tooling can be offset from the centerline of the rod to handle large parts or multiples of parts in one cycle.

PHD Escapements provide a simple, reliable means to isolate and release parts from various types of feeding mechanisms. This application shows the escapement being used vertically over a gravity parts feeder. The tooling is designed to handle parts that are wider than the distance between the escapement rods. The built-in sequence of the rods ensures that only one part is released at a time.



PHD Escapements can also be located at the side of a feeder track by allowing clearance holes in the side of the track. The stroke adjustment in the escapement is used to limit the retract stroke of the escapement rods. This allows the unit to be adjusted so that tooling is flush with the side of the feeder track when the escapement rod is retracted. This adjustment limits excess travel and reduces cycle time.



- Premount the unit using two cap screws with flat washers (A) through the optional slotted mounting hole into pretapped holes in the mounting surface. Tighten until snug.
- Adjust the escapement forward or back until the parts are releasing properly. Tighten the screws (A) to maintain the position of the unit (slotted mounting only).
- Transfer punch the locations for the second set of mounting holes to be drilled and tapped (B).
- Roll or dowel pins (C) can be used for final position if required.
- The optional stroke adjustment screws (D) can be used to fine tune the retracted position.

