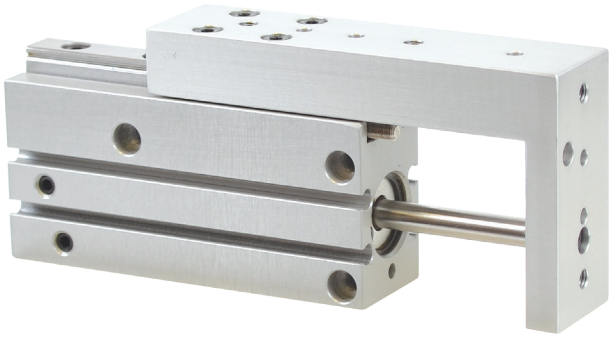
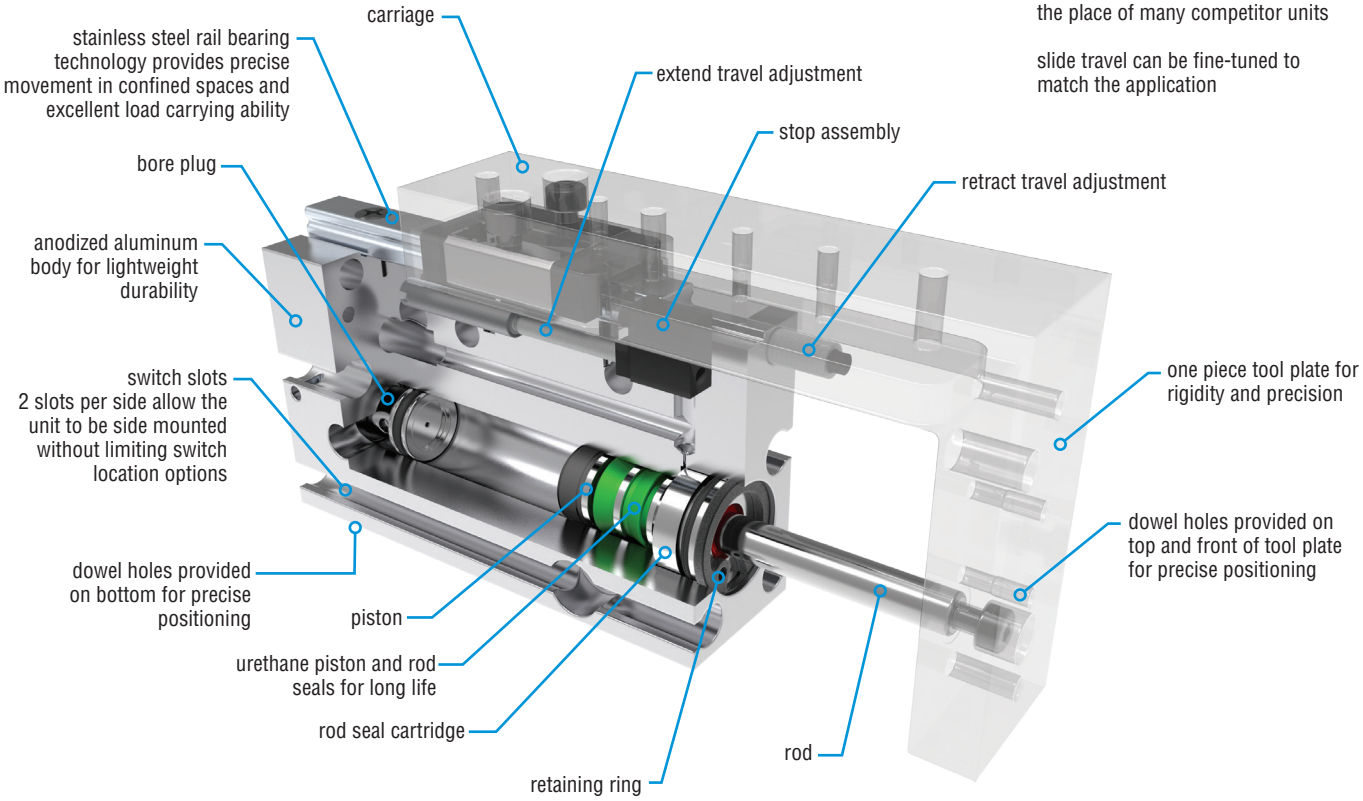
SHP

Major Benefits

- Built-in travel adjustment to fit your application needs
- Multiple mounting surfaces with dowel holes for flexibility
- Imperial and metric versions available
- High load carrying capacity
- Three bore sizes offered
- Precision ground rail bearing technology



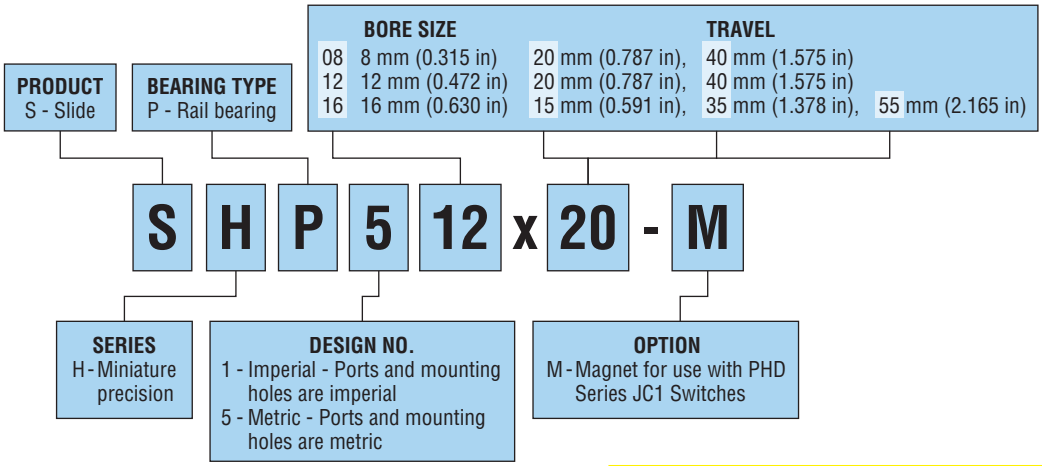


▶ greater travel adjustment per end means one travel length slide can take the place of many competitor units

slide travel can be fine-tuned to match the application

▶ PHD also offers Series SIP Slides for applications where space is limited.

TO ORDER SPECIFY:
Product, Series, Bearing Type,
Design No., Size, Travel, and Option.



Options may affect unit length. See dimensional pages and option information details.

JC1 SOLID STATE AND REED SWITCHES

JC1 SWITCH	DESCRIPTION
JC1SDN-5	NPN DC Solid State, 5 meter cable
JC1SDP-5	PNP DC Solid State, 5 meter cable
JC1SDN-K	NPN DC Solid State, Quick Connect
JC1SDP-K	PNP DC Solid State, Quick Connect
JC1RDU-5	PNP or NPN DC Reed, 5 meter cable
JC1RDU-K	PNP or NPN DC Reed, Quick Connect
JC1ADU-K	AC Reed, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification. Switches must be ordered separately.

JC1 SOLID STATE AND REED CORDSETS

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable
81284-1-010	M12, 4 pin, Straight Female Connector, 2 meter cable

NOTE: Cordsets are ordered separately.

CAD & Sizing Assistance

Use PHD's free online Product Sizing and
CAD Configurator at **phdinc.com/myphd**

SPECIFICATIONS	SERIES SHP
OPERATING PRESSURE	20 psi min to 100 psi max [1.4 bar min to 6.9 bar max] air
OPERATING TEMPERATURE	-20° to +180°F [-29° to +82°C]
TRAVEL TOLERANCE	Extend and retract travel adjustments standard
REPEATABILITY	± 0.001 inch [± 0.025 mm] of original position
VELOCITY	21 in/sec [0.53 m/sec] max (zero load at 100 psi [6.9 bar])
LUBRICATION	Factory lubricated for life
MAINTENANCE	Field repairable

SIZE	TRAVEL		TRAVEL TIME	ROD DIAMETER		BORE DIAMETER		EXTEND PISTON AREA		RETRACT PISTON AREA		BASE WEIGHT		MAX DYNAMIC LOAD		TYPICAL DYNAMIC LOAD	
	in	mm	sec	in	mm	in	mm	in²	mm²	in²	mm²	lb	kg	lb	N	lb	N
08	0.79	20	0.1	0.157	4	0.315	8	0.08	50	0.06	38	0.20	0.09	1.13	5	0-0.84	0-3.75
	1.57	40	0.18									0.26	0.12				
12	0.79	20	0.18	0.236	6	0.472	12	0.17	110	0.13	85	0.38	0.17	2.25	10	0.23-1.69	1-7.5
	1.57	40	0.22									0.48	0.22				
16	0.59	15	0.15	0.236	6	0.630	16	0.31	200	0.27	170	0.56	0.25	3.38	15	0.34-2.53	1.5-11.5
	1.38	35	0.2									0.71	0.32				
	2.17	55	0.25									0.85	0.39				

NOTE: Thrust capacity, allowable mass and dynamic moment capacity must be considered when selecting a slide.

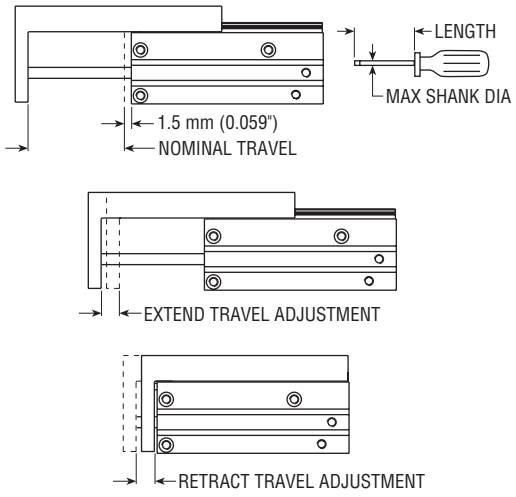
TRAVEL ADJUSTMENT

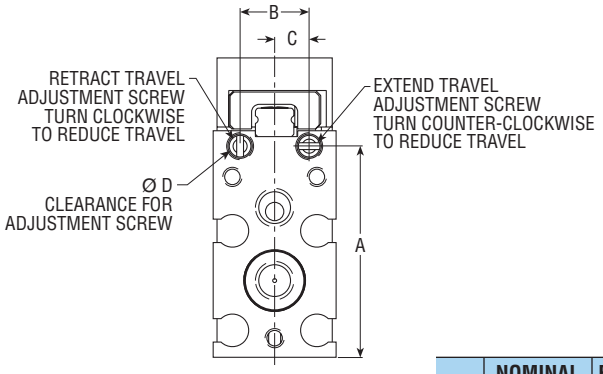
Standard Series SHP Slides provide travel adjustment in both the retract and extend directions. Travel adjustments are made using a small flat bladed or standard screwdriver via the adjustment holes located on the back of the slide. Series SHP Slides are designed to provide nominal travel. Using the travel adjustment screws allows reducing either the extend or retract travel by 0.394 in [10 mm] (0.197 in [5 mm] for SHP08).

Travel adjustment requires a small flat bladed screwdriver with a minimum shank length and diameter as shown in the table below. Blade thickness should not exceed 0.030 in [0.75 mm]. Travel adjustments should not be adjusted beyond positions shown in illustration. Loss of components or damage to the mechanism may occur if adjusted beyond the recommended limits.

CYLINDER FORCE CALCULATIONS	Imperial F = P x A	Metric F = 0.1 x P x A
F = Cylinder Force	lbs	N
P = Operating Pressure	psi	bar
A = Effective Area (Extend or Retract)	in²	mm²

TRAVEL ADJUSTMENT





LETTER DIM	SIZE 08		SIZE 12		SIZE 16	
	in	mm	in	mm	in	mm
A	1.082	27.5	1.300	33.0	1.436	36.5
B	0.354	9.0	0.480	12.2	0.570	14.5
C	0.177	4.5	0.240	6.1	0.285	7.2
D	0.125	3.2	0.165	4.2	0.165	4.2

SIZE	NOMINAL TRAVEL		EXTEND TRAVEL ADJUSTMENT		RETRACT TRAVEL ADJUSTMENT		ADJUSTMENT MIN. SHANK LENGTH		SCREWDRIVER MAX. SHANK DIAMETER	
	in	mm	in	mm	in	mm	in	mm	in	mm
08	0.79	20	0.197	5	0.197	5	1.5	38	0.083	2.1
	1.57	40	0.197	5	0.197	5	2.3	58	0.083	2.1
12	0.79	20	0.394	10	0.394	10	1.1	28	0.130	3.3
	1.57	40	0.394	10	0.394	10	1.2	30	0.130	3.3
16	0.59	15	0.394	10	0.394	10	1.3	33	0.130	3.3
	1.38	35	0.394	10	0.394	10	1.3	33	0.130	3.3
	2.17	55	0.394	10	0.394	10	2.2	56	0.130	3.3

All dimensions are reference only unless specifically toleranced.

SLIDE SELECTION

There are three major factors to consider when selecting a slide: thrust capacity, allowable mass, and dynamic moment capacity.

1 THRUST CAPACITY

Use the Theoretical Output Table to determine if thrust is sufficient for the applied load.

2 MAXIMUM PAYLOAD CAPACITY

All Series SHP Slides come standard with end of travel shock pads. However, these shock pads are limited in the amount of energy that they can dissipate. Therefore, the slides have a maximum payload limit. Use the Allowable Velocity Graph to verify that the slide can carry the payload at the desired velocity.

3 DYNAMIC MOMENT CAPACITY

The Dynamic Moment Load Graphs show the allowable load for the three most common mounting positions of the Series SHP Slide. Determine the distance "x" from the edge of the tool plate to the load center of gravity. Use the graph appropriate for the loading condition to determine the allowable load. It is generally best to keep the load center of gravity as close to the slide as possible. (See the following graphs.) If the application requires combined loading such as a horizontal pitch load combined with a roll load, if static loads exceed dynamic loads, or if there are other questions concerning the selection of an appropriate slide, please contact PHD's Inside Sales Department.

THEORETICAL OUTPUT TABLE lb [N]

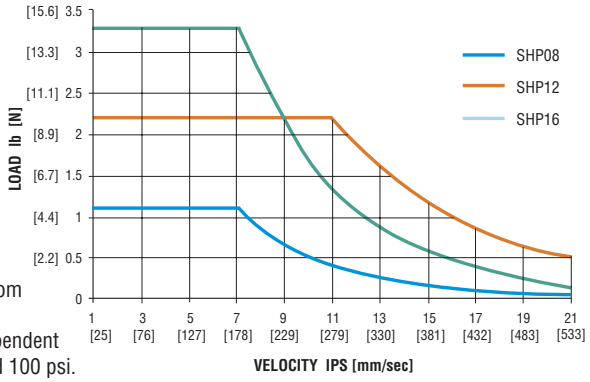
SIZE	DIRECTION	OPERATING PRESSURE								
		20 psi [1.4 bar]	30 psi [2.1 bar]	40 psi [2.8 bar]	50 psi [3.4 bar]	60 psi [4.1 bar]	70 psi [4.8 bar]	80 psi [5.5 bar]	90 psi [6.2 bar]	100 psi [6.9 bar]
08	RETRACT	1.2 [5.3]	1.8 [8.0]	2.4 [10.7]	3.0 [13.3]	3.6 [16.0]	4.2 [18.7]	4.8 [21.3]	5.4 [24.0]	6.0 [26.7]
	EXTEND	1.6 [7.1]	2.4 [10.7]	3.1 [13.8]	3.9 [17.3]	4.7 [20.9]	5.5 [24.4]	6.3 [28.0]	7.1 [31.6]	7.9 [35.1]
12	RETRACT	2.7 [12.0]	4.0 [17.8]	5.3 [23.6]	6.7 [29.8]	8.0 [35.6]	9.3 [41.3]	10.7 [47.6]	12.0 [53.3]	13.3 [59.1]
	EXTEND	3.5 [15.6]	5.3 [23.6]	7.1 [31.6]	8.8 [39.1]	10.6 [47.1]	12.4 [55.1]	14.1 [62.7]	15.9 [70.7]	17.6 [78.2]
16	RETRACT	5.4 [24.0]	8.1 [36.0]	10.8 [48.0]	13.5 [60.0]	16.2 [72.0]	18.9 [84.0]	21.6 [96.0]	24.3 [108.0]	27.0 [120.0]
	EXTEND	6.3 [28.0]	9.4 [41.8]	12.5 [55.6]	15.7 [69.8]	18.8 [83.6]	22.0 [97.8]	25.1 [111.6]	28.2 [125.3]	31.4 [139.6]

UNIT	TRAVEL TIME
SHP08x20	0.1
SHP08x40	0.18
SHP12x20	0.18
SHP12x40	0.22
SHP16x15	0.15
SHP16x35	0.2
SHP16x55	0.25

NOTES:

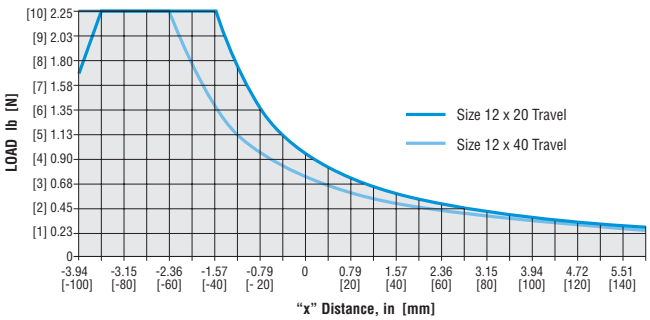
1) Travel time is in seconds from application of pressure.
2) Travel times relatively independent of pressure between 60 and 100 psi.

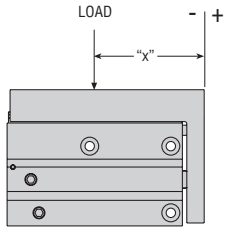
ALLOWABLE LOAD VS. VELOCITY



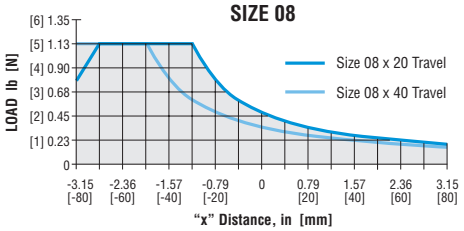
MAXIMUM DYNAMIC HORIZONTAL PITCH MOMENT LOADS

SIZE 12

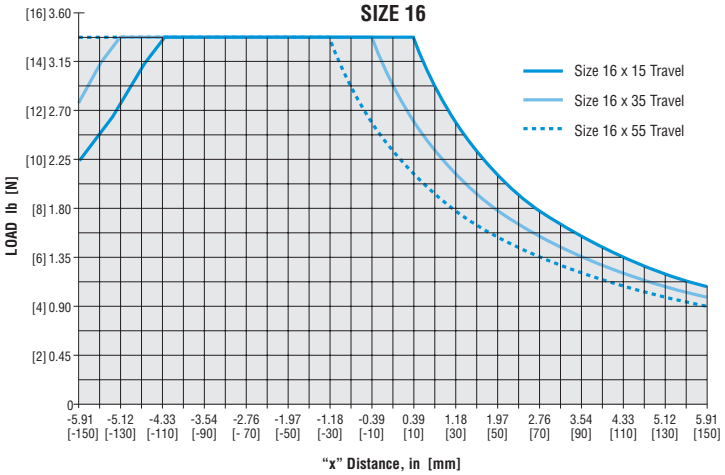




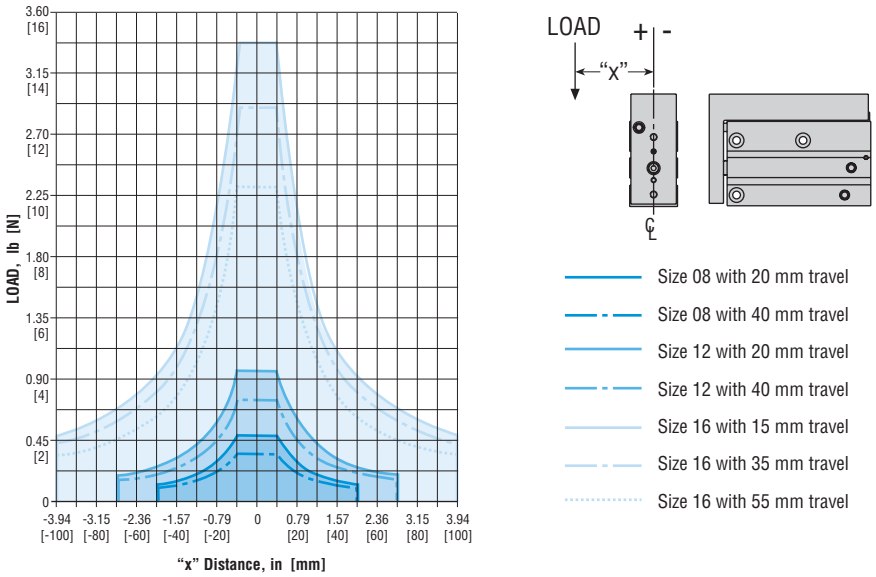
SIZE 08



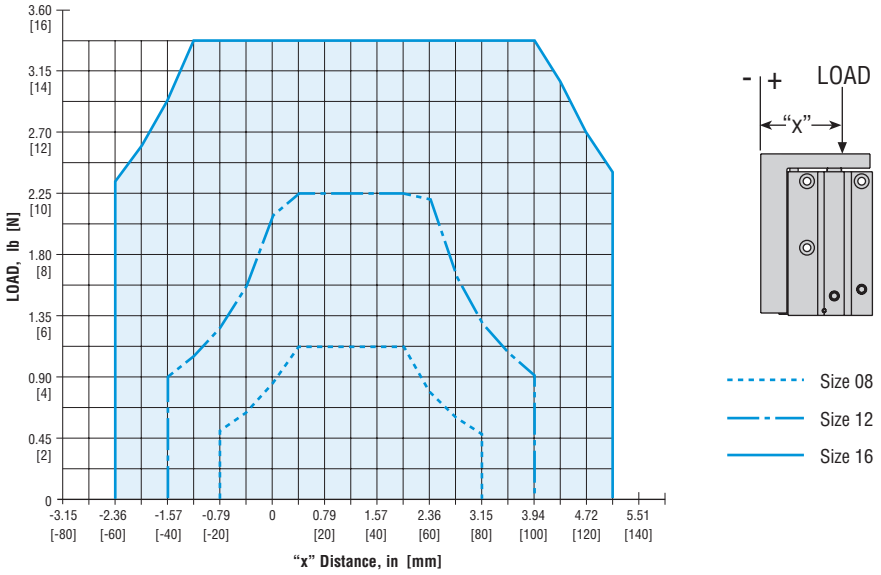
SIZE 16

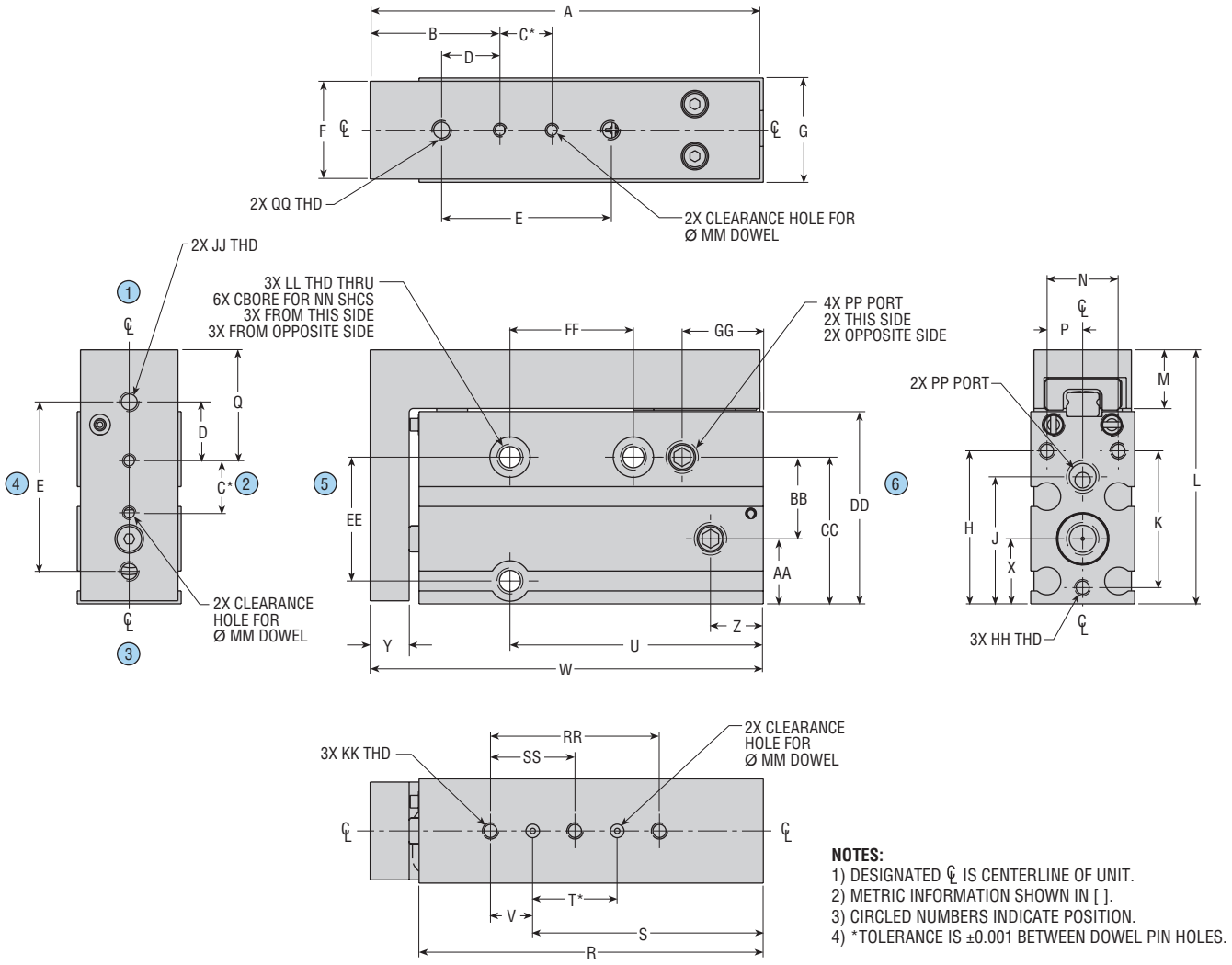


MAXIMUM DYNAMIC ROLL MOMENT LOADS



MAXIMUM DYNAMIC VERTICAL PITCH MOMENT LOADS





NOTES:
1) DESIGNATED ℄ IS CENTERLINE OF UNIT.
2) METRIC INFORMATION SHOWN IN [ ].
3) CIRCLED NUMBERS INDICATE POSITION.
4) *TOLERANCE IS ±0.001 BETWEEN DOWEL PIN HOLES.

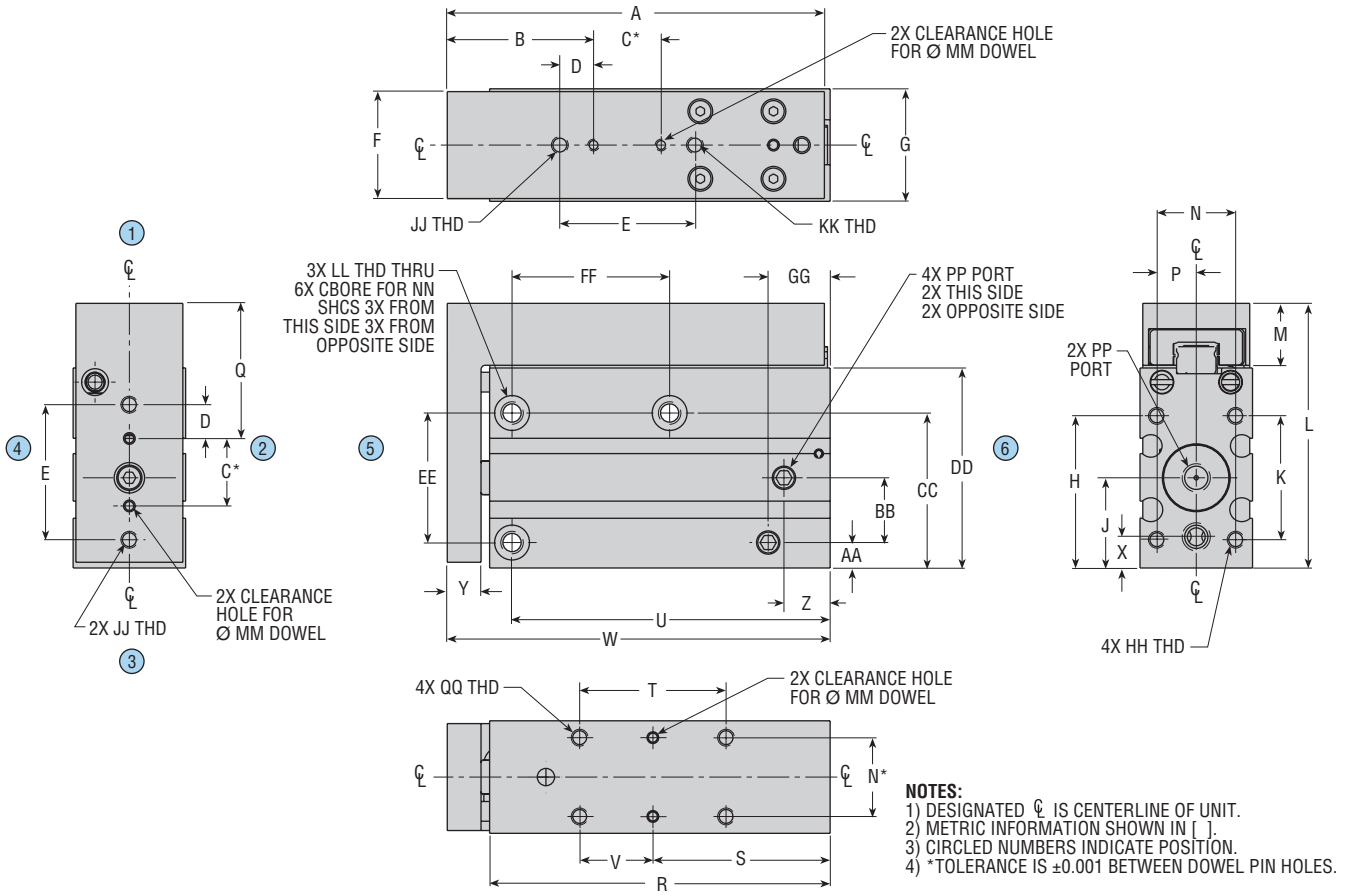
SIZE 08	LETTER DIMENSION																
TRAVEL in [mm]	A	B	C*	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
0.79 [20]	2.362 [60.0]	0.787 [20.0]	0.315 [8.0]	0.355 [9.0]	1.024 [26.0]	0.591 [15.0]	0.630 [16.0]	0.925 [23.5]	0.767 [19.5]	0.827 [21.0]	1.534 [39.0]	0.354 [9.0]	0.432 [11.0]	0.216 [5.5]	0.669 [17.0]	2.087 [53.0]	1.398 [35.5]
1.57 [40]	3.149 [80.0]	1.574 [40.0]														2.874 [73.0]	1.791 [45.5]

SIZE 08	LETTER DIMENSION														
TRAVEL in [mm]	T*	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH
0.79 [20]	0.512 [13.0]	1.536 [39.0]	0.256 [6.5]	2.383 [60.5]	0.393 [10.0]	0.240 [6.1]	0.320 [8.1]	0.393 [10.0]	0.493 [12.5]	0.886 [22.5]	1.161 [29.5]	0.748 [19.0]	0.748 [19.0]	0.492 [12.5]	#4-40 UNC x 0.320 DP [M2.5 x 0.45 x 8.1 mm DP]
1.57 [40]		2.323 [59.0]		3.17 [80.5]									1.535 [39.0]		

SIZE 08	LETTER DIMENSION								
TRAVEL in [mm]	JJ	KK	LL	MM	NN	PP	QQ	RR	SS
0.79 [20]	#4-40 UNC THRU [M3 x 0.5 THRU]	#4-40 UNC x 0.140 DP [M2.5 x 0.45 x 3.6 mm DP]	#8-32 UNC THRU [M4 x 0.7 THRU]	1/16 x 0.125 DP [2 mm x 3.2 mm DP]	#5 [M3]	#10-32 PORT [M5 x 0.8 PORT]	#4-40 UNC x 0.157 DP [M3 x 0.5 x 4.0 mm DP]	1.024 [26.0]	0.512 [13.0]
1.57 [40]									

All dimensions are reference only unless specifically toleranced.

DIMENSIONS: Series SHP Slides



NOTES:
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2) METRIC INFORMATION SHOWN IN [ ].
3) CIRCLED NUMBERS INDICATE POSITION.
4) *TOLERANCE IS ±0.001 BETWEEN DOWEL PIN HOLES.

SIZE	TRAVEL in [mm]	LETTER DIMENSION																
		A	B	C*	D	E	F	G	H	J	K	L	M	N*	P	Q	R	S
12	0.79 [20]	2.638 [67.0]	1.024 [26.0]	0.472 [12.0]	0.237 [6.0]	0.945 [24.0]	0.748 [19.0]	0.787 [20.0]	1.064 [27.0]	0.631 [16.0]	0.866 [22.0]	1.851 [47.0]	0.433 [11.0]	0.551 [14.0]	0.276 [7.0]	0.945 [24.0]	2.382 [60.5]	1.240 [31.5]
	1.57 [40]	3.425 [87.0]	1.811 [46.0]														3.169 [80.5]	1.633 [41.5]
16	0.59 [15]	2.874 [73.0]	1.201 [30.5]	0.472 [12.0]	0.512 [13.0]	1.496 [38.0]	0.945 [24.0]	0.984 [25.0]	1.141 [29.0]	0.669 [17.0]	0.944 [24.0]	2.106 [53.5]	0.551 [14.0]	0.630 [16.0]	0.315 [8.0]	0.768 [19.5]	2.559 [65.0]	1.338 [34.0]
	1.38 [35]	3.661 [93.0]	1.988 [50.5]														3.346 [85.0]	1.731 [44.0]
	2.17 [55]	4.449 [113.0]	2.776 [70.5]														4.134 [105.0]	2.126 [54.0]

SIZE	TRAVEL in [mm]	LETTER DIMENSION													
		T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH
12	0.79 [20]	1.024 [26.0]	2.225 [56.5]	0.512 [13.0]	2.678 [68.0]	0.218 [5.5]	0.240 [6.1]	0.323 [8.2]	0.178 [4.5]	0.453 [11.5]	1.084 [27.5]	1.399 [35.5]	0.906 [23.0]	1.102 [28.0]	0.433 [11.0]	#4-40 UNC x 0.236 DP [M3 x 0.5 x 6 mm DP]
	1.57 [40]		3.012 [76.5]		3.465 [88.0]									1.889 [48.0]		
16	0.59 [15]	1.181 [30.0]	2.362 [60.0]	0.591 [15.0]	2.895 [73.5]	0.197 [5.0]	0.280 [7.1]	0.372 [9.5]	0.197 [5.0]	0.472 [12.0]	1.161 [29.5]	1.535 [39.0]	0.984 [25.0]	1.181 [30.0]	0.530 [13.5]	#8-32 UNC x 0.276 DP [M4 x 0.7 x 7 mm DP]
	1.38 [35]		3.149 [80.0]		3.682 [93.5]									1.968 [50.0]		
	2.17 [55]		3.937 [100.0]		4.47 [113.5]									2.756 [70.0]		

SIZE	TRAVEL in [mm]	LETTER DIMENSION						
		JJ	KK	LL	MM	NN	PP	QQ
12	0.79 [20]	#4-40 UNC x 0.236 DP [M3 x 0.5 x 6 mm DP]	#4-40 UNC x 0.167 DP [M3 x 0.5 x 4.2 mm DP]	#8-32 UNC THRU [M4 X 0.7 THRU]	1/16 x 0.125 DP [2 mm x 3.2 mm DP]	#5 [M3]	#10-32 PORT [M5 x 0.8 PORT]	#4-40 UNC x 0.177 DP [M3 x 0.5 x 4.5 mm DP]
	1.57 [40]							
16	0.59 [15]	#8-32 UNC x 0.295 DP [M4 x 0.7 x 7.5 mm DP]	#8-32 UNC x 0.207 DP [M4 x 0.7 x 5.3 mm DP]	#10-32 UNF THRU [M5 x 0.8 THRU]	1/8 x 0.188 DP [2 mm x 4.8 mm DP]	#6 [M4]	#10-32 PORT [M5 x 0.8 PORT]	#8-32 UNC x 0.236 DP [M4 x 0.7 x 6 mm DP]
	1.38 [35]							
	2.17 [55]							

All dimensions are reference only unless specifically toleranced.

M MAGNET FOR PHD SERIES JC1 SWITCHES

This option equips the unit with a magnetic piston for use with PHD's Series JC1 Switches. The switch housing is contained by the slide housing and provides a very compact switch design. The switches mount easily into two small grooves located on the side of the slide housing and are locked into place with a setscrew. **Hand tighten the setscrew until the switch is securely retained. Do not overtighten.**

JC1 SOLID STATE AND REED SWITCHES

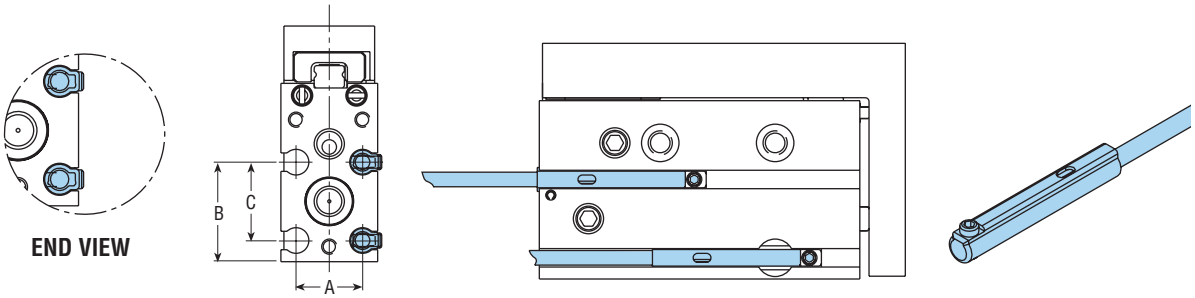
JC1 SWITCH	DESCRIPTION
JC1SDN-5	NPN DC Solid State, 5 meter cable
JC1SDP-5	PNP DC Solid State, 5 meter cable
JC1SDN-K	NPN DC Solid State, Quick Connect
JC1SDP-K	PNP DC Solid State, Quick Connect
JC1RDU-5	PNP or NPN DC Reed, 5 meter cable
JC1RDU-K	PNP or NPN DC Reed, Quick Connect
JC1ADU-K	AC Reed, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification. Switches must be ordered separately.

JC1 SOLID STATE AND REED CORDSETS

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable
81284-1-010	M12, 4 pin, Straight Female Connector, 2 meter cable

NOTE: Cordsets are ordered separately.



END VIEW

LETTER DIM	SIZE 08		SIZE 12		SIZE 16	
	in	mm	in	mm	in	mm
A	0.433	11.0	0.636	16.2	0.786	20.0
B	0.648	16.5	0.854	21.7	0.892	22.7
C	0.510	13.0	0.446	11.3	0.447	11.4

All dimensions are reference only unless specifically toleranced.