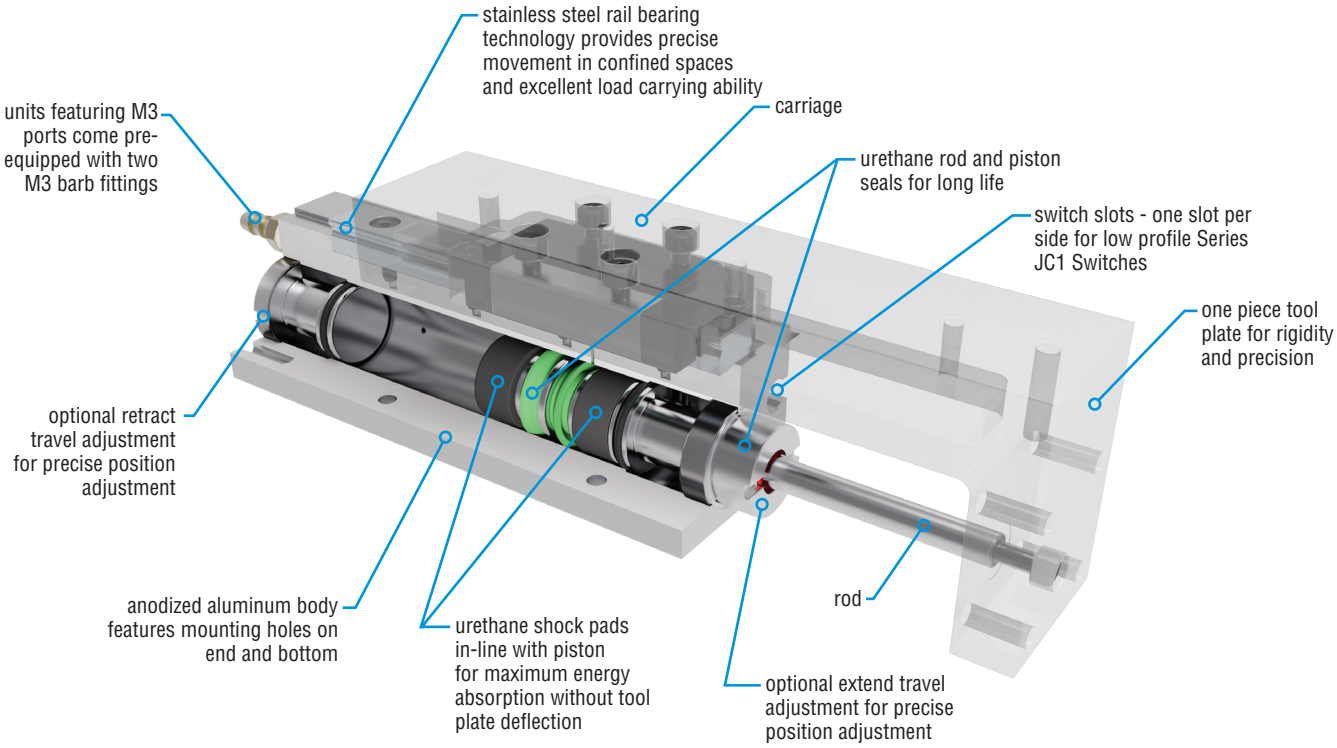
SIP

Major Benefits

- Compact, low-profile design
- High load carrying capability
- Three bore sizes (12, 16, and 20 mm)
- Optional travel adjustment
- Profile ground rail bearing technology
- One piece tool plate
- Large internal shock pads for high speeds



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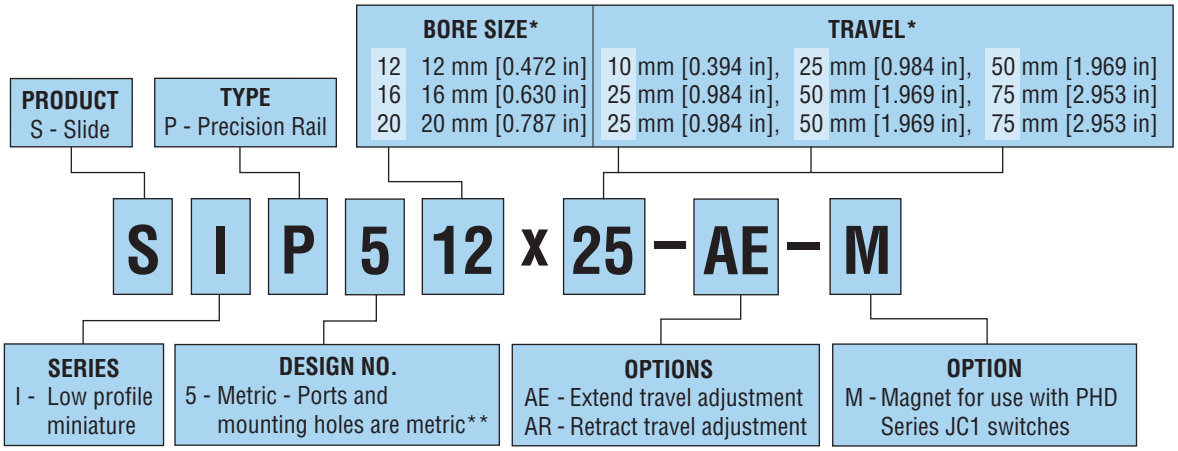
+32(0) 2 266 13 13

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



NOTES:
1)*Consult PHD for additional bore sizes and travel increments.
2)**Port also accepts #10-32 fitting on bore sizes 16 and 20.

⚠ 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.

SPECIFICATIONS	SERIES SIP
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	Nominal travel, +0.039/-0.000 in [+1.0/-0.0 mm]
REPEATABILITY	± 0.001 in [± 0.025 mm] of original position and regulated pressure
VELOCITY	30 in/sec [0.76 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
12	0.39	10	0.03	0.157	4	0.472	12	0.17	110	0.16	100	0.30	0.14	2.25	10	0 - 2.03	0 - 9
	0.98	25	0.07									0.35	0.16				
	1.97	50	0.14									0.46	0.21				
16	0.98	25	0.07	0.236	6	0.630	16	0.31	200	0.27	170	0.71	0.32	3.38	15	0.68 - 3.38	3 - 15
	1.97	50	0.14									0.88	0.40				
	2.95	75	0.21									1.04	0.47				
20	0.98	25	0.07	0.315	8	0.787	20	0.49	310	0.41	260	1.04	0.47	4.50	20	0.90 - 4.5	4 - 20
	1.97	50	0.14									1.26	0.57				
	2.95	75	0.21									1.48	0.67				

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

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)	in^2	mm^2

SLIDE SELECTION

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

1 THRUST CAPACITY

To determine if thrust is sufficient for the applied load, see previous page.

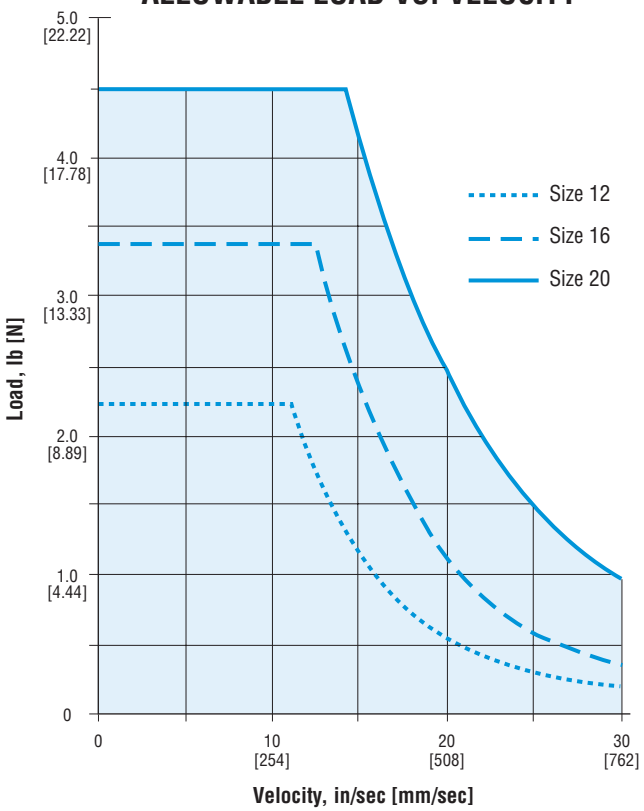
2 DYNAMIC MOMENT CAPACITY

The Dynamic Moment Load Graphs (pages 8 to 20) show the allowable load for the three most common mounting positions of the Series SIP Slide. Determine the distance "x" from the edge of the tool plate to the load center of gravity. Use the appropriate graph for the loading condition to determine the allowable load. It is generally best to keep the center of gravity of the load as close to the slide as possible. 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.

3 ALLOWABLE VELOCITY

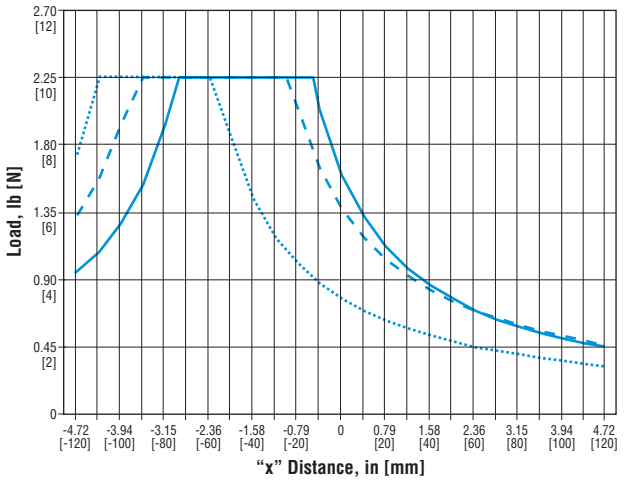
Use the Allowable Velocity Graph to verify that the slide selected can carry the payload at the desired velocity.

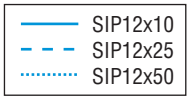
ALLOWABLE LOAD VS. VELOCITY

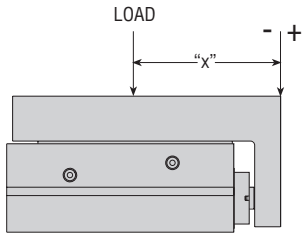


SIZE 12

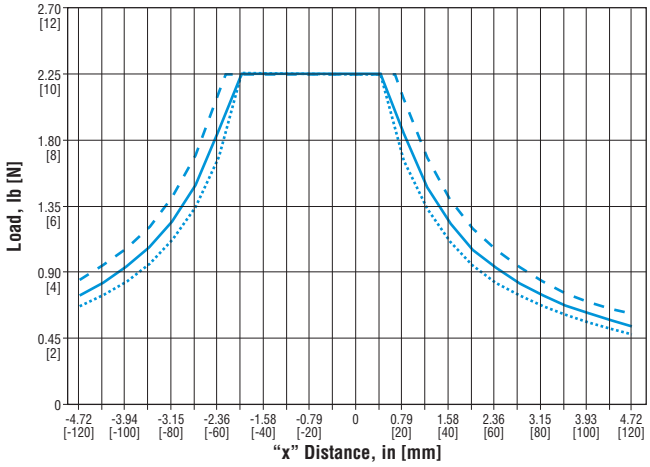
MAXIMUM DYNAMIC HORIZONTAL PITCH MOMENT LOADS

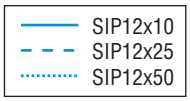


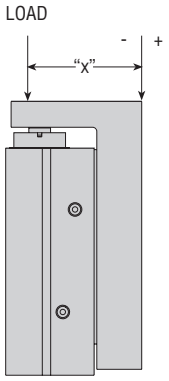




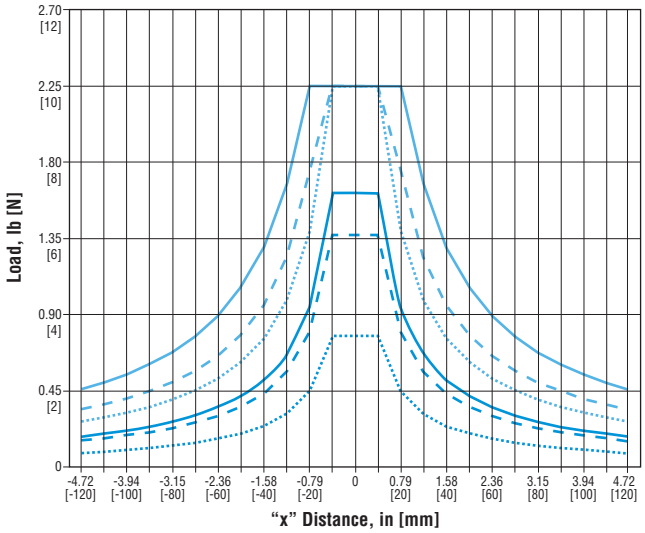
MAXIMUM DYNAMIC VERTICAL PITCH MOMENT LOADS

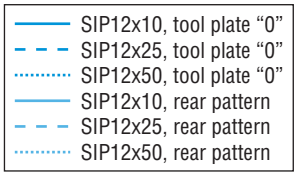


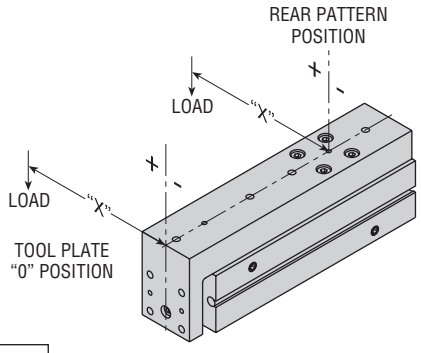




MAXIMUM DYNAMIC ROLL MOMENT LOADS







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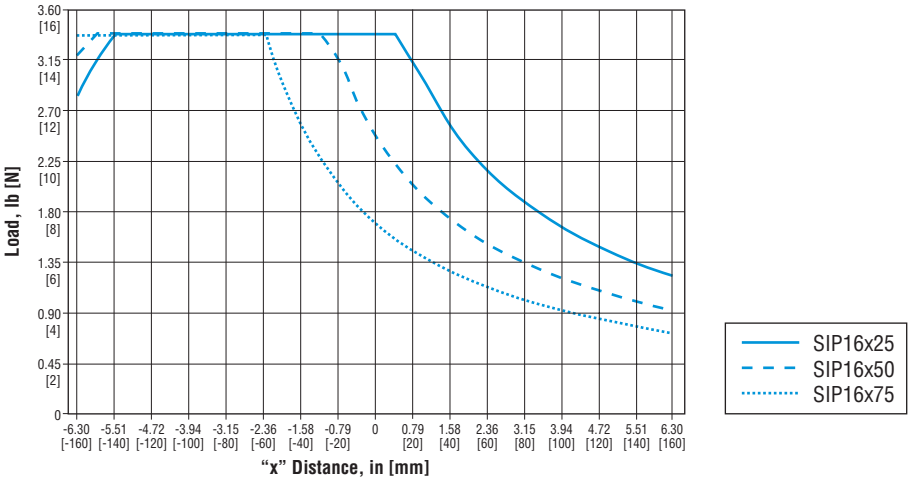
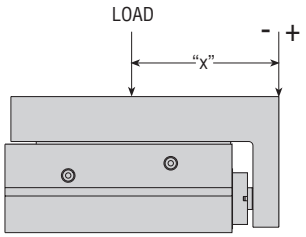
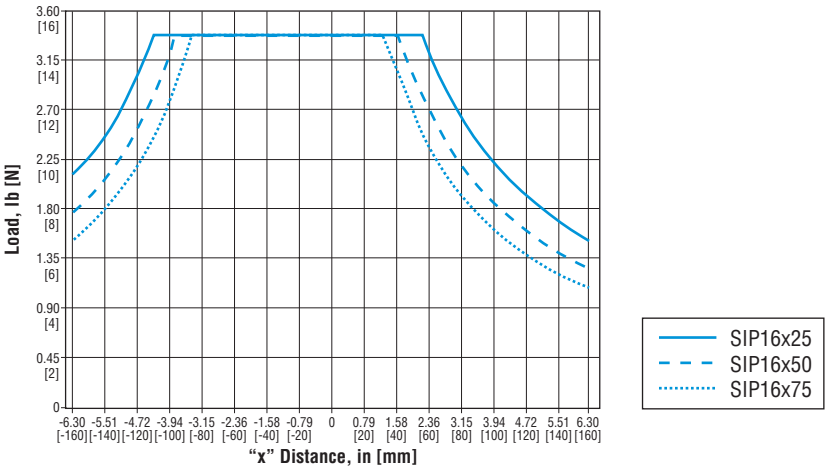
SIZE 16

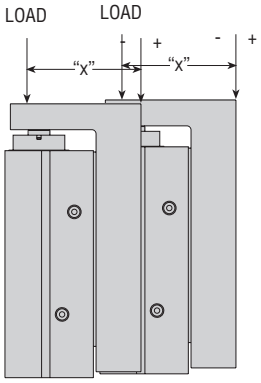
MAXIMUM DYNAMIC HORIZONTAL PITCH MOMENT LOADS



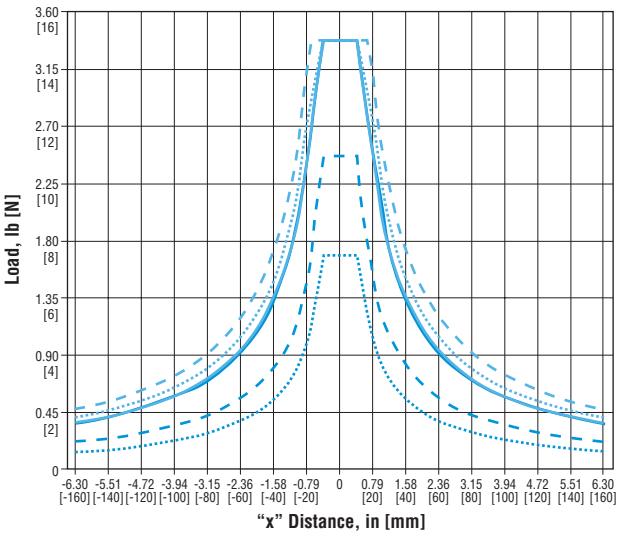


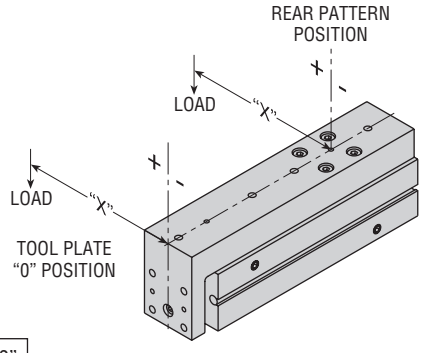
MAXIMUM DYNAMIC VERTICAL PITCH MOMENT LOADS





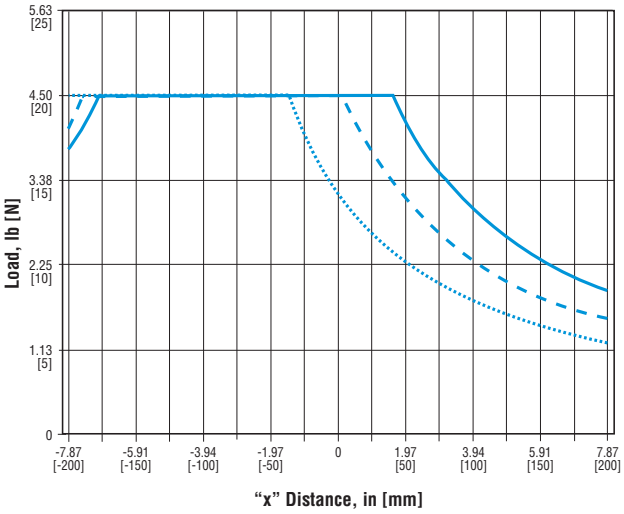
MAXIMUM DYNAMIC ROLL MOMENT LOADS

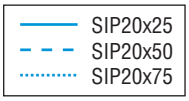


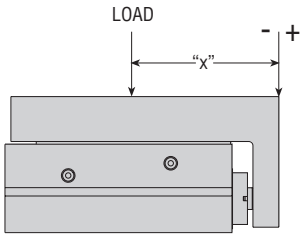


SIZE 20

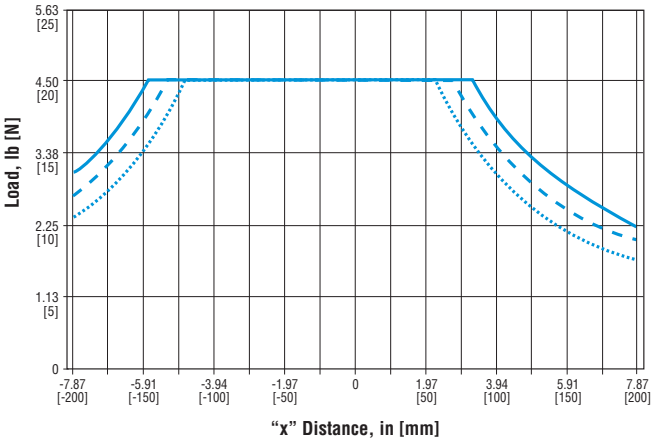
MAXIMUM DYNAMIC HORIZONTAL PITCH MOMENT LOADS

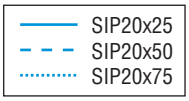


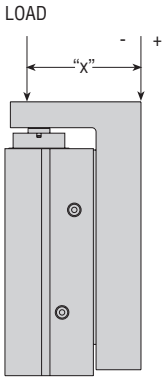




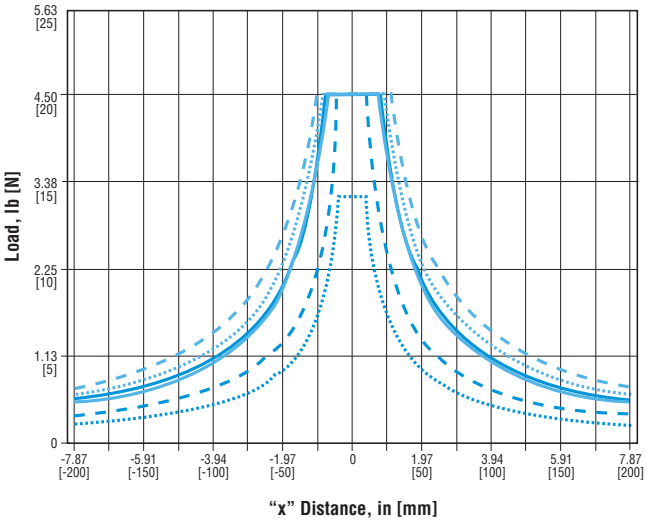
MAXIMUM DYNAMIC VERTICAL PITCH MOMENT LOADS

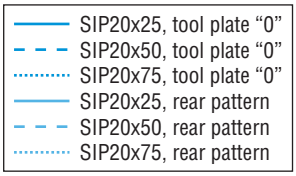


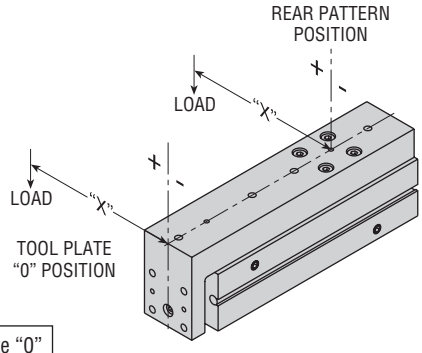




MAXIMUM DYNAMIC ROLL MOMENT LOADS







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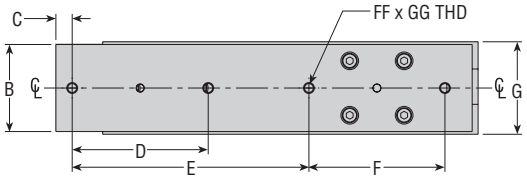
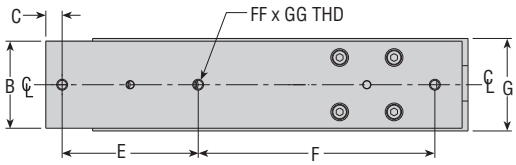
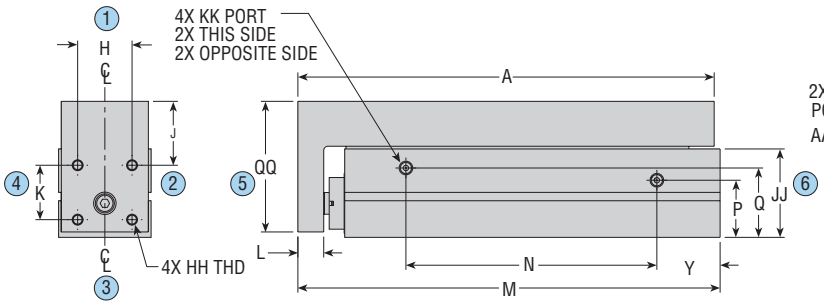
DIMENSIONS: Series SIP Slides

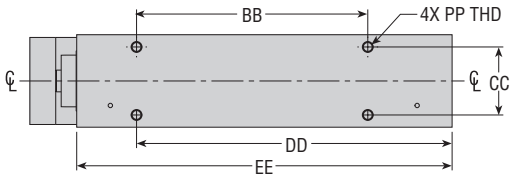
TOOL PLATE 4 HOLE CONFIGURATION
SIP 12-50 mm
SIP 16-50 & 75 mm
SIP 20-75 mm



TOOL PLATE 3 HOLE CONFIGURATION
SIP 12-10 & 25 mm
SIP 16-25 mm
SIP 20-25 & 50 mm







NOTES:
1) DESIGNATED ℄ IS CENTERLINE OF UNIT
2) CIRCLED NUMBERS INDICATE POSITION

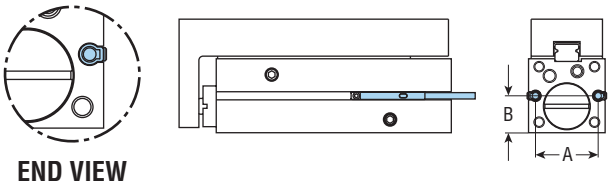
SIZE	TRAVEL [mm]	LETTER DIMENSION																						
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	Y	Z
SIPx12	10.0	75.0	21.0	5.0	—	21.0	36.0	23.0	14.0	15.0	14.0	7.1	77.0	19.7	6.5	17.1	17.0	15.0	33.0	3.5	7.0	2.5	21.3	17.1
	25.0	90.0				36.0							92.0	34.7										
	50.0	115.0			20.0	61.0							117.0	59.7										
SIPx16	25.0	102.0	27.0	6.0	—	41.0	42.0	29.0	18.0	19.0	18.0	7.6	104.0	44.8	5.0	22.0	21.0	21.0	43.0	4.0	10.5	6.5	23.2	21.5
	50.0	127.0			42.0	66.0							129.0	69.8										
	75.0	152.0				91.0							154.0	94.8										
SIPx20	25.0	103.0	32.0	6.0	—	37.0	50.0	34.0	20.0	23.5	20.0	9.6	105.0	42.2	21.0	25.5	27.0	25.0	50.0	4.0	15.5	11.0	23.3	23.0
	50.0	128.0				62.0							130.0	67.2										
	75.0	153.0			50.0	87.0							155.0	92.2										

SIZE	TRAVEL [mm]	LETTER DIMENSION												
		AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	NN	PP	QQ
SIPx12	10.0	0.00	20.0	17.0	48.0	62.5	3	M3 x 0.5 x 4.6	M3 x 0.5 x 7	21.0	M3 x 0.5 x 3.5	M3 x 0.5 x 5.5	M3 x 0.5 x 5.5	32.0
	25.0		35.0		63.0	77.5	3							
	50.0		60.0		88.0	102.5	4							
SIPx16	25.0	1.8	34.0	22.0	68.0	89.0	3	M4 x 0.7 x 6	M4 x 0.7 x 7.5	28.0	M5 x 0.8 x 4	M4 x 0.7 x 8	M4 x 0.7 x 6	41.0
	50.0		59.0		93.0	114.0	4							
	75.0		84.0		118.0	139.0	4							
SIPx20	25.0	3.5	35.0	25.0	66.0	88.0	3	M4 x 0.7 x 6	M4 x 0.7 x 9.5	32.5	M5 x 0.8 x 4.0	M4 x 0.7 x 8	M4 x 0.7 x 6	48.0
	50.0		60.0		91.0	113.0	3							
	75.0		85.0		116.0	138.0	4							

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.**



END VIEW

LETTER DIM	SIZE 12 mm	SIZE 16 mm	SIZE 20 mm
A	17.5	23.7	28.5
B	12.5	14	15

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.

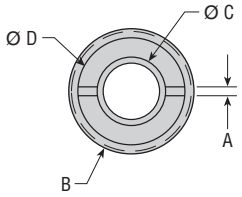
AE AR TRAVEL ADJUSTMENT

The AE and AR options provide travel adjustment by reducing the extend or retract travel respectively. Normal shock pad operation is maintained regardless of travel adjustment setting. Travel adjustments have internal stops to prevent damage to components. Both options may be used together to provide adjustment at both ends of travel.

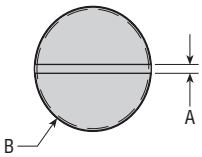
AE- Travel Adjustment on Extend
This option provides up to 5 mm of travel reduction on extend. Travel adjustment is made using a spanner wrench or similar tool to engage the slots in the cartridge. Rotating the cartridge clockwise reduces the travel.

AR- Travel Adjustment on Retract
This option provides up to 5 mm of travel reduction on retract. Travel adjustment is made using a flat-bladed screwdriver to engage the slot in the bore plug. Rotating the bore plug clockwise reduces the travel.

AE
CARTRIDGE SLOT DETAIL



AR
BORE PLUG SLOT DETAIL



SIZE	A SLOT WIDTH	B THREAD	C ROD CLEARANCE DIA	D MAX TOOL DIA	SLOT DEPTH
12	1.6 mm	17/32 - 32UN-2A	5.5 mm	11.6	0.8 mm
16	1.6 mm	11/32 - 32UN-2A	9.2 mm	15.4	1.5 mm
20	1.6 mm	7/8 - 32UN-2A	12.1 mm	19.0	1.5 mm

All dimensions are reference only unless specifically toleranced.