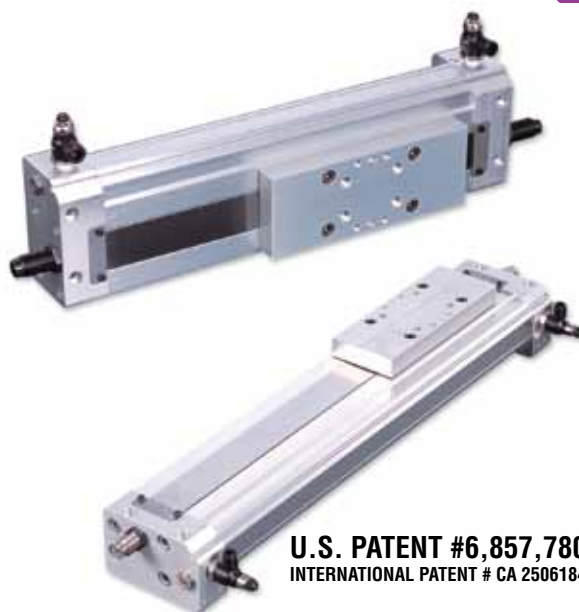
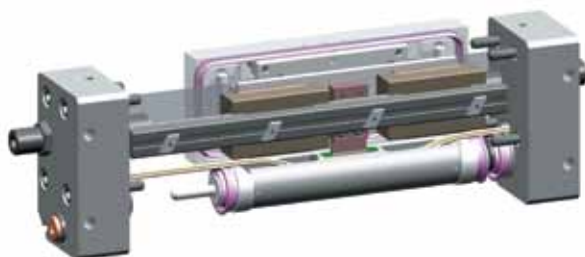


SFP

**LOWEST DEFLECTION AND
HIGHEST MOMENT CAPACITY
COMBINATION IN THE INDUSTRY**



SFP



U.S. PATENT #6,857,780
INTERNATIONAL PATENT # CA 2506184

optional travel adjustment with integral shock pad or optional shock absorber for precise positioning and end-of-travel kinetic energy absorption

stainless steel band and saddle seal protect precision bearing system from dirt and contaminants

removable saddle with dowel holes standard, allows easy addition of custom mounting holes for tooling or components

IMPROVED

stop pin on each end protects internal drive components from overstroke damage

phd product mounting holes for quick multi-axis solutions without transition plates

easy access switch slot enables switch to be mounted at any point along slide travel

dual carriage precision rail bearing for maximum rigidity and moment capacity

optional adjustable cushions offer precise control of slide deceleration

standard mounting from top, end, and bottom enables maximum application flexibility

standard port positions (both ends)

Major Benefits

- Space-saving design
- Smooth, precise movement
- High load capacity with very low deflection
- Improved moment capacity
- Two bore sizes offered (27 and 40 mm)
- Long travel lengths (27 mm bore up to 1800 mm, 40 mm bore up to 3400 mm)

Industry Uses

- General automation
- Packaging
- Assembly machine builders
- Medical
- Semiconductor
- Optical
- Plastics
- Automotive

Product, Series, Type, Design No.,
Package Size, Travel, and Options.

UNIQUE SLIDES ARE
AVAILABLE. PLEASE
CONSULT PHD.



- NOTES:**
- 1) If travel adjustment AB, AE, or AR is ordered, corresponding cushion option DB, DE, or DR must also be ordered.
 - 2) Switches and switch bracket kits must be ordered separately.
 - 3) Option -M required with Series 6790 & JC1 Switches.
 - 4) Each direction of travel must have either a travel adjustment or shock absorber specified.
 - 5) Saddle dowel holes are standard.
 - 6) Modular mounting interface with PHD Series STP and SK/SL Slides is standard.
 - 7) Mounting on top, bottom, ends, and t-slots is standard.

PART NO.	DESCRIPTION
67902-1-05	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, 5 m cable
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
67922-1	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, Quick Connect
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect
67929-2	PNP (Source) or NPN (Sink) Reed, 65-120 VDC, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification.

SERIES 6790 & JC1SDx CORDSET CHART

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable

SPECIFICATIONS	SERIES SFP
OPERATING PRESSURE	36 psi min to 116 psi max [2.5 bar min to 8 bar max] air
OPERATING TEMPERATURE	41° to 140°F [5° to 60°C]
TRAVEL TOLERANCE	+ .12/- .00 in [+3.0/-0.0 mm]
REPEATABILITY	±.001 in [±.025 mm] of original position
VELOCITY	4 to 60 in/sec [.1 to 1.5 m/sec]
LUBRICATION	Factory lubricated for life
MAINTENANCE	Field repairable

UNIT SIZE	MAXIMUM TRAVEL		BORE DIAMETER		EFFECTIVE AREA		BASE WEIGHT		ADDER WEIGHT (per 25mm)		TYPICAL DYNAMIC LOAD		MOVING SADDLE	
	in	mm	in	mm	in²	mm²	lb	kg	lb	kg	lb	N	lb	kg
27	70.8	1800	1.06	27	.88	570	7.20	3.27	0.37	0.17	0 - 100	0 - 440	2.3	1.04
40	133.8	3400	1.57	40	1.95	1260	20.1	9.12	0.71	0.32	20 - 250	89 - 1100	6.5	2.95

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

MAXIMUM BEARING CAPACITY

SIZE	LOAD		PITCH MOMENT		YAW MOMENT		ROLL MOMENT	
	lb	N	in-lb	Nm	in-lb	Nm	in-lb	Nm
27	946	4208	460	52.0	460	52.0	299	33.8
40	1971	8767	1535	173.4	1535	173.4	911	102.9

FORCE TABLE

DIRECTION	SFP627		SFP640	
	lb/psi	N/bar	lb/psi	N/bar
Extend	.887	57.3	1.948	125.7
Retract	.887	57.3	1.948	125.7

CYLINDER FORCE CALCULATIONS

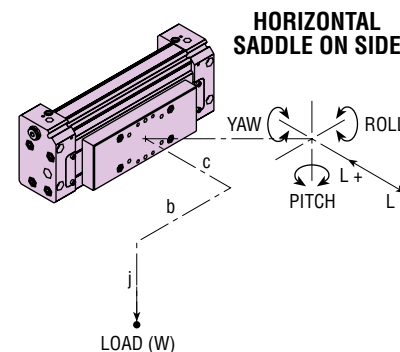
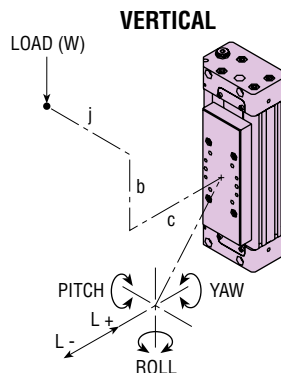
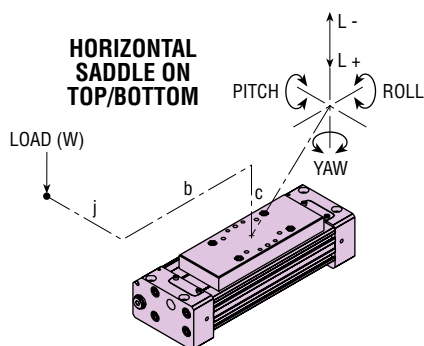
	IMPERIAL	METRIC
	$F = P \times A$	$F = 0.1 \times P \times A$
F = Cylinder Force	lbs	N
P = Operating Pressure	psi	bar
A = Effective Area	in²	mm²
(Extend or Retract)		

STATIC MOMENT CHART

HORIZONTAL SADDLE TOP OR BOTTOM	VERTICAL	HORIZONTAL SADDLE ON SIDE
M_p (Pitch) = Load x b	M_p = Load x e	M_p = 0
M_y (Yaw) = 0	M_y = Load x j	M_y = Load x b
M_r (Roll) = Load x j	M_r = 0	M_r = Load x e

SIZE	"d" CONSTANT	
	in	mm
27	1.448	36.8
40	1.713	43.5

NOTE: $e = c + d$



SIZING AND APPLICATION ASSISTANCE

See PHD Product Sizing Catalog for specific and complete sizing information.
Online sizing assistance is available at: www.phdinc.com/apps/sizing

SFP



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SIZE	KK	LL	MM	NN	PP	RR	SS	TT	UU	VV	WW	YY	ZZ	ZZ TOL.	AAA	BBB
27	1.240	.610	2.244	2.359	1.909	.650	1.870	.945	1.752	.807	M5 x 0.8	.590	.19702	+ .00030/- .00020	.197	.486
	[31.5]	[15.5]	[57.0]	[59.9]	[48.5]	[16.5]	[47.5]	[24.0]	[44.5]	[20.5]	M5 x 0.8	[15.0]	[5.0043]	[+ .0075/- .0051]	[5.0]	[12.3]
40	1.535	.945	2.992	3.146	2.657	.925	2.540	1.232	2.657	.925	M6 x 1.0	.945	.23639	+ .00030/- .00020	.315	.630
	[39.0]	[24.0]	[76.0]	[79.0]	[67.5]	[23.5]	[64.5]	[31.5]	[67.5]	[30.5]	M6 x 1.0	[24.0]	[6.0043]	[+ .0075/- .0051]	[6.0]	[16.1]

2) NUMBERS IN [] ARE METRIC.

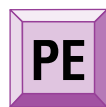
OPTIONS: SERIES SFP SLIDES



PORT CONTROLS ON EXTEND AND RETRACT



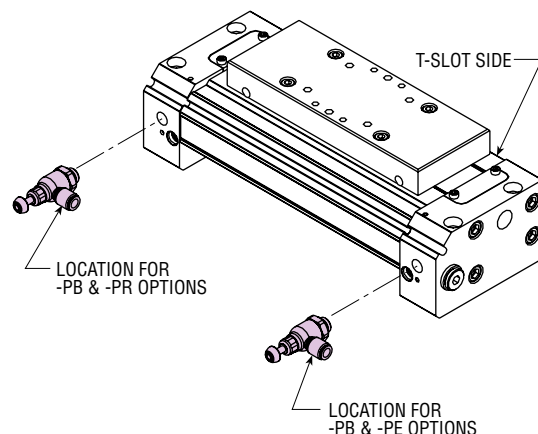
PORT CONTROLS ON RETRACT



PORT CONTROLS ON EXTEND

The PHD Series SFP Slide utilizes external compact banjo flow control fittings to adjust the saddle velocity. The control fittings are unidirectional flow control valves where intake air flows freely through the flow control and exhaust air is metered out through an adjustment screw. Intake capacity is slightly greater than the full open exhaust capacity, enabling maximum variation of saddle speeds.

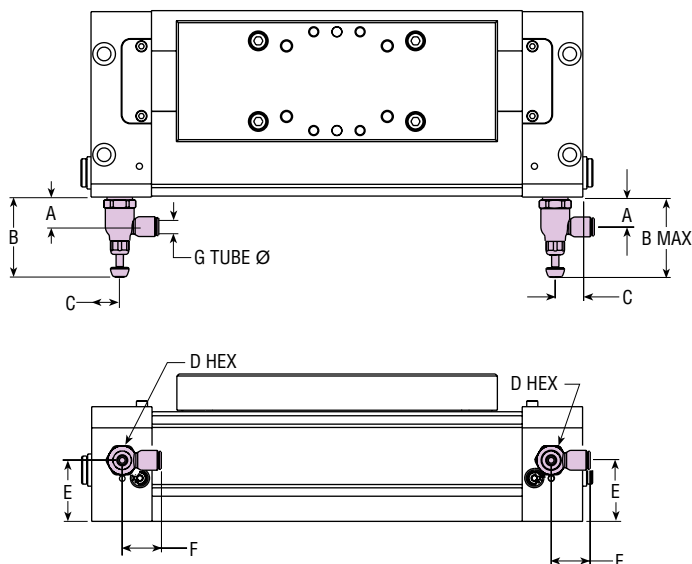
The PHD Series SFP flow control fittings are supplied for direct mounting to the caps and provide integral tube fitting connection. They also swivel 360 degrees around the ports, easing tube routing



SFP

installation. Saddle velocities are adjusted and maintained by the captivated fine adjustment screw with a locking nut, which ensures precise velocity control and repeatability.

Note: Flow control fitting is effective throughout the Series SFP temperature and pressure range.



SIZE	SPEED CONTROL REPLACEMENT KIT NO.	
	METRIC	IMPERIAL
27	70696-03	70695-03
40	70696-06	70695-05

Kit includes flow control for one end.

SIZE	LETTER DIMENSIONS			
	A	B MAX	C	D HEX
27	.630 [16.0]	1.730 [44.0]	.610 [15.5]	.630 [16.0]
40	.730 [18.5]	1.890 [48.0]	.945 [24.0]	.750 [19.0]

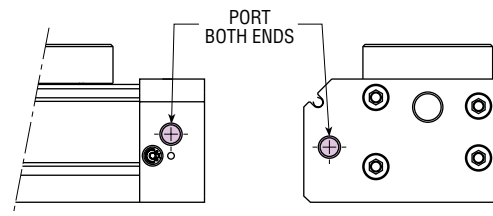
SIZE	STANDARD		-L9 OPTION	
	E	F	G	G
27	1.240 [31.5]	.870 [22.0]	[6.0]	.250
40	1.535 [39.0]	1.100 [28.0]	[8.0]	.375

Numbers in [] are metric.



NPT PORTS

This option provides NPT ports instead of the standard BSPP ports. The NPT ports are located in the same location as the BSPP ports.



SIZE	PORT SIZE
27	1/8-27 NPT
40	1/4-18 NPT

NOTE: Port locations are the same as BSPP ports on page 2-84.

All dimensions are reference only unless specifically toleranced.

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OPTIONS: SERIES SFP SLIDES

SFP

AB

TRAVEL ADJUSTMENT WITH SHOCK PADS ON EXTEND AND RETRACT

AR

TRAVEL ADJUSTMENT WITH SHOCK PADS ON RETRACT

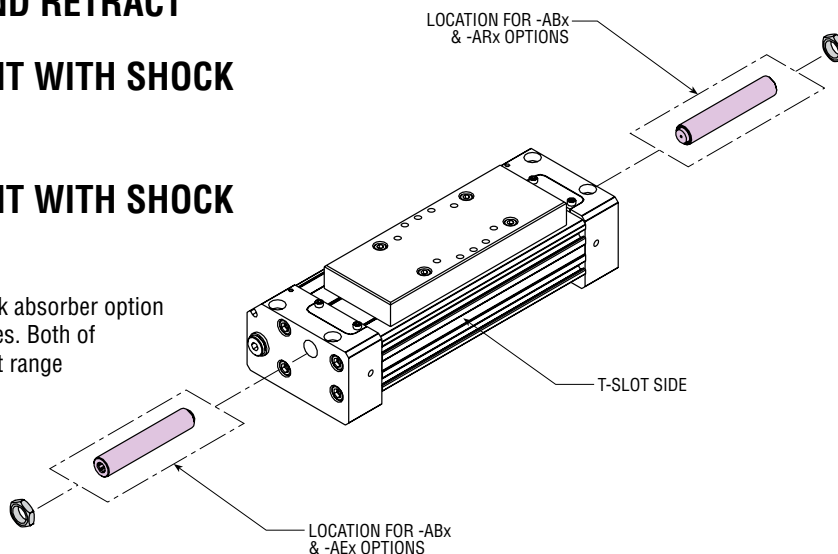
AE

TRAVEL ADJUSTMENT WITH SHOCK PADS ON EXTEND

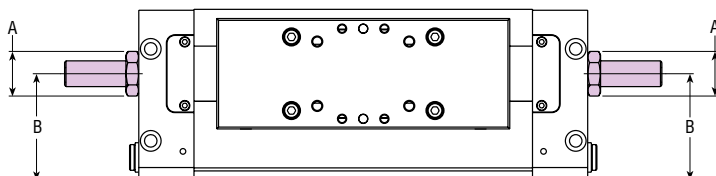
A travel adjustment option and/or a shock absorber option must be ordered with all PHD Series SFP Slides. Both of these mechanical stops provide an adjustment range of 0.55 in [14 mm] from each end of travel.

The travel adjustment screw works in conjunction with its specified cushion and is supplied with a shock pad, which provides quiet actuator operation. In more demanding applications, shock absorbers handle the energy dissipation.

NOTE: Travel adjustment must be specified with corresponding cushion option, shown below.

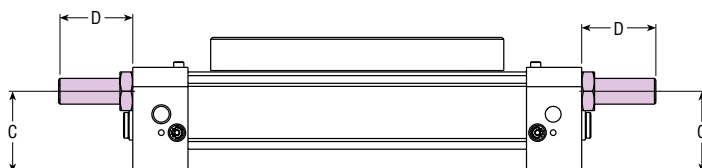


Caution: Care should be taken to ensure that stopping is always accomplished with either Travel Adjustment Screws, Shock Absorbers, or customer applied tooling or fixturing.



SIZE	TRAVEL ADJUSTMENT REPLACEMENT KIT NO.	
	-STD	-Z1 PLATING
27	72139-00	72139-03
40	72443-00	72443-03

Kit includes one travel adjustment screw and nut for one end.



SIZE	LETTER DIMENSIONS			
	A	B	C	D
27	.955 [24.3]	2.264 [57.5]	1.732 [44.0]	.787 [20.0]
40	1.364 [34.6]	3.126 [78.4]	2.441 [62.0]	1.731 [44.0]

Numbers in [] are metric.

DB

CUSHIONS ON EXTEND AND RETRACT

DR

CUSHION ON RETRACT

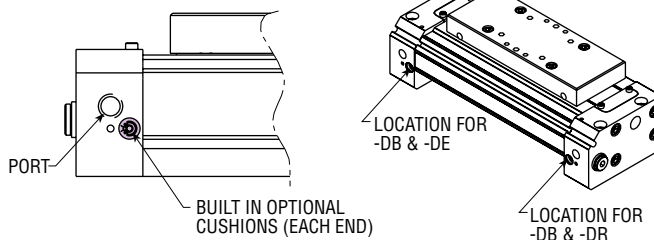
DE

CUSHION ON EXTEND

Optional adjustable cushions at each end of travel provide smooth deceleration of the applied load. Threaded cushion control needles, located on the side of the slide, provide a wide adjustment range making the cushion ideal for reduction of impact forces at the end of travel. **NOTE:** Cushion option must be specified with above

corresponding travel adjustment option. See PHD Product Sizing Catalog for cushion capabilities.

CAUTION: The use of the travel adjustment screw will affect the kinetic energy capacity of the cushions. Therefore, to get the maximum capabilities from the cushion, specify the stroke of the slide to match the required travel of the application.



OPTIONS: SERIES SFP SLIDES

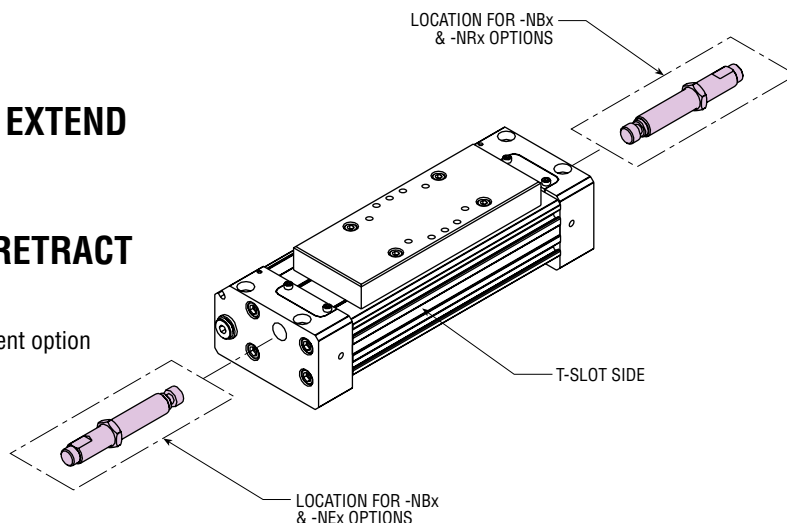
NBx SHOCK ABSORBER ON EXTEND AND RETRACT

NEx SHOCK ABSORBER ON EXTEND

NRx SHOCK ABSORBER ON RETRACT

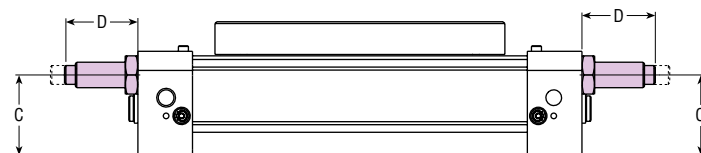
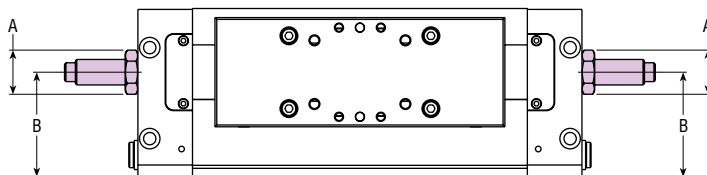
The shock absorber option and/or travel adjustment option must be ordered with all PHD Series SFP Slides. Both of these mechanical stops provide an adjustment range of 0.55 in [14 mm] from each end of stroke.

The hydraulic shock absorber options are designed for the maximum deceleration control and load stopping ability. The -NBx, -NEx, and -NRx options provide the Series SFP actuator with the hydraulic shock absorber factory installed. See PHD Product Sizing Catalog for details on shock absorber stopping capacity and to determine proper damping constant value (Damping constant NBx, NEx, NRx).



Caution: Care should be taken to ensure that stopping is always accomplished with either Travel Adjustment Screws, Shock Absorbers, or customer applied tooling or fixturing.

SIZE	AVAILABLE DAMPING CONSTANT NBx, NEx, NRx
27	2 = -02, 3 = -03, 5 = -05, 6 = -06
40	2 = -02, 3 = -03, 4 = -04



SIZE	SHOCK ABSORBER REPLACEMENT KIT NO.
27	63290-02-00-xx
40	63290-03-00-xx

Kit includes one shock and nut for one end.
-xx = Shock Damping Constant (See PHD Product Sizing Catalog)

SIZE	LETTER DIMENSIONS							
	A	B	C	D				
27	.955	2.264	1.732	-2	-3	-4	-5	-6
	[24.3]	[57.5]	[44.0]	1.39	1.39	—	1.40	1.66
40	1.364	3.126	2.441	-2	-3	-4	-5	-6
	[34.6]	[78.4]	[62.0]	1.93	1.93	1.93	—	—

Numbers in [] are metric.

Z1 CORROSION RESISTANT PLATING

This option provides corrosion resistant plating on all externally exposed ferrous parts. This optional plating can be used to protect the slide from severe or corrosive environments.

NOTE: Shock Absorbers are not plated with -Z1 option.

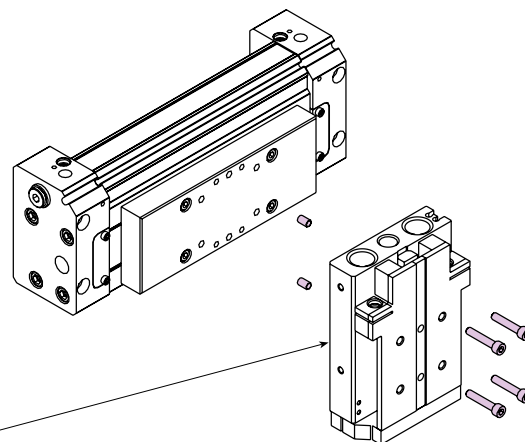
All dimensions are reference only unless specifically toleranced.

MODULAR MOUNTING KITS

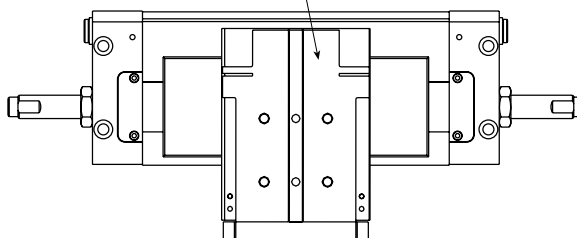
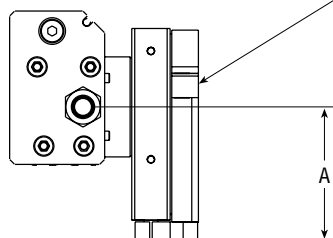
Modular design of the Series SFP saddle allows units to bolt and dowl together without the need for a transition plate. See chart below for slide compatibility and hardware kits required. Each kit contains two dowel pins and four SHCS to mount the units together.

PRIMARY UNIT	SECONDARY UNIT	DOWEL PIN READY	FASTENER KIT	DIMENSION A (WITHOUT ADJUSTMENT)
SFP627	STPD516	YES	73234-xx	3.111 [79]
SFP640	STPD525	YES	73235-xx	3.977 [101]

Numbers in [] are in mm.
 -xx = -00 = Standard Plating
 -03 = Z1 Electroless Nickel Plating

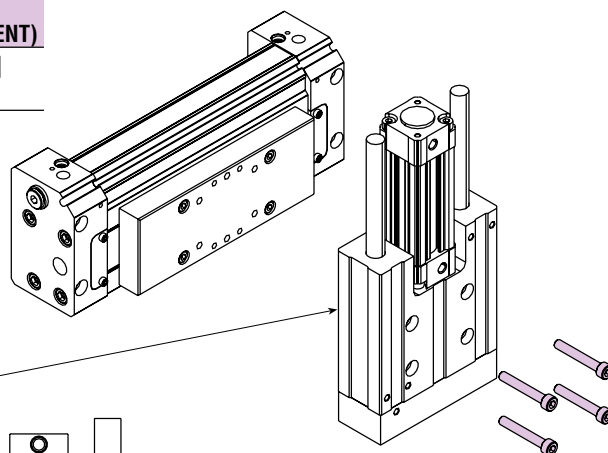


PHD Series STP Slide

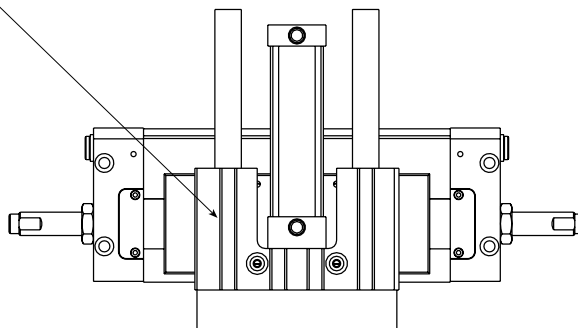
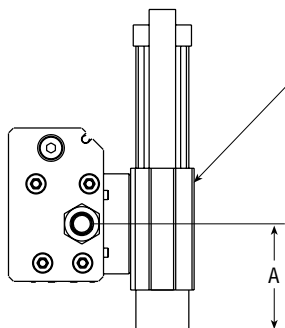


PRIMARY UNIT	SECONDARY UNIT	DOWEL PIN READY	FASTENER KIT	DIMENSION A (WITHOUT ADJUSTMENT)
SFP627	SK/SLxx2	NO	73230-xx	2.539 [64.5]
SFP640	SK/SLxx4	NO	73231-xx	2.559 [65]

Numbers in [] are in mm.
 -xx = -00 = Standard Plating
 -03 = Z1 Electroless Nickel Plating

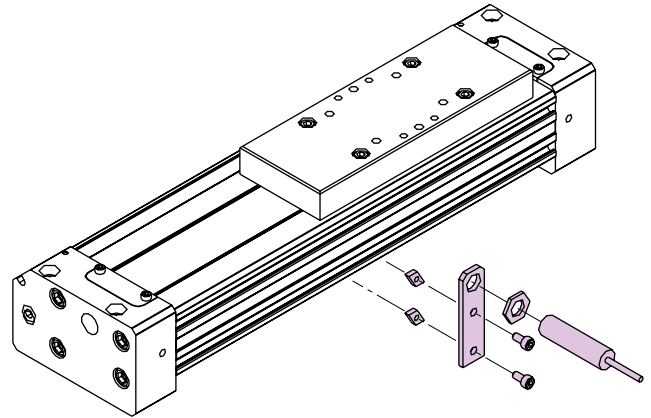


PHD Series SK/SL Slide

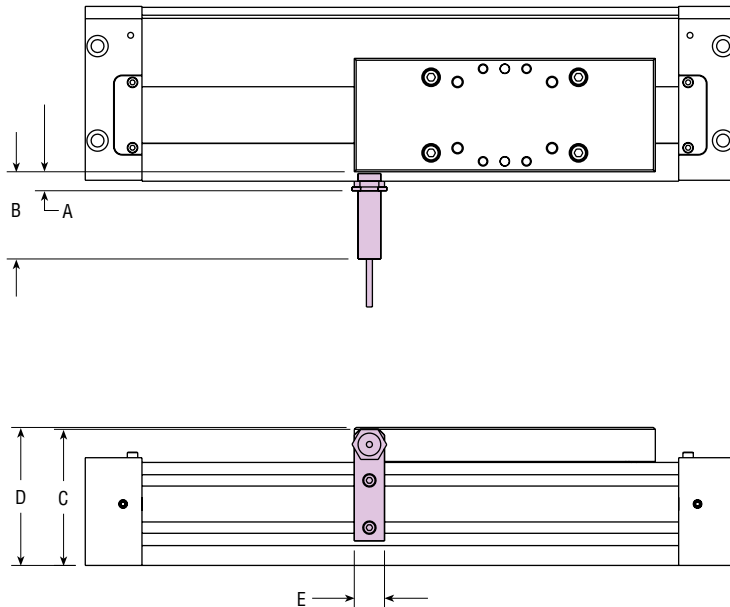


EXTERNAL PROXIMITY SWITCH READY BRACKETS

This accessory provides for external mounting of a 12 mm round metal sensing proximity switch. One switch mount kit is required per switch and includes the bracket with the required mounting hardware. The Series SFP Slide utilizes the t-slots on the side of the tube to attach the proximity mounting bracket. Proximity switches are ordered separately. See Switches and Sensors section for complete switch specifications.



SFP



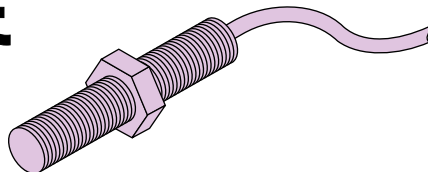
SIZE	LETTER DIMENSIONS				
	A	B	C	D	E
27	.396	2.192	2.835	2.884	.630
27	[10.1]	[55.7]	[72.0]	[73.3]	[16.0]
40	.376	2.132	3.702	3.846	.787
40	[9.6]	[54.6]	[94.0]	[97.7]	[20.0]

SIZE	PROXIMITY MOUNTING KIT (METRIC)
27	72137-xx
40	72441-xx

Kit includes hardware for one end.
Switches ordered separately.
-xx = -00 = Standard Plating
-03 = Z1 Electroless Nickel Plating

12 mm THREADED

CE



PART NO.	DESCRIPTION
15561-001	NPN (Sink) 3 meter cable
15561-002	PNP (Source) 3 meter cable
15561-003	VAC Solid State, 3 meter cable

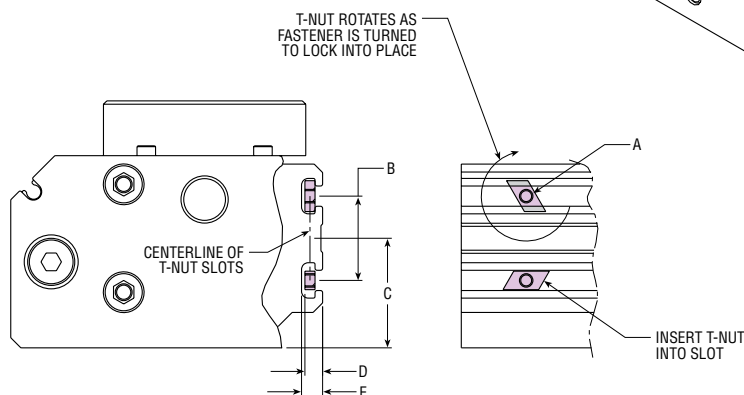
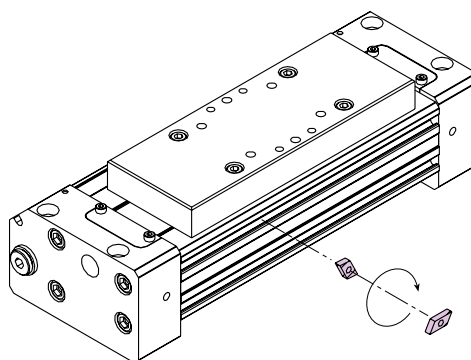
All dimensions are reference only unless specifically toleranced.

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ACCESSORIES: SERIES SFP SLIDES

T-NUTS

T-nuts allow attachment of switches, cable carriers, or other accessories to be easily mounted to the actuator. T-nuts can be positioned at any point along the t-slot grooves. The swiveling t-nut design allows insertion from the top of the slot. When the nut is tightened, it rotates into the locking position and securely clamps the bolted part.



SIZE	LETTER DIMENSIONS				
	A	B	C	D	E
27	M3 x 0.5	.984	1.280	.195	.246
27	M3 x 0.5	[25.0]	[32.5]	[5.0]	[6.2]
40	M5 x 0.8	1.181	1.732	.303	.386
40	M5 x 0.8	[30.0]	[44.0]	[7.7]	[9.8]

NOTE: Dimensions D and E are for minimum (D) and maximum (E) thread engagement.

SIZE	SWIVEL T-NUT (METRIC)
27	72128-xx
40	72129-xx

NOTE: Each number represents one T-Nut.
 -xx = -00 = Standard Plating
 -03 = Z1 Electroless Nickel Plating

SIZE	TORQUE	
	in-lb	Kgf-m
27	20	9.1
40	80	36.3

NOTE: Over torquing fastener may damage tube, t-nut, and/or fastener.

M MAGNET FOR PHD SERIES 6790 & JC1 SWITCHES

Series SFP Slides are optionally internally equipped with a magnet for use with PHD Series 6790 and JC1 Switches. These switches mount easily to the unit using the switch slot on the side of the tube.

PHD Series 6790 and JC1 Switches are designed specifically to provide an input signal to various types of programmable controllers or logic systems. See the Switches and Sensors section for complete switch specifications.

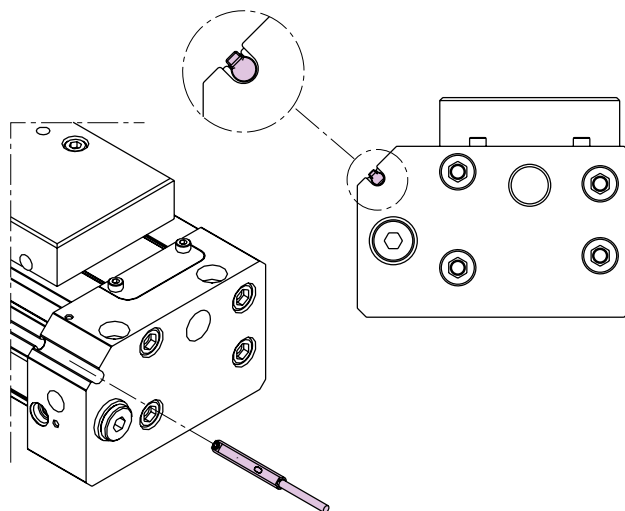
SERIES 6790 & JC1 SWITCHES

PART NO.	DESCRIPTION
67902-1-05	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, 5 m cable
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
67922-1	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, Quick Connect
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect
67929-2	PNP (Source) or NPN (Sink) Reed, 65-120 VDC, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification.

SERIES 6790 & JC1SDx CORDSET CHART

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable



TORQUE CHART

SWITCH	TORQUE
6790	16 in-oz
JC1SDx	Hand tighten clockwise until switch is securely retained. Do not overtighten.