

# SERIES SJP RAIL BEARING SLIDES

MRO Drop-In  
Replacement  
Unit Opportunity\*

*Compact Precision*

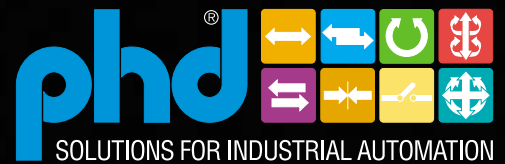


**ISO-9001  
CERTIFIED**  
Quality Management  
System Certified



*\*Contact PHD or your local distributor for unit compatibility.*

SJP01



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# ORDERING DATA: SERIES SJP RAIL BEARING SLIDES

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### Ordering Data

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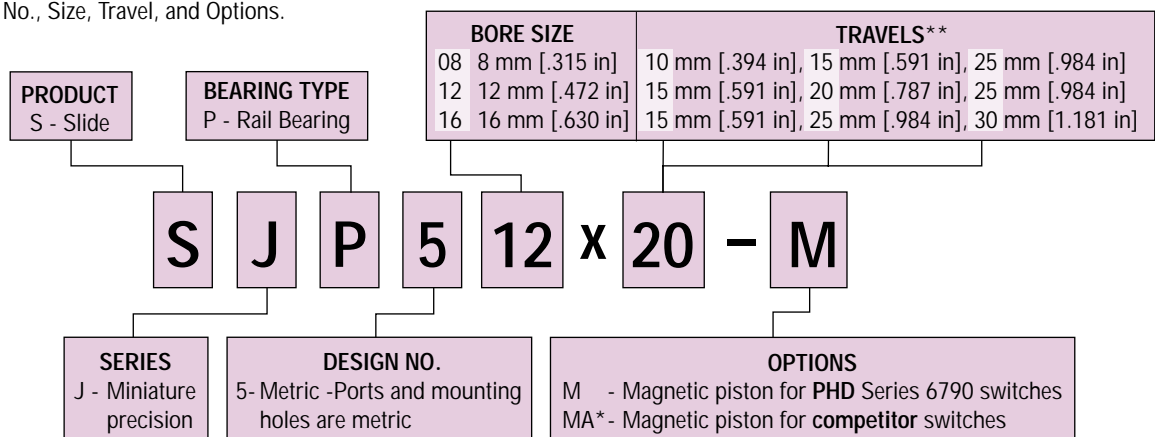
Page 7

### Parts Lists & Repair Kits

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#### TO ORDER SPECIFY:

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



PART NO.	DESCRIPTION
67902-1-02	NPN (Sink) or PNP (Source) DC Reed, 2 m cable
67902-1-05	NPN (Sink) or PNP (Source) DC Reed, 5 m cable
67903-1-02	NPN (Sink) DC Solid State, 2 m cable
67903-1-05	NPN (Sink) DC Solid State, 5 m cable
67904-1-02	PNP (Source) DC Solid State, 2 m cable
67904-1-05	PNP (Source) DC Solid State, 5 m cable
67922-1	NPN (Sink) or PNP (Source) DC Reed, Quick Connect
67923-1	NPN (Sink) DC Solid State, Quick Connect
67924-1	PNP (Source) DC Solid State, Quick Connect
63549-02	2 m Cordset with Quick Connect
63549-05	5 m Cordset with Quick Connect

#### NOTES:

\*See page 7 for use of the -MA option.

\*\*Consult PHD for additional travel increments.

# BENEFITS: SERIES SJP RAIL BEARING SLIDES

## BENEFITS

- This slide is designed to be an MRO drop-in. Consult PHD or your local distributor for unit compatibility.
- Series SJP Slides use rail bearing technology to provide smooth, precise movement with high accuracy within confined spaces.
- Available in three bore sizes with three travel lengths each.
- Standard internal shock pads eliminate metal to metal contact reducing noise and end-of-travel impact forces.
- Standard Series SJP Slides provide multiple mounting options for maximum flexibility. Bodies feature mounting holes on sides, end, and bottom.
- Slide body incorporates twin switch slots on both sides for convenient mounting of PHD's Series 6790 4 mm Reed and solid state switches. Magnet option -M is required when using Series 6790 Switches.
- Series SJP Slides can be fitted with certain competitor's switches. Magnet option -MA is required when using these switches.



SPECIFICATIONS	BORE SIZE					
	08		12		16	
	in	mm	in	mm	in	mm
POWER SOURCE	Integral pneumatic cylinder					
MAX. OPERATING PRESSURE	100 psi [6.9 bar]					
OPERATING TEMPERATURE RANGE	-20° to 180°F [-29° to 82°C]					
TRAVELS	.394	10	.591	15	.591	15
	.591	15	.787	20	.984	25
	.984	25	.984	25	1.181	30
STANDARD FEATURES	Multiple port positions, multiple mounting positions					
BEARINGS	Stainless steel ground rail bearing system with recirculating ball bearings					
BODY	Anodized aluminum alloy					
TOOL PLATE	Anodized aluminum alloy					

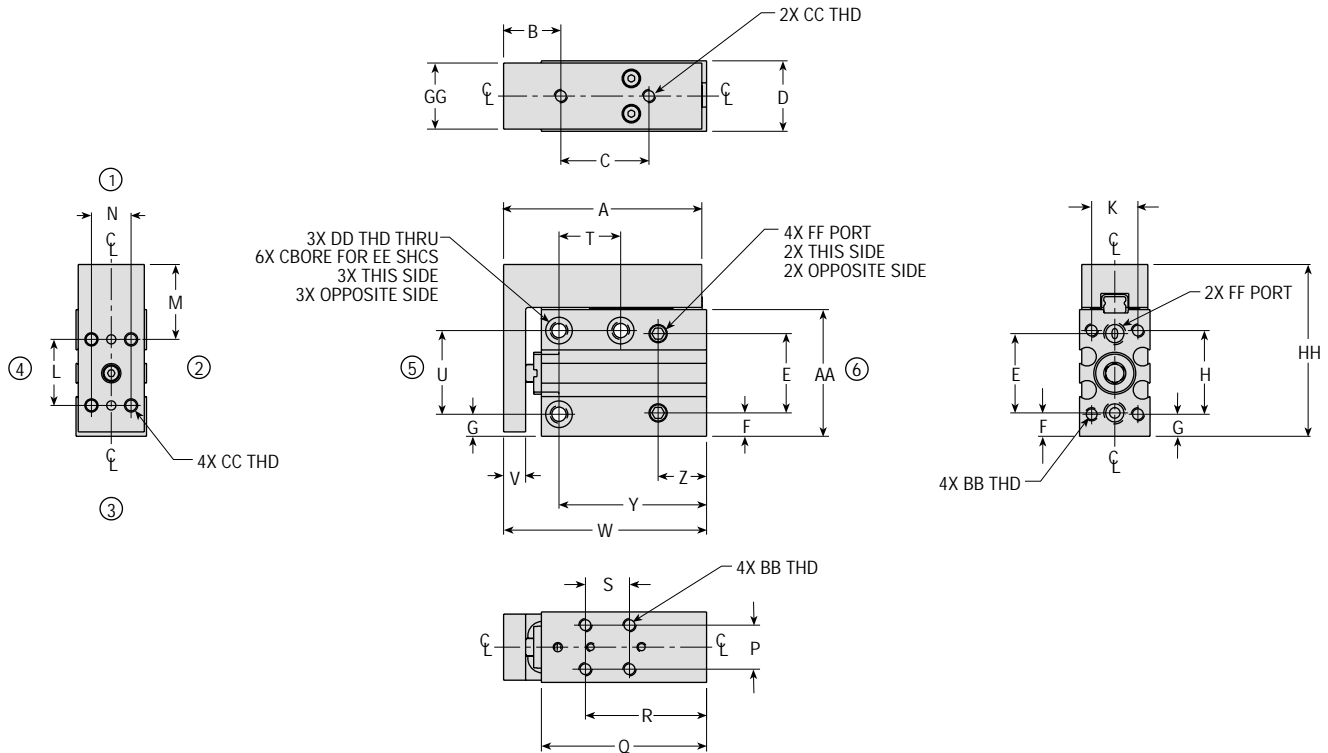
FORCE TABLE

DIRECTION	SIZE 08		SIZE 12		SIZE 16	
	lb/psi	N/bar	lb/psi	N/bar	lb/psi	N/bar
EXTEND	.079	5.1	.175	11.3	.314	20.3
RETRACT	.060	3.9	.132	8.5	.270	17.4



***For more options and design flexibility,  
try the NEW Series SHP Slide.  
Contact PHD for a FREE catalog.***

# DIMENSIONS: SERIES SJP RAIL BEARING SLIDES



LETTER DIM.	SIZE 08 TRAVEL, in [mm]			SIZE 12 TRAVEL, in [mm]			SIZE 16 TRAVEL, in [mm]				
	.394 [10]	.591 [15]	.984 [25]	.591 [15]	.787 [20]	.984 [25]	.591 [15]	.984 [25]	1.181 [30]		
A	1.969 [50.0]	2.165 [55.0]	2.559 [65.0]	2.441 [62.0]	2.638 [67.0]	2.953 [75.0]	2.953 [75.0]	3.346 [85.0]	3.543 [90.0]		
B		0.512 [13.0]			0.591 [15.0]			0.709 [18.0]			
C	.787 [20.0]	0.984 [25.0]	1.575 [40.0]	.984 [25.0]	1.181 [30.0]	1.575 [40.0]	1.378 [35.0]	1.772 [45.0]	1.969 [50.0]		
D		.630 [16.0]			.787 [20.0]			.984 [25.0]			
E		.709 [18.0]			.866 [22.0]			.984 [25.0]			
F		.209 [5.3]			.217 [5.5]			.256 [6.5]			
G		.197 [5.0]			.197 [5.0]			.217 [5.5]			
H		.748 [19.0]			.906 [23.0]			1.063 [27.0]			
K		.413 [10.5]			.512 [13.0]			.669 [17.0]			
L		.591 [15.0]			.709 [18.0]			1.024 [26.0]			
M		.669 [17.0]			.846 [21.5]			.846 [21.5]			
N		.354 [9.0]			.433 [11.0]			.630 [16.0]			
P		.394 [10.0]			.512 [13.0]			.669 [17.0]			
Q	1.673 [42.5]	1.870 [47.5]	2.264 [57.5]	2.028 [51.5]	2.224 [56.5]	2.539 [64.5]	2.441 [62.0]	2.835 [72.0]	3.031 [77.0]		
R	1.279 [32.5]	1.476 [37.5]	1.870 [47.5]	1.555 [39.5]	1.752 [44.5]	2.067 [52.5]	1.969 [50.0]	2.362 [60.0]	2.559 [65.0]		
S	.591 [15.0]	.787 [20.0]	1.181 [30.0]	.709 [18.0]	.945 [24.0]	1.260 [32.0]	1.181 [30.0]	1.575 [40.0]	1.772 [45.0]		
T	.551 [14.0]	.945 [24.0]	1.339 [34.0]	.945 [24.0]	.945 [24.0]	1.339 [34.0]	1.339 [34.0]	1.575 [40.0]	1.575 [40.0]		
U		.748 [19.0]			.906 [23.0]			1.063 [27.0]			
V		.197 [5.0]			.276 [7.0]			.374 [9.5]			
W	2.008 [51.0]	2.205 [56.0]	2.598 [66.0]	2.480 [63.0]	2.677 [68.0]	2.992 [76.0]	2.993 [76.0]	3.386 [86.0]	3.583 [91.0]		
Y	1.516 [38.5]	1.713 [43.5]	2.107 [53.5]	1.831 [46.5]	2.028 [51.5]	2.343 [59.5]	2.244 [57.0]	2.638 [67.0]	2.835 [72.0]		
Z		.433 [11.0]			.492 [12.5]			.512 [13.0]			
AA		1.132 [28.8]			1.319 [33.5]			1.516 [38.5]			
BB		[M3 x 0.5 x 4.8]			[M4 x 0.7 x 6.0]			[M4 x 0.7 x 6.0]			
CC		[M3 x 0.5 x 5]			[M4 x 0.7 x 6 MIN]			[M4 x 0.7 x 6 MIN]			
DD		[M4 x 0.7]			[M5 x 0.8]			[M5 x 0.8]			
EE		[M3]			[M4]			[M4]			
FF		[M5 x 0.8 PORT]			[M5 x 0.8 PORT]			[M5 x 0.8 PORT]			
GG		.591 [15.0]			.748 [19.0]			.945 [24.0]			
HH		1.536 [39.0]			1.850 [47.0]			2.106 [53.5]			

**NOTES:**

- DESIGNATED  $\phi$  IS CENTERLINE OF UNIT.
- METRIC INFORMATION SHOWN IN [ ].
- CIRCLED NUMBERS INDICATE POSITION CALLOUT.

# ENGINEERING DATA: SERIES SJP RAIL BEARING SLIDES

## PRESSURE RATINGS

All Series SJP Slides have an operating pressure range of 20 psi minimum to 100 psi maximum [1.4 to 6.9 bar]. Maximum life will be achieved when pressure and velocity are no greater than necessary for proper operation. External flow controls are recommended. Series SJP Slides feature standard pneumatic ports on the end and both sides of the slide body, and are provided with the end ports ready for use and the side ports plugged with set screws and thread sealant.

## OPERATING TEMPERATURE

Series SJP Slides are designed for use in temperatures between -20° to 180° F [-29° to 82° C]. For temperatures outside this range, consult PHD.

## SEALS

Series SJP Slides utilize urethane and Nitrile seals which are compatible with standard paraffin-based lubrication oils used for pneumatic cylinders. For compatibility with other fluids, consult PHD.

## LUBRICATION

All units are pre-lubricated at the factory for service under normal operating conditions. Slides are designed and tested with non-lubricated air. However, the use of lubricated air will extend life.

## SLIDE SELECTION

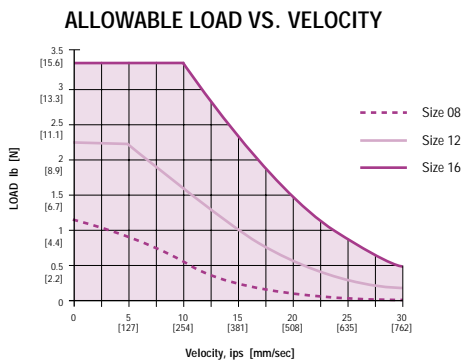
There are three major factors to consider when selecting a slide: thrust capacity, dynamic moment capacity, and the allowable velocity.

### 1 THRUST CAPACITY

Use the theoretical force output table to determine if thrust is sufficient for the applied load.

### 2 DYNAMIC MOMENT CAPACITY

The Dynamic Moment Load graphs show the allowable load for the three most common mounting positions of the Series SJP Slide. Determine the distance "x" from the edge of the tool plate to the load



## TOTAL TRAVEL LENGTH AND WEIGHT

Tolerance of minimum travel length is +.039/- .000 [+1 mm/-0 mm].

SIZE	MINIMUM TRAVEL		UNIT BASE WEIGHT	
	in	mm	lb	kg
08	(.394)	10	.16	.07
	(.591)	15	.18	.08
	(.984)	25	.21	.10
12	(.591)	15	.32	.15
	(.787)	20	.35	.16
	(.984)	25	.39	.18
16	(.591)	15	.57	.26
	(.984)	25	.65	.29
	(1.181)	30	.68	.31

## MATERIAL SPECIFICATIONS

The slide housing and tool plate are anodized aluminum alloy. Linear rail and bearings are hardened and ground stainless steel.

## MAINTENANCE

In common with most PHD products, these slides are fully field repairable. Repair kits and main structural components are available as needed for extended service life.

## MOUNTING INSTRUCTIONS

PHD recommends to mount load or tooling with tool plate retracted. Support tool plate while tightening fasteners. Maximum mounting torques (for screw thread engagement of one diameter or greater):

SIZE	in-lb	Nm
08	9	1
12	18	2
16	35	4

THEORETICAL FORCE 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]	

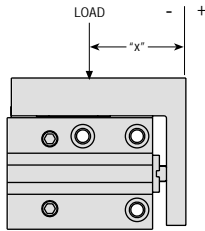
center of gravity. Use the appropriate graph for the loading condition to determine the allowable load. It is generally best to keep the center of gravity of the load as close to the slide as possible. (See next page for graphs.) If the application requires combined loading such as a horizontal pitch 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 Customer Service Department.

### 3 ALLOWABLE VELOCITY

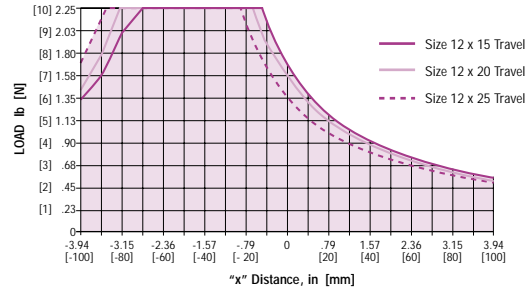
Use the allowable velocity graph at left to verify that the slide selected can carry the payload at the desired velocity.

# ENGINEERING DATA: SERIES SJP RAIL BEARING SLIDES

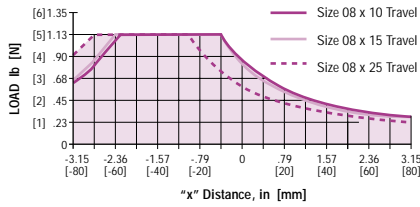
## MAXIMUM DYNAMIC HORIZONTAL PITCH MOMENT LOADS



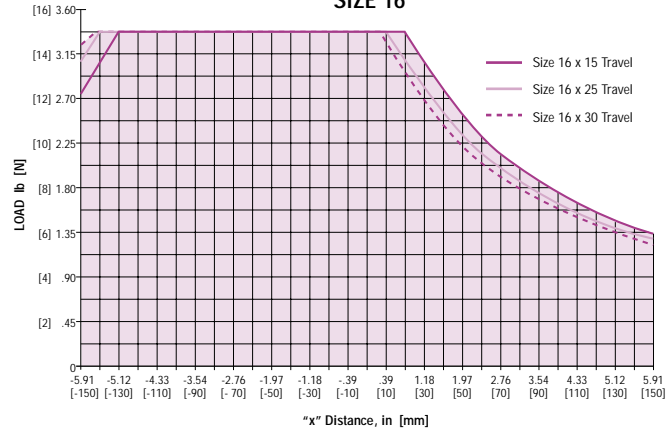
### SIZE 12



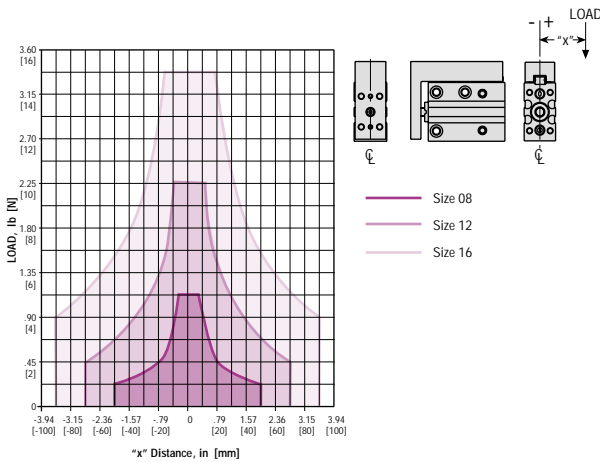
### SIZE 08



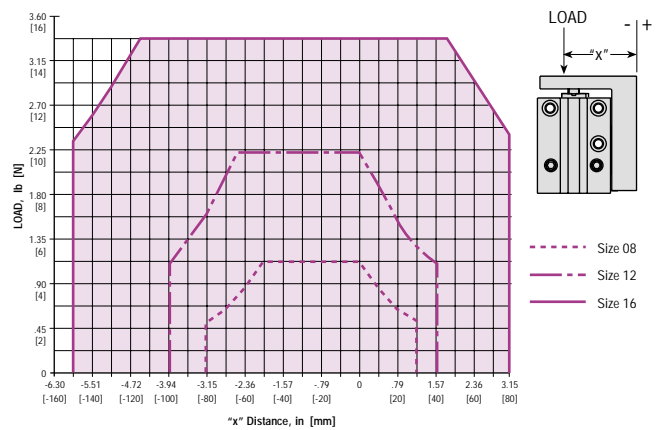
### SIZE 16



## MAXIMUM DYNAMIC ROLL MOMENT LOADS



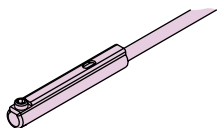
## MAXIMUM DYNAMIC VERTICAL PITCH MOMENT LOADS



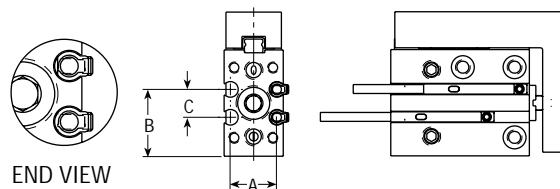
# OPTIONS: SERIES SJP RAIL BEARING SLIDES

## M MAGNET FOR PHD SERIES 6790 REED AND SOLID STATE SWITCHES

This option equips the unit with a magnetic piston for use with PHD's Series 6790 Switch. 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 set screw.



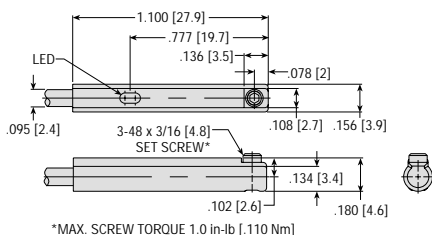
LETTER DIM	SIZE 08		SIZE 12		SIZE 16	
	in	mm	in	mm	in	mm
A	0.496	12.6	0.645	16.4	0.786	20.0
B	0.712	18.1	0.844	21.4	0.972	24.7
C	0.297	7.5	0.388	9.9	0.447	11.4



## REED BENEFITS

- Available as 4.5 - 30 VDC model for simple interfacing to sequencers and programmable controllers.
- Can be used to directly drive some types of relays or valve solenoids within the switch specifications stated.

SPECIFICATIONS	67902 & 67922
OPERATING PRINCIPLE	Magnetic Reed
ACTUATED BY	Piston Magnet
INPUT VOLTAGE	4.5 - 30 VDC
OUTPUT TYPE	Contact Closure
CURRENT RATING	50 mA Max.
CONTACT RESISTANCE	.115 Ohm Max.
ENVIRONMENTAL	IP67
OPERATING TEMP.	-20° to 85°C



## MA MAGNET FOR COMPETITOR'S REED AND SOLID STATE SWITCHES

The Series SJP can be used as an exact drop-in replacement for a competitor's commercially available rail slide. If the Series SJP is being used to replace the competitor's slide, and you wish to continue using their switches, the MA option must be specified. For additional information and switch compatibility, contact your local PHD distributor or PHD customer service.

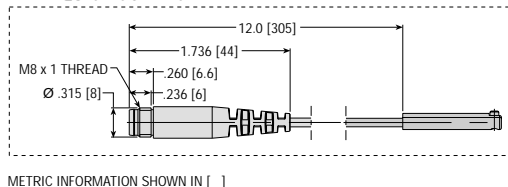
PART NO.	DESCRIPTION
67902-1-02	NPN (Sink) or PNP (Source) DC Reed, 2 m cable
67902-1-05	NPN (Sink) or PNP (Source) DC Reed, 5 m cable
67903-1-02	NPN (Sink) DC Solid State, 2 m cable
67903-1-05	NPN (Sink) DC Solid State, 5 m cable
67904-1-02	PNP (Source) DC Solid State, 2 m cable
67904-1-05	PNP (Source) DC Solid State, 5 m cable
67922-1	NPN (Sink) or PNP (Source) DC Reed, Quick Connect
67923-1	NPN (Sink) DC Solid State, Quick Connect
67924-1	PNP (Source) DC Solid State, Quick Connect
63549-02	2 m Cordset with Quick Connect
63549-05	5 m Cordset with Quick Connect

## SOLID STATE BENEFITS

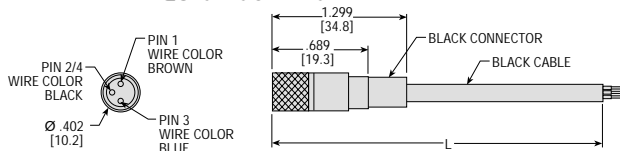
- Solid state switches afford long life. Constant amplitude output allows use with most digital logic systems.
- Switch circuitry protects against voltage surges and other electrical anomalies associated with operating systems.
- Excellent switch hysteresis characteristics and symmetry.
- Offered in 4.5 - 30 VDC current sinking and current sourcing versions for simple interfacing to electronic system controllers.

SPECIFICATIONS	67903 & 67923	67904 & 67924
OPERATING PRINCIPLE	Solid State	
ACTUATED BY	Piston Magnet	
INPUT VOLTAGE	4.5 - 30 VDC	
OUTPUT TYPE	NPN (Sink)	PNP (Source)
CURRENT RATING	50 mA. Max	
VOLTAGE DROP	.5 VDC	
SWITCH BURDEN	10 mA. Max.	
ENVIRONMENTAL	IP67	
OPERATING TEMP.	-20° to 85°C	

### MALE QUICK CONNECT DETAIL

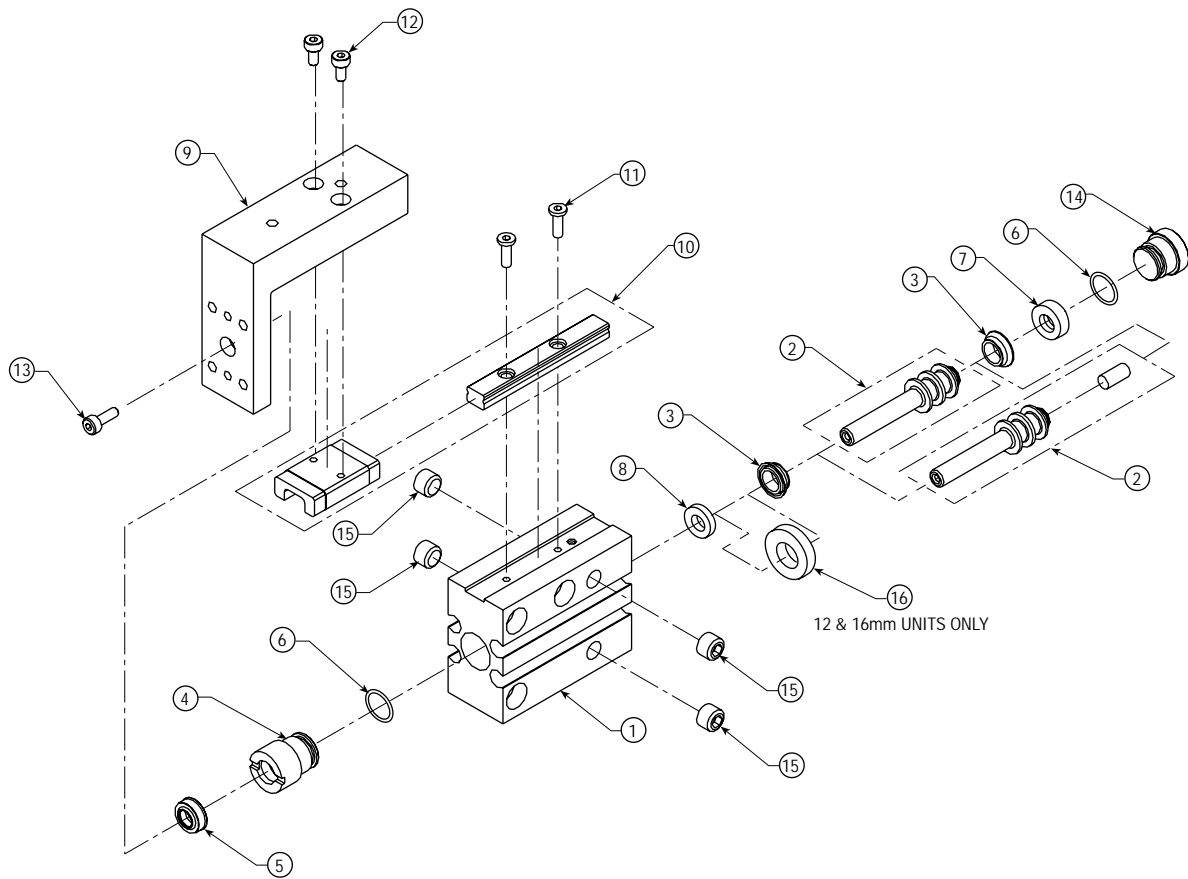


## 63549-xx CORDSET WITH FEMALE QUICK CONNECT



MODEL NO.	LETTER DIM. L
63549-02	78.74 [2 m]
63549-05	196.85 [5 m]

# EXPLODED VIEW & PARTS LIST: SERIES SJP RAIL BEARING SLIDES



KEY	PART DESCRIPTION	SIZE		
		08	12	16
1	Body Assembly		H2400	
2	Piston & Rod Assembly		H1000	
3	Piston Seal	Sold as part of seal kit		
4	Rod Seal Cartridge	71509	71609	71709
5	Rod Seal	Sold as part of seal kit		
6	Cartridge/Plug Seal	Sold as part of seal kit		
7	Retract Shock Pad	71510	71610	71710
8	Extend Shock Pad	68093	71615	71715
9	Tool Plate	H6400		
10	Rail & Carriage Assembly	Sold as part of bearing kit		
11	Rail Mounting Screw	Sold as part of bearing kit or fastener kit		
12	Tool Plate to Carriage Screw	Sold as part of bearing kit or fastener kit		
13	Tool Plate to Rod Screw	Sold as part of bearing kit or fastener kit		
14	Bore Plug	71506	71606	71706
15	Port Plug	17424-110		
16	Spacer	Full unit description required		

KIT DESCRIPTION	KIT NUMBER
Seal Kit	H9000
Fastener Kit	H9020
Bearing Kit	H7000

**PHD, Inc.**  
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 P.O. Box 9070, Fort Wayne, Indiana 46899 U.S.A.  
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