

# PUSHWHEEL SWITCHES

This section contains a wide assortment of pushwheel switches with numerous options. To facilitate easy selection, the table below summarizes each Series with specifications and features. Series are presented in this table (and in the following pages) in ascending order of size - i.e. - subminiature, miniature and standard.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SERIES	SH6/6G/6S	PICOD	SMCD	DPS8	DPS9	DPS10
Page(s) (Sockets - see page J20)	J2-J4	J5-J7	J8-J10	J11-J13	J14-J16	J17-J19
Panel mounting hole: Height	.590"(15mm)	.590"(15mm)	.945"(24mm)	.709"(18mm)	1.300"(33mm)	1.300"(33mm)
Width	.236"(6mm)	.300"(7.62mm)	.315"(8mm)	.315"(8mm)	.315"(8mm)	.394"(10mm)
Installed depth with p.c. board:						
Short	.925"(23.5mm)	.945"(24mm)	1.260"(32mm)	1.260"(32mm)	1.535"(39mm)	1.535"(39mm)
Long	1.213"(30.8mm)	1.358"(34.5mm)	1.654"(42mm)	1.614"(41mm)	1.968"(50mm)	1.968"(50mm)
Insertion from front	x	x	x		x	x
Insertion from rear	x	x	x	x		
<b>CODES</b>						
Code positions marking						
111 decimal 10 0-9		x	x	x	x	x
131 BCD 10 0-9	x	x	x	x	x	x
137 BCD comp 10 0-9	x	x	x	x	x	
141 BCD+comp 10 0-9				x	x	x
301 hexadecimal 16 0-9,A-F (0-15)		x	x	x	x	x
307 hexadecimal 16 0-9,A-F (0-15) complement		x			x	x
400 change-over 10 +,-,+,-,etc..	x	x	x	x	x	x
<b>ELECTRICAL DATA</b>						
Operating voltage: 40 V max.	x	x	x	x	x	x
Contact load, static:	0.5 A max.	0.5 A max.	1 A max.	1 A max.	1 A max.	1 A max.
Contact load, dynamic: 100 mA max.	x	x	x	x	x	x
Contact resistance (type AK): less than 100 mOhm	x	x	x	x	x	x
<b>TECHNICAL DATA</b>						
Operating temperature range:	-20°C to 80°C	-20°C to 60°C	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
Electric life, min. switching cycles:	100,000	100,000	1,000,000	1,000,000	1,000,000	1,000,000
Actuation force, approx (oz.):	14	11	14	14	16	16
Weight, approx. (grams):	1.5	2	4	4	6.5	7.5
Character height: 10 digit	.122"(3.1mm)	.122"(3.1mm)	.193"(4.9mm)	.193"(4.9mm)	.268"(6.8mm)	.276"(7mm)
16 digit	-	.094"(2.4mm)	.134"(3.4mm)	.134"(3.4mm)	.169"(4.3mm)	.169"(4.3mm)
Audible click	x	x	x	x	x	x
Vibration DIN IEC 68, parts 2-6	x	x	x	x	x	x
Shock DIN 40046, part 7	x	x	x	x	x	x
<b>MATERIALS</b>						
Body: PPO	x	x	x	x	x	x
PC board: FR 4 DIN 40802						
IEC 249-2, Contact surface gold over nickel on copper	x	x	x	x	x	x
Sliding contact: Gold over nickel on copper alloy	x	x	x	x	x	x
<b>STANDARD COLORS TYPE 2</b>						
Housing,Drum,Printing						
2 = black 3 = white	2,2,3	2,2,3	2,2,3	2,2,3	2,2,3	2,2,3

Other special features are available upon request including ESD protection, illumination, colored drum, special codes & marking. Consult factory.



# New! DPS8 SERIES MINIATURE PUSHWHEEL SWITCHES



## FEATURES

- Lower cost miniature pushwheel switches with large visible readout characters .
- Bi-directional snap action detent pushbutton mechanism.
- Black housing and drum with white printing.
- Gangable rear mounting models with spacers and side covers.
- Gold wiping action contacts.
- P.C. board options include solderable lands.

## DPS8 SPECIFICATIONS

Panel mounting hole:	
Height	.709"(18mm)
Width	.315"(8mm)
Installed depth with p.c. board:	
Short	1.260"(32mm)
Long	1.614"(41mm)
Insertion from front	no
Insertion from rear	yes

## CODES

Code	positions	marking	
111 Decimal	10	0-9	see truth tables
131 BCD	10	0-9	see truth tables
137 BCD comp	10	0-9	see truth tables
141 BCD + comp	10	0-9	see truth tables
301 Hexadecimal	16	0-9, A-F(0-15)	see truth tables
400 change-over	10	+,-,+,-,etc..	see truth tables

## ELECTRICAL DATA

Operating voltage:	40 V max.
Contact load, static:	1 A max.
Contact load, dynamic:	100 mA max.
Contact resistance (type AK):	less than 100 mOhm

## TECHNICAL DATA

Operating temperature range:	-20°C to 80°C
Electric life, min. switching cycles	1,000,000
Actuation force, approx (oz.):	14
Weight, approx. (grams):	4
Character height:	10 digit .193" (4.9mm)
	16 digit .134" (3.4mm)
Audible click	yes
Vibration DIN IEC 68, parts 2-6	yes
Shock DIN 40046, part 7	yes

## MATERIALS

Body:	PPO
PC board:	FR 4 DIN 40802 IEC 249-2, Contact surface gold over nickel on copper
Sliding contact:	Gold over nickel on copper alloy

## STANDARD COLORS

Housing, Drum, Printing	
2 = black 3 = white	2,2,3

Other special features are available upon request including:

- Factory or customer set stops (10 digit models)
- L.E.D. illumination (transparent drum)
- Red digits
- Decimal point
- Special codes or printing
- Gray housing
- See sockets at end of Pushwheel section.

# New! DPS8 SERIES MINIATURE PUSHWHEEL SWITCHES

## TRUTH TABLES

CODE 131 BCD						
	C	1	2	4	8	
0	●					
1	●	●				
2	●		●			
3	●	●	●			
4	●			●		
5	●	●			●	
6	●	●	●	●		
7	●	●	●	●	●	
8	●				●	
9	●	●			●	

CODE 137 BCD COMP.					
	C	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
0	●	●	●	●	●
1	●		●	●	●
2	●	●		●	●
3	●			●	●
4	●	●	●		●
5	●		●		●
6	●	●			●
7	●				●
8	●	●	●	●	
9	●		●	●	

CODE 400 CHANGE-OVER			
	C	A+	A-
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●

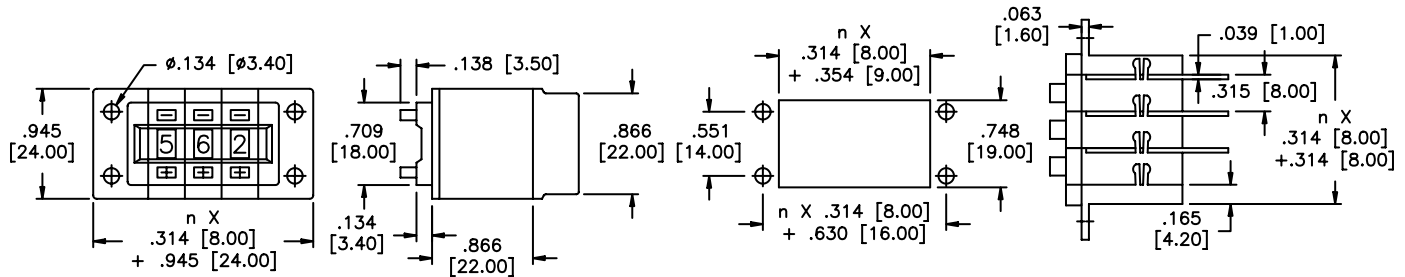
CODE 301 HEXADECIMAL					
	1	2	4	8	C
0					●
1	●				●
2		●			●
3	●	●			●
4			●		●
5	●		●		●
6		●	●		●
7	●	●	●		●
8				●	●
9	●			●	●
A		●	●		●
B	●	●			●
C			●	●	●
D	●		●	●	●
E		●	●	●	●
F	●	●	●	●	●

CODE 111 DECIMAL											
	C	0	1	2	3	4	5	6	7	8	9
0	●	●									
1	●		●								
2	●			●							
3	●				●						
4	●					●					
5	●						●				
6	●							●			
7	●								●		
8	●									●	
9	●										●

CODE 141 BCD + COMP.									
	C	1	2	4	8	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
0	●					●	●	●	●
1	●	●				●	●	●	●
2	●		●			●	●	●	●
3	●	●	●			●	●	●	●
4	●			●		●	●	●	●
5	●	●			●	●	●	●	●
6	●		●	●		●	●	●	●
7	●	●	●	●		●	●	●	●
8	●				●	●	●	●	●
9	●	●			●	●	●	●	●

## MECHANICAL OUTLINE WITH PANEL CUT-OUT & MOUNTING

n = number of switches



## PIN CONNECTIONS

● The switching mode is shorting - i.e. - even during actuation, at least one output is connected to input C.

● "bl" is used for models ordered with L.E.D. illumination only.

AK	131	137	141	301	400	111	111bl
	+	+	1	+	+	0	+
			$\bar{1}$			1	0
			2			2	1
			$\bar{2}$			3	2
			4			4	3
			$\bar{4}$			C	4
			8			5	5
			$\bar{8}$			6	6
			C			7	7
			A+			8	8
			A-			9	9
						-	-

Pitch .079"(2mm)

Pitch .067"(1.7mm)

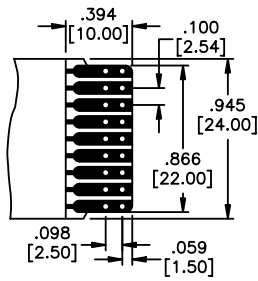
131	C	1	2	4	8
301	C	1	2	4	8

●	131	C	1	2	4	8		
●	137	C	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$		
●	301	C	1	2	4	8		
●	400	C		+	-			
●	131bl	+	C	1	2	4	8	-

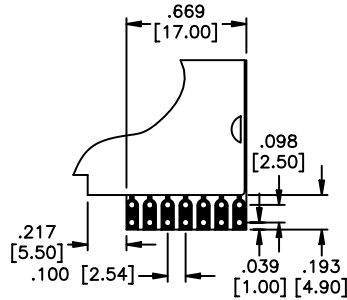
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! DPS8 SERIES MINIATURE PUSHWHEEL SWITCHES

## PRINTED CIRCUIT OPTIONS

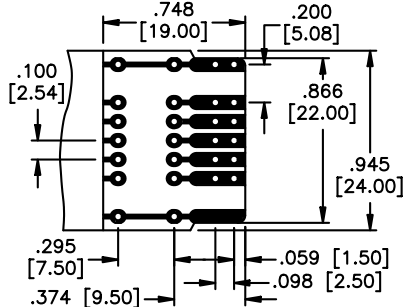


**AK** short p.c. board



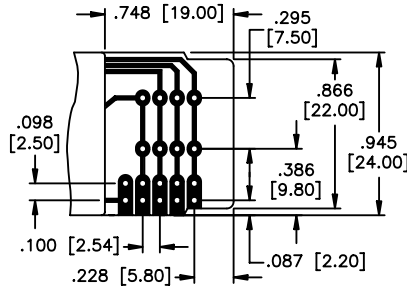
**AKU** short p.c. board

P.C. boards have .039" (1mm) holes and are suitable for soldering or socket connection (with the exception of LED illumination option).

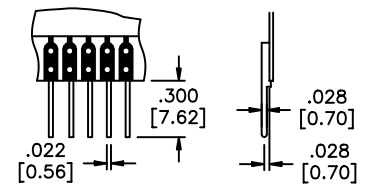


**AL** long p.c. board

For BCD models, the output traces are supplied disconnected



**ALU** long p.c. board



**LS** p.c. board w/solder pins

**Ordering information:** Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from available options shown and filling in the boxes.

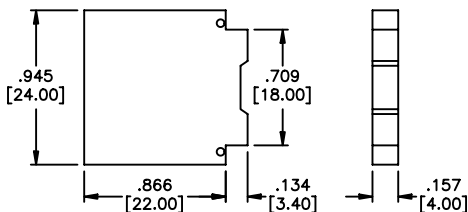
### 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Series model	Code	P.C. board	Terminations	Standard colors
D P S 8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	1 1 1 Decimal 1 3 1 BCD 1 3 7 BCD comp. 1 4 1 BCD +comp. 3 0 1 Hexadecimal. 4 0 0 Change-over	A K Short A K U Short (rt. angle) A L Long A L U Long (rt. angle)	(NONE) L S With p.c. solder pins	Black housing. & drum, white lettering.

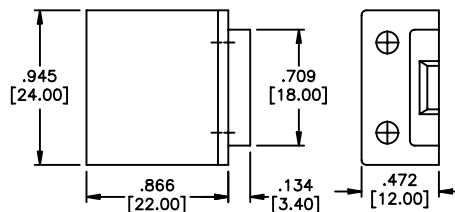
Example of complete model no.: **DPS8131ALLS2**  
Order SP12 as a separate line item for limit stop pin (for 10 position models only).

## ACCESSORIES

Order separately



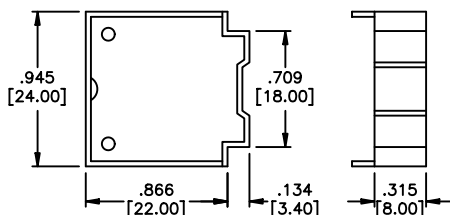
**DPS8A2** Spacer



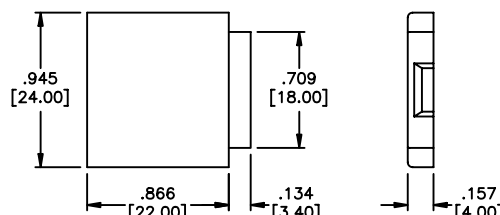
**DPS8PW2** Pair of side covers

### DPS8L2 Dummy switches

These are empty plastic housings with the same dimensions as DPS8 model (see outline). Use to fill hole where switch is not needed.



**DPS8L2** Dummy housing



**DPS8P2** Pair of side covers

# New! DPS9 SERIES PUSHWHEEL SWITCHES



## FEATURES

- .315" (8mm) wide pushwheel switches with extra large visible readout characters .
- Bi-directional snap action detent pushbutton mechanism.
- Black housing and drum with white printing.
- Gangable front mounting models with spacers and side covers.
- Gold wiping action contacts.
- P.C. board options include solderable lands.

## DPS9 SPECIFICATIONS

Panel mounting hole:	
Height	1.300" (33mm)
Width	.315" (8mm)
Installed depth with p.c. board:	
Short	1.535" (39mm)
Long	1.968" (50mm)
Insertion from front	yes
Insertion from rear	no

## CODES

Code	positions	marking	
111 Decimal	10	0-9	see truth tables
131 BCD	10	0-9	see truth tables
137 BCD comp	10	0-9	see truth tables
141 BCD + comp	10	0-9	see truth tables
301 Hexadecimal	16	0-9, A-F(0-15)	see truth tables
307 Hexadec comp	16	0-9, A-F(0-15)	see truth tables
400 change-over	10	+, -, +, -, etc..	see truth tables

## ELECTRICAL DATA

Operating voltage:	40 V max.
Contact load, static:	1 A max.
Contact load, dynamic:	100 mA max.
Contact resistance (type AK):	less than 100 mOhm

## TECHNICAL DATA

Operating temperature range:	-20°C to 80°C
Electric life, min. switching cycles	greater than 1,000,000
Actuation force, approx (oz.):	16
Weight, approx. (grams):	6.5
Character ht: 10 digit - .268" (6.8mm)	16 digit - .169" (4.3mm)
Audible click	yes
Vibration DIN IEC 68, parts 2-6	yes
Shock DIN 40046, part 7	yes

## MATERIALS

Body:	PPO
PC board:	FR 4 DIN 40802 IEC 249-2, Contact surface gold over nickel on copper
Sliding contact:	Gold over nickel on copper alloy

## STANDARD COLORS

Housing, Drum, Printing	
2 = black 3 = white	2,2,3

Other special features are available upon request including:

- Factory or customer set stops (10 digit models)
- L.E.D. illumination (transparent drum)
- Red digits
- Decimal point
- Special codes or printing
- Gray housing
- See sockets at end of Pushwheel section.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! DPS9 SERIES PUSHWHEEL SWITCHES

## TRUTH TABLES

**CODE 131  
BCD**

	C	1	2	4	8
0	●				
1	●	●			
2	●		●		
3	●	●	●		
4	●			●	
5	●	●			●
6	●	●	●	●	
7	●	●	●	●	●
8	●				●
9	●	●			●

**CODE 137  
BCD COMP.**

	C	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
0	●	●	●	●	●
1	●	●	●	●	●
2	●	●	●	●	●
3	●	●	●	●	●
4	●	●	●	●	●
5	●	●	●	●	●
6	●	●	●	●	●
7	●	●	●	●	●
8	●	●	●	●	●
9	●	●	●	●	●

**CODE 400  
CHANGE-OVER**

	C	A+	A-
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●
+	●	●	
-	●		●

**CODE 301  
HEXADECIMAL**

	1	2	4	8	C
0					●
1	●				●
2		●			●
3	●	●			●
4			●		●
5	●		●		●
6		●	●		●
7	●	●	●		●
8				●	●
9	●			●	●
A		●		●	●
B	●	●		●	●
C			●	●	●
D	●		●	●	●
E		●	●	●	●
F	●	●	●	●	●

**CODE 307  
HEXADDEC. COMP.**

	C	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
0	●	●	●	●	●
1	●	●	●	●	●
2	●	●	●	●	●
3	●	●	●	●	●
4	●	●	●	●	●
5	●	●	●	●	●
6	●	●	●	●	●
7	●	●	●	●	●
8	●	●	●	●	●
9	●	●	●	●	●
A	●	●	●	●	●
B	●	●	●	●	●
C	●	●	●	●	●
D	●	●	●	●	●
E	●	●	●	●	●
F	●	●	●	●	●

**CODE 111  
DECIMAL**

	C	0	1	2	3	4	5	6	7	8	9
0	●	●									
1	●		●								
2	●			●							
3	●				●						
4	●					●					
5	●						●				
6	●							●			
7	●								●		
8	●									●	
9	●										●

**CODE 141  
BCD + COMP.**

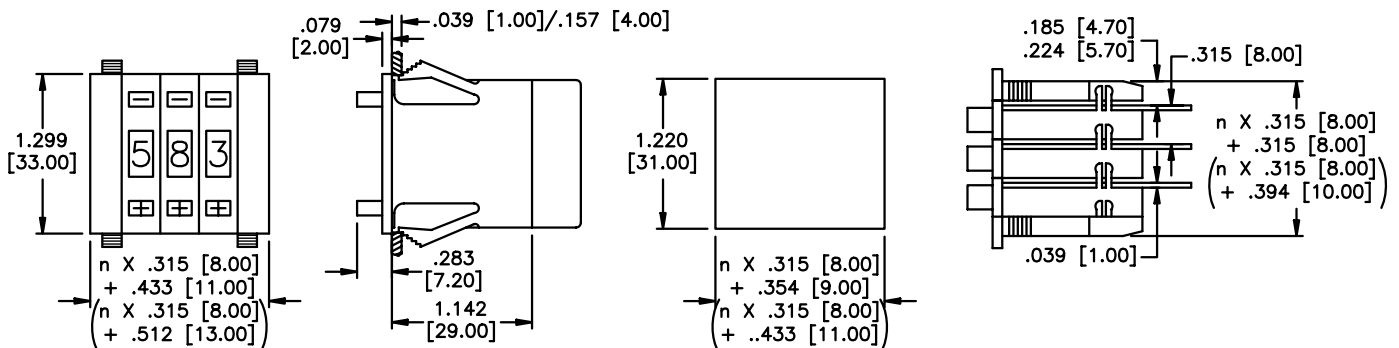
	C	1	2	4	8	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
0	●					●	●	●	●
1	●	●				●	●	●	●
2	●		●			●	●	●	●
3	●	●	●			●	●	●	●
4	●			●		●	●	●	●
5	●	●			●	●	●	●	●
6	●	●	●			●	●	●	●
7	●	●	●	●		●	●	●	●
8	●				●	●	●	●	●
9	●	●			●	●	●	●	●

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## MECHANICAL OUTLINE WITH PANEL CUT-OUT & MOUNTING

n = number of decades

Dimensions in brackets apply when **DPS910PB2** side covers are used.



## PIN CONNECTIONS



● The switching mode is shorting - i.e. - even during actuation, at least one output is connected to input C.

AK ●

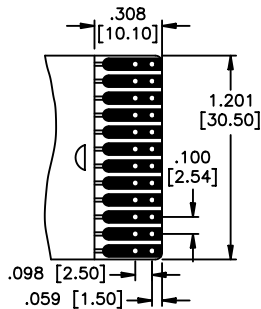
131	+	1	2			C	8	4	-			
137	+	$\bar{1}$	$\bar{2}$			C	$\bar{8}$	$\bar{4}$	-			
141	+	2	$\bar{4}$	$\bar{2}$	C	$\bar{8}$	$\bar{1}$	8	4			
301	+	1	2			C	8	4	-			
307	+	$\bar{1}$	$\bar{2}$			C	$\bar{8}$	$\bar{4}$	-			
400	+	C				A-	A+		-			
111		0	1	2	3	C	4	5	6	7	8	9

**111bl** + C 0 1 2 3 4 5 6 7 8 9 - Pitch .079"(2mm)

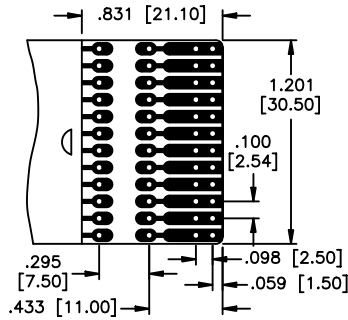
# New! DPS9 SERIES PUSHWHEEL SWITCHES

## PRINTED CIRCUIT OPTIONS

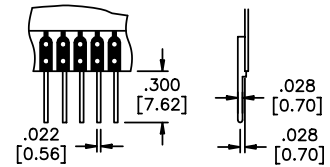
P.C. boards have .039" (1mm) holes and are suitable for soldering or socket connection (with the exception of LED illumination option).



**AK** short p.c. board



**AL** long p.c. board  
Allows customer to add resistors, diodes, ect.



**LS** p.c. board w/solder pins

**Ordering information:** Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from available options shown and filling in the boxes.

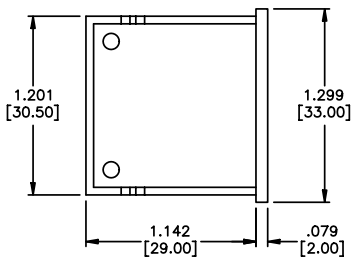
### 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Series model	Code	P.C. board	Terminations	Standard colors
D P S 9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	1 1 1 Decimal 1 3 1 BCD 1 3 7 BCD comp. 1 4 1 BCD + comp. 3 0 1 Hexadecimal. 3 0 7 Hexadecimal comp. 4 0 0 Change-over	A K Short A L Long	(NONE) L S with p.c. solder pins	2 Black housing, & drum, white lettering.

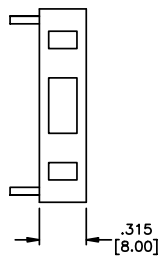
Example of complete model no.: **DPS9141AKLS2**  
Order **SP15** as a separate line item for limit stop pin (for 10 position models only).

## ACCESSORIES

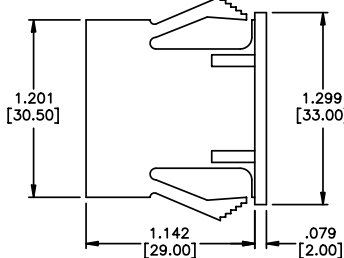
Order separately



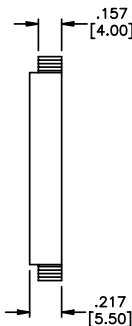
**DPS9L2** Dummy housing



**DPS910P2** Pair of side covers

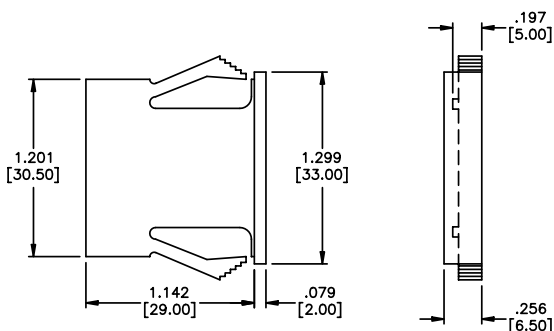


**DPS910PB2** Pair of side covers



**DPS9L2** Dummy switches

These are empty plastic housings with the same dimensions as DPS9 model (see outline). Use to fill hole where switch is not needed.



**DPS910A2** Spacer

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