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PICOD Series - Page J4

Pushwheel



Pushwheel Switches

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Pushwheel Switches

Order Description and Code Tables (Wiring Diagram)

DPS10 - 131 - AK

Series/types	Codes	Connections
SH6	111 = Decimal	AK = pcb short
PICOD	131 = BCD	AL = pcb long
SMCD	137 = BCD Complement	LS = solder pin
DPS8	141 = BCD + Complement	AL/D = pcb long, interrupted
DPS9	301 = Hexadecimal	AKU = pcb long downward
DPS10	307 = Hexa. Complement	ALU = pcb long downward
	400 = Switch-over	

FACTORY ASSEMBLED GROUP

Special type numbers will be assigned for customers requiring delivery of assembled groups of code switches. These will be pre-tested, identified and individually packaged. Consult factory for details.

CUSTOM SWITCHES

Contact factory for information concerning the feasibility, pricing and delivery of special switches, including non-standard codes, limit stopping, special markings, PC terminals and optional colors.

Code tables (wiring diagram)

Code 131

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

Code 137

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

Code 141

BCD + Compl.									
	C	1	2	4	8	1	2	4	8
0	●					●	●	●	●
1	●	●				●	●	●	●
2	●		●			●	●	●	●
3	●	●	●			●	●	●	●
4	●			●		●	●	●	●
5	●	●	●	●		●	●	●	●
6	●	●	●	●	●	●	●	●	●
7	●	●	●	●	●	●	●	●	●
8	●				●	●	●	●	●
9	●				●	●	●	●	●

Code 400

change-over switch			
	C	A+	A-
+	●	●	
1	●	●	●
2	●	●	●
+	●	●	
-	●	●	●
4	●	●	●
+	●	●	
-	●	●	●
7	●	●	●
+	●	●	
-	●	●	●

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

Hexadecimal Compl.					
	C	1	2	4	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	●										●

Specifications

Series/Types Catalog Page	SH6 J6	PICOD J7-8	SMC-D J9
Dimensions/type of mounting			
panel / height x width	15x6 mm	15x7.62 mm	24x7.62mm
installed depth width PCB, short/long	23.5/30.8 mm	24/34.5 mm	32/42mm
insertion from the front	x	x	x
insertion from the rear	x		
Codes			
Code	switching position	printing	
111 decimal	10	0-9	x
131 BCD	10	0-9	x
137 BCD complement	10	0-9	x
141 BCD + complement	10	0-9	x
301 hexadecimal	16	0-9-A-F (0-15)	x
307 hexadecimal compl.	16	0-9-A-F (0-15)	
400 change-over switch	10	+, -, +-, etc.	x
Electrical data			
operating voltage max.	40V	40V	40V
contact load, static max.	0.5A	0.5A	1A
contact load, dynamic (resistive) max.	100mA	100mA	100mA
contact resistance type AK (measured from the supply line to the output)	< 100 mOhm	< 100 mOhm	< 100 mOhm
Technical data			
permissible ambient temperature	-20...+80°C	-20...+60°C	-20...+80°C
expected life (switching cycles)	> 10 ⁵	> 10 ⁵	> 10 ⁶
actuating force approx.	4 N	3 N	4 N
weight approx.	1.5 g	2 g	4 g
digit height 10-/16-digit	3.1mm	3.1/2.4mm	4.9/3.4mm
click action (working point)	x	x	x
vibration DIN EN 60068-2-6	x	x	x
shock DIN EN 60068-2-27	x	x	x
Material			
housing: PPO UL94V-0	x	x	x
pc board: base material FR 4 respectively CEM3 DIN IEC 249-2, contact surface Au over Ni on Cu	x	x	x
Connections			
AK: short	x	x	x
AL: long	x	x	x
LS: solder point	x	x	x
AL/D: long/interrupted		x	
ALU: long downward		x	x

J

Specifications

Specifications

Series/Types Catalog Page	DPS8 J10	DPS9 J11	DPS10 J11
Dimensions/type of mounting			
panel / height x width	18x8mm	33x8mm	33x10mm
installed depth width PCB, short/long	32/41mm	39/50mm	39/50mm
insertion from the front	x	x	
insertion from the rear		x	
Codes			
Code	switching position	printing	
111 decimal	10	0-9	x
131 BCD	10	0-9	x
137 BCD complement	10	0-9	x
141 BCD + complement	10	0-9	x
301 hexadecimal	16	0-9-A-F (0-15)	x
307 hexadecimal compl.	16	0-9-A-F (0-15)	
400 change-over switch	10	+, -, +-, etc.	
Electrical data			
operating voltage max.	40V	40V	40V
contact load, static max.	1A	1A	1A
contact load, dynamic (resistive) max.	100mA	100mA	100mA
contact resistance type AK (measured from the supply line to the output)	< 100 mOhm	< 100 mOhm	< 100 mOhm
Technical data			
permissible ambient temperature	-20...+80°C	-20...+80°C	-20...+80°C
expected life (switching cycles)	> 10 ⁶	> 10 ⁶	> 10 ⁶
actuating force approx.	4 N	4 N	4 N
weight approx.	4 g	6.5 g	7.5 g
digit height 10-/16-digit	4.9/3.4mm	6.8/4.3mm	7.0/4.3mm
click action (working point)	x	x	x
vibration DIN EN 60068-2-6	x	x	x
shock DIN EN 60068-2-27	x	x	x
Material			
housing: PPO UL94V-0	x	x	x
pc board: base material FR 4 respectively CEM3 DIN IEC 249-2, contact surface Au over Ni on Cu	x	x	x
Connections			
AK: short	x	x	x
AL: long	x	x	x
LS: solder point	x	x	x
AKU: short downward			x
ALU: long downward	x		



Pushwheel Switches, Subminiature, Panel Mount, Dual Button

SH6 Series pushwheel switches are the smallest panel mounted dual pushbutton code switches available. They have a snap-action detent with an audible click. The dual-purpose finger terminals may be used for direct mounting on printed circuit boards, or wire may be soldered directly to the gold-plated conductors. The SH6 is designed for several means of panel mounting: groups of any number of switches may be snapped into panel holes of proper size and retained by the integral clips (front mounting), or groups may be held in place in a panel hole by being supported from rear when the switches are PC mounted. These reliable switches are made to the same exacting requirements as the SMCD, PICOD and DPS Series.

MATERIAL SPECIFICATIONS

Moving ContactsGold-clad Ni over copper alloy
 Fixed ContactsAU over Ni
 PC BoardFR4 Glass Epoxy
 Molded PartsNoryl-SE1, black matte finish
 WindowThermoplastic resin

TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating0.4 VA @ 20 VDC (max.)
 Contact Circuit Resistance0.12 ohm max.

PERFORMANCE CHARACTERISTICS

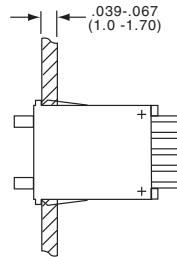
Operating ForceApprox. 11 oz.
 PC Terminal Spacing0.100"
 Character Height/Color.....0.118" White
 Life ExpectancyMore than 10⁵ operations
 Operating Temperature-20°C to +80°C

SH6 SERIES

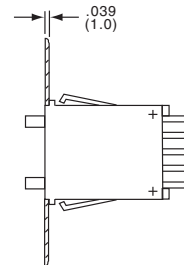


SH6131AK

FRONT MOUNTING
(See note below)



REAR MOUNTING



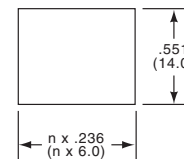
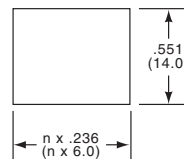
SH6 - 131 - AK

Codes

131 = BCD
 137 = BCD Complement

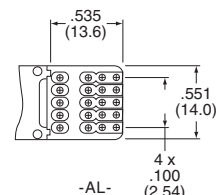
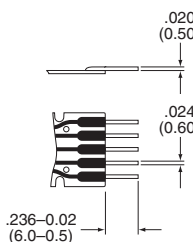
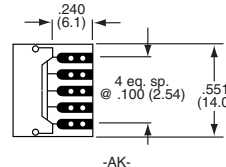
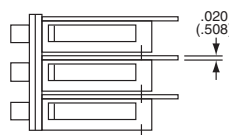
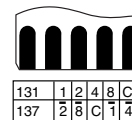
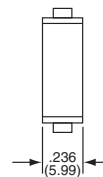
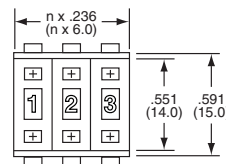
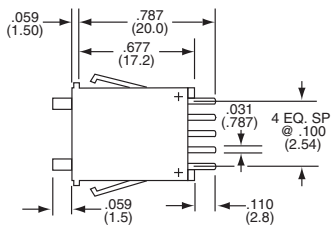
Connections

AK = pcb short
 AL = pcb long
 LS = solder pin



See Code Tables on Page J3

n = Number of switches



Note: Remove locating lugs from side of last switch to enable mounting from the front panel.

Note: Use Card Edge Connector B5LS or B5L with AK type.

Pushwheel Switches, Subminiature, Panel Mount, Dual Button

The PICOD family offers small panel-mounted pushwheel code switches, ideally suited for high density applications. They are used for the controlling and programming of frequency synthesizers, counters and timers, data comparators, security encoders, weighing machines, etc. The dependable pushbutton action allows narrow 0.3 inch width on panel. Changes to higher or lower settings are accomplished rapidly by successive operation of the appropriate buttons. The featherweight PICOD is less than 0.6 inch high, yet rugged enough for hand-held and portable instruments that may be subjected to field abuse. Heavy gold plating on wiping contacts affords low contact resistance for reliable operation over long periods of service. Easy-to-read characters are viewed through dust-sealed window. Installation costs are minimized by snap-together design – no inconvenient hardware.

MATERIAL SPECIFICATIONS:

Fixed Contacts1 microns AU over Ni over Cu
 Moving ContactsGold-clad Ni over copper alloy
 PC BoardFR4 Glass epoxy
 Molded PartsNoryl-SE1, Black matte finish
 WindowThermoplastic resin

TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 20 VDC max.
 Contact Circuit Resistance0.15 Ohm max.
 Operating ForceApprox. 11 oz.
 PC Terminal Spacing0.100"
 Character Height/Color122" White (.094" for hex codes)
 Life ExpectancyMore than 10⁵ operations
 Operating temperature-10° C to + 60° C

PICOD - 131 - AK

Codes	Connections
111 = Decimal	AK = pcb short
131 = BCD	AL = pcb long
137 = BCD Complement	LS = solder pin
301 = Hexadecimal	AL/D = pcb long, interrupted
307 = Hexa. Complement	ALU = pcb long downward
400 = Switch-over	

See Code Tables on Page J3



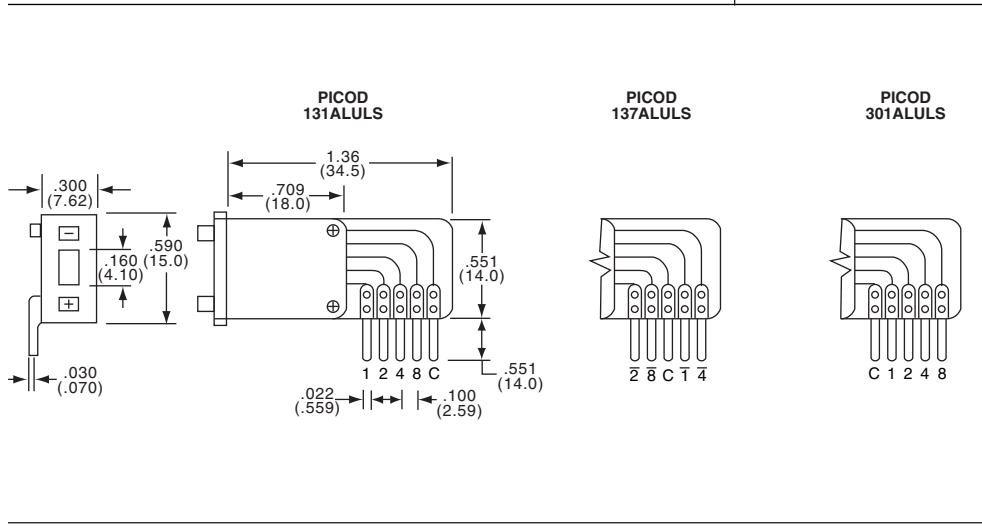
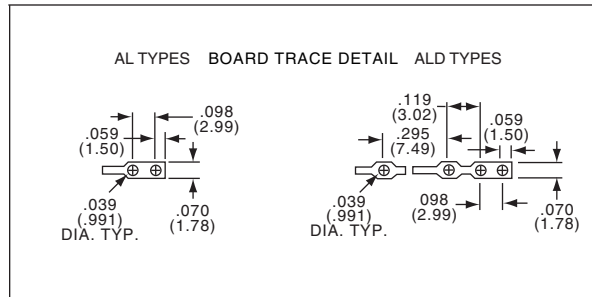
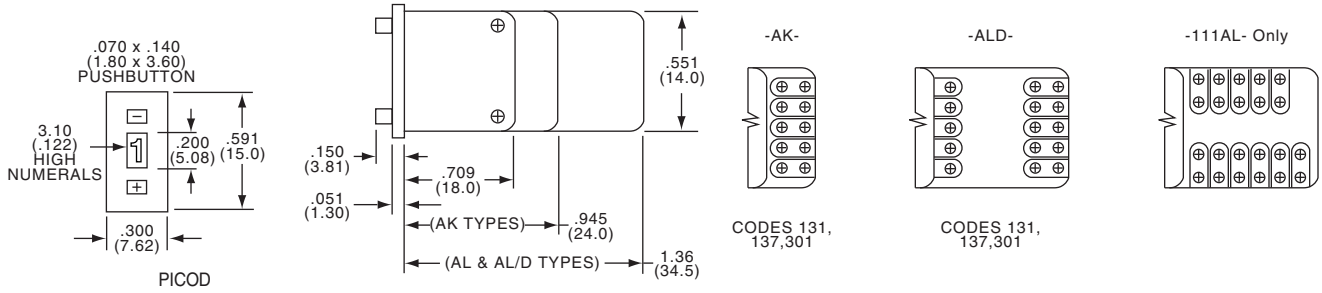
PICOD111AL

ACCESSORIES

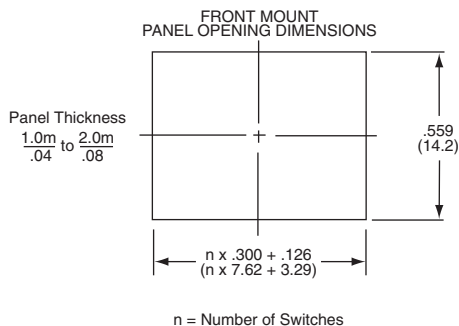
Front Mount Snap Detent	Description	Wheel Marks
PICOA	Spacer, 0.1" wide	
PICOADP	Spacer, 0.1" wide, with decimal point	
PICOBG	Spacer, 0.3" wide (same size as switch)	
PICOP	End-plate pair	
B5LS	5 pin connector with PC pins for AK types	
B5L	5 pin connector with wire lug termination for AK types	

Pushwheel Switches, Options

PICOD



PICOD



J
PICOD Series

Pushwheel Switches, Mini, Front Mount

SMCD Series have large visible readout characters despite it's small size. This popular family is used in measurement and test instrumentation for range setting, data programming and count controlling; and in communications equipment for digital tuning. The simple, reliable bi-direction pushbutton mechanism permits rapid changes to either higher or lower numerical settings. Instrument-grade performance and long service life are enhanced by the heavy gold wiping contacts. Large readout characters are protected by dust-sealed windows. Snap-together grouping and snap-in panel mounting minimize installation time and cost. SMCD models have snap detent with slight audible click.

SMCD bi-directional code switches may be easily assembled into groups of any number. The tabs or pins of one decade section press fit into the holes in the adjacent section. Spacers and end mounting plates may be included in the same manner as desired.

Groups of SMCD switches with end plates snap into panel holes of the recommended size and are retained by plastic clips. Again, tools and additional hardware items are not required.

MATERIAL SPECIFICATIONS:

PC BoardGlass epoxy type, FR4
 PC TerminalsGold over Ni on Cu
 Character Height/Color.....White on black background
 SMC .197/.134; SMCD .193/.134
 Except 301 & SG558: .140 and
 SG557 .120
 Molded partsNoryl-SE1, Black matte finish
 HousingBlack matte finish

TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 20 VDC or Peak AC
 Contact Circuit Resistance0.12 Ohm max. (Total internal ckt. res.)
 Mechanical LifeMore than 10⁶ operations
 Operational ForceApprox. 14 oz.

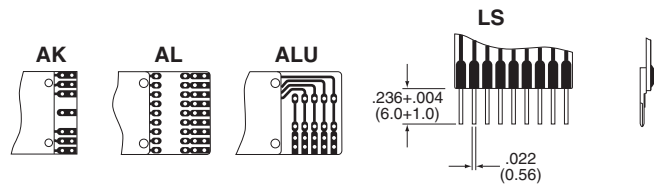
ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....(-20°C to +80°C)

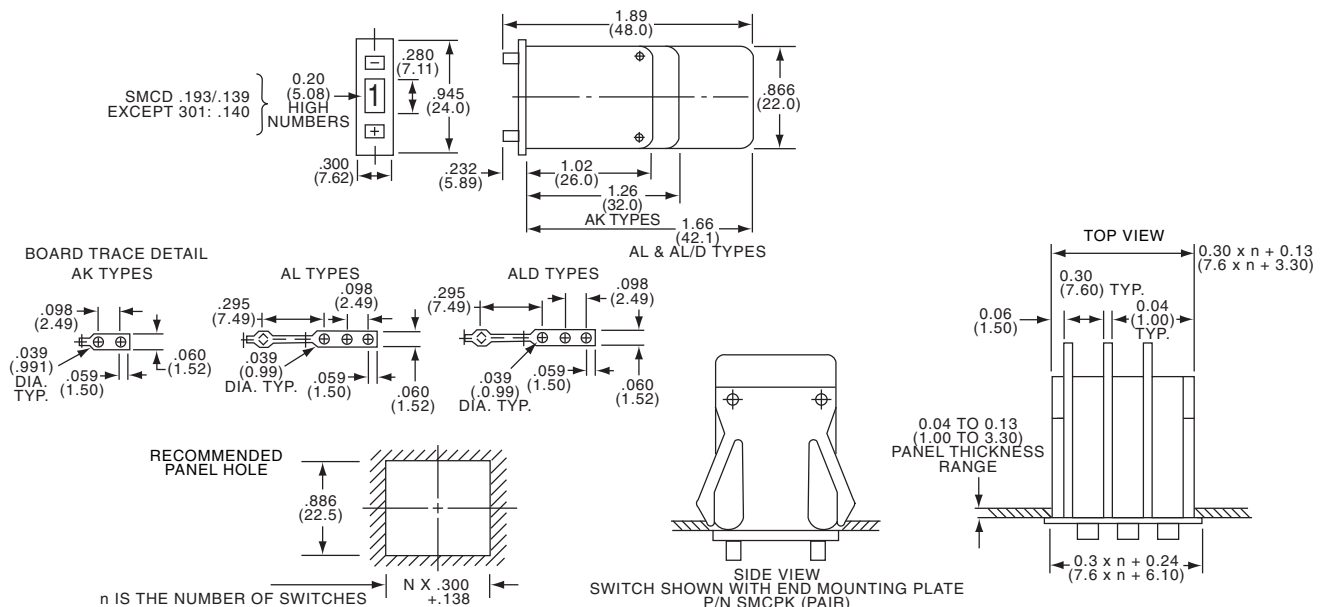
Model	Description
SMCPK	End mounting plates (pair)
SMCL	300" spacer section
SMCA	.100" spacer (with mounting clips)
SMCADP	.100" spacer, decimal point (with mounting clips)
B9L	Connector, 9 contacts, solder lug terminals
B9LS	Connector, 9 contacts, PC pins
B9LS5PIN	Connector, 5 contacts, PC pins
B11LS	Connectors, 11 contacts, PC pins (for 111)
SP1.2	Limit stop pin for SMD 10 position only

SMCD - 131 - AK

Codes	Connections
111 = Decimal	AK = pcb short
131 = BCD	AL = pcb long
137 = BCD Complement	LS = solder pin
141 = BCD + Complement	ALU = pcb long downward
301 = Hexadecimal	



See Code Tables on Page J3



Pushwheel Switches, Mini, Rear Mount

The DPS8 Series is a compact, lower cost family of instrument grade, pushbutton code switches for numerical input applications. DPS8 models are similar in size to those of the SMCD Series and also feature a fast-snap-together assembly with conventional behind-the-panel mounting. A simple reliable bidirectional pushbutton mechanism allows rapid changes to either higher or lower numerical setting. Reliable performance in logic level circuits and long service life are provided by gold clad wiping contacts. A dust-sealed window protects the readout characters, which are larger than those of comparable thumbwheel switches. DPS8 switches have snap-action detent.

MATERIAL SPECIFICATIONS

PC BoardGlass epoxy type, FR4
 PC Terminal SpacingDSP811: .079", 131,137, 141: .100"
 Character Height/Color0.193" White on black background
 HousingNoryl-SE1, Black, matte finish
 Operating ForceApprox. 14 oz.

TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating0.4 VA @ 20 VDC or Peak AC
 Contact Circuit Resistance ...0.15 ohms max.
 Mechanical LifeMore than 10⁶ operations

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature(-20°C to +80°C)

MODULE ASSEMBLY METHOD

DPS bi-directional code switches may be easily assembled into groups of any number. Each switch, spacer or end-plate pair has appropriate snap-together assembly. No tools are required, little time consumed.

Groups of DPS8 switches, with end-plates mount into panel holes of the recommended size using four screws plus nuts and washers.

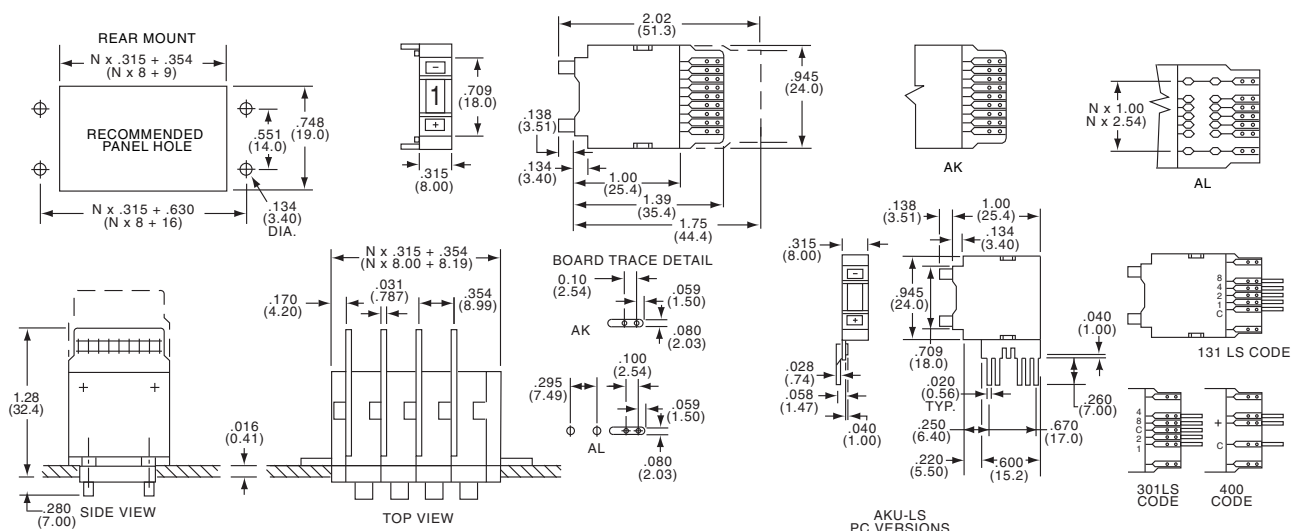
ACCESSORIES

Model	Description
DPS8A	Spacer .157" (4mm)
DPS8L	.315" spacer section
DPS8P	End mounting plates, decorative only (pair)
DPS8PW	End mounting plates, flanged with mounting holes (pair)
B9L	Connector, 9 contacts, solder lug terminals
B9LS	Connector, 9 contacts, pc terminals
B11LS	Connector, 11 contacts, PC terminals (for Code III Switch)
SP1.2	Limit stop pin for 10 position only.

DPS8 - 131 - AK

Codes	Connections
111 = Decimal	AK = pcb short
131 = BCD	AL = pcb long
137 = BCD Complement	LS = solder pin
141 = BCD + Complement	AKU = pcb short downward
301 = Hexadecimal	ALU = pcb long downward

See Code Tables on Page J3



DPS8 Series

Pushwheel Switches, Front Mount

DPS9 and DPS10 dual pushbutton code switches have identical heights but differ in width. These switches provide silent, reliable state-of-the-art bi-directional operation and can directly retrofit common thumbwheel switches. The readout characters are up to 60% larger than those of comparable thumbwheels. DPS9 models have the popular .315" per section width, and DPS10 types are .395" wide.

A simple reliable dual pushbutton mechanism permits rapid change to a higher or a lower numerical setting. Gold clad wiping contacts provide dependable low-level operation and extended life expectancy. Snap-together modular design enables fast assembly hardware. Wheel markings are protected by a dust-sealed window.

MATERIAL SPECIFICATIONS:

PC BoardGlass epoxy type, FR4
 PC Terminal Spacing100" Centers on integral multiples
 Character Height/ColorSee below
 HousingNoryl-SE1, Black, matte finish

TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 20 VDC or Peak AC
 Contact Circuit Resistance ...0.20 Ohm max.
 Mechanical LifeMore than 10⁶ operations
 Operating ForceApprox. 16 oz.

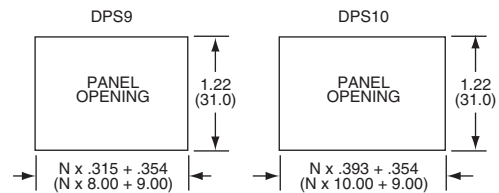
ENVIRONMENTAL SPECIFICATIONS

Operating Temperature(-20°C to +80°C)

ACCESSORIES

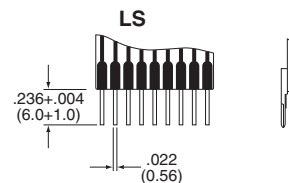
DPS9 Model	DPS10 Model	Description
DPS910A	DPS910A	Spacer, 0.1 inch
	DPS10	*Dummy switch (no electrical function)
DPS9L	DPS10L	Spacer, same width as switch
**DPS910P	**DPS910P	End mounting plate pair
B12L	B12L	Connector, 12 contacts, solder lugs
B12LS	B12LS	Connector, 12 contacts, PC terminals
SP1.5	SP1.5	Limit stop pin for 10 position switch

* Indicates switch mechanically operable, optionally available with wheel in fixed position.; ** Indicates sold in pairs only.

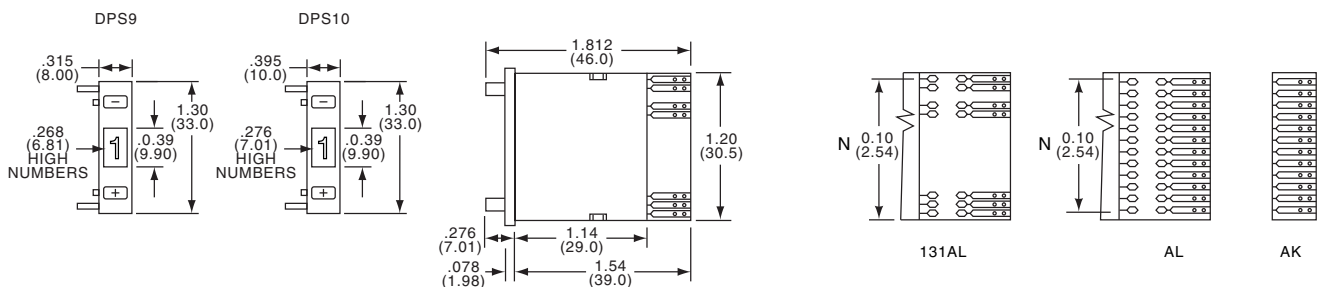


DPS9 - 131 - AK

Series/types	Codes	Connections
DPS9	111 = Decimal	AK = pcb short
DPS10	131 = BCD	AL = pcb long
	137 = BCD Complement	LS = solder pin
	301 = Hexadecimal	



See Code Tables on Page J3



Character height . . .	Model DPS9	10 digit .268	16 digit .169
	Model DPS10	10 digit .276	16 digit .169

Engineering Notes



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