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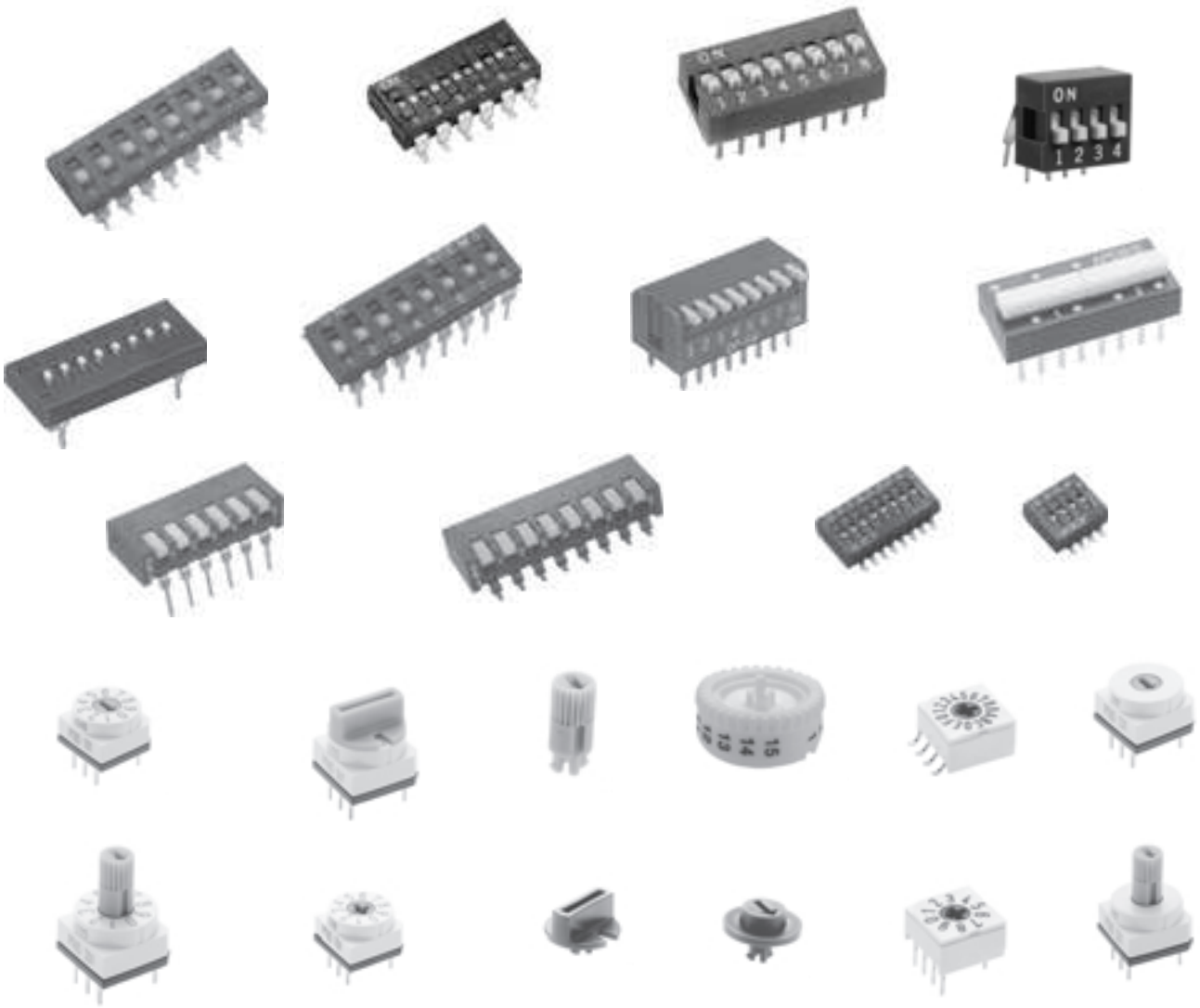
DIP & ROTARY DIP SWITCHES

DIP & ROTARY DIP SWITCH SELECTION GUIDE: This catalog contains an extensive variety of DIP & rotary DIP switches with many options. To facilitate easy selection of the desired switch for your application, this guide lists the various Series with a brief description.



G

SERIES	DESCRIPTION	PAGE(S)
IK	DIP switches, low profile, surface and through-hole mounting	G2-G3
DS, DA & DP	DIP switches, vertical, right angle and piano styles, through-hole mounting	G4-G6
DI & DM	DIP switches, low profile, surface and through-hole mounting	G7-G8
PI & PM	DIP switches, sealed piano style, low profile, surface and through-hole mounting	G9-G10
DHS	DIP switches, ultra-compact 1/2 pitch, surface mounting	G11
MPG	DIP switches, transfer style in 1, 2, 3 & 4 pole models, through-hole mounting	G12-G13
TDS	DIP switches, 3 state (+, 0, -), through-hole mounting	G14
P36 & P36S	Rotary DIP switches, low profile, surface and through-hole mounting	G15-G16
PT65	Rotary DIP switches, through-hole mounting with extensive options	G17-G20
P60A & P60AS	Rotary DIP switches, low profile, surface and through-hole mounting, 4+1 terminal layout	G21-G22
PT65	Rotary DIP switches, pulse generator, through-hole mounting	G23-G24

IK SERIES HIGH REL SPST SURFACE MOUNT DIP SWITCHES

FEATURES

Ultra-compact size with very low-profile.
Self-cleaning wiping contacts.
Tin plated terminals.
IR & vapor phase reflow solderable.
Washable.
Heavy gold plate.

GENERAL SPECIFICATIONS

ELECTRICALS

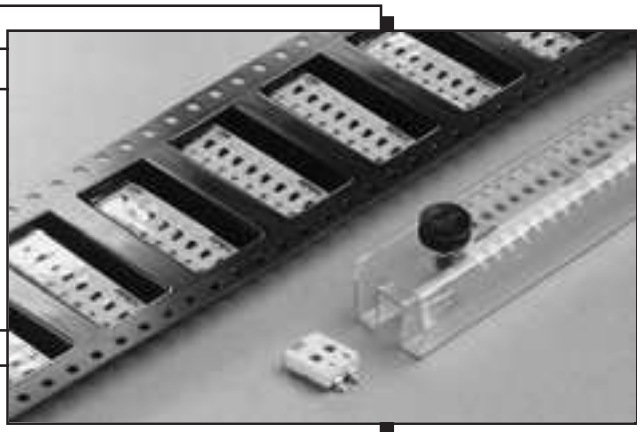
Electrical life	2000 cycles minimum
Contact rating, non-switching	100 mA at 48 VDC
Contact rating, switching	100 mA at 24 VDC
Initial contact resistance	30 mΩ maximum
	after 2000 cycles: 100 mΩ max.
Insulation resistance	1000 MΩ min. at 500 VDC
Dielectric strength	500 VAC minimum

MECHANICALS, THERMALS

Travel	.026" (0.67mm)
Operating temperature range	-40°C to +100°C
Storage temperature range	-40°C to +125°C

SOLDERING & CLEANING RECOMMENDATIONS

Hand soldering	330°C max. for 3 seconds max.(30 watt iron max.)
Reflow soldering	Set oven at 215°C max. for 90 seconds max.
Cleaning (with standard tape seal)	1-1-1 Trichloroethane, Freon TE, Isopropyl alcohol or aqueous cleaner for 2 minutes max. at 20°C



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

MATERIALS

Case	UL94-VO, thermoplastic, white
Actuators	UL94-VO, thermoplastic, black
Stationary contact	Gold over nickel over bronze
Moving contact	Gold over beryllium copper
Terminals	Tin plated over nickel barrier
Tape seal	Polyimide

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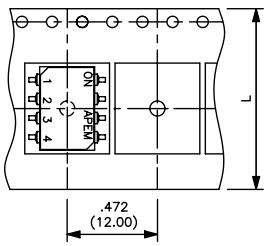
ANTISTATIC PACKAGING

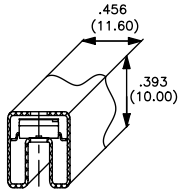
Standard packaging:
Reels of 1,000 units - Tape meeting IEC Standard - Publication 286-3 (EIA481A). Start leader: 15.7" (400mm) min. End leader: 6.3" (160mm) - see illustration.
IC tubes - see illustration

TAPE & REEL



Pos.	Tape dim. 'L'
2	.629 (16mm)
4	.944 (24mm)
6	.944 (24mm)
8	1.259 (32mm)

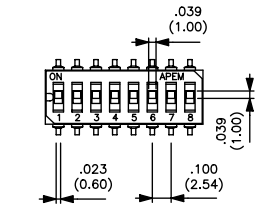
IC TUBES

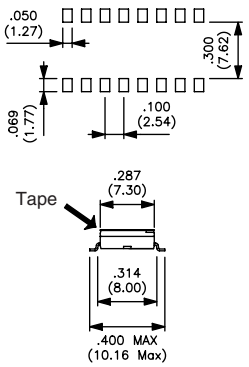


Pos.	Qty per tube
2	88
4	48
6	33
8	25

Tape & reel Model No.	IC tubes Model No.	No of pos.	Dimension 'A'
IKN0204000	IKN0203000	2	.236 (6mm)
IKN0404000	IKN0403000	4	.437 (11.1mm)
IKN0604000	IKN0603000	6	.637 (16.2mm)
IKN0804000	IKN0803000	8	.838 (21.3mm)

All switches are supplied in 'ON' position.
Dimensions shown in millimeters and inches (in parenthesis).





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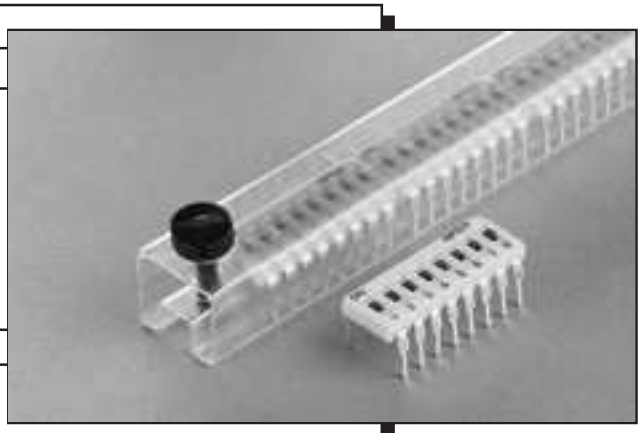
IK SERIES HIGH REL SPST THROUGH-HOLE DIP SWITCHES

FEATURES

Ultra-compact size with low-profile.
Self-cleaning wiping contacts.
Tin plated terminals.
Wave solderable.
Washable.
Heavy gold plate.



GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	2000 cycles minimum
Contact rating, non-switching	100 mA at 48 VDC
Contact rating, switching	100 mA at 24 VDC
Initial contact resistance	30 mΩ maximum
	after 2000 cycles: 100 mΩ max.
Insulation resistance	1000 MΩ min. at 500 VDC
Dielectric strength	500 VAC minimum

MECHANICALS, THERMALS

Travel	.026" (0.67mm)
Operating temperature range	-40°C to +100°C
Storage temperature range	-40°C to +125°C

SOLDERING & CLEANING RECOMMENDATIONS

Hand soldering	330°C max. for 3 seconds max.(30 watt iron max.)
Reflow soldering	Set oven at 215°C max. for 90 seconds max.
Cleaning (with standard tape seal)	1-1-1 Trichloroethane, Freon TE, Isopropyl alcohol or aqueous cleaner for 2 minutes max. at 20°C

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

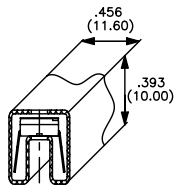
MATERIALS

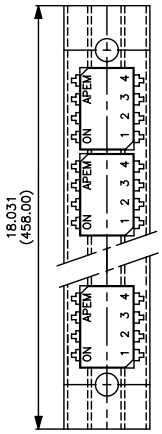
Case	UL94-VO, thermoplastic, white
Actuators	UL94-VO, thermoplastic, black
Stationary contact	Gold over nickel over bronze
Moving contact	Gold over beryllium copper
Terminals	Tin plated over nickel barrier
Tape seal	Polyimide

ANTISTATIC PACKAGING

Standard packaging:
IC tubes - see illustration

IC TUBES





Pos.	Qty per tube
2	88
4	48
6	33
8	25

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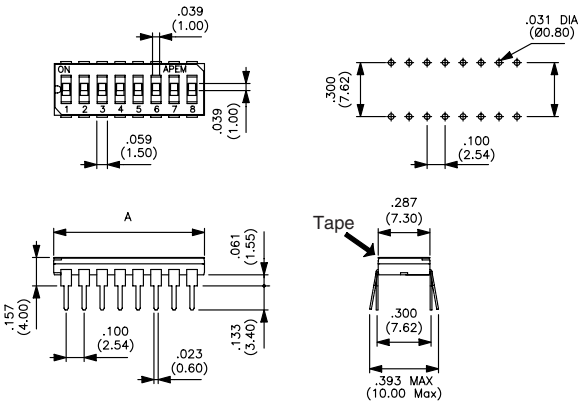
Model Number	No of pos.	Dimension 'A' Model No.
IKN0200000	2	.236 (6mm)
IKN0400000	4	.437 (11.1mm)
IKN0600000	6	.637 (16.2mm)
IKN0800000	8	.838 (21.3mm)

All switches are supplied in 'ON' position.
General dimensional tolerances are ± .012 (0.3mm)
Dimensions shown in millimeters and inches (in parenthesis).



DS, DA & DP SERIES
SPST STANDARD DIP SWITCHES

FEATURES
High reliability.
Self-cleaning contacts.
Multi- positions.
Process compatible with tape seal.
Dual in-line .100" x .300" term. spacing.

GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	2000 cycles min. per switch @ 24 VDC, 25 mA
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	25 mA at 24 VDC
Contact resistance at current 100 mA	50 mΩ max. initial - 100 mΩ max. after life test
Insulation resistance at 500 VDC	100 MΩ minimum
Dielectric strength	500 VAC for 1 minute
Capacitance	5 pf. max. between adjacent terminals

MECHANICALS, THERMALS

Mechanical life	2000 cycles min. per switch
Operating force	1000 grams max. (DP Series only - 400 grams max.)
Vibration	10-55 Hz.per MIL-STD-202F METHOD 201A
Shock	50 G (peak value) for 11 msec. per MIL-STD-202F, METHOD 213B
Operating temperature range	-40°C to 85°C

SOLDERING & CLEANING RECOMMENDATIONS*

Hand soldering	320°C max. for 2 seconds max.(30 watt iron max.)
Wave soldering	260°C max. for 5 seconds max.
Cleaning (with tape seal)	Spray wash from top side only.

* Note: keep switches in “OFF” position during soldering and cleaning for best results

MATERIALS

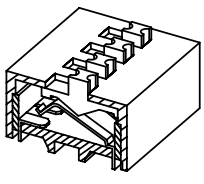
Base	UL94V-O, glass fiber filled PBT, black
Cover	UL94V-O, glass fiber filled PBT, red
Actuators	UL94V-O, glass fiber filled PBT, white
Contacts & Terms.	Gold over nickel plated phosphor bronze
Sealing	Epoxy
Tape seal	Polyester film

PACKAGING

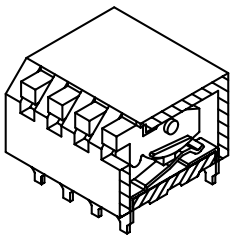
DIP switches are shipped in standard IC tubes with all actuators in the "OFF" position.

SWITCH CROSS SECTIONS

Normally open contact system

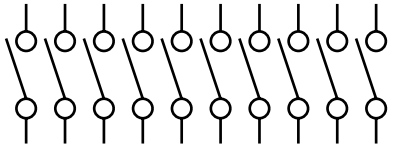


DS & DA



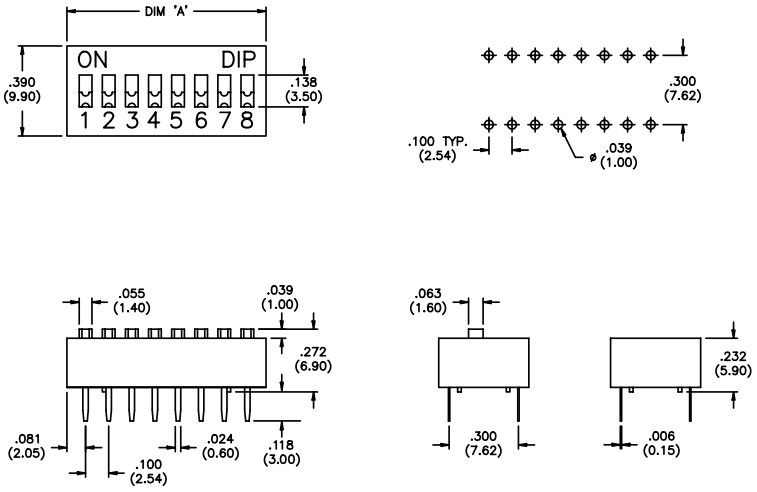
DP

SCHEMATIC (TYPICAL)



See tabulations on following pages for number of positions available (10 shown)

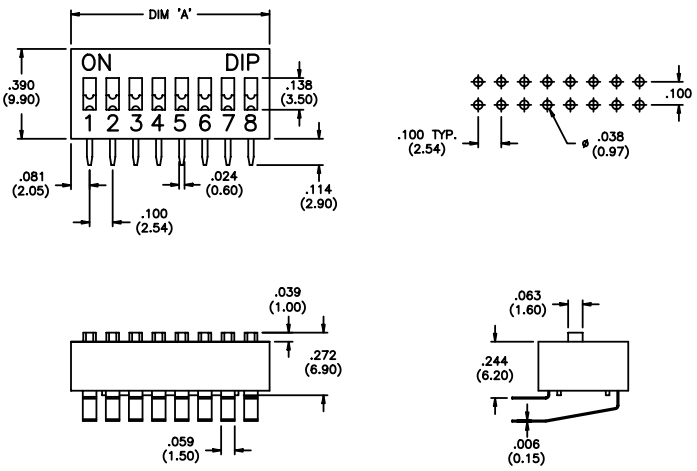
DS Series Slides



Actuator Style & Terminal Mat'l.	MODEL NO. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension +.008/-.000" (+0.2/-0.0mm)
Raised Actuator Gold Terms.	DS02	DS02T	2	.254 (6,45)
	DS03	DS03T	3	.354 (8,98)
	DS04	DS04T	4	.454 (11,52)
	DS05	DS05T	5	.554 (14,08)
	DS06	DS06T	6	.654 (16,60)
	DS07	DS07T	7	.754 (19,14)
	DS08	DS08T	8	.854 (21,68)
	DS09	DS09T	9	.954 (24,22)
	DS10	DS10T	10	1.054 (26,77)
	DS12	DS12T	12	1.254 (31,85)
Recessed Actuator Gold Terms.	n/a	DSR02T	2	.254 (6,45)
	n/a	DSR03T	3	.354 (8,98)
	n/a	DSR04T	4	.454 (11,52)
	n/a	DSR05T	5	.554 (14,08)
	n/a	DSR06T	6	.654 (16,60)
	n/a	DSR07T	7	.754 (19,14)
	n/a	DSR08T	8	.854 (21,68)
	n/a	DSR09T	9	.954 (24,22)
	n/a	DSR10T	10	1.054 (26,77)
	n/a	DSR12T	12	1.254 (31,85)

n/a = not available.

DA Series Right angle



Actuator Style	MODEL NO. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension +.008/-.000" (+0.2/-0.0mm)
Raised Actuator	DA04	DA04T	4	.454 (11,52)
	DA05	DA05T	5	.554 (14,08)
	DA06	DA06T	6	.654 (16,60)
	DA07	DA07T	7	.754 (19,14)
	DA08	DA08T	8	.854 (21,68)
	DA09	DA09T	9	.954 (24,22)
	DA10	DA10T	10	1.054 (26,77)
	DA12	DA12T	12	1.254 (31,85)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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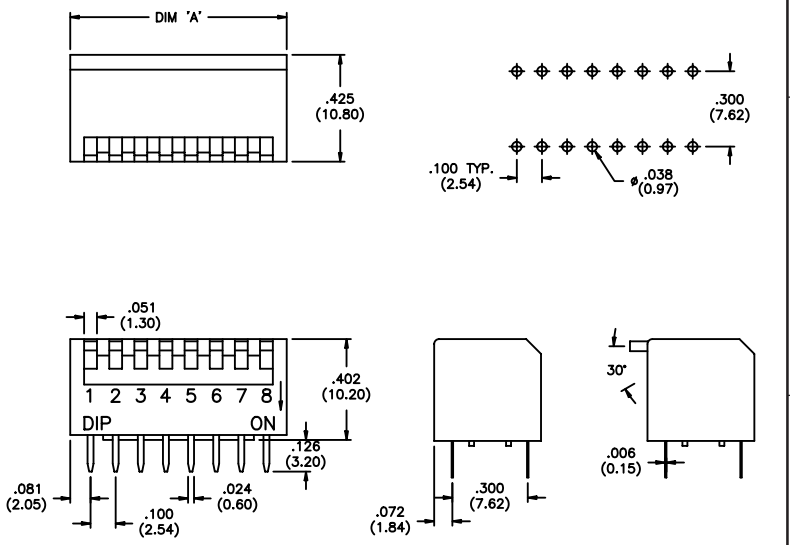
DP Series Piano



Actuator Style	MODEL NO. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension +.008/-.000" (+0.2/-0.0mm)	
Recessed Actuator	DP02	DP02T	2	.261	(6,64)
	DP03	DP03T	3	.361	(9,18)
	DP04	DP04T	4	.461	(11,72)
	DP05	DP05T	5	.561	(14,25)
	DP06	DP06T	6	.661	(16,80)
	DP07	DP07T	7	.761	(19,34)
	DP08	DP08T	8	.861	(21,88)
	DP09	DP09T	9	.961	(24,42)
	DP10	DP10T	10	1.061	(26,96)
	DP12	DP12T	12	1.261	(32,04)
Extended Actuator	DPL02	DPL02T	2	.261	(6,64)
	DPL03	DPL03T	3	.361	(9,18)
	DPL04	DPL04T	4	.461	(11,72)
	DPL05	DPL05T	5	.561	(14,25)
	DPL06	DPL06T	6	.661	(16,80)
	DPL07	DPL07T	7	.761	(19,34)
	DPL08	DPL08T	8	.8601	(21,88)
	DPL09	DPL09T	9	.961	(24,42)
	DPL10	DPL10T	10	1.061	(26,96)
	DPL12	DPL12T	12	1.261	(32,04)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Note: Push up for ON position is also available on special order - consult factory.

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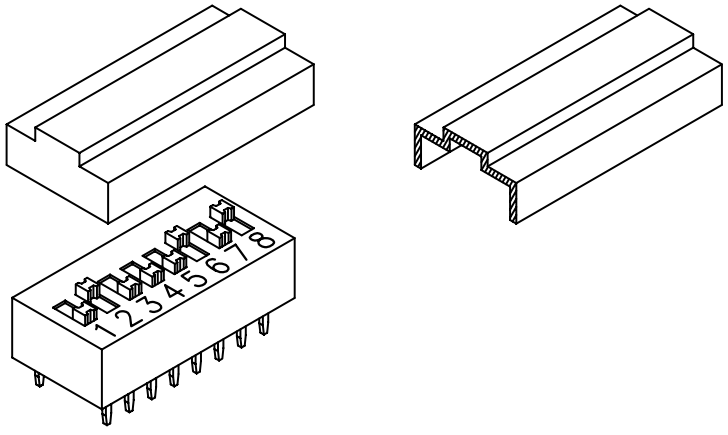

SPLASHPROOF COVER

Clear polyethylene snap-fit cover for models **DS08** and **DSR08**. Order part no. **C8**

DI & DM SERIES
SPST STANDARD DIP SWITCHES

FEATURES
High reliability.
Self-cleaning contacts.
Multi- positions.
Process compatible with tape seal.
Dual in-line .100" x .300" term. spacing.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	2000 cycles min. per switch @ 24 VDC, 25 mA
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	25 mA at 24 VDC
Contact resistance at current 100 mA	50 mΩ max. initial - 100 mΩ max. after life test
Insulation resistance at 100 VDC	100 MΩ minimum
Dielectric strength	500 VAC for 1 minute
Capacitance	5 pf. max. between adjacent terminals

MECHANICALS, THERMALS

Mechanical life	2000 cycles min. per switch
Operating force	1000 grams max.
Vibration	10-55 Hz.per MIL-STD-202F METHOD 201A
Shock	50 G (peak value) for 11 msec. per MIL-STD-202F, METHOD 213B
Operating temperature range	-40°C to 85°C

SOLDERING & CLEANING RECOMMENDATIONS*

Hand soldering	320°C max. for 2 seconds max.(30 watt iron max.)
Wave soldering	260°C max. for 5 seconds max.
Cleaning (with tape seal)	Spray wash from top side only.

* Note: keep switches in “OFF” position during soldering and cleaning for best results

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MATERIALS

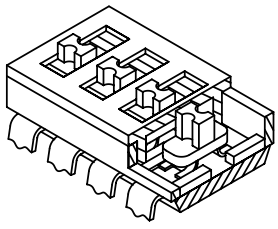
Base & Cover	DI: UL94V-O, glass fiber filled PBT, black DM: UL94V-O, glass fiber filled PPS, black
Actuators	UL94V-O, Nylon, white
Contacts	Gold over nickel plated copper alloy
Terminals	DI: Tin/lead plated brass. DM: Gold over nickel plated copper alloy.
Term. Sealing	Molded-in
Tape seal	Kapton

PACKAGING

DIP switches are shipped in standard IC tubes with all actuators in the "OFF" position.
Tape & reel packaging per EIA available for DMR models (see next page).

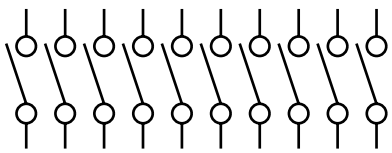
SWITCH CROSS SECTIONS

Double contact system



DI & DM

SCHEMATIC (TYPICAL)

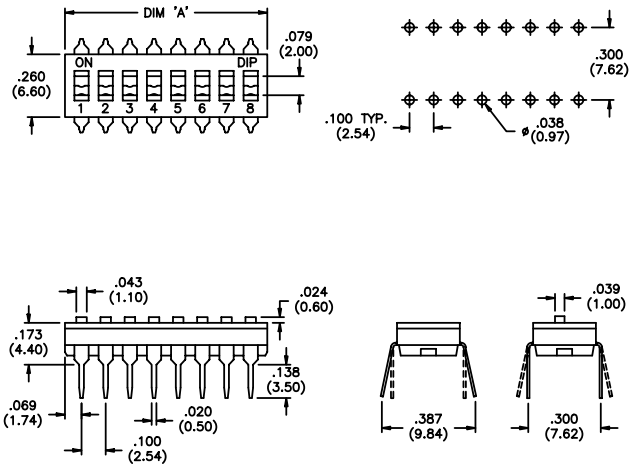


See tabulations on following pages for number of positions available (10 shown)

DI Series Machine Insertable ⋆

Tin/lead plated brass terminals
Gold plated terminals available on request

Actuator	Squared terminals: MODEL NO. with no tape seal	Squared terminals: MODEL NO. with tape seal	Spread terminals: MODEL NO. with no tape seal	Spread terminals: MODEL NO. with tape seal	No. of Pos.	'A' Dim. +.008/-.000" (+0.2/-0.0mm)
Raised	DI01H	n/a	DI01S	n/a	1	.137 (3,48)
	DI02H	n/a	DI02S	n/a	2	.237 (6,02)
	DI04H	n/a	DI04S	n/a	4	.437 (11.10)
	DI06H	n/a	DI06S	n/a	6	.637 (16,18)
	DI08H	n/a	DI08S	n/a	8	.837 (21,26)
	DI10H	n/a	DI10S	n/a	10	1.037 (26,34)
Recessed	DIR01H	n/a	DIR01S	DIR01ST	1	.137 (3,48)
	DIR02H	DIR02HT	DIR02S	DIR02ST	2	.237 (6,02)
	DIR04H	DIR04HT	DIR04S	DIR04ST	4	.437 (11,10)
	DIR06H	DIR06HT	DIR06S	DIR06ST	6	.637 (16,18)
	DIR08H	DIR08HT	DIR08S	DIR08ST	8	.837 (21,26)
	DIR10H	DIR10HT	DIR10S	DIR10ST	10	1.037 (26,34)



⋆ Auto-insertable using equipment from Amistar, Dynapert, Panasert, Northeastern Tool, Universal and others.

n/a = not available.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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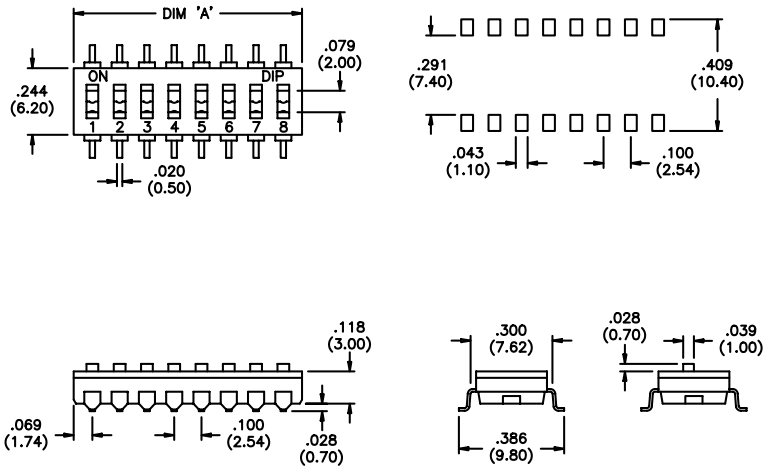
DM Series Surface Mount ⋆

Actuator Style	MODEL NO. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension +.008/-.000" (+0.2/-0.0mm)
Raised Actuator	DM01	n/a	1	.137 (3,48)
	DM02	n/a	2	.237 (6,02)
	DM03	n/a	3	.337 (8,56)
	DM04	n/a	4	.437 (11,10)
	DM05	n/a	5	.537 (13,64)
	DM06	n/a	6	.637 (16,18)
	DM07	n/a	7	.737 (18,72)
	DM08	n/a	8	.837 (21,26)
	DM09	n/a	9	.937 (23,80)
	DM10	n/a	10	1.037 (26,34)
	DM12	n/a	12	1.237 (31.42)
Recessed Actuator	DMR01	n/a	1	.137 (3,48)
	DMR02	DMR02T	2	.237 (6,02)
	DMR03	DMR03T	3	.337 (8,56)
	DMR04	DMR04T	4	.437 (11,10)
	DMR05	DMR05T	5	.537 (13,64)
	DMR06	DMR06T	6	.637 (16,18)
	DMR07	DMR07T	7	.737 (18,72)
	DMR08	DMR08T	8	.837 (21,26)
	DMR09	DMR09T	9	.937 (23,80)
	DMR10	DMR10T	10	1.037 (26,34)
	DMR12	DMR12T	12	1.237 (31.42)



For tape & reel packaging on DMR models only, add 'TR' to model number - example: DMR08TTR. Note- tape & reel packaging is available only with tape seal models. 900 switches per reel.

PI & PM SERIES SPST
SEALED PIANO DIP SWITCHES

FEATURES
Built-in seal for process compatibility.
High reliability.
Splayed thru-hole or SMT terminals.
2, 4, 6, 8 & 10 positions.
Piano style actuators.
Dual in-line .100" x .300" term. spacing.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	200 cycles min. per switch @ 24 VDC, 25 mA
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	25 mA at 24 VDC
Contact resistance at current 100 mA	50 mΩ max. initial - 100 mΩ max. after life test
Insulation resistance at 500 VDC	100 MΩ minimum
Dielectric strength	300 VAC for 1 minute
Capacitance	5 pf. max. between adjacent terminals

MECHANICALS, THERMALS

Mechanical life	500 cycles min. per switch
Operating force	800 grams max.
Vibration	10-55 Hz.per MIL-STD-202F METHOD 201A
Shock	50 G (peak value) for 11 msec. per MIL-STD-202F, METHOD 213B
Operating temperature range	-40°C to 85°C

SOLDERING & CLEANING RECOMMENDATIONS*

Hand soldering	320°C max. for 2 seconds max.(30 watt iron max.)
Wave soldering	260°C max. for 5 seconds max. Note PM Series is vapor phase or IR reflow solderable.
Force rinse, high agitation or triple bath cleaning method	Sealed construction permits washing with freons, alcohol, water and steam. When vapor methods are used, do not subject switch to solvents above 51°C.

* Note: keep switches in “ON” position during soldering and cleaning for best results

MATERIALS

Base & Cover	UL94V-O, high temperature thermoplastic, color black
Actuators	UL94V-O, high temperature thermoplastic, color `.01*white
Contacts	Gold over nickel plated copper alloy or brass
Terminals	Tin/lead (90/10 solder) plated copper alloy or brass
Term. Sealing	Molded-in
Tape seal	High temperature modulus Teflon internal seal

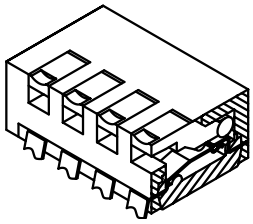
PI and PM models feature a uniquely designed internal seal!

PACKAGING

DIP switches are shipped in standard IC tubes with all actuators in the "ON" position.
Tape & reel packaging per EIA available for PM models - consult factory.

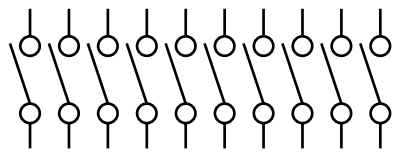
SWITCH CROSS SECTION

Double contact system



PI & PM

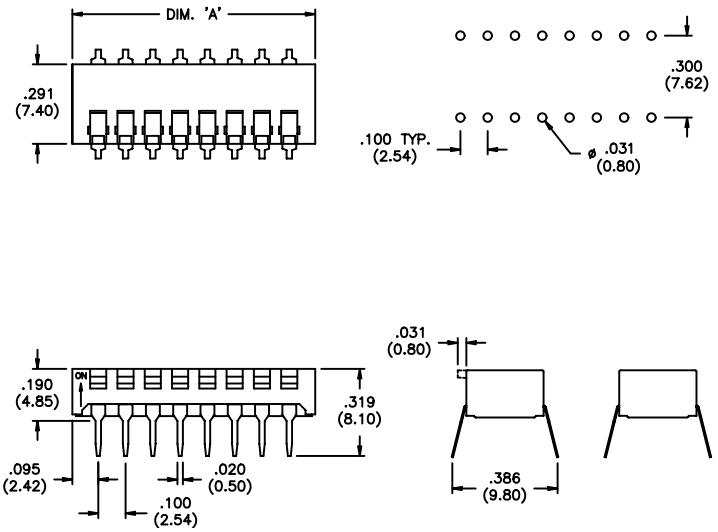
SCHEMATIC (TYPICAL)



See tabulations on following page for number of positions available (10 shown)

G

PI Series Piano ⋆



Actuator Style	MODEL N0. (internally sealed)	No. of Pos.	'A' Dimension ±.012 (0,30mm)	
Flush	PI02090	2	.290	(7,37)
	PI04090	4	.490	(12,45)
	PI06090	6	.690	(17,53)
	PI08090	8	.890	(22,61)
	PI10090	10	1.090	(27,69)
Extended	PI02190	2	.290	(7,37)
	PI04190	4	.490	(12,45)
	PI06190	6	.690	(17,53)
	PI08190	8	.890	(22,61)
	PI10190	10	1.090	(27,69)

⋆ Auto-insertable using equipment from Amistar, Dynapert, Panasert, Northeastern Tool, Universal and others.

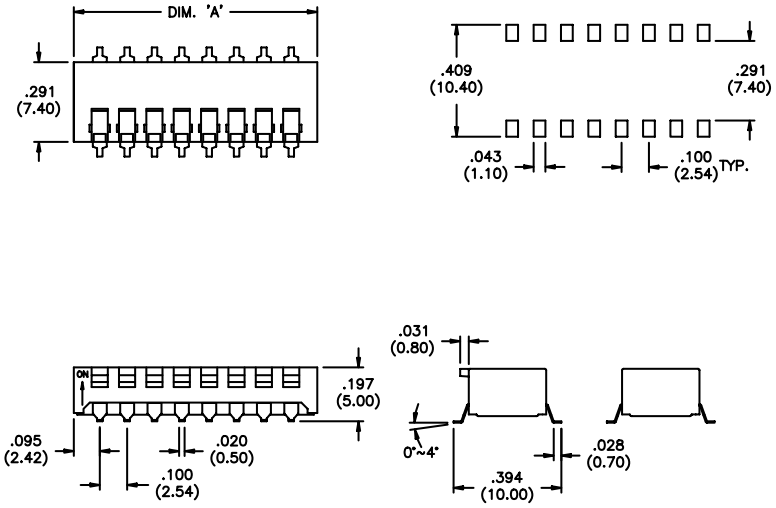
PI and PM models listed feature a uniquely designed internal seal!

Non-sealed versions are also available. To order the non-sealed model, replace the '**0**' at the end of the model number with '**1**'.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

G

PM Series Piano ⋆

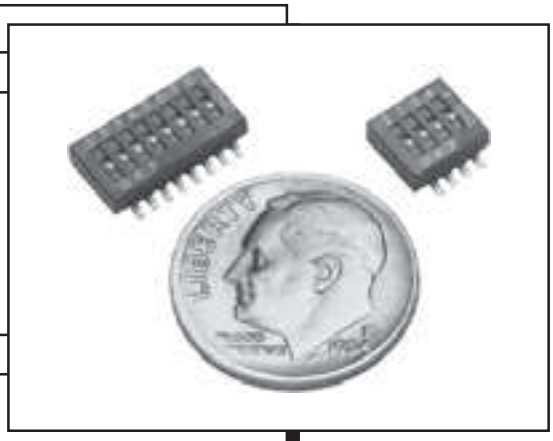


Actuator Style	MODEL N0. (internally sealed)	No. of Pos.	'A' Dimension ±.012 (0,30mm)	
Flush	PM02090	2	.290	(7,37)
	PM04090	4	.490	(12,45)
	PM06090	6	.690	(17,53)
	PM08090	8	.890	(22,61)
	PM10090	10	1.090	(27,69)
Extended	PM02190	2	.290	(7,37)
	PM04190	4	.490	(12,45)
	PM06190	6	.690	(17,53)
	PM08190	8	.890	(22,61)
	PM10190	10	1.090	(27,69)

DHS SERIES 1/2 PITCH SPST SURFACE MOUNT DIP SWITCHES

FEATURES

Ultra-compact low-profile size.
.050" (1.27mm) terminal spacing.
Self-cleaning twin point contacts.
Auto-insertable and reflow solderable.
Process compatible with std'd. tape seal.



GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	1000 cycles minimum
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	100 mA at 6 VDC
Contact resistance	100 mΩ maximum
Insulation resistance	100 MΩ minimum
Dielectric strength	250 VDC for 1 min. between adjacent or opposite terminals
Capacitance	5 pf. max. between adjacent or opposite terminals

MECHANICALS, THERMALS

Operating force	400 grams maximum
Vibration	10-55 Hz. per MIL-STD-202F, METHOD 201A
Shock	50 g (peak value) for 11 msec. per MIL-STD-202F, METHOD 213B
Operating temperature range	-40°C to +80°C

SOLDERING & CLEANING RECOMMENDATIONS

Hand soldering	330°C max. for 3 seconds max.(30 watt iron max.)
Reflow soldering	Set oven at 215°C max. for 90 seconds max.
Cleaning (with standard tape seal in place)	1-1-1 Trichloroethane, Freon TE, Isopropyl alcohol or aqueous cleaner for 2 minutes max. at 20°C

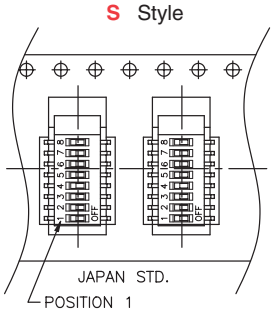
MATERIALS

Base	UL94V-O, glass fiber filled PPS, black
Cover	UL94V-O, glass fiber filled PPS, black
Actuators	UL94V-O, Polyamide, yellow
Contacts	Gold plated beryllium copper
Terminals	Gold plated copper alloy
Terminal seal	Epoxy
Tape seal	Polyimide

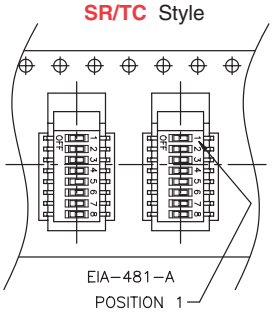
PACKAGING

Supplied in tape & reel packaging.
Reel & tape meets the requirements of EIA-481-A.

S Style



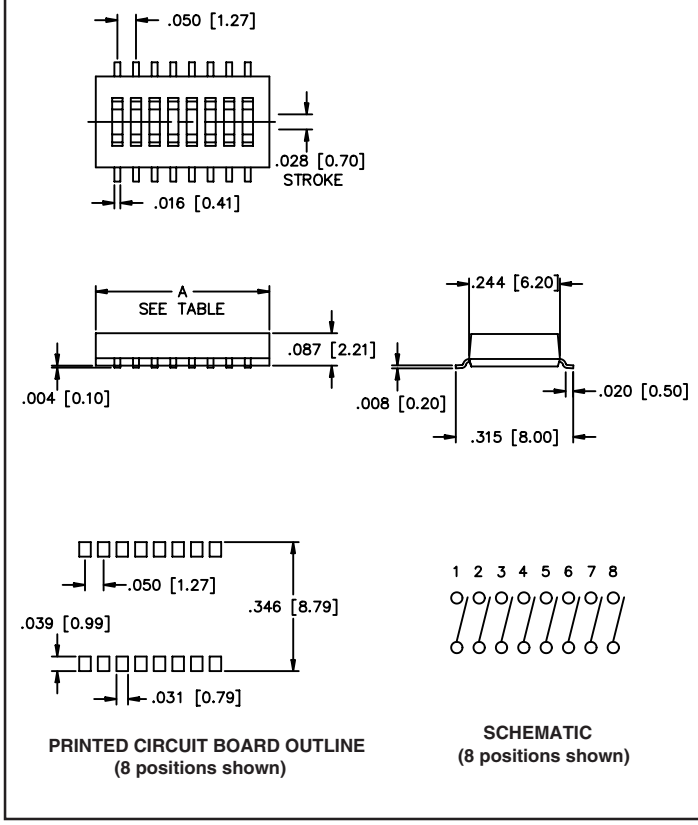
SR/TC Style



MODEL NUMBER	NO. 0F POS.	A DIMENSION	
		IN(± .012)	MM(± 0.30)
DHS4S	4	.268	6.81
DHS6S	6	.368	9.35
DHS8S	8	.468	11.89
DHS10S	10	.568	14.43

Note: S at end of model no. indicates **S** style packaging. Substitute SR/TC for S for **SR/TC** packaging.

MECHANICAL OUTLINE



PRINTED CIRCUIT BOARD OUTLINE
(8 positions shown)

SCHEMATIC
(8 positions shown)

G

MDG & MPG SERIES
TRANSFER DIP SWITCHES
SPDT & DPDT MODELS

FEATURES
Gold plated contacts.
Self-cleaning contacts.
UL94V-O materials used throughout.
Process compatible with tape seal.
Dual in-line .100" x .300" term. spacing.

GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	2000 cycles minimum
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	25 mA at 24 VDC
Contact resistance	50 mΩ max. initial - 100 mΩ max. after life test
Insulation resistance at 100 VDC	1000 MΩ minimum
Dielectric strength	500 VDC for 1 minute
Capacitance	5 pf. max. between adjacent terminals

MECHANICALS, THERMALS

Mechanical life	3000 cycles minimum
Operating force	MDG; 800 grmas max. per pole MPG; 400 grams max. per pole.
Vibration	Per MIL-STD-202, METHOD 204B
Humidity	95% relative humidity, 40°C for 96 hours
Temperature range	Operating: -25°C to 70°C Storage: -40°C to 85°C

SOLDERING & CLEANING RECOMMENDATIONS

Hand soldering	320°C max. for 2 seconds max.(30 watt iron max.)
Wave soldering	230°C max. for 3 seconds max.
Cleaning (with tape seal)	Spray wash from top side only

G

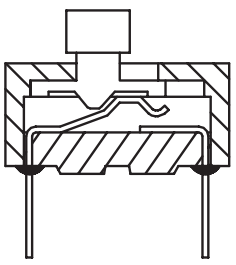
MATERIALS

Cover	UL94V-O, Polyamide
Actuators	UL94V-O, Polyamide
Contacts & Terminals	Gold over nickel plate over brass
Sealing	Epoxy
Tape seal	Polyester film

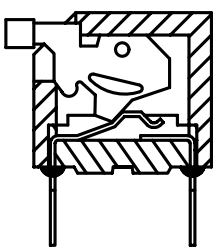
PACKAGING

DIP switches are shipped in standard IC tubes with all actuators in the “OFF” position

SWITCH CROSS SECTION



MDG



MPG

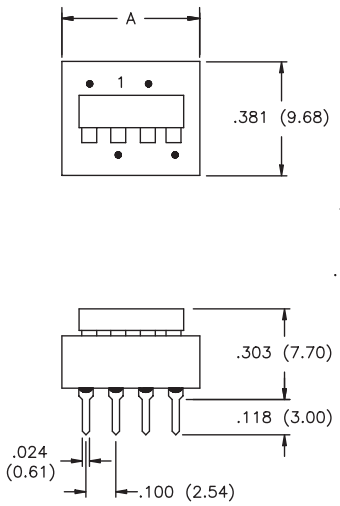
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

MDG Series
Slides
DPDT

MDG602S

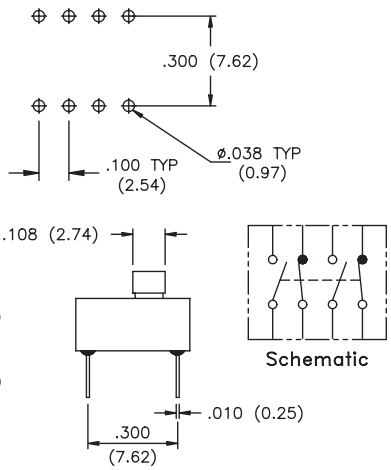
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Mechanical Outline



Printed circuit board layout

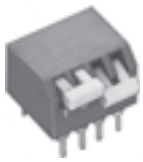
Hole size and layout tolerance ±.005 (0.12) non-cumulative



Schematic

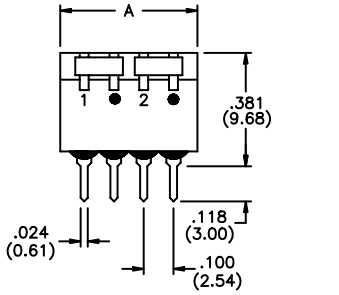
Actuator Style & Contact Material	MODEL N0. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension ±.012 (0,30mm)
Std'd Act.	MDG601S	MDG601ST	1	.461 (11,7)
Gold Cont.	MDG602S	MDG602ST	2	.854 (21,7)

MPG Series
Piano
SPDT



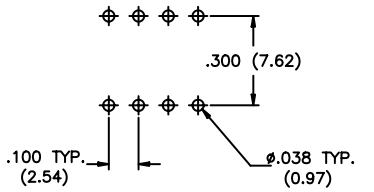
MPG302B

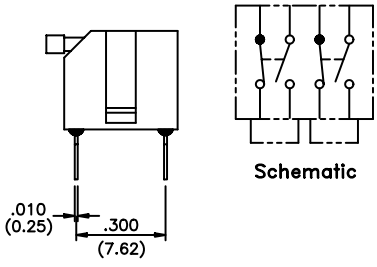
Mechanical Outline



Printed circuit board layout

Hole size and layout tolerance ±.002 (0.05) non-cumulative





Schematic

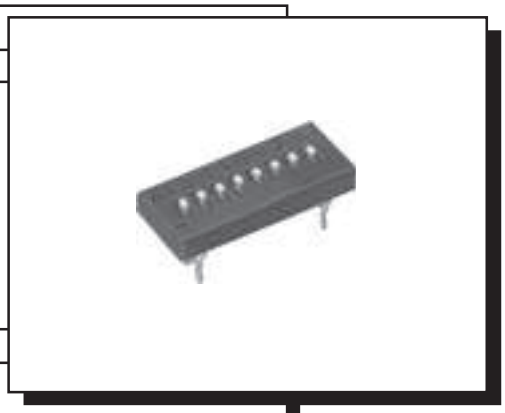
Actuator Style & Contact Material	MODEL N0. with no tape seal	MODEL NO. with tape seal	No. of Pos.	'A' Dimension ±.012 (0,30mm)
Piano	MPG301B	MPG301BT	1	.264 (6,7)
	MPG302B	MPG302BT	2	.461 (11,7)
	MPG303B	MPG303BT	3	.657 (16,7)
	MPG304B	MPG304BT	4	.854 (21,7)
Gold Contacts	MPG305B	MPG305BT	5	1.050 (26,7)
	MPG306B	MPG306BT	6	1.250 (31,8)

G

TDS SERIES SP 3 POSITION 3 STATE (+,0,-) DIP SWITCHES

FEATURES

3 code functions per position (n).
Self-cleaning twin point contacts.
UL94V-O materials used throughout.
Process compatible.
Crimped terminals for positive p.c. board retention during installation.



GENERAL SPECIFICATIONS

ELECTRICALS

Electrical life	2000 operations minimum per switch
Contact rating, non-switching	100 mA at 50 VDC
Contact rating, switching	25 mA at 24 VDC
Contact resistance	Initial:50 mΩ max. After 2000 operations: 100 mΩ max.
Insulation resistance	100 MΩ minimum between adjacent terms.at 500 VDC
Dielectric strength	500 VDC for 1 minute
Capacitance	5 pf. maximum

MECHANICALS, THERMALS

Mechanical life	2000 operations minimum per switch
Operating force	1000 grams maximum
Vibration	10-55-10 Hz./1 min. (3 planes) per MIL-STD-202F, METHOD 201A
Shock	50 G (peak value) for 11 msec. per MIL-STD-202F, METHOD 213B
Temperature range	Operating and storage: -40°C to +85°C

SOLDERING RECOMMENDATIONS*

Hand soldering	320°C max. for 2 seconds max.(30 watt iron max.)
Wave soldering	260°C max. for 5 seconds

*For best results, keep actuator in 'O' position during soldering.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

G

MATERIALS

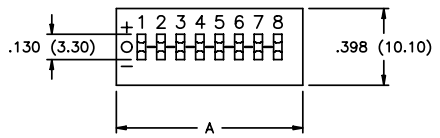
Base	UL94V-O, glass fiber filled PBT, black
Cover	UL94V-O, glass fiber filled PBT, black
Actuators	UL94V-O, glass fiber filled Nylon, white
Contacts	Gold over nickel over brass
Terminals	90/10 Solder plate over brass

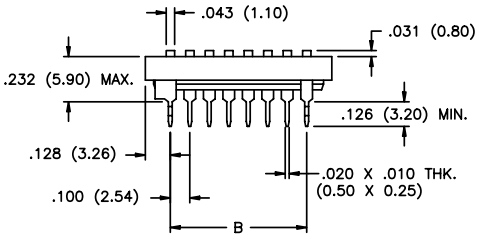
PACKAGING

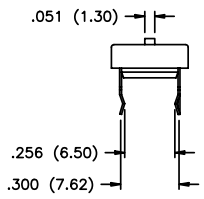
Normally supplied in standard IC tubes with all actuators in the 'O' position

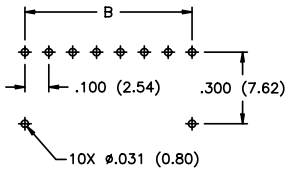
MODEL NUMBER	NO. 0F POS. (n)	A DIM. (MAX) INCHES	A DIM. (MAX) MM	B DIMENSION INCHES	B DIMENSION MM
TDS04	4	.557	14.14	.300	7.62
TDS08	8	.957	24.3	.700	17.78
TDS09	9	1.057	26.84	.800	20.32
TDS10	10	1.157	29.39	.900	22.86

MECHANICAL OUTLINE

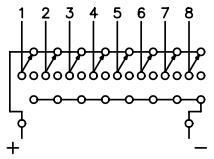








PRINTED CIRCUIT BOARD OUTLINE
(8 POSITIONS SHOWN)



SCHEMATIC
(8 POSITIONS SHOWN)

P36 & P36S SERIES ROTARY DIP SWITCHES

FEATURES

- **3 + 3 terminal layout.**
- **Completely sealed for process compatibility.**
- **Ultra-compact size with 10 or 16 positions.**
- **Precision designed detent action.**
- **Thru-hole (P36 Series) & SMT (P36S Series) models.**
- **High reliability & long life.**
- **Clockwise or counterclockwise settable.**
- **Solder coated terminals.**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

GENERAL SPECIFICATIONS

ELECTRICALS

Operating voltage	24 VDC max.
Contact rating, static	400 mA max.
Contact rating, dynamic	100 mA max.
Test voltage	250V 50Hz/1 min.
Initial contact resistance	< 100 milliohms
Insulation resistance	> 100 megohms

MECHANICALS, THERMALS

Torque	0.98 inch-oz. min. (0.7 Ncm min.)
Expected life	10,000 switching operations
Contact force	15 grams min.
Operating temperature range	-30°C to 90°C

SOLDERING RECOMMENDATIONS

Hand soldering	340°C max. for 2 seconds max. (40 watt iron max.)
Wave soldering	260°C max. for 10 seconds max.
Reflow soldering (SMT)	215°C max. for 40 seconds max.
Solvent washing	Freons or alcohol. (Do not use chlorinated solvents)
Aqueous cleaning	Deionized water preferred

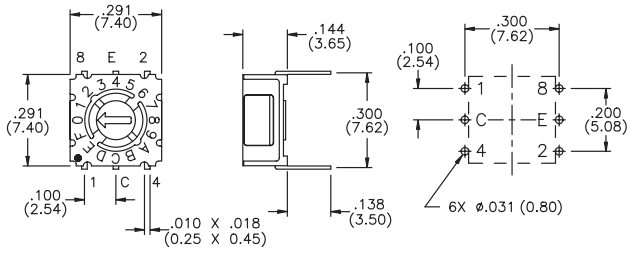
MATERIALS

Base	UL94V-O, high temperature thermoplastic
Cover	Stainless steel
Actuator	UL94V-O, high temperature thermoplastic
Contacts	Gold over nickel plated stainless steel
Terminals	Solder coated brass
Terminal sealing	Molded-in
Actuator seal	'O'-ring

G

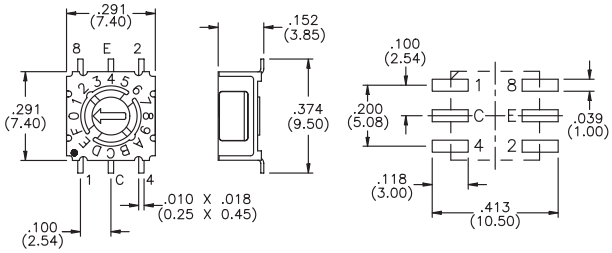
Thru-hole and SMT Printed Circuit Models		Model No. Thru-hole Mounting (see fig. 1)	Model No. Surface Mounting (see fig. 2)
Code (see truth tables pg. G16)	**Positions**		
Binary Coded Decimal	10	P36101	P36S101
Complement of BCD	10	P36102	P36S102
Binary Coded Hexadecimal	16	P36103	P36S103
Complement of BCH	16	P36106	P36S106

Figure 1



Mechanical outline P.C. hole pattern

Figure 2



Mechanical outline P.C. pad layout

P36 & P36S SERIES

STANDARD OPTIONS BY SERIES:

Series		P36	P36S
Actuators			
1	Arrow shaped slot	X	X
3	Spindle	X	X
8	Slotted spindle	X	X
Codes			
01	BCD	X	X
02	BCD complement	X	X
03	Hexadecimal	X	X
06	Hexadecimal Comp.	X	X
Terminals			
None	Straight	X	
V	Crimped	X	
L254	Rt. angle 2.54 (.100")	X	
None	SMT		X

ORDER GUIDE:

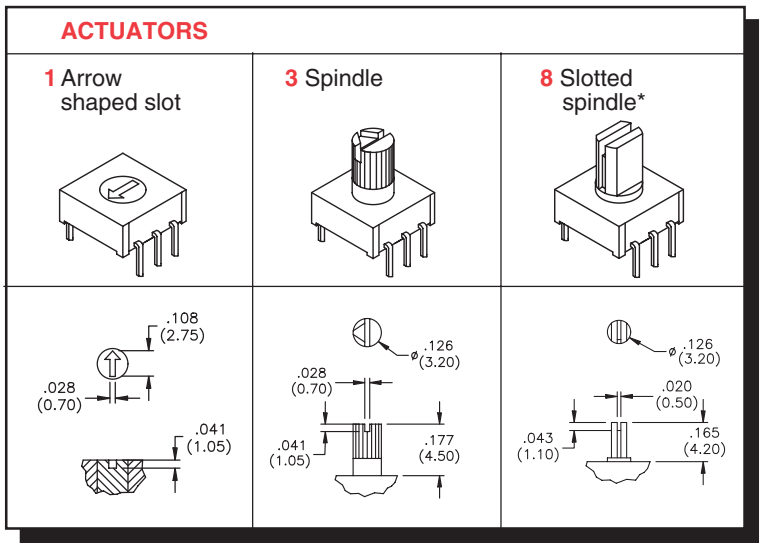
Make selections from the above table in sequence to specify a complete model number.

Note that 'None' indicates that no option suffix is required.

Example; **P36101V**

Series — Actuator — Terminals — Code

ACTUATORS



* Slotted spindle actuator is color coded to truth table code selection as follows: BCD - red, BCD complement - Orange, Hexadecimal - gray, Hexadecimal complement - white.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Tape and reel packaging available for SMT models - consult factory.

CODES

NOTE: For each dial position in tables, Common terminals (C) are connected to terminal number(s) indicated - i.e. - none or combinations of 1, 2, 4 or 8. Each model in this series has 2 Common terminals.

BINARY CODED DECIMAL (01)
10 Positions

Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●

COMP. OF BINARY CODED DECIMAL (02)
10 Positions

Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	

BINARY CODED HEXADECIMAL (03)
16 Positions

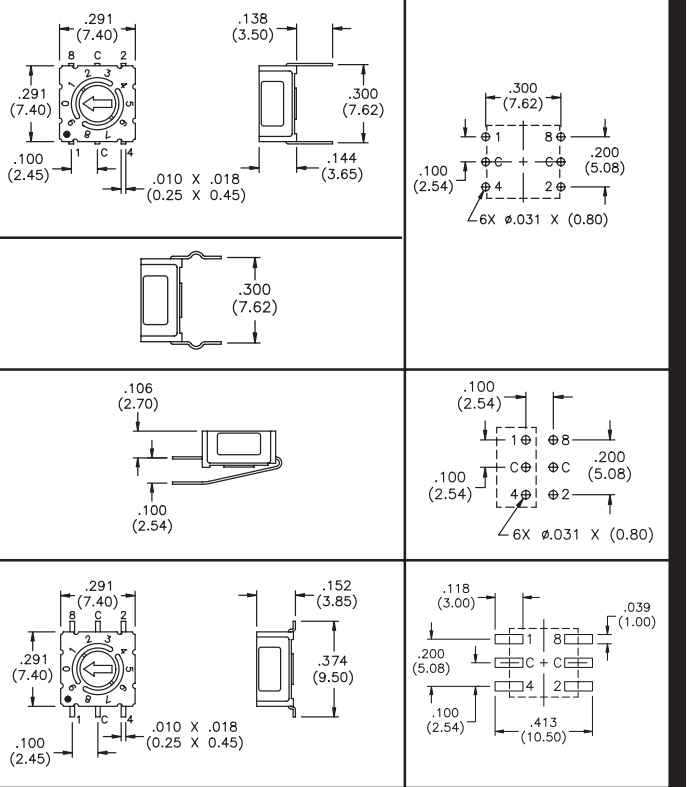
Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
A		●		●
B	●	●		●
C			●	●
D	●		●	●
E		●	●	●
F	●	●	●	●

COMP. OF BINARY CODED HEXADEC. (06)
16 Positions

Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	
A	●		●	
B			●	
C	●	●		
D		●		
E	●			
F				

MECHANICAL OUTLINES

Terminal option suffix*: | **Mtg. hole pattern:**



* 'None' indicates no option suffix is required.

APEM, PO BOX 8288, HAVERHILL, MA USA 01835-0788 TOLL FREE: (877) 246-7890 FAX: (781) 245-4531 E-mail: info@apem.com

PT65 SERIES
ROTARY DIP SWITCHES

FEATURES

- **3 + 3 terminal layout.**
- **Completely sealed for process compatibility.**
- **4, 6, 8, 10 or 16 positions w/extensive codings.**
- **Precision designed detent action.**
- **Compact size.**
- **High reliability & long life.**
- **Clockwise or counterclockwise settable.**
- **Solder coated terminals.**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

MATERIALS

Base	UL94V-O, high temperature thermoplastic
Cover	UL94V-O, high temperature thermoplastic
Actuator	POM
Contacts	Gold over nickel plated bronze
Terminals	Gold over nickel plated bronze
Terminal sealing	Molded-in
Actuator seal	'O'-ring

GENERAL SPECIFICATIONS

ELECTRICALS

Operating voltage	24 VDC max.
Contact rating, static	400 mA max.
Contact rating, dynamic	150 mA max.
Switching capacity	1.5 VA max.
Initial contact resistance	< 80 milliohms
Insulation resistance	> 100 megohms

MECHANICALS, THERMALS

Torque	7.0 inch-oz. min. (0.7 Ncm min.)
Expected life	10,000 switching operations
Contact force	15 grams min.
Operating temperature range	-20°C to 70°C

SOLDERING RECOMMENDATIONS

Hand soldering	340°C max. for 2 seconds max. (40 watt iron max.)
Wave soldering	260°C max. for 10 seconds max.
Solvent washing	Freons or alcohol. (Do not use chlorinated solvents)
Aqueous cleaning	Deionized water preferred

CODES

NOTE: For each dial position in tables, Common terminal(s) (C) are connected to terminal number(s) indicated - i.e. - none or combinations of 1, 2, 3, 4 or 8. Each model in this series has 2 Common terminals except codes 11 and 24 which have one.

CODE 11 ON/OFF
4 Positions

Dial No.	1
0	
1	●
0	
1	●

CODE 12 BCD
4 Positions

Dial No.	1	2
0		
1	●	
2		●
3	●	●

CODE 21 DECIMAL
4 Positions

Dial No.	1	2	3	4
1	●			
2		●		
3			●	
0				●

CODES 24 & 25 BCD
6 Positions

Dial No.	1	2	4
0			
1	●		
2		●	
3	●	●	
4			●
5	●		●

CODE 05 GRAY CODE
16 Positions

Dial No.	1	2	4	8
0				
1	●			
2	●	●		
3		●		
4		●	●	
5	●	●	●	
6	●		●	
7			●	
8			●	●
9	●		●	●
A	●	●	●	●
B		●	●	●
C		●		●
D	●	●		●
E	●			●
F				●

CODE 26 OCTAL
8 Positions

Dial No.	1	2	4
0			
1	●		
2		●	
3	●	●	
4			●
5	●		●
6		●	●
7	●	●	●

CODE 27 OCTAL COMPLEMENT
8 Positions

Dial No.	$\overline{1}$	$\overline{2}$	$\overline{4}$	$\overline{8}$
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●

BINARY CODED DECIMAL (01)
10 Positions

Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●

COMP. OF BINARY CODED DECIMAL (02)
10 Positions

Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	

BINARY CODED HEXADECIMAL (03)
16 Positions

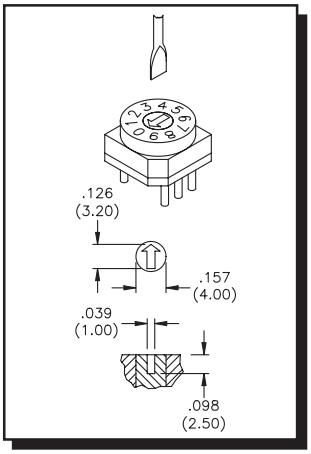
Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
A		●		●
B	●	●		●
C			●	●
D	●		●	●
E		●	●	●
F	●	●	●	●

COMP. OF BINARY CODED HEXADEC. (06)
16 Positions

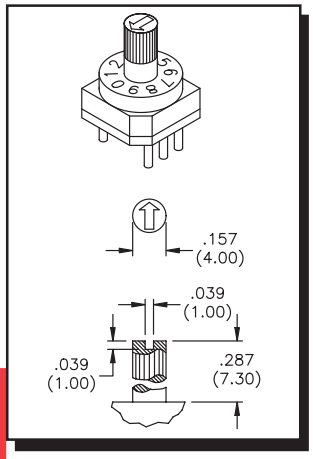
Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	
A	●			●
B			●	●
C	●	●		
D		●		
E	●			
F				

G

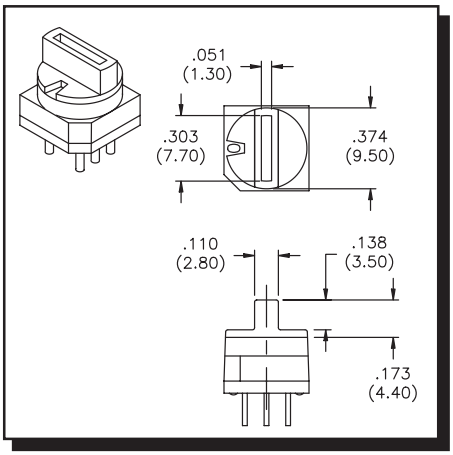
PT65 SERIES



Arrow shaped slot Actuator Models		Complete Model No. by Terminal Style		
		Straight	Right Angle	
			Pitch	
Code (see truth tables)	Positions		.100" (2,54)	.200"(5,08)
Binary Coded Decimal	10	PT65101	PT65101L254	PT65101L508
Comp. of Binary Coded Dec.	10	PT65102	PT65102L254	PT65102L508
Binary Coded Hexadecimal	16	PT65103	PT65103L254	PT65103L508
Code 05, Gray Code	16	PT65105	PT65105L254	PT65105L508
Comp. of Binary Coded Hex.	16	PT65106	PT65106L254	PT65106L508
Code 11, ON/OFF	4	PT65111	PT65111L254	PT65111L508
Code 12, Binary Coded Dec.	4	PT65112	PT65112L254	PT65112L508
Code 21, Decimal	4	PT65121	PT65121L254	PT65121L508
Code 24, Binary Coded Dec.	6	PT65124	PT65124L254	PT65124L508
Code 25, Binary Coded Dec.	6	PT65125	PT65125L254	PT65125L508
Code 26, Octal	8	PT65126	PT65126L254	PT65126L508
Code 27, Octal complement	8	PT65127	PT65127L254	PT65127L508



Spindle Actuator Models		Complete Model No. by Terminal Style		
		Straight	Right Angle	
			Pitch	
Code (see truth tables)	Positions		.100" (2,54)	.200"(5,08)
Binary Coded Decimal	10	PT65301	PT65301L254	PT65301L508
Comp. of Binary Coded Dec.	10	PT65302	PT65302L254	PT65302L508
Binary Coded Hexadecimal	16	PT65303	PT65303L254	PT65303L508
Code 05, Gray Code	16	PT65305	PT65305L254	PT65305L508
Comp. of Binary Coded Hex.	16	PT65306	PT65306L254	PT65306L508
Code 11, ON/OFF	4	PT65311	PT65311L254	PT65311L508
Code 12, Binary Coded Dec.	4	PT65312	PT65312L254	PT65312L508
Code 21, Decimal	4	PT65321	PT65321L254	PT65321L508
Code 24, Binary Coded Dec.	6	PT65324	PT65324L254	PT65324L508
Code 25, Binary Coded Dec.	6	PT65325	PT65325L254	PT65325L508
Code 26, Octal	8	PT65326	PT65326L254	PT65326L508
Code 27, Octal complement	8	PT65327	PT65327L254	PT65327L508



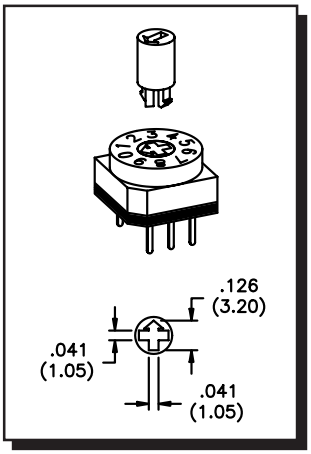
All models listed on this page have 2 Common terminals except Code 11 and Code 24 which have one.

Other codes are available - consult factory.

Segment Wheel Actuator Models		Complete Model No. by Terminal Style		
		Straight	Right Angle	
			Pitch	
Code (see truth tables)	Positions		.100" (2,54)	.200"(5,08)
Binary Coded Decimal	10	PT65501	PT65501L254	PT65501L508
Comp. of Binary Coded Dec.	10	PT65502	PT65502L254	PT65502L508
Binary Coded Hexadecimal	16	PT65503	PT65503L254	PT65503L508
Code 05, Gray Code	16	PT65505	PT65505L254	PT65505L508
Comp. of Binary Coded Hex.	16	PT65506	PT65506L254	PT65506L508
Code 11, ON/OFF	4	PT65511	PT65511L254	PT65511L508
Code 12, Binary Coded Dec.	4	PT65512	PT65512L254	PT65512L508
Code 21, Decimal	4	PT65521	PT65521L254	PT65521L508
Code 24, Binary Coded Dec.	6	PT65524	PT65524L254	PT65524L508
Code 25, Binary Coded Dec.	6	PT65525	PT65525L254	PT65525L508
Code 26, Octal	8	PT65526	PT65526L254	PT65526L508
Code 27, Octal complement	8	PT65527	PT65527L254	PT65527L508

G

PT65 SERIES

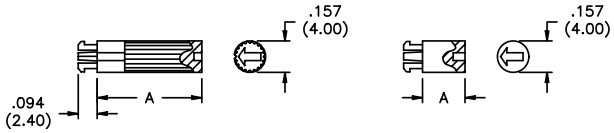


Cross shaped slot Actuator Models		Complete Model No. by Terminal Style		
		Straight	Right Angle	
			Pitch	
Code (see truth tables)	Positions		.100" (2,54)	.200"(5,08)
Binary Coded Decimal	10	PT65701	PT65701L254	PT65701L508
Comp. of Binary Coded Dec.	10	PT65702	PT65702L254	PT65702L508
Binary Coded Hexadecimal	16	PT65703	PT65703L254	PT65703L508
Code 05, Gray Code	16	PT65705	PT65705L254	PT65705L508
Comp. of Binary Coded Hex.	16	PT65706	PT65706L254	PT65706L508
Code 11, ON/OFF	4	PT65711	PT65711L254	PT65711L508
Code 12, Hexadecimal	4	PT65712	PT65712L254	PT65712L508
Code 21, Decimal	4	PT65721	PT65721L254	PT65721L508
Code 24, Binary Coded Dec.	6	PT65724	PT65724L254	PT65724L508
Code 25, Binary Coded Dec.	6	PT65725	PT65725L254	PT65725L508
Code 26, Octal	8	PT65726	PT65726L254	PT65726L508
Code 27, Octal complement	8	PT65727	PT65727L254	PT65727L508

Operating Elements snap-fit securely into PT65 (& P60A) Series switch models with cross shaped slot actuators. Order separately by Model number shown below and indicate color.

Spindle colors: red, gray or black

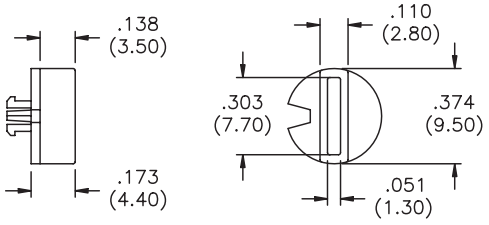
Model No.	Dim. A
SAPT65473	.287
SAPT654116	.457
SAPT654133	.524



Short spindle above applies to model SAPT65473 only

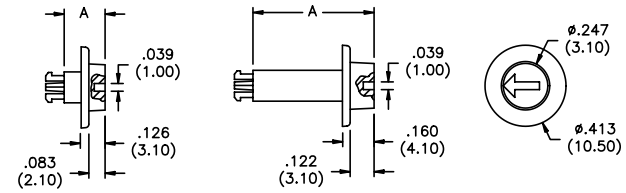
Segment wheel colors: yellow, red, green, blue, gray or black

Model No.
SRPT659544



Knob color: red

Model No.	Dim. A
DKPT6510553	.209
DKPT65105157	.618
DKPT65105291	1.146
DKPT65105344	1.354

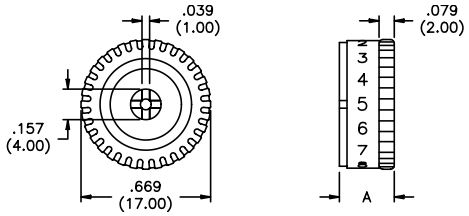


Short knob above applies to model DKPT6510553 only

Wheel color: white

Model No.	Dim. A
DRPT651772	.283

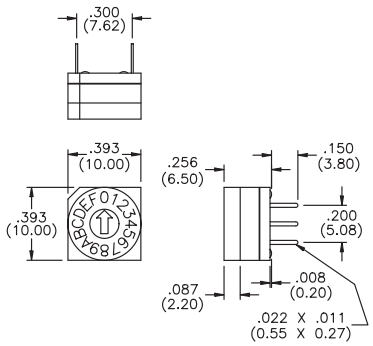
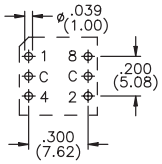
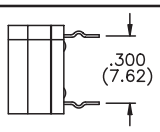
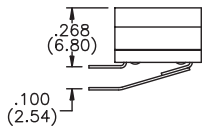
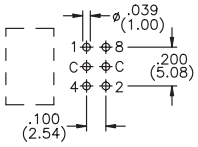
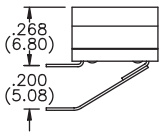
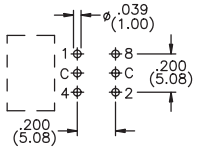
consult factory for printing (fits PT65 models only)



G

PT65 SERIES

MECHANICAL OUTLINES

Terminal option suffix*:	Mtg. hole pattern:
NONE Straight terminals 	
V Crimped terminals 	
L254 Right angle terminals 	
L508 Right angle terminals 	

* 'None' indicates no option suffix is required.

PT65 SERIES STANDARD OPTIONS :

Actuators

1 Arrow shaped slot
3 Spindle
5 Segment wheel
7 Cross shaped slot

Codes

01 BCD
02 BCD complement
03 Hexadecimal
06 Hexadecimal Comp.
See other available codes on page G17

Terminals

None Straight
V Crimped
L254 Rt. angle 2.54 (.100")
L508 Rt. angle 5.08 (,200")

ORDER GUIDE:

Make selections from the above table in sequence to specify a complete model number.

Note that 'None' indicates that no option suffix is required.

Example; **PT65101V**

Series Actuator — **Terminals Code**

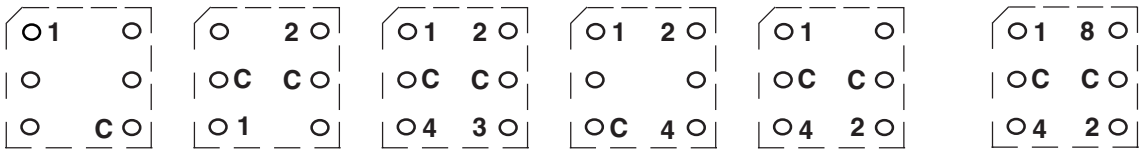
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

G

TERMINAL IDENTIFICATION FOR ALL MODELS

(viewed from top of switch inserted into printed circuit board).

Refer to TRUTH TABLES on page G17.



Code 11 **Code 12** **Code 21** **Code 24** **Codes 25 & 26** **Code 27 and 10& 16 pos. models**

P60A & P60AS SERIES ROTARY DIP SWITCHES

New!

FEATURES

- New 4 + 1 terminal layout.
- Completely sealed for process compatibility.
- Ultra-compact size with 10 or 16 positions.
- Precision designed detent action.
- Thru-hole (P60A Series) & SMT (P60AS Series) models.
- High reliability & long life.
- Clockwise or counterclockwise settable.
- Solder coated terminals.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

GENERAL SPECIFICATIONS

ELECTRICALS

Operating voltage	24 VDC max.
Contact rating, static	400 mA max.
Contact rating, dynamic	150 mA max.
Test voltage	250V 50Hz/1 min.
Initial contact resistance	< 100 milliohms
Insulation resistance	> 100 megohms

MECHANICALS, THERMALS

Torque	0.98 inch-oz. min. (0.7 Ncm min.)
Expected life	10,000 switching operations
Contact force	15 grams min.
Operating temperature range	-20°C to 85°C

SOLDERING RECOMMENDATIONS

Hand soldering	340°C max. for 2 seconds max. (40 watt iron max.)
Wave soldering	260°C max. for 10 seconds max.
Reflow soldering (SMT)	215°C max. for 40 seconds max.
Solvent washing	Freons or alcohol. (Do not use chlorinated solvents)
Aqueous cleaning	Deionized water preferred

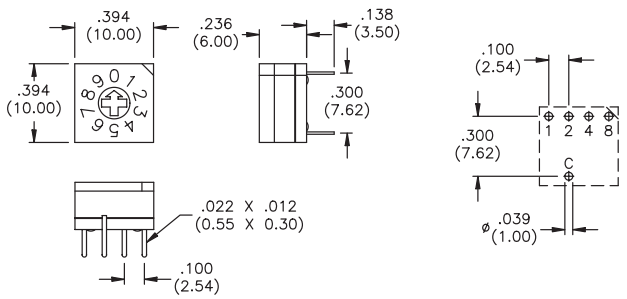
MATERIALS

Base	UL94V-O, high temperature thermoplastic
Cover	UL94V-O, high temperature thermoplastic
Actuator	Nylon
Contacts	Gold over nickel plated stainless steel
Terminals	Solder coated copper
Terminal sealing	Molded-in
Actuator seal	'O'-ring

G

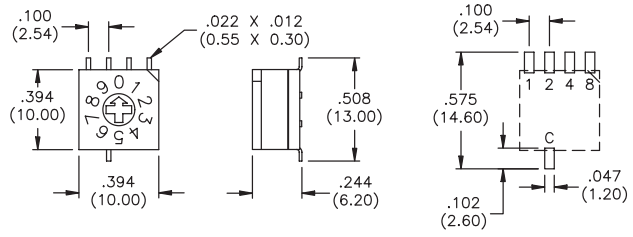
Thru-hole and SMT Printed Circuit Models		Model No. Thru-hole Mounting (see fig. 1)	Model No. Surface Mounting (see fig. 2)
Code (see truth tables pg. G22)	**Positions**		
Binary Coded Decimal	10	**P60A701**	**P60AS701**
Complement of BCD	10	**P60A702**	**P60AS702**
Binary Coded Hexadecimal	16	**P60A703**	**P60AS703**
Complement of BCH	16	**P60A706**	**P60AS706**

Figure 1



Mechanical outline P.C. hole pattern

Figure 2



Mechanical outline P.C. pad layout

STANDARD OPTIONS BY SERIES:

Series		P60A	P60AS
Actuators			
3	Spindle	X	X*
5	Segment wheel	X	X*
7	Cross shaped slot	X	X
Codes			
01	BCD	X	X
02	BCD complement	X	X
03	Hexadecimal	X	X
06	Hexadecimal Comp.	X	X
Terminals			
None	Straight	X	
V	Crimped	X	
L508	Rt. angle 5.08 (.200")	X	
None	SMT		X

*** -** Assemble after soldering process.

ORDER GUIDE:

Make selections from the above table in sequence to specify a complete model number.

Note that 'None' indicates that no option suffix is required.

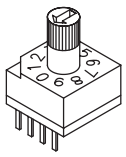
Example; **P60A301V**

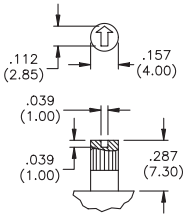
Series / Actuator — Terminals / Code

New! P60A & P60AS SERIES

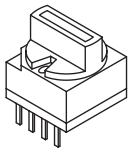
ACTUATORS

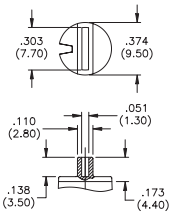
3 Spindle



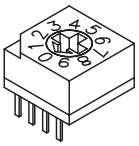


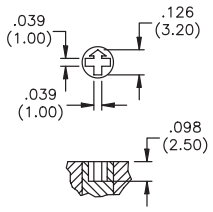
5 Segment wheel





7 Cross shaped slot





See page G19 for optional Operating Elements.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

CODES

NOTE: For each dial position in tables, Common terminals (C) are connected to terminal number(s) indicated - i.e. - none or combinations of 1, 2, 4 or 8. Each model in this series has 2 Common terminals.

BINARY CODED DECIMAL (01)
10 Positions

Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●

COMP. OF BINARY CODED DECIMAL (02)
10 Positions

Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	

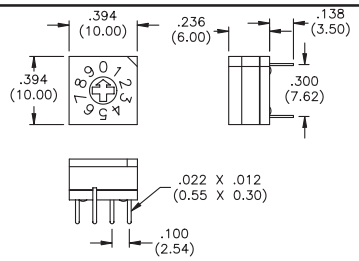
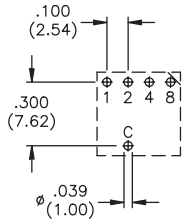
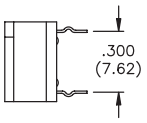
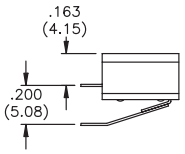
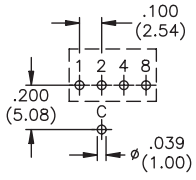
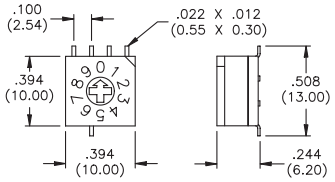
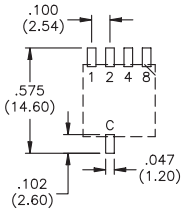
BINARY CODED HEXADECIMAL (03)
16 Positions

Dial No.	1	2	4	8
0				
1	●			
2		●		
3	●	●		
4			●	
5	●		●	
6		●	●	
7	●	●	●	
8				●
9	●			●
A		●		●
B	●	●		●
C			●	●
D	●		●	●
E		●	●	●
F	●	●	●	●

COMP. OF BINARY CODED HEXADEC. (06)
16 Positions

Dial No.	1	2	4	8
0	●	●	●	●
1		●	●	●
2	●		●	●
3			●	●
4	●	●		●
5		●		●
6	●			●
7				●
8	●	●	●	
9		●	●	
A	●		●	
B			●	
C	●	●		
D		●		
E	●			
F				

MECHANICAL OUTLINES

Terminal option suffix*:		Mtg. hole pattern:
NONE Straight terminals		
V Crimped terminals		
L508 Right angle terminals		
NONE SMT terminals		

* 'None' indicates no option suffix is required.

PT65 SERIES
PULSE GENERATORS

FEATURES

- **3 + 3 terminal layout.**
- **10 positions.**
- **Completely sealed for process compatibility.**
- **Precision designed detent action.**
- **Compact size.**
- **High reliability & long life.**
- **Clockwise or counterclockwise settable.**
- **Solder coated terminals.**

The pulse generator is a mechanical rotary switch connecting input C to outputs 1 and 2 in a time delayed sequence. Typical applications include dimmer and volume control, where adding or subtracting instructions are read into digital electronics.

Code 31: The connections between input C and terminals 1 and 2 occur only for the duration of the pulses, after which they are disconnected (set back to 0).

Contact bounce pulse duration (at 15 rpm):

C+Pin 1	> 50 ms
C+Pin 1+Pin 2	> 100 ms
C+Pin 2	> 50 ms

MATERIALS

Base	UL94V-O, high temperature thermoplastic
Cover	UL94V-O, high temperature thermoplastic
Actuator	POM
Contacts	Gold over nickel plated bronze
Terminals	Gold over nickel plated bronze
Terminal sealing	Molded-in
Actuator seal	'O'-ring

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GENERAL SPECIFICATIONS

ELECTRICALS

Operating voltage	12 VDC max.
Contact rating, static	400 mA max.
Contact rating, dynamic	150 mA max.
Test voltage	250 V for 1 minute
Initial contact resistance	< 80 milliohms
Contact bounce	< 10 milliseconds
Pulse durations	See graphs below

MECHANICALS, THERMALS

Torque	0.98 inch-oz. min. (0.7 Ncm min.)
Expected life	10,000 switching operations
Contact force	15 grams min.
Positions per rotation	10
Rotation speed	50 rpm (Max.)
Vibration resistance	10g
Operating temperature range	-20°C to 70°C

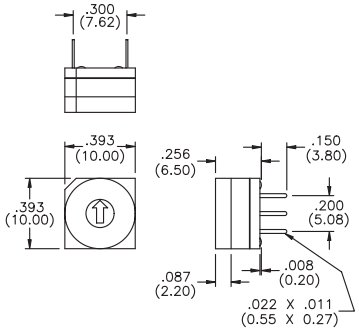
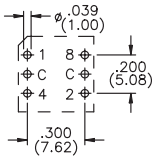
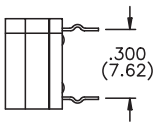
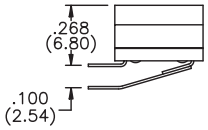
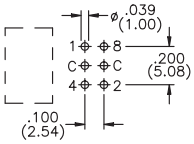
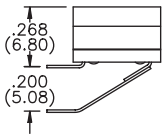
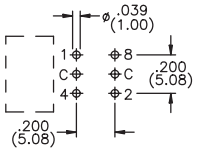
SOLDERING RECOMMENDATIONS

Hand soldering	340°C max. for 2 seconds max. (40 watt iron max.)
Wave soldering	260°C max. for 10 seconds max.
Solvent washing	Freons or alcohol. (Do not use chlorinated solvents)
Aqueous cleaning	Deionized water preferred

Refer to Actuator drawings shown		Complete Model No. by Terminal Style		
		Straight	Right Angle	
			Pitch	
Code	Actuator		.100" (2,54)	.200"(5,08)
Code 31	Arrow shpd. slot	PT65131	PT65131L254	PT65131L508
Code 31	Spindle	PT65331	PT65331L254	PT65331L508

PT65 SERIES PULSE GENERATORS

MECHANICAL OUTLINES

Terminal option suffix*:		Mtg. hole pattern:
NONE Straight terminals		
V Crimped terminals		
L254 Right angle terminals		
L508 Right angle terminals		

* 'None' indicates no option suffix is required.

PT65 SERIES STANDARD OPTIONS :

Actuators

1 Arrow shaped slot
3 Spindle
5 Segment wheel
7 Cross shaped slot

Codes

31 10 position pulse generator

Terminals

None Straight
V Crimped
L254 Rt. angle 2.54 (.100")
L508 Rt. angle 5.08 (,200")

ORDER GUIDE:

Make selections from the above table in sequence to specify a complete model number.

Note that 'None' indicates that no option suffix is required.

Example; **PT65131V**

Series Actuator — **Terminals Code**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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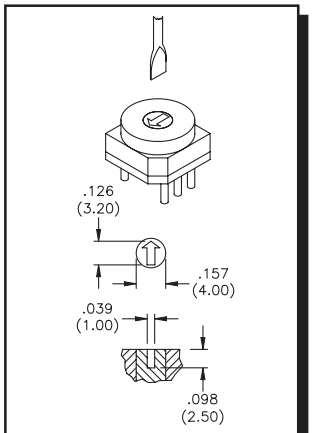
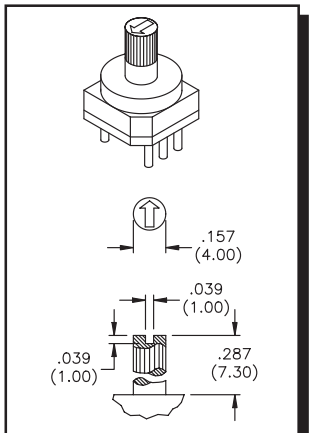
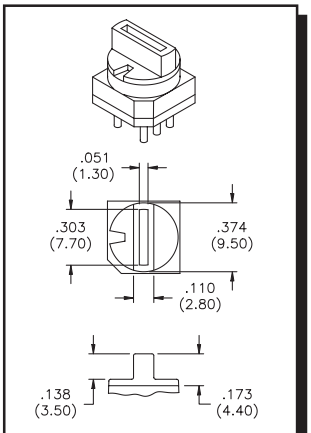
ACTUATORS



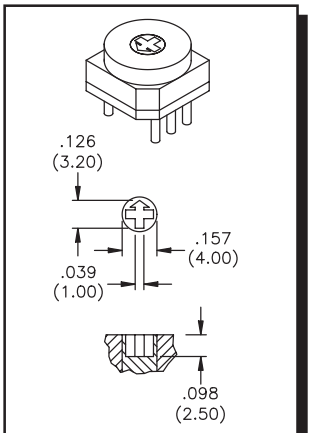
Arrow shaped slot



Spindle



Segment wheel



Cross shaped slot