

# 3 Series Thumbwheel Switches



## Features/Benefits

- Most complete product offering in the industry
- Spacers available to fit most panel cutouts
- Front or rear mounting options

## Typical Applications

- Test & measurement equipment
- Industrial equipment
- Computer devices

## Specifications

### CONTACT RATING:

CARRY: 1 AMP continuous.  
SWITCH: 100 mA max.

OPERATING VOLTAGE: 50 mV to 28 V DC or 120 V AC.

ELECTRICAL LIFE: 100,000 actuations.

CONTACT RESISTANCE: Below 100 m Ω typ. initial @  
2-4 V DC, 100 mA.

INSULATION RESISTANCE: 10<sup>9</sup> Ω min.

DIELECTRIC STRENGTH: 500 Vrms min. @ sea level  
between common terminal and any output.

OPERATING TEMPERATURE: -40°C to 65°C.

## Materials

HOUSING: ABS plastic.

THUMBWHEEL: ABS plastic.

ROTOR CONTACTS: Precious metal on copper alloy.

STATOR CONTACTS: Hard gold over nickel over copper  
on epoxy fiberglass.

**NOTE:** Specifications and materials listed above are for switches with standard options  
For information on specific and custom switches, consult Customer Service Center.

\* Note: All models listed are RoHS compliant. See Technical Data section of this catalog for  
RoHS compliant and compatible definitions and specifications.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages M-4 thru M-10. For additional options not shown in catalog, consult Customer Service Center.

Consult factory for illumination availability.

<p><b>Series</b></p> <p><b>3</b> Thumbwheel switch</p>	<p><b>Number of Sections</b></p> <p><b>0</b> Switch section <b>1</b> 1 Switch section <b>2</b> 2 Switch sections <b>3</b> 3 Switch sections <b>4</b> 4 Switch sections <b>5</b> 5 Switch sections <b>6</b> 6 Switch sections <b>7</b> 7 Switch sections <b>8</b> 8 Switch sections <b>9</b> More than 8 switch sections</p>	<p><b>Function Code</b></p> <p><b>11</b> Decimal, SP, 10 position <b>14</b> Resistor decade <b>21</b> BCD, 10 position <b>23</b> Complement of BCD, 10 position <b>27</b> BCD, 10 position <b>31</b> BCD, 10 position <b>71</b> BCH, 16 position</p>	<p><b>Mounting Style</b></p> <p><b>00</b> Snap-in, front mount <b>09</b> Snap-in, front mount* <b>10</b> Rear mount <b>19</b> Rear mount* <b>20</b> Rear mount <b>29</b> Rear mount*</p>	<p><b>Terminations</b></p> <p><b>0</b> Type 0 <b>1</b> Type 1, extended type 0 <b>N</b> Solder pins with .100" spacing** <b>P</b> Solder pins with .156" spacing** <b>9</b> Any combination</p>	<p><b>Color/Marking/Stops</b></p> <p><b>0</b> Matte black body, gloss black wheel, white marking</p>	<p><b>Seal</b></p> <p><b>0</b> No seal <b>1</b> Sealed contacts <b>2</b> Dust lens <b>3</b> Sealed contacts &amp; dust lens</p>
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\*X9 mounting styles must be ordered with '0' number of sections.

\*\* Note: Termination option N (RoHS compliant) replaced termination option 3 (Non-RoHS compliant).  
Termination option P (RoHS compliant) replaced termination option B (Non-RoHS compliant).

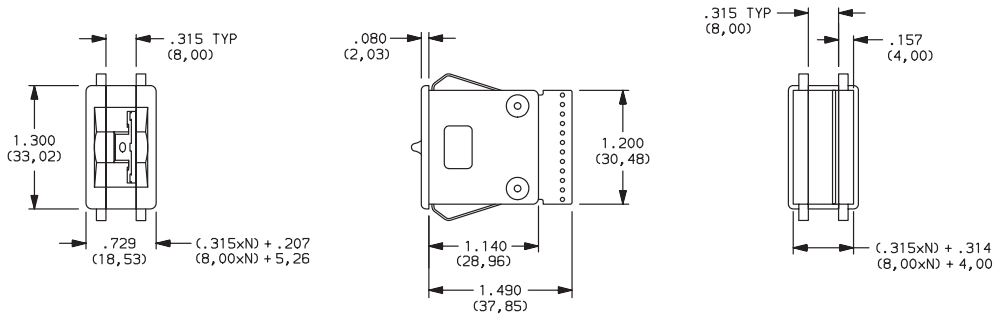
Thumbwheel & Pushwheel



# 3 Series Thumbwheel Switches

## SERIES

### 3 THUMBWHEEL SWITCHES



## NUMBER OF SECTIONS

- 0** Switch section only, no assembly. Blank bodies are considered sections; endplates are not sections. Must be ordered with 09 or 19 mounting style options, see pages M-5 and M-6.
- 1-8** Number of switch sections in assembly, includes endplates.
- 9** More than 8 switch sections, specify on CONFIGURATION FORM, page M-10 and consult Customer Service Center.

**NOTE:** Endplates and blank sections available separately, see pages M-13 and M-14.

## FUNCTION CODE

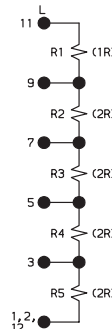
- 11** DECIMAL-1 POLE; 10 POSITION
- 14** RESISTOR DECADE; 1-2-2-2-2 CODE (RESISTORS NOT SUPPLIED)
- 21** BCD 1-2-4-8; 10 POSITION

WHEEL	SIGNALS CONNECTED TO COMMON SIGNAL C										
	0	1	2	3	4	5	6	7	8	9	C
0	●										●
1		●									●
2			●								●
3				●							●
4					●						●
5						●					●
6							●				●
7								●			●
8									●		●
9										●	●
	2	3	4	5	6	7	8	9	10	11	12
	TERM. LOCATION										

Available Terminations: 0, 1, N  
See fig. 1, page M-7.

WHEEL	SWITCH CIRCUIT										
	0	1	2	3	4	5	6	7	8	9	C
0	●										●
1	●	●									●
2	●	●	●								●
3	●	●	●	●							●
4	●	●	●	●	●						●
5	●	●	●	●	●	●					●
6	●	●	●	●	●	●	●				●
7	●	●	●	●	●	●	●	●			●
8	●	●	●	●	●	●	●	●	●		●
9	●	●	●	●	●	●	●	●	●	●	●
	11	9	7	5	3	1,2	12				
	TERM. LOCATION										

Available Terminations: 1  
See fig. 1, page M-7.



WHEEL	SIGNALS CONN. TO COMM. SIG. C									
	1	2	4	8	C					
0					●					
1	●				●					
2		●			●					
3	●	●			●					
4			●		●					
5	●	●	●		●					
6	●	●	●	●	●					
7	●	●	●	●	●					
8	●	●	●	●	●					
9	●	●	●	●	●					
	3	5	7	11	9					
	TERM. LOCATION									

Available Terminations: 0, 1, N  
See fig. 1, page M-7.

**NOTE:** For terminal location diagram, see page M-7.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 3 Series Thumbwheel Switches

## FUNCTION CODE

**23** COMPLEMENT OF BCD 1-2-4-8;  
10 POSITION

W H E E L	SIGNALS CONN. TO			
	1	2	4	8
0	●	●	●	●
1	●	●	●	●
2	●	●	●	●
3	●	●	●	●
4	●	●	●	●
5	●	●	●	●
6	●	●	●	●
7	●	●	●	●
8	●	●	●	●
9	●	●	●	●
	3	9	11	5
	TERM. LOCATION			

Available Terminations: 0, 1, N  
See fig. 1, page M-7.

**27** BCD 1-2-4-8; 10 POSITION

W H E E L	SIGNALS CONN. TO			
	1	2	4	8
0				
1	●			●
2		●		●
3	●			●
4		●		●
5	●			●
6		●		●
7	●			●
8		●		●
9	●			●
	4	5	1	2
	TERM. LOCATION			

Available Terminations: P  
See fig. 2, page M-7.

**31** BCD 1-2-4-8; 10 POSITION

W H E E L	SIGNALS CONN. TO			
	1	2	4	8
0				
1	●			●
2		●		●
3	●			●
4		●		●
5	●			●
6		●		●
7	●			●
8		●		●
9	●			●
	2	3	11	9
	TERM. LOCATION			

Available Terminations: 0, 1, N  
See fig. 1, page M-7.

**71** BINARY CODED HEXADECIMAL,  
16 POSITION

W H E E L	SIGNALS CONN. TO			
	1	2	4	8
0				
1	●			●
2		●		●
3	●			●
4		●		●
5	●			●
6		●		●
7	●			●
8		●		●
9	●			●
A		●		●
B	●			●
C		●		●
D	●			●
E		●		●
F	●			●
	3	5	7	11
	TERM. LOCATION			

Available Terminations: 0, 1, N  
See fig. 1, page M-7.

NOTE: For terminal location diagram, see page M-7.

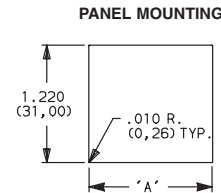
## MOUNTING STYLE

### Type 0 Snap-In Front Mount

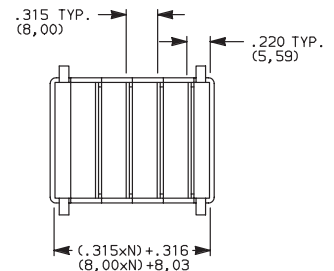
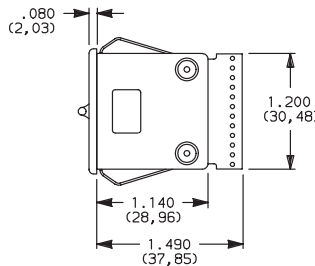
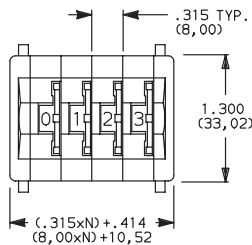
MOUNTING STYLE	DIM. 'A'
00	(.315 x N) + .326 (8,00 x N) + (8,28)

N = Number of sections.

Recommended panel thickness:  
0.46-.125  
(1,16-3,18)



**00** SWITCH ASSEMBLY W/ ENDPLATES-.315 (8,00) SECTION PITCH



N = Number of sections.

**09** SWITCH SECTION ONLY-UNASSEMBLED WITHOUT ENDPLATES OR SPACERS  
(Must be ordered with number of sections option "0", see Page M-4.)

NOTE: Endplates, blank sections, spacers  
and assembly hardware available separately, see pages M-8 and M-9.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 3 Series Thumbwheel Switches

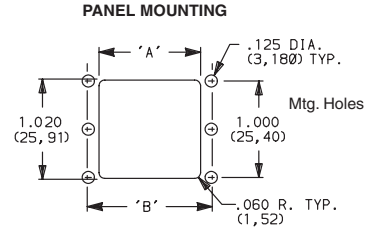
## MOUNTING STYLE

### Type 1 Rear Mount

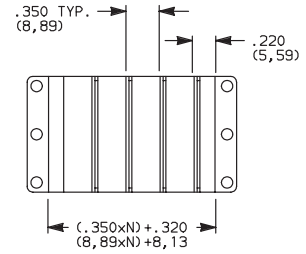
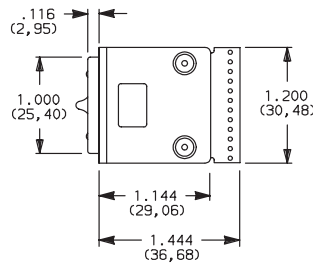
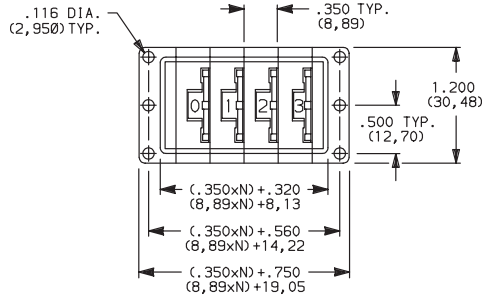
MOUNTING STYLE	DIM. 'A'	DIM. 'B'
10	$(.350 \times N) + .340$ $(8,89 \times N) + (8,64)$	$(.350 \times N) + .560$ $(8,89 \times N) + (14,22)$

N = Number of sections.

Recommended panel thickness:  
0.46-.125  
(1,16-3,18)



### 10 SWITCH ASSEMBLY W/ ENDPLATES-.350 (8,89) SECTION PITCH



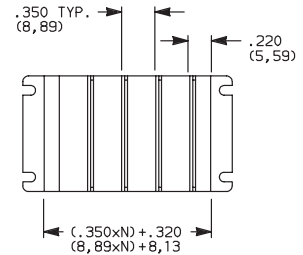
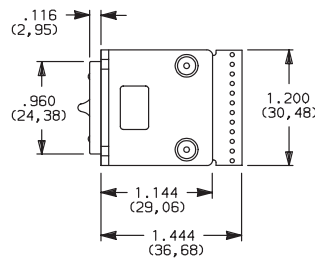
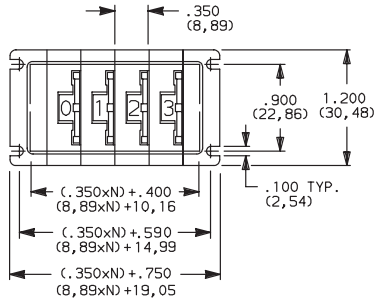
N = Number of sections.

### 19 SWITCH SECTION ONLY-UNASSEMBLED WITHOUT ENDPLATES OR SPACERS (Must be ordered with number of sections option "0", see Page M-4.)

Thumbwheel & Pushwheel

### Type 2 Rear Mount

### 20 SWITCH ASSEMBLY W/ ENDPLATES-.350 (8,89) SECTION PITCH



N = Number of sections.

### 29 SWITCH SECTION ONLY-UNASSEMBLED WITHOUT ENDPLATES OR SPACERS (Must be ordered with number of sections option "0", see Page M-4.)



M

**NOTE:** Endplates, blank sections, spacers and assembly hardware available separately, see pages M-8 and M-9.



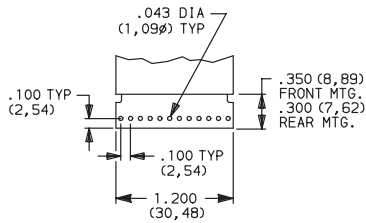
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**

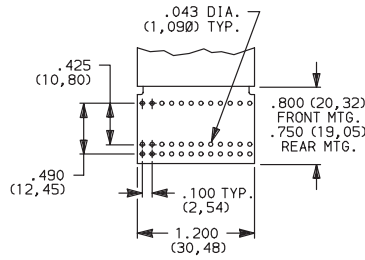
# 3 Series Thumbwheel Switches

## TERMINATIONS

### 0 TYPE 0

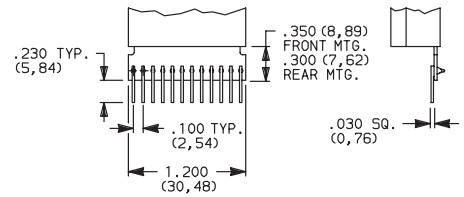


### 1 TYPE 1, EXTENDED TYPE 0



Signal traces cut except for common(s).

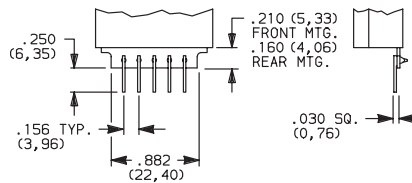
### N SOLDER PINS WITH .100" SPACING



### 9 ANY COMBINATION OF TERMINATION CONFIGURATIONS OR SPECIAL TERMINATIONS.

Specify on configuration form, page M-10 and consult Customer Service Center.

### P SOLDER PINS WITH .156" SPACING



PC Board 1/32" (0,79) thick.

**NOTE:** All terminal holes shown may not be present for all function codes, consult Customer Service Center. Terminal connector available for termination options 0 & 1, see page M-9.

**NOTE:** Termination option N (RoHS compliant) replaced termination option 3 (Non-RoHS compliant). Termination option P (RoHS compliant) replaced termination option B (Non-RoHS compliant).

## Terminal Location Numbers

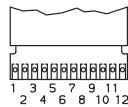


FIG. 1



FIG. 2

**NOTE:** See function codes, pages M-4 and M-5, for signal locations.

## COLOR/MARKING/STOPS

### 0 MATTE BLACK HOUSING (Gloss black wheel with white characters; no stops.)

**NOTE:** Stop pins are available separately, see page M-8.

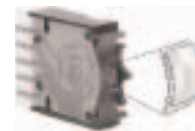
## SEAL

### 0 UNSEALED SWITCHING CONTACTS.

**1 SEALED SWITCHING CONTACTS.** (Sealing is by means of an o-ring rotary seal and a cured-in-place elastomer gasket. Switching contact area is protected from moisture, oil, and airborne contaminants.)

**2 DUST LENS.** (Protects the character face of the wheel from abrasion and dirt.)

**3 SEALED SWITCHING CONTACTS AND DUST LENS**



Dust Lens



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 3 Series Thumbwheel Switches

## AVAILABLE HARDWARE

Blank sections, Type 0,  
.315 THK.



**PART NO.**  
**413602000** W/RIB-BLACK  
**400502000** W/RIB & W/OUT SPRINGS-BLACK

Blank sections, Front mount, Type 0,  
.315 THK.



**PART NO.**  
**413502000** PLAIN-BLACK  
**400702000** PLAIN & W/OUT SPRINGS-BLACK

Blank sections, Rear mount, Type 1,  
.350 THK.



4006                      4008

**PART NO.**  
**400602000** W/RIB-BLACK  
**400802000** PLAIN-BLACK

Blank sections, Rear mount, Type 2,  
.350 THK.



4734                      4733

**PART NO.**  
**473402000** W/RIB-BLACK  
**473302000** PLAIN-BLACK

End plates, Front mount, Type 0



**PART NO.**  
**413402000** BLACK  
 Two required for complete assembly.

End plates, Rear mount, Type 1



**PART NO.**  
**400402003** BLACK  
 Two required for complete assembly.

End plates, Rear mount, Type 2



**PART NO.**  
**473202003** BLACK  
 Two required for complete assembly.

Spacers, Front mount, Type 0 & 3, .078 THK.  
(Makes section pitch 10mm)



**PART NO.**  
**410802000** BLACK

Stop pins



**PART NO.**  
**402900000**

Thumbwheel & Pushwheel



M



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change

# 3 Series Thumbwheel Switches

## AVAILABLE HARDWARE

Terminal connector



605A00000



605A02000

PART NO.

605A00000 PC

605A02000 SOLDER LUG

Fits 0 & 1 terminations only.

Screws for field assembly of thumbwheel switches  
(2 screws needed per assembly + 403500000 nuts)

SCREW PART NUMBER (0-80 UNF THD. SIZE)	NUMBER OF SECTIONS IN ASSEMBLY	
	FRONT MOUNTING	REAR MOUNTING
	MTG. STYLE - 00	MTG. STYLE - 10
412700000	1-2	1-2
412701000	3-4	3
412702000	5-7	4-6

Nut



Two nuts required per assembly and screws.

PART NO.

403500000

Nut driver (For 403500000 nut)



PART NO.

406100652

Thumbwheel & Pushwheel



M

# 3 Series Thumbwheel Switches

## Configuration Form

GRAY SHADED AREAS TO BE FILLED IN BY CUSTOMER SERVICE.

CATALOG PART NO.

**3**

C&K PART NUMBER












C&K PART NUMBER

COMPANY NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ TEL.# \_\_\_\_\_  
 CUSTOMER CONTACT \_\_\_\_\_ DATE \_\_\_\_\_  
 ORIGINATED BY \_\_\_\_\_ SALES REP. \_\_\_\_\_

CUSTOMER  
PRINT  
REVISION:

DETAILS:

Thumbwheel & Pushwheel

THUMBWHEEL SECTIONS	NO. OF SEC.	FUNCTION CODE – TERMINATIONS – COLOR/MARKING/STOPS/SEAL – ILLUMINATION <small>ENTER OPTION CODES IN APPROPRIATE BOXES. FUNCTION CODES INCLUDE BLANK SECTIONS (SEE PAGES M-9 &amp; M-10).</small>	DESCRIBE IN APPROPRIATE ROW
	1	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	2	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	3	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	4	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	5	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	6	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	7	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	8	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	9	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	10	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
	11	3 - <input type="text"/> <input type="text"/> - - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

QUALITY CONTROL INSTRUCTIONS

PRODUCTION APPROVAL DATE

Q.C. APPROVAL DATE

REV. INITIALS DATE

FOR SWITCHES WITH MORE THAN 11 SECTIONS, CONTINUE ON ADDITIONAL SHEETS.

SPECIAL INSTRUCTIONS OR SPECIFICATIONS:

SHEET \_\_\_\_ OF \_\_\_\_



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change