

C&K 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
- Illuminated models available

Typical Applications

- Test & measurement equipment
- Industrial equipment
- Computer devices

Build-A-Switch

Our easy Build-A-Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-9 thru J-16. For additional options not shown in catalog, consult Customer Service Center.



Thumbwheel & Pushwheel

Typical Example: **3** — **1** — **2 1** — **0 0** — **0** — **0** — **0** — **0**

Series

3 (STD.) Thumbwheel switch

Number of Sections

- 0 Switch section
- 1 1 Switch section
- 2 2 Switch sections
- 3 3 Switch sections
- 4 4 Switch sections
- 5 5 Switch sections
- 6 6 Switch sections
- 7 7 Switch sections
- 8 8 Switch sections
- 9 More than 8 switch sections

Function Code

- 11 Decimal, SP, 10 position
- 14 Resistor decade
- 21 BCD, 10 position
- 22 Octal, 8 position
- 23 Complement of BCD, 10 position
- 26 Complement of BCD, 10 position
- 27 BCD, 10 position
- 29 BCD, 10 position
- 31 BCD, 10 position
- 35 BCD with separate common to not true bits, 10 position
- 41 BCD with complement, 10 position
- 51 BCD with complement, 10 position
- 61 SPDT repeating, 10 position
- 71 BCH, 16 position
- 72 BCH, 16 position
- 99 Mixed sections

Mounting Style

- 00 Snap-in, front mount
- 03 Snap-in, front mount
- 04 Snap-in, front mount
- 09 Snap-in, front mount
- 10 Rear mount
- 14 Rear mount
- 19 Rear mount
- 20 Rear mount
- 24 Rear mount
- 29 Rear mount
- 30 Snap-in, front mount
- 33 Snap-in, front mount
- 34 Snap-in, front mount

Terminations

- 0 (STD.) Type 0
- 1 Type 1, extended type 0
- 3 Type 0 with solder pins
- 4 Type 4
- 5 Type 5, extended type 4
- 6 Type 6
- 9 Any combination
- A Type 1 with solder pins
- B Type 6 with solder pins
- E Type 5 with solder pins

Color/Marking/Stops

- 0 (STD.) Matte black body, gloss black wheel, white marking
- 1 Matte gray body, gloss black wheel, white marking
- 5 Matte black body, translucent off-white wheel, black marking
- 6 Matte gray body, translucent off-white wheel, black marking
- 9 Combination of body colors, wheel colors, marking and/or stops

Seal

- 0 (STD.) No seal
- 1 Sealed contacts
- 2 Dust lens
- 3 Sealed contacts & dust lens
- 9 Sealing varies

Illumination

- NONE (STD.) No illumination
- 3 Red LED
- 5 Yellow LED
- 6 Green LED

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 milliohms typ. initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: 10^9 ohms min.

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

OPERATING TEMPERATURE: -10°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.

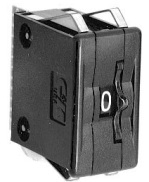
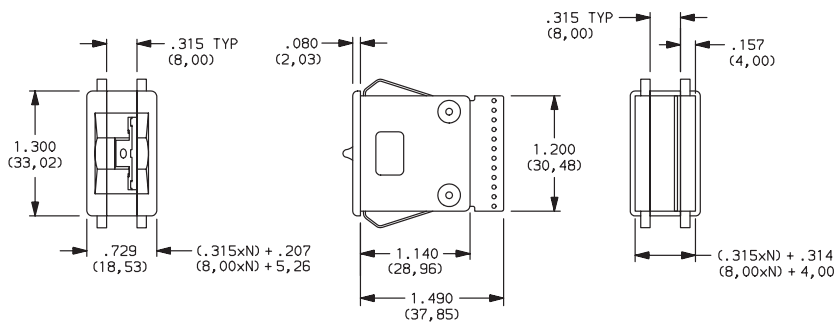
NOTE: Specifications and materials listed above are general specifications for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

SERIES



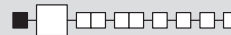
3 (STD.) THUMBWHEEL SWITCHES

PART NUMBER	NO. SECTIONS	NO. POSITIONS
312100000	1	10



312100000

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 J-11 and J-14.

1-8 Number of switch sections in assembly, includes endplates.

9 More than 8 switch sections, specify on CONFIGURATION FORM, page J-17 and consult Customer Service Center.

NOTE: Endplates and blank sections available separately, see section L.

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

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

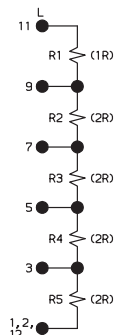
22 OCTAL 1-2-4; 8 POSITION (STOPPED BETWEEN 0-7 INCL.)

WHEEL	SIGNALS CONNECTED TO COMMON SIGNAL C										C
	0	1	2	3	4	5	6	7	8	9	
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, 3, A
See fig. 1, page J-15.

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

Available Terminations: 1, A
See fig. 1, page J-15.



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

Available Terminations: 0, 1, 3, A
See fig. 1, page J-15.

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

Available Terminations: 0, 1, 3, A
See fig. 1, page J-15.

NOTE: For terminal location diagram, see page J-15.

C&K 3 Series Thumbwheel Switches

FUNCTION CODE

26 COMPLEMENT OF BCD 1-2-4-8;
10 POSITION

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

Available Terminations: 6, B
See fig. 2, page J-15.

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

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

Available Terminations: 6, B
See fig. 2, page J-15.

29 BCD 1-2-4-8; 10 POSITION

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

Available Termination: B
See fig. 2, page J-15.

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

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

Available Terminations: 0, 1, 3, 4, 5, A, E
See fig. 1, page J-15.

35 BCD 1-2-4-8 W/ SEPARATE COMMON
TO NOT TRUE BITS, 10 POSITION

W H E E L	SIGNALS CONN. TO COMMON COMMON SIGNALS				
	1	2	4	8	C
0	○	○	○	○	○
1	●	○	○	○	○
2	○	●	○	○	○
3	○	○	●	○	○
4	○	○	○	●	○
5	○	○	○	○	○
6	○	○	○	○	○
7	○	○	○	○	○
8	○	○	○	○	○
9	○	○	○	○	○
8 6 4 2 10 12					
TERM. LOCATION					

Available Terminations: 0, 1, 3, A
See fig. 1, page J-15.

41 BCD 1-2-4-8 W/ COMPLEMENT;
10 POSITION

W H E E L	SIGNALS CONN. TO COMM. SIG. C				
	1	2	4	8	C
0					●
1	●				●
2		●			●
3	●	●			●
4			●		●
5	●			●	●
6	●	●	●		●
7	●	●	●	●	●
8				●	●
9	●			●	●
10 9 8 7 3 4 5 6 11					
TERM. LOCATION					

Available Terminations: 0, 1, 3, A
See fig. 1, page J-15.

51 BCD 1-2-4-8 W/ COMPLEMENT;
ONE COMMON, 10 POSITION

W H E E L	SIGNALS CONN. TO COMM. SIG. C				
	1	2	4	8	C
0					●
1	●				●
2		●			●
3	●	●			●
4			●		●
5	●			●	●
6	●	●	●		●
7	●	●	●	●	●
8				●	●
9	●			●	●
5 4 3 2 10 9 8 7 6					
TERM. LOCATION					

Available Terminations: 0, 1, 3, 4, 5, A, E
See fig. 1, page J-15.

61 SPDT REPEATING; PLUS (+) AND
MINUS (−) ALTERNATING,
10 POSITION

W H E E L	SIG. CONN. TO C	
	+	−
0	●	●
1	●	●
2	●	●
3	●	●
4	●	●
5	●	●
6	●	●
7	●	●
8	●	●
9	●	●
9 8 2		
TERM. LOC.		

Available Terminations: 0, 1, 3, 4, 5, A, E
See fig. 1, page J-15.

71 BINARY CODED HEXADECIMAL,
16 POSITION

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

Available Terminations: 0, 1, 3, A
See fig. 1, page J-15.

72 BINARY CODED HEXADECIMAL,
16 POSITION

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

Available Terminations: 6, B
See fig. 2, page J-15.

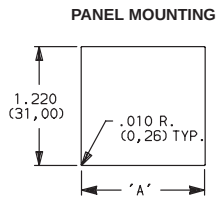
99 INTERMIXED SECTIONS, SPECIFY
ON CONFIGURATION FORM,
PAGE J-17 AND CONSULT
CUSTOMER SERVICE CENTER

Available Terminations: Consult
Customer Service Center.

NOTE: For terminal location diagram, see page J-15.

MOUNTING STYLE

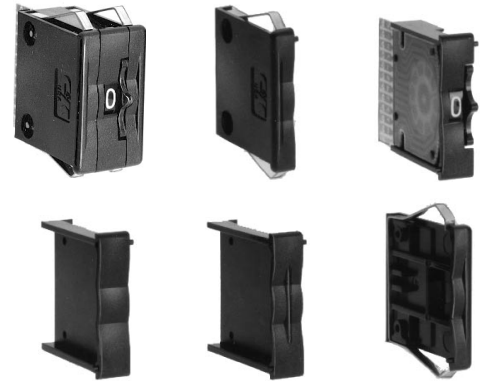
Type 0 Snap-In Front Mount



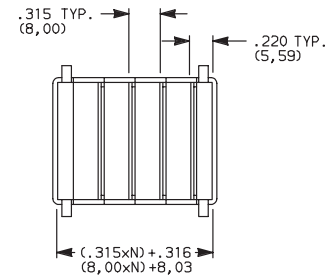
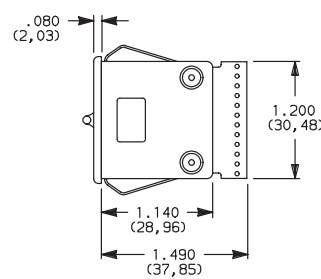
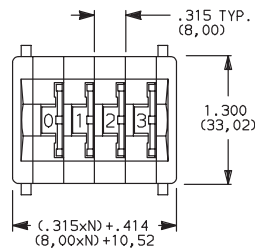
MOUNTING STYLE	DIM. 'A'
00	$(.315 \times N) + .326$ (8,00 x N) + (8,28)
03	$(.394 \times N) + .326$ (10,00 x N) + (8,28)
04	$(.500 \times N) + .326$ (12,70 x N) + (8,28)

N = Number of sections.

Recommended panel thickness:
.046-.125
(1,16-3,18)

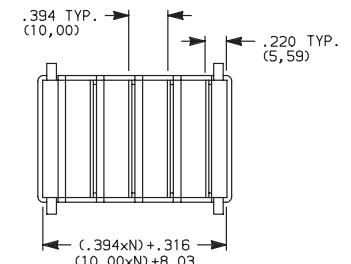
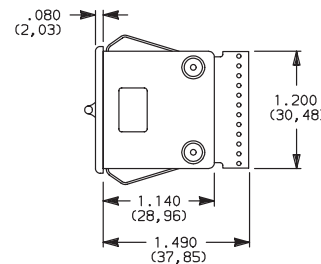
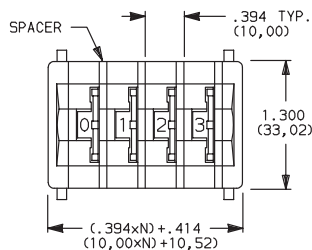


00 SWITCH ASSEMBLY W/ ENDPLATES—.315 (8,00) SECTION PITCH



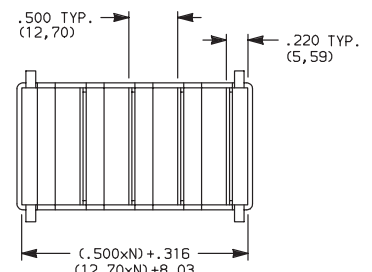
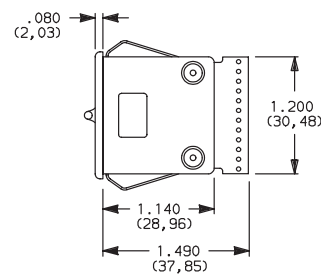
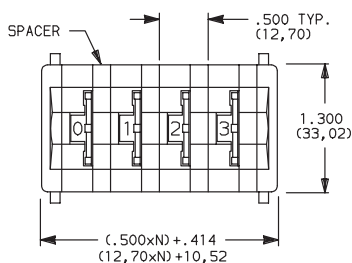
N = Number of sections.

03 SWITCH ASSEMBLY W/ ENDPLATES AND SPACER(S)—10mm SECTION PITCH



N = Number of sections.

04 SWITCH ASSEMBLY W/ ENDPLATES AND SPACER(S)—.500 (12,70) 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 J-9.)

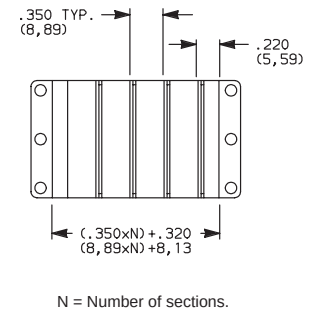
NOTE: Endplates, blank sections, spacers and assembly hardware available separately, see section L.

Thumbwheel & Pushwheel

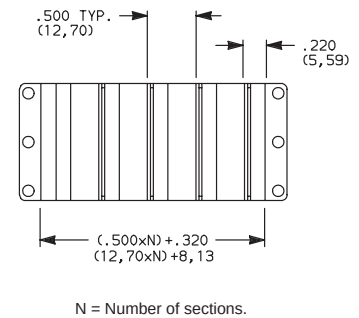
PANEL MOUNTING

Diagram illustrating the panel mounting dimensions and features:

- Panel dimensions: 1.020 (25, 91) (Height) and .060 R. TYP. (1, 52) (Radius).
- Mounting holes: .125 DIA. (3, 180) TYP. (Holes).
- Mounting holes: 1.000 (25, 40) (Holes).
- Panel dimensions: 'A' (Width) and 'B' (Width).



Thumbnail



ITT Industries

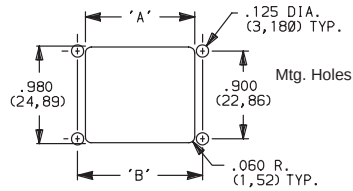
www.ittcannon.com

C&K 3 Series Thumbwheel Switches

MOUNTING STYLE

Type 2 Rear Mount

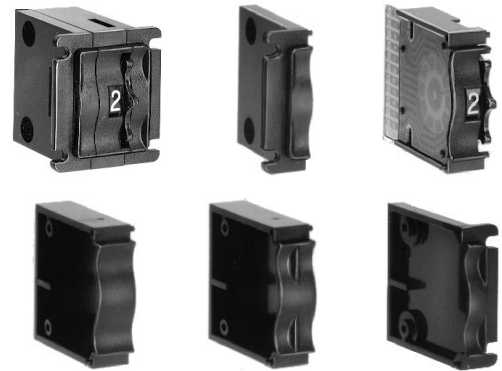
PANEL MOUNTING



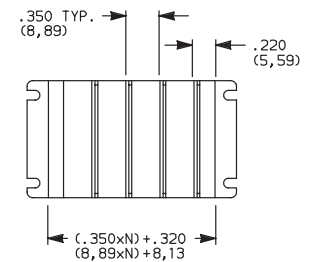
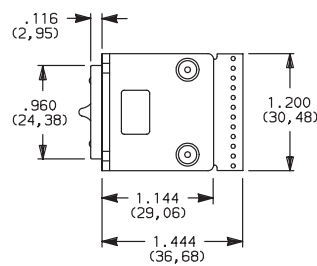
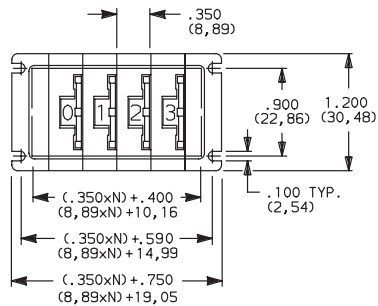
MOUNTING STYLE	DIM. 'A'	DIM. 'B'
20	$(.350 \times N) + .420$ (8,89 x N) + (10,67)	$(.350 \times N) + .590$ (8,89 x N) + (14,99)
24	$(.500 \times N) + .420$ (12,70 x N) + (10,67)	$(.500 \times N) + .590$ (12,70 x N) + (14,99)

N = Number of sections.

Recommended panel thickness:
.046-.125
(1,16-3,18)

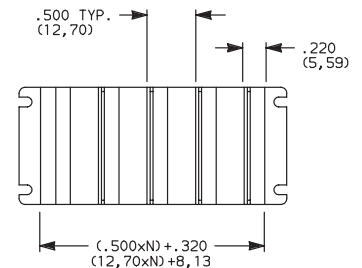
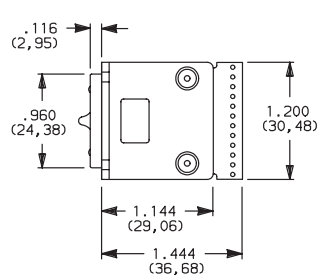
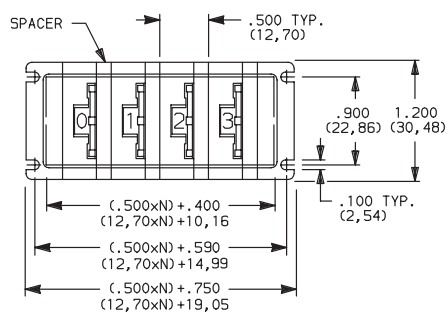


20 SWITCH ASSEMBLY W/ ENDPLATES—.350 (8,89) SECTION PITCH



N = Number of sections.

24 SWITCH ASSEMBLY W/ ENDPLATES AND SPACER(S)—.500 (12,70) 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 J-9.)

NOTE: Endplates, blank sections, spacers and assembly hardware available separately, see section L.

C&K 3 Series Thumbwheel Switches

MOUNTING STYLE

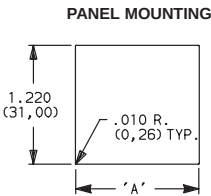
Type 3 Snap-In Front Mount



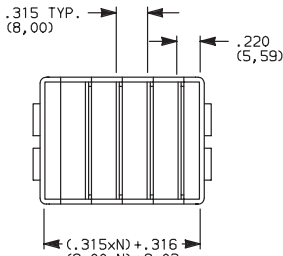
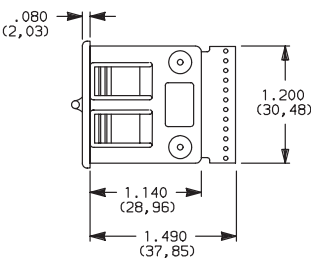
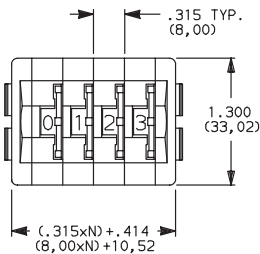
MOUNTING STYLE	DIM. 'A'
30	$(.315 \times N) + .360$ (8,00 x N) + (9,14)
33	$(.394 \times N) + .360$ (10,01 x N) + (9,14)
34	$(.500 \times N) + .360$ (12,70 x N) + (9,14)

N = Number of sections.

Recommended panel thickness:
.046-.125
(1,16-3,18)

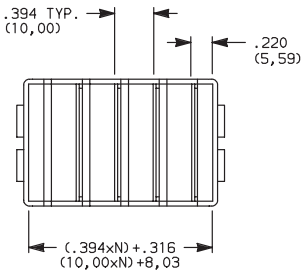
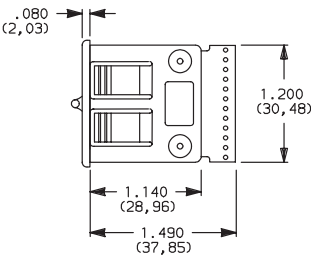
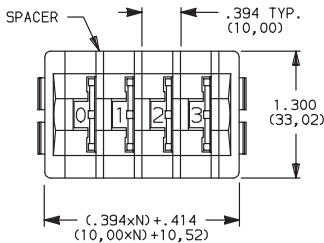


30 SWITCH ASSEMBLY W/ ENDPLATES—.315 (8,00) SECTION PITCH



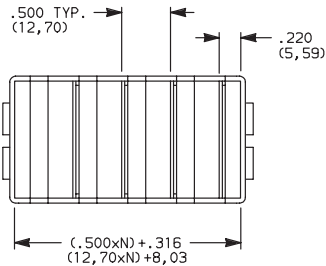
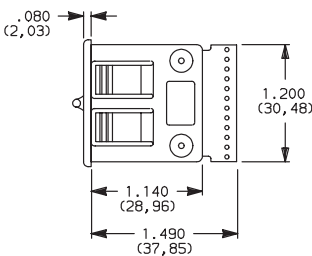
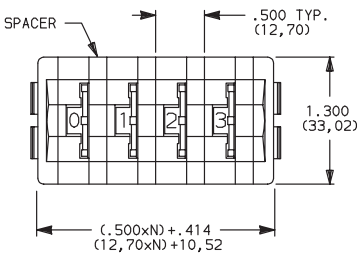
N = Number of sections.

33 SWITCH ASSEMBLY W/ ENDPLATES AND SPACER(S)—10mm SECTION PITCH



N = Number of sections.

34 SWITCH ASSEMBLY W/ ENDPLATES AND SPACER(S)—.500 (12,70) SECTION PITCH



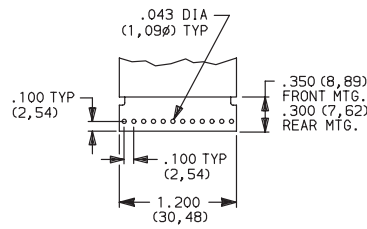
N = Number of sections.

09 SWITCH SECTION ONLY—UNASSEMBLED WITHOUT ENDPLATES OR SPACERS (Must be ordered with number of sections option "0", see Page J-9.)

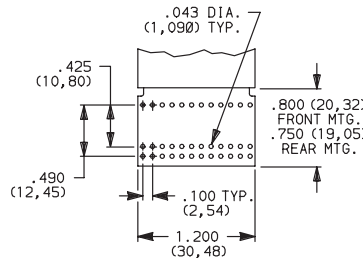
NOTE: Endplates, blank sections, spacers and assembly hardware available separately, see section L.

TERMINATIONS

0 (STD.) TYPE 0

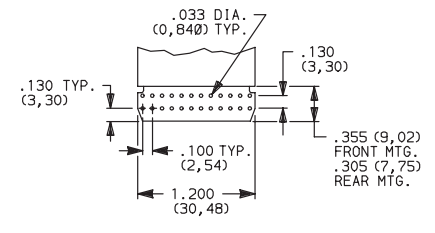


1 TYPE 1, EXTENDED TYPE 0

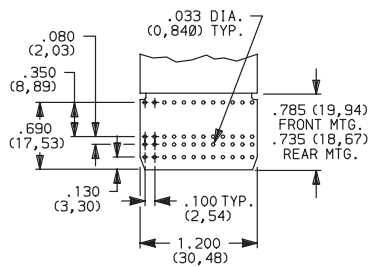


Signal traces cut except for common(s).

4 TYPE 4

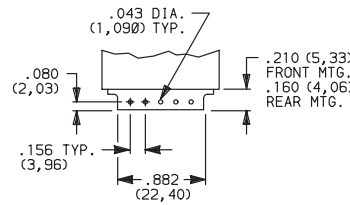


5 TYPE 5, EXTENDED TYPE 4

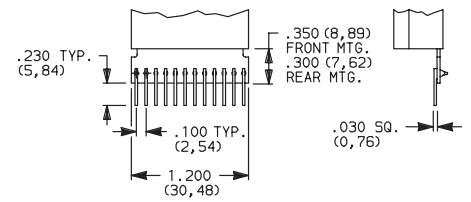


Signal traces cut except for common(s).

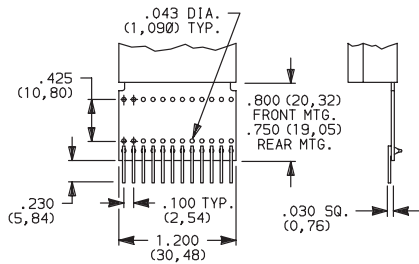
6 TYPE 6



3 TYPE 0 WITH SOLDER PINS

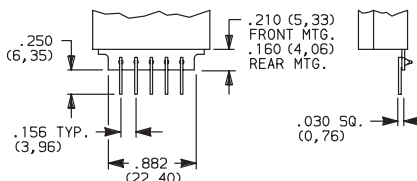


A TYPE 1 WITH SOLDER PINS

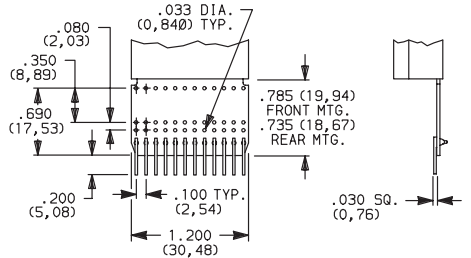


Signal traces cut except for common(s).

B TYPE 6 WITH SOLDER PINS



E TYPE 5 WITH SOLDER PINS



Signal traces cut except for common(s).

9 ANY COMBINATION OF TERMINATION CONFIGURATIONS OR SPECIAL TERMINATIONS. ALSO USED WITH FUNCTION CODES 91 AND 92.

Specify on configuration form, page J-17 and consult Customer Service Center.

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, 4 & 5, see section L.

Terminal Location Numbers



FIG. 1

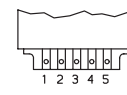


FIG. 2

NOTE: See function codes, pages J-9 and J-10, for signal locations.

C&K 3 Series Thumbwheel Switches

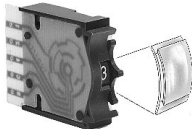
COLOR/MARKING/STOPS

- 0** (STD.) MATTE BLACK HOUSING (Gloss black wheel with white characters; no stops.)
 - 1** MATTE GRAY HOUSING (Gloss black wheel with white characters; no stops.)
 - 5** MATTE BLACK HOUSING (Translucent off-white wheel with black characters; no stops, recommended with ILLUMINATION option.)
 - 6** MATTE GRAY HOUSING (Translucent off-white wheel with black characters; no stops, recommended with ILLUMINATION option.)
 - 9** SPECIAL COLOR OR MARKINGS FOR HOUSING OR WHEEL, STOPS (Specify on CONFIGURATION FORM, Page J-17 and consult Customer Service Center).
- AVAILABLE COLORS: Marking: white, black
Body: black, gray (matte finish)
Wheel: white, black, red, orange, yellow, green, blue, brown, gray (gloss finish)

NOTE: Stop pins are available separately, see section L.

SEAL

- 0** (STD.) 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, recommended with ILLUMINATION option).
- 3** SEALED SWITCHING CONTACTS AND DUST LENS. (options 1 and 2 recommended with ILLUMINATION option).
- 9** SEALING VARIATIONS, SECTION TO SECTION WITHIN ASSEMBLY. (Specify on CONFIGURATION FORM, page J-17 and consult Customer Service Center. Also specify with blank sections, where seal is not applicable).



Dust Lens

ILLUMINATION

- NONE** (STD.) NO ILLUMINATION
- 3** RED LED
- 5** YELLOW LED
- 6** GREEN LED

NOTE: Illumination option recommended with COLOR/MARKING/STOPS options 5, 6 and SEAL options 2 and 3.
Illumination option not available with termination options with solder pins, Internal LED illuminates wheel characters for low-light visibility.

Thumbwheel & Pushwheel

Configuration Form

GRAY SHADED AREAS TO BE FILLED IN BY C&K.

C&K CATALOG PART NO.

3

C&K PART NUMBER

C&K PART NUMBER

COMPANY NAME

CUSTOMER
PRINT
REVISION:

ADDRESS TEL.#

CUSTOMER CONTACT DATE

DETAILS:

ORIGINATED BY SALES REP.

THUMBWHEEL SECTIONS	NO. OF SEC.	FUNCTION CODE—TERMINATIONS— COLOR/MARKING/STOPS/SEAL— ILLUMINATION ENTER OPTION CODES IN APPROPRIATE BOXES. FUNCTION CODES INCLUDE BLANK SECTIONS (SEE CATALOG PAGE NO TAG).	DESCRIBE IN APPROPRIATE ROW
	1	3 - -	
	2	3 - -	
	3	3 - -	
	4	3 - -	
	5	3 - -	
	6	3 - -	
	7	3 - -	
	8	3 - -	
	9	3 - -	
	10	3 - -	
	11	3 - -	

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 ____