

# 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
- 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  $\Omega$  typ. initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: 10<sup>9</sup>  $\Omega$  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.

Series

3 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  
23 Complement of BCD, 10 position  
27 BCD, 10 position  
31 BCD, 10 position  
71 BCH, 16 position

Mounting Style

00 Snap-in, front mount  
09 Snap-in, front mount\*  
10 Rear mount  
19 Rear mount\*  
20 Rear mount  
29 Rear mount\*

Terminations

0 Type 0  
1 Type 1, extended type 0  
N Solder pins with .100" spacing\*\*  
P Solder pins with .156" spacing\*\*  
9 Any combination

Color/Marking/Stops

0 Matte black body, gloss black wheel, white marking

Seal

0 No seal  
1 Sealed contacts  
2 Dust lens  
3 Sealed contacts & dust lens

Thumbwheel

M

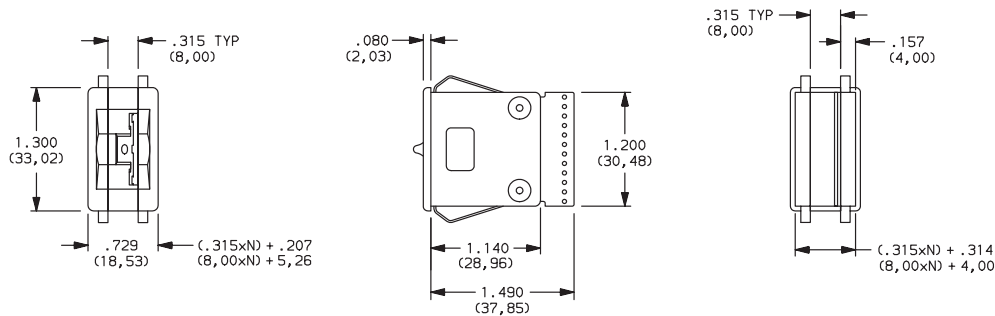
\*X9 mounting styles must be ordered with '0' number of sections.

\*\* 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).

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

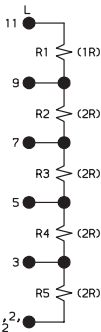
- 11 DECIMAL-1 POLE; 10 POSITION
- 14 RESISTOR DECADE; 1-2-2-2-2 CODE (RESISTORS NOT SUPPLIED)
- 21 BCD 1-2-4-8; 10 POSITION

| W<br>H<br>E<br>E<br>L    | 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                        |                                      |   |   |   |   |   |   |   |   | ● | ● |
| TERM. LOCATION           |                                      |   |   |   |   |   |   |   |   |   |   |
| 2 3 4 5 6 7 8 9 10 11 12 |                                      |   |   |   |   |   |   |   |   |   |   |

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

| W<br>H<br>E<br>E<br>L | SWITCH CIRCUIT |   |   |   |   |   |   |   |   |   | C |
|-----------------------|----------------|---|---|---|---|---|---|---|---|---|---|
|                       | 0              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |   |
| 0                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 1                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 2                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 3                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 4                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 5                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 6                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 7                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 8                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 9                     | ●              | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| TERM. LOCATION        |                |   |   |   |   |   |   |   |   |   |   |
| 11 9 7 5 3 1,2 12     |                |   |   |   |   |   |   |   |   |   |   |

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



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

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

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



Third Angle  
Projection

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<br>H<br>E<br>E<br>L | SIGNALS CONN. TO<br>COMM. SIG. C |   |   |   |
|-----------------------|----------------------------------|---|---|---|
|                       | 1                                | 2 | 4 | 8 |
| 0                     | ●                                | ● | ● | ● |
| 1                     | ●                                | ● | ● | ● |
| 2                     | ●                                | ● | ● | ● |
| 3                     | ●                                | ● | ● | ● |
| 4                     | ●                                | ● | ● | ● |
| 5                     | ●                                | ● | ● | ● |
| 6                     | ●                                | ● | ● | ● |
| 7                     | ●                                | ● | ● | ● |
| 8                     | ●                                | ● | ● | ● |
| 9                     | ●                                | ● | ● | ● |
| TERM. LOCATION        |                                  |   |   |   |

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

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

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

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

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

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

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

**71** BINARY CODED HEXADECIMAL,  
16 POSITION

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

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

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

## MOUNTING STYLE

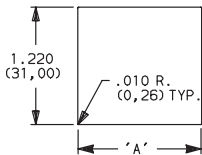
### Type 0 Snap-In Front Mount

| MOUNTING<br>STYLE | DIM. 'A'                                 |
|-------------------|------------------------------------------|
| 00                | (.315 x N) + .326<br>(8,00 x N) + (8,28) |

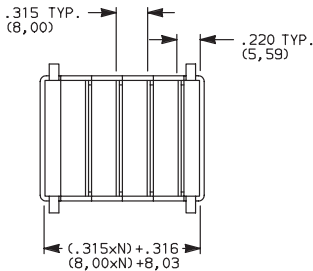
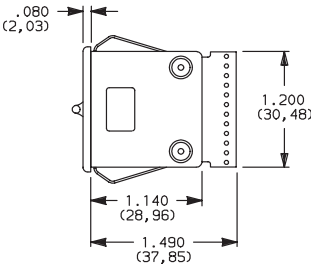
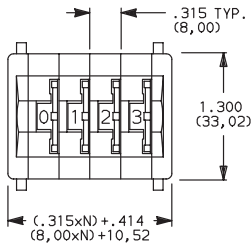
N = Number of sections.

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

#### PANEL MOUNTING



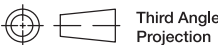
**00** SWITCH ASSEMBLY W/ ENDPLATES-.315 (8,00) SECTION PITCH



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

www.ck-components.com



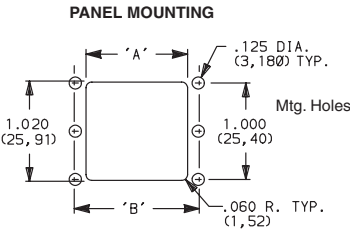
# 3 Series Thumbwheel Switches

## MOUNTING STYLE

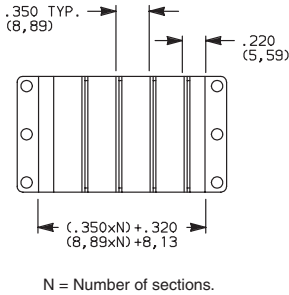
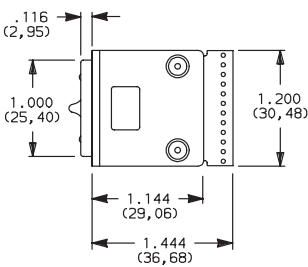
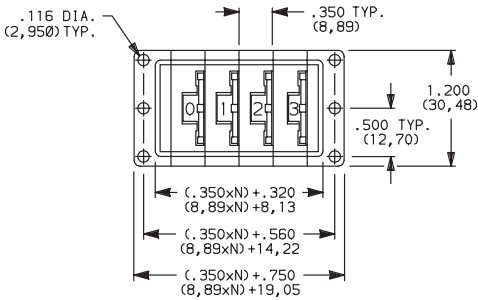
### Type 1 Rear Mount

| MOUNTING STYLE | DIM. 'A'                                 | DIM. 'B'                                  |
|----------------|------------------------------------------|-------------------------------------------|
| 10             | (.350 x N) + .340<br>(8,89 x N) + (8,64) | (.350 x N) + .560<br>(8,89 x N) + (14,22) |

N = Number of sections.  
Recommended panel thickness:  
0.46-.125  
(1,16-3,18)



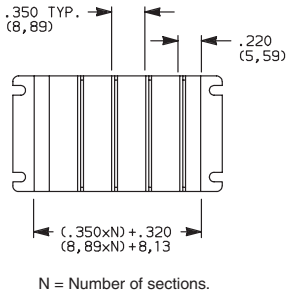
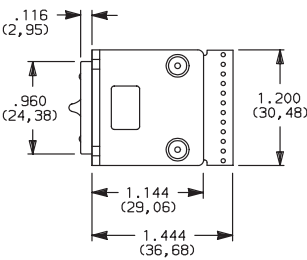
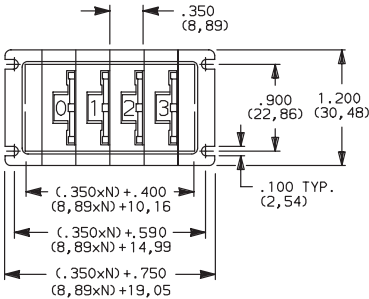
### 10 SWITCH ASSEMBLY W/ ENDPLATES-.350 (8,89) SECTION PITCH



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

### Type 2 Rear Mount

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



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

Thumbwheel



M

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



Third Angle  
Projection

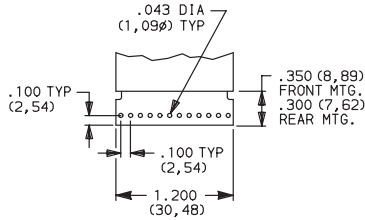
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



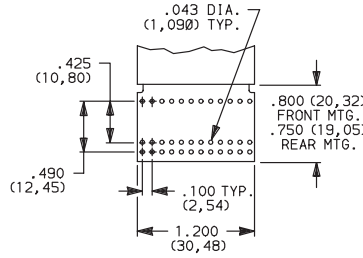
# 3 Series Thumbwheel Switches

## TERMINATIONS

### 0 TYPE 0

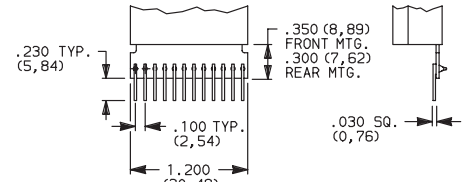


### 1 TYPE 1, EXTENDED TYPE 0



Signal traces cut except for common(s).

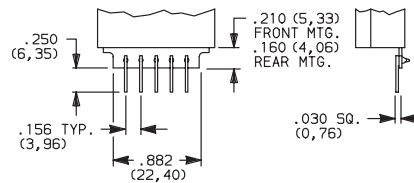
### N SOLDER PINS WITH .100" SPACING



### 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

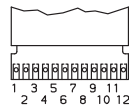


FIG. 1

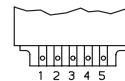


FIG. 2

**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.

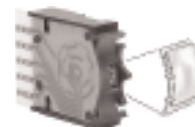
## SEAL

### 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



# 3 Series Thumbwheel Switches

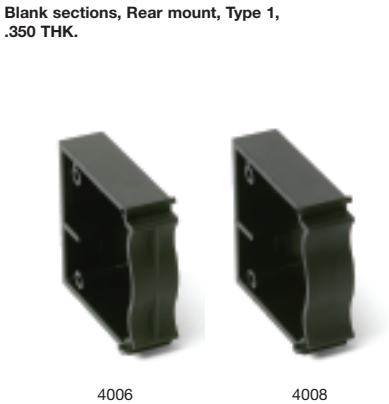
## AVAILABLE HARDWARE



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



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



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



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



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



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



M

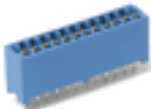


Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change

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<br>(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



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



Thumbwheel



M