# 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: $10^9$ 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.

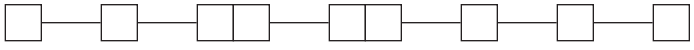
**NOTE:** Specifications and materials listed above are for switches with standard options For information on specific and custom switches, consult Customer Service Center.

* 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 N–9 thru N–12. 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*

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

**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

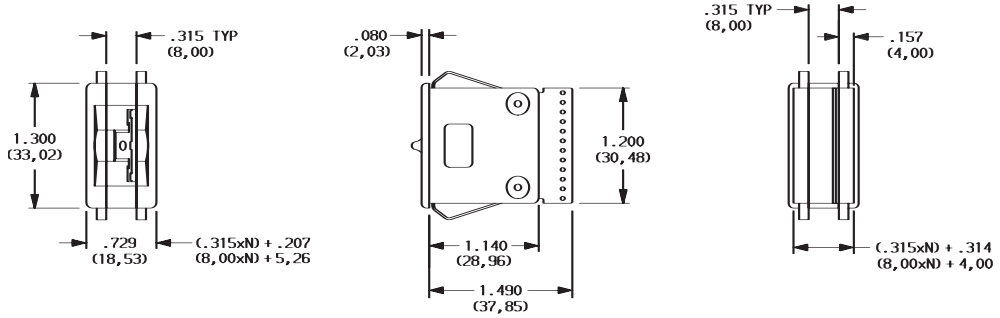
** Note: Termination option N (RoHS compliant) replaced termination option 3 (Non-RoHS compliant). Termination option P (RoHS compliant) replaced termination option B (Non-RoHS compliant).

**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

## 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 N–10 and N–11.

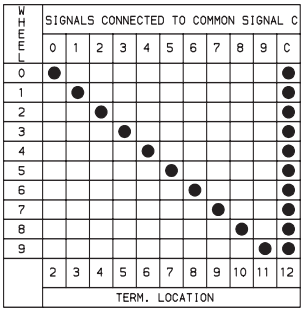
**1-8** Number of switch sections in assembly, includes endplates.

**9** More than 8 switch sections, specify on CONFIGURATION FORM, page N–15 and consult Customer Service Center.

**NOTE:** Endplates and blank sections available separately, see pages N–13 and N–14.

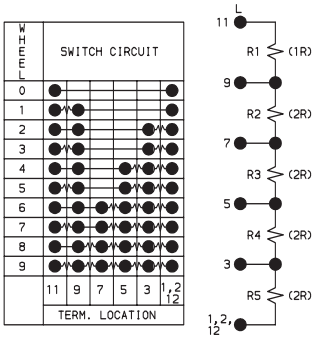
## FUNCTION CODE

**11** DECIMAL–1 POLE; 10 POSITION



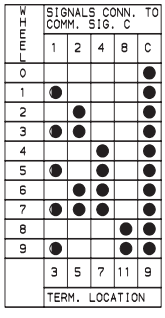

Available Terminations: 0, 1, N
See fig. 1, page N-12.

**14** RESISTOR DECADE; 1-2-2-2-2 CODE (RESISTORS NOT SUPPLIED)




Available Terminations: 1
See fig. 1, page N-12.

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




Available Terminations: 0, 1, N
See fig. 1, page N-12.

**NOTE:** For terminal location diagram, see page N-12.

Third Angle Projection

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

## FUNCTION CODE

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

| WHEEL | SIGNALS CONN. TO COMM. SIG. C | | | | |
|---|---|---|---|---|---|
| | $\overline{1}$ | $\overline{2}$ | $\overline{4}$ | $\overline{8}$ | C |
| 0 | ● | ● | ● | ● | ● |
| 1 | | ● | ● | ● | ● |
| 2 | ● | | ● | ● | ● |
| 3 | | | ● | ● | ● |
| 4 | ● | ● | | ● | ● |
| 5 | | ● | | ● | ● |
| 6 | ● | | | ● | ● |
| 7 | | | | ● | ● |
| 8 | ● | ● | ● | | ● |
| 9 | | ● | ● | | ● |
| | 3 | 9 | 11 | 5 | 7 |
| | TERM. LOCATION | | | | |

Available Terminations: 0, 1, N

See fig. 1, page N-12.

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

| WHEEL | 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: P

See fig. 2, page N-12.

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

| WHEEL | 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, N

See fig. 1, page N-12.

**71** BINARY CODED HEXADECIMAL, 16 POSITION

| WHEEL | 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, N

See fig. 1, page N-12.

**NOTE:** For terminal location diagram, see page N–12.

## MOUNTING STYLE

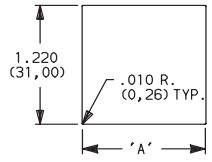
### Type 0 Snap-In Front Mount

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

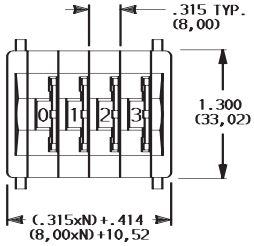
N = Number of sections.

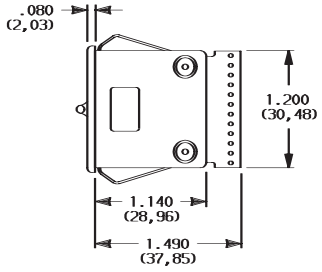
Recommended panel thickness:
0.46-.125
(1,16-3,18)

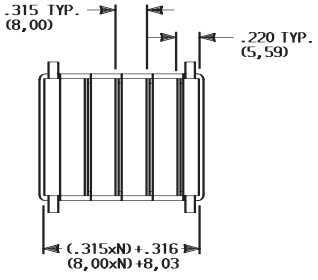
**PANEL MOUNTING**




**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 N–9.)

**NOTE:** Endplates, blank sections, spacers
and assembly hardware available separately, see pages N–13 and N–14.

Third Angle Projection

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

## MOUNTING STYLE

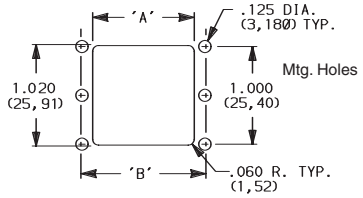
### Type 1 Rear Mount

| 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) |

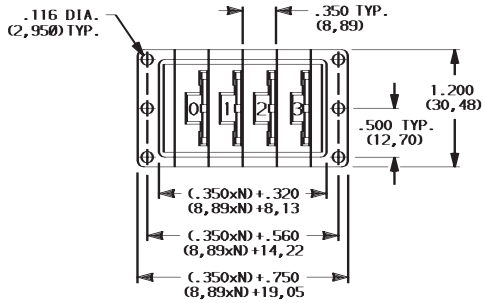
N = Number of sections.

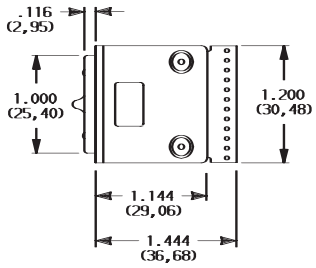
Recommended panel thickness:
0.46-.125
(1,16-3,18)

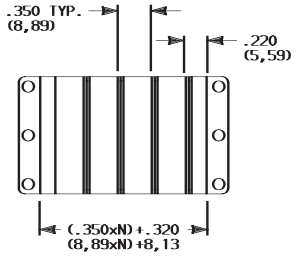
**PANEL MOUNTING**




**10** SWITCH ASSEMBLY W/ ENDPLATES–.350 (8,89) SECTION PITCH



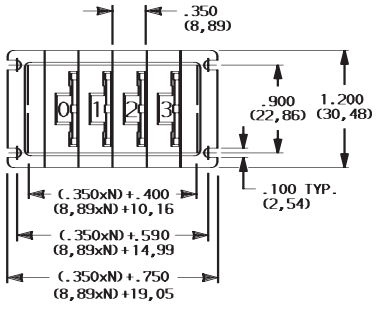



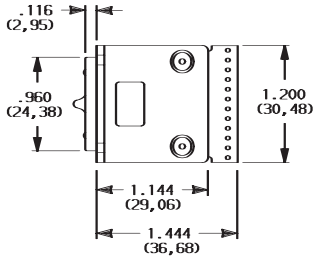

N = Number of sections.

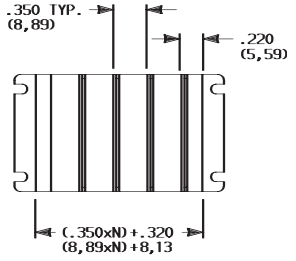
**19** SWITCH SECTION ONLY–UNASSEMBLED WITHOUT ENDPLATES OR SPACERS
(Must be ordered with number of sections option "0", see Page N–9.)

### 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 N–9.)

**NOTE:** Endplates, blank sections, spacers and assembly hardware available separately, see pages N–13 and N–14.



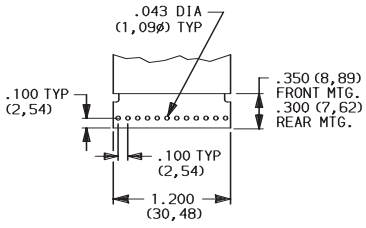
Third Angle Projection

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

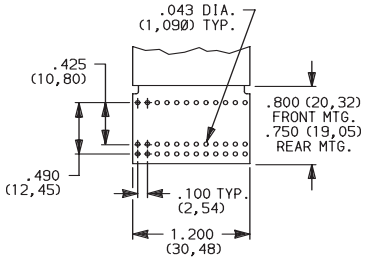
# 3 Series
# Thumbwheel Switches

## TERMINATIONS

**0** TYPE 0

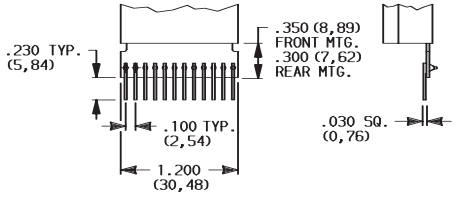



**1** TYPE 1, EXTENDED TYPE 0




Signal traces cut except for common(s).

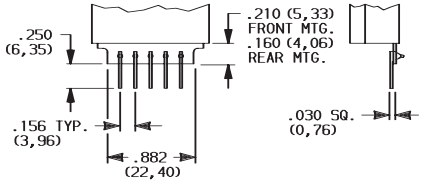
**N** SOLDER PINS WITH .100" SPACING




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

Specify on configuration form, page N–15 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 N–14.

**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

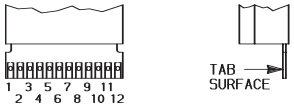



FIG. 1

FIG. 2

**NOTE:** See function codes, pages N–9 and N–10, 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 N–14.

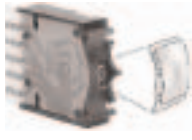
## SEAL

**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: Inch (mm)*
*Specifications and dimensions subject to change*

## 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

# 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

# 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 SECTIONS | NO. OF SEC. | FUNCTION CODE – TERMINATIONS – COLOR/MARKING/STOPS/SEAL – ILLUMINATION<br>ENTER OPTION CODES IN APPROPRIATE BOXES. FUNCTION CODES INCLUDE BLANK SECTIONS (SEE PAGES M-9 & M-10). | DESCRIBE IN APPROPRIATE ROW |
|---|---|---|---|
| 1 | 1 | 3 – _ _ – – _ _ _ _ | |
| 2 | 2 | 3 – _ _ – – _ _ _ _ | |
| 3 | 3 | 3 – _ _ – – _ _ _ _ | |
| 4 | 4 | 3 – _ _ – – _ _ _ _ | |
| 5 | 5 | 3 – _ _ – – _ _ _ _ | |
| 6 | 6 | 3 – _ _ – – _ _ _ _ | |
| 7 | 7 | 3 – _ _ – – _ _ _ _ | |
| 8 | 8 | 3 – _ _ – – _ _ _ _ | |
| 9 | 9 | 3 – _ _ – – _ _ _ _ | |
| 0 | 10 | 3 – _ _ – – _ _ _ _ | |
| 1 | 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 _____

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

**Данный компонент на территории Российской Федерации**

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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