


Thumb/Pushwheels Product Selection Guide

Thumbwheel & Pushwheel



M

| | |
|----------------------------------|---|
| Thumbwheel/ Pushwheel |  |
| Series | 3 |
| Switch Type | Thumbwheel |
| Sealed | • |
| Dust Lens | • |
| Max. Current | 1 Amp |
| Actuators | |
| Pushwheel Actuator | |
| Thumbwheel Actuator | • |
| Section Pitches | |
| 10mm Section Pitch | • |
| .300 Section Pitch | .315/.350 |
| .400 Section Pitch | |
| Number of Positions | |
| 10 Position | • |
| 16 Position | • |
| Mounting Options | |
| Board Mount w/Pins | • |
| Front Mount | • |
| Rear Mount | • |
| Snap-in | • |
| Page Number | M-3 |

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

*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

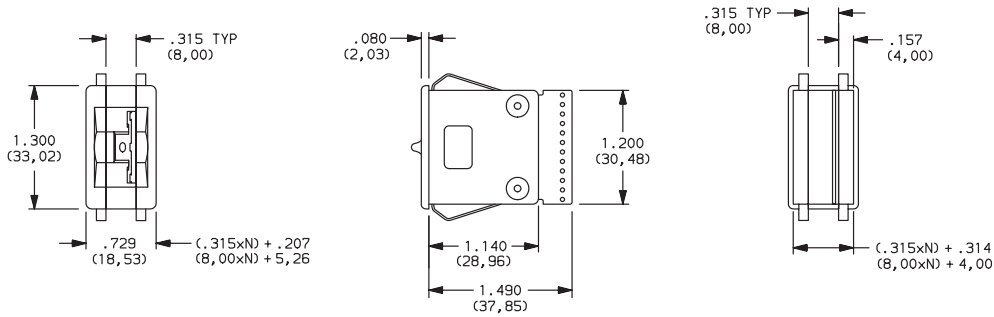


M

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

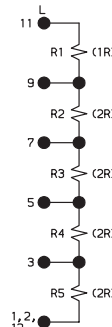
- 11** DECIMAL-1 POLE; 10 POSITION
- 14** RESISTOR DECADE; 1-2-2-2-2 CODE (RESISTORS NOT SUPPLIED)
- 21** BCD 1-2-4-8; 10 POSITION

| W H E E L | 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.

| W H E E L | 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.



| 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 | ● | | | | ● | | | | | |
| | 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.

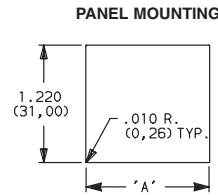
MOUNTING STYLE

Type 0 Snap-In Front Mount

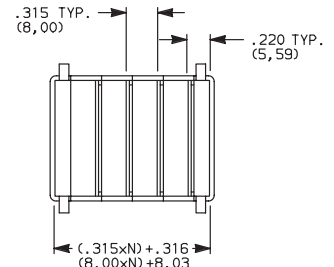
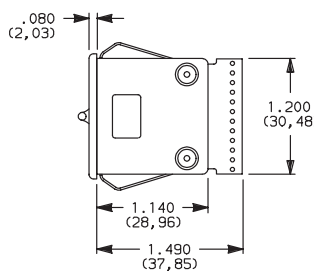
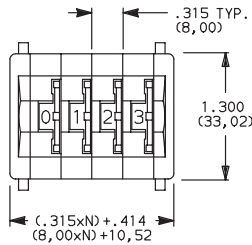
| MOUNTING STYLE | DIM. 'A' |
|----------------|--|
| 00 | (.315 x N) + .326 (8,00 x N) + (8,28) |

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

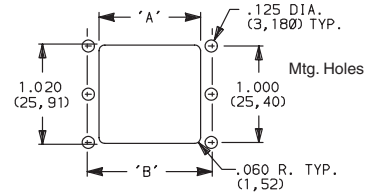
Type 1 Rear Mount

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

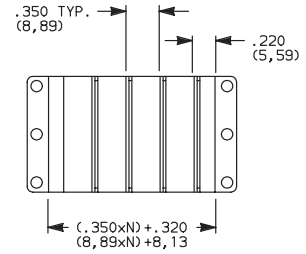
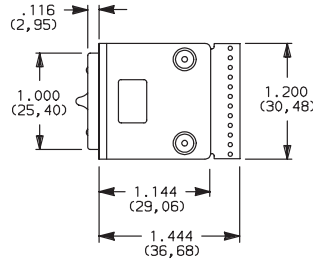
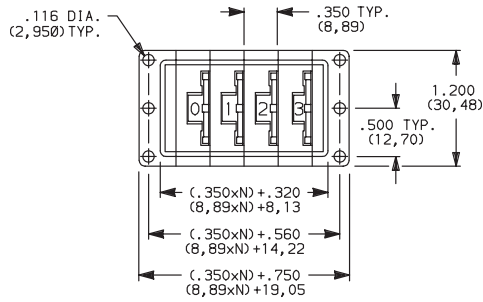
N = Number of sections.

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

PANEL MOUNTING



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



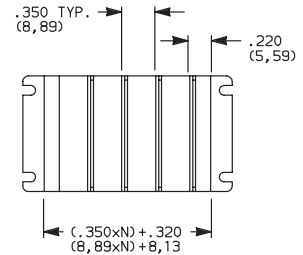
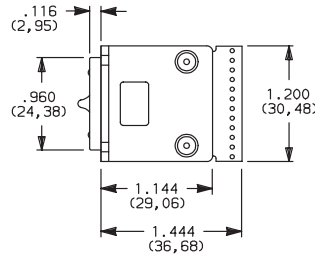
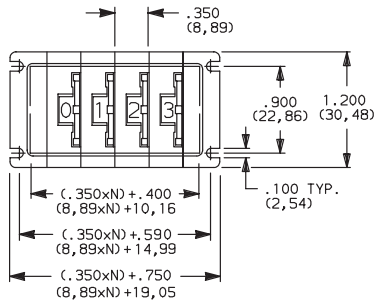
N = Number of sections.

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

Thumbwheel & Pushwheel

Type 2 Rear Mount

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



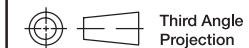
N = Number of sections.

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.



Third Angle Projection

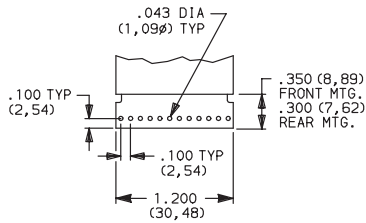
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change



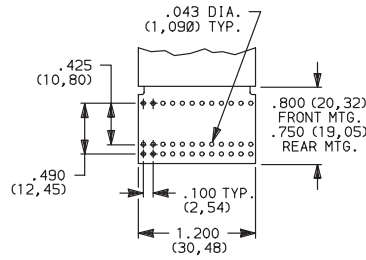
3 Series Thumbwheel Switches

TERMINATIONS

0 TYPE 0

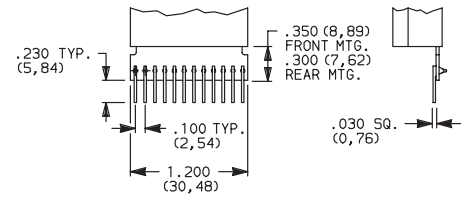


1 TYPE 1, EXTENDED TYPE 0



Signal traces cut except for common(s).

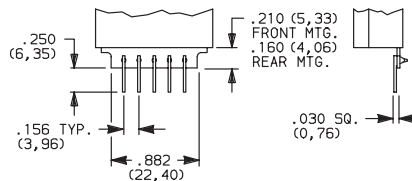
N SOLDER PINS WITH .100" SPACING



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

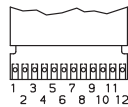


FIG. 1

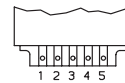


FIG. 2

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



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.



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

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



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

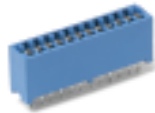


Dimensions are shown: Inches (mm)
 Specifications and dimensions subject to change

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



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 _____












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 <small>ENTER OPTION CODES IN APPROPRIATE BOXES. FUNCTION CODES INCLUDE BLANK SECTIONS (SEE PAGES M-9 & 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"/> | |

Thumbwheel & Pushwheel



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