BULLETIN 800T
30.5mm
Type 4/13, Watertight/Oiltight

Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>2</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Push Buttons, Non-Illuminated</td>
<td>2</td>
</tr>
<tr>
<td>Push Buttons, Illuminated</td>
<td>2</td>
</tr>
<tr>
<td>Selector Switches</td>
<td>3</td>
</tr>
<tr>
<td>Pilot Lights</td>
<td>3</td>
</tr>
<tr>
<td>Push-Pull and Push-Pull/Twist</td>
<td>3</td>
</tr>
<tr>
<td>Other Devices</td>
<td>4</td>
</tr>
<tr>
<td>Contact Blocks</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical Ratings</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Ratings</td>
<td>6</td>
</tr>
<tr>
<td>Environmental Ratings</td>
<td>7</td>
</tr>
<tr>
<td>Standards</td>
<td>7</td>
</tr>
<tr>
<td>Manufacturers</td>
<td>7</td>
</tr>
</tbody>
</table>
1. General
   a. Devices covered in this specification guide include, but are not limited to: push buttons, selector switches, pilot lights, and push-pull and push-pull/twist emergency stop units.
   b. Operators shall mount in a standard 1-13/64 in. hole.
   c. Non-illuminated operators shall allow a maximum of eight circuits and illuminated operators shall allow a maximum of 4 circuits.

2. Construction
   a. Push Buttons, Non-Illuminated
      - Push buttons shall be offered with flush head, extended head, and mushroom head caps. The cap shall be available in green, black, orange, grey, white, red, blue, and yellow colors.
      - The push button panel mounting bushing shall be die cast from a non-hexavalent chromated zinc alloy material.
      - The push button base plate shall be molded of a glass-filled nylon composite material.
      - The push button assembly shall incorporate a non-lubricated diaphragm seal to protect the actuating mechanism components from liquids, corrosives, and abrasives. The seal shall be molded from a black Nitrile material.
      - The push button cap shall be molded from a thermoplastic polyester resin that is resistant to corrosive agents. The cap shall be non-removable to maintain integrity of the internal seal.
      - The push button internal return spring shall be formed from stainless steel.
      - The push button panel mounting bushing and diaphragm seal shall be assembled to the base plate with four rivets, ensuring secureness and tamper resistance.
      - The push button shall be supplied with three black Nitrile gaskets to ensure the enclosure rating integrity is maintained as installed.
      - The push button mounting ring shall be formed from anodized aluminum.
      - Thrust washer shall be molded of a mineral filled nylon composite material.
      - Trim washer shall be die cast from a non-hexavalent chromated zinc alloy material.
   b. Push Buttons, Illuminated
      - Push buttons shall be offered with flush head, guarded head, and mushroom head caps. The cap shall be available in amber, blue, clear, green, red, and white colors.
      - Illumination options shall include incandescent, LED, and neon.
      - Power module options for illumination shall include full voltage and transformer.
      - The push button panel mounting bushing shall be die cast from a non-hexavalent chromated zinc alloy material.
      - The push button base plate shall be molded of a glass-filled nylon composite material.
      - The push button lens cap shall be molded from a transparent nylon compound that is resistant to corrosive agents.
      - The lens cap shall incorporate a black Nitrile sealing gasket.
      - The push button internal return spring shall be formed from stainless steel.
      - The push button shall incorporate a K-seal to protect the actuating mechanism components from liquids, corrosives, and abrasives.
      - The push button panel mounting bushing shall be assembled to the base plate with four rivets, ensuring secureness and tamper resistance.
      - The push button shall be supplied with three black Nitrile gaskets to ensure the enclosure rating integrity is maintained as installed.
      - The push button mounting ring shall be formed from anodized aluminum.
      - Thrust washer shall be molded of a mineral filled nylon composite material.
      - Trim washer shall be die cast from a non-hexavalent chromated zinc alloy material.
c. Selector Switches
- Selector switches shall be offered in 2-position, 3-position, and 4-position configurations.
- Selector switches shall be available with options for standard knob, knob lever, metal wing lever, and cylinder lock operators.
- Selector switches shall be offered in maintained, spring return from left, spring return from right, and spring return from both position configurations.
- The selector switch shall be available with 23 different cams.
- The selector switch panel mounting bushing shall be die cast from a non-hexavalent chromated zinc alloy material.
- The selector switch shall incorporate a cam design that creates a positive detent, preventing the switch from hanging up between two positions.
- The indexing assembly spring shall be constructed from stainless steel.
- The selector switch shall incorporate a K-seal to protect the actuating mechanism components from corrosives and abrasives.
- The selector switch panel mounting bushing shall be assembled to the base plate with four rivets, ensuring secureness and tamper resistance.
- The selector switch shall be supplied with three black Nitrile gaskets to ensure the enclosure rating integrity is maintained as installed.
- The selector switch mounting ring shall be formed from anodized aluminum.
- Thrust washer shall be molded of a mineral filled nylon composite material.
- Trim washer shall be die cast from a non-hexavalent chromated zinc alloy material.

d. Pilot Lights
- Pilot lights shall be available in standard, push-to-test, and dual input offerings.
- Illumination options shall include incandescent, LED, and neon.
- Power module options for illumination shall include full voltage and transformer.
- The pilot light panel mounting bushing shall be die cast from a non hexavalent chromated zinc alloy material.
- The pilot light base plate shall be molded of a glass-filled nylon composite material.
- The pilot light cap shall be molded from a transparent nylon compound that is resistant to corrosive agents.
- The lens cap shall incorporate a black Nitrile sealing gasket.
- Push-to-test pilot lights shall incorporate an additional K-seal to protect the actuating mechanism components from liquids, corrosives, and abrasives.
- The pilot light panel mounting bushing shall be assembled to the base plate with four rivets, ensuring secureness and tamper resistance.
- The pilot light shall be supplied with three black Nitrile gaskets to ensure the enclosure rating integrity is maintained as installed.
- The pilot light mounting ring shall be formed from anodized aluminum.
- Thrust washer shall be molded of a mineral filled nylon composite material.
- Trim washer shall be die cast from a non-hexavalent chromated zinc alloy material.

e. Push-Pull and Push-Pull/Twist
- Push-pull and push-pull/twist devices shall be available in non-illuminated and illuminated offerings.
- The operator shall be provided with a mushroom head cap.
- The cap shall be molded from a thermoplastic polyester (non-illuminated devices) or transparent nylon compound (illuminated devices) that is resistant to corrosive agents.
- The cap shall incorporate a black nitrile sealing gasket.
- Illumination options shall include incandescent and LED.
– Power module options for illumination shall include full voltage and transformer.
– The panel mounting bushing shall be die cast from a non-hexavalent chromated zinc alloy material.
– The base plate shall be molded of a glass filled nylon composite material.
– Push-pull and push-pull/twist devices shall incorporate a K-seal to protect the actuating mechanism components from liquids, corrosives, and abrasives.
– The panel mounting bushing shall be assembled to the base plate with four rivets, ensuring secureness and tamper resistance.
– Push-pull and push-pull/twist devices shall be supplied with three black Nitrile gaskets to ensure the enclosure rating integrity is maintained as installed.
– The mounting ring shall be formed from anodized aluminum.
– 2-position devices with normally closed late break contacts shall comply with EN418 and EN60947-5-5 for emergency stop applications.
– Thrust washer shall be molded of a mineral filled nylon composite material.
– Trim washer shall be die cast from a non-hexavalent chromated zinc alloy material.

f. Other Devices
Other devices such as toggle switches, potentiometer units, selector push buttons, and cluster pilot lights shall be of similar construction to the devices identified above.

g. Contact Blocks

– Standard
  • Contacts shall be rated for 10 A (thermal continuous).
  • Contact blocks shall be available in single circuit and double circuit configurations.
  • The contact block body shall be molded from a chemically resistant glass-filled polyester material.
  • The contact body side plate shall be molded from a chemically resistant transparent clear nylon material, allowing visibility to the contacts for inspection.
  • Contacts shall be made from pure fine silver for corrosion resistance and reliable switching.
  • The spanner shall employ a flexible bifurcated design, improving contact reliability by providing four current paths and limited contact bounce.
  • The spanner guide and return springs shall be formed from stainless steel.
  • The wiring terminal shall employ a self-lifting saddle clamp design and shall accommodate connection of two wires (#18…14 AWG) in addition to ring and fork terminals.
  • Contact blocks shall be available with IP2X finger-safe protection.

– High Power
  • Contacts shall be rated for 24 A (thermal continuous).
  • Contact blocks shall be available in single circuit configurations.
  • The contact block body shall be molded from a chemically resistant glass filled polyester material.
  • Contacts shall be made from a 90-10 silver-nickel alloy for corrosion resistance and reliable high power switching.
  • The spanner guide shall be formed from stainless steel. The return spring shall be formed from music wire to provide a strong, low stress spring.
  • The wiring terminal shall employ a self-lifting saddle clamp design and shall accommodate connection of two wires (#18…10 AWG) in addition to ring and fork terminals.
– Pentafurcated
• Contacts shall be rated for 2.5 A AC/1.0 A DC (thermal continuous).
• Contact blocks shall deliver reliable direct drive switching of low voltage signals to 5V, 1 mA.
• Contact blocks shall be available in single circuit and double circuit configurations.
• The contact block body shall be molded from a chemically resistant glass-filled polyester material.
• The contact body side plate shall be molded from a chemically resistant transparent blue nylon material, allowing visibility to the contacts for inspection.
• The spanner guide and return springs shall be formed from stainless steel.
• The spanner shall employ a flexible pentafurcated design, improving contact reliability and limited contact bounce.
• The wiring terminal shall employ a self-lifting stainless steel saddle clamp design and shall accommodate connection of two wires (#18…14 AWG) in addition to ring and fork terminals.
• The contact block shall offer IP2X finger-safe protection.

– Sealed Switch
• Contacts shall be rated for 5 A (thermal continuous).
• Contact blocks shall be suitable for installation in Division 2/Zone 2 hazardous location environments.
• Contact blocks shall be available in single circuit and double circuit configurations.
• The contact block body shall be molded from a chemically resistant glass-filled polyester material.
• Contacts shall be hermetically sealed in a glass cylinder for reliable switching in highly contaminated and corrosive environments.
• Contacts shall be made from tungsten for welding resistance.
• The wiring terminal shall employ a self-lifting stainless steel saddle clamp design and shall accommodate connection of two wires (#18…14 AWG) in addition to ring and fork terminals.
• Contact blocks shall be available with IP2X finger-safe protection.

– Stackable Sealed Switch
• Contacts shall be rated for 2.5 A (thermal continuous).
• Contact blocks shall be suitable for installation in Division 2/Zone 2 hazardous location environments.
• Contact blocks shall be available in single circuit and double circuit configurations.
• The contact block body shall be molded from a chemically resistant glass-filled polyester material.
• Contacts shall be hermetically sealed in a glass cylinder for reliable switching in highly contaminated and corrosive environments.
• Contacts shall be made from tungsten for welding resistance.
• The wiring terminal shall provide IP2X finger safety.
• The wiring terminal shall employ a self-lifting saddle clamp design and shall accommodate connection of two wires (#18…14 AWG).
• The contact block shall offer IP2X finger-safe protection.

– Logic Reed
• Contact blocks shall be suitable for installation in Division 2/Zone 2 hazardous location environments.
• Contact blocks shall be available in single circuit and double circuit configurations.
• The contact block body shall be molded from a chemically resistant thermoset material.
• Contacts shall be hermetically sealed in a glass cylinder for reliable switching in highly contaminated and corrosive environments.
• Contacts shall be made from two inert precious metals for corrosion resistance.
• The wiring terminal shall employ a self-lifting saddle clamp design and shall accommodate connection of two wires (#18…14 AWG).
• Contact blocks shall be available with IP2X finger-safe protection.

3. Mechanical Ratings
   a. The device shall operate successfully with a vibration level of 10G max., 10…2000 Hz, 1.52mm displacement (peak-to-peak) max.
   b. The device shall operate successfully with a shock event defined as half cycle sine wave for 11 ms at a level greater than or equal to 25G, and with no damage occurring at 100G.
   c. The device shall be suitable for installation in enclosures rated NEMA Type 1, 4, 12, and 13 (IEC 529 IP 66/65).
   d. Device types shall provide the following minimum life cycles:
      – Momentary, non-illuminated push buttons: 10 000 000
      – Momentary, illuminated push buttons: 250 000
      – Push-pull/twist to release push buttons: 250 000
      – Non-illuminated selector switches: 1 000 000
      – Illuminated selector switches: 200 000
      – Potentiometer units: 100 000
      – All other device types: 200 000
   e. Pilot lights shall deliver the following operational hours (AC current):
      – Incandescent: 5000…20 000 hours
      – LED: 100 000 hours
      – Neon: 15 000 hours

4. Electrical Ratings
   a. The device shall have a dielectric strength of 2200V for one minute (1300V for one minute - logic reed contact blocks).
   b. The device contacts shall have an electrical design life of 1 000 000 cycles at max. rated load (200 000 cycles at max. rated load - logic reed contact blocks).
   c. Contact blocks shall have the following ratings:
      – Standard
         • \( I_{th} \): 10 A AC/2.5 A DC
         • Utilization Category: A600 (AC-15) / Q600 (DC-13)
         • Minimum: 24V, 24 mA
      – High Power
         • \( I_{th} \): 24 A AC/2.5 A DC
         • Pilot Duty: 120V AC, 12 A; 24V DC, 10 A
         • Motor Ratings: 120V AC, 1.5 Hp; 240V AC, 3 Hp; 24V DC, 10 A FLA/60 A LRA
      – Pentafurcated
         • \( I_{th} \): 2.5 A AC/1.0 A DC
         • Utilization Category: C300 (AC-15) / R150 (DC-13)
         • Minimum: 5V, 1 mA
– Sealed Switch
  • $I_{th}$: 5 A
  • Utilization Category: B600 (AC-15) / P300 (DC-13)
  • Minimum: 5V, 1 mA
– Stackable Sealed Switch
  • $I_{th}$: 2.5 A
  • Utilization Category: C300 (AC-15) / Q150 (DC-13)
  • Minimum: 5V, 10 mA; 24V, 1 mA
– Logic Reed
  • Minimum - DC: 5V, 1 mA
  • Maximum - DC: 30V, 0.06 A; AC: 150V, 0.15 A
– Snap Action
  • Utilization Category: A300
– Time Delay
  • Utilization Category: B150

5. Environmental Ratings
   a. The device shall perform reliably in a temperature range of -40…+131 °F (-40…+55 °C).
   b. The device shall be capable of being stored in a temperature range of -40…+185 °F (-40…+85 °C).
   c. The device shall perform reliably at a humidity level of 50% at +104 °F (+40 °C).

6. Standards
   The 30.5 mm Type 4/13 push buttons shall comply with the following standards:
   a. UL508
   b. CSA C22.2 No. 14
   c. EN 60947-5-1

7. Manufacturers
   The following manufacturer models shall be accepted:
   a. Allen-Bradley Bulletin 800T