

OTTO[®]

Expect Excellence.

SWITCHES • GRIPS • JOYSTICKS

Hall Effect Technology
Operator Control Modules
Value Added Products And Solutions



AEROSPACE AND MILITARY GRIPS



Cobra Style Grip



B8 Style Grip

MILITARY FLIGHT CONTROL GRIPS:

- B8 & Cobra style grips are made in accordance with MIL-DTL-25561
- Most ergonomic versions on the market
- Cast aluminum or non-reflecting, non-hygroscopic, rugged injection molded grips
- Choice of termination styles—from integral connectors to wire harnesses
- Threaded disconnect or tube mounting
- Can be populated with MIL qualified switches, standard or custom configurations



MILITARY GROUND VEHICLE GRIPS:

- Custom machined heads available to fit standard handles
- Backlighting options
- Custom head can be outfitted with a variety of OTTO switches



Commander Grip

THROTTLE CONTROL GRIPS:

- Control for fixed-wing aircraft
- Various switches can be chosen to meet high cycle requirements



Systems Grip



Throttle Grip

AEROSPACE AND MILITARY GRIPS

HELICOPTER CYCLIC & COLLECTIVE GRIPS:

- Grips have thin-wall, investment cast aluminum construction for high strength & low weight
- Modular construction
- Custom heads & switch mounting plates can be fabricated to fit standard handles
- Available with switch access panel for easy repair & maintenance
- A variety of button colors & style options available
- Transducer & electromechanical trim switch options



Collective Grip with Thumbwheel Switch and NVG Backlighting



Collective Grip Head



Cyclic Grip



Modular Design



Cyclic Grip



Cyclic Grips with Custom Switch Guards



SMALL AND MEDIUM UNIVERSAL GRIPS

G3 SMALL & MEDIUM UNIVERSAL GRIPS:

- Standard design eliminates the need for tooling charges
- Compatible with the OTTO JH and JHM series Hall Effect joysticks
- Accommodate a full line of pushbutton, rocker, toggle, HP Hall Effect & HPL proportional output series of switches
- Various mounting & termination options available
- Includes mounting adapter with boot ring
- Standard catalog codeable and custom configurations

STANDARD CONFIGURATIONS



CUSTOM CONFIGURATIONS



HEAVY EQUIPMENT COMMERCIAL GRIPS

CONTOUR GRIPS



Shown with
JHM Joystick

CONTOUR GRIPS:

- Ergonomic design reduces muscle strain and fatigue
- Customizable switch configurations on the front, side and back of grip
- Left-handed, right-handed or universal orientation
- Accommodates virtually any OTTO switch
- Compatible with OTTO JH and JHM series Hall Effect joysticks

SOFT TOUCH GRIPS



Left-handed
Orientation

Universal
Orientation

Right-handed
Orientation

HEAVY EQUIPMENT & MATERIAL HANDLING GRIPS:

- Rugged injection molded grip can be outfitted with a variety of OTTO switches
- Ergonomic design for extended use
- Custom designs including termination and mounting
- Left-handed, right-handed or universal orientation
- Soft touch options available



PALM GRIPS



TRACTOR GRIPS

FLIGHT CONTROL GRIPS AND DUAL GRIPS

STANDARD FLIGHT CONTROL GRIPS:

- Available in three versions:
 - Left hand with hand rest
 - Right hand with hand rest
 - Right hand with no hand rest
- Made with thin-wall, investment cast aluminum construction
- Incorporates switch access panel for easy repair & maintenance

FLIGHT CONTROL GRIPS



G2-0216



G2-0217



G2-0218



Standard Configurations

DUAL GRIPS

DUAL GRIPS:

- Durable, lightweight game style grip
- Ergonomic design
- Standard USB or serial interface
- Readily available options include HTL series joysticks and pushbutton switches
- Excellent proportional control
- Switches sealed to IP68S
- Switches provide excellent EMI/RFI shielding



SEALED SWITCH MODULES:

- Incorporates keypad functionality
- Up to 5 positions, IP68S sealed
- Use in grip, front panel or handheld device
- Top mount or rear mount
- LED backlighting available
- Standard or custom legends available



TC-3
(Ribbon Cable)



TC-4
(Flying Leads)



TC-5 with Legends
(FPC)



TC-5 in a
Left-Handed
Contour Grip

OPERATOR CONTROL MODULES (OCM):

- Multi-use device with joystick and keypad functionality
- Can include virtually any OTTO switch
- Use of CAN communication protocol
- OTTO can provide 3D prototypes of the design prior to tooling
- Robust to handle the rigors of construction, mining, agriculture and forestry equipment

Small OCM
with Keypad



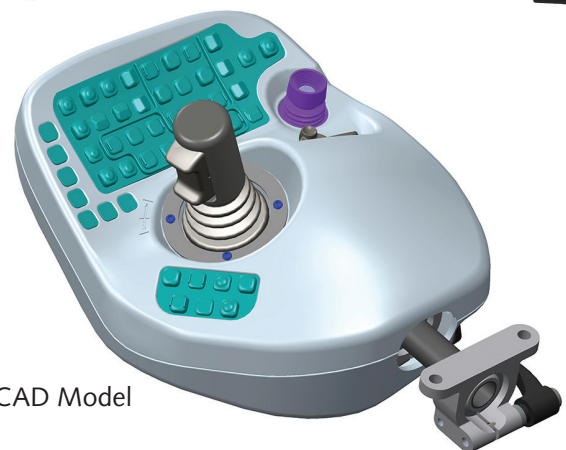
Small OCM
with
Touch Pad



OCM with Keypad
and Hall Effect Controls



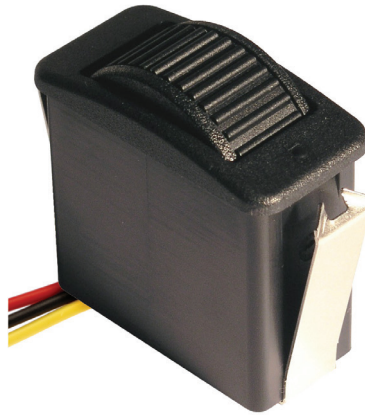
OCM CAD Model



HALL EFFECT THUMBWHEEL SWITCHES

HTW RETURN TO CENTER THUMBWHEELS:

- Hall Effect proportional output thumbwheel
- PC pin or wire termination
- 8 output options
- 3 million cycle rotational life
- Excellent EMI/RFI immunity
- Electronics sealed to IP68S
- Detent options available
- Redundant option available



Knurled Wheel HTW



Paddle Wheel HTW



Paddle Wheel HTWE

HTWE RETURN TO END THUMBWHEELS:

- Hall Effect proportional output thumbwheel
- PC pin or wire termination
- 6 output options
- 1 million cycle rotational life
- Excellent EMI/RFI immunity
- Electronics sealed to IP68S
- Redundant option available

HTWF FRICTION HOLD THUMBWHEELS:

- Hall Effect thumbwheel
- PC pin or wire termination
- 8 output options
- 250,000 cycle life, full forward to full backward with center detent
- Maintained control positioning
- Excellent EMI/RFI immunity
- Electronics sealed to IP68S
- Redundant option available



Paddle Wheel HTWF



Knurled Wheel HTWF

HALL EFFECT THUMBWHEELS AND ROCKERS

HTWM RETURN TO CENTER THUMBWHEELS:

- Offers same performance and features as HTW but with shorter behind panel depth
- Ideal for use in grip, armrest and panel applications



Paddle Wheel HTWM



Knurled Wheel HTWM

HTWME RETURN TO END THUMBWHEELS:

- Offers same performance and features as HTWE but with shorter behind panel depth
- Ideal for use in grip, armrest and panel applications



Knurled Wheel HTWME

HPL-R ROCKERS:

- Uses two linear output Hall Effect pushbutton switches
- 10 million cycle life
- Reliable contactless switching
- Wire or PC pin termination



HPL-R Rocker

HALL EFFECT ROCKERS (U2-452):

- Proportional output
- Momentary action
- 2.5 million cycle life
- Electronics sealed to IP68S
- Wire termination



U2-452 Hall Effect Rocker

HFNR ROCKERS:

- Hall Effect forward/neutral/reverse rocker
- 3 million cycle life, full forward to full backward
- Choice of bezel and button colors
- LED backlighting options
- Electronics sealed to IP68S
- Outstanding EMI/RFI immunity
- Snap-in panel mounting—accepts multiple panel thicknesses



HFNR Rockers

HALL EFFECT FINGER JOYSTICKS & PADDLES

HTL/HTLT FINGER JOYSTICKS:

- Hall Effect finger joystick
- Performs like a full size, dual axis joystick
- Designed for grip, armrest & panel mounting
- Available in 2-way, 4-way and 360° styles
- Wire or pinned terminations
- Redundant outputs available
- 1 million cycles (HTL)
3 million cycles (HTLT)
- Electronics watertight to IP68S
- Outstanding EMI/RFI immunity
- Pushbutton option (HTLT)



HTL4 with Bat Handle Style Button



HTL2 with Tall Concave Stadium Style Button



HTLT with Pushbutton



HTL2 with Low Profile Button

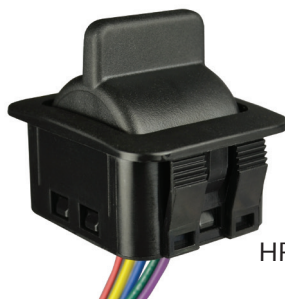


HTL4 with Castle Style Button



HPW Lever Style

HPW Ergonomic Lever Style



HPW Paddle Style

HPW PADDLES:

- Hall Effect self-centering single axis actuator
- Provides linear change in voltage output in either direction from center
- Designed for grip, armrest & panel mounting
- Proven contactless analog output Hall Effect technology
- 8 output options
- Up to 5 million cycle mechanical life
- Electronics watertight to IP68S
- Outstanding EMI/RFI immunity

HALL EFFECT JOYSTICKS

JH HALL EFFECT JOYSTICKS:

- Designed around the rugged mechanism of a traditional hydraulic joystick
- Up to 15 million cycle mechanical life
- Single axis, dual axis and z-axis (JH and JHT) available
- Outstanding EMI/RFI immunity
- Multiple output options
- CAN, J1939, USB, Ethernet and serial output options
- Redundant options available

JH Large Joystick
shown with Small
Universal Grip



JHM Medium
Joystick with
Big Round Handle



JHM Medium
Joystick with
Hall Effect
Rocker



JHS-F Single Axis
Friction Hold Joystick
(Return-to-Center
Style also Available)



JHT Miniature
Z-Axis Joystick with
Two Pushbuttons



JHT Miniature
Joystick with a
Pushbutton



ELECTROMECHANICAL PUSHBUTTON SWITCHES

ELECTROMECHANICAL PUSHBUTTONS:

- Seal options include MIL-PRF-8805 Design 2 and Design 3, IP64, IP68S and IP69K
- Momentary, alternate and latching action available
- Variety of housing and mounting styles
- Variety of button types, colors and illumination options
- Military qualified parts available including thousands qualified to MIL-PRF-8805/110

ILLUMINATED PUSHBUTTONS



LP3-3 Custom with Green LED



LP3-E Exposed Dome with Amber LED



LP3-F Flush Dome with Red LED



LP3-F with Amber LED and Legend



LP3-6



LP5-6 Rear Mount with Green LED



LP7-D Raised Dome with Red LED and Matte Finish



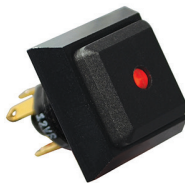
LP7-D Flush Dome with Blue LED



LP9 Flush Button Style with Green LED



LP9-5 Fully Illuminated with Legend



LP7-D Square Dome with Red LED



LP9 Group with White LEDs



LP9-6 Raised Dome Button Style

VANDAL RESISTANT ILLUMINATED PUSHBUTTONS



LP3-A with Red LED and Black Aluminum Case



LP5-A with Deep Green LED and Black Aluminum Case



LP5-A with Blue LED and Black Aluminum Case



LP3S-A Shorter Behind Panel with Aluminum Case



LP5-V with Green LED and Stainless Steel Case

ELECTROMECHANICAL PUSHBUTTON SWITCHES

PUSHBUTTONS



PE Momentary Action MIL-PRF-8805/96



P1-8 Momentary Action MIL-PRF-8805/3



P2-1 Three Position, Two Step Momentary Action



P3-6 Sealed Momentary Action



P3-3 Sealed Momentary Action



P4-3 Auxiliary Actuator for Basic Switches



P7 Subminiature Series Momentary Action MIL-PRF-8805/110



P3-D Sealed Flush Dome Momentary Action



Custom P3 with Wire Leads



P5-D Alternate Action Flush Dome, Sealed Options



P5-1 Alternate Action, Sealed Options



P7-A Subminiature Square Momentary Action



P7-D with Flush Dome, Sealed Options



P7-D5 Square Momentary Action



P5-3 Alternate Action, Sealed Options



P8-V Compact Momentary Action Vandal Resistant



P8-8 Compact Momentary Action (Push Pull Version)



P9C Lower Cost P9



P9-A Small Bezel Momentary Action



P9 Series - Sealed Momentary Action Also Available with Matte Finish



P9M Latching Action



P9-2 with Raised Dome and White Case

HALL EFFECT PUSHBUTTON SWITCHES

HP7 HALL EFFECT PUSHBUTTONS:

- Momentary action (normally high or low)
- 10 million cycle life
- Moistureproof & dusttight to IP64 or watertight to IP68S
- Choice of termination styles
- Mechanical detent available for tactile feedback
- Stylish dome-shaped buttons in 9 colors
- Great for applications that require repeated “jogging” and other continuous operations such as those found in material handling equipment



Raised Dome
HP7



Raised Dome HP7



Exposed
Dome HP7



Flush Dome HP7



Lower Cost HP7C



HPL-3

5/8" Thread Front Mount
with Dome Button



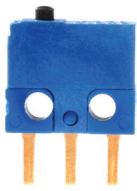
HPL-4

15/32" Thread
Rear Mount

HPL HALL EFFECT PROPORTIONAL PUSHBUTTONS:

- Provides the user an output proportional to the travel of the button
- Operator can control the motion of a device as well as the speed of the movement
- Programmable output options, e.g. 0.5 to 4.5 volts
- 10 million cycles full stroke per button (IP64)
- Watertight per IP68S available
- Choice of termination styles
- Front or behind panel mounting
- Rocker version available
- Ideal for valves and variable speed drives, and can be used in industrial control, heavy equipment and material handling applications

BASIC SWITCHES



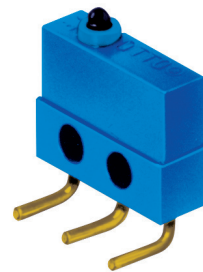
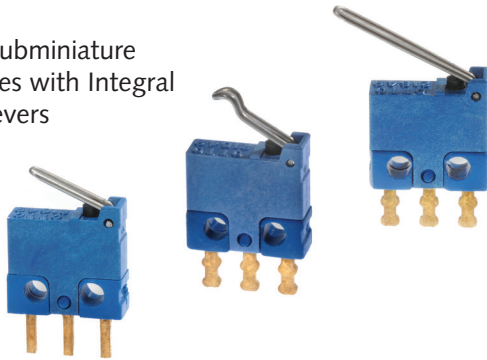
B1 Ultra-Subminiature Basic Switch



BASIC SWITCHES:

- Miniature, subminiature and ultra-subminiature sizes available
- Low level to 10A loads
- Wide temperature range, -65°C up to 205°C
- Long operating life
- UL recognized & CSA certified
- Pushbutton, toggle and lever actuations are available
- MIL spec per M8805 and commercial grades

B1-5 Ultra-Subminiature Basic Switches with Integral Actuating Levers



B2 Subminiature Basic Switch



B2-5 Subminiature Basic Switches with Integral Actuating Levers

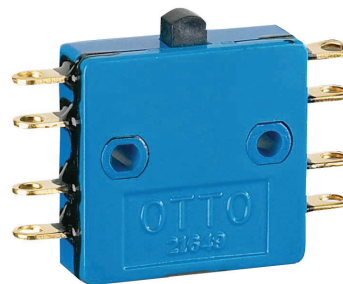


B5 Miniature Basic Switch



B3 Subminiature Basic Switch with Auxiliary Lever Actuator

B3 Subminiature Basic Switch



End Terminal Style



Front Terminal Style

B5-7 Miniature Basic Switches

LIMIT SWITCHES

P6 LIMIT SWITCHES:

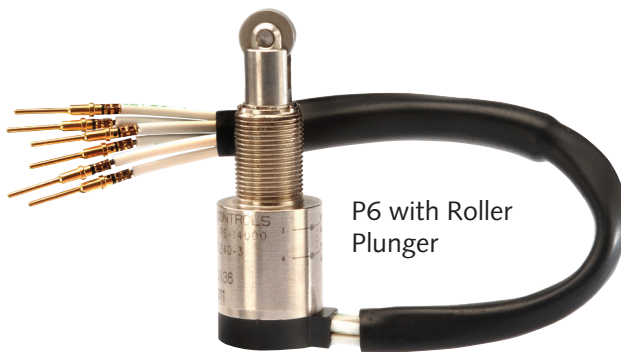
- One-piece stainless steel, aluminum or nickel plated brass housing
- Sealed against immersion and corrosive atmospheres, up to MIL-PRF-8805 Design 4
- Sealed at plunger with O-rings
- Sealed at base with a glass to metal seal
- EMI reduction construction
- Choice of pin or roller plunger
- Choice of axial or radial leads
- Low level up to 10A
- Choose military versions qualified to MIL-PRF-8805/39, MIL-PRF-8805/40, MIL-PRF-8805/43, MIL-PRF-8805/100 and MIL-PRF-8805/104 or choose a modified military version specific to your application



P6-3 Double Pole



P6 with Pin Plunger Radial Leads



P6 with Roller Plunger

P6 with Roller Plunger Axial Leads



P6 with Pin Plunger Axial Leads



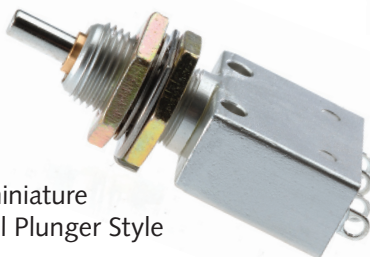
P6 with Custom Paint



P6-4 with Roller Plunger, Lower Cost Version



P6-4 with Ball Actuator, Lower Cost Version



P6-3 Subminiature Over-Travel Plunger Style



P6-3 Subminiature Lever Style

TRANSDUCERS, ROTARY & SLIDE SWITCHES

TRANSDUCERS:

- Strain gauge based, force transducer
- Provides analog output proportional to the force applied to the button
- Enclosure dusttight to M8805 Design 2
- Applications include flight control of aircraft, operating ground vehicles, and target acquisition



J2-S2 with Flat Button Style



J2-S3 with Conical Hat Button Style



J3 with Short Concave Button Style



SL Slide Switches

SL SLIDE SWITCHES:

- Three-position center off with momentary or maintained switch action is available in any combination
- Single and double pole, double throw switch configurations
- Available in commercial and military grades
- Low level up to 5A loads
- Dusttight to MIL-PRF-8805 Design 2
- Choice of raised or flush contoured buttons in a variety of colors
- FAA/PMA available

R2 ROTARY SWITCHES:

- 2 or 3 positions in all combinations of momentary and maintained action
- Plastic or soft touch knob options in various colors
- Sealed watertight per IP68S
- Unique lighting options - up to 3 independent LED light positions
- Commonly used on front panels in heavy equipment, marine, process control and instrumentation markets



R2 Rotary Switches



ELECTROMECHANICAL ROCKER SWITCHES

ROCKER SWITCHES:

- Snaps into industry standard panel opening
- Seal options include IP68S and IP69K
- Low level up to 20A
- Single and double pole circuits
- Mating connectors available on some styles
- Incandescent, neon and LED illumination options
- Standard and custom legends available
- UL recognized & CSA certified
- Precision designed to comply with standards established for appliance, marine (ignition protection) and off-road vehicles



K1 Single Pole Rockers



K2 Double Pole Rockers



K2 with Paddle



K3 Rockers for Rugged Environments



K3P Panel Plug with Indicator Lights



U2 Custom Rocker



K5 Rockers for Rugged Environments

TOGGLE SWITCHES

TOGGLE SWITCHES:

- Seal options include IP64, IP68S and IP69K
- Single, double and up to 8 pole (T1) circuits
- MIL spec and UL recognized versions available
- Lever lockout options
- Non-teasible versions
- Panel snap-in versions available
- Wide variety of toggle styles, bushing styles and terminal styles
- Suitable for applications in military, off-highway, aviation, commercial and industrial equipment



TE with Black Finish



TE with 15/32" Bushing



Unsealed T1 with Three Positions



Sealed T1 with Three Positions



T3 with 15/32" Bushing and Lever Lock in Center Position



T3 Double Pole with 1/4-40 Bushing



T3 with Concave Button



T7 - Double Pole with Bushing Seal



Thin T71 Single Pole



Custom T7 with Long Bat Handle



K4 Snap-in Toggles



Standard T9



Custom T9 with Lever Lock and Black Bat Handle

MINI AND LARGE TRIM SWITCHES

MINI TRIM SWITCHES:

- Toggle switches in 2-way, 4-way, 4-way plus pushbutton and 8-way versions
- Military grade and commercial versions
- Seal options up to IP68S and MIL-PRF-8805 Design 3
- Momentary action on all except momentary/maintained on T1-T style
- Detent and positive click options
- Many button styles available
- Press fit mounted into control grips or panel, or threaded body



T1 Mini Trim



T1-T Mini Trim



SPLIT TRIM SWITCHES:

- Each two-way momentary action trim switch can operate independently or simultaneously
- Commercial and military grades available
- Ideal for use in aircraft, medical, unmanned vehicle, construction and agricultural equipment



T4-TCL Mini Trim



T4-TCN Mini Trim



T4 Mini Trim



SPT Split Trim



T5 Mini Trim



T8-T Mini Trim



T8 Mini Trim

LARGE TRIM SWITCHES:

- Toggle and pushbutton action in one switch
- Available in 2-way, 2-way plus pushbutton, 4-way and 4-way plus pushbutton versions
- Seal options up to MIL-PRF-8805 Design 4
- Military grade and commercial versions
- Low level options
- Many button styles available



T2-0004



T4-0111



T5-0026



T5-0128



T5-0138

TRIGGER SWITCHES



U2-016
MIL-PRF-8805/111-01

TRIGGER SWITCHES:

- Available in single-step and two-step styles
- Military grade and commercial versions
- Detent options
- Low level options
- Actuation forces up to 8 lbs.
- Anodized aluminum or thermoplastic materials
- Suitable for grips, handheld equipment and power tools



U2-025
MIL-PRF-8805/111-04



U2-037
Two-Step Sealed



U2-082
MIL-PRF-8805/111-03



U2-054 Single-Step



U2-084
MIL-PRF-8805/111-06



U2-169 Two-Step



U2-605 Two-Step, Sealed
Anodized Aluminum Button and Housing

NOTEWORTHY DESIGNS

INTEGRATED FLIP GUARD

Combines a pushbutton and flip guard into one assembly, are extremely robust and offer a reliable panel seal up to IP68S. The guard cover can be maintained open or closed or have spring return to close. Available for both commercial and military applications.



U2-351 FLIGHT GRIP ROCKER SWITCH

This design includes a shallow mounting depth and utilizes OTTO's B3 basic switches per MIL-PRF-8805/101.



U2-326 PARK BRAKE

This heavy duty push-pull switch was designed specifically for off-road heavy duty equipment.



P1-90158 EMERGENCY PUSHBUTTON

Designed to prevent inadvertent actuation. The operator's finger must be directed into the protective cup before the OTTO 4 pole pushbutton switch can be actuated. Edge backlighted.



P8 CUSTOM CALL BUTTON

This custom call button uses the P8 pushbutton switch style "G" case.

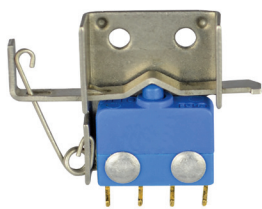
U2-451 TRIM SWITCH

This low level trim switch is a double pole, double throw, center-off, three-position momentary switch. Ideal for the aviation industry.



P1-30075 LARGE DIAMETER PUSHBUTTON

Red anodized aluminum alloy mushroom style button. Button is mounted on a Type P1 style "C" body.



U2-053 DOOR INTERLOCK SWITCH

Features a defeat function. The assembly features an OTTO B3 double break snap-action basic switch.



P3 SHROUDED PUSHBUTTON

Designed to avoid accidental actuation of the switch because the actuation occurs below the protective shroud.

T3 TOGGLE WITH CUSTOM ENGRAVED BAT HANDLE

Add a custom engraved legend, lettering or logo to the bat handle of this miniature toggle.



T1 TOGGLE WITH IWTS TERMINATION

Choose an integrated wire termination system (IWTS) for ease of installation and maintenance. An internal retainer locks the wires into place, eliminating the need to solder.



ACCESSORIES AND HARDWARE



SHROUDS

Shrouds can be added to pushbutton switches to guard against inadvertent actuation.

HEXNUTS AND WASHERS

Mounting hardware such as keyway washers, internal tooth lockwashers, standard hexnuts and wire-locking hex nuts are available, including MIL spec.



FLIP GUARDS

The flip guard assembly offers a maintained or momentary function for pushbutton switches.



Standard colors are red and black

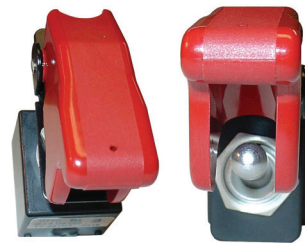
ROCKER AND ROTARY SWITCH CONNECTORS

The panel assembly process will go much more smoothly when these connectors are used, and swapping out a switch is easy.



SEALING BOOTS

Choose from dozens of sealing boots in a variety of colors and sizes for pushbutton and toggle switches when additional protection is needed. Military qualified boots available.



TOGGLE GUARDS

Features spring loaded covers that lock in either the open or closed positions. Military qualified parts available.

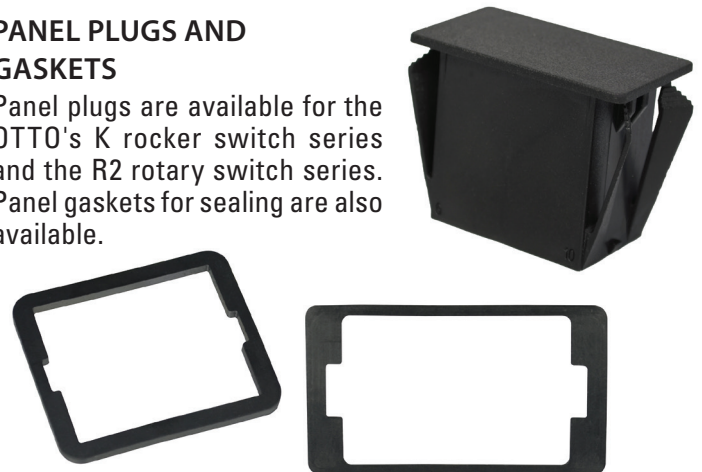
ANODIZING

Anodizing provides a decorative, durable, corrosion-resistant finish to metal surfaces. Available in clear or a variety of colors.



PANEL PLUGS AND GASKETS

Panel plugs are available for the OTTO's K rocker switch series and the R2 rotary switch series. Panel gaskets for sealing are also available.



OTTO[®]

Expect Excellence.

For nearly 60 years, OTTO has built a reputation for innovative engineering capabilities and adherence to the highest quality standards. Our switches and controls perform every day in some of the toughest applications in the world, from Military Ground Support Grips, Throttle Quadrant and Control Grips for fixed-wing aircraft, to Helicopter Cyclic and Collective Grips. OTTO houses a complete MIL-I-45208, as well as ISO 17025 (A2LA), onsite test lab facility with environmental, mechanical, electrical and audio test capabilities. Registration to ISO 9001, ISO 14001, AS9100 and FAA (including EASA) Part 145 Repair Station. Our experience in the design and manufacturing of precision switches and grips have made us a supplier to a multitude of applications and industries. With an emphasis on sealed-switch technology and custom electromechanical switch design and development, OTTO has a solution to meet the most demanding applications found in construction, agriculture, military, aerospace and material handling.



Far Part 145



EASA Part 145



ISO 14001:2015
ISO 9001:2015



AS9100:2016



ISO 17025

www.ottoexcellence.com

2 East Main Street, Carpentersville, IL 60110
847-428-7171 • info@ottoexcellence.com



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