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## General Purpose and Micro-Voltage/Current Load Switch

■ Requires only 22 mm mounting depth
■ All LEDs, lamps, legends and pushbutton units replaceable without tools
■ Oil-resistant version (satisfies IP65) also available, making it ideal for machine tools subject to oil splashes

## Ordering Information



Lighted Switches




## 

PUSHBUTTON UNITS

## Non-Lighted/Mushroom Type Switches

Round

| Switch Type | Degree of Sealing | Color | Part Number |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Round | Rectangular | Square |
| Convex | IP40 | Red | A3BT-502R | A3BJ-502R | A3BA-502R |
|  |  | Yellow | A3BT-502Y | A3BJ-502Y | A3BA-502Y |
|  |  | Green | A3BT-502G | A3BJ-502G | A3BA-502G |
|  |  | White | A3BT-502W | A3BJ-502W | A3BA-502W |
|  |  | Blue | A3BT-502A | A3BJ-502A | A3BA-502A |
|  |  | Black | A3BT-502B | A3BJ-502B | A3BA-502B |
|  | Oil-tight IP65 | Red | A3BT-512R | A3BJ-512R | A3BA-512R |
|  |  | Yellow | A3BT-512Y | A3BJ-512Y | A3BA-512Y |
|  |  | Green | A3BT-512G | A3BJ-512G | A3BA-512G |
|  |  | White | A3BT-512W | A3BJ-512W | A3BA-512W |
|  |  | Blue | A3BT-512A | A3BJ-512A | A3BA-512A |
|  |  | Black | A3BT-512B | A3BJ-512B | A3BA-512B |


| LAMPS |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Type | Color | Part Number |  |  |  |
|  |  | 5 VDC | 12 VDC | 24 VDC |  |
| LED Light | Red | A3B-005R | A3B-012R | A3B-024R |  |
|  | Yellow | A3B-005Y | A3B-012Y | A3B-024Y |  |
|  | Green* | A3B-005G | A3B-012G | A3B-024G |  |
|  | White | A3B-005W | A3B-012W | A3B-024W |  |
| Incandescent Lamp |  | 14 V | 28 V |  |  |
|  |  | A3B-014 | A3B-028 |  |  |

* Note: With the exception of green, all pushbutton units can be used with either LED or incandescent lamps. To avoid an undesirable hue change with green pushbutton units, use a green LED lamp with a green LED pushbutton and an incandescent lamp with a green incandescent pushbutton.

SWITCH UNITS
IP40 Cases


| Application | Contacts | Switch Action | Terminal | Part Number |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Rectangular |  |  | Square | Round |
|  |  |  |  | Standard | Large flange | 3-dir. barrier | Standard | Standard |
| Generalpurpose | SPST-NO + SPST-NC | Momentary | Solder | A3BJ-7011-1 | A3BP-7011-1 | A3BK-7011-1 | A3BA-7011-1 | A3BT-7011-1 |
|  |  | Alternate | - | A3BJ-7021-1 | A3BP-7021-1 | A3BK-7021-1 | A3BA-7021-1 | A3BT-7021-1 |
|  | DPST-NO + | Momentary | - | A3BJ-7031-1 | A3BP-7031-1 | A3BK-7031-1 | A3BA-7031-1 | A3BT-7031-1 |
|  | DPST-NC | Alternate | - | A3BJ-7041-1 | A3BP-7041-1 | A3BK-7041-1 | A3BA-7041-1 | A3BT-7041-1 |
| Micro-load | SPST-NO + <br> SPST-NC | Momentary | Solder | A3BJ-7111-1 | A3BP-7111-1 | A3BK-7111-1 | A3BA-7111-1 | A3BT-7111-1 |
|  |  |  | PCB | A3BJ-7112-1 | A3BP-7112-1 | A3BK-7112-1 | A3BA-7112-1 | A3BT-7112-1 |
|  |  | Alternate | Solder | A3BJ-7121-1 | A3BP-7121-1 | A3BK-7121-1 | A3BA-7121-1 | A3BT-7121-1 |
|  |  |  | PCB | A3BJ-7122-1 | A3BP-7122-1 | A3BK-7122-1 | A3BA-7122-1 | A3BT-7122-1 |
|  | DPST-NO + <br> DPST-NC | Momentary | Solder | A3BJ-7131-1 | A3BP-7131-1 | A3BK-7131-1 | A3BA-7131-1 | A3BT-7131-1 |
|  |  |  | PCB | A3BJ-7132-1 | A3BP-7132-1 | A3BK-7132-1 | A3BA-7132-1 | A3BT-7132-1 |
|  |  | Alternate | PCB | A3BJ-7141-1 | A3BP-7141-1 | A3BK-7141-1 | A3BA-7141-1 | A3BT-7141-1 |
| For indication (without switch unit) |  |  | PCB | A3BJ-7142-1 | A3BP-7142-1 | A3BK-7142-1 | A3BA-7142-1 | A3BT-7142-1 |
| For indication (without switch unit) |  |  | Solder | M2BJ-7001-1 | M2BP-7001-1 | M2BK-7001-1 | M2BA-7001-1 | M2BT-7001-1 |
|  |  |  | PCB | M2BJ-7002-1 | M2BP-7002-1 | M2BK-7002-1 | M2BA-7002-1 | M2BT-7002-1 |

Note: 1. Can be used for both lighted and non-lighted units, except indicator.
2. Models A3BP and A3BK are available in micro-load and indication types.
3. These switch units usually are mounted with a nut. However, an optional leaf spring for snap-in mounting is also available.
4. The switch unit bears UL and CSA markings to indicate the standards by which the switch unit is recognized. The SEV marking can also be marked on the switch unit if requested.

## IP65 Cases (Oil Tight)

| Application | Contacts | Switch Action | Terminal | Part Number |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Rectangular |  |  | Square <br> Standard | Round Standard |
|  |  |  |  | Standard | Large flange | 3-dir. barrier |  |  |
| Generalpurpose | SPST-NO | Momentary | Solder | A3BJ-7011-3 | A3BP-7011-3 | A3BK-7011-3 | A3BA-7011-3 | A3BT-7011-3 |
|  | SPST-NC | Alternate | Solder | A3BJ-7021-3 | A3BP-7021-3 | A3BK-7021-3 | A3BA-7021-3 | A3BT-7021-3 |
|  | DPST-NO | Momentary | Solder | A3BJ-7031-3 | A3BP-7031-3 | A3BK-7031-3 | A3BA-7031-3 | A3BT-7031-3 |
|  | DPST-NC | Alternate | Solder | A3BJ-7041-3 | A3BP-7041-3 | A3BK-7041-3 | A3BA-7041-3 | A3BT-7041-3 |
| Micro-load | $\begin{aligned} & \text { SPST-NO + } \\ & \text { SPST-NC } \end{aligned}$ | Momentary | Solder | A3BJ-7111-3 | A3BP-7111-3 | A3BK-7111-3 | A3BA-7111-3 | A3BT-7111-3 |
|  |  |  | PCB | A3BJ-7112-3 | A3BP-7112-3 | A3BK-7112-3 | A3BA-7112-3 | A3BT-7112-3 |
|  |  | Alternate | Solder | A3BJ-7121-3 | A3BP-7121-3 | A3BK-7121-3 | A3BA-7121-3 | A3BT-7121-3 |
|  |  |  | PCB | A3BJ-7122-3 | A3BP-7122-3 | A3BK-7122-3 | A3BA-7122-3 | A3BT-7122-3 |
|  | $\begin{aligned} & \text { DPST-NO + } \\ & \text { DPST-NC } \end{aligned}$ | Momentary | Solder | A3BJ-7131-3 | A3BP-7131-3 | A3BK-7131-3 | A3BA-7131-3 | A3BT-7131-3 |
|  |  |  | PCB | A3BJ-7132-3 | A3BP-7132-3 | A3BK-7132-3 | A3BA-7132-3 | A3BT-7132-3 |
|  |  | Alternate | Solder | A3BJ-7141-3 | A3BP-7141-3 | A3BK-7141-3 | A3BA-7141-3 | A3BT-7141-3 |
|  |  |  | PCB | A3BJ-7142-3 | A3BP-7142-3 | A3BK-7142-3 | A3BA-7142-3 | A3BT-7142-3 |
| For indication (without switch unit) |  |  | Solder | M2BJ-7001-3 | M2BP-7001-3 | M2BK-7001-3 | M2BA-7001-3 | M2BT-7001-3 |
|  |  |  | PCB | M2BJ-7002-3 | M2BP-7002-3 | M2BK-7002-3 | M2BA-7002-3 | M2BT-7002-3 |

Note: 1. Can be used for both lighted and non-lighted pushbutton units, except indicator.
2. Models A3BP and A3BK are available in micro-load and indication types.
3. These switch units usually are mounted with a nut. However, an optional leaf spring for snap-in mounting is also available.
4. The switch unit bears UL and CSA markings to indicate the standards by which the switch unit is recognized. The SEV marking can also be marked on the switch unit if requested.


## ■ ACCESSORIES

| Part | Remarks | Classification | Part Number |
| :--- | :--- | :--- | :--- |
| Socket | Cannot be used with insulation cover. | Wire-wrap terminal | A3B-4101 |
|  |  | PCB terminal | A3B-4102 |
|  |  | Solder terminal | A3B-4103 |


| Part | Remarks | Part Number |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Round | Rectangular | Square |
| Switch Guard | Cannot be used with protective dust cover. Cannot be used for A3BP switch unit. | A3BT-5050 | A3BJ-5050 | A3BA-5050 |
| Protective Dust Cover | Cannot be used with switch guard. Cannot be used for A3BP switch unit. | A3BT-5060 | A3BJ-5060 | A3BA-5060 |
| Snap-in Mounting Leaf Spring | Cannot be used with mounting nut. | A3B-3001 |  |  |
| Insulation Cover | Cannot be used with socket. | A3B-3002 |  |  |
| Panel Plug | To reserve a hole cutout on a panel for future mounting. | A3BT-3003 | A3BJ-3003 | A3BA-3003 |
| Tightening Tool | Convenient for ganged installation. Do not overtighten. | A3B-3004 |  |  |
| Extractor | Aids in getting a non-slip grip when removing keytops. | A3PJ-5080 |  |  |


| Part | Remarks | Type | Opacity | Part Number |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Round | Rectangular | Square |
| Legend Panel | A single legend plate is included with the standard unit. | Dust Proof | White | A3BT-5201 | A3BJ-5201 | A3BA-5201 |
|  |  | IP40 | Transparent | A3BT-5202 | A3BJ-5202 | A3BA-5202 |
|  |  | Oil-resistant IP65 | Transparent | A3BT-5203 | A3BJ-5203 | A3BA-5203 |

## Specifications

$\qquad$

## CONTACT RATINGS

| Type | AC Resistant Load | DC Resistant Load |
| :--- | :--- | :--- |
| General purpose load | $0.5 \mathrm{~A}, 250 \mathrm{VAC}$ <br> $1 \mathrm{~A}, 125 \mathrm{VAC}$ | $1 \mathrm{~A}, 30 \mathrm{VDC}$ |
| Micro-voltage/current load | $0.1 \mathrm{~A}, 125 \mathrm{VAC}$ | $0.1 \mathrm{~A}, 30 \mathrm{VDC}$ |

Note: The minimum applicable load is 1 mA at 5 VDC.

## LED RATINGS

| Rated Voltage | Rated Current | Operating Voltage |
| :--- | :--- | :--- |
| 5 VDC | 30 mA | $5 \mathrm{VDC} \pm 5 \%$ |
| 12 VDC | 15 mA | $12 \mathrm{VDC} \pm 5 \%$ |
| 24 VDC | 10 mA | $24 \mathrm{VDC} \pm 5 \%$ |

Note: All switch models listed have a built-in current limiting resistor (for use with LED).

## LAMP RATINGS

| Rated Voltage | Rated Current | Operating Voltage |
| :--- | :--- | :--- |
| 14 V | 40 mA | 12 V |
| 28 V | 24 mA | 24 V |

## APPROVALS

UL (File No. E41515) / CSA (File No. LR45258)

| Type | Rating |
| :--- | :--- |
| General purpose load | $3 \mathrm{~A}, 250$ VAC |
|  | $5 \mathrm{~A}, 125$ VAC |
|  | 1 A, 30 VAC |
| Micro-voltage/current load | 0.1 A, 125 VAC |
|  | 0.1 A, 30 VDC |

SEV (File No. D2.21/407)

| Type | Rating |
| :--- | :--- |
| - | $5 \mathrm{~A}, 250$ VAC |

Note: The rated values approved by each of the safety standards (e.g. UL, CSA) may be different from the performance characteristics individually defined in this catalog.

## Characteristics

| Operating frequency | Mechanical | Momentary action type: 120 operations per minute max. |
| :---: | :---: | :---: |
|  |  | Alternate action type: 60 operations per minute max. |
|  | Electrical | 20 operations per minute max. |
| Insulation resistance |  | $100 \mathrm{M} \Omega \mathrm{min}$. (at 500 VDC ) |
| Contact resistance | General type | $50 \mathrm{M} \Omega$ max. 6-8 VDC at rated current or 1A |
|  | Micro-load type | $100 \mathrm{M} \Omega$ max. $6-8 \mathrm{VDC} / 0.1 \mathrm{~A}$ |
| Dielectric strength |  | $1,000 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ for 1 minute between terminals of same polarity |
|  |  | $2,000 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ for 1 minute between terminals of different polarity and also between each terminal and ground |
| Vibration | Mechanical/ malfunction durability | 10 to $55 \mathrm{~Hz}, 1.5 \mathrm{~mm}$ double amplitude |
| Shock | Mechanical durability Malfunction durability | $500 \mathrm{~m} / \mathrm{s}^{2}$ approx. ( 50 G ) |
|  |  | $50 \mathrm{~m} / \mathrm{s}^{2}$ approx. ( 15 G ) |
| Ambient temperature | Operating | $-10^{\circ}$ to $55^{\circ} \mathrm{C}$ |
| Humidity |  | $35 \%$ to 85\% RH |
| Service life | Mechanical | Momentary action type: 1,000,000 operations per min. |
|  |  | Alternate action type: 100,000 operations per min. |
|  | Electrical | See "Characteristic Data" |
| Weight (see note) |  | Approx. 7 g |

Note: The weight indicated is for the lighted type (DPST-NO + DPST-NC).

## CHARACTERISTIC DATA

## Applicable load range



Electrical service life


Note: The load range shown above is applicable only during the standard conditions.

## OPERATING CHARACTERISTICS

| Contacts | A3B -7■aワ-1 |  | A3B-7ППП-3 |  |
| :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \text { SPST-NO } \\ + \\ \text { SPST-NC } \end{gathered}$ | $\begin{gathered} \text { DPST-NO } \\ + \\ \text { DPST-NC } \end{gathered}$ | $\begin{gathered} \hline \text { SPST-NO } \\ + \\ \text { SPST-NC } \end{gathered}$ | $\begin{gathered} \text { DPST-NO } \\ + \\ \text { DPST-NC } \end{gathered}$ |
| Operating force (OF) max. | 250 g | 350 g | 400 g | 500 g |
| Releasing force (RF) min. | 30 g | 30 g | 30 g | 30 g |
| Total Travel (TT) | Approx. 3.5 mm | Approx. 3.5 mm | Approx. 3.5 mm | Approx. 3.5 mm |
| Pretravel (PT) max. | 2.5 mm | 2.5 mm | 2.5 mm | 2.5 mm |
| Lock stroke (LTA) min. (see note) | 0.5 mm | 0.5 mm | 0.5 mm | 0.5 mm |

Note: LTA denotes the distance from the free position (FP) to where the actuator locks after it reaches the operating position (OP).

## Dimensions

$\qquad$
Unit: mm (inch)

## SWITCH UNITS

The following dimensions are applicable to the switch units with solder terminals and SPST-NO+SPST-NC contact configuration:
A3BJ (M2BJ), with standard pushbutton unit*
Panel cutout (top view) (for mounting switch unit only)


A3BA (M2BA), with standard pushbutton unit*


Panel cutout (top view)


Note: 1. Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.
2. Recommended panel thickness is 1.0 to 3.2 mm .
3. Use sockets when mounting many switch units in a matrix.


A3BK, with 3-direction pushbutton unit


## Panel cutout (top view)

## A3BA, with mushroom pushbutton unit



## Panel cutout (top view)



A3BT, with mushroom pushbutton unit


Panel cutout (top view)


Note: 1. Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.
2. Recommended panel thickness is 1.0 to 3.2 mm .
3. Use sockets when mounting many switch units in a matrix.

## SOLDER TERMINALS

## SPST-NO+SPST-NC

Lighted type


Dimensions of terminal holes


Terminal arrangement (bottom view)


DPST-NO+DPST-NC
Lighted type


Dimensions of terminal holes


Terminal arrangement (bottom view)


## Indicator



Dimensions of terminal holes


Terminal arrangement (bottom view)


## PCB TERMINALS

## SPST-NO+SPST-NC

Lighted/Non-lighted type

Indicator

DPST-NO+DPST-NC
Lighted/Non-lighted type


Terminal arrangement (bottom view)



Terminal arrangement (bottom view)


Mounting hole (bottom view) (bottom view)


Mounting hole (bottom view)


## LEGEND PLATE

A3BJ


A3BA



Note: 1. Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.
2. Recommended panel thickness is 0.6 mm .
3. The materials used in the switches are polycarbonate resin in products satisfying P40, and polyarirate resin in products satisfying P65.

## - WITH SOCKET MOUNTED

(The following dimensions are applicable to the rectangular type.)


Note: When mounting the socket, the side of the socket groove is the $\mathrm{L}+$ terminal side.

## WITH INSTALLED SWITCH GUARD

## Rectangular



Panel cutout


Square, Round


- WITH MOUNTED DUST COVER


Tightening tool A3B-3004


## WITH ATTACHED INSULATION COVER

(The following dimensions are applicable to the rectangular pushbutton unit.)

After mounting the switch unit on a panel, and after tightening the mounting nut, insert the lead wires into the hole on the insulation cover before wiring. Align the insulation cover so that the cylindrical portion of the insulation cover will face the switch unit. This means that the lead wires will be inserted from the barrier side of the insulation cover. After wiring has been completed, slide the
 insulation cover over the switch unit.

## PANEL PLUG

Select the panel plug which best compliments the design of the mounting panel. The dimensions of the hole cutout for the panel plugs are the same as those of the switch unit.


Square


Round



## Assembly/Disassembly

## MOUNTING AND REPLACING THE PUSHBUTTON UNIT

## Mounting directions of the LED/lamp and pushbutton unit

The Omron pushbutton unit doubles the roles in which a pushbutton switch is normally used. The pushbutton unit may be inserted one of two ways:
(1) For operation as a lighted pushbutton switch:

Fit the LED/lamp so that its guide projection is inserted into the wider opening in the receptacle of the pushbutton unit.

(2) For operation as an indicator unit: Insert the LED/lamp guide into the narrower opening in the indicator's receptacle.


## REMOVING THE PUSHBUTTON UNIT

With your thumb and forefinger, while holding the recessed portions on both sides, firmly and steadily pull out the top of the pushbutton unit.
Pulling out the cap with pliers or a similar tool will damage the cap.


## Mounting

## NUT MOUNTING

- Insert the switch unit from the front of the panel (a rubber seal is provided for the IP65 type only) and tighten the mounting nut inserted from the rear of the panel.
- Since a projection exists on the rear portion of the switch unit, if the mounting nut cannot be fitted into position, turn the nut slightly.

- The tightening torque of the mounting nut should be less than $5 \mathrm{~kg}-\mathrm{cm}$.
- Solder the terminals after mounting the nut. Otherwise, the terminals when thickened by solder, may prevent the nut from being screwed down onto the switch unit.


## SNAP-IN MOUNTING

- Fit the spring mounting clip for snap-in mounting to the switch unit.
- Insert the tab of the spring mounting clip into the two grooves on the threaded part of the switch unit.
- Be sure to use the two spring mounting clips. Ensure that each tab is firmly inserted onto the grooves.
- Do not use the spring mounting clips for the switch unit conforming to IP65. The rubber seal may not be held in close enough contact to prevent the inflow of liquid. Use a nut to secure the switch.
- Insert the switch unit from the front of the panel, and push until you hear the clips snap into place.


## SOCKET MOUNTING

- After mounting the switch unit on the panel, secured by the mounting nut, attach the socket to the switch unit.
- In doing so, make sure that the projection on the switch unit fits in the positioning hole (at the wider side) of the socket.



Push the tab of the spring mounting clips firmly into the grooves


## Hints on Correct Use

