













































Ø25mm TWS Series Switches & Pilot Lights











































IDEC CORPORATION

ø25 TWS Series (Selection Guide)











| Function | Pushbutton | | | | |
|----------|--|--|--|---|--|
| Category | Flush | Extended | Extended with Half Shroud | Extended with Full Shroud | Mushroom |
| | Momentary/Maintained | | | | |
| Shape |      |      |      |      |      |
| Model | ABS1 AOS1 | ABS2 AOS2 | ABGS2 AOGS2 | ABFS2 AOFS2 | ABS3 AOS3 |
| Page | 9 | 9 | 9 | C-9 | 10 |











| Function | Pushbutton | | | |
|----------|--|--|--|---|
| Category | Mushroom with Full Shroud | Mushroom Pushlock Turn Reset | Mushroom Push Turn Lock | Mushroom Push-Pull |
| | Momentary/Maintained | | | |
| Shape |      |     |      |      |
| Model | ABGS3 AOGS3 | AVS3 | AJS3 | AYS3 |
| Page | 10 | 10 | 10 | 11 |

| Function | Pushbutton | | | |
|----------|--|--|--|--|
| Category | Square Flush | Square Extended | Square Twin Momentary | Square Twin Maintained |
| | Momentary/Maintained | | | |
| Shape |      |      |      |      |
| Model | UBQS1 UOQS1 | UBQS2 | UWQN1 | UWQN2 |
| Page | 11 | 11 | 12 | 12 |

| Function | Pilot Light | | | | |
|----------|-------------|--|--|--|---|
| Category | Dome | Square (Marking) (Plastic Bezel) | Square (Marking) (Metal Bezel) | Rectangular (Marking) (Plastic Bezel) | Dome Push-to-Check |
| | Shape |      |      |      |      |
| Model | APS1 | UPQS1B | UPQMS1B | UPQS4B | APS1*PN |
| Page | 13 | 13 | 13 | 13 | 13 |

TWS Series (Selection Guide) ø25

| Function | Illuminated Pushbutton | | | | |
|----------|--|--|--|---|--|
| Category | Extended (Non-marking) | Extended with Half Shroud (Non-marking) | Extended with Full Shroud (Non-marking) | ø35mm Mushroom (Non-marking) | Mushroom Pushlock Turn Reset |
| Shape |   |   |   |   |   |
| Model | ALS2 AOLS2 | ALGS2 AOLGS2 | ALFS2 AOLFS2 | ALS3 AOLS3 | AVLS3 |
| Page | 15 | 16 | 17 | 18 | 18 |

| Function | Illuminated Pushbutton | Selector Switch | | | Illuminated Selector Switch |
|----------|--|--|--|---|--|
| Category | Square Flush (Marking) | Knob | Lever | Key | Knob |
| Shape |   |   |   |   |   |
| Model | ULQS1B UOLQS1B | ASS | ASS□L | ASS□K | ASLS |
| Page | 19 | 21 | 22 | 23 | 24 |

ø25 TWS Series

Highly reliable heavy-duty switches and pilot lights Suitable for industrial use

- HW-C contact blocks are used.
- Degree of protection: IP65 (IEC 60529)
- UL and CSA approved, EN and CCC compliant

| Applicable Standards | Mark | File No. or Organization |
|----------------------|------|---|
| UL508 | | UL Listing File No. E68961 |
| CSA C22.2 No.14 | | CSA File No. LR21451 |
| EN60947-1 | | TÜV Rheinland |
| | | EU Low Voltage Directive |
| GB14048.5 | | CCC No. 2007010305223156 (Pilot light: 2007010304226714) |



Specifications and Ratings

Contact Ratings

| | | |
|---------------|--|------------------------------|
| Contact Block | Rated Insulation Voltage | 600V |
| | Rated Continuous Current | 10A |
| | Contact Ratings by Utilization Category IEC 60947-5-1 | AC-15 (A600) DC-13 (P600) |

Characteristics

Contact Ratings by Utilization Category

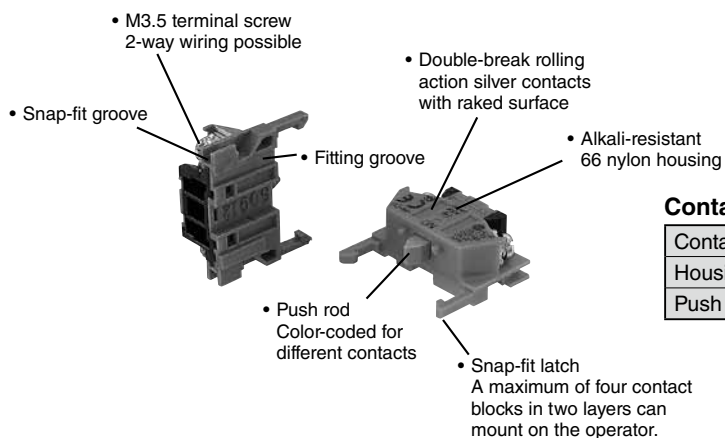
| Operational Voltage | | | 24V | 48V | 50V | 110V | 220V | 440V |
|---------------------|----------------|--|-----|-----|-----|------|------|------|
| Operational Current | AC 50/60 Hz | AC-12 Control of resistive loads and solid state loads | 10A | — | 10A | 10A | 6A | 2A |
| | | AC-15 Control of electromagnetic loads (> 72 VA) | 10A | — | 7A | 5A | 3A | 1A |
| | DC | DC-12 Control of resistive loads and solid state loads | 8A | 4A | — | 2.2A | 1.1A | — |
| | | DC-13 Control of electromagnets | 4A | 2A | — | 1.1A | 0.6A | — |

Minimum applicable load: 3V AC/DC, 5 mA (applicable range may vary with operating conditions and load types)

For the units listed below, the rated current (load switching current) is reduced to a half of the rated operational current of the contact block. The rated insulation voltage (600V) and the rated thermal current (10A) remain unchanged.

- Selector switches and illuminated selector switches with contact code 2R, 3S, 4S, or 4R.

HW-C (Contact Block)



Contact Blocks

| Contact | NO | NC | $\overline{\text{NO}}$ (early make) | $\overline{\text{NC}}$ (late break) |
|----------|-------|------------|-------------------------------------|-------------------------------------|
| Housing | Blue | Purple red | Blue | Purple red |
| Push Rod | Green | Red | Black | White |

Note: BS contact block is used for square twin pushbuttons UWQN1 and UWQN2.

Specifications

| | |
|--------------------------------------|---|
| Operating Temperature | -25 to +50°C (no freezing) |
| Storage Temperature | -40 to +80°C (no freezing) |
| Operating Humidity | 45 to 85% RH (no condensation) |
| Contact Resistance | 50 mΩ maximum (initial value) |
| Insulation Resistance | 100 MΩ minimum (500V DC megger) |
| Dielectric Strength | Between live and dead metal parts: 2,500V AC, 1 minute (Full voltage illuminated units: 2,000V AC, 1 minute) |
| Vibration Resistance | Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm |
| Shock Resistance | Damage limits: 1,000 m/s ² Operating extremes: 100 m/s ² |
| Mechanical Life (minimum operations) | Pushbuttons, Illuminated pushbuttons Momentary: 5,000,000 Others: 500,000 Pushlock turn reset: 250,000 Selector switches: 500,000 Key selector switches: 500,000 Illuminated selector switches: 500,000 |
| Electrical Life (minimum operations) | Pushbuttons: 500,000 *1 Illuminated pushbuttons: 500,000 *1 Pushlock turn reset: 250,000 *1 Square twin maintained: 500,000 *2 Selector switches: 500,000 *3 Key selector switches: 500,000 *3 Illuminated selector switches: 250,000 *3 Others: 500,000 *1 *1 Switching frequency 1,800 operations/h, duty ratio 40% *2 Switching frequency 900 operations/h, duty ratio 40% *3 Switching frequency 1,200 operations/h, duty ratio 40% |
| Wegiht (approx.) | 72g (ABS122N) 36g (APS122DN) 97g (ALS22222DN) 76g (ASS222N) 117g (ASS2K22N) 97g (ASLS22222DN) |

LED Illuminated Unit Specifications

| Unit | Color Code ② | Input | Operating Voltage | LED Lamp | | | |
|--|--|--------------|--|-----------|----------|---------------|----------------|
| | | | | Lamp Base | Part No. | Voltage | |
| Pilot Light Illuminated Pushbutton Illuminated Selector Switch | A: amber G: green PW: pure white R: red S: blue W: white Y: yellow | Full Voltage | 6V AC/DC | BA9S/13 | LSTD-6② | 6V AC/DC ±10% | |
| | | | 12V AC/DC | | | LSTD-1② | 12V AC/DC ±10% |
| | | | 24V AC/DC | | | LSTD-2② | 24V AC/DC ±10% |
| | | Transformer | 100/110V AC/DC 115/120V AC/DC 200/220V AC/DC 230/240V AC/DC 380V AC/DC 400/440V AC/DC (50/60 Hz) | | LSTD-6② | 6V AC/DC ±10% | |
| | | | DC-DC Converter | | 110V DC | LSTD-6② | 6V AC/DC ±10% |

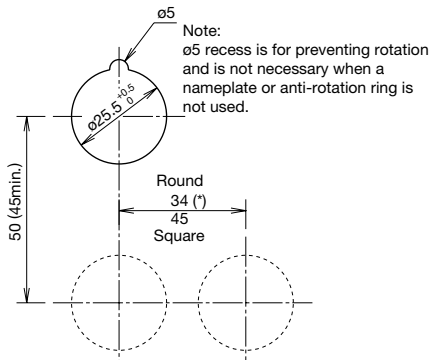
- Use a pure white (PW) LED for yellow illumination.

ø25 TWS Series Specifications

LED Lamp Ratings (LSTD)

| Part No. | LSTD-6② | | LSTD-1② | LSTD-2② |
|------------------------|--|---------------------------------|----------------|----------------|
| Lamp Base | BA9S/13 | | | |
| Rated Voltage | 6V AC/DC | | 12V AC/DC | 24V AC/DC |
| Voltage Range | 6V AC/DC ±10% | | 12V AC/DC ±10% | 24V AC/DC ±10% |
| Current Draw | AC | 8 mA | | 11 mA |
| | DC | A, R, W: 7 mA, G, PW, S: 5.5 mA | | 10 mA |
| Color Code ② | A (amber), G (green), PW (pure white), R (red), S (blue), W (white) | | | |
| Lamp Base Color | Same as illumination color | | | |
| Voltage Marking | Die stamped on the base | | | |
| Life (reference value) | Approx. 50,000 hours (The luminance is reduced to 50% the initial intensity when used on complete DC.) | | | |
| Internal Circuit | | | | |

Mounting Hole Layout



* The minimum mounting centers are applicable to switches with one layer of contact blocks (two contact blocks). When two layers of contact blocks are mounted, determine the minimum mounting centers in consideration of convenience for wiring.

- ø35mm mushroom: 35 mm minimum
- Mushroom with shroud: 42 mm minimum
- 2-position, 3-position lever selector switch: 42 mm minimum
- 4-position, 5-position lever selector switch: 50 mm minimum

Degree of Protection

| Part No. | Unit | NEMA ICS 6-110 | IEC 60529 |
|----------|---|-------------------------------|-----------|
| A**** | Pushbuttons, pilot lights, illuminated pushbuttons, and selector switches | Type 1, 2, 3, 3R, 4, 5, 12,13 | IP65 |
| | Illuminated selector switches and key selector switches | Type 1, 2, 3R, 5, 12, 13 | IP54 |
| U**** | Square pushbuttons, square pilot lights, and square illuminated pushbuttons | Type 1, 2 | IP40 |

Ordering Information

Standard Units

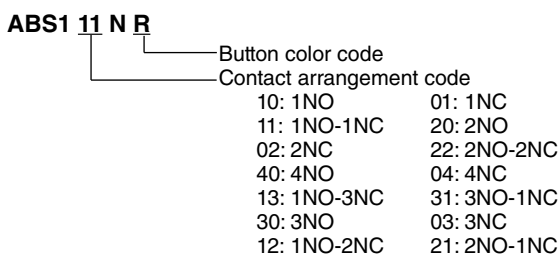
- Specify an operator or lens color code in the Part No.
- Full voltage illuminated units are not supplied with a lamp. Order LED lamps separately. Transformer and DC-DC converter illuminated units contain an LED lamp.
- All standard units are UL, CSA, EN, and TÜV approved (except DC-DC converter).
- Terminal covers, nameplates, and accessories are ordered separately.

Terminal Cover

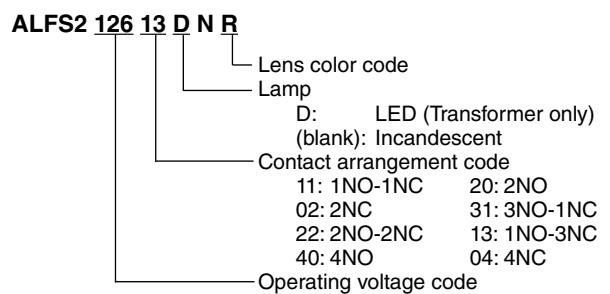
- When a terminal cover is required, order an applicable terminal cover referring to page 29.

The Part No. development charts shown below can be used to specify switches/pilot lights other than those listed on the following pages.

Pushbuttons



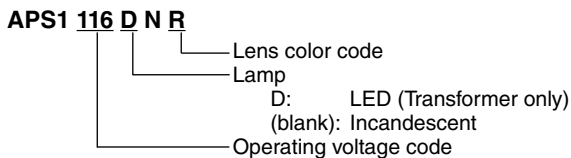
Illuminated Pushbuttons



Note:

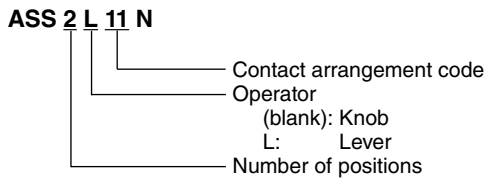
- Push-pull AYS3 can have a maximum of two contact blocks.

Pilot Lights



ø25 TWS Series (Ordering Information)

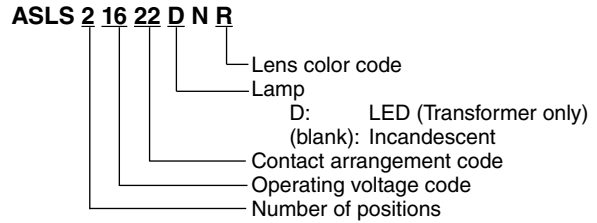
Selector Switch



Note:

- See pages C-26 to C-28 for contact arrangement codes.

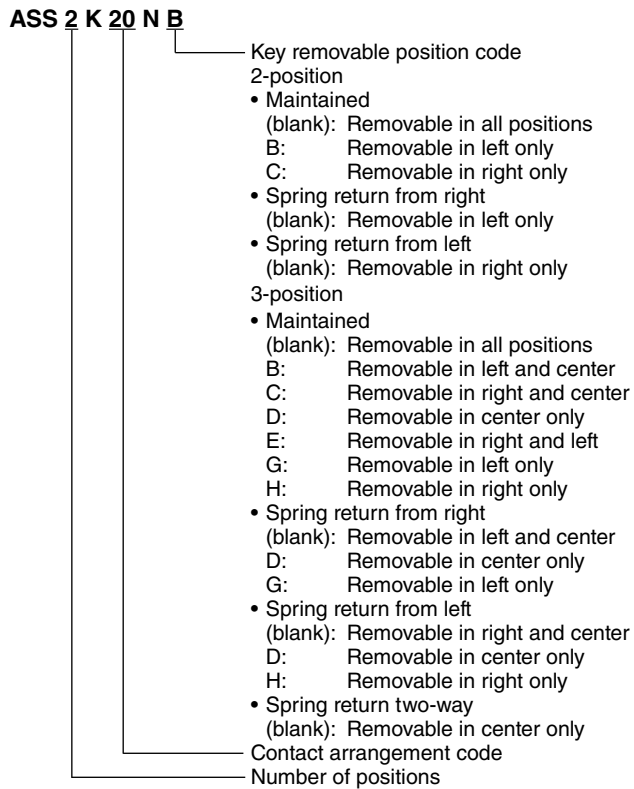
Illuminated Selector Switch



Note:

- See pages C-26 to C-28 for contact arrangement codes.

Key Selector Switch



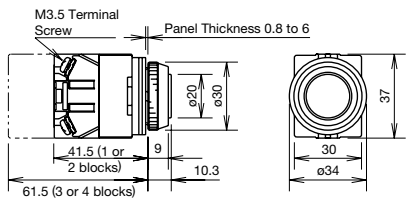


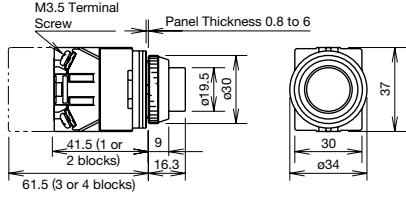


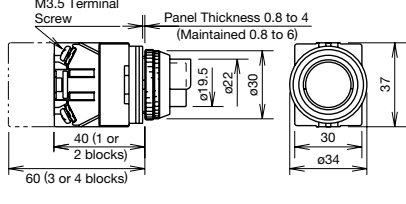


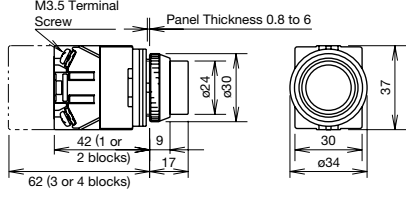


Note:

- See page 26 to C-28 for contact arrangement codes.
- The key cannot be removed in the return position.

Flush / Extended Pushbuttons



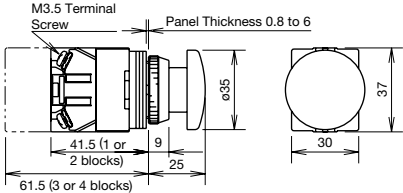


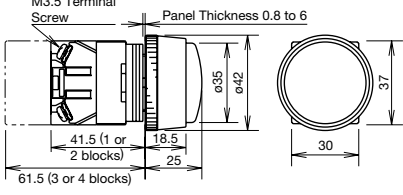


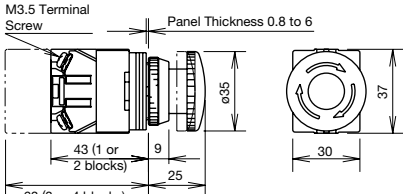


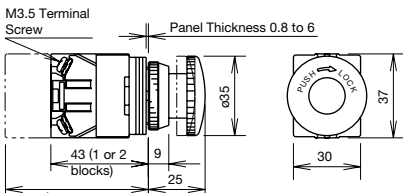
Package Quantity: 1

| Shape | Operation | Contact | Part No. | ① Button Color Code | Dimensions (mm) | | | | |
|---|---|---|-------------------|--|---|---|---|---|---|
| Flush ABS1 AOS1   | Momentary | 1NO | ABS110N ① | Black (B), green (G), and red (R) buttons are supplied with each unit as standard. Specify S, W, or Y when a blue, white, or yellow button is required. |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> | | | | |
| | | 1NC | ABS101N ① | | | | | | |
| | | 1NO-1NC | ABS111N ① | | | | | | |
| | | 2NO | ABS120N ① | | | | | | |
| | | 2NC | ABS102N ① | | | | | | |
| | | 2NO-2NC | ABS122N ① | | | | | | |
| | Maintained | 1NO | AOS110N ① | | | | | | |
| | | 1NC | AOS101N ① | | | | | | |
| | | 1NO-1NC | AOS111N ① | | | | | | |
| | | 2NO | AOS120N ① | | | | | | |
| | | 2NC | AOS102N ① | | | | | | |
| | | 2NO-2NC | AOS122N ① | | | | | | |
| | | Extended ABS2 AOS2   | Momentary | | | 1NO | ABS210N ① | Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> |
| | | | | | | 1NC | ABS201N ① | | |
| 1NO-1NC | ABS211N ① | | | | | | | | |
| 2NO | ABS220N ① | | | | | | | | |
| 2NC | ABS202N ① | | | | | | | | |
| 2NO-2NC | ABS222N ① | | | | | | | | |
| Maintained | 1NO | | AOS210N ① | | | | | | |
| | 1NC | | AOS201N ① | | | | | | |
| | 1NO-1NC | | AOS211N ① | | | | | | |
| | 2NO | | AOS220N ① | | | | | | |
| | 2NC | | AOS202N ① | | | | | | |
| | 2NO-2NC | | AOS222N ① | | | | | | |
| | Extended with Half Shroud ABGS2 AOGS2   | | Momentary | 1NO | ABGS210N ① | Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> | | |
| | | | | 1NC | ABGS201N ① | | | | |
| 1NO-1NC | | ABGS211N ① | | | | | | | |
| 2NO | | ABGS220N ① | | | | | | | |
| 2NC | | ABGS202N ① | | | | | | | |
| 2NO-2NC | | ABGS222N ① | | | | | | | |
| Maintained | | 1NO | AOGS210N ① | | | | | | |
| | | 1NC | AOGS201N ① | | | | | | |
| | | 1NO-1NC | AOGS211N ① | | | | | | |
| | | 2NO | AOGS220N ① | | | | | | |
| | | 2NC | AOGS202N ① | | | | | | |
| | | 2NO-2NC | AOGS222N ① | | | | | | |
| | | Extended with Full Shroud ABFS2 AOFS2   | Momentary | 1NO | ABFS210N ① | | | Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> |
| | | | | 1NC | ABFS201N ① | | | | |
| 1NO-1NC | ABFS211N ① | | | | | | | | |
| 2NO | ABFS220N ① | | | | | | | | |
| 2NC | ABFS202N ① | | | | | | | | |
| 2NO-2NC | ABFS222N ① | | | | | | | | |
| Maintained | 1NO | | AOFS210N ① | | | | | | |
| | 1NC | | AOFS201N ① | | | | | | |
| | 1NO-1NC | | AOFS211N ① | | | | | | |
| | 2NO | | AOFS220N ① | | | | | | |
| | 2NC | | AOFS202N ① | | | | | | |
| | 2NO-2NC | | AOFS222N ① | | | | | | |

- Specify a button color code in place of ① in the Part No.
- Round bezel and shroud (metal): Chrome-plated
- Pushbuttons with one or three contact blocks contain a dummy block.
- Other contact arrangements are also available. See page 7.

Mushroom / Pushlock Turn Reset / Push Turn Lock Pushbuttons



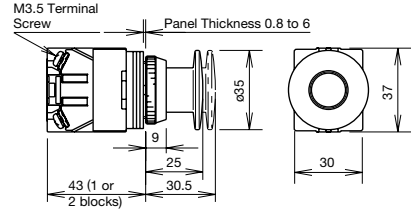


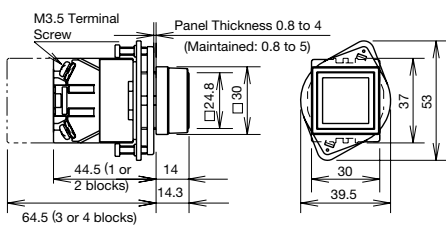


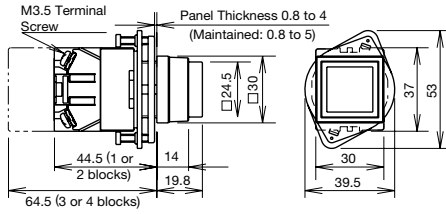
Package Quantity: 1

| Shape | Operation | Contact | Part No. | ① Button Color Code | Dimensions (mm) |
|---|------------|---------|-----------|---|---|
| Mushroom ABS3 AOS3   | Momentary | 1NO | ABS310N① | Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> |
| | | 1NC | ABS301N① | | |
| | | 1NO-1NC | ABS311N① | | |
| | | 2NO | ABS320N① | | |
| | | 2NC | ABS302N① | | |
| | Maintained | 2NO-2NC | ABS322N① | | |
| | | 1NO | AOS310N① | | |
| | | 1NC | AOS301N① | | |
| | | 1NO-1NC | AOS311N① | | |
| | | 2NO | AOS320N① | | |
| Mushroom with Full Shroud ABGS3 AOGS3   | Momentary | 1NO | ABGS310N① | Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> |
| | | 1NC | ABGS301N① | | |
| | | 1NO-1NC | ABGS311N① | | |
| | | 2NO | ABGS320N① | | |
| | | 2NC | ABGS302N① | | |
| | Maintained | 2NO-2NC | ABGS322N① | | |
| | | 1NO | AOGS310N① | | |
| | | 1NC | AOGS301N① | | |
| | | 1NO-1NC | AOGS311N① | | |
| | | 2NO | AOGS320N① | | |
| Pushlock Turn Reset AVS3   | | 1NO | AVS310N① | R: red Y: yellow |  |
| | | 1NC | AVS301N① | | |
| | | 1NO-1NC | AVS311N① | | |
| | | 2NO | AVS320N① | | |
| | | 2NC | AVS302N① | | |
| | | 2NO-2NC | AVS322N① | | |
| Push Turn Lock AJS3   | | 1NO | AJS310N① | B: black G: green R: red Y: yellow |  |
| | | 1NC | AJS301N① | | |
| | | 1NO-1NC | AJS311N① | | |
| | | 2NO | AJS320N① | | |
| | | 2NC | AJS302N① | | |
| | | 2NO-2NC | AJS322N① | | |

- Specify a button color code in place of ① in the Part No.
 - Round bezel (metal): Chrome-plated
 - Pushbuttons with one or three contact blocks contain a dummy block.
 - Other contact arrangements are also available. See page C-7.
 - **Pushlock Turn Reset:** Button is maintained when pressed and is reset when turned clockwise.
- Note: AVS3 and AJS3 cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapter (ISO 13850 and IEC 60947-5-5 compliant).
- **Push Turn Lock:** Button is locked when turned clockwise in the depressed position and is reset when turned counterclockwise.

Push-Pull / Square Flush / Square Extended Pushbuttons











Package Quantity: 1

| Shape | Operation | Contact | Part No. | ① Button Color Code | Dimensions (mm) |
|--|------------|---------|-------------------|---|---|
| Mushroom Push-Pull AYS31   | Maintained | 1NO | AYS3110N ① | B: black G: green R: red Y: yellow |  |
| | | 1NC | AYS3101N ① | | |
| | | 1NO-1NC | AYS3111N ① | | |
| | | 2NO | AYS3120N ① | | |
| | | 2NC | AYS3102N ① | | |
| Square Flush UBQS1 UOQS1   | Momentary | 1NO | UBQS110N ① | B: black G: green R: red S: blue Y: yellow |  <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p> |
| | | 1NC | UBQS101N ① | | |
| | | 1NO-1NC | UBQS111N ① | | |
| | | 2NO | UBQS120N ① | | |
| | | 2NC | UBQS102N ① | | |
| | Maintained | 1NO | UOQS110N ① | | |
| | | 1NC | UOQS101N ① | | |
| | | 1NO-1NC | UOQS111N ① | | |
| | | 2NO | UOQS120N ① | | |
| | | 2NC | UOQS102N ① | | |
| Square Extended UBQS2   | Momentary | 1NO | UBQS210N ① |  | |
| | | 1NC | UBQS201N ① | | |
| | | 1NO-1NC | UBQS211N ① | | |
| | | 2NO | UBQS220N ① | | |
| | | 2NC | UBQS202N ① | | |
| | | 2NO-2NC | UBQS222N ① | | |

- Specify a button color code in place of ① in the Part No.
- Round bezel (metal): Chrome-plated
- Square bezel (plastic): Black
- Pushbuttons with one or three contact blocks contain a dummy block.
- Other contact arrangements are also available. See page C-7
- **Push-Pull:** Button is maintained in both depressed and reset positions. Up to 2 contact blocks (1 layer) can be mounted on AYS31 push-pull switches.

Note: AYS31 cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapter (ISO 13850 and IEC 60947-5-5 compliant).

Contact Statuses of Push-Pull Switch

| Contact | AYS31 | |
|---------|---|---|
| | Push | Pull |
| 1NO |  |  |
| 1NC |  |  |
| 1NO-1NC |  |  |
| 2NO |  |  |
| 2NC |  |  |

Note: Push-pull switch can have a maximum of two contact blocks.



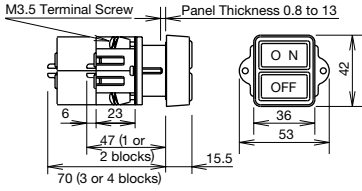


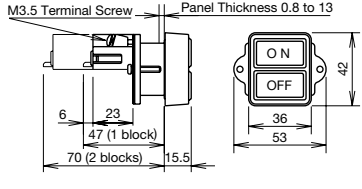
Panel Mounting of Square Pushbuttons

1. Tighten the square bezel to the operator and position the ring correctly.
2. Lightly tighten the screw to secure the pushbutton onto the panel.

ø25 TWS Series Pushbuttons

Square Twin Pushbuttons











Package Quantity: 1

| Shape | Contact | Part No. | Button Color | Dimensions (mm) |
|---|--------------------------------------|------------------|-----------------------|---|
| Square Twin (Momentary) UWQN1   | ON OFF 1NO 1NO | UWQN11010 | ON: Black OFF: Red |  |
| | 1NO 1NC | UWQN11001 | | |
| | 2NO 2NC | UWQN12002 | | |
| Square Twin (Maintained) UWQN2   | 1NO | UWQN21000 | ON: Black OFF: Red |  |
| | 1NC | UWQN20100 | | |
| | 1NO-1NC | UWQN21100 | | |
| | 2NO | UWQN22000 | | |
| | 2NC | UWQN20200 | | |

- Square Twin (Momentary):** Two independent momentary switches are contained in one unit, each operated by ON or OFF button. With the ø30 adapter removed from the sleeve, the unit can mount in a ø25.5mm mounting hole for the ø25 series.
- Square Twin (Maintained):** The contact operates when ON button is pressed and is maintained in the depressed position. The button is reset by pressing the OFF button. With the ø30 adapter removed from the sleeve, the unit can mount in a ø25.5mm mounting hole for the ø25 series.

Dome / Square / Rectangular (Marking) Pilot Lights

Package Quantity: 1

| Shape | Lamp | Part No. | ②Lens/LED Color Code |
|--|--------------|------------------------------|--|
| Dome APS1   | Without Lamp | APS199 ② | NA: amber, NC: clear, NG: green, NR: red, NS: blue, NW: white, DNY: yellow |
| | LED | APS1 ③ DN ② | A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow |
| Square (Marking) UPQS1B (Plastic Bezel)   | Without Lamp | UPQS1B99 ② | NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow |
| | LED | UPQS1B ③ DN ② | A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow |
| Square (Marking) UPQMS1B (Metal Bezel)   | Without Lamp | UPQMS1B99 ② | NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow |
| | LED | UPQMS1B ③ DN ② | A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow |
| Rectangular (Marking) UPQS4B (Plastic Bezel)   | Without Lamp | UPQS4B99N ② | A: amber, G: green, R: red, S: blue, W: white |
| Push-to-Check APS1*PN   | Without Lamp | APS199PN ② | A: amber, C: clear, G: green, R: red, S: blue, W: white |

• Incandescent lamp is also available.

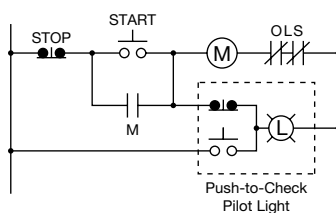
Operating Voltage Code

Specify an operating voltage code in place of ③ in the Part No.

| ③ Operating Voltage Code | Input |
|--------------------------|-------------------|
| LED | |
| 66: 6V AC/DC | Full Voltage |
| 11: 12V AC/DC | |
| 22: 24V AC/DC | |
| 16: 100/110V AC | Transformer |
| 126: 115/120V AC | |
| 26: 200/220V AC | |
| 246: 230/240V AC | |
| 386: 380V AC | |
| 46: 400/440V AC | |
| 486: 480V AC | DC-DC Converter * |
| 16D: 110V DC | |

- Specify a color code in place of ② in the Part No.
- Round bezel (metal): Chrome-plated Square bezel (plastic): Black Square bezel (metal): Chrome-plated
- * DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

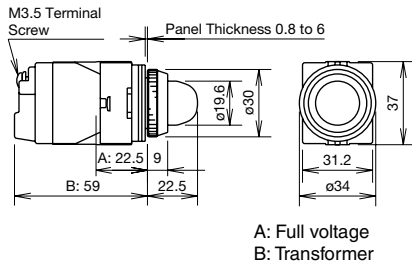
The lamp of push-to-check pilot light is not connected to the contact terminal. To connect, refer to the circuit diagram example below.



ø25 TWS Series Pilot Lights

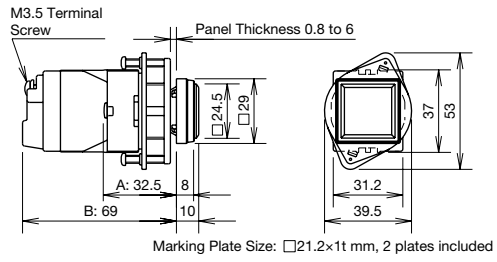
Dimensions

Dome APS1



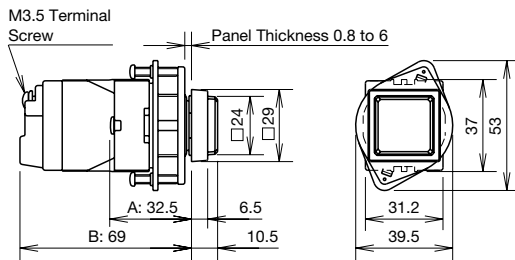
A: Full voltage
B: Transformer

Square (Marking) UPQS1B (Plastic Bezel)

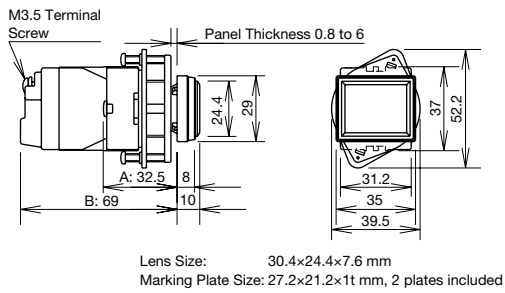


Marking Plate Size: 21.2x11 mm, 2 plates included

Square (Marking) UPQMS1B (Metal Bezel)

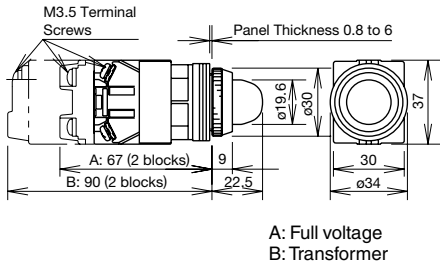


Rectangular (Marking) UPQS4B



Lens Size: 30.4x24.4x7.6 mm
Marking Plate Size: 27.2x21.2x11 mm, 2 plates included

Push-to-Check APS1*PN



A: Full voltage
B: Transformer

All dimensions in mm.

Terminal Wiring (Bottom View)






Arrows indicate access directions for wiring.

Panel Mounting of Square and Rectangular Pilot Lights

1. Tighten the square or rectangular bezel to the operator and position the ring correctly.
2. Lightly tighten the screw to secure the pilot light onto the panel.

Round Extended Illuminated Pushbuttons

Package Quantity: 1

| Shape | Operation | Lamp | Contact | Part No. |
|---|------------|--------------|---------|--|
| Round Extended ALS2 AOLS2      | Momentary | Without Lamp | 1NO-1NC | ALS29911 ^② |
| | | | 2NO | ALS29920 ^② |
| | | | 2NO-2NC | ALS29922 ^② |
| | | LED | 1NO-1NC | ALS2 ^③ 11DN ^② |
| | | | 2NO | ALS2 ^③ 20DN ^② |
| | | | 2NO-2NC | ALS2 ^③ 22DN ^② |
| | | | 1NO-1NC | ALS21611DDN ^② (Note) |
| | | | 2NO | ALS21620DDN ^② (Note) |
| | | | 2NO-2NC | ALS21622DDN ^② (Note) |
| | Maintained | Without Lamp | 1NO-1NC | AOLS29911 ^② |
| | | | 2NO | AOLS29920 ^② |
| | | | 2NO-2NC | AOLS29922 ^② |
| | | LED | 1NO-1NC | AOLS2 ^③ 11DN ^② |
| | | | 2NO | AOLS2 ^③ 20DN ^② |
| | | | 2NO-2NC | AOLS2 ^③ 22DN ^② |
| | | | 1NO-1NC | AOLS21611DDN ^② (Note) |
| | | | 2NO | AOLS21620DDN ^② (Note) |
| | | | 2NO-2NC | AOLS21622DDN ^② (Note) |

Note: DC-DC converter types.

- Incandescent lamp is also available.

Designation Code

Specify a code in place of ② or ③ in the Part No.

| ② Lens/LED Color Code | | ③ Operating Voltage Code | Input | | |
|--|--|--------------------------|-------------------|-----------------|-------------|
| Without Lamp | LED | LED | | | |
| Specify a lens color code in place of ②. NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow | Specify a lens/LED color code in place of ②. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination. | 66: 6V AC/DC | Full Voltage | | |
| | | 11: 12V AC/DC | | | |
| | | 22: 24V AC/DC | | | |
| | | | | 16: 100/110V AC | Transformer |
| | | | 126: 115/120V AC | | |
| | | | 26: 200/220V AC | | |
| | | | 246: 230/240V AC | | |
| | | | 386: 380V AC | | |
| | | | 46: 400/440V AC | | |
| | | | | 486: 480V AC | |
| | | 16□□D: 110V DC | DC-DC Converter * | | |

- Round bezel (metal): Chrome-plated







- Other contact arrangements are also available. See page 7.

* DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

ø25 TWS Series Illuminated Pushbuttons

Round Extended with Half Shroud Illuminated Pushbuttons

Package Quantity: 1

| Shape | Operation | Lamp | Contact | Part No. |
|--|------------|--------------|---------|---------------------------------------|
| Round Extended with Half Shroud ALGS2 AOLGS2       | Momentary | Without Lamp | 1NO-1NC | ALGS29911 ^② |
| | | | 2NO | ALGS29920 ^② |
| | | | 2NO-2NC | ALGS29922 ^② |
| | | LED | 1NO-1NC | ALGS2 ^③ 11DN ^② |
| | | | 2NO | ALGS2 ^③ 20DN ^② |
| | | | 2NO-2NC | ALGS2 ^③ 22DN ^② |
| | | | 1NO-1NC | ALGS21611DDN ^② (Note) |
| | | | 2NO | ALGS21620DDN ^② (Note) |
| | | | 2NO-2NC | ALGS21622DDN ^② (Note) |
| | Maintained | Without Lamp | 1NO-1NC | AOLGS29911 ^② |
| | | | 2NO | AOLGS29920 ^② |
| | | | 2NO-2NC | AOLGS29922 ^② |
| | | LED | 1NO-1NC | AOLGS2 ^③ 11DN ^② |
| | | | 2NO | AOLGS2 ^③ 20DN ^② |
| | | | 2NO-2NC | AOLGS2 ^③ 22DN ^② |
| | | | 1NO-1NC | AOLGS21611DDN ^② (Note) |
| | | | 2NO | AOLGS21620DDN ^② (Note) |
| | | | 2NO-2NC | AOLGS21622DDN ^② (Note) |

Note: DC-DC converter types.

- Incandescent lamp is also available.

Designation Code

Specify a code in place of ② or ③ in the Part No.

| ② Lens/LED Color Code | | ③ Operating Voltage Code | Input | | |
|--|--|--------------------------|--------------|------------------|-------------------|
| Without Lamp | LED | LED | | | |
| Specify a lens color code in place of ②. NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow | Specify a lens/LED color code in place of ②. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination. | 66: 6V AC/DC | Full Voltage | | |
| | | 11: 12V AC/DC | | | |
| | | 22: 24V AC/DC | | | |
| | | | | 16: 100/110V AC | Transformer |
| | | | | 126: 115/120V AC | |
| | | | | 26: 200/220V AC | |
| | | | | 246: 230/240V AC | |
| | | | | 386: 380V AC | |
| | | | | 46: 400/440V AC | |
| | | | | 486: 480V AC | DC-DC Converter * |
| | | 16□□D: 110V DC | | | |

- Round bezel (metal): Chrome-plated





- Other contact arrangements are also available. See page 7.

* DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

ø25 TWS Series Illuminated Pushbuttons

Mushroom / Mushroom Pushlock Turn Reset Illuminated Pushbuttons

Package Quantity: 1

| Shape | Operation | Lamp | Contact | Part No. | |
|---|--------------|-------------------------------|--------------|--|--|
| ø35mm Mushroom ALS3 AOLS3   | Momentary | Without Lamp | 1NO-1NC | ALS39911N ^② | |
| | | | 2NO | ALS39920N ^② | |
| | | | 2NO-2NC | ALS39922N ^② | |
| | | | 1NO-1NC | AOLS39911N ^② | |
| | | | 2NO | AOLS39920N ^② | |
| | | | 2NO-2NC | AOLS39922N ^② | |
| | Maintained | Without Lamp | 1NO-1NC | AOLS3^③11N ^② | |
| | | | 2NO | AOLS3^③20N ^② | |
| | | | 2NO-2NC | AOLS3^③22N ^② | |
| | | | Incandescent | 1NO-1NC | AOLS3^③11N ^② |
| | | | | 2NO | AOLS3^③20N ^② |
| | | | | 2NO-2NC | AOLS3^③22N ^② |
| Mushroom Pushlock Turn Reset AVLS3   | Without Lamp | Without Lamp | 1NO-1NC | AVLS39911NR | |
| | | | 2NO | AVLS39920NR | |
| | | | 2NO-2NC | AVLS39922NR | |
| | | | LED | 1NO-1NC | AVLS3^③11DNR |
| | 2NO | AVLS3^③20DNR | | | |
| | 2NO-2NC | AVLS3^③22DNR | | | |

- Incandescent lamp is also available.

Designation Code






Specify a code in place of ② or ③ in the Part No.

| ② Lens Color Code | ③ Operating Voltage Code | Input |
|---|--------------------------|--------------|
| | LED | |
| Specify a lens color code in place of ②. A: amber G: green R: red S: blue W: white | 66: 6V AC/DC | Full Voltage |
| | 11: 12V AC/DC | |
| | 22: 24V AC/DC | |
| | 16: 100/110V AC | Transformer |
| | 126: 115/120V AC | |
| | 26: 200/220V AC | |
| | 246: 230/240V AC | |
| | 386: 380V AC | |
| | 46: 400/440V AC | |
| | 486: 480V AC | |

- Round bezel (metal): Chrome-plated
- Other contact arrangements are also available. See page 7.
- **Pushlock Turn Reset:** Lens is maintained when pressed and is reset when turned clockwise. Red lens only.
- Note: AVLS3 pushlock turn reset switches cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapters (ISO 13850 and IEC 60947-5-5 compliant).

Square Flush Illuminated Pushbuttons

Package Quantity: 1

| Shape | Operation | Lamp | Contact | Part No. |
|---|------------|--------------|---------|--------------------------------|
| Square Flush (Marking) ULQS1B UOLQS1B      | Momentary | Without Lamp | 1NO-1NC | ULQS1B9911 ② |
| | | | 2NO | ULQS1B9920 ② |
| | | | 2NO-2NC | ULQS1B9922 ② |
| | | LED | 1NO-1NC | ULQS1B ③ 11DN ② |
| | | | 2NO | ULQS1B ③ 20DN ② |
| | | | 2NO-2NC | ULQS1B ③ 22DN ② |
| | Maintained | Without Lamp | 1NO-1NC | UOLQS1B9911 ② |
| | | | 2NO | UOLQS1B9920 ② |
| | | | 2NO-2NC | UOLQS1B9922 ② |
| | | LED | 1NO-1NC | UOLQS1B ③ 11DN ② |
| | | | 2NO | UOLQS1B ③ 20DN ② |
| | | | 2NO-2NC | UOLQS1B ③ 22DN ② |

- Incandescent lamp is also available.

Designation Code

Specify a code in place of ② or ③ in the Part No.

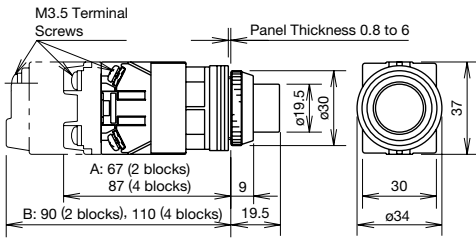
| ② Lens/LED Color Code | | ③ Operating Voltage Code | Input |
|---|--|---|---|
| Without Lamp | LED | LED | |
| Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow | Specify a lens/LED color code in place of ②. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination. | 66: 6V AC/DC 11: 12V AC/DC 22: 24V AC/DC 16: 100/110V AC 126: 115/120V AC 26: 200/220V AC 246: 230/240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC | Full Voltage Transformer |

- Square bezel (plastic): Black
- Marking plate size: □21.2 × 1.0 mm (2 pieces supplied)
- Illumination color W (white) and PW (pure white) marking consist of clear lens and white marking plate. See page 38.
- Other contact arrangements are also available. See page 7.

ø25 TWS Series Illuminated Pushbuttons

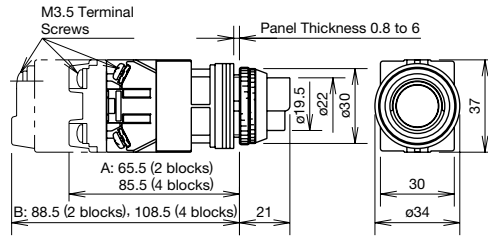
Dimensions

Round Extended ALS2 / AOLS2



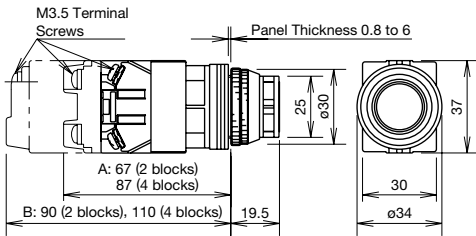
A: Full voltage
B: Transformer

Round Extended with Half Shroud ALGS2 / AOLGS2



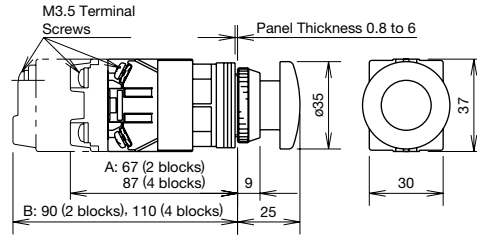
A: Full voltage
B: Transformer

Round Extended with Full Shroud ALFS2 / AOLFS2



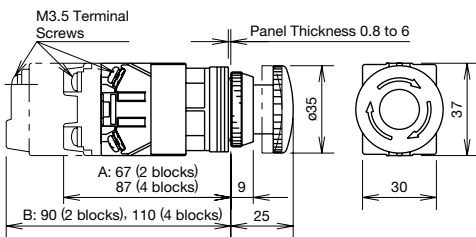
A: Full voltage
B: Transformer

ø35mm Mushroom ALS3 / AOLS3



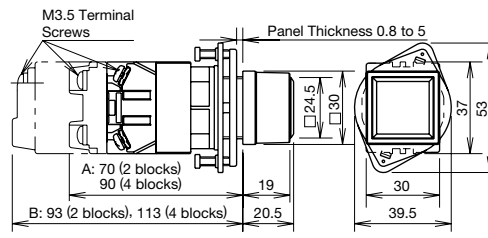
A: Full voltage
B: Transformer

Mushroom Pushlock Turn Reset AVLS3



A: Full voltage
B: Transformer

Square Flush ULQS1B / UOLQS1B




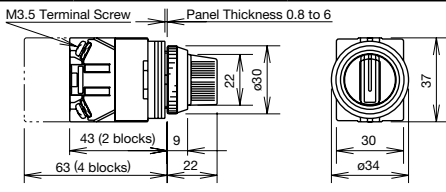








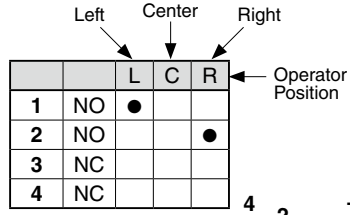


Marking Plate Size: □21.2×11 mm, 2 plates included

A: Full voltage
B: Transformer

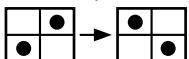
All dimensions in mm.

Selector Switches (Knob Operator)

Package Quantity: 1

| No. of Positions | Shape | | ASS | |   | | | | | | |
|---------------------------------|---------------------------|-------------------|---|-------------------|--|---|---|---|---|---|---|
| | Contact Arrangement Chart | |  | | | | | | | | |
| 90° 2-position | Contact Code | Contact Block | | Operator Position | | Maintained | Spring Return from Right | Spring Return from Left | — | | |
| | | Mounting Position | Contact | L | R |  |  |  | | | |
| | 10 (1NO) | 1 | NO | ● | | ASS210N | ASS2110N | ASS2210N * | | | |
| | | 2 | Dummy | | | | | | | | |
| | 11 (1NO-1NC) | 1 | NO | ● | ● | ASS211N | ASS2111N | ASS2211N * | | | |
| | | 2 | NC | ● | | | | | | | |
| | 20 (2NO) | 1 | NO | ● | ● | ASS220N | ASS2120N | ASS2220N * | | | |
| | | 2 | NO | ● | ● | | | | | | |
| | 22 (2NO-2NC) | 1 | NO | ● | ● | ASS222N | ASS2122N | ASS2222N * | | | |
| | | 2 | NC | ● | ● | | | | | | |
| 3 | | NO | ● | ● | | | | | | | |
| 2R ★ (1NO-1NC) | 1 | NO | ● | ■ | ASS22RN-118 ★ | ASS212RN-118 ★ | — | | | | |
| | 2 | NC | ● | ■ | | | | | | | |
| 2R ★ (1NO-1NC) | 1 | NC | ● | ■ | — | — | ASS222RN-169 ★ | | | | |
| | 2 | NO | ● | ■ | | | | | | | |
| 45° 3-position | Contact Code | Contact Block | | Operator Position | | | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two-way | |
| | | Mounting Position | Contact | L | C | R |  |  |  |  | |
| | 20 (2NO) | 1 | NO | ● | | | ASS320N | ASS3120N | ASS3220N | ASS3320N | |
| | | 2 | NO | | ● | | | | | | |
| | 02 (2NC) | 1 | NC | ■ | | | ASS302N | ASS3102N | ASS3202N | ASS3302N | |
| | | 2 | NC | ■ | | | | | | | |
| | 22 (2NO-2NC) | 1 | NO | ● | | ● | ASS322N | ASS3122N | ASS3222N | ASS3322N | |
| | | 2 | NO | | ● | ● | | | | | |
| | | 3 | NC | ■ | | ■ | | | | | |
| | 40 (4NO) | 1 | NO | ● | | | ASS340N | ASS3140N | ASS3240N | ASS3340N | |
| | | 2 | NO | | ● | | | | | | |
| | | 3 | NO | ● | | ● | | | | | |
| | | 4 | NO | | ● | ● | | | | | |
| | 04 (4NC) | 1 | NC | ■ | | | ASS304N | ASS3104N | ASS3204N | ASS3304N | |
| | | 2 | NC | ■ | | | | | | | |
| | | 3 | NC | ■ | | ■ | | | | | |
| 4 | | NC | ■ | | ■ | | | | | | |
| 3S ★ | 1 | NO | ● | | ● | ASS33SN-243 ★ | — | — | — | | |
| | 2 | NO | | ● | ● | | | | | | |
| | 3 | NC | ■ | | ■ | | | | | | |
| | 4 | Dummy | | | | | | | | | |
| 30° 5-position / 45° 4-position | Contact Code | Contact Block | | Operator Position | | | | | Maintained | Maintained | Contact Block Mounting Position and Contact Arrangement Chart  |
| | | Mounting Position | Contact | 1 | 2 | 3 | 4 | 5 |  |  | |
| | 4S ★ | 1 | NO | ● | ■ | | | | | ASS44SN-407 ★ | — |
| | | 2 | NC | ● | ■ | | | | | | |
| | | 3 | NC | ● | ■ | | | | | | |
| | 4S ★ | 1 | NO | ● | ● | | | | | ASS44SN-411 ★ | — |
| | | 2 | NC | ● | ● | | | | | | |
| | | 3 | NC | ● | ● | | | | | | |
| | 3S ★ | 1 | NO | ● | | | | | | ASS43SN-461 ★ | — |
| | | 2 | NC | ● | | | | | | | |
| | | 3 | NC | ● | | | | | | | |
| | 4S ★ | 1 | NO | ● | | | | | | — | ASS54SN-501 ★ |
| 2 | | NC | ● | | | | | | | | |
| 3 | | NC | ● | | | | | | | | |
| 4 | | NO | | ● | | | | | | | |

• On the 2-position selector switches marked with * above, the contact operation is reversed as follows.


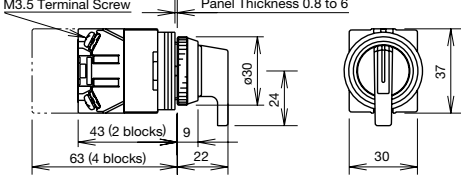

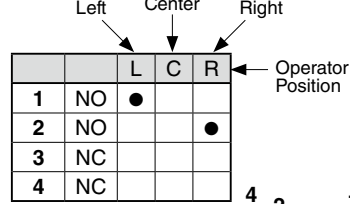


- On the contact arrangement marked with ★ in the table above, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.
- Selector switches with one or three contact blocks contain a dummy block.
- Knob operator: White indicator on black knob

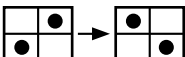
ø25 TWS Series Selector Switches

Selector Switches (Lever Operator)

Package Quantity: 1

| No. of Positions | Shape | | ASS□L | |   | | | | | |
|---------------------------------|---------------------------|-------------------|---|---|--|-----------------|--------------------------|-------------------------|-----------------------|---|
| | Contact Arrangement Chart | |  | | | | | | | |
| 90° 2-position | Contact Code | Contact Block | Operator Position | | | Maintained | Spring Return from Right | Spring Return from Left | — | |
| | | Mounting Position | Contact | L | R | | | | | |
| | 10 (1NO) | 1 | NO | | ● | ASS2L10N | ASS21L10N | ASS22L10N * | — | |
| | | 2 | Dummy | | | | | | | |
| | 11 (1NO-1NC) | 1 | NO | | ● | ASS2L11N | ASS21L11N | ASS22L11N * | | |
| | | 2 | NC | ● | | | | | | |
| | 20 (2NO) | 1 | NO | | ● | ASS2L20N | ASS21L20N | ASS22L20N * | | |
| | | 2 | NO | | ● | | | | | |
| | 22 (2NO-2NC) | 1 | NO | | ● | ASS2L22N | ASS21L22N | ASS22L22N * | | |
| | | 2 | NC | ● | | | | | | |
| 3 | | NO | | ● | | | | | | |
| 2R★ (1NO-1NC) | 1 | NO | | ■ | ASS2L2RN-118 ★ | ASS21L2RN-118 ★ | — | | | |
| | 2 | NC | ■ | | | | | | | |
| 2R★ (1NO-1NC) | 1 | NC | | ■ | — | — | ASS22L2RN-169 ★ | | | |
| | 2 | NO | ■ | | | | | | | |
| 45° 3-position | Contact Code | Contact Block | Operator Position | | | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two-way | |
| | | Mounting Position | Contact | L | C | R | | | | |
| | 20 (2NO) | 1 | NO | ● | | | ASS3L20N | ASS31L20N | ASS32L20N | ASS33L20N |
| | | 2 | NO | | | ● | | | | |
| | 02 (2NC) | 1 | NC | | ■ | | ASS3L02N | ASS31L02N | ASS32L02N | ASS33L02N |
| | | 2 | NC | | ■ | | | | | |
| | 22 (2NO-2NC) | 1 | NO | ● | | | ASS3L22N | ASS31L22N | ASS32L22N | ASS33L22N |
| | | 2 | NO | | | ● | | | | |
| | | 3 | NC | | ■ | | | | | |
| | 40 (4NO) | 1 | NO | ● | | | ASS3L40N | ASS31L40N | ASS32L40N | ASS33L40N |
| | | 2 | NO | | | ● | | | | |
| | | 3 | NO | ● | | | | | | |
| | | 4 | NO | | | ● | | | | |
| | 04 (4NC) | 1 | NC | | ■ | | ASS3L04N | ASS31L04N | ASS32L04N | ASS33L04N |
| | | 2 | NC | | ■ | | | | | |
| | | 3 | NC | | ■ | | | | | |
| 4 | | NC | | ■ | | | | | | |
| 3S ★ | 1 | NO | ● | | | ASS3L3SN-243 ★ | — | — | — | |
| | 2 | NO | | | ● | | | | | |
| | 3 | NC | | ■ | | | | | | |
| | 4 | Dummy | | | | | | | | |
| 30° 5-position / 45° 4-position | Contact Code | Contact Block | Operator Position | | | | | Maintained | Maintained | Contact Block Mounting Position and Contact Arrangement Chart  |
| | | Mounting Position | Contact | 1 | 2 | 3 | 4 | 5 | | |
| | 4S ★ | 1 | NC | | | | | | ASS4L4SN-407 ★ | — |
| | | 2 | NC | | ● | | | | | |
| | | 3 | NC | | | ● | | | | |
| | | 4 | NO | | | | ● | | | |
| | 4S ★ | 1 | NO | ● | | | | | ASS4L4SN-411 ★ | — |
| | | 2 | NC | | ● | | | | | |
| | | 3 | NC | | | ● | | | | |
| | | 4 | NO | | | | ● | | | |
| | 3S ★ | 1 | NO | ● | | | | | ASS4L3SN-461 ★ | — |
| | | 2 | NC | | ● | | | | | |
| | | 3 | NC | | | ● | | | | |
| | | 4 | Dummy | | | | ● | | | |
| | 4S ★ | 1 | NO | ● | | | | | — | ASS5L4SN-501 ★ |
| | | 2 | NC | | ● | | | | | |
| 3 | | NC | | | ● | | | | | |
| 4 | | NO | | | | ● | | | | |

• On the 2-position selector switches marked with * above, the contact operation is reversed as follows.



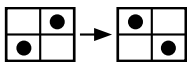
- On the contact arrangement marked with ★ in the table above, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.
- Selector switches with one or three contact blocks contain a dummy block.
- Lever operator: White indicator on black lever

Key Selector Switches

Package Quantity: 1

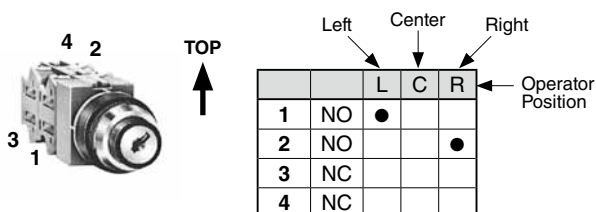
| No. of Positions | Shape | | | Contact Arrangement Chart | | | | | | | | | | | |
|------------------|-------------------|-------|-------|---------------------------|--------|--------|--------|--------|--------|--------|--|--|--|---|---|
| | Shape | Model | Code | Symbol | Symbol | Symbol | Symbol | Symbol | Symbol | Symbol | | | | | |
| 90° 2-position | 10 (1NO) | 1 | NO | | ● | | | | | | | | | — | |
| | | 2 | Dummy | | | | | | | | | | | | |
| | 11 (1NO-1NC) | 1 | NO | | | ● | | | | | | | | | — |
| | | 2 | NC | ● | | | | | | | | | | | |
| | 20 (2NO) | 1 | NO | | | ● | | | | | | | | | — |
| | | 2 | NO | | | ● | | | | | | | | | |
| | 22 (2NO-2NC) | 1 | NO | | | ● | | | | | | | | | — |
| | | 2 | NC | ● | | | | | | | | | | | |
| | | 3 | NO | | | ● | | | | | | | | | |
| | 2R ★ (1NO-1NC) | 1 | NO | | | ● | | | | | | | | | — |
| | | 2 | NC | ● | | | | | | | | | | | |
| | 2R ★ (1NO-1NC) | 1 | NC | ● | | | | | | | | | | | |
| 2 | | NO | | | ● | | | | | | | | | | |
| 45° 3-position | 20 (2NO) | 1 | NO | ● | | | | | | | | | | | |
| | | 2 | NO | | | ● | | | | | | | | | |
| | 02 (2NC) | 1 | NC | | | | ● | | | | | | | | |
| | | 2 | NC | | | | ● | | | | | | | | |
| | 22 (2NO-2NC) | 1 | NO | ● | | | | | | | | | | | |
| | | 2 | NO | | | ● | | | | | | | | | |
| | | 3 | NC | | | | ● | | | | | | | | |
| | 40 (4NO) | 1 | NO | ● | | | | | | | | | | | |
| | | 2 | NO | | | ● | | | | | | | | | |
| | | 3 | NO | ● | | | | | | | | | | | |
| | | 4 | NO | | | ● | | | | | | | | | |
| | 04 (4NC) | 1 | NC | | | | ● | | | | | | | | |
| | | 2 | NC | | | | ● | | | | | | | | |
| | | 3 | NC | | | | | ● | | | | | | | |
| | 3S ★ | 1 | NO | ● | | | | | | | | | | | |
| | | 2 | NO | | | ● | | | | | | | | | |
| | | 3 | NC | | | | ● | | | | | | | | |
| | | 4 | Dummy | | | | | | | | | | | | |

- On the spring-returned, the key can be released only from the maintained position. On the maintained, the key can be released from every position. Key retained positions are also available. See page C-8.
- On the 2-position selector switches marked with * above, the contact operation is reversed as follows.



- On the contact arrangement marked with ★ in the table above, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.
- Key selector switches with one or three contact blocks contain a dummy block.
- Cylinder cover: Black
- Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



- For more contact arrangement chart, see pages C-26 to C-28.

ø25 TWS Series Illuminated Selector Switches

Illuminated Selector Switches

90° 2-position

Package Quantity: 1

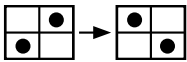
| Shape | | ASLS | | | | | | |
|---------------------------|-------------------|---------|-------------------|---|--------------|-------------|--------------------------|-------------------------|
| | | | | | | | | |
| Contact Arrangement Chart | | | | | | | | |
| Contact Code | Contact Block | | Operator Position | | Lamp | Maintained | Spring Return from Right | Spring Return from Left |
| | Mounting Position | Contact | L | R | | L R | L R | L R |
| 11 (1NO-1NC) | 1 | NO | | ● | Without Lamp | ASLS29911② | ASLS219911② | ASLS229911② * |
| | 2 | NC | ● | | LED | ASLS2③11DN② | ASLS21③11DN② | ASLS22③11DN② * |
| 20 (2NO) | 1 | NO | | ● | Without Lamp | ASLS29920② | ASLS219920② | ASLS229920② * |
| | 2 | NO | | ● | LED | ASLS2③20DN② | ASLS21③20DN② | ASLS22③20DN② * |
| 22 (2NO-2NC) | 1 | NO | | ● | Without Lamp | ASLS29922② | ASLS219922② | ASLS229922② * |
| | 2 | NC | ● | | | | | |
| | 3 | NO | | ● | LED | ASLS2③22DN② | ASLS21③22DN② | ASLS22③22DN② * |
| | 4 | NC | ● | | | | | |

Designation Code

Specify a code in place of ② or ③ in the Part No.

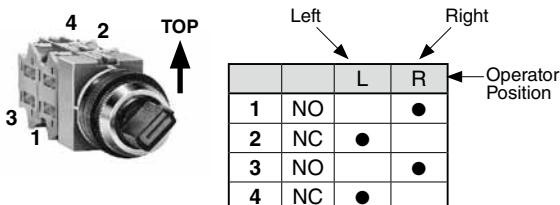
| ② Lens/LED Color Code | | ③ Operating Voltage Code | Input |
|---|--|--------------------------|--------------|
| Without Lamp | LED | LED | |
| Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow | Specify a lens/LED color code in place of ②. A: amber G: green R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination. | 66: 6V AC/DC | Full Voltage |
| | | 11: 12V AC/DC | |
| 22: 24V AC/DC | | | |
| | | 16: 100/110V AC | Transformer |
| | | 136: 115/120V AC | |
| | | 26: 200/220V AC | |
| | | 256: 230/240V AC | |
| | | 386: 380V AC | |
| | | 46: 400/440V AC | |
| | | 486: 480V AC | |

- On the selector switches marked with * above, the contact operation is reversed as follows.



- Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



- For more contact arrangement chart, see pages C-26 to C-28.

Illuminated Selector Switches

45° 3-position

| Contact Code | Contact Block | | Operator Position | | | Lamp | Maintained | Spring Return from Right | Spring Return from left | Spring Return Two-way |
|-----------------|-------------------|---------|-------------------|---|---|--------------|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| | Mounting Position | Contact | L | C | R | | | | | |
| 20 (2NO) | 1 | NO | ● | | | Without Lamp | ASLS39920 ^② | ASLS319920 ^② | ASLS329920 ^② | ASLS339920 ^② |
| | 2 | NO | | | ● | LED | ASLS3 ^③ 20DN ^② | ASLS31 ^③ 20DN ^② | ASLS32 ^③ 20DN ^② | ASLS33 ^③ 20DN ^② |
| 02 (2NC) | 1 | NC | | ■ | | Without Lamp | ASLS39902 ^② | ASLS319902 ^② | ASLS329902 ^② | ASLS339902 ^② |
| | 2 | NC | ■ | | | LED | ASLS3 ^③ 02DN ^② | ASLS31 ^③ 02DN ^② | ASLS32 ^③ 02DN ^② | ASLS33 ^③ 02DN ^② |
| 22 (2NO-2NC) | 1 | NO | ● | | | Without Lamp | ASLS39922 ^② | ASLS319922 ^② | ASLS329922 ^② | ASLS339922 ^② |
| | 2 | NO | | | ● | Without Lamp | ASLS39922 ^② | ASLS319922 ^② | ASLS329922 ^② | ASLS339922 ^② |
| | 3 | NC | | ■ | | Without Lamp | ASLS39922 ^② | ASLS319922 ^② | ASLS329922 ^② | ASLS339922 ^② |
| | 4 | NC | ■ | | | Without Lamp | ASLS39922 ^② | ASLS319922 ^② | ASLS329922 ^② | ASLS339922 ^② |
| 40 (4NO) | 1 | NO | ● | | | Without Lamp | ASLS39940 ^② | ASLS319940 ^② | ASLS329940 ^② | ASLS339940 ^② |
| | 2 | NO | | | ● | Without Lamp | ASLS39940 ^② | ASLS319940 ^② | ASLS329940 ^② | ASLS339940 ^② |
| | 3 | NO | ● | | | LED | ASLS3 ^③ 40DN ^② | ASLS31 ^③ 40DN ^② | ASLS32 ^③ 40DN ^② | ASLS33 ^③ 40DN ^② |
| | 4 | NO | | | ● | LED | ASLS3 ^③ 40DN ^② | ASLS31 ^③ 40DN ^② | ASLS32 ^③ 40DN ^② | ASLS33 ^③ 40DN ^② |
| 04 (4NC) | 1 | NC | | ■ | | Without Lamp | ASLS39904 ^② | ASLS319904 ^② | ASLS329904 ^② | ASLS339904 ^② |
| | 2 | NC | ■ | | | Without Lamp | ASLS39904 ^② | ASLS319904 ^② | ASLS329904 ^② | ASLS339904 ^② |
| | 3 | NC | | ■ | | LED | ASLS3 ^③ 04DN ^② | ASLS31 ^③ 04DN ^② | ASLS32 ^③ 04DN ^② | ASLS33 ^③ 04DN ^② |
| | 4 | NC | ■ | | | LED | ASLS3 ^③ 04DN ^② | ASLS31 ^③ 04DN ^② | ASLS32 ^③ 04DN ^② | ASLS33 ^③ 04DN ^② |

• Incandescent lamp is also available.

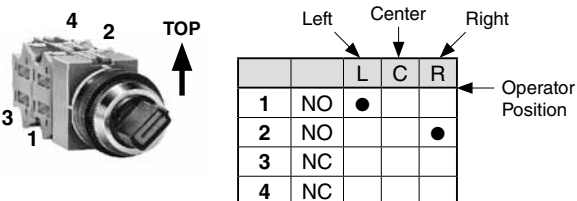
Designation Code

Specify a code in place of ② or ③ in the Part No.

| ② Lens/LED Color Code | | ③ Operating Voltage Code | Input |
|---|--|---|---|
| Without Lamp | LED | LED | |
| Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow | Specify a lens/LED color code in place of ②. A: amber G: green R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination. | 66: 6V AC/DC 11: 12V AC/DC 22: 24V AC/DC 16: 100/110V AC 136: 115/120V AC 26: 200/220V AC 256: 230/240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC | Full Voltage Transformer |

• Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



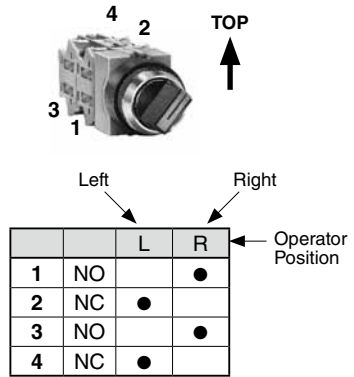
• For more contact arrangement chart, see pages C-26 to C-28.

ø25 TWS series Selector Switch Contact Arrangement Charts

90° 2-position (Maintained / Spring Return)

| Positions | | | | Maintained | Spring Return from Right | Spring Return from Left | | | |
|-----------------|-------------|-------------------|---------|-------------------------------|--------------------------|-------------------------|---|---|---|
| | | | | | | | | | |
| Operator | | | | Knob, Lever, Key, Illuminated | | | | | |
| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | | | |
| | | | | | | | | | |
| | | | | L | R | L | R | | |
| 10 (1NO) | — | 1 | NO | | ● | ● | | | |
| | | 2 | Dummy | | | | | | |
| 01 (1NC) | — | 1 | NC | ● | | | ● | | |
| | | 2 | Dummy | | | | | | |
| 11 (1NO-1NC) | — | 1 | NO | | ● | ● | | | |
| | | 2 | NC | ● | | | ● | | |
| | 103 | 1 | NC | ● | | | ● | | |
| | | 2 | NO | | ● | ● | | | |
| 20 (2NO) | — | 1 | NO | | ● | ● | | | |
| | | 2 | NO | | ● | ● | | | |
| 02 (2NC) | — | 1 | NC | ● | | | ● | | |
| | | 2 | NC | ● | | | ● | | |
| | | 22 (2NO-2NC) | — | 1 | NO | | ● | ● | |
| | | | | 2 | NC | ● | | | ● |
| 3 | NO | | | | ● | ● | | | |
| 4 | NC | | | ● | | | ● | | |
| 110 | — | 1 | NC | ● | | | ● | | |
| | | 2 | NO | | ● | ● | | | |
| | | 3 | NC | ● | | | ● | | |
| | | 4 | NO | | ● | ● | | | |
| 111 | — | 1 | NO | | ● | ● | | | |
| | | 2 | NO | | ● | ● | | | |
| | | 3 | NC | ● | | | ● | | |
| | | 4 | NC | ● | | | ● | | |
| 117 | — | 1 | NC | ● | | | ● | | |
| | | 2 | NO | | ● | ● | | | |
| | | 3 | NO | | ● | ● | | | |
| | | 4 | NC | ● | | | ● | | |
| 31 (3NO-1NC) | 107 | 1 | NC | ● | | | ● | | |
| | | 2 | NO | | ● | ● | | | |
| | | 3 | NO | | ● | ● | | | |
| | | 4 | NO | | ● | ● | | | |
| 40 (4NO) | — | 1 | NO | | ● | ● | | | |
| | | 2 | NO | | ● | ● | | | |
| | | 3 | NO | | ● | ● | | | |
| | | 4 | NO | | ● | ● | | | |
| 2R ★ | 118 ★ | 1 | NO | | | | | | |
| | | 2 | NC | | | | | | |
| | 168 ★ | 1 | NO | | | | | | |
| | | 2 | NC | | | | | | |
| | 119 ★ | 1 | NC | | | | | | |
| | | 2 | NO | | | | | | |
| | 169 ★ | 1 | NC | | | | | | |
| | | 2 | NO | | | | | | |
| 4R ★ | 120 ★ | 1 | NO | | | | | | |
| | | 2 | NC | | | | | | |
| | | 3 | NO | | | | | | |
| | | 4 | NC | | | | | | |
| | 170 ★ | 1 | NO | | | | | | |
| | | 2 | NC | | | | | | |
| | | 3 | NO | | | | | | |
| | | 4 | NC | | | | | | |
| | 121 ★ | 1 | NC | | | | | | |
| | | 2 | NO | | | | | | |
| | | 3 | NC | | | | | | |
| | | 4 | NO | | | | | | |
| 171 ★ | 1 | NC | | | | | | | |
| | 2 | NO | | | | | | | |
| | 3 | NC | | | | | | | |
| | 4 | NO | | | | | | | |

Contact Block Mounting Position and Contact Arrangement Chart



• On the contact arrangement marked with ★ in the table, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.

Part No. Development

• When circuit number is not required:

ASS 2 11 N

└─ Contact Code (1NO-1NC)
└─ 2-position

• When circuit number is required:

ASS 2 11 N - 103

└─ Circuit No.
└─ Contact Code (1NO-1NC)
└─ 2-position

TWS Series Selector Switch Contact Arrangement Charts ø25

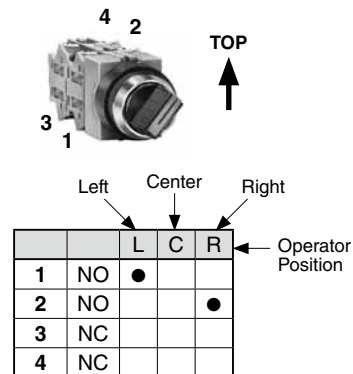
45° 3-position (Maintained / Spring Return)

| Positions | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two-way |
|-----------|-------------------------------|--------------------------|-------------------------|-----------------------|
| | | | | |
| Operator | Knob, Lever, Key, Illuminated | | | |

| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | |
|-----------------|-------------|-------------------|---------|--------------------|---|---|---|
| | | | | | | | |
| | | | | L | C | R | |
| 11 (1NO-1NC) | 202 | 1 | NO | ● | | | |
| | | 2 | NC | | | | |
| | 203 | 1 | NC | | | | |
| | | 2 | NO | | | ● | |
| | 302 | 1 | NO | ● | | ● | |
| | | 2 | NC | | | | |
| 303 | 1 | NC | | ● | | | |
| | 2 | NO | | | ● | | |
| 20 (2NC) | — | 1 | NO | ● | | | |
| | | 2 | NO | | | ● | |
| 301 | — | 1 | NO | | | ● | |
| | | 2 | NO | | | ● | |
| 02 (2NC) | — | 1 | NC | | | | |
| | | 2 | NC | | | | |
| 304 | — | 1 | NC | | ● | | |
| | | 2 | NC | | | | |
| 22 (2NO-2NC) | — | 1 | NO | ● | | | |
| | | 2 | NO | | | ● | |
| | | 3 | NC | | | | |
| | | 4 | NC | | | | |
| | 210 | — | 1 | NC | | | ● |
| | | | 2 | NO | | | ● |
| | | | 3 | NC | | | |
| | | | 4 | NO | | | ● |
| | 308 | — | 1 | NO | ● | | ● |
| | | | 2 | NC | | | |
| | | | 3 | NO | ● | | ● |
| | | | 4 | NC | | | |
| 309 | — | 1 | NO | ● | | ● | |
| | | 2 | NC | | | | |
| | | 3 | NC | | ● | | |
| | | 4 | NO | | | ● | |
| 310 | — | 1 | NC | | ● | | |
| | | 2 | NO | | | ● | |
| | | 3 | NC | | ● | | |
| | | 4 | NO | | | ● | |
| 31 (3NO-1NC) | 206 | 1 | NO | ● | | | |
| | | 2 | NC | | | | |
| | 207 | 3 | NO | ● | | | |
| | | 4 | NO | | | ● | |
| 13 (1NC-3NC) | 212 | 1 | NO | ● | | | |
| | | 2 | NC | | | | |
| | | 3 | NC | | | | |
| | | 4 | NC | | | | |
| | 313 | 1 | NC | | ● | | |
| | | 2 | NO | | | ● | |
| | | 3 | NC | | ● | | |
| | | 4 | NC | | | | |

| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | |
|--------------|-------------|-------------------|---------|--------------------|---|---|---|
| | | | | | | | |
| | | | | L | C | R | |
| 40 (4NO) | — | 1 | NO | ● | | | |
| | | 2 | NO | | | ● | |
| | | 3 | NO | ● | | | |
| | | 4 | NO | | | ● | |
| | 305 | — | 1 | NO | ● | | ● |
| | | | 2 | NO | | | ● |
| | | | 3 | NO | ● | | ● |
| | | | 4 | NO | | | ● |
| 04 (4NC) | — | 1 | NC | | | | |
| | | 2 | NC | | | | |
| | | 3 | NC | | | | |
| | | 4 | NC | | | | |
| | 314 | — | 1 | NC | | ● | |
| | | | 2 | NC | | | |
| | | | 3 | NC | | ● | |
| | | | 4 | NC | | | |

Contact Block Mounting Position and Contact Arrangement Chart



Part No. Development

- When circuit number is not required:

ASS 3 22 N

— Contact Code (2NO-2NC)
— 3-position

- When circuit number is required:

ASS 3 22 N - 210

— Circuit No.
— Contact Code (2NO-2NC)
— 3-position

ø25 TWS Series Selector Switch Contact Arrangement Charts

45° 3-position (Maintained)

| Positions | | | | Maintained | | | |
|--------------|-------------|-------------------|---------|--------------------------|---|---|---|
| | | | | | | | |
| Operator | | | | Knob, Lever, Illuminated | | | |
| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | |
| | | | | | | | |
| | | | | L | C | R | |
| 3S ★ | 243 ★ | 1 | NO | ● | | | |
| | | 2 | NO | | | ● | |
| | | 3 | NC | | ● | | |
| | | 4 | Dummy | | | | |
| 4S ★ | 233 ★ | 1 | NO | ● | | | |
| | | 2 | NC | | | ● | |
| | | 3 | NO | ● | | ● | |
| | | 4 | NO | | | ● | |
| | 234 ★ | 1 | NO | ● | | | |
| | | 2 | NC | | | | ● |
| | | 3 | NC | | ● | | |
| | | 4 | NC | | | | |
| | 235 ★ | 1 | NC | | | | ● |
| | | 2 | NO | | | | ● |
| | | 3 | NC | | ● | | |
| | | 4 | NO | | | | ● |
| | 237 ★ | 1 | NO | ● | | | |
| | | 2 | NO | | | | ● |
| | | 3 | NC | | ● | | |
| | | 4 | NO | | | | ● |
| 240 ★ | 1 | NC | | | | ● | |
| | 2 | NC | | | | ● | |
| | 3 | NC | | ● | | | |
| | 4 | NO | | | | ● | |

45° 4-position (Maintained)

| Positions | | | | Maintained | | | | |
|--------------|-------------|-------------------|---------|--------------------|---|---|---|---|
| | | | | | | | | |
| Operator | | | | Knob, Lever | | | | |
| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | | |
| | | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | |
| 3S ★ | 461 ★ | 1 | NO | ● | | | | |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | Dummy | | | | | |
| 4S ★ | 405 ★ | 1 | NC | | | | ● | |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | NC | | | | | |
| | 407 ★ | 1 | NC | | | | | ● |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | NO | | | | | ● |
| | 409 ★ | 1 | NO | ● | | | | |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | NC | | | | | |
| | 411 ★ | 1 | NO | ● | | | | |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | NO | | | | | ● |

30° 5-position (Maintained)

| Positions | | | | Maintained | | | | |
|--------------|-------------|-------------------|---------|--------------------|---|---|---|---|
| | | | | | | | | |
| Operator | | | | Knob, Lever | | | | |
| Contact Code | Circuit No. | Mounting Position | Contact | Operator Positions | | | | |
| | | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 5 |
| 4S ★ | 501 ★ | 1 | NO | ● | | | | |
| | | 2 | NC | | ● | | | |
| | | 3 | NC | | | | ● | |
| | | 4 | NO | | | | | ● |

Contact Block Mounting Position and Contact Arrangement Chart

| | | L | C | R |
|---|----|---|---|---|
| 1 | NO | ● | | |
| 2 | NC | | | |
| 3 | NO | ● | | ● |
| 4 | NC | | | ● |

• On the contact arrangement marked with ★ in the table, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.

Part No. Development

- When circuit number is not required:

ASS 3 4S N

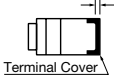











└─ Contact Code
└─ 3-position

- When circuit number is required:

ASS 3 4S N - 233

└─ Circuit No.
└─ Contact Code (2NO-2NC)
└─ 3-position

Terminal Covers

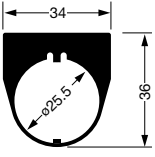
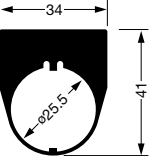
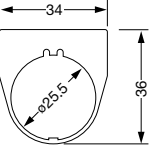
| Terminal Cover | | HW-VL2 | HW-VL3 | HW-VL5 | APS-PVL | Use of terminal covers increases the depth by the dimensions below. |
|---|---|---|--|--|--|---|
|  | |  39.8H × 14.1W |  37.8H × 26W |  39.1H × 15.5W |  36H × 29.4W | |
| <ul style="list-style-type: none"> • Pilot light APS UPQS UPQMS | Full Voltage | | | | X | +6 mm |
| | Transformer DC-DC Converter | | X | | | +3 mm |
| <ul style="list-style-type: none"> • Pushbutton ABS AOS ABGS AOGS ABFS AOFS AKS AVS AJS AZS ATS UTS AYS • Selector switch ASS | 1 contact block  | X | | | | +3.5 mm |
| | 2 contact blocks  | X 2 pieces | | | | |
| | 3 contact blocks  | X 2 pieces | | | | |
| | 4 contact blocks  | X 2 pieces | | | | |
| <ul style="list-style-type: none"> • Illuminated pushbutton ALS AOLF AOLS ULOS ALGS UOLQS AOLGS AVLS ALFS ATLS | Full Voltage  | X 2 pieces | | | | +3.5 mm |
| | <ul style="list-style-type: none"> • Illuminated selector switch ASLS | Full Voltage  | | | X | |
| <ul style="list-style-type: none"> • Push-to-check pilot light APS | Transformer DC-DC Converter  | | X | | | +3 mm |

Ordering Terminal Covers

Terminal covers are ordered separately.
When ordering terminal covers, specify the Part No. and required quantity.

ø25 TWS Series Accessories and Replacement Parts

Nameplates

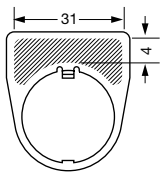
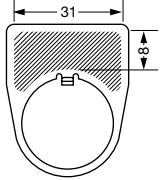
| Dimensions (mm) | Legend | Material | Part No. | Ordering No. | Package Quantity | Description |
|--|-------------|---------------------------------|----------|--------------|------------------|---|
|  | Blank | Aluminium 1.2 mm thick | NSA-0 | NSA-0 | 1 | • Black |
| | | | | NSA-0PN10 | 10 | |
| | With Legend | | NSA-* | NSA-* | 1 | • White letters on black back- ground |
| | | | | NSA-*PN10 | 10 | |
|  | Blank | Aluminium 1.2 mm thick | NSALO | NSALO | 1 | • Black |
| | | | | NSALOPN10 | 10 | |
|  | Blank | Stainless steel 0.8 mm thick | NFSO | NFSO | 1 | • Stainless steel ground color |
| | | | | NFSOPN10 | 10 | |

• Specify a legend code in place of * in the Ordering No.

Legends


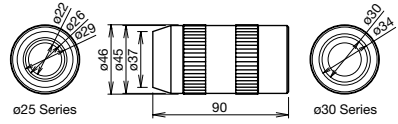

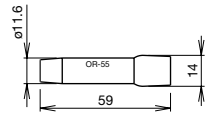

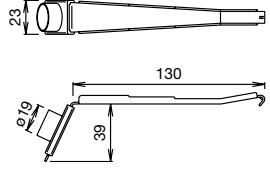

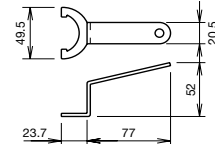

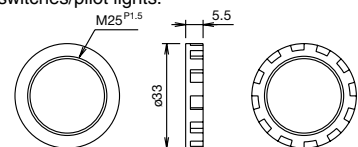

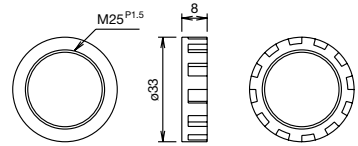

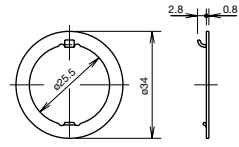

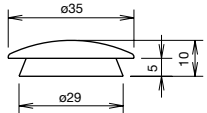
| Code | Legend |
|------|---------------|
| 0 | (blank) |
| 1 | ON |
| 2 | OFF |
| 3 | START |
| 4 | STOP |
| 31 | OFF-ON |
| 35 | HAND-AUTO |
| 53 | HAND-OFF-AUTO |

Example of Shape and Engraving Area



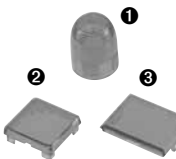
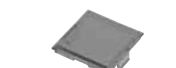

| Shape | Engraving Area | | Max. No. of Lines | No. of Letters on 1 Line |
|--|----------------|-------|-------------------|--------------------------|
| | Height | Width | | |
| Standard (NSA/NFSO)  | 4 | 31 | 1 | 17 |
| Mushroom (NSALO)  | 8 | 31 | 2 | 17 |

• The above example is when the letter is 3 mm tall.
 • Engraving must be made within 1.5 mm from the sides.

Accessories

| Shape | Material | Part No. | Ordering No. | Package Quantity | Dimensions (mm) |
|--|--|----------------|--------------------|------------------|---|
|  | Rubber (nitril) | OR-12 | OR-12 | 1 | <ul style="list-style-type: none"> Used to tighten the round bezel when installing the TWS switch/pilot light onto a panel.  |
|  | Rubber (nitril) | OR-55 | OR-55 | 1 | <ul style="list-style-type: none"> Used to install and remove LED/incandescent lamps.  |
|  | Metal (steel: zinc-plated) / Rubber (nitril) | TW-KC1 | TW-KC1 | 1 | <ul style="list-style-type: none"> Used to remove contact blocks, transformers, lenses and adapters.  |
|  | Metal (steel: zinc-plated) | TWST-T1 | TWST-T1 | 1 | <ul style="list-style-type: none"> Used to tighten the locking ring on the square switches/pilot lights.  |
| Locking Ring (For Square Units)  | Pushbutton Illuminated Pushbutton | OG-RT1 | OG-RT1PN02 | 2 | <ul style="list-style-type: none"> Used to attach square pushbuttons and illuminated pushbuttons on to the panel. Mounting centers are the same as round switches/pilot lights.  |
|  | Pilot Light | OG-RT2 | OG-RT2PN02 | 2 | <ul style="list-style-type: none"> Used to attach pilot lights on to the panel. Mounting centers are the same as round switches/pilot lights.  |
|  | Metal (steel: zinc-plated) | OGL-21 | OGL-21PN10 | 10 | <ul style="list-style-type: none"> Used to prevent the operator from rotating. Generally used when using no nameplates on selector switches.  |
|  | Rubber (nitril /black) | OBS-13B | OBS-13BPN05 | 5 | <ul style="list-style-type: none"> Used to plug unused ø25.5mm mounting holes. Gray also available (ordering no. OBS-13PN05)  |





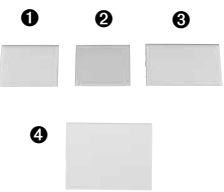









Maintenance Parts

| Shape | Material | Part No. | Ordering No. | Package Quantity | Color Code | | |
|---|---|-------------------------------|--|------------------|---------------|---|---|
|  | Polycarbonate | ① Pushbutton Pilot Light | OGP-22① | OGP-22①PN02 | 2 | B (black), G (green), R (red), Y (yellow), W (white) • Cannot be used for switches/pilot lights with half shroud or full shroud. | |
| | | ② Selector Switch | OGP-33① | OGP-33①PN02 | | | |
| | Metal (chrome-plated) ZDC | Shroud: brass Others: ZDC | ③ Pushbutton Pilot Light Key Selector Illuminated Selector | OG-22 | OG-22PN02 | 1 | • Cannot be used for switches/pilot lights with half shroud or full shroud. |
| | | | ④ Selector Switch (except key selector) | OG-33 | OG-33PN02 | | |
| | | | ⑤ Pushbutton with Full Shroud | ABS2FN | ABS2FN | | |
| | | | ⑥ Mushroom with Full Shroud | ABS3GN | ABS3GN | | |
| | ⑦ Pushbutton, Illuminated Pushbutton with Half Shroud | Metal (chrome-plated) ZDC | ALS1G | ALS1G | | | |
| | ⑧ Illuminated Pushbutton with Full Shroud | Metal (chrome-plated) ZDC | ALS1F | ALS1F | | | |
|  | Polyacetal | ① Flush | ABS1BN-① | ABS1BN-①PN05 | 5 | B (black), G (green), R (red), S (blue), Y (yellow), W (white) • Light color | |
| | | ② Extended | ABS2BN-① | ABS2BN-①PN05 | | | |
| | | ③ ø35mm Mushroom | ABS3BN-① | ABS3BN-①PN02 | 2 | | |
| | | 2 | ④ Square Flush | UBQS1BN-① | UBQS1BN-①PN02 | B (black), G (green), R (red), S (blue), Y (yellow) • Light color | |
| | | | ⑤ Square Extended | UBQS2BN-① | UBQS2BN-①PN02 | | |
| | | | ⑥ Pushlock Turn Reset | AVS3BN-① | AVS3BN-①PN02 | | R (red), Y (yellow) |
| | | | ⑦ Push-Pull | AYS3BN-① | AYS3BN-①PN02 | | B (black), G (green), R (red), Y (yellow) |
|  | AS resin | ① Dome | APS106L-② | APS106L-②PN05 | 5 | C (clear), G (green), R (red), S (blue) | |
| | | | APS106LD-② | APS106LD-②PN05 | | A (amber), W (white), Y (yellow) | |
| | | ② For Square Metal Bezel Unit | UPQS306L-② | UPQS306L-②PN05 | | C (clear), G (green), R (red), S (blue) | |
| | | | UPQS306LD-② | UPQS306LD-②PN05 | | A (amber), Y (yellow) | |
| ③ Rectangular | UPQS406L-② | UPQS406L-②PN05 | A (amber), C (clear), G (green), R (red), S (blue) | | | | |
|  | AS resin | For Square with Plastic Bezel | UPQS106L-② | UPQS106L-②PN05 | 5 | C (clear), G (green), R (red), S (blue) | |
| | | | UPQS106LD-② | UPQS106LD-②PN05 | 5 | A (amber), Y (yellow) | |
|  | AS resin | ① Extended | ALS06L-② | ALS06L-②PN05 | 5 | C (clear), G (green), R (red), S (blue) | |
| | | | ALS06LD-② | ALS06LD-②PN05 | | A (amber), Y (yellow), W (white) | |
| | | ② Mushroom | ALS3L-② | ALS3L-②PN02 | 2 | G (green), R (red), S (blue) | |
| | | | ALS3LD-② | ALS3LD-②PN02 | | A (amber), W (white) | |
| ③ Pushlock Turn Reset | AVLS3L-R | AVLS3L-RPN02 | | | | | |

Note: Specify a button color code or lens color code in place of ① or ② in the Ordering No.
Use a clear lens for white or pure white illumination.

ø25 TWS Series Accessories and Replacement Parts

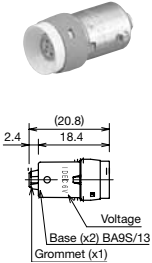
Maintenance Parts

| Shape | | Material | Part No. | Ordering No. | Package Quantity | Remarks |
|---|---|---|------------|----------------|------------------|---|
|  | ① Knob | Plastic | ASSHHY-① | ASSHHY-①PN02 | 2 | B (black), G (green), R (red) |
| | ② Lever | | ASSHHL-① | ASSHHL-①PN02 | | |
| | ③ Color Insert | Plastic | TWS-HC1① | TWS-HC1①PN05 | 5 | B (black), G (green), R (red), S (blue), Y (yellow), W (white) |
| | ④ Illuminated Selector | | ASLSLDY-② | ASLSLDY-② | | |
| | | | ASLSDDY-② | ASLSDDY-② | 1 | G (green), R (red), S (blue) A (amber), W (white), Y (yellow) |
|  | | Plastic | AKS2B-① | AKS2B-①PN05 | 5 | B (black), R (red) |
|  | | Plastic | ABS1B-C | ASB1B-CPN05 | 5 | B (black), G (green), R (red), W (white), Y (yellow) • Used on flush pushbuttons to indicate a mark or a symbol engraved on the marking plate. The clear button cover holds the marking plate. |
|  | | Plastic | TWS-0① | TWS-0①PN10 | 10 | |
|  | ① For Square Pilot Lights and Illuminated Pushbuttons | Plastic | UPQS106P-W | UPQS106P-WPN02 | 2 | • □21.2 × 1t mm |
| | ② For Square Pilot Lights with Metal Bezel | | UPQS106P-C | UPQS106P-CPN02 | | |
| | ③④ For Rectangular Pilot Lights | | UPQS306N-W | UPQS306N-WPN02 | | • □20 × 2t mm |
| | | | UPQS406P-W | UPQS406P-WPN02 | | |
| | | | UPQS406P-C | UPQS406P-CPN02 | | 27.2 × 21.2 × 1t mm |
|  | 1NO |  | HW-C10 | HW-C10 | 1 | Housing: Blue Push rod: Green |
| | 1NC |  | HW-C01 | HW-C01 | | Housing: Purple red Push rod: Red |
| | Early Make |  | HW-C10R | HW-C10R | | Housing: Blue Push rod: Black |
| | Late Break |  | HW-C01R | HW-C01R | | Housing: Purple red Push rod: White |
|  | | | TW-DB | TW-DBPN10 | 10 | • Used for non-illuminated units with 1NO or 1NC contact blocks. |
|  | | | TW-DA1B | TW-DA1BPN02 | 2 | • Adapter with M3.5 screws used for illuminated pushbutton or illuminated selector switch. Snaps on to the back of the contact block. |
|  | For Key Selector Switch | Metal | TW-SK-0 | TW-SK-0PN02 | 2 | |
|  | ① 3.0-mm thick | Rubber | OW-22 | OW-22PN10 | 10 | • Outside diameter: ø33.8 • Inside diameter: ø25.5 |
| | ② 1.5-mm thick | | OW-21 | OW-21PN10 | | |

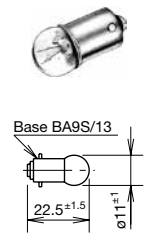
Note: Specify a color code in place of ① or ② in the Ordering No.

Maintenance Parts

LED Lamps (LSTD)


| Dimensions | Operating Voltage | Current Draw | | Part No. | Ordering No. | Illumination Color Code | Package Quantity | Base |
|--|-------------------|--------------|---|----------------|----------------|---|--------------------|---------|
| | | AC | DC | | | | | |
|  <p>2.4 (20.8) 18.4</p> <p>Voltage Base (x2) BA9S/13 Grommet (x1)</p> | 6V AC/DC ±5% | 8 mA | 7 mA (A, R, W) 5.5 mA (G, PW, S) | LSTD-6② | LSTD-6② | Specify a color code in place of ② in the Ordering No. A: amber G: green PW: pure white R: red S: blue W: white | 1 | BA9S/13 |
| | | | | | | | LSTD-6②PN10 | |
| | 12V AC/DC ±10% | 11 mA | 10 mA | LSTD-1② | LSTD-1② | 1 | | |
| | | | | | | LSTD-1②PN10 | 10 | |
| | 24V AC/DC ±10% | 11 mA | 10 mA | LSTD-2② | LSTD-2② | 1 | | |
| | | | | | | LSTD-2②PN10 | 10 | |

Incandescent Lamps (LS)

| Dimensions | Rated Operating Voltage | Lamp Ratings | Part No. | Package Quantity |
|---|-------------------------|--------------|-------------|------------------|
|  <p>Base BA9S/13</p> <p>22.5±1.5 0.11±1</p> | 6V AC/DC | 1W (6.3V) | LS-6 | 1 |
| | 12V AC/DC | 1W (18V) | LS-8 | |
| | 18V AC/DC | 1W (24V) | LS-2 | |
| | 24V AC/DC | 1W (30V) | LS-3 | |

ø25 TWS Series Accessories and Replacement Parts

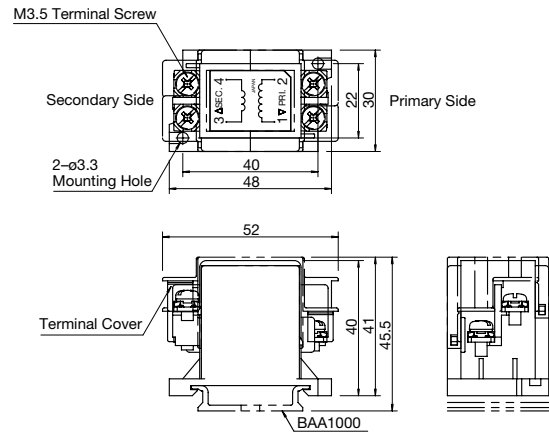
Transformer

| Shape | Primary Voltage | Secondary Voltage | Part No. | Applicable Load |
|---|-----------------|-------------------|----------------|--|
| For 6V  | 100/110V AC | 5.5V AC, 1W | TWR516 | LSTD-6 LED lamp (6V AC/DC) or LS-6 incandescent lamp (6V AC/DC, 1W) |
| | 115/120V AC | | TWR5126 | |
| | 200/220V AC | | TWR526 | |
| | 230/240V AC | | TWR5246 | |
| | 380V AC | | TWR5386 | |
| | 400/440V AC | | TWR546 | |
| | 480V AC | | TWR5486 | |

Specifications

| | |
|--------------------------|---|
| Operating Voltage | 100/110V AC, 115/120V AC, 200/220V AC, 230/240V AC, 380V AC, 400/440V AC, 480V AC (50/60Hz) |
| Current Draw | 2.4 VA |
| Rated Insulation Voltage | 600V |
| Insulation Resistance | 100 MΩ minimum (500V DC megger) |
| Operating Temperature | -30 to +60°C (no freezing) |
| Storage Temperature | -40 to +80°C (no freezing) |
| Operating Humidity | 35 to 85% RH (no condensation) |
| Vibration Resistance | Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm |
| Shock Resistance | Damage limits : 1,000 m/s ² |
| Dielectric Strength | 2,500V AC, 1 minute |
| Terminal Screw | M3.5 |
| Applicable Wire | 2 mm ² maximum, 2 wires maximum |
| Weight (approx.) | 87g |

Dimensions

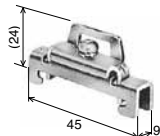


Accessories

DIN Rail

| Part No. | Ordering No. | Length | Weight (approx.) | Material | Package Quantity |
|----------------|--------------------|---------|------------------|----------|------------------|
| BAA1000 | BAA1000PN10 | 1000 mm | 200g | Aluminum | 10 |
| BAP1000 | BAP1000PN10 | 1000 mm | 320g | Steel | 10 |

End Clip

| Part No. | Ordering No. | Applicable DIN Rail | Weight (approx.) | Material | Package Quantity | Dimensions |
|-------------|-----------------|----------------------------------|------------------|------------------------|------------------|---|
| BNL6 | BNL6PN10 | BAA1000 BAP1000 | 15g | Steel (Zinc-plated) | 10 |  |

- Use plastic end clip BC9Z-E/NS35N when using 400/440V AC primary voltage transformers.

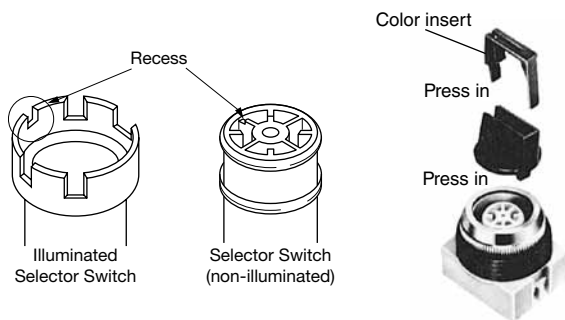
Safety Precautions

- Turn off the power to the TWS series before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid a burn on your hand, use the lamp holder tool when replacing lamps.
- For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the M3.5 terminal screws to a tightening torque of 1.0 to 1.3 N·m. Failure to tighten terminal screws may cause overheat and fire.
- Use HW-C contact blocks for the TWS series. Do not replace with or add conventional TW series contact blocks. Using a different type of contact block may lead to malfunction.

Instructions

Installation of Selector Operators

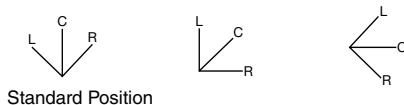
1. The shaft of each selector or illuminated selector switch has a recess to identify in which direction to install the operator. Align the operator with the recess and press in the operator.
2. Press color insert (non-illuminated) into the operator. The color insert retains the operator.



Standard Position

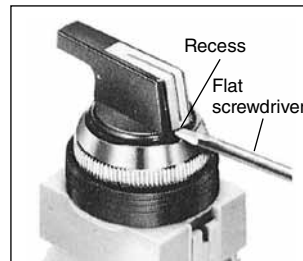
| 2-Position, 90° | 3-Position, 45° | 4-Position, 45° | 5-Position, 30° |
|-----------------|-----------------|-----------------|-----------------|
| | | | |

[Example]



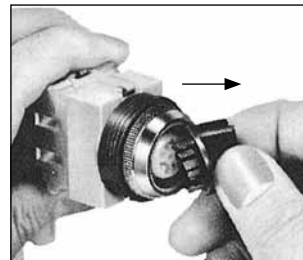
The non-illuminated operators can be installed in positions other than the standard position as shown above.

Removing the Operator



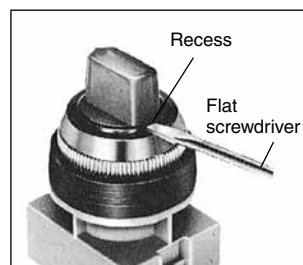
1. Removing the Color Insert

Insert a flat screwdriver (4.5mm wide at maximum) into the recess of the color insert. Turn the screwdriver to push out the insert from the operator.



2. Removing the Operator (Non-illuminated)

Push the operator sideways as shown in the left photo to remove the operator.

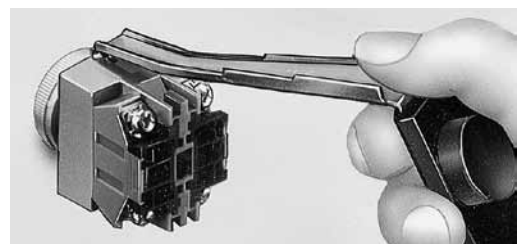


3. Removing the Operator (Illuminated)

Insert a flat screwdriver into the recess of the operator and turn the screwdriver to remove the operator.

Removing Contact Blocks, Transformers, and Full Voltage Adapters

Insert the end of the contact block removal tool into the snap-fit latch of the contact block (or transformer, full voltage adapter) and pull the tool as shown on the right.



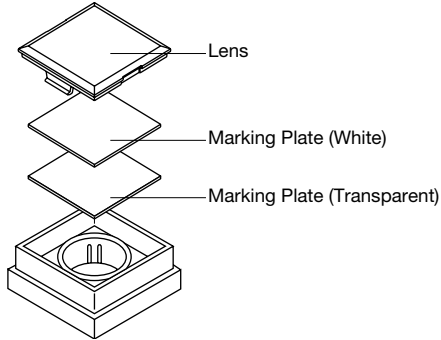
Instructions

Installing Lenses

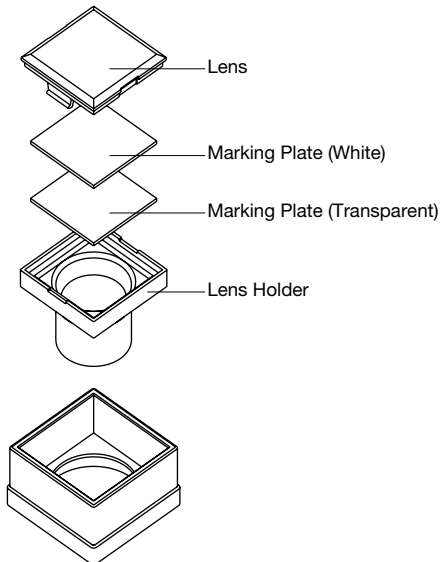
Lens Structure and Marking Plate

All square lens units are marking types. To engrave on the marking plate, remove the marking plate from the lens.

Square Pilot Lens



Square Illuminated Pushbutton



Replacement of Lamps

Lamps can be replaced by using the lamp holder tool (OR-55) from the front of the panel.

How to remove

To remove, slip the lamp holder tool onto the lamp head lightly. Then push slightly, and turn the lamp holder tool counterclockwise.

How to install

To install, insert the lamp head into the lamp holder tool. Place the pins on the lamp base to the grooves in the lamp socket. Insert the lamp and turn it clockwise.

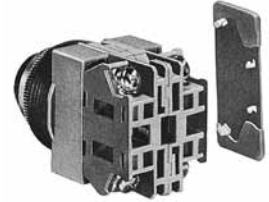
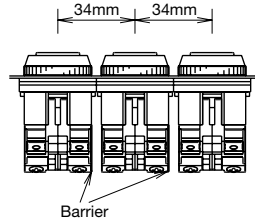


OR-55



Collective Mounting

When mounting the units closely in a horizontal row on 34mm centers, use optional barriers to prevent interconnection between adjoining terminals. The barriers can be attached simply by pressing them onto the sides of contact blocks.



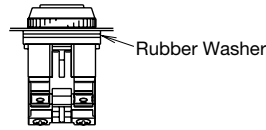
Tightening Torque

Tighten the M3.5 terminal screws to a torque of 1.0 to 1.3 N·m.

Instructions

Panel Thickness and Rubber Washer

Adjust the thickness of the rubber washers according to the panel thickness. Also, make sure to include the nameplate thickness when using a nameplate.



Applicable Models

- Momentary Pushbutton (Excluding Extended with Half Shroud, Extended with Full Shroud, and Square)
- Round Pilot Light (APS1)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 2 pieces | 1 piece |
| 0.8 to 2.5 | 2 pieces | 1 piece |
| 2.5 to 4.0 | 1 piece | 1 piece |
| 4.0 to 5.5 | — | 1 piece |
| 5.5 to 6.0 | 1 piece | — |

Applicable Models

- Momentary Pushbutton with Half Shroud (ABGS2)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 1 piece | 1 piece |
| 0.8 | 1 piece | 1 piece |
| 0.8 to 2.3 | — | 1 piece |
| 2.3 to 3.8 | 1 piece | — |

Applicable Models

- Maintained Extended Pushbutton with Half Shroud (AOGS2)
- Momentary Illuminated Pushbutton with Half Shroud (ALGS2)
- Maintained Illuminated Pushbutton with Half Shroud (AOLGS2)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 2 pieces | 1 piece |
| 0.8 | 2 pieces | 1 piece |
| 0.8 to 2.3 | 1 piece | 1 piece |
| 2.3 to 3.8 | — | 1 piece |
| 3.8 to 5.3 | 1 piece | — |

Applicable Models

- Momentary Extended Pushbutton with Full Shroud (ABFS2)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 3 pieces | 1 piece |
| 0.8 to 1.5 | 3 pieces | 1 piece |
| 1.5 to 3 | 2 pieces | 1 piece |
| 3.0 to 4.5 | 1 piece | 1 piece |
| 4.5 to 6 | — | 1 piece |

Applicable Models

- Maintained Extended Pushbutton with Full Shroud (AOFSS2)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 4 pieces | 1 piece |
| 0.8 to 1.5 | 4 pieces | 1 piece |
| 1.5 to 3.0 | 3 pieces | 1 piece |
| 3.0 to 4.5 | 2 pieces | 1 piece |
| 4.5 to 6.0 | 1 piece | 1 piece |

Applicable Models

- Other Models (Excluding Square)

| Panel Thickness (mm) | Rubber Washer | |
|----------------------|---------------|---------|
| | 1.5 mm | 3.0 mm |
| Supplied | 3 pieces | 1 piece |
| 0.8 to 2.5 | 3 pieces | 1 piece |
| 2.5 to 4.0 | 2 pieces | 1 piece |
| 4.0 to 5.5 | 1 piece | 1 piece |
| 5.5 to 6.0 | — | 1 piece |

Installation of LED Illuminated Units

1. Note the polarity for wiring when connecting to DC-DC converter unit.

| Terminal No. | Polarity |
|--------------|----------|
| X1 | Positive |
| X2 | Negative |

2. Transformer units are recommended for use in areas subjected to noise.

Notes on LED Illuminated Units

LED lamps consist of semiconductors. If the applied voltage exceeds the rated voltage, LED elements may deteriorate due to overheat, resulting in significant decrease in luminance, hue change, or failure of lighting. Also, if an extraneous noise, transient voltage, or transient current is applied to the circuit, similar effects may occur. When using LED lamps, observe the following instructions.

Rated Voltage

The LED lamps are rated at 6V, 12V, or 24V AC/DC, and can be used within $\pm 10\%$ the rated voltage of either AC or DC.

DC Power

1. Switching power supply

Regulated voltage from switching power supply is best suited. Make sure to use within the rated voltage of the LED lamp.

2. Rechargeable battery

Note that the battery voltage may exceed the rated voltage of the LED lamp while the battery is being charged and immediately after the charging is complete. Be sure to use the LED lamp on a voltage of $\pm 10\%$ the rated voltage.

3. Full-wave rectification

Since the LED lamp is AC/DC compatible, a diode bridge for rectification is not necessary. If the LED lamp is used on a full-wave rectification current through a diode bridge, the rectifier diodes will reduce the voltage, resulting in lower luminance.

4. Single-phase half-wave rectification

This is not suitable for the power source of LED lamps. Use constant-voltage DC power.

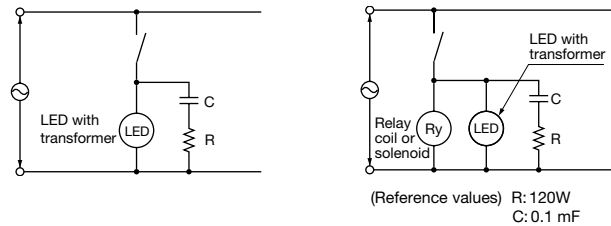
Noise

LED elements deteriorate due to extraneous noise, resulting in significant decrease in luminance, hue change, or failure of lighting. When such effects are anticipated, take a protection measure shown below, such as RC elements or a surge absorber.

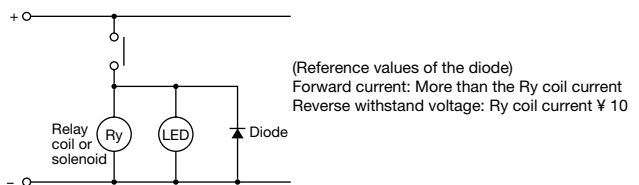
3. Notes for Pure White LED Lamps

- Do not use the pure white LED outdoors, otherwise it will lead to the degradation of brightness and color. Do not remove or apply shock to the cap on the pure white LED lamp, otherwise it may break or damage the cap.
- For the pure white LED, use a white lens. The illumination color will be dull if a different color is used.

[Protection Example 1] For AC circuit



[Protection Example 2] For DC circuit

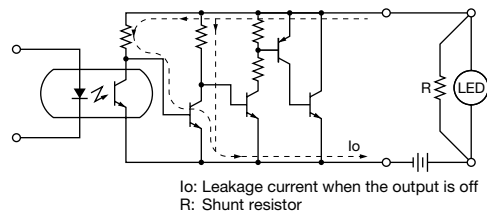


Countermeasures against Dim Lighting

- Leakage currents through the transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.
- When the LED lamp is illuminated by a transistor output, take the following measure.

[Circuit Example]

Connect shunt resistor R in parallel with the LED lamp.



Io: Leakage current when the output is off
R: Shunt resistor

Specifications and other descriptions in this brochure are subject to change without notice.



IDEC CORPORATION

6-64, Nishi-Miyahara 2-Chome, Yodogawa-ku, Osaka 532-0004, Japan
Tel: +81-6-6398-2527, Fax: +81-6-6398-2547
E-mail: marketing@idec.co.jp

IDEC CORPORATION (USA)
1175 Elko Drive, Sunnyvale, CA 94089-2209, USA
Tel: +1-408-747-0550 / (800) 262-IDEAC (4332)
Fax: +1-408-744-9055 / (800) 635-6246
E-mail: opencontact@idec.com

IDEC CANADA LIMITED
3155 Pepper Mill Court, Unit 4
Mississauga, Ontario, L5L 4X7, Canada
Tel: +1-905-890-8561, Toll Free: (800) 262-IDEAC (4332)
Fax: +1-905-890-8562
E-mail: sales@ca.idec.com

IDEC AUSTRALIA PTY. LTD.
Unit 17, 104 Ferntree Gully Road,
Oakleigh, Victoria 3166, Australia
Tel: +61-3-8523-5900, Toll Free: 1800-68-4332
Fax: +61-3-8523-5999
E-mail: sales@au.idec.com

IDEC ELECTRONICS LIMITED
Unit 2, Beechwood, Chineham Business Park,
Basingstoke, Hampshire RG24 8WA, UK
Tel: +44-1256-321000, Fax: +44-1256-327755
E-mail: sales@uk.idec.com

IDEC ELEKTROTECHNIK GmbH
Wendenstrasse 331, 20537 Hamburg, Germany
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24
E-mail: service@idec.de

IDEC (SHANGHAI) CORPORATION
Room 701-702 Chong Hing Finance Center,
No. 288 Nanjing Road West, Shanghai 200003, PRC
Tel: +86-21-6135-1515
Fax: +86-21-6135-6225 / +86-21-6135-6226
E-mail: idec@cn.idec.com

IDEC (BEIJING) CORPORATION
Room 211B, Tower B, The Grand Pacific Building,
8A Guanghua Road, Chaoyang District,
Beijing 100026, PRC
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

IDEC (SHENZHEN) CORPORATION
Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park,
Fu Tian District, Shenzhen, Guang Dong 518040, PRC
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

IDEC IZUMI (H.K.) CO., LTD.
Unit G & H, 26/F., MG Tower,
No. 133 Hoi Bun Road, Kwun Tong, Kowloon,
Hong Kong
Tel: +852-2803-8989, Fax: +852-2565-0171
E-mail: info@hk.idec.com

IDEC TAIWAN CORPORATION
8F-1, No. 79, Hsin Tai Wu Road, Sec. 1,
Hsi-Chih District, 22101 New Taipei City, Taiwan
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931
E-mail: service@tw.idec.com

IDEC IZUMI ASIA PTE. LTD.
No. 31, Tannery Lane #05-01,
HB Centre 2, Singapore 347788
Tel: +65-6746-1155, Fax: +65-6844-5995
E-mail: info@sg.idec.com

IDEC ASIA (THAILAND) CO., LTD.
20th Fl., Sorachai Bldg., No.23/78,
Soi Sukhumvit 63, Sukhumvit Rd.,
Klongton-nua, Wattana, Bangkok 10110
Tel: +662-392-9765, Fax: +662-392-9768
E-mail: sales@th.idec.com

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