

























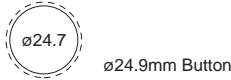



# Ø16mm H6 Series Miniature Control Units



# ø16 H6 Series Miniature Control Units

| Series                        |                                    | H6 Series Miniature Control Units  |  |   |   |
|-------------------------------|------------------------------------|--|--|---|---|
| Mounting Hole Size            |                                    | ø16 mm   |  |   |   |
| Type                          |                                    | HA□L   | HA1L-□3  | HA□P  | HA□B-#1   |
| Appearance                    |                                    |   |               | Separate Type<br><br><br>Unibody Type<br>   |                            |
| Unit                          |                                    | Illuminated Pushbuttons<br>(Momentary, Maintained)   | Mushroom Illuminated<br>Pushbuttons<br>(Momentary, Maintained)                                 | Pilot Lights<br>(Separate type,<br>Unibody type)  | Flush Pushbuttons<br>(Momentary, Maintained)  |
| Bezel Size<br>(Operator Size) |                                    |     |  ø30mm Button |    |   |
| Bezel Color                   |                                    | Black  |  |   |   |
| Light Source                  |                                    | LED lamp (IDEC's LFTD Type)  |  |   | —   |
| Lens/Button Color             |                                    | Lens Color: Amber, Blue, Green, Red, Yellow, White   |  |   | Button Color:<br>Black, Blue, Green, Red,<br>Yellow, White  |
| Contact                       | Contact Configuration              | SPDT, DPDT (gold-clad silver, silver)  |  | —   | SPDT, DPDT<br>(gold-clad silver, silver)  |
|                               | Contact Rating<br>(resistive load) | Gold-clad silver contacts:<br>125V AC · 0.1A, 30V DC · 0.1A<br>Silver contacts: 125V AC · 3A, 30V DC · 2A  |  | —   | Gold-clad silver contacts:<br>125V AC · 0.1A,<br>30VDC · 0.1A<br>Silver contacts:<br>125V AC · 3A, 30VDC · 2A |
| Durability                    | Electrical                         | 100,000 operations minimum   |  | —   | 100,000 operations<br>minimum   |
|                               | Mechanical                         | Momentary: 1,000,000 operations minimum<br>Maintained: 200,000 operations minimum  |  | —   | Momentary:<br>1,000,000 operations<br>minimum<br>Maintained:<br>200,000 operations<br>minimum                 |
| Degree of Protection          |                                    | IP65 (IEC 60529)   |  |   |   |
| Terminal Style                |                                    | Solder/Tab terminal #110<br>PCB Terminal (gold contact only)   |  |   |   |
| Accessories                   | Switch Guard                       | Yes  | —  | —   | Yes   |
|                               | Terminal Cover                     | Yes  | Yes  | Yes   | Yes   |
|                               | Mounting Hole Plug                 | Yes  |  |   |   |
| Remarks                       |                                    | <ul style="list-style-type: none"> <li>Separate contact block mount can be removed from the operator.</li> <li>Large operators for easy operation; bezel size ø24mm or 24 × 24 mm</li> <li>Shock- and vibration-resistant rugged design, waterproof and dust-tight</li> </ul>  |  |   |   |
| Approvals                     |                                    |     |  |   |   |
| See Page                      |                                    | 6  | 7  | 9   | 11  |

Note: Specify a bezel code in place of □ in the Type No.

| Series                     | H6 Series Miniature Control Units   |  |  |  |
|----------------------------|---|--|--|--|
| Mounting Hole Size         | Ø16 mm  |  |  |  |
| Type                       | HA□B-*2   | HA1B-*3  | HA1B-V2E   | HA1E-V2S   |
| Appearance                 |    |                             | Direct Opening Action<br><br> | Direct Opening Action<br><br><br>Short Body Type |
| Unit                       | Extended Pushbuttons<br>(Momentary, Maintained)   | Mushroom Pushbuttons<br>(Momentary, Maintained)  | Pushlock Turn Reset<br>Emergency Stop Switch   | Pushlock Turn Reset<br>Emergency Stop Switch   |
| Bezel Size (Operator Size) |    |                             |   |  |
| Bezel Color                | Black   |  |  |  |
| Light Source               | —   |  |  |  |
| Lens/Button Color          | Button Color:<br>Black, Blue, Green, Red, Yellow, White   |  | Button Color:<br>Red only  | Button Color:<br>Red only  |
| Contact                    | Contact Configuration   | SPDT, DPDT (gold-clad silver, silver)  |  | 1NC, 2NC (silver)  |
|                            | Contact Ratings (resistive load)  | Gold-clad silver contacts:<br>125V AC · 0.1A, 30V DC · 0.1A<br>Silver contacts:<br>125V AC · 3A, 30V DC · 2A |  | 250V AC · 1.5A<br>125VDC · 0.22A   |
| Durability                 | Electrical  | 100,000 operations minimum   |  | 100,000 operations minimum   |
|                            | Mechanical  | Momentary: 1,000,000 operations minimum<br>Maintained: 200,000 operations minimum                            |  | 250,000 operations minimum   |
| Degree of Protection       | IP65 (IEC 60529)  |  |  |  |
| Terminal Style             | Solder/Tab terminal #110<br>PCB Terminal (gold contacts only)   |  | Solder/Tab terminal #110<br>PCB Terminal   | Solder Terminal<br>PCB Terminal  |
| Accessory                  | Terminal Cover  | Yes  |  | Yes  |
|                            | Mounting Hole Plug  | Yes  |  | Yes  |
| Remarks                    | <ul style="list-style-type: none"> <li>Separate contact block can be removed from the operator.</li> <li>Large operators for easy operation</li> <li>Shock- and vibration-resistant rugged design, water-proof</li> </ul> |  | <ul style="list-style-type: none"> <li>Direct opening action</li> <li>Safety lock mechanism</li> </ul>   |  |
| Approvals                  |    |  |    |   |
| See Page                   | 12  | 12   | 27   | 27   |

Note: Specify a bezel code in place of □ in the Type No.

# ø16 H6 Series Miniature Control Units

| Series                     |                                  | H6 Series Miniature Control Units  |   |   |   |
|----------------------------|----------------------------------|--|---|---|---|
| Mounting Hole Size         |                                  | ø16 mm   |   |   |   |
| Type                       |                                  | HA1S / HA3S  | HA1K / HA3K   | HA1F / HA3F   | HA1R  |
| Appearance                 |                                  |   |    |   |  |
| Unit                       |                                  | Selector Switches<br>2-position maintained<br>2-position spring-return<br>3-position maintained<br>3-position spring-return  | Key Selector Switches<br>2-position maintained<br>2-position spring-return<br>3-position maintained<br>3-position spring-return | Illuminated Selector Switches<br>2-position maintained<br>2-position spring-return<br>3-position maintained<br>3-position spring-return | Selector Pushbuttons<br>2-position<br>3-position                                    |
| Bezel Size (Operator Size) |                                  |    |   |   |  |
| Bezel Color                |                                  | Black  |   |   |   |
| Light Source               |                                  | —  | —   | LED lamp (IDEC's LFTD Type)   | —   |
| Lens/Button Color          |                                  | Knob Color: Black<br>Color Insert: White   | Key Cylinder:<br>Black (plastic)  | Illumination Color:<br>Amber, Blue, Green, Red,<br>Yellow, White  | Button Color:<br>Black, Blue, Green, Red,<br>Yellow                                 |
| Contact                    | Contact Configuration            | SPDT, DPDT (gold-clad silver, silver)  |   |   |   |
|                            | Contact Ratings (resistive load) | Gold-clad silver contacts:<br>125V AC · 0.1A, 30V DC · 0.1A<br>Silver contacts:<br>125V AC · 3A, 30V DC · 2A   |   |   |   |
| Durability                 | Electrical                       | 100,000 operations minimum   |   |   |   |
|                            | Mechanical                       | 250,000 operations minimum   |   |   |   |
| Degree of Protection       |                                  | IP65 (IEC 60529)   |   |   |   |
| Terminal Style             |                                  | Solder/Tab terminal #110<br>PCB Terminal (gold contacts only)  |   |   |   |
| Accessory                  | Terminal Cover                   | Yes  |   |   |   |
|                            | Mounting Hole Plug               | Yes  |   |   |   |
| Remarks                    |                                  | <ul style="list-style-type: none"> <li>Separate contact block can be removed from the operator.</li> <li>Large operators for easy operation; bezel size ø24mm or 24 × 24 mm</li> <li>Shock- and vibration-resistant rugged design, waterproof</li> </ul>   |   |   |   |
| Approvals                  |                                  |     |   |   |   |
| See Page                   |                                  | 14   | 16 and 17   | 19 and 20   | 22  |

# ø16 H6 Series Miniature Control Units

**Designed to ensure ease of operation and safety**  
**Ideal for heavy duty applications such as machine tools**

- Separate contact block makes installation and removal easy.
- Large operators; bezel size (ø24 mm, 24×24 mm)
- High operating force and long stroke prevent inadvertent operation.
- Contact blocks can be removed when units are mounted collectively.
- Shock- and vibration-resistant rugged design
- IP65
- UL recognized, CSA certified
- EN compliant (EN 60947-1, EN 60947-5-1, TÜV approved)



Emergency stop switches are DEMKO-approved.



## Contact Ratings

Except for emergency stop switches (see page 27).

### • Gold Contact

|  |                  |        |
|--|------------------|--------|
| Rated Insulation Voltage                 | 250V             |        |
| Rated Thermal Current                    | 3A               |        |
| Rated Operating Voltage                  | 125V AC          | 30V DC |
| Rated Operating Current (resistive load) | 0.1A             | 0.1A   |
| Contact Material                         | Gold-clad silver |        |

Minimum applicable load (reference value): 5V AC/DC, 1 mA  
 (Applicable range is subject to the operating condition and load.)

### • Silver Contact

|                          |             |                |      |      |      |
|--------------------------|-------------|----------------|------|------|------|
| Rated Insulation Voltage | 250V        |                |      |      |      |
| Rated Thermal Current    | 5A          |                |      |      |      |
| Rated Operating Voltage  | 30V         | 125V           | 250V |      |      |
| Rated Operating Current  | AC 50/60 Hz | Resistive Load | —    | 3A   | 2A   |
|                          |             | Inductive Load | —    | 2A   | 1.5A |
|                          | DC          | Resistive Load | 2A   | 0.4A | —    |
|                          |             | Inductive Load | 1A   | 0.2A | —    |
| Contact Material         | Silver      |                |      |      |      |

AC inductive load: PF = 0.6 to 0.7, DC inductive load: L/R = 7 ms maximum

## Built-in LED Lamp Ratings









|                        |   |                |                |
|------------------------|---|----------------|----------------|
| Type No.               | LFTD-5②   | LFTD-1②        | LFTD-2②        |
| Lamp Base              | SX6S/8×5.4  |                |                |
| Operating Voltage      | 5V DC±5%  | 12V AC/DC ±10% | 24V AC/DC ±10% |
| Rated Voltage          | 5V DC   | 12V AC/DC      | 24V AC/DC      |
| Current Draw           | AC  | —              | 9 mA           |
|                        | DC  | 8 mA           | 8 mA           |
| Color Code ②           | Specify a color code in place of ② in the Type No. A (amber), G (green), R (red), S (blue), W (white), Y (yellow) |                |                |
| Lamp Base Color        | Same as illumination color  |                |                |
| Voltage Marking        | Die stamped on the lamp base.   |                |                |
| Life (reference value) | Approx. 50,000 hours (When used on complete DC, luminance reduces to 50% of the initial intensity.)               |                |                |
| Internal Circuit       | A, R, W, Y  | A, R, W, Y     |                |
|                        |   |                |                |
|                        | G, S  | G, S           |                |
|                        |   |                |                |
|                        |   |                |                |
|                        |   |                |                |

## Specifications

|  |  |
|--|--|
| Operating Temperature                      | -25 to +55°C (no freezing)                             |
| Storage Temperature                        | -30 to +80°C   |
| 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                        | Switch Unit  |
|  | Illumination Unit                                      |
| Vibration Resistance                       | Between live part and ground: 2,500V, 1 minute         |
|  | Between terminals of different poles: 2,500V, 1 minute |
|  | Between terminals of the same pole: 1,000V, 1 minute   |
| Shock Resistance                           | Operating extremes: 2,500V, 1 minute                   |
|  | Damage limits: 1,000V, 1 minute                        |
| Mechanical Durability (minimum operations) | Operating extremes: 5 to 55 Hz, amplitude 0.5 mm       |
|  | Operating extremes: 100 m/s <sup>2</sup> (10G)         |
|  | Damage limits: 1,000 m/s <sup>2</sup> (100G)           |
|  | Momentary: 1,000,000                                   |
|  | Maintained: 200,000                                    |
| Electrical Durability (minimum operations) | Selector switch: 250,000                               |
|  | Key selector switch: 250,000                           |
|  | Illuminated selector switch: 250,000                   |
|  | Selector pushbutton: 250,000                           |
| Degree of Protection                       | Momentary: 100,000 (at 1,800 operations/hour)          |
|  | Maintained: 100,000 (at 1,200 operations/hour)         |
|  | Selector switch: 100,000                               |
| Terminal Style                             | IP65 (IEC 60529)                                       |
| Weight (approx.)                           | Solder/tab terminal #110                               |
|  | PC board terminal                                      |
|  | HA1L-M1C24: 18g  |
|  | HA1P-1C04: 17g   |
|  | HA1P-14: 13g   |
|  | HA1B-M1C2: 16g   |
|  | HA1S-2C2: 18g  |
| HA1K-2C2A: 33g                             |  |
| HA1F-2C24: 20g                             |  |

# ø16 H6 Series Miniature Control Units

## HA1L/HA2L Illuminated Pushbuttons

| Style  | Operation   | Contact Material | Operating Voltage | Contact     | Type No.            |                   | ② Lens Color Code  |              |
|--|---|------------------|-------------------|-------------|---------------------|-------------------|--|--------------|
|  |   |                  |                   |             | Solder/Tab Terminal | PC Board Terminal |  |              |
| <b>Round HA1L</b><br><br><br><br>UL  SF  △  CE | Momentary   | Gold             | 5V DC ±5%         | SPDT        | HA1L-M1C11②         | HA1L-M1C11V②      | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |              |
|  |   |                  |                   | DPDT        | HA1L-M1C21②         | HA1L-M1C21V②      |  |              |
|  |   |                  | 12V AC/DC ±10%    | SPDT        | HA1L-M1C13②         | HA1L-M1C13V②      |  |              |
|  |   |                  |                   | DPDT        | HA1L-M1C23②         | HA1L-M1C23V②      |  |              |
|  |   |                  | 24V AC/DC ±10%    | SPDT        | HA1L-M1C14②         | HA1L-M1C14V②      |  |              |
|  |   |                  |                   | DPDT        | HA1L-M1C24②         | HA1L-M1C24V②      |  |              |
|  |   | DPDT             | HA1L-M1C61②       |             |                     |                   |  |              |
|  |   | 12V AC/DC ±10%   | SPDT              | HA1L-M1C53② |                     |                   |  |              |
|  |   |                  | DPDT              | HA1L-M1C63② |                     |                   |  |              |
|  |   | 24V AC/DC ±10%   | SPDT              | HA1L-M1C54② |                     |                   |  |              |
|  |   |                  | DPDT              | HA1L-M1C64② |                     |                   |  |              |
|  |   | Maintained       | Gold              | 5V DC ±5%   | SPDT                | HA1L-A1C11②       |  | HA1L-A1C11V② |
|  | DPDT  |                  |                   |             | HA1L-A1C21②         | HA1L-A1C21V②      |  |              |
|  | 12V AC/DC ±10%  |                  |                   | SPDT        | HA1L-A1C13②         | HA1L-A1C13V②      |  |              |
|  |   |                  |                   | DPDT        | HA1L-A1C23②         | HA1L-A1C23V②      |  |              |
|  | 24V AC/DC ±10%  |                  |                   | SPDT        | HA1L-A1C14②         | HA1L-A1C14V②      |  |              |
|  |   |                  |                   | DPDT        | HA1L-A1C24②         | HA1L-A1C24V②      |  |              |
|  | DPDT  |                  | HA1L-A1C61②       |             |                     |                   |  |              |
|  | 12V AC/DC ±10%  |                  | SPDT              | HA1L-A1C53② |                     |                   |  |              |
|  |   |                  | DPDT              | HA1L-A1C63② |                     |                   |  |              |
|  | 24V AC/DC ±10%  |                  | SPDT              | HA1L-A1C54② |                     |                   |  |              |
|  |   |                  | DPDT              | HA1L-A1C64② |                     |                   |  |              |
|  | <b>Square HA2L</b><br><br><br><br>UL  SF  △  CE |                  | Momentary         | Gold        | 5V DC ±5%           | SPDT              |  | HA2L-M1C11②  |
|  |   | DPDT             |                   |             |                     | HA2L-M1C21②       |  | HA2L-M1C21V② |
| 12V AC/DC ±10%   |   | SPDT             |                   |             | HA2L-M1C13②         | HA2L-M1C13V②      |  |              |
|  |   | DPDT             |                   |             | HA2L-M1C23②         | HA2L-M1C23V②      |  |              |
| 24V AC/DC ±10%   |   | SPDT             |                   |             | HA2L-M1C14②         | HA2L-M1C14V②      |  |              |
|  |   | DPDT             |                   |             | HA2L-M1C24②         | HA2L-M1C24V②      |  |              |
| DPDT   |   | HA2L-M1C61②      |                   |             |                     |                   |  |              |
| 12V AC/DC ±10%   |   | SPDT             |                   | HA2L-M1C53② |                     |                   |  |              |
|  |   | DPDT             |                   | HA2L-M1C63② |                     |                   |  |              |
| 24V AC/DC ±10%   |   | SPDT             |                   | HA2L-M1C54② |                     |                   |  |              |
|  |   | DPDT             |                   | HA2L-M1C64② |                     |                   |  |              |
| Maintained   |   | Gold             |                   | 5V DC ±5%   | SPDT                | HA2L-A1C11②       | HA2L-A1C11V②   |              |
|  |   |                  | DPDT              |             | HA2L-A1C21②         | HA2L-A1C21V②      |  |              |
|  |   |                  | 12V AC/DC ±10%    | SPDT        | HA2L-A1C13②         | HA2L-A1C13V②      |  |              |
|  |   |                  |                   | DPDT        | HA2L-A1C23②         | HA2L-A1C23V②      |  |              |
|  |   |                  | 24V AC/DC ±10%    | SPDT        | HA2L-A1C14②         | HA2L-A1C14V②      |  |              |
|  |   |                  |                   | DPDT        | HA2L-A1C24②         | HA2L-A1C24V②      |  |              |
|  |   | DPDT             | HA2L-A1C61②       |             |                     |                   |  |              |
|  |   | 12V AC/DC ±10%   | SPDT              | HA2L-A1C53② |                     |                   |  |              |
|  |   |                  | DPDT              | HA2L-A1C63② |                     |                   |  |              |
|  |   | 24V AC/DC ±10%   | SPDT              | HA2L-A1C54② |                     |                   |  |              |
|  |   |                  | DPDT              | HA2L-A1C64② |                     |                   |  |              |

Note: Specify a lens color code in place of ② in the Type No.  
 Package quantity: 1

**HA3L/HA4L/HA1L-M3/A3 LED Illuminated Pushbuttons**

| Style   | Operation  | Contact Material | Operating Voltage | Contact | Type No.            |                   | ② Lens Color Code |              |
|---|------------|------------------|-------------------|---------|---------------------|-------------------|-------------------|--------------|
|   |            |                  |                   |         | Solder/Tab Terminal | PC Board Terminal |                   |              |
| <b>Round w/Square Bezel<br/>HA3L</b><br><br><br><br>            | Momentary  | Gold             | 5V DC<br>±5%      | SPDT    | HA3L-M1C11②         | HA3L-M1C11V②      |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C21②         | HA3L-M1C21V②      |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA3L-M1C13②         | HA3L-M1C13V②      |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C23②         | HA3L-M1C23V②      |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA3L-M1C14②         | HA3L-M1C14V②      |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C24②         | HA3L-M1C24V②      |                   |              |
|   |            | Silver           | 5V DC<br>±5%      | SPDT    | HA3L-M1C51②         | —                 |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C61②         |                   |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA3L-M1C53②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C63②         |                   |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA3L-M1C54②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA3L-M1C64②         |                   |                   |              |
|   | Maintained | Gold             | 5V DC<br>±5%      | SPDT    | HA3L-A1C11②         |                   |                   | HA3L-A1C11V② |
|   |            |                  |                   | DPDT    | HA3L-A1C21②         |                   |                   | HA3L-A1C21V② |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA3L-A1C13②         |                   |                   | HA3L-A1C13V② |
|   |            |                  |                   | DPDT    | HA3L-A1C23②         |                   |                   | HA3L-A1C23V② |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA3L-A1C14②         |                   |                   | HA3L-A1C14V② |
|   |            |                  |                   | DPDT    | HA3L-A1C24②         |                   |                   | HA3L-A1C24V② |
|   |            | Silver           | 5V DC<br>±5%      | SPDT    | HA3L-A1C51②         | —                 |                   |              |
|   |            |                  |                   | DPDT    | HA3L-A1C61②         |                   |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA3L-A1C53②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA3L-A1C63②         |                   |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA3L-A1C54②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA3L-A1C64②         |                   |                   |              |
| <b>Square w/Four-sided<br/>Barrier HA4L</b><br><br><br><br> | Momentary  | Gold             | 5V DC<br>±5%      | SPDT    | HA4L-M1C11②         |                   | HA4L-M1C11V②      |              |
|   |            |                  |                   | DPDT    | HA4L-M1C21②         |                   | HA4L-M1C21V②      |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA4L-M1C13②         |                   | HA4L-M1C13V②      |              |
|   |            |                  |                   | DPDT    | HA4L-M1C23②         |                   | HA4L-M1C23V②      |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA4L-M1C14②         |                   | HA4L-M1C14V②      |              |
|   |            |                  |                   | DPDT    | HA4L-M1C24②         |                   | HA4L-M1C24V②      |              |
|   |            | Silver           | 5V DC<br>±5%      | SPDT    | HA4L-M1C51②         | —                 |                   |              |
|   |            |                  |                   | DPDT    | HA4L-M1C61②         |                   |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA4L-M1C53②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA4L-M1C63②         |                   |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA4L-M1C54②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA4L-M1C64②         |                   |                   |              |
| <b>ø30 Mushroom<br/>HA1L-□3</b><br><br><br><br>             | Momentary  | Gold             | 5V DC<br>±5%      | SPDT    | HA1L-M3C11②         |                   | HA1L-M3C11V②      |              |
|   |            |                  |                   | DPDT    | HA1L-M3C21②         |                   | HA1L-M3C21V②      |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA1L-M3C13②         |                   | HA1L-M3C13V②      |              |
|   |            |                  |                   | DPDT    | HA1L-M3C23②         |                   | HA1L-M3C23V②      |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA1L-M3C14②         |                   | HA1L-M3C14V②      |              |
|   |            |                  |                   | DPDT    | HA1L-M3C24②         |                   | HA1L-M3C24V②      |              |
|   |            | Silver           | 5V DC<br>±5%      | SPDT    | HA1L-M3C51②         | —                 |                   |              |
|   |            |                  |                   | DPDT    | HA1L-M3C61②         |                   |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA1L-M3C53②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA1L-M3C63②         |                   |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA1L-M3C54②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA1L-M3C64②         |                   |                   |              |
|   | Maintained | Gold             | 5V DC<br>±5%      | SPDT    | HA1L-A3C11②         |                   | HA1L-A3C11V②      |              |
|   |            |                  |                   | DPDT    | HA1L-A3C21②         |                   | HA1L-A3C21V②      |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA1L-A3C13②         |                   | HA1L-A3C13V②      |              |
|   |            |                  |                   | DPDT    | HA1L-A3C23②         |                   | HA1L-A3C23V②      |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA1L-A3C14②         |                   | HA1L-A3C14V②      |              |
|   |            |                  |                   | DPDT    | HA1L-A3C24②         |                   | HA1L-A3C24V②      |              |
|   |            | Silver           | 5V DC<br>±5%      | SPDT    | HA1L-A3C51②         | —                 |                   |              |
|   |            |                  |                   | DPDT    | HA1L-A3C61②         |                   |                   |              |
|   |            |                  | 12V AC/DC<br>±10% | SPDT    | HA1L-A3C53②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA1L-A3C63②         |                   |                   |              |
|   |            |                  | 24V AC/DC<br>±10% | SPDT    | HA1L-A3C54②         |                   |                   |              |
|   |            |                  |                   | DPDT    | HA1L-A3C64②         |                   |                   |              |

A: amber  
G: green  
R: red  
S: blue  
W: white  
Y: yellow

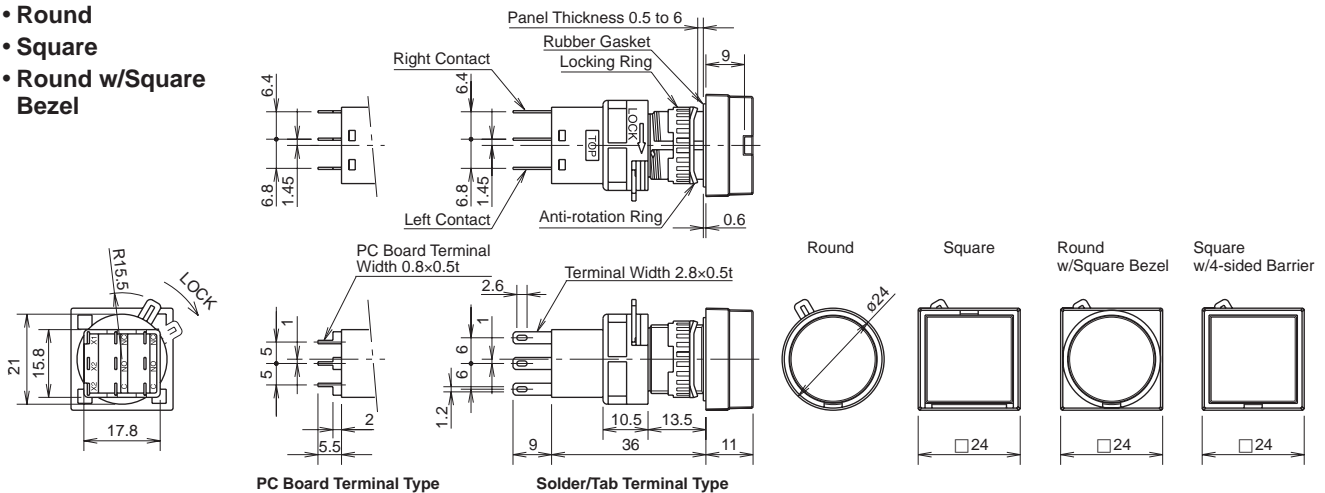
Note: Specify a lens color code in place of ② in the Type No.  
Package quantity: 1



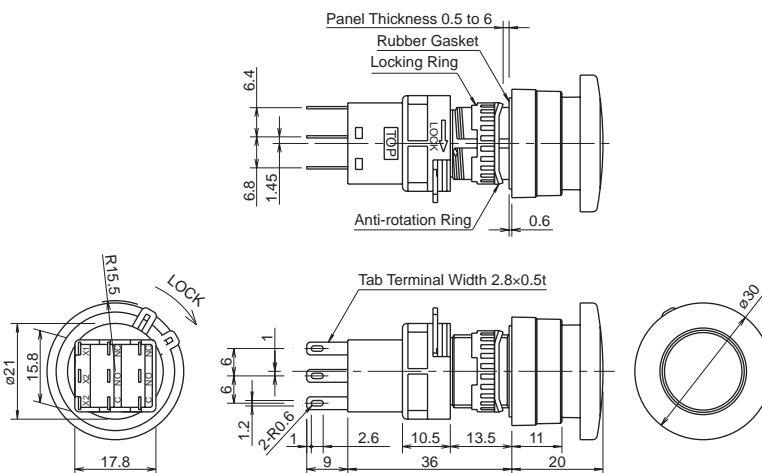
# ø16 H6 Series Miniature Control Units

## Dimensions (Illuminated Pushbuttons)

- Round
- Square
- Round w/Square Bezel



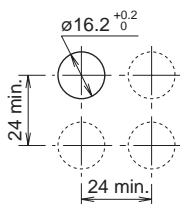
- Mushroom



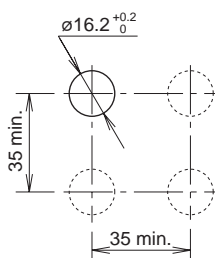
## Mounting Hole Layout

### Mounting Centers

- Round
- Square
- Round w/Square Bezel

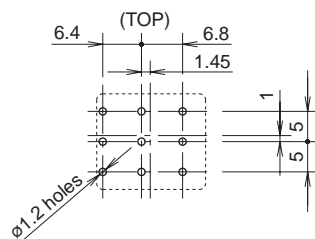


- Mushroom



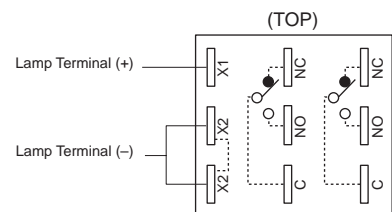
## PC Board Drilling Layout

### (Bottom View)



## Terminal Arrangement

### (Bottom View)



- SPDT has C, NO, and NC on the right only.
- X2 and X2 are wired internally.





Note: Determine mounting centers to ensure easy operation.

All dimensions in mm.







**HA1P/HA2P/HA3P/HA4P LED Illuminated Pilot Lights**

**Separate Type**

| Shape  | Operating Voltage | Type No.            |                   | ② Lens Color Code  |
|--|-------------------|---------------------|-------------------|--|
|  |                   | Solder/Tab Terminal | PC Board Terminal |  |
| <b>Round HA1P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕                        | 5V DC ±5%         | HA1P-1C01②          | HA1P-1C01V②       | Specify a color code in place of ② in the Type No.<br>A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  | 12V AC/DC ±10%    | HA1P-1C03②          | HA1P-1C03V②       |  |
|  | 24V AC/DC ±10%    | HA1P-1C04②          | HA1P-1C04V②       |  |
| <b>Square HA2P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕                       | 5V DC ±5%         | HA2P-1C01②          | HA2P-1C01V②       |  |
|  | 12V AC/DC ±10%    | HA2P-1C03②          | HA2P-1C03V②       |  |
|  | 24V AC/DC ±10%    | HA2P-1C04②          | HA2P-1C04V②       |  |
| <b>Round w/Square Bezel HA3P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕         | 5V DC ±5%         | HA3P-1C01②          | HA3P-1C01V②       |  |
|  | 12V AC/DC ±10%    | HA3P-1C03②          | HA3P-1C03V②       |  |
|  | 24V AC/DC ±10%    | HA3P-1C04②          | HA3P-1C04V②       |  |
| <b>Square w/Four-sided Barrier HA4P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕ | 5V DC ±5%         | HA4P-1C01②          | HA4P-1C01V②       |  |
|  | 12V AC/DC ±10%    | HA4P-1C03②          | HA4P-1C03V②       |  |
|  | 24V AC/DC ±10%    | HA4P-1C04②          | HA4P-1C04V②       |  |

• See page 10 for dimensions.

**Unibody Type**

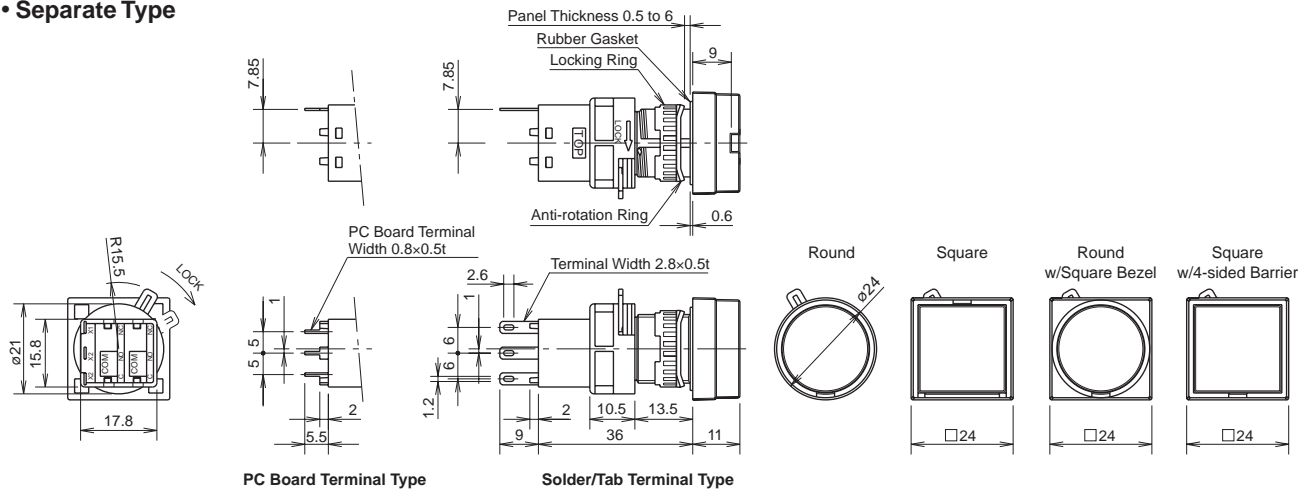
| Shape   | Operating Voltage | Type No.            |                   | ② Lens Color Code  |
|---|-------------------|---------------------|-------------------|--|
|   |                   | Solder/Tab Terminal | PC Board Terminal |  |
| <b>Round HA1P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕                       | 5V DC ±5%         | HA1P-11②            | —                 | Specify a color code in place of ② in the Type No.<br>A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|   | 12V AC/DC ±10%    | HA1P-13②            | —                 |  |
|   | 24V AC/DC ±10%    | HA1P-14②            | —                 |  |
| <b>Square HA2P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕                      | 5V DC ±5%         | HA2P-11②            | —                 |  |
|   | 12V AC/DC ±10%    | HA2P-13②            | —                 |  |
|   | 24V AC/DC ±10%    | HA2P-14②            | —                 |  |
| <b>Round w/Square Bezel HA3P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕        | 5V DC ±5%         | HA3P-11②            | —                 |  |
|   | 12V AC/DC ±10%    | HA3P-13②            | —                 |  |
|   | 24V AC/DC ±10%    | HA3P-14②            | —                 |  |
| <b>Square w/Four-sided Barrier HA4P</b><br><br>㉑ ㉒ ㉓ ㉔ ㉕ | 5V DC ±5%         | HA4P-11②            | —                 |  |
|   | 12V AC/DC ±10%    | HA4P-13②            | —                 |  |
|   | 24V AC/DC ±10%    | HA4P-14②            | —                 |  |

• See page 10 for dimensions.

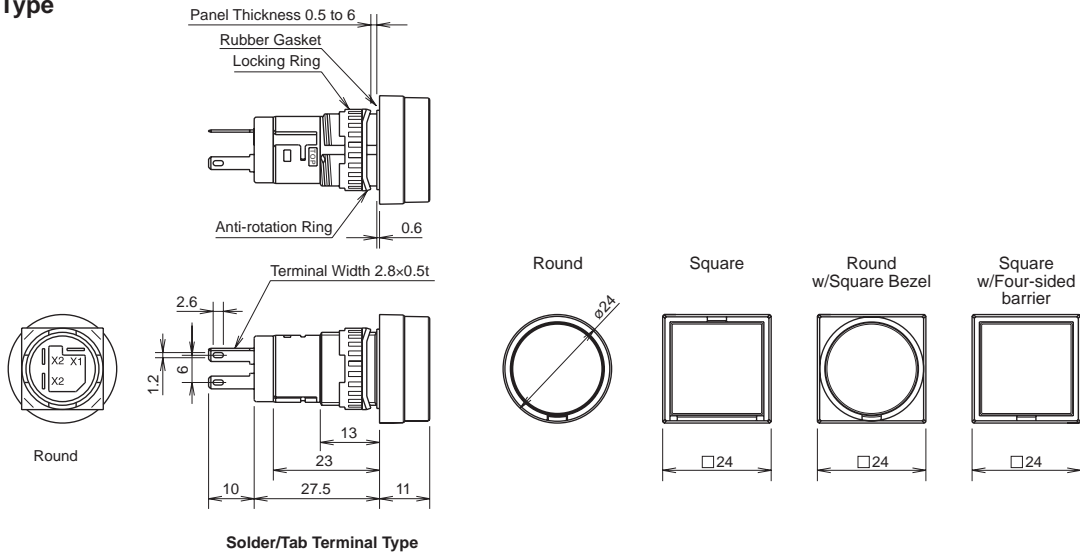
# ø16 H6 Series Miniature Control Units

## Dimensions (Pilot Lights)

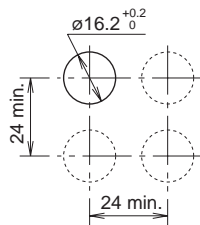
### • Separate Type



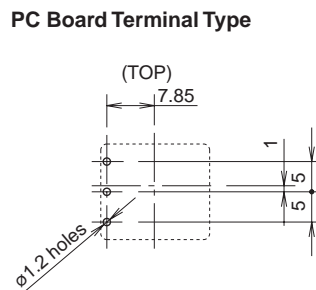
### • Unibody Type



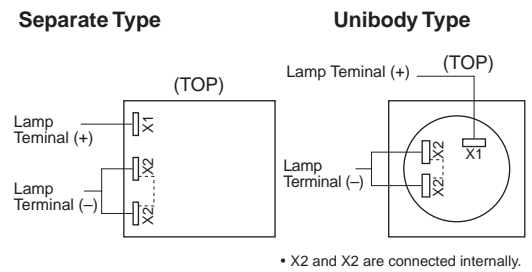
## Mounting Hole Layout Mounting Centers



## PC Board Drilling Layout (Bottom View)











## Terminal Arrangement (Bottom View)



All dimensions in mm.











**HA1B/HA2B/HA3B/HA4B Pushbuttons**

| Shape  | Button Type       | Operation Type | Contact     |             | Type No.            |                   | Color Code ①②  |
|--|-------------------|----------------|-------------|-------------|---------------------|-------------------|--|
|  |                   |                |             |             | Solder/Tab Terminal | PC Board Terminal |  |
| <b>Round</b><br><b>HA1B-□1</b><br><br>                           | Button            | Momentary      | Gold        | SPDT        | HA1B-M1C1①          | HA1B-M1C1V①       | B: black<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA1B-M1C2①          | HA1B-M1C2V①       |  |
|  |                   |                | Silver      | SPDT        | HA1B-M1C5①          | —                 |  |
|  |                   | DPDT           |             | HA1B-M1C6①  | —                   |                   |  |
|  |                   | Maintained     | Gold        | SPDT        | HA1B-A1C1①          | HA1B-A1C1V①       |  |
|  |                   |                |             | DPDT        | HA1B-A1C2①          | HA1B-A1C2V①       |  |
|  | Silver            |                | SPDT        | HA1B-A1C5①  | —                   |                   |  |
|  |                   | DPDT           | HA1B-A1C6①  | —           |                     |                   |  |
|  | Illumination Lens | Momentary      | Gold        | SPDT        | HA1B-M1C1L②         | HA1B-M1C1VL②      | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA1B-M1C2L②         | HA1B-M1C2VL②      |  |
|  |                   |                | Silver      | SPDT        | HA1B-M1C5L②         | —                 |  |
|  |                   | DPDT           |             | HA1B-M1C6L② | —                   |                   |  |
| Maintained   |                   | Gold           | SPDT        | HA1B-A1C1L② | HA1B-A1C1VL②        |                   |  |
|  |                   |                | DPDT        | HA1B-A1C2L② | HA1B-A1C2VL②        |                   |  |
|  | Silver            | SPDT           | HA1B-A1C5L② | —           |                     |                   |  |
| DPDT   |                   | HA1B-A1C6L②    | —           |             |                     |                   |  |
| <b>Square</b><br><b>HA2B-□1</b><br><br>                       | Button            | Momentary      | Gold        | SPDT        | HA2B-M1C1①          | HA2B-M1C1V①       | B: black<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA2B-M1C2①          | HA2B-M1C2V①       |  |
|  |                   |                | Silver      | SPDT        | HA2B-M1C5①          | —                 |  |
|  |                   | DPDT           |             | HA2B-M1C6①  | —                   |                   |  |
|  |                   | Maintained     | Gold        | SPDT        | HA2B-A1C1①          | HA2B-A1C1V①       |  |
|  |                   |                |             | DPDT        | HA2B-A1C2①          | HA2B-A1C2V①       |  |
|  | Silver            |                | SPDT        | HA2B-A1C5①  | —                   |                   |  |
|  |                   | DPDT           | HA2B-A1C6①  | —           |                     |                   |  |
|  | Illumination Lens | Momentary      | Gold        | SPDT        | HA2B-M1C1L②         | HA2B-M1C1VL②      | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA2B-M1C2L②         | HA2B-M1C2VL②      |  |
|  |                   |                | Silver      | SPDT        | HA2B-M1C5L②         | —                 |  |
|  |                   | DPDT           |             | HA2B-M1C6L② | —                   |                   |  |
| Maintained   |                   | Gold           | SPDT        | HA2B-A1C1L② | HA2B-A1C1VL②        |                   |  |
|  |                   |                | DPDT        | HA2B-A1C2L② | HA2B-A1C2VL②        |                   |  |
|  | Silver            | SPDT           | HA2B-A1C5L② | —           |                     |                   |  |
| DPDT   |                   | HA2B-A1C6L②    | —           |             |                     |                   |  |
| <b>Round w/Square Bezel</b><br><b>HA3B-□1</b><br><br>        | Button            | Momentary      | Gold        | SPDT        | HA3B-M1C1①          | HA3B-M1C1V①       | B: black<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA3B-M1C2①          | HA3B-M1C2V①       |  |
|  |                   |                | Silver      | SPDT        | HA3B-M1C5①          | —                 |  |
|  |                   | DPDT           |             | HA3B-M1C6①  | —                   |                   |  |
|  |                   | Maintained     | Gold        | SPDT        | HA3B-A1C1①          | HA3B-A1C1V①       |  |
|  |                   |                |             | DPDT        | HA3B-A1C2①          | HA3B-A1C2V①       |  |
|  | Silver            |                | SPDT        | HA3B-A1C5①  | —                   |                   |  |
|  |                   | DPDT           | HA3B-A1C6①  | —           |                     |                   |  |
|  | Illumination Lens | Momentary      | Gold        | SPDT        | HA3B-M1C1L②         | HA3B-M1C1VL②      | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA3B-M1C2L②         | HA3B-M1C2VL②      |  |
|  |                   |                | Silver      | SPDT        | HA3B-M1C5L②         | —                 |  |
|  |                   | DPDT           |             | HA3B-M1C6L② | —                   |                   |  |
| Maintained   |                   | Gold           | SPDT        | HA3B-A1C1L② | HA3B-A1C1VL②        |                   |  |
|  |                   |                | DPDT        | HA3B-A1C2L② | HA3B-A1C2VL②        |                   |  |
|  | Silver            | SPDT           | HA3B-A1C5L② | —           |                     |                   |  |
| DPDT   |                   | HA3B-A1C6L②    | —           |             |                     |                   |  |
| <b>Square w/Four-sided Barrier</b><br><b>HA4B-M1</b><br><br> | Button            | Momentary      | Gold        | SPDT        | HA4B-M1C1①          | HA4B-M1C1V①       | B: black<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA4B-M1C2①          | HA4B-M1C2V①       |  |
|  |                   |                | Silver      | SPDT        | HA4B-M1C5①          | —                 |  |
|  | DPDT              | HA4B-M1C6①     |             | —           |                     |                   |  |
|  | Illumination Lens | Maintained     | Gold        | SPDT        | HA4B-M1C1L②         | HA4B-M1C1VL②      | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |                |             | DPDT        | HA4B-M1C2L②         | HA4B-M1C2VL②      |  |
| Silver   |                   |                | SPDT        | HA4B-M1C5L② | —                   |                   |  |
|  | DPDT              | HA4B-M1C6L②    | —           |             |                     |                   |  |

- Specify a color code in place of ① or ② in the Type No.
- For dimensions, see page 13.

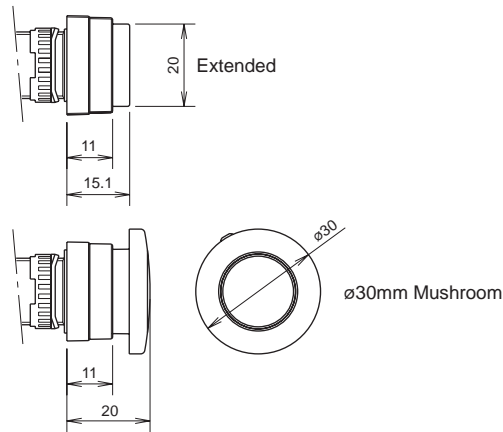
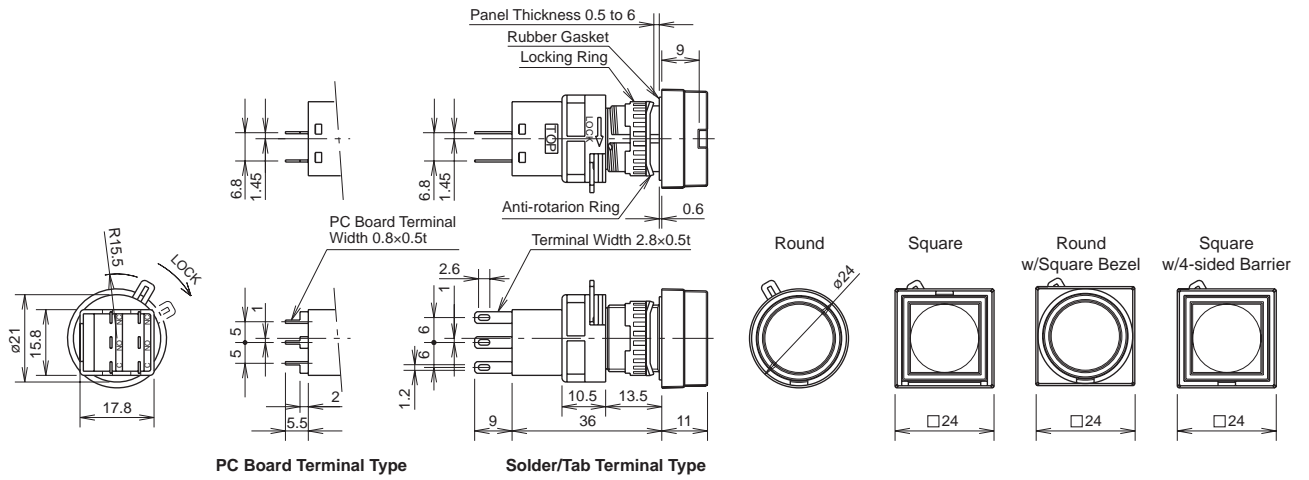
# ø16 H6 Series Miniature Control Units

## HA1B/HA2B/HA3B/HA4B Pushbuttons

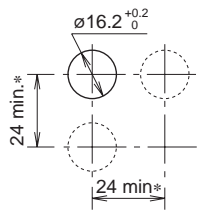
| Shape  | Button Type | Operation Type  | Contact |            | Type No.            |                   | Color Code ①   |             |             |
|--|-------------|---|---------|------------|---------------------|-------------------|--|-------------|-------------|
|  |             |   |         |            | Solder/Tab Terminal | PC Board Terminal |  |             |             |
| Round<br>HA1B-□2<br><br>                   | Button      | Momentary   | Gold    | SPDT       | HA1B-M2C1①          | HA1B-M2C1V①       | B: black<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |             |             |
|  |             |   |         | DPDT       | HA1B-M2C2①          | HA1B-M2C2V①       |  |             |             |
|  |             |   | Silver  | SPDT       | HA1B-M2C5①          | —                 |  |             |             |
|  |             |   |         | DPDT       | HA1B-M2C6①          | —                 |  |             |             |
|  |             | Maintained  | Gold    | SPDT       | HA1B-A2C1①          | HA1B-A2C1V①       |  |             |             |
|  |             |   |         | DPDT       | HA1B-A2C2①          | HA1B-A2C2V①       |  |             |             |
|  |             |   | Silver  | SPDT       | HA1B-A2C5①          | —                 |  |             |             |
|  |             |   |         | DPDT       | HA1B-A2C6①          | —                 |  |             |             |
|  |             | Square<br>HA2B-□2<br><br>                             | Button  | Momentary  | Gold                | SPDT              |  | HA2B-M2C1①  | HA2B-M2C1V① |
|  |             |   |         |            |                     | DPDT              |  | HA2B-M2C2①  | HA2B-M2C2V① |
|  |             |   |         |            | Silver              | SPDT              |  | HA2B-M2C5①  | —           |
|  |             |   |         |            |                     | DPDT              |  | HA2B-M2C6①  | —           |
| Maintained   | Gold        |   |         | SPDT       | HA2B-A2C1①          | HA2B-A2C1V①       |  |             |             |
|  |             |   |         | DPDT       | HA2B-A2C2①          | HA2B-A2C2V①       |  |             |             |
|  | Silver      |   |         | SPDT       | HA2B-A2C5①          | —                 |  |             |             |
|  |             |   |         | DPDT       | HA2B-A2C6①          | —                 |  |             |             |
| Round w/Square Bezel<br>HA3B-□2<br><br> | Button      |   |         | Momentary  | Gold                | SPDT              | HA3B-M2C1①   | HA3B-M2C1V① |             |
|  |             |   |         |            |                     | DPDT              | HA3B-M2C2①   | HA3B-M2C2V① |             |
|  |             |   |         |            | Silver              | SPDT              | HA3B-M2C5①   | —           |             |
|  |             |   |         |            |                     | DPDT              | HA3B-M2C6①   | —           |             |
|  |             | Maintained  | Gold    | SPDT       | HA3B-A2C1①          | HA3B-A2C1V①       |  |             |             |
|  |             |   |         | DPDT       | HA3B-A2C2①          | HA3B-A2C2V①       |  |             |             |
|  |             |   | Silver  | SPDT       | HA3B-A2C5①          | —                 |  |             |             |
|  |             |   |         | DPDT       | HA3B-A2C6①          | —                 |  |             |             |
|  |             | Square<br>w/Four-sided Barrier<br>HA4B-M2<br><br> | Button  | Momentary  | Gold                | SPDT              | HA4B-M2C1①   | HA4B-M2C1V① |             |
|  |             |   |         |            |                     | DPDT              | HA4B-M2C2①   | HA4B-M2C2V① |             |
|  |             |   |         |            | Silver              | SPDT              | HA4B-M2C5①   | —           |             |
|  |             |   |         |            |                     | DPDT              | HA4B-M2C6①   | —           |             |
| Round<br>HA1B-□3<br><br>               | Button      |   |         | Momentary  | Gold                | SPDT              | HA1B-M3C1①   | HA1B-M3C1V① |             |
|  |             |   |         |            |                     | DPDT              | HA1B-M3C2①   | HA1B-M3C2V① |             |
|  |             |   |         |            | Silver              | SPDT              | HA1B-M3C5①   | —           |             |
|  |             |   |         |            |                     | DPDT              | HA1B-M3C6①   | —           |             |
|  |             |   |         | Maintained | Gold                | SPDT              | HA1B-A3C1①   | HA1B-A3C1V① |             |
|  |             |   |         |            |                     | DPDT              | HA1B-A3C2①   | HA1B-A3C2V① |             |
|  |             |   |         |            | Silver              | SPDT              | HA1B-A3C5①   | —           |             |
|  |             |   |         |            |                     | DPDT              | HA1B-A3C6①   | —           |             |

- Specify a color code in place of ① in the Type No.
- For dimensions, see page 13.

**Dimensions (Pushbuttons)**



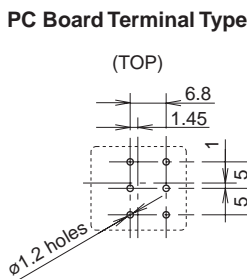
**Mounting Hole Layout  
Mounting Centers**



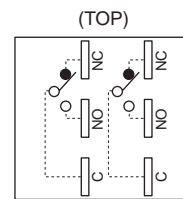
\* 35 min. for mushroom type

Note: Determine mounting centers to ensure easy operation.

**PC Board Drilling Layout  
(Bottom View)**

















**Terminal Arrangement  
(Bottom View)**



• SPDT has C, NO, and NC on the right only.



















All dimensions in mm.

**HA1S/HA3S Selector Switches**

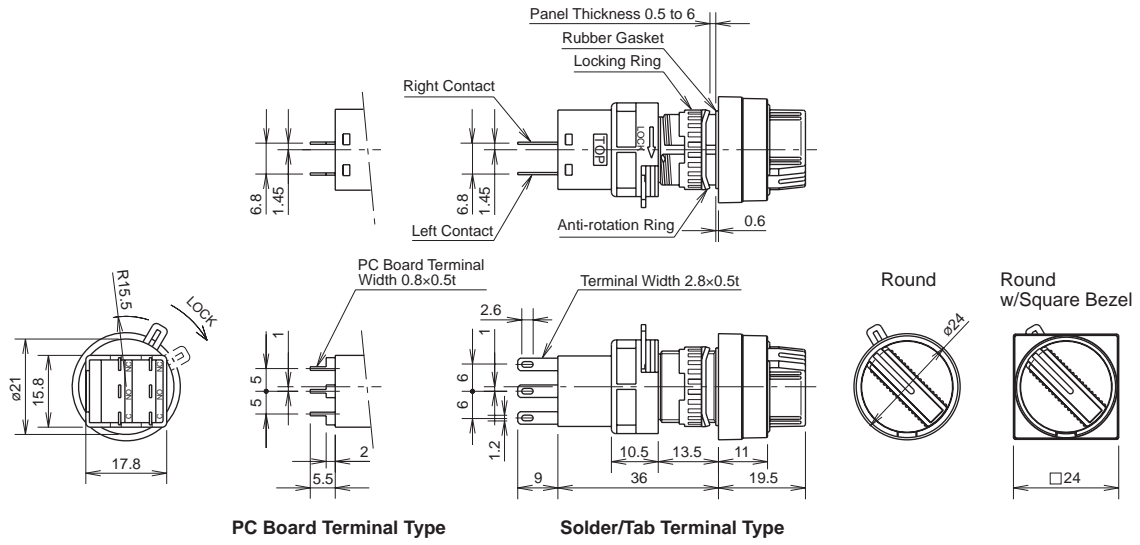
| Shape  | Operator Position   |   | Operation Type  | Contact   |            | Type No.            |                   |
|--|---|---|---|-----------|------------|---------------------|-------------------|
|  |   |   |   |           |            | Solder/Tab Terminal | PC Board Terminal |
| <b>Round HA1S</b><br><br>                    | 90°<br>2-position   | Maintained  |    | Gold      | SPDT       | HA1S-2C1            | HA1S-2C1V         |
|  |   |   |   |           | DPDT       | HA1S-2C2            | HA1S-2C2V         |
|  |   |   |   | Silver    | SPDT       | HA1S-2C5            | —                 |
|  |   | DPDT  | HA1S-2C6  |           | —          |                     |                   |
|  |   | Spring return from right  | Gold  | SPDT      | HA1S-21C1  | HA1S-21C1V          |                   |
|  |   |   |   | DPDT      | HA1S-21C2  | HA1S-21C2V          |                   |
|  | Silver  |   | SPDT  | HA1S-21C5 | —          |                     |                   |
|  |   | DPDT  | HA1S-21C6   | —         |            |                     |                   |
|  | 45°<br>3-position   | Maintained  |    | Gold      | DPDT       | HA1S-3C2            | HA1S-3C2V         |
|  |   |   |   |           | Silver     | DPDT                | HA1S-3C6          |
|  |   | Spring return from right  |    | Gold      | DPDT       | HA1S-31C2           | HA1S-31C2V        |
|  |   |   |   |           | Silver     | DPDT                | HA1S-31C6         |
| Spring return from left  |   |    | Gold  | DPDT      | HA1S-32C2  | HA1S-32C2V          |                   |
|  |   |   |   | Silver    | DPDT       | HA1S-32C6           | —                 |
| Spring return two-way  |    | Gold  | DPDT  | HA1S-33C2 | HA1S-33C2V |                     |                   |
|  |   |   | Silver  | DPDT      | HA1S-33C6  | —                   |                   |
| <b>Round w/Square Bezel HA3S</b><br><br> | 90°<br>2-position   | Maintained  |  | Gold      | SPDT       | HA3S-2C1            | HA3S-2C1V         |
|  |   |   |   |           | DPDT       | HA3S-2C2            | HA3S-2C2V         |
|  |   |   |   | Silver    | SPDT       | HA3S-2C5            | —                 |
|  |   | DPDT  | HA3S-2C6  |           | —          |                     |                   |
|  |   | Spring return from right  | Gold  | SPDT      | HA3S-21C1  | HA3S-21C1V          |                   |
|  |   |   |   | DPDT      | HA3S-21C2  | HA3S-21C2V          |                   |
|  | Silver  |   | SPDT  | HA3S-21C5 | —          |                     |                   |
|  |   | DPDT  | HA3S-21C6   | —         |            |                     |                   |
|  | 45°<br>3-position   | Maintained  |  | Gold      | DPDT       | HA3S-3C2            | HA3S-3C2V         |
|  |   |   |   |           | Silver     | DPDT                | HA3S-3C6          |
|  |   | Spring return from right  |  | Gold      | DPDT       | HA3S-31C2           | HA3S-31C2V        |
|  |   |   |   |           | Silver     | DPDT                | HA3S-31C6         |
| Spring return from left  |   |  | Gold  | DPDT      | HA3S-32C2  | HA3S-32C2V          |                   |
|  |   |   |   | Silver    | DPDT       | HA3S-32C6           | —                 |
| Spring return two-way  |  | Gold  | DPDT  | HA3S-33C2 | HA3S-33C2V |                     |                   |
|  |   |   | Silver  | DPDT      | HA3S-33C6  | —                   |                   |

- Bezel: black
- Knob: black with white indicator
- See page 15 for dimensions.

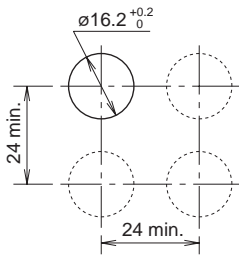
**Contact Operation**

| Operator Position & Contact Operation (Top View) |   |         |   |   |   |
|--|---|---------|---|---|---|
| Positions  |   | Contact | Left  | Center  | Right   |
| 90° 2-position                                   |  Maintained  Spring return from right   | SPDT    |   | —   |    |
|  |   | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | —   | Left Contact:  NO NC<br>Right Contact:  NO NC |
| 45° 3-position                                   |  Maintained  Spring return from right  Spring return from left  Spring return two-way | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC |

**Dimensions (Selector Switch)**

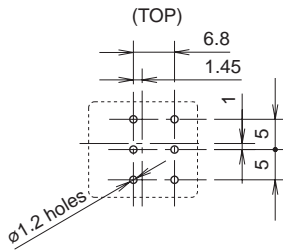


**Mounting Hole Layout  
Mounting Centers**

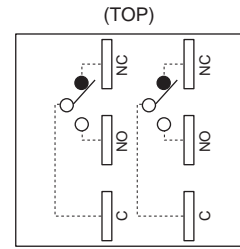


Note: Determine mounting centers to ensure easy operation.

**PC Board Drilling Layout  
(Bottom View)**



**Terminal Arrangement  
(Bottom View)**























• SPDT has C, NO, and NC on the right only.

All dimensions in mm.



HA1K Key Selector Switches





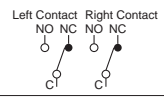
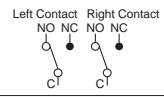




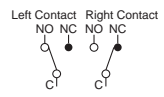
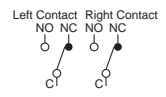
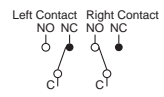
| Shape  | Operator Position        | Keys Retained at ●  | Contact   | Type No.  |                   |             |             |            |
|--|--------------------------|---|---|---|-------------------|-------------|-------------|------------|
|  |                          |   |   | Solder/Tab Terminal   | PC Board Terminal |             |             |            |
| Round<br>HA1K<br><br><br><br> | 90°<br>2-position        | Maintained  | A   |    | Gold              | SPDT        | HA1K-2C1A   | HA1K-2C1VA |
|  |                          |   |   |   | DPDT              | HA1K-2C2A   | HA1K-2C2VA  |            |
|  |                          |   | Silver  | SPDT  | HA1K-2C5A         | —           |             |            |
|  |                          |   |   | DPDT  | HA1K-2C6A         | —           |             |            |
|  |                          |   | B   |    | Gold              | SPDT        | HA1K-2C1B   | HA1K-2C1VB |
|  |                          |   |   |   | DPDT              | HA1K-2C2B   | HA1K-2C2VB  |            |
|  |                          | Silver  | SPDT  | HA1K-2C5B   | —                 |             |             |            |
|  |                          |   | DPDT  | HA1K-2C6B   | —                 |             |             |            |
|  |                          | C   |    | Gold  | SPDT              | HA1K-2C1C   | HA1K-2C1VC  |            |
|  |                          |   |   | DPDT  | HA1K-2C2C         | HA1K-2C2VC  |             |            |
|  |                          | Silver  | SPDT  | HA1K-2C5C   | —                 |             |             |            |
|  |                          |   | DPDT  | HA1K-2C6C   | —                 |             |             |            |
|  | Spring return from right | B   |    | Gold  | SPDT              | HA1K-21C1B  | HA1K-21C1VB |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-21C2B  | HA1K-21C2VB |            |
|  |                          |   |   | Gold  | SPDT              | HA1K-21C5B  | —           |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-21C6B  | —           |            |
|  | 45°<br>3-position        | Maintained  | A   |    | Gold              | DPDT        | HA1K-3C2A   | HA1K-3C2VA |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6A   | —          |
|  |                          |   | B   |    | Gold              | DPDT        | HA1K-3C2B   | HA1K-3C2VB |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6B   | —          |
|  |                          |   | C   |    | Gold              | DPDT        | HA1K-3C2C   | HA1K-3C2VC |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6C   | —          |
|  |                          |   | D   |   | Gold              | DPDT        | HA1K-3C2D   | HA1K-3C2VD |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6D   | —          |
|  |                          |   | E   |  | Gold              | DPDT        | HA1K-3C2E   | HA1K-3C2VE |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6E   | —          |
|  |                          |   | G   |  | Gold              | DPDT        | HA1K-3C2G   | HA1K-3C2VG |
|  |                          |   |   |   | Silver            | DPDT        | HA1K-3C6G   | —          |
|  |                          | H   |  | Gold  | DPDT              | HA1K-3C2H   | HA1K-3C2VH  |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-3C6H   | —           |            |
| Spring return from right   |                          | B   |  | Gold  | DPDT              | HA1K-31C2B  | HA1K-31C2VB |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-31C6B  | —           |            |
|  |                          | D   |  | Gold  | DPDT              | HA1K-31C2D  | HA1K-31C2VD |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-31C6D  | —           |            |
|  |                          | G   |  | Gold  | DPDT              | HA1K-31C2G  | HA1K-31C2VG |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-31C6G  | —           |            |
| Spring return from left  |                          | C   |  | Gold  | DPDT              | HA1K-32C2C  | HA1K-32C2VC |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-32C6C  | —           |            |
|  |                          | D   |  | Gold  | DPDT              | HA1K-32C2D  | HA1K-32C2VD |            |
|  |                          |   |   | Silver  | DPDT              | HA1K-32C6D  | —           |            |
|  | H                        |  | Gold  | DPDT  | HA1K-32C2H        | HA1K-32C2VH |             |            |
|  |                          |   | Silver  | DPDT  | HA1K-32C6H        | —           |             |            |
| Spring return two-way  | D                        |  | Gold  | DPDT  | HA1K-33C2D        | HA1K-33C2VD |             |            |
|  |                          |   | Silver  | DPDT  | HA1K-33C6D        | —           |             |            |

• Two keys are supplied.
























• The front of key cylinder is made of black plastic.

• See page 18 for dimensions.

Contact Operation

| Operator Position & Contact Operation (Top View) |   |         |  |   |   |
|--|---|---------|--|---|---|
| Positions  |   | Contact | ↙ Left   | ↑ Center  | ↘ Right   |
| 90° 2-position                                   |     | SPDT    |   | —   |  |
|  |   | DPDT    |  | —   |  |
| 45° 3-position                                   |     | DPDT    |  |  |  |

**HA3K Key Selector Switches**



















| Shape   | Operator Position        |   | Keys Retained at ●  |   | Contact   |             | Type No.            |                   |             |
|---|--------------------------|---|---|---|---|-------------|---------------------|-------------------|-------------|
|   |                          |   |   |   |   |             | Solder/Tab Terminal | PC Board Terminal |             |
| Round w/Square Bezel<br><b>HA3K</b><br><br><br><br>UL     | 90°<br>2-position        | Maintained  | A   |    | Gold  | SPDT        | HA3K-2C1A           | HA3K-2C1VA        |             |
|   |                          |   |   |   |   | DPDT        | HA3K-2C2A           | HA3K-2C2VA        |             |
|   |                          |   | Silver  | SPDT  | HA3K-2C5A   | —           |                     |                   |             |
|   |                          |   |   | DPDT  | HA3K-2C6A   | —           |                     |                   |             |
|   |                          |   | B   |    | Gold  | SPDT        | HA3K-2C1B           | HA3K-2C1VB        |             |
|   |                          |   |   |   |   | DPDT        | HA3K-2C2B           | HA3K-2C2VB        |             |
|   |                          | Silver  | DPDT  | SPDT  | HA3K-2C5B   | —           |                     |                   |             |
|   |                          |   |   | DPDT  | HA3K-2C6B   | —           |                     |                   |             |
|   |                          | C   |    | Gold  | SPDT  | HA3K-2C1C   | HA3K-2C1VC          |                   |             |
|   |                          |   |   |   | DPDT  | HA3K-2C2C   | HA3K-2C2VC          |                   |             |
|   |                          |   |   | Silver  | SPDT  | HA3K-2C5C   | —                   |                   |             |
|   |                          |   |   |   | DPDT  | HA3K-2C6C   | —                   |                   |             |
|   | Spring return from right |   |   | B   |  | Gold        | SPDT                | HA3K-21C1B        | HA3K-21C1VB |
|   |                          |   |   |   |   |             | DPDT                | HA3K-21C2B        | HA3K-21C2VB |
|   |                          | Silver  | SPDT  |   |   | HA3K-21C5B  | —                   |                   |             |
|   |                          |   | DPDT  |   |   | HA3K-21C6B  | —                   |                   |             |
|   | 45°<br>3-position        | Maintained  | A   |    | Gold  | DPDT        | HA3K-3C2A           | HA3K-3C2VA        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6A         | —           |
|   |                          |   | B   |    | Gold  | DPDT        | HA3K-3C2B           | HA3K-3C2VB        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6B         | —           |
|   |                          |   | C   |   | Gold  | DPDT        | HA3K-3C2C           | HA3K-3C2VC        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6C         | —           |
|   |                          |   | D   |  | Gold  | DPDT        | HA3K-3C2D           | HA3K-3C2VD        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6D         | —           |
|   |                          |   | E   |  | Gold  | DPDT        | HA3K-3C2E           | HA3K-3C2VE        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6E         | —           |
|   |                          |   | G   |  | Gold  | DPDT        | HA3K-3C2G           | HA3K-3C2VG        |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-3C6G         | —           |
|   |                          | H   |  | Gold  | DPDT  | HA3K-3C2H   | HA3K-3C2VH          |                   |             |
|   |                          |   |   |   | Silver  | DPDT        | HA3K-3C6H           | —                 |             |
|   |                          | Spring return from right  | B   |  | Gold  | DPDT        | HA3K-31C2B          | HA3K-31C2VB       |             |
|   |                          |   |   |   |   | Silver      | DPDT                | HA3K-31C6B        | —           |
| D   |                          |   |  | Gold  | DPDT  | HA3K-31C2D  | HA3K-31C2VD         |                   |             |
|   |                          |   |   |   | Silver  | DPDT        | HA3K-31C6D          | —                 |             |
| G   |                          |   |  | Gold  | DPDT  | HA3K-31C2G  | HA3K-31C2VG         |                   |             |
|   |                          |   |   |   | Silver  | DPDT        | HA3K-31C6G          | —                 |             |
| Spring return from left   |                          | C   |  | Gold  | DPDT  | HA3K-32C2C  | HA3K-32C2VC         |                   |             |
|   |                          |   |   |   | Silver  | DPDT        | HA3K-32C6C          | —                 |             |
|   |                          | D   |  | Gold  | DPDT  | HA3K-32C2D  | HA3K-32C2VD         |                   |             |
|   |                          |   |   |   | Silver  | DPDT        | HA3K-32C6D          | —                 |             |
|   | H                        |  | Gold  | DPDT  | HA3K-32C2H  | HA3K-32C2VH |                     |                   |             |
|   |                          |   |   | Silver  | DPDT  | HA3K-32C6H  | —                   |                   |             |
| Spring return two-way   | D                        |  | Gold  | DPDT  | HA3K-33C2D  | HA3K-33C2VD |                     |                   |             |
|   |                          |   |   | Silver  | DPDT  | HA3K-33C6D  | —                   |                   |             |

• Two keys are supplied.

• The front of key cylinder is made with black plastic.

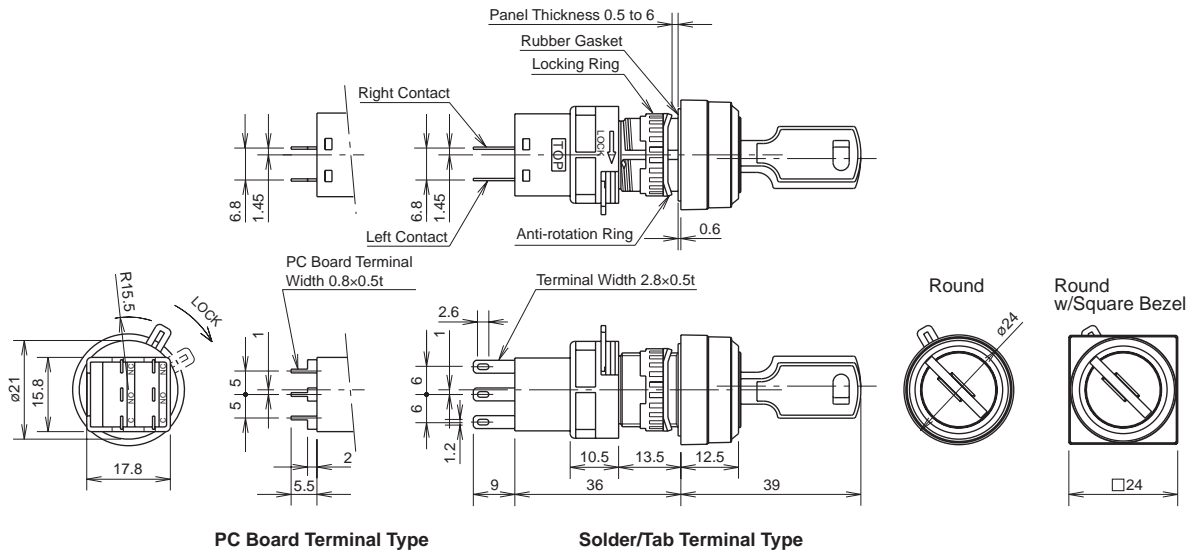
• See page 18 for dimensions.

**Contact Operation**

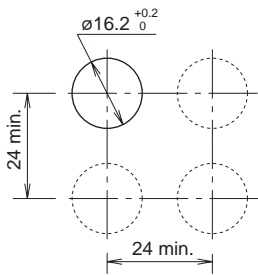
| Operator Position & Contact Operation (Top View) |   |         |  |   |   |
|--|---|---------|--|---|---|
| Positions  |   | Contact | ↙ Left   | ↑ Center  | ↘ Right   |
| 90° 2-position                                   |  Maintained  Spring return from right   | SPDT    |    | —   |    |
|  |   | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | —   | Left Contact:  NO NC<br>Right Contact:  NO NC |
| 45° 3-position                                   |  Maintained  Spring return from right  Spring return from left  Spring return two-way | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC |

# Ø16 H6 Series Miniature Control Units

## Dimensions (Key Selector Switch)

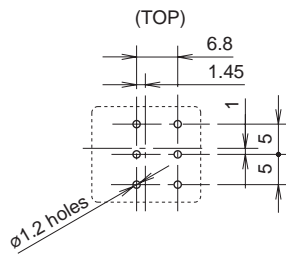


### Mounting Hole Layout Mounting Centers

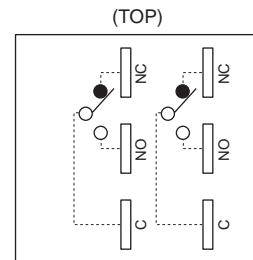


Note: Determine mounting centers to ensure easy operation.

### PC Board Drilling Layout (Bottom View)












### Terminal Arrangement (Bottom View)



• SPDT has C, NO, and NC on the right only.




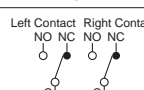
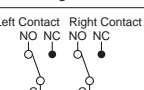
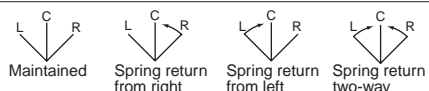

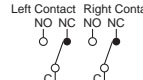

All dimensions in mm.

**HA1F LED Illuminated Selector Switches**











| Shape  | Operator Position | Contact Material  | Operating Voltage | Contact      | Type No.            |                   | Color Code ②  |
|--|-------------------|---|-------------------|--------------|---------------------|-------------------|---|
|  |                   |   |                   |              | Solder/Tab Terminal | PC Board Terminal |   |
| <br> | 90° 2-position    | Maintained<br>                 | 5V DC ±5%         | SPDT         | HA1F-2C11②          | HA1F-2C11V②       | Specify a lens color code in place of ② in the Type No.<br><br>A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |
|  |                   |   |                   | DPDT         | HA1F-2C21②          | HA1F-2C21V②       |   |
|  |                   |   | 12V AC/DC ±10%    | SPDT         | HA1F-2C13②          | HA1F-2C13V②       |   |
|  |                   |   |                   | DPDT         | HA1F-2C23②          | HA1F-2C23V②       |   |
|  |                   |   | 24V AC/DC ±10%    | SPDT         | HA1F-2C14②          | HA1F-2C14V②       |   |
|  |                   |   |                   | DPDT         | HA1F-2C24②          | HA1F-2C24V②       |   |
|  |                   | Silver  | 5V DC ±5%         | SPDT         | HA1F-2C51②          | —                 |   |
|  |                   |   |                   | DPDT         | HA1F-2C61②          |                   |   |
|  |                   |   | 12V AC/DC ±10%    | SPDT         | HA1F-2C53②          |                   |   |
|  |                   |   |                   | DPDT         | HA1F-2C63②          |                   |   |
|  |                   |   | 24V AC/DC ±10%    | SPDT         | HA1F-2C54②          |                   |   |
|  |                   |   |                   | DPDT         | HA1F-2C64②          |                   |   |
|  | 90° 3-position    | Maintained<br>               | 5V DC ±5%         | SPDT         | HA1F-21C11②         | HA1F-21C11V②      |   |
|  |                   |   |                   | DPDT         | HA1F-21C21②         | HA1F-21C21V②      |   |
|  |                   |   | 12V AC/DC ±10%    | SPDT         | HA1F-21C13②         | HA1F-21C13V②      |   |
|  |                   |   |                   | DPDT         | HA1F-21C23②         | HA1F-21C23V②      |   |
|  |                   |   | 24V AC/DC ±10%    | SPDT         | HA1F-21C14②         | HA1F-21C14V②      |   |
|  |                   |   |                   | DPDT         | HA1F-21C24②         | HA1F-21C24V②      |   |
|  |                   | Spring return from right<br>   | 5V DC ±5%         | SPDT         | HA1F-21C51②         | —                 |   |
|  |                   |   |                   | DPDT         | HA1F-21C61②         |                   |   |
|  |                   |   | 12V AC/DC ±10%    | SPDT         | HA1F-21C53②         |                   |   |
|  |                   |   |                   | DPDT         | HA1F-21C63②         |                   |   |
|  |                   |   | 24V AC/DC ±10%    | SPDT         | HA1F-21C54②         |                   |   |
|  |                   |   |                   | DPDT         | HA1F-21C64②         |                   |   |
|  | 45° 3-position    | Maintained<br>               | 5V DC ±5%         | DPDT         | HA1F-3C21②          | HA1F-3C21V②       |   |
|  |                   |   |                   | DPDT         | HA1F-3C23②          | HA1F-3C23V②       |   |
|  |                   |   | 12V AC/DC ±10%    | DPDT         | HA1F-3C24②          | HA1F-3C24V②       |   |
|  |                   |   |                   | DPDT         | HA1F-3C61②          | —                 |   |
|  |                   |   | 24V AC/DC ±10%    | DPDT         | HA1F-3C63②          |                   |   |
|  |                   |   |                   | DPDT         | HA1F-3C64②          |                   |   |
|  |                   | Spring return from right<br> | 5V DC ±5%         | DPDT         | HA1F-31C21②         |                   | HA1F-31C21V②  |
|  |                   |   |                   | DPDT         | HA1F-31C23②         |                   | HA1F-31C23V②  |
|  |                   |   | 12V AC/DC ±10%    | DPDT         | HA1F-31C24②         |                   | HA1F-31C24V②  |
|  |                   |   |                   | DPDT         | HA1F-31C61②         | —                 |   |
|  |                   |   | 24V AC/DC ±10%    | DPDT         | HA1F-31C63②         |                   |   |
|  |                   |   |                   | DPDT         | HA1F-31C64②         |                   |   |
| Spring return from left<br>   | 5V DC ±5%         | DPDT  | HA1F-32C21②       | HA1F-32C21V② |                     |                   |   |
|  |                   | DPDT  | HA1F-32C23②       | HA1F-32C23V② |                     |                   |   |
|  | 12V AC/DC ±10%    | DPDT  | HA1F-32C24②       | HA1F-32C24V② |                     |                   |   |
|  |                   | DPDT  | HA1F-32C61②       | —            |                     |                   |   |
|  | 24V AC/DC ±10%    | DPDT  | HA1F-32C63②       |              |                     |                   |   |
|  |                   | DPDT  | HA1F-32C64②       |              |                     |                   |   |
| Spring return two-way<br>   | 5V DC ±5%         | DPDT  | HA1F-33C21②       |              | HA1F-33C21V②        |                   |   |
|  |                   | DPDT  | HA1F-33C23②       |              | HA1F-33C23V②        |                   |   |
|  | 12V AC/DC ±10%    | DPDT  | HA1F-33C24②       |              | HA1F-33C24V②        |                   |   |
|  |                   | DPDT  | HA1F-33C61②       | —            |                     |                   |   |
|  | 24V AC/DC ±10%    | DPDT  | HA1F-33C63②       |              |                     |                   |   |
|  |                   | DPDT  | HA1F-33C64②       |              |                     |                   |   |

• See page 21 for dimensions.

**Contact Operation**



















| Operator Position & Contact Operation (Top View) |   |         |  |   |   |
|--|---|---------|--|---|---|
|  | Positions   | Contact | Left   | Center  | Right   |
| 90° 2-position                                   |  | SPDT    |  | —   |  |
|  |   | DPDT    |  | —   |  |
| 45° 3-position                                   |  | DPDT    |  |  |  |

**HA3F LED Illuminated Selector Switches**

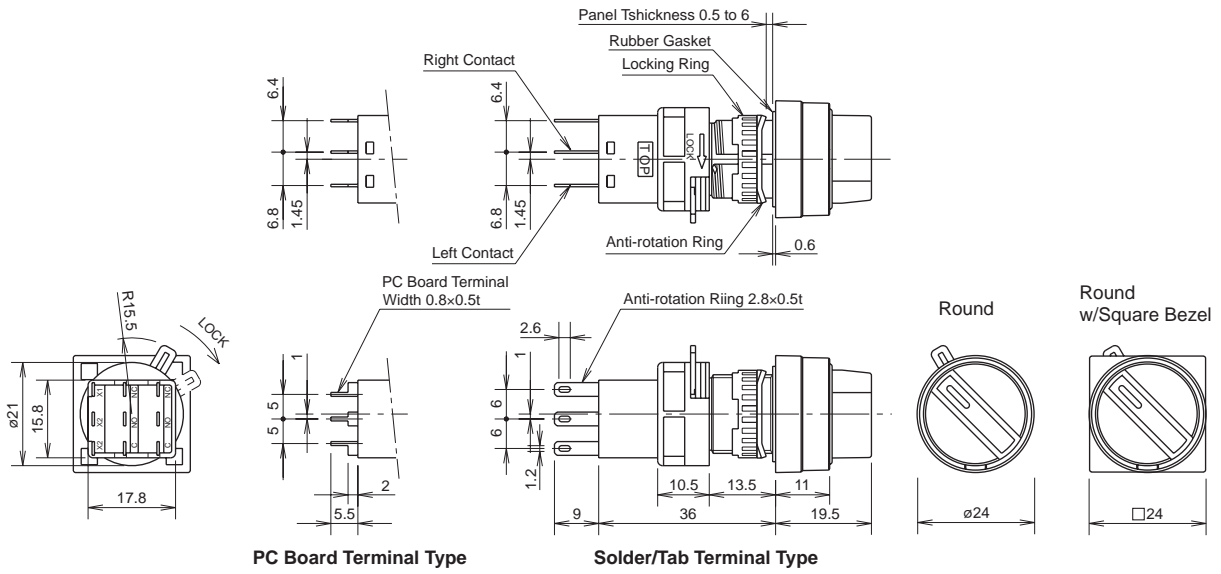
| Shape   | Operator Position   | Contact Material  | Operating Voltage | Contact        | Type No.            |                   | Color Code ②  |             |              |
|---|---|---|-------------------|----------------|---------------------|-------------------|---|-------------|--------------|
|   |   |   |                   |                | Solder/Tab Terminal | PC Board Terminal |   |             |              |
| Round w/Square Bezel HA3F<br><br><br><br>UL    | 90° 2-position  | Maintained<br>                 | 5V DC ±5%         | SPDT           | HA3F-2C11②          | HA3F-2C11V②       | Specify a lens color code in place of ② in the Type No.<br><br>A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow |             |              |
|   |   |   |                   | DPDT           | HA3F-2C21②          | HA3F-2C21V②       |   |             |              |
|   |   |   | 12V AC/DC ±10%    | SPDT           | HA3F-2C13②          | HA3F-2C13V②       |   |             |              |
|   |   |   |                   | DPDT           | HA3F-2C23②          | HA3F-2C23V②       |   |             |              |
|   |   |   | 24V AC/DC ±10%    | SPDT           | HA3F-2C14②          | HA3F-2C14V②       |   |             |              |
|   |   |   |                   | DPDT           | HA3F-2C24②          | HA3F-2C24V②       |   |             |              |
|   |   | Silver  | 5V DC ±5%         | SPDT           | HA3F-2C51②          | —                 |   |             |              |
|   |   |   |                   | DPDT           | HA3F-2C61②          |                   |   |             |              |
|   |   |   | 12V AC/DC ±10%    | SPDT           | HA3F-2C53②          |                   |   |             |              |
|   |   |   |                   | DPDT           | HA3F-2C63②          |                   |   |             |              |
|   |   |   | 24V AC/DC ±10%    | SPDT           | HA3F-2C54②          |                   |   |             |              |
|   |   |   |                   | DPDT           | HA3F-2C64②          |                   |   |             |              |
|   | Spring return from right<br> | Gold  | 5V DC ±5%         | SPDT           | HA3F-21C11②         | HA3F-21C11V②      |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C21②         | HA3F-21C21V②      |   |             |              |
|   |   |   | 12V AC/DC ±10%    | SPDT           | HA3F-21C13②         | HA3F-21C13V②      |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C23②         | HA3F-21C23V②      |   |             |              |
|   |   |   | 24V AC/DC ±10%    | SPDT           | HA3F-21C14②         | HA3F-21C14V②      |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C24②         | HA3F-21C24V②      |   |             |              |
|   |   | Silver  | 5V DC ±5%         | SPDT           | HA3F-21C51②         | —                 |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C61②         |                   |   |             |              |
|   |   |   | 12V AC/DC ±10%    | SPDT           | HA3F-21C53②         |                   |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C63②         |                   |   |             |              |
|   |   |   | 24V AC/DC ±10%    | SPDT           | HA3F-21C54②         |                   |   |             |              |
|   |   |   |                   | DPDT           | HA3F-21C64②         |                   |   |             |              |
|   | 45° 3-position  | Maintained<br>               | Gold              | 5V DC ±5%      | DPDT                | HA3F-3C21②        |   | HA3F-3C21V② |              |
|   |   |   |                   | 12V AC/DC ±10% | DPDT                | HA3F-3C23②        |   | HA3F-3C23V② |              |
|   |   |   |                   | 24V AC/DC ±10% | DPDT                | HA3F-3C24②        |   | HA3F-3C24V② |              |
|   |   |   | Silver            | 5V DC ±5%      | DPDT                | HA3F-3C61②        |   | —           |              |
|   |   |   |                   | 12V AC/DC ±10% | DPDT                | HA3F-3C63②        |   |             |              |
|   |   |   |                   | 24V AC/DC ±10% | DPDT                | HA3F-3C64②        |   |             |              |
|   |   | Spring return from right<br> | Gold              | 5V DC ±5%      | DPDT                | HA3F-31C21②       |   |             | HA3F-31C21V② |
|   |   |   |                   | 12V AC/DC ±10% | DPDT                | HA3F-31C23②       |   |             | HA3F-31C23V② |
|   |   |   |                   | 24V AC/DC ±10% | DPDT                | HA3F-31C24②       |   |             | HA3F-31C24V② |
|   |   |   | Silver            | 5V DC ±5%      | DPDT                | HA3F-31C61②       |   | —           |              |
|   |   |   |                   | 12V AC/DC ±10% | DPDT                | HA3F-31C63②       |   |             |              |
|   |   |   |                   | 24V AC/DC ±10% | DPDT                | HA3F-31C64②       |   |             |              |
| Spring return from left<br>  |   | Gold  | 5V DC ±5%         | DPDT           | HA3F-32C21②         | HA3F-32C21V②      |   |             |              |
|   |   |   | 12V AC/DC ±10%    | DPDT           | HA3F-32C23②         | HA3F-32C23V②      |   |             |              |
|   |   |   | 24V AC/DC ±10%    | DPDT           | HA3F-32C24②         | HA3F-32C24V②      |   |             |              |
|   |   | Silver  | 5V DC ±5%         | DPDT           | HA3F-32C61②         | —                 |   |             |              |
|   |   |   | 12V AC/DC ±10%    | DPDT           | HA3F-32C63②         |                   |   |             |              |
|   |   |   | 24V AC/DC ±10%    | DPDT           | HA3F-32C64②         |                   |   |             |              |
| Spring return two-way<br>  | Gold  | 5V DC ±5%   | DPDT              | HA3F-33C21②    | HA3F-33C21V②        |                   |   |             |              |
|   |   | 12V AC/DC ±10%  | DPDT              | HA3F-33C23②    | HA3F-33C23V②        |                   |   |             |              |
|   |   | 24V AC/DC ±10%  | DPDT              | HA3F-33C24②    | HA3F-33C24V②        |                   |   |             |              |
|   | Silver  | 5V DC ±5%   | DPDT              | HA3F-33C61②    | —                   |                   |   |             |              |
|   |   | 12V AC/DC ±10%  | DPDT              | HA3F-33C63②    |                     |                   |   |             |              |
|   |   | 24V AC/DC ±10%  | DPDT              | HA3F-33C64②    |                     |                   |   |             |              |

• See page 21 for dimensions.

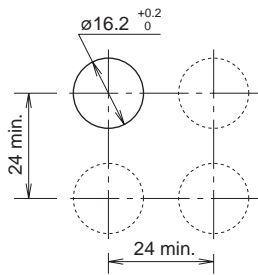
**Contact Operation**

| Operator Position & Contact Operation (Top View)  |         |  |   |   |  |
|---|---------|--|---|---|--|
| Positions   | Contact | Left   | Center  | Right   |  |
| 90° 2-position<br><br> Maintained  Spring return from right   | SPDT    |    | —   |    |  |
|   | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | —   | Left Contact:  NO NC<br>Right Contact:  NO NC |  |
| 45° 3-position<br><br> Maintained  Spring return from right  Spring return from left  Spring return two-way | DPDT    | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC | Left Contact:  NO NC<br>Right Contact:  NO NC |  |

**Dimensions (Illuminated Selector Switch)**

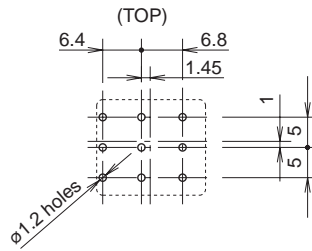


**Mounting Hole Layout  
Mounting Centers**



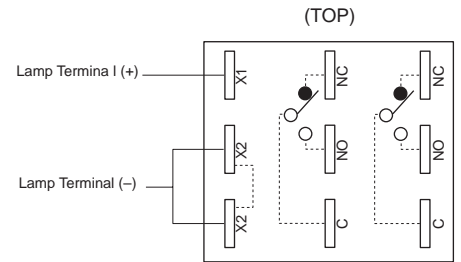
Note: Determine mounting centers to ensure easy operation.

**PC Board Drilling Layout  
(Bottom View)**



Note: For details, see page 30 about oneboard mounting.

**Terminal Arrangement  
(Bottom View)**





























- SPDT has C, NO, and NC on the right only.
- X2 and X2 are wired internally.

All dimensions in mm.

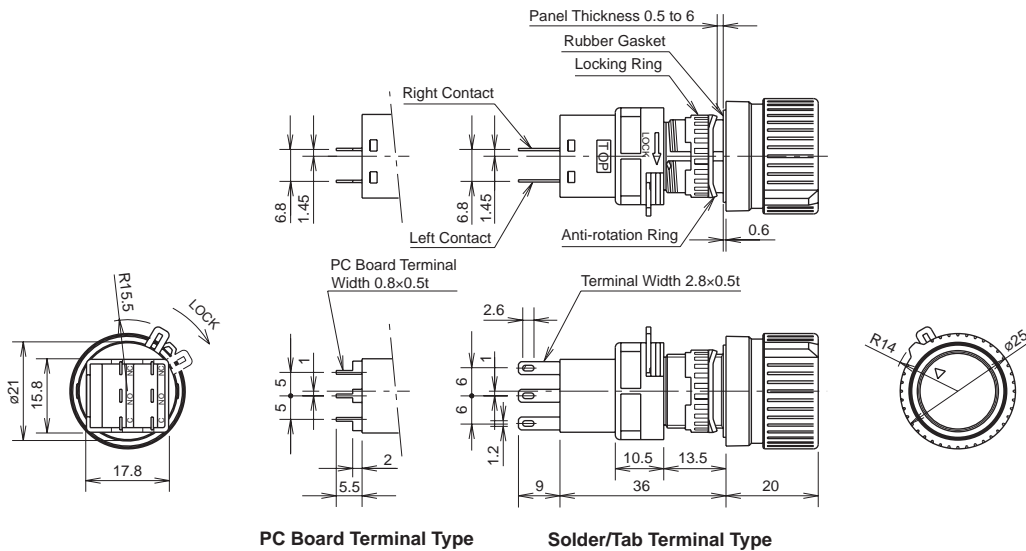
# ø16 H6 Series Miniature Control Units

## HA1R Selector Pushbuttons

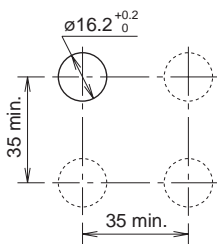
| Shape  | Operator Position  | Contact Operation |  |  |         |  |  | Contact Material   | Contact | Type No. Terminal Type        | Color Code ①                  |  |
|--|--|-------------------|--|--|---------|--|--|--|---------|-------------------------------|-------------------------------|--|
|  |  | L                 |  | C  |         | R  |  |  |         |                               |                               |  |
|  |  | Normal            | Push   | Normal   | Push    | Normal   | Push   |  |         |                               |                               |  |
| <br>Round HA1R<br> | 90° 2-position   | Maintained        | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | —       | —  | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Gold    | DPDT                          | Solder Tab Terminal HA1R-2C2① | B: black<br>G: green<br>R: red<br>S: blue<br>Y: yellow |
|  |  |                   | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | —       | —  | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Silver  | DPDT                          | Solder Tab Terminal HA1R-2C6① |  |
|  |  |                   | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Blocked | Blocked  | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Gold    | DPDT                          | Solder Tab Terminal HA1R-3C2① |  |
|  | <br>Left Contact NO NC<br>Right Contact NO NC |                   | <br>Left Contact NO NC<br>Right Contact NO NC | Blocked  | Blocked | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Silver   | DPDT    | PC Board Terminal HA1R-3C2V①  |                               |  |
|  | <br>Left Contact NO NC<br>Right Contact NO NC |                   | <br>Left Contact NO NC<br>Right Contact NO NC | Blocked  | Blocked | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Gold   | DPDT    | Solder Tab Terminal HA1R-3C6① |                               |  |
|  | <br>Left Contact NO NC<br>Right Contact NO NC |                   | <br>Left Contact NO NC<br>Right Contact NO NC | Blocked  | Blocked | <br>Left Contact NO NC<br>Right Contact NO NC | <br>Left Contact NO NC<br>Right Contact NO NC | Silver   | DPDT    | Solder Tab Terminal HA1R-3C6① |                               |  |

• Specify a button color code in place of ① in the Type No.

### Dimensions

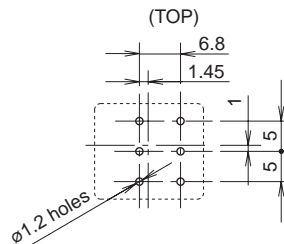


### Mounting Hole Layout Mounting Centers



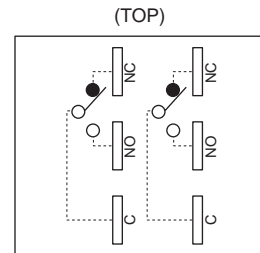
Note: Determine mounting centers to ensure easy operation.

### PC Board Panel Cut-out (Bottom View)



Note: For details, see page 30 about oneboard mounting.

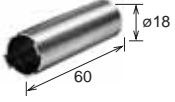

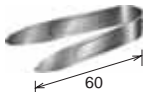



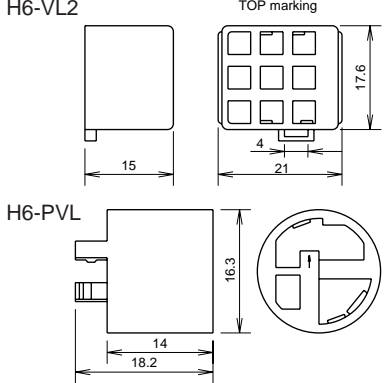

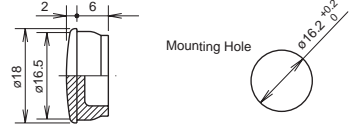
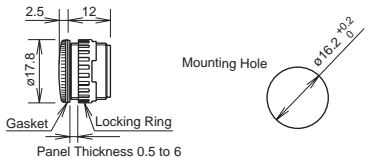
### Terminal Arrangement (Bottom View)



All dimensions in mm.

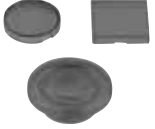
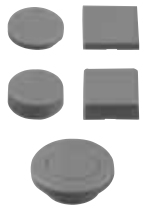









## Accessories




| Shape  | Material                          | Type No.                                  | Ordering Type No. | Package Quantity | Dimensions (mm)  |  |
|--|-----------------------------------|---|-------------------|------------------|--|--|
| Locking Ring Wrench<br>               | Metal (nickel-plated brass)       | MT-001                                    | MT-001            | 1                | <ul style="list-style-type: none"> <li>Used to tighten the locking ring when installing H6 control units into a panel.</li> <li>Tighten the locking ring to a torque of 0.88 N·m.</li> </ul> |  |
| Lamp Holder Tool<br>                  | Rubber                            | OR-44                                     | OR-44             | 1                | <ul style="list-style-type: none"> <li>Used to install and remove LED lamps.</li> </ul>  |  |
| Lens Removal Tool<br>                 | Stainless Steel                   | MT-101                                    | MT-101            | 1                | <ul style="list-style-type: none"> <li>Used to remove the lens or buttons.</li> </ul>  |  |
| Switch Guard (180° spring return)<br> | Standard                          | Guard (Polyarylate)                       | HA9Z-K1           | HA9Z-K1          | 1  | <ul style="list-style-type: none"> <li>Degree of protection: IP65</li> <li>Used to protect flush pushbuttons from inadvertent operation.</li> </ul>   |
|  | For oneboard                      | Base (polyacetal)                         | HA9Z-KW1          | HA9Z-KW1         | 1  |  |
| Terminal Cover<br>                  | Standard                          | Nylon                                     | H6-VL2            | H6-VL2PN10       | 10   | <ul style="list-style-type: none"> <li>Terminal cover is not attached and must be ordered separately.</li> <li>When wiring the terminals, insert the lead wires into the terminal cover holes before soldering.</li> </ul>  |
|  | Exclusive for Unibody Pilot Light |   |                   | H6-PVL           | H6-PVLPN10   |  |
| Mounting Hole Plug<br>              | Rubber                            | Nitril Rubber (black)                     | AL-B6             | AL-B6PN05        | 5  | <ul style="list-style-type: none"> <li>Degree of protection: IP65</li> </ul>    |
|  | Metal                             | Metal (diecast)<br>Locking ring (plastic) | AL-BM6            | AL-BM6           | 1  | <ul style="list-style-type: none"> <li>Degree of protection: IP65</li> </ul>    |

# ø16 H6 Series Miniature Control Units


## Maintenance Parts

| Shape   | Specification   | Type No.                           | Ordering Type No. | Package Quantity | Color Code ①② |   |
|---|---|------------------------------------|-------------------|------------------|---------------|---|
|    | Round, Round w/Square Bezel                           | Polyarylate                        | HA9Z-L11②         | HA9Z-L11②PN05    | 5             | Specify a color code in place of ② in the Type No.<br>A (amber), G (green), R (red), S (blue), W (white), Y (yellow)  |
|   | Square  |                                    | HA9Z-L21②         | HA9Z-L21②PN05    |               |   |
|   | ø30mm Lens  |                                    | HA9Z-L13②         | HA9Z-L13②PN05    |               |   |
|    | Round Flush, Round w/Square Bezel                     | Polyacetal                         | HA9Z-B11①         | HA9Z-B11①PN05    | 5             | Specify a color code in place of ① in the Type No.<br>B (black), G (green), R (red), S (blue), W (white), Y (yellow)  |
|   | Square Flush  |                                    | HA9Z-B21①         | HA9Z-B21①PN05    |               |   |
|   | Round Extended, Round Extended w/Square Bezel         |                                    | HA9Z-B12①         | HA9Z-B12①PN05    |               |   |
|   | Square Extended                                       |                                    | HA9Z-B22①         | HA9Z-B22①PN05    |               |   |
|   | ø30mm Button  |                                    | HA9Z-B13①         | HA9Z-B13①PN05    |               |   |
|    | Round, Round w/Square Bezel                           | Acrylic                            | HA9Z-P1W          | HA9Z-P1WPN05     | 5             | <ul style="list-style-type: none"> <li>• White</li> <li>• HA9Z-P1W (engraving area: ø16.4 mm, engraving depth: 0.5 mm max.)</li> <li>• HA9Z-P2W (engraving area: □16.4 mm, engraving depth: 0.5 mm max.)</li> </ul> |
|   | Square  | Acrylic                            | HA9Z-P2W          | HA9Z-P2WPN05     |               |   |
|  | For all types   | Plastic                            | HA9Z-LN           | HA9Z-LNPN10      | 10            |   |
|  | For all types except for HA1E                         | Stainless Steel                    | HA9Z-LP           | HA9Z-LPPN10      | 5             |   |
|  | For all types except for collective mounting and HA1E | Polyacetal                         | HA9Z-LS           | HA9Z-LSPN10      | 5             | <ul style="list-style-type: none"> <li>• Lever lock is not attached and must be ordered separately.</li> <li>• Yellow</li> </ul>  |
|  | For selector switch                                   | Polyacetal                         | HA9Z-HC1①         | HA9Z-HC1①PN05    | 5             | Specify a color code in place of ① in the Type No.<br>G (green), R (red), S (blue), W (white), Y (yellow)   |
|  | For key selector switches                             | Nickel-plated Brass                | KG9Z-SK-231       | KG9Z-SK-231PN02  | 2             | <ul style="list-style-type: none"> <li>• Thickness: 2.0mm</li> <li>• Two keys of the same number. Different key numbers are not available.</li> </ul>   |
|  | For illuminated selector switch                       | Polyarylate (w/water-proof gasket) | HA1A-F②           | HA1A-F②          | 1             | Specify a color code in place of ② in the Type No.<br>A (amber), G (green), R (red), S (blue), W (white), Y (yellow)  |

## LED Lamps

| Operating Voltage   | Current Draw |      | Type No. | Ordering Type No. | ② Illumination Color Code  | Package Quantity | Base       |
|---|--------------|------|----------|-------------------|--|------------------|------------|
|   | AC           | DC   |          |                   |  |                  |            |
| 5V DC ±5%<br>      | —            | 8 mA | LFTD-5②  | LFTD-5②           | Specify a color code in place of ② in the Ordering Type No.        | 1                | SX6S/8×5.4 |
|   |              |      |          | LFTD-5②PN10       |  | 10               |            |
| 12V AC/DC ±10%<br> | 9 mA         | 8 mA | LFTD-1②  | LFTD-1②           | A: amber<br>G: green<br>R: red<br>S: blue<br>W: white<br>Y: yellow | 1                |            |
|   |              |      |          | LFTD-1②PN10       |  | 10               |            |
| 24V AC/DC ±10%<br> | 9 mA         | 8 mA | LFTD-2②  | LFTD-2②           |  | 1                |            |
|   |              |      |          | LFTD-2②PN10       |  | 10               |            |

## Transformer

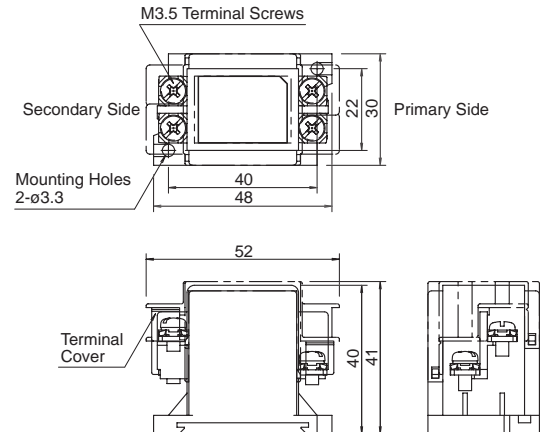
| Shape   | Primary Voltage | Secondary Voltage | Type No. | Applicable LED Lamp |
|---|-----------------|-------------------|----------|---------------------|
| Separate Mounting Type for 24V<br> | 100/110V AC     | 24V AC, 0.5W      | TWR512   | LFTD-2②             |
|   | 200/220V AC     |                   | TWR522   |                     |
|   | 400/440V AC     |                   | TWR542   |                     |

- Terminal covers are supplied with separate mounting type transformers.
- Connect only one LFTD LED to separate mounting type transformers.
- Use plastic mounting clip BC9Z-E/NS35N when using 400/440V primary voltage.

## Specifications


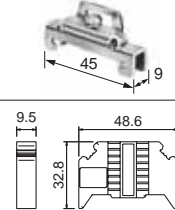
|                              |  |                               |
|------------------------------|--|-------------------------------|
| Operating Voltage            | 100/110V AC, 200/220V AC, 400/440V AC (50/60 Hz) |                               |
| Power Consumption            | 2.4VA  |                               |
| Rated Insulation Voltage     | 600V   |                               |
| Insulation Resistance        | 100 MΩ minimum (500V DC megger)                  |                               |
| Dielectric Strength          | 2500V AC, 1 minute                               |                               |
| Standard Operating Condition | Operating Temperature                            | -30 to +60°C (no freezing)    |
|                              | Relative Humidity                                | 35 to 85% (no condensation)   |
| Vibration Resistance         | Operating Extremes                               | 5 to 55 Hz, amplitude 0.5 mm  |
| Shock Resistance             | Damage Limits                                    | 1,000 m/s <sup>2</sup> (100G) |
| Terminal Screw               | M3.5   |                               |
| Applicable Wire              | 2 mm <sup>2</sup> maximum, 2 wires maximum       |                               |

## Dimensions



All dimensions in mm.

## Accessories

| Description   | Appearance  | Description                      | Type No.     | Ordering Type No. | Package Quantity |
|---------------|---|----------------------------------|--------------|-------------------|------------------|
| DIN Rail      |  | Aluminum<br>Weight: Approx. 200g | BAA1000      | BAA1000PN10       | 10               |
|               |   | Steel<br>Weight: Approx. 320g    | BAP1000      | BAP1000PN10       |                  |
| Mounting Clip |  | Steel<br>Weight: Approx. 15g     | BNL6         | BNL6PN10          |                  |
|               |   | Plastic<br>Weight: Approx. 15g   | BC9Z-E/NS35N | BC9Z-E/NS35NPN10  |                  |

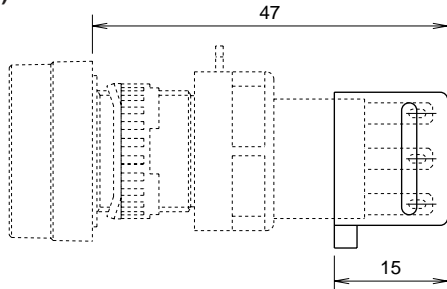
- Use plastic mounting clip BC9Z-E/NS35N when using 400/440V primary voltage.

**Maintenance Parts**

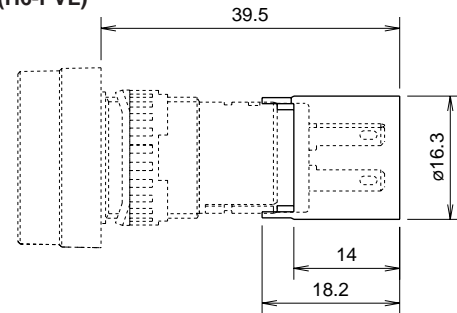
**Dimensions**

• Terminal Cover

For Separate Type (except for unibody type pilot lights)  
(H6-VL2)

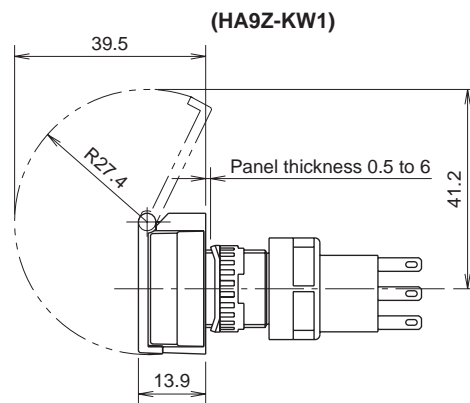
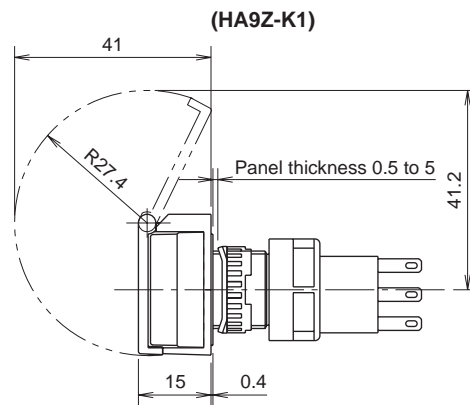
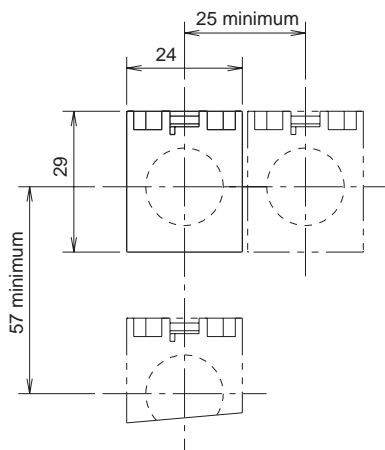


For Unibody Type Pilot Lights  
(H6-PVL)



• Switch Guard

For Flush Pushbuttons and Illuminated Pushbuttons



All dimensions in mm.

# ø16 H6 Series Emergency Stop Switches

## H6 Emergency Stop Switches

### Contact Ratings

|                               |                |                        |      |       |      |
|-------------------------------|----------------|------------------------|------|-------|------|
| Rated Insulation Voltage (Ui) |                | 250V                   |      |       |      |
| Rated Thermal Current (Ith)   |                | 10A                    |      |       |      |
| Rated Operating Voltage (Ue)  |                | 30V                    | 125V | 250V  |      |
| Rated Operating Current       | AC<br>50/60 Hz | Resistive Load (AC-12) | —    | 5A    | 3A   |
|                               |                | Inductive Load (AC-15) | —    | 3A    | 1.5A |
|                               | DC             | Resistive Load (DC-12) | 2A   | 0.4A  | 0.2A |
|                               |                | Inductive Load (DC-13) | 1A   | 0.22A | 0.1A |

Minimum applicable load (reference value): 3V AC/DC, 5 mA  
(Applicable range is subject to the operating condition and load.)

### Contact Ratings

| Applicable Standard | File No. or Organization                      |
|---------------------|---|
| UL508               | File No. E68961 (HA1E), E55996 (HA1B)         |
| CSA C22.2 No. 14    | File No. LR21451 (HA1B), E68961 (HA1E) (c-UL) |
| EN60947-5-5         | DEMKO   |

### Specifications



|                       |  |
|-----------------------|--|
| Operating Temperature | -25 to +60°C (no freezing)   |
| Operating Humidity    | 45 to 85% RH (no condensation)   |
| Storage Temperature   | -30 to +80°C   |
| Contact Resistance    | 50 mΩ maximum (initial value)  |
| Insulation Resistance | 100 MΩ minimum (500V DC megger)  |
| Dielectric Strength   | Between live and dead parts:<br>2,500V, 1 minute   |
|                       | Between terminals of different poles:<br>2,500V, 1 minute<br>Between terminals of the same pole:<br>1,000V, 1 minute |
| Vibration Resistance  | Operating extremes:<br>5 to 55 Hz, amplitude 0.75 mm   |
|                       | Damage limits: 100 m/s <sup>2</sup> (10G)  |
| Shock Resistance      | Operating extremes: 300 m/s <sup>2</sup> (30G) maximum   |
|                       | Damage limits: 1,000 m/s <sup>2</sup> (100G) maximum   |
| Mechanical Durability | 1,000,000 operations minimum   |
| Electrical Durability | 100,000 operations minimum   |
| Degree of Protection  | IP65   |
| Terminal Style        | Solder/tab terminal #110 (HA1B)  |
|                       | Solder terminal (HA1E)   |
|                       | PC board terminal  |
| Weight (approx.)      | HA1B-V2E2R: 23g  |
|                       | HA1E-V2S2R: 19g  |

## HA1B Emergency Stop Switch (Pushlock Turn Reset)

IDEC's Unique safety lock mechanism. Ideal for emergency stop of machine tools.

### Features

- 36-mm depth behind the panel same as H6 and L6 series control units.
- Direct opening action mechanism (IEC 60947-5-1, Annex K)
- Safety lock mechanism to prevent inadvertent operation.
- The operator cannot be removed from the front of the panel.
- UL recognized, CSA certified, DEMKO approved.



| Shape   | Contact Material | Contact | Type No.            |                   | Button Color |
|---|------------------|---------|---------------------|-------------------|--------------|
|   |                  |         | Solder/Tab Terminal | PC Board Terminal |              |
| ø25mm<br>Mushroom<br><br> | Silver Contact   | 1NC     | HA1B-V2E1R          | HA1B-V2E1VR       | Red only     |
|   |                  | 2NC     | HA1B-V2E2R          | HA1B-V2E2VR       |              |

## HA1E Series Short Body Emergency Stop Switch (Pushlock Turn Reset)

Short 28.5-mm-long emergency stop switch suitable for installing on teaching pendants.

### Features

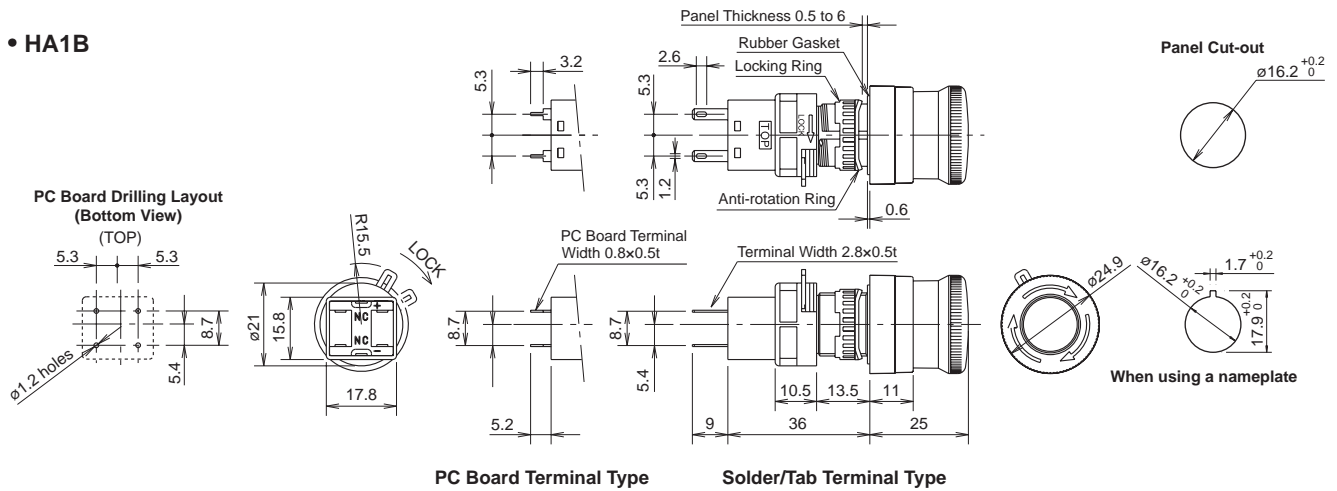
- Short 28.5-mm-long body
- Direct opening action mechanism (IEC 60947-5-1, Annex K)
- Safety lock mechanism to prevent inadvertent operation.
- The operator cannot be removed from the front of the panel.
- UL recognized, CSA certified, DEMKO approved.

| Shape   | Contact Material | Contact | Type No.            |                   | Button Color |
|---|------------------|---------|---------------------|-------------------|--------------|
|   |                  |         | Solder/Tab Terminal | PC Board Terminal |              |
| ø25mm<br>Mushroom<br><br> | Silver Contact   | 1NC     | HA1E-V2S1R          | HA1E-V2S1VR       | Red only     |
|   |                  | 2NC     | HA1E-V2S2R          | HA1E-V2S2VR       |              |

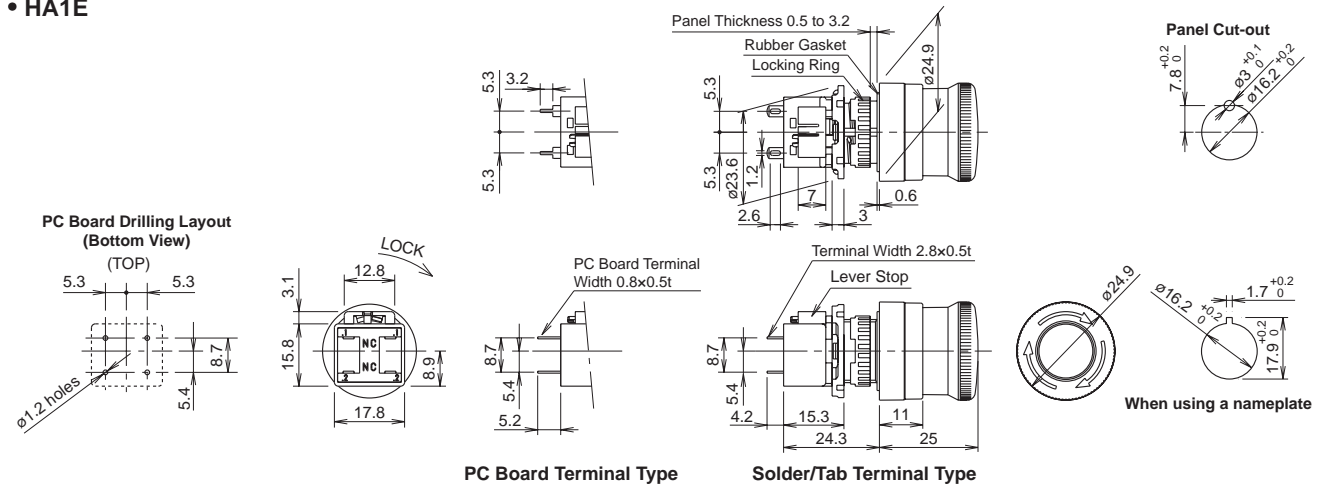
# ø16 H6 Series Emergency Stop Switches

## Dimensions (Emergency Stop Switch)

### • HA1B

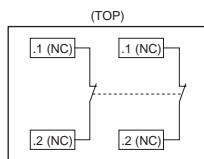


### • HA1E



## Terminal Arrangement (bottom view)

### • HA1E



Note: 1NC type has contacts on the left only.

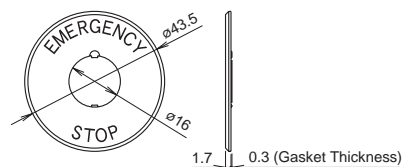
## Accessories

### • Nameplate for ø16mm Emergency Stop Switch

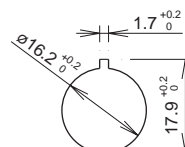


| Type No. | Legend         | Remarks  |
|----------|----------------|--|
| HAAV0    | (blank)        | Material: polyamide  |
| HAAV-27  | EMERGENCY STOP | Background color: yellow<br>Legend color: black<br>Package quantity: 1 |

### • Dimensions



### • Panel Cut-out



### • Panel Thickness

HA1B-V2E□R: 0.5 to 4.4 mm  
HA1E-V2S□R: 0.5 to 1.6 mm

All dimensions in mm.

## Safety Precautions

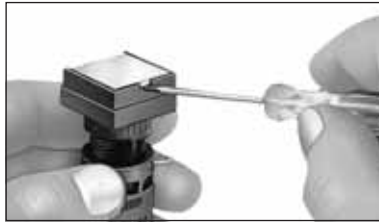
- Turn off the power to H6 series control units before installation, removal, wiring, maintenance, and inspection of the control units. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid burning your hand, use the lamp holder tool when replacing lamps.
- For wiring, use wires of a proper gauge to meet voltage and current requirements. Improper soldering may cause overheating and create a fire hazard.

## Instructions

### Replacement of Lens and Marking Plate

#### • Removing the Lens Assembly

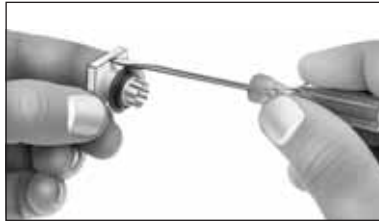
Remove the lens assembly (color lens, marking plate, and lens holder) by inserting a screwdriver into the recess of the lens through the bezel.



#### • Removing the Marking Plate

Remove the marking plate by pushing the lens from the rear to disengage the latches between the lens and the lens holder, using the screwdriver as shown below.

Note: The translucent filter in the lens holder cannot be removed because this filter is sealed to make the unit waterproof.

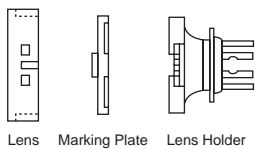


#### • Installing

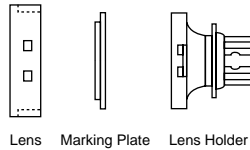
For round lens types, place the marking plate on the lens holder with the projection engaged and press the lens onto the lens holder to engage the latches. For square lens types, insert the marking plate into the lens, and press the lens onto the holder to engage the latches.

Note: Make sure of correct orientation of the marking plate.

[Round Lens Type]



[Square Lens Type]



### Replacement of Lamps

Lamps can be replaced using the lamp holder tool (OR-44) from the front of the panel, or by removing the contact block from the operator.

#### • Removing the Lamp

1. Slip the lamp holder tool onto the lamp head. Then push slightly, and turn the lamp holder tool counterclockwise.

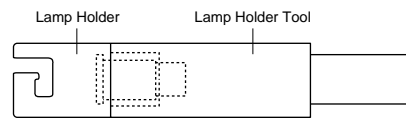


2. Push the bulb, and remove from the rear of the lamp holder.

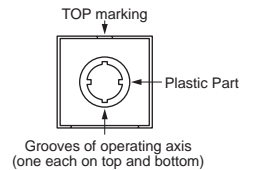


#### • Installing the Lamp

1. Insert the lamp into the lamp holder from the rear, and push in completely using the smaller end of the lamp holder tool.
2. Hold the bulb with the lamp holder tool as shown below.



3. Place the insertion guide of the lamp holder and the TOP marking side or the groove in the operator unit in the same direction. Insert the lamp holder into the housing with the lamp holder tool. Then push the lamp lightly and turn it clockwise to install.



### Panel Mounting

Remove the contact block from the operator. Insert the operator into the panel cut-out from the front, then install the contact block to the operator.

#### • Removing the Contact Block

Turn the locking lever on the contact block in the direction opposite to the arrow on the housing. Then the contact block can be removed.



#### • Installing the Contact Block

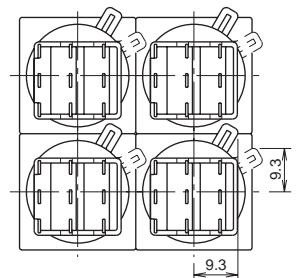
Insert the contact block with the TOP markings on the contact block and the operator placed in the same direction. Then lock the units, turning the locking lever in the direction of the arrow.

#### • Notes for Mounting

Use the optional Ring Wrench (MT-001) to mount the operator onto a panel. Tightening torque should not exceed 0.88 N·m. Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged.

#### • Collective Mounting

As the locking lever can be turned easily from the rear of the units using a screwdriver, the contact blocks can be removed even when mounted collectively.





## Instructions

### Marking Plates and Films

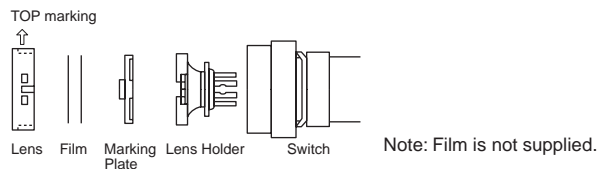
For H6 series illuminated pushbuttons and pilot lights, legends and symbols can be engraved on marking plates, or printed mylar film can be inserted under the lens for labelling purposes.

#### • Marking Plate and Marking Film Size

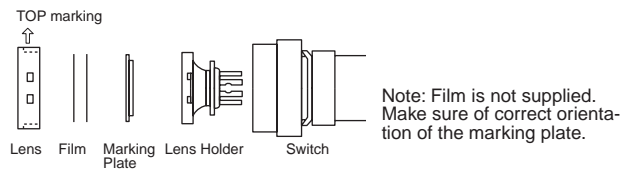
| Lens                       | Round Lens<br>(round, round w/square<br>bezel)   | Square Lens |
|----------------------------|--|-------------|
| Built-in<br>Marking Plate  | <ul style="list-style-type: none"> <li>Engraving must be made on the engraving area within 0.5mm deep.</li> <li>The marking plate is made of white acrylic resin.</li> </ul>   |             |
| Applicable<br>Marking Film | <ul style="list-style-type: none"> <li>Two 0.1mm-thick films or one 0.2mm-thick film can be installed in the lens.</li> <li>Marking film is not included.</li> <li>Recommended marking film: Polyester film</li> </ul> |             |

#### • Insertion Order of Marking Plate and Film

[Round Lens Type]



[Square Lens Type]



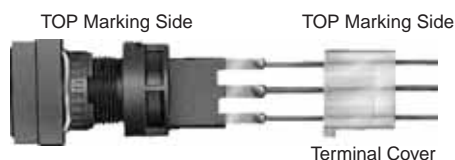
### Wiring

- Solder the terminals at 350°C within 3 seconds using a 60W soldering iron. Sn-Ag-Cu type is recommended when using lead-free solder. When soldering, do not touch the control unit with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
- Use non-corrosive liquid flux.

### Notes on Terminal Cover

Insert the terminal cover into the contact block with the TOP markings on the contact block and the terminal cover in the same direction.

Note: When wiring, insert the lead wires into the terminal cover holes before soldering.



### Connection

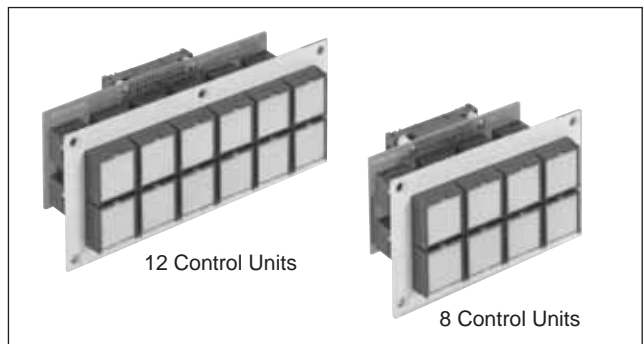
Positive-lock connector and easy-lock connector are applicable to tab terminals.

#### Recommended Connectors

| Item    | Positive-lock Connector<br>(Tyco Electronics) |                            | Easy-lock Connector<br>(Nichifu Co., Ltd.) |                            |
|---------|---|----------------------------|--|----------------------------|
|         | Terminal                                      | 0.2 to 0.5 mm <sup>2</sup> | 175412-1                                   | 0.2 to 0.3 mm <sup>2</sup> |
|         | 0.2 to 1.25 mm <sup>2</sup>                   | 174778-1                   | 0.5 to 1.25 mm <sup>2</sup>                | OSS-62815F3                |
| Housing | 174779-1                                      |                            | NET1-28-1P                                 |                            |

Note: Positive-lock is a registered trademark of Tyco Electronics.

### One Board Mounting



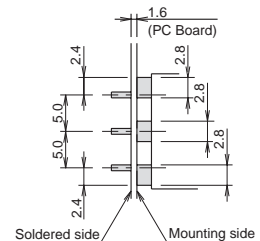
Mounting the PC board terminal type control units on a PC board offers the following features.

### Features

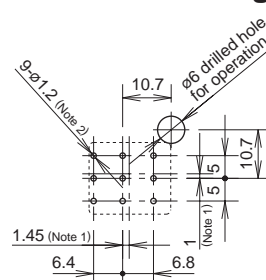
- Reduced installation labor, easy wiring, space saving, and standardization.
- Since the contact blocks on the PC board can be removed easily using a locking lever, the H6 series control units are easy to maintain.
- Because the H6 series control units require no studs for fastening the control unit to a PC board, special preparation of the control panel is not needed.

### Notes for Designing PC board and Circuit

- Use 1.6-mm-thick glass epoxy PC board with drilled holes.
- Design a circuit so that the H6 series control unit can operate within the rated voltage and current range. Make sure that inrush current and voltage do not exceed the rating.
- Minimum applicable load is 5V AC/DC, 1 mA on gold contacts. Applicable range is subject to the operating condition and load.
- Since the 2.8-mm-wide terminal touches the PC board as shown on the right, short circuit may occur with pattern lines. Design a circuit carefully to prevent short circuit.



### PC Board Drilling Layout

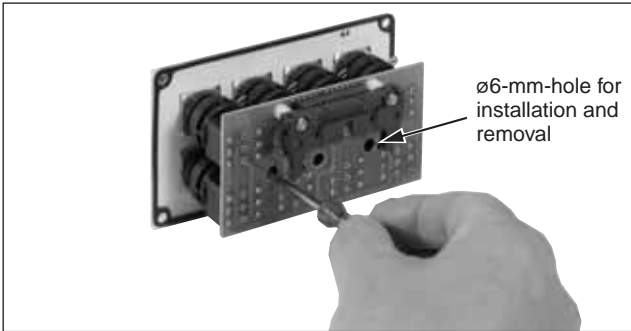


Note 1: When designing, note the alignment of centerlines of the contact blocks and centerlines of the operators.

Note 2: The diameter of the terminal hole is 1.2 mm.

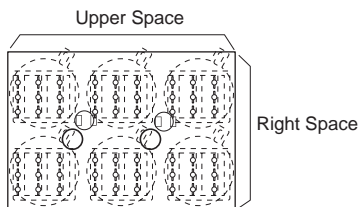
## Installation and Removal of Contact Blocks

Turn the locking lever to install and remove the contact block on the PC board by using a screwdriver from a hole (ø6 mm) of the PC board.



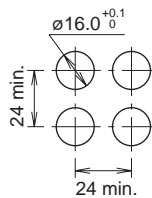
Hole diameter may vary to meet installation requirements. When the locking lever can be turned by using a screwdriver from the upper or right space, the holes are not necessary.

<Example>



## Mounting Holes and Assembly Procedure

- Drill mounting holes in the panel as shown below. When the units are mounted collectively, provide adequate clearance.



### • Assembly Procedure

1. Install the operator to the operation panel.
2. Insert the contact block to the operator from the rear.
3. Turn the lock lever to lock the contact block.
4. Insert the PC board to terminals and solder.

Note 1: Make sure that each terminal is inserted into the PC board correctly.

Note 2: Do not apply tensile force to the connector cable for extended period of time.

Note 3: Do not expose the contact block to water.

Note 4: Ensure to lock contact blocks when the contact blocks are installed on the operators.

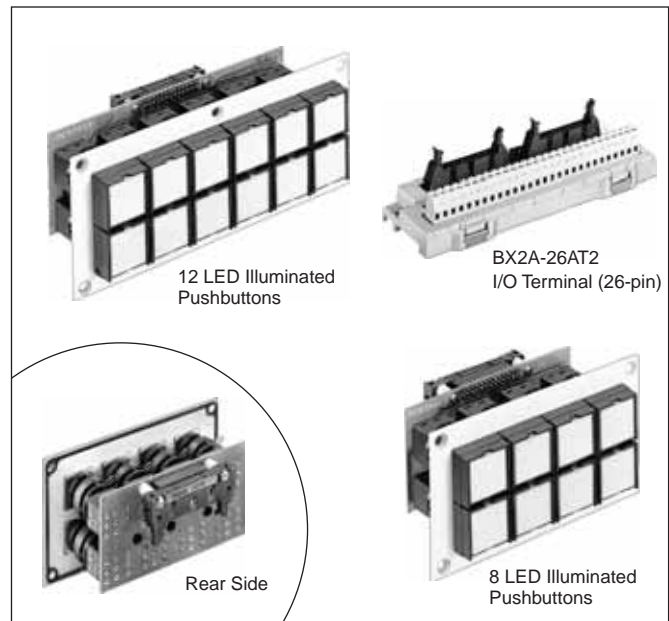
ø16

# HA5W Series Oneboard Control Units

## Reduces wiring and installation space. Achieves standard panel design.

Reduce time and space by using a PC board and flat cable solution. Standard panels can be designed with flexibility.

- The separate structure of operator and contact/board makes maintenance easy.
- IDEC's unique lock lever structure requires no studs on the board.
- H6 series control units can be used without modification.
- Available with I/O terminals for parallel wiring.



### Types

| No. of Control Units | Illumination Type | Operating Voltage | Type No. | Notes                      |
|----------------------|-------------------|-------------------|----------|----------------------------|
| 8                    | LED               | 24V AC/DC ±10%    | HA5W-84  | Panel color: Munsell 5Y7/1 |
| 12                   |                   | 24V AC/DC ±10%    | HA5W-24  |                            |

### Contact Ratings

|                         |                        |
|-------------------------|------------------------|
| Rated Operating Voltage | 24V DC                 |
| Rated Operating Current | 30 mA (resistive load) |
| Contact Material        | Gold-clad silver       |

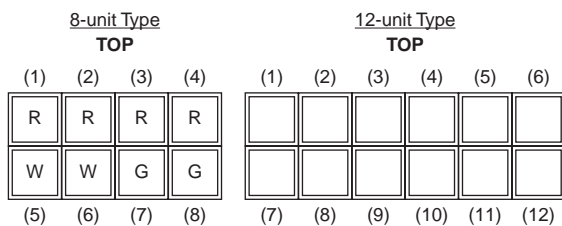
### Ordering Information

1. Specify a button or lens color code in the Type No. [Example]

#### HA5W-84 RRRR WW GG

Type No. Specify color codes for the control units in order of (1) to (8) (see below).

2. All units are supplied with an LED lamp.
3. Illuminated pushbuttons HA2L-M1C14V② (momentary, SPDT) are provided.

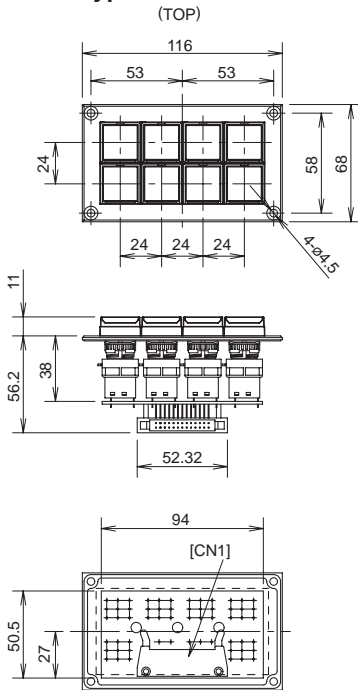


### Built-in LED Lamp Ratings

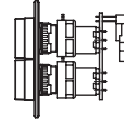
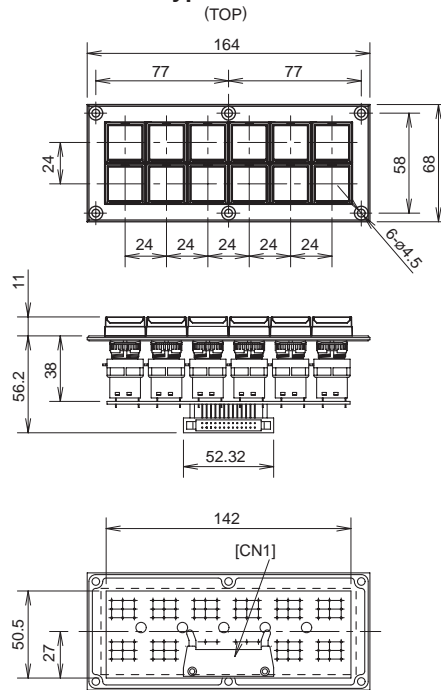
|                        |   |
|------------------------|---|
| Type No.               | LFTD-2②   |
| Base                   | SX6S/8×5.4  |
| Operating Voltage      | 24V AC/DC ±10%  |
| Rated Voltage          | 24V AC/DC   |
| Current Draw           | AC 9 mA   |
|                        | DC 8 mA   |
| Color Code ②           | Specify a color code in place of ②. A (amber), G (green), R (red), S (blue), W (white), Y (yellow)  |
| Lamp Base Color        | Same as illumination color  |
| Voltage Marking        | Die stamped on the lamp base  |
| Life (reference value) | Approx. 50,000 hours (When used on complete DC, luminance reduces to 50% of the initial intensity.) |
| Internal Circuit       | A, R, W, Y  |
|                        | A, R, W, Y  |
|                        | G, S  |
|                        | LED Chip<br>Protection Diode<br>Zener Diode   |

## Dimensions

### 8-unit Type

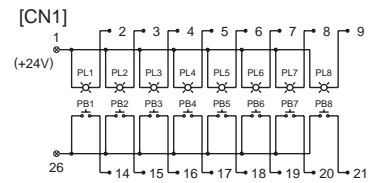


### 12-unit Type

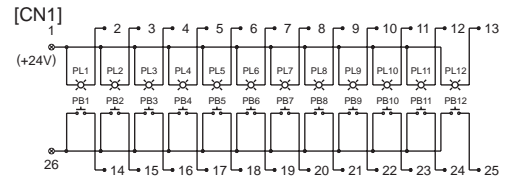


## Wiring Diagram

### 8-unit Type

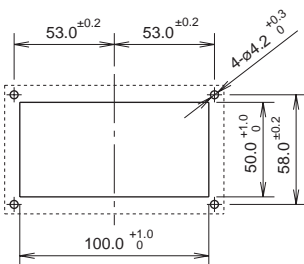


### 12-unit Type

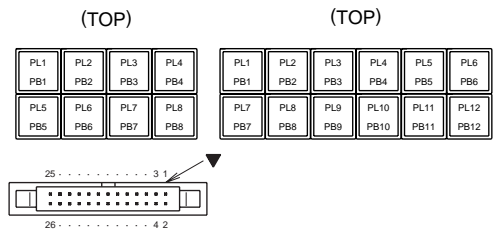
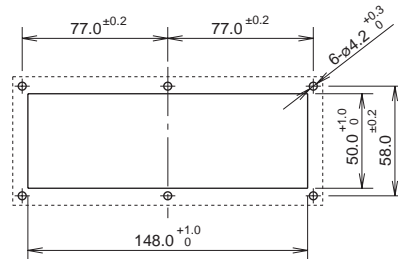


## Panel Cut-out

### 8-unit Type

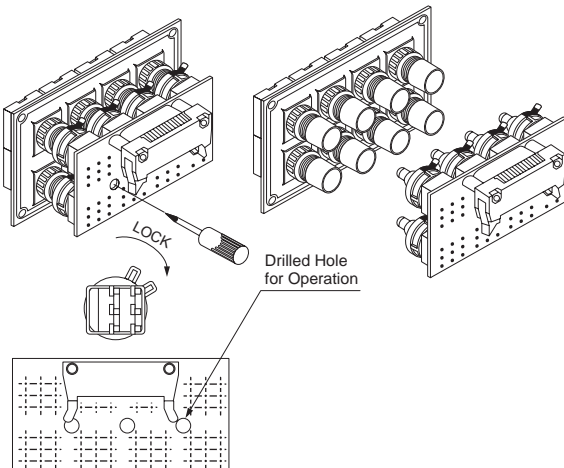


### 12-unit Type



## Installing and Removing the Contact Blocks/PC Board

The contact blocks and PC board can be installed and removed by operating the lock levers using a screwdriver as shown below.



## Degree of Protection

The HA5W Oneboard Control Units become IP65 when waterproof gasket is used on the mounting screws. The HA2L-M1C14V illuminated pushbuttons used on the HA5W are IP65.

## Panel Mounting Screws

Use M4 countersunk screws for panel mounting.

All dimensions in mm.

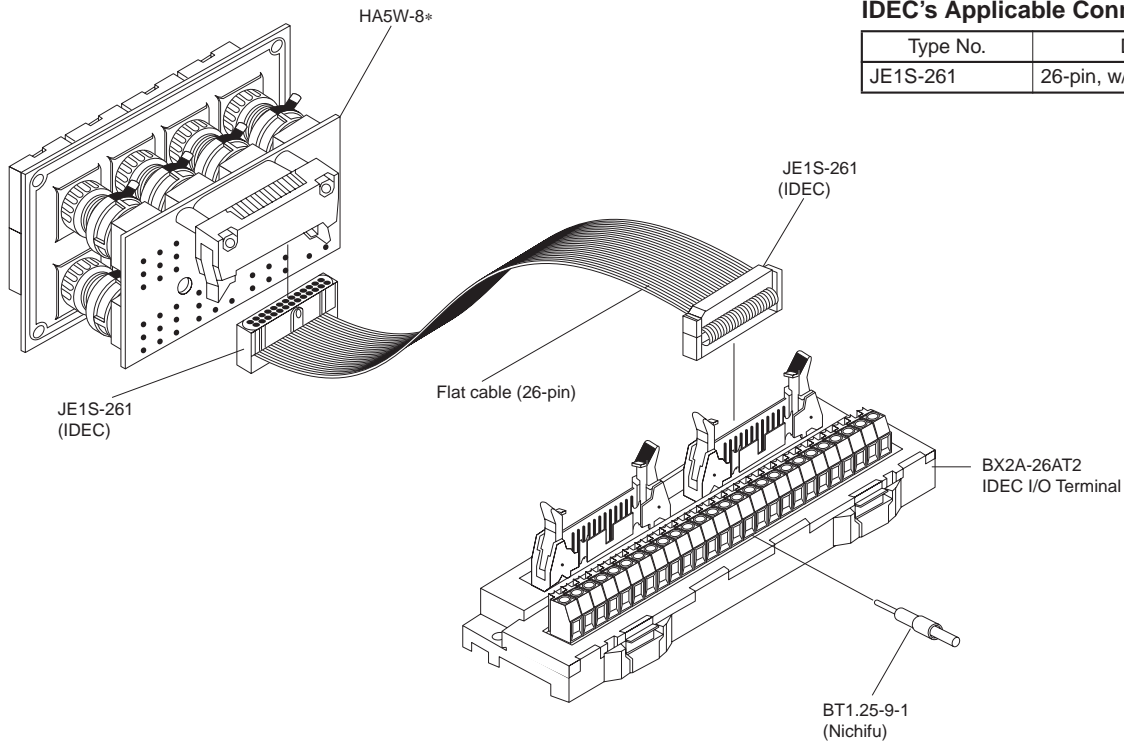
# ø16 HA5W Series Oneboard Control Units

## Wiring Example

For oneboard control units, use the connectors compliant with MIL standard.

### IDEC's Applicable Connector

| Type No. | Description             |
|----------|-------------------------|
| JE1S-261 | 26-pin, w/strain relief |



## Safety Precautions

- Turn off the power to the oneboard control units before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid burning your hand, use the lamp holder tool when replacing lamps.



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



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