

## SERIES 86

### Unsealed, .500" Centers, Flange Mounted

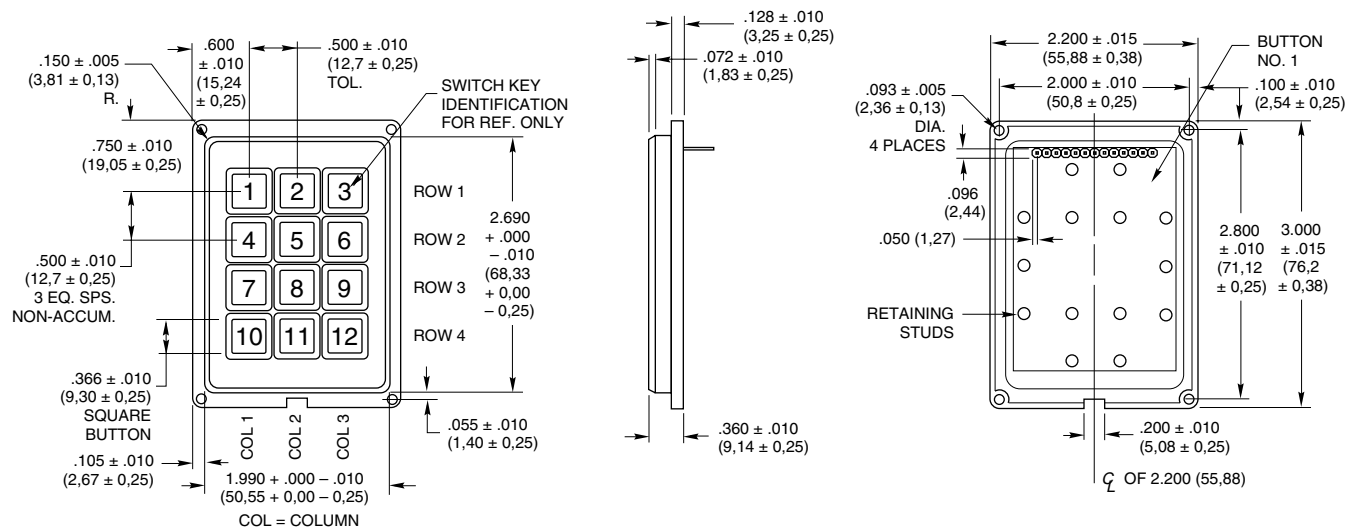


## FEATURES

- 1/2" Button Centers
- Flange Mounted
- Top Surface or Sub Surface Mounting
- Snap-Dome Contact Provides Positive Feedback

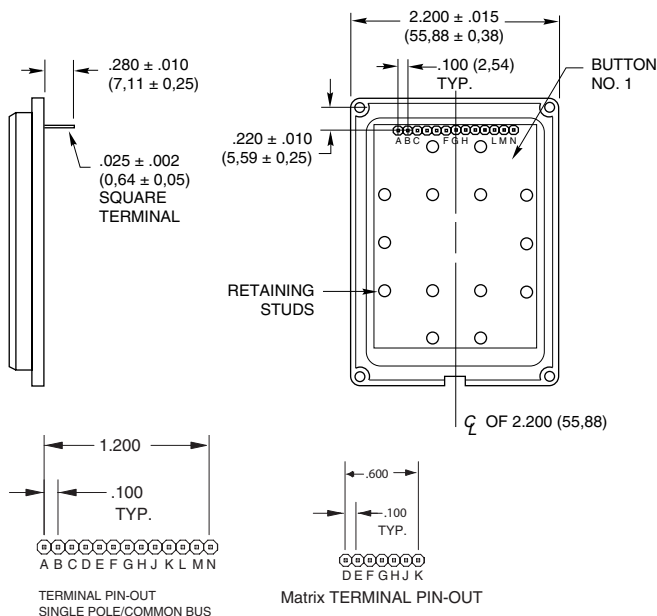
### DIMENSIONS In inches (and millimeters)

### 3x4 Keyboard

**Termination** In inches (and millimeters)

### Code and Truth Table

**3x4**



Dots in the chart indicate connected terminals when switch is closed. Terminals are identified on the keyboard.

| 3x4             |    | CODES             |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |   |   |   |   |
|-----------------|----|-------------------|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|---|---|---|---|
|                 |    | Matrix            |   |   |   |   |   |   |   | Single Pole/Common Bus |   |   |   |   |   |   |   |   |   |   |   |
| BUTTON LOCATION | 1  | ●                 |   |   | ● |   |   |   |   |                        | ● |   |   |   |   |   |   |   |   |   | ● |
|                 | 2  |                   | ● |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 3  |                   |   | ● |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 4  |                   | ● |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 5  | ●                 |   |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 6  |                   |   | ● |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 7  | ●                 |   |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 8  |                   | ● |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 9  |                   |   | ● |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 10 | ●                 |   |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 11 |                   | ● |   |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 | 12 |                   |   | ● |   |   |   |   |   |                        |   | ● |   |   |   |   |   |   |   |   | ● |
|                 |    | F                 | E | D | K | J | H | G | J | E                      | A | K | F | B | L | G | C | M | H | D | N |
|                 |    | TERMINAL LOCATION |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |   |   |   |   |

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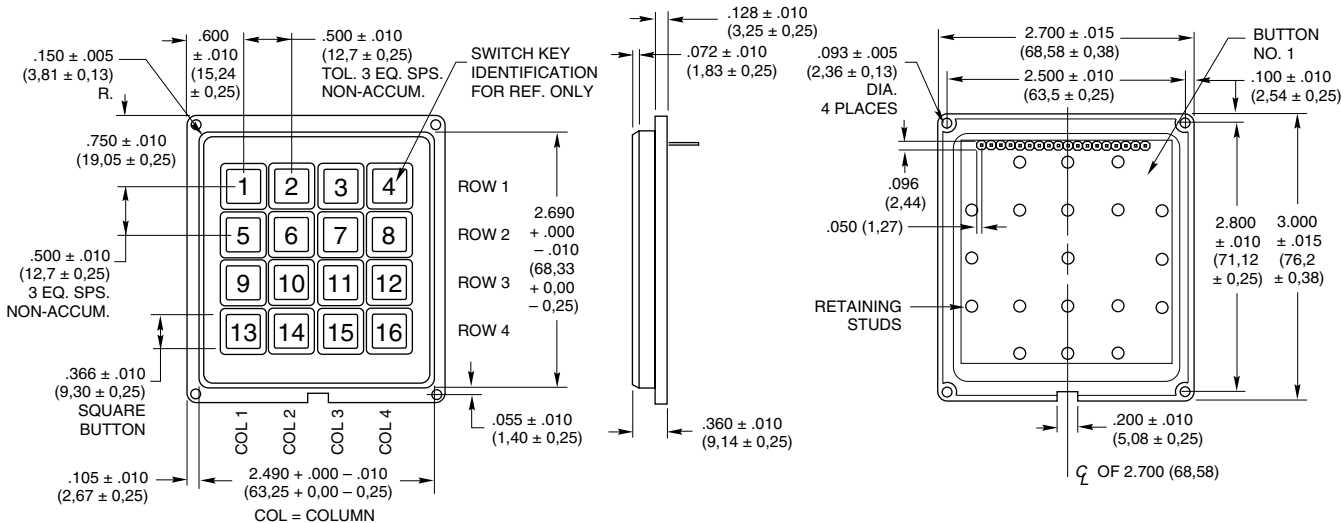
## FEATURES

- 1/2" Button Centers
- Flange Mounted
- Top Surface or Sub Surface Mounting
- Snap-Dome Contact Provides Positive Feedback



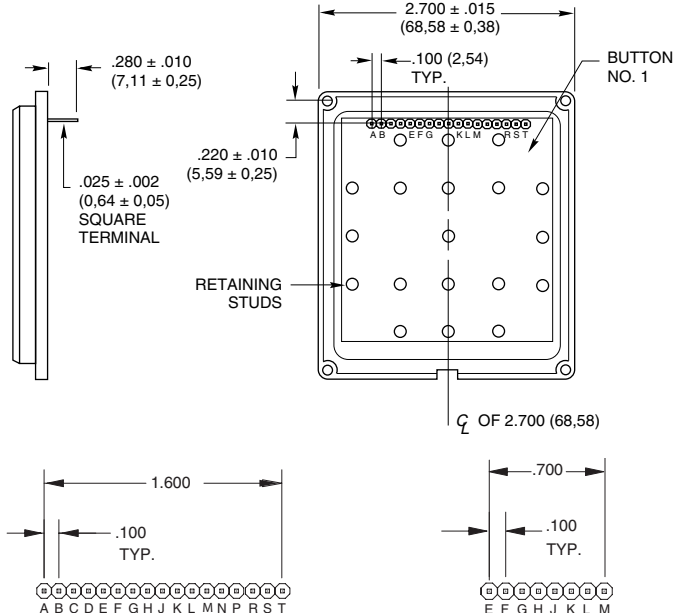
## DIMENSIONS In inches (and millimeters)

### 4x4 Keyboard



## Termination In inches (and millimeters)

### 4x4



SINGLE POLE COMMON BUS TERMINAL

MATRIX TERMINAL PIN-OUT

## Code and Truth Table

Dots in the chart indicate connected terminals when switch is closed. Terminals are identified on the keyboard.

| 4x4             |    | CODES             |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |
|-----------------|----|-------------------|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|
|                 |    | Matrix            |   |   |   |   |   |   |   | Single Pole/Common Bus |   |   |   |   |   |   |   |
| BUTTON LOCATION | 1  | •                 |   |   |   |   |   |   |   | •                      |   |   |   |   |   |   | • |
|                 | 2  |                   | • |   |   |   |   |   |   |                        | • |   |   |   |   |   |   |
|                 | 3  |                   |   | • |   |   |   |   |   |                        |   | • |   |   |   |   |   |
|                 | 4  |                   |   |   | • |   |   |   |   |                        |   |   | • |   |   |   |   |
|                 | 5  |                   |   |   |   | • |   |   |   |                        |   |   |   | • |   |   |   |
|                 | 6  |                   |   |   |   |   | • |   |   |                        |   |   |   |   | • |   |   |
|                 | 7  |                   |   |   |   |   |   | • |   |                        |   |   |   |   |   | • |   |
|                 | 8  |                   |   |   |   |   |   |   | • |                        |   |   |   |   |   |   | • |
|                 | 9  |                   |   |   |   |   |   |   |   | •                      |   |   |   |   |   |   |   |
|                 | 10 |                   |   |   |   |   |   |   |   |                        | • |   |   |   |   |   |   |
|                 | 11 |                   |   |   |   |   |   |   |   |                        |   | • |   |   |   |   |   |
|                 | 12 |                   |   |   |   |   |   |   |   |                        |   |   | • |   |   |   |   |
|                 | 13 |                   |   |   |   |   |   |   |   |                        |   |   |   | • |   |   |   |
|                 | 14 |                   |   |   |   |   |   |   |   |                        |   |   |   |   | • |   |   |
|                 | 15 |                   |   |   |   |   |   |   |   |                        |   |   |   |   |   | • |   |
|                 | 16 |                   |   |   |   |   |   |   |   |                        |   |   |   |   |   |   | • |
|                 |    | H                 | G | F | E | M | L | K | J | P                      | J | E | A | R | L | F | B |
|                 |    | S                 | M | H | C | T | N | G | D | K                      |   |   |   |   |   |   |   |
|                 |    | TERMINAL LOCATION |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |

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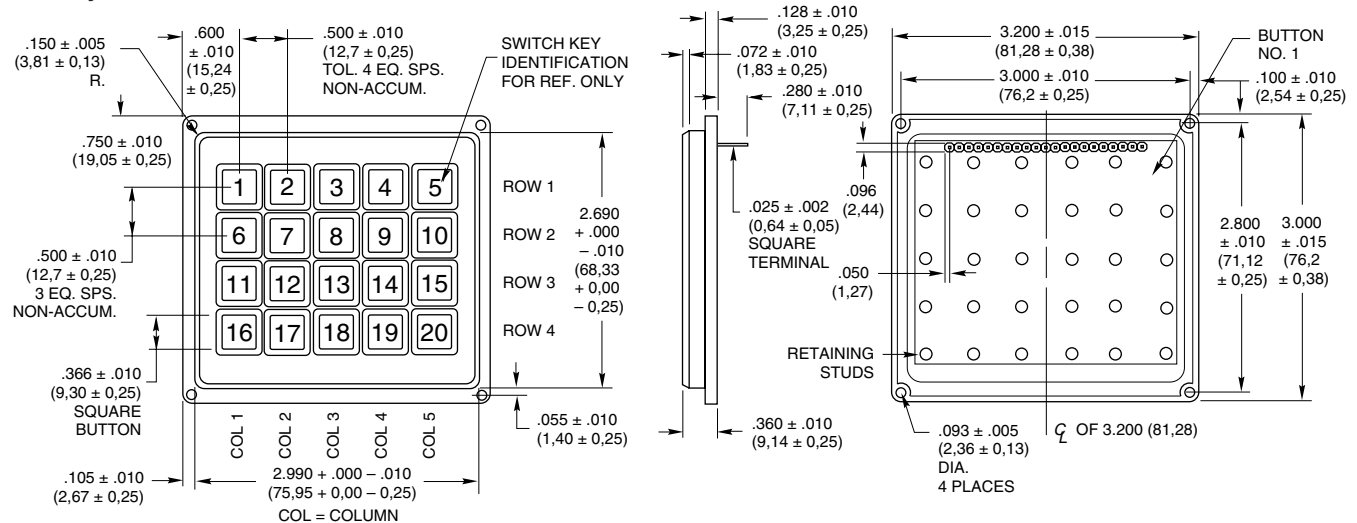
### FEATURES

- 1/2" Button Centers
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- Snap-Dome Contact Provides Positive Feedback



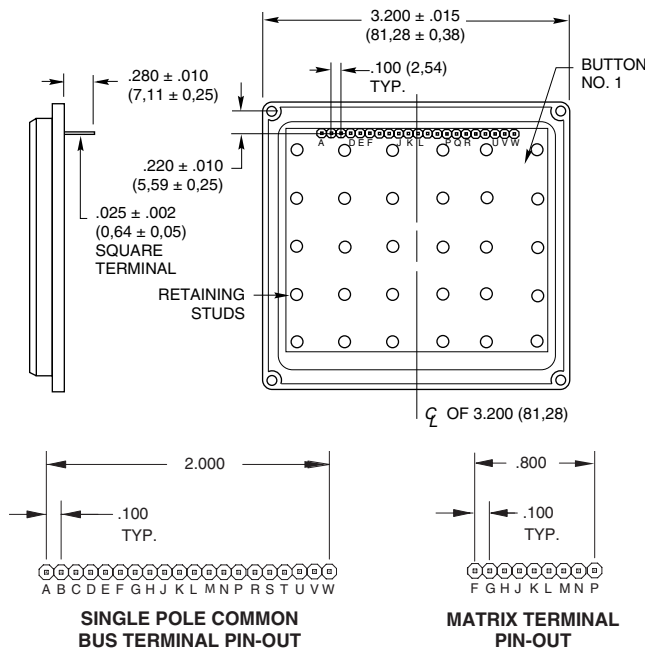
### DIMENSIONS In inches (and millimeters)

#### 5x4 Keyboard



### Termination In inches (and millimeters)

#### 5x4



### Code and Truth Table

Dots in the chart indicate connected terminals when switch is closed. Terminals are identified on the keyboard.

| 5x4             |    | CODES             |   |   |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------|----|-------------------|---|---|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                 |    | Matrix            |   |   |   |   |   |   |   |   |   | Single Pole/Common Bus |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| BUTTON LOCATION | 1  | •                 |   |   |   |   |   |   |   |   |   | •                      |   |   |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 2  |                   | • |   |   |   |   |   |   |   |   |                        | • |   |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 3  |                   |   | • |   |   |   |   |   |   |   |                        |   | • |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 4  |                   |   |   | • |   |   |   |   |   |   |                        |   |   | • |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 5  |                   |   |   |   | • |   |   |   |   |   |                        |   |   |   | • |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 6  | •                 |   |   |   |   | • |   |   |   |   |                        |   |   |   |   | • |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 7  |                   | • |   |   |   |   | • |   |   |   |                        |   |   |   |   |   | • |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 8  |                   |   | • |   |   |   |   | • |   |   |                        |   |   |   |   |   |   | • |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 9  |                   |   |   | • |   |   |   |   | • |   |                        |   |   |   |   |   |   |   | • |   | • |   |   |   |   |   |   |   |   |   |
|                 | 10 |                   |   |   |   | • |   |   |   |   | • |                        |   |   |   |   |   |   |   |   | • | • |   |   |   |   |   |   |   |   |   |
|                 | 11 | •                 |   |   |   |   |   |   |   |   |   | •                      |   |   |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 12 |                   | • |   |   |   |   |   |   |   |   |                        | • |   |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 13 |                   |   | • |   |   |   |   |   |   |   |                        |   | • |   |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 14 |                   |   |   | • |   |   |   |   |   |   |                        |   |   | • |   |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 15 |                   |   |   |   | • |   |   |   |   |   |                        |   |   |   | • |   |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 16 | •                 |   |   |   |   |   |   |   |   |   |                        |   |   |   |   | • |   |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 17 |                   | • |   |   |   |   |   |   |   |   |                        |   |   |   |   |   | • |   |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 18 |                   |   | • |   |   |   |   |   |   |   |                        |   |   |   |   |   |   | • |   |   | • |   |   |   |   |   |   |   |   |   |
|                 | 19 |                   |   |   | • |   |   |   |   |   |   |                        |   |   |   |   |   |   |   | • |   | • |   |   |   |   |   |   |   |   |   |
|                 | 20 |                   |   |   |   | • |   |   |   |   |   |                        |   |   |   |   |   |   |   |   | • | • |   |   |   |   |   |   |   |   |   |
|                 |    | P                 | N | K | G | F | J | L | M | H | T | P                      | M | H | D | U | Q | L | G | C | V | R | K | F | B | W | S | J | E | A | N |
|                 |    | TERMINAL LOCATION |   |   |   |   |   |   |   |   |   |                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

# SPECIFICATIONS

## Rating Criteria

**Rating at 24 Vdc:** 10 milliamps, resistive  
**Contact Resistance:** Compatible with MOS, TTL and DTL (10 ohms maximum)  
**Voltage Breakdown:** 250 Vac between mutually insulated parts  
**Life Expectancy:** 3,000,000 operations per button

**Contact Bounce:** Less than 4 milliseconds at make, 10 milliseconds at break  
**Operating Temperature:** -40°C to +80°C

## Materials and Finishes

**Housing:** ABS polycarbonate, black  
**Buttons:** ABS plastic, white. Legends are black.  
**Snap-On-Cap:** Clear polycarbonate

**Contact Dome:** Stainless steel, selectively gold-plated  
**Terminals:** Phosphor bronze

## Operating Features

**Button Travel:** 0.015" nominal total travel  
**Typical Operating Force:** 350 grams

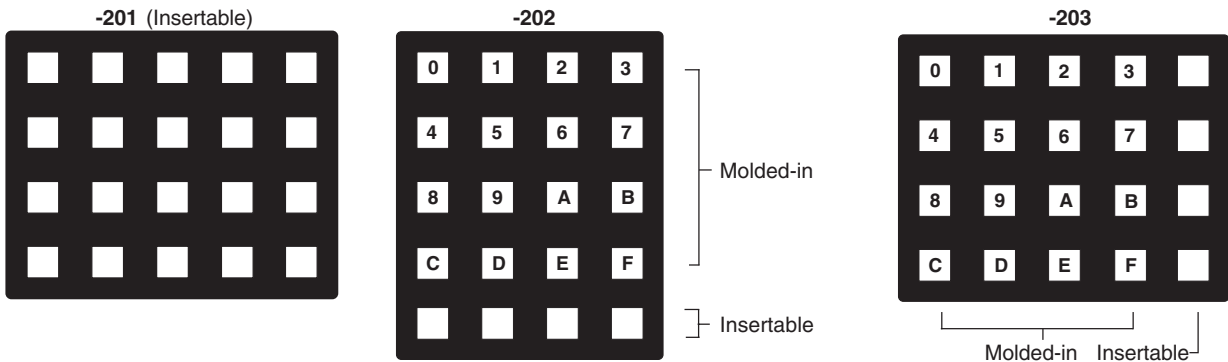
# STANDARD LEGENDS

Insertable legend version (legend numbers -101, -001, -201 and row or column indicated in -202 and -203) has a removable cap. The revealed button surface can be legended by an insert or a dry transfer of a blank legend

5x4: Shown below

insert. This surface can also be ink stamped by Grayhill in higher volume quantities. When the cap is replaced, the assembly extends approximately .015" (0,38 mm) above the surface. The legend sheet information follows

the legend presentation. All other legends incorporate molded-in (two shot) legends with the exception of legend numbers -202 and -203. The blank legends or spaces in legends -202 and -203 are insertable legends, others are molded-in.

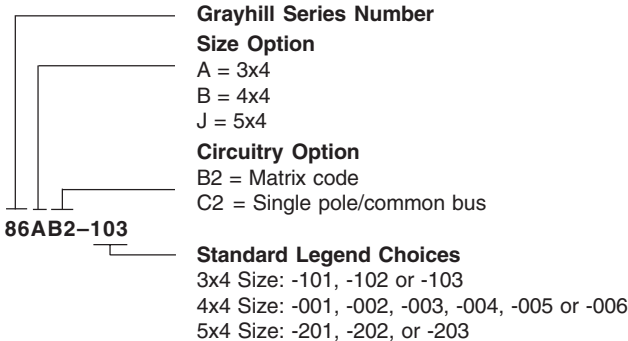


# INSERTABLE LEGENDS

For use with -101, -001, -201, -202 and -203 legend options. Legends are die cut to fit button surface when cap is removed. Dry transfer legends offer some flexibility to customize the blank inserts included on the sheet of popular legend letters, words and symbols provided or on the insertable legends sheet.

| Description                    | Part No.       |
|--------------------------------|----------------|
| Sheet of Legend Inserts        | 87AC2046       |
| Dry Transfer Lettering, Small  | 87-DT-2096-088 |
| Dry Transfer Lettering, Medium | 87-DT-2096-125 |
| Dry Transfer Lettering, Large  | 87-DT-2096-187 |

# ORDERING INFORMATION



**Available from your local Grayhill Distributor.**  
 For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.