# SERIES 88

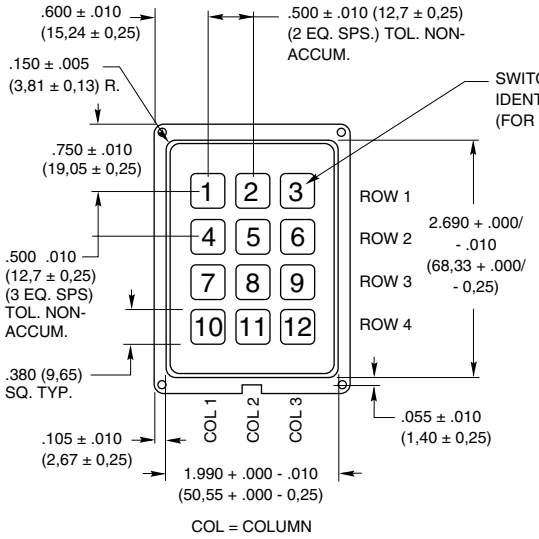
## Sealed, Flange Mounted

### FEATURES

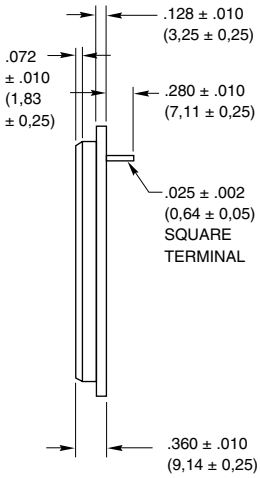
- Sealed Keyboard
- Colorful Graphic Overlay
- Audible, Snap-Dome Contact
- User Legendable Styles
- 3,000,000 Operations per Button
- Optional Panel Seal Gasket to Protect Your Equipment

## DIMENSIONS In inches (and millimeters)

### 3x4 Keyboard



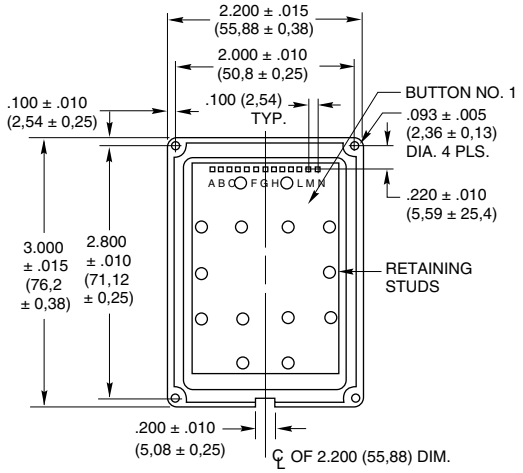

COL = COLUMN

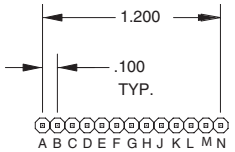



BUTTON AREAS ARE EMBOSSED

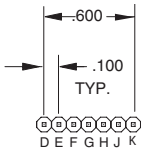
## Termination In inches (and millimeters)

### 3x4




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.

| 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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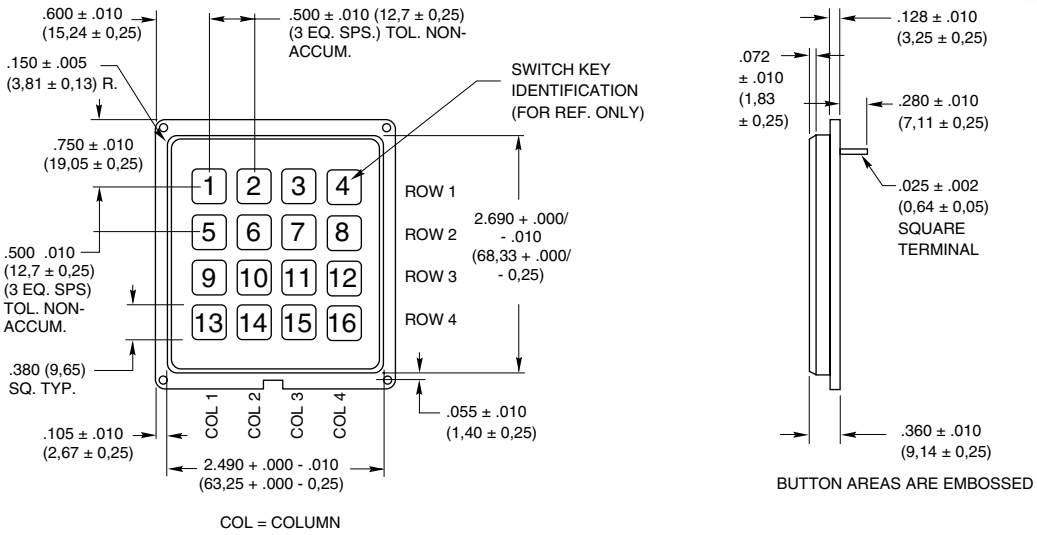
## DIMENSIONS In inches (and millimeters)

### 4x4 Keyboard

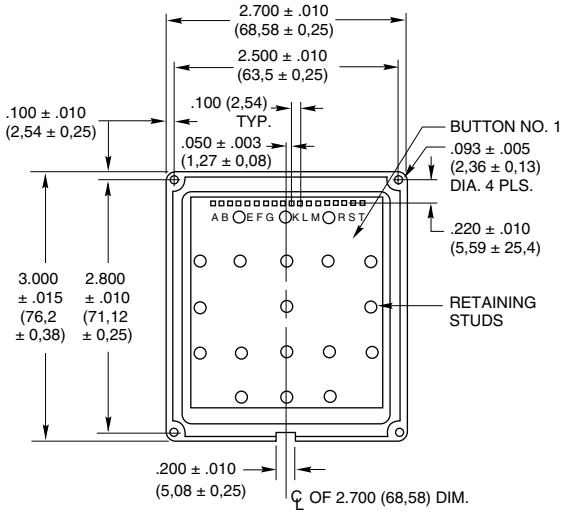



COL = COLUMN

BUTTON AREAS ARE EMBOSSED

## Termination In inches (and millimeters)

### 4x4




## Code and Truth Table

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

| 4x4 | CODES | |
|---|---|---|
| BUTTON LOCATION | Matrix | Single Pole/Common Bus |
| 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 | |

# SERIES 88

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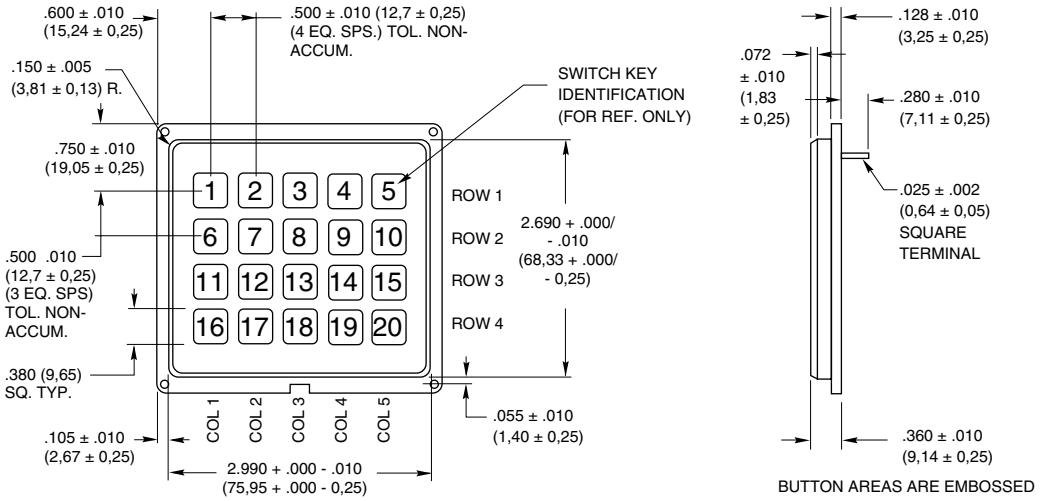
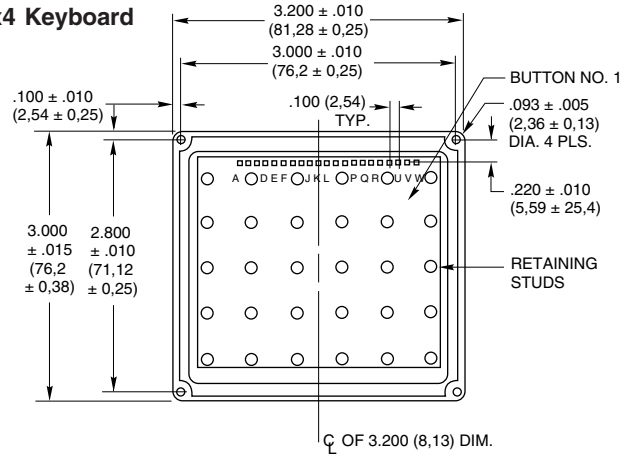
### DIMENSIONS In inches (and millimeters)

**5x4 Keyboard**



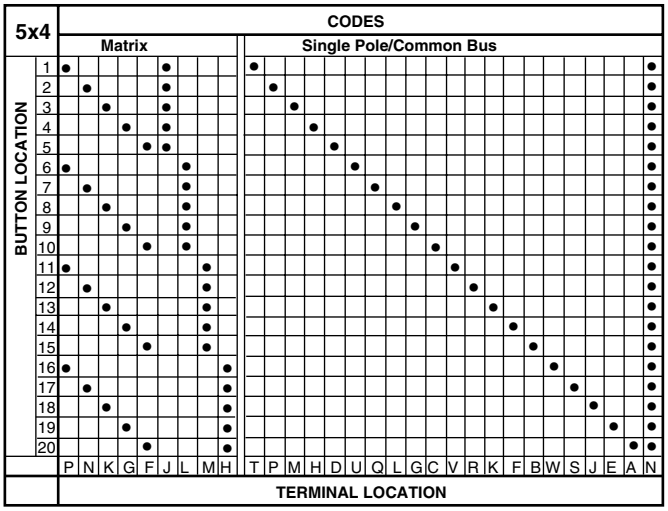

### Termination In inches (and millimeters)

**5x4 Keyboard**




### Code and Truth Table

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



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## 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
**Temperature:** -40°C to +80°C

### Operating Features

**Button Travel:** 0.015"(0,38 mm) nominal total travel
**Typical Operating Force:** 350 grams

### Materials and Finishes

**Housing:** ABS polycarbonate, black
**Graphic Overlay:** Polyester
**Contact Dome:** Stainless steel, selectively gold-plated
**Terminals:** Phosphor bronze

## STANDARD LEGENDS

Colorful graphic overlays are polyester with a tough acrylic bond to provide maximum protection against dirt and moisture. Second surface printed, the overlay wipes clean and continues to look bright and bold throughout the keyboard life. Available through distributors. For instant custom legends, order separate blank keyboards as indicated in the Ordering Information section and choose one of the clear window overlays below; then order a sheet of legend inserts. Or, if you prefer, order the keyboard custom printed by Grayhill; see Ordering Information.

-143

-152

-172

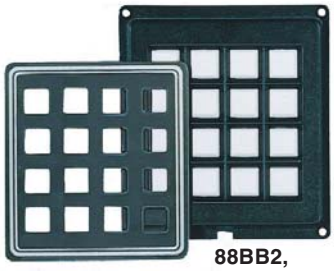
88-101

88AB2, 88AC2

-052

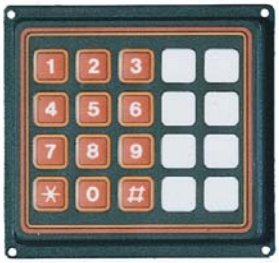
-072

-082



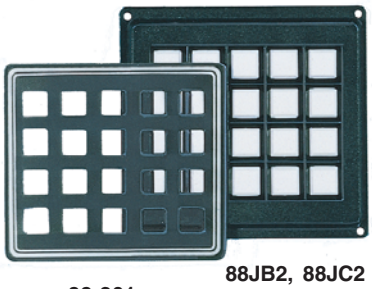
88-001

88BB2, 88BC2




-252

-262



88-201

88JB2, 88JC2

## SEALING OF KEYBOARDS

The graphic legend is silk-screen printed on the second surface of a clear polyester film, providing maximum legend protection. It withstands high humidity, and it is resistant to scratching, marring, and dulling of the surface caused by fingernails, wiping cloths, and cleaning materials. It has excellent solvent resistance to water, petroleum oil, alcohols and aliphatic hydrocarbons.

These common liquids do not attack the overlay: 5% acetic acid, 5% citric acid, 2% detergent solution, soapy water, 30% hydrogen peroxide, wine, beer, whiskey, coffee, cocoa, milk, tomato juice, lemon juice, etc. Hydrocarbons, ketones and freon do not affect the overlay. But, we recommend that you do not subject the keyboard to these chemicals, since they may affect the switch housing, which is ABS plastic. To discuss a particular solvent, contact Grayhill.

Protect your equipment in outdoor or harsh environmental conditions by sealing the keyboard to the equipment panel. Use an optional gasket with the keyboard. There are two types of gaskets: one for mounting the keyboard beneath the panel, and one for mounting it above the equipment panel. See Panel Seal Gaskets.

The contact system is internally sealed by a special adhesive backed sheet that holds the domes in position on the PC board.

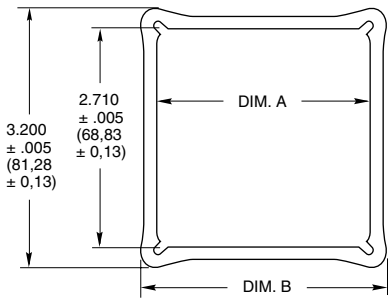
## PANEL SEAL GASKETS

Weatherproof and waterproof your subpanel and topside mounted keyboards with optional panel seal gaskets.

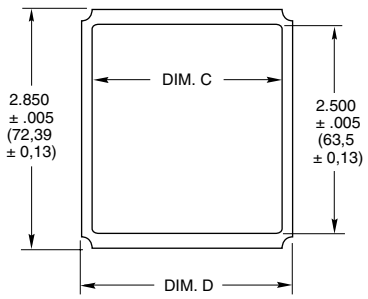
Subpanel keyboard gasket is .062" (1,57 mm) thick; topside keyboard gasket is .094" (2,39 mm).

Material is cellulose fiber, foam, nitrile rubber. Order gaskets separately from keyboard.

**Subpanel Mounting**




**Topside Mounting**




Subpanel 3x4 **Part No. 88M2001-2**
Subpanel 4x4 **Part No. 88M2009-2**
Subpanel 5x4 **Part No. 88M2019-1**

Topside 3x4 **Part No. 88M2012-1**
Topside 4x4 **Part No. 88M2015-1**
Topside 5x4 **Part No. 88M2018-1**

| Size of Keyboard | Subpanel Mount Dim. A | Subpanel Mount Dim. B | Topside Mount Dim. C | Topside Mount Dim. D |
|---|---|---|---|---|
| 3x4 | 2.010 ± .005 (51,05 ± 0,.13) | 2.400 ± .005 (60,96 ± 0,13) | 1.800 ± .005 (45,72 ± 0,13) | 2.040 ± .005 (51,82 ± 0,13) |
| 4x4 | 2.510 ± .005 (63,75 ± 0,13) | 2.900 ± .005 (73,66 ± 0,13) | 2.300 ± .005 (58,42 ± 0,13) | 2.540 ± .005 (64,52 ± 0,13) |
| 5x4 | 3.010 ± .005 (76,45 ± 0,13) | 3.400 ± .005 (86,36 ± 0,13) | 2.800 ± .005 (71,12 ± 0,13) | 3.040 ± .005 (77,22 ± 0,13) |

## INSTANT CUSTOM LEGENDS

**Available through Distributors**
Create your own legends using these 3 items: 1) a blank keyboard, 2) the clear window overlays shown on Standard Legend page and 3) a sheet of legend inserts.

**Blank Keyboards**
The numbers below order blank keyboards for the user to legend. For description, refer to the part numbering scheme below. The keyboards and overlays are ordered separately.

3x4 Matrix **Part No. 88AB2**
3x4 SP/Com Bus **Part No. 88AC2**
4x4 Matrix **Part No. 88BB2**
4x4 SP/Com Bus **Part No. 88BC2**
5x4 Matrix **Part No. 88JB2**
5x4 SP/Com Bus **Part No. 88JC2**

**Legend Insert Sheet and Dry Transfers**
Self-adhesive inserts are die-cut to fit the button. Legends are printed in black on clear film in News Gothic Condensed type style. They include letters A through Z, numbers 0-69, telephone legends, commonly used words, symbols and blanks.
**Part No. 87AC2046**

Use matching dry transfer lettering on blank inserts of legend sheet: upper and lower case letters, 0-9, and common symbols.

Small Print **Part No. 87-DT-2096-088**
Medium Print **Part No. 87-DT-2096-125**
Large Print **Part No. 87-DT-2096-187**

**Clear Window Overlays**
Order separately from keyboards. See also ordering information.

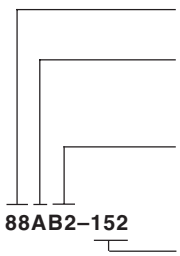
3x4 Overlay **Part No. 88-101**
4x4 Overlay **Part No. 88-001**
5x4 Overlay **Part No. 88-201**

## PRINTED LEGENDS

**Not available through Distributors.** For medium volume applications, or where legends cannot be produced by the self legend method, you can order epoxy ink printed legends. Virtually anything which can be photographed can be printed. Grayhill will print your legend and then add the clear window overlay.

| Type I.D. No. | Simulated Style & Size | Character & Line Limitations * |
|---|---|---|
| 4GH088 | ABCDEFGH | END DATA |
| 1GH125 | ABCDE | LAD |
| 3GH187 | ABCD | ON |
| 2GH250 | ABC | 15 |

## ORDERING INFORMATION




**Grayhill Series Number**
**Size Option**
A = 3x4
B = 4x4
J = 5x4
**Circuitry Option**
B2 = Matrix code
C2 = Single pole/common bus
**Standard Legend Choices**
3x4 Size: -143, -152, or -172
4x4 Size: -052, -072 or -082
5x4 Size: -252 or -262

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

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
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- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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AVIC JONHON

**«JONHON»** (основан в 1970 г.)

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**«FORSTAR»** (основан в 1998 г.)

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(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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Электронная почта: ocean@oceanchips.ru
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