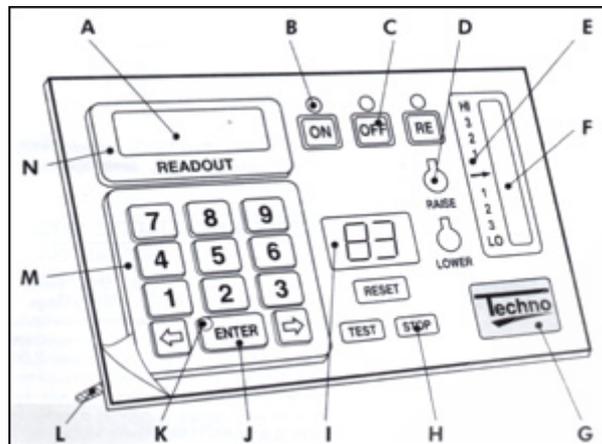


# TECHNICAL INFORMATION

## Design Options



**A** Transparent lens for LED display (UV hardcoated clear glossy)

**B** Frosted windows for LEDs

**C** Membrane switch contact with embossed locating ring

**D** Die-cut keyways for push buttons

**E** Electro-luminescent lighting

**F** Photo-luminescent lighting

**G** UV - textured velvet finish

**H** Membrane switch contact flat keypad surface

**I** Printed deadfont legend for seven segment display visible only when illuminated. A variety of colours is available

**J** Membrane switch contact with embossed keypad and stainless steel domes

**K** Surface mount LEDs

**L** Threaded studs and fasteners

**M** Polycarbonate face with UV - printed hardcoat finish

**N** Embossed surface for decorative effect

## Overlay Material

It is very important to select the proper overlay material first! The overlay material can be specified depending on the environment in which it is to be used. The most commonly used material can be used where exceptional chemical resistance is not required. It has basically a non-glaze matte surface with good handling characteristics. We use special grade POLYESTER to provide special characteristics like chemical resistance, scratch resistance and excellent durability.

## Colours on Graphics

Any shade of colour can be used for the keyboard provided that the sample of colour shade is given. However it is recommended that one should use primary colours. The reason being, it is very difficult to obtain the same shade of colour harmony of the keyboard overlay it is recommended that minimum colours should be used. We recommend four colour combinations to achieve excellent result. The use of less colours will also reduce the cost of keyboard.

## Keyboard Layout

In order to give accurate requirement of your keyboard it is necessary that you must specify all sizes, shapes and dimensions in detail. The fixed starting point for all dimensions can be any one of the corners of the keyboard. To avoid confusion, we recommend the following sequence of drawings as far as possible. You must furnish front view, side view and basic view of each drawings.

### Sequence

**Sheet 1:** This sheet should contain the detailed overlay drawing. Here you must also indicate the name of the font and size for legends on the graphic.

**Sheet 2:** This sheet should contain detailed dimensions of overall keyboard size, LEDs, keys, display window etc.

**Sheet 3:** This sheet should contain details of keys, display windows, or any other graphic mimic to be done on overlay with proper dimensions.

**Sheet 4:** This sheet should contain a detailed drawing of mounting holes & keyboard connectors with dimensions. The drawing may show the rear view when viewed from front and side view to give details of length of studs.

**Sheet 5:** This sheet should contain details about colour specifications showing colour shades and specific locations.

**Sheet 6:** This sheet should provide details about circuit diagrams, pinout details, dome specification, connector specifications etc.

## Tactile & Non-Tactile Keyboards

Non-tactile keyboards are momentary contact keyboards designed to carry low voltage signals. These keyboards are made without metal domes and need less pressure to activate the key. The life expectancy

of each key in these keyboards is very high at over 2,000,000 cycles. Tactile keyboards are momentary-contact keyboards designed to carry low voltage signals by using metal domes or poly domes to provide a tactile feedback when the key is pressed. In non tactile keyboards, it is preferable to have embossed keys for this feedback. The metal domes normally used are of stainless steel with nickel or gold plating. The life expectancy in these keyboard is over 1,000,000 cycles.

### **Display Window**

There are various types of selective textured windows. To have a better and clear visibility, the display should be mounted as close as possible to the keyboard. For LCD display, one can have either clear and transparent window or transparent textured window. For LED displays, one can have coloured textured window or transparent window.

### **Pin-Outs**

When you specify the circuit and pinout yourself, it is very important that pin no. 1 be designed in the circuit. However, because of our experience in track design we recommend to allow us to specify pinout, which can result in the supply of workable, cost effective keyboard to you.

### **Connectors**

We can supply any type of connector, which is PCB solderable. There can be different types of connectors, like low cost Reliamate connector, FRC connectors etc. all these connectors can be either right angled or straight. The specifications of connectors and their pin configurations have to be given properly to enable us to quickly develop the keyboard.

### **Thickness/ Mounting**

Keetronics can offer various thickness for the PCB depending on your requirement. The minimum thickness like 0.8mm, 1.6mm, 2.4mm can be ideally replace membrane keypads. For 1.6mm thickness, we suggest the use of mounting studs. Metal studs from 7 mm length to 30 mm length are offered for mounting the keyboards for longer stud lengths we prescribe to use internal threads Stand Off, where any length of screws can be inserted. For firm grip and mounting, we recommend to use M3 and M4 thread studs.

### **ESD/ EMI Shielding**

We can provide special protection to keyboards, when they are to be used in conditions of extreme temperature and humidity. We can also provide ESD/EMI shielding on keyboards, to protect sensitive circuit components from Electromagnetic interference and Electrostatic Discharge.

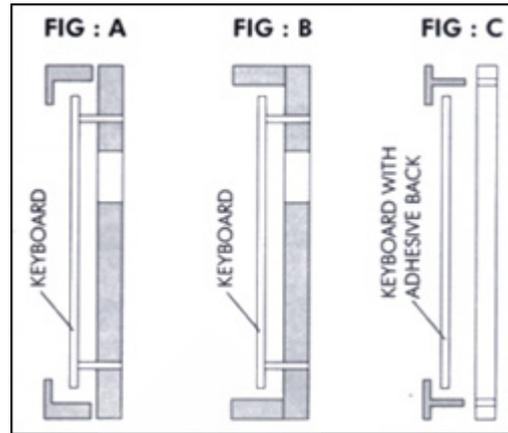
### **Keyboard Edge Protection**

Sealed Keyboard Switches should always be mounted in such a way so as to protect keyboard edges against operator handling and abuse. We offer some of the best protection methods which you can easily use in your application.

A One of the most common method is to provide a Bezel which will go around the rim of the plate on which the keyboard is mounted or pasted thus protecting the edges. The construction is as shown in Fig. A

B A most common protection is to have a recess around the plate on which the keyboard is mounted or support panel. The keyboard is mounted on plate which has recess around it, as shown in Fig. B. The overall keyboard edge to edge tolerance should be around +0.3 mm to have cosmetically satisfactory fit.

C The keyboard can be mounted on a support panel which is then fixed against an opening in the enclosure as shown in Fig. C.



### Applications

- Process Control & Automation
- Test & Measuring Equipment
- Telecommunications
- Medical Electronics
- Automobile Electronics
- Weighing Scales
- Power Electronics
- Hotel Automation
- Textile Electronics
- Customised Equipment
- Import Substitute Keyboards
- Aeronautics

### Sample Sketches



Diagram Showing Details of Key Legends

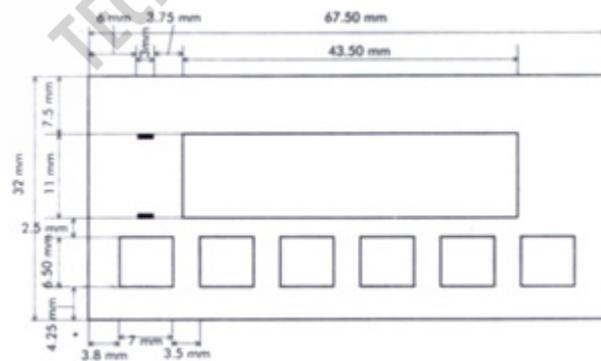


Diagram showing detailed Dimensional Drawing of keys & Display window

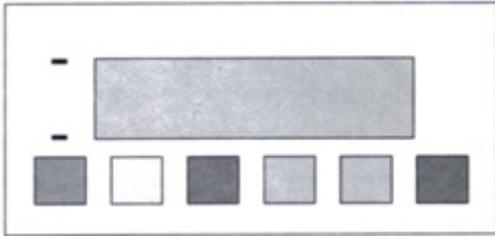


Diagram showing colour specifications of keys and keyboard background

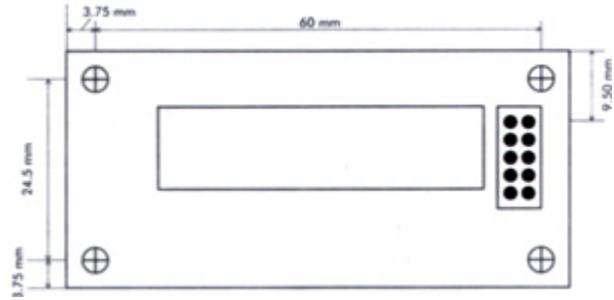
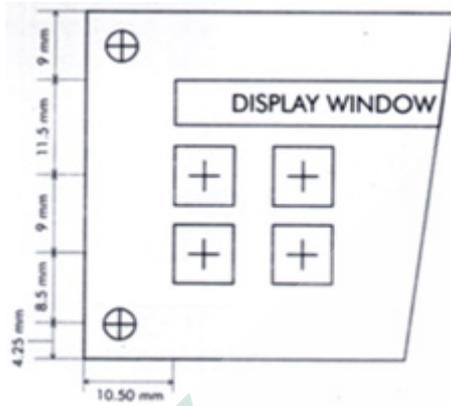


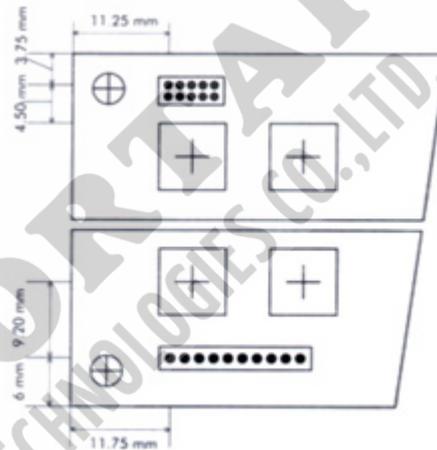
Diagram showing detailed Dimensional Drawing of Studs and keyboard connector

### Dimension Guidelines

You must maintain minimum distance between units like keys, LEDs, Windows, Cutouts, connectors. These minimum distances provide surface bond strength and ensure better scaling and proper key location. Some typical sketches are given below:



Position of keys with respect to studs, display window and keyboard edge. If you want LEDs in keys then add 2mm in distances of keys.



Position of connectors pin with respect to keys and keyboard edge.

### Standard Operating Characteristics/ Specifications

Operating Voltage	30 V dc max.
Operating Current	100 mA max.
Contact Resistance	<3 Ohms
Life Expectancy	Tactile - 1Million Non-Tactile/ Embossed - 2 Million
Activation Force	Tactile - 180 - 450 grams Non-Tactile/ Embossed - 150-350 grams
Contact Bounce	10 milli seconds
Operating Temperature	-18°C to + 70° C
Humidity	95%RH/40°C/48 Hrs.
Insulation Resistance	@ 500 VDC between terminal & Aluminum foil wrapped around the keyboard.
Vibration	1 hour freq. 10-150-10 Hz
Degree of protection (front side)	IP 54
Dimensional tolerance	+/- 0.2mm
Warranty	One year from the date of Sale & against manufacturing defect only.

### Optional Features

- EMI/ RFI shielding with Aluminum foil/ Conductive mesh.
- Ultra Violet, hard coated windows.
- Display only when lit, windows.
- SMD Components, such as LED's, Resistors, Capacitors and Multipin IC's.
- Re-legendable pockets for inserting customised legends.
- Embossing, Round, Triangular, Square shapes possible.
- Phosphorescent Lightening.
- Gold plated PCB/ Domes.