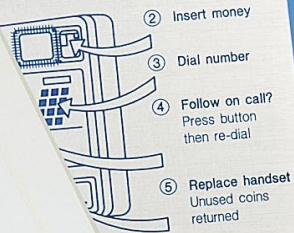


# SERIES 37F CUSTOM PIEZO KEYPADS AND PUSHBUTTONS

VANDAL RESISTANT AND  
VIRTUALLY INDESTRUCTIBLE

*Grayhill*  
INC.



Call

1 2 3 ANUL-LAR X  
4 5 6 CORREGIR ←  
7 8 9 0

↑ 1 2 3  
↓ 4 5 6  
\* 7 8 9

X S M L XL  
Power

DIAGNOSTIC SYSTEM

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

TERBERG  
MACHINES

▲ ▼ C ◀

# Technology

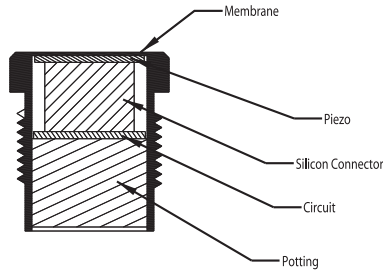
## Function

The switch function is based on the the physical principal of the Piezo effect. The external push force (increase or decrease) activates a Piezo element that releases voltage utilized for switching (MosFet).

We offer three switching functions:

- Pulse - 120 Msec. Pulse Typical
- Momentary - Circuit closed as long as switch is pressed (requires external power) max 30 sec
- Toggle - Switch changes position at each activation (requires external power)

## Section View



## Advantages

- Suitable for harsh environments
- Sealed metal surface, epoxy potted
- Pressure activated, no moving parts
- Versatile mechanical configuration
- Water and dust proof - indoor and outdoor use (IP68 Degree of Protection)
- Virtually Indestructible, vandal proof, easy to keep clean
- Long life expectancy, tested for 50 million cycles
- Manufactured in any shape

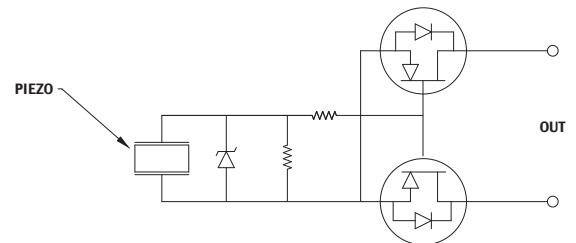
## Applications

- Vending machines
- Lifts
- Beverage dispensers
- Food industry
- Mining equipment
- Public internet and information kiosks
- Chemical and petrochemical industry
- Safety and security
- Medical equipment
- Industrial machinery

## Technical Data

Rated Voltage:	24 V ac or Vdc
Rated Current:	200 mA Max 1A if requested
Switch Resistance "ON":	10 ohms Max
Switch Resistance "OFF":	> 5 Megohms
Switch Capacitance:	25 pF
Actuation Force (Typical):	3 - 5 N
Operating Temperature: (according to customer request)	-20°C to +75°C, -40°C to +125°C if requested
Cycles:	>50 million
EMI or RFI Effect:	none
Degree of Protection:	IP68 per IEC 529
LED:	5 V dc, I <sub>max</sub> 10 mA

## Circuit Diagram



## Environmental

High Temperature (Operational)	MIL STD 810 C	High Temperature (Storage)	MIL STD 810 C
Low Temperature (Operational)	MIL STD 810 C	Low Temperature (Storage)	MIL STD 810 C
Rain	MIL STD 810 C	Humidity	MIL STD 810 C
Sand And Dust	MIL STD 810 C	Water	MIL STD 810 C
Temperature shock	MIL STD 202 E	Vibration	MIL STD 202 E
Mechanical shock	MIL STD 202 E	Salt fog	MIL STD 202 E

# Custom Keypads

Our custom made keypads range from minimal solutions of 2 keys per keypad to large keypads in various colors, designs and sizes.

The patented Piezo technology allows for extremely economical prototypes and short run series. Available Features:

- Various colors, surface materials and sizes
- N.O. - N.C. Pulse functions as well as momentary and toggle
- Integrated LED's available
- Cables and connectors to customer specifications
- Character marking, laser engraved and anodized printing



## Piezo Pushbuttons

We also offer pushbutton switches.

Sizes:      $\varnothing$  .79" (20,0)  
               $\varnothing$  1.02" (26,0)  
               $\varnothing$  1.10" (28,0)  
               $\varnothing$  1.36" (34,6)

Materials: Aluminum, Stainless steel

Functions: Pulse, Momentary

Colors: Red, Green, Blue,  
Gold, Black, Natural  
(Anodized Aluminum)

Integrated: LED's Available



## Standard Keypads

We also offer a line of standard keypads.

3x4 (4x3)

4x4

5x4

Surface

Material: Aluminum, Stainless steel,  
Brass

Interface: Flat cable, Pins

Output: Matrix, Common Bus





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Contact Grayhill or your local  
Grayhill Sales Representative for  
more information.

 All products  
meet CE Requirements

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Original 072602