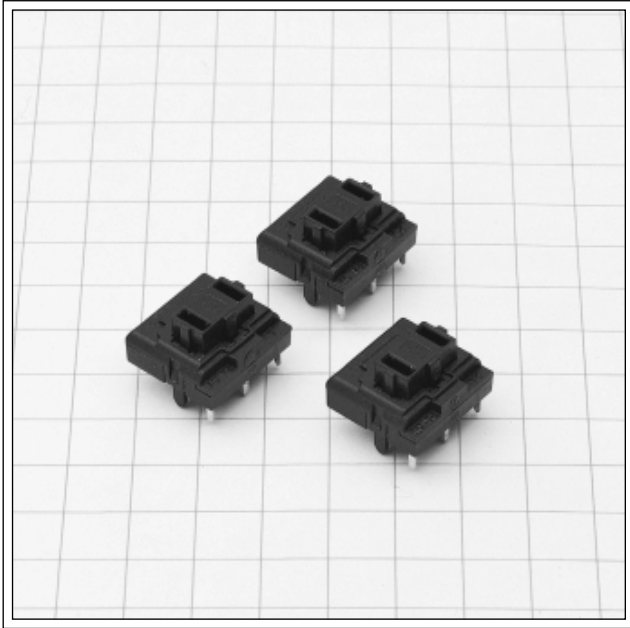


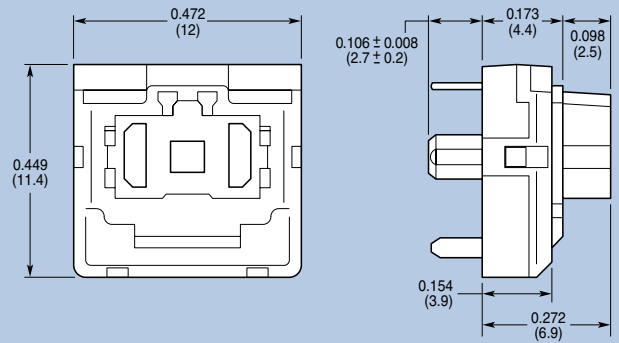
# ML Series

# Keypad

## ML Notebook Profile



### Dimensions: Inches (mm)



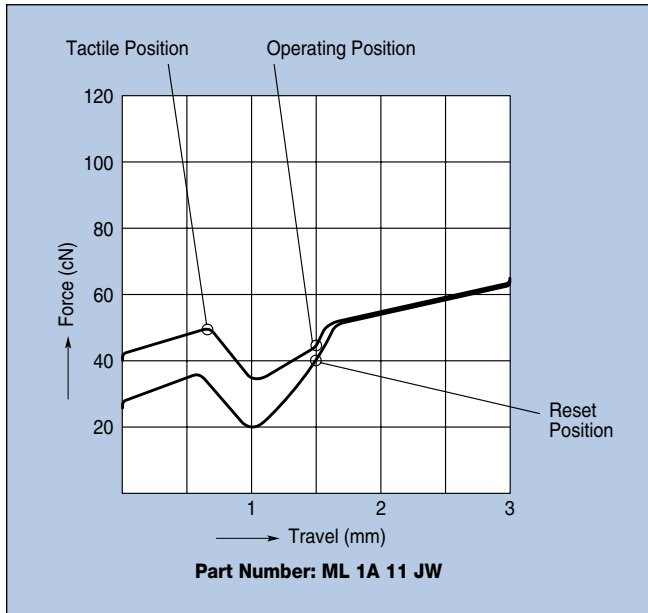
## Specifications

Voltage	12 VAC/DC max. 2 VDC min.
Current	10mA AC/DC max. 100µA DC min.
Insulation Resistance	100 M Ω at 100V
Bounce Time	≤5ms (at op. speed 0.4m/s)
Life	>20 million operations
Initial Contact Resist.	<200 m Ω (25 m Ω typical)
Materials	
Plastics	Thermoplastic, UL-rated
Contacts	AuAg 10
Spring	Stainless steel
Flammability Rating	UL94HB
Solderability	Wave solder 5 seconds at 500°F
Environmental	
Operating Temp. Range	-10° to +70°C
Storage Temp. Range	-40° to +70°C
Relative Humidity	5% to 95%, non-condensing

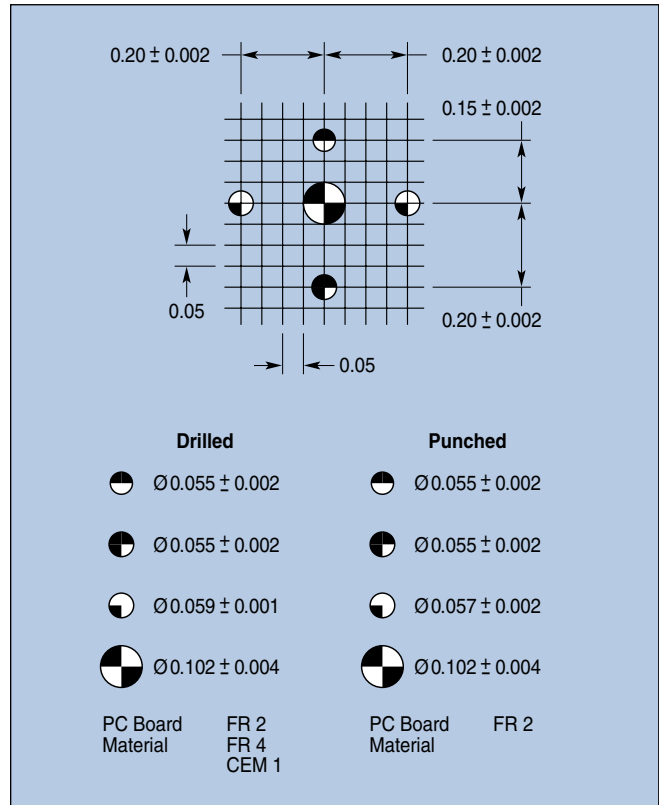
## Mechanical Motion

Function	Normally open contact
Total Travel	0.118" -0.020"
Pretravel	0.059" ±0.020"
Initial Actuating Force	1.058 oz min.
Operating Force	1.587 ± 0.705 oz
Tactile Force	1.764 ± 0.705 oz
End force	Max. 2.998 oz, typical 2.469 oz

## Force/Travel Diagram



## Circuit Board Layout



## Soldering Parameters

### Foam Flux

- v 2.3 m/min
- h Minimum height however the PCB must be moistened equally with flux (the foam wave must not be "interrupted")

Flux  
Density 0.84 g/cm

### Pre-heating

- v 2.3 m/min
- t 200° to 280°C (6 pre-heating plates; t increases regularly) on the PCB bottom side. A temperature of 80° to 85°C is being reached.
- h Distance between heating plate and PCB bottom side is approximately 66 mm.

### Soldering

- v 2.3 m/min
- Sol< 6° to 7°
- t 255° to 260°C (according to display)

## Ordering Information

Part Number	Description
ML1A-11NW	Standard force, tactile, PCB mount
ML1A-11JW	Standard force, tactile, PCB mount, integrated jumper wire