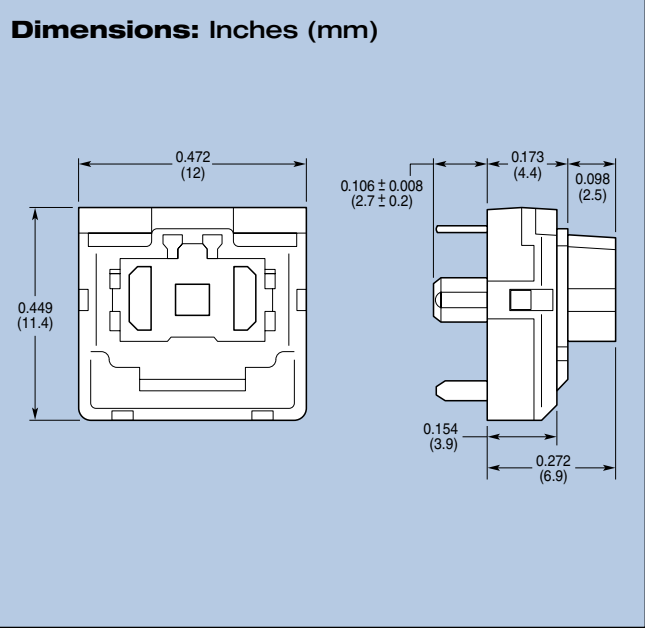
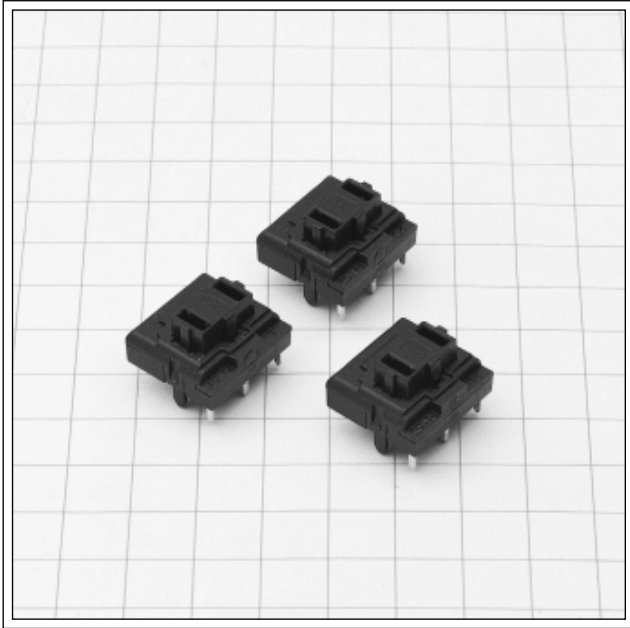


# ML Series

# Keypad

## ML Notebook Profile



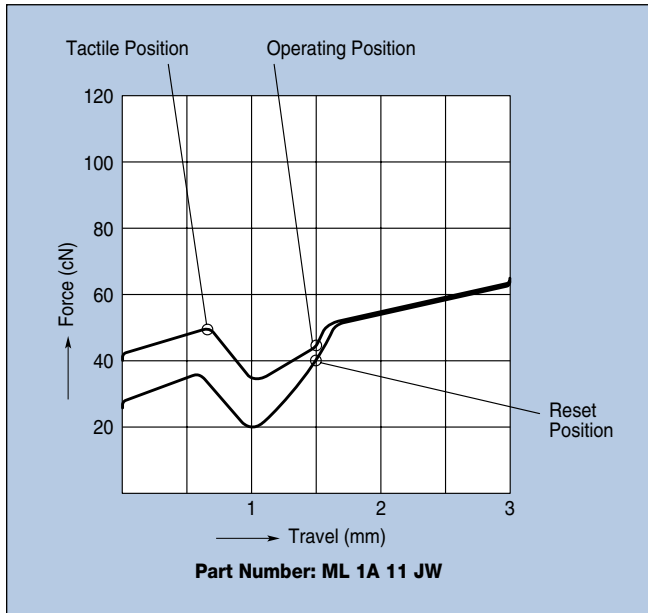
## Specifications

|                         |                                |
|-------------------------|--------------------------------|
| 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)      |
| <b>Materials</b>        |                                |
| Plastics                | Thermoplastic, UL-rated        |
| Contacts                | AuAg 10                        |
| Spring                  | Stainless steel                |
| Flammability Rating     | UL94HB                         |
| Solderability           | Wave solder 5 seconds at 500°F |
| <b>Environmental</b>    |                                |
| Operating Temp. Range   | -10° to +70°C                  |
| Storage Temp. Range     | -40° to +70°C                  |
| Relative Humidity       | 5% to 95%, non-condensing      |

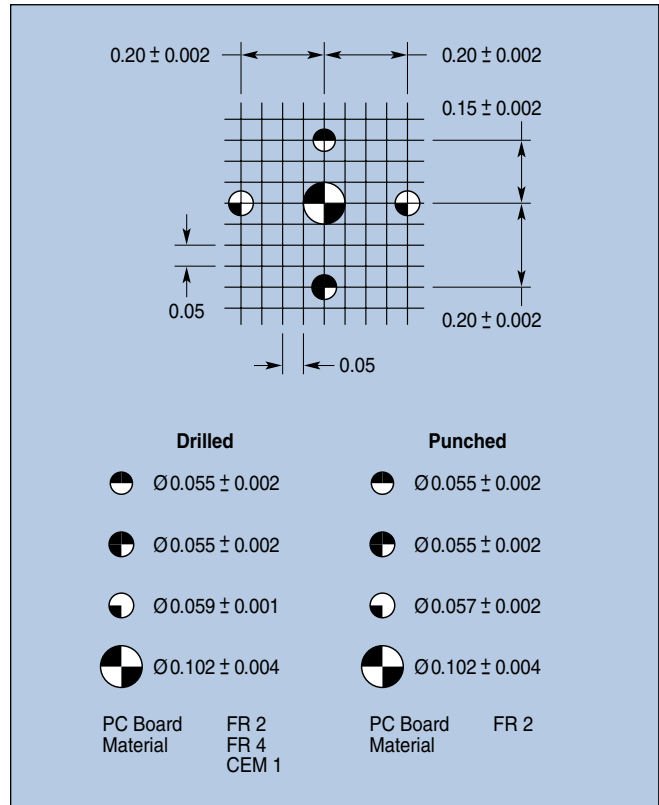
## Mechanical Motion

|                         |                                 |
|-------------------------|---------------------------------|
| 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 |