

## Displacement Sensor, Ultra Flat



### FEATURES

- Sealed
- Infinite resolution
- High integration capacity
- Durability
- Rectilinear: UFPMA type
- Circular: UFPMC type
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### LINKS TO ADDITIONAL RESOURCES



### QUICK REFERENCE DATA

|                  |  |
|------------------|--|
| Sensor type      | LINEAR or ROTATIONAL, conductive plastic |
| Output type      | Output by wires or connector             |
| Market appliance | Industrial, avionics                     |
| Dimensions       | 4 mm (thickness max.)                    |

### ELECTRICAL SPECIFICATIONS

| PARAMETER                           | UFPMA                                    | UFPMC               |
|-------------------------------------|--|---------------------|
| Total resistance ( $R_n$ )          |  | 4.7 k $\Omega$      |
| Tolerance on $R_n$                  |  | $\pm 20\%$          |
| Dissipation                         | $\leq 0.1$ W/cm of travel <sup>(1)</sup> | $\leq 1$ W to 70 °C |
| Theoretical electrical travel (TET) | 20 mm to 250 mm <sup>(1)</sup>           | 270°                |
| Tolerance on TET                    | $\pm 1$ mm                               | $\pm 3^\circ$       |
| Electrical continuity travel        | TET + 4 mm                               | 310°                |
| Linearity                           | $\pm 2\%$                                | $\pm 1.5\%$         |
| Temperature coefficient             | $-300$ ppm/°C $\pm 300$ ppm/°C           |                     |
| Collector / track current ( $I_c$ ) | $\leq 1$ mA                              |                     |
| Recommended current $I_c$           | $\leq 100$ $\mu$ A                       |                     |
| Recommended load impedance          | $\geq 100 R_n$                           |                     |
| Output smoothness                   | $< 0.1\%$ (NFC 93 255)                   |                     |

#### Note

<sup>(1)</sup> See "Specific UFPMA Characteristics" table

### MECHANICAL SPECIFICATIONS

| PARAMETER                     | UFPMA  | UFPMC   |
|-------------------------------|--|---|
| Design                        | Flexible insulating films                                  | Flexible insulating films on FR4 substrate      |
| Mechanical travel             | = Electrical continuity travel                             | = Electrical continuity travel (customer stops) |
| Backlash                      | $< 0.1$ mm   | $< 0.3^\circ$                                   |
| Mounting                      | With double-sided adhesive on flat, clean, and dry support |   |
| Speed displacement            | $\leq 1.5$ m/s   |   |
| Drive                         | Force $\geq 0.3$ N   | Torque $\geq 1$ N cm                            |
| Protection class (NFC 20 010) | IP 66  |   |
| Maximum alignment fault       | $\pm 1$ mm   | -   |

### PERFORMANCE

| PARAMETER                   | UFPMA   | UFPMC           |
|-----------------------------|---|-----------------|
| Life                        | 25M operations for TET $< 200$ mm<br>15M operations for TET $\geq 200$ mm | $> 10$ M cycles |
| Operating temperature range | $-30$ °C to $+80$ °C  |                 |
| Storage temperature range   | $-40$ °C to $+90$ °C  |                 |
| Support                     | Flat, clean, and dry  |                 |

#### Note

- Nothing stated herein shall be construed as a guarantee of quality or durability

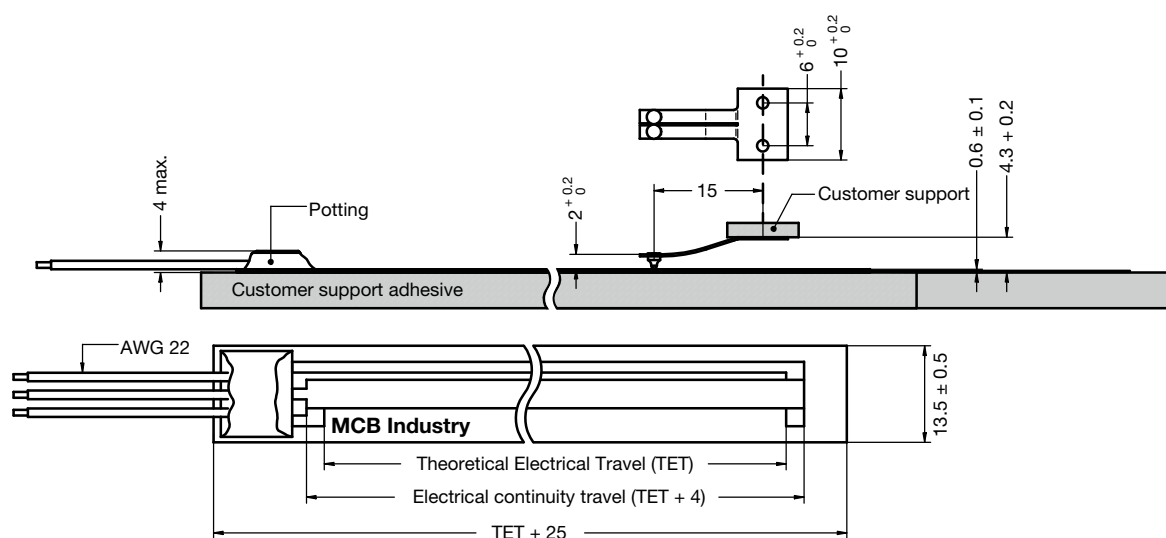
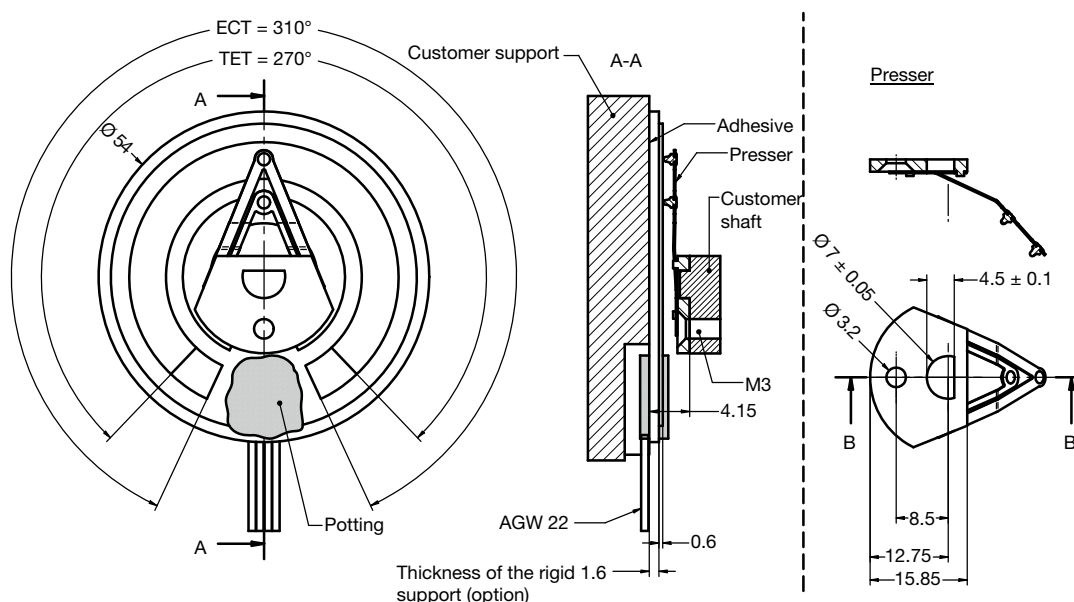
**SAP PART NUMBERING GUIDELINES - UFPMA**

| MODEL | TYPE       | THEORETICAL ELECTRICAL TRAVEL (mm) | TYPE                                       | VALUE     | LINEARITY                | LEADS     | PACKAGING |
|-------|------------|------------------------------------|--|-----------|--------------------------|-----------|-----------|
| UFPM  | A = linear | 060<br>100<br>150<br>200<br>250    | A = aeronautic,<br>off-road, or<br>medical | 472 = 4K7 | X = $\pm 2\%$<br>(UFPMA) | W = wires | B = bulk  |

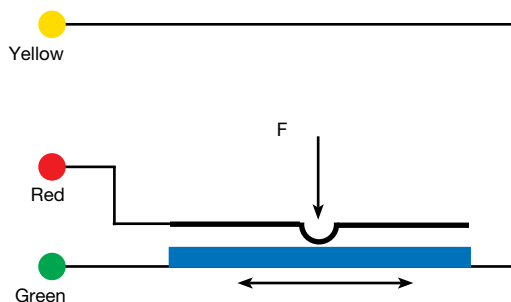
**CONNECTIONS**

3 x AWG 22 color wires length 300 mm

**DIMENSIONS** in millimeters

**UFPMA**

**UFPMC (ON REQUEST)**


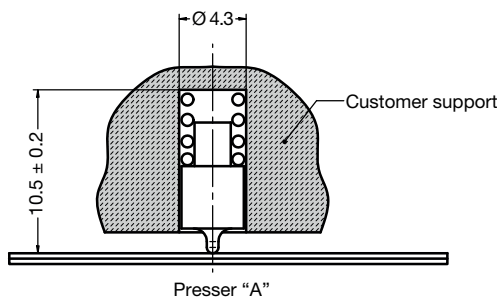
## ELECTRICAL DIAGRAM



The voltage varies according to the position of the presser on the deformable membrane.

## OPTIONS (on request)

- Other presser

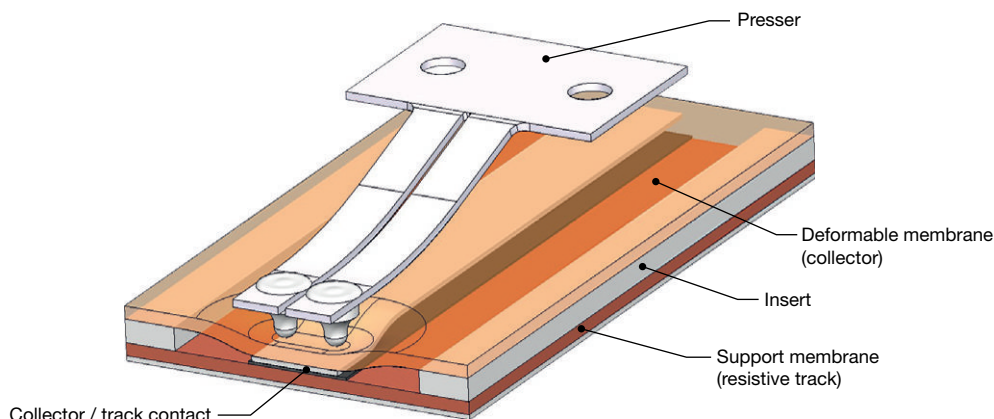


## SPECIFIC VERSIONS (on request)

- Other electrical or mechanical characteristics
- Other bases
- Integration in equipment
- Other versions: outdoor design, ...
- Integration in equipment (flat flex cable, contacts, connector, ...)

| SPECIFIC UFPMA CHARACTERISTICS           |                           |   |                  |
|--|---------------------------|---|------------------|
| THEORETICAL ELECTRICAL TRAVEL (TET) (mm) | DISSIPATION AT +40 °C (W) | ELECTRICAL CONTINUITY TRAVEL (ECT) (mm) | FILM LENGTH (mm) |
| 50                                       | ≤ 0.5                     | 54                                      | 75               |
| 100                                      | ≤ 1.0                     | 104                                     | 125              |
| 150                                      | ≤ 1.5                     | 154                                     | 175              |
| 200                                      | ≤ 2.0                     | 204                                     | 225              |
| 250                                      | ≤ 2.5                     | 254                                     | 275              |

## OPERATING DESCRIPTION





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