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

LINKS TO ADDITIONAL RESOURCES

3D Models | Videos | Application Notes

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 kΩ	
Tolerance on R_n	± 20 %	
Dissipation	≤ 0.1 W/cm of travel (1)	≤ 1 W to 70 °C
Theoretical electrical travel (TET)	20 mm to 250 mm (1)	270°
Tolerance on TET	± 1 mm	± 3°
Electrical continuity travel	TET + 4 mm	310°
Linearity	± 2 %	± 1.5 %
Temperature coefficient	-300 ppm/°C ± 300 ppm/°C	
Collector / track current (I_c)	≤ 1 mA	
Recommended current I_c	≤ 100 µA	
Recommended load impedance	≥ 100 R_n	
Output smoothness	< 0.1 % (NFC 93 255)	

Note

(1) 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°
Mounting	With double-sided adhesive on flat, clean, and dry support	
Speed displacement	≤ 1.5 m/s	
Drive	Force ≥ 0.3 N	Torque ≥ 1 N cm
Protection class (NFC 20 010)	IP 66	
Maximum alignment fault	± 1 mm	-

PERFORMANCE		
PARAMETER	**UFPMA**	**UFPMC**
Life	25M operations for TET < 200 mm 15M operations for TET ≥ 200 mm	> 10M 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

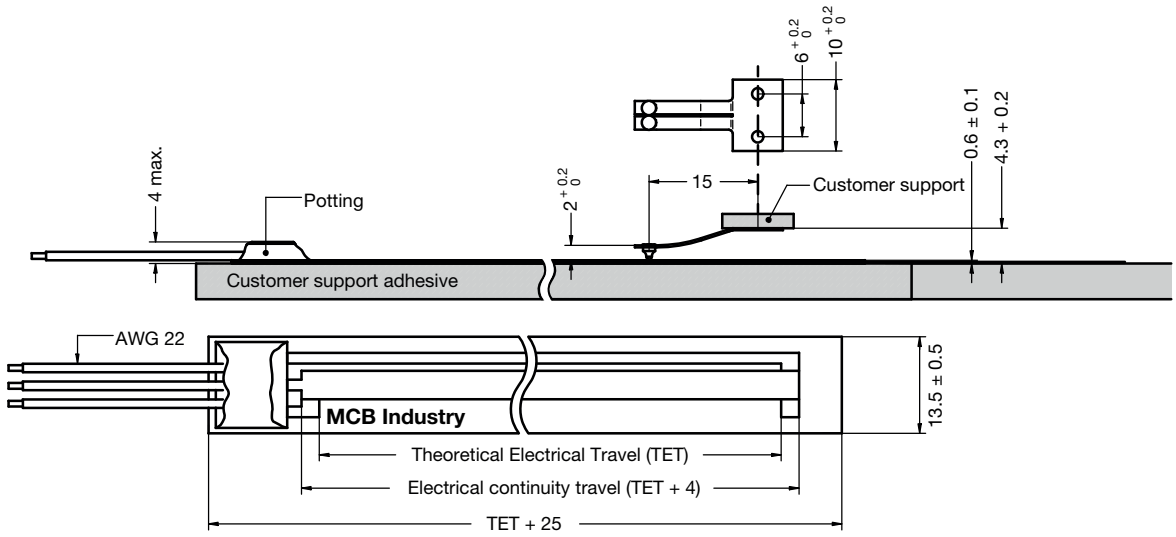
MODEL	TYPE	THEORETICAL ELECTRICAL TRAVEL (mm)	TYPE	VALUE	LINEARITY	LEADS	PACKAGING
UFPM	A = linear	060 100 150 200 250	A = aeronautic, off-road, or medical	472 = 4K7	X = ± 2 % (UFPMA)	W = wires	B = bulk

CONNECTIONS

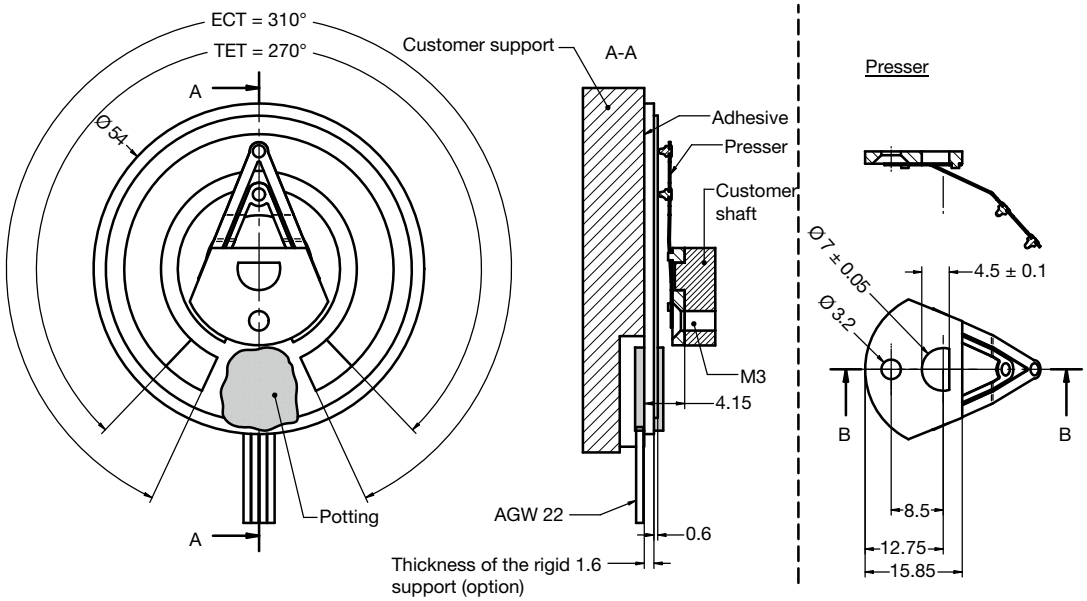
3 x AWG 22 color wires length 300 mm

DIMENSIONS in millimeters

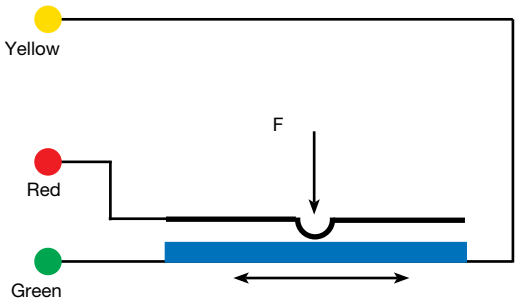
UFPMA



UFPMC (ON REQUEST)



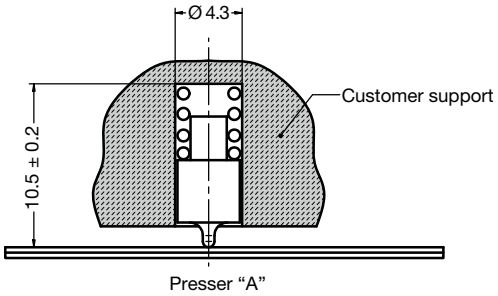
ELECTRICAL DIAGRAM



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

OPTIONS (on request)

- Other presser

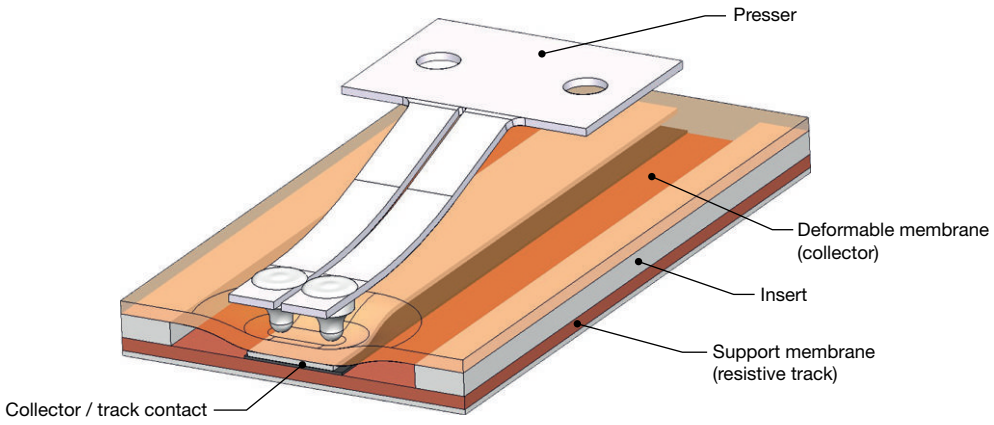


SPECIFIC VERSIONS (on request)

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

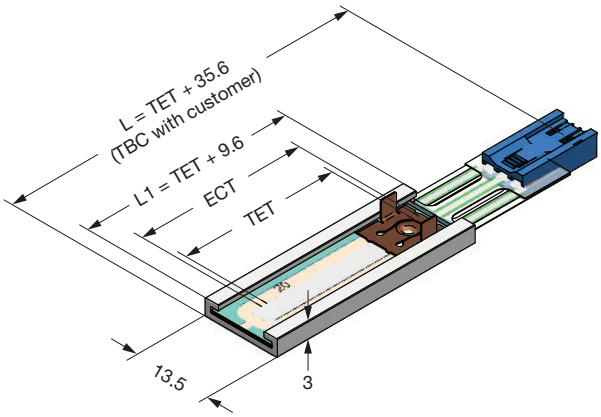
SPECIFIC UFPMA CHARACTERISTICS			
THEORETICAL ELECTRICAL TRAVEL (TET) (mm)	DISSIPATION AT +40 °C (W)	ELECTRICAL CONTINUITY TRAVEL (ECT) (mm)	FILM LENGTH (mm)
50	≤ 0.5	54	75
100	≤ 1.0	104	125
150	≤ 1.5	154	175
200	≤ 2.0	204	225
250	≤ 2.5	254	275

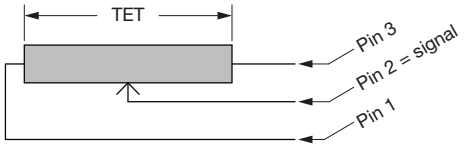
OPERATING DESCRIPTION



ON REQUEST

KITPMA: **KIT P**otentiometer **M**embrane **A**ssembled with flat flex cable output
(active track and wiper mounted inside a metal profile for easier assembling inside customer equipment: no need to manage the distance between wiper and track)





Electrical diagram

ELECTRICAL CHARACTERISTICS

PARAMETER	
Resistance (R_n)	4700 Ω ± 30 % (for TET = 27.4 mm, other values on request)
Theoretical electrical travel (TET)	27.4 mm (other values on request)
Electrical continuity travel (ECT)	TET + 2 mm
Maximum using electrical travel	TET - 2 mm
Recommended load impedance on the wiper	≥ 1000 R_n
Wiper current	< 1 mA
Maximum dissipation up to +85 °C	0.025 W/mm

ENVIRONMENTAL CHARACTERISTICS

PARAMETER	
Operating temperature	-30 °C / +80 °C
Non operating temperature	-40 °C / +90 °C

Feasible Variants:

- TET: from 27.4 mm to 2000 mm
- Linearity:
  - standard 2 % (1 % on request) for TET 27.4 mm
  - 0.25 % for TET 2000 mm
- Customizable profile: the shape of metal profile (shape and outer dimensions: width, height) can be adapted to customer request. Comment: width of 13.5 mm + thickness of 3 mm are only for small length (to consult us to define dimensions)
- Interfacing: the wiper drive interface can be customized
- Output: by flat flex cable or wires
- Temperature range (on request): -55 °C to +100 °C

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