

Membrane keyboards

Application

The rapidly advancing microelectronics industry requires input systems that have task-oriented attributes. Membrane keyboards are preferred over conventional keyboards due to their advantages in many areas

Their specific advantages

- self-contained front surface with embedded circuit elements,
- dust proof and water tight,
- easy to care for, hygienic,
- robust, scratchproof,
- individual design

Construction

The spacer, safety chamber and front membrane are connected and pressure bonded using high-grade sheet glue. Gold-plated snap disks ensure tactile feedback.

The rear printed front-film protects the keyboard from environmental influences such as humidity, dirt, chemicals, etc.

Technical data

	Polydome	Metal dome technology
technology		
Key surface	from 10 x 10 mm	from 10 x 10 mm
Smallest centre spacing	0.9 mm	13, 16, 19 mm
Contact surfaces depending on the version	through-contacted, silver plated	through-contacted, silver plated, gold-plated snap disks
Contact travel	0.2-0.3 mm	ca. 0.6 mm
Switching pressure depending on the foil	1-3 N	3-5 N
Protection class (towards the front)	IP 65	IP 65
Maximum voltage	42 V	42 V
Maximum current	50 mA	50 mA
Minimum current	50 µA (silver)	50 µA (silver)
Maximum power	1 W	1 W
Volume resistivity depending on version	< 1 Ohm (silver)	< 1 Ohm (silver)
Insulation resistance	> 100 MOhm	> 100 MOhm
Bounce time (depending on activation)	< 10 ms	< 10 ms
Service life	> 1 m actuations	> 2 m actuations
Operating temperature	-20 °C bis +70 °C	-20 °C bis +70 °C
Storage temperature	-40 °C bis +80 °C	-40 °C bis +80 °C

Characteristics and resistance of the synthetics utilized

Properties	Polycarbonate (PC)	Polyester (PETP)
Mechanical properties	Ultimate and tensile strength: good Scratch resistance: very good Workmanship, embossing, punching: very good Printing: very good	Ultimate and tensile strength: very good Scratch resistance: good Workmanship, embossing, punching: good Printing: good
Electrical properties	Resilience under impact: • 60 kV/mm Insulation resistance: 109 - 1011 Ohm	Resilience under impact: • 250kV/mm Insulation resistance: 109 - 1011 Ohm

	Polycarbonate (PC)	Polyester (PETP)
Optical properties	Good translucency, highly suitable for LED displays, Colour reproduction slightly subdued	Very good translucency, good visibility of the LED and LCD displays, good colour reproduction
Chemical properties	Polycarbonate is resistant to mineral acids, many organic acids, oxidation and reducing agents, neutral and acidic saline solutions, oils, saturated aliphatic and cycloaliphatic hydrocarbons and alcohols except methyl alcohol (depending on the concentration).	Polyester is resistant to detergents, water, benzenes, oil, alcohol, vinegar, aliphatic hydrocarbons, bleaching agents, two-percent ferritic chloride solutions, iodine, ethyl acetate, food dyes, machine oil; less resistant to chlorinated hydrocarbons, ketones, aromatic hydrocarbons (depending on the concentration).

- **External dimension tolerances membrane / case**

- > Membranes: upper dimension = 0 / lower dimension = - 0.2
- > Case: indicate 0.2 mm larger and notification: 'Comply with case dimensions'

- **Standard thickness of membrane keyboards**

- > Are complied with in most cases (ca. 80%),
- In the future, the thickness will be indicated in the membrane drawing.
- > Overall membrane thickness (on edge) in

- **Case depths on housings**

- > 0.2 mm deeper than membrane thickness

- **Dimensions in window area**

- > Transparent observation window integrated into membrane.
- > Due to punching under membrane observation window.
- > Restricted to weld-in through the spring strength.
- > Agreement: acryl washer stands 0.5 mm under the material surface.
- > Window dimensions continuous + 1 mm of observation window.
- > Punch out under observation window: surround + 2 mm of observation window.

- **Plug on membrane cable (tail)**

- > Most commonly used: Crimpflex. The plug type will be indicated on the drawing!

Dimensions for Crimpflex:

Thickness:	Length:	Width:
ca. 2.7 mm	ca. 14 mm	ca. 2 mm narrower than cable

- **Housing slot for the membrane cable (tail)**

- > Slot width: min. 3.5 mm and slot length: min. 4 mm wider than tail.
- > Housing slot directly under the membrane punch-out for the tail.
- > In practice, the tail is bent to 90°; merely complete folding is impossible.