BOS 800-805, no. of keys: 16, for membrane keypads, for BOS/EGP enclosures

Product no.: 70348016

Length: 92.2

Width: 79.7

Height: 1

Pcs.: 0

Information

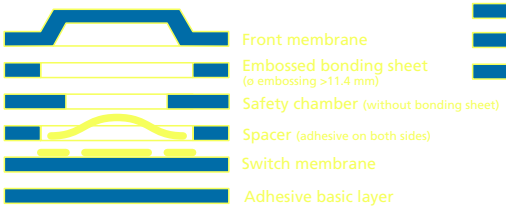
Construction

Normally the external side of the transparent front membrane is matt. The membrane is printed on the back, so the printing is protected against environmental influences such as dirt, moisture and scratches. The front membrane, switch membrane, spacers and the basic layer are glued together using high-quality bonding sheets and can subsquently be pressed if required. Pressing of the membrane keypad is not a standard process! It is only carried out for special applications, e.g.:
– increased impermeability
– impermeability against alcohol

Conductive silver

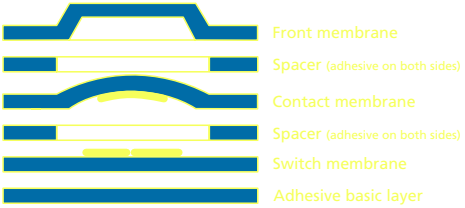
Version 1 (Standard)
Keypad with pressure point

Version 2
Keypad with pressure point and embossing



Version 3
Keypad without pressure point

Version 4
Keypad with pressure point with embossing (Mylardom indirect)



Version 5
Keypad with pressure point with embossing (Mylardom direct)

Copper laminated

Version 1 (Standard)
Keypad with pressure point

Version 2
Keypad with pressure point, 2-layer

LEDs

If LEDs also need to be integrated into the keypad, the front panel must be provided with a dimpled embossing in the area where the LEDs are to be fitted.
If embossing is not wanted, the keypad can also be fitted using an additional LED layer and a pad. Note that this method increases the total thickness of the keypad.

Screening membrane (option)

In order to carry off discharges of static electricity and to prevent the influence of spurious frequencies, screening can be built into the keypad. This screening membrane is fitted underneath the covering membrane; display screen with screening available on request.

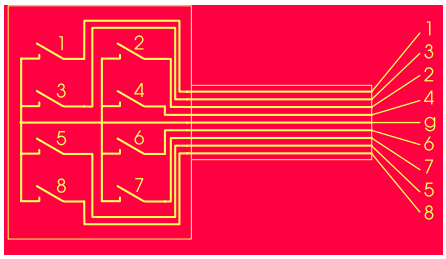
Snap discs

Snap discs or metal domes are manufactured of stainless steel. The contact side is gold-plated. The switch operation pressure of our standard snap discs is approx. 2.5 to 3 N. Depending on the size of the domes, the minimum distance from the centre of one key to the next is 16 (11) mm.

Our construction department reserves the right to carry out the technical realisation of individual types!

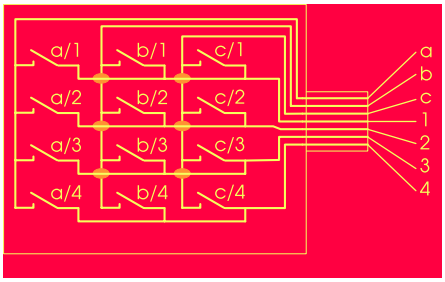
Circuits

a) Common conductor cable



Each key is connected to the common cable and a strip conductor output. No additional decoding is required. All conductors are led to a highly flexible membrane cable in order to connect the entire keypad area to the electronics.

b) X-Y matrix

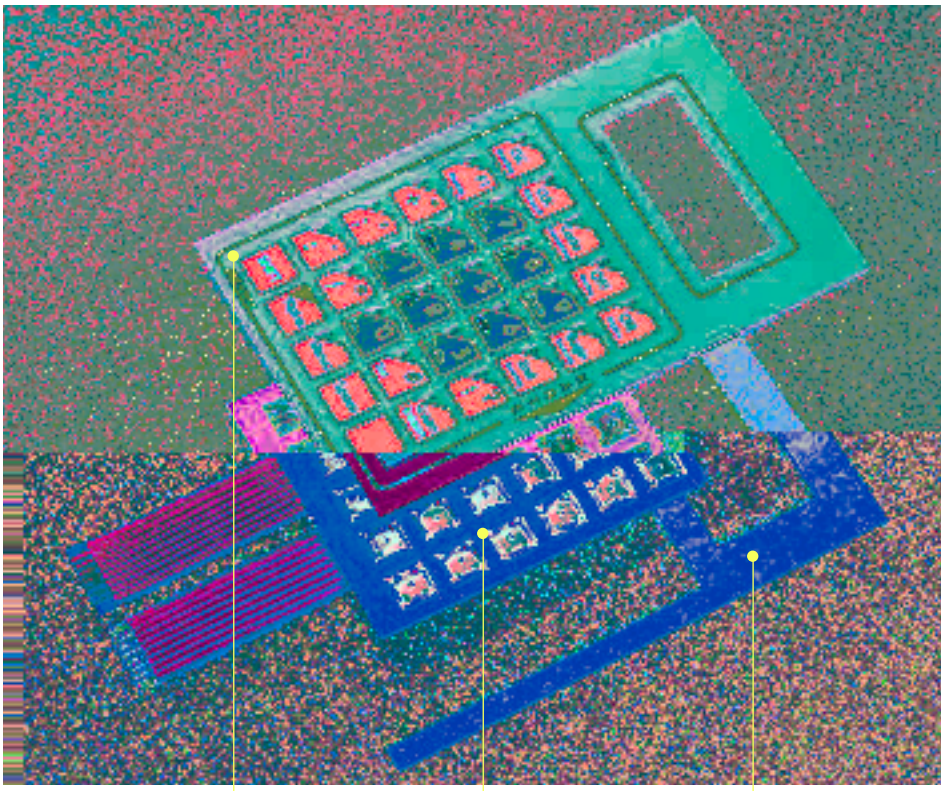


The horizontal X output conductors and the vertical Y output conductors are connected to the contact points of the keys. This reduces the number of connections to just a few conductors.

Padding keypads

Low-cost customer-specific membrane keypads can be manufactured on the basis of our standard keypad range.

After selection of a basic keypad body, the rest of the surface is filled with a spacer. A front membrane, back-printed according to the customer's instructions, is then fitted over the whole construction.



Front membrane | Body | Bonding sheet (pad)

Information

Membrane cable

The position of the exit point and the related length of the connection membrane should be determined during the planning phase. The leading out of the contact connections is via the membrane cable.
The ribbon is punched out of the keypad in the area of the exit so that the membrane cannot tear when it is bent. The standard grid dimension is 2.54 mm. Avoid excessive bending. The ideal bending radius for the cable is > 4 mm.

Plugs

The membrane cable can be led either into one membrane direct plug soldered to the PCB, or a plug is crimped at the end of the cable. If plugs have been crimped in position, a single-row post plug must be fitted as a counter-piece on the PCB.

Protection types

When laminating the keypad onto a support, we recommend sealing the cable exit with a suitable adhesive. If the keypad is pressed onto the supports by means of a pressing device, the keypad is absolutely waterproof (also alcohol-proof, depending on the design).

If an enclosure used with a keypad is expected to achieve ingress protection category IP 65, note the following:

1. The cable inlet in the enclosure must be sealed with a special adhesive.

2. It may be necessary to adapt the construction of the keypad.

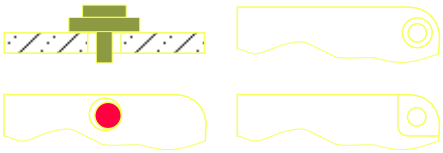
Slot-in pockets

Slot-in pockets can be incorporated in the keypad for the subsequent individual marking of keys or surfaces. Replaceable slot-in strips (e.g. for logos) can be inserted from the side, front or rear. The slot-in pocket is fitted directly behind the front membrane, so the slot-in strip is visible in the unprinted area.

Mounting holes

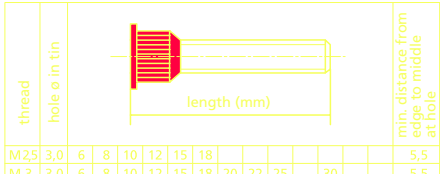
If components are fitted in the supporting plate and centered in the front membrane, take the amount of play into consideration. The punched-out hole in the front membrane must be larger.

If the mounting drill-holes are very close to the corner of a keyboard, the result is thin, unequal intermediate sections. In such cases, the corner should be completely cut out.



Supporting plates

The supporting plates are manufactured according to customers' specifications.
They can be supplied with press-in bolts with the following standard dimensions:



thread	hole ø in tin	length (mm)													min. distance from edge to middle at hole
M2,5	3,0	6	8	10	12	15	18								5,5
M 3	3,0	6	8	10	12	15	18	20	22	25		30			5,5
M 4	4,0	6	8	10	12	15	18	20	22	25	28	30	35	38	7,5

aluminium/steel

Embossings

Dome embossing

On the dome embossing the embossed area is about 0.3 mm higher than the front membrane.

Possible embossing forms:

Edge embossing

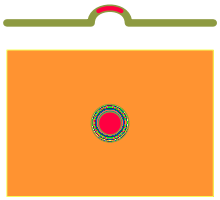
The edge embossing is used to guide the fingers.
The niveau at front membrane and key area remains the same.

Possible embossing forms:

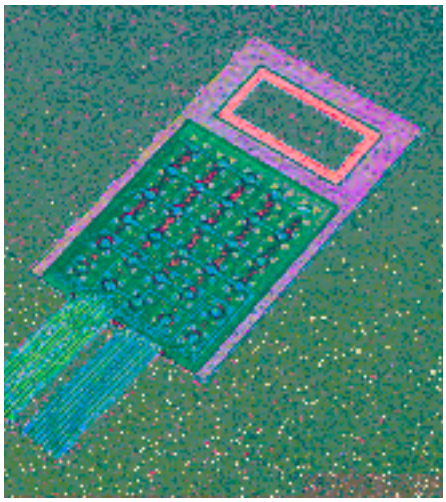
Bubble embossing

The bubble embossing is in various diameters from 8 to 17 mm available.

Wart embossing for LEDs



Our construction department reserves the right to carry out the technical realisation of individual types!



Colours

Special silk screen paints for plastics – so-called key switch colours – are used for the printing of the front membranes. Printing is on the back, which protects the layers of paint against environmental influences. Standard paints are selected and used according to RAL.

Shades of colours according to the HKS and Pantone scale can be printed. Additional costs for special colours will be charged for according to the work involved.

Front membrane design

A minimum line thickness of 0.3 mm must be kept to when the front panel is being designed. High-quality printing cannot be guaranteed if the line thickness is less than 0.3 mm.

For the front membrane design, Corel DRAW can be provided as a *.cdr file and used if necessary, as can vectored Windows data.

Surfaces

The following roughness grades are available for the surface of the front membranes:
1. gloss
2. silk-matt
3. matt
Matt surfaces are used in most cases.

Protective membranes

If required, a protective membrane can be drawn over the front membrane or only over the screen. This protective membrane can be removed without leaving any adhesive residues after the keypad has been fitted.

Releases

Before series manufacturing starts, a file will be emailed, or if preferred, a paper print-out will be sent by post for the purpose of release.

On request, release samples will be silk-screen printed and charged for according to the work involved.

Assembly

BOPLA offers a complete range of processing and assembly services.
The advantages for the customer are: faster delivery times, fewer order requirements, and a reduced risk of rejects.

In this way, the customer can be certain that the keypad bonding sheet fits the various enclosure surfaces and that there is a high level of fitting accuracy.

External contour Front membrane / membrane keypad

The amount of play must be taken into consideration when planning a membrane keypad / front membrane on a supporting plate or in an enclosure.
The contour can be designed according to specific requirements.

Display glass

Glass is frequently used for screens instead of closed, clear membranes (front membranes).

The following materials can be offered:
1. acrylic glass (e.g. plexiglass)
2. polycarbonate (e.g. Macrolon)
3. crystal glass (e.g. window glass).

Information

Conductive silver membrane keypads

Technical data	Without press. point	With pressure point	Direct contact Mylardom	Indirect contact Mylardom
Key area	from 10 x 10 mm	from 7 x 7 mm	from 9 x 9 mm, ø 9 mm	from 9 x 8 mm, ø 8 mm
Min. average distance between keys	12 mm	10 mm	11 mm	11 mm
Installation height	approx. 1.0 mm	approx. 1.0 mm	approx. 0.6 mm	approx. 1 mm
Contact surfaces depending on type	conductive silver/ graphite	cond. silver/ graphite, gold-plated snap discs	conductive silver/ graphite	conductive silver/ graphite
Switch travel (dep. on embossing)	approx. 0.2 - 0.3 mm	approx. 0.6 - 0.7 mm	approx. 0.3 - 0.6 mm	approx 0.4 - 0.6 mm
Switch pressure dep. on membrane	depending on design	depending on design	depending on design	depending on design
and type of protection up to IP 65	depending on design	depending on design	depending on design	depending on design
Voltage	1 - 42 VDC	1 - 42 VDC	1 - 42 VDC	1 - 42 VDC
Maximum output	0.6 W	0.6 W	0.6 W	0.6 W
Conductive strip resistance	< 6 ohm (at 100 mm	< 6 ohm (at 100 mm	< 6 ohm (at 100 mm	< 6 ohm (at 100 mm
depending on type	length - 1 mm width)	length - 1 mm width)	length - 1 mm width)	length - 1 mm width)
Insulation resistance to front memb.	≥ 100 Mohm	≥ 100 Mohm	≥ 100 Mohm	≥ 100 Mohm
Bouncing time (dep. on actuation)	< 10 msec	< 10 msec	< 10 msec	< 10 msec
Operating life	> 500 000 actuations	> 1 million actuations	> 300 000 actuations	> 500 000 actuations
Operating temperature				
for keypads with embossing	0° C to + 45° C	0° C to + 45° C	0° C to + 45° C	0° C to + 45° C
for keypads without embossing	- 20° C to + 70° C	- 20° C to + 70° C	- 20° C to + 70° C	- 20° C to + 70° C
Transport/storage temperature				
for keypads with embossing	- 30° C to + 45° C	- 30° C to + 45° C	- 30° C to + 45° C	- 30° C to + 45° C
for keypads without embossing	- 40° C to + 80° C	- 40° C to + 80° C	- 40° C to + 80° C	- 40° C to + 80° C
Bending radius membrane cable	≥ 3 mm	≥ 3 mm	≥ 3 mm	≥ 3 mm

Characteristics and resistance of the plastic parts

Characteristics	Polycarbonate PC		Polyester PETP	
Mechanical characteristics	Tensile strength:	good	Tensile strength:	good
	Scratch resistance:	very good	Scratch resistance:	very good
	Processing embossing/punching:	very good	Processing embossing/punching:	very good
	Printing:	very good	Printing:	very good
Electrical characteristics	Penetration resistance:	ø 60 kV/mm	Penetration resistance:	ø 250 kV/mm
	Insulation resistance:	10^9 - 10^{11} Ω	Insulation resistance:	10^9 - 10^{11} Ω
Thermal characteristics	Temperature range:	- 50° C to - 120° C	Temperature range:	- 70° C to - 150° C
	Melting point:	220° C	Melting point:	250° C
	Flammability:	slow to self-extinguishing	Flammability:	slow to self-extinguishing
Visual characteristics	Good light permeability, very suitable for LED displays; colour reproduction slightly reduced.		Excellent light permeability, giving good legibility of LED and LCD displays. Good colour reproduction.	
Chemical characteristics	Polycarbonate is resistant to mineral acids, many organic acids, oxidation and reduction agents, neutral and acid saline solutions, oils, saturated aliphatic and cycloaliphatic hydrocarbons and alcohol, excluding methyl alcohol.		To a great extent, polyester membrane is insensitive to moisture and most chemicals. Polyester is resistant to detergents, water, petrol, oil, alcohol, vinegar, aliphatic hydrocarbons, bleaching agents, 2% ferric chloride solution, iodine, ethyl acetate, food colouring engine oil; less resistant to chlorinated hydrocarbons, ketone, aromatic hydrocarbons.	

NOTE: If different media come into contact with each other, the stability factors may change. For this reason, we cannot accept any liability for the details.

Copper-laminated membrane keypads

Technical data	Without pressure point	With pressure point
Key area	from 10 x 10 mm	from 10 x 10 mm
Min. average distance between keys	12 mm	13 mm, 16 mm, 19 mm
Installation height	approx. 1.0 mm	approx. 1.0 - 1.2 mm
Contact surfaces depending on type	copper-laminated, silver-plated	copper-laminated, silver-plated or gold-plated, gold-plated snap discs
Switch travel (dep. on design up to IP 65)	0.2 - 0.3 mm	approx. 0.6 - 0.7 mm
Switch pressure dep. on membrane	1 - 3 N	3 - 5 N
Type of protection	depending on design up to IP 65	depending on design up to IP 65
Maximum voltage	42 V	42 V
Maximum output	1 W	1 W
Conductive strip resistance* depending on type	< 0.1 ohm (at 100 mm length - 1 mm width)	< 0.1 ohm (at 100 mm length - 1 mm width)
Insulation resistance	≥ 100 Mohm	≥ 100 Mohm
Bouncing time (dep. on actuation)	< 10 msec	< 10 msec
Operating life	> 1 million actuations	> 1 million actuations
Operating temperature		
for keypads with embossing	0° C to + 45° C	0° C to + 45° C
for keypads without embossing	- 20° C to + 70° C	- 20° C to + 70° C
Transport/storage temperature		
for keypads with embossing	- 30° C to + 45° C	- 30° C to + 45° C
for keypads without embossing	- 40° C to + 80° C	- 40° C to + 80° C

* The conductive strip resistance is dependent on the product layout arrangement. Conductive silver bridges in CuLs technology increase conductor resistance.

Panel production

Depending on the quality ordered and the size of keypad, we always try to make use of the least expensive method of production. For example, a greater number of panel units (see photo) would reduce the manufacturing costs if the size of orders justifies this. However, note that an increased number of panel units will also result in higher tool costs. So that we can prepare an accurate calculation, please give us details of the total quantity and individual batch sizes and we will prepare a cost-optimised offer for you.

HINT:
Make use of our inquiry check list on page 605.