

# Data Sheet

## Keypads Monobloc 1x4

- ♦ Magnetic recall (tactile feeling, constant pressure point, long life)
- ♦ Full travel (reliable contact)
- ♦ Double contact (minimum bounce time)
- ♦ Self-cleaning contact (low contact resistance)
- ♦ High protection (IP 67 for outdoor application)
- ♦ Temperature range -40 °C ... +70 °C
- ♦ Changeable key tops marking by customer (possibility of individual marking)



### General

The Monobloc keypads are designed and manufactured to the highest quality standards. The robust rugged design makes them absolutely dust and water proof.

The full stroke keys give an excellent tactile feedback. The patented magnetic retract mechanism ensures a long service life of the product.

Monobloc keypads are available with 1 x 4, 3 x 4 and 4 x 4 keys.

The 1 x 4 Monobloc keypads are delivered without connection print. The 3 x 4 and 4 x 4 Monobloc keypads are available without electronics, and with electronics of 3...15V or 24V.

Monobloc keypads are available with embedded keys (KNM2) or with raised keys (KNM3).

The key tops can be exchanged individually. In addition, different key marking sets are available.

**For more detailed information about key top sets please refer to special documentation.**

### Technical Data

#### Mechanical

Housing / membrane	Crastin / Silicon rubber
Key travel	1,35 mm
Actuating force	2,2 N ± 0,4N
Connection	Soldering pins
Service life	5 x 10 <sup>6</sup> operations

#### Electrical

Contact surface	Make contact (4µ Ni / 2µ Au)
Supply voltage	max. 42 V ≅
Test voltage	2.000 V≅
Nom. current (Ω load)	max. 125 mA≅
Contact rating	max. 2 W
Contact resistance	≤ 150 mΩ
Insulation resistance	> 10 <sup>2</sup> MΩ
Bounce time	< 5 ms

#### Environment

Application class as per DIN40040	GSF
Temperature range	-40 °C...+70 °C
Storage range	-40 °C...+70 °C
Humidity, warmth	75% annual average, 95% 30 days

**Protection class (DIN) IP 67**

Characteristics of material: page 4.

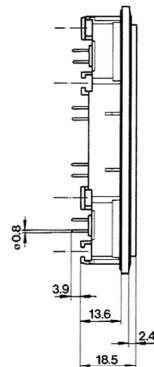
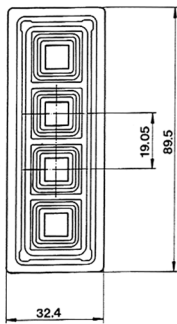
### Order Number

Configuration	Connection mode	embedded keys	raised keys
Monobloc 1x4 Standard, without PCB*	Soldering pins	KNM20S14	KNM30S14

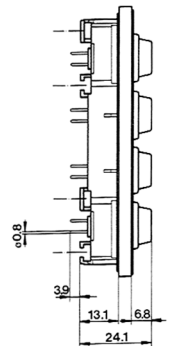
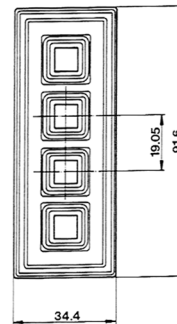
\*Keypads Monobloc 1x4 are delivered with fixing set and with plexiglass key top set Code LLL (0-9 / A-F / + / - / \* / # / .).

## Dimensions

### KNM2

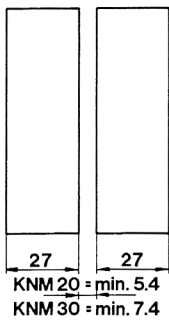


### KNM3

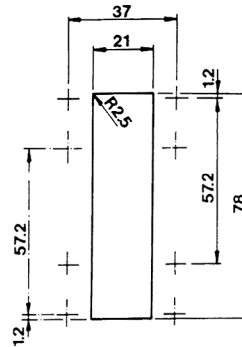


## Panel Cut-Out

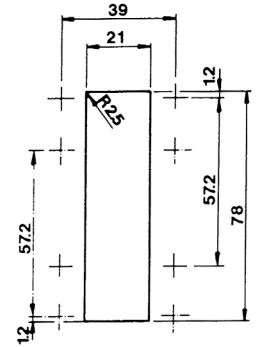
### Front mounting



### Rear mounting KNM2

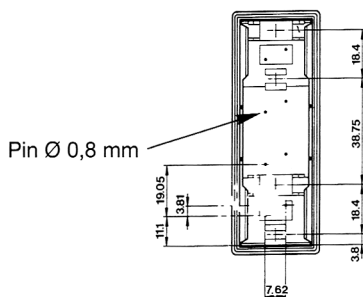


### KNM3



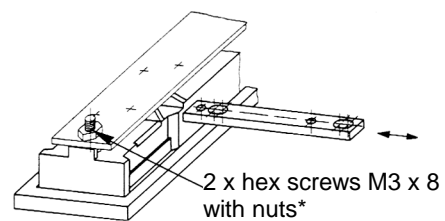
## Electrical connection

### Print layout



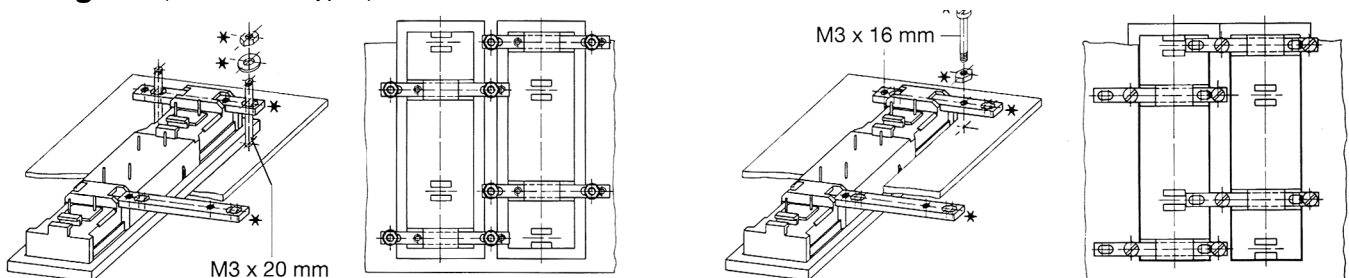
Thickness max. 2.0 mm

### Mounting of PCB

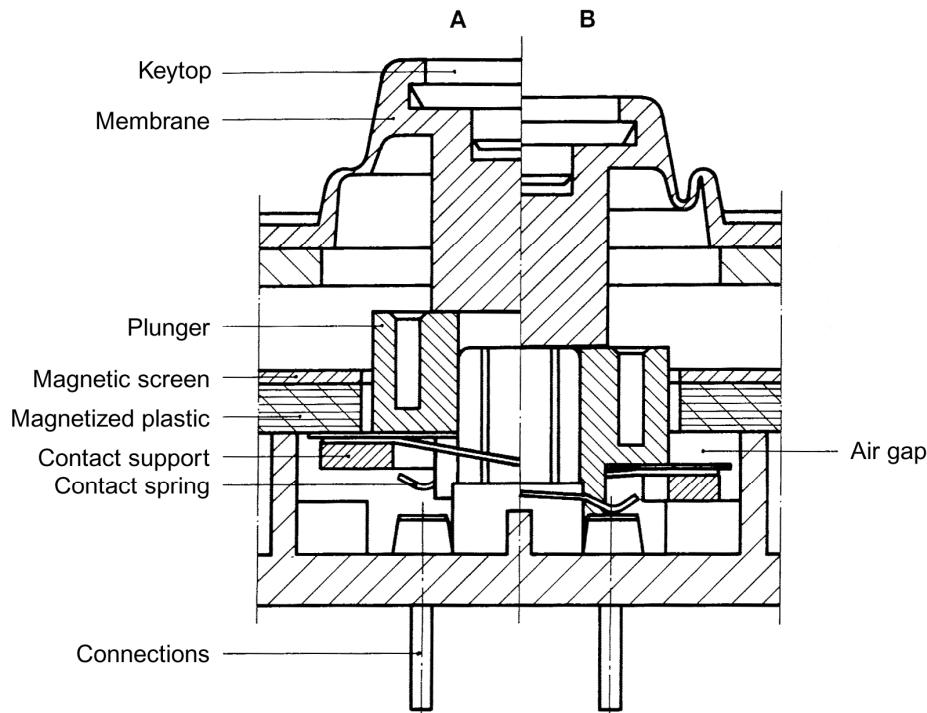


\*included in fixing set.

## Fixing Set (included in keypad)



## Functioning principle



### A Off position

Magnetic circuit between magnetized plastic and contact support closed. Contact open.

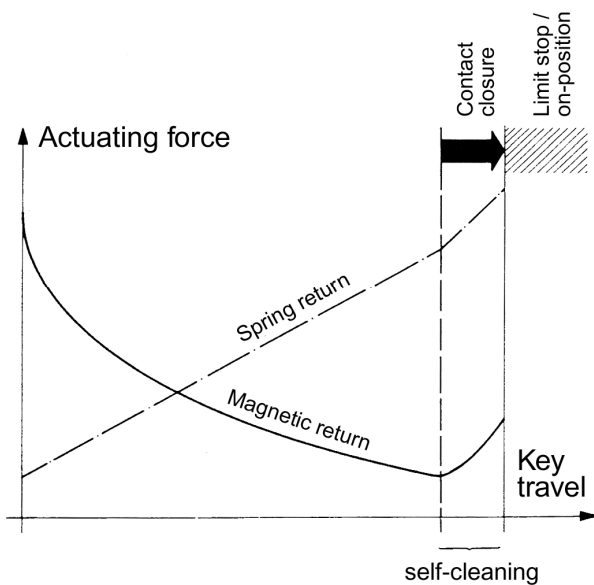
### B On position

Magnetic circuit between magnetized plastic and contact support open. Contact closed.

The magnetized plastic attracts the contact support. The force of attraction is a maximum when the contact support lies on the magnetized plastic (off-position).  
Depressing the key switch results in an air gap between magnetized plastic and contact support, thus overcoming the force of attraction (pressure point).

The force decreases until the contact is closed (on-position). The magnetic attraction returns the key plunger reliably to its off-position when the key switch is released.

## Working diagram



## Soldering instructions

### Manual soldering

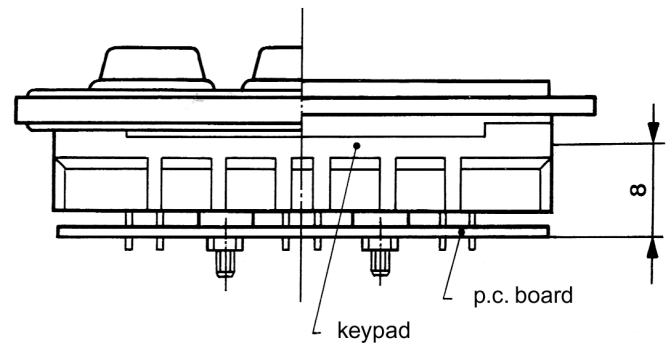
Soldering temperature	320 °C
Soldering time	3 Seconds

### Wave soldering

Max. temperature in dip brazing	245 °C
Soldering time	3...4 Seconds
Preheating temperature	80 °C
Preheating time	30 Seconds

### Cleaning

Do not immerse keypad more than 8 mm into the detergent (see sketch below).



## Characteristics of material

### Keypad housing

Polyester thermoplastic  
Crastine XB 3035, fire protection class V-O as UL94

### Membrane

Silicon rubber  
Elastosil R420/60 black

#### Characteristics:

- ♦ Weatherproof and resistant to aging
- ♦ repulsive to water and adhesives
- ♦ physiologically neutral
- ♦ odorless and insipid
- ♦ resistant to ozone
- ♦ non corrosive
- ♦ bacteriological immunity
- ♦ ant vibrant effect at extreme temperatures
- ♦ radio-resistant
- ♦ easy to combine with other materials
- ♦ excellent dielectric data, such as high disruptive strength, creeping strength, resistant to electric arc and corona, low dissipation factor.

Ask for our list of resistance to chemicals or provide all details of your specific application.