

Electrotechnical and Electronic Products for the Future.

Keyboards of high technology and excellent quality.

With high switching reliability even during speed typing. Standard or customized, intelligent or non-encoded versions. Connectable to all popular EDP systems. Modern design. Harmonious colours. Variety of sizes and heights. Ergonomic styling. With or without housing.

Keymodules. For high technology keyboards.

M 8, M 9, MX. Keyswitches with exceptional performance. High switching reliability through »Gold Crosspoint« contacts. Low profile design. Excellent touch feeling. Variety of keycap styles and colours. Ideal for ergonomically designed keyboards.



Selector switches with proven reliability and long life.

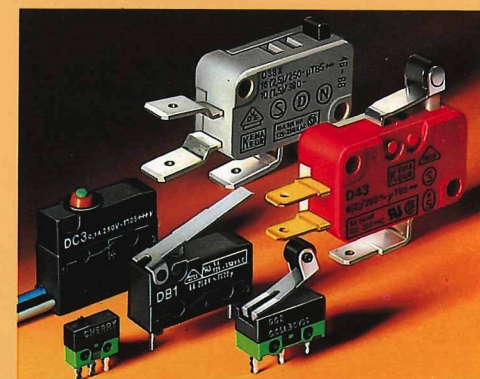
Available in many standard and customized codes. Thumbwheel, leverwheel or pushwheel versions. Gang assemblies. Solder-pins, connectors or plain soldering. Standard, miniature and subminiature sizes. Also illuminated through LEDs or lamps. Customized lettering and stop limitation available.

Snap switches for the future.

For precise switching and high reliability. Large range of standard and non-standard models. Many different connecting possibilities. Standard, miniature and subminiature sizes. And a large number of auxiliary actuators.

New generation displays.

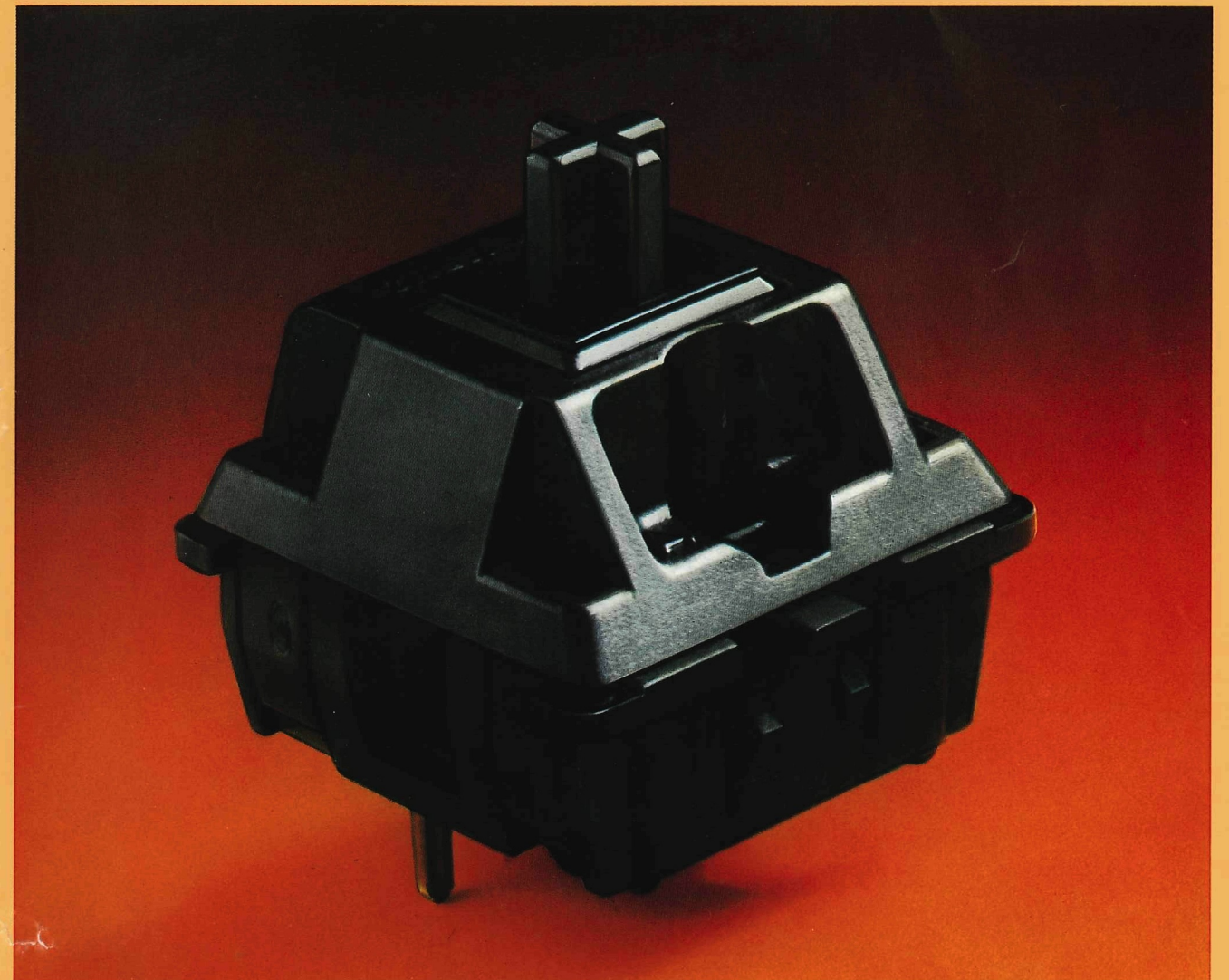
For text and graphic applications. With continuous brightness of all letters. Stable display picture. Long life. Slim profile. Light weight. Low power consumption.

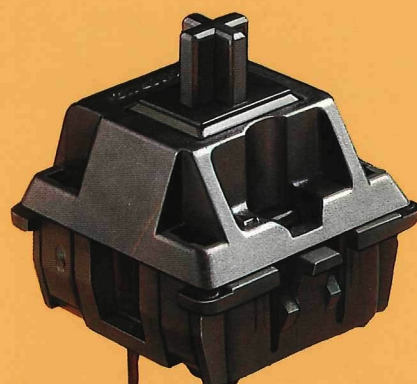


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Keymodule MX.

Modern Technology for ergonomic Keyboards.





Important Features

- Switch versions include momentary and alternate action as well as linear or tactile feel.
- 4mm full travel.
- Circuitry S.P.S.T. – N.O.
- Connector pins constructed for machine soldering.
- Switches can be snapped into a frame or mounted directly onto the printed circuit board.
- Low contact resistance.

Technical Data

Material – plastic parts _____ Thermoplastic UL-recog.-comp.
 – contacts _____ AuAg 10
 – spring _____ Stainless steel.

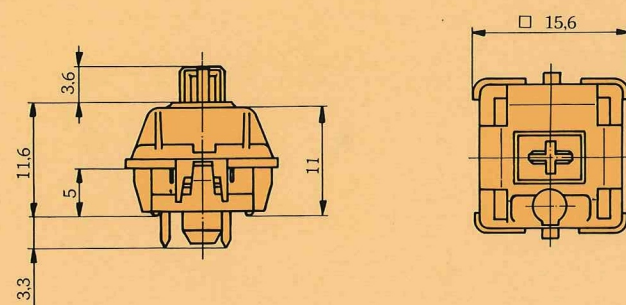
Protection _____ DIN 40050 IP 40.

Storage Temperature _____ -40°C (-40°F) to +70°C (+158°F).

Operating Temperature _____ -10°C (+14°F) to +70°C (+158°F).

Humidity _____ 5% – 95% w/o cond.

Solderability _____ applicable for machine soldering 5 sec. at 260°C.

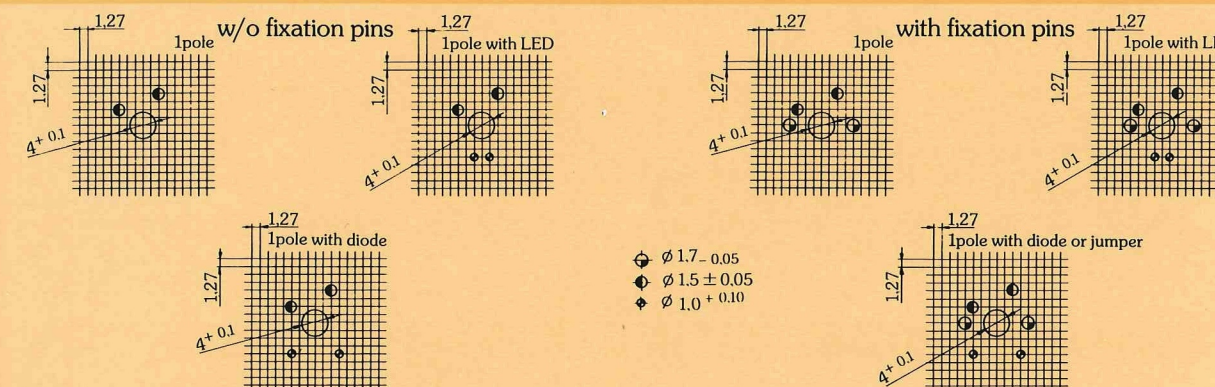


Main Advantages

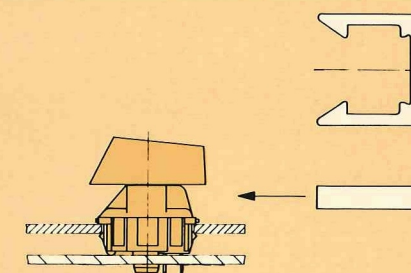
- The MX is a modern full-travel low-profile keyswitch.
- »Gold Crosspoint« Contacts ensure highest reliability.
- The keyswitch module is designed to meet all current ergonomic standards demanded for word and data processing applications.
- High reliability also during quick actuation.
- Switch options include integrated color LED, de-coupling diode and wire jumper.
- MCBF = 1×10^9

- Standard spacing 19.05 mm (upon request ≥ 16 mm).
- Low-profile height from base of keyboard to top of keycaps in homerow using cylindrical keycaps < 30 mm.

Layout of P.C.B.



Locking Unit

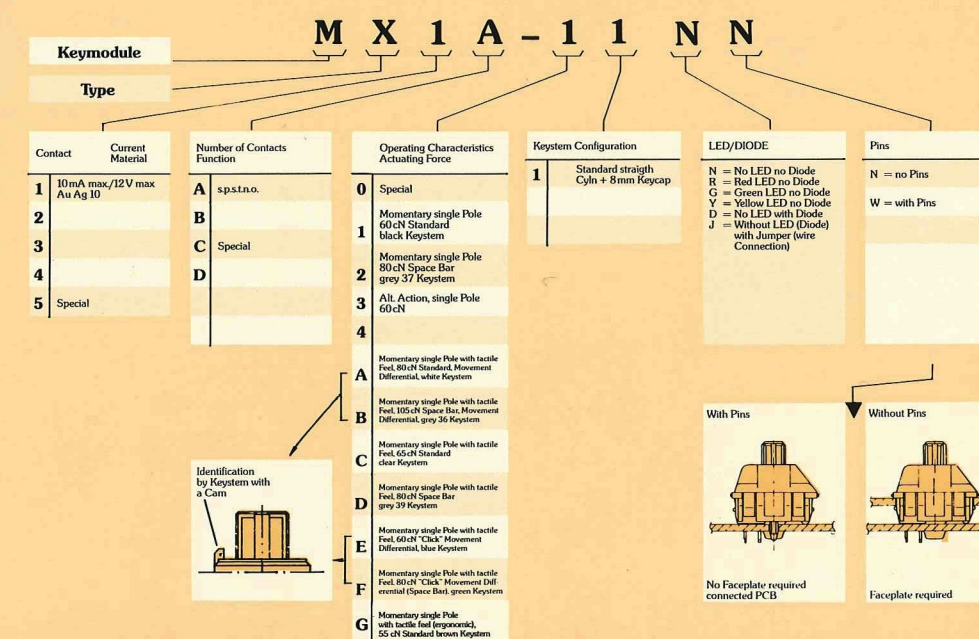


Locking Device
for MX Keyswitches

Locking Device for the following Keycaps

| Part. No. | Cyln. | 8mm |
|-----------|-------|-----|
| 604-0323 | x | |
| 604-0324 | | x |

Index System



Mechanical Data

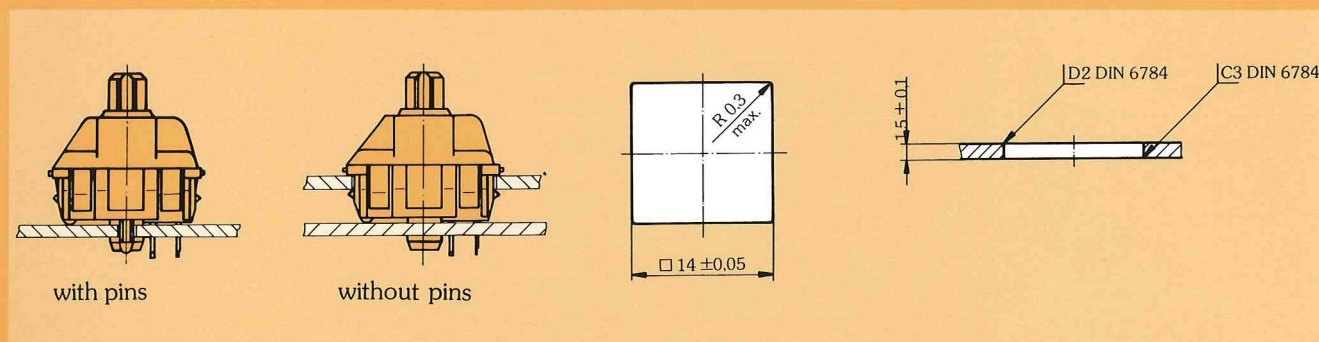
| | Keyswitch with linear actuation | Keyswitch with soft tactile feel | Keyswitch with click tactile feel | Keyswitch with alternate action | Keyswitch with tactile feel (ergonomic) |
|-----------------|---------------------------------|----------------------------------|-----------------------------------|---------------------------------|---|
| Total travel | 4 - 0.4 mm | 4 - 0.5 mm | 4 - 0.5 mm | 4.2 ± 0.3 mm | 4 - 0.4 mm |
| Pretravel | 2 ± 0.6 mm | 2.0 ± 0.6 mm | 2.2 ± 0.6 mm | 1.4 ± 0.4 mm | 2 ± 0.6 mm |
| Operating force | 60 ± 20 cN | 55 ± 20 | 50 ± 15 cN | 60 ± 20 cN | 45 ± 20 cN |
| Tactile force | - | 65 ± 20 | 60 ± 15 cN | - | 55 ± 20 cN |

Electrical Data

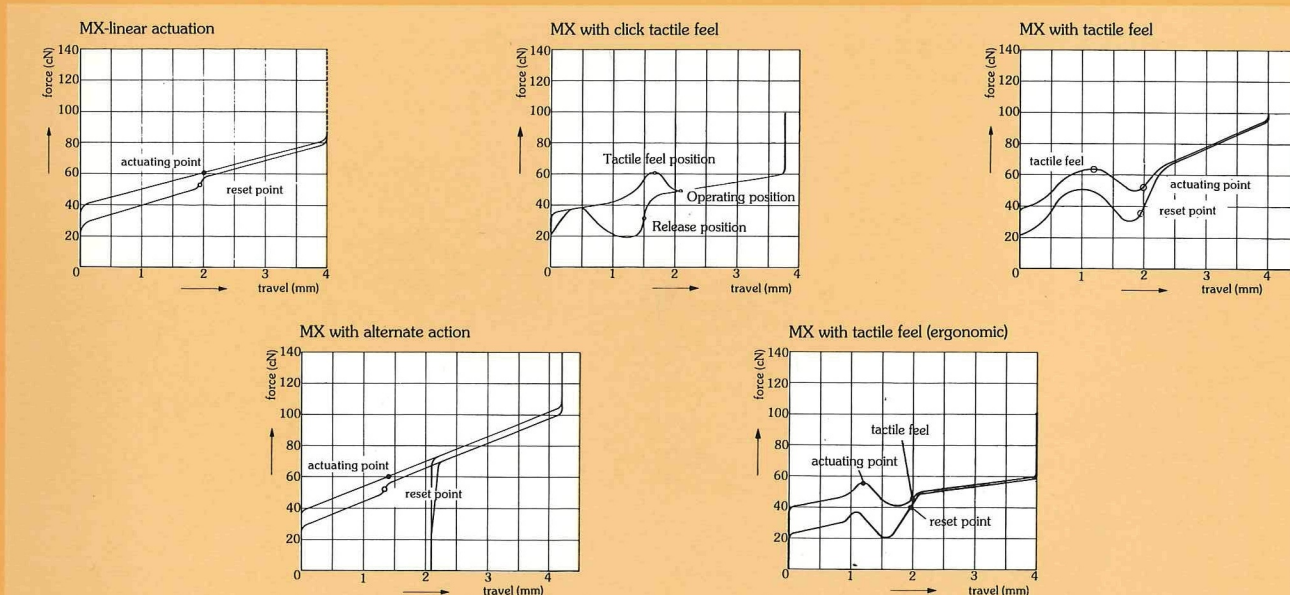
| | | |
|--|---------------------------------|--|
| Voltage | 12 V max. AC/DC; 2 V min. DC | Life cycle w/o electrical load/at 5 V, 1 mA |
| Current | 10 mA max. AC/DC; 10 µA min. DC | - MX linear 50 x 10 ⁶ operations |
| Insulation resistance | new/100 M Ω | - MX soft 20 x 10 ⁶ operations |
| Capacity at 1/kHz | < 2 pF | - MX click 20 x 10 ⁶ operations |
| Bounce time at actuation speed 0.4 m/s | ≤ 5 ms | - MX alternate action 500 000 alternate operations |
| | | - MX ergonomic 50 x 10 ⁶ operations |
| | | Initial contact resistance 200 m Ω (typ. 25 m Ω) |

Keyswitch Assembly

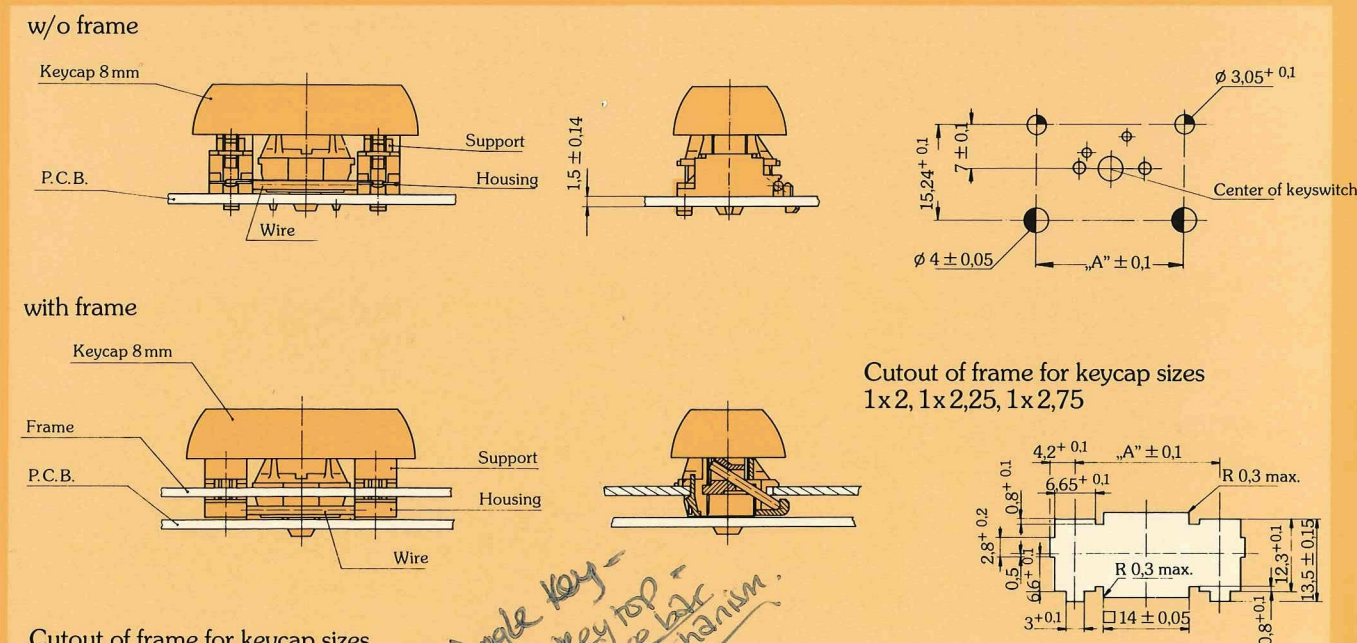
Direct PCB-Mounting onto metal frame



Force/Travel Diagram



Spacebar Mechanism



Cutout of frame for keycap sizes 1x3, 1x7, 1x8, 1x9, 1x10

| Size of keycap | 1x2 1x2,25 1x2,75 | 1x3 | 1x8 | 1x8 1x9 1x10 | 1x7 |
|---------------------|-------------------------|-------------|----------|--------------------|------|
| Type of keycap | 8mm Cyl. | 8mm Cyl. | 8mm | Cyl. | Cyl. |
| „A“ (in mm) | 23,8 | 38,1 | 133,35 | 114,3 | |
| Part No. with frame | G99-0224 | G99-0225 | G99-0226 | G99-0379 | |
| Part No. w/o frame | G99-0742 | G99-0743 | G99-9744 | G99-0745 | |

Keycaps

Cylindrical type (7 mm)

