

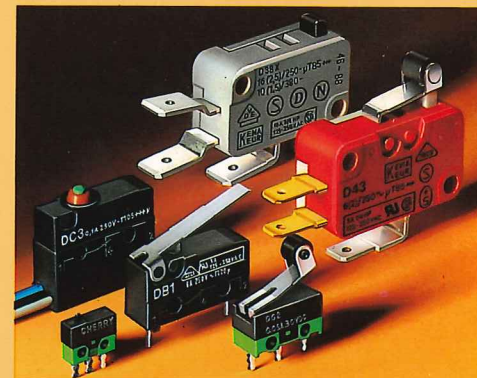
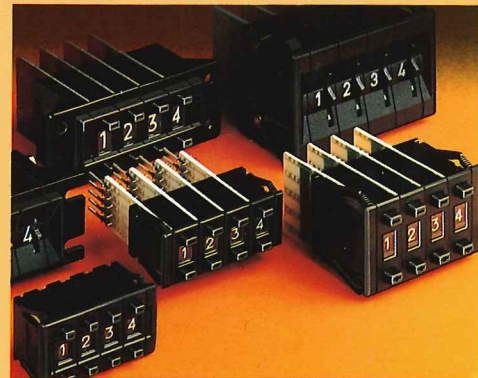
Electrotechnical and Electronic Products for the Future.

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.

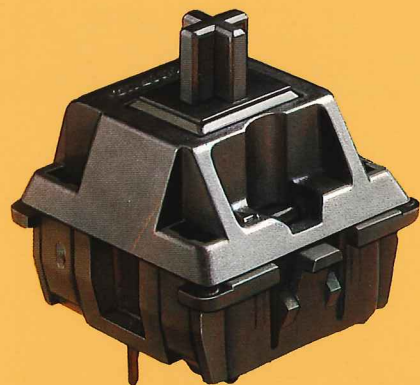


Keymodule MX.

Modern Technology for ergonomic Keyboards.



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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

Important Features

- Switch versions include momentary and alternate action as well as linear or tactile feel.
- 4 mm 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.

- 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.

Technical Data

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

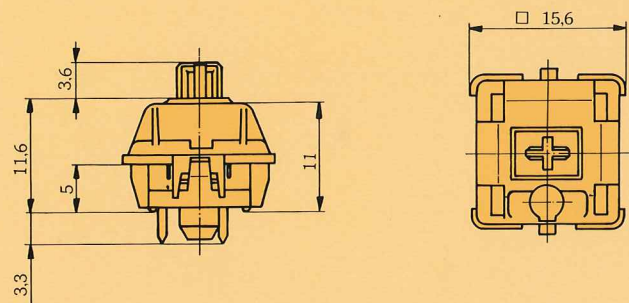
Protection _____ DIN 40050 IP 40.

Storage Temperature _____ -40°C (-40°F) to $+70^\circ\text{C}$ ($+158^\circ\text{F}$).

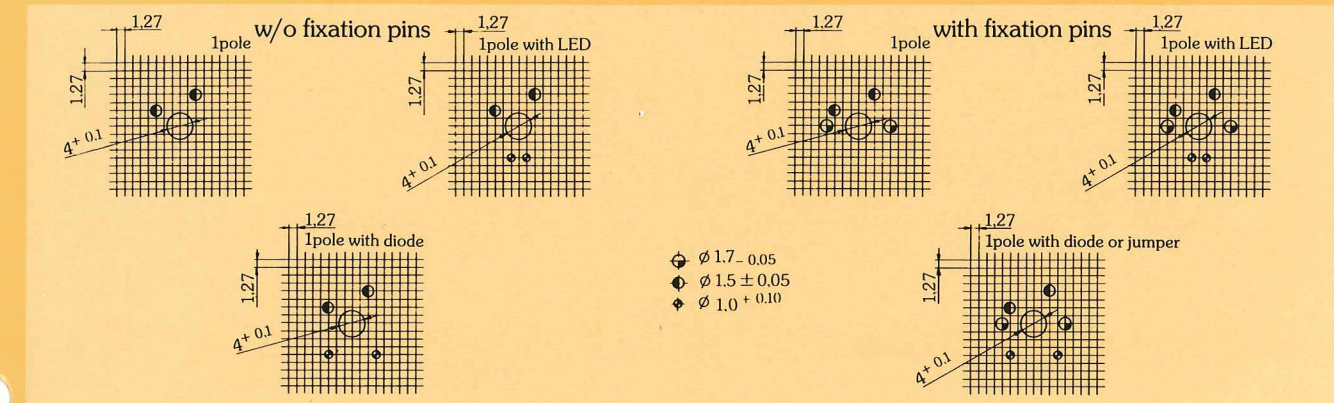
Operating Temperature _____ -10°C ($+14^\circ\text{F}$) to $+70^\circ\text{C}$ ($+158^\circ\text{F}$).

Humidity _____ 5% – 95% w/o cond.

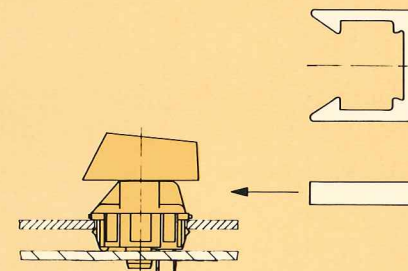
Solderability _____ applicable for machine soldering 5 sec. at 260°C .



Layout of P.C.B.



Locking Unit

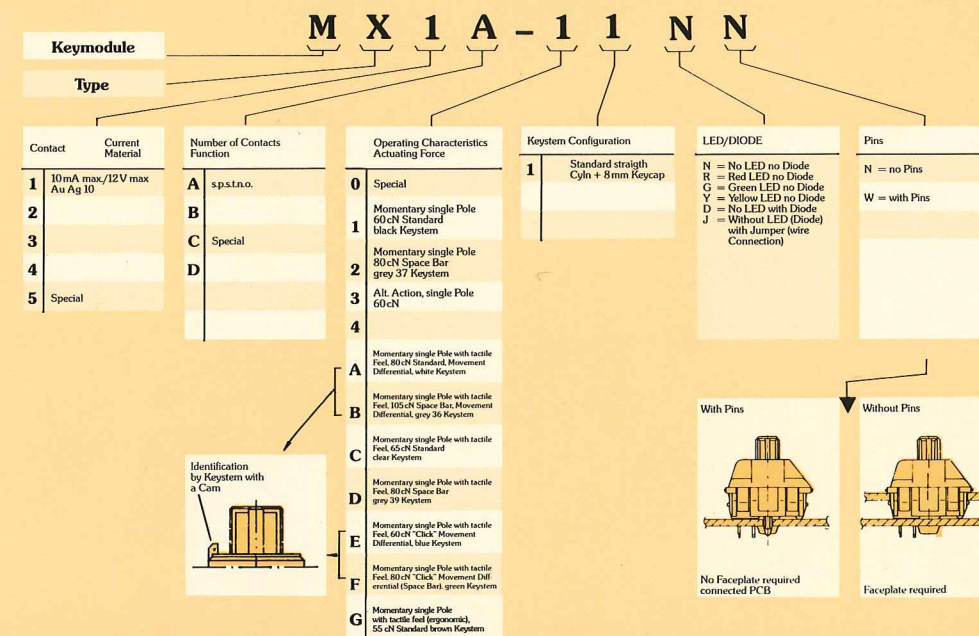


Locking Device for MX Keyswitches

Locking Device for the following Keycaps

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

Index System



Errors, omissions and technical modifications excepted. Technical specifications provided herein constitute specifications only; they do not guarantee that actual products do possess these characteristics. Exact figures can only be taken from drawings in connection with product specifications.

Mechanical Data

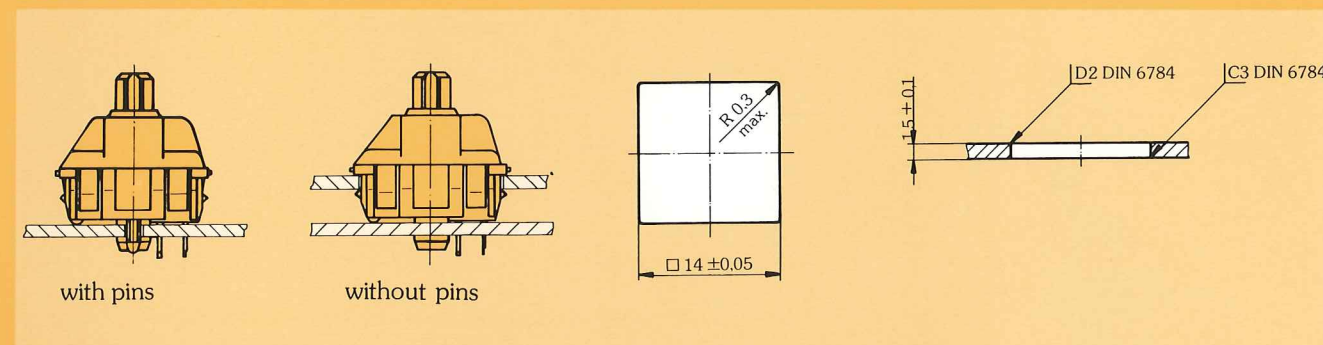
	Keyswitch with linear actuation	Keyswitch with soft tactile feel	Keyswitch with click tactile feel	Keyswitch with alternate action	Keyswitch with tactile feel (ergonomic)
Total travel	4 - 0.4 mm	4 - 0.5 mm	4 - 0.5 mm	4.2 ± 0.3 mm	4 - 0.4 mm
Pretravel	2 ± 0.6 mm	2.0 ± 0.6 mm	2.2 ± 0.6 mm	1.4 ± 0.4 mm	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

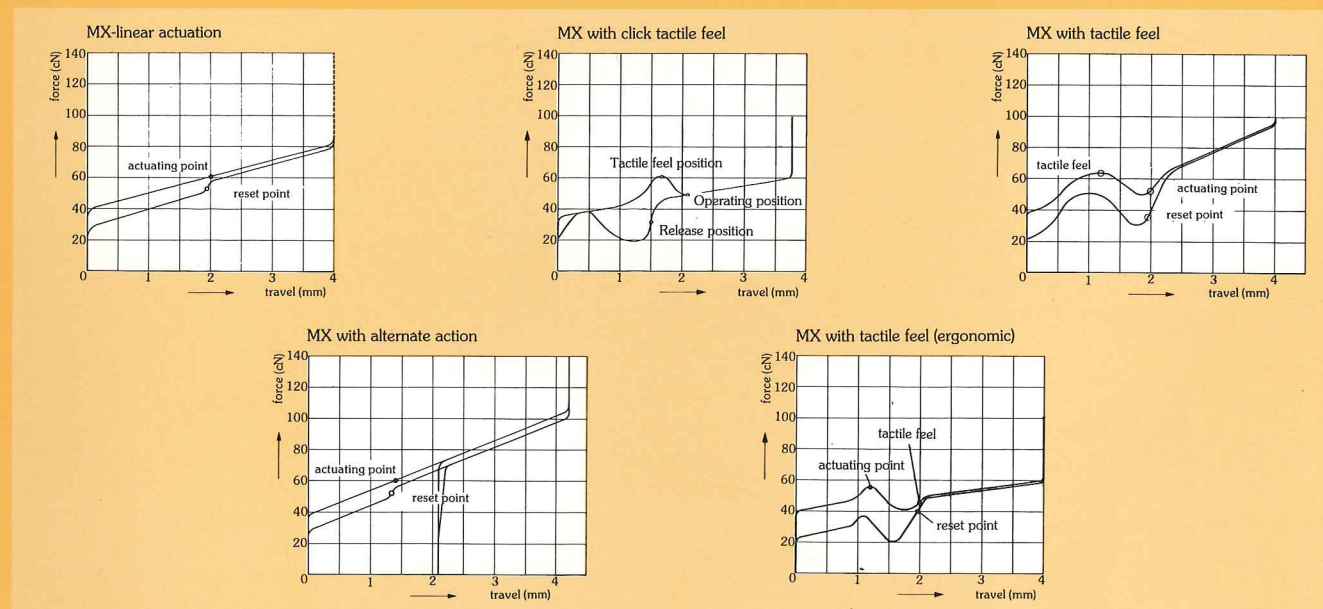
Voltage	12 V max. AC/DC; 2 V min. DC	Life cycle w/o electrical load/at 5 V, 1 mA	
Current	10 mA max. AC/DC; 10 µA min. DC	- MX linear	50 x 10 ⁶ operations
Insulation resistance	new/100 M Ω	- MX soft	20 x 10 ⁶ operations
Capacity at 1/kHz	< 2 pF	- MX click	20 x 10 ⁶ operations
Bounce time at actuation 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

w/o frame

with frame

Cutout of frame for keycap sizes 1x2, 1x2,25, 1x2,75

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

*- single key-top -
Double key top -
with space bar mechanism.*

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

