

## Technical specifications

Electrical characteristics	Module ML	Module MX	
Switching voltage	12 VAC/DC max.	12 V AC/DC max.	
Switching current	10 mA AC/DC max.	10 mA AC/DC max.	
Dielectric strength	500 V / 50 Hz	500 V/50Hz	
Durability at 5V, 1mA linear actuation	_	50 x 10 <sup>6</sup>	
Durability at 5V, 1mA tactile feel click	20 x 10 <sup>6</sup>	50 x 10 <sup>6</sup>	
Durability at 5V, 1mA alternate action	_	0,5x10 <sup>6</sup>	
Durability at 5V, 1mA alternate action		50x10 <sup>6</sup>	
Mechanical characteristics			
Contact configuration	Single-pole contact	Single-pole contact	
Action	Pressure point click	Linear, pressure point click, alternate action, ergonomic	
Actuator travel	3,0-0,5mm	4,0-0,4 mm Impuls/4,2 0,3 mm Rast/4-0,5 mm click	
Pretravel	$1,5 \pm 0,5\mathrm{mm}$	2 ± 0,6 mm lmpuls/1,4 0,4 mm Rast/2,2 0,6 mm click	
Initial force	30 cN min	25 cN min.	
Actuation force	$45 \pm 20  \text{cN}$	$60 \pm 20\text{cN}$ linear a. Rast; 45 20 cN, ergonom. and 50 15 cN click	
Pressure point force	$50 \pm 20 \mathrm{cN}$	$55 \pm 20\mathrm{cN}$ , pressure point ergonomic/60 $15\mathrm{cN}$ pressure point click	
Bounce time during actuation with 0,4 m/s	≤5 ms	≤5 ms	
Standard lead spacing	18 mm (16 mm min.)	19,05 mm (16 mm min.)	
Fastening	Fixing pins in the printed circuit board	Snap fastening in frame or fixing pins in the printed circuit board	
Lighting (optional)	_	LED in red, green or yellow	
Decoupling diode	_	optional	
Wire jumper	optional	optional	
Materials			
Insulation materials	Thermoplastics (min.UL 94 HB)	Thermoplastics (min.UL 94 HB)	
Spring	Stainless steel	Stainless steel	
Contacts	High-quality gold alloy	High-quality gold alloy	
Other Characteristics			
Protection class	IP 40	IP 40	
Operating temperature	-10°C to +70°C	−10°C to +70°C	
Storage temperature	-40°C to +70°C	-40°C to +70°C	
Humidity (without condensation)	5% to 95%	5% to 95%	
Soldering capability	see soldering specifications	see soldering specifications	

For detailed information and the layout of the details described above, please do not hesitate to ask for our technical specifi cations and drawing.



# Keymodule MX

### Features

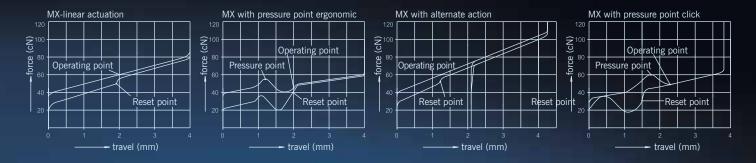
The constructive design of the key and the design of the associated keycaps fulfil the ergonomic requirements for data input workstations. Long operating life with gold crosspoint contact and high reliability with quick actuation. Optionally with integrated colour LED decoupling diode or wire bridge. 4 mm actuation travel.

Size of keycap	1 x 2 1 x 2,25 1 x 2,75	1x3	1x8
Type of keycap	8 mm/CyIn	8 mm/CyIn	8 mm/CyIn
"A" (in mm)	23,8	38,1	133,35
Part-No. (without Pins)	G99-0224	G99-0225	G99-0226
Part-No. (with Pins)	G99-0742	G99-0743	G99-0744

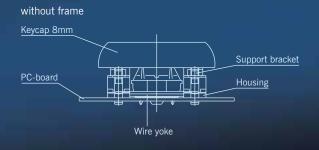
# View of keymodule Keyswitch assembly With fixing pins with fixing pins and diode or wire bridge With fixing pins with fixing pins and diode or wire bridge



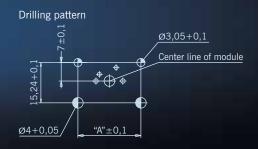
## Force/travel diagram

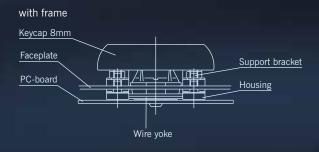


## Multiple key mechanical











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

