K12 Key Switch

The K12 key switch has been successful in measurement and control equipment, in industrial electronics, as well as in automotive applications. The contact system is distinguished by its high switching reliability during the life of one million operations, because making contact and tactile feel point are separate.

This key switch, with gold contacts, has become a family with a broad range of versions.

New: K12P: same as K12D but without external attachment for LED.

New: K12PL, K12PM, K12PN: three versions: each with a special coding pin but in different position. Coding of LED color.

New: Types with 1.5 mm (0.0591) travel and 5N (500 grams) operating force are available with a snap-point free pre-travel of 0.3 mm (0.0118) or 0.5 mm (0.0197).
The switches can be mounted with light pretension.

Main features

- Tactile feedback: distinctive tactile feel
- Available in a choice of travel lengths of 1.0 –1.5 – 2.0 mm (0.039 – 0.059 – 0.079) and a choice of operating forces (2.5 and 5N as standard). The special contact system of the K12 allows for variation of the button travel, the tactile snap point and the operating force according to the customers' application. The tactile feedback can be soft (with 2.5N (250 grams) or without snap-point and 1.5N (150 grams)) for frequent operation or strong (5N (500 grams)) for operation under rough conditions e.g. with gloves.
- K12C is sealed by a rubber cap: IP 67, others IP 50, the PC board can be washed till 5 housing height of K12. IP 67 means dust tight and protected against the effects of immersion in water.
- Buttons: see page B-9.

Construction	
Function	Momentary action
Contact arrangement (NO = normally open, NC = normally closed)	1A (1 make contact = SPST) NO, 1R (1 break contact[2]) NC
Illumination	K12PL, K12GL and K12DL with 1 LED (central, second LED in external attachment to housing, only central mounted)
Distance between button centers, min.	11 (0.433); K12C = 13 (0.512)
Terminals	PC pins, tinned
Mounting	Locating pins, K12D, K12G and K12P additionally with snap-in housing
Electrical data	
Switching power min./max.	0.02 mW / 3 W
Switching voltage min./max.	2 V DC / 30 V DC
Switching current min./max.	10 µA / 100 mA
Dielectric strength (50 Hz, 1 Min.)	≧ 500 V
Operating life with max. switching power	≧ 10^6 operations[1]; K12G: 5×10^4 operations
Contact resistance, initial	≦ 50 mΩ; K12G second contact: 50 mΩ
Insulation resistance	≧ 10^{10} Ω
Bounce-time Operating speed 400 mm/s (15.75/s)	≦ 1 ms
Mechanical data	
Total travel/switching travel	see table page B-7 switching travel 0.6 (0.024)
Operating force	5N (500 grams) with 1 (0.039) total travel; K12A and K12P also with 2 (0.079) total travel; 2.5N (250 grams) with 1.5 (0.059) total travel; all versions without snap-point available, but only with 1.5N (150 grams) K12G, K12GL: 3.5/7N (350/700 grams) or 6/12N (600/1200 grams)
Protection class	K12C: IP 67 (dust tight, protected against the effects of immersion in water), others IP 50
Further data	
Contact material	Gold over Ni
Housing material	Thermoplastic
Color of the integrated button	black, colored buttons available on request
LED-colors	red, green, yellow
Graphics	upon request
Max. soldering time and temperature	5 s at 260°C
Solderability	The PC board can be washed till 5 housing height of K12
Operating temperature	– 40°C to + 85°C
Storage temperature	– 40°C to + 95°C

[1] Tested with U = 5 V and I = 10 mA; contact resistance after 10^6 operations and test with industrial atmosphere: < 250 mΩ, typ 30 mΩ

[2] Standard: 1A = make contact/NO (without indication), break contact/NC; 1R = break contact: 1R to be added to the designation: for all types except K12AL, K12DL, K12G, K12GL, K12PL, K12PM and K12PN

Ordering code: see page B-10

K12 versions:

K12P: flat-sided, snap-in housing, integrated button, mountable in rows with 11 mm (0.433) spacing between button centers, also available with 2.0 mm (0.078) total travel

K12A: integrated button, mountable in rows with 11mm (0.433) spacing between centers, flat-sided without snap-in housing. Also available with 2.0 mm (0.078) total travel.

Same as K12A, but:

K12AL: with 1 central LED, mounted; LED color: RD (red), GN (green) or YE (yellow)

K12C: round housing, IP 67 acc. to DIN/IEC 529 (dust tight, protected against the effects of immersion in water), with rubber cap, mountable in rows with 13.0 mm (0.512) spacing between button centers

Same as K12P, but:

K12D: flat-sided, snap-in housing, integrated button, mountable in rows with 11.0 mm (0.433) spacing between button centers, external attachment to housing for a second LED (not mounted, must be ordered separately with indication of color: RD (red), GN (green) or YE (yellow): e.g. LED RD = red LED

Same as K12D, but:

K12DL: with 1 central LED, mounted; LED color: RD (red), GN (green) or YE (yellow)

Overview K12 family:

The types with 1.5N (150 grams) have no snap-point. K12A and K12P also available with 2 (0.0787) total travel. All types – except with a central LED: K12AL, K12DL, K12GL, K12PL, K12PM and K12PN – are available as break contact (NC = normally closed): 1R to be added to the designation.

Description	integrated button	with central LED
Standard = K12P with snap-in housing 11 mm (0.433) spacing between button centers	K12P	K12PL
Rubber cap, IP 67	K12C	–
LED attachment to housing; snap-in housing	K12D	K12DL
2 impulses: one after the other; snap-in housing; LED attachment to housing	K12G	K12GL
Same as K12P but without snap-in housing 11 mm (0.433) spacing between button centers	K12A	K12AL

K12G: 2 make contacts (2 × SPST), with 2 separate contact systems, which switch one after the other, operating force: 3.5N and 7N (350 grams and 700 grams) or 6N and 12N (600 grams and 1200 grams) the first contact can also be a break contact (upon request), integrated button, mountable in rows with spacing between button centers 11.0 mm (0.433), snap-in housing with external attachment for LED (not mounted, LED must be ordered separately with color indication: RD = red, GN = green or YE = yellow: e.g. LED RD = red LED)

Same as K12G, but:

K12GL: with 1 central LED, mounted; LED color: RD (red), GN (green) or YE (yellow)

Applications for K12G and K12GL: switching circuits e.g. slow – fast, left – right or up – down

New: K12P, K12PL, K12PM and K12PN

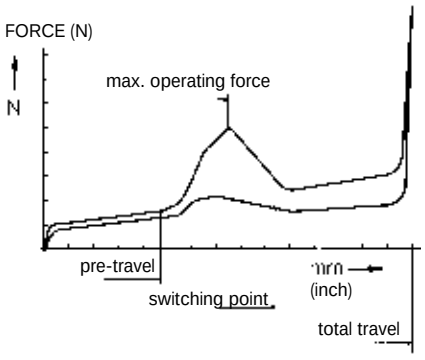
Same as K12P, but:

K12PL, K12PM, K12PN: with 1 central LED, mounted with coding pin for LED color or any other function.

LED color: RD (red), GN (green) or YE (yellow)

These 3 versions have one special coding pin each but in different position (see drawing)

Typical force/travel curve

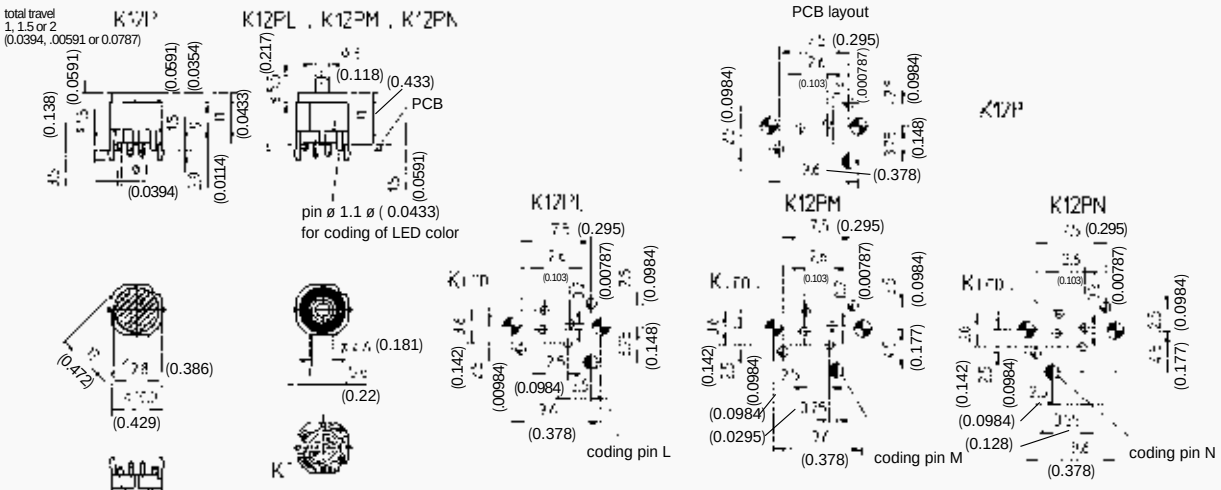


Note: The types with 1.5N (150 grams) have no snap-point. K12A and K12P also available with 2 (0.0787) total travel. All types – except with a central LED: K12AL, K12DL, K12GL, K12PL, K12PM and K12PN – are available as break contact (NC = normally closed): 1R to be added to the designation.

K12 Key Switch

Dimensional Drawings

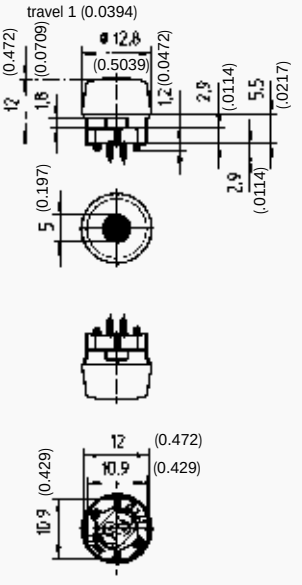
K12P (same as K12D but without external attachment to housing); K12PL, K12PM and K12PN with different pin for coding (e.g. LED color)

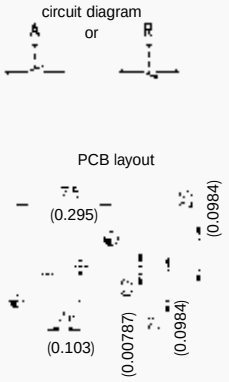


circuit diagram

	1.8 ± 0.1 (0.0709)	2×	2×	snap-in		
	1.5 ± 0.1 (0.0591)	1×	1×	(L, M, N) / coding hole		
	1.1 + 0.05 (0.0433)	2×	2×	center hole		
	0.9 ± 0.05 (0.0354)		2×	LED	⌀0.5 (0.0197)	SnPb
		2×	2×	switch	0.7×0.2 (0.0276×".00787)	SnPb
hole	B	without LED	with LED	description	terminal section	surface

K12C with cap, IP 67 acc. to DIN/IEC 529: dust tight, protected against the effects of immersion in water

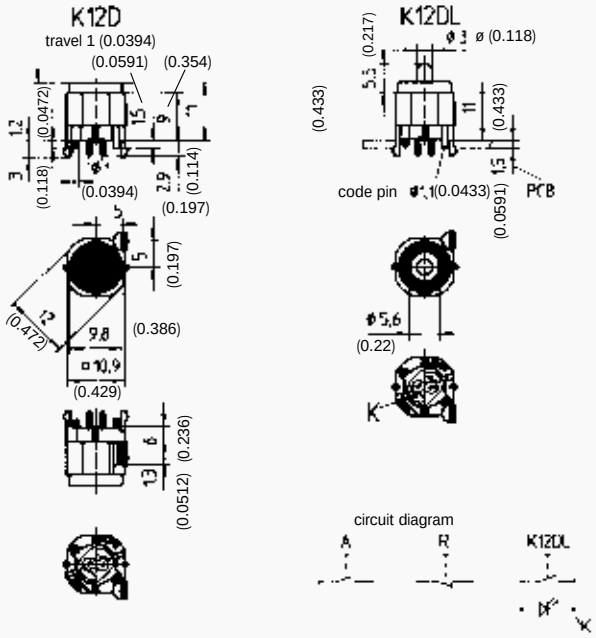


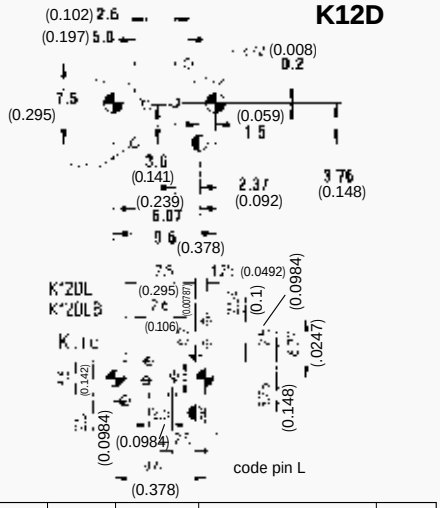


	1.1 + 0.05 (0.0433)	2×	center hole		
	0.9 ± 0.05 (0.0354)	2×	switch	0.7×0.2 (0.0276×0.0787)	SnPb
hole	B	without LED	description	terminal section	surface

Dimensional Drawings

K12D types



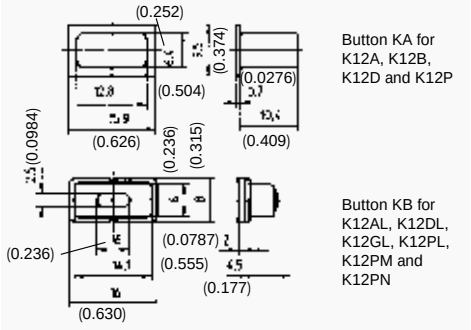


⊕	1.8 ± 0.1 (0.0709)	2×	2×	snap-in		
⊕	1.5 ± 0.1 (0.0591)	1×	1×	code		
⊕	1.1 + 0.05 (0.0433)	2×	2×	center hole		
⊕	0.9 ± 0.05 (0.0354)		2×	2. LED	⌀0.5 (0.0197)	SnPb
			2×	LED		
		2×	2×	switch	0.7×0.2 (0.0276×0.00787)	SnPb
hole	B	without LED	with LED	description	terminal section	surface

K12 buttons

The K12A, K12C, K12D and K12P key switches have an integrated button.

The KA and KB buttons can be mounted as free floating in key boards and are held by the front panel. KA and KB have no permanent fastening with the K12 key switch like K12A, K12B, K12D or K12P.



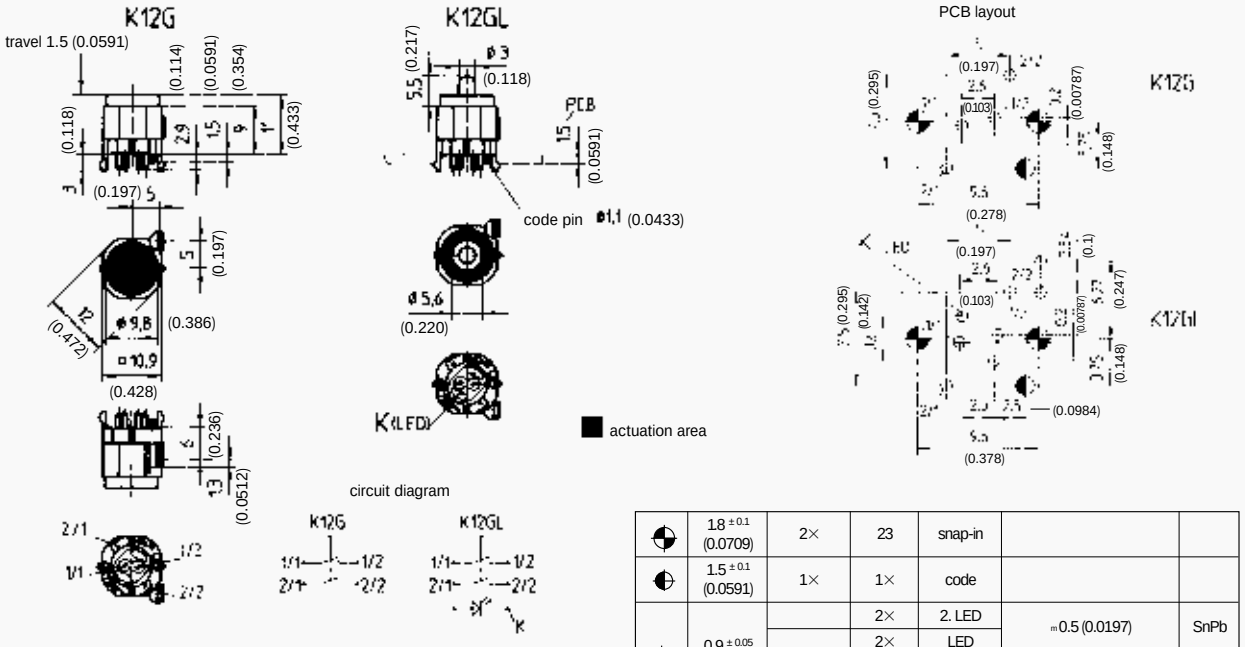
Button KA for K12A, K12B, K12D and K12P

Button KB for K12AL, K12DL, K12GL, K12PL, K12PM and K12PN

K12 Key Switch

Dimensional Drawings

K12G with 2 make contacts (2 × SPST), 2 pulses: one after the other, the first can also be a break contact, K12GL with LED
Operating force: 3.5N and 7N (350 grams and 700 grams) or 6N and 12N (600 grams and 1200 grams)



	1.8 ±0.1 (0.0709)	2×	23	snap-in		
	1.5 ±0.1 (0.0591)	1×	1×	code		
	0.9 ±0.05 (0.0354)		2×	2. LED	⌀0.5 (0.0197)	SnPb
			2×	LED		
		2×	2×	switch 2	0.7×0.3 (0.0276×0.0118)	SnPb
		2×	2×	switch 1	0.7×0.2 (0.0276×0.00787)	SnPb
hole	B	without LED	with LED	description	terminal section	surface

Ordering code		1	2	3	4	5	6
	Example:	K12DL		RD	1	5N	
1	**Designation:** K12A, K12AL, K12AH, K12AK, K12C, K12D, K12DL, K12DH, K12DK, K12G, K12GL K12P, K12PL, K12PM, K12PN						
2	**Button color** of K12A, K12D, or K12P: BK (black) = standard, other colors available on request						
3	**LED color** for K12AL, K12GL, K12DL, K12PL, K12PM, K12PN: (Central Mounted LED[1]) RD (red), YE (yellow), GN (green)						
4	**Total travel** in mm (inch): 1 (0.0394); 1.5 (0.0591); K12A and K12P also 2 (0.0787)						
5	**Operating force:** 5N (500 grams) = standard, 2.5N (250 grams); 1.5N (150 grams) (= without snap-point) **K12G, K12GL:** 3.5/7N (350 grams and 700 grams) or 6/12N (600 grams and 1200 grams)						
6	**Special versions:** 1R (to be added for break contact[2]); RA (to be added for K12G and K12GL: first contact is a break (R = normally closed) contact, second is a make (A = normally open) contact						

[1]) LED for external attachment of K12DL, K12G, K12GL, must be ordered separately with color indication: RD (red), YE (yellow), GN (green)
[2]) not for K12AL, K12DL, K12G, K12GL, K12PL, K12PM and K12PN