

New!

KH series

Power rocker switches with protection guard

Distinctive features and specifications



- ☐ Protected against accidental actuation
- ☐ Wide choice of colors
- ☐ Laser etched or pad printed symbols
- ☐ Illuminated or non-illuminated
- ☐ Sealed to IP69K

SW-KH-1709

ELECTRICAL SPECIFICATIONS

- Current/voltage rating with resistive load :
 - Silver plated contacts (A) : 5 A 24 VDC, 100,000 cycles
 - 10 A 24 VDC, 10,000 cycles (terminals 6.35 x 0.8 only)
 - Gold plated contacts (D) : 20 mA 12 V, 150,000 cycles
- Current/voltage rating with lamp load - silver contacts (A) :
 - function 6 : 100 W 24 VDC, 10,000 cycles
 - other functions : 60 W 24 VDC, 10,000 cycles
- Initial contact resistance : 10 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500 VDC
- Dielectric strength : 2,000 Vrms 50 Hz min. between terminals
- Mechanical life : 150,000 cycles min.

MATERIALS

- Case : PA 6-6
- Actuator : ABS
- Bezel : PA 6-6
- Contacts & terminals : brass, solid silver grain, silver plated (A) or brass, solid silver grain, gold plated (D)
- Contact roller : brass, nickel plated

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP69K according to DIN 40050-9
- Salt spray resistance : 96 hours according to IEC 512-6, test 11f
- Vibration resistance : 10-500 Hz / 10 g per IEC 60068-2-6
- Operating temperature : -40 °C to +85 °C

The company reserves the right to change specifications without notice.

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Overview

CASE + LEDS

KH										Side A	Side B												
SERIES				Poles				Contacts				Sealing				LEDS				Wiring			
				3 Single pole 4 Double pole				A Silver D Gold plated				Z IP69K Standard				X None A LED 6 V red B LED 6 V green C LED 6 V yellow M LED 6 V blue R LED 6 V white D LED 12 V red E LED 12 V green F LED 12 V yellow N LED 12 V blue S LED 12 V white J LED 24 V red K LED 24 V green L LED 24 V yellow P LED 24 V blue T LED 24 V white ...				See following pages.			
Protection guard								Terminals				Terminals (continued)											
1 On 4 sides 2 On 2 sides								Solder lug/quick-connect A 10 term. with barrier B 10 term. w/o barrier C 10 terminals for use with connector U2292 or U3152 Normalized quick-connect 6.35.0,8 D 10 term. with barrier E 10 term. w/o barrier F 10 term. for use with connector U2292 or U3152				Normalized quick-connect 2.8x0.8 G 10 term. with barrier H 10 term. w/o barrier J 10 terminals for use with connector U2282											
Electrical functions																							
4 ON ON ON 4-1R ON ON MOM 5 MOM - ON 6 ON - ON 7 MOM OFF MOM 8 ON OFF MOM 9 ON OFF ON																							

ACTUATOR

Type	Color
1 For non-illuminated application	1 Blue
2 For illuminated application	1/4 Dark blue
	2 Black
	3 Green
	4 Grey
	5 Yellow
	6 Red
	7 Ivory
	9 Orange
	A Aluminum bright

ACTUATOR MARKING

	Area A	Area M	Area B
Orientation	Symbols		
N			
O			
S			
E			

Symbols & Accessories : see end of the series.



NOTICE : please note that not all combinations of above numbers are available. Refer to the following pages for further information.

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Case

CASE + LEDS

MODEL STRUCTURE

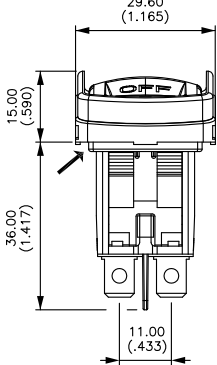
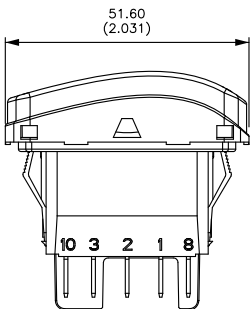
Protection guard on 4 sides - KH1



		2-3	5-6	1-2	4-5
Single pole	Double pole				
	KH144*	ON	ON	ON	
	KH144-1R*	ON	ON	MOM	
KH135	KH145	MOM	-	ON	
KH136	KH146	ON	-	ON	
KH137	KH147	MOM	OFF	MOM	
KH138	KH148	ON	OFF	MOM	
KH139	KH149	ON	OFF	ON	

* Function 4 : single pole in double pole case

→ Flat seal



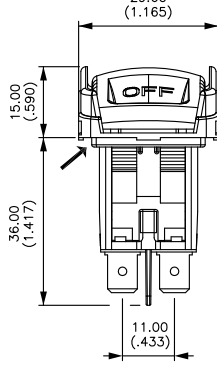
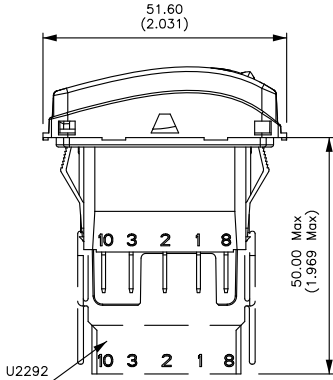
Protection guard on 2 sides - KH2



		2-3	5-6	1-2	4-5
Single pole	Double pole				
	KH244*	ON	ON	ON	
	KH244-1R*	ON	ON	MOM	
KH235	KH245	MOM	-	ON	
KH236	KH246	ON	-	ON	
KH237	KH247	MOM	OFF	MOM	
KH238	KH248	ON	OFF	MOM	
KH239	KH249	ON	OFF	ON	

* Function 4 : single pole in double pole case

→ Flat seal



APEM

www.apem.com

3

KH series

Power rocker switches with protection guard

Case

New!

ELECTRICAL FUNCTIONS AND CONNECTIONS

In the tables below, terminal connections as viewed from bottom of switch.
Only the contact area is represented.

For single pole models, only terminals 1, 2 and 3 are to be considered (not terminals 6, 5, 4).

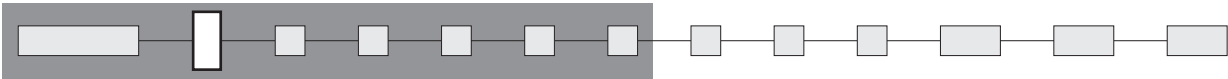
o = with terminal
▲ = momentary

	Positions		
Function 5 KH35-KH45			
Function 6 KK36-KH46			
Function 7 KH37-KH47			

	Positions		
Function 8 KH38-KH48			
Function 9 KH39-KH49			
Function 4 KH44			
Function 4-1R KH44-1R			

TERMINALS

CASE + LEDS



Solder lug / quick-connect

A 10 terminals with barrier
B 10 terminals w/o barrier
C 10 terminals for use with connector U2292 or U3152

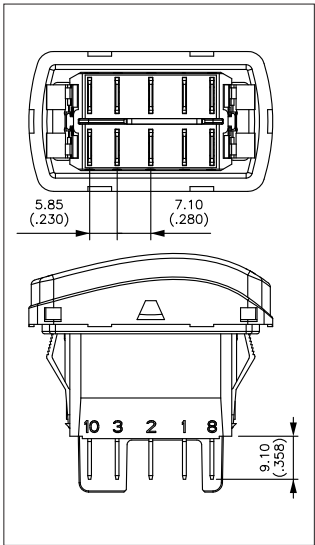
Normalized quick-connect 6.35x0.8

D 10 terminals with barrier
E 10 terminals w/o barrier
F 10 terminals for use with connector U2292 or U3152

Normalized quick-connect 2.8x0.8

G 10 terminals with barrier
H 10 terminals w/o barrier
J 10 terminals for use with connector U2282

Terminals are marked on the case.
The drawings show the maximum possible number of terminals.



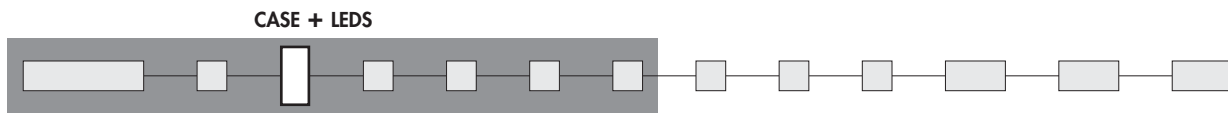
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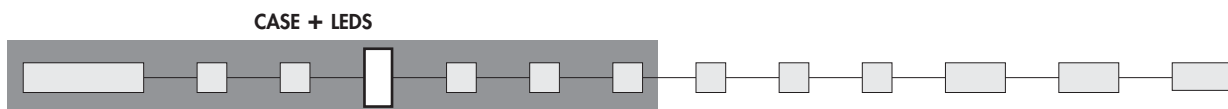
Case

CONTACT MATERIALS



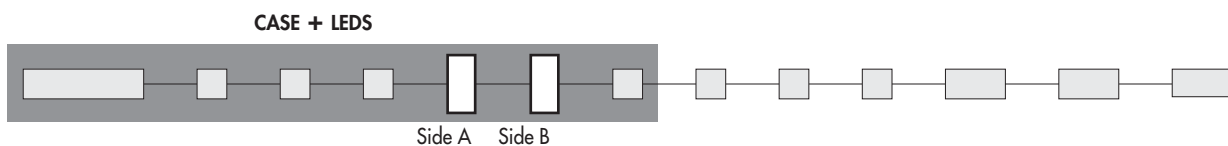
A	Silver
D	Silver, gold plated

SEALING



Z IP69K - standard

LEDS

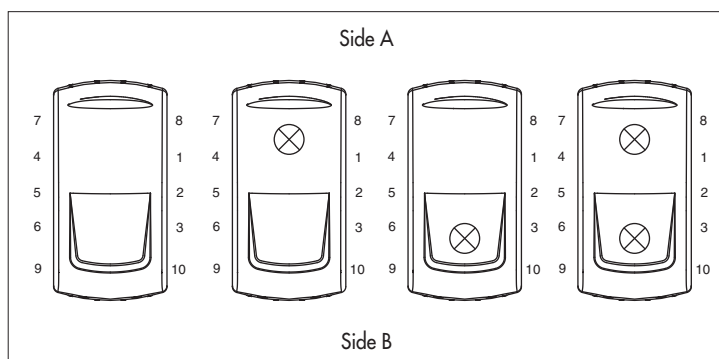


Complete each enlarged box with one of the codes listed below.

X Without LED

	Red	Green	Yellow	Blue	White	Amber	Red/green
6 VDC	A	B	C	M	R	4	1
12 VDC	D	E	F	N	S	5	2
24 VDC	J	K	L	P	T	6	3
No resistor	U	V	W	Y	Z	9	8

LED consumption : 20 mA @ nominal voltage (25 °C)
Other illumination solutions : on request.



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Case - LEDs

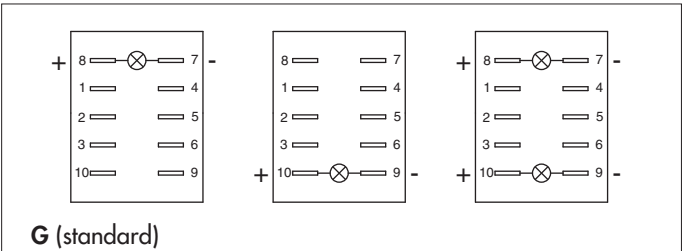
WIRING

The LED wiring diagram is shown on the case.

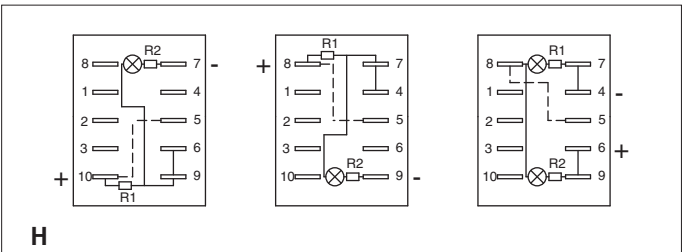
CASE + LEDs



Independent LED or integrated functions



To have independent LEDs.



Available in Single Pole only, with H and J quick-connect terminals.

To obtain 2 symbol illumination levels (night illumination when OFF and higher illumination when ON).

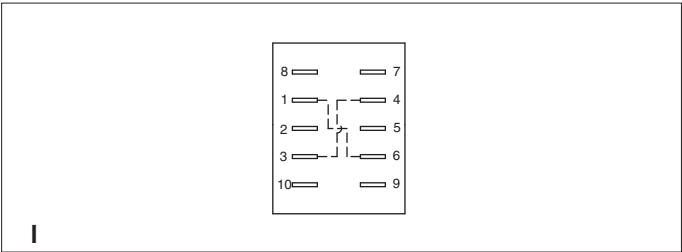
H wiring with LED on side A available with functions 6, 8, 9 and 44.

H wiring with LED on side B available with functions 5, 6 and 9.

H wiring with 2 LEDs available with functions 8 and 9.

More information (H wiring schematics) : on request.

Dotted line = external wiring, continuous line = internal wiring



Power supply between 2 and 5 - Load between 1 and 4 or 3 and 6.
Available with H and J quick-connect terminals.

To have a polarity inversion (typical application : fan motor).

Dotted line = external wiring

Please contact us for other wiring solutions.

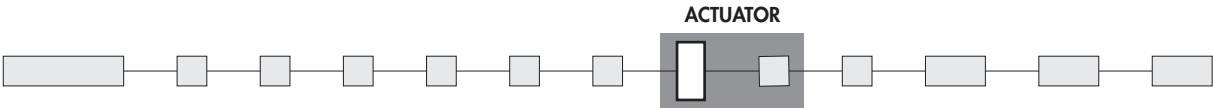
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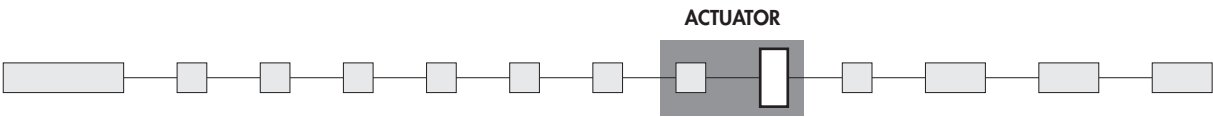
Actuator - Marking

ACTUATOR TYPE



- 1 For non-illuminated application
 - 2 For illuminated application
- Other rocker design : on request.

ACTUATOR COLOR



Code	Color
1	Blue
1/4	Dark blue
2	Black
3	Green

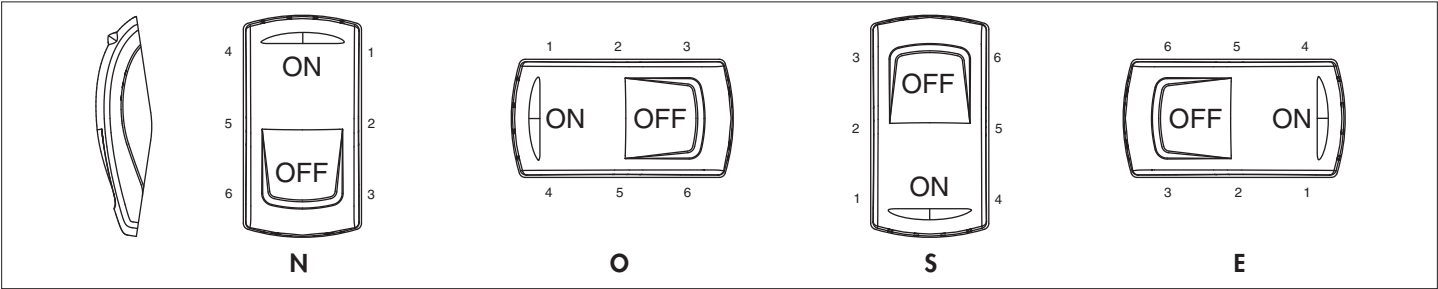
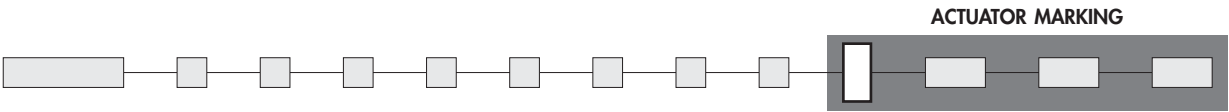
Code	Color
4	Grey
5	Yellow
6	Red
7	Ivory

Code	Color
7/1	White
9	Orange
A	Aluminum bright

Note : colors 7 and 7/1 not available on illuminated versions.
A **soft-touch varnish** can be added. Consult us.



MARKING ORIENTATION If no marking required, complete the box with code N.



Other orientations : on request

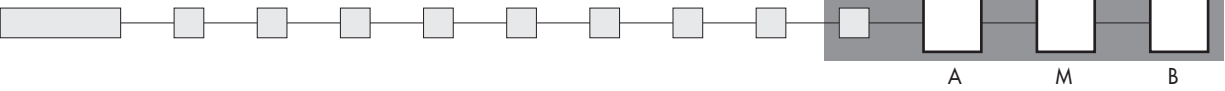
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Marking - Mounting

SYMBOLS



XX No symbol

Available symbols : see end of the series.

Marking color

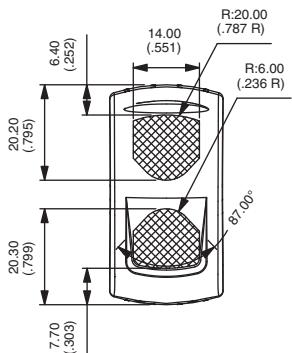
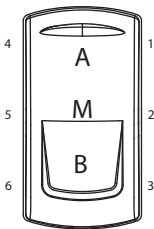
White marking for illuminated rockers (laser etching) and non-illuminated black rockers (pad printing). Black marking for non-illuminated color rockers (pad printing). Other : on request.

Laser etching resistance

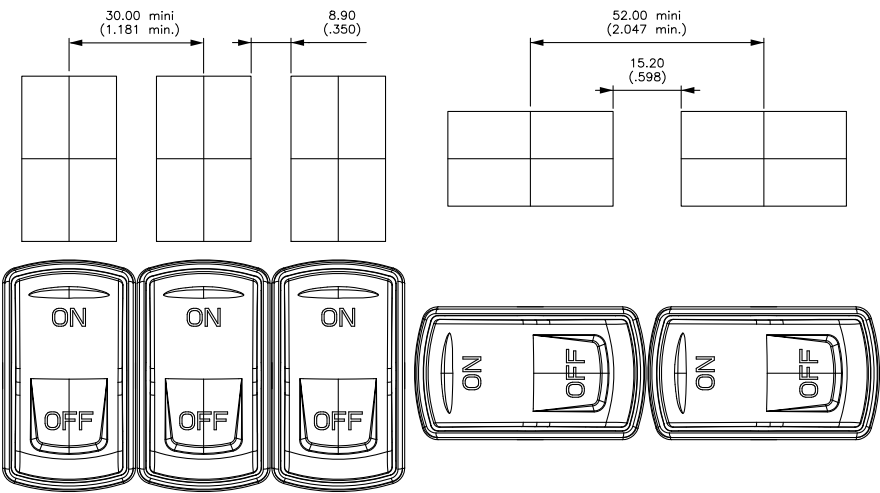
- Water and petrol resistant according to EN61058-1
- Tear resistant (cross-cut test) according to NF ISO 2409 : class 0
- UV resistant according to ISO 4892-2

Marking area

For illuminated versions. The symbol will be included in the hatched area. Marking in M area : on request.

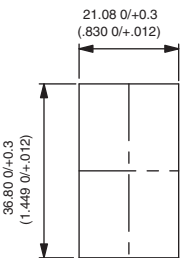


MATRIX MOUNTING



PANEL CUT-OUT

Panel thickness : 0.8 mm to 4.6 mm
Recommended panel thickness :
between 2 mm and 3.5 mm



K range

Power rocker switches and indicators

Symbols

Most symbols meet the ISO 7000 standard “graphical symbols for use on equipment” (code given in bracket in the description). Contact us for symbols not featured in the following tables.

Legend scale :

Depending on space available on the product (see “Symbols” section at the end of each series).

CODE	SYMBOL	DESCRIPTION
XX	None	-
01	ON	-
02	OFF	-
03	○	-
04	I	-
05	II	-
06	STOP	-
07	A	Stop
08	M	Motion
09	▲	Up motion
10	▼	Down motion
11	☀	Hot
12	✱	Cold
13	⚠	Hazard warning (0085)
14	☎	Traveller lighting
15	☎	Driver lighting (1421)

CODE	SYMBOL	DESCRIPTION
16	☎	Revolving light
17	☎	Rear ventilator
18	☎	Heating (0637)
19	☎	Door opening
20	☎	Windshield demister/defroster (0635)
21	☎	Windshield wiper (0086)
22	☎	Windshield washer (0088)
23	☎	Ventilator fan (0089)
24	☎	Side mirror defroster
25	☎	Restarting pump
26	☎	Front fog lights (0633)
27	☎	Rear fog lights (0634)
28	☎	Propulsion system trim
29	☎	Beacon (1141)
30	☎	Anchor
31	☎	Electric motor (0011)

CODE	SYMBOL	DESCRIPTION
32	☎	Emergency first aid vehicle (2565)
33	☎	Load tipping (1557)
34	☎	Loading light (2457)
35	☎	Tractor, rear-ward (1667)
36	☎	Combine, direction of movement (1678)
37	☎	Use no forks (2406)
38	☎	Transmission (1166)
39	☎	Working spot light (1145)
40	☎	Engine (0640)
41	☎	Horn (0244)
42	☎	Lock (1656)
43	☎	Taxi sign light (2551)
44	☎	Working light (1204)
45	☎	Working light symmetric (1204)
46	☎	-
47	ASM	-

K range

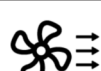
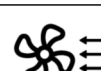
Power rocker switches and indicators

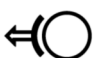
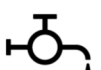
Symbols

Most symbols meet the ISO 7000 standard "graphical symbols for use on equipment" (code given in bracket in the description). Contact us for symbols not featured in the following tables.

Legend scale :

Depending on space available on the product (see "Symbols" section at the end of each series).

CODE	SYMBOL	DESCRIPTION
48		All wheel drive
49		Differential lock (1662)
50		-
51		-
52		-
53	N	-
54		Rear window wiper (0097)
55		Rear window washer (0099)
56		Lower load (2223)
57		Cab lock (1560)
58		Extraction
59		Pumping in
60		Rear PTO (1572)
61		Front PTO
62		Rockshaft down
63		Rockshaft up

CODE	SYMBOL	DESCRIPTION
64		Indicator
65		Brake release
66		Baggage room left door
67		Baggage room right door
68		Power blinds
69		Engine idle control
70	CRUISE RES/SET	Cruise res/set
71		Driver windows up/down
72		Middle door opening
73		Front door opening
74		Lighting in baggage room
75	CRUISE ON/OFF	Cruise on/off
76	TV	TV
77		Pump
78	WC	Toilet
79		Toilet decontamination

CODE	SYMBOL	DESCRIPTION
80		Front windshield heating
81	AUS	Aus
82		Radiator fan
83		Remove retarder
84		Restricted speed
85		Preheater
86		ABS detection
87		ECAS detection
88		Engine stop
89	CRUISE RES/CAN	Cruise res/cancel
90		ECAS reset
91		Driver windows heating
92	CRUISE SET+/SET-	Cruise set
93		Air bag up/down
94		Read lighting
95		Lighting main switch

K range

Power rocker switches and indicators

Symbols

Most symbols meet the ISO 7000 standard “graphical symbols for use on equipment” (code given in bracket in the description). Contact us for symbols not featured in the following tables.

Legend scale :

Depending on space available on the product (see “Symbols” section at the end of each series).

CODE	SYMBOL	DESCRIPTION
96		Heating using water
97		Low beam
98		Position lights
99		Diesel acceleration
A1		Manual mode
A2		Clockwise cabin rotation
A3		Anticlockwise cabin rotation
A4		-
A5		-
A6		Parking brake
A7		-
A8		-
A9		-
AA		-
AB		-
AC		-

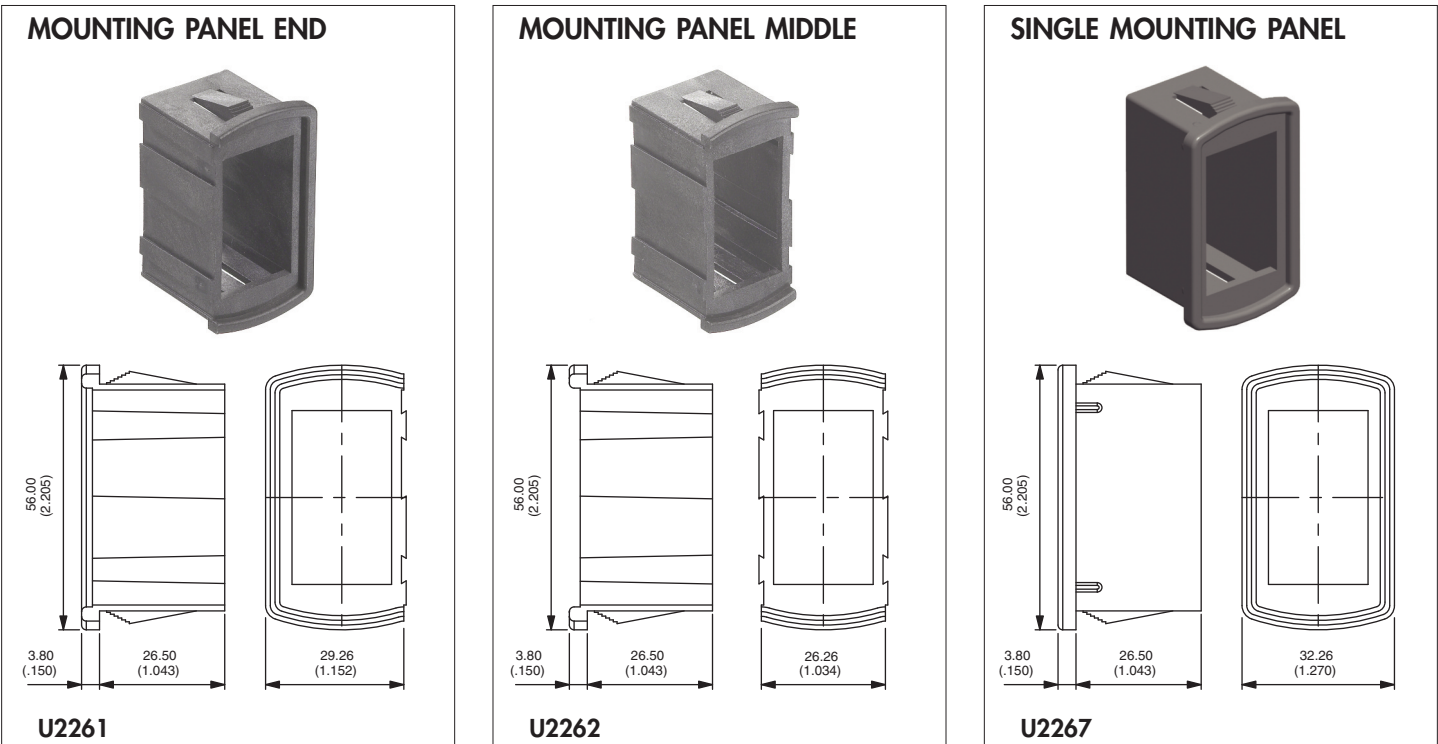
CODE	SYMBOL	DESCRIPTION
AD		-
AE		-
AF		-
AG		Battery charging condition (0247)
AH		Turn signals (0084)
AJ		High beam (0082)
AK		Differential lock, bogie (2600)
AL		Brushing with a rotating brush (0070)
AM		Differential lock, transfer case 4x4 (2475)
AN		Loader bucket, float (1441)
AP		Loader bucket (1437)
AQ		Rear window washer & wiper (0098)
AR		Header Header drive (1579)
AS		Excavator/backhoe boom side shift (2091)
AT		Chemical water treatment (1851)
AU		Grapple skidder, single funct° boom (1762)

CODE	SYMBOL	DESCRIPTION
AV		-
AW		-
AY		-
AZ		-
B1	HIGH	-
B2	LOW	-
B3		-

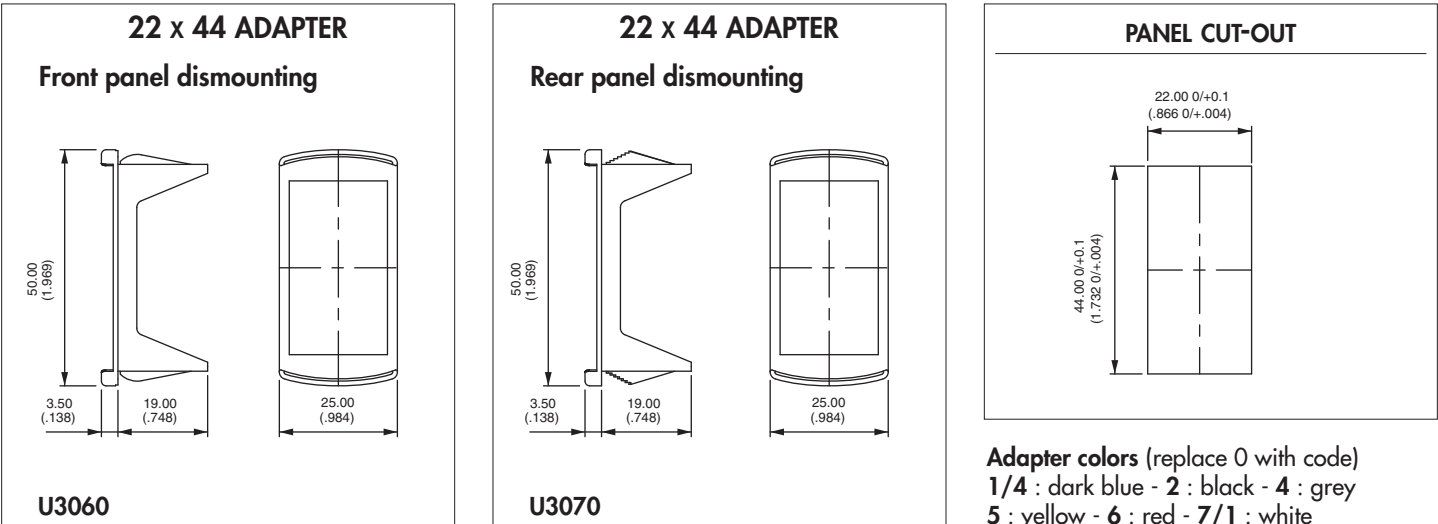
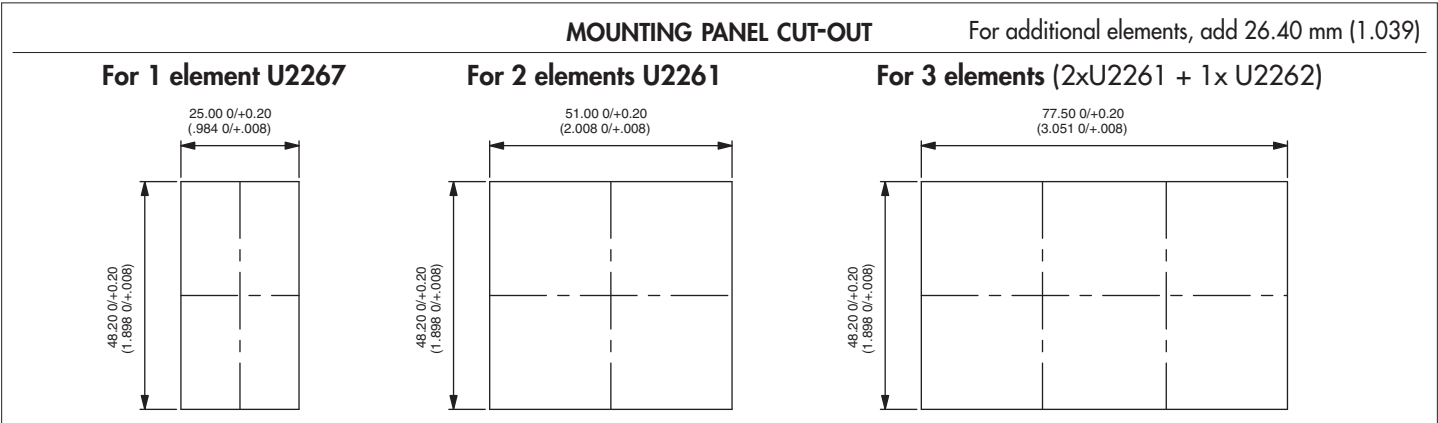
K range

Power rocker switches and indicators

Accessories



Recommended panel thickness : 1.10 mm - 1.80 mm - 2.60 mm - 3.40 mm - 4.20 mm - 5 mm - 5.80 mm



Recommended panel thickness : 0.60 mm to 1.50 mm

Recommended panel thickness : 1.60 mm -0,1/0 to 5.60 mm -0,1/0 in stages of 0.40 mm

ACTUATOR REMOVING TOOL



U3052

2 tools are supplied

EXTRACT ACTUATOR (KR ONLY)

Allows the extraction of the rocker / rocker support assembly.
Place the 2 claws under the support and push as indicated by the arrow.

EXTRACT ROCKER (KR ONLY)

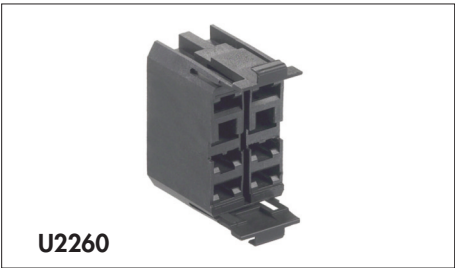
Allows to separate the rocker from its support.
Insert the tool between rocker and support as indicated by the arrow. Pull out the tool in the opposite direction.

EXTRACT SWITCH (KR, KL AND KI)

Allows to extract switch from panel mounting units. 2 tools are necessary.
Insert the tools between switch and panel mounting units from the rear to compress the snap-in device. Pull off switch manually.

CONNECTORS

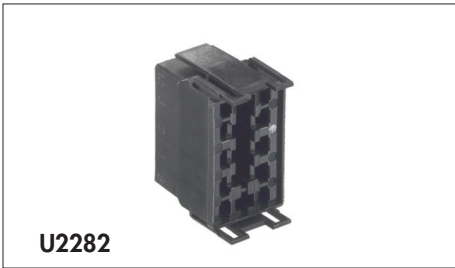
Standard color : black. Other colors : on request.
Connectors cannot be combined with wiring types H and I.



U2260

6 terminal version

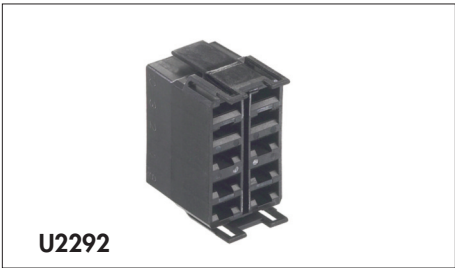
For use with terminals type 2, 3, 4 or 5.
6.35 (1/4) tabs to be fitted by the user
(example : TE42282-2).
Can be used for the KG series.



U2282

10 terminal version

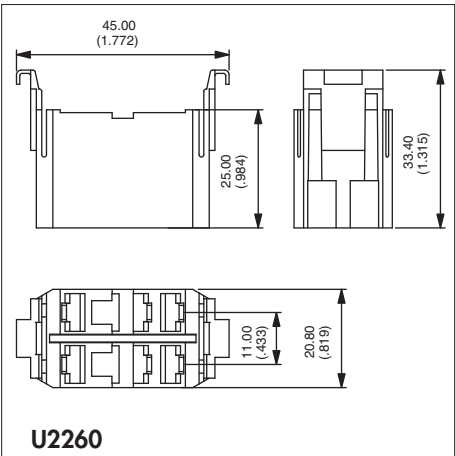
For use with terminals type H or J.
2.8 (.110) tabs to be fitted by the user
(example : AMP/Tyco 0-927779-3).



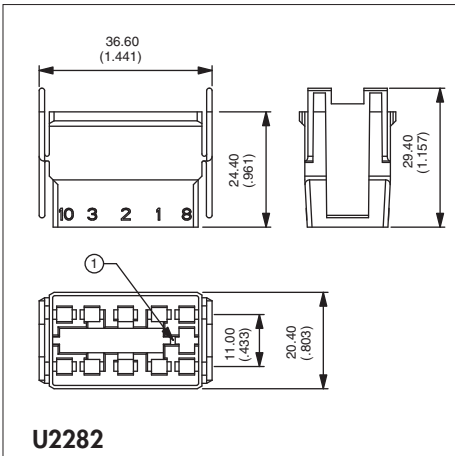
U2292

10 terminal version

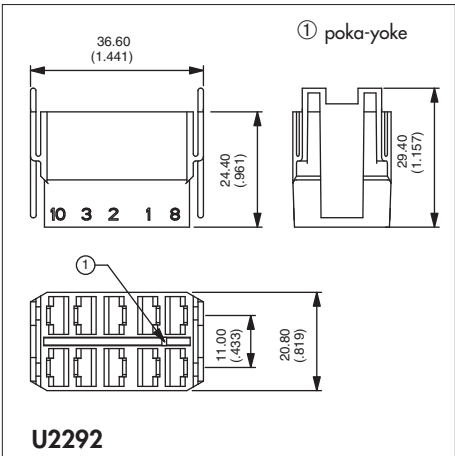
For use with terminals type B, C, E or F.
6.35 (1/4) tabs to be fitted by the user
(example : TE42282-2).



U2260



U2282



U2292

K range

Power rocker switches and indicators

Accessories

CONNECTORS (continued)

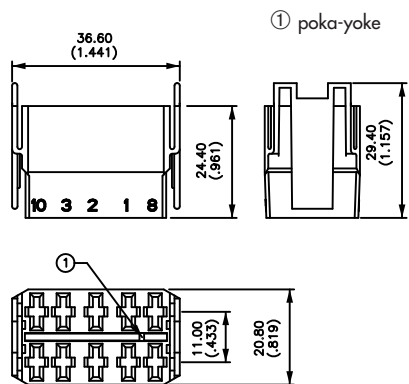


U3152

New!

10 terminal version

For use with terminals type B, C, E or F.
6.35 (1/4) tabs to be fitted by the user
(example : «Timer» terminals TE927833-2)



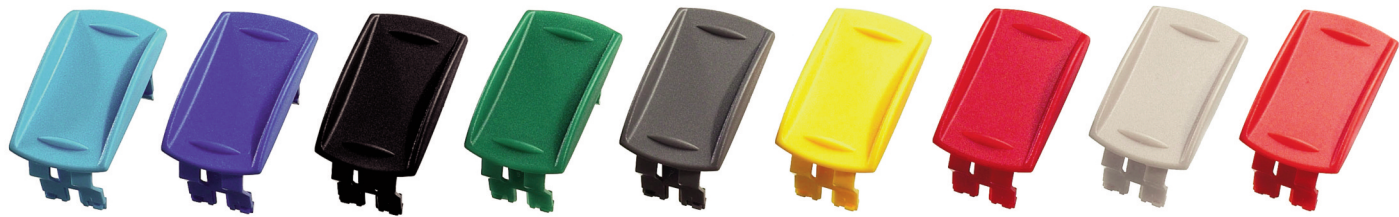
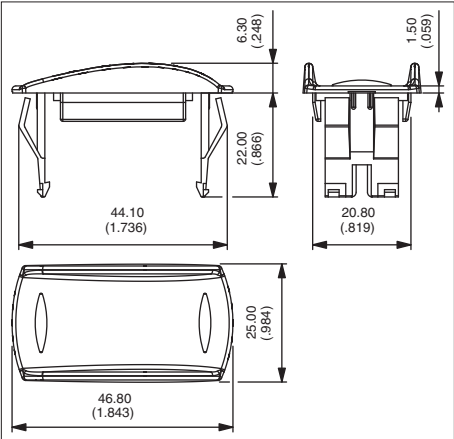
U3152

BLANKING CAPS

Usefull for future extensions.

Code	Color	Code	Color
U2271	Blue	U2274	Grey
U2271/4	Dark blue	U2275	Yellow
U2272	Black	U2276	Red
U2273	Green	U2277	Ivory
		U2279	Orange

Recommended panel thickness :
1.50 mm to 6 mm



Connectors can be hanged on specific hole plugs. Contact APEM.