

# KH series

Power rocker switches with protection guard



## DISTINCTIVE FEATURES

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



## 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 (-40 °F to +185 °F)



## 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) :
  - functions 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



## GENERAL SPECIFICATIONS

- Mechanical life : 150,000 cycles min.
- Panel thickness : 0.8 mm to 4.6 mm
- Recommended panel thickness : between 2 mm and 3.5 mm

The company reserves the right to change specifications without notice.



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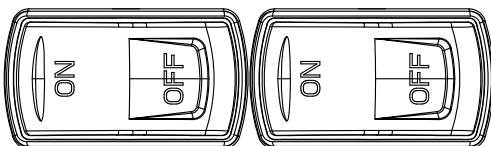
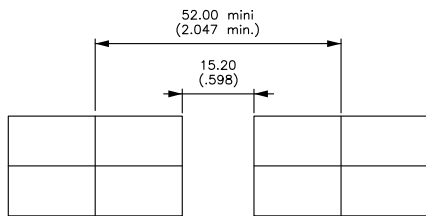
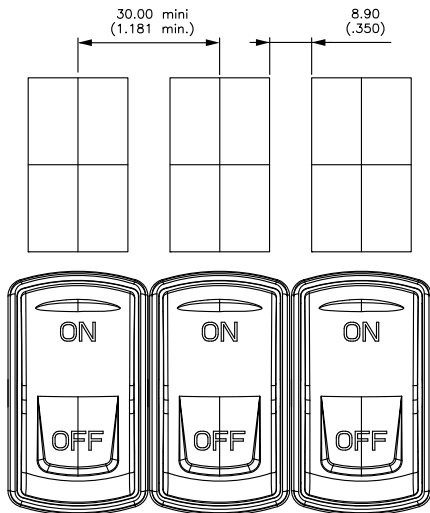
## MATERIALS

- 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

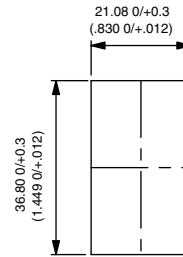
APEM products may be recycled at end-of-life for the re-claiming of valuable metal components.



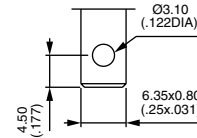
## MATRIX MOUNTING



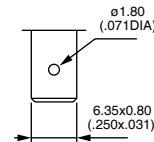
## PANEL CUT-OUT



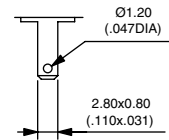
## TERMINALS



Solder lug / quick-connect



Normalized quick-connect 6.35x0.8



Normalized quick-connect 2.8x0.8

## Power rocker switches with protection guard



### 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

#### 2 POSITIONS

Function 5 KH35 - KH45	 	 
Function 6 KH36-K46	 	 

#### 3 POSITIONS

Function 7 KH37-KH47	 	 	 
Function 8 KH38-KH48	 	 	 
Function 9 KH39-KH49	 	 	 
Function 4 KH44	 	 	 
Function 4-1R KH44-1R	 	 	 

# KH series

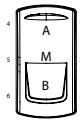
Power rocker switches with protection guard

## BUILD YOUR PART NUMBER

### CASE + LEADS

<b>KH</b>							Side A	Side B	
<b>SERIES</b>	<b>PROTECTION GUARDS</b>	<b>POLES</b>	<b>ELECTRICAL FUNCTIONS</b>	<b>CONTACTS</b>	<b>SEALING</b>	<b>LEADS</b>	<b>LEDS</b>	<b>LEDS</b>	<b>WIRING</b>
	<b>1</b> On 4 sides <b>2</b> On 2 sides	<b>3</b> Single pole <b>4</b> Double pole	<b>4</b> ON ON ON <b>4-1R</b> ON ON MOM <b>5</b> MOM - ON <b>6</b> ON - ON <b>7</b> MOM OFF MOM <b>8</b> ON OFF MOM <b>9</b> ON OFF ON	<b>A</b> Silver <b>D</b> Gold plated	<b>Z</b> IP69K Standard	<b>X</b> None <b>A</b> LED 6 V red <b>B</b> LED 6 V green <b>C</b> LED 6 V yellow <b>M</b> LED 6 V blue <b>R</b> LED 6 V white <b>D</b> LED 12 V red <b>E</b> LED 12 V green	<b>F</b> LED 12 V yellow <b>N</b> LED 12 V blue <b>S</b> LED 12 V white <b>J</b> LED 24 V red <b>K</b> LED 24 V green <b>L</b> LED 24 V yellow <b>P</b> LED 24 V blue <b>T</b> LED 24 V white etc.	See following pages.	
			<b>TERMINALS</b>						
			<b>Solder lug/quick-connect</b>	<b>Normalized quick-connect 6.35x0.8</b>	<b>Normalized quick-connect 2.8x0.8</b>				
			<b>A</b> 10 term. with barrier <b>B</b> 10 term. w/o barrier <b>C</b> 10 terminals for use with connector U2292 or U3152	<b>D</b> 10 term. with barrier <b>E</b> 10 term. w/o barrier <b>F</b> 10 term. for use with connector U2292 or U3152	<b>G</b> 10 term. with barrier <b>H</b> 10 term. w/o barrier <b>J</b> 10 terminals for use with connector U2282				

### ACTUATOR

			Area A	Area M	Area B
<b>TYPE</b>	<b>COLOR</b>	<b>COLOR</b>	<b>MARKING ORIENTATION</b>	<b>SYMBOLS</b>	
<b>1</b> For non-illuminated application <b>2</b> For illuminated application	<b>1</b> Blue <b>1/4</b> Dark blue <b>2</b> Black <b>3</b> Green <b>4</b> Grey	<b>5</b> Yellow <b>6</b> Red <b>7</b> Ivory <b>9</b> Orange <b>A</b> Aluminum bright	<b>N</b> North <b>O</b> West <b>S</b> South <b>E</b> East Drawings on following pages.	 <p><b>Symbols &amp; Accessories :</b> see end of the series.</p>	

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

## Power rocker switches with protection guard

### PROTECTION GUARD ON 4 SIDES - KH1



Single pole	Double pole	2-3 5-6		1-2 4-5
		KH144*	KH145	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

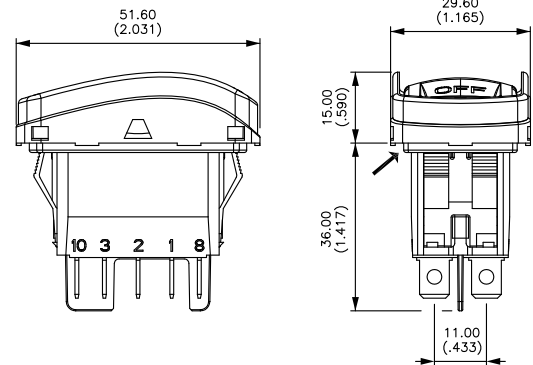
### PROTECTION GUARD ON 2 SIDES - KH2



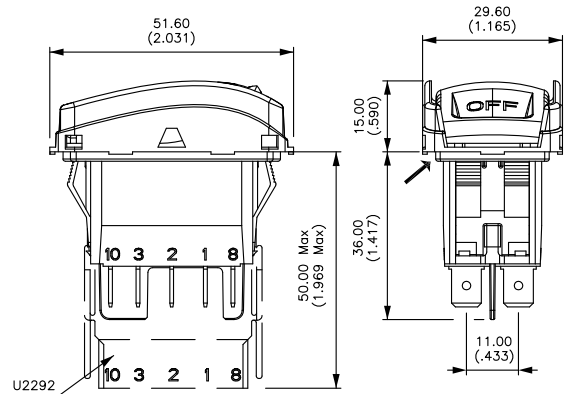
Single pole	Double pole	2-3 5-6		1-2 4-5
		KH244*	KH245	ON
	KH244-1R*	ON	ON	MOM
KH235	KH245	MOM	-	ON
KH236	KH246	ON	-	ON
KH237	KH247	MOM	OFF	MOM
KH238	KH248	ON	OFF	MOM
KH239	KH249	ON	OFF	ON

\*Function 4 : single pole in double pole case

→ FLAT SEAL



→ FLAT SEAL



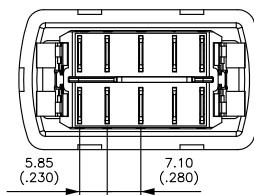
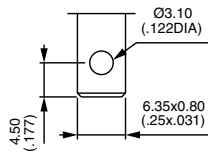
### CASE + LEDS

### TERMINALS



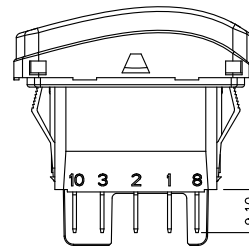
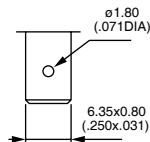
### SOLDER LUG / QUICK-CONNECT

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



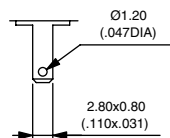
### NORMALIZED QUICK-CONNECT 6.35X0.8

- 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.

# KH series

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### CASE + LEDS

### CONTACT MATERIALS

BASIC P/N

ACTUATOR

- A Silver
- D Silver, gold plated

### CASE + LEDS

### SEALING

BASIC P/N

ACTUATOR

- Z IP69K - standard

### CASE + LEDS

### LEDS

BASIC P/N

Side A

Side B

ACTUATOR

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

- X Without LED

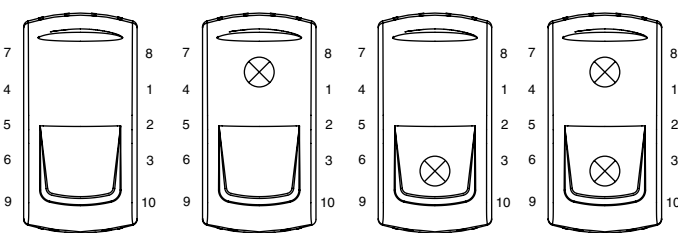
	Red	Green	Yellow	Blue	White	Amber	Red/green
6 VDC	<b>A</b>	<b>B</b>	<b>C</b>	<b>M</b>	<b>R</b>	<b>4</b>	<b>1</b>
12 VDC	<b>D</b>	<b>E</b>	<b>F</b>	<b>N</b>	<b>S</b>	<b>5</b>	<b>2</b>
24 VDC	<b>J</b>	<b>K</b>	<b>L</b>	<b>P</b>	<b>T</b>	<b>6</b>	<b>3</b>
No resistor	<b>U</b>	<b>V</b>	<b>W</b>	<b>Y</b>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

LED consumption : 20 mA @ nominal voltage (25 °C / 77 °F)  
 Other illumination solutions : on request.

For non-stabilized on-board power supplies submitted to potential voltage surges due to the alternator, 15 V and 30 V LED configurations are also available on request.

LED Tolerance ±10 %

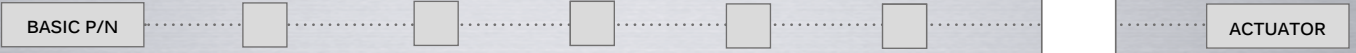
### Side A



### Side B

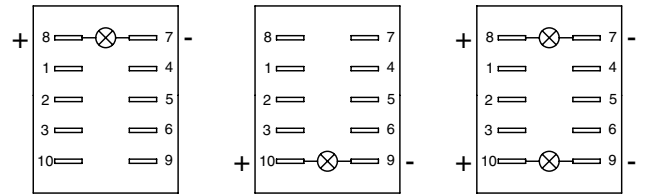
### CASE + LEDS

### WIRING

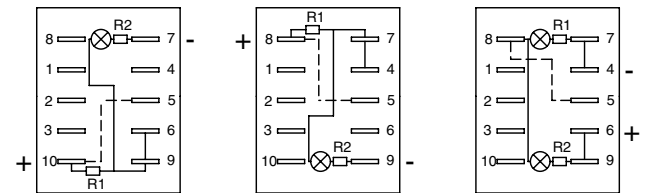


The LED wiring diagram is shown on the case.

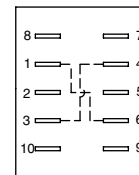
- G** Standard, to have independent LED.
- H** To obtain 2 symbol illumination levels (night illumination when OFF and higher illumination when ON).
  - H wiring with LED on side A available with functions 6, 8, 9 and 44.
  - H wiring with LED on side B available with functions 5, 6 and 9.
  - H wiring with 2 LEDs available with functions 8 and 9.
 More information (H wiring schematics) : on request.  
*Dotted line = external wiring, continuous line = internal wiring*  
 Available in Single Pole only, with H and J quick-connect terminals.
- I** To have a polarity inversion (typical application : fan motor).  
*Dotted line = external wiring*  
 Power supply between 2 and 5 - Load between 1 and 4 or 3 and 6.  
 Available with H and J quick-connect terminals.



G



H

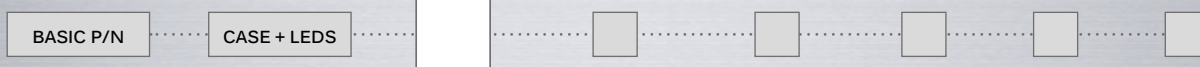


I

Please contact us for other wiring solutions.

### ACTUATOR

### ACTUATOR TYPE



- 1 For non-illuminated application
- 2 For illuminated application

Other rocker design : on request.



# KH series

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### ACTUATOR

### ACTUATOR COLOR

BASIC P/N

CASE + LEDS

1	Blue	6	Red
1/4	Dark blue	7	Ivory
2	Black	7/1	White
3	Green	9	Orange
4	Grey	A	Aluminum bright
5	Yellow		



Note : colors 7 and 7/1 not available on illuminated versions.

A soft-touch varnish can be added. Consult us.

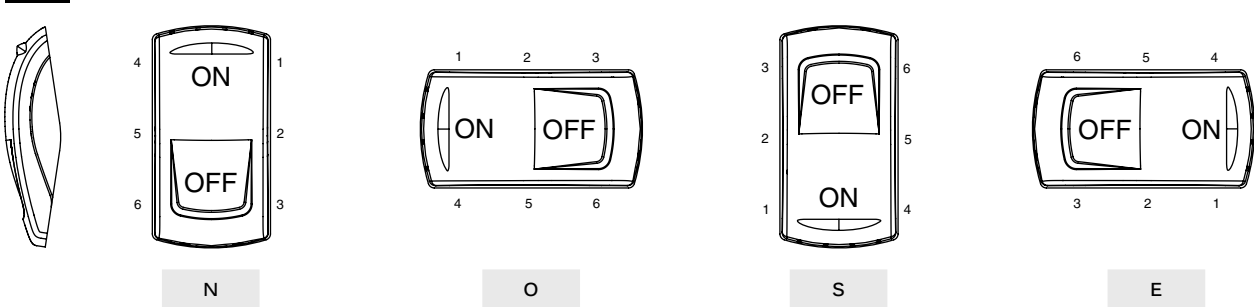
### ACTUATOR

### MARKING ORIENTATION

BASIC P/N

CASE + LEDS

If no marking required, complete the box with code **N**. Other orientations : on request.



### ACTUATOR

### SYMBOLS

BASIC P/N

CASE + LEDS

Area A

Area M

Area B

XX No symbol

**Available symbols :** Complete each enlarged box with the one of the codes listed on the following pages.

**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.

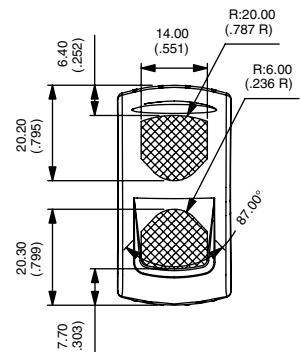
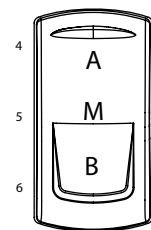
#### Laser etching resistance

- Water and petrol resistant according to EN 61058-1
- 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.

#### MARKING AREA





# K range

Power rocker switches and indicators • symbols and accessories

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.



CODE	SYMBOL	DESCRIPTION
XX	None	-
01	<b>ON</b>	-
02	<b>OFF</b>	-
03	○	-
04	I	-
05	II	-
06	<b>STOP</b>	-
07	<b>A</b>	Stop
08	<b>M</b>	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	<b>ASM</b>	-

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# K range

Power rocker switches and indicators • symbols and accessories

CODE	SYMBOL	DESCRIPTION	CODE	SYMBOL	DESCRIPTION	CODE	SYMBOL	DESCRIPTION
48		All wheel drive	69		Engine idle control	90		ECAS reset
49		Differential lock (1662)	70		Cruise res/set	91		Driver windows heating
50		-	71		Driver windows up/down	92		Cruise set
51		-	72		Middle door opening	93		Air bag up/down
52		-	73		Front door opening	94		Read lighting
53		-	74		Lighting in baggage room	95		Lighting main switch
54		Rear window wiper (0097)	75		Cruise on/off	96		Heating using water
55		Rear window washer (0099)	76		TV	97		Low beam
56		Lower load (2223)	77		Pump	98		Position lights
57		Cab lock (1560)	78		Toilet	99		Diesel acceleration
58		Extraction	79		Toilet decontamination	A1		Manual mode
59		Pumping in	80		Front windshield heating	A2		Clockwise cabin rotation
60		Rear PTO (1572)	81		Aus	A3		Anticlockwise cabin rotation
61		Front PTO	82		Radiator fan	A4		-
62		Rockshaft down	83		Remove retarder	A5		-
63		Rockshaft up	84		Restricted speed	A6		Parking brake
64		Indicator	85		Preheater	A7		-
65		Brake release	86		ABS detection	A8		-
66		Baggage room left door	87		ECAS detection	A9		-
67		Baggage room right door	88		Engine stop	AA		-
68		Power blinds	89		Cruise res/cancel	AB		-

# K range

Power rocker switches and indicators • symbols and accessories

CODE	SYMBOL	DESCRIPTION
AC		-
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		-

### Legend scale

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

# K range

Power rocker switches and indicators • symbols and accessories

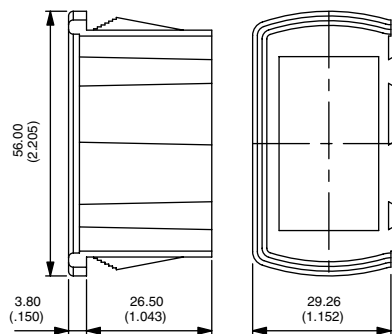
## MOUNTING PANELS

(NOT AVAILABLE FOR USE WITH THE KH SERIES)

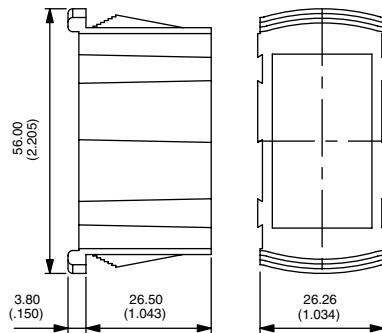
MOUNTING PANEL END

MOUNTING PANEL MIDDLE

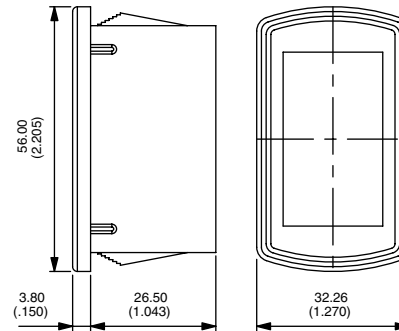
SINGLE MOUNTING PANEL



U2261



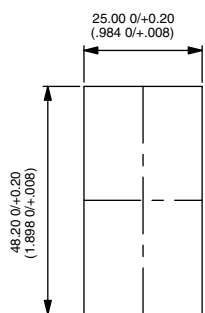
U2262



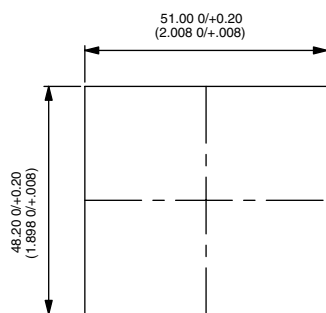
U2267

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

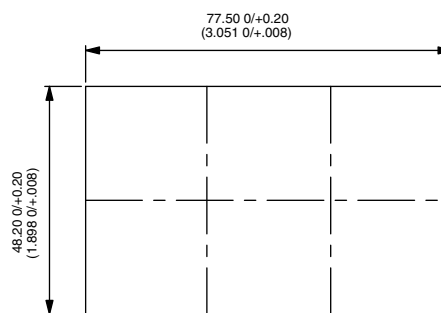
## MOUNTING PANEL CUT-OUT



For 1 element U2267



For 2 elements U2261



For 3 elements (2xU2261 + 1x U2262)

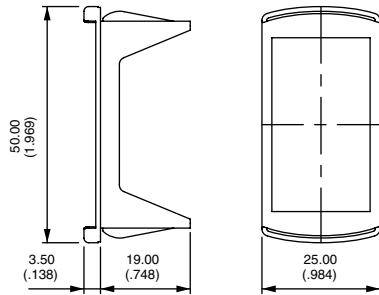
For additional elements, add 26.40 mm (1.039)

# K range

Power rocker switches and indicators • symbols and accessories

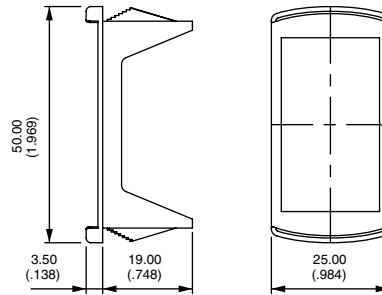
## 22 X 44 ADAPTERS

FRONT PANEL DISMOUNTING



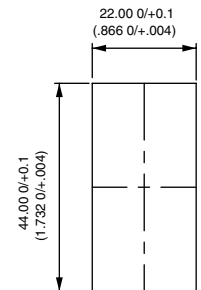
U3060

REAR PANEL DISMOUNTING



U3070

PANEL CUT-OUT



**Recommended panel thickness**

**U3060** 0.60 mm to 1.50 mm

**U3070** 1.60 mm -0.1/0 to 5.60 mm -0.1/0 in stages of 0.40 mm

**Adapter colors (replace 0 with code)**

- 1/4 Dark blue
- 2 Black
- 4 Grey
- 5 Yellow
- 6 Red
- 7/1 White

## ACTUATOR REMOVING TOOL

(NOT SUITABLE FOR USE WITH KH1 MODELS - 4-SIDE PROTECTION GUARDS)

### 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.



U3052

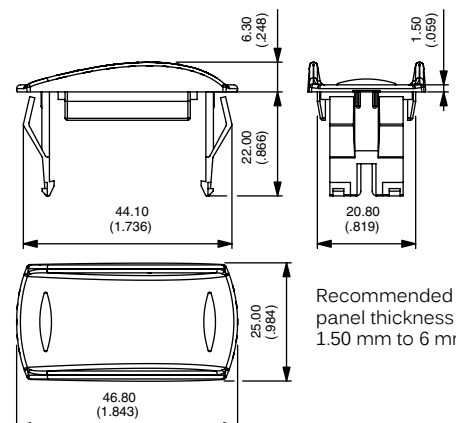
to be ordered by pairs

## BLANKING CAPS

Usefull for future extensions.

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

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



Recommended panel thickness : 1.50 mm to 6 mm



# K range

Power rocker switches and indicators • symbols and accessories

## CONNECTORS

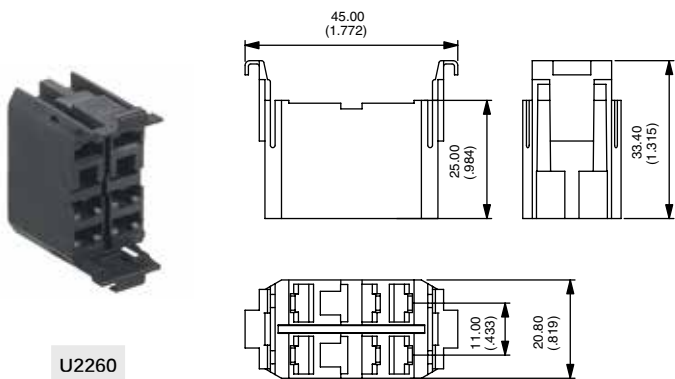
Standard color : black. Other colors : on request. Connectors cannot be combined with wiring types H and I.

**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.

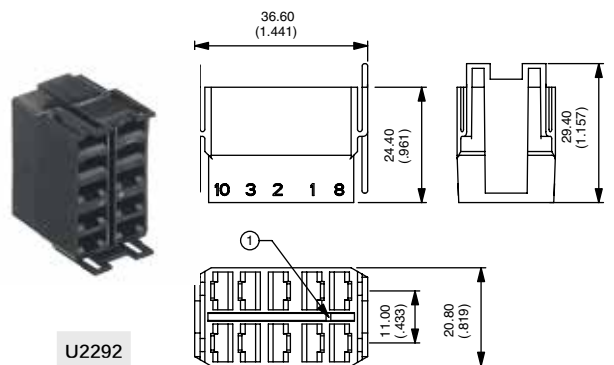
**U2282** 10 terminal version. For use with terminals type H or J.  
2.8 (.110) tabs to be fitted by the user (example : AMP/Tyco 0-927779-3).

**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).

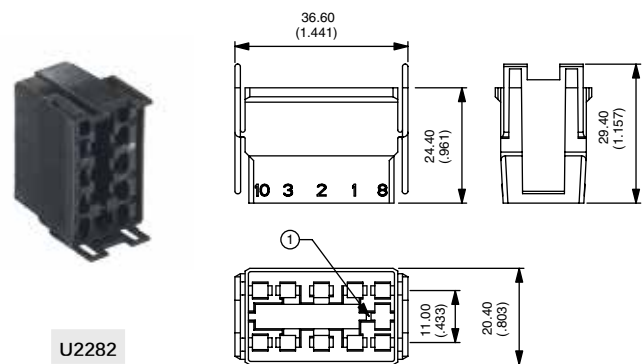
**U3152** 10 terminal version. For use with terminals type B, C, E or F.  
6.35 (1/4) tabs to be fitted by the user (example : "Timer" terminals TE927833-2)



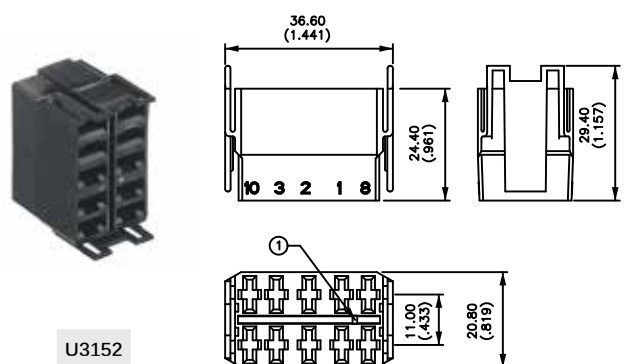
U2260



U2292



U2282



U3152