

<b>KAT</b>		<b>3</b>
<b>POWER OUTLET</b>		<b>4</b>
<b>CONTROL LIGHT</b>		<b>8</b>
<b>FUSE BOX</b>		<b>12</b>
<b>POLYFUSE</b>		<b>18</b>
<b>POSITION SWITCH</b>		<b>20</b>
<b>CONTACT SWITCH</b>		<b>22</b>
<b>PUSH BUTTON</b>		<b>24</b>
<b>ROTARY SWITCH</b>		<b>28</b>
<b>MAIN CIRCUIT BREAKER</b>		<b>34</b>
<b>IGNITION LIGHT SWITCH</b>		<b>42</b>
<b>IGNITION SWITCH</b>		<b>46</b>
<b>STARTER SWITCH</b>		<b>58</b>
<b>UNIVERSAL ROCKER SWITCH</b>		<b>66</b>
<b>HEAVY DUTY ROCKER SWITCH</b>		<b>72</b>
<b>IMMOBILISER PRODUCT LINE</b>		<b>82</b>





<b>SMT</b>	<b>R&amp;D</b>
<b>Metal Cutting</b>	<b>Coating</b>
<b>Tool Manufacturing</b>	<b>Painting</b>
<b>Plastic Injection</b>	<b>Laser Marking</b>
<b>Automated Assembly</b>	<b>Automotive Laboratory</b>



*High quality production*

37 COUNTRIES  
**across**  
5 CONTINENTS

KAT, is a family owned company with an experience of over 60 years. Offers products in Electromechanics, Electronics, Mechatronics and focuses on the following segments:

Agriculture  
Marine  
Motorbikes  
Off-Highway  
Passenger Cars  
Trucks  
Busses

KAT which is located in Istanbul/Trakya Free Trade Zone has fully integrated, modern and efficiently automatized production processes, are approved by "Global Premium OEM's".

KAT carries on these manufacturing processes in its high energy efficient plant with an area of 25,000 square meters, which is supported by a motivated, trained and highly qualified international team. KAT has been operating in 37 countries across 5 continents together with its foreign partner, Brehmer Mechatronics since 2003.

# “POWER OUTLET”



## MAIN PROPERTIES

- Voltage Range: 12 V / 24 V
- Current: max. 16 A
- Temperature Range: -40°C / +85°C
- Delivery: Cover and nut are delivered separately.
- Suitable for 2 pole Fastin-Faston adapter plug housing AMP no:180907-0

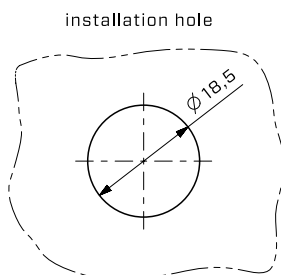
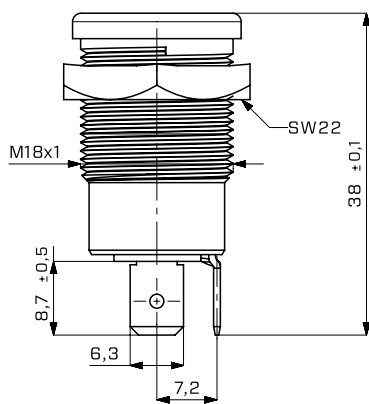




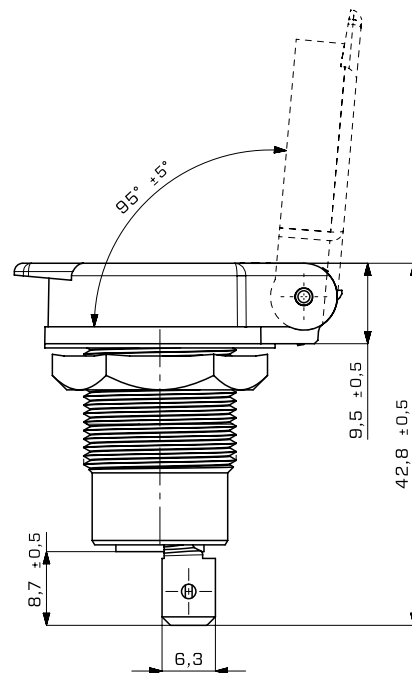
## TECHNICAL CHARACTERISTICS

The power outlet which is designed formerly to supply the electric lighter in vehicles, has become a standard accessory over time and is currently used for the supply of car interior or proximal other electrical appliances operating with DC current (lighting, fan, heater, etc.) as well.

KAT power outlet meets the requirements of ISO 4165.



Size up to 10 mm



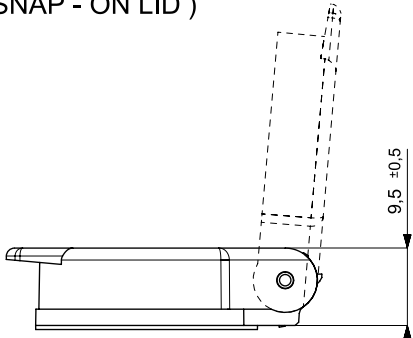
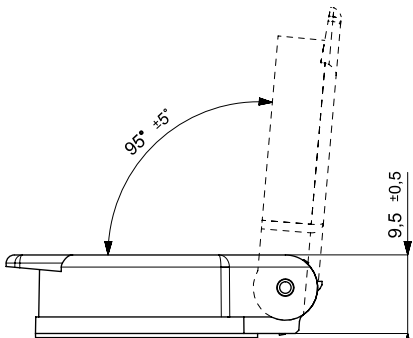
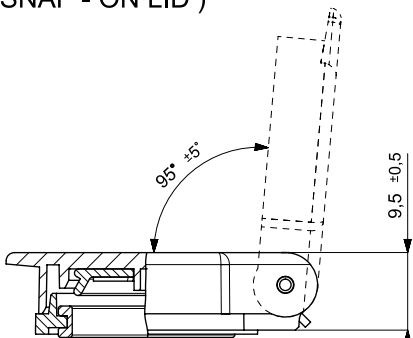
### Materials

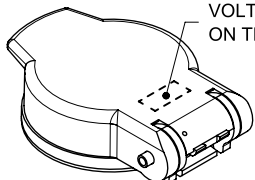
Cover	: PA 66
Cover spring	: EN 10270-3 / 1.4310
Cover ring	: PA 6
Housing	: Aluminium 6013
Contact	: CuSn 6
Socket	: PA 66
Terminals	: MS 63, silver coated
M18 nut	: CuZn 39

# ORDERING SCHEME

Please define your product by selecting the technical features below

<b>1</b>	<b>2</b>	<b>1-</b> Version <b>2-</b> Voltage Information
—	—	

<b>1</b>	VERSION
<b>A</b>	IP34 (SNAP - ON LID ) 
<b>B</b>	IP34 (SNAP - ON LID, LOCKED IN PLACE) 
<b>C</b>	IP00 (WITHOUT SNAP - ON LID)
<b>D</b>	IP44 (SNAP - ON LID) 

<b>2</b>	VOLTAGE INFORMATION	
1	12 V	
2	24 V	
3	-	

## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics	
	CODE	
	1	2
34477	A	1
34478	A	2
32008	A	3
34479	B	1
34480	B	2
33676	B	3
33434	C	3
34795	D	1
34625	D	2

SPARE PART NUMBERS FOR LID								
VERSION A			VERSION B			VERSION D		
12 V	24 V	-	12 V	24 V	-	12 V	24 V	-
34481	34483	33670	34484	34485	33677	36276	34636	36277

Delivery Volume		
Item	Designation	Number
1	Lid	1
2	Outlet	1
3	M18 Nut	1

\* Lid and nut will be provided separately without mounting

# “CONTROL LIGHT”



## MAIN PROPERTIES

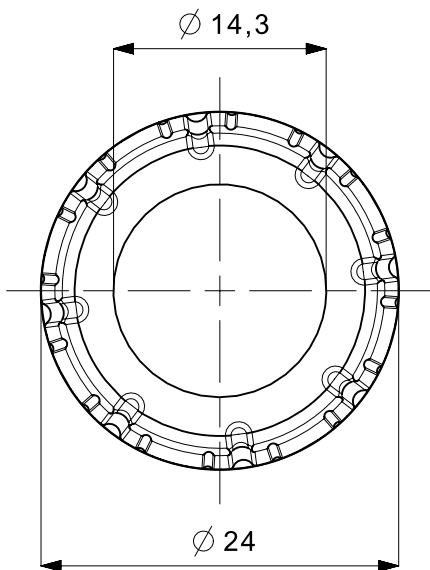
- Temperature Range: -40°C / +85°C
- Protection Class: IP 30
- Voltage Range: 12 V / 24 V
- Spring made of stainless steel





# TECHNICAL CHARACTERISTICS

Top view



KAT control lights are specially designed to operate under severe conditions of transportation, agriculture and construction vehicles.

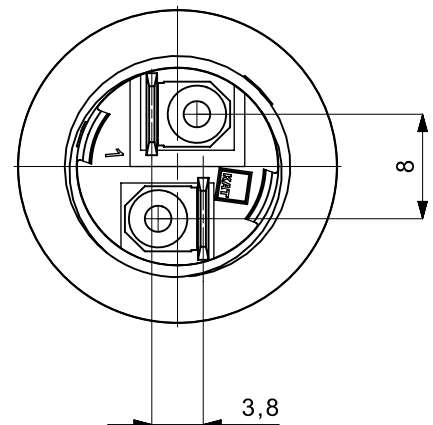
They are used for reporting the status of auxiliary systems used in vehicle to the driver and warning the driver in case of breakdown/failure.

(For example; battery status, headlights on/off, fuel, oil level error.) Different symbols and colours are available.

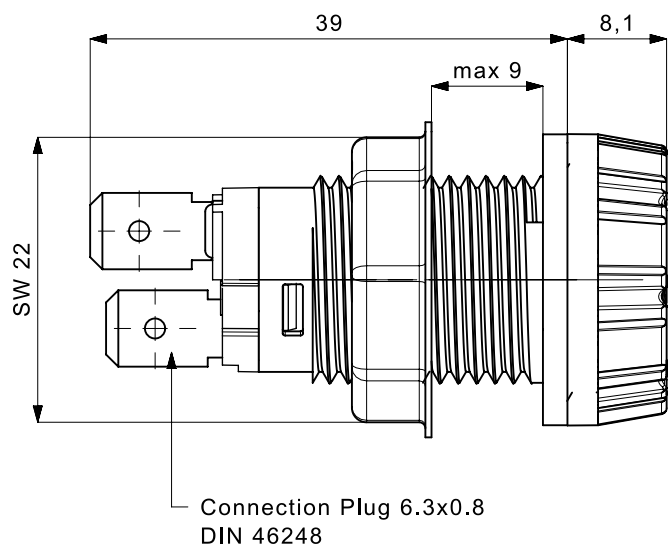
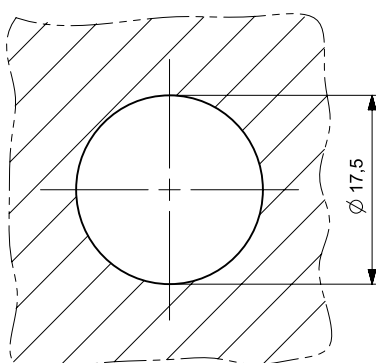
## Materials

- Housing : PA6 GF30/Black
- Plastic Cover : ABS
- Metal Cover : AlMgSiSnBi
- Lens : PC or Makrofol LT
- Nut : St 3 , zinc coated
- Terminals : Cu Zn 37 F 38, silver coated
- Socket : CuZn39

Bottom view



Mounting hole



# ORDERING SCHEME

Please define your product by selecting the technical features below

1                      2                      3                      4

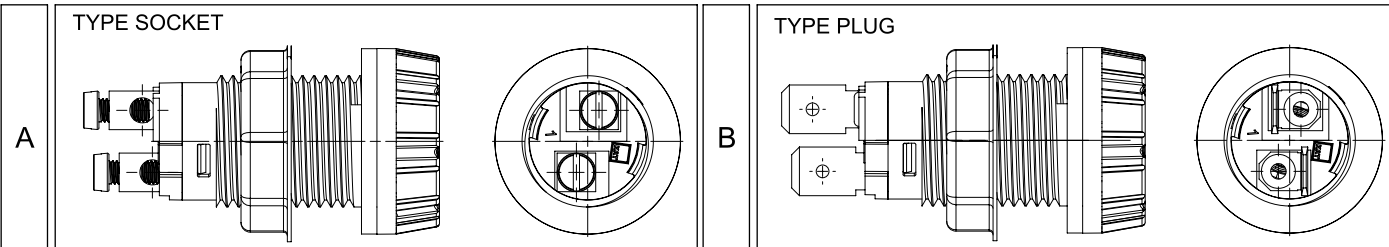
--	--	--	--

**1- Warning Light Symbol**  
**2- Connection Type**  
**3- Cover Type**  
**4- illumination**

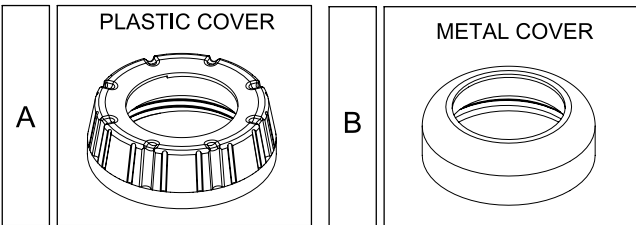
## 1 WARNING LIGHT SYMBOL

Code	Symbol name	Symbol No	Symbol	Figure colour	Pane								
					Material	Color							
01	Battery	10146		White	PC Film	Red	14	Fuel low level	10159		White	PC Film	Red
02	Air filter	10147		White	PC Film	Red	15	Water level	10160		White	PC Film	Red
03	Oil	10148		White	PC Film	Red	16	Diagnostic	10161		White	PC Film	Red
04	Temperature	10149		White	PC Film	Red	17	Differential lock	10162		White	PC Film	Red
05	Timing Belt Broken	10150		White	PC Film	Red	18	Beacon	10163		White	PC Film	Orange
06	-	10151		-	PC Film	Red	19	Oil heat	10164		White	PC Film	Red
07	-	10152		-	PC Film	Blue	20	Diagnostic	10165		White	PC Film	Orange
08	-	10153		-	PC Film	Orange	21	Glow	10166		White	PC Film	Orange
09	-	10154		-	PC Film	Green	22	-	20437		-	PC Lens	Red
10	Brake	10155		White	PC Film	Red	23	-	20438		-	PC Lens	Blue
11	Turn Signals	10156		White	PC Film	Green	24	-	20439		-	PC Lens	Green
12	Pre-Heat	10157		White	PC Film	Orange	25	-	20440		-	PC Lens	Orange
13	Oil heat	10158		White	PC Film	Orange	26	Lap belt	16369		White	PC Film	Red
							27	Door open	16370		White	PC Film	Red

## 2 CONNECTION TYPE



## 3 COVER TYPE



## 4 ILLUMINATION

- A** No illumination
- B** LAMP ( 12V )
- C** LAMP ( 24V )

## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics			
	Code 1	Code 2	Code 3	Code 4
34050	01	B	A	A
34385	01	B	A	B
34051	02	B	A	A
34053	03	B	A	A
34377	03	B	A	A
34386	03	B	A	B
34052	04	B	A	A
34378	05	B	A	A
34344	06	B	A	A
34384	06	B	A	B
36566	06	B	B	B
34371	07	B	A	A
36567	07	B	B	B
34342	08	B	A	A
34375	08	B	A	B
36568	08	B	B	B
34343	09	B	A	A
34379	10	B	A	A
34376	11	B	A	A
34049	12	B	A	A
36298	12	B	A	B
34345	13	B	A	A
34380	14	B	A	A
34346	15	B	A	A
34382	16	B	A	A
34383	17	B	A	A
34372	18	B	A	A
34381	19	B	A	A
34373	20	B	A	A
34374	21	B	A	A
34395	22	A	A	A
34396	22	B	A	A
34397	22	B	A	B
34404	22	A	B	A
34405	22	B	B	A
36569	22	B	B	B
34387	23	A	A	A
34388	23	B	A	A
34398	23	A	B	A
34399	23	B	B	A
36570	23	B	B	B
34392	24	A	A	A
34393	24	B	A	A
34394	24	B	A	B
34402	24	A	B	A
34403	24	B	B	A
34389	25	A	A	A
34390	25	B	A	A
34391	25	B	A	B
34400	25	A	B	A
34401	25	B	B	A
36571	25	B	B	B

Delivery Volume		
Item	Designation	Number
1	Signal Lamp	1
2	M18 Nut	1

# “FUSE BOX”



## MAIN PROPERTIES

- Operating Voltage: 12/24V
- Operating Current: 3A-30A
- Voltage drop max. 250 mv
- High temperature test 2 hrs @ +95 °C
- Low temperature test 72 hrs @ -40 °C
- Fuse replacing force 20~40N
- Terminal: at the bottom





## TECHNICAL CHARACTERISTICS

KAT fuse boxes are specially designed to operate under severe working conditions in agriculture and construction vehicles and industrial machines.

The product is available with complete accessories like contact bridges, connectors and fuses.

### Important properties are:

- The fuse boxes can be delivered with 2-, 4-, 6-, und 8-poles.
- The transparent cover has 2 versions: with or without screw fixing.
- The housing is available in 5 different colours as: nature, black, yellow, green, red.

\* Cover Side Protection Level :

Cover Without Screw IP53

Cover With Screw IP56

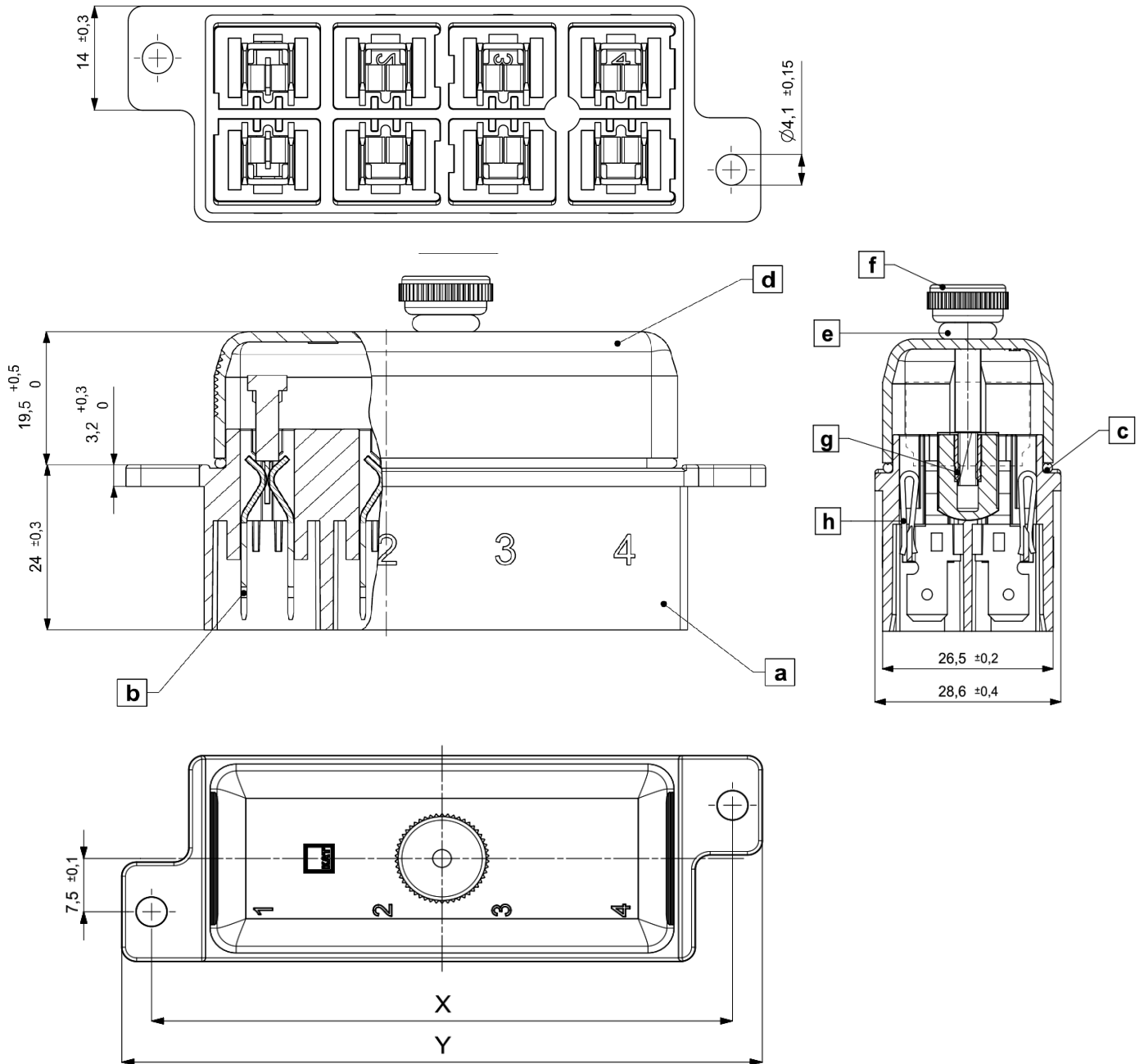
### Materials

Item	Designation	Material	Flammability	Hardness	Coating	Color	Weight (g)	
a	Housing	2 Pole	PA66 GF25	UL94 V-0	N/A	N/A	17,20	
		4 Pole					27,4	
		6 Pole					43,2	
		8 Pole					51,1	
b	Contact	2-4-6-8 Pole	CuSn6	N/A	160-190 HV (R500)	Ag / 1-3µm	N/A	2,1
c	O-Ring	2 Pole	NBR	N/A	50 ShoreA	N/A	Black	0,2
		4 Pole					0,3	
		6 Pole					0,4	
		8 Pole					0,5	
d	Cover	2 Pole	PC	UL94 V-0	N/A	N/A	Transparent	4,15
		4 Pole					7,3	
		6 Pole					10,9	
		8 Pole					14,5	
e	O-Ring	2-4-6-8 Pole	PERBUNAN	N/A	70 ShoreA	N/A	Black	0,1
f	Screw		11SMnPb37	N/A	112-169 HB	Zinc / 5µm	N/A	3,3
g	Nut		CuZn39Pb3	N/A	125-165 HV (R420)	N/A	N/A	0,35
* h	Bridge		CuSn6	N/A	160-190 HV (R500)	Ag / 1-3µm	N/A	1,5

\* Has to be ordered separately

**NOTE : To insert the bridge push it all the way to the stop.**

# Dimensions



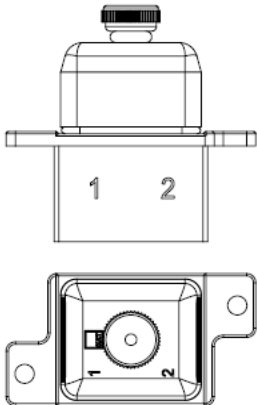
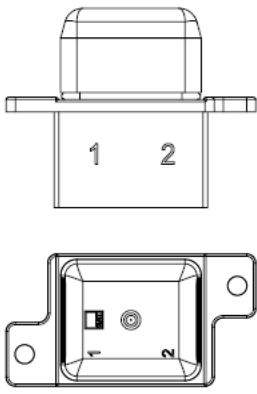
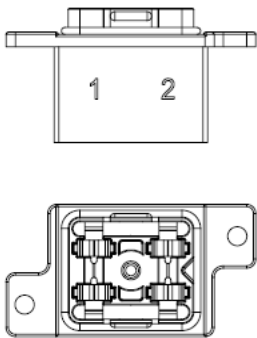
Fuse Box Dimensions				
	2 Pole	4 Pole	6 Pole	8 Pole
X	$46 \pm 0.3$	$78 \pm 0.5$	$110 \pm 0.5$	$142 \pm 0.8$
Y	$54 \pm 0.3$	$86 \pm 0.5$	$118 \pm 0.5$	$150 \pm 0.8$
Z	$33 \pm 0.3$	$65 \pm 0.5$	$97 \pm 0.5$	$129 \pm 0.8$

# ORDERING SCHEME

Please define your product by selecting the technical features below

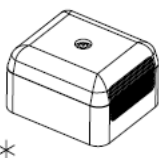
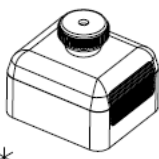
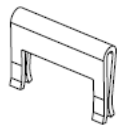
1	2	3
_____	_____	_____

1- Fuse Box Types  
2- Pole  
3- Colour

<b>1</b>	<b>FUSE BOX TYPES</b>
<b>A</b>	<b>WITH COVER &amp; SCREW</b>
	
<b>B</b>	<b>WITH COVER, WITHOUT SCREW</b>
	
<b>C</b>	<b>WITHOUT COVER &amp; SCREW</b>
	

<b>2</b>	<b>POLE</b>
1	2 POLE
2	4 POLE
3	6 POLE
4	8 POLE

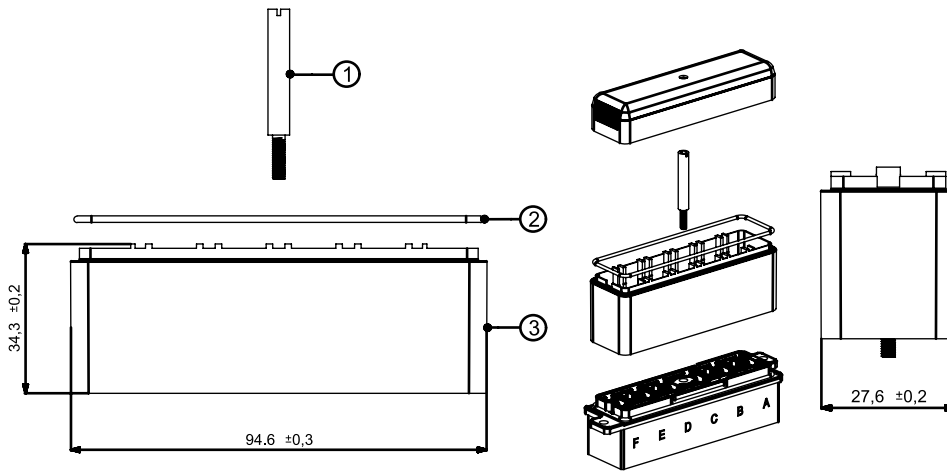
<b>3</b>	<b>COLOR</b>
A	White
B	Black
C	Green
D	Red
E	Yellow

<b>SPARE PARTS</b>			
<b>COVER</b>		2 Pole	30887
		4 Pole	30891
		6 Pole	30895
		8 Pole	30899
<b>COVER WITH SCREW</b>		2 Pole	30888
		4 Pole	30892
		6 Pole	30896
		8 Pole	30900
<b>BRIDGE</b>		30788	

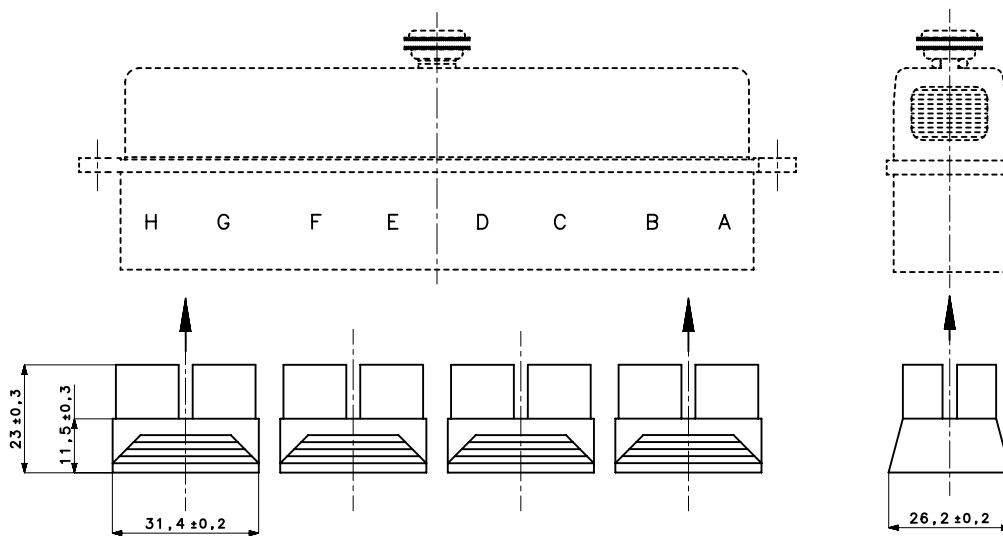
\* Fitting o-ring is included.

## Accessories

Item	Designation	Material	Flammability	Hardness	Coating	Color	Weight (g)
1	Adapter Screw	11SMnPb37	N/A	112-169 HB	Zinc / 5µm	N/A	4,5
2	O-Ring	NBR		50 ShoreA	N/A	Black	0,4
3	Adapter Housing	PA66 GF25	UL94 V-0	N/A	N/A		36,2



## Connector Set & Connector



Material : PA66

	Colour	2 Pole	4 Pole	6 Pole	8 Pole
		Code 1-2 / A-B	Code 3-4 / C-D	Code 5-6 / E-F	Code 7-8 / G-H
CONNECTOR	Natur	31910	31914	31918	31922
	Black	31911	31915	31919	31923
	Green	31912	31916	31920	31924
	Red	31913	31917	31921	31925
	Yellow	33513	33514	33515	31926
CONNECTOR SET	Natur	-	30773	30778	30783
	Black	-	30774	30779	30784
	Green	-	30775	30780	30785
	Red	-	30776	30781	30786
	Yellow	-	30777	30782	30787



## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics		
	CODE		
	1	2	3
30698	A	1	A
30699	A	1	B
30700	A	1	C
30701	A	1	D
30702	A	1	E
30718	A	2	A
31626	A	2	B
30720	A	2	C
30721	A	2	D
30722	A	2	E
30738	A	3	A
34217	A	3	B
30740	A	3	C
30741	A	3	D
30742	A	3	E
30758	A	4	A
30759	A	4	B
30760	A	4	C
30761	A	4	D
30762	A	4	E
30693	B	1	A
30694	B	1	B
30695	B	1	C
30696	B	1	D
30697	B	1	E
30713	B	2	A
30714	B	2	B
30715	B	2	C
30716	B	2	D
30717	B	2	E

Product Nr.	Technical Characteristics		
	CODE		
	1	2	3
30733	B	3	A
30734	B	3	B
30735	B	3	C
30736	B	3	D
30737	B	3	E
30753	B	4	A
30754	B	4	B
30755	B	4	C
30756	B	4	D
30757	B	4	E
30688	C	1	A
30689	C	1	B
30690	C	1	C
30691	C	1	D
30692	C	1	E
30708	C	2	A
30709	C	2	B
30710	C	2	C
30711	C	2	D
30712	C	2	E
30728	C	3	A
30729	C	3	B
30730	C	3	C
30731	C	3	D
30732	C	3	E
30748	C	4	A
30749	C	4	B
30750	C	4	C
30751	C	4	D
30752	C	4	E

Delivery Volume		
Item	Designation	Number
1	Fuse Box	1

\* Delivery Volume may differ according to the selected variant

# “POLYFUSE” Customised Resettable Fuse”



## MAIN PROPERTIES

- Temperature Range: -40 °C / + 85 °C
- Voltage Range: 16 V - 32 V
- Housing: PA, UL 94 V0
- Tabs: CuFe2P, Sn coated



## TECHNICAL CHARACTERISTICS

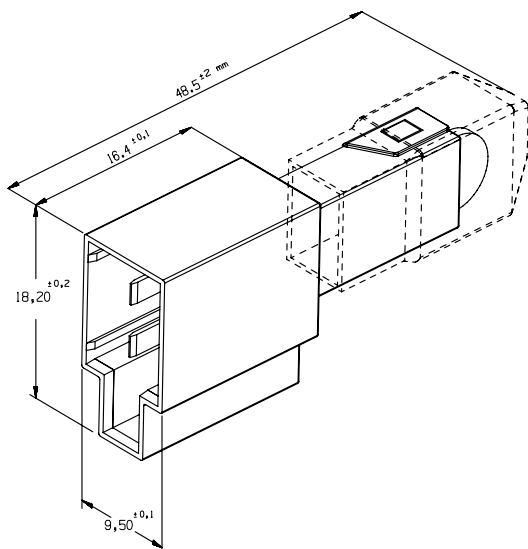
KAT develops and manufactures customer-specific overcurrent protection devices for automotive applications.

Like traditional fuses, KAT Polyfuse limits the flow of high current during fault conditions however resets after the fault is cleared.

According to customer requirements automotive grade PTC elements with different temperature-resistance characteristics are used in KAT polyfuses.



Advantages are low weight, self-regulating, long life, no maintenance, high operation reliability by omitting active component, EMC/ESD proved.



Delivery Volume		
Item	Designation	Number
1	Polyfuse	1

**\*Product will be customised upon request**

# “POSITION SWITCH”



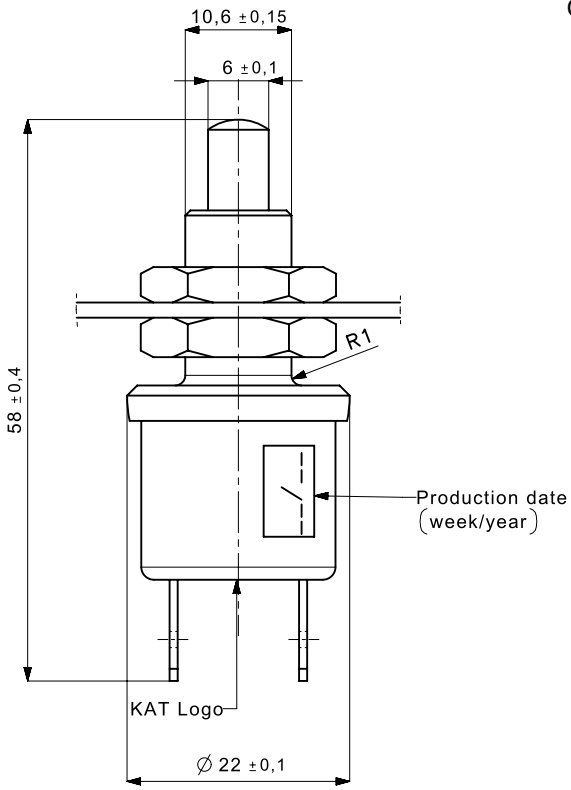
## MAIN PROPERTIES

- Temperature Range: -40°C / +85°C
- Protection Class: IP 66
- Voltage: 12 V
- Current: 10 A
- Electromechanical Life: min. 200.000 cycles



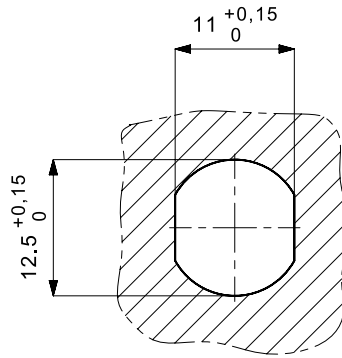
# TECHNICAL CHARACTERISTICS

KAT position switch is designed to determine the position status of some mechanical parts in agricultural, commercial vehicles and construction machinery. The switch is normally closed.

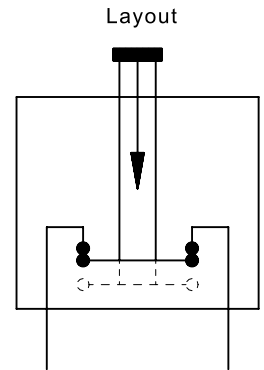


## Materials

Threaded Cover: die-cast ZnAl4Cu1  
 Housing : PA 66  
 Push Rod : PA 6  
 Contacts : AgNi10  
 Terminals : CuSn6 ,tinned  
 Spring : Stainless steel

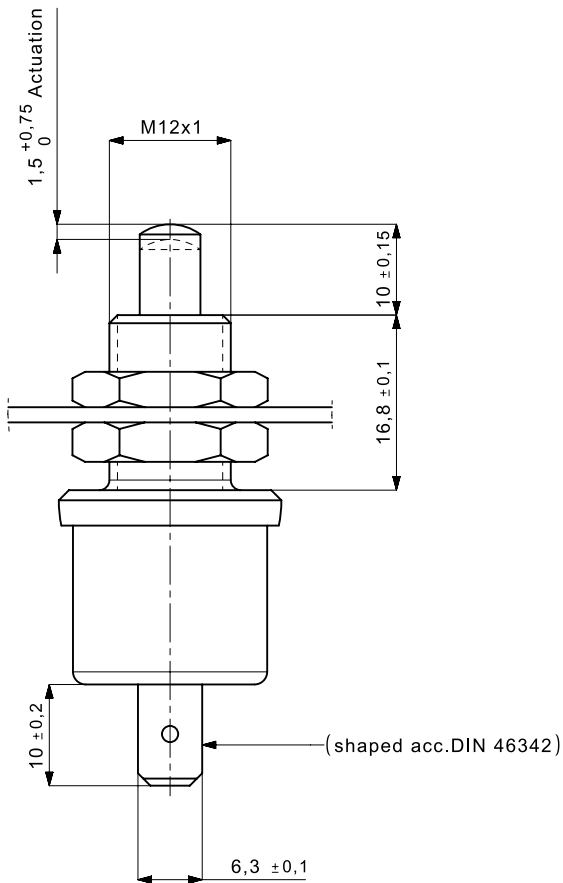


installation hole on bracket



Layout

The switch can be fixed with the M12 nut on metal cover regarding its location of use.



Delivery Volume		
Item	Designation	Number
1	Position Switch	1
2	Nut	2

**Product Nr.**

36002

# “CONTACT SWITCH”



## MAIN PROPERTIES

- Current / Voltage: 2 A / 24 V
- Operating Temperature: - 40 °C / + 85 °C
- Material: Housing : POM
- Socket and Tappet: PA
- Contacts: AgCu3
- Terminals: CuZn, Ag plated
- Electromechanical Life: min. 100.000 cycles

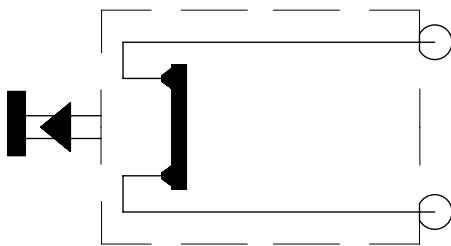




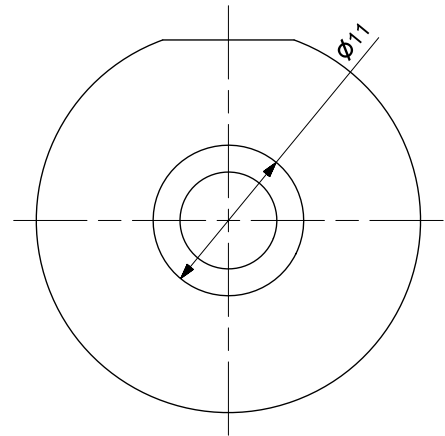
# TECHNICAL CHARACTERISTICS

KAT Contact Switch is a universal pin switch which causes lights or any other 12 / 24 volt circuit to turn on when hood, trunk, door, tailgate, etc. are opened. The robust design of the switch allows the use in commercial vehicles.

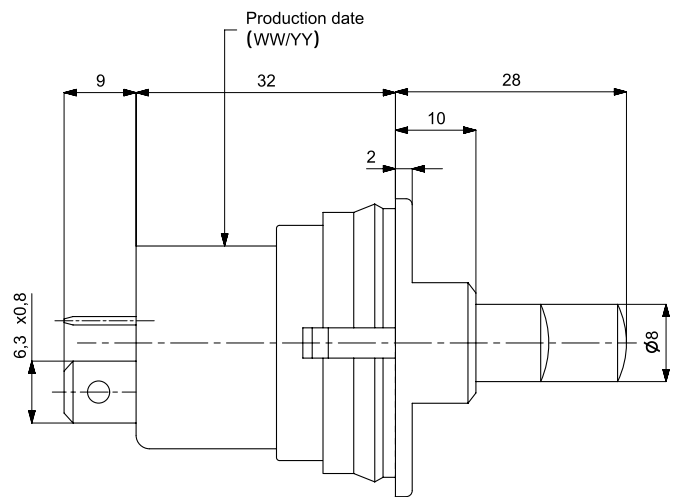
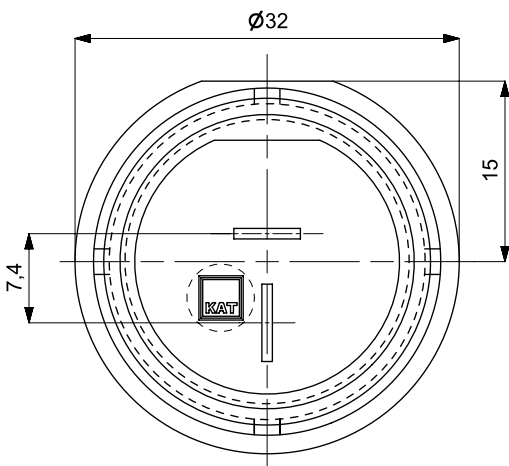
Circuit Diagram



Top View



Bottom View



Delivery Volume		
Item	Designation	Number
1	Contact Switch	1

**Product  
Nr.**  
36279

# “PUSH BUTTON”



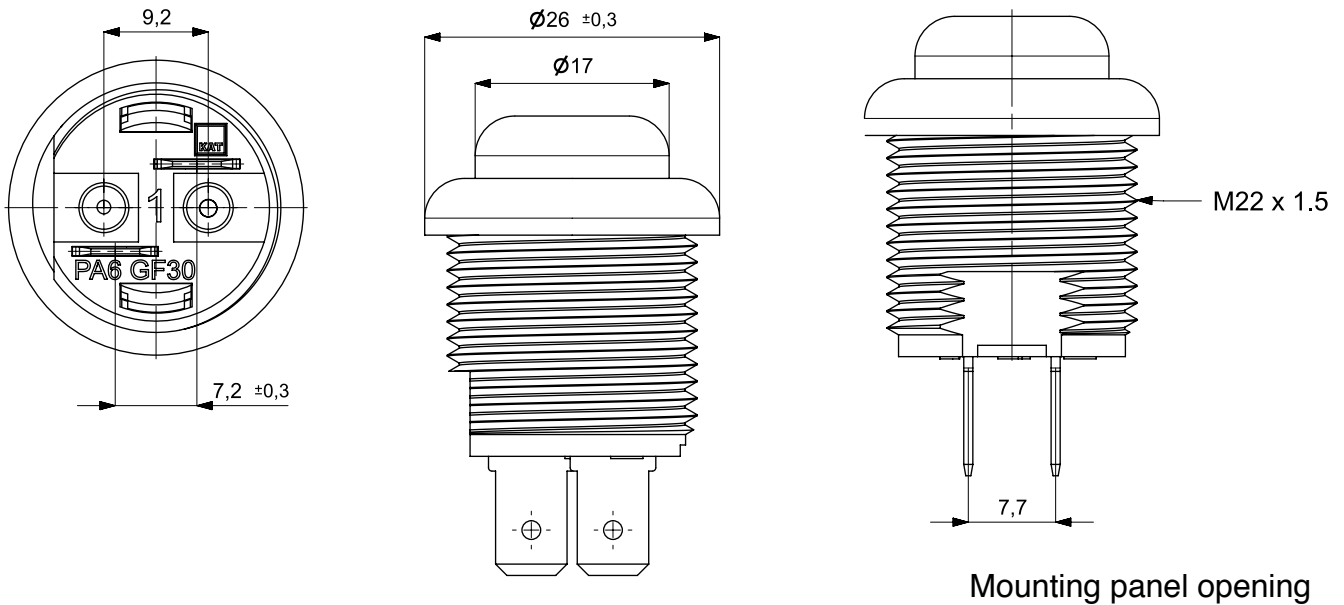
## MAIN PROPERTIES

- Voltage: 12 V / 24 V
- Temperature Range: - 40°C / + 85 °C
- Max. Current: 12,5 A/12V or 6,25A/24V
- Protection Class:  
button side, with/without cover IP 66/IP 40  
terminal side, with/without cap IP 64/IP 20
- Stroke:  $4,4 \pm 0,2$  mm
- Actuation Point:  $1,6 \pm 0,6$  mm
- Force at Actuation Point:  $9 \pm 1$  N
- Electromechanical Life: min. 25.000 cycles



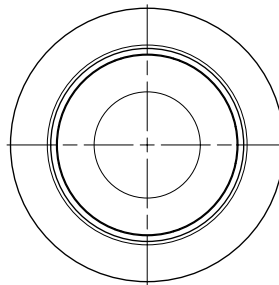
## TECHNICAL CHARACTERISTICS

KAT Push Button is a product designed for spring (momentary) switching in the front panels of agricultural, commercial vehicles and construction machines. It has two different contact configurations as normally open and normally closed.

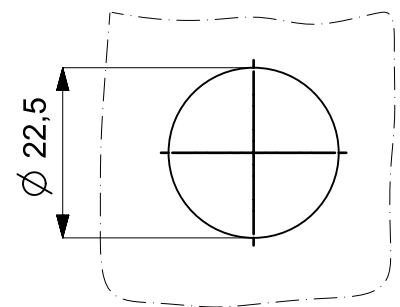


### Materials

Housing	: PA6, glass-fiber-reinforced
Button	: POM black
Nut 6.5mm	: St 3 Lg Fe
Nut 3mm	: Al Mg SiSn Bi
Terminals	: CuZn37, silver coated

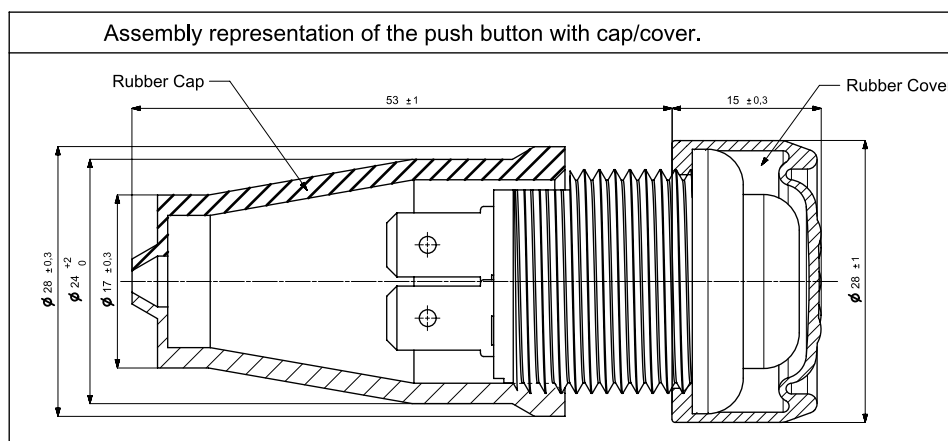


Mounting panel opening



The product is mounted from the top of the panel with the M22 nut on the housing. The terminals of the product are available as blade or screw.

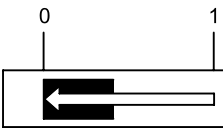
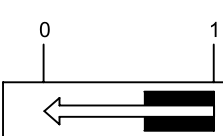
Depending on the customer's request, increased protection class suitable for use in open-cabin vehicles is available as well.



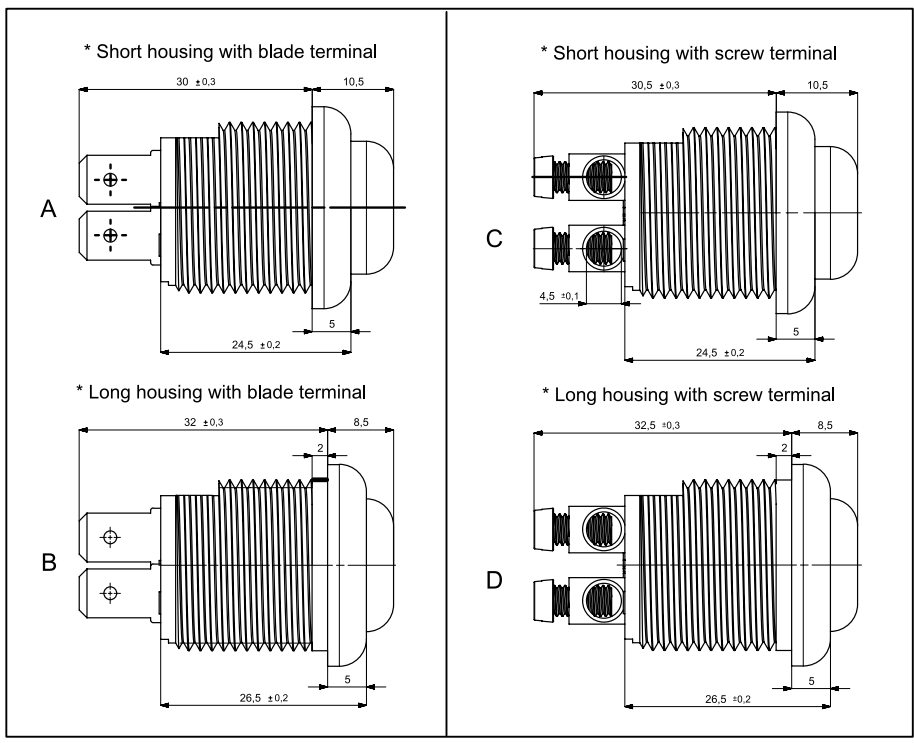
# ORDERING SCHEME

Please define your product by selecting the technical features below

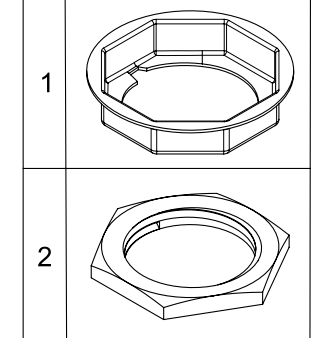
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>		<b>1-</b> Electrical Diagram <b>2-</b> Switch Types <b>3-</b> Nut Types	<b>4-</b> Rubber Cover <b>5-</b> Button <b>6-</b> Rubber Cap
----------	----------	----------	----------	----------	----------	--	---	--

<b>1</b> ELECTRICAL DIAGRAM	<b>1</b>		max. intensity of current at 12V	Voltage drop	max. intensity of current at 24V	Voltage drop
			12.5A	≤300mV	6.25A	≤300mV
* ONLY FOR "A" HOUSING TYPE						
	<b>2</b>		max. intensity of current at 12V	Voltage drop	max. intensity of current at 24V	Voltage drop
			12.5A	≤300mV	6.25A	≤300mV

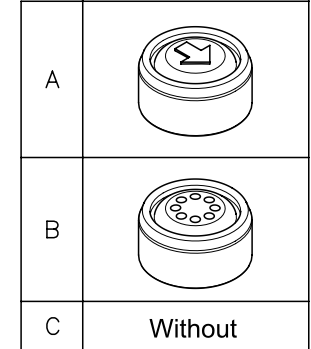
## 2 SWITCH TYPE



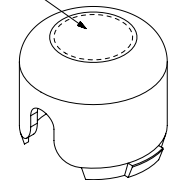
## 3 NUT TYPES



## 4 RUBBER COVER

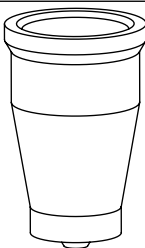


## 5 BUTTON

1	Black Button With Symbol	
2	Black Button Without Symbol	
3	Red Button With Symbol	
4	Red Button Without Symbol	

\* Symbols are acc.to ISO7000

## 6 RUBBER CAP

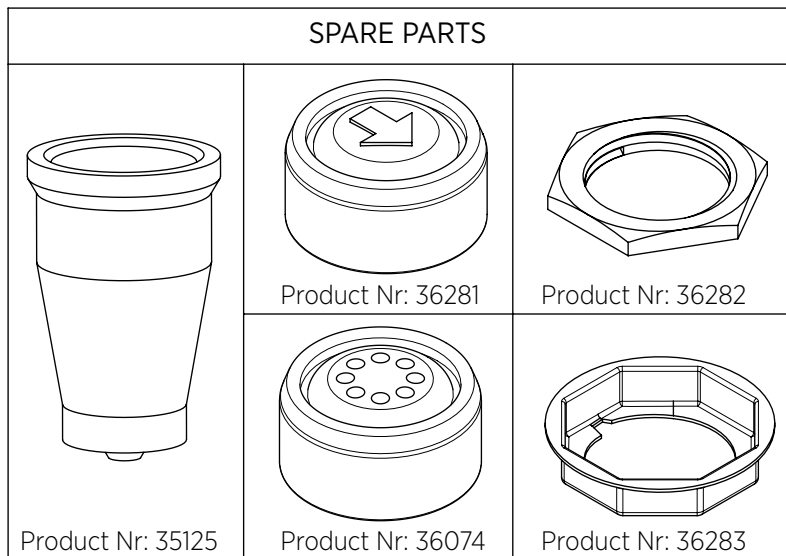
1	With	
2	Without	

\* For button side IP Protection upgrade

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics					
	CODE					
	1	2	3	4	5	6
34418	1	A	1	B	2	1
34417	1	A	1	B	2	2
34416	1	A	1	C	2	2
34784	1	A	2	B	2	2
34783	1	A	2	C	2	2
34414	2	A	1	A	2	2
34415	2	A	1	B	2	1
34413	2	A	1	B	2	2
34412	2	A	1	C	2	1
34409	2	A	1	C	2	2
35908	2	A	2	B	2	2
34419	2	A	2	C	2	2
34935	2	A	2	C	4	2
34821	2	B	1	B	2	2
34411	2	B	1	C	2	2
34408	2	C	1	B	2	1
34407	2	C	1	B	2	2
34406	2	C	1	C	2	2



Delivery Volume		
Item	Designation	Number
1	Push Button	1
2	Nut	1

# “ROTARY SWITCH,”



## MAIN PROPERTIES

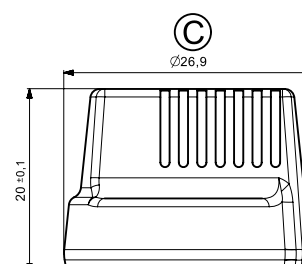
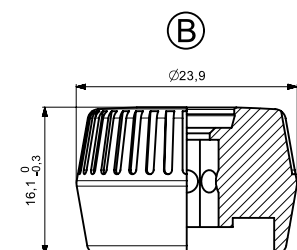
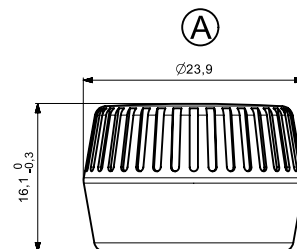
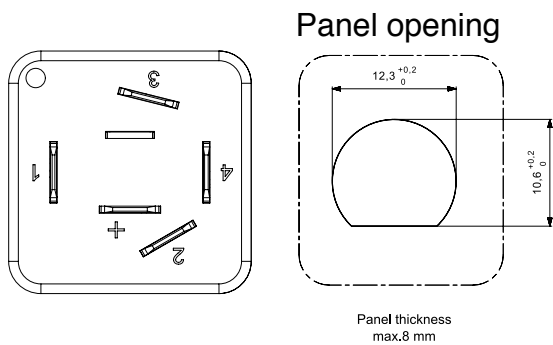
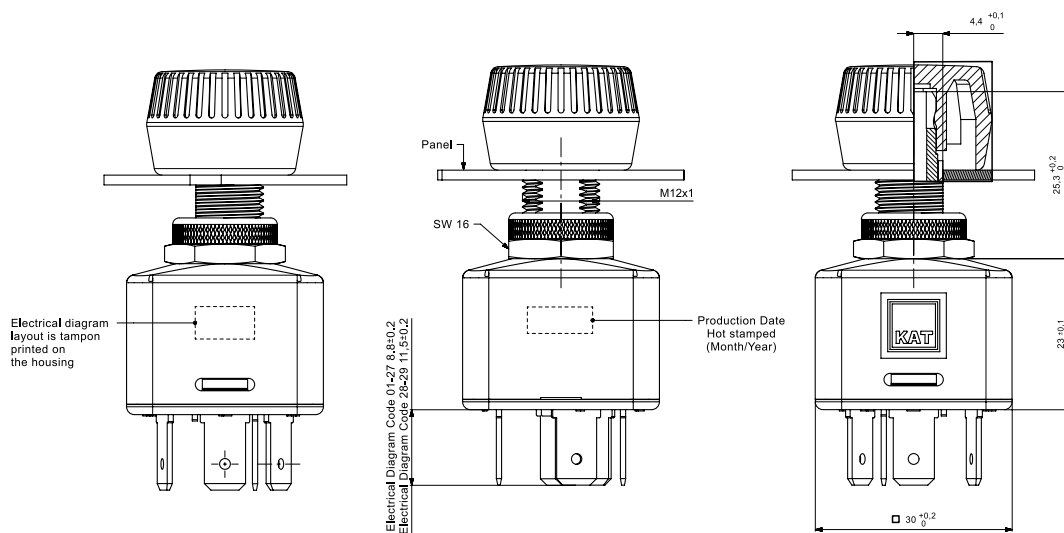
- Temperature Range: -40°C / +85°C
- Protection Class: IP 53 Knob Side
- Voltage: 12 V / 24 V
- Current: max. 15 A
- Electromechanical Life: min. 25.000 cycles



# TECHNICAL CHARACTERISTICS

KAT rotary switches are qualified according to international standards (electrical, mechanical and environmental) . They are mainly used in agricultural vehicles, construction equipment and marine vessels for panel-mount applications.

Available in maintained and momentary function options the KAT rotary switches offer maximum performance and reliability. Several switching options up to 4 positions increase the versatility of application. Different button types, symbols and illumination colors can be selected. Connectors are available.



## Materials

Housing	: PA 6
Socket	: PA 66
Knob	: PA 6
Nut	: AlMgSiSnBi
Hexagonal Nut	: Al Cu Mg
Terminals	: Cu Zn 37, silver coated



# ORDERING SCHEME

Please define your product by selecting the technical features below

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
_____	_____	_____	_____	_____

- 1-** Electrical Diagram
- 2-** Knob Types
- 3-** Nut Type 1
- 4-** Nut Type 2
- 5-** Illumination

## 1 ELECTRICAL DIAGRAM


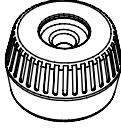
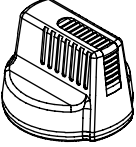








































Code	Layout	Position	Illumination	Self-Recoiling
01		Off-On	No	No
02		Off-On	No	Yes
03		Off-On	Yes	No
04		Off-On	Yes	No
05		Off-On	Yes	Yes
06		Off-On	Yes	Yes
07		On-On	No	No
08		On-On	Yes	No
09		On-On	Yes	No
10		On-On	Yes	Yes
11		On-On	Yes	Yes
12		On-On	No	Yes
13		Off-On-On	No	No
14		Off-On-On	No	Yes
15		Off-On-On	Yes	No
16		Off-On-On	Yes	No

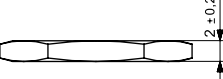
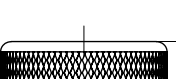
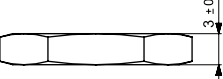
Code	Layout	Position	Illumination	Self-Recoiling
17		On-Off-On	No	No
18		On-Off-On	No	Yes
19		On-Off-On	No	Yes
20		On-Off-On	Yes	No
21		On-Off-On	Yes	No
22		On-Off-On	Yes	Yes
23		On-Off-On	Yes	Yes
24		On-On-On	No	No
25		On-On-On	No	Yes
26		On-On-On	Yes	No
27		On-On-On	Yes	No
28		Off-On-On	No	No
29		Off-On-On-On	No	No



\* If illuminated version is selected then knob type has to be selected among types B&C

2

KNOB TYPES

Note	For non-illuminated versions		For illuminated versions		
					
					
Code	Image	Code	Image	Code	Image
A01		A15		B01	 3 glass Yellow-Red-Green
A02		A16		B02	 Yellow glass
A03		A17		B03	 Red glass
A04		A18		B04	 Green glass
A05		A19		B05	 Yellow glass
A06		A20		B06	 Red glass
A07		A21		B07	 Yellow glass
A08		A22		B08	 Green glass
A09		A23		B09	 Green glass
A10		A24		B10	 Red glass
A11		A25		B11	 Yellow glass
A12		A26		B12	 Yellow glass
A13		A27		B13	 Green glass
A14					

3	NUT TYPE 1		
A		C	
B		D	No Nut

4	NUT TYPE 2	
A		
B		

5	ILLUMINATION
0	No illumination
1	Lamp(14V)
2	Lamp(28V)
3	LED(14V)
4	LED(28V)

## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics				
	CODE				
	1	2	3	4	5
31703	1	-	C	A	0
31697	1	A03	C	B	0
31698	1	A04	C	B	0
31699	1	A05	C	B	0
31695	1	A11	C	B	0
31696	1	A16	C	B	0
36286	1	A24	C	A	0
31700	1	A24	C	B	0
36287	1	A25	C	A	0
31701	1	A25	C	B	0
31702	1	A26	C	B	0
31704	1	C01	C	B	0
35891	1	C04	C	B	0
31705	2	A12	C	B	0
36289	2	A20	C	A	0
31706	2	A20	C	B	0
36143	2	A21	C	B	0
31707	2	C01	C	B	0
31723	3	B01	C	B	3
36021	3	B03	C	B	1
31720	3	B03	C	B	3
31722	3	B04	C	B	3
31721	3	B05	C	B	3
36288	3	B12	C	A	1
34878	3	B12	C	B	3
31975	3	C01	C	B	3
31724	3	C02	C	B	3
31725	3	C03	C	B	3
31726	3	C04	C	B	3
31753	4	B01	C	B	4
36022	4	B03	C	B	2
31749	4	B03	C	B	4
31752	4	B04	C	B	4
31751	4	B05	C	B	4
31750	4	B12	C	B	4
34462	4	C01	C	B	4
31754	4	C02	C	B	4
31755	4	C03	C	B	4
36318	4	C04	C	A	2
31756	4	C04	C	B	4
32006	5	C01	C	B	3
31711	7	-	C	A	0
31709	7	A01	C	B	0
31710	7	A04	C	B	0
31708	7	A13	C	B	0
31712	7	C01	C	A	0
32007	8	C01	C	B	3
35399	9	C01	C	B	4
35503	9	C04	C	B	4
31980	13	A10	C	B	0
31713	13	A14	C	B	0
31714	13	A18	C	B	0
31715	13	C01	C	B	0
36295	14	A07	C	A	0
31762	14	A07	C	B	0
36303	14	C01	C	A	0

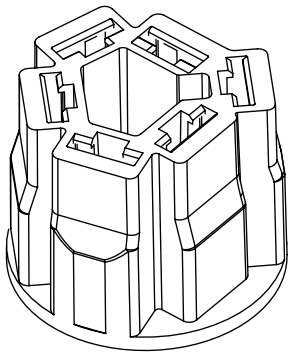
Product Nr.	Technical Characteristics				
	CODE				
	1	2	3	4	5
31763	14	C01	C	B	0
31727	15	B06	C	B	3
36290	15	B07	C	A	1
31728	15	B07	C	B	3
36291	15	B08	C	A	1
31729	15	B08	C	B	3
36284	15	C02	C	A	1
31730	15	C02	C	B	3
36285	15	C03	C	A	1
31731	15	C03	C	B	3
35843	15	C04	C	A	3
31732	15	C04	C	B	3
31759	16	C03	C	B	4
31760	16	C04	C	B	4
31717	17	-	C	B	0
31716	17	A15	C	B	0
31686	17	C01	C	A	0
36297	18	A08	C	A	0
31764	18	A08	C	B	0
31765	18	C01	C	B	0
31718	19	A17	C	B	0
36052	19	C01	C	A	0
31719	19	C01	C	B	0
36294	20	B02	C	A	1
31735	20	B09	C	B	3
36292	20	B10	C	A	1
31733	20	B10	C	B	3
36293	20	B11	C	A	1
31734	20	B11	C	B	3
31736	20	B13	C	B	3
36273	20	C01	C	A	3
31737	20	C02	C	B	3
31738	20	C03	C	B	3
35842	20	C04	C	A	3
31739	20	C04	C	B	3
31757	21	C03	C	B	4
31758	21	C04	C	B	4
31742	24	-	C	B	0
35011	24	A01	C	A	0
31740	24	A19	C	B	0
31741	24	A21	C	B	0
35844	24	C01	C	A	0
31743	24	C01	C	B	0
36300	24	C02	C	A	0
31974	26	C01	C	B	3
31778	26	C02	C	B	3
36215	26	C04	C	A	1
35841	26	C04	C	A	3
35400	27	C01	C	B	4
34664	28	-	B	A	0
31771	28	-	C	A	0
31766	28	A09	C	B	0
31768	28	A10	C	B	0
31767	28	A18	C	B	0
31769	28	A22	C	B	0
31770	28	A23	C	B	0

# LEADING PRODUCT VERSIONS

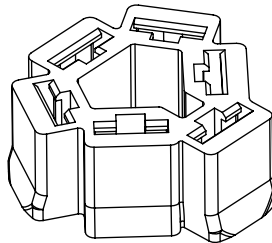
Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics				
	CODE				
	1	2	3	4	5
31772	28	C01	C	A	0
34226	28	C01	C	B	0
34665	29	-	B	A	0
36212	29	-	B	B	0
31773	29	-	C	A	0
35233	29	-	C	B	0
31747	29	-	D	B	0
35838	29	A02	C	A	0
31687	29	A02	C	B	0
31745	29	A06	C	B	0
34921	29	A21	C	A	0
31744	29	A21	C	B	0
31746	29	A22	C	B	0
36313	29	A27	D	A	0
31748	29	C01	C	A	0
35922	29	C03	C	B	0

## ACCESSORIES



Connector 6 pole  
H=24mm  
Product Nr: 31858

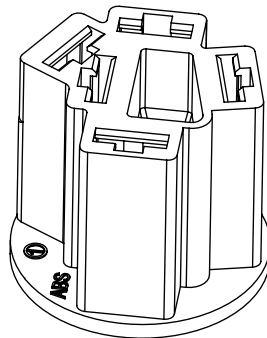


Connector 6 pole  
H=11.5mm  
Product Nr: 32036



Connector 6 pole  
H=11.5mm  
Product Nr: 33555

\* With cable insertion channel



\* Connector 5 pole  
H=24mm  
Product Nr: 31805

Delivery Volume		
Item	Designation	Number
1	Rotary Switch	1
2	Nut	1 or 2 (Optional)
3	Knob	1

\* This Connector is for following Electrical Diagrams applicable: 28 - 29

# “MAIN CIRCUIT BREAKER,”



## MAIN PROPERTIES

- Temperature Range:  $-40^{\circ}\text{C}$  /  $+85^{\circ}\text{C}$
- Protection Class: IP 69K
- Voltage: max. 32 V
- Current: 250 A , 500 A
- Electromechanical Life: min. 5.000 cycles
- Key Torque: max. 1,6 Nm
- Key Rotation Angle:  $103^{\circ}$  +/-  $2^{\circ}$



# WHY KAT

Advantages of KAT's Main Circuit Breaker product line (250A / 500A / load-switching or non-load-switching) against the competition are explained below.

Main circuit breakers were designed decades ago by well-known manufacturers. These designs no longer meet today's criteria of reliability and service life. Therefore, KAT analysed the market and developed a copyrighted product line and successfully placed it in the market. Almost the entire commercial vehicle sector, manufacturers of construction vehicle machines, tractors, and forklifts rely on KAT's premium products.

**The weak points of the products on the market are, above all:**

1. Inadequate IP protection
2. Structurally weak design of the housing / socket connection
3. The electrical contact
4. Inferior materials
5. Unsafe production processes

**The utility model is primarily concerned with improvements in IP protection and contact reliability:**

1. The design principle of the housing / base connection has been designed so that no forces are transmitted into the interior of the switch via the cable harness - contact interrupts are successfully prevented.
2. The contact bridge is "float-mounted" - thus contact breaks are successfully prevented.
3. All current / voltage-carrying parts are made of high-quality copper/copper-wrought alloys and, if necessary, alloyed silver materials.
4. The housing is ultrasonically welded and additionally sealed with an O-ring. Moisture and dust are permanently prevented from entering the contact area.
5. The key is sealed by an additional O-ring to the switch housing. - Moisture and dust are permanently prevented from entering the contact area.
6. The protective cap prevents dust and water ingress into the switch area.

In addition, state-of-the-art production methods are applied - all processes are monitored according to statistical methods. An automatic 100% function test of all important parameters is carried out and results are saved. This also ensures traceability.

The above-mentioned principles are extremely effective. Due to persistent progress, an exceptionally high failsafe performance has been achieved. KAT has been the sole and preferred supplier to OEMs because of the gained customer confidence.

# TECHNICAL CHARACTERISTICS

## 250A

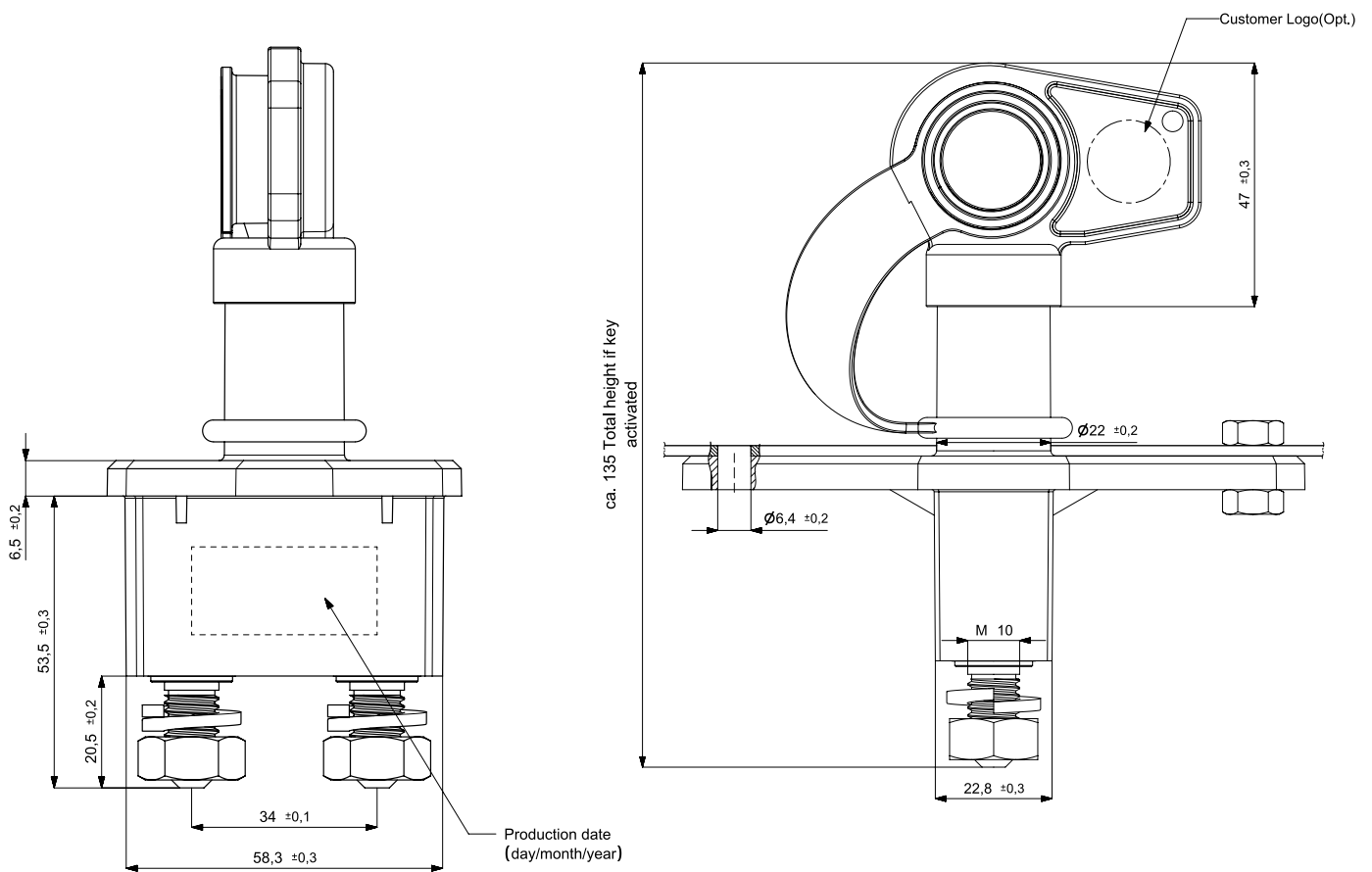
KAT main circuit breakers are specially designed to operate under severe conditions of transportation, agriculture and construction vehicles.

The circuit breaker is used for security purposes in case of maintenance, and for eliminating the danger of a possible fire hazard. With the removable key, it creates additional safeguards against unauthorized use.

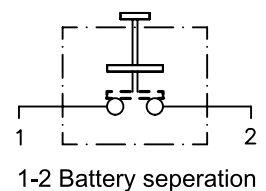
The circuit breaker rubber cap is a standard accessory and provides effective protection against dust, dirt and moisture while the key is not inserted.

2 function versions are available: with or without ULA ( Under Load Activating)  
Key options are lockable and non-lockable.

KAT circuit breaker can be delivered with oval or round flange.

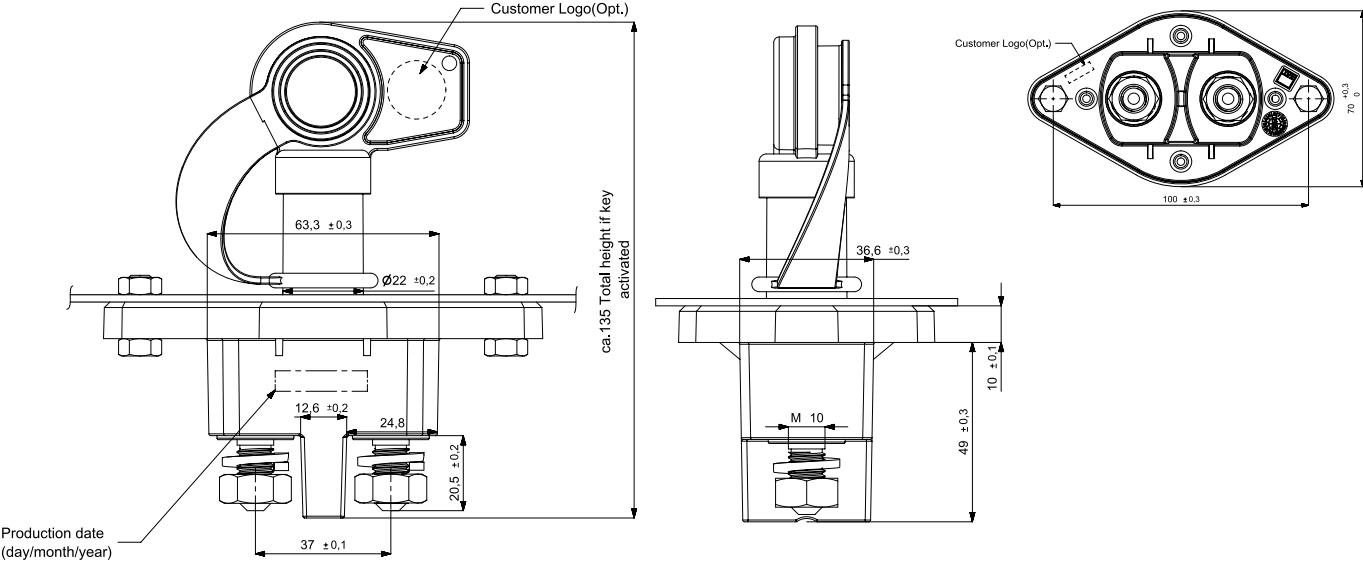


### Circuit Diagram

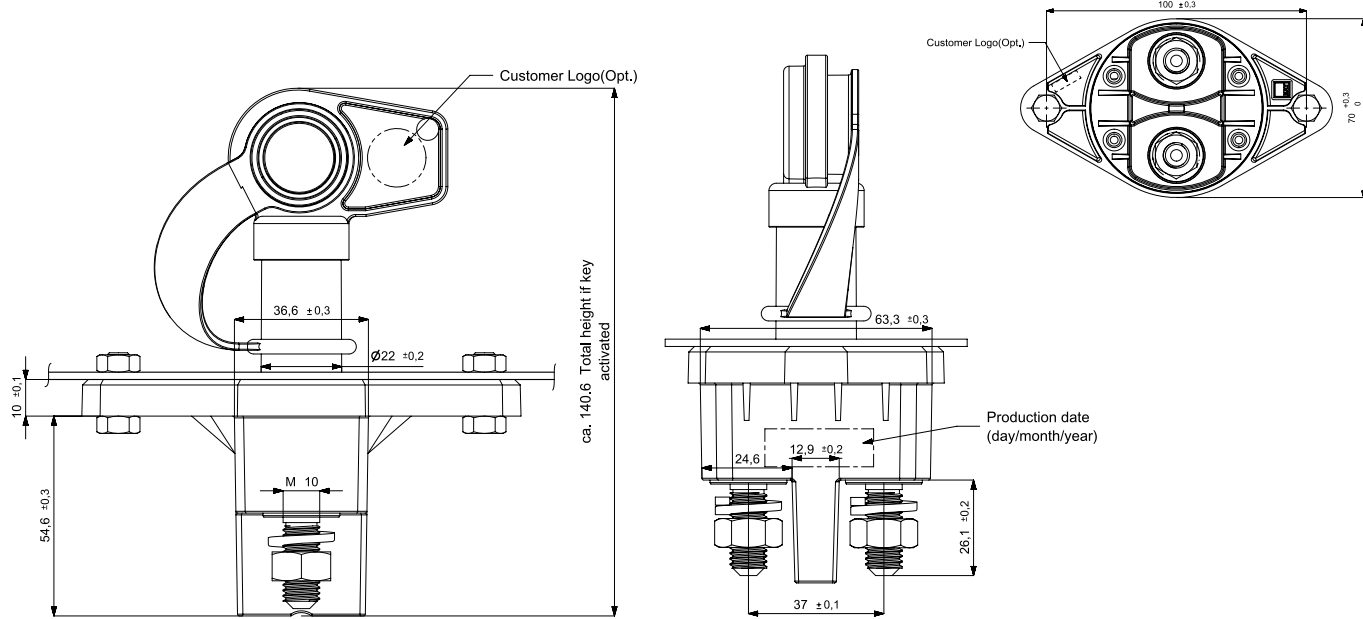




### 500 A / coaxial housing



### 500 A / non-coaxial housing



**Materials**

- Key : PA 6
- Protection Cap : PVC
- Contacts (welded) : AgSnO2
- Housing and Flange: PC GF20 (UL94 V-0)
- Washer (DIN 127) : A2-60/70 XN
- Nut : A2-60/70 XN
- O-ring : NBR
- Lock Plate(opt.) : Stainless Steel (thickness 2mm)

# ORDERING SCHEME

Please define your product by selecting the technical features below

**250 A**

1	2	3	4	5

- 1 \_ Battery Separation Switch Type / Mounting Panel Opening
- 2 \_ Electrical Values
- 3 \_ Nut Type
- 4 \_ Accessories
- 5 \_ Key Logo

	SWITCH TYPE	MOUNTING PANEL OPENING
<b>1</b>		<p style="font-size: small;">panel thickness is max. 2 mm</p>
<b>2</b>		<p style="font-size: small;">panel thickness is max. 2 mm</p>
<b>3</b>		<p style="font-size: small;">panel thickness is max. 2 mm</p>

<b>2 ELECTRICAL VALUES</b>	
<b>A</b>	
(WITH ACTIVATION UNDER LOAD)	
Max. Voltage	: 24V
Continuous load	: 250A
Short term	: 2500A for 5 sec.
Can be activated	: max. 50 times under load 250A
Voltage drop	: max. 50 mV under 250A
Connection bolt material	: CuZn39Pb3 / EN 12164-R500 +Ag plated (3 micron)
Contact material	: AgCu3
Connection bridge material	: Cu+Ag plated (3 micron)
<b>B</b>	
(WITHOUT ACTIVATION UNDER LOAD)	
Max. Voltage	: 24V
Continuous load	: 250A
Short term	: 2000A for 5 sec.
Voltage drop	: max. 100 mV under 250A
Connection bolt material	: CuZn39Pb3 / EN 12164-R500
Contact material	: Cu
Connection bridge material	: Cu

	NUT TYPE	Quant.
<b>1</b>	<p>(DIN 934)</p>	2
<b>2</b>	<p>(DIN 439)</p>	4

\* Product fulfills requirements best when it is mounted underneath panel.

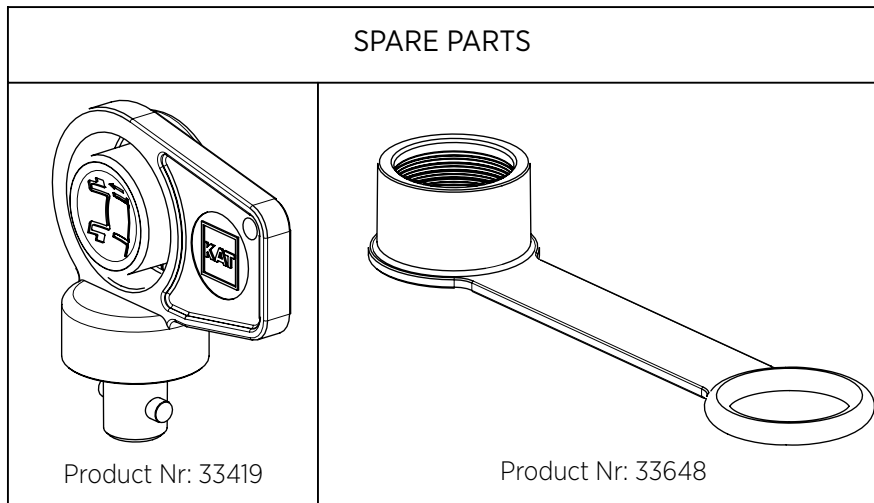
	A	B	C												
<b>4</b>	<b>NO LOCK</b>	<b>LOCK OFF</b>	<b>LOCK ON/OFF</b>												
		<p>*Comes with special key</p>	<p>*Comes with special key</p>												
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">1</th> <th style="width: 50%;">2</th> </tr> <tr> <td style="text-align: center;">WITH PADLOCK</td> <td style="text-align: center;">WITHOUT PADLOCK</td> </tr> <tr> <td style="text-align: center;"> <p>ABUS 72 / 30</p> </td> <td style="text-align: center;"> <p>Padlock must be acc.to below requirements</p> </td> </tr> </table>	1	2	WITH PADLOCK	WITHOUT PADLOCK	<p>ABUS 72 / 30</p>	<p>Padlock must be acc.to below requirements</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">1</th> <th style="width: 50%;">2</th> </tr> <tr> <td style="text-align: center;">WITH PADLOCK</td> <td style="text-align: center;">WITHOUT PADLOCK</td> </tr> <tr> <td style="text-align: center;"> <p>ABUS 72 / 30</p> </td> <td style="text-align: center;"> <p>Padlock must be acc.to below requirements</p> </td> </tr> </table>	1	2	WITH PADLOCK	WITHOUT PADLOCK	<p>ABUS 72 / 30</p>	<p>Padlock must be acc.to below requirements</p>
1	2														
WITH PADLOCK	WITHOUT PADLOCK														
<p>ABUS 72 / 30</p>	<p>Padlock must be acc.to below requirements</p>														
1	2														
WITH PADLOCK	WITHOUT PADLOCK														
<p>ABUS 72 / 30</p>	<p>Padlock must be acc.to below requirements</p>														

	KEY LOGO
<b>1</b>	Without Logo
<b>2</b>	With KAT Logo
<b>3</b>	Customer Specific

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics				
	Code 1	Code 2	Code 3	Code 4	Code 5
31990	1	A	1	A	2
36489	1	A	1	A	1
34931	1	A	2	A	2
35333	1	A	2	A	2
33302	1	B	1	A	2
34488	1	B	1	A	1
35127	1	B	1	A	2
31688	2	A	1	A	2
35252	2	A	1	A	2
33545	2	A	2	A	2
34806	2	A	-	A	2
33298	2	B	1	A	2
34895	2	B	1	A	2
35218	2	B	1	A	2
34996	2	B	2	A	2
35821	3	A	1	A	2
36819	3	A	1	A	1
35753	3	A	2	A	2
35250	3	B	1	A	2



Delivery Volume		
Item	Designation	Number
1	Battery Disconnection Switch	1
2	Key	1
3	Protection Cap	1
4	Washer	2
5	Nut	2 or 4 (Optional)

# “IGNITION SWITCH PRODUCT LINE,,



# WHY KAT

Advantages and benefits of KAT's Ignition Switch Product Line against the competition are explained below.

Ignition switches which are currently in the market were developed decades ago by well-known manufacturers. These designs do no longer meet today's criteria of reliability and durability and, above all, the switching of low loads in vehicles with BUS systems.

This is why KAT has analysed the market and developed a product line which also works as a future proof core product in immobiliser systems or systems for operating data acquisition. Here, a complete product line was systematically developed, such as those released by the German Federal Motor Transport Authority or Thatcham, among others.

KAT is now the largest supplier in Europe for safety systems in the construction vehicle industry. The market leaders of this industry, such as JCB, Liebherr, Terex, Wacker Neuson, among others, use KAT products in their original equipment.

## **The weak points of the ignition switch product line in the market are, above all:**

- 1.** Inadequate IP protection
- 2.** The electrical contact
- 3.** Inferior materials
- 4.** Unsafe production processes

All current / voltage-carrying parts are made of high-quality copper/copper-wrought alloys and, if necessary, alloyed silver materials.

Contacts are fully welded in a process-safe manner.

Entry of moisture and dust into the contact area is permanently prevented by secure O-ring seals.

On request, the connection side is encapsulated. Entry of moisture and dust entry into the contact area is permanently prevented.

The key cylinder side is protected by a special foam if desired.

In addition, state-of-the-art production methods are applied - all processes are monitored according to statistical methods. An automatic 100% function test of all important parameters is carried out and results are saved. This also ensures traceability.

The above-mentioned principles are extremely effective. Due to persistent progress, an exceptionally high failsafe performance has been achieved. KAT has been the sole and preferred supplier to OEMs because of the gained customer confidence.

# “IGNITION LIGHT SWITCH”



## MAIN PROPERTIES

- Voltage Range: 12 V / 24 V
- Max. Load: 20 A for 12 V, 10 A for 24 V
- Temperature Range: - 40 °C / + 85 °C
- Protection Class: IP 53

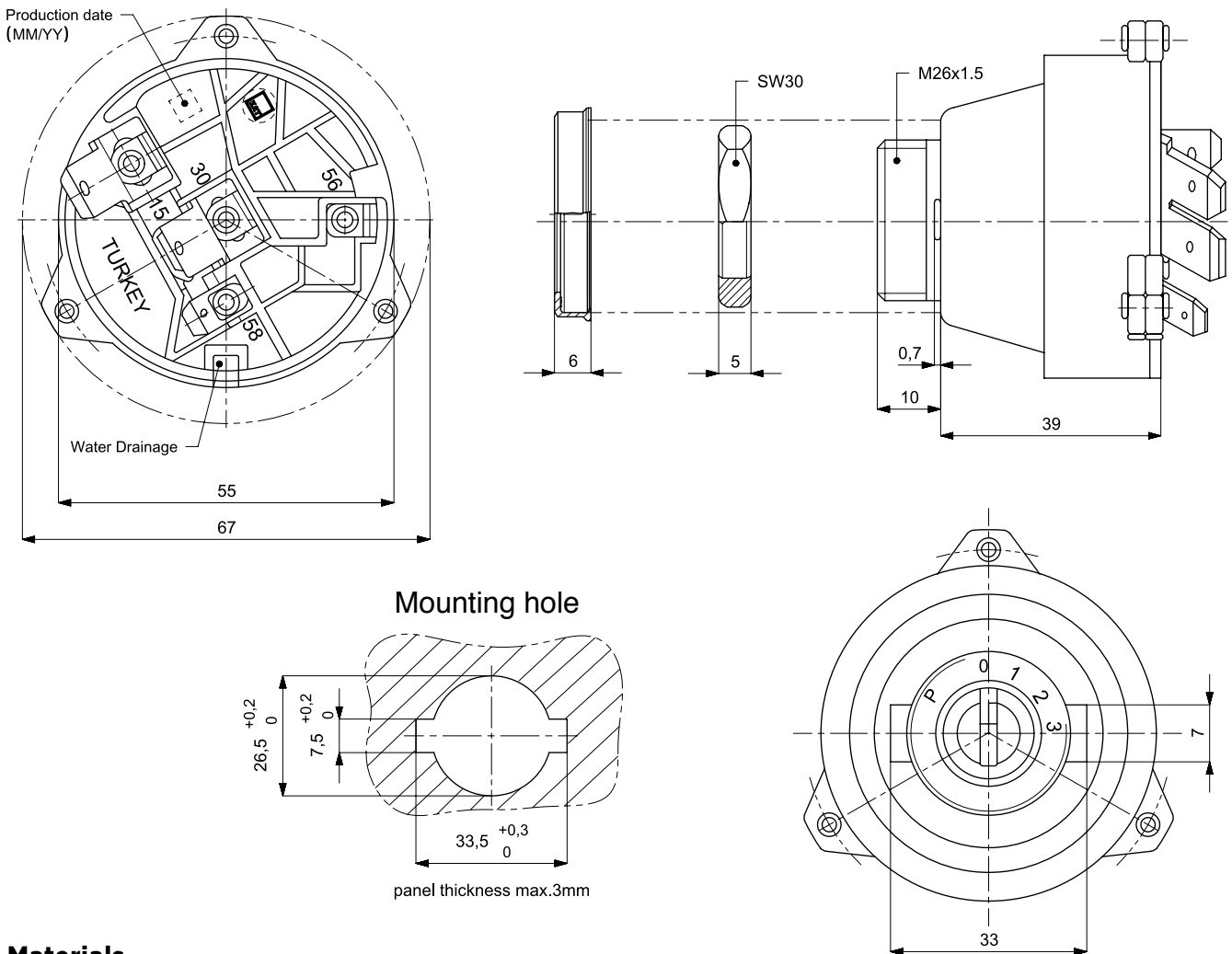


## TECHNICAL CHARACTERISTICS

KAT Ignition Light switches are specially designed to operate under severe working conditions in agricultural machines.

### Some of main properties of this switch are:

- has 5 or 6 positions
- has screw or blade terminals
- is supplied with 2 keys
- has key removing in P and O position
- requires 26,5 mm diameter panel hole
- has individual parts made of PA 6 (housing and socket), CuSn6 (terminals) and stainless steel (springs)



### Materials

Key	: CuNi alloy
Housing / base	: PA 6, glass-fiber reinforced
Terminals	: CuSn 6 for blade, CuZn 38 for screw
Contact bridges	: E-Cu 57



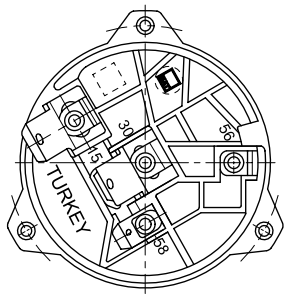
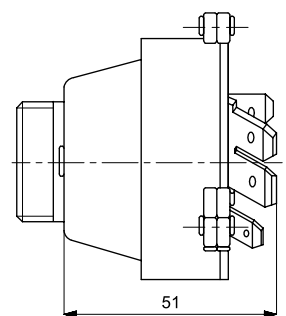
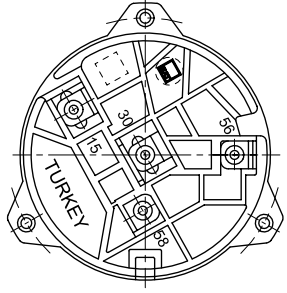
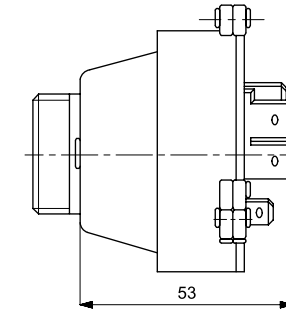
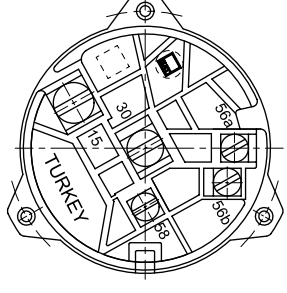
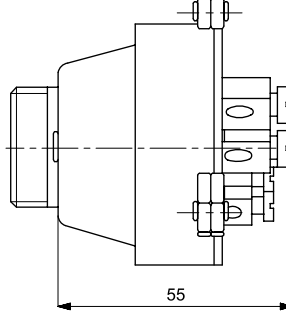
# ORDERING SCHEME

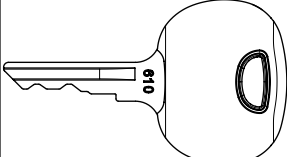
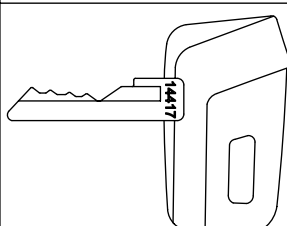
Please define your product by selecting the technical features below


1	2	3	4	5	6	7	8
—	—	—	—	—	—	—	—

- 1- Electrical Diagram
- 2- Switch Types
- 3- Key
- 4- Cover
- 5- Water Drainage
- 6- Plugs Silver plated
- 7- Color of the key (black,red,blue)
- 8- Customer Logo (on the key)

<b>1</b>	<b>ELECTRICAL DIAGRAM</b>																																			
A	5 circuit positions (P-0-1-2-3)																																			
	<table border="1"> <tr> <td></td> <td>P</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>30-58</td> <td>█</td> <td></td> <td></td> <td>█</td> <td>█</td> </tr> <tr> <td>30-15</td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> </tr> <tr> <td>30-56</td> <td></td> <td></td> <td></td> <td></td> <td>█</td> </tr> </table>		P	0	1	2	3	30-58	█			█	█	30-15			█	█	█	30-56					█											
		P	0	1	2	3																														
30-58	█			█	█																															
30-15			█	█	█																															
30-56					█																															
B	6 circuit positions (P-0-1-2-3-4)																																			
	<table border="1"> <tr> <td></td> <td>P</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>30-15</td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> </tr> <tr> <td>30-58</td> <td>█</td> <td></td> <td></td> <td>█</td> <td>█</td> <td></td> </tr> <tr> <td>30-56b</td> <td></td> <td></td> <td></td> <td></td> <td>█</td> <td></td> </tr> <tr> <td>30-56a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>█</td> </tr> </table>		P	0	1	2	3	4	30-15			█	█	█	█	30-58	█			█	█		30-56b					█		30-56a						█
		P	0	1	2	3	4																													
	30-15			█	█	█	█																													
	30-58	█			█	█																														
30-56b					█																															
30-56a						█																														

<b>2</b>	<b>SWITCH TYPE</b>
1	60 - degree blade  
2	90 - degree blade  
3	Screw  

<b>3</b>	<b>KEY</b>
A	610 
B	417 
C	Without

<b>4</b>	<b>COVER</b>
1	With 
2	Without

<b>5</b>	<b>WATER DRAINAGE</b>
A	With
B	Without

<b>6</b>	<b>PLUGS</b>
1	Silver Plated
2	No Plating

<b>7</b>	<b>KEY COLOR</b>
A	BLACK (Standard)
B	RED
C	BLUE

<b>8</b>	<b>CUSTOMER LOGO (on the key)</b>
1	With
2	Without

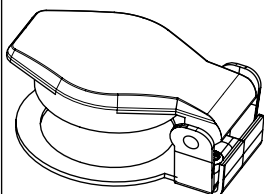
## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics							
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7	Code 8
36207	A	1	A	2	B	2	A	2
36252	A	1	-	2	B	2	-	-
36253	A	2	-	2	B	1	-	-
36208	B	1	B	2	A	2	A	2
36254	B	1	A	2	A	2	A	2
36255	B	3	A	2	B	2	A	2
36256	B	3	-	2	B	2	-	-
36299	B	3	A	1	B	2	A	2

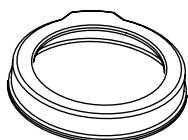
### ACCESSORIES

**Cover**



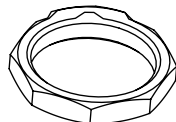
Product Nr: 31447

**Protection Cap**



Product Nr: 33672

**Nut**



Product Nr: 33673

### Delivery Volume

Item	Designation	Number
1	Light Switch	1
2	Nut	1
3	Protection Cap	1
4	Keys	2

# “IGNITION SWITCH”



## MAIN PROPERTIES

- Temperature Range: -40°C / +85°C
- Protection Class (Key side): IP 63 or IP 64
- Protection Class (Terminal side): IP 63 or IP 66
- Voltage Range: 12V / 24V



# TECHNICAL CHARACTERISTICS

KAT ignition switches are specially designed to operate under severe conditions of transportation, agriculture, construction vehicles and machines.

The KAT ignition switch family can be installed in many vehicle types with different switching diagram options. Up to 5 different electrical switching diagrams are available such as 0-I-II-III-IV.

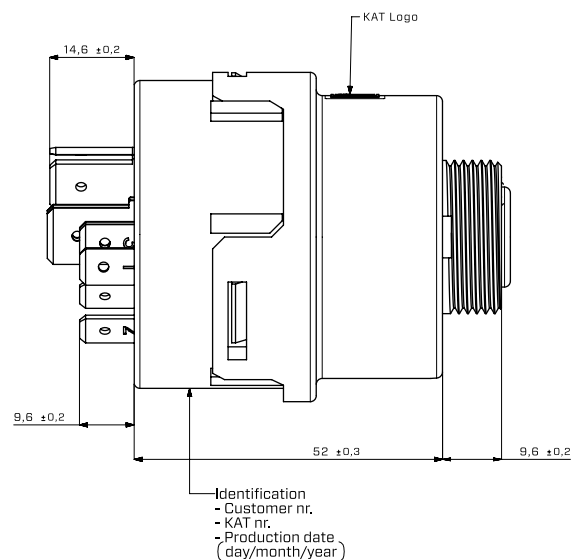
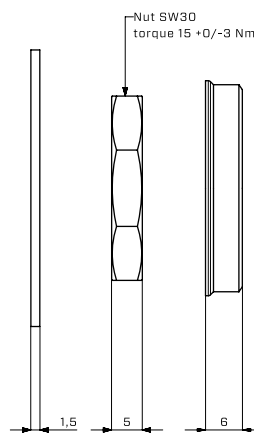
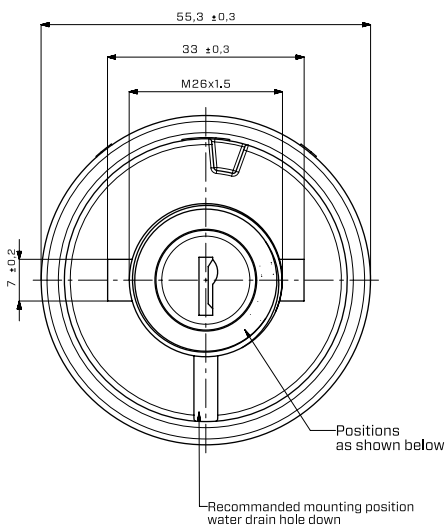
The starter position is a temporary position that is triggered by the spring. After fulfillment of the starter function, it returns to the driving position.

The blocking mechanism located in the ignition switch prohibits re-starting in running vehicles in order to protect the starter motor.

According to the environmental conditions of use, models with different IP grades are available. In addition, the flap cover supporting the protection class is available optionally.

Ignition switches are delivered together with keys suitable for encryption on them. Some key types have sealing supplementary capabilities while mounted in the product. Key models with different designs and different colors are available. Special designs can be developed according to customer requirements.

The ignition switch is fixed from behind with the nut provided together to the slot opened in the panel according to the measurements indicated in the technical drawing. The plastic cover mounted on the nut completes the product visually.



## Materials

- Base : PA 6.6, glass-fiber reinforced
- Housing : PA 6, glass-fiber reinforced
- Terminals : E- Cu57, silver coated
- Contacts : AgSnO2
- Springs : X12 CrNi 17 7
- Seal : Neoprene
- Key : CuNi alloy

# ORDERING SCHEME

Please define your product by selecting the technical features below

**1      2      3      4      5      6      7      8      9      10      11**

--	--	--	--	--	--	--	--	--	--	--

- 1- Electrical diagrams for ignition switches for engines with or without pre-heating
- 2- If restart-inhibitor desired
- 3- Ingress protection grade (at the front and rear side separately)
- 4- If condensation water drainage desired
- 5- Immobiliser Type
- 6- The Key types (The type A,B,C,D,L,M,N,P is used only for switches with IP64 & IP65 at the front side)
- 7- Color of the key (black,red,blue)
- 8- Customer Logo (on the key)
- 9- Key removing Position
- 10-The mounting hole type for installation
- 11- If cover desired

**1** ELECTRICAL DIAGRAM

**G** WITH PRE-HEATING

**A**

	0° P	50° 0	90° I	130° II	170° III	max. load at 12V	voltage drop	max. load at 24V	voltage drop	max. load at 80V	voltage drop	loading time
30-58						8A	≤300 mV	4A	≤300 mV	3A	≤300 mV	∞
30-15/54						35A		17.5A				∞
30-19						70A		35A				3.5 min.
30-17						70A		35A				3.5 min.
30-50a						70A/18A Induk.		40A/5A				temporary (1min.)

**B**

	0° P	50° 0	90° I	130° II	170° III	max. load at 12V	voltage drop	max. load at 24V	voltage drop	max. load at 80V	voltage drop	loading time
30-58						8A	≤300 mV	4A	≤300 mV	3A	≤300 mV	∞
30-15/54						35A		17.5A				∞
30-19						70A		35A				3.5 min.
30-17						70A		35A				3.5 min.
30-50a						70A/18A Induk.		40A/5A				temporary (1min.)

**C**

	0° 0	40°	80° II	120° III	max. load at 12V	voltage drop	max. load at 24V	voltage drop	max. load at 80V	voltage drop	loading time
30-15/54					35A	≤300 mV	17.5A	≤300 mV	3A	≤300 mV	∞
30-19					70A		35A				3.5 min.
30-17					70A		35A				3.5 min.
30-50a					70A/18A Induk.		40A/5A				temporary (1min.)

D

	0° 0	40°	80° II	120° III	max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
30-58					8A	≤ 300 mV	4A	≤ 300 mV	∞
30-15/54					35A		17.5A		∞
30-19					70A		35A		3.5 min.
30-17					70A		35A		3.5 min.
30-50a					70A/18A Induk.		40A/5A		temporary (1min.)

Connection Terminals		
Nr.	A 6,3 x 0,8 DIN 46244	A 9.5 x 1.2 DIN 46244
30		2x
58	1x	
15/54	2x	
19	2x	
17		2x
50a	1x	



Z WITHOUT PRE-HEATING

A

	0° 0	40°	max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
30-15/54			35A	≤ 300 mV	17.5A	≤ 300 mV	∞

B

	0° P	50° 0	90° I	130° II	max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
30-58					8A	≤ 300 mV	4A	≤ 300 mV	∞
30-15/54					35A		17.5A		∞
30-50a					70A/18A Induk.		40A/5A		temporary (1min.)

C

	0° P	50° 0	90° I	130° II	max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
30-58					8A	≤ 300 mV	4A	≤ 300 mV	∞
30-15/54					35A		17.5A		∞
30-50a					70A/18A Induk.		40A/5A		temporary (1min.)

D

	0° 0	40°	80° II	max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
30-15/54				35A	≤ 300 mV	17.5A	≤ 300 mV	∞
30-50a				70A/18A Induk.		40A/5A		temporary (1min.)

E

			max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
				≤ 300 mV		≤ 300 mV	
30-58	0°	40°	8A	≤ 300 mV	4A	≤ 300 mV	∞
30-15/54		35A	17.5A		∞		
30-50a		70A/18A Induk.	40A/5A		temporary (1min.)		

F

			max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
				≤ 300 mV		≤ 300 mV	
30-58	0°	50°	8A	≤ 300 mV	4A	≤ 300 mV	∞
30-SF		8A	4A		∞		
30-15/54		35A	17.5A		∞		
30-50a		70A/18A Induk.	40A/5A	VI	VI	temporary (1min.)	

G

			max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
				≤ 300 mV		≤ 300 mV	
30-SF	0°	90°	8A	≤ 300 mV	4A	≤ 300 mV	∞
30-15/54		35A	17.5A		∞		
30-50a		70A/18A Induk.	40A/5A		temporary (1min.)		

H

			max. load at 12V	voltage drop	max. load at 24V	voltage drop	loading time
				≤ 300 mV		≤ 300 mV	
30-15/54	0°	90°	35A	≤ 300 mV	17.5A	≤ 300 mV	∞
30-50a		70A/18A Induk.	40A/5A		temporary (1min.)		

total key rotation 90° + 5°

Connection terminals		
Nr.	A 6,3 x 0,8 DIN 46244	A 9,5 x 1,2 DIN 46244
30		2x
58	1x	
15/54	2x	
50a	2x	
SF	1x	

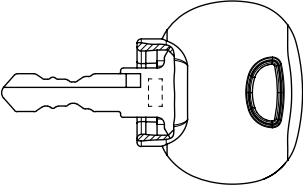
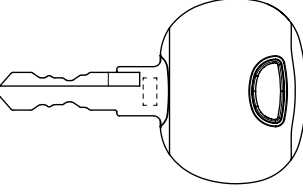
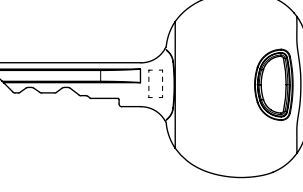
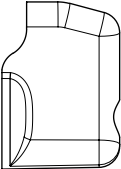
2	RESTART INHIBITOR
1	WITH
2	WITHOUT

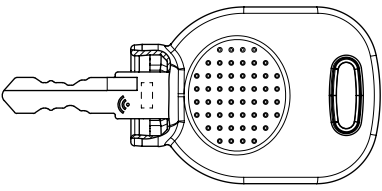
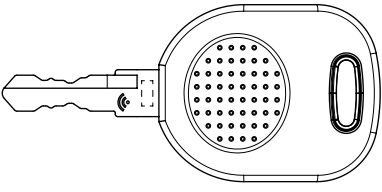
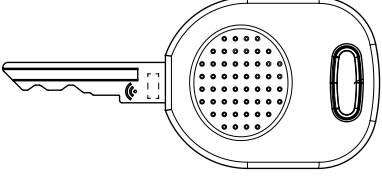
4	WATER DRAINAGE
1	WITH
2	WITHOUT

3	IP (DIN40050)	
	KEY SIDE	TERMINAL SIDE
1	IP64	IP66
2	IP64	IP63
3	IP63	IP66
4	IP63	IP63
5	IP65	IP66
6	IP65	IP63

5	IMMOBILISER TYPE	
M	WITH *	
O	WITHOUT	

\* For Immobiliser Selection please refer to page 82

6		KEY TYPES	
A	606		<b>FOR SWITCHES WITHOUT IMMOBILISER</b>
B	607		
C	608		
D	0-250		
E	602		
F	603		
G	0-250		
H	609		
j	610		
* K	001		

L	606		<b>FOR SWITCHES WITH IMMOBILISER</b>
M	607		
N	608		
P	0-250		
R	602		
S	603		
T	0-250		
U	609		
V	610		
W	628		
Z	Customer specific		

Keys for Switches with Immobiliser delivered in Immobiliser box

\*Key type K is to be screwed on the ignition switch.

\*D,G,P,T types are keyed different

Note: \*Locking system available from 0-250

\*Locking number to be given separately

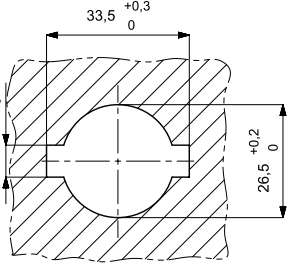
If not mentioned random deliveries will be made

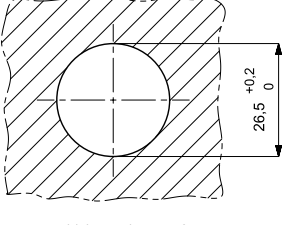
7		KEY COLOR
1	BLACK (Standard)	
2	RED	
3	BLUE	
4	N/A	

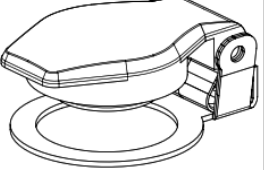
8		CUSTOMER LOGO
A	WITH	
B	WITHOUT	

9		KEY REMOVING POSITION
1	0	
2	P	
3	P+0	

\* Immobiliser types delivered in Red (for master key) and Blue (for slave key)

10		MOUNTING HOLE
K		

O	
---	---

11		COVER
1	WITH	
2	WITHOUT	



# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics										
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10	Code 11
31156	G-A	2	4	1	O	J	1	B	1	O	2
31157	G-A	2	4	1	O	F	1	B	1	O	2
31161	G-A	1	4	1	O	F	1	B	1	O	2
31427	G-A	2	3	1	O	J	1	B	1	O	2
31428	G-A	2	3	1	O	F	1	B	1	O	2
33013	G-A	2	4	1	M	V	1	B	1	O	2
33014	G-A	2	4	1	M	S	4	B	1	O	2
33081	G-A	2	3	1	M	V	1	B	1	O	2
33082	G-A	2	3	1	M	S	4	B	1	O	2
33018	G-A	1	4	1	M	S	4	B	1	O	2
33086	G-A	1	3	1	M	S	4	B	1	O	2
31459	G-A	1	3	1	O	F	1	B	1	O	2
31158	G-A	2	2	2	O	D	1	B	1	K	2
31159	G-A	2	2	2	O	A	1	B	1	O	2
31160	G-A	2	2	2	O	B	1	B	1	O	2
31162	G-A	1	2	2	O	M	1	B	1	O	2
31648	G-A	1	2	2	O	A	1	B	1	O	2
31456	G-A	2	1	2	O	D	1	B	1	O	2
31457	G-A	2	1	2	O	A	1	B	1	O	2
31458	G-A	2	1	2	O	B	1	B	1	O	2
31460	G-A	1	1	2	O	B	1	B	1	O	2
31649	G-A	1	1	2	O	A	1	B	1	O	2
33015	G-A	2	2	2	M	P	4	B	1	K	2
33016	G-A	2	2	2	M	L	4	B	1	O	2
33017	G-A	2	2	2	M	M	4	B	1	O	2
33019	G-A	1	2	2	M	M	4	B	1	O	2
33080	G-A	1	2	2	M	L	4	B	1	O	2
33083	G-A	2	1	2	M	P	4	B	1	K	2
33084	G-A	2	1	2	M	L	4	B	1	O	2
33085	G-A	2	1	2	M	M	4	B	1	O	2
33087	G-A	1	1	2	M	M	4	B	1	O	2
33148	G-A	1	1	2	M	L	4	B	1	O	2
31165	G-B	2	4	1	O	F	1	B	3	O	2
31167	G-B	2	4	1	O	E	1	B	3	O	2
31172	G-B	1	4	1	O	F	1	B	3	O	2
31174	G-B	1	2	1	O	M	1	B	3	K	2
31566	G-B	1	4	1	O	F	1	B	3	K	1
35249	G-B	1	4	1	O	F	1	B	3	O	1
35822	G-B	2	1	1	O	B	1	B	3	K	2
35939	G-B	1	4	1	O	S	1	B	3	O	1
36042	G-B	1	2	1	O	B	1	B	3	K	1
35122	G-B	2	4	1	O	F	1	B	3	O	1
34930	G-B	2	4	1	O	S	1	B	3	O	1
31472	G-B	1	1	1	O	B	1	B	3	K	2
34628	G-B	1	1	1	O	D	1	B	1	K	2
31463	G-B	2	3	1	O	F	1	B	3	O	2
31470	G-B	1	3	1	O	F	1	B	3	O	2
31164	G-B	2	4	1	O	G	1	B	3	O	2
31166	G-B	2	4	1	O	H	1	B	3	O	2
31171	G-B	1	4	1	O	E	1	B	3	O	2
33030	G-B	1	2	1	M	M	4	B	3	K	2
33098	G-B	1	1	1	M	M	4	B	3	K	2
31462	G-B	2	3	1	O	G	1	B	3	O	2
33021	G-B	2	4	1	M	T	4	B	3	O	2
33089	G-B	2	3	1	M	T	4	B	3	O	2
33022	G-B	2	4	1	M	S	4	B	3	O	2
33090	G-B	2	3	1	M	S	4	B	3	O	2
31464	G-B	2	3	1	O	H	1	B	3	O	2
31465	G-B	2	3	1	O	E	1	B	3	O	2
33024	G-B	2	4	1	M	R	4	B	3	O	2
33092	G-B	2	3	1	M	R	4	B	3	O	2
31469	G-B	1	3	1	O	E	1	B	3	O	2
33027	G-B	1	4	1	M	R	4	B	3	O	2
33095	G-B	1	3	1	M	R	4	B	3	O	2
33028	G-B	1	4	1	M	S	4	B	3	O	2
33096	G-B	1	3	1	M	S	4	B	3	O	2
31565	G-B	2	3	1	M	S	4	B	3	O	2
31567	G-B	1	3	1	O	F	1	B	3	K	1
33079	G-B	1	4	1	M	S	4	B	3	K	1
33147	G-B	1	3	1	M	S	4	B	3	K	1
33043	G-B	2	4	1	M	S	4	B	2	O	2
33111	G-B	2	3	1	M	S	4	B	2	O	2
31187	G-B	2	4	1	O	F	1	B	2	O	2
31510	G-B	2	3	1	O	F	1	B	2	O	2
34751	G-B	2	4	1	O	F	1	B	3	O	1

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

31461	G-B	2	3	1	O	-	-	-	3	K	2
34461	G-B	1	2	1	O	D	1	B	1	K	2
31163	G-B	2	4	1	-	-	-	-	3	K	2
36610	G-B	1	1	1	O	M	1	B	3	K	2
36620	G-B	2	4	1	O	S	1	B	3	O	2
36622	G-B	1	4	1	O	S	1	B	3	O	2
31169	G-B	2	2	2	O	A	1	B	3	O	2
31170	G-B	2	2	2	O	B	1	B	3	O	2
31173	G-B	1	2	2	O	B	1	B	3	O	2
35251	G-B	1	1	2	O	B	1	B	1	K	2
34762	G-B	1	2	2	O	B	1	B	3	O	1
31468	G-B	2	1	2	O	B	1	B	3	O	2
34032	G-B	1	2	2	O	K	1	B	3	O	2
34916	G-B	1	2	2	O	K	2	B	3	O	2
31467	G-B	2	1	2	O	A	1	B	3	O	2
31471	G-B	1	1	2	O	B	1	B	3	O	2
33025	G-B	2	2	2	M	L	4	B	3	O	2
33026	G-B	2	2	2	M	M	4	B	3	O	2
33029	G-B	1	2	2	M	M	4	B	3	O	2
33093	G-B	2	1	2	M	L	4	B	3	O	2
33094	G-B	2	1	2	M	M	4	B	3	O	2
33097	G-B	1	1	2	M	M	4	B	3	O	2
36609	G-B	1	2	2	O	M	1	B	3	O	2
36621	G-B	2	2	2	O	M	1	B	3	O	2
31176	G-C	2	4	1	O	F	1	B	1	O	2
31180	G-C	1	4	1	O	F	1	B	1	O	2
34910	G-C	1	1	1	O	B	1	B	1	O	1
34917	G-C	1	2	1	O	B	1	B	1	O	1
35161	G-C	1	2	1	O	A	1	B	1	K	2
33036	G-C	1	4	1	M	S	4	B	1	O	2
31181	G-C	1	4	1	O	-	-	-	1	O	2
35171	G-C	1	-	1	-	-	-	-	1	-	2
31175	G-C	2	4	1	O	G	1	B	1	O	2
31179	G-C	1	4	1	O	G	1	B	1	O	2
31473	G-C	2	3	1	O	G	1	B	1	O	2
31474	G-C	2	3	1	O	F	1	B	1	O	2
31477	G-C	1	3	1	O	G	1	B	1	O	2
31498	G-C	1	3	1	O	F	1	B	1	O	2
33031	G-C	2	4	1	M	T	4	B	1	O	2
33032	G-C	2	4	1	M	S	4	B	1	O	2
33035	G-C	1	4	1	M	T	4	B	1	O	2
33099	G-C	2	3	1	M	T	4	B	1	O	2
33100	G-C	2	3	1	M	S	4	B	1	O	2
33103	G-C	1	3	1	M	T	4	B	1	O	2
33104	G-C	1	3	1	M	S	4	B	1	O	2
31499	G-C	1	3	1	O	-	-	-	1	O	2
36623	G-C	2	4	1	O	S	1	B	1	O	2
36642	G-C	1	4	1	O	S	1	B	1	O	2
31178	G-C	2	2	2	O	B	1	B	1	O	2
34061	G-C	1	4	2	O	F	1	B	1	O	2
31182	G-C	1	2	2	O	B	1	B	1	O	2
35225	G-C	1	2	2	O	B	1	B	1	K	2
31500	G-C	1	1	2	O	B	1	B	1	O	2
33038	G-C	1	2	2	M	M	4	B	1	O	2
31177	G-C	2	2	2	O	D	1	B	1	O	2
31475	G-C	2	1	2	O	D	1	B	1	O	2
31476	G-C	2	1	2	O	B	1	B	1	O	2
33033	G-C	2	2	2	M	P	4	B	1	O	2
33034	G-C	2	2	2	M	M	4	B	1	O	2
33101	G-C	2	1	2	M	P	4	B	1	O	2
33102	G-C	2	1	2	M	M	4	B	1	O	2
33106	G-C	1	1	2	M	M	4	B	1	O	2
36613	G-C	1	2	2	O	M	1	B	1	O	2
36624	G-C	2	2	2	O	M	1	B	1	O	2
31184	G-D	2	4	1	O	S	1	B	1	O	2
31186	G-D	1	4	1	O	F	1	B	1	O	2
35548	G-D	1	1	1	O	A	1	B	1	O	2
35123	G-D	1	2	1	O	A	1	B	1	K	1
35214	G-D	1	2	1	O	B	1	B	1	K	1
35993	G-D	1	1	1	O	A	1	B	1	K	2
31509	G-D	1	3	1	O	F	1	B	1	O	2
31183	G-D	2	4	1	O	G	1	B	1	O	2
31506	G-D	2	3	1	O	G	1	B	1	O	2
31507	G-D	2	3	1	O	F	1	B	1	O	2
33039	G-D	2	4	1	M	-	4	B	1	O	2
33040	G-D	2	4	1	M	S	4	B	1	O	2
33042	G-D	1	4	1	M	S	4	B	1	O	2
33107	G-D	2	3	1	M	T	4	B	1	O	2
33108	G-D	2	3	1	M	S	4	B	1	O	2

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

33110	G - D	1	3	1	M	S	4	B	1	O	2
36947	G - D	1	4	1	O	G	1	B	1	O	2
31185	G - D	2	2	2	O	B	1	B	1	O	2
35499	G - D	2	1	2	O	A	1	B	1	O	2
31508	G - D	2	1	2	O	B	1	B	1	O	2
33041	G - D	2	2	2	M	M	4	B	1	O	2
33109	G - D	2	1	2	M	M	4	B	1	O	2
31188	Z - A	2	4	1	O	F	1	B	1	O	2
35082	Z - A	2	2	1	O	M	1	B	1	K	2
36023	Z - A	2	1	1	O	B	1	B	1	O	2
36139	Z - A	2	4	1	O	S	1	B	1	K	2
31511	Z - A	2	3	1	O	F	1	B	1	O	2
33044	Z - A	2	4	1	M	S	4	B	1	O	2
33112	Z - A	2	3	1	M	S	4	B	1	O	2
36348	Z - A	2	4	1	O	-	-	-	1	-	2
36512	Z - A	2	3	1	O	G	1	B	1	O	2
34776	Z - A	1	2	1	M	M	4	B	1	O	2
36625	Z - A	2	4	1	O	S	1	B	1	O	2
35256	Z - A	2	1	2	O	M	1	B	1	O	2
35276	Z - A	2	1	2	O	B	1	B	1	O	2
31191	Z - B	2	4	1	O	F	1	B	3	O	2
31196	Z - B	1	4	1	O	F	1	B	3	O	2
35088	Z - B	1	1	1	O	A	1	B	3	K	2
34618	Z - B	1	4	1	O	-	-	-	1	O	2
31539	Z - B	1	3	1	O	F	1	B	3	O	2
31189	Z - B	2	4	1	O	G	1	B	3	O	2
31190	Z - B	2	4	1	O	E	1	B	3	O	2
31193	Z - B	2	4	1	O	G	1	B	2	O	2
33360	Z - B	1	4	1	O	F	1	B	2	O	2
31512	Z - B	2	3	1	O	G	1	B	3	O	2
31513	Z - B	2	3	1	O	E	1	B	3	O	2
31514	Z - B	2	3	1	O	F	1	B	3	O	2
31516	Z - B	2	3	1	O	G	1	B	2	O	2
33045	Z - B	2	4	1	M	T	4	B	3	O	2
33046	Z - B	2	4	1	M	R	4	B	3	O	2
33047	Z - B	2	4	1	M	S	4	B	3	O	2
33049	Z - B	1	4	1	M	T	4	B	2	O	2
33052	Z - B	1	4	1	M	S	4	B	3	O	2
33113	Z - B	2	3	1	M	T	4	B	3	O	2
33114	Z - B	2	3	1	M	R	4	B	3	O	2
33115	Z - B	2	3	1	M	S	4	B	3	O	2
33117	Z - B	2	3	1	M	T	4	B	2	O	2
33120	Z - B	1	3	1	M	S	4	B	3	O	2
33361	Z - B	1	3	1	O	F	1	B	2	O	2
31192	Z - B	2	4	1	O	J	1	B	3	O	2
31515	Z - B	2	3	1	O	J	1	B	3	O	2
34460	Z - B	2	2	1	O	D	1	B	1	K	2
36626	Z - B	2	4	1	O	S	1	B	3	O	2
36627	Z - B	1	4	1	O	S	1	B	3	O	2
31195	Z - B	2	2	2	O	B	1	B	3	O	2
31197	Z - B	1	2	2	O	B	1	B	3	O	2
31538	Z - B	2	1	2	O	B	1	B	3	O	2
31540	Z - B	1	1	2	O	B	1	B	3	O	2
33051	Z - B	2	2	2	M	M	4	B	3	O	2
33053	Z - B	1	2	2	M	M	4	B	3	O	2
33119	Z - B	2	1	2	M	M	4	B	3	O	2
33121	Z - B	1	1	2	M	M	4	B	3	O	2
31194	Z - B	2	2	2	O	14640	1	B	3	O	2
31517	Z - B	2	1	2	O	14640	1	B	3	O	2
36628	Z - B	1	2	2	O	M	1	B	3	O	2
36661	Z - B	2	2	2	O	M	1	B	3	O	2
31199	Z - C	2	4	1	O	F	1	B	1	O	2
31203	Z - C	1	4	1	O	E	1	B	1	O	2
31204	Z - C	1	4	1	O	F	1	B	1	O	2
35222	Z - C	1	3	1	O	F	1	B	1	O	2
36020	Z - C	2	4	1	O	F	1	B	1	K	2
31198	Z - C	2	4	1	O	G	1	B	1	O	2
31541	Z - C	2	3	1	O	G	1	B	1	O	2
31542	Z - C	2	3	1	O	F	1	B	1	O	2
31546	Z - C	1	3	1	O	E	1	B	1	O	2
31547	Z - C	1	3	1	O	F	1	B	1	O	2
33054	Z - C	2	4	1	M	T	4	B	1	O	2
33055	Z - C	2	4	1	M	S	4	B	1	O	2
33059	Z - C	1	4	1	M	R	4	B	1	O	2
33060	Z - C	1	4	1	M	S	4	B	1	O	2
33122	Z - C	2	3	1	M	T	4	B	1	O	2
33123	Z - C	2	3	1	M	S	4	B	1	O	2
33127	Z - C	1	3	1	M	R	4	B	1	O	2
33128	Z - C	1	3	1	M	S	4	B	1	O	2

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program


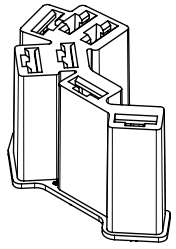
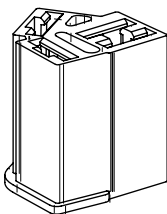
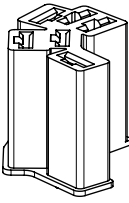
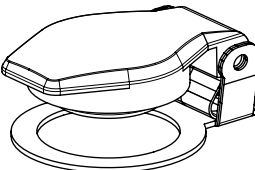
36630	Z-C	1	4	1	O	S	1	B	1	O	2
31202	Z-C	2	2	2	O	B	1	B	1	O	2
34662	Z-C	1	4	2	O	Z	1	-	1	O	2
35091	Z-C	1	4	2	O	F	1	B	1	O	2
31200	Z-C	2	2	2	O	D	1	B	1	O	2
31201	Z-C	2	2	2	O	A	1	B	1	O	2
31543	Z-C	2	1	2	O	D	1	B	1	O	2
31544	Z-C	2	1	2	O	A	1	B	1	O	2
31545	Z-C	2	1	2	O	B	1	B	1	O	2
33056	Z-C	2	2	2	M	P	4	B	1	O	2
33057	Z-C	2	2	2	M	L	4	B	1	O	2
33058	Z-C	2	2	2	M	M	4	B	1	O	2
33124	Z-C	2	1	2	M	P	4	B	1	O	2
33125	Z-C	2	1	2	M	L	4	B	1	O	2
33126	Z-C	2	1	2	M	M	4	B	1	O	2
33698	Z-C	1	-	2	-	-	-	-	1	K	2
36629	Z-C	2	2	2	O	M	1	B	1	O	2
31205	Z-D	2	4	1	O	F	1	B	1	O	2
31210	Z-D	1	4	1	O	G	1	B	1	O	2
31211	Z-D	1	4	1	O	F	1	B	1	O	2
34584	Z-D	2	4	1	O	F	1	B	1	O	1
36144	Z-D	1	4	1	O	S	1	B	1	K	2
33061	Z-D	2	4	1	M	S	4	B	1	O	2
31212	Z-D	1	4	1	O	-	-	-	1	O	2
31206	Z-D	2	4	1	O	J	1	B	1	O	2
31207	Z-D	2	4	1	O	G	1	B	1	O	2
31548	Z-D	2	3	1	O	F	1	B	1	O	2
31549	Z-D	2	3	1	O	J	1	B	1	O	2
31550	Z-D	2	3	1	O	G	1	B	1	O	2
31553	Z-D	1	3	1	O	G	1	B	1	O	2
31554	Z-D	1	3	1	O	F	1	B	1	O	2
33062	Z-D	2	4	1	M	J	1	B	1	O	2
33063	Z-D	2	4	1	M	T	4	B	1	O	2
33066	Z-D	1	4	1	M	T	4	B	1	O	2
33067	Z-D	1	4	1	M	S	4	B	1	O	2
33129	Z-D	2	3	1	M	S	4	B	1	O	2
33130	Z-D	2	3	1	M	J	1	B	1	O	2
33131	Z-D	2	3	1	M	T	4	B	1	O	2
33134	Z-D	1	3	1	M	T	4	B	1	O	2
33135	Z-D	1	3	1	M	S	4	B	1	O	2
31555	Z-D	1	3	1	O	-	-	-	1	O	2
36618	Z-D	2	4	1	O	S	1	B	1	O	2
36631	Z-D	1	4	1	O	S	1	B	1	O	2
36663	Z-D	1	4	1	O	T	1	B	1	O	2
31208	Z-D	2	2	2	O	M	1	B	1	O	2
31214	Z-D	1	2	2	O	B	1	B	1	O	2
33901	Z-D	1	2	2	O	K	1	B	1	O	2
31557	Z-D	1	1	2	O	B	1	B	1	O	2
33070	Z-D	1	2	2	M	M	4	B	1	O	2
36319	Z-D	2	6	2	O	L	1	B	1	K	2
31209	Z-D	2	2	2	O	C	1	B	1	O	2
31213	Z-D	1	2	2	O	D	1	B	1	O	2
31551	Z-D	2	1	2	O	B	1	B	1	O	2
31552	Z-D	2	1	2	O	C	1	B	1	O	2
31556	Z-D	1	1	2	O	D	1	B	1	O	2
33064	Z-D	2	2	2	M	M	4	B	1	O	2
33065	Z-D	2	2	2	M	N	4	B	1	O	2
33069	Z-D	1	2	2	M	P	4	B	1	O	2
33132	Z-D	2	1	2	M	M	4	B	1	O	2
33133	Z-D	2	1	2	M	N	4	B	1	O	2
33137	Z-D	1	1	2	M	P	4	B	1	O	2
33138	Z-D	1	1	2	M	M	4	B	1	O	2
36619	Z-D	1	2	2	O	M	1	B	1	O	2
31216	Z-E	2	4	1	O	F	1	B	1	O	2
31219	Z-E	1	4	1	O	F	1	B	1	O	2
31220	Z-E	1	4	1	O	T	1	B	1	O	2
35395	Z-E	1	-	1	-	-	-	-	1	K	2
31215	Z-E	2	4	1	O	G	1	B	1	O	2
31558	Z-E	2	3	1	O	G	1	B	1	O	2
31559	Z-E	2	3	1	O	F	1	B	1	O	2
31562	Z-E	1	3	1	O	F	1	B	1	O	2
31563	Z-E	1	3	1	O	G	1	B	1	O	2
33071	Z-E	2	4	1	M	T	4	B	1	O	2
33072	Z-E	2	4	1	M	S	4	B	1	O	2
33075	Z-E	1	4	1	M	S	4	B	1	O	2
33076	Z-E	1	4	1	M	T	4	B	1	O	2
33139	Z-E	2	3	1	M	T	4	B	1	O	2
33140	Z-E	2	3	1	M	S	4	B	1	O	2
33143	Z-E	1	3	1	M	S	4	B	1	O	2

## LEADING PRODUCT VERSIONS


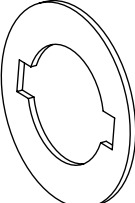
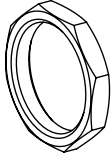

Versions which are not listed below are also included in our production program

33144	Z-E	1	3	1	M	T	4	B	1	O	2
31564	Z-E	1	3	1	O	G	1	B	1	O	2
33077	Z-E	1	-	1	M	-	-	-	1	O	2
33145	Z-E	1	-	1	M	-	-	-	1	O	2
36632	Z-E	1	4	1	O	S	1	B	1	O	2
31217	Z-E	2	2	2	O	B	1	B	1	O	2
35242	Z-E	1	4	2	O	S	1	B	1	K	2
35490	Z-E	1	4	2	O	S	1	B	1	K	2
35934	Z-E	2	2	2	O	A	1	B	1	O	2
31218	Z-E	2	2	2	O	D	1	B	1	O	2
31560	Z-E	2	1	2	O	B	1	B	1	O	2
31561	Z-E	2	1	2	O	D	1	B	1	O	2
33073	Z-E	2	2	2	M	M	4	B	1	O	2
33074	Z-E	2	2	2	M	P	4	B	1	O	2
33141	Z-E	2	1	2	M	M	4	B	1	O	2
33142	Z-E	2	1	2	M	P	4	B	1	O	2
36046	Z-F	1	-	1	-	-	-	-	1	K	2

## ACCESSORIES

<p>Protective cap with tie</p>  <p style="text-align: center;">Product Nr : 36167</p>	<p>Connector 7 pole * Only applicable for Z-F and Z-G Electrical Diagrams</p>  <p style="text-align: center;">Product Nr : 35491</p>	<p>Connector 4 pole</p>  <p style="text-align: center;">Product Nr : 31617</p>	<p>Connector 6 pole</p>  <p style="text-align: center;">Product Nr : 31616</p>	<p>Cover</p>  <p style="text-align: center;">Product Nr : 31447</p>
--	---	---	--	--

## SPARE PARTS

 <p style="text-align: center;">Cap</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>0-I-I</td><td>33734</td></tr> <tr><td>0-I-I-III</td><td>33735</td></tr> <tr><td>0-I-I-III-IV</td><td>33738</td></tr> <tr><td>P-0-I-I</td><td>33559</td></tr> <tr><td>P-0-I-I-III</td><td>33736</td></tr> <tr><td>No number</td><td>33672</td></tr> </table>	0-I-I	33734	0-I-I-III	33735	0-I-I-III-IV	33738	P-0-I-I	33559	P-0-I-I-III	33736	No number	33672	 <p style="text-align: center;">Spacer Product Nr : 33674</p>	 <p style="text-align: center;">Nut Product Nr : 33673</p>	 <p style="text-align: center;">* Sealing Cap</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>0-I-II</td><td>35677</td></tr> <tr><td>0-I-II-III</td><td>35678</td></tr> <tr><td>0-I-II-III-IV</td><td>35679</td></tr> <tr><td>P-0-I-II</td><td>35680</td></tr> <tr><td>P-0-I-II-III</td><td>35681</td></tr> <tr><td>No number</td><td>35694</td></tr> </table>	0-I-II	35677	0-I-II-III	35678	0-I-II-III-IV	35679	P-0-I-II	35680	P-0-I-II-III	35681	No number	35694
0-I-I	33734																										
0-I-I-III	33735																										
0-I-I-III-IV	33738																										
P-0-I-I	33559																										
P-0-I-I-III	33736																										
No number	33672																										
0-I-II	35677																										
0-I-II-III	35678																										
0-I-II-III-IV	35679																										
P-0-I-II	35680																										
P-0-I-II-III	35681																										
No number	35694																										

\* For only IP65 Level Switches

Delivery Volume		
Item	Designation	Number
1	Ignition Switch	1
2	Spacer	1
3	Keys	2
4	Cap	1
5	Nut	1

\* Delivery Volume may differ according to the selected variant

# “STARTER SWITCH”



## MAIN PROPERTIES

- Temperature Range: -40°C / + 85°C
- Protection Class (key side): IP 40 / IP 69K
- Protection Class (terminal side): IP 40 or IP 69
- Voltage: 12 V
- Max Current: 50 A





# TECHNICAL CHARACTERISTICS

KAT starter switches are designed for 12 V vehicles and industrial machines.

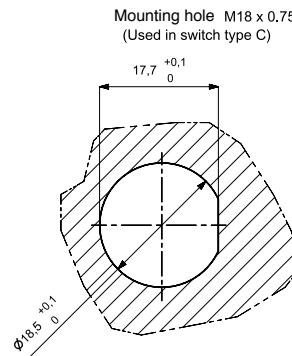
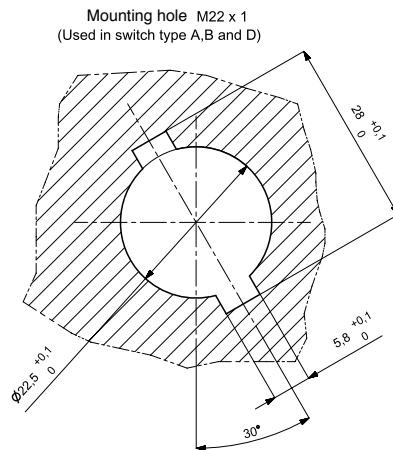
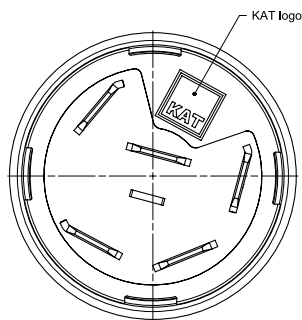
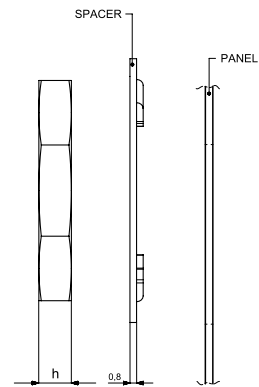
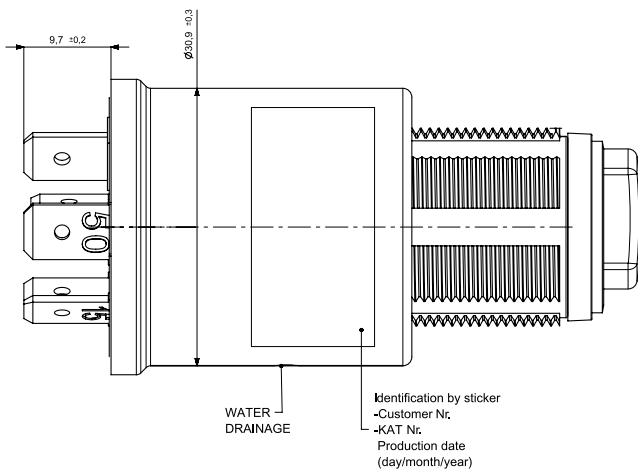
## The versatility of the product is reached with the following options:

- Different sealing options: at key side with special lock, at terminal side with o-ring and epoxy resin
- Anti-restart
- Custom logo on key and cover
- Single and different key codes
- Up to 4 switching positions
- Different key colours

The product is supplied with 2 keys.  
Connectors are available.

## Materials

Housing	: die-cast ZnAl4Cu1
Socket	: PA 6 , glass-fiber-reinforced
Terminals	: CuZn 37 , silver coated
Contact	: CuZn 37 , silver coated
O-Ring	: NBR Rubber
Key	: CuNi alloy





# ORDERING SCHEME

Please define your product by selecting the technical features below

1	2	3	4	5	6	7	8	9	10	11	12	13
—	—	—	—	—	—	—	—	—	—	—	—	—

- |                             |                                 |
|-----------------------------|---------------------------------|
| 1- Electrical diagrams      | 8- Key Color                    |
| 2- Switch Type              | 9- Customer logo on key         |
| 3- Restart inhibitor        | 10- Spacer Type                 |
| 4- Water drainage           | 11- Octagonal Nut Type          |
| 5- Terminal Side Protection | 12- Key Side Protection         |
| 6- Plugs Silver Plated      | 13- Customer logo on IP69 Cover |
| 7- Key types                |                                 |

**1** ELECTRICAL DIAGRAM

**A**

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	max.intensity of current for 12V	Voltage drap	Time of load
30-15														25 A	≤100mV	∞	
30-50														50 / 12 A	≤150mV	shortly ∞	

**B**

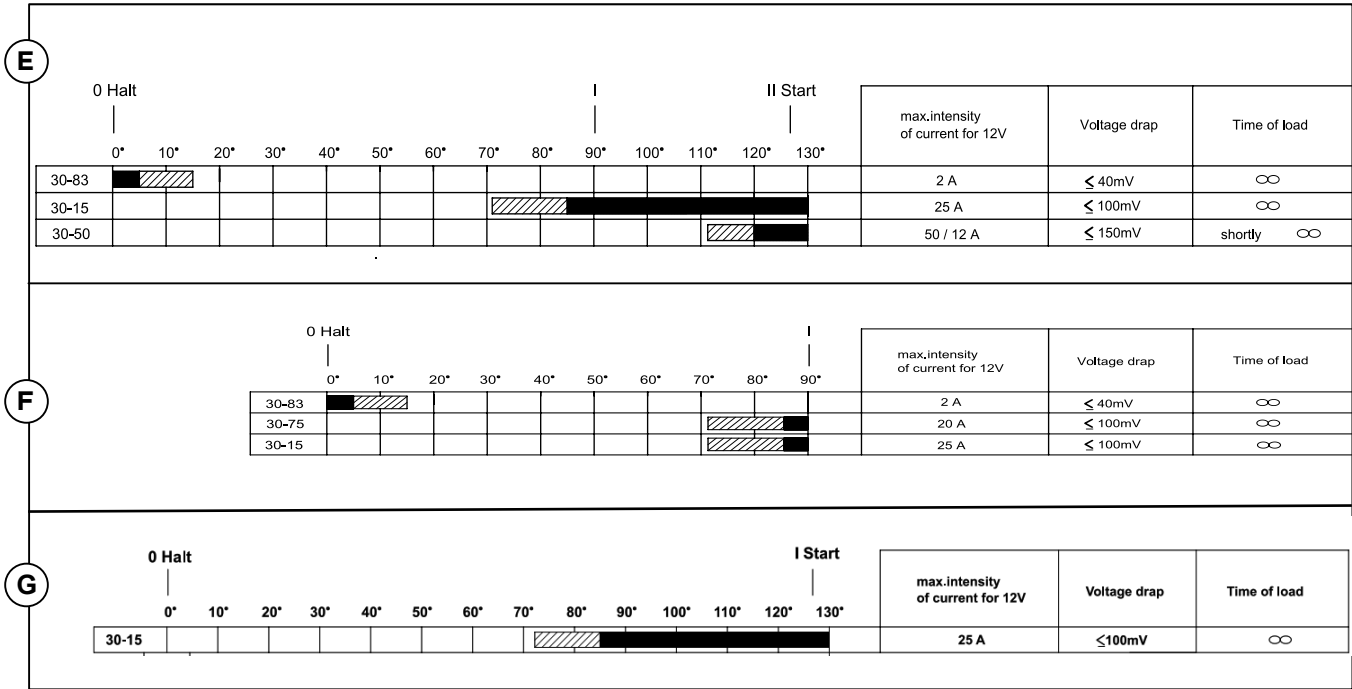
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	max.intensity of current for 12V	Voltage drap	Time of load
30-83															2 A	≤ 40mV	∞
30-75															20 A	≤ 100mV	∞
30-15															25 A	≤ 100mV	∞
30-50															50 / 12 A	≤ 150mV	shortly ∞

**C**

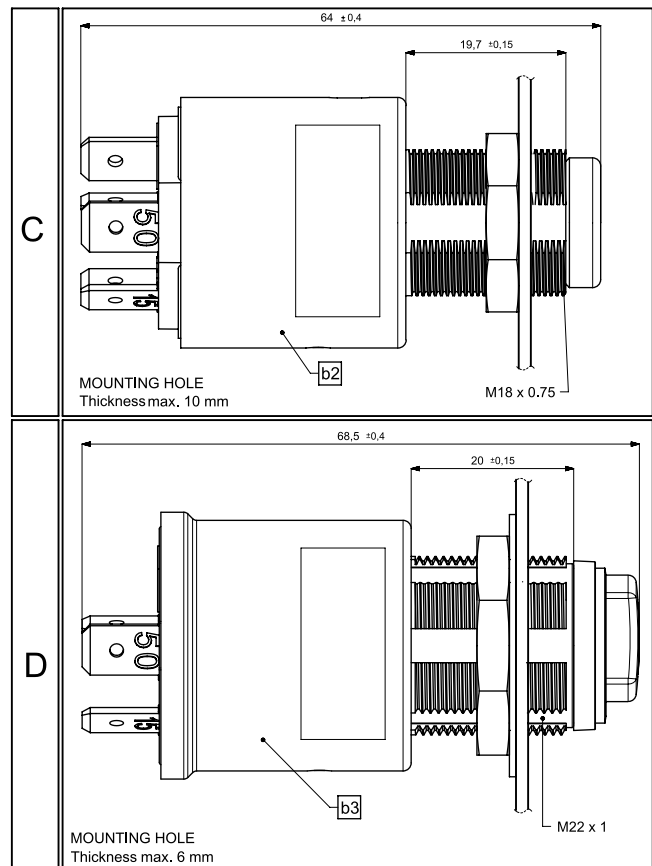
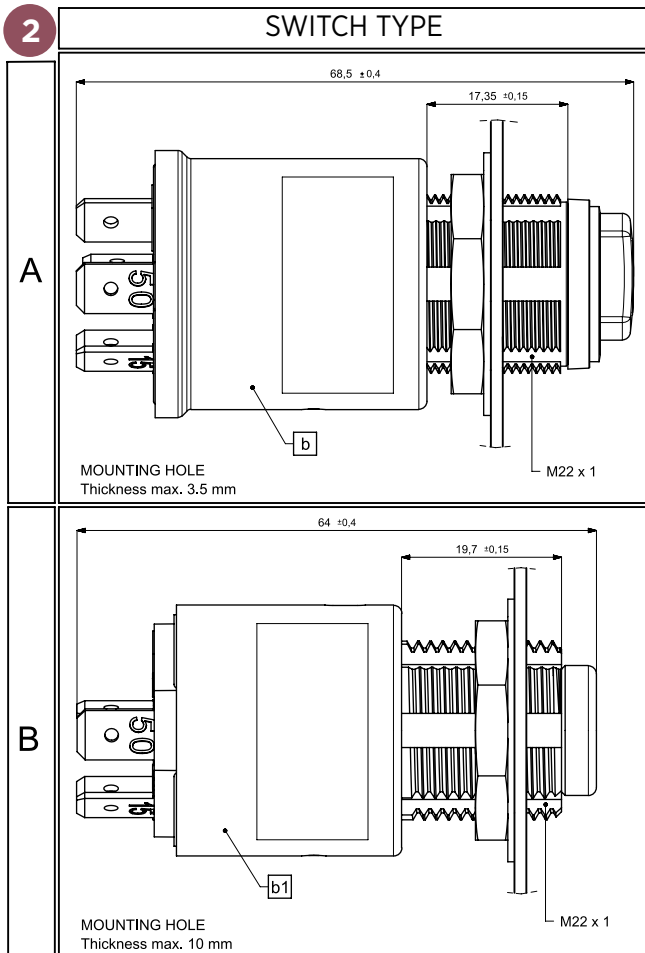
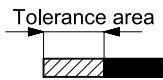
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	max.intensity of current for 12V	Voltage drap	Time of load
30-75															20 A	≤ 100mV	∞
30-15															25 A	≤ 100mV	∞
30-50															50 / 12 A	≤ 150mV	shortly ∞

**D**

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	max.intensity of current for 12V	Voltage drap	Time of load
30-75															20 A	≤ 100mV	∞
30-15															25 A	≤ 100mV	∞
30-50															50 / 12 A	≤ 150mV	shortly ∞



Connection Terminals	
Nr.	A 6,3 x 0,8 DIN 46244
30	1x
15	1x
50	1x
75	1x
83	1x

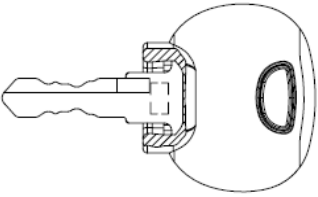
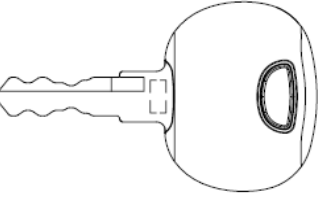
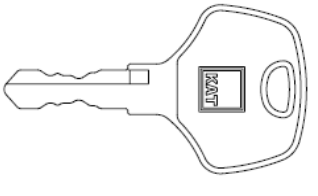
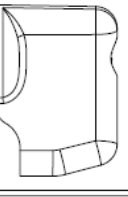
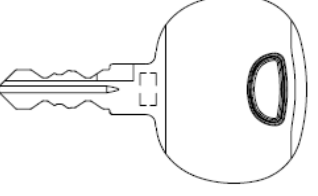


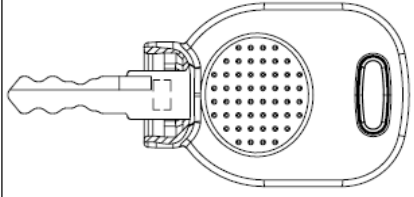
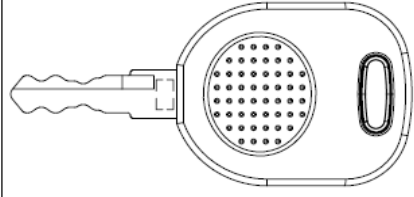
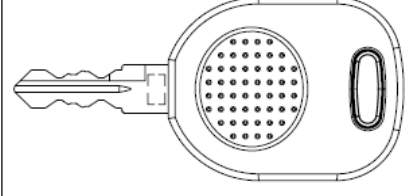
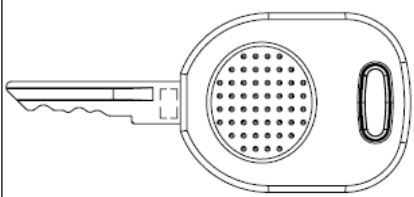
<b>3</b>	RESTART INHIBITOR
1	WITH (except for A Electrical diagram)
2	WITHOUT

<b>4</b>	WATER DRAINAGE
A	WITH
B	WITHOUT

<b>5</b>	TERMINAL SIDE PROTECTION	SWITCH TYPE
A	IP69K (With resin)	A-D
B	IP63	A-D
C	IP40	B-C

<b>6</b>	PLUGS SILVER PLATED
1	WITH
2	WITHOUT

<b>7</b>		KEY TYPES	SWITCH TYPE
1	606		A-D
2	607		
3	608		
4	0-250		
5	602		B-C
6	603		
7	0-250		
8	602		B-C
*	9		A-D
10	644		B-C
11	609		
12	610		

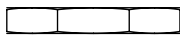
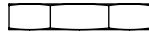
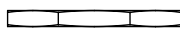
13	606		A-D
14	607		
15	608		
16	0-250		
17	602		B-C
18	603		
19	0-250		
20	644		B-C
21	609		B-C
22	610		

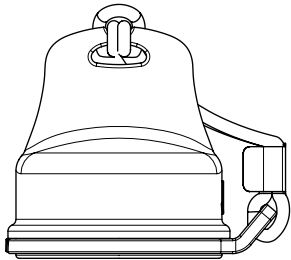
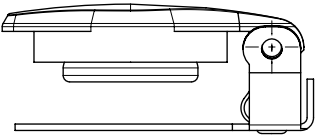
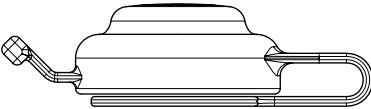
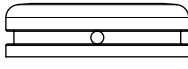
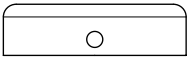
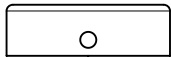
\*Key type 9 is to be screwed on the ignition switch.  
 \*4,7 types are keyed different  
 Note: \*Locking system available from 0-250  
 \*Locking number to be given separately  
 If not mentioned random deliveries will be made

<b>8</b>	KEY COLOR
A	BLACK (Standard)
B	RED
C	BLUE
D	GRAY

<b>9</b>	CUSTOMER LOGO ON KEY
A	WITH
B	WITHOUT

<b>10</b>	SPACER TYPE	SWITCH TYPE
1	Plastic Spacer	A-B-D
2	Metal Spacer	A-B-D
3	No Spacer (for M18)	C

<b>11</b>	OCTAGONAL NUT	SWITCH TYPE
1	 M22x1 (h : 4mm)	A-B-D
2	 M18x0.75 (h : 4mm)	C
3	 M22x1 (h : 2,5mm)	A-B-D

<b>12</b>	KEY SIDE PROTECTION	SWITCH TYPE
1	 IP69K	A-D
2	 IP65	
3	 IP65	
4	 IP63	
5	 IP40 (M22)	B
6	 IP40 (M18)	C

<b>13</b>	CUSTOMER LOGO ON IP 69K COVER
1	WITH
2	WITHOUT

# LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

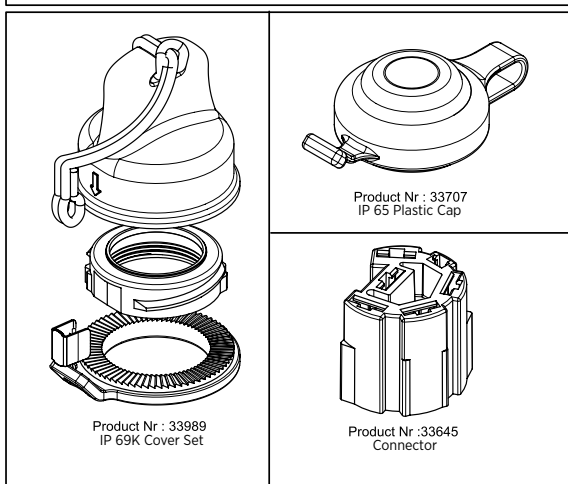
Product Nr.	Technical Characteristics												
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10	Code 11	Code 12	Code 13
34866	A	A	1	B	B	2	1	A	B	1	1	3	2
33985	A	A	2	A	A	1	2	A	B	1	1	1	2
33983	A	A	2	A	B	1	2	A	B	1	1	2	2
34054	A	A	2	A	B	1	2	A	B	1	1	2	2
33699	A	A	2	B	A	1	1	A	B	1	1	1	2
33729	A	A	2	B	A	1	1	A	B	1	1	2	2
33543	A	A	2	B	A	1	1	A	B	1	1	3	2
34552	A	A	2	B	A	1	2	A	B	1	1	3	2
35209	A	A	2	B	A	1	4	A	B	1	1	3	2
34914	A	A	2	B	B	1	2	A	B	1	1	3	2
34913	A	A	2	B	B	1	14	A	B	1	1	4	2
32063	A	B	2	A	C	1	5	A	B	1	1	5	2
36161	A	B	2	A	C	1	10	A	B	1	1	5	2
34997	A	B	2	A	C	2	5	A	B	1	1	5	2
35561	A	B	2	A	C	2	6	A	B	1	1	5	2
32060	A	B	2	A	C	2	8	-	B	1	1	5	2
36265	A	C	2	A	C	1	10	A	B	3	2	6	2
35083	A	C	2	A	C	2	5	A	B	3	2	6	2
35562	A	C	2	A	C	2	18	A	B	3	2	6	2
35217	A	D	2	B	A	1	2	A	B	1	1	3	2
33986	B	A	1	A	A	1	2	A	B	1	1	1	2
34976	B	A	1	A	A	1	14	A	B	1	1	4	2
33984	B	A	1	A	B	1	14	A	B	1	1	2	2
34602	B	A	1	A	B	2	2	A	B	1	1	5	2
33701	B	A	1	B	A	1	1	A	B	1	1	1	2
33554	B	A	1	B	A	1	1	A	B	1	1	3	2
34890	B	A	1	B	A	1	9	A	B	2	1	4	2
33955	B	A	1	B	A	2	1	A	B	1	1	2	2
33542	B	A	1	B	A	2	1	A	B	1	1	3	2
33717	B	A	1	B	A	2	2	A	B	1	1	3	2
35231	B	A	1	B	A	2	9	B	B	1	1	4	2
35102	B	A	1	B	B	2	2	A	B	1	1	1	2
33702	B	A	2	A	A	2	1	A	B	1	1	1	2
35626	B	A	2	B	A	1	9	A	B	2	1	4	2
35629	B	A	2	B	A	1	9	A	B	2	1	4	2
35422	B	B	1	A	C	1	5	A	B	1	1	5	2
36164	B	B	1	A	C	1	10	A	B	1	1	5	2
34251	B	B	1	A	C	2	5	A	B	1	1	5	2
35339	B	B	1	A	C	2	18	A	B	1	1	5	2
33341	B	B	1	A	C	2	7	A	B	1	1	5	2
31822	B	B	1	A	C	2	8	-	B	1	1	5	2
36165	B	B	1	A	C	2	10	A	B	1	1	5	2
35085	B	B	2	A	C	2	5	A	B	1	1	5	2
32062	B	C	1	A	C	1	5	A	B	3	2	6	2
36166	B	C	1	A	C	1	10	A	B	3	2	6	2
34252	B	C	1	A	C	2	5	A	B	3	2	6	2
35563	B	C	1	A	C	2	6	A	B	3	2	6	2
32059	B	C	1	A	C	2	8	-	B	3	2	6	2
35087	B	C	2	A	C	2		A	B	3	2	6	2
34749	B	D	1	A	A	2	2	A	B	1	3	1	2
36043	B	D	1	A	A	2	2	A	B	2	3	1	2
34663	B	D	1	A	B	1	14	A	B	1	1	4	2
33987	C	A	1	A	A	1	2	A	B	1	1	1	2
33988	C	A	1	A	B	1	2	A	B	1	1	2	2
34938	C	A	1	A	B	2	4	A	B	1	1	4	2

# LEADING PRODUCT VERSIONS

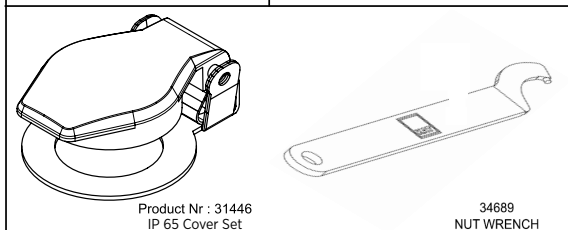
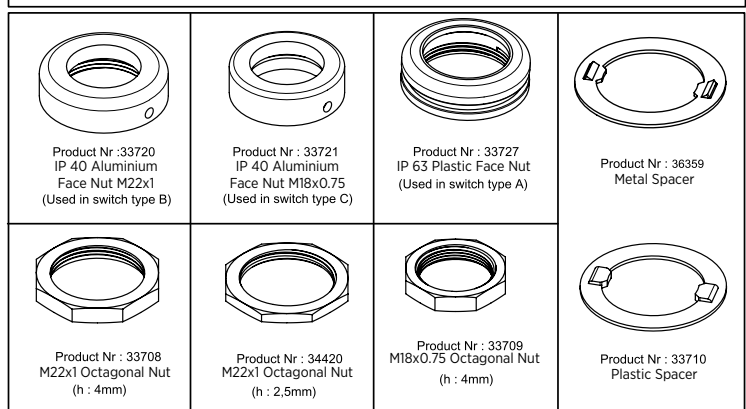
Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics												
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10	Code 11	Code 12	Code 13
33544	C	A	1	B	A	1	1	A	B	1	1	3	2
33953	C	A	1	B	A	2	1	A	B	1	1	3	2
36152	C	A	1	B	A	2	9	A	B	1	1	4	2
33704	C	A	2	B	A	1	1	A	B	1	1	1	2
33653	C	A	2	B	A	1	1	A	B	1	1	3	2
35421	C	A	2	B	A	1	14	A	B	1	1	3	2
32064	C	B	1	A	C	1	5	A	B	1	1	5	2
36163	C	B	1	A	C	1	10	A	B	1	1	5	2
35282	C	B	1	A	C	2	17	A	B	2	1	-	2
35564	C	B	1	A	C	2	6	A	B	1	1	5	2
32061	C	B	1	A	C	2	8	-	B	1	1	5	2
35084	C	B	2	A	C	2	5	A	B	1	1	5	2
33652	C	B	2	A	C	2	8	-	B	1	1	5	2
33643	C	C	1	A	C	1	5	A	B	3	2	6	2
36162	C	C	1	A	C	1	10	A	B	3	2	6	2
34915	C	C	1	A	C	2	5	A	B	3	2	6	2
35565	C	C	1	A	C	2	6	A	B	3	1	6	2
33644	C	C	1	A	C	2	8	-	B	3	2	6	2
35086	C	C	2	A	C	2	5	A	B	3	2	6	2
35236	D	A	1	A	A	1	2	A	B	1	1	2	2
35235	D	A	1	B	A	1	4	A	B	1	1	3	2
34640	D	A	1	B	A	1	9	A	B	1	1	4	2
33981	D	A	1	B	A	2	1	A	B	1	1	2	2
34809	D	B	1	A	C	1	6	A	B	1	1	5	2
34603	E	A	1	B	B	1	2	A	B	1	1	4	2
34777	E	B	1	A	C	1	6	A	B	1	1	5	2
33982	E	B	1	A	C	2	8	-	B	1	1	5	2
34642	E	D	1	A	B	1	2	A	B	1	1	4	2

## ACCESSORIES



## SPARE PARTS



Delivery Volume		
Item	Designation	Number
1	Ignition Switch	1
2	Spacer	1
3	Keys	2
4	Nut	1

\* Delivery Volume may differ according to the selected variant

# “UNIVERSAL ROCKER SWITCH”



## MAIN PROPERTIES

- Temperature Range: -40°C / +85°C
- Protection Class: IP 52 (Actuator Side), IP 40 (Terminal Side)
- Voltage: 24 V
- Mechanical Life Cycle: 200.000
- Electrical Life Cycle: Power Switch:  
Lamp Load: 6 A / 60.000
- Inductive Load: 3 A / 120.000 Cycle
- Electronic Switch: Ohmic Load: 12 mA / 200.000 Cycle  
Hazard Switch:  
Electronic Load: 5 mA / 200.000 Cycle



## TECHNICAL CHARACTERISTICS

The rocker switch is designed to operate in heavy-duty vehicles and buses. It is an electromechanical product, which opens-closes electrical circuits by tipping off to one side with the press of a button.

It offers various alternatives to users within the same structure with options such as variable electrical values, button designs, lighting shapes and colors, paint colors, symbols, etc.

### **The switch has 2 versions such as single pole (1P2T & 1P1T) and double pole (2P2T & 2P1T).**

It includes circuits positioned as one or two stage maintained or momentary.

The lighting feature is offered as dependent (LED illuminated with external triggering) or independent (LED illuminated by internal mechanism). The optional LED colors offered for the lighting feature are Amber, Red, Green and Yellow.

The product is mounted on top of the panel. It is mounted easily and quickly to vehicle panels with different thicknesses by its specially designed latches.

#### **Materials**

Actuator	: Makrolon 2405 white, black or red laser painted
Housing	: PC
Contacts	: Ag Ni 90 /10
Rocker	: PA 66
Terminals	: CuSn6 , silver coated
Circuit board	: CEM1 / FR4 / 1.2 mm



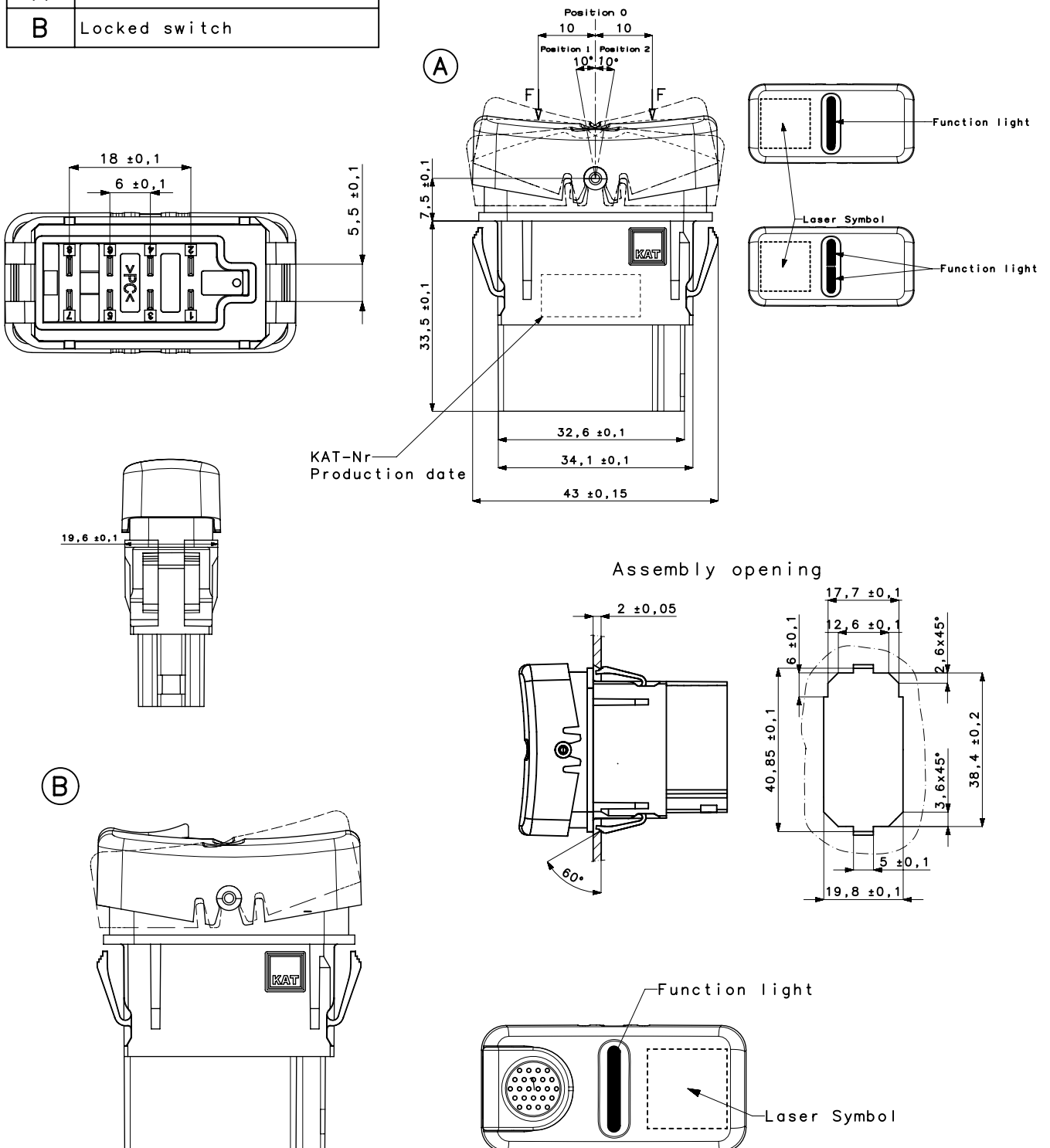
# ORDERING SCHEME

Please define your product by selecting the technical features below

1	2	3	4	5	6
_	_ _	_	_	_	_ _

- 1- Switch Type
- 2- Mechanical diagram
- 3- Electrical diagram
- 4- Night Illumination LED color
- 5- Function Illumination LED color
- 6- Symbol No

<b>1</b>	<b>SWITCH TYPE</b>
<b>A</b>	Standart switch
<b>B</b>	Locked switch



2

MECHANICAL DIAGRAM (Please see TABLE-1 for Electrical Diagram matches)

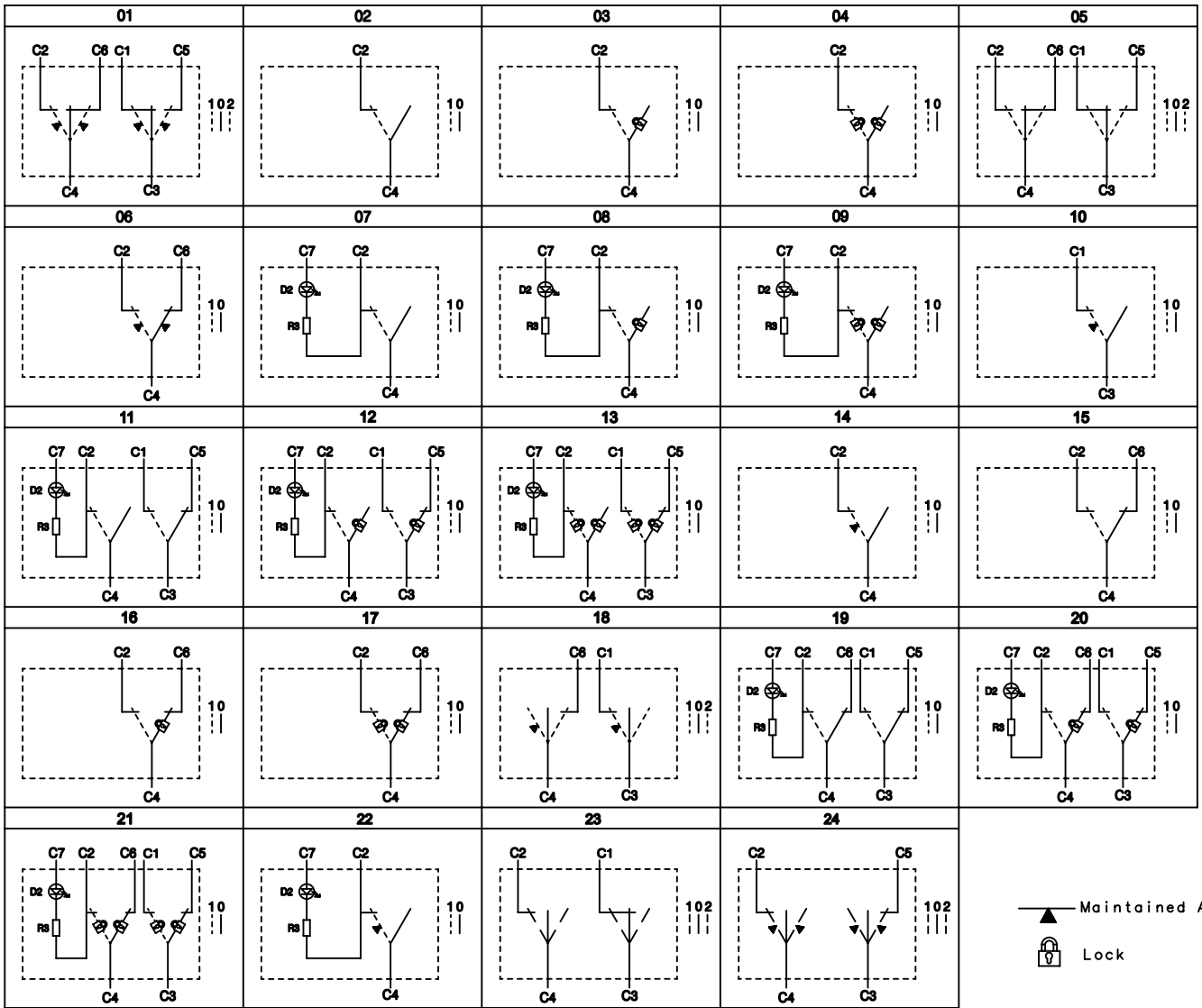


TABLE-1			Application	Explanations	
1	A	Electronic switching / Load switching			
2	B/E				
3					
4					
5	A	Load switching			
6	B				
7	C/D				
8					
9					
10	D/G			Electronic switching / Load switching	
11	C				
12					
13					
14	A	Electronic switching / Hazard warning switching	For Hazard warning switch "F" Electrical diagram shall be used.		
15	B/F				
16					
17					
18	A	Electronic switching / Load switching			
19	C				
20					
21					
22	C/D	Electronic switching			
23	H				
24	I	Electronic switching			



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57			

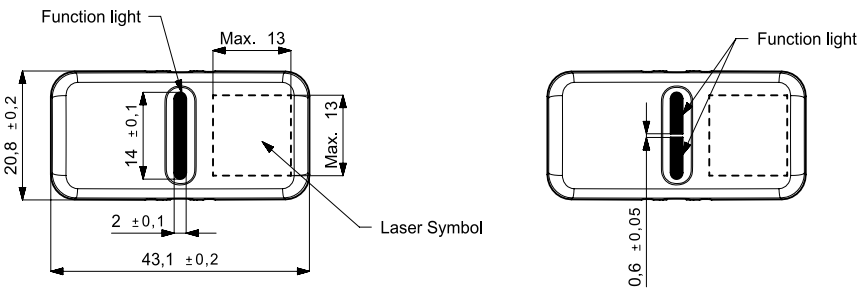
Note:

\* Other standard icons are available.

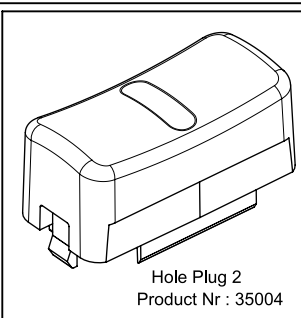
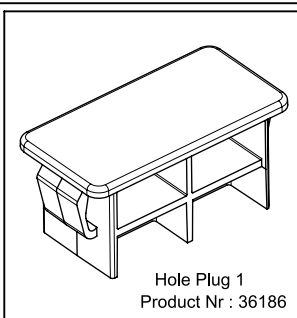
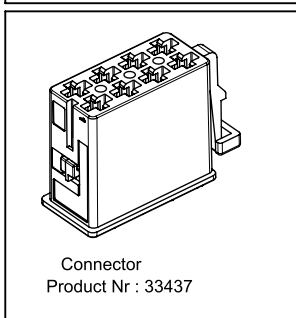
Contact your sales representative for a complete listing of standard icons.

\* Hazard warning & function light shall be red.

58	59



### ACCESSORIES



Delivery Volume		
Item	Designation	Number
1	Rocker Switch	1
2	Actuator	1

# “HEAVY DUTY ROCKER SWITCH”



## MAIN PROPERTIES

- Temperature Range: -40°C / + 85°C
- Insulation Resistance: 50 Megohms
- Initial Contact Resistance: 10 miliohms max./4 VDC
- Electromechanical Life: min. 90.000 - 200.000 cycles, current dependent
- Illumination: All Led's are amber unless otherwise stated.
- Wave length= 610 nm peak, luminous intensity 16-50 mcd.
- Protection Class: IP 66 / IP 68



## TECHNICAL CHARACTERISTICS

KAT heavy duty rocker switches are specially designed to operate under severe conditions of heavy-duty, commercial, agriculture and construction vehicles and 100% exchangeable to products which are on the market for years- but semi automatic produced with latest technologies and under statistical process control according ISO TS 16949. In the most known forklifts, construction machines and cranes you find the KAT heavy duty rocker switches. We offer complete range of variants, frames, miscellaneous accessories and product customization like individual rocker design, rocker colour, LED colour, etc.

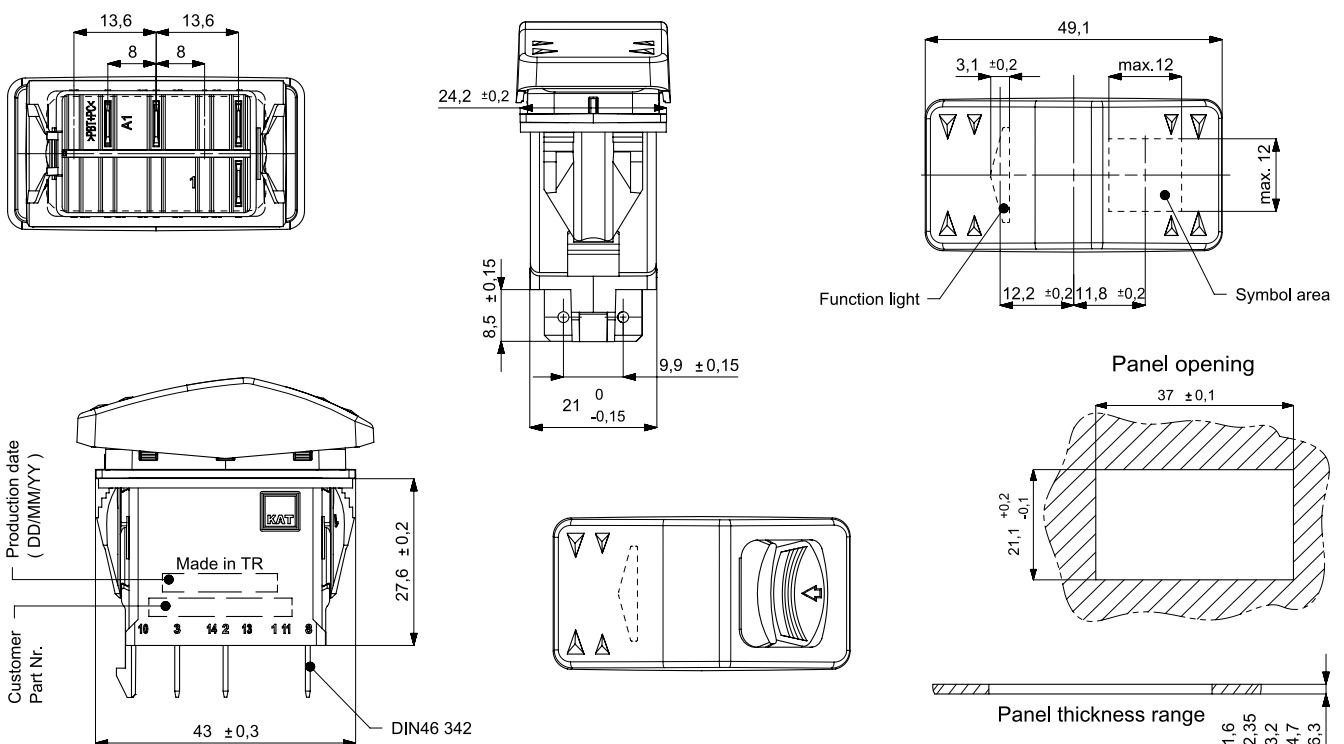
Protection class is IP 66 / IP 68, and it is offered with a gasket that allows the sealing of the panel. With these features, it is durable against dust, prolonged spraying water and underwater pressure (up to 1 m). It adapts to all kinds of panels with its compact structure and provides gain in panels with limited space.

**The switch has versions such as single pole (1P2T & 1P1T) and double pole (2P2T & 2P1T). It includes circuits positioned as two or three stage maintained or momentary.**

The lighting feature is offered as dependent (LED illuminated with external triggering) or independent (LED illuminated by internal mechanism). The optional LED colors offered for the lighting feature are Amber, Red, Green, Yellow, Blue and White.

The product is mounted on top of the panel. It is mounted easily and quickly to vehicle panel or frames offered as accessory with its specially designed latches (changeable). And again, it is dismantled with the removal apparatus offered as accessory. With these features it allows easy assembly (mounting) and removal (dismounting) for the user.

The products offer various alternatives with options such as variable electrical values, button designs and shapes, lighting shapes and colors, paint colors, symbols, etc. The products are durable against vibration, mechanical and thermal shock, moisture and saline environments.



# ORDERING SCHEME

Please define your product by selecting the technical features below

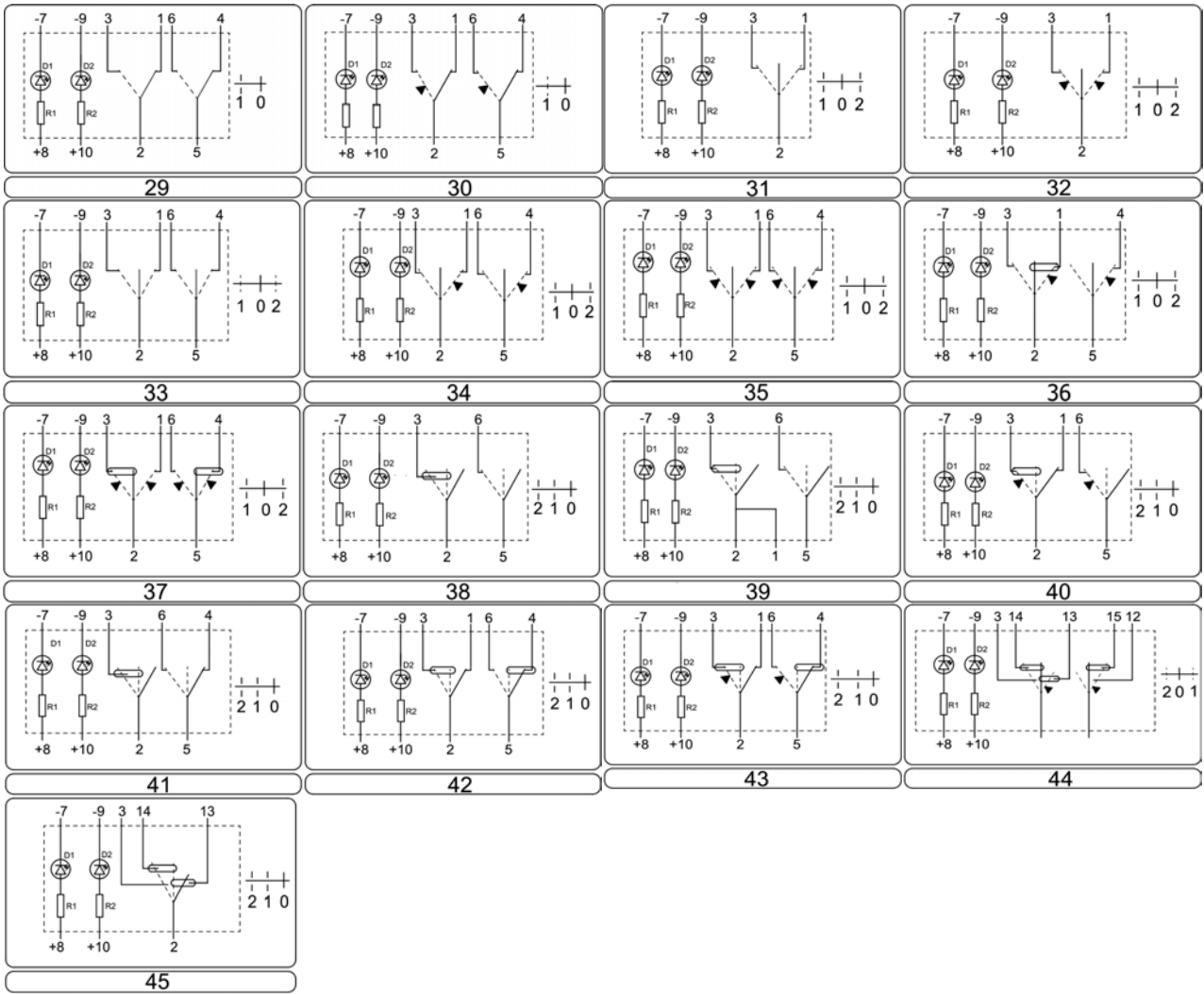
1	2	3	4	5	6	7	8
___	___	___	___	___	___	___	___

- 1- Circuit diagram
- 2- Symbol No
- 3- Assembly direction of Switch to the Customer Counter Part
- 4- Night Illumination LED COLOR TABLE
- 5- Function Illumination LED COLOR TABLE
- 6- Actuator Color
- 7- Actuator Paint Color
- 8- Voltage Rating

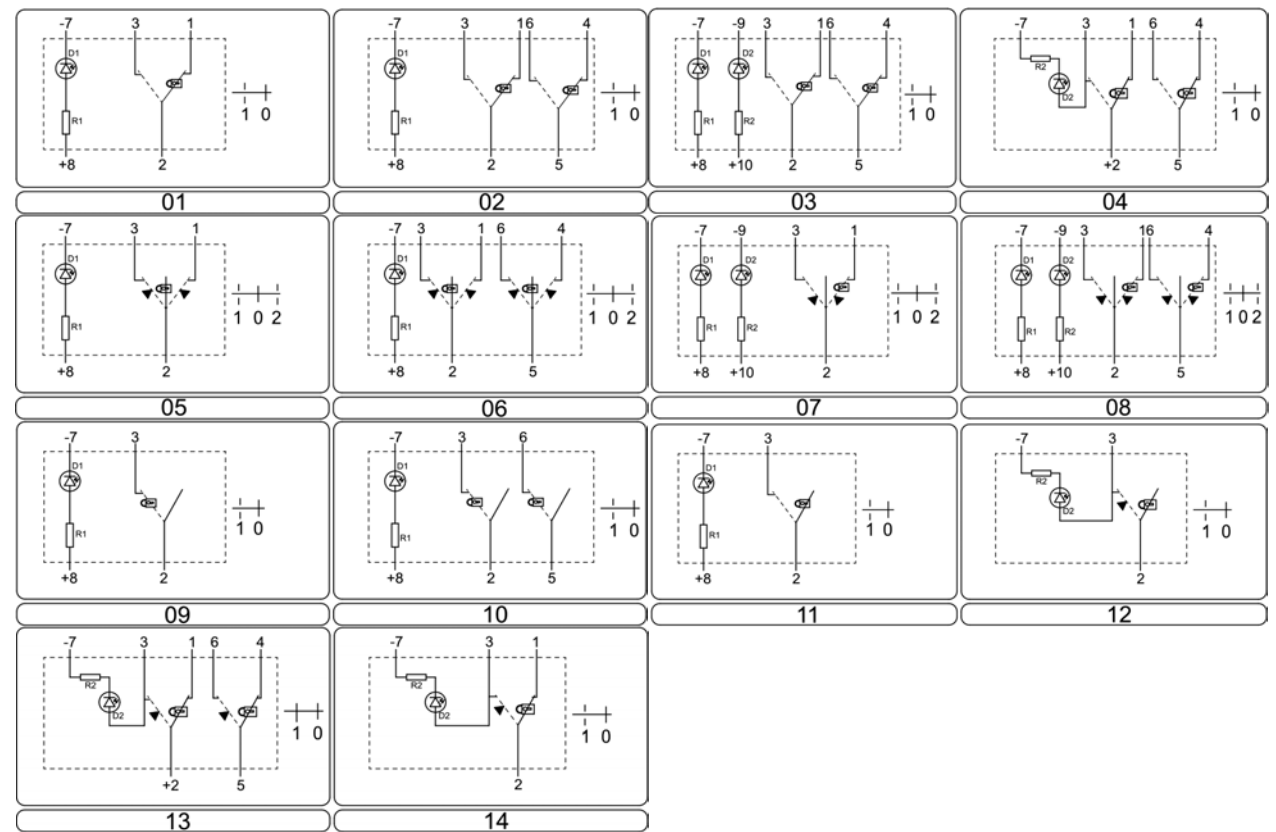
## 1 MECHANICAL AND ELECTRICAL DIAGRAM

Standard Switch

A				
	<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>
	<b>05</b>	<b>06</b>	<b>07</b>	<b>08</b>
	<b>09</b>	<b>10</b>	<b>11</b>	<b>12</b>
	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>
	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>



**B Interlocking Switch**





SYMBOL NO

A

Single Symbol

Special Request													
001	002	003	004	005	006	007	008	009	010	011	012	013	014
015	016	017	018	019	020	021	022	023	024	025	026	027	028
029	030	031	032	033	034	035	036	037	038	039	040	041	042
043	044	045	046	047	048	049	050	051	052	053	054	055	056
057	058	059	060	061	062	063	064	065	066	067	068	069	070
		Mode											
071	072	073	074	075	076	077	078	079	080	081	082	083	084
085	086	087	088	089	090	091	092	093	094	095	096	097	098
099	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154

B

Double Symbol

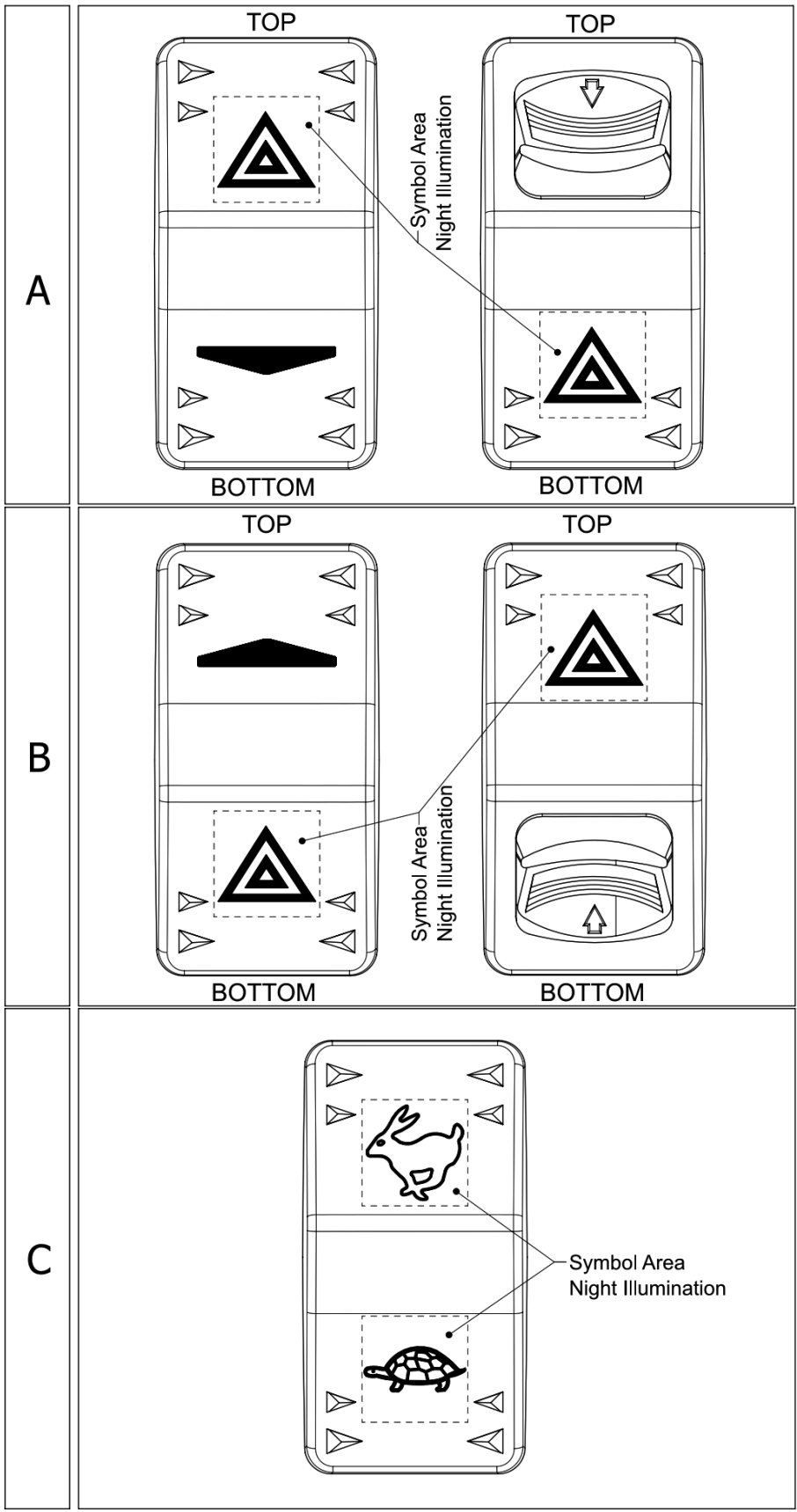
Special Request													
001	002	AUTO 											
												ZH1 	
015	016	017	018	019	020	021	022	023	024	025	026	027	028
								* Both symbols are same color					
029	030	031	032	033	034	035	036						

C

Without Symbol

3 Assembly direction of Switch to the Customer Counter Part

Symbol Area



**4** (D1) NIGHT ILLUMINATION LED COLOR TABLE

A	Amber (Standard)
Y	Yellow
G	Green
R	Red
W	White
B	Blue
-	No Led (1)

**5** (D2) FUNCTION ILLUMINATION LED COLOR TABLE

A	Amber (Standard)
Y	Yellow
G	Green
R	Red
W	White
B	Blue
-	No Led (1)

**6** ACTUATOR COLOR

1	BLACK (Standard)
2	RED
3	GRAY

7	ACTUATOR PAINT COLOR	COLOR INFORMATION
1	BLACK (Standard)	NWC (Supply of paint):LACK000194.01 Graphit 85 Paint thickness: 30 - 33 µm
2	RED	NWC (Paint supplier):LACK000214-1K Paint thickness: 23-28 µm

**8** VOLTAGE RATING

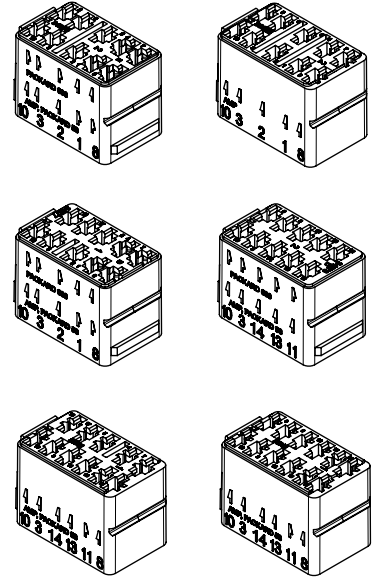
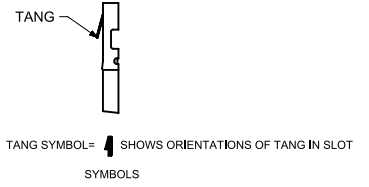
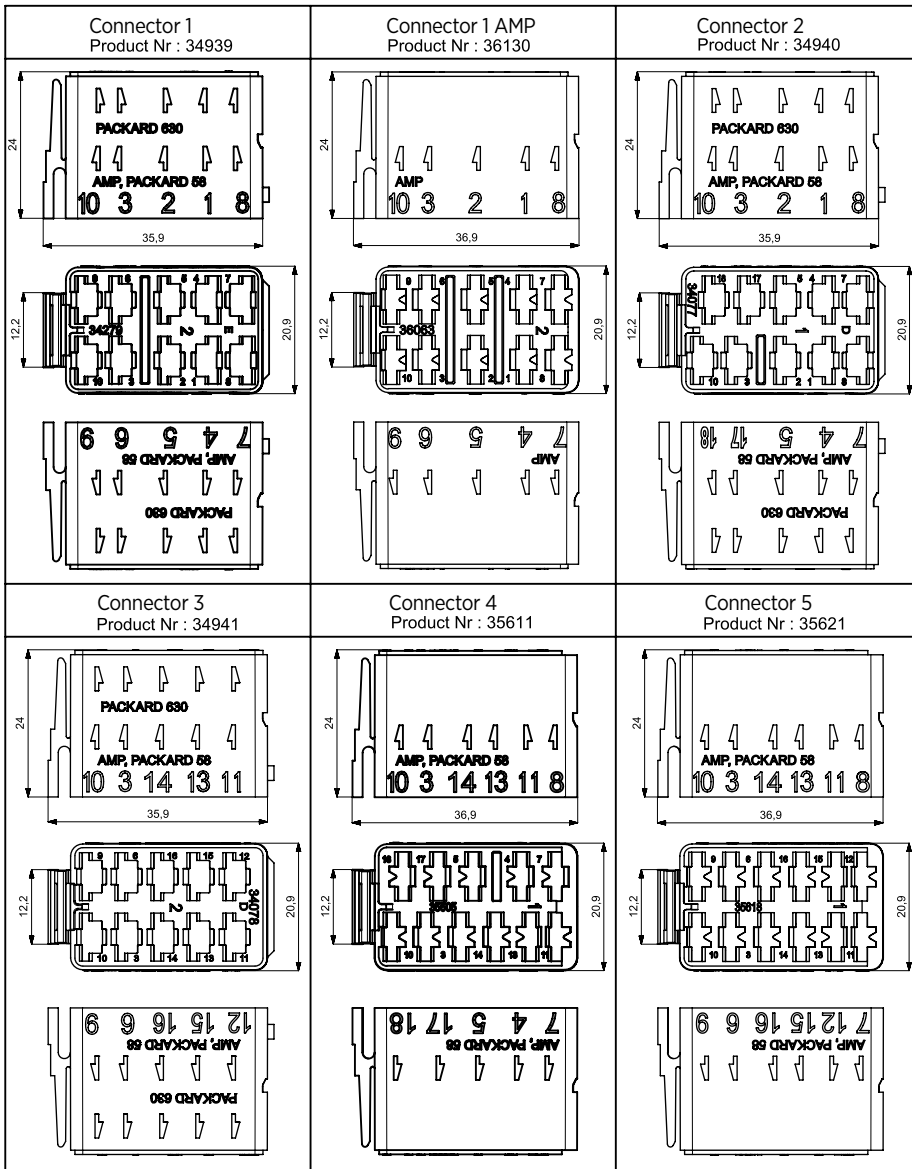
A	12V
B	24V

D1 LED :Night illumination  
D2 LED :Function illumination

 Maintained Action

 Lock

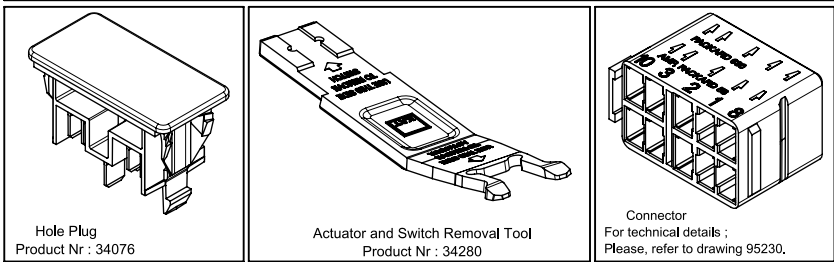
ACCESSORIES



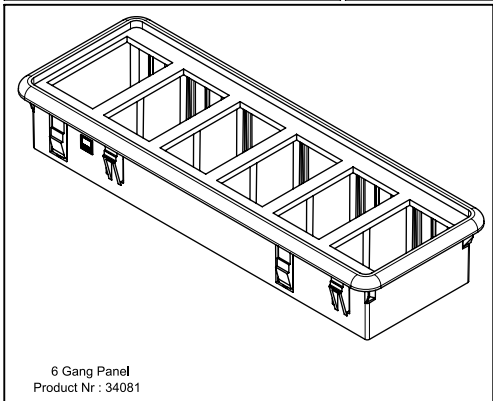
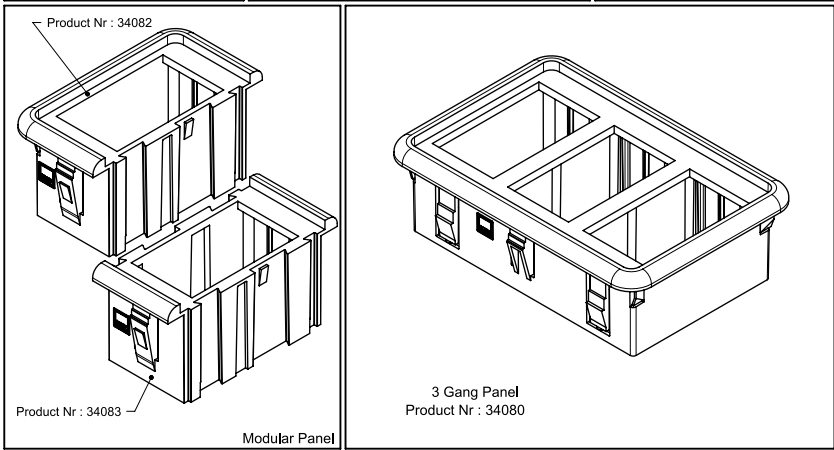
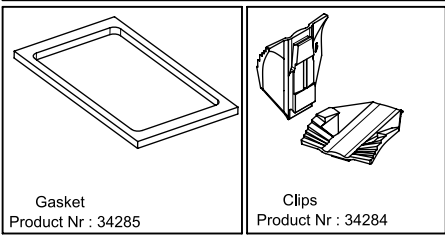
95230 Connectors

Designation	Switch Types
Connector 1	Interlocking Switch : 1,2,3,4,5,6,7,8,9,10.
Connector 1 AMP	Standard Switch : 1,2,3,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,35,36,37,38,40,41,42,43,44,45,46.
Connector 2	Standard Switch : 5
Connector 3	Standard Switch : 4
Connector 4	Standard Switch : 34
Connector 5	Standard Switch : 39

**ACCESSORIES**

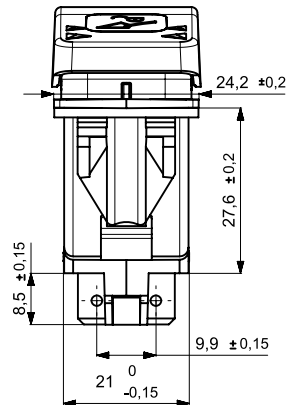
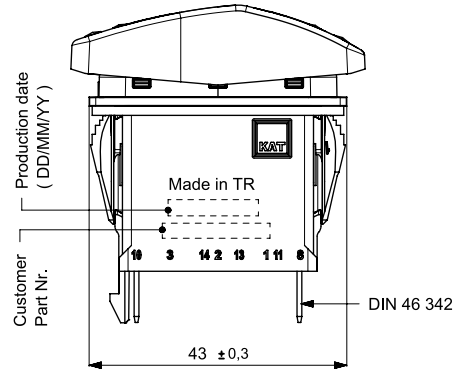
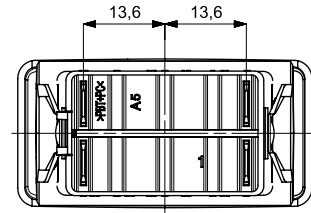


**SPARE PARTS**



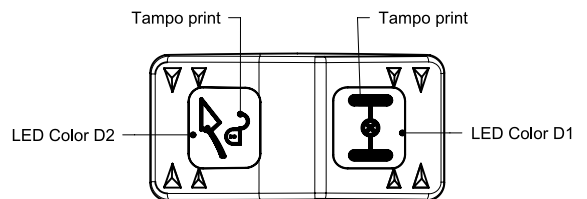
Delivery Volume		
Item	Designation	Number
1	Rocker Switch	1
2	Actuator	1

# “INDICATOR LAMP”

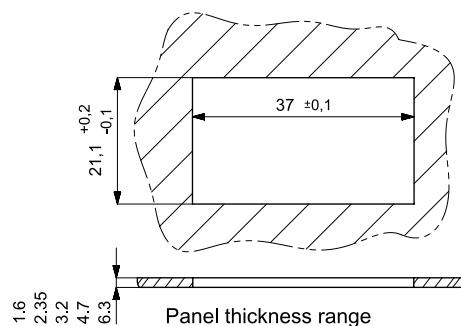


To complete the Heavy Duty Rocker Switch product line, KAT has designed an indicator lamp with same dimensions and same appearance. These indicator lamps can be used in a row together with the switches and give a unique look to the vehicle dash panel.

Different symbols and colours are available.



## Panel opening



### MAIN PROPERTIES

- Insulation Resistance: 50 Megohms
- Actuator side: IP68 (With inserted actuator)
- Terminal side: IP66 (With inserted actuator)
- Operating Temperature: -40°C to + 85°C



# ORDERING SCHEME

Please define your product by selecting the technical features below

1	2	3	4	5
_____	_____	_____	_____	_____

- 1- Electrical diagram
- 2- (D1) LED Color Table
- 3- (D2) LED Color Table
- 4- Voltage Rating
- 5- Symbol No

**1** ELECTRICAL DIAGRAM

**2** (D1) LED COLOR TABLE

A	Amber (Standard)
Y	Yellow
G	Green
R	Red
W	White
B	Blue
-	No Led (1)

**3** (D2) LED COLOR TABLE

A	Amber (Standard)
Y	Yellow
G	Green
R	Red
W	White
B	Blue
-	No Led (1)

**4** VOLTAGE RATING

A	12V
B	24V

**5** SYMBOL NO

	Single Symbol				Double Symbol				
A					B				

ACCESSORIES

Hole Plug  
Product Nr : 34076

Actuator and Switch Removal Tool  
Product Nr : 34280

Connector  
For technical details :  
Please, refer to drawing 95230.

6 Gang Panel  
Product Nr : 34081

Product Nr : 34082

Product Nr : 34083

Modular Panel

3 Gang Panel  
Product Nr : 34080

SPARE PARTS

Gasket  
Product Nr : 34285

Clips  
Product Nr : 34284



# “IMMOBILISER PRODUCT LINE,”





# “IMMOBILISER UNIVERSAL”



## MAIN PROPERTIES

### a) Electrical data

- Voltage Range: 6-32V
- Nominal Voltage: 24 V/ 12 V
- Power Consumption Relay Open: typically 10mA
- Power Consumption Relay Closed: typically 300mA
- Stand-by Current (operation clamp 30):  $-30 \mu\text{A}$

### b) Relay outputs

- Maximum Switching Voltage: 32V
- Maximum Switching Current: 10A
- Continuous Current (Tu 23°C): 15A
- Voltage Drop (10A): typically 50mV

### c) RF module

- Transmission Frequency: typically 134.2 kHz
- Coding Scheme: FSK
- Range: approx. 10cm



## TECHNICAL CHARACTERISTICS

### Universal Version

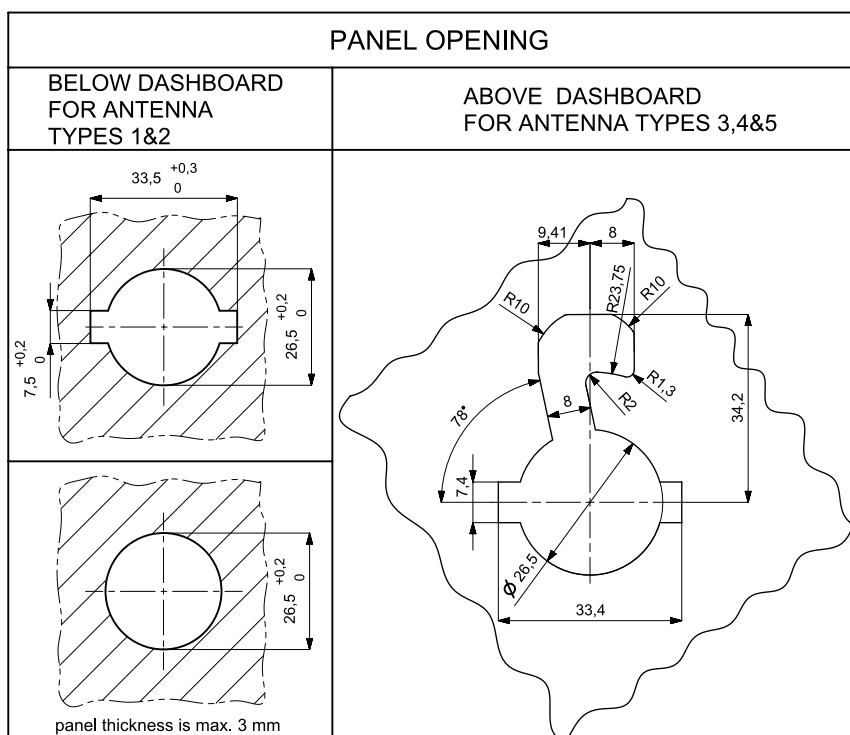
The system consists of a mechanical locking system and an independently functioning, electronically coded, immobiliser. The mechanical locking system is a starting switch made by the KAT Company. This switch's clamp 15/54 is switched on, the key is mechanically locked and cannot be removed.

When activated, the electronically coded immobiliser disconnects 3 operating-relevant control devices: for example the starter the fuel pump and the brake valve. The disconnection takes place potential-free via 3 independent power relays.

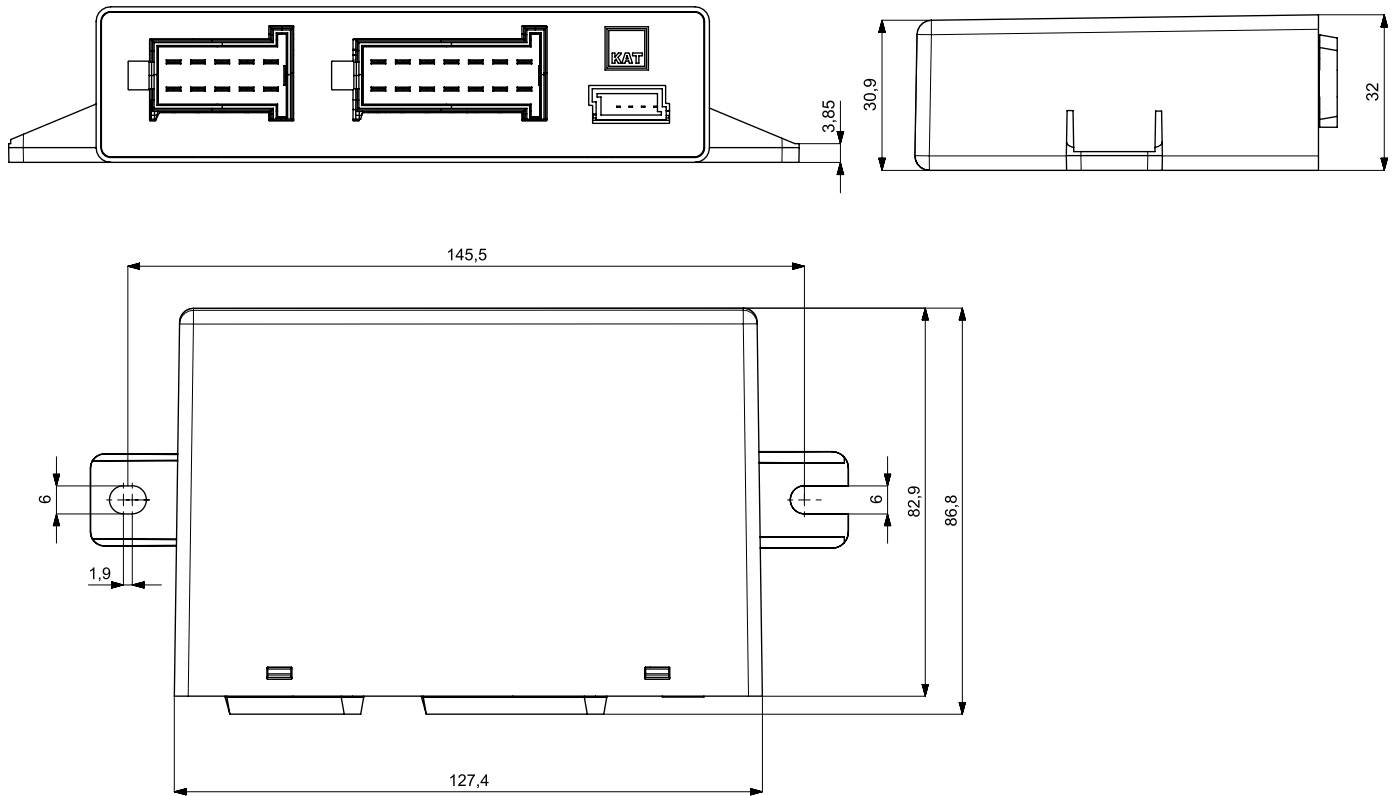
The immobiliser control electronic is based on microprocessor technology. The electronic key is based on proximity transponder technology and is securely integrated into the key handle of the starting switch.

Antenna is installed below dashboard which energises the transponder, causing it to transmit a code back to the antenna using a charge/response mechanism. This response code is read by the ECU and disarms the immobiliser circuits if valid. Also top mount antenna is available in standard production. Immobiliser ECU controls six electronic outputs that are isolated when the immobiliser is armed and able to send specific CAN messages to block other system ECU's. The current is limited with 15A due to the limitations of the connector.

Designation	Material	Color	Weight (g)
Housing	PA66 GF30	Black	85,4
Cover 10 and 14 pin			5,9
Cover 14 pin			6,7



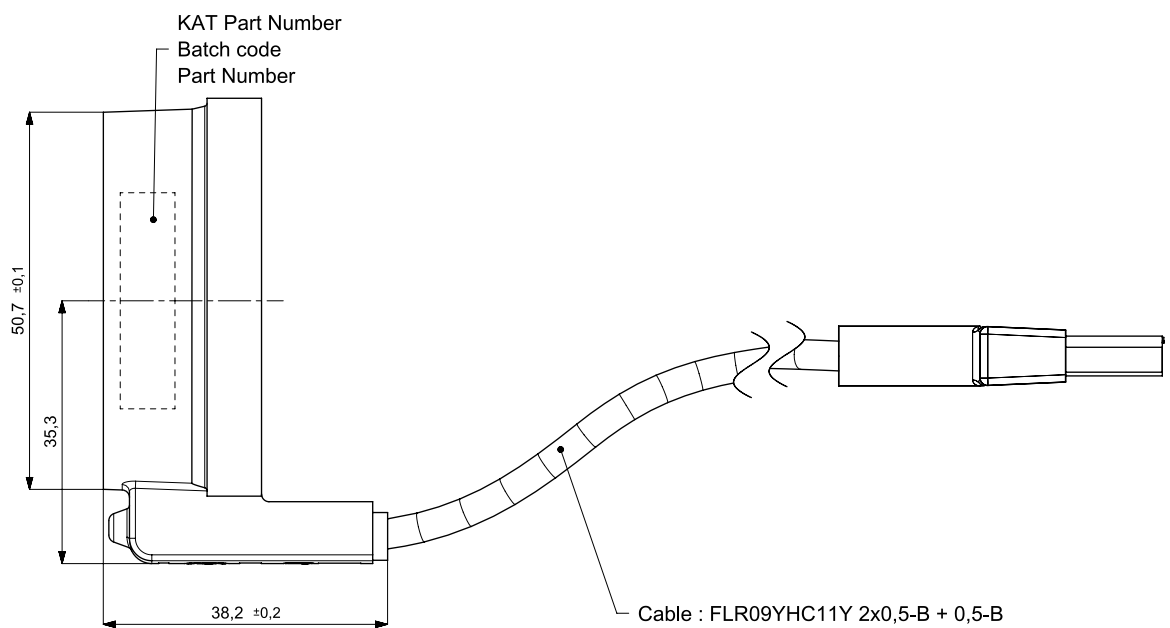
## HOUSING MEASUREMENTS



## IMPORTANT REMARKS

- \* KAT immobiliser system is approved by the German Federal Motor Transport Authority  
Date and nr of approval certificate are 04.07.2005 and e1\*74/61\*95/56\*0501\*00
- \* The standard cable type and length is shown on the drawing unless otherwise requested by the customer.
- \* KAT Immobiliser will only be activated by KAT Ignition Switch. Immobiliser keys are standardly produced in blue and master keys in red colour.

## ANTENNA MEASUREMENTS

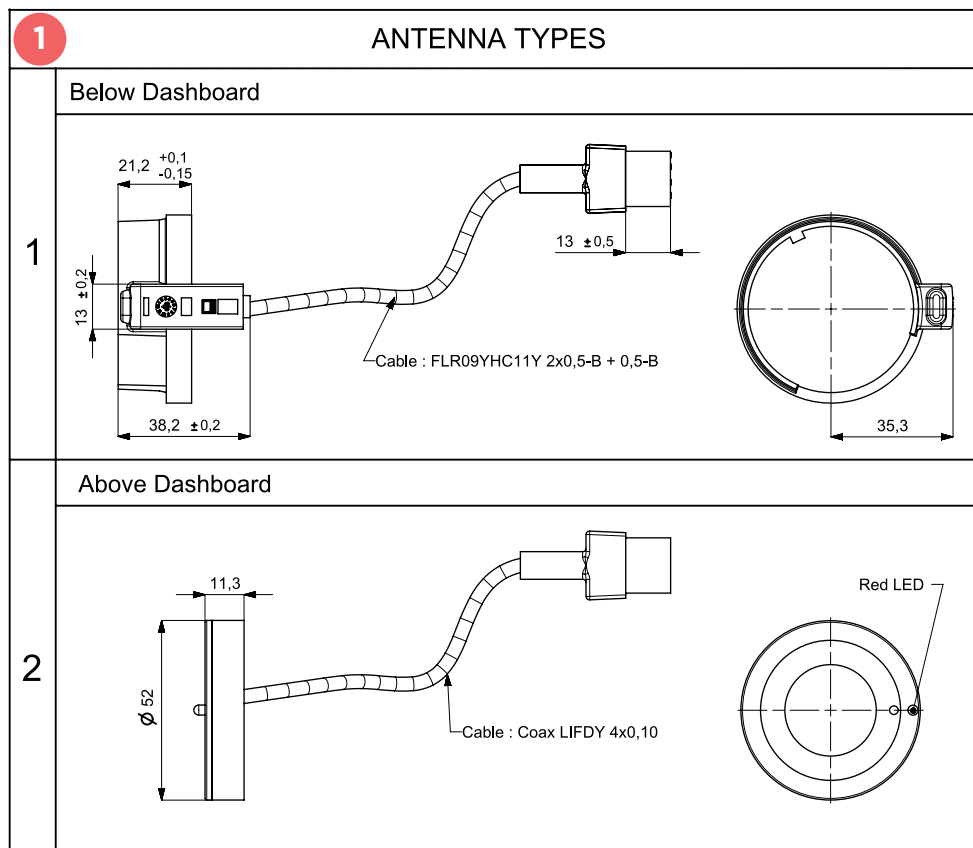


# ORDERING SCHEME

Please define your product by selecting the technical features below

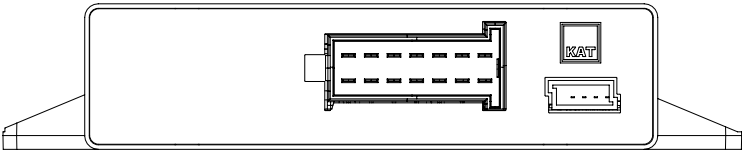
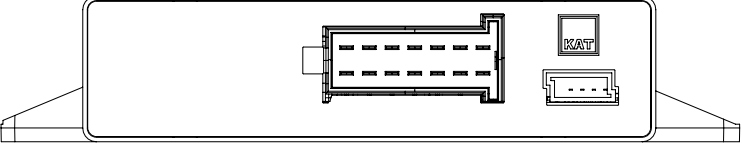
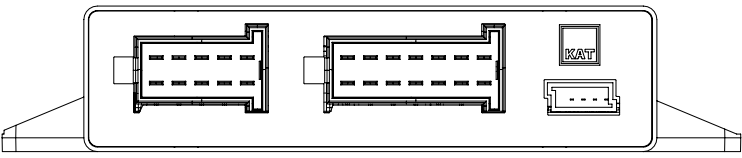
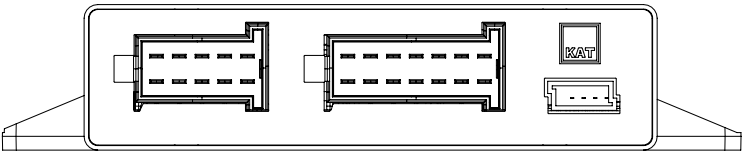
1	2	3	4	5
—	—	—	—	—

- 1- Antenna Types
- 2- Types of electronic control unit
- 3- Cable length
- 4- Key Types
- 5- Customer logo on key



3	<p><b>Above Dashboard With Cap</b></p> <p>2x0.5 YSLY FLR09YHC11Y 2x0,5-B + 0,5-B</p> <p>Conduit Art.-Nr: 1926120 Ø12</p> <p>DEUTSCH CONNECTOR DTM04-4P</p> <p>Red LED</p> <p>Ø52</p> <p>37,1</p> <p>Max. 120°</p> <p>10</p> <p>150 ± 10</p> <p>* Extension cable option is available</p>	<p><b>Extension Cable</b></p> <p><b>Extension Cable for antenna types 3 and 4</b></p> <p>DEUTSCH CONNECTOR DTM06-4S</p> <p>2x0.5 YSLY FLR09YHC11Y 2x0,5-B + 0,5-B</p> <p>DEUTSCH CONNECTOR DTM04-4P</p> <p>Red LED</p> <p>L</p> <p>See table 3 for "L" length options</p>
4	<p><b>Above Dashboard Without Cap</b></p> <p>2x0.5 YSLY FLR09YHC11Y 2x0,5-B + 0,5-B</p> <p>DEUTSCH CONNECTOR DTM04-4P</p> <p>Red LED</p> <p>Conduit Art.-Nr: 1926120 Ø12</p> <p>150 ± 10</p> <p>* Extension cable option is available</p>	
5	<p><b>Above Dashboard Without Cap and LED</b></p> <p>10</p> <p>Cable : FLR09YHC11Y 2x0,5-B + 0,5-B</p>	
6	<p><b>No ANTENNA</b></p>	

\* For technical details refer to;  
(Antenna type-1) 95090,(Antenna type 2,3,4&5) 95421

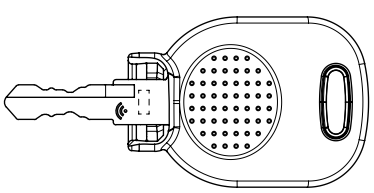
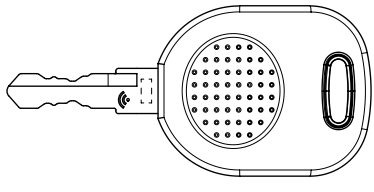
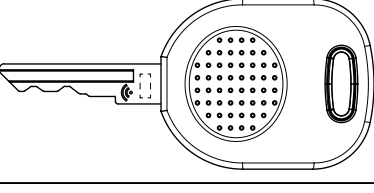
2 TYPES OF ELECTRONIC CONTROL UNIT	
A	<p>With 14 pin plug (Pairs with only Antenna type 1)</p> 
B	<p>With 14 pin plug (Pairs with only Antenna types 2,3,4&amp;5)</p> 
C	<p>With 10 and 14pin plug (Pairs with only Antenna type 1)</p>  <p>( 10 pin plug for Can-Bus)</p>
D	<p>With 10 and 14pin plug (Pairs with only Antenna types 2,3,4&amp;5)</p>  <p>( 10 pin plug for Can-Bus)</p>
E	NO ELECTRONIC CONTROL UNIT

Tyco Article Nr : 828801-4 to be fitted with 929504-4  
Used for CAN bus controlled immobiliser systems.  
Includes analog input and electronic switch outputs,  
terminated with 120 Ohm and non-terminated  
CAN BUS outputs.

Tyco Article Nr : 828801-5 to be fitted with 929504-5  
Used for relay controlled immobiliser systems.  
Supports up to 4-relays.

3 CABLE LENGTH		
	Cable length for Antenna Types 1,2&5	Extension Cable length(L) for Antenna Types 3&4
1	1000mm	850mm
2	1700mm	1550mm
3	1800mm	1650mm
4	2000mm	1850mm
5	2200mm	2050mm
6	2500mm	2350mm
7	Customer specific	
8	Without	

5 CUSTOMER LOGO ON KEY	
A	With
B	Without

4 KEY TYPES		
L	606	
M	607	
N	608	
P	0-250	
R	602	
S	603	
T	0-250	
U	609	
V	610	
W	628	
Y	Customer specific	
Z	Without Key	

## LEADING PRODUCT VERSIONS

Versions which are not listed below are also included in our production program

Product Nr.	Technical Characteristics				
	Code 1	Code 2	Code 3	Code 4	Code 5
33869	1	A	1	M	B
33861	1	A	1	S	B
36173	1	C	1	L	B
33248	1	C	1	M	B
33249	1	C	1	N	B
33256	1	C	1	P	B
31883	1	C	1	R	B
33241	1	C	1	S	B
33254	1	C	1	T	B
33250	1	C	1	V	B
33251	1	C	1	W	B
35007	1	C	2	M	B
31968	1	E	1	Z	B
34272	1	E	2	Z	B
34273	1	E	3	Z	B
34274	1	E	4	Z	B
34275	1	E	5	Z	B
34276	1	E	6	Z	B
33226	2	D	1	L	B

Product Nr.	Technical Characteristics				
	Code 1	Code 2	Code 3	Code 4	Code 5
33230	2	D	1	M	B
31882	2	D	1	R	B
33223	2	D	1	S	B
31967	2	E	1	Z	B
36094	3	E	1	Z	B
34874	5	E	1	Z	B
35163	5	E	2	Z	B
33262	6	C	8	L	B
33266	6	C	8	M	B
33267	6	C	8	N	B
33274	6	C	8	P	B
31969	6	C	8	R	B
34932	6	C	8	S	B
33272	6	C	8	T	B
33268	6	C	8	V	B
33269	6	C	8	W	B
34759	6	D	8	M	B
34933	6	D	8	S	B

SPARE PARTS						
Part Name	Cable Length					
	1000 mm	1700 mm	1800 mm	2000 mm	2200 mm	2500 mm
Below Dashboard	31968	34272	34273	34274	34275	34276
Above Dashboard	31967	*	*	*	*	*
Above Dashboard With Cap	*	*	*	*	*	*
Above Dashboard Without Cap	*	*	*	*	*	*
Above Dashboard Without Cap and LED	34874	35163	*	*	*	*
Extension Cable	34713	34714	34715	*	34716	*
ECU Housing 14 Pin & Cover Without PCB	Product Nr : 34305					
ECU Housing 10-14 Pin & Cover Without PCB	Product Nr : 34303					

\* Available upon request

Delivery Volume		
Item	Designation	Number
1	Control Unit	1
2	Antenna	1
3	Ignition Key (Blue)	2
4	Master Key (Red)	1
5	Manual	1

# “IMMOBILISER COMPACT,”



## MAIN PROPERTIES

### a) Electrical data

- Supply Voltage: 6-32V
- Operating Voltage: 12V/24V
- Communication Interface: 250/500 Kbps CAN 2.0 B
- LED Drive Output: 1A (max.)
- Operating Current: 15A
- CAN-Bus: SAE J1939 v2.0B

### b) RF Module

- Frequency: 134.2kHz
- Encoding Method: Frequency Key Shifting (FSK)

### c) Mechanical data

- Mounting Position: Frequency Key
- Shifting (FSK)
- Housing Material: PA 66 / UL 94 V0

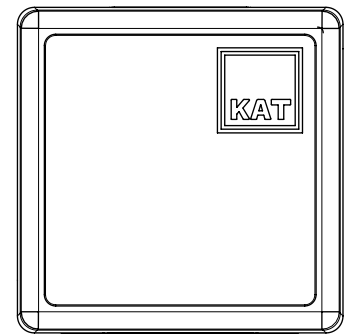
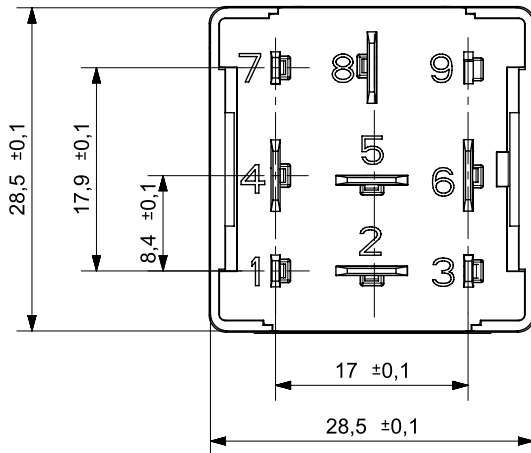




# TECHNICAL CHARACTERISTICS

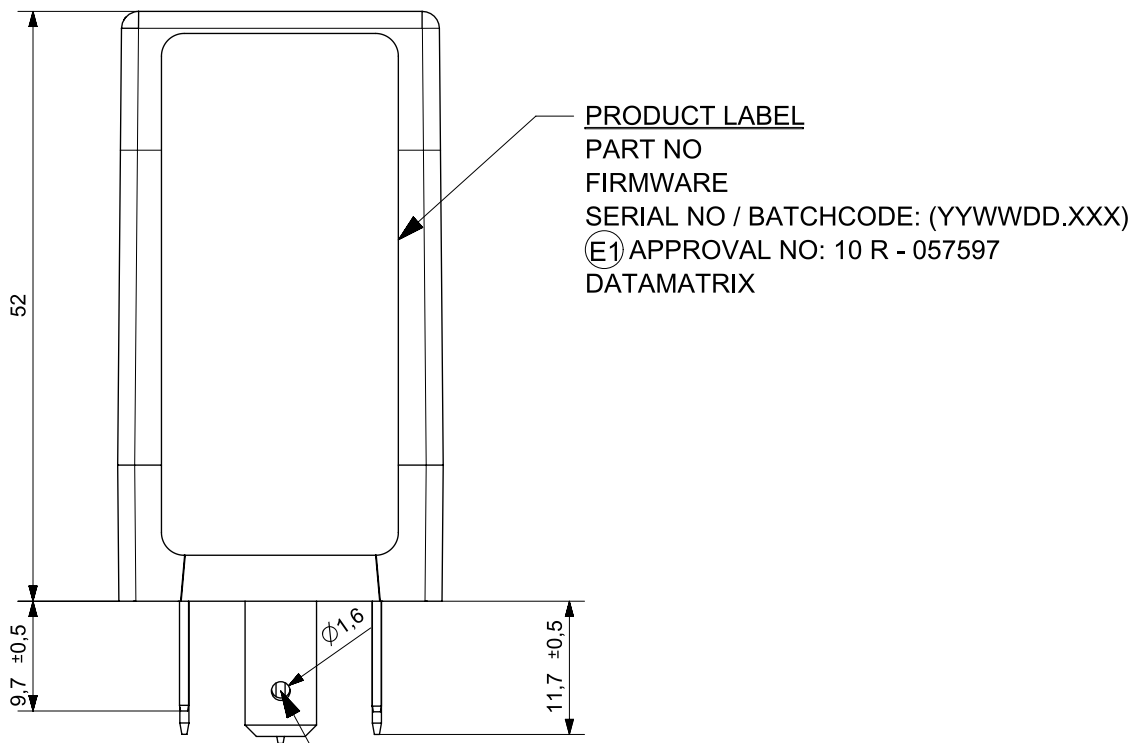
## Compact Version

The system consists of a relay containing the record of the transponder code, an ignition switch with integrated transponder and an antenna. The antenna and switch key with integrated transponder fulfill their function without the need for an external power source.



Firmware version: v1.00

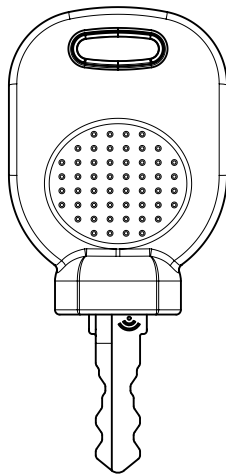
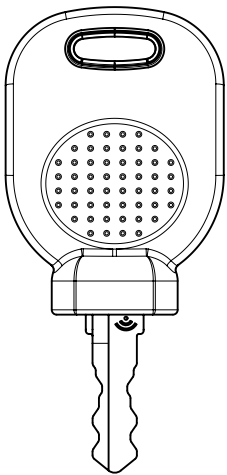
Key memory: 15 keys



PLUG HOLE DIMENSIONS ARE ACCORDING TO DIN 46342

PIN-OUT TABLE

Pin Number	Signal	Description
1	ANT-2 (SIGNAL)	Antenna Connection
2	Output	Low side switching - LED drive
3	Ignition IN- KI.15	Ignition supply
4	CAN-Low	CAN Interface
5	ANT-1 (SHIELD)	Antenna Connection
6	GND (-)	Ground
7	CAN-High	CAN Interface
8	Battery (+)	Power Supply
9	Input	N/A



2x SLAVE KEY  
 BLUE (RAL-5005)  
 BLACK (RAL-9017)

1X MASTER KEY  
 RED (RAL-3020)  
 BLACK (RAL-9017)

**The main properties are:**

- Communication with CAN Bus J1939 protocol
- IP54 protection class
- 1x Analog output
- 1x Digital output
- Panel top and panel bottom antenna options (Illuminated warning for operator, optional)
- Diagnostic feature
- Compact size
- Connection suitable to standard relay connector
- Approved by the German Federal Motor Transport Authority

**\*Product will be customised upon request**

Delivery Volume		
Item	Designation	Number
1	Immobiliser	1
2	Ignition Key (Blue)	2
3	Master Key (Red)	1
4	Manual	1

# “IMMOBILISER HEAVY DUTY,”



## MAIN PROPERTIES

### a) Electrical data

- Supply Voltage: 6-32V
- Operating Voltage: 12V/24V
- Communication Interface: 250/500 Kbps CAN 2.0 B
- LED Drive Output: 1A (max.)
- Operating Current: 15A
- CAN-Bus: SAE J1939 v2.0B

### b) RF Module

- Frequency: 134.2kHz
- Encoding Method: Frequency Key Shifting (FSK)

### c) Mechanical data

- Mounting Position: Frequency Key
- Shifting (FSK)
- Housing Material: PA 66 / UL 94 V0



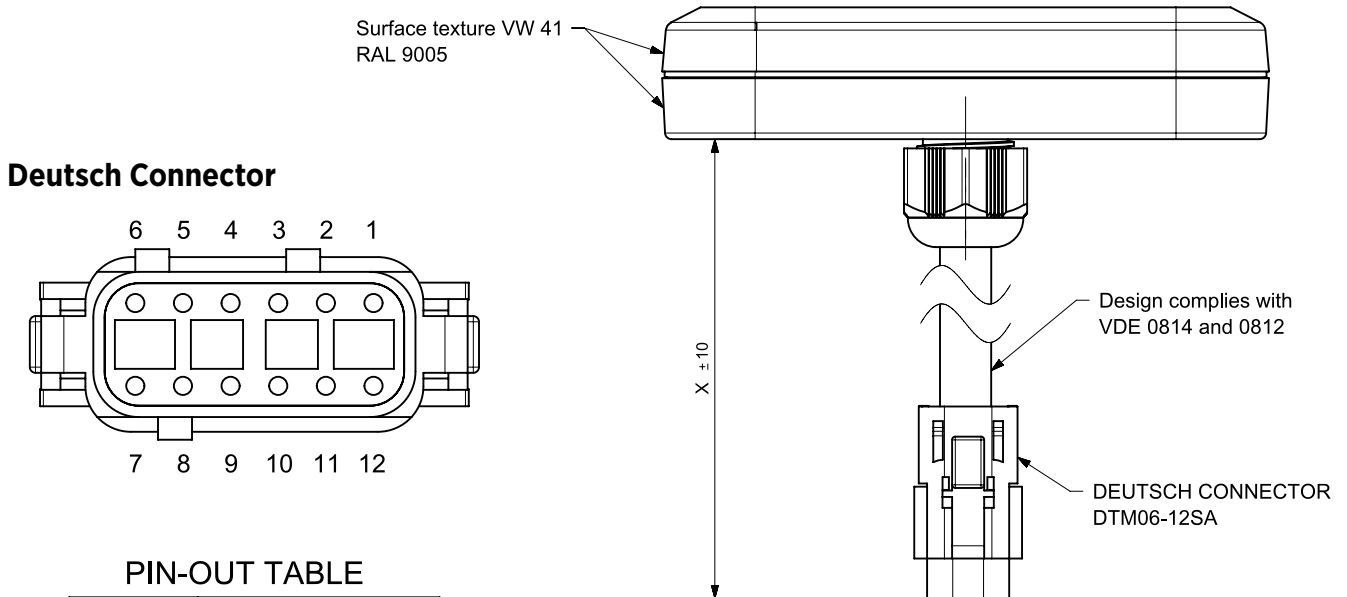
# TECHNICAL CHARACTERISTICS

## Heavy Duty Version

KAT Immobiliser System for Heavy Duty has 2 versions, with keypad or with antenna.

- IP67 Housing, IP 64 Membrane
- Coaxial cable
- LED indicated
- Directly connected to CAN-Bus Harness system
- Metal dome membran plate
- Crypto message for high security

To disarm immobiliser and operate vehicle with a customer specified keypad code, keypad solution is suggested. In this solution antenna and transponder in the key is not required.



PIN-OUT TABLE

PIN	FUNCTION
1	KEY 7
2	KEY 6
3	KEY 5
4	KEY 4
5	KEY 3
6	KEY 2
7	KEY 1
8	KEY 0
9	GND
10	LED - DRW
11	NC
12	NC

### The main properties are :

- Communication with CAN Bus J1939 protocol (Encrypted communication, optional)
- IP69K protection class
- 2x 5A Electromechanical relay
- 1x 1A Electromechanical relay
- Panel top and panel bottom antenna options (Illuminated warning for operator, optional)
- Option to use with keypad (for vehicles, where usage of antenna is inapplicable)
- Diagnostic feature
- Connection with DTM series Deutsch connector
- Thatcham (3 Star) approval

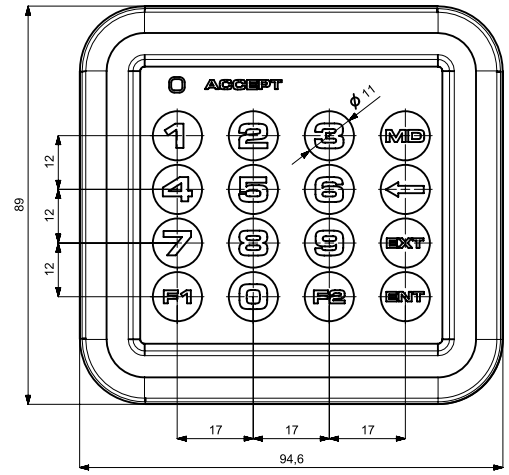
Keystroke : 400 g ± 50  
 Operating life is 200.000 push

Storage Temperature : -40 +85 C  
 Operation Temperature : -40 +85 C  
 Water and Dust Ingress : IP 69 K

Mechanical/ Electrical/ Electronic/Environmental characteristics are according to  
 STD00140 JCB Specification  
 Keypad endurance / Life test according to STD00262

Accessories  
 M5x8mm Socket Button Head Screw Zinc Plated Black Passivated

Quantity  
 2 Pcs



### PIN-OUT TABLE KEYPAD VERSION

GREY CONNECTOR	
PIN	FUNCTION
1	KEY 7
2	KEY 6
3	KEY 5
4	KEY 4
5	KEY 3
6	KEY 2
7	KEY 1
8	KEY 0
9	GND
10	LED - DRW
11	NC
12	NC

BLACK CONNECTOR	
PIN	FUNCTION
1	RELAY 3A - (COM)
2	RELAY 3B - (NO)
3	RELAY 2A - (COM)
4	RELAY 2B - (NO)
5	RELAY 1 - (NO)
6	RELAY 1 - (NC)
7	+12/24DC BAT
8	IGNITION 15/54
9	CAN-H
10	CAN-L
11	GND - (-)
12	RELAY 1 - (COM)

### PIN-OUT TABLE ANTENNA VERSION

GREY CONNECTOR	
PIN	FUNCTION
1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	NC
8	NC
9	GND
10	LED - DRW
11	ANT-2 (Signal)
12	ANT-1 (Shield)

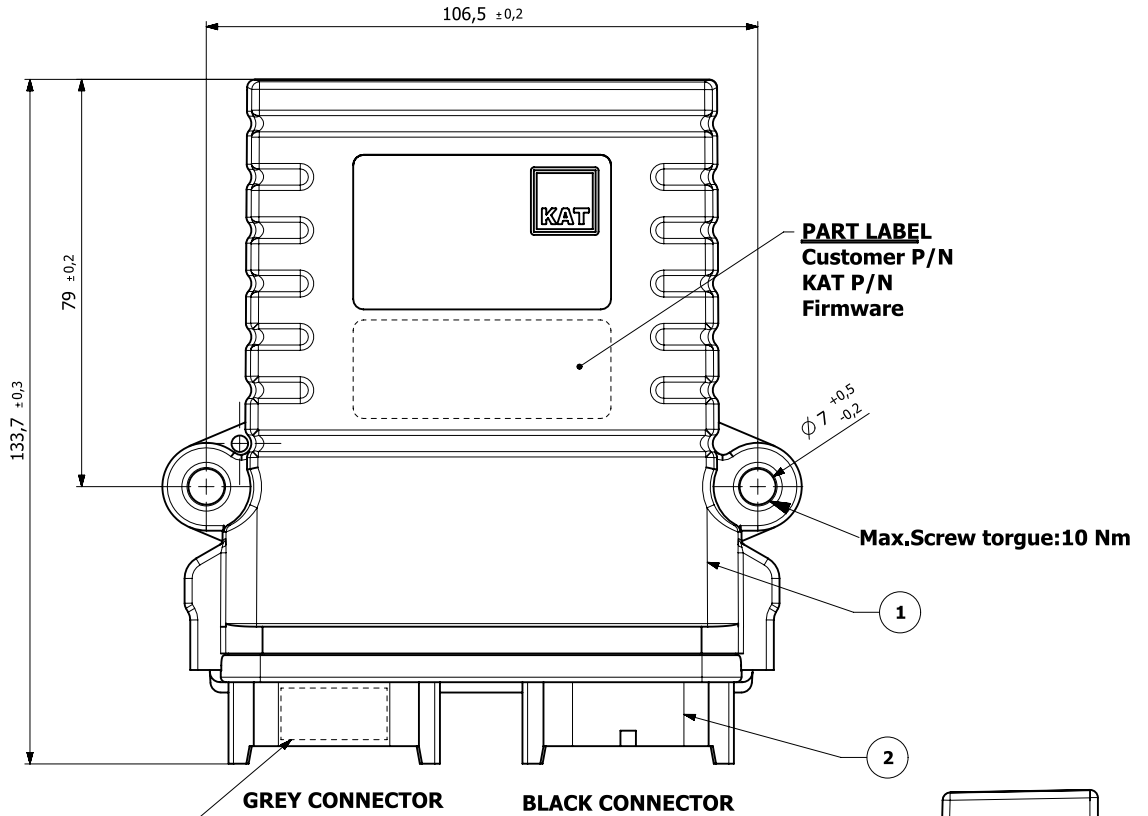
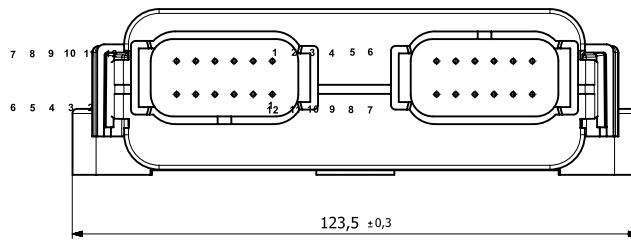
BLACK CONNECTOR	
PIN	FUNCTION
1	RELAY 3A - (COM)
2	RELAY 3B - (NO)
3	RELAY 2A - (COM)
4	RELAY 2B - (NO)
5	RELAY 1 - (NO)
6	RELAY 1 - (NC)
7	+12/24DC BAT
8	IGNITION 15/54
9	CAN-H
10	CAN-L
11	GND - (-)
12	RELAY 1 - (COM)

\* NC: Not connected

\* NC: Normally closed

\*\* NO: Normally open

\*\*\* COM: Common

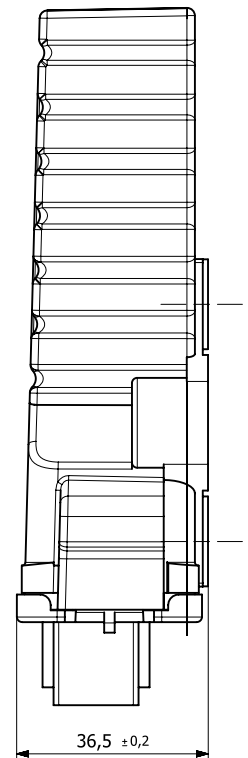


**PART LABEL**  
Customer P/N  
KAT P/N  
Firmware

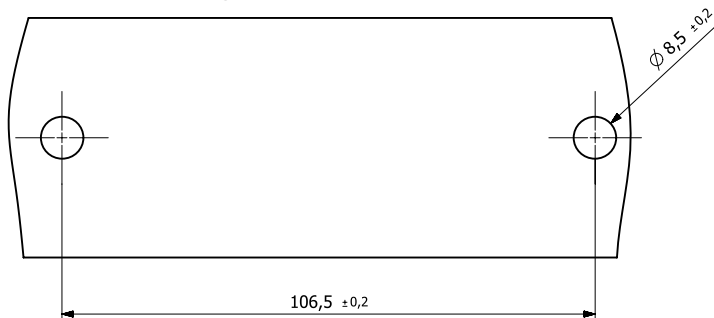
Max. Screw torque: 10 Nm

Serial number  
(Batch code, Date code)

No	Partname	Material
1	Housing	PA66 GF30 / Black
2	DEUTSCH Connector	DTM13-12PA-12PB-R008



Mounting Hole dimenions on panel



**\*Product will be customised upon request**

Delivery Volume		
Item	Designation	Number
1	Immobiliser	1

# “IMMOBILISER INTEGRATED,”



## MAIN PROPERTIES

- Operating Temperature: -40°C/ +85°C
- IP Rating: IP 67
- Operating Voltage: 12V/ 24V
- LED Drive Output: 250mA
- CAN-BuS: SAE J1939 v2.0B
- Approvals: CE
- Communication Interface: 250Kbps  
CAN 2.0 B



# TECHNICAL CHARACTERISTICS

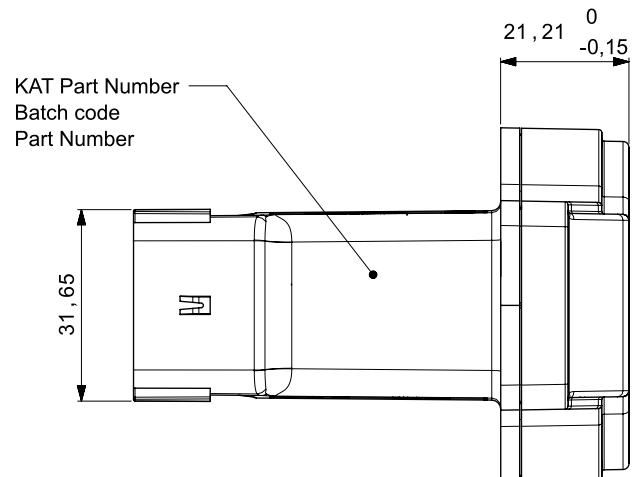
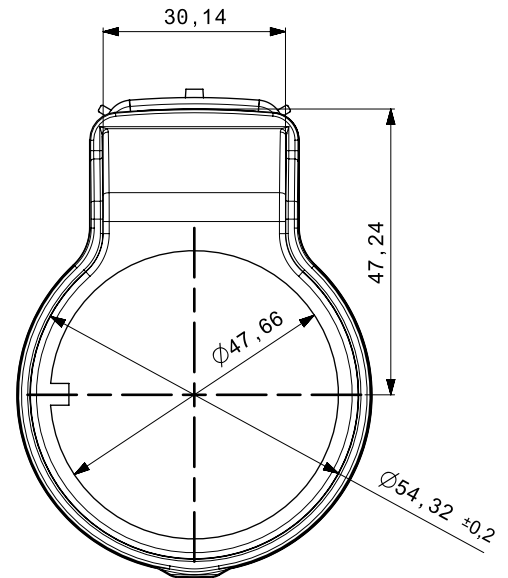
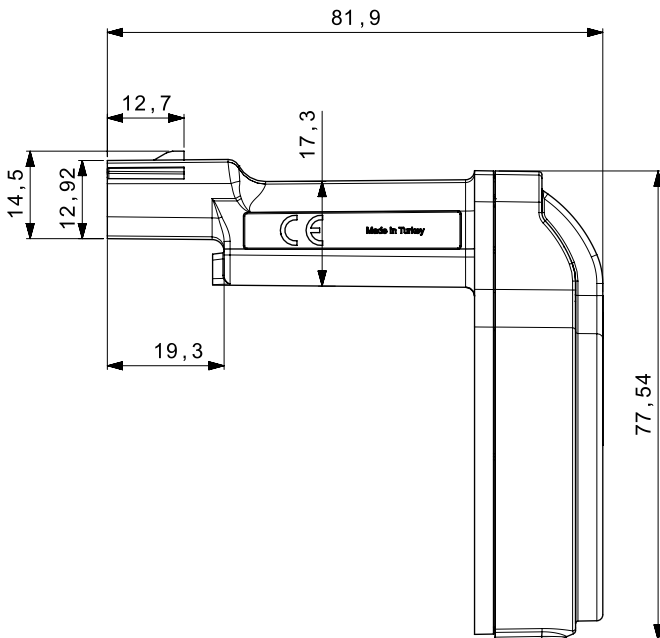
## Integrated Version

The main purpose of KAT Immobiliser systems is to prevent theft of the vehicle by blocking the ignition system of the vehicle. The system consists of a control unit (ECU) and key(s) with transponder. The antenna and ECU are combined in the same housing which makes the system compact and easy to assemble. The design is compatible to the KAT Ignition Switch and fitting below dashboard.

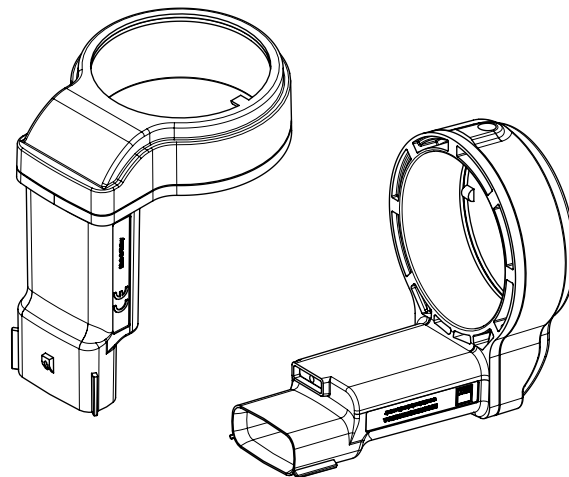
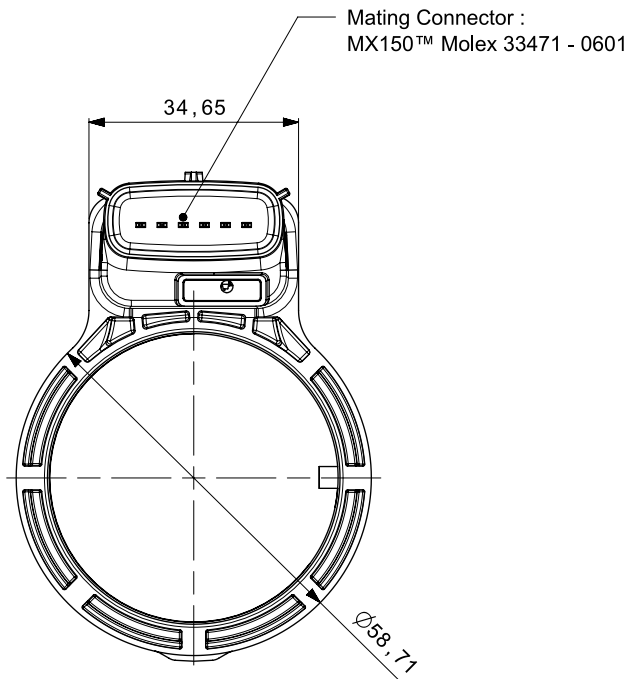
The system is capable to communicate securely\* via CAN-Bus with another controller carrying out functionality to immobilize the machine.

KAT Immobiliser models are offered to our customers with certifications obtained from international institutions as a result of meticulous work and a long testing process.

\* The CAN-BUS communication is secured according to customer specific requirements.







Sharp 90 degree bends in the harness should be avoided!  
Excessive force, or severe bending of the wire harness may damage the harness.

ANTENNA	
Operating frequency	134,2 kHz
Encoding method	FSK
Coil winding	65 turns
Coil wire	Enameled copper wire
Coil wire diameter	0,18mm

ELECTRICAL SPECIFICATION	
Supply voltage	6-30V
Operating voltage	12V/ 24V
Operating temperature	-40°C to +85°C
Communication Interface	250Kbps CAN 2.0B
LED Drive Output	250mA
Current consumption	40mA
Current consumption (Sleep mode)	<10mA

PIN-OUT TABLE	
Pin Number	Connection
1	Ignition Kl. 15/54
2	LED (Low Side Switching)
3	CAN-L
4	CAN-H
5	Ground (-)
6	Battery (+)

Designation	Material	Material code	Weight
Resin	TBD	N/A	25 gr
PCB	FR4	N/A	N/A
Pins	C26000 Brass, Plating; 1.25 µm Nickel Overall 2.5µm Select Matte Tin PC Tail Area 0.05-0.25µm Select Gold Contact Area	N/A	N/A
Housing	ZYTEL 70 G30 HSL BK-39B Black	PA66 GF30	25,50 gr
Cover	ZYTEL 70 G30 HSL BK-39B Black	PA66 GF30	8,6 gr

**\*Product will be customised upon request**

Delivery Volume		
Item	Designation	Number
1	Immobiliser	1

# REFERENCE CUSTOMERS

