



# VANDAL-PROOF PIEZO SWITCHES

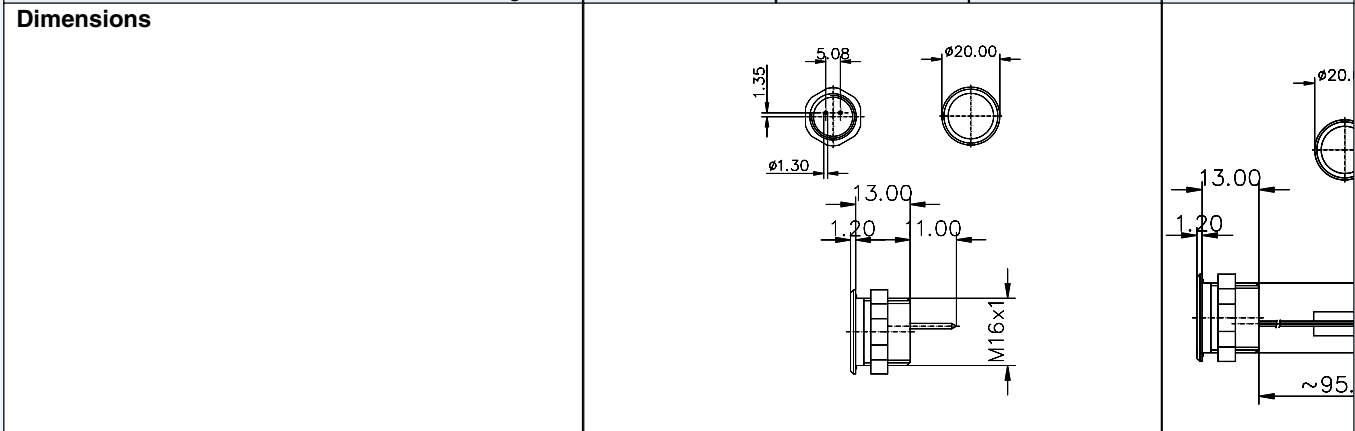
From a lower cost plastic version to the "EX" version the range is impressively complete. A special feature is the Piezo switch with mechanical stroke. All switches are available in a variety of colors and housing materials.




<b>Standard Versions</b> All other types as well as labeling are available on request.	M16 plastic housing (pins)	M16 metal housing (pins)	M16 intrinsic safe 	M16 prolonged signal*1
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Features				
<b>Housing material (stainless steel on request)</b>	plastic (PBT, UL 94)	aluminum	aluminum	aluminum
<b>Switching function</b>	N.O.	N.O.	N.O.	N.O.
<b>Terminals</b>	Faston Pins Wires (200 mm)	see M16 Faston	available on request	●
<b>Accessories</b>	Screwing clip for terminal pins*2  0701.9225 Nut and O-ring seal	●	●	●
<b>All switches are supplied with nut and O-ring seal</b>				

Part numbers				
<b>Color of housing</b>	red	<b>1241.2350</b>	<b>1241.2411.3</b>	—
	white	<b>1241.2351</b>	—	—
	natural	<b>1241.2352</b>	<b>1241.2411.8</b>	<b>1241.2415.8</b>
	black	<b>1241.2353</b>	<b>1241.2411.7</b>	—
	green	—	<b>1241.2411.5</b>	—
	blue	—	<b>1241.2411.4</b>	—
	gold	—	<b>1241.2411.1</b>	—



 The explosion-proof type of our PSE switches was specifically designed for potentially explosive areas and is tested to type of production "i" according to DIN EN 50014/20 (Ex ib IICT4). Due to contactless circuitry there is no danger of igniting explosive goods.

- \*1 Prolonged signal means that the signal stays on as long as the switch is actuated. Make impulse time: 0,2 – 50 sec. (depending on actuating force).
- \*2 The clamp for the threaded terminal end must be ordered separately. Part no. 0701.9225

Changes for technical improvement are subject to change.



M16 faston	M19 pins	M22 Prolonged signal* <sup>1</sup> with temperature compensation* <sup>3</sup>	M22 pins	M16 with tactile feedback	M27 mechanical stroke
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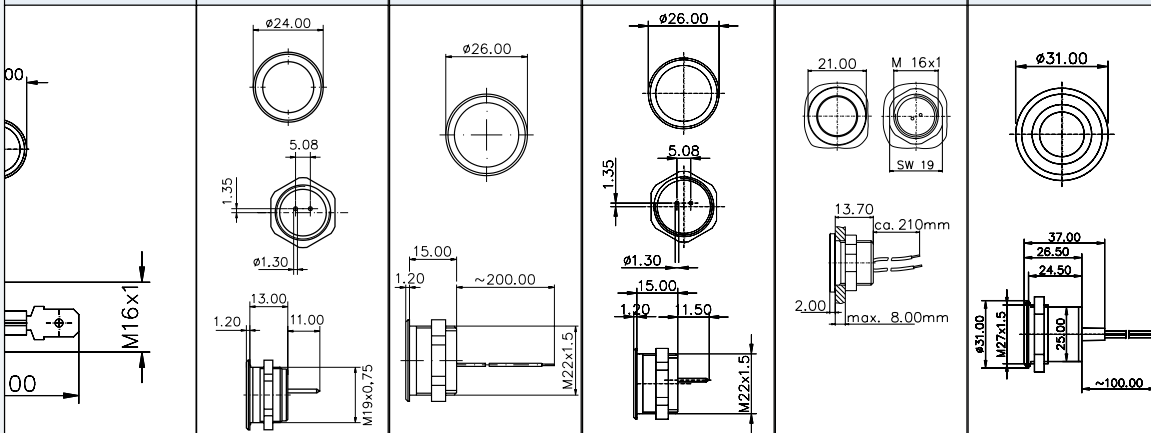
### Features

aluminum	aluminum	aluminum	aluminum	aluminum	aluminum
N.O.	N.O.	N.O.	N.O.	N.O.	N.O.
●	—	—	available on request	—	—
—	●	—	●	—	—
●	—	● 200 mm	—	● 210 mm	● Wire 100 mm
—	●	—	●	—	—

All switches are supplied with nut and O-ring seal

### Part numbers

1241.3000	—	—	1241.3005	—	1241.2625.3
—	—	—	—	—	—
1241.3003	1241.3123	1241.3998	1241.3008	1241.5200.8.093	1241.2625.8
1241.3002	—	—	1241.3007	with red foil	1241.2625.7
1241.3001	—	—	1241.3006	—	1241.2625.5
—	—	—	—	—	1241.2625.4
—	—	—	—	—	1241.2625.1

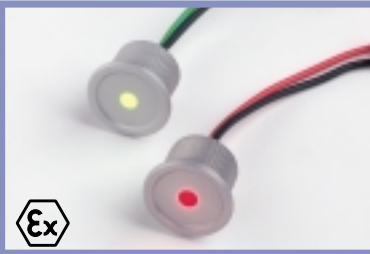


\*1 Extended impulse means that the signal is shown as long as the key is pressed. Duration of actuation: 0.2 – 50 sec. (depending upon actuating force, time and velocity).

\*3 In case the pyroeffect occurs due to large temperature jumps a special circuit ensures functional safety of the switch.

# ILLUMINATED VANDAL-PROOF PIEZO SWITCHES

The illuminated piezo switches complement the piezo range for applications which require optical feedback. Illumination can be either point or ring type. The M16 version also includes an indicator without switching function for explosion-proof applications.



## Standard Versions

Other versions (as well as laser labeling) on request (see page 8).

M16 indicator without switching function faston

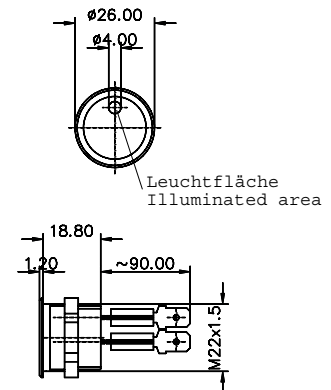
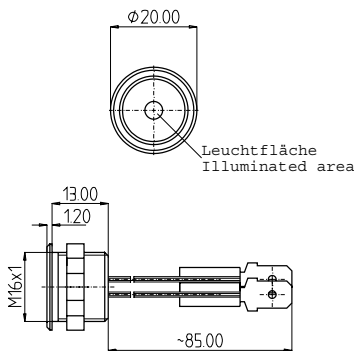
M22 point illuminated faston

<b>Housing material</b>		aluminum	aluminum
<b>Switching function</b>		none	N.O.
<b>Terminals</b>	Faston	●	●
	Pins	—	—
	Wires (200mm)	—	—
<b>Illumination</b>	Point illumination	● LED 2 V* without built-in resistor	● LED red, 24 V*
	Ring illumination	—	—
<b>Nut and O-ring seal</b>		All switches are supplied with nut and O-ring seal	

## Part numbers

<b>Color of housing</b>	natural	1241.3033	LED red	1241.3020
	natural	1241.3034	LED green	—
	natural	1241.3035	LED yellow	—
	red	1241.3036	LED red	—
	green	1241.3037	LED green	—
	gold	1241.3038	LED yellow	—

## Dimensions



\* cf. LED-Data p. 1



M24 ring illuminated wires	M27 ring illuminated wires	M30 ring illuminated wires
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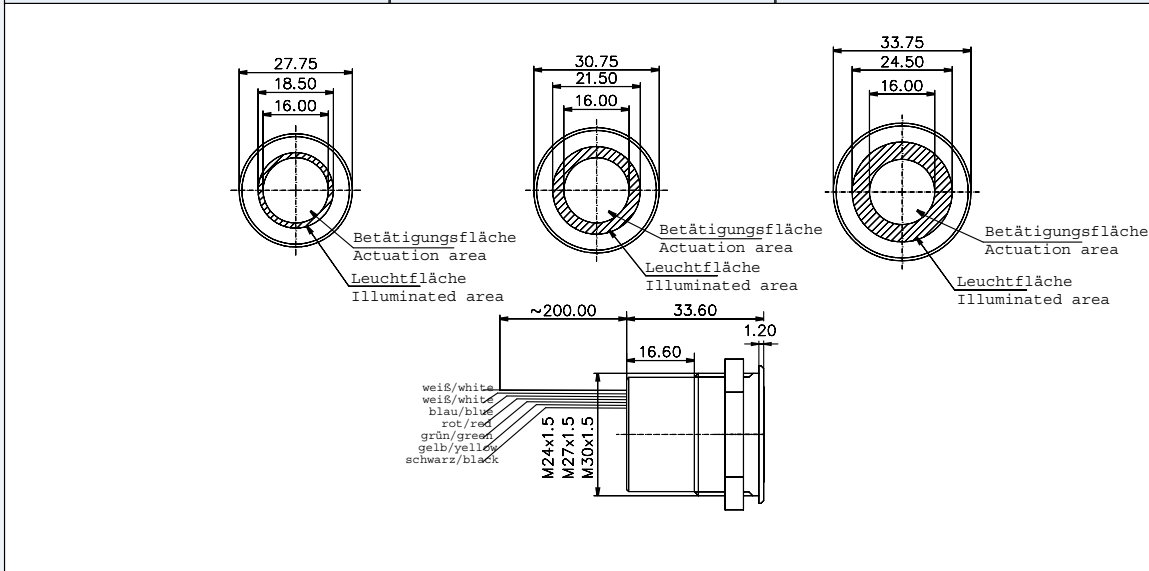
**Features**

aluminum	aluminum	aluminum
N.O.	N.O.	N.O.
—	—	—
—	—	—
● 200 mm	● 200 mm	● 200 mm
—	—	—
● LEDs red/green, 24 V*	● LEDs red/green, 24 V*	● LEDs red/green, 24 V*

All switches are supplied with nut and O-ring seal

**Part numbers**

—	—	—
<b>1241.3010</b>	<b>1241.3011</b>	<b>1241.3012</b>
—	—	—
—	—	—
—	—	—
—	—	—



# PIEZO ELECTRONIC SWITCHES WITH EXTENDED TEMPERATURE

The switch with extended temperature range can be used under critical climatic conditions. The operating temperature is from -40 to + 85° C.



**Standard Versions**  
Other versions on request.

M19  
with extended temperature range

## Features

<b>Housing material</b>	aluminum	aluminum
<b>Switching function</b>	N.O.	N.O.
<b>Terminals</b>	Faston receptacle with wire 0.34 mm <sup>2</sup>	Faston receptacle with wire 0.34 mm <sup>2</sup>
<b>Nut</b>	Supplied with nut	

## Part numbers

<b>Color of housing (natural)</b> 1241.5003	1241.5002
<p>Metric threading</p>	<p>Inch Threading</p>

## TECHNICAL DATA

### Electrical data

Switching voltage max.	50 VDC
Switching current max.	15 A
Breaking capacity max.	0,4 W
Lifetime at rated breaking capacity	>10 Mio. cycles
Isolation resistance (OFF = not actuated)	not testet
Initial contact resistance (ON = actuated)	< 7,5 Ω
Capacity	25 pF
N.O. make impulse time* <sup>1</sup>	min. 40 ms

### Mechanical data

Min. actuating force	0,6 N
Switching travel	0,002 mm
Degree of protection	IP 67
Max. starting torque	250 N/cm

### Climatic data

Operating temperature / storage temperature	-40°C to +85°C
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\*1 depending on actuating force, time and speed

## TECHNICAL DATA FOR PIEZO SWITCHES

### Electrical data

Switching voltage max.
Switching current max.
Breaking capacity max.
Lifetime at rated breaking capacity
Isolation resistance (OFF = not actuated)
Initial contact resistance (ON = actuated)
Capacity
NO make impulse time
(depending on actuating force, time and speed)

general	prolonged signal	Ex version
60 VDC	60 VDC	24 VDC
42 VAC	42 VAC	24 VAC
0,1 A	2,6 A	0,04 A
1 W	15,6 W	0,96 W
> 20 · 10 <sup>6</sup> cycles	> 20 · 10 <sup>6</sup> cycles	> 20 · 10 <sup>6</sup> cycles
> 10 M	> 10 M	> 10 M
< 20	< 5	< 20
30 pF	30 pF	30 pF
20 – 1000 ms	20 – 50000 ms	20 – 1000 ms

### Mechanical data

Min. actuating force
Contact travel
Degree of protection (sealed)
Max. starting torque
Mechanical life

1,5 – 3 N (4,25 N for PSE with mechanical stroke)
0,002 mm
67 IP
250 N/cm
1 Mio actuations
(applies to piezo switches with tactile feedback)

### Climatic data

Operating temperature
Storage temperature

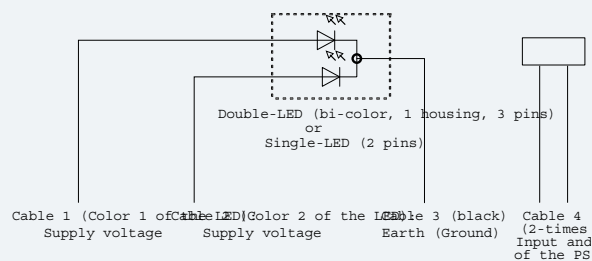
-20°C to +60°C
-20°C to +60°C

## LED DATA FOR ILLUMINATED VERSIONS

### Point illumination:

Color	Current I <sub>F</sub> = mA	Remark
red	2.0	
green	2.0	
yellow	2.0	
red/green	2.0	bi-colored

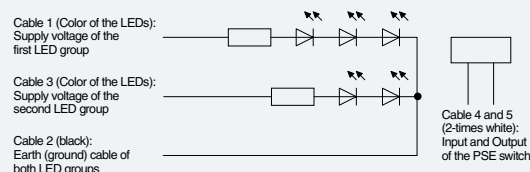
All LEDs have a nominal diameter of 5 mm.



For the illumination either a one color LED (2 pins) or a bi-color LED (3 pins) is used. Cable 2 is not needed if a one color LED will be used. Color switching can be achieved through a corresponding drive current.

### Ring illumination:

Color	Current I <sub>F</sub> = mA
signal yellow	2.0
signal red	2.0
signal blue	2.0
signal green	2.0



# CONFIGURATION GUIDE FOR PIEZO VARIATION



**Example:** M27, aluminum nature, with fingerrip, ring illumination, with 3 yellow LEDs, for 5 V closer (NO) -

2	7	A	N	A	F	-	R	I	0	0	G	B	0	5	-	N	O	-	L	-	0	0	0
Housing data					Illumination										Function	Connector	Labeling						

# # # = Numerical code according to cross-reference list  
**laser labeling**

A = AMP-connector (for 0,6 x 0,6 WW-Pins)  
F = Faston 6,3 x 0,8 mm on 90 mm 0,5 mm<sup>2</sup> cable  
L = Wire (0,22 mm<sup>2</sup>, 200 mm)  
S = Pins (not with illumination)  
**connectors**

A = Indicator (no PSE)  
E X = N.O. EX-version (without illumination)  
I V = N.O. with prolonged signal  
N C = N.C. (5,000 pc. min.)  
N O = N.O.  
O H = without hybrid  
e T = extended temperature range  
T K = temperature compensation  
**function**

0 0 = without built-in resistor  
0 5 = for 5 Volt  
1 2 = for 12 Volt  
2 4 = for 24 Volt  
**voltage for ring illumination**

0	0	0	0	= without illumination			
				<b>Number of LEDs for ring illumination</b>	<b>Number of LEDs for point illumination</b>	<b>Number of LEDs for ring illumination</b>	<b>Number of LEDs for point illumination</b>
				<b>for 5 volts</b>	<b>for 12/24 volts</b>	<b>round</b>	<b>rectangular</b>
0	0	B	L	= blue	3 LEDs	2 LEDs	—
0	0	G	E	= yellow	3 LEDs	2 LEDs	1 LED
0	0	G	N	= green	3 LEDs	2 LEDs	1 LED
0	0	R	T	= red	—	—	1 LED
R	T	R	T	= red	6 LEDs	5 LEDs	—
R	T	G	E	= red/yellow	3 + 3 LEDs	3 + 2 LEDs	—
R	T	G	N	= red/green	3 + 3 LEDs	3 + 2 LEDs	1 LED
G	N	G	E	= green/yellow	3 + 3 LEDs	2 + 3 LEDs	—
<b>color of LED</b>							

0 0 = without illumination  
R U = point illumination round (for indicator from M16, otherwise from M22)  
R E = point illumination rectangular (for indicator from M16, otherwise from M22)  
R I = ring (not for M16, M19 and M22)  
**shape of LED**

F = fingerrip  
E = flat(not for M16 plastic)  
**shape of actuating area**

A L = aluminum color (only for plastic)  
B L = blue (not for stainless steel)  
C R = chromium (only for brass)  
G O = gold (not for stainless steel)  
G N = green (not for stainless steel)  
N A = natural  
R T = red (not for stainless steel)  
S W = black (not for stainless steel)  
W S = white (not for stainless steel and aluminum)  
**color of housing**

A = aluminum  
S = stainless steel  
K = plastic (PBT)  
M = chromium (on request)  
P = chromium-plated plastic (on request)  
**housing material**

1 6 = M16 x 1,0  
1 9 = M19 x 0,75  
2 2 = M22 x 1,5  
2 4 = M24 x 1,5  
2 7 = M27 x 1,5  
3 0 = M30 x 1,5  
**housing diameter**