Piezoelectric Switches

Petroleum Dispensing   **Elevators Panels**
Mining Equipment   **Medical**
Industrial equipment control **Access Control**
Emergency call system   **Marine**
Clean Room Interfaces

Piezoelectric Switches

PX series

EX series

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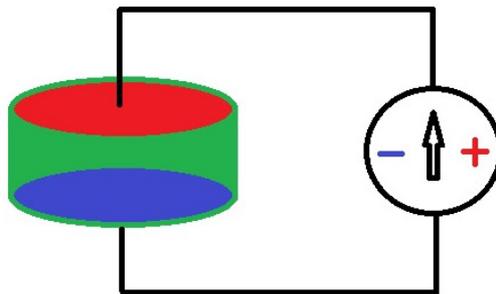
Piezoelectric Switches

Introduction

Rosslare's piezoelectric switches series are general purpose high performance switches suited for long-life and rugged use applications. The piezoelectric switches require no external power source to operate; are vandal, water and weather resistant and can be operated with fingers, gloves and through elastomeric overlays.

What is Piezoelectric?

Piezoelectric switches are based on the principle of piezoelectricity. The piezoelectric effect is the ability of certain crystalline materials to convert mechanical stress into electrical signals and vice versa. The piezo switch is based on the functional principle of the piezoelectric crystal. The action of force on the piezoelectric switch causes a voltage to be induced due to a charge transfer.

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How PX piezo switch works?

Pressure applied to the switch surface creates an electrical pulse. This electrical pulse is transferred to an electronic circuit, which then controls the behaviour of the switch as described below.

For the Normally Open (N.O) circuitry, the Piezo sensor is connected to terminals 1 and 2. The application circuit or device to be controlled is connected at terminals 3 and 4. The application circuit or device can be either DC or AC control circuitry. When pressure is applied to the switch, voltage difference is generated between terminal 1 and 2 resulting in the circuit being closed.
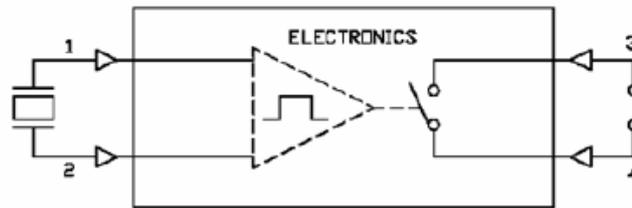
In the neutral, non-actuated position of the piezo switch (meaning no pressure is being applied to the switch), terminals 3 and 4 are in high impedance (non-conductive). When the piezo sensor is actuated, the piezo switch is no longer in a neutral position and the high resistance is eliminated, which results in terminals 3 and 4 being activated. The piezo switch returns to its neutral non-actuated state when the pressure is being applied to the switch is relased.
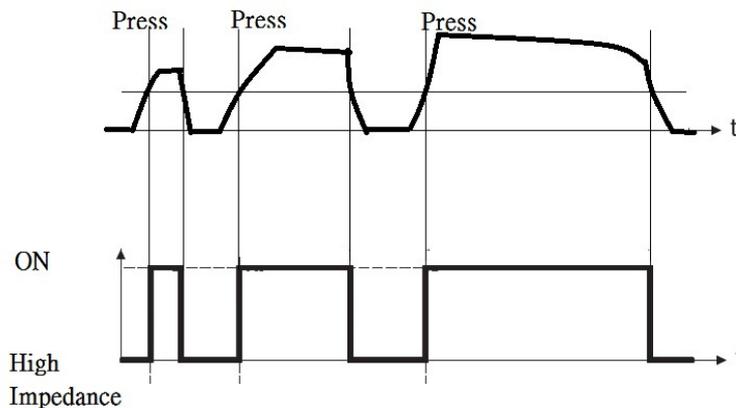
The diagram above demonstrates the electrical behaviour of the switch when it is pressed.   The duration of the signal depends on the duration of actuation.

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Piezoelectric Switches

Characteristics of Piezoelectric Switches

The Piezoelectric switches are designed and developed using advanced technology:

- Waterproof, rated IP-68 (PX series), rated IP-65 (EX series)
- Works in harsh conditions -40°C~+70°C (-40°F~+158°F)_
- Long-life expectancy (over a million cycles)
- No external power source required to power the switch. Supports a wide range of switch voltages
- No moving parts, maintenance free
- No polarity considerations for the wiring the switch
- SMT designed electronics for higher quality, superior performance, and reduced cost
- Meets RoHS Requirement
- ESD & EMI protection
- Piezoelectric technology can sense actuation within a solid metal enclosure
- Fully potted design prevents penetration of dirt, dust and water
- Vandal resistant
- Can be operated with fingers, gloves and through elastomeric overlays
- Heavy duty, non-magnetic, corrosion resistant for both Indoor and Outdoor use
- Non-sparking, made of aluminium alloy without moving parts, for use in spark sensitive environments
- Can be custom laser engraved, or anodize printed

Applications

- Petroleum Dispensing
- Mining Equipment
- Access Control
- Medical
- Industrial equipment control
- Emergency Call Systems
- Marine
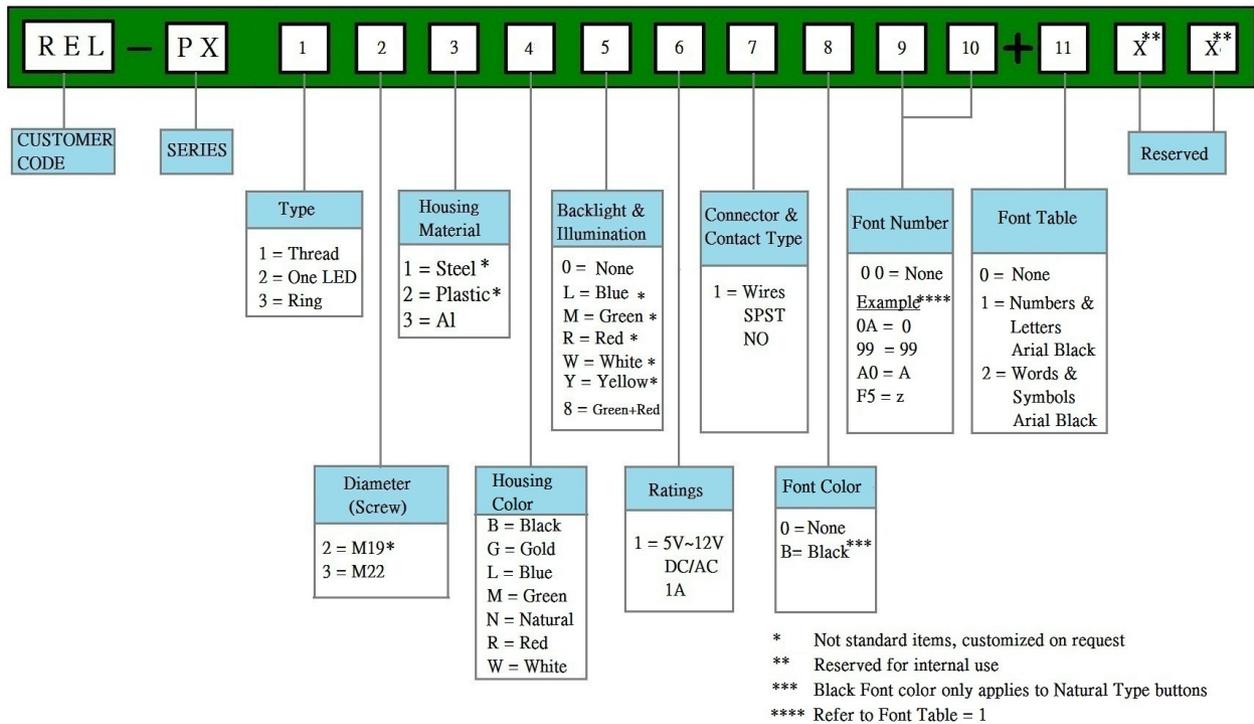- Elevators Panels
- Clean Room Interfaces

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Piezoelectric Switches

PiezoElectric Button

Rosslare's PX family (PX-13, PX-23 & PX-33) are heavy duty, non-sparking, non-magnetic, corrosion resistant, illuminated, anti-vandal piezoelectric switches, designed for both indoor and harsh weather outdoor use.

How to Order?

| REL | — | PX | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | + | 11 | X** | X** |

CUSTOMER CODE

SERIES

Reserved

Type
1 = Thread
2 = One LED
3 = Ring

Housing Material
1 = Steel *
2 = Plastic *
3 = Al

Backlight & Illumination
0 = None
L = Blue *
M = Green *
R = Red *
W = White *
Y = Yellow*
8 = Green+Red

Connector & Contact Type
1 = Wires SPST NO

Font Number
0 0 = None
Example****
0A = 0
99 = 99
A0 = A
F5 = z

Font Table
0 = None
1 = Numbers & Letters Arial Black
2 = Words & Symbols Arial Black

Diameter (Screw)
2 = M19*
3 = M22

Housing Color
B = Black
G = Gold
L = Blue
M = Green
N = Natural
R = Red
W = White

Ratings
1 = 5V~12V DC/AC 1A

Font Color
0 = None
B= Black***

*　　Not standard items, customized on request
**　 Reserved for internal use
***　Black Font color only applies to Natural Type buttons
**** Refer to Font Table = 1

1. Type

There are 3 types of Piezoelectric Button for selection.

1=Thread　　　　2=One LED　　　　3=Ring
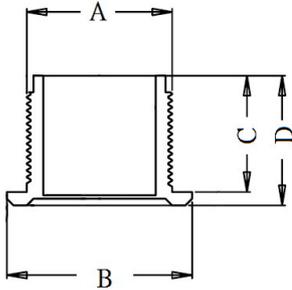
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Piezoelectric Switches

2. Diameter (Screw)

The standard screw diameter is 22mm. Other diameters may be customized on request.

(mm)	A	B	C	D
M22	22.00	28.00	17.50	19.50

3. Housing Material

The standard material is Aluminium. Other materials may be customized on request.

  1=Steel   2=Plastic   3=Aluminium
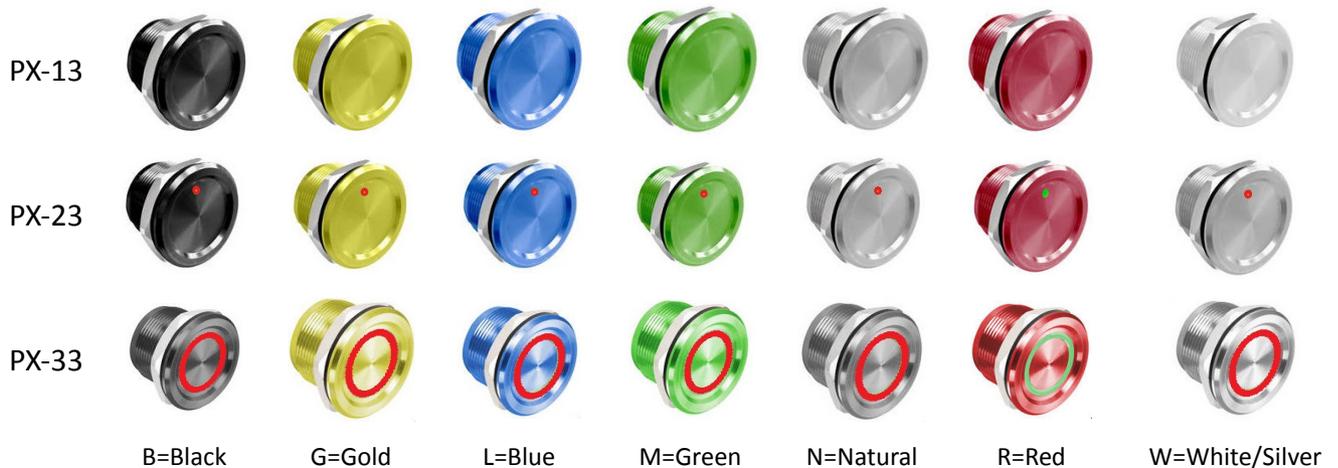
4. Housing Color

There are 7 standard colors: Black, Natural(Mat), Gold, Green, Red, Blue and Silver.

5. Backlight & Illumination

For PX-23 and PX-33 series, different LED colors may be selected.

0=None for PX-13 series
8=Green + Red (Bi-Color) for PX-23 & PX-33 series.

PX-13

PX-23

PX-33

B=Black   G=Gold   L=Blue   M=Green   N=Natural   R=Red   W=White/Silver

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Piezoelectric Switches

6. **Ratings**

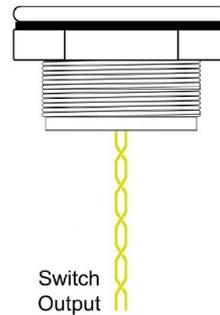The standard ratings is:

1= 5~12V DC/AC 1A

7. **Connector & Contact Type**

The standard connector and contact type is:

1 = Wires, SPST (Single Pole Single Throw), NO (Normally Open)
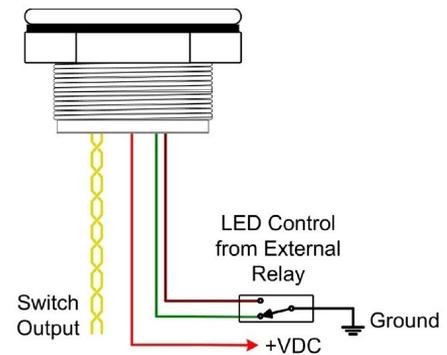
PX-13

Wires	Function
2	Switch Output

Simplest connection, no power supply and no control required

PX-23

Wires	Function
2 X Yellow	Switch Output
Red	+Vdc input for LED Power Supply
Green	LED (Green) Control Input
Brown	LED (Red) Control Input

Bi-Color LED for status indication by simple control & connection

PX-33

Wires	Function
2 X Yellow	Switch Output
Red	+Vdc input for LED Power Supply
Black	Ground
Green	LED (Green) Control Input
Brown	LED (Red) Control Input

Bi-Color Ring Illumination for status indication by simple control & connection

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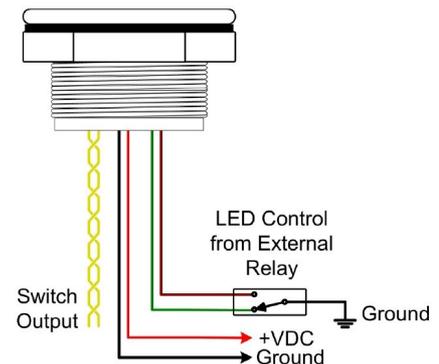
Piezoelectric Switches

8. Font Color

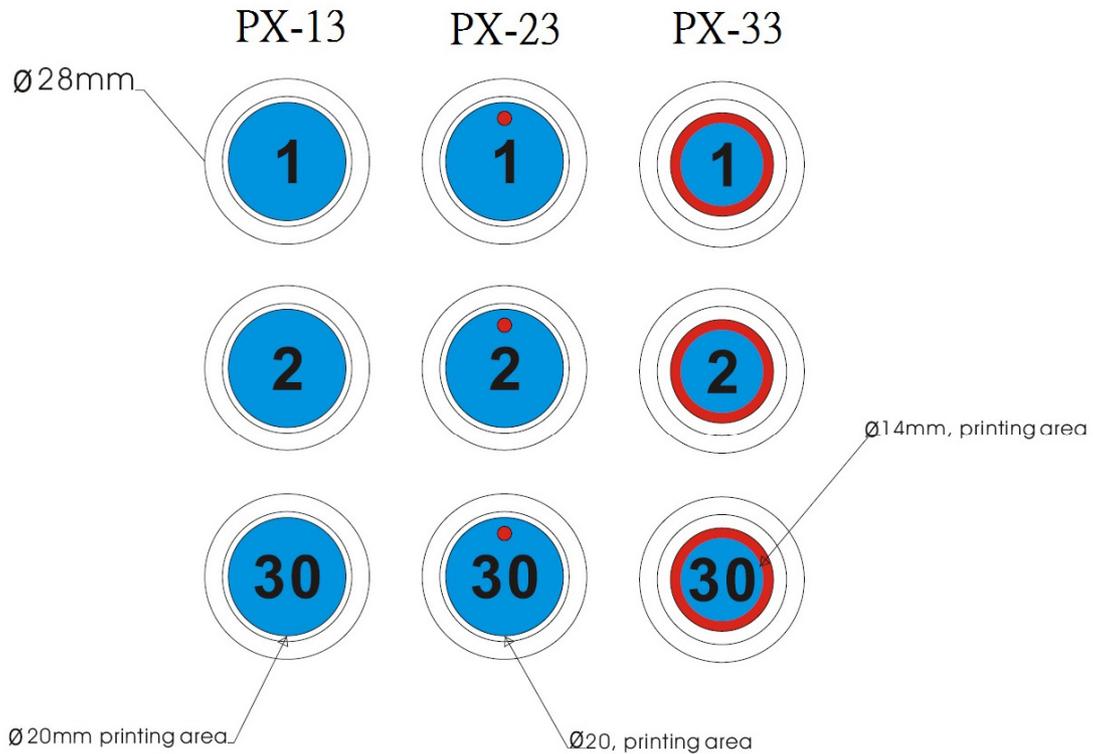0=None (No printing)

B=Black (Standard)

Font color only applies to **Natural Color** anodized piezoelectric buttons at the moment.

Lettering with different fonts, languages, colors and sizes are available on request.
Please refer to the pricelist for the corresponding extra works.

Printing Area

The printing for M22 type piezoelectric buttons are shown below.

Piezoelectric Switches

9. &10. Font Number

00 = None (No printing)

XX = Character code

11. Font Table

Standard Tables are provided for selection. The font size to be printed depends on the printing area of the switches and is not defined in the ordering number.

0=None (No printing)

1=Latin Arial Black (Numbers & Letters)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	01	02	03	04	05	06	07	08	09	0	À	Á	Â	Ã	Ä
1	10	11	12	13	14	15	16	17	18	19	1	Å	È	É	Ê	Ë
2	20	21	22	23	24	25	26	27	28	29	2	Ì	Í	Î	Ï	Ò
3	30	31	32	33	34	35	36	37	38	39	3	Ó	Ô	Õ	Ö	Ù
4	40	41	42	43	44	45	46	47	48	49	4	Ú	Û	Ü	Š	Œ
5	50	51	52	53	54	55	56	57	58	59	5	Đ	Ñ	Æ	Ç	Ø
6	60	61	62	63	64	65	66	67	68	69	6	Ý	Ÿ	Ž	ß	Þ
7	70	71	72	73	74	75	76	77	78	79	7					
8	80	81	82	83	84	85	86	87	88	89	8	à	á	â	ã	ä
9	90	91	92	93	94	95	96	97	98	99	9	å	è	é	ê	ë
A	A	B	C	D	E	F	G	H	I	J		ì	í	î	ï	ò
B	K	L	M	N	O	P	Q	R	S	T		ó	ô	õ	ö	ù
C	U	V	W	X	Y	Z						ú	û	ü	š	œ
D	a	b	c	d	e	f	g	h	i	j		ð	ñ	æ	ç	ø
E	k	l	m	n	o	p	q	r	s	t		ý	ÿ	ž		þ
F	u	v	w	x	y	z										

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2=Arial Black (Words & Symbols) – to be expanded

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1	PUSH	EXIT	ON	OFF	IN	OUT	START	STOP	UP	DOWN	LEFT	RIGHT	CTRL	RETURN	SHIFT	ON/OFF
2	HIGH	LOW	LOCK	ENTER	BACK	LOCK										
3																
4																
5																
6																
7																
8	$	€	¢	£	¤	¥	@	µ	§							
9	¼	½	¾	‰												
A	+	−	×	÷	=	±	#	%	?	&	¦	!	*	,	:	;
B	‹	›	«	»	<	>	"									
C																
D																
E																
F																

Font tables for lettering could be customized upon request.

Font size will be subjected to the available printing area.

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Piezoelectric Switches

Cross Reference for Existing Item Code to New Item Code

Existing Item Code	Short Name	New Item Code
REL-PX13B0+011	PIEZO SWITCH THREAD BLACK	REL-PX133B011000+011
REL-PX13G0+011	PIEZO SWITCH THREAD GOLD	REL-PX133G011000+011
REL-PX13L0+011	PIEZO SWITCH THREAD BLUE	REL-PX133L011000+011
REL-PX13M0+011	PIEZO SWITCH THREAD GREEN	REL-PX133M011000+011
REL-PX13N0+011	PIEZO SWITCH THREAD NATURAL	REL-PX133N011000+011
REL-PX13R0+011	PIEZO SWITCH THREAD RED	REL-PX133R011000+011
REL-PX13W0+011	PIEZO SWITCH THREAD WHITE	REL-PX133W011000+011
REL-PX23B8+011	PIEZO SWITCH ONE LED BLK BODY	REL-PX233B811000+011
REL-PX23G8+011	PIEZO SWITCH ONE LED GOLD BODY	REL-PX233G811000+011
REL-PX23L8+011	PIEZO SWITCH ONE LED BLUE BODY	REL-PX233L811000+011
REL-PX23M8+011	PIEZO SWITCH ONE LED GRN BODY	REL-PX233M811000+011
REL-PX23N8+011	PIEZO SWITCH ONE LED NAT BODY	REL-PX233N811000+011
REL-PX23R8+011	PIEZO SWITCH ONE LED RED BODY	REL-PX233R811000+011
REL-PX23W8+011	PIEZO SWITCH ONE LED WHT BODY	REL-PX233W811000+011
REL-PX33B8+011	PIEZO SWITCH RING BLACK	REL-PX333B811000+011
REL-PX33G8+011	PIEZO SWITCH RING GOLD	REL-PX333G811000+011
REL-PX33L8+011	PIEZO SWITCH RING BLUE	REL-PX333L811000+011
REL-PX33M8+011	PIEZO SWITCH RING GREEN	REL-PX333M811000+011
REL-PX33N8+011	PIEZO SWITCH RING NATURAL	REL-PX333N811000+011
REL-PX33R8+011	PIEZO SWITCH RING RED	REL-PX333R811000+011
REL-PX33W8+011	PIEZO SWITCH RING WHITE	REL-PX333W811000+011

System Components

The PX Piezoelectric switches are compatible with Rosslare's controllers, security systems and many third party systems.

AC-225

AC-215

L-4K

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Piezoelectric Switches

The EX Piezoelectric REX Buttons

Rosslare's EX piezoelectric switches are designed for industrial, high-risk environment requirements and indoor applications.

EX04 series with plastic housing provides a competitive option for reliable and cost effective piezoelectric switches for indoor use.

EX06, EX16, EX07 & EX17 are designed for intrinsically safe indoor and outdoor applications (meeting the IP-65 standard) to control industrial equipment in various fields including: mining, oil and gas production, military installations and more.

Model	EX04	EX06	EX16	EX07	EX17
Appearance					
Material	**Plastic**	**Metallic**		**Metallic**	
Illumination LED	**Ring (Green/Red)**			**Square (Green/Red)**	
Power Supply	**8~18 VDC**	**12~24 VDC/VAC**			
Switching Capability	**1A @ 12VDC N.O**	**2A DPDT**		**2 X 2A Form-C, N.O and N.C**	
Environment	**Indoor**	**Indoor & Outdoor (IP-65)**			
Temperature	**-10°C ~ 63°C** **14°F~145°F**	**-40°C~63°C** **-40°F~145°F**			
Humidity	**10%~95%**	**0%~95% non-condensing**			
Size	**Standard Gang**	**Standard Gang**	**Mullion**	**Standard Gang**	**Mullion**
Built-in-sounder	**No**	**No**	**No**	**Yes**	**Yes**
Button Switch Life	**Over 1 Million Cycles**	**1 Billion Cycles**			
Relay Life Expectancy	**No Relay**	**100,000 @ 2A 30VDC** **500,000 @ 1A 30VDC**			
Output Time Control	**None**	**1~60 seconds (Jumpers settings)**			
Connector Type	**5-wire cable**	**Terminal block**		**10-wire cable**	

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Existing Items

EX04 Series	REL-EX0400+011
	REL-EX04E0+011 (PUSH TO EXIT)
EX06 & EX16 series	REL-EX0600+011
	REL-EX06E0+011 (PUSH TO EXIT)
	REL-EX1600+011
	REL-EX1600+012
	REL-EX16E0+011 (EXIT)
EX07 & EX17 Series	REL-EX0700+011
	REL-EX07E0+011 (PUSH TO EXIT)
	REL-EX1700+011
	REL-EX17E0+011 (EXIT)

System Components

The EX series are compatible with all switch operated electrical devices. The unit also works with all of Rosslare's Access control units as well as all standard access control systems.

AC-F44   AC-Q42HB   AC-225

Mounting Peripherals

MP-06

Metal Housing for REX button mounting compatible with EX-04/06/07

MP-16

Metal Housing for REX button mounting compatible with EX-16/17

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Piezoelectric Switches

Rosslare received the Red Dot Product Design

Winning Award 2010 for EX-17 and Biometric reader family

The red dot design award is the largest and most renowned design competition worldwide.
The prestige award for high design quality, expressing innovation in form and function in an exemplary manner, was given to EX-17 and the biometric reader family on July 5th 2010 at Essen, in a special gala ceremony.

Rosslare's award- winning products are displayed at the red dot design museum among other top-class designed products from companies such as Apple, Samsung, BMW, Bosch, Dell, HP, Siemens and many more.

EX-17 and Rosslare's new Swipe fingerprint reader family (AY-B1663, AY-B3663, and AY-B4663), were chosen from among a total of 4,252 products representing designers and companies from 57 nations and have both won an award in the red dot design award competition for their outstanding and innovative design.

The EX-17 is a heavy-duty, time-controlled digital switch with non-sparking and non-magnetic qualities. Its elegantly designed, attractive case is made with architects and designers in mind. Being corrosion resistant, illuminated, and vandal-safe, the switch is suitable for both indoor and outdoor use. Following an innovative concept, it features solid-state piezoelectric switch technology that generates a dry-contact N.O. and N.C. relay pulse. This is achieved by the simple touch of a finger without any physical movement or moving parts. Among its well thought-out features are also a jumper selectable illumination status with light-dimming option as well as timed-operation and relay-toggle options. The EX-17 mounts directly to a standard US-size switchbox and is crafted to high manufacturing standards out of the finest materials under Rosslare's ISO 9000:2000 Certified Quality Standards.

www.red-dot.de/press

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