

Energy Harvester

ALPS ELECTRIC CO., LTD

Sep.2018

C2 Engineering Dept.

Perfecting the Art of Electronics
ALPS®

1

Comfortable function feeling

- low noise

2

Long life

- more than 1,000,000 operations

3

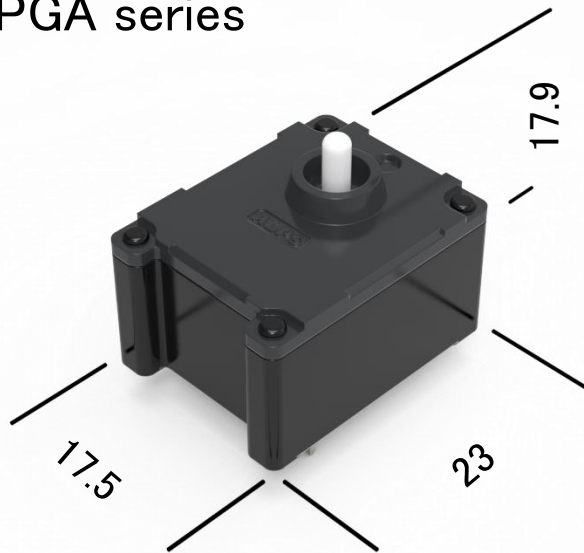
Generate enough power generation

- Generate more than $170 \mu\text{J}$ w/ each action (press or return)

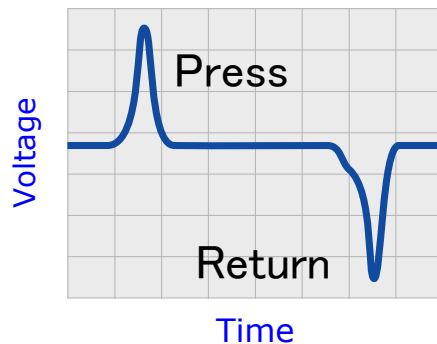
Energy Harvester

You can generate electricity anywhere, anytime you want without batteries.

SPGA series



Output sample
(electromotive force)



Features

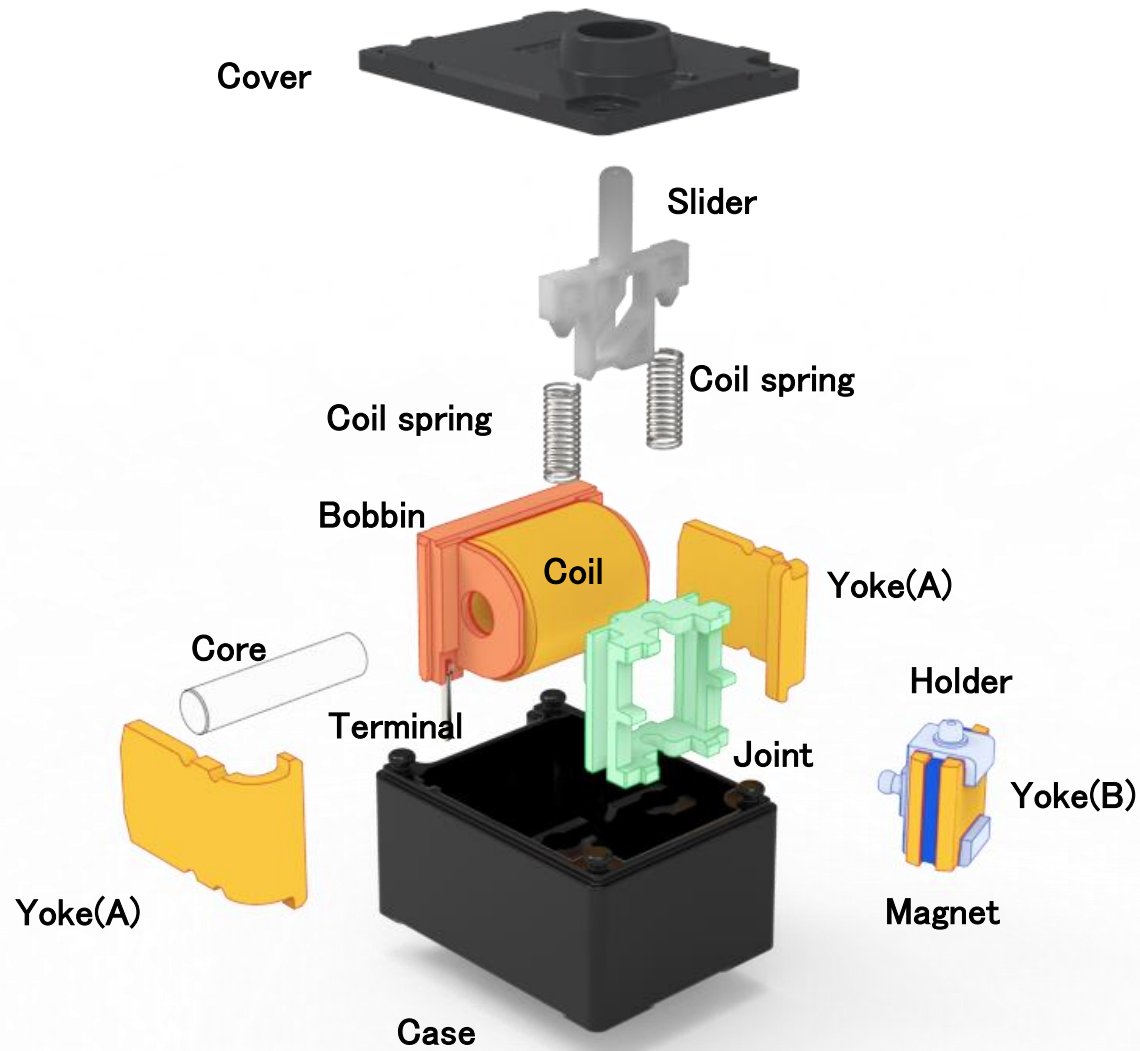
- Soft, comfortable function feeling
- Low noise
- Long life
- Different polar output during pressing and returning
- Compact size (17.5 × 23 × 17.9 mm)

Specs

Power generation amount	: >170 μ J (every action)
Stroke	: 3.3 mm
Operation force	: 7.5N max.
Operating life	: >1,000,000 operations

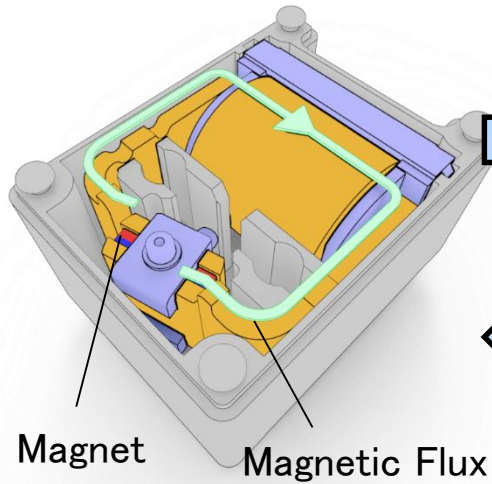
Applications

- Remote-control for Ceiling light, Outdoor light, Gate open/close etc.
- Open/close operation detection of Door/Locker
- Report support such as Emergency call button

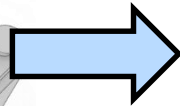


Power generation principle

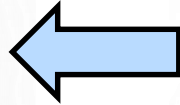
Free position



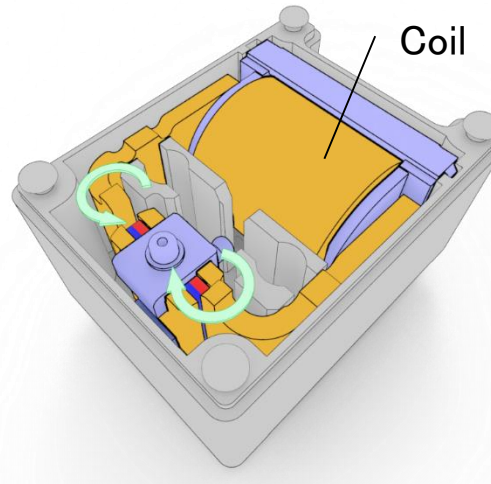
Press



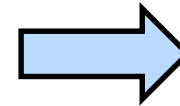
Return



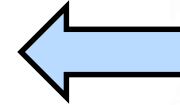
Inversion start position



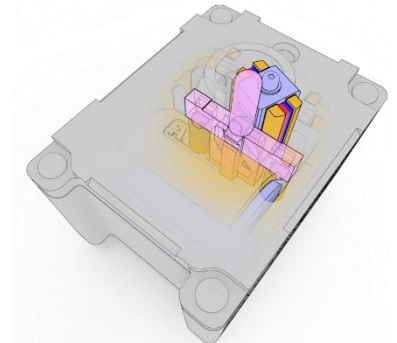
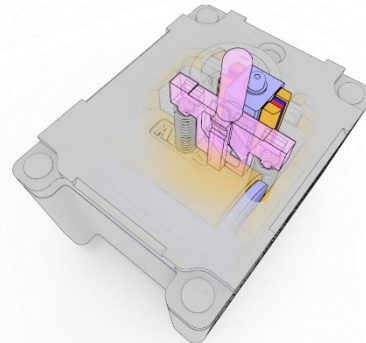
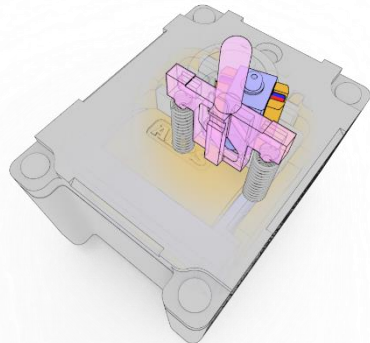
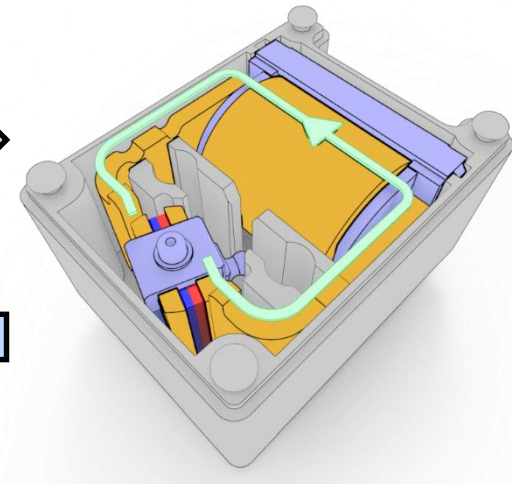
Press



Return



Total Travel position



Faraday's law of induction

$$V = -N \frac{\Delta \phi}{\Delta t}$$

V : Induced Electromotive force

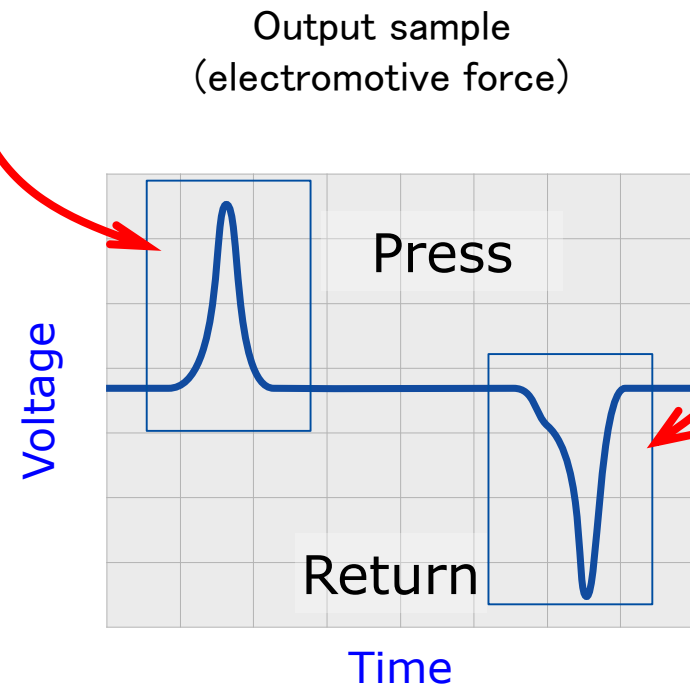
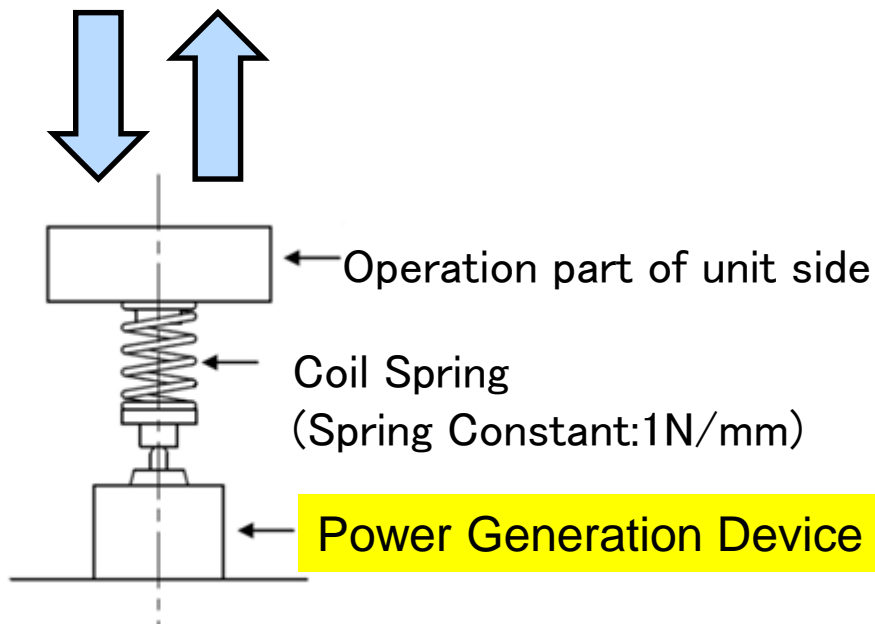
N : Coil turns

$\frac{\Delta \phi}{\Delta t}$: Change of magnetic flux
per unit of time

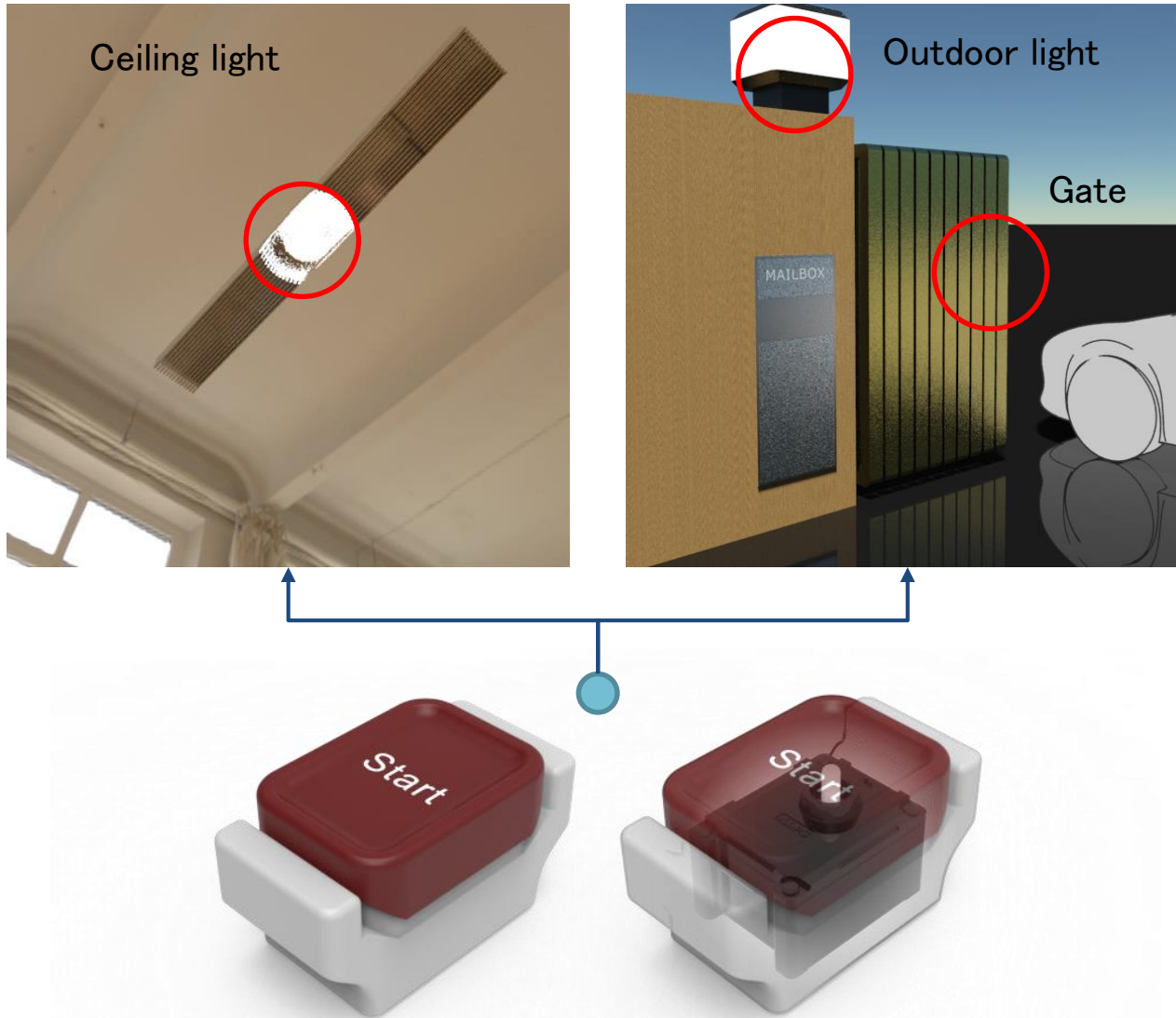
Recommended operating conditions

Each amount of electricity generated
:170 μJ min.

During pressing and returning
(Operation velocity:20mm/s. min.)



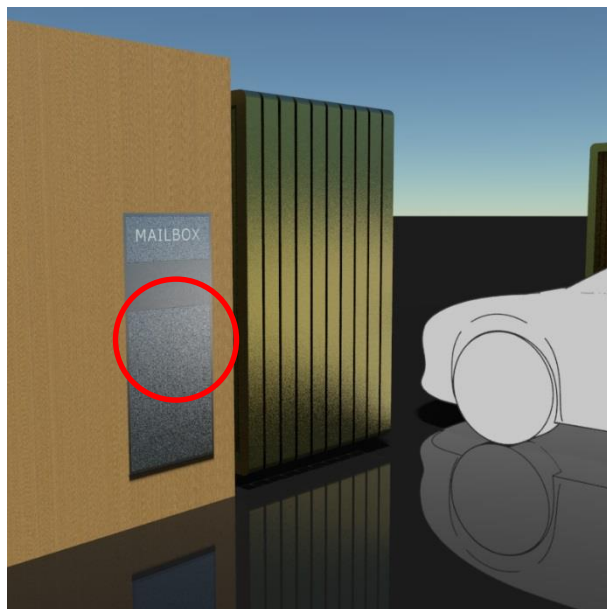
One-key remote controller



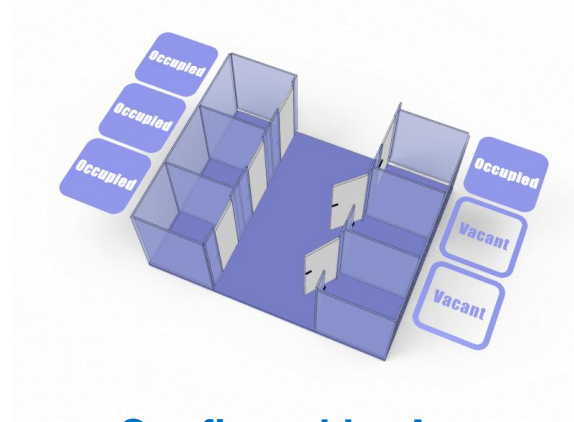
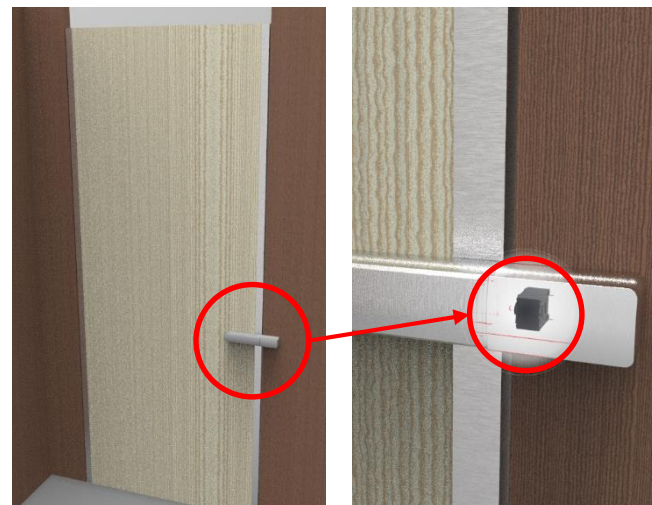
Application example: Wireless, unpowered

Open/close detection

Mailbox/Delivery locker



Toilet using state notice



Confirmed by App

Application example : Wireless, unpowered

Report support such as Emergency call button



Emergency call button

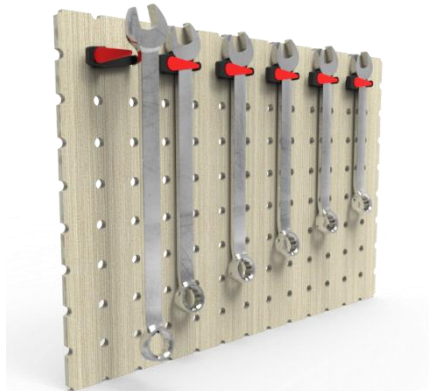


Fire extinguisher chest



Notice of fire extinguisher use

Automatic transmission of operation history



Wall-hanging tool shelf



Torque wrench