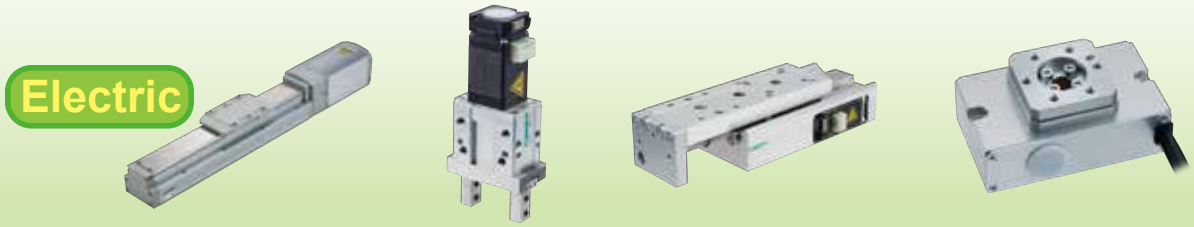
CKD

Which is better,

Air or Electric?

At CKD, we aim to become a global total FA supplier and promise to provide the best options!



CKD Corporation

CC-1446A

Go for it! Road to becoming

Hmm...

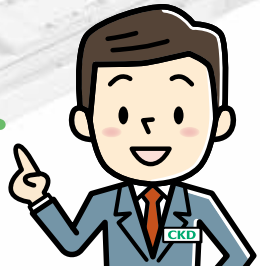
New employee at CKD

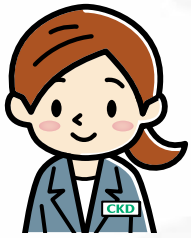
What's wrong?
Is something troubling you?

Employee of 10 years at CKD
FA total sales

A customer asked me to help them select an actuator, but I don't know whether to choose Air or Electric...

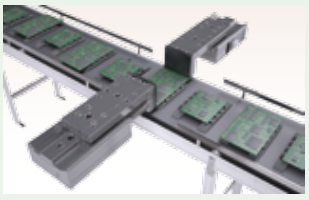
I see... It's important to select the ideal actuator according to the customer's needs



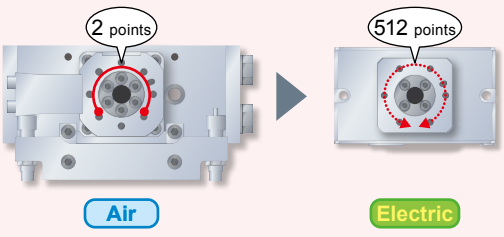


For instance, when should I recommend Electric?

Electric is better when there are several stopping points due to the size of the products in **multi-product production lines** or when you want to adjust the position.



I see!
Air basically travels between two points, whereas Electric can stop at many points!

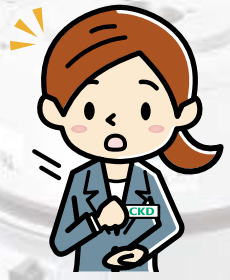


That's right. Electric also enables **easy IoT**.

a total FA consultant

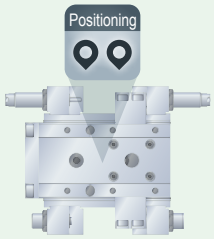
Does it mean it can output various information?

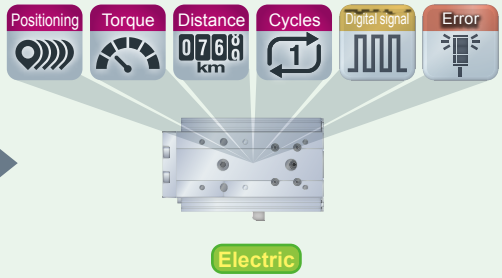
That's right. Using an industrial network, you can not only see the current position and speed, but also change the operating conditions, enabling **flexible production lines**

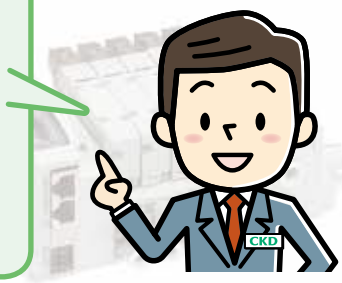


Oh! I remember the customer saying that **preventive maintenance is prioritized**.

I see. **Electric** facilitates preventive maintenance because it can calculate the distance traveled and number of cycles, and output the current value (force).





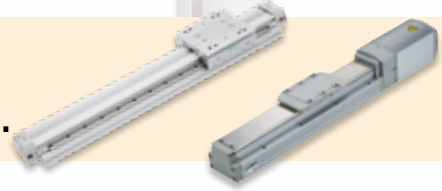


Sounds like **Electric** is **"better"**!

You may think so, but that's not necessarily true. There are many cases where **Air** is recommended over Electric.

Really?!
When is **Air** recommended then?

Is Electric better after all?
Will Air show its power? To the next page...



Air is recommended when it's important to **save space**

Air is small and powerful!

Another benefit of Air is... It's affordable!

That's true...
Air is great when you want to reduce the **initial cost**.
But Electric might be a better choice considering the **operation costs**.

Is that so?
Which is better in terms of the total cost?

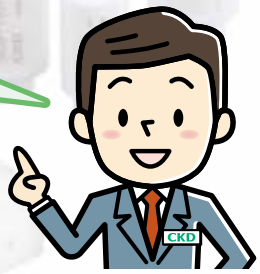
That's a good question. The total cost varies depending on usage conditions and processes, so there is no correct answer.

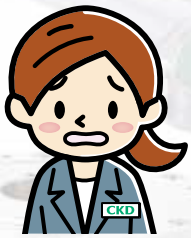
Sounds complicated...

If you're not sure, ask me anytime.

I will!
Which is better in terms of environmental conditions?

Air has more variations for environmental conditions such as **cutting oil, dust and outdoor use**. But there are cases where it is better to use Electric, like where **noise and drainage** must be avoided.





Costs and environment conditions are both difficult to compare...

CKD is a total FA supplier and the only one that can recommend either Air and Electric according to the customer's needs.

I will do my best to become a total FA supplier!

Summary

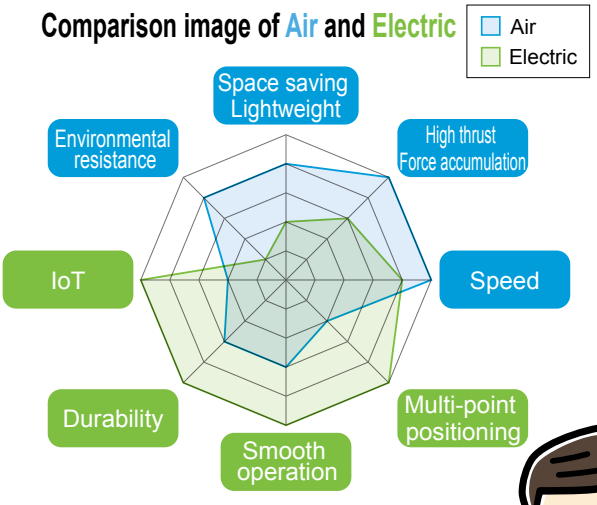
Benefits of Air

- Space saving and lightweight
- Travels between two points
- High thrust and force accumulation

Benefits of Electric

- Multi-point positioning
- Smooth operation
- IoT

Comparison image of Air and Electric



See the next page for specific examples of total cost comparison →

Case 1

Compare the total costs! Air ? Electric ?

Handling process

Air
LSH Series

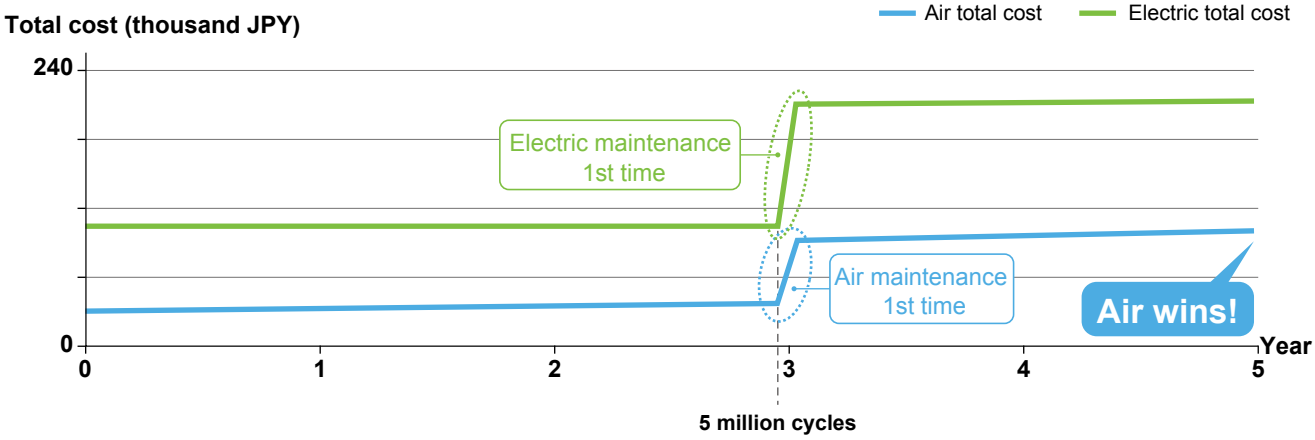
or

Electric
FLSH Series

■ **Actuator conditions**

Stroke length: 10 mm
Gripping power: 42 N

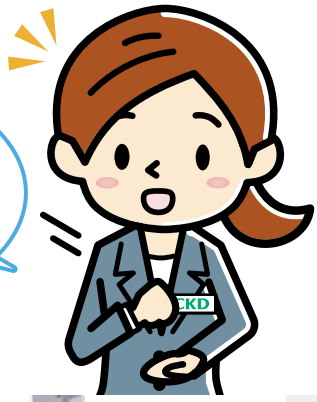
Comparison of Air and Electric by total costs over 5 years!



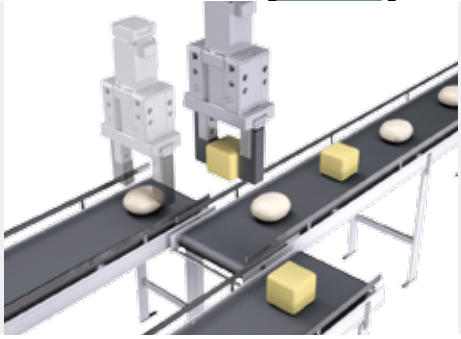
Device operating conditions

■ **Cycle time: 5 seconds**
(Stop: 1 second → Grip: 2 seconds → Travel: 1 second → Stop: 1 second)

■ **Estimated replacement time:**
[5 million cycles for Air and 5 million cycles for Electric]
Maintenance time/cycle: 4 hours (charge amount: 10,000 JPY/hour)
Energy efficiency: Air 20% (pressure: 0.5 MPa), Electric 75%
Cost: 2.5 JPY per 1 m^3 for Air, 24 JPY per 1 kWh for Electric



Recommended in the following cases!

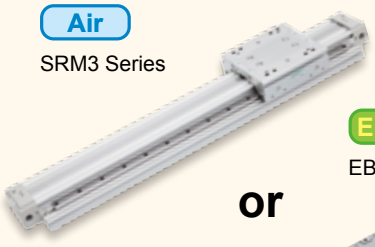


Case 2

Compare the total costs! Air ? Electric ?

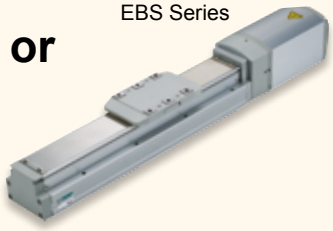
Transport process

Air
SRM3 Series



Electric
EBS Series

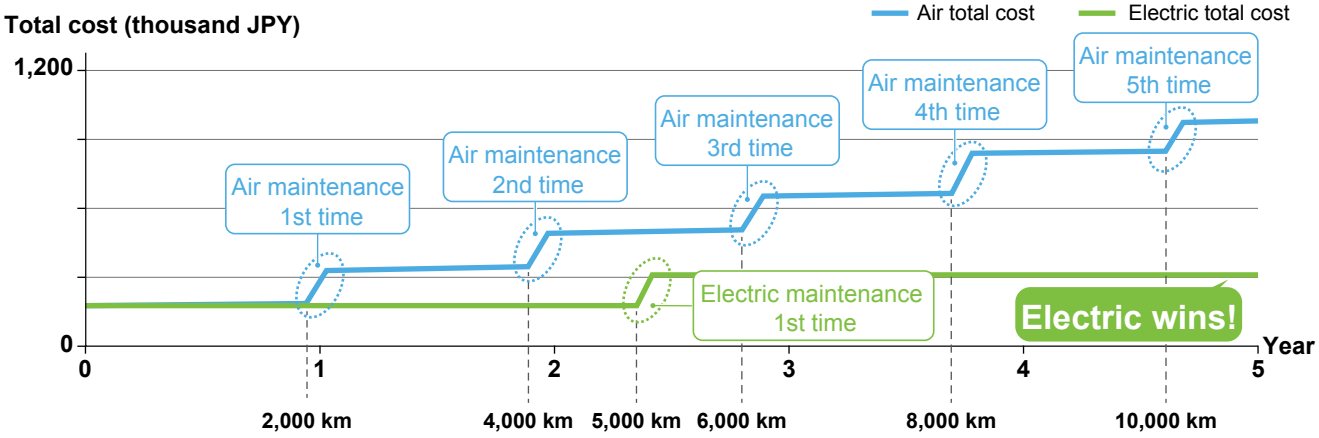
or



■ **Actuator conditions**

Stroke length: 500 mm
Load capacity: 6 kg

Comparison of Air and Electric by total costs over 5 years!



Device operating conditions

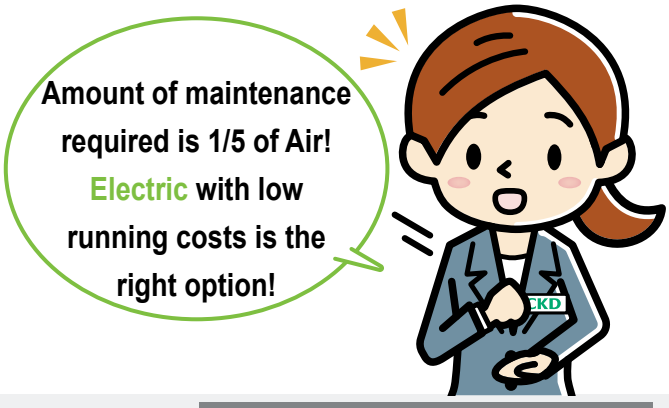
■ **Cycle time: 4 seconds**

(Stop: 1 second → Travel: 1 seconds → Stop: 1 second → Travel: 1 second)

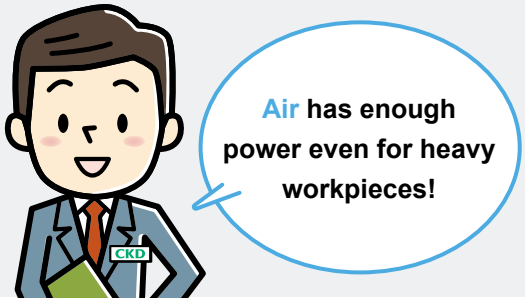
■ **Maintenance time guideline:**

[Every 2,000 km for Air and every 5,000 km for Electric]

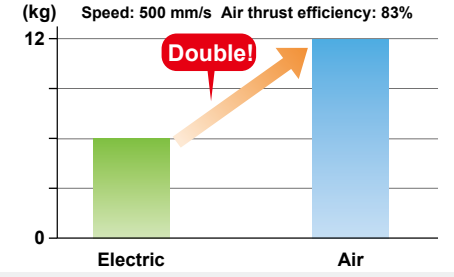
Maintenance time/cycle: 4 hours (charge amount: 10,000 JPY/hour)
Energy efficiency: Air 20% (pressure: 0.5 MPa), Electric 75%
Cost: 2.5 JPY per 1 m^3 for Air, 24 JPY per 1 kWh for Electric



Recommended in the following cases!



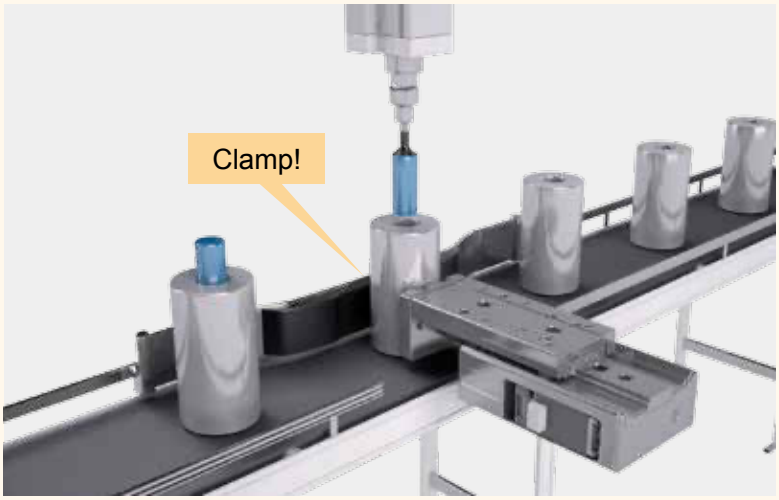
Load capacity comparison



Case 3

Compare the total costs! Air ? Electric ?

Clamping process



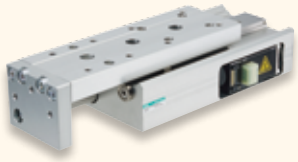
Air

LCR Series

or

Electric

FLCR Series

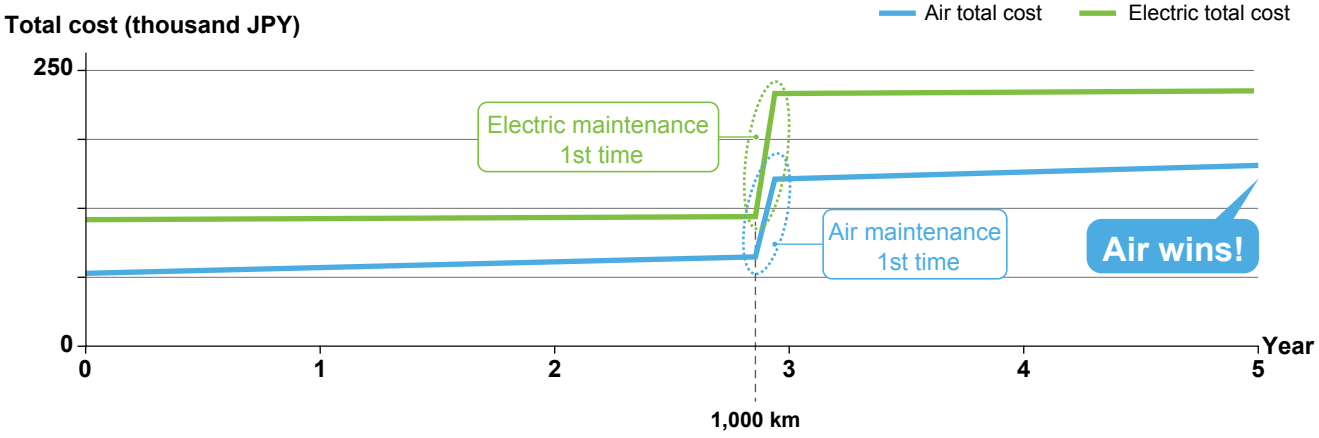


■ **Actuator conditions**

Stroke length: 100 mm

Clamping force: 150 N

Comparison of Air and Electric by total costs over 5 years!



Device operating conditions

■ **Cycle time: 5 seconds**

(Travel: 1 second → Clamp: 2 seconds → Travel: 1 second → Stop: 1 second)

■ **Estimated replacement time:**

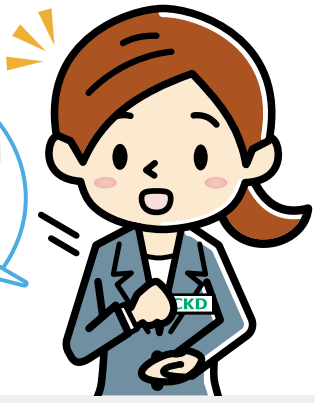
[1,000 km for Air and 1,000 km for Electric]

Maintenance time/cycle: 4 hours (charge amount: 10,000 JPY/hour)

Energy efficiency: Air 20% (pressure: 0.5 MPa), Electric 75%

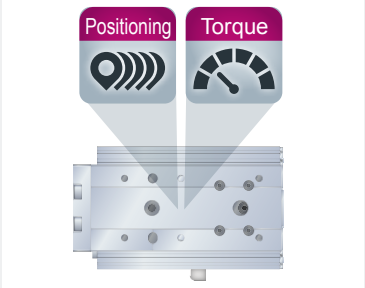
Cost: 2.5 JPY per 1 m^3 for Air, 24 JPY per 1 kWh for Electric

Air is ideal considering the total cost of clamping operations!



Recommended in the following cases!

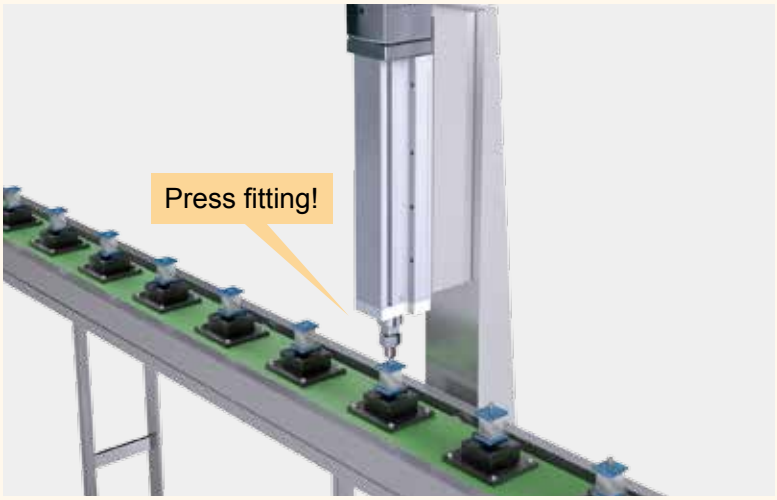
Electric is ideal because changing the settings is all it takes in multi-product production!



Case 4

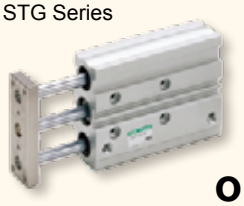
Compare the total costs! Air ? Electric ?

Press fitting process



Air

STG Series



or

Electric

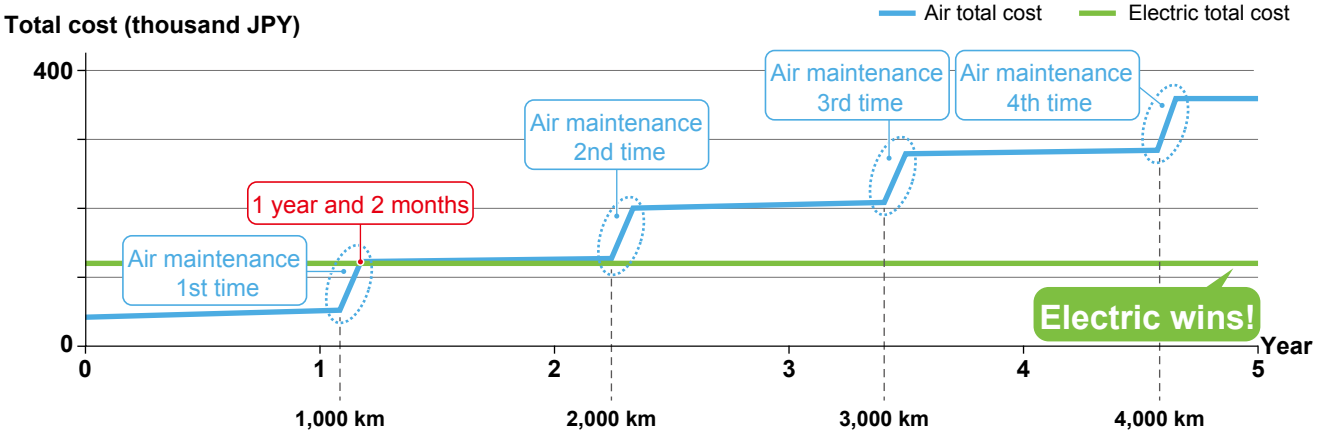
EBR Series

■ Actuator conditions

Stroke length: 200 mm

Clamping force: 130 N

Comparison of Air and Electric by total costs over 5 years!



Device operating conditions

■ Cycle time: 4 seconds

(Stop: 1 second → Travel: 1 seconds → Press fitting: 1 second → Travel: 1 second)

■ Estimated replacement time:

[Every 1,000 km for Air and every 5,000 km for Electric]

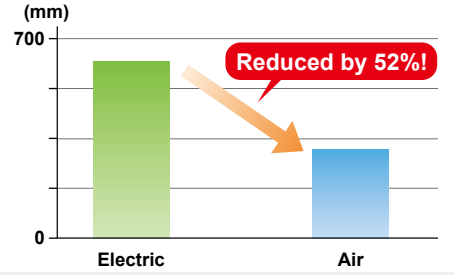
Maintenance time/cycle: 4 hours (charge amount: 10,000 JPY/hour)

Energy efficiency: Air 20% (pressure: 0.5 MPa), Electric 75%

Cost: 2.5 JPY per 1 m^3 for Air, 24 JPY per 1 kWh for Electric

Recommended in the following cases!

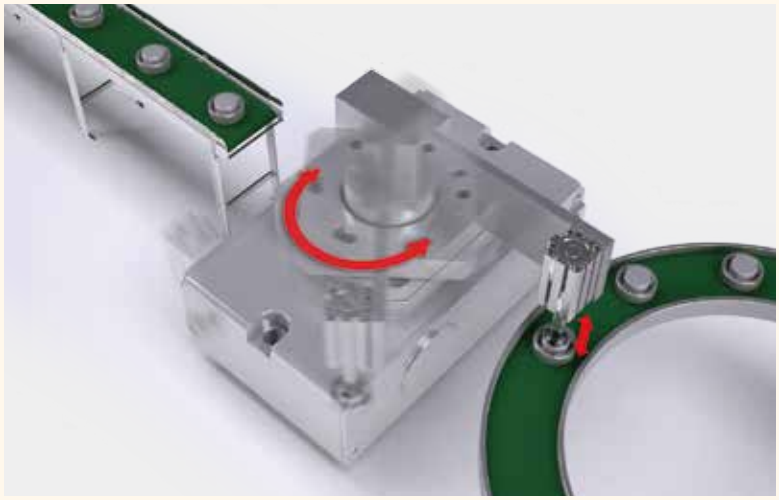
Total length comparison



Case 5

Compare the total costs! Air ? Electric ?

Transport process by oscillation



Air GRC Series

or

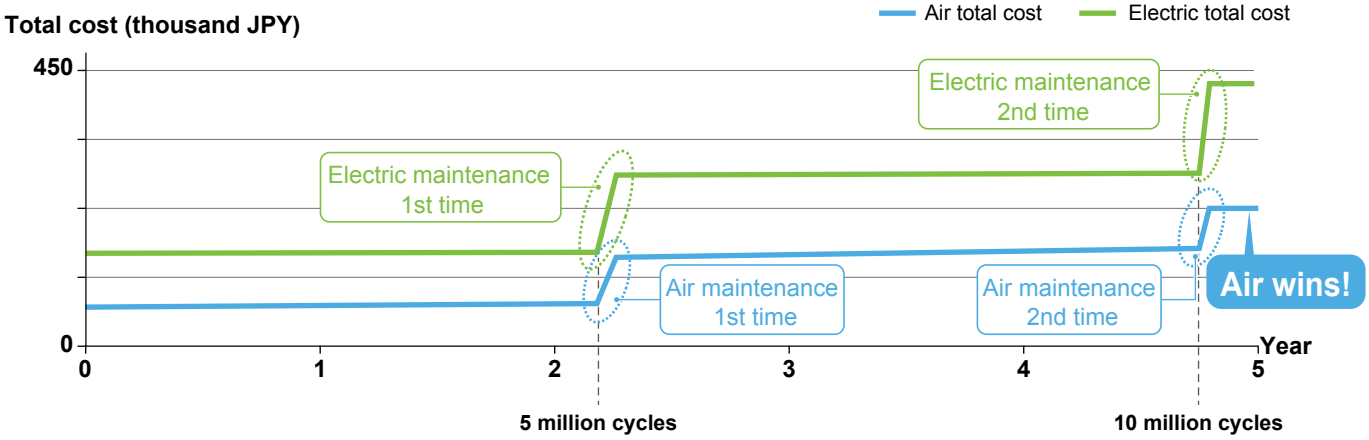
Electric FGRC Series

■ **Actuator conditions**

Movement angle: 180°

Torque: 3 N·m

Comparison of Air and Electric by total costs over 5 years!



Device operating conditions

■ **Cycle time: 4 seconds**

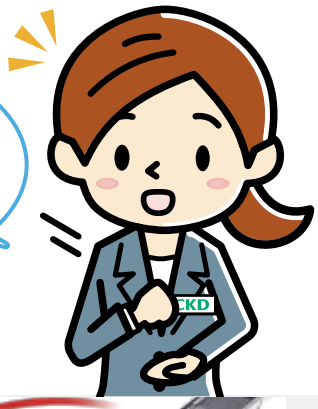
(Stop: 1 second → Travel: 1 seconds → Stop: 1 second → Travel: 1 second)

■ **Estimated replacement time:**
[5 million cycles for Air and 5 million cycles for Electric]

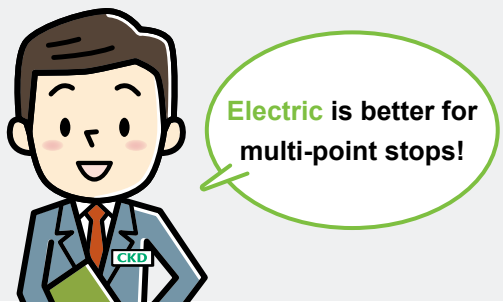
Maintenance time/cycle: 4 hours (charge amount: 10,000 JPY/hour)

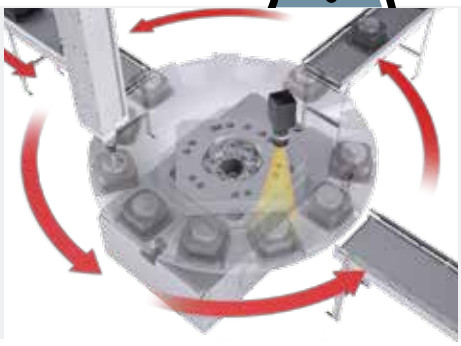
Energy efficiency: Air 20% (pressure: 0.5 MPa), Electric 75%

Cost: 2.5 JPY per 1 m^3 for Air, 24 JPY per 1 kWh for Electric



Recommended in the following cases!





Related products

Pneumatic components

Cylinders I

Cylinders II

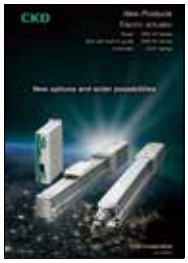
Valve

Auxiliary components

Vacuum system components

Electric actuator

EBS/EBR



FLSH/FLCR/FGRC

KBX

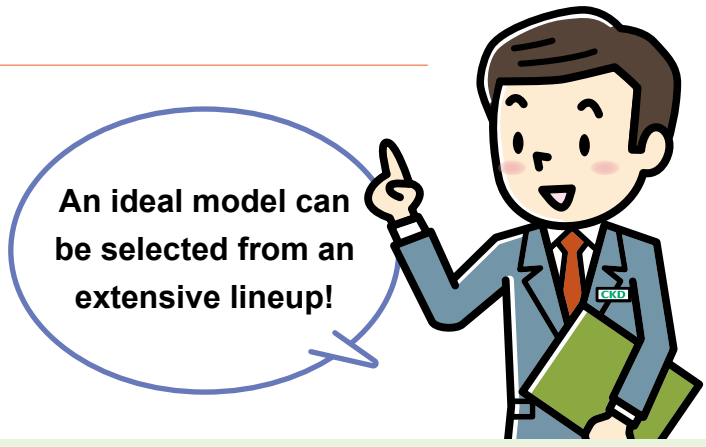
Motorless general

Direct drive motor, cam index

ABSODEX

τ DISC NIKKI DENSO

Index units (Index Drive)

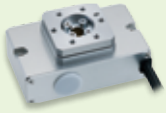


For rotation, leave it to CKD!

GRC Series

Index units (Index Drive)

FGRC Series

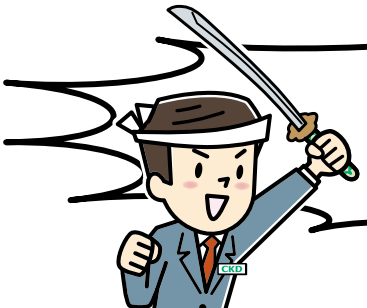


ABSODEX

τ DISC NIKKI DENSO

Comparison by product

		Size variation	Positioning accuracy	Smooth operation	High rigidity	Locking mechanism	Shockless	High durability	Ease	Low cost
Pneumatic rotary (GRC Series)		△	○	△	△	○	△	△	◎	◎
Cam index (Index Drive)		◎	◎	◎	◎	◎	◎	◎	△	△
Electric rotary (FGRC Series)		△	△	○	△	◎	◎	○	○	○
Direct drive motor	ABSODEX	◎	◎	◎	◎	○	◎	◎	△	△
	τ DISC	◎	◎	◎	○	△	◎	◎	△	△



Resolves all your problems!

Leave it all to Air and Electric C K D experts!