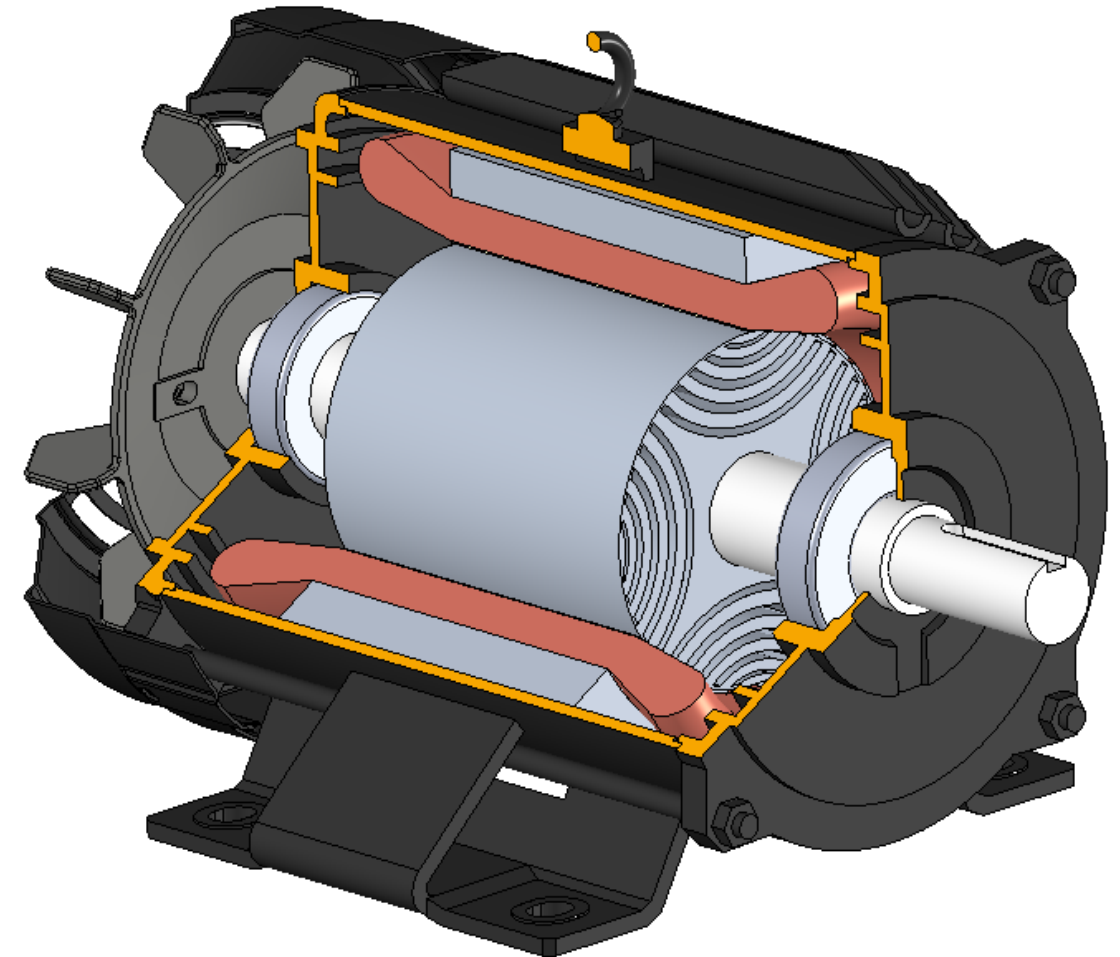


## Features

- High efficiency model achieving the IE5 efficiency class for variable-speed AC motors.
- Magnet-less design improves centrifugal force resistance and enables high-speed operation up to 5,400 min<sup>-1</sup>.
- Smaller size and weight for space savings
- No permanent magnets means no need to worry about bearing replacement or demagnetization.  
Bearings and other maintenance parts can be easily replaced.

## Schematic drawing



# Ultra-premium efficiency IE5 is achieved

MELSUSMO Sustainable Motor

## Product Features

Synchronous reluctance motor with ultra-premium efficiency (IE5), contributing to energy savings

Commercial power supply operation

Variable speed operation

**IE5** Ultra-premium efficiency

**IE4** Super premium efficiency

**IE3** Premium efficiency

**IE2** High efficiency

**IE1** Standard efficiency

(Substandard)

Superline premium series **SF-PR**

Superline eco series **SF-HR**

Superline series **SF-JR**

Sustainable motor **RF-SR**

Premium high-efficiency IPM motor **MM-EFS**

**NEW**

Efficiency class based on the following standards.

Commercial power supply operation: IEC 60034-30-1

Variable speed operation: IEC TS 60034-30-2:2016

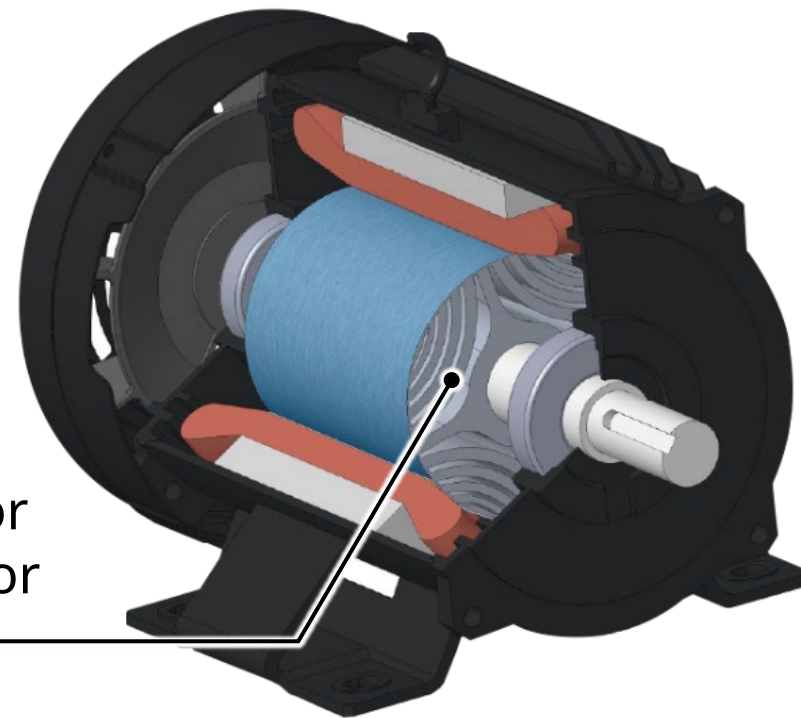
## Product Features

Energy saving / CO<sub>2</sub> emission reduction

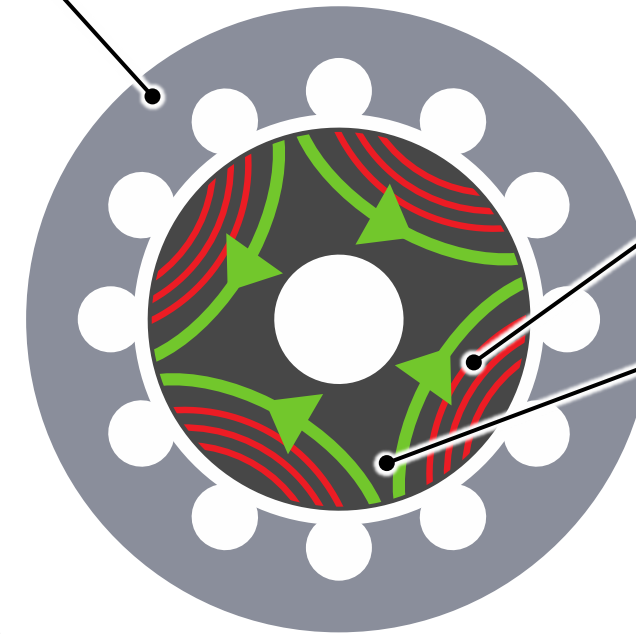
### ➤ High-efficiency technologies

- With our proprietary optimization technology, this model features a structure that achieves both high efficiency and rotor strength, which are mutually competing attributes.

No use of magnets or aluminum in the rotor



Magnetic flux



- Rotor core
- Space layer (magnetic resistance: **high**)
- Core (magnetic resistance: **low**)



**Achieve the optimized structure**

## Product Features

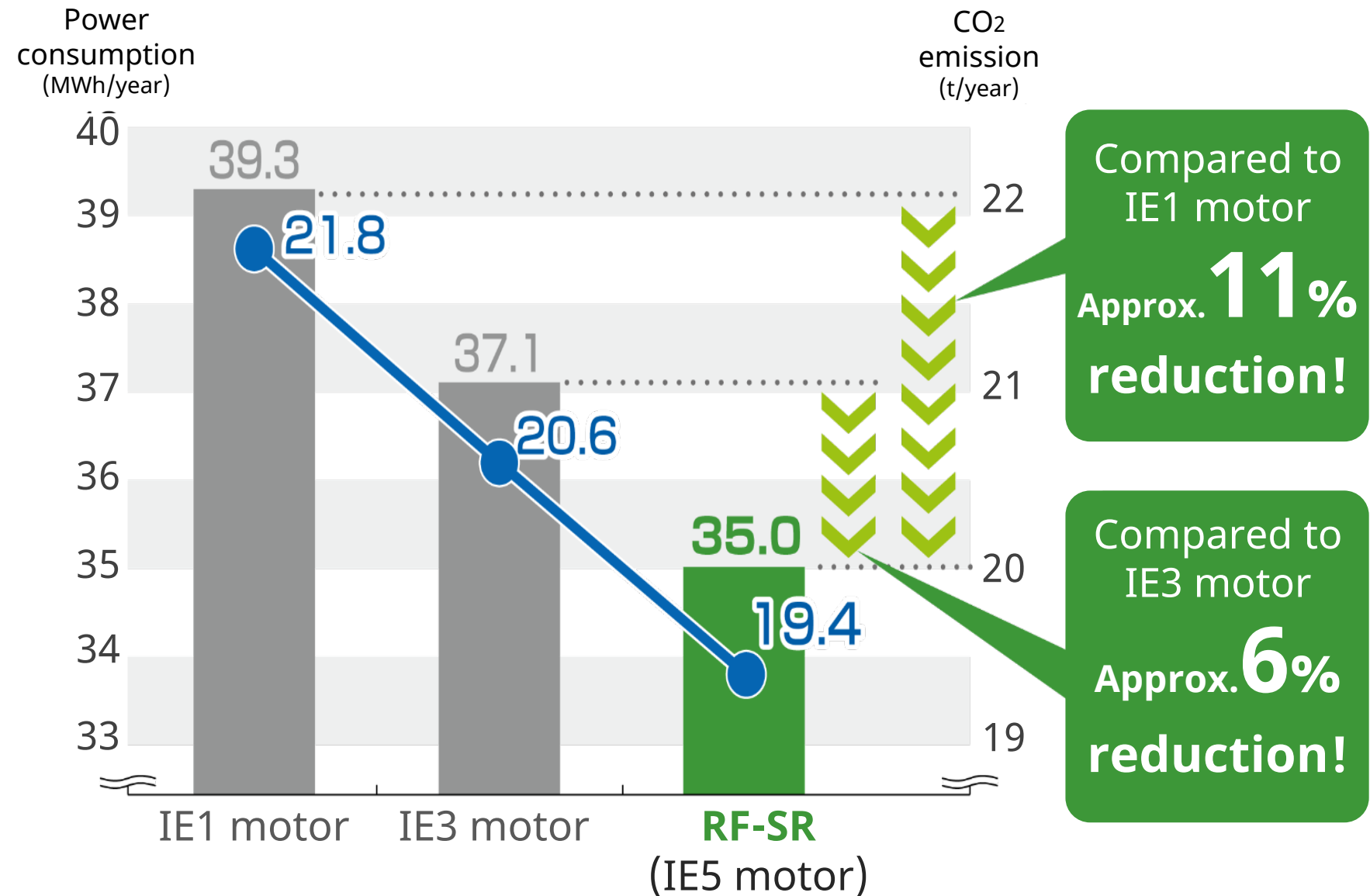
### Energy saving / CO<sub>2</sub> emission reduction

#### ➤ Reduced power consumption and CO<sub>2</sub> emissions

- Achieving the IE5 efficiency class has resulted in reduced power consumption and CO<sub>2</sub> emissions in comparison with conventional motors.

#### Calculation condition

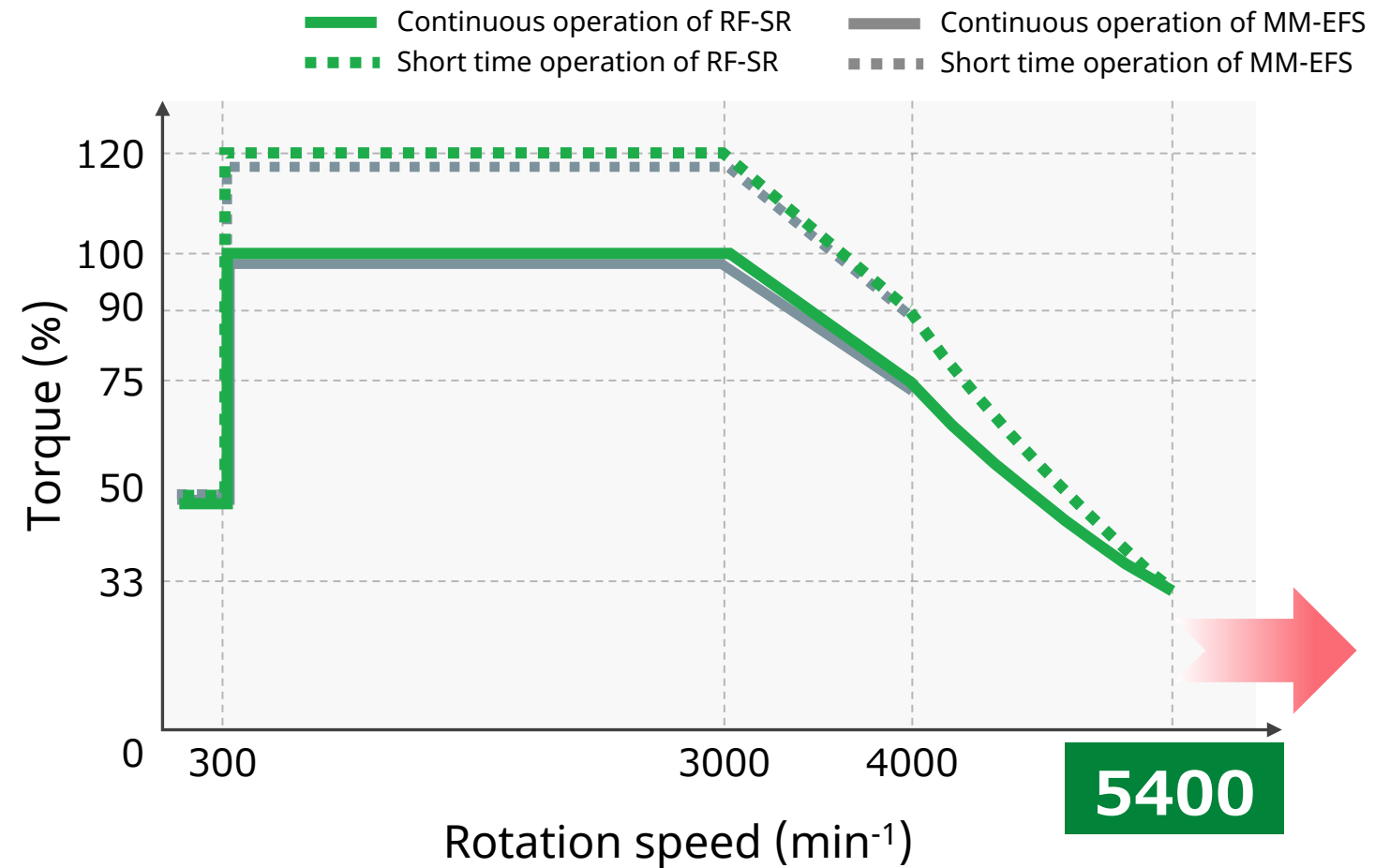
- Load conditions | 5.5 kW 3,600 min<sup>-1</sup>
- Operation time | 17h/day, 335 days
- Inverter efficiency | 96.2%
- CO<sub>2</sub> emission factor | 0.555 kg/kWh



Graph: Comparison of power consumption (MWh/year) and CO<sub>2</sub> emission (t/year)

## Product Features

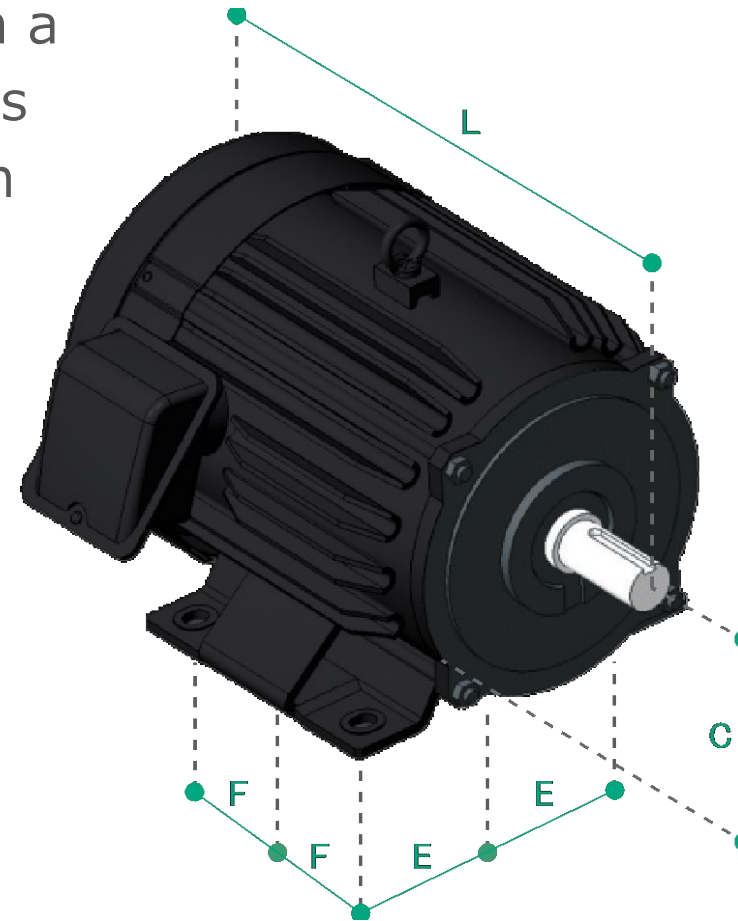
Magnet-less design enables high-speed operation up to 5,400 min<sup>-1</sup>, an improvement over permanent magnet motors.



## Product Features

### Size/weight reduction

- Better control of rising temperatures through a reduction in losses has enabled a reduction in frame sizes over the SF-PR and MM-EFS motors to achieve size and weight reduction.



### ■ 7.5 kW and 3,000 min<sup>-1</sup>

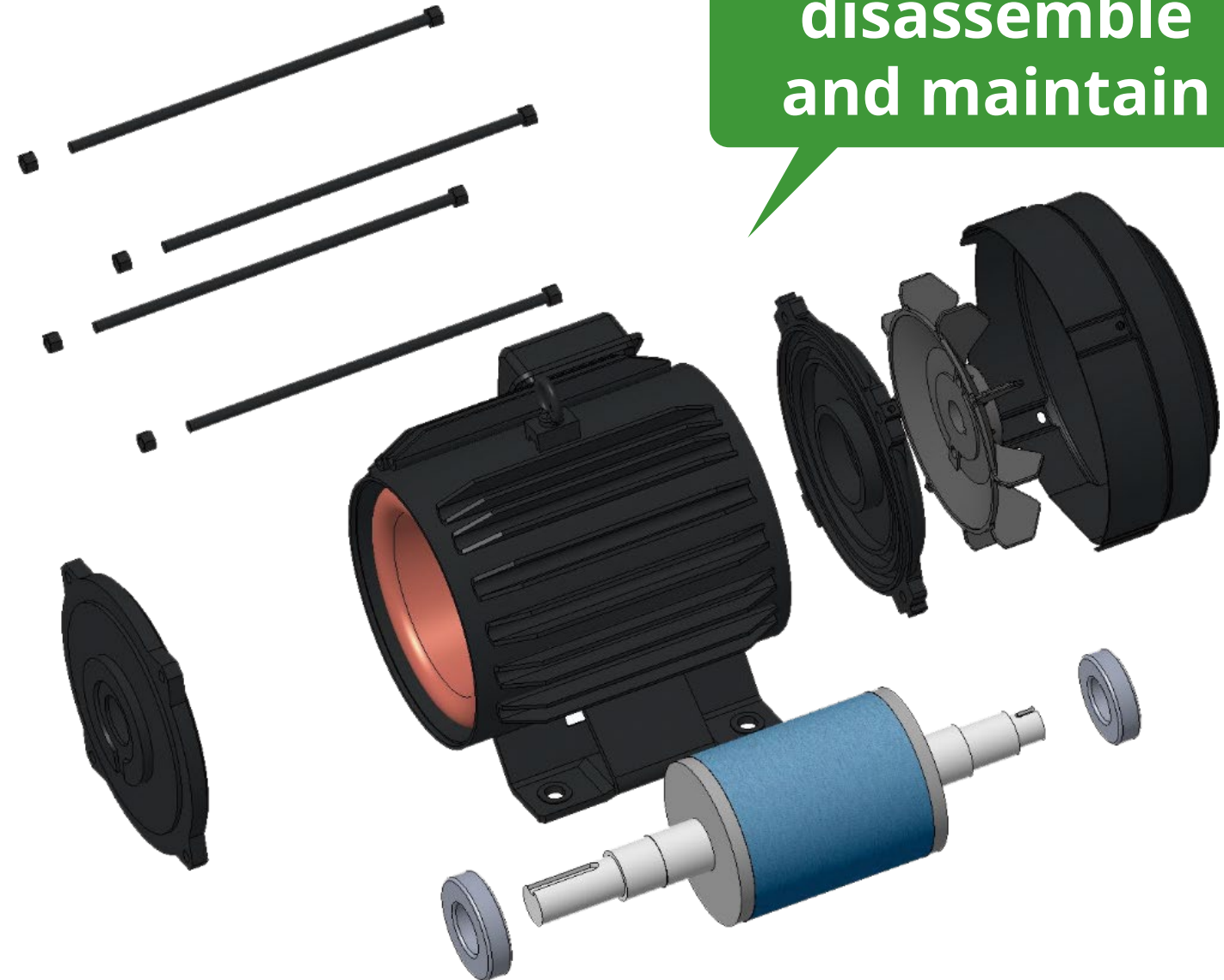
	Frame No.	Mass (kg)	Dimensions (mm)			
			C	E	F	L
MM-EFS	132S	41	132	108	70	451
SF-PR (2-pole)		56				
<b>RF-SR</b>	<b>112M</b>	<b>38</b>	<b>112</b>	<b>95</b>	<b>70</b>	<b>381</b>

Volume  
**35%**  
reduction!

## Product Features

### Easier maintenance

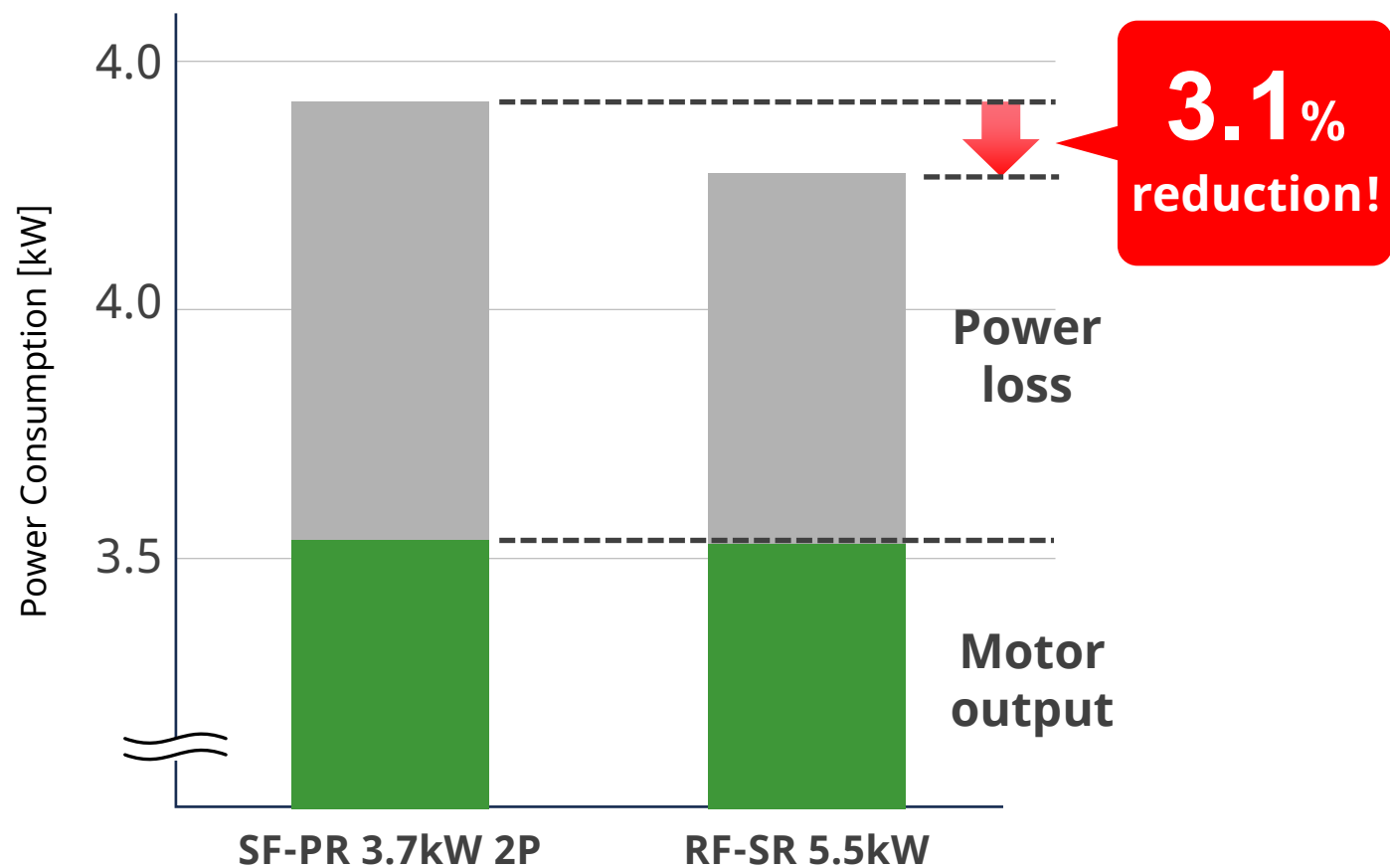
- No permanent magnets means ease of disassembly and maintenance.
- Like induction motors, bearings and other maintenance parts can be easily replaced on site.



## Field tests

**MELSUSMO RF-SR field tests underway** to compare power consumption with SF-PR

■ Usage status of electrodeposition painting line UF (paint recovery filter) with pressure pump



Electricity consumption reduced by approx.  
**7,000 [yen/year]**  
CO<sub>2</sub> emissions reduced by approx.  
**178 [kg/year]**

Calculation conditions			
Electricity unit price	Operation time		CO <sub>2</sub> emission factor
<b>22 [yen/kWh]</b>	<b>10 [h/day]</b>	<b>240 [days/year]</b>	<b>0.555 [kg/kWh]</b>

\*The comparison was made using the same size (frame number 112M) due to equipment availability. However, depending on the motor size to be replaced, further energy-saving effects may be expected.