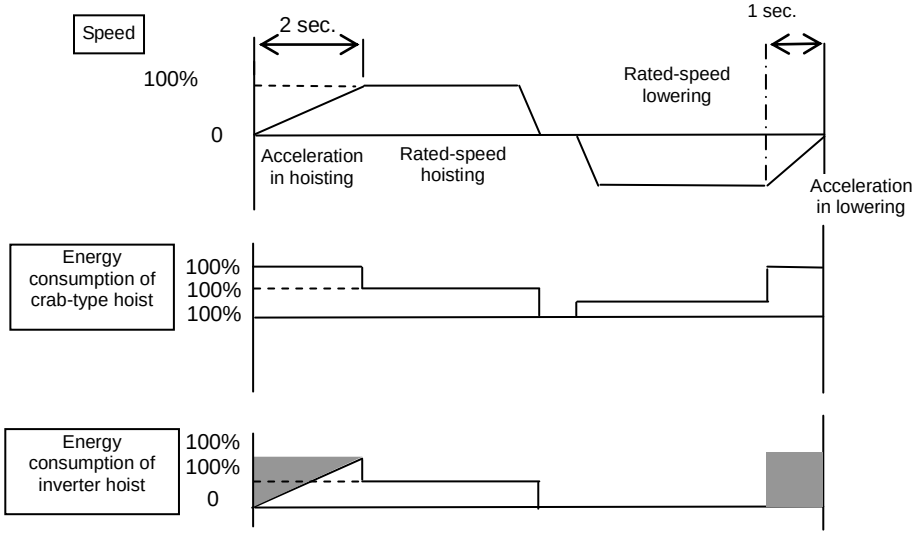
Tip	Example of energy savings by replacing a crab crane to U2 type

1. Energy savings

Since crab-type hoists have a wound-rotor induction motor controlled by secondary resistance, almost the same amount of energy is required when low-speed hoisting/lowering versus high-speed hoisting.
The crab-type hoists are always connected with secondary resistors, and lose energy as heat from the resistors.

2. Comparison with inverter operation

The chart below indicates energy consumption of crab-type hoists and inverter hoists when hoisting and lowering in the following pattern.



- Gray zones indicate energy saved by using the inverter.
- Although significant differences are found in energy consumption during acceleration and deceleration, there was hardly any difference during rated-speed operations.
- Therefore, frequent acceleration and deceleration with the rated torque load lead to greater energy savings.

3. Example of calculation of improvement in energy savings

When a 12 kW motor (U2-10A hoist) is operated at 250 s/Hr in the pattern of the above chart, the energy savings without taking into account motor loss would be:

<Crab-type>	<Inverter>
During acceleration: 1.5 × 12 kW × 2 sec. × (250/2) During acceleration: 1.5 × 12 kW × 1 sec. × (250/2)	During acceleration: 1.5 × 12 kW × 2 sec. × (1/2) × (250/2)
Total: 6,750 kW seconds = 1.875 kWh	Total: 2,250 kW seconds = 0.625 kWh

<Energy savings by replacing to inverter hoist>

- 1.875 kWh − 0.625 kWh = 1.25 kWh/ 1 hr, 8 hr/day, 300 days/year operation is:

  1.25 kWh × 8 × 300 = 3,000 kWh

- With an energy price per unit of 17 yen/kWh, the electricity cost per year is:

  3,000 kWh × 17 = 51,000 yen saved.