

Tip	Proposal for replacing old model hoists (HB-B and HY types) to S type
-----	---

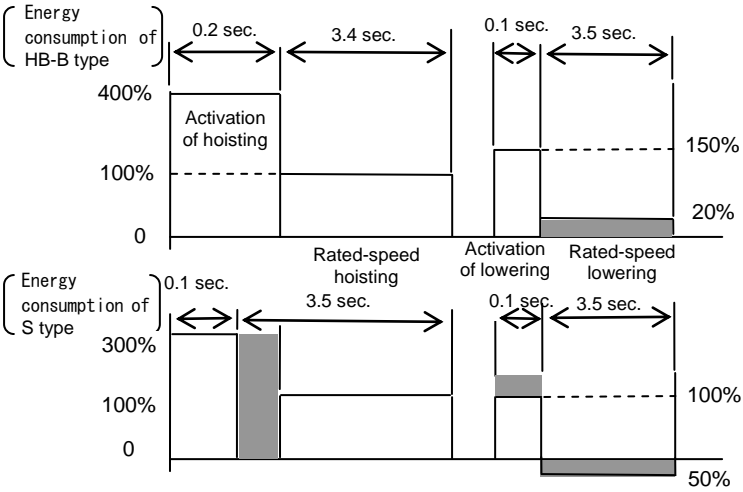
1. Reasons for proposing replacement

The production of old model hoists (HB-B and HY types) already ended decades ago. The reasons we propose upgrading to S type are:

- (1) Energy savings: S type is energy saving due to technological innovations and advanced materials.
- (2) Improvement in workability: The increase in hoist speed of the S type contributes to energy efficiency. The smaller shape and reduced weight make the hoists easy to use.
- (3) Effective use of space: S type's smaller head dimensions make effective use of space available.
- (4) Service parts: Some of the materials for service parts for maintenance and servicing of old-type products are limited availability, and it takes a long time for delivery.

2. Comparison between old and new types

(1) Example of calculation of improvement in energy savings — 5-ton hoists



- Gray zones indicate energy saved by using the S type.
- Since mechanical brakes of HB-B types work when lowering, energy is not regenerated.
- The motor of the HB-B type is large, and frequent activation leads to higher consumption of energy.
- Therefore, using S type lead to reduction in the running costs and greater energy savings.

When hoists are operated in the pattern of the above chart (40% ED, 400 s/Hr), the savings in energy per year are as below:

<Energy consumption of HB-B type>	
During acceleration in hoisting: $4 \times 7.5 \text{ kW} \times 0.2 \text{ sec.} \times (400/2)$	
During rated-speed hoisting: $7.5 \text{ kW} \times 3.4 \text{ sec.} \times (400/2)$	
During deceleration in lowering: $1.5 \times 7.5 \text{ kW} \times 0.1 \text{ sec.} \times (400/2)$	
During rated-speed lowering: $0.2 \times 7.5 \text{ kW} \times 3.4 \text{ sec.} \times (400/2)$	
Total: 7,575 kW seconds $\doteq$ 2.1 kWh	



<Energy consumption of S type>	
During acceleration in hoisting: $3 \times 7.5 \text{ kW} \times 0.1 \text{ sec.} \times (400/2)$	
During rated-speed hoisting: $7.5 \text{ kW} \times 3.5 \text{ sec.} \times (400/2)$	
During deceleration in lowering: $7.5 \text{ kW} \times 0.1 \text{ sec.} \times (400/2)$	
During rated-speed lowering: $(-) 0.5 \times 7.5 \text{ kW} \times 3.5 \text{ sec.} \times (400/2)$	
Total: 3,225 kW seconds $\doteq$ 0.9 kWh	

<Energy savings by replacement to S type hoist>

- Difference in energy consumption:  
 $2.1 \text{ kWh} - 0.9 \text{ kWh} = 1.2 \text{ kWh} / 1 \text{ hr}, 8 \text{ hr} / \text{day}, 300 \text{ days} / \text{year} \text{ operation}$   
the energy consumption per year is:  $1.2 \text{ kWh} \times 8 \times 300 \text{ kWh} = 2880 \text{ kWh}$
- With an energy price per unit of 17 yen/kWh, the electricity cost per year is:  
 $1.2 \text{ kWh} \times 8 \times 300 \times 17 = 48,960 \text{ yen saved.}$

(2) Comparison of speed, weight and head dimension between the old and new models

Hoist speed	1.08 to 1.67 times faster	Total weight	0.48 to 0.86 times lighter
Head dimension	0.8 to 0.93 times smaller	Weight of hook block	0.68 to 0.89 times lighter