Functions and options of the H.Solution

△ Limited functions ○ Available ◎ Excellent ※ Provided at cost

Item	Details	HRGC-100 (general type)	HRGC-1000 (standard type)	HRGC-3000 (premium type)	Option
Automatic operation	Automatic operation of one elevator by separating it from group control operation	○	○	○	
VIP operation	Exclusive operation by VIP call signal	○	○	○	
NEAR MISS restriction	When high speed elevator is operated in same direction within the same hoistway, occurrence of noise / vibration due to air current is suppressed.	○	○	○	
DOOR TIME auto adjustment	Automatically controls door opening / closing time depending on floor, call type, and traffic situation	○	○	○	
Function for changing departure base floor	Function that can change departure base floor	○	○	○	
Function for changing service floor	Changes service floor by controlling switch or using E/L monitoring panel	○	○	○	
System BACKUP function	Uses double-calculation micom configuration to operate group control as assistant group controller in case of failure of main group controller	○	○	○	※
Device to display platform information	Device for displaying E/L information, building information, and general information on the screen for passengers waiting for elevator	○	○	○	※
Device for displaying information in the elevator	Device for displaying elevator information such as floor and location and general information in text or video for the passengers in the elevator	○	○	○	※
Elevator monitoring system	System that monitors elevator operating status, changes operation item on group control, and controls monitoring function using personal computer	○	○	○	※
Remote monitoring control system	System that uses central computer and communications network installed in the maintenance center to inspect operating status of elevators on a 24-hour basis	○	○	○	※
Collective function for group control performance	Can display operating status of elevator group control into statistics so that collective function for group control operation can be achieved using computer	○	○	○	※(Add E/L monitoring panel)

※HRGC-1000 : Planned to be launched in March, 2018.

Items that are added and changed in system upgrade

Category	Parts	Independent ▶ Group control system		Group control system ▶ Destination Selecting System		Remarks
		HRGC-100	HRGC-1000 HRGC-3000	HRGC-100	HRGC-1000 HRGC-3000	
Components in machine	Main group controller	○		X (program upgrade is needed)		
	Auxiliary group controller	○ (applied when requested by customers)		○		Double-calculation back up system
	CAN module for destination selecting system	X		X	○	
	Group control communication board for each elevator	○		X		
	Power supply device for group control board	○	X	X		DC24V 1.5A
	Uninterruptible Power Supply (UPS)	X	○	○		Adapted when used on touch screen destination selecting system and building information
	For ten-key destination selecting system Power supply device	X		○		DC24V 13A
	Group control communication cable for each elevator	○		X		
Components within the elevator	Button removal swing panel within the elevator	X		○		
	LCD to display registered floors	X		○		Displays location and building information
Components on platform / hoistway	Destination selecting system	X		○		
	Destination selecting system communication cable	X		○		
	Elevator lantern	○ (applied when requested by customers)		○		
	Guide sign for elevator	X		○		Applied to every floor

※Available type STVF7, FIVF3, FIVF4, T&S, HSVF, WBVF, WBHS, SUVF

H.SOLUTION

Group control system · Destination selecting system

HYUNDAI ELEVATOR CO., LTD.

www.hyundaielevator.com

H.Solution Group control system·Destination Selecting System C-GCS-E0117 / 2017. 12 / 1st edition

Hyundai Elevator H.Solution Offers the fastest and most effective movement

H.Solution is an elevator operation system that offers the most effective elevator operation that is suitable for the purpose and characteristics of each building.

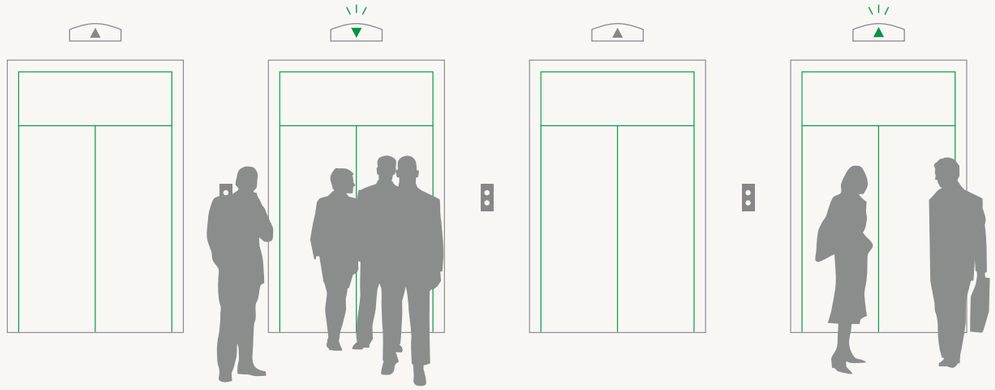
- Group control system
- Destination selecting system

Group Control System

It controls movement by integrally managing and controlling several elevators in a group.
This is a system that encourages passengers going in the same orientation to board the first arriving elevator.

Characteristics of group control system

Designates one elevator that arrives the earliest.
Use a conventional operating method.
Able to change destination floor after boarding the elevator.
Suitable for places where residents amount to 1,000 or less such as apartment complexes, small and medium-sized offices, and shopping malls.



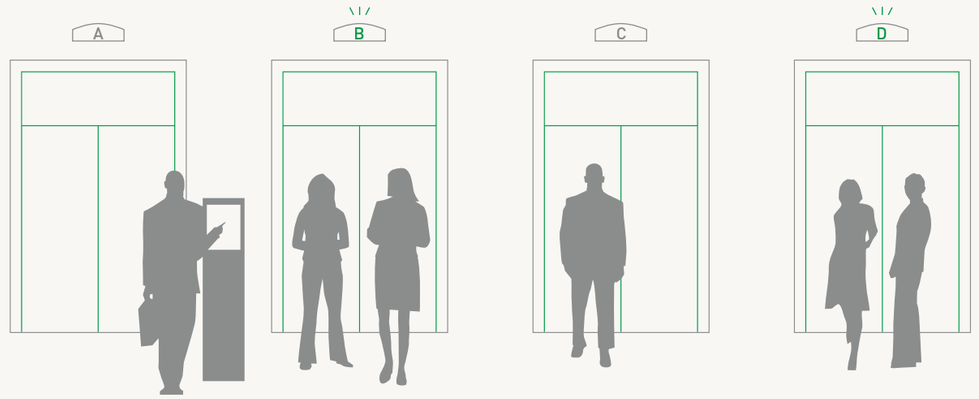
Boards the elevator that arrives the earliest at the platform and inputs destination in the elevator

Destination Selecting System

As an advanced group control system, it is a system that features improved operation efficiency of elevators by encouraging passengers going in the same orientation to board the first arriving elevator and reducing waiting time and boarding time.

Characteristics of destination selecting system

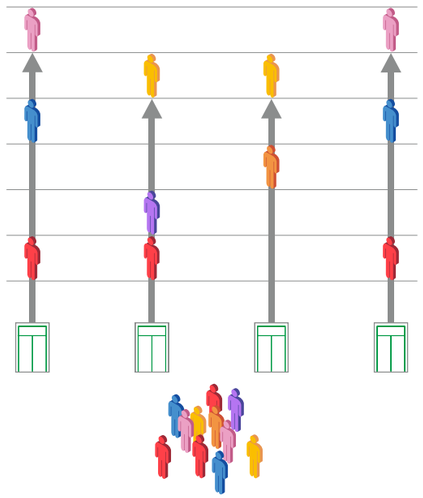
Minimizes number of stops to reduce boarding time.
Designates elevator depending on the destination and improves operation.
Efficiency of elevators by up to 20 - 30% by reducing waiting time and congestion in lobby.
Easy to expand additional functions and to be linked to security system in the building.
Suitable for places where residents amount to 1,000 or more such as skyscrapers, small and medium-sized offices, and shopping malls.



Inputs destination at the platform and boards on the designated elevator

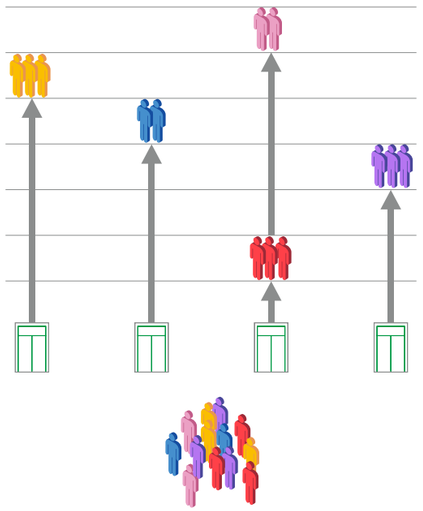
Group control system

After ascertaining the traffic within the building, it operates several elevators effectively.



Destination selecting system

It encourages passengers going in the same orientation boarding the elevator and reduces boarding time and waiting time.

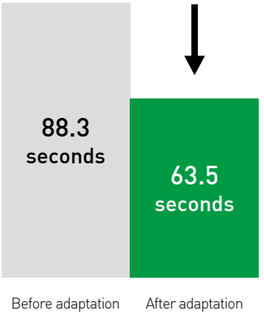


Effect of introducing destination selecting system

It dramatically reduces time needed for waiting for elevators at the platform and congestion in lobby to improve operation efficiency of elevators. Successful cases prove the excellence of the destination selecting system.

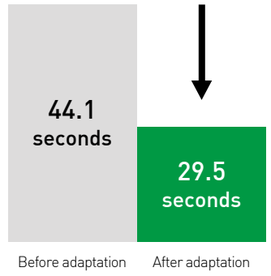
H company building (20 floors)

Waiting time is reduced by 24.8 seconds (▼29%)



K company building (33 floors)

Waiting time is reduced by 14.6 seconds (▼34%)



SMART H.Solution

Hyundai Elevator H.Solution achieves optimal operation efficiency by using the latest artificial intelligence technology.
It provides customers with a complete movement system based on its advanced smart service.

Customizing Service

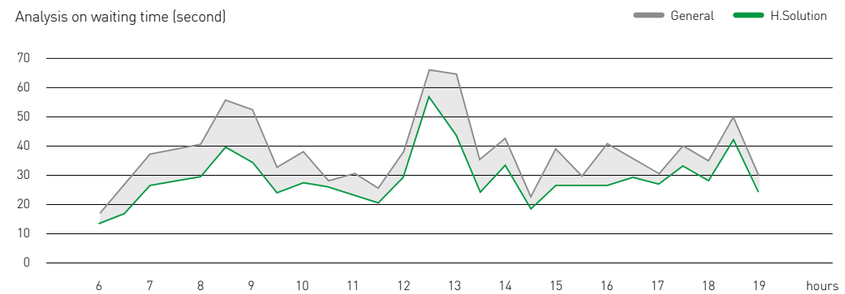
Customized system that considers characteristics of each building

It establishes a system that is suitable for a building's characteristics and uses a simulator to provide an optimal operation plan that is suitable for each building. Also, it provides a solution for improving traffic in rush hours. It can be optimally used on different types of buildings ranging from low-rise buildings to skyscrapers that have 60 floors or more.

Artificial Intelligence

Adaptation of deep learning artificial intelligence algorithm

Based on artificial intelligence analysis on elevator traffic, it learns weekly estimated traffic and patterns for optimal group control, which enables effective control and operation of several elevators.



PREMIUM H.Solution

Hyundai Elevator pledges to provide the highest satisfaction based on priority customized service.
We always strive for customer's safety and convenience and watch for customer's preferences in order to achieve customer's satisfaction.

Performance of Hyundai Elevator H.Solution

LG U+
New building in Yongsan

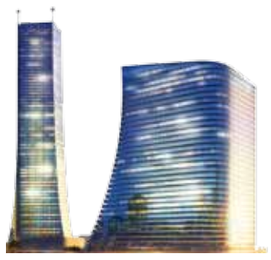
- Adaptation of double + single deck destination selecting system
- Speed 4 m/s
- 21 floors service
- Linkage to building security system

BIFC
Busan International Finance Center

- Adaptation of destination selecting system
- Speed 6 - 10 m/s
- Serves 62 floors service

DAISHIN Securities
New building
in Myeong-dong

- Adaptation of destination selecting system
- Speed 4 m/s
- 28 floors service
- Linkage to building security system



Turkey Metropol Istanbul

- Adaptation of destination selecting system
- Speed 10 m/s
- 67 floors service

Malaysia KL Gateway Office
& Residential Towers

- Adaptation of destination selecting system
- Speed 4 m/s
- 48 floors service
- Linkage to building security system

Panama Hilton Hotel

- Adaptation of destination selecting system
- Speed 4 m/s
- Serves 62 floors

Stylish Design

Customized design considering building's characteristics

Not only is destination input device provided by Hyundai Elevator excellent in functionality such as audio guidance and linkage to card key, but also has refined design, which enhances building's quality.

Touch screen destination input device (audio guidance and card key linkage are provided)

E/L floor, E/L status, destination can be marked

HTS-K01

HTS-A02

HTS-B01

HTS-C01
Applied LED light at the bottom

Ten key destination input device

Capacitive ten key (audio guidance)

HTL-A01
LCD, card key

HTK-A01

HTK-C01
Rear LED light

HTK-B03

Push button

HTK-B05
Audio,
satisfies EN 81 code

HTK-A02
Braille,
audio guidance

HTK-B01
Braille

HTK-B04
For the disabled, audio

HTK-B02
Braille,
bottom LED light

H.Solution selection guide

H.Solution product

Category for group controller	Number of group control	Number of floors adapted	Characteristics	Buildings adapted
HRGC-100 (general type)	2 - 6	64 floors or below	• Fuzzy + ETA assignment • Neural network learning function	• Adaptation to small and medium size building • When adapted to elevator without a machine room (MRL) • When adapted with default specifications
HRGC-1000 (standard type) ※ Planned to be launched in March, 2018.	2 - 8	96 floors or less	• Gametree* + ETA assignment • Deep-learning function based on ANFIS* • Adapted expert system	• Adaptation to medium and large-size buildings • When adapted to elevator without a machine room (MRL) • Linked to security of building having 6 or more elevators
HRGC-3000 (premium type)	2 - 10	128 floors or below	• Game tree + ETA assignment • Deep-learning function based on ANFIS • Adapted expert system • Installation of control panel separately designed for group controller	• Adaptation to high-rises and skyscrapers • Adaptation to variable double deck • When there are too many residents compared to the number of elevators

* Game Tree: An optimization technique that compares every assignment method
* ANFIS: An artificial intelligence technique that conducts learning based on adaptation neuro-fuzzy inference

H.Solution Application Map

Number of elevators	System type and purpose of building				
9 - 10	Destination selecting system	HRGC-1000	HRGC-1000 HRGC-3000	HRGC-1000 HRGC-3000	HRGC-3000 *Only the destination selecting system can be selected
7 - 8	Destination selecting system Group Control System				
3 - 6	Destination Selecting system: Hotel · Apartment · Office Destination Selecting system: Shoppingmall · Hospital Group Control System	HRGC-100			
2	Destination Selecting System Group Control System	Duplex			
		MRL	MR	MR	MR
		1 - 64floors		65floors or above	1~128floors
		Single deck			Double deck or double + single deck

※Adaptation of building security system •Destination selecting system : Can be linked with speed gate and destination input device
•Group control system : Can be linked with buttons in the elevator

Functions and options of the H.Solution

△ Limited functions ○ Available ◎ Excellent ※ Provided at cost

Item	Details	HRGC-100 (general type)	HRGC-1000 (standard type)	HRGC-3000 (premium type)	Option
AI processing function	Optimal control of building traffic volume through application of the latest AI technology	※Fuzzy	※Game Tree	※Game Tree	
Learning function	Improves group control performance by conducting learning by day/ time zone	※Neural network	※ANFIS	※ANFIS	
Adaptation of variable speed elevator	Optimal control of elevator where speed varies depending on elevator load		○	○	
Adaptation of double deck and double + single deck	Optimal control for group control on double deck or double + single deck			○	
Predictive assignment type	Optimal control after conducting comprehensive evaluation on present / future traffic situations		○	○	
Evaluation on weighted waiting time depending on estimated number of passengers	Reduces congestion in platform by providing service to the floor where it is expected to have many passengers waiting for the elevator		○	○	
Linkage control of security system in the building	Can control personnel having access to each floor by linking with security system within building (card key, speed gate) (destination selecting system)	△	○	○	※
Hybrid destination selecting system	Installs destination selecting system at the floor where it is frequently congested and general hole button at other floors (used call button in the elevator)	○	○	○	
System control by experts	Provides solutions for improving traffic during peak congestion	△	○	○	
Controls waiting status of the elevator	Controls operation so that at least one elevator can stand by at the floor	○	○	○	
Commuting hour service	Controls operation so that several numbers of elevators can stand by at the floor during peak hours	○	○	○	
lunch time service	Controls operation so that several numbers of elevators can stand by at the floor during peak hours	○	○	○	※(Add E/L monitoring panel)
Closing hour service	Minimizes waiting time by distributing elevators during peak hours	○	○	○	
after-lunch time service	Minimizes waiting time by distributing elevators during peak hours	○	○	○	※(Add E/L monitoring panel)
Off-peak hour service	Reduces power consumption by minimizing unnecessary operations during night time	○	○	○	
Distribution service during commuting hours	Distributes elevators into low-floor and high-floor elevators during commuting hours to maximize transportation ability	○	○	○	※(Add E/L monitoring panel)
Centralized service on certain floors	Executes multi-batch in order to solve temporary congestion within a short period of time	△	○	○	
Multiple objective control evaluation type	Can select certain objectives such as focusing on waiting time, changing operating floors, and designating certain floors	△	○	○	
Controls stop status on the floor	Every elevator that passes by departure floor stops at the base floor	○	○	○	※(Add E/L monitoring panel)
Power saving service	Executes power saving operation by minimizing number of operating elevators when the number of passengers is reduced	○	○	○	
Control for priority assignment	Assigns the elevator that has been called upon from adjacent floor		○	○	
Estimated control for capacity	Estimates the number of passengers to control capacity in advance and improve operation efficiency	△	○	○	
Exclusive operation	Operated exclusively by car call separately from operation of group control	○	○	○	
Displays arrival alarm	Generates signal that can be recognized visually / audibly at the time when car speed is reduced	○	○	○	
Prompt notification function	Generates a signal that can be recognized visually / audibly by selecting the car to be serviced immediately after the call is registered	○	○	○	
Displays the selected elevator	Turns on lantern on the elevator that leaves from base floor to provide customers with convenience	○	○	○	
Cancel registration	Press the button once more to cancel the registration (only available in group control system)	○	○	○	

※HRGC-1000 : Planned to be launched in March, 2018.