HYUNDAI ELEVATOR THE EL

ULTRA HIGH SPEED ELEVATOR

HYUNDAI ELEVATOR

THE EL
HYUNDAI

Elevate to The Exclusive Leader

Hyundai Elevator

The sole elevator is for a building
of unrivaled height.

THE EL, an ultra high speed elevator that enables
you to experience the most advanced technologies and
class, achieves previously unimagined heights and
unfolds a new reality before your eyes.

THE EL, realizing more unique greater value,
offers you new technologies,
for the environment and safety.

BRAND IDENTITY
THE EL : The Exculsive Leader

SPEED
300mpm ~ 1080mpm

RISE
600m (More than 150 floors)

The overwhelming performance of THE EL that is proven by its "world's first, world's best" records.

THE EL embodies the meanings 'the only' and 'unrivaled',
and aims to become the only ultra high speed elevator in its class.

Your expectations will be elevated AFTER experiencing THE EL

A Product of Cutting-Edge, Smart Operation, Green Technology

From the world's most advanced technologies
to a smart operation system and green technologies.
THE EL is the best solution for enhancing the value of the
ultra high rise building that you are planning and designing.

An encounter with THE EL will substantially raise your
standard for ultra high speed elevators.

PRESTIGE TECHNOLOGY

The world's highest speed and sophisticated technologies
make your imagination come true.
Cutting-edge technology only for you, THE EL.

Aerodynamic DESIGN

600 RISE m

9 3-phase motor x 3Set MULTI MOTOR

World Best Speed 1,080 mpm

01

The fastest speed in the world

Ultra high speed, nine-phase synchronous motor

THE EL has the heart of a fault tolerance design, a nine-phase multi-motor that is a three sets combination of three-phase synchronous motors. Even if there is a problem with some parts, the elevator remains fully operational, improving safety and service.

Noise, Vibration, Harshness (N.V.H) technology

The streamlined capsule structure, which minimizes air resistance, and the vibration control system remove even the slightest noise and vibration, offering a comfortable, smooth riding experience.

Atmospheric pressure controller

By controlling atmospheric pressure fluctuations caused by altitude change, the controller minimizes ringing in the ears. This enables a comfortable riding experience even inside an ultra high rise building.

The Hyundai Asan Tower, an ultra high speed elevator test tower

The Hyundai Asan Tower has the world's fastest elevator, with a speed of 18mps (1,080mpm). Here, the safety and reliability of ultra high speed elevators are proven in an environment that is most similar to an ultra high rise building. The Hyundai Asan Tower is opening a new horizon in the development of the world's top-notch elevator systems.

SMART TECHNOLOGY

All spaces within your building are pleasant and convenient, but the elevator will be remembered as being much more.
THE EL, offering smart technologies.

Intelligent Building System — *Cutting-edge security and management system*

iGC-3000 — *GROUP CONTROL SYSTEM*

Reduces waiting time and energy consumption *Destination* — *SELECTING SYSTEM*

02

The next generation of intelligent operating system

IBS (Intelligent Building System)

IBS creates a smart spatial culture in connection with the building's security and management system. You can receive high-quality services based on IT convergence technologies within a top-class building.

Destination selecting system (Destination floor reservation system)

This is a system where you register your destination floor at a landing and the most appropriate elevator is automatically serviced. This enables maximum operational efficiency.

Artificial intelligence-based group control system

Artificial intelligence-based analysis of traffic volume enables estimation of future traffic volume and patterns and necessary preparations. Optimal group management is allowed, leading to efficient control of elevator operations.

Remote monitoring system

Remote monitoring of the elevator operation status all across the nation 24/7 prevents breakdowns and accidents.

GREEN TECHNOLOGY

Inside THE EL, you are able to concentrate on your business only without any doubt in environment or energy.
THE EL, already made with green technology.

25%
Lower energy consumption

30%
Lower electricity use

Received "A" class energy efficiency certificate of VDI 4707

A CLASS

77.5% *RECYCLE ENERGY*
Energy use improved by reuse of electricity

GREEN TECHNOLOGY

03

"A" class Energy Efficiency

First in the world to receive a grade of A from Tüv, German Institute

Energy efficiency rating (VDI 4707 Part1) involves giving international certification after assessing an elevator's operation time, energy consumption, and average operation distance. THE EL became the first in the world to receive the A class(the best-in-class system) in the ultra high speed elevator (600mpm) category.

Energy recycling inverter

THE EL has a energy recycling inverter, which reuses energy that is generated during operation, resulting in increased energy efficiency of up to 77.5%. There is no charging or braking resistance area, which minimizes the emission of carbon. THE EL features leading green technology.

Ultra lightweight, ultra slim green technology

The permanent magnet synchronous motor of THE EL has an ultra slim and lightweight design, resulting in reduced machine room construction costs. It also consumes 25% less energy compared to induction motors.

Green process

Hyundai Elevator develops environmental-friendly elevators for customer satisfaction through a design and material development process that reduces environmental pollution. Hyundai Elevator is continually developing low electricity-consuming products and reducing the amount of materials used in the production process in line with customers' 'well-being' demands, thereby taking the lead in environment-friendly technologies.

ENTRANCE

Landing Door	STS Bead Blast
Jamb	Flush Type, STS Bead Blast LED Lighting (Arrival Announcement System)
Hall Button	Destination Selecting System (Box Type)
Hall Lantern	HLS-750 STS Bead Blast Acryl Lens, LED Lighting

CAR DESIGN

Ceiling	CD-499C (Barrisol, LED Lighting, STS Mirror 3S Vibration)
Car Wall	Marble (THASSOS) 3 Form Bear Grass (SEA WEED/19T) LED Lighting System STS Mirror 3S Vibration
Car Door	STS Mirror 3S Vibration
Operating Panel	Swing Panel Micro Push Button
Handrail	STS Bead Blast, LED Lighting
Flooring	Marble (THASSOS) STS Hairline (5T)

Information Display System (Car Wall)

Hall Lantern

Arrival Announcement System

Ceiling

Handrail

Operating Panel Button

ENTRANCE

Landing Door	Bonded Metal (Delta/Bronze) Ti-Bronze 3S Vibration High Glossy Coating
Jamb	200TYPE, Down Light Ti-Bronze 3S Vibration High Glossy Coating
Hall Button	Destination Selecting System (Box Type)
Hall Lantern	STS Bead Blast Half Mirror Acryl LED Lighting

CAR DESIGN

Ceiling	CD-529C (Ti-Bronze Bead Blast, LED Indirect Lighting)
Car Wall	Marble (BROWNTINI) 3 Form Bear Grass (NIA) LED Lighting
Car Door	3 Form Bear Grass (NIA) Ti-Bronze Bead Blast
Operating Panel	Swing Panel Micro Push Button
Handrail	Ti-Bronze Hairline 1 Pipe
Flooring	Marble (BOTTICINO, BROWNTINI)

Information Display System & Lighting

Destination Selecting System

Hall Lantern

Information Display System & Car Doors

Ceiling

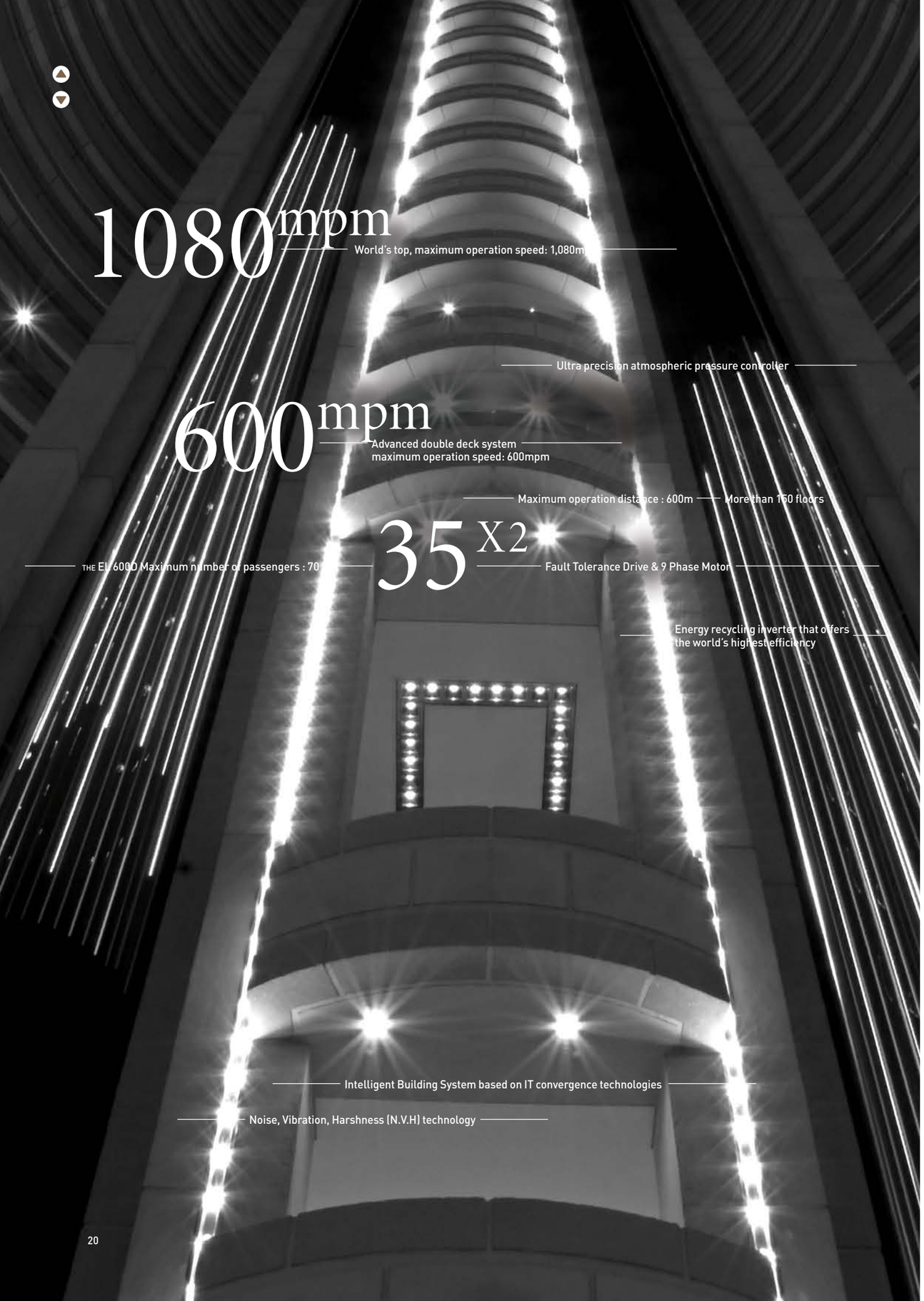
Handrail

Your decision will be elevated AFTER experiencing THE EL

The high-class technologies of THE EL enhance buildings' value.
The smart technology that enables outstanding operational performance and the green technology that considers the environment while ensuring efficiency is provided to you with great satisfaction.
THE EL offers everything demanded for ultra high speed elevators.

Experiencing the state-of-the-art technologies featured by THE EL will enable you to make a quicker, clearer decision.

Core Advantage

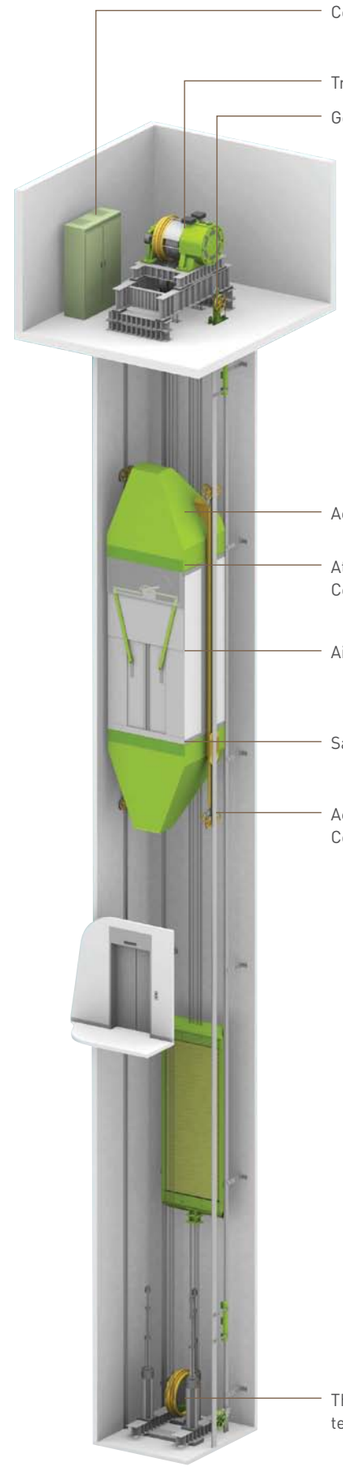


THE EL
HYUNDAI

THE EL,
an ultra high speed elevator
that was created with the world's
advanced technologies
These technologies result
in core advantages of THE EL,
providing you with greater value.

1080 mpm

Category	Name		Function
Machine structure	Ultra high speed nine–phase synchronous motor		Fault tolerance function
	N.V.H system	Airtight car door system	Low noise, low vibration
		High–performance roller guide shoe	
		Vibration control system	
		Streamlined capsule cage	
	Atmospheric pressure controller		Minimization of ringing in the ears
	Safety device	Emergency stop device	Excellent braking performance and shock absorber
		Fly ball governor	
		Three-stage telescopic buffer	
Operation system	IBS support system		Smart IT system (Bi–directional video telephony, mobile call, speed gate connection, etc.)
	Destination Selecting System		Outstanding enhancement of operational efficiency
	Artificial intelligence–based group control system		
	Remote monitoring and video telephony system		Prevention of crime and emergency situations
	Advanced double deck system		Outstanding enhancement of operational efficiency



KEY FEATURES

The ultra high speed nine-phase synchronous motor, which demonstrates the world's most outstanding traction power and is also very compact, a streamlined capsule design, and technologies that minimize noise and vibration... All the things mentioned above are in THE EL.

TRACTION MACHINE

Fault tolerance system

With a design that employs three three-phase permanent magnet synchronous motors in a single frame, the fault tolerance system is a key technology of THE EL that prevents breakdowns or out of service. Even when there is an issue with some parts, the other synchronous motors ensure normal operation.

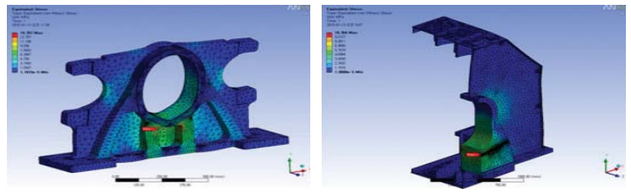
Electro-magnetic field simulation test

By reviewing safety based on electro-magnetic field simulation and structural analysis, an elevator that is the quietest and has the lowest level of vibration in the world was created to offer greater value.

∗Torque Ripple of no more than 0.1%, the lowest in the world

Hydraulic brake

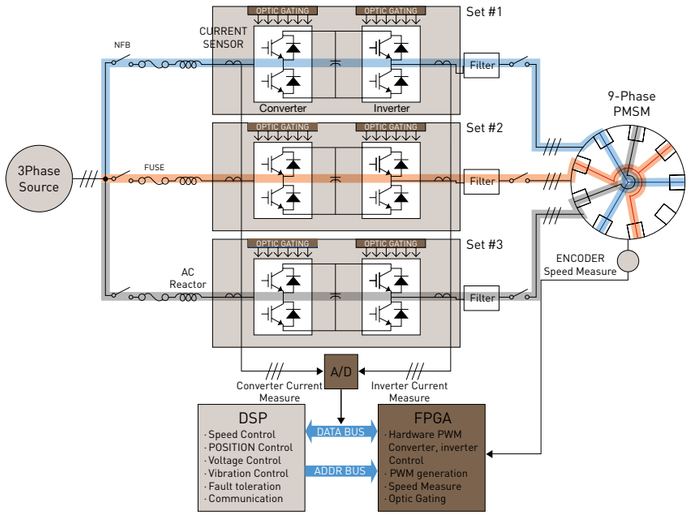
The high-capacity, hardened hydraulic brake is more compact than a magnetic brake and has excellent braking performance. This also allows for control that is as much as ten times more precise than regular braking.



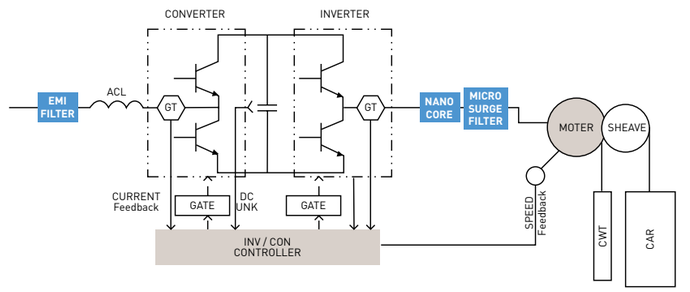
Structural analysis simulation in consideration of heavy load

	GT 350	GT 500	GT900(D/D)	GT 1000	GT 1500 (D/D)
Max. Rise (m)	200	300	400	600	600
Max. Capacity (kg)	2000	2000	3200	2000	4000
Max. Speed (mpm)	420	600	600	1080	600

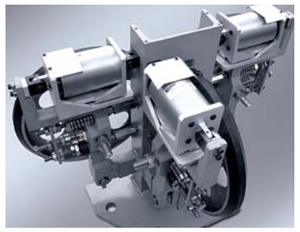
Three-phase parallel control device The three-phase parallel control device maintains the independence of three synchronous motors and mutually connects them, and it has a highly efficient, high-capacity control board, resulting in outstanding shift quality and quietness.



∗ **EMI Filter:** Satisfies EMC standards (EN12015, EN12016, EN61000-4 etc)
∗ **Nano Core:** Minimizes Common Mode Noise
∗ **Micro Surge Filter:** Protects the motor, minimizes leakage current, reduces noise



N.V.H SYSTEM
(NOISE, VIBRATION, HARSHNESS)



Airtight car door system After the door closes, it slides towards the cage. This completely seals the entrance, which is the main source of noise, resulting in excellent noise insulation and atmospheric pressure control.

Aerodynamic capsule cage The aerodynamic, streamlined capsule cage that was designed through flow analysis and simulation minimizes air resistance, resulting in a smooth riding experience with little noise and vibration.

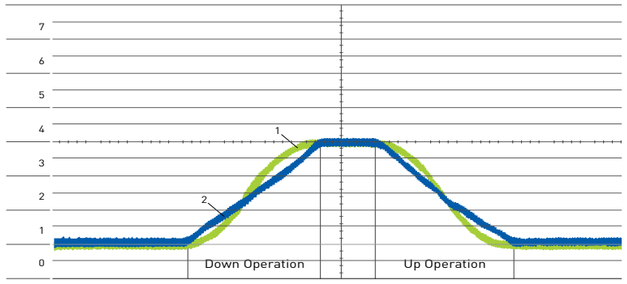
High performance roller guide shoe The high elasticity roller and lever structure minimizes the transmission of external force from the rail to the inside of the car, ensuring optimal comfort during high speed operation.

Vibration control system The active guide roller control system reduces the lateral vibration within the car to less than 5gal. The longitudinal vibration control system uses a motor control device and reduces vibration by 40%.

ATMOSPHERIC PRESSURE CONTROLLER

Minimization of ringing in the ears By controlling the induction and exhaust system within the cage, the atmospheric pressure control system reduces air pressure fluctuation to within 5% inside the car. It maintains atmospheric pressure at a certain level, preventing the pressure change that would otherwise occur during ultra high speed operation. This allows the body to more easily adapt to the change, resulting in a comfortable riding experience.

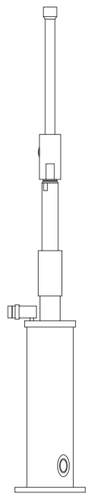
[Change in the atmospheric pressure within the cage]

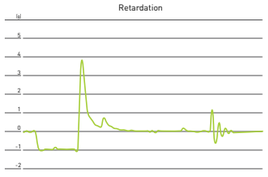


1. No–controlled atmospheric pressure 2. Controlled atmospheric pressure

MECHANICAL SAFETY COMPONENTS

Emergency stop device Attached to the bottom of the cage, this device grasps the guide rail like a wedge in the event of excessive speed, resulting in outstanding braking force. The special ceramic friction material can maintain frictional force even at high temperatures of more than 1000℃. It offers excellent braking performance and safety by its outstanding thermal resistance and durability.





Fly ball governor A fly ball governor detects abnormal speed and activates an emergency stop when necessary. Speed can be precisely measured even during ultra high speed operation, resulting in a level of safety that befits the elevator's class.

Three-stage telescopic buffer The three-stage telescopic buffer reduces shock to the car if the elevator were to descend below the lowest floor to the pit. The buffer can reduce the height in three stages, which improves the use of space with pit depth.

OPERATION SYSTEM

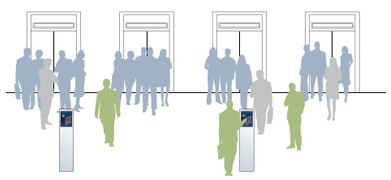
High efficiency and security are both offered by the double deck system maximizing transport efficiency, the destination floor reservation system, the mobile call system that features the latest technologies, and the remote monitoring system.

INTELLIGENT BUILDING SYSTEM

The IBS support system connects the building's management systems and information technologies to create a smart spatial culture. It provides optimal services and systems of the kind expected of a cutting-edge building based on various information technologies, including bi-directional video telephony, mobile calling, speed gate connection and operation, handwrite enabled OPB(Operating Panel Board), and crime prevention system.

DESTINATION SELECTING SYSTEM

(DESTINATION FLOOR RESERVATION SYSTEM)

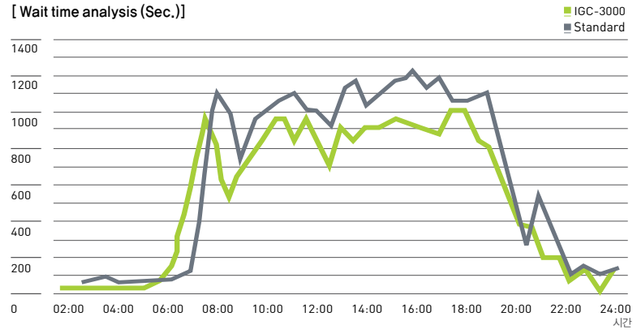


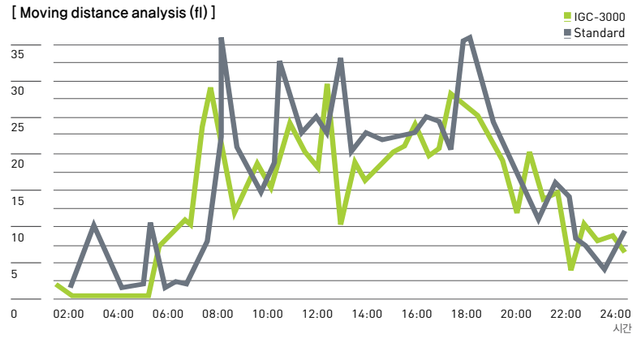
This is a system where you register a destination floor at a landing. The most appropriate elevator is automatically selected. In addition to reducing passenger wait time and unnecessary operation, it enables maximum energy saving.

ARTIFICIAL INTELLIGENCE–BASED GROUP CONTROL SYSTEM

(IGC-3000)

Artificial intelligence-based analysis of elevator traffic volume allows the system to learn weekly traffic volume and patterns. This enables optimal group management and efficient operation of several elevators.

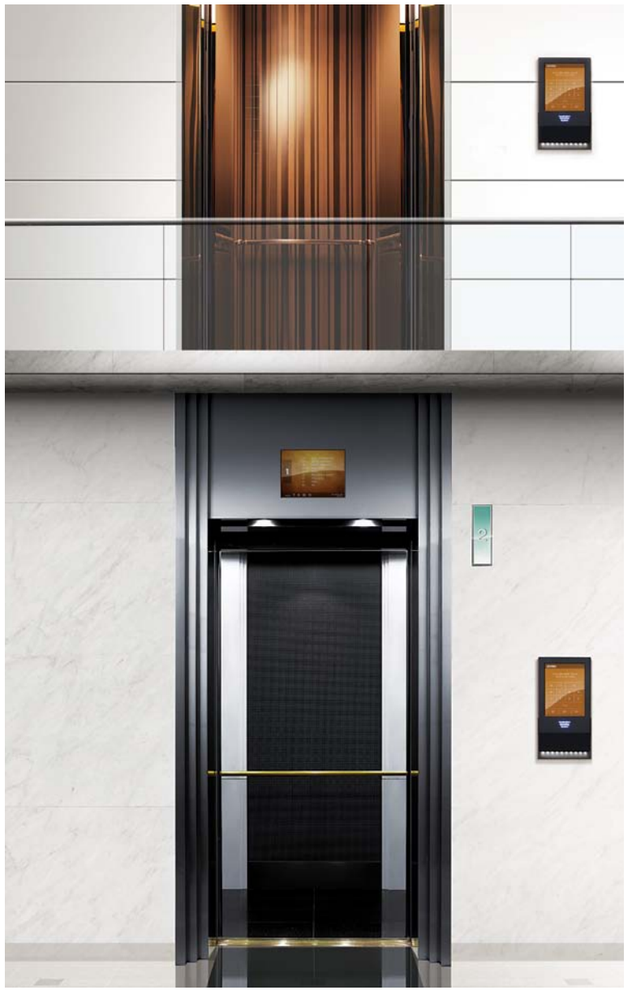


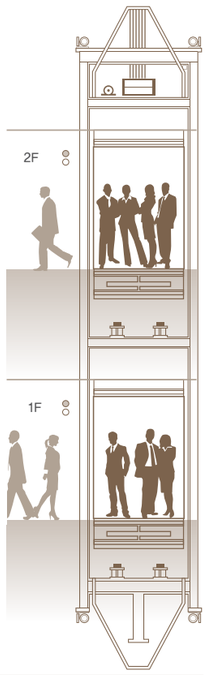


REMOTE MONITORING AND VIDEO TELEPHONY SYSTEM

Terminals on control panels that are used for collecting and analyzing operation data allow remote real-time monitoring of the operation of elevators across the nation. This prevents breakdowns and accidents. The video telephony system is used to determine the status inside cars through the customer center. This system prevents crime and accidents caused by emergency situations.

ADVANCED
DOUBLE DECK SYSTEM

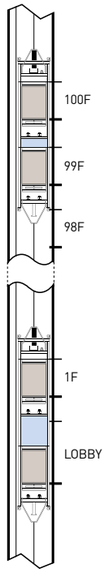




Higher transport efficiency Two elevators connected vertically are simultaneously run to offer 1.8 times greater transport capability. Fewer hoistways mean lower construction costs and more available floor space.

Streamlined capsule design An aerodynamic capsule design that is applied to airplanes was adopted to minimize air resistance for a smooth riding experience with low noise and vibration.

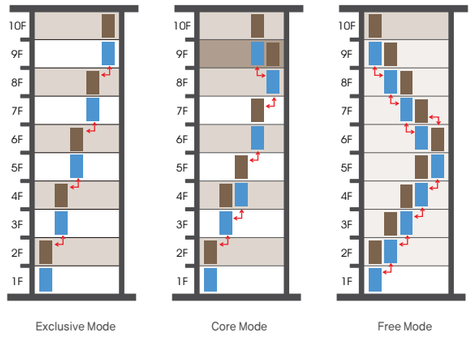
[Floor distance adjustable device]



This enables the adjustment of the floor distance between the higher and lower cage. Varying floor heights are accommodated to enable more latitude in building design.

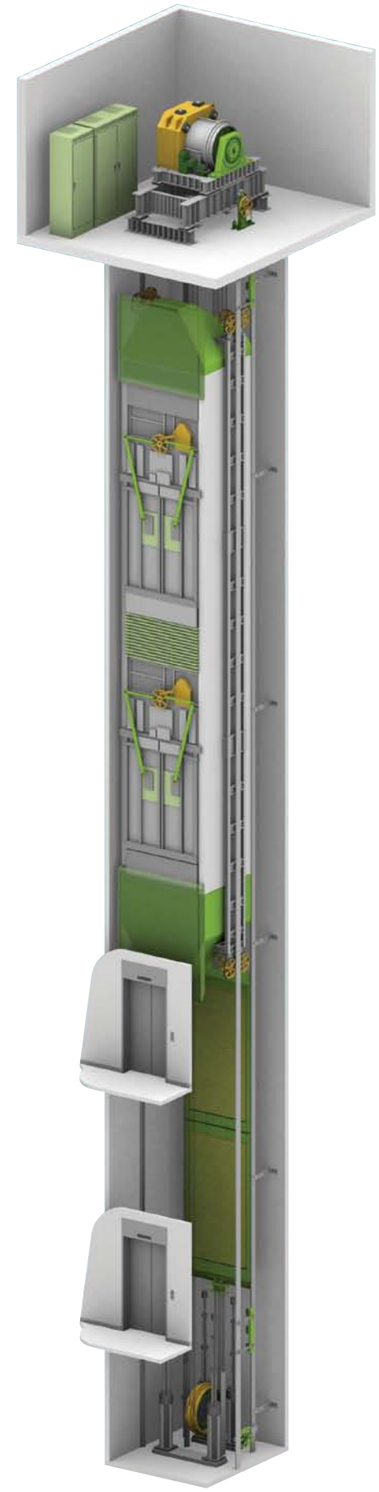
(Hyundai Asan Tower: Floor distance is adjustable up to 7m)

[Three modes of operation of the double deck system]



The system can be flexibly operated in one of three modes – Exclusive, Core, Free – depending on building characteristics or traffic volume.

Exclusive Mode A typical approach based on odd number floor/even number floor operation
Core Mode Top and bottom deck service is enabled for specific floors
Free Mode The bottom deck services all floors except for the very top floor, while the top deck services all floors except for the very bottom floor



PERFORMANCE

Hyundai Elevator is there for a new ultra high rise building that becomes the latest and greatest landmark in the city.
THE EL is the only elevator that can provide top speed and performance for your ultra high rise building.

BIFC
(63 Fl.)

Busan, Korea
Speed : 600m/min (2units)
540m/min (3units)
480m/min (8units)
Total : 46units

Park-Hyatt Hotel
(34 Fl.)

Busan, Korea
Speed : 360m/min (2units)
Total : 11units

I-SET Tower
(30 Fl.)

Ekaterinburg, Russia
Speed : 360m/min(2units)
210m/min(1units)
Total : 6units

Hilton Panama City Hotel
(53 Fl.)

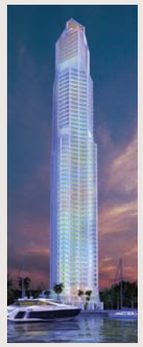
Panama City, Panama
Speed : 240m/min (8units)
Total : 31units

Songdo I-Tower
(33 Fl.)

Incheon, Korea
Speed : 360m/min (2units)
Total : 18units

Kepco Company Building
(31Fl.)

Naju, Korea
Speed : 300m/min(6units)
240m/min(5units)
Total : 26units



Rivage Tower
(68 Fl.)

Panama City, Panama
Speed : 240m/min (4units),
180m/min (1units)
Total : 5units

Hanoi Landmark Tower
(72 Fl.)

Hanoi, Vietnam
Speed : 240m/min (2units),
210m/min (10units)
Total : 29units

Venezuela Centro Simon Bolivar
(56 Fl.)
(Government Complex)

Caracas, Venezuela
Speed : 480m/min (2units),
420m/min (4units),
360m/min (2units)
Total : 15units

Lerthai Center
(29 Fl.)

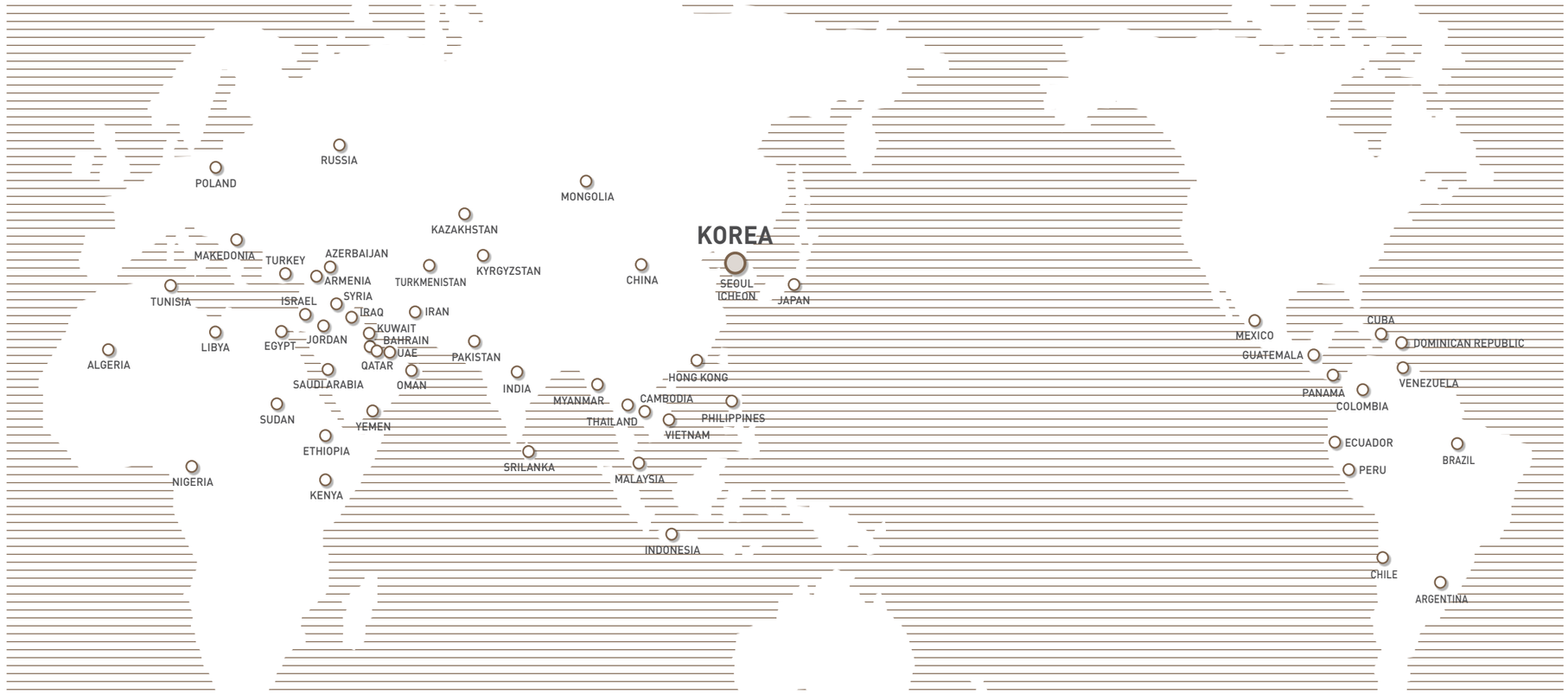
Shijiazhuang, China
Speed : 360m/min (4units),
210m/min (4units),
180m/min (2units)
Total : 10units

Panama F&F Tower (55 Fl.)

Panama City, Panama
Speed : 240m/min (5units)
Total : 5units

Varyap Meridian Hotel
(58 Fl.)

Istanbul, Turkey
Speed : 240m/min (7units),
210m/min (5units)
Total : 53units



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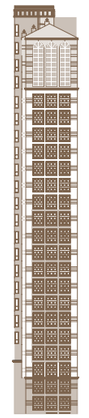

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