Total solutions for Movement

HYUNDAI ELEVATOR

I·X E L

INNOVATIVE EXPRESS ELEVATORS

HYUNDAI ELEVATOR

Contents

Elevate your Thinking...

Smart technology and state-of-the-art
safety systems are changing the concept for elevator.
Green technology, considering of the global environment,
protects the future of Earth.
A world-class, exquisite design increases building value.
The i·XEL redefines and raises
your standards of elevators.

i·XEL

ELEVATE YOUR Thinking about Tech

Since its founding in 1984, Hyundai Elevator has been an industry leader in Korea with innovative technology and a pioneering mindset. The company is becoming a global leader in the elevator industry by taking action in many areas to offer advanced technology, design, safety, and environment-friendliness.

The i·XEL, a high-speed elevator, is an uncommon product of state-of-the-art technology. It increases the value of high-rise buildings beyond your imagination.

▲ Project Gallery

▲ Ultra-High Speed / Double Deck PR Film

01

Distinctive technologies available nowhere else make the i·XEL suitable for VIPs.

The permanent magnetic gearless traction machine

First-class riding comfort The permanent magnetic gearless traction machine was developed by Hyundai Elevator. There is no vibration from the mechanism of gears. You will enjoy a comfortable, smooth riding experience as if you were riding first class.

The best technology for the best building We have adopted an electric regenerative converter and high-precision control inverter drive system that optimally controls the speed of the electric motor by simultaneously and continually changing the voltage and frequency. This has resulted in the smoothest ride ever and substantially improves energy-efficiency, thus enhancing the value of a building.

Advanced technology that considers even the building space Since the traction machine used for the i·XEL allows for multiple arrangements, it is about 50% smaller and lighter compared to the previous induction motor. The machine occupies little space, thus allowing more space available for renting and other usage.

Smart system that considers both passengers and managers More convenient services are offered based on state-of-the-art IT convergence technologies, such as the Destination Selecting System(destination floor reservation system), which reduces both wait time and unnecessary elevator operation; an artificial intelligence-based group control system that forecasts use for more efficient operation; and a computer monitoring and remote monitoring system that efficiently controls elevator operation.

i·XEL

SMART TECHNOLOGY

We offer optimal performance and efficiency,
in addition to maximum use of space,
to our customers, and ensure an optimal level of comfort and
the best riding experience to passengers.
Enjoy the most advanced, distinctive high-speed elevator
technologies of the i·XEL by Hyundai Elevator.

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i·XEL

02

The i·XEL ensures a clean environment and unvaried performance and efficiency.

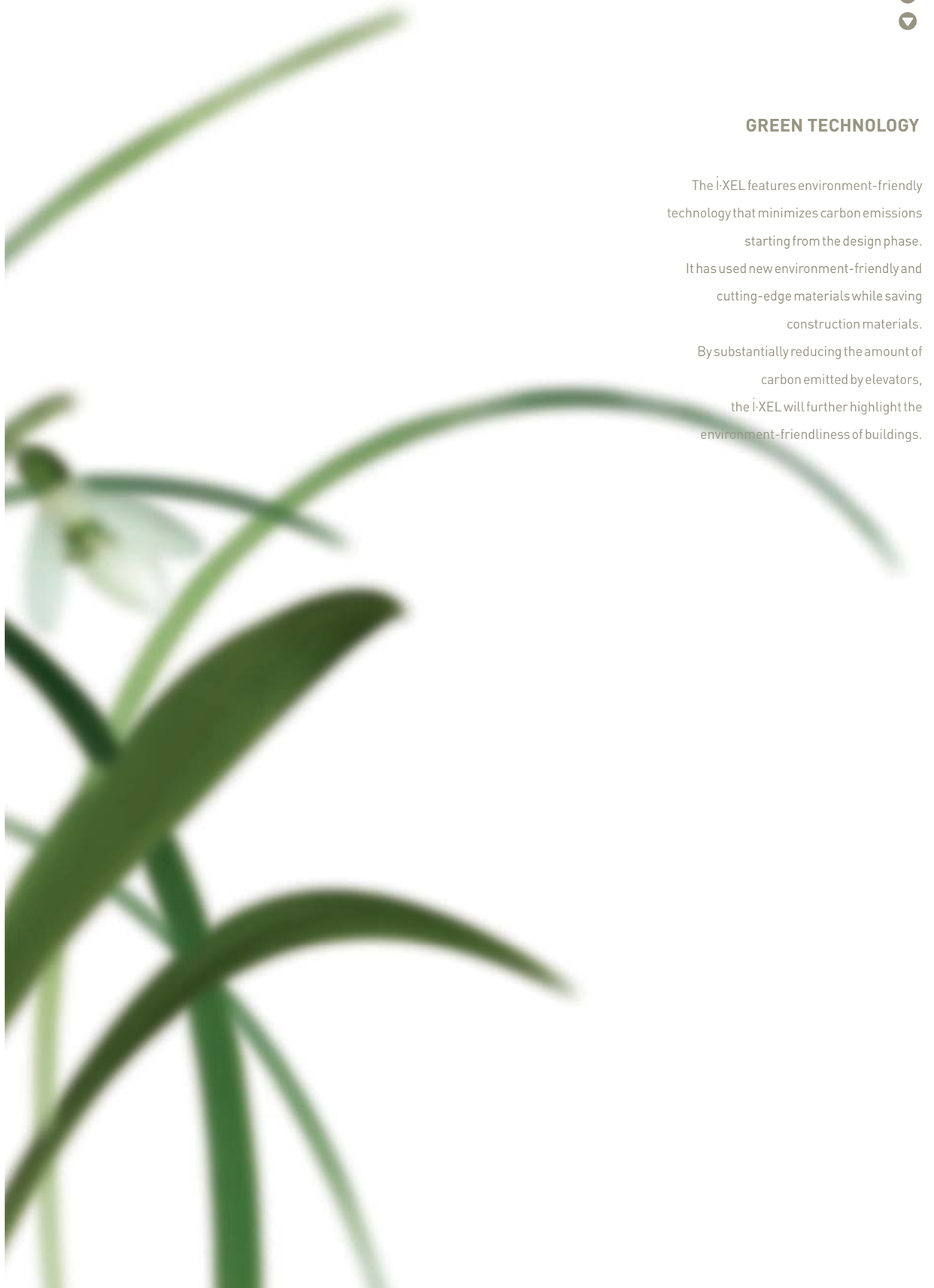
Environment-friendly system

A green elevator that has substantially lower electricity consumption enabled by energy reduction technologies The application of a gearless traction machine that uses a permanent magnet ensures 25% lower energy consumption compared to induction motors. Highly energy-efficient lighting fixtures, such as indoor LED lighting, are used, lowering total energy consumption by around 30%.

Green technology of the i·XEL that reuses electricity Precise, quick motor control technologies enable precise speed control for the smoothest possible riding experience. Using regenerative Hyundai drive, it actually captures energy and feeds it back to the building's power grid. So energy efficiency can be increased by more than 77.5%.

Green process where development and production take place in an environment-friendly setting By introducing a design and development process and materials that reduce environmental pollution, Hyundai Elevator is developing environment-friendly elevators that satisfy customers in every way. In line with the 'well-being' needs of customers, we are reducing the amount of materials used throughout the development and production process, thus taking the lead in environment-friendly technology.

i·XEL



GREEN TECHNOLOGY

The i·XEL features environment-friendly technology that minimizes carbon emissions starting from the design phase. It has used new environment-friendly and cutting-edge materials while saving construction materials. By substantially reducing the amount of carbon emitted by elevators, the i·XEL will further highlight the environment-friendliness of buildings.

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i·XEL

03

The test tower, with the world's best systems, ensures the safety of the i·XEL.

The Hyundai Asan Tower

A test tower based on the world's top systems,
challenging itself to showcase an ultra high-speed elevator
with a speed of 18mps(1080mpm).

Enhanced safety by a self-diagnosis system Further improvements were made to the overall system's reliability by adopting an ultra high-speed microprocessor that controls speed and operation. Multi-protection monitoring functions, including the self-diagnosis function, promise safety 365 days a year.

Dual brake system and multi-safety circuits We adopted a dual brake system that ensures that when one brake fails, the other brake activates. The fail-safe devices and circuits make the i·XEL safe. It even satisfies EN81, an European elevator standard, to ensure the world's highest safety.

Safety and durability enabled by the door breakaway prevention system The door breakaway prevention system that is installed on the top and bottom of the door prevents passengers from falling outside the elevator or into the elevator shaft as a result of breakaway of the door. Safety and reliability have been certified through an impact test by a government-recognized organization. It has been applied in all Hyundai products starting in September 2008.

A double deck system that boosts transport efficiency around two times based on a new dimension of flexibility

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. An extremely strong chain operation system prevents slipperiness. Hyundai double deck system with the floor distance adjusting device provides customers a revolutionary solution to accommodate varying floor height.

i·XEL

CONFIDENCE in SAFETY

Comfort is based on safety.
The i·XEL features state-of-the-art safety systems including the self-diagnosis system, dual brake system, and door breakaway prevention system to prevent breakdowns. Furthermore, we are thoroughly researching and verifying product safety and reliability at the test tower, which is equipped with the world's very best systems.

Unrivaled advantages of the double deck system of Hyundai Elevator

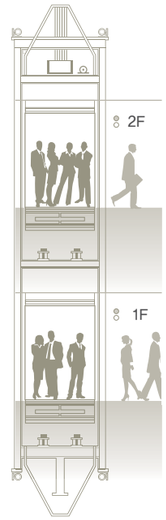
Floor Distance Adjustable Device

There is no restriction on floor distance.
The extremely strong chain operation system prevents slipperiness and enables precise control.

Aerodynamic Capsule

The aerodynamic capsule minimizes air resistance.
Use of lightweight materials allows a smooth riding experience with low noise and vibration.

∗ Refer to the bottom of Page 10 for a detailed explanation of the double deck system.



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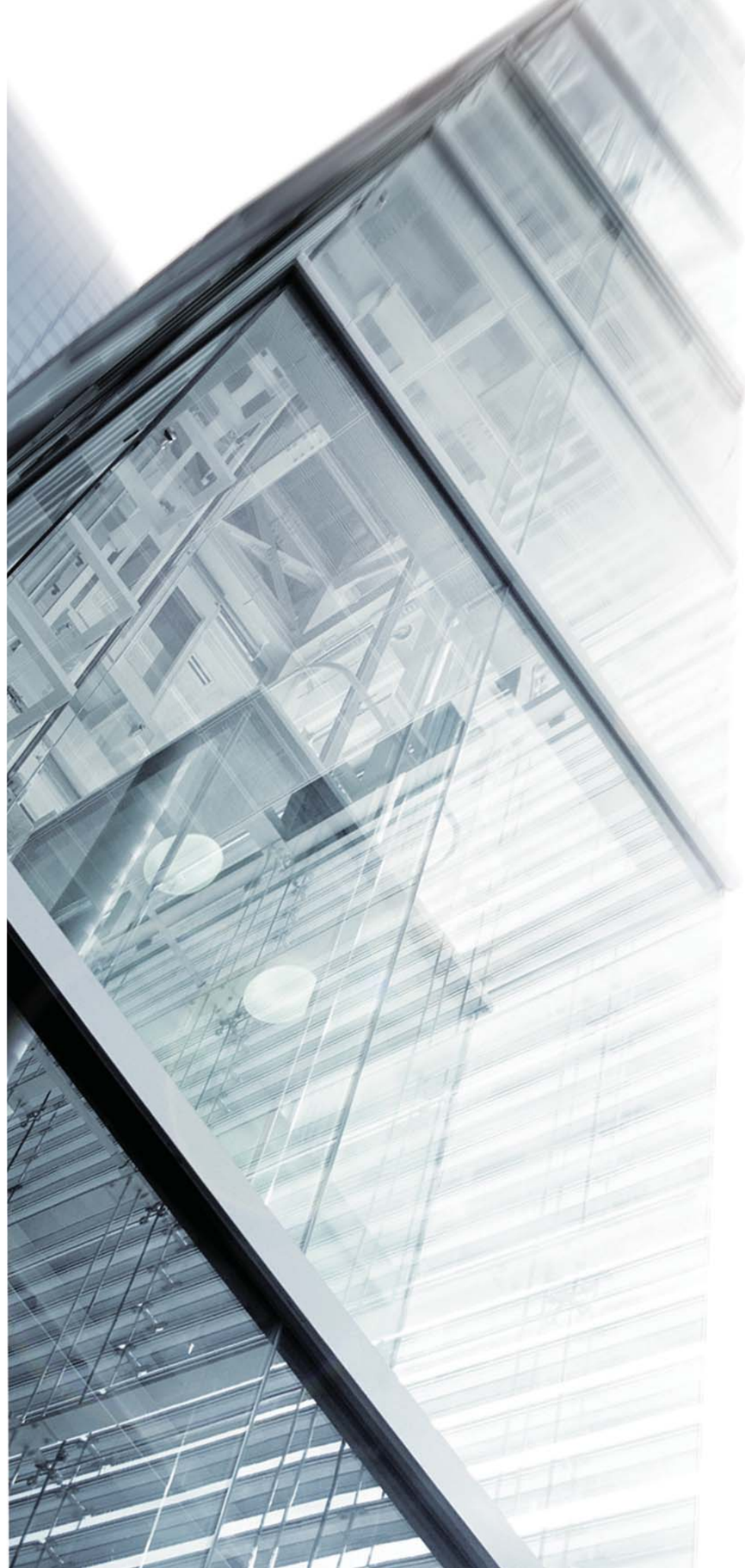

04

The classiest space in this building is the i·XEL.

High-class design

Entrance design The elevator entrance is an important space that determines one's impression of a building. The extremely refined design of the i·XEL embodies the sophisticated and modern image of a high-rise building. The design keeps passengers interested while waiting for the elevator and is an uncommon touch of class to the entire building.

Car interior design The interior creates a pleasant feel and is of a spatial design that makes the inside look much more spacious than it actually is. It provides an enjoyable, emotional experience even during the short time passengers are inside.

Detailed design of the ceiling and panel Each and every detail of the interior of the elevator ensures a distinctive sense of satisfaction, ranging from the detailed ceiling design that enables passengers to feel a sense of openness as soon as they enter the elevator to the panel design that ensures easy understanding of information and the buttons that offer a good sense of touch.

i·XEL

EMOTIONAL DESIGN

The design of the i·XEL with cutting-edge technology, environment-friendliness, and class, does not involve designing only the limited space of the elevator. The design further upgrades the image of the entire building by adopting an outstanding spatial design that considers the building's image and functions as well as a superior sense of interior décor.

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i·XEL

Elevate your Thinking about Products

The i·XEL is more than a simple elevator. It enhances the value of a building. It is an extremely special space that moves the hearts of passengers. The greatest riding comfort that can be offered by a high-speed elevator, energy reduction effects, optimal services, and a high-class design...

The i·XEL, will satisfy you beyond your expectations.

ENTRANCE

PERFORMANCE
DESIGN COLLECTION

01

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	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)

CAR DESIGN

Information Display System & Lighting

Destination Selecting System

Hall Lantern

Information Display System & Car Doors

Ceiling

Handrail

Bottom Lighting & Flooring

ENTRANCE

PERFORMANCE
DESIGN COLLECTION

02

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	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)

CAR DESIGN

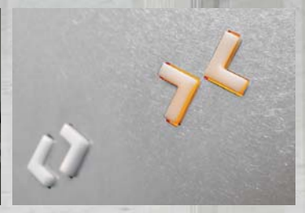
Information Display System (Car Wall)

Hall Lantern

Arrival Announcement System

Ceiling

Handrail



Operating Panel Button

ENTRANCE

PERFORMANCE
DESIGN COLLECTION

03

ENTRANCE

Landing Door	Inco-Black Mirror Etching
Jamb	Flush Type, Inco-Black Mirror
Hall Button	70TYPE Button, Inco-Black Mirror
Hall Lantern	HLS-640 Inco-Black Mirror Acryl Lens, LED Lighting
Indicator	Deluxe Type

CAR DESIGN

Ceiling	Inco-Black Mirror, Wood Barrisol LED Lighting
Car Wall	Wood, Brass Hairline Brass Hairline Trim Inco-Black Mirror
Car Door	Inco-Black Mirror Etching (10T)
Operating Panel	Swing Panel Inco-Black Mirror Etching Handwriting Operation Panel
Handrail	Wood1 Pipe, Ti-Bronze Hairline 1 Pipe
Flooring	Marble (BOTTICINO)

CAR DESIGN

Jamb Light

Hall Button

Indicator

Handwriting Operation Panel

Ceiling

Handrail

CEILINGS &
SIGNAL FIXTURES

Ceiling

1 STS Bead Blast, LED Lighting, Architecture Metal (DALLAS)
2 Ti-Bronze Bead Blast, Ti-Bronze Mirror, Sheet, LED Indirect Lighting
3 Inco-Black Mirror, Wood, Barrisol LED Lighting
4 STS Bead Blast, LED Lighting

Operating Panel

Touch Screen
Operating Panel

* The design may change depending on the building.

1 OPP-N240B
2 OPP-D241B
3 OPP-N260A
4 OPP-N270A
5 OPP-N280A
6 OPP-N290A

SIGNAL FIXTURES

Hall Lantern

HLS-640 HLS-720 HLS-750 HLS-760 HLS-770 HLS-790 (Boxless Type)

∗ Up : Green Lamp , Down : Orange Lamp

Hall Button

HPB-344 (41 Type Button) HPB-342 HPB-660 (Boxless Type) HPB-270 HPB-880 (Boxless Type) HPB-993 (Boxless Type (Touch-Less Button)) HIP-D660 (Boxless Type) HIP-D270 HIP-D880 (Boxless Type)

∗ Boxless Type : 90type button cannot be applied.

Indicator

PI-D600 (SIZE : 352mm X 82mm)

PI-D400 (SIZE : A X 70mm)

∗ A is changeable according to the size of Clear Opening. (A : 750mm ~ 1250mm)

PI-D110 (SIZE : 372mm X 72mm)

PI-S100 (SIZE : 233mm X 70mm)

Information Display System

IDS-01 (LCD TYPE)

IDS-02 (LED TYPE)

IDS-03 (LCD TYPE)

Button

40 TYPE 41 TYPE 60 TYPE 90 TYPE (Touch-Less Button)

70 TYPE 80 TYPE

SPECIFICATIONS

GROUP CONTROL OPERATING SYSTEM

The group control operating system is designed to optimize elevator operational efficiency by operating, distributing, and controlling such operation information as location, speed, number of passengers, and registered call numbers for each of the elevators when a hall call occurs. This improves the overall efficiency of elevator operation.

Basic Functions of Group Control

Standard Feature ○ Optional Feature ★

Feature	Description	Applicable Item by Building Type		
		Office	Hotel	Multiplex Skyscraper
Artificial Intelligence	Artificial intelligence applying fuzzy logic automatically controls ambiguous changes in complex traffic patterns and always provides the best service.	○	○	○
Learning Function	This function learns elevator usage by day and time and sets operational parameters automatically to improve group control operational performance.	○	○	○
Forecast Allocation Method	Optimal car usage is determined by forecasting traffic and evaluating elevator suitability for the calls.	○	○	○
Minimize Average Waiting Time	Calls are allocated to minimize the average waiting time of passengers.	○	○	○
Minimize Number of Long-Waiting Passengers	When traffic demand is high, this control function minimizes the number of passengers waiting more than 60 seconds.	○	○	○
Minimize Energy Consumption	When there is little traffic, the number of floors the elevator moves to and the number of times the elevator stops can be minimized to reduce energy consumption as much as possible.	○	○	○
Overall Evaluation	The performance of the overall system is improved by evaluating all of the previously registered hall calls as well as the newly registered calls in terms of call allocation.	○	○	○
Multi-purpose Control	Optimal group control is available all the time since details such as waiting time of the basic control target, ratio of waiting passengers, and importance of energy consumption are determined automatically depending on traffic status, allowing flexible response to the traffic stream.	○	○	○

Operation Functions

Standard Feature ○ Optional Feature ★

Feature	Description	Applicable Item by Building Type		
		Office	Hotel	Multiplex Skyscraper
Rush Hour Service (Up)	During rush hour, elevators under group control will return to the base floor during heavy service.	○	★	★
Rush Hour Service (Down)	To minimize the waiting time of passengers going down during rush hour, the down calls are allocated to the nearest elevators.	○	★	★
Peak Traffic Control	Considering other floor services, elevators are allocated to the floors with peak traffic.	★	★	★
Distributed Waiting Function	Idle elevators are distributed to other floors with higher demand.	○	○	○
Allocation in Priority	Elevators with calls for a certain floor are allocated to that floor as a priority.	○	○	○
Automatic bypass	A fully-loaded car will bypass hall calls in order to maintain maximum operating efficiency.	○	○	○
Automatic Separation of an out-of-order Elevator	An out-of-order elevator is separated from group control automatically to isolate its effect.	○	○	○
No Service for Certain Floors	Certain service floors are designated as closed, and elevators do not service such floors.	○	○	○
Group Control including Elevators for the Handicapped	Elevators for the handicapped are included in group control.	○	○	○
Cut Service	Certain elevators are cut out from group control and transferred to independent operation by the cut service hall button.	★	★	★
Service Reservation Indication	When you press the hall button, the Reserved for Service hall lantern turns on to indicate that the service is reserved.	★	★	★
Car Arrival Lantern	The lantern begins flashing 4 or 5 seconds prior to car arrival to alert passengers to the arriving elevator.	○	○	○

Services

Standard Feature ○ Optional Feature ★

Feature	Description	Applicable Item by Building Type		
		Office	Hotel	Multiplex Skyscraper
Independent Operation	Cars can be separated from group control and transferred to independent operation by car calls.	○	○	○
Programmable Door Timer	Timing can be set to automatic control of opening/closing of doors according to the call registered.	○	○	○
Repeating Door Operation	If the door cannot fully close, it will repeatedly open and close a specified number of times.	○	○	○
Door Reopen by Hall Button	If the hall button in the moving direction of the car is pressed when the door is closing, the door will reopen.	○	○	○
Parking	The car can be parked at a specified floor at night or on holidays.	○	○	○
Each Floor Stop	The car can be made to stop at each floor up to its arrival on a specified floor for the purpose of crime prevention during the night or on holidays.	○	○	○
Safety Shoe	If the door cannot fully close because of an object on the door track, it will repeatedly open and close until the object has been removed.	○	○	○
Cancel Reverse Direction Call	Car call registration in the reverse direction can be cancelled.	○	○	○
Anti-Nuisance	Determines the number of people in the car and compares that value to the number of car calls registered. If the number of calls exceeds the number of people in the car, the car call exceeding the number of passengers is not registered.	○	○	○
Car Call Cancel	When the registered car call button is pressed, the car call is cancelled.	○	○	○
Light, Fan Shut-Off	The light and fan in the car are automatically shut off if there is no call registered for a predetermined period of time.	○	○	○
Auxiliary Car Operating Panel	Even when the car is crowded, calls can be registered easily.	★	★	★
Multi-Beam Door Protection	The multi-beam sensor installed in the door senses any obstruction caught in the door, causing the door to reopen, or stay open before the door touches such obstruction.	★	★	★
Photo Eye Door Protection	If the safety ray from the beam sensor in the door is interrupted, the door reopens or stays open.	★	★	★
Voice Guidance System	A synthesized voice instructs passengers on current status, including floor number.	★	★	★
Touch Button	Hall or car calls can be registered only by touching.	★	★	★
Information Display System	Information display installed on each floor and/or inside the car shows traffic information and other necessary information.	★	★	★
EDS (Electronic Display System)	Inside or outside of the elevator or in the building lobby, an TFT-LCD (Thin Film Transistor-Liquid Crystal Display) or PDP (Plasma Display Panel) provides various information such as news, weather, transportation, financial news, music video, and commercials.	★	★	★
Reserving System for Target Floor	The purpose of registration is to automatically select the best service sequence of the elevator car within the system and the passenger does not need to click the car operating button in the car. It manages the elevator more effectively.	★	★	★
LCD Touch Screen	The elevator has an LCD touch screen that gives it a refined, modern style.	★	★	★

Supervisory Operation

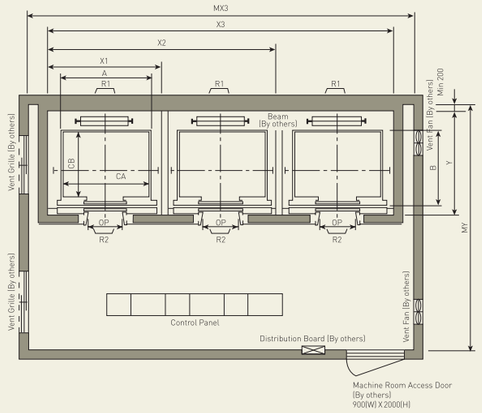
Standard Feature ○ Optional Feature ★

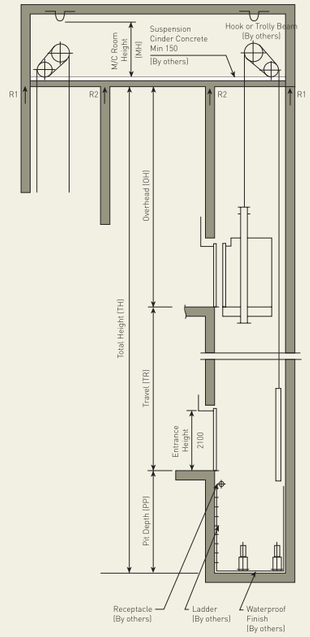
Feature	Description	Applicable Item by Building Type		
		Office	Hotel	Multiplex Skyscraper
Performance Monitoring	The operation and performance of the elevator can be monitored in the machine room.	★	★	★
Earthquake Service - S wave	When the seismic sensor detects an earthquake, all cars stop at the nearest floors to prevent damage.	★	★	★
Earthquake Service - P wave	When the seismic sensor detects a delicate tremor (P wave) before an earthquake (S wave) arrives, all cars stop at the nearest floors to prevent damage.	★	★	★
Fire Emergency Service	When a fire breaks out, all cars are immediately called to the specified rescue floor for service.	★	★	★
Firefighting Operation	Elevators can be used by key switches for firefighting. (Emergency Elevator)	★	★	★
Emergency Power	Service continues by automatically or manually selecting the number of cars powered by the building's emergency power source.	★	★	★
Computer Monitoring System (HELMON)	Monitors operation of all elevators in the building and within the apartment complex. (Floors not to be serviced by the cars can be specified.)	★	★	★
Remote Monitoring System (RMS)	Monitors operation of elevators with RMS remotely by telephone line and computer.	★	★	★

INSTALLATION LAYOUT PLAN & STANDARD DIMENSIONS

The hoistways of the i·XEL occupy a minimum of space. They are the result of joint research and design by Hyundai Elevator's top engineers and designers. In addition to offering outstanding technologies, the hoistways have a high-class design, enabling building owners to use building space to maximum effect and passengers to enjoy a comfortable, beautiful space.

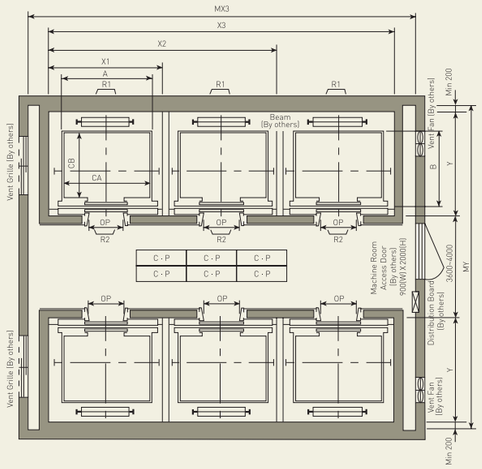
Plan of Hoistway & Machine Room (In-Line Arrangement of 3 Units) / Section of Hoistway

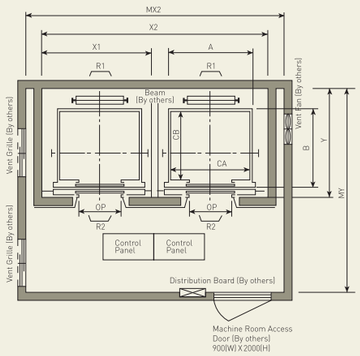




∗ Temperature should be maintained below 40°C and humidity below 90%, with installation of a ventilating fan, ventilating grille, and air conditioner (if necessary). Toxic gas or dust should not be generated.

Face-to-Face Arrangement





Standard Dimensions & Reactions

(Unit : mm)

Speed (M/Min)	Persons/Capacity		Clear Opening	Car		Hoistway				M/C Room				M/C Room Reaction(Kg)	
				Internal	External	1Car	2Cars	3Cars	Depth	1Car	2Cars	3Cars	Depth		
	persons	(kg)	OP	CA x CB	A x B	x 1	x 2	x 3	Y	MX1	MX2	MX3	MY	R1	R2
180	13	900	900	1600×1350	1700×1520	2300	4550	6900	2150	2800	5500	7900	4500	12030	6630
	15	1000	900	1600×1500	1700×1670	2300	4550	6900	2300	2800	5500	7900	4700	12810	6950
	17	1150	1000	1800×1500	1900×1670	2500	4950	7500	2350	3000	6100	8800	4700	13080	7130
			1100	2000×1350	2100×1520	2700	5350	8100	2200	3200	6250	9100	4500		
	20	1350	1000	1800×1700	1900×1870	2500	4950	7500	2550	3000	6100	8900	5000	14360	7650
			1100	2000×1500	2100×1670	2700	5350	8100	2350	3200	6250	9100	4700		
	24	1600	1100	2000×1750	2100×1920	2700	5350	8100	2600	3200	6250	9100	5000	15090	8080
				2150×1600	2250×1770	2850	5650	8550	2450	3400	6500	9400	4900		
210 240	15	1000	900	1600×1500	1700×1670		4600	6950	2350		5600	8200	4900	12810	7800
			1000	1800×1300	1900×1470		5000	7550	2150		5800	8400	4900		
	17	1150	1000	1800×1500	1900×1670		5000	7550	2350		6100	8900	4900	14100	8000
			1100	2000×1350	2100×1520		5400	8150	2200		6200	9000	4900		
	20	1350	1000	1800×1700	1900×1870		5000	7550	2550		6100	8800	5000	15100	8050
			1100	2000×1500	2100×1670		5400	8150	2350		6200	9000	5000		
	24	1600	1100	2000×1750	2100×1920		5400	8150	2600		6400	9000	5000	15700	8100
				2150×1600	2250×1770		5700	8650	2450		6500	9400	5000		
300	20	1350	1000	1800×1700	1900×1920		5100	7700	2650		6200	9100	6000	17800	13200
			1100	2000×1500	2100×1720		5500	8300	2450		6200	9100	5900		
	24	1600	1100	2000×1750	2100×1970		5500	8300	2650		6500	9100	6300	18100	13500
				2150×1600	2250×1820		5800	8750	2500		6500	9400	6200		

∗ 1. The minimum hoistway dimensions are shown in the above table. Some allowances should be made in consideration of the sloping of the hoistways.
2. The above dimensions assume use of cars with center opening doors. Consult Hyundai for dimensions with side opening doors.
3. For elevators with capacity of more than 28 persons, consult Hyundai.
4. When non-standard capacities and dimensions are required to meet the local code, consult Hyundai.
5. The capacity in persons is calculated at 65kg/person. (EN81=75kg/person)
6. The above dimensions are applied in case the door is standard. In case a fire protection door is required, the hoistway size for one car should be applied above X1 dimension plus 100mm.
7. The maximum speed capabilities of Hyundai is 1080m/min. Consult Hyundai.

(Unit : mm)

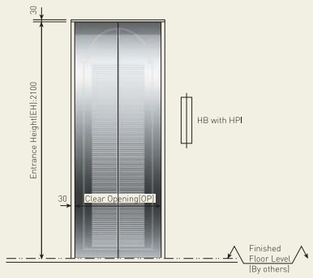
Speed (M/Min)	Overhead (OH)	Top Clearance (TC)	Pit (PP)	M/C Room Height (MH)
180	6000	2300	2700	2500
210	6400	2700	3200	2800
240	7100	3350	3850	2800
300	8000	4000	4200	3000

∗ 1. The above table shows minimum figures. Therefore, some allowances should be made considering errors that may occur during construction.
2. Above dimensions are applied in case car height is 2800 mm. In case car height is over 2800 mm, overhead should be applied above dimension plus additional height.

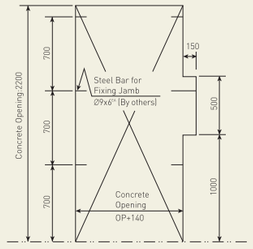
TYPICAL ENTRANCE LAYOUTS

(Unit : mm)

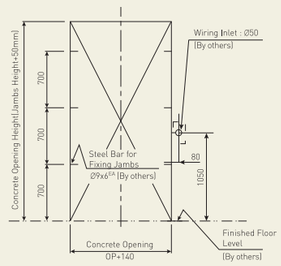
JP050 Type (Standard)



Entrance

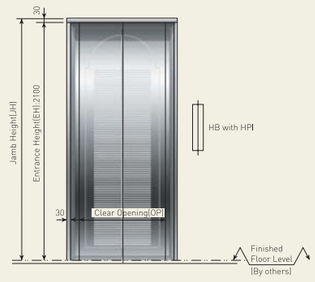


Structural Opening of Entrance

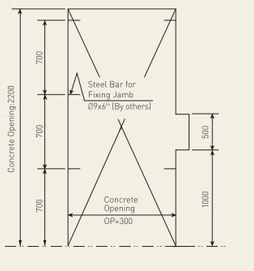


In case of Boxless type Button

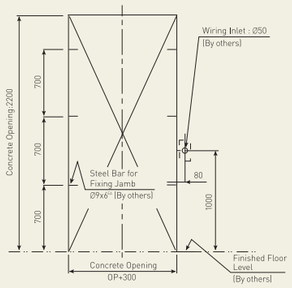
JP100 Type (Optional)



Entrance

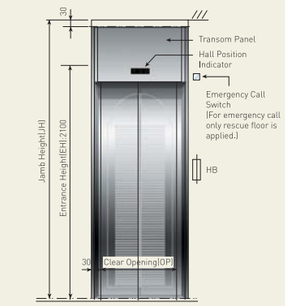


Structural Opening of Entrance

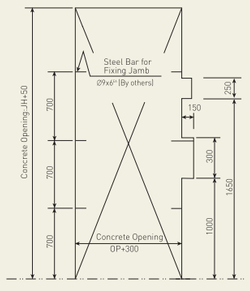


In case of Boxless type Button

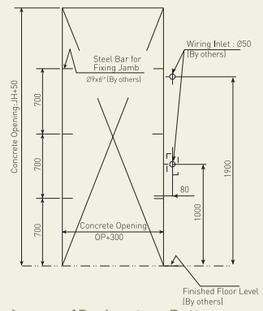
JP200 Type (Optional)



Entrance



Structural Opening of Entrance



In case of Boxless type Button
and Fire man's Switch

WORK TO BE DONE BY OTHER CONTRACTORS

(CONDITIONS FOR ESTIMATE)

The following works are not included in the elevator contract, and shall be done by other contractors in accordance with Hyundai Elevator's drawings and the applicable codes and regulations. The reference rules shown are from Code ANSI.

Building Work

■ **Hoistway**

1. Clear, plumb hoistway with fire resistant hatch walls as required by the applicable code. (Rule 100.1a)
2. 75° bevel guards on all projections, recesses, or setbacks over 50mm except on side used for loading or unloading. (Rule 100.6)
3. Venting of the hoistway as required by the applicable code or responsible authority. (Rule 100.4)
4. Supports for rail brackets at each floor, roof, and machine room. (Rule 200.9)
   Maximum allowable vertical spacing of rail supports without backing. (Rule 200.4 and 301.1)
   Divider beams 100mm between hoistway at each floor and roof, for guide rail bracket supports. (Rule 200.4, 200.9 and 301.1)
5. Recesses supports and patching as required to accommodate hall button boxes, signal fixtures, etc.
6. All barricades either outside elevator hoistways or between inside hoistways as required.
7. Dry pit reinforced to sustain normal vertical forces from rails and buffers. (Rule 106.1b and 109) Consult Hyundai Elevator Company for rail forces and buffer impacts. Where there is space below the pit floor that can be occupied, consult Hyundai Elevator Company for special requirements. (Rule 300.4) Cylinder hole, casings under the pit as required, and backfilling around the cylinder casings when direct plunger type is to be installed.
8. Where access to the pit is by means of the lowest hoistway entrance, vertical iron ladder extending 1060mm minimum above sill of access door. (Rule 106.1d)
9. Entrance walls and finished floor are not to be constructed until after door frames and sills are in place. Door frames are to be anchored to walls and properly grouted in place to maintain legal fire rating.
10. For application as indoor or outdoor observation elevator, a glass enclosure of at least 3.6m in height at the bottom landing is recommended for safety. For use as an outdoor observation elevator, a full-height glass enclosure is required.

■ **Machine Room**

11. Enclosed and protected machine room. (Rule 101.1)
12. Access to the machine room and machinery space as required by the applicable code or responsible authority. (Rule 101.3)
13. Reinforced concrete machine room floor slab or grating, as specified, which must not be placed over the hoistway until elevator machinery is set in position. (Rule 100.3 for Traction Elevator)
    Clear access above ceiling or trench in floor, for oil line and wiring duct from machine room, if machine room is remote from elevator hoistway. (For Hydraulic Elevator)
    Cutout through machine room wall, for oil line and wiring duct as required by Hyundai Elevator's shop drawings. (For Hydraulic Elevator)
14. Hoisting beams, trap doors, and other means of access to machine room for maintenance and equipment removal purposes. (Rule 101.3d)
15. Cable guards in the machine room or secondary level. (Rule 104.1)
16. Supports for machine and sheave beams and reactions including wall pockets and patching after beams are set in place. (Rule 105.1 to 105.5)

Electrical Work

■ **Hoistway**

1. Light outlet for each elevator, in center of hoistway (or in machine room) as indicated by Hyundai Elevator Company.
2. Convenience outlet and light fixture in pit with switch located adjacent to the access door. (Rule 106.1e)
3. Wiring and piping work of emergency bell, interphone, etc. outside the hoistway and the machine room.

■ **Machine Room**

4. Lighting, convenience outlets, ventilation, heating of machine room, and machinery space. (Rule 101.5)
5. Temperature should be maintained below 40°C by a ventilating fan and/or air conditioner, if necessary, and humidity below 90%.
6. A fused disconnect switch or circuit breaker for each elevator and light switch located per the applicable code and where practicable located adjacent to the door of the machine room. (Rule 210.5 and 306.7)
7. Feeder and branch wiring to the controller, including main-line switch and convenience outlets.
8. Suitable power feeder and branch wiring circuits as required for elevators with power-operated doors, including disconnect switch or circuit breaker.

■ **Emergency Provisions**

9. Elevator fireman's and other emergency services wiring and interconnections to automatic sprinkler systems or heat and smoke sensing devices furnished by others and installed to terminal points on the elevator controllers.
10. When emergency power operation of elevators is required, the electrical contractor should coordinate with Hyundai Elevator Company or local distributor for operation requirements.
11. Elevator fireman's and other emergency service requirements may differ from each country. Consult Hyundai Elevator Company or local distributor for other local requirements.
12. When provisions for earthquake protection are required, consult Hyundai Elevator Company for special requirements.

HEAT EMISSION OF MACHINE ROOM

Q(kcal/H)=W x V x F x N
W: Capacity (kg)
V : Speed
F : Factor
N : Number of cars
F :1/40-VVVF

Electric Power Requirements (By others)

(50/60Hz, 380V)

Persons	Capacity (kg)	Speed (m/min)	Motor (kW)	C.B,Rated Current(A)			Transformer Capacity(kVA)			Power Feeder(㎟)			Earth Wire(㎟)		
				1Car	2Cars	3Cars	1Car	2Cars	3Cars	1Car	2Cars	3Cars	1Car	2Cars	3Cars
13	900	180	16.6	50	100	150	18	33	47	10	25	50	6	16	35
15	1000	180	18.4	60	100	150	20	37	52	10	25	50	6	16	35
		210	23.0	75	125	175	26	46	65	16	35	50	10	25	35
		240	26.0	100	150	200	29	52	74	25	50	70	16	35	50
17	1150	180	21.2	75	125	175	24	42	60	16	35	50	10	25	35
		210	25.0	75	150	200	28	50	71	16	50	70	10	35	50
		240	30.0	100	175	225	33	60	85	25	50	70	16	35	50
		300	36.0	125	200	300	40	72	102	35	70	120	25	50	95
20	1350	180	25.0	75	150	200	28	50	71	16	50	70	10	35	50
		210	30.0	100	175	225	33	60	85	25	50	70	16	35	50
		240	35.0	125	200	300	39	70	99	35	70	120	25	50	95
		300	42.0	125	225	350	47	84	119	35	70	150	25	50	120
24	1600	180	30.0	100	175	225	33	60	85	25	50	70	16	35	50
		210	35.0	125	200	300	39	70	99	35	70	120	25	50	95
		240	40.0	125	225	300	44	80	113	35	70	120	25	50	95
		300	50.0	150	300	400	56	100	142	50	120	150	35	95	150

* 1. The above power sizes are for lengths of electric wire up to 50 meters from the elevator machine room to the transformer.
For lengths of 50 meters or more, the following formula should be applied :
Power feeder size (mm^2)= $\frac{\text{Power feeder length(m)}}{50}$ X size in the above (mm^2)

Number of elevator(N)	1	2	3	4	5
Diversity factor	1.00	0.91	0.85	0.80	0.76

2. Above power feeder sizes are for copper wires inside electro-metallic tubing.
3. It is recommended a larger diameter earth wire be used.
4. For installing several elevators, apply the following formula.
   Transformer Capacity (kVA) = Number of elevator X Diversity factor
5. For AC-Geared elevators, consult Hyundai Elevator.
6. Consult Hyundai if you need eletric power requirements for 220V.

Prize & Certification

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