



Hitachi Elevator

VFI-II



HITACHI
Inspire the Next

VFI-II

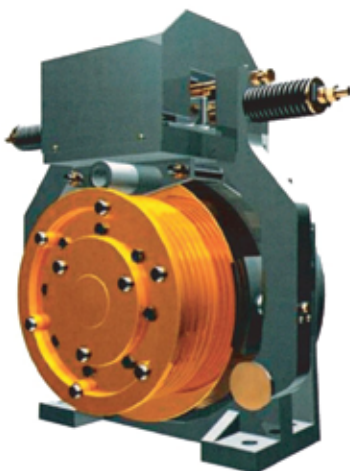
The VFI elevator has been reborn with the latest and most reliable Hitachi technology for a sustainable environment.

The new **VFI-II** elevator serves as an environmentally friendly transportation system to your building in addition to being reliable, safe, comfortable, of high quality and user-friendly.

Energy conservation

A gearless traction machine with Permanent Magnet-type synchronous motor (PM motor) conserves energy by improving power efficiency.

A PM motor is also used in the drive unit for car doors and a direct drive method is employed to realize improved energy efficiency and smoother door opening and closing motions.



Gearless traction machine with PM motor
(By 3D modeling)



PM motor with VVVF door control
(By 3D modeling)

Energy-saving features

Automatic dimming of indication light

The brightness of the elevator hall and car position indicator is dimmed automatically after a preset duration when elevator is idle.

Automatic turn-off of elevator light and fan

In the event that the elevator is idle, the light and ventilation fan in the elevator are automatically turned off to conserve energy.

Hall and car buttons using LED light

Hall and car buttons utilizes LED lights which consumes less energy.

Hall lanterns (optional) using LED light

Hall lanterns using LED light are available for your selection.

Regenerative system (optional)

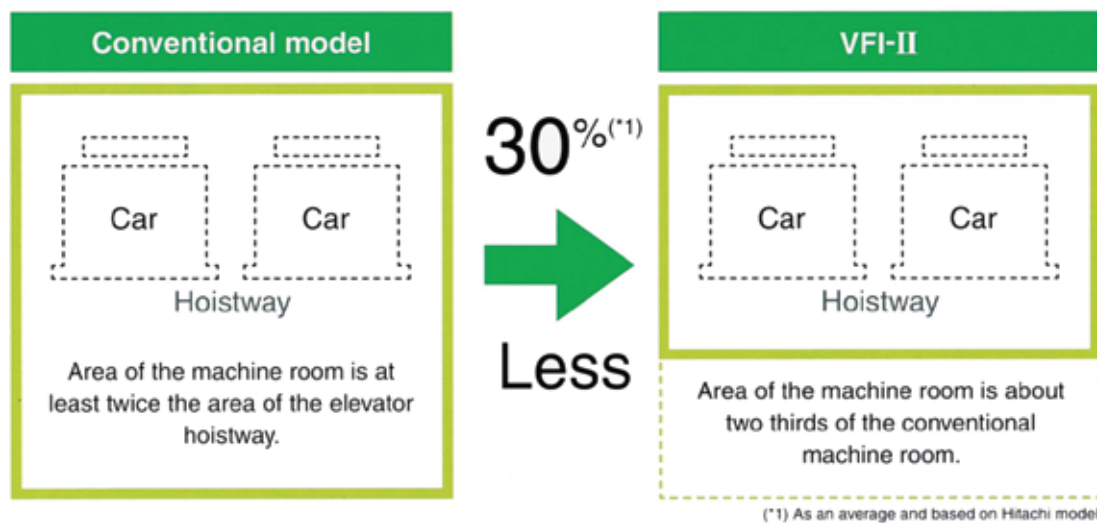
Making use of the energy generated by an elevator when traveling downwards with a heavy car load or upwards with a light car load, the traction machine acts as a power generator to transmit power back to the electrical network in the building.

Energy-saving preference control (applicable to FI-600 group control only)

As one of the standard functions of the FI-600 group control system, the number of elevators in service is reduced when traffic demand is low. This reduces energy consumption.

Space-saving design

The **VFI-II** elevator requires a smaller machine room size through the use of slimmer traction machine, control panel and machine room equipment. This allows flexibility in building design through maximizing the usage of building space.

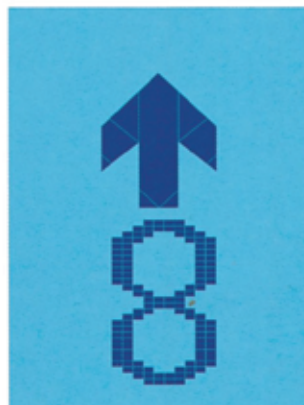


The human touch

The **VFI-II** elevator provides a comfortable ride and appeals to different aspects of the human sense, touch, sight and hearing - by stainless steel button, LCD display, voice synthesizer and multi-beam door sensor.



Touch: stainless steel hairline and LED light



Sight: LCD (monochrome) car position indicator

Hearing: Voice synthesizer (optional)

Preset standard messages are announced to the passengers by a voice synthesizer.

The human touch: Multi-beam door sensor

In the event that the beam paths are obstructed this sensor, installed on the edge of the doors, will keep the doors open.

Standard Car and ceiling design



ST-I(CS-101S) Ceiling design

Center : Milky white acrylic
 Surrounding : Painted sheet steel
 Lighting : Fluorescent
 Height (from floor) : 2350mm

Side and rear walls (3 sides)
 Painted sheet steel

Front return panel/ transom panel
 Stainless steel hairline

Kickplate
 Stainless steel hairline

Car door
 Painted sheet steel

Flooring
 Vinyl tile

Door sill
 Extruded hard aluminum

Car position indicator ^(*)
 LCD (monochrome), incorporated into car operating panel

Ventilation
 Air-blown through ceiling duct



OPE-10A-TNS3 ^(*) Operating panel

Face plate
 Stainless steel side edge

Button type
 TNS-3

Indicator Type
 LCD (monochrome)

Standard Entrance design



AS-1X Type Jamb

Jamb frame
Painted sheet steel, 50mm wide

Door panel
Painted sheet steel

Door sill
Extruded hard aluminum



VIB-10A-TNS3



VIB-10AD-TNS3
(Duplex)

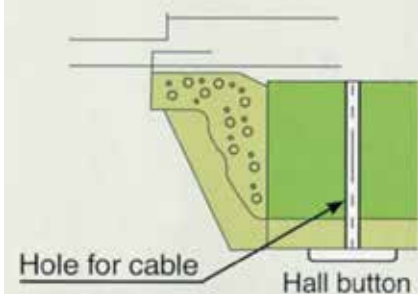
Surface-mount type hall button and indicator

Face plate
Stainless steel hairline

Button type
TNS-3

Indicator type
LCD (monochrome)

Surface-mount type minimizes building interfacing



(*1) In case the number of floor buttons is more than 20, OPE-10B-TNS3 shall be applied.

Optional Car and ceiling designs

Car and ceilings



Side and rear walls (3 sides)
Stainless steel hairline

Front return panel/ car door/ transom panel
Stainless steel hairline

Operating panel type
OPE-10A-TNS3

Kickplate
Stainless steel hairline

Flooring
Vinyl tile

Door sill
Extruded hard aluminum

Car position indicator
LCD type, incorporated into car operating panel (monochrome)

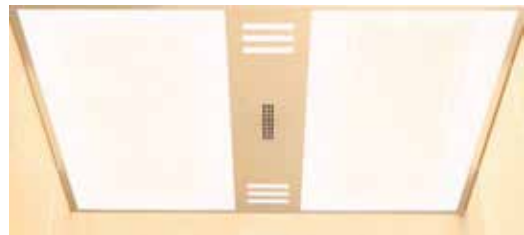
Ventilation
Air-blown through ceiling duct

DX- series



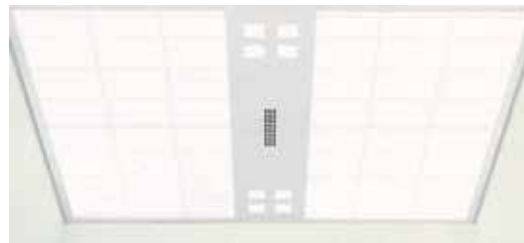
DX-I (DX-201) Ceiling Design

Ceiling :
Center Portion: Painted sheet steel
Both Sides: Milky white acrylic with semi indirect lights
Surrounding Portion: Painted sheet steel
Height (from floor): 2300mm



DX-II (DX-202) Ceiling Design

Ceiling :
Center Portion: Painted sheet steel
Both Sides: Milky white acrylic with semi indirect lights
Surrounding Portion: Painted sheet steel
Height (from floor): 2300mm



DX-III (DX-203) Ceiling Design

Ceiling :
Center Portion: Painted sheet steel
Both Sides: Milky white acrylic with semi indirect lights
Surrounding Portion: Painted sheet steel
Height (from floor): 2300mm

LX- series



LX- I (EX-401) Ceiling Design

Ceiling :
Center Portion : Painted sheet steel
Curved Portion : Painted sheet steel
Surrounding portion : Painted sheet steel
Height (from floor) : 2300mm.
Center of curved : 2565mm.
Both Sides : 2250mm.



LX- II (SL-102) Ceiling Design

Upper portion : Painted sheet steel (with emergency hatch)
Both sides : Painted sheet steel
Lighting : Fluorescent & Down light
Height (from floor) : Upper 2470mm,
Lower 2300mm

EX- series



EX-I (EX-403) Ceiling Design

(Applicable for car loading of 600kg and above)
Center : Milky white acrylic
Center decoration : Painted sheet steel
Surrounding : Painted sheet steel
(with acrylic lens)
Lighting : Fluorescent
Height (from floor) : Upper 2425mm.
Lower 2300mm.



EX- II (H-401) Ceiling Design

Ceiling :
Lighting : Semi indirect light with milky white
acrylite
Ceiling : Painted sheet steel
Height (from floor) :
Center Portion : 2500mm.
Surroundings portion 2300mm.

Optional Entrance designs

Entrances

Jamb frame

TS-1X (wide) type,
stainless steel hairline

Door panels

Stainless steel hairline

Landing sill

Extruded hard aluminum



Jamb frame

TS-1X (wide) type,
painted sheet steel

Door panels

Painted sheet steel

Landing sill

Extruded hard aluminum



Jamb frame

TL-2X (wide) type with transom panel,
painted sheet steel

Door panels

Painted sheet steel

Landing sill

Extruded hard aluminum



Jamb frame

SL-2X (wide) type,
stainless steel hairline

Door panels

Stainless steel hairline

Landing sill

Extruded hard aluminum

Optional Car and Entrance fixtures

Operating panels

Hall buttons & Indicators



OPE-10B-TNS3

Face plate
Stainless steel hairline

Button type
TNS3

Indicator type
LCD (Monochrome)



HNLX

Surface-mount type hall indicator
Face plate :
Stainless steel hairline

Indicator type :
LCD (monochrome)



BN-TNS3

Surface-mount type hall button
Face plate : Stainless steel hairline

Optional Car and Entrance fixtures

Hall lanterns (when group control system is employed, HYD-94 Type hall lanterns are provided as a standard.)



HYD-94

Surface-mount type hall lantern
Face plate : Stainless steel hairline



VLS-115

Vertical hall lantern
Face plate : Stainless steel hairline



HYD-93

Surface-mount type hall lantern
Face plate : Stainless steel hairline



L-03



L-37

Vertical hall lantern
Face plate : Stainless steel hairline

Intelligent group control system

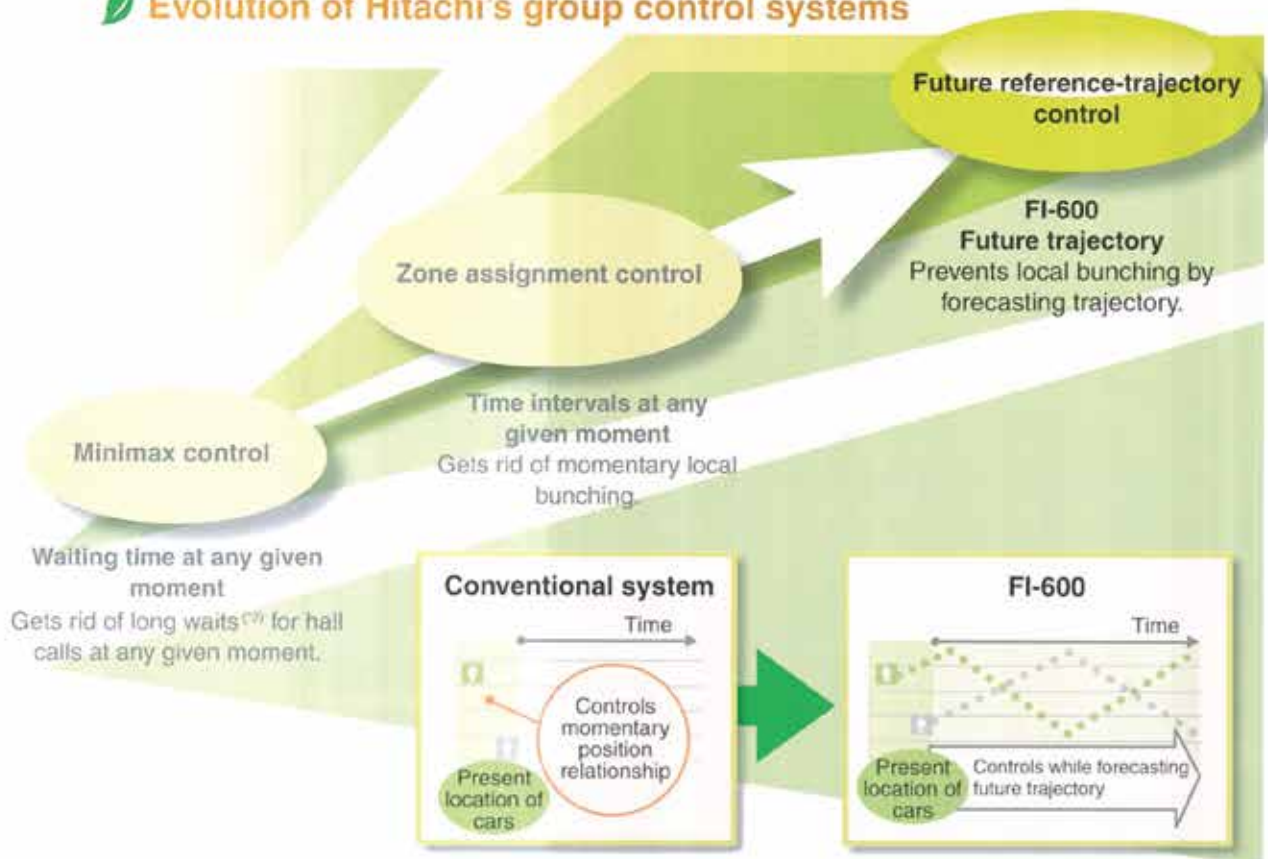
VFI-II comes with Hitachi's new group control system, FI-600

Shortening waiting times and reducing the probability of a long wait^(*) are always the most critical concerns of group control systems.

Hitachi has been striving for the development of control algorithms to address these concerns. A new algorithm, "Future reference-trajectory control" is used for the FI-600.

The probability of a long wait^(*) is minimized by operating elevator cars at equal time intervals while forecasting future trajectories.

Evolution of Hitachi's group control systems



With our proprietary algorithm, "Future reference-trajectory control", changes in traffic demand are taken into account.

A future reference-trajectory control algorithm that forecasts the future trajectory of elevator cars is implemented in FI-600. FI-600 is a next-generation elevator group supervisory control system using advanced forecasting trajectory technique, by means of a high performance RISC* micro-controller and intelligent processing application technology.



Using this algorithm, you can determine and configure the optimum trajectory by taking into account not only the past and present usage data, but also the trend of future traffic demand. This allows the system to cope with the change in status flexibly and quickly, optimizing the allocation and operation of elevator cars for every user.

*RISC: Stands for Reduced Instruction Set Computer. It is a microprocessor that implements high-speed operation with a small number of simple instructions.

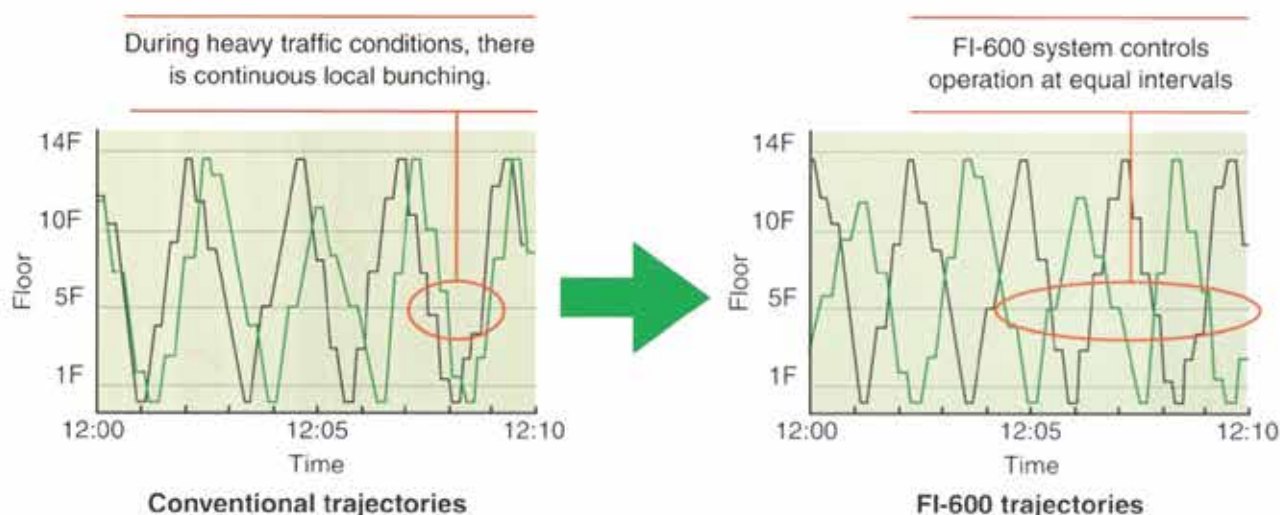
What is future reference-trajectory-control?

Generally speaking, a group of elevator cars must be operated at equal time intervals to minimize passenger waiting times, but in heavy traffic conditions, cars are frequently operated in a bunch, or all cars would end up clustering around the same level on their way and moving in the same direction in unison. In the conventional group control method, the most available cars at that moment are allocated to hall calls to eliminate local bunching, but when heavy traffic conditions are prolonged, this state cannot be completely eliminated, resulting in long waiting times. In contrast, with future reference-trajectory control, elevator cars are controlled by taking into account their forecasted trajectories, allowing shorter passenger waiting times and reducing the probability of a long wait^(*).

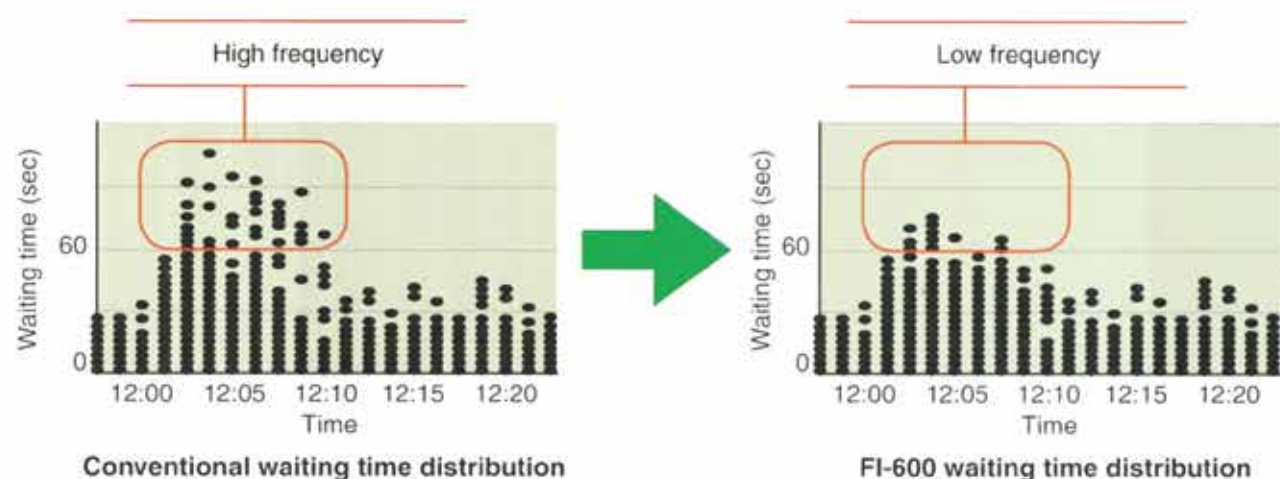
Major advantages of FI-600

The FI-600 controls the fluctuation in waiting times, thereby shortening the average waiting times, reducing the probability of a long wait^(*) during heavy traffic, and improving the "quality of waiting times" of users.

Reduce average waiting time by as much as 10% ^(*)



Reduce probability of a long wait ^(*) by up to 12% ^(*)



(*) Comparison is based on Hitachi's conventional group control system.

(*) "Long wait" is defined as waiting times of more than 60 seconds.

FI series group control system

- Standard specification
- ▲ Optional specification
- Not applicable

Basic functions

No.	Function		Description	FI series		
				600	100	10
1	Instantaneous reservation and service forecasting (FI-IRF)		Upon receipt of a hall call, this function activates an elevator to serve this call, and at the same time the call is acknowledged by the hall lantern and chime.	●	—	—
2	Arrival notice indication (FI-ANI)		Four to five seconds prior to the arrival of an elevator, this function will activate the hall lantern flickering and the chime sound.	●	●	▲
3	Basic call assignment control	Future reference-trajectory control (FI-FRTC)	Controls the allocation of elevator cars to hall calls according to the future reference trajectory resulting from learning-based daily traffic flows.	●	—	—
4		Reference-trajectory control (FI-RTC)	Controls the allocation of elevator cars to hall calls based on the theory used in the highest model in the FI series, FI-600, and the intelligent-based data containing our know-how accumulated over a long period of time.	—	●	—
5		Ring control (FI-RC)	Allocates an elevator car closest to the floor where a new hall call is made.	—	—	●
6	Bunching prevention (FI-BP)		This function prevents local bunching of elevator cars using the "future reference-trajectory control" or the "reference trajectory control" for operating cars at equal time intervals.	●	●	—
7	Learning function	Collection of usage data (FI-CUD)	Collects the traffic status information by floor and direction for a unit time based on the elevator information such as car positions and the number of passengers getting on and off, and hall call information.	●	●	—
8		Recognition of traffic flow mode (FI-RTM)	Extracts characteristics at any given moment, including congested floors, from the collected usage data, and identifies the traffic flow mode at that moment.	● 40 mode	● 2 mode	—
9		Search for optimum operation program (FI-SOP)	Searches the optimum operation program of the moment based on the identified traffic mode.	●	●	—
10	Congested floor recognition (FI-CFR)		Identifies congested floors according to the usage data learned in each traffic flow mode.	●	—	—
11	Service forecasting for hall call assignment (FI-SFH)		This function assigns elevator cars to hall calls more precisely by forecasting the arrival time and number of passengers in the car according to the learning-based traffic demand.	●	—	—
12	Intelligent function	Generation of new traffic flow modes (FI-GNT)	Extracts new characteristics according to the learning-based usage data, and registers them as a building-specific new traffic flow mode.	●	—	—
13		Generation of optimum operation programs (FI-GOP)	Generates an optimum operation program for a building by simulating the elevator operation according to the usage data learned in each traffic mode and preferential control target.	●	—	—
14	Energy-saving preference control (FI-ESC)		This system reduces the number of elevator cars in service when traffic demand is low.	●	—	—
15	Floor standby control	Forecasting dynamic allocation control (FI-FDA)	Dynamically allocates elevator cars in response to continuously changing situations in the building by determining the area assigned to each car according to the forecasted number of passengers and car usage.	●	—	—
16		Zone distribution control (FI-ZD)	Distributes the idle elevator cars to the pre-assigned zones.	—	●	—
17		Fixed floor distribution control (FI-FD)	Distributes the idle elevator cars to the pre-assigned floors.	—	—	●
18	Learning-based concentrated service (FI-LCS)		Centralizes the service to the learning-based congested floors during peak times including morning, lunch time and evening peaks while taking the service for other floors into account.	●	—	—
19	Automatic door open time control (FI-ADT)		This function automatically controls the duration of the door open time according to the floor and the kind of call (hall call or car call) as well as the elevator condition.	●	●	—

Operating functions

- Standard specification
- ▲ Optional specification
- Not applicable

No.	Function	Description	FI series		
			600	100	10
20	Centralized control for special floors (FI-CCF)	This function preferentially assigns an elevator to the special floor (e.g. the director's room).	▲	—	—
21	Service floor selection (FI-SFS)	Allows the operator to select the service and non-service floors using, for example, the switches on the control panel.	▲	▲	—
22	Independent automatic operation (FI-IAO)	This operation allows an elevator to be separated from the group supervisory control and operate independently by a separate hall button.	▲	▲	▲
23	VIP service (FI-VIP)	When welcoming or sending off important guests, this function permits an elevator to be summoned directly to the desired car call floor by pushing a specially provided hall button.	▲	▲	▲
24	Closest car priority service (FI-CPS)	When a hall call button is pressed, the elevator car in the shaft closest to the hall call floor is preferentially dispatched.	▲	▲	—
25	Destination floor reservation system (FI-DFRS)	Allows the passenger to preselect the destination floor on the destination floor panel installed at the landing hall. This reduces button operations to one, improving the operability.	▲	—	—
26	Scheduled reservation system (FI-SRS)	Allows the operator to schedule various elevator services in the building, including the reassignment of service floors, centralized service and priority service, at a specific date and time (setting through XEMS is also possible).	▲	—	—
27	Zoning express service (FI-EZS)	Starts a divided express service when the peak traffic demand takes place in the preset time zones.	▲	—	—

Man-machine functions

No.	Function	Description	600	100	10
28	Hall information (FI-HI)	General and elevator operation information is indicated on the LED or LCD hall indicator.	▲	▲	—
29	Car information (FI-CI)	Information useful for passengers is presented on the LED or LCD car indicator.	▲	▲	—
30	Traffic follow door control (FI-TFDC)	The door open time is adjusted by detecting passengers getting on and off with multiple infrared light beams that cover the full height and width of elevator doors.	●	▲	▲

System backup functions

No.	Function	Description	600	100	10
31	Group management A.I. microprocessor malfunction recovery system (FI-AMR)	If the A.I. micro-processor malfunctions, this system will allow hall call assignments to be carried out by choosing from standard modes of traffic flow.	●	—	—
32	Group management operation microprocessor malfunction recovery system (FI-OMR)	When the active micro-controller in the dual system fails, the standby micro-controller takes over the group control to continue operation.	●	—	—
33	Hall call circuit malfunction recovery system (FI-HMR)	In the event that the associated hall call button is not responsive, other hall call buttons located on the same floor can be used for registering hall calls.	●	●	●
34	Group management control system malfunction recovery system (FI-GMR)	When the group management control system malfunctions, this system activates the "skip/ stop" operation for all elevators, covering either the odd number or even number floors with respect to the lowest floor.	●	●	—
35	Individual signal or control microprocessor malfunction recovery system (FI-SMR)	When individual control microprocessor malfunctions, or when miscommunication is detected, this system isolates the elevator from the group management control immediately.	●	●	●
36	Individual control malfunction recovery system (FI-CMR)	If the hall call is not responded to for a certain period of time due to, for example, a fault in the mechanical shoe of the door, the failed section is disconnected from the group control until normal operation is resumed.	●	●	●

Operating systems and functions

Depending on your requirements and the number of elevators in a group, customers can choose from a range of collective control systems, group control systems (including FI-series group control system) and operating systems. There are also basic and optional functions which you can choose from, depending on the building type and building requirements.

Operating systems

Legend STD: Standard
OPT: Optional

No.	Name	Description	STD	OPT
1	Simplex collective control (CCTL)	This is a fully automatic operation used for a single elevator system. Hall calls in the direction in which the elevator is travelling are responded to sequentially and when all calls in that direction are cleared, calls in the opposite direction will be responded to. When there are no more calls, the elevator will stay on the last floor served.	●	
2	Duplex collective control (DCTL)	This is a fully automatic operation used for a two-elevator system. Hall calls are responded to by whichever elevator that can serve the hall call faster. When there are no more calls, one of the elevators will standby on the start floor while the other elevator will stay on the last floor served.		●
3	Group control See "FI series group control functions" for more details.	FI-600 This is a group control system used to operate three to eight elevator cars in a large-sized building. This control system consists of 3 smart systems: "future reference- trajectory control", "learning system" and "intelligent system".		●
4		FI-100 This is a group control system used to operate three to six elevator cars in a medium-sized building. This system uses "reference-trajectory control", which is based on the theory used in the highest model of the "future reference-trajectory control".		●
5		FI-10 This is a simplified group control system used to operate three or four elevator cars. The system provides a ring control to allocate the elevator car closed to the floor where a new hall call is registered.		●
6	Down collective control (DWCC)	For this system, all floors have "down" call buttons only, except for the start floor, where there is "up" call button only. The other operations are the same as in simplex selective-collective and duplex selective-collective operations.		●
7	Attendant operation (ATT)	For this system, the stop floor is manually set by an attendant, such as in a department store.		●
8	Independent operation (INOC)	This operation system is used when there is a need to serve special passengers. Under this operation, all hall calls are disabled and the elevator is reserved for exclusive use of the special passengers.		●

Safety functions

No.	Name	Description	STD	OPT
1	Multi-beam door sensor (MBDS)	In the event that the beam paths are obstructed, this sensor, installed on the edge of the doors, will keep the doors open.		●
2	Door safety return system (ORS)	In the event of door overload, such as when passengers get their fingers, hands or personal belongings caught in the door, this system automatically senses this and either re-closes or re-opens the doors to prevent injury.	●	
3	Interphone system (INPS)	An interphone system is provided for emergency communication between the elevator car and the master unit (in the supervisory panel, etc.).	●	
4	Car emergency lighting (CEML)	In the event of power failure, an emergency light inside the elevator car will be automatically activated.	●	
5	Nearest landing operation (NLNO)	In the unlikely event of temporary trouble during operation, the elevator automatically goes to the nearest floor at a low speed and doors will open to prevent passengers from being trapped inside.	●	
6	Overload detection system (OLDS)	In the event of overloading, this system will activate an audio/ visual alarm and prevent the elevator from moving.	●	
7	Door Safety edge (one side) (DSEB)	Mechanical safety units are installed on one side of the elevator doors. In the event of passengers coming into contact with the safety edges of closing doors, the doors will immediately re-open.	●	
8	Door Safety edge (both sides) (DSEB)	Mechanical safety units are installed on both sides of the elevator doors. The function is the same as above.		●
9	3D door safety device (3DDS)	This device detects passengers getting on or off the elevator, keeping the doors open as long as passengers are within the area of detection.		●
10	Abnormal speed protection function (ASPF)	In the event that the elevator is moving downwards at an abnormally high speed, the brakes will be automatically engaged and the elevator will cease operation.	●	
11	Out of door-open zone alarm (ASOZ)	In the event that the elevator stops out of the door-open zone of a selected floor, doors will not open, and an alarm will be sounded in the elevator car.	●	

Service functions

Legend STD: Standard
OPT: Optional

No.	Name	Description	STD	OPT
1	Mischievous call cancellation (MCCC)	In the event that a large number of calls is registered by a small number of passengers, the calls are determined to be mischievous and will be automatically cancelled upon responding to the next call. This thus eliminates unnecessary stops.	●	
2	Door time adjustment (DTAD)	The duration of the door open timing is tailored to usage conditions, substantially improving operational efficiency.	●	
3	Floor "deselect" function (FDSF)	This function allows you to cancel the selection of a floor you have pressed accidentally by pressing the button again. (This thus eliminates unnecessary stops.)	●	
4	Automatic return function (ARTF)	After all the calls have been served, the elevator will return to the start floor for standby.	●	
5	Door open prolong button (DOPB)	In the event that this button on the car operating board is pressed, the elevator doors will remain open for a pre-set period of time.		●
6	Automatic bypass operation (ABPO)	In the event that the elevator is fully loaded, the elevator will not respond to any hall calls but will only respond to the car calls.		●
7	Sub-operating panel (SOPB)	Additional floor selection and door open/ close buttons are located on the opposite side of the main operating panel in the elevator. This will be extremely convenient during rush hours.		●
8	Keypad sub-operating board (KSOP)	In order to comply with the barrier-free code, especially for high-rise buildings, individual car call buttons can be replaced with a keypad system.		●
9	Voice synthesizer (VSYS)	Preset standard messages are announced to the passengers by a voice synthesizer.		●
10	Arrival signal (ASGN)	An electronic chime (located at the top and bottom of the elevator) will be sounded just before the arrival of the elevator.		●
11	Interfacing with BGM speaker (BGMS)	A speaker for background music and public announcements for the building can be installed in the elevator car. Music and announcement systems, including wiring, is to be provided by others.)		●

Emergency operations

No.	Name	Description	STD	OPT
1	Earthquake emergency operation (EEMO)	In the event that an earthquake is detected, the elevator will stop at the nearest floor. (This function is not applicable to buildings with private lobby layouts.)		●
2	Fire emergency operation (FEMO)	In the event of fire, the elevator is automatically brought to the designated floor where it remains inoperative for passengers' safety.		●
3	Emergency operation for power failure (EPFO)	In the event of building power failure, the elevator can be operated by the building standby generator to move the elevator to the designated floor.		●
4	Automatic rescue device for power failure (ALP)	In the event of building power failure, the elevator automatically switches to battery power to bring the elevator to the nearest floor. (This function is not applicable to buildings with private lobby layouts.)		●
5	Fireman operation (FMNO)	In the event that the fireman switch is turned on, the elevator returns to the designated floor and will be ready for firemen's use.		●

Operating systems and functions

Management functions

Legend STD: Standard
OPT: Optional

No.	Name	Description	STD	OPT
1	Automatic turn-off of elevator light and fan (ATFL)	In the event that the elevator is idle, the light and ventilation fan in the elevator are automatically turned off to conserve energy.	●	
2	Maintenance operation (MTNO)	In the event that elevator maintenance is being carried out, the elevator operates at a lower speed.	●	
3	Parking operation (PKGO)	The elevator can be parked at a designated floor with a key switch.		●
4	Rush-hour schedule operation (RHSD)	By programming the rush-hour time, during this preset rush-hour timing, all the elevators automatically return to the start floor after serving the last call.		●
5	Floor lock-out operation (FLLO)	Specific service floors can be locked out by activating a switch.		●
6	Floor lock-out operation by Cipher code (ROCC)	By inputting a pre-programmed code using the car operating board floor buttons, only restricted passengers can gain access to certain floors.		●
7	Intelligent operation security system (IPSS)	This function allows controlled access to certain floors by means of a password or ID card. Note: Keypad or ID card-reader system is to be provided and installed by others, interfacing shall be by means of dry (voltage-free) contacts.		●
8	Interfacing with closed-circuitTV (CCTV)	This system enables the security personnel to monitor the movement inside the elevator. This will be effective in preventing criminal and mischievous acts inside the elevator. (CCTV system, including wiring, is to be supplied by others.)		●
9	Supervisory panel (SVP)	This panel provides various supervisory operations, including communication, and status monitoring.		●
10	Extensible Elevator Monitoring System (XEMS)	This system shows the real time situation of the elevators such as the elevator position, movement direction and abnormal operation on the PC (Personal Computer) display. It is also possible to turn on/ off the elevators and change the service floors of the elevators using the PC.		●

List of designs and finishes

Car designs

No.	Item	Finishes / Design / Type	STD	OPT
1	Ceiling	Standard (CS-101S)	●	
2		DX-series (DX-I,DX-II,DX-III)		●
3		LX-series (LX-I,LX-II)		●
4		EX-series (EX-I,EX-II)		●
5	Car wall (3 sides)	Painted sheet steel	●	
6		Stainless steel hairline		●
7		Stainless steel hairline etched		●
8	Front return panel & Transom panel	Stainless steel hairline	●	
9		Stainless steel hairline etched		●
10		Stainless steel hairline mirror		●
11	Door	Painted sheet steel	●	
12		Stainless steel hairline etched		●
13		Stainless steel hairline mirror		●
14	Kickplate (3 sides)	Stainless steel hairline	●	
15	Sill	Extruded hard aluminum	●	
16	Operating panel	Stainless steel hairline with LCD indicator ^(*) (OPE-10A) ^(*)	●	
17		Stainless steel hairline with LCD indicator (OPE-10B)		●
18		Stainless steel face plate without Braille (TNS3)	●	

List of designs and finishes

Entrance designs

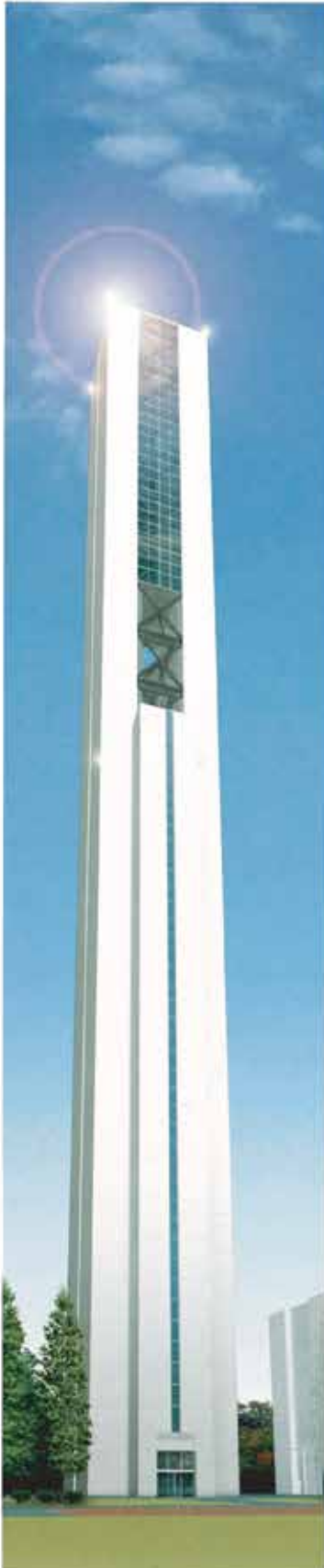
Legend STD: Standard
OPT: Optional

No.	Item	Finishes / Design / Type			STD	OPT
1	Jamb frame	Narrow type (AS-1X)		Painted sheet steel	●	
2				Stainless steel hairline		●
3				Stainless steel mirror		●
4		T-wide type	Without transom panel (TS-1X) With transom panel (TL-2X)	Painted sheet steel		●
5				Stainless steel hairline		●
6				Stainless steel mirror		●
7		S-wide type	Without transom panel (SS-1X) With transom panel (SL-2X)	Painted sheet steel		●
8				Stainless steel hairline		●
9				Stainless steel mirror		●
10	Sill	Extruded hard aluminum			●	
11	Door	Painted sheet steel			●	
12		Stainless steel hairline				●
13		Stainless steel hairline etched (Hitachi standard pattern)				●
14		Stainless steel mirror				●
15		Stainless steel mirror etched (Hitachi standard pattern)				●
16	Hall button and Indicator ^(*)	Incorporated type	Surface-mount type	(VIB-10A) (VIB-10AD)	●	
17		Separated type	Surface-mount type	(BN)		●
18			LCD, surface-mount type	(HNLX)		●
19	Hall button	Stainless steel surface plate without Braille		(TNS3)	●	
20	Hall lantern	Vertical type	Surface-mount type	(HYD-93) (HYD-94)		●
21				(L-03) (L-37) (VLS-115)		●

(*) In case the number of floor buttons is more than 20, OPE-10B-TNS3 shall be applied.

(*) Hall indicator is not recommended for FI-600 and FI-100 operations.

Research and development



Hitachi is always in the process of developing new technologies for next generation products through continuous research and development activities.

Excellence and flexibility in design at manufacturing plant in Thailand



An integrated engineering system - from development, to design and production



Head office, research centers and plants work closely together to develop new technologies

Staff throughout the company work together as one team to conduct research and develop technologies.

High performance simulator enhances overall elevator system efficiency

A high performance simulator is utilized for all stages of elevator development, from planning through system design. Planning, research and development are carried out according to the results of this statistical analysis.

Cutting-edge CAD/CAM systems

The latest in CAD/CAM systems help us carry out elevator layout and various other design and production steps more quickly and efficiently.



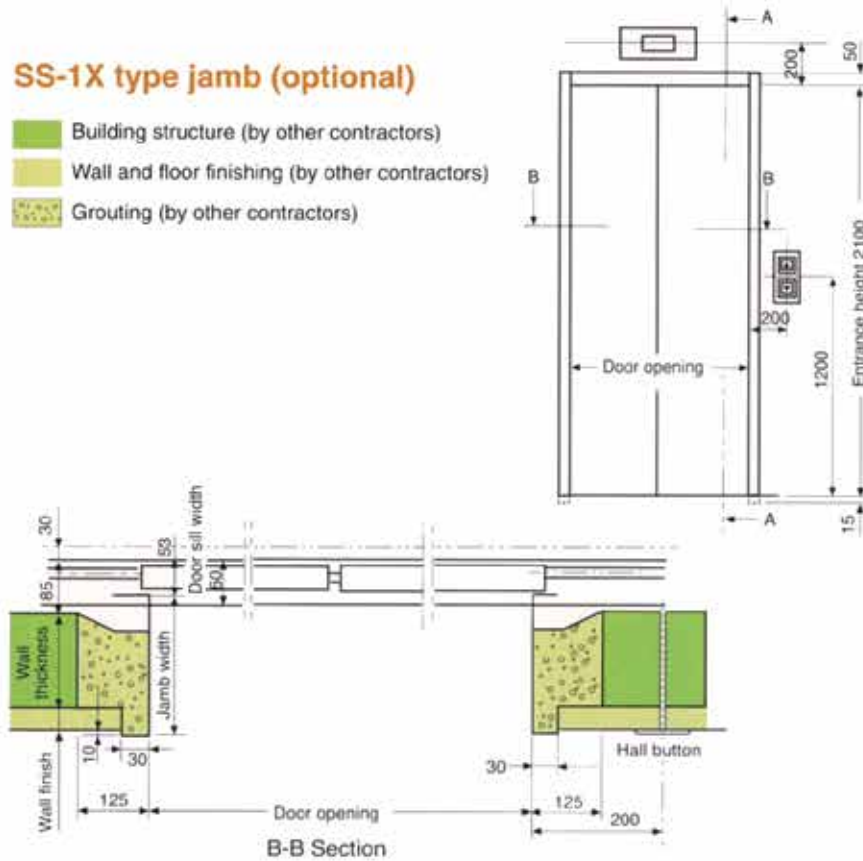
One of the tallest elevator research towers. (Left: Photo)
Hitachi has one of the tallest elevator research towers, enabling the research and development of ultra-high speed and large-capacity elevators.

Entrance details

(For two panel center opening door)

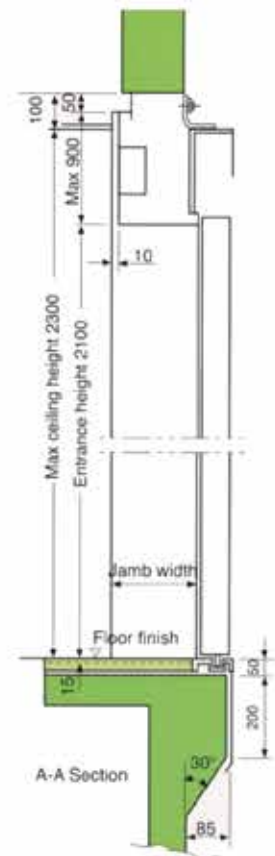
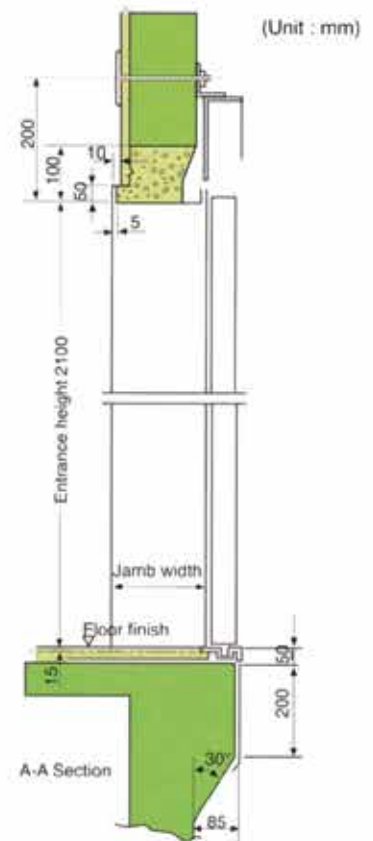
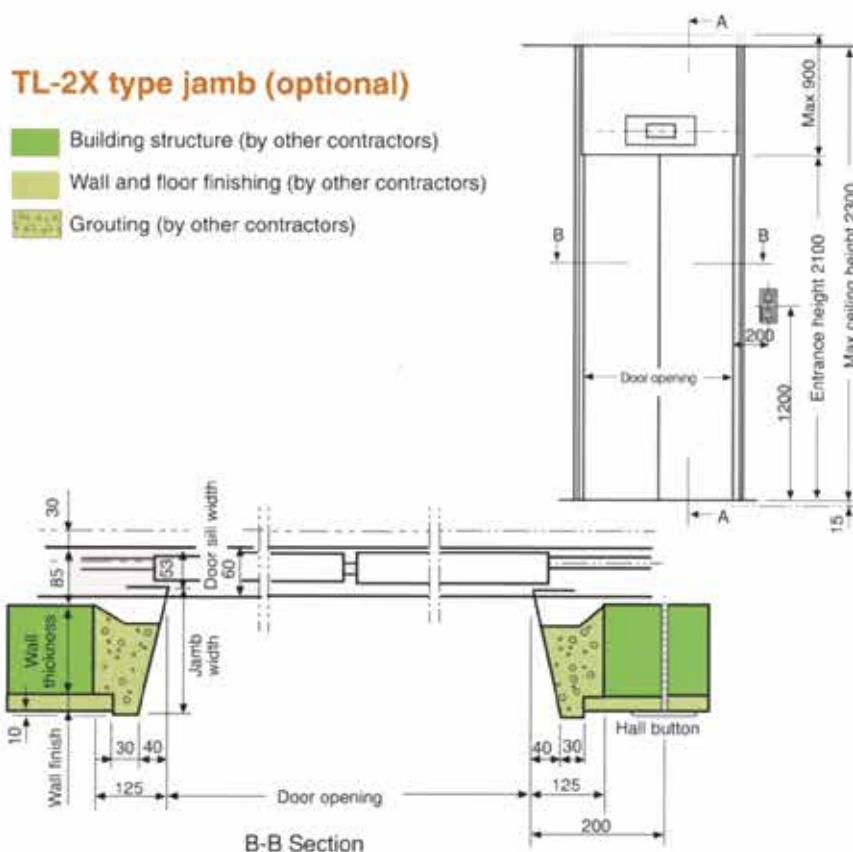
SS-1X type jamb (optional)

- Building structure (by other contractors)
- Wall and floor finishing (by other contractors)
- Grouting (by other contractors)






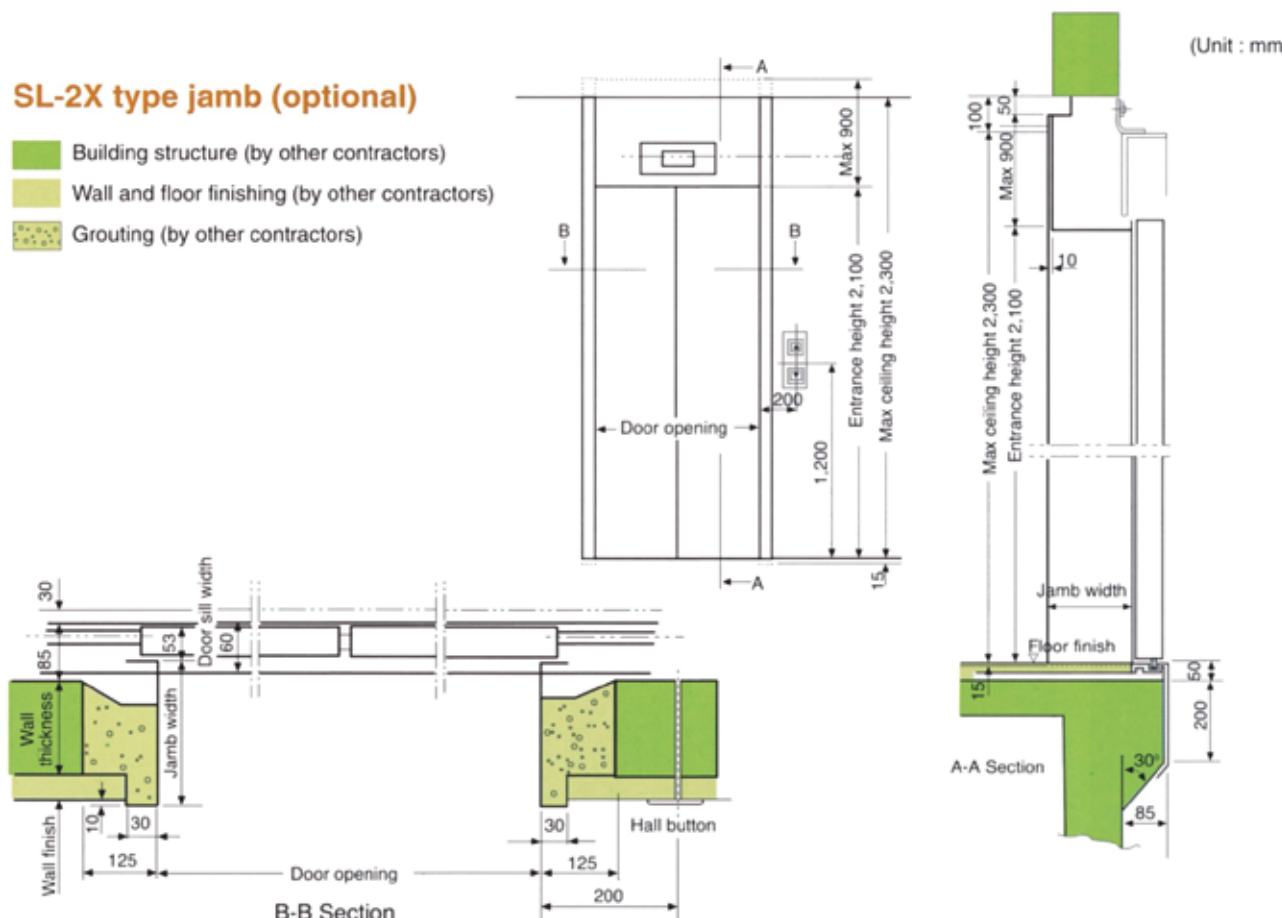
TL-2X type jamb (optional)

- Building structure (by other contractors)
- Wall and floor finishing (by other contractors)
- Grouting (by other contractors)



SL-2X type jamb (optional)

-  Building structure (by other contractors)
-  Wall and floor finishing (by other contractors)
-  Grouting (by other contractors)



Work to be done by building contractors

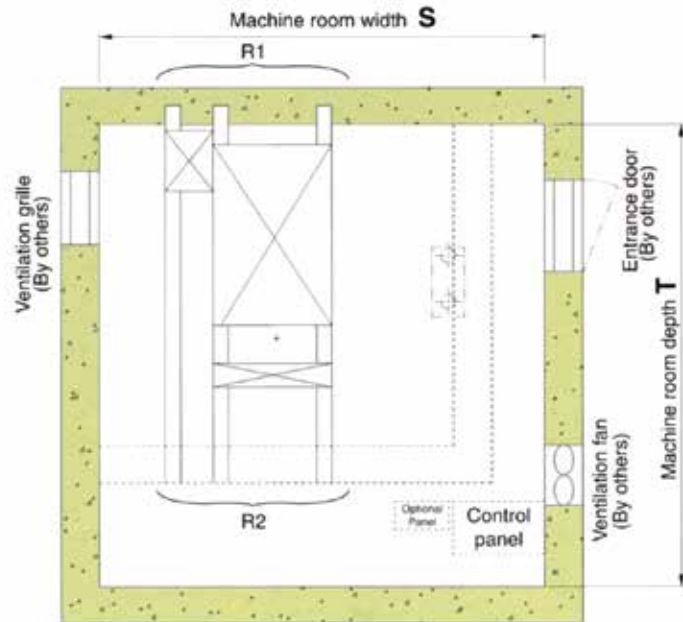
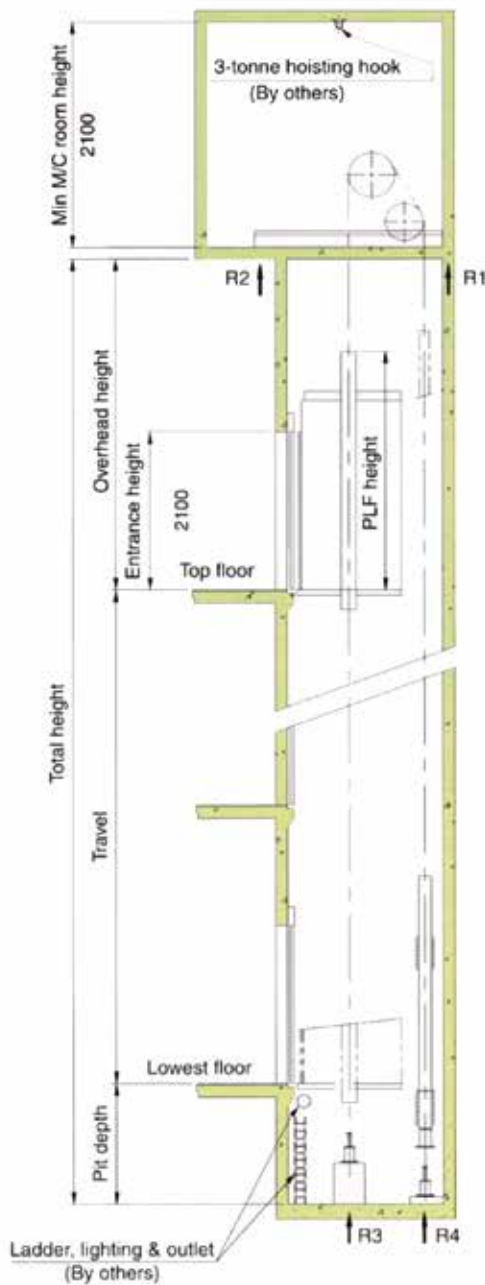
The preparatory work for elevator installation outlined below should be undertaken by building contractors in accordance with Hitachi drawings and applicable national or local codes and regulations.

1. Prepare hoistway with proper framing and enclosure, suitable pit of proper depth with drains and water-proofing if required, properly lit and ventilated machine room of adequate size with concrete floors, access doors, ladders and guards as required.
2. Provide and/ or cut all necessary holes, chases, and openings and finishes after equipment installation.
3. Supply and secure all supports, reinforced concrete slabs, etc., necessary for installation of the machinery, doors, buffers, etc.
4. Furnish all necessary cement and/or concrete for grouting-in of brackets, bolts, machine beams, etc.
5. Prepare and erect suitable scaffolding and protective measures for the work in progress.
6. Furnish mains for three-phase electric power and single-phase lighting supply to machine room, following the instructions of the elevator contractor on outlet position and wire size.
7. Provide, free of charge, a suitable theft-proof storage area for materials and tools during erection work.
8. Supply electric power for lighting of work area, installation work, elevator testing and spray painting.
9. Hoisting hook for loading shown on page 26 at top of the machine room.

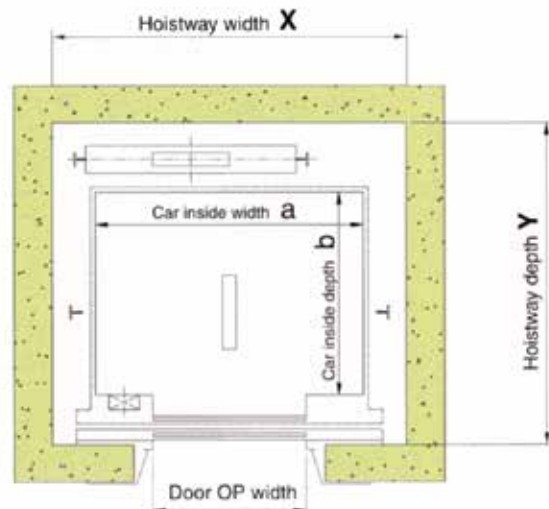
Maintenance parts

If a maintenance contract is signed with a Hitachi authorized maintenance company, Hitachi assures the repair and availability of replacement parts for 20 years from the date of FOB of the elevator.

Hoistway and machine room layout



Note: Machine room temperature should be maintained below 38°C with ventilating fan or air conditioner.



Dimensions and reaction loading (for 1 elevator)

Based on JIS regulation (non-fire rated door)

No.	Rated load (kg)	Persons	Ratedspeed m/s (m/min)	Model	Door OP width (mm)	Car inside	Hoistway	Machine room	Machine room and pit reaction loading (KN)			
						a x b (mm)	X x Y (mm)	S x T (mm)	R1	R2	R3	R4
1	450	6	1.0 (60)	VFI-450-CO60	800	1400 x 850	1750 x 1450	2300 x 2300	43	25	81	71
2	550	8	1.0 (60)	VFI-550-CO60		1400 x 1030	1750 x 1630	2300 x 2350	46	27	90	78
3			1.5 (90)	VFI-550-CO90			1850 x 1680	2400 x 2350	49	29	90	79
4			1.75 (105)	VFI-550-CO105							107	93
5	600	9	1.0 (60)	VFI-600-CO60		1400 x 1100	1750 x 1700	2300 x 2400	47	28	93	80
6			1.5 (90)	VFI-600-CO90			1850 x 1750	2400 x 2400	50	29	93	81
7			1.75 (105)	VFI-600-CO105							110	96
8	700	10	1.0 (60)	VFI-700-CO60		1400 x 1250	1750 x 1850	2300 x 2500	51	30	105	89
9			1.5 (90)	VFI-700-CO90			1850 x 1900	2400 x 2500	54	32	103	89
10			1.75 (105)	VFI-700-CO105							122	106
11	750	11	1.0 (60)	VFI-750-CO60		1400 x 1350	1750 x 1950	2300 x 2550	52	31	108	94
12			1.5 (90)	VFI-750-CO90			1850 x 2000	2400 x 2550	55	32	106	93
13			1.75 (105)	VFI-750-CO105							126	110
14	900	13	1.0 (60)	VFI-900-CO60	900	1600 x 1350	2000 x 2000	2550 x 2750	57	33	122	102
15			1.5 (90)	VFI-900-CO90			2100 x 2050	2550 x 2750	61	36	120	101
16			1.75 (105)	VFI-900-CO105							142	120
17	1000	15	1.0 (60)	VFI-1000-CO60		1600 x 1500	2000 x 2150	2550 x 2800	59	35	128	106
18			1.5 (90)	VFI-1000-CO90			2100 x 2200	2650 x 2800	63	37	125	104
19			1.75 (105)	VFI-1000-CO105							148	124

Minimum dimensions for overhead height and pit depth, and other specifications

No.	Ratedspeed	Minimum overhead (mm) ^(*)					Minimum pit depth (mm)	Maximum number of stops	Maximum travel (m)	Minimum floor height (mm)
	(m/min)	EN81-1	CP2	Malaysia	JIS	Kuwait KFB				
1	60	4450				4550	1500	16	60	2700
2	90	4550				4700	1600	32	100	
3	105	4600				4750				

(*) Minimum overhead height shall be increased by 200mm if the ceiling design is LX-series or EX-series type.



Electrical information

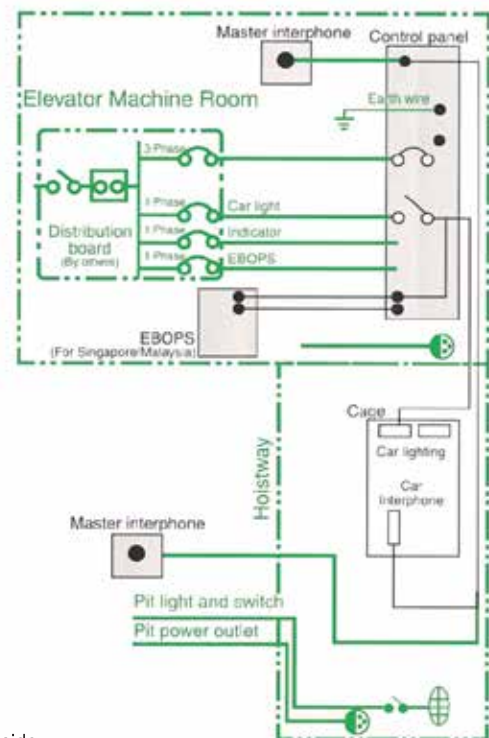
Wiring diagram

Shows the works to be done by others.

Pit lighting, including wiring and piping, are to be provided by others (minimum 200 lux at floor level). Power socket outlet, including wiring and piping in put, are to be provided by others.

Item	Work to be provided by others
Main power supply ^(*)	To install facilities to ensure that power does not fluctuate outside the range of -10% to +5% of the normal voltage rating and to ensure that the unbalance factor of voltage does not exceed 5%.
Lighting power supply ^(*)	To provide lighting power supply for car lighting indicators and maintenance work.
Interphone	To provide pipes and wiring located outside hoistway. To provide 12 interphone wires of 0.9mm ² / elevator.
Ventilation	To provide mechanical ventilation to the machine room to ensure that the temperature in the machine room is maintained at below 38°C.
Pit light, power outlet	To provide single-phase AC 200V, 10A power outlet and pit lighting with switch below the entrance floor level for maintenance purposes.

(*) Main and lighting supply shall lead into the elevator machine room.



Electrical data

Required capacity of circuit breaker, transformer and starting power at building side.

No.	Model	Rated load (kg)	Rated speed (m/min)	Electrical data (For 1 elevator unless specified)							
				Main supply voltage (kW)	Main supply voltage (3-phase) (V)	Circuit breaker capacity per unit (A)	Transformer capacity (kVA)			Starting power (kVA/ unit)	Calorific value for 1 lift (kcal/ hr)
1	VFI-450-CO60	450	60	4.5	200-220 380-480	40 20	6	10	14	19	600
2	VFI-550-CO60		60	4.5	200-220 380-480	40 20	6	10	14	19	734
3	VFI-550-CO90	550	90	5.5	200-220 380-415 440-480	40 30 20	7	11	15	22	1100
4	VFI-550-CO105		105	6.7	200-220 380-480	50 30	8	13	18	25	1284
5	VFI-600-CO60		60	4.5	200-220 380-480	40 20	6	10	14	19	800
6	VFI-600-CO90	600	90	6.7	200-220 380-480	50 30	8	13	18	25	1200
7	VFI-600-CO105		105	7.8	200-220 380-415 440-480	50 40 30	9	15	20	28	1400
8	VFI-700-CO60		60	5.5	200-220 380-415 440-480	40 30 20	7	11	15	22	934
9	VFI-700-CO90	700	90	7.8	200-220 380-415 440-480	50 40 30	9	15	20	28	1400
10	VFI-700-CO105		105	8.3	200-220 380-415 440-480	50 40 30	9	15	21	29	1634
11	VFI-750-CO60		60	5.5	200-220 380-415 440-480	40 30 20	7	11	15	22	1000
12	VFI-750-CO90	750	90	7.8	200-220 380-415 440-480	50 40 30	9	15	20	28	1500
13	VFI-750-CO105		105	9.7	200-220 380-480	60 40	9	15	21	33	1750
14	VFI-900-CO60		60	6.7	200-220 380-480	50 30	8	13	18	25	1200
15	VFI-900-CO90	900	90	9.7	200-220 380-480	60 40	9	15	21	33	1800
16	VFI-900-CO105		105	10.2	200-220 380-480	60 40	9	16	22	34	2100
17	VFI-1000-CO60		60	6.7	200-220 380-480	50 30	8	13	18	25	1334
18	VFI-1000-CO90	1000	90	9.7	200-220 380-480	60 40	9	15	21	33	2000
19	VFI-1000-CO105		105	11.7	200-220 380-480	75 40	11	18	24	38	2334

ทำเป็นช่องใส่
เอกสารขนาดครึ่ง
15x20 cm.



HITACHI

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