Hitachi Elevator

VFI-Ⅱ

HITACHI
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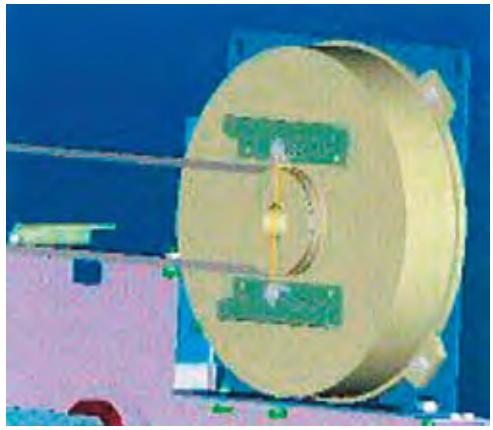
VFI-Ⅱ

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)

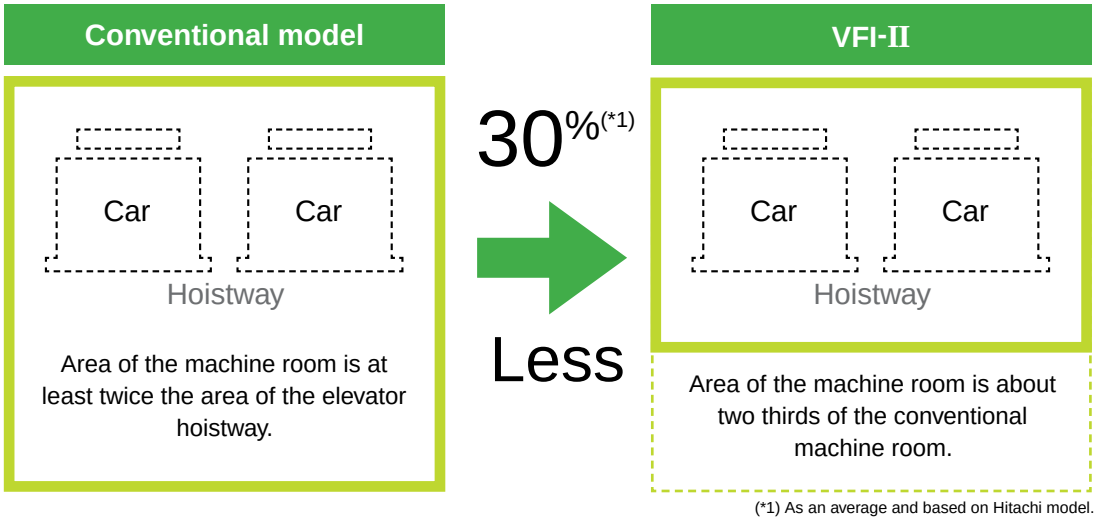
Making use of the energy generated by an elevator when traveling downwards with a heavy car load or upwards with a light car load, the traction machine acts as a power generator to transmit power back to the electrical network in the building.

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.



(*1) As an average and based on Hitachi model.

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 the integration of tactile button, LCD display, voice synthesizer and multi-beam door sensor.

Touch: Button with Braille and tactile, and LED light (optional)

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

CS-101S Ceiling design

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

Side and rear walls (3 sides)
Stainless steel hairline

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

Kickplate
Stainless steel hairline

Flooring
Vinyl tile

Door sill
Extruded hard aluminum

Car position indicator (*1)
LCD (monochrome), incorporated into car operating panel

Ventilation
Air-blown through ceiling duct

OPE-10A-TNS3 (*1) Operating panel

Face plate
Stainless steel hairline
with aluminum 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

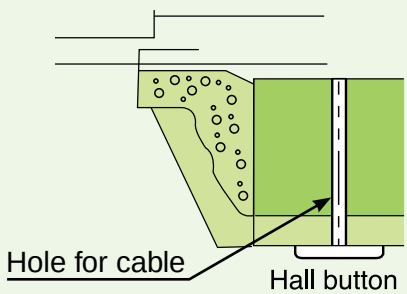
VIB-10A-TNS3
Surface-mount type hall button and indicator

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-10**B**-TNS3 shall be applied.

Optional Car and ceiling designs

Cars 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 (*1)

Kickplate
Stainless steel hairline

Flooring
Vinyl tile

Door sill
Extruded hard aluminum

Car position indicator (*1)
LCD (monochrome), incorporated into car operating panel

Ventilation
Air-blown through ceiling duct

DX-201S Ceiling design

Center	: Painted sheet steel
Both sides	: Milky white acrylic
Ceiling trim	: Anodized aluminum
Lighting	: Fluorescent
Height (from floor)	: 2300mm

DX-12S Ceiling design

Center	: Painted sheet steel
Both sides	: Painted aluminum with recess
Ceiling trim	: Anodized aluminum
Lighting	: Fluorescent
Height (from floor)	: 2300mm

DX-23S Ceiling design

Center	: Half mirror
Both sides	: Painted aluminum with recess
Ceiling trim	: Anodized aluminum
Lighting	: Fluorescent
Height (from floor)	: 2300mm

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 (*1)

Kickplate
Stainless steel hairline

Flooring
Vinyl tile

Door sill
Extruded hard aluminum

Car position indicator (*1)
LCD type, incorporated into car operating panel (monochrome)

Ventilation
Air-blown through ceiling duct

SL-102S 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-32S Ceiling design

(Applicable for car loading of 600kg and above)

Upper portion	: Painted sheet steel (with emergency hatch)
Other portions	: Painted sheet steel
Lighting	: Fluorescent
Height (from floor)	: Upper 2600mm, Lower 2300mm

EX-403S 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

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

Note: Colors reproduced here may vary slightly from the actual.

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 fixtures

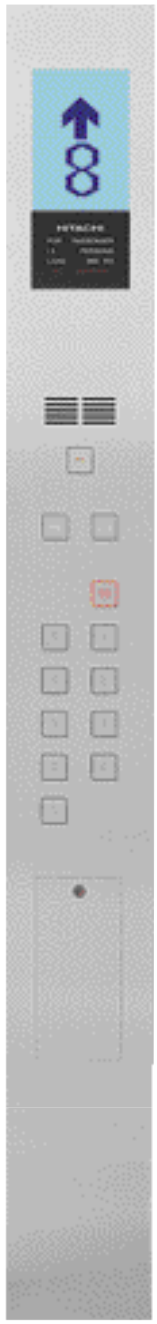
Operating panels

OPE-10A-TNS7 (*1)

Face plate
Stainless steel hairline with aluminum side edge

Button type
TNS7

Indicator type
LCD (monochrome)



OPE-10B-TNS3

Face plate
Stainless steel hairline

Button type
TNS3

Indicator type
LCD (monochrome)

OPS-B95

Face plate
Stainless steel hairline

Button type
B95

Indicator type
Dot matrix

OPS-A98-1

Face plate
Stainless steel hairline

Button type
A98-1

Indicator type
Dot matrix

Buttons (Applicable to both car and hall sides)

TNS3 (*2) **(Standard)**
Stainless steel hairline

TNS7 (*2)
Stainless steel hairline with Braille and tactile

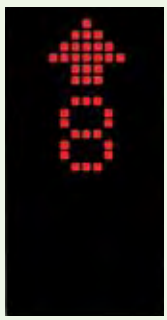
DMD3
Stainless steel hairline

DMD7
Stainless steel hairline with Braille and tactile

A98-1
Plastic resin

B95
Plastic resin

Position indicator



Dot matrix type

(*1) In case the number of floor buttons is more than 20, OPE-10**B**-TNS3 shall be applied.
(*2) Only applicable to OPE-10A type operating panel and surface-mount type hall button.

Optional Entrance fixtures

Hall buttons with indicators

VIB-10A-TNS7

VIB-10AD-TNS7

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

Indicator type:
LCD (monochrome)

VIB-10B-DMD3

VIB-10BD-DMD3

Hall button with indicator
Face plate: Stainless steel hairline

Indicator type:
LCD (monochrome)

Hall buttons

BN-TNS3

BN-TNS7

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

BL-B95

BL-A98-1

Hall button
Face plate: Stainless steel hairline

Hall indicators

HNLX

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

Indicator type:
LCD (monochrome)

HFLX

Hall indicator
Face plate:
Stainless steel hairline

Indicator type:
LCD (monochrome)

HSDX

Hall indicator
Face plate:
Stainless steel hairline

Indicator type:
Dot matrix

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

VLS-90S

Vertical hall lantern
Face plate: Stainless steel hairline

HYD-93

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

HLS-025S

Horizontal hall lantern
Face plate: Stainless steel hairline

Intelligent group control system

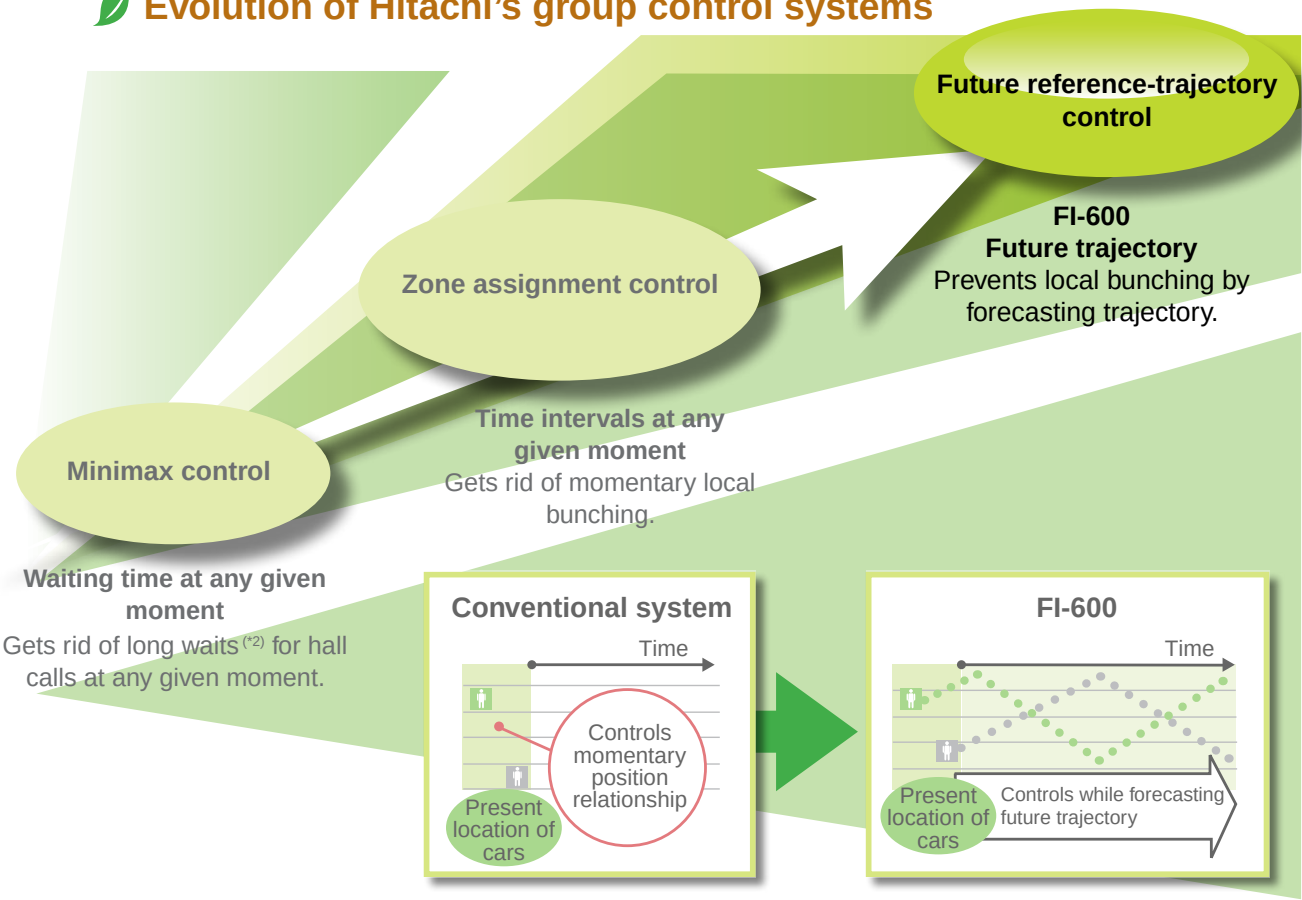
VFI-Ⅱ comes with Hitachi's new group control system, FI-600

Shortening waiting times and reducing the probability of a long wait (*2) 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.

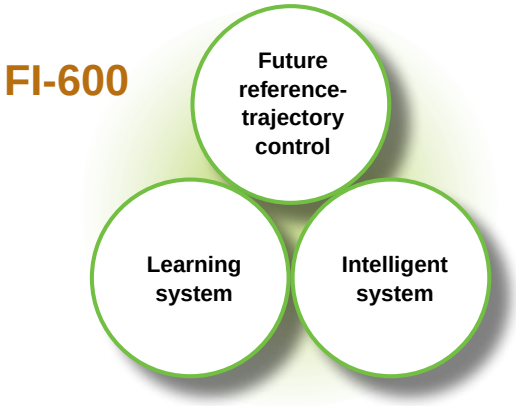
The probability of a long wait (*2) is minimized by operating elevator cars at equal time intervals while forecasting future trajectories.

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.

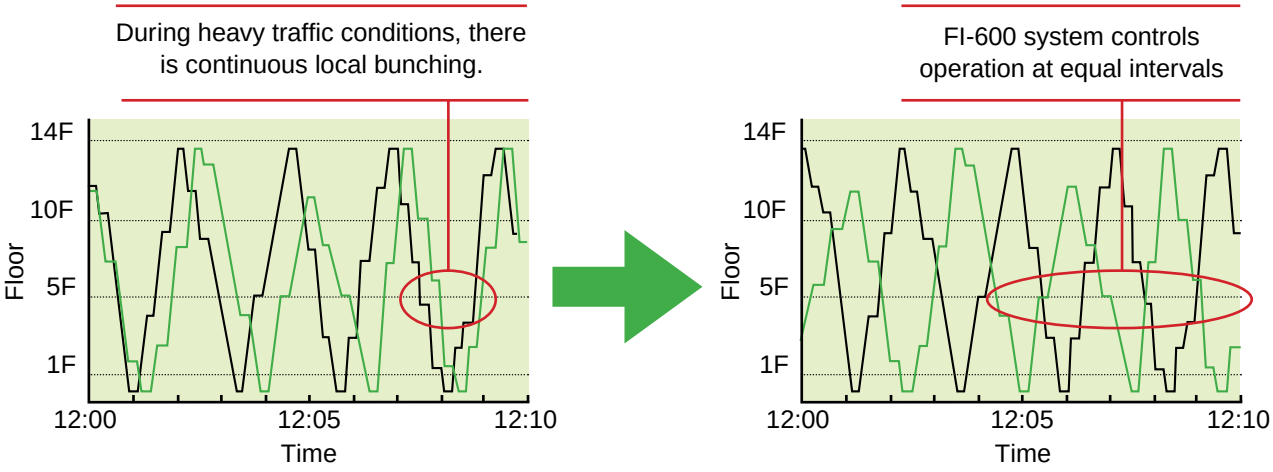
What is future reference-trajectory-control?

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(*2).

Major advantages of FI-600

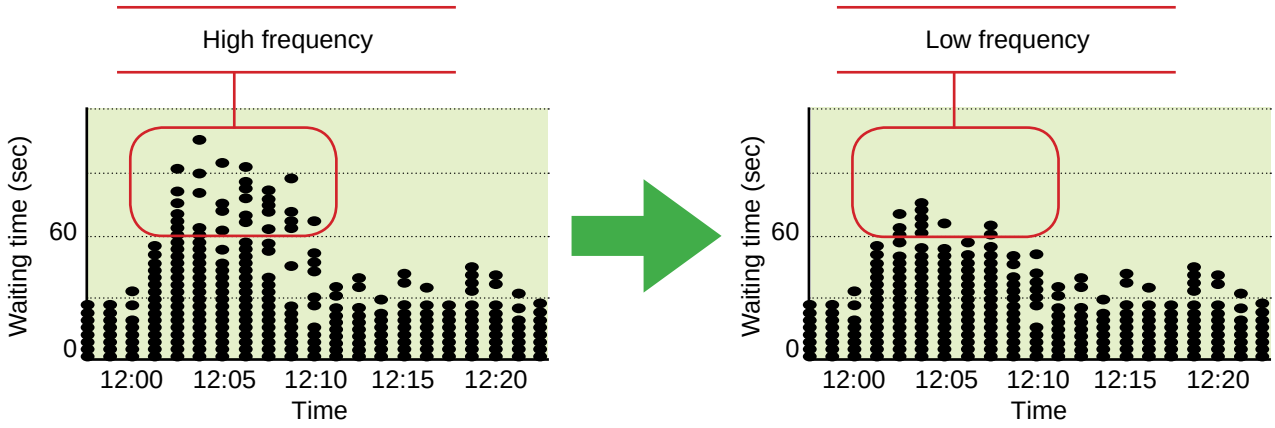
The FI-600 controls the fluctuation in waiting times, thereby shortening the average waiting times, reducing the probability of a long wait(*2) during heavy traffic, and improving the “quality of waiting times” of users.

Reduce average waiting time by as much as 10% (*1)



Conventional trajectories **FI-600 trajectories**

Reduce probability of a long wait(*2) by up to 12%(*1)



Conventional waiting time distribution **FI-600 waiting time distribution**

(*1) Comparison is based on Hitachi’s conventional group control system.
(*2) “Long wait” is defined as waiting times of more than 60 seconds.

List of designs and finishes

Car designs

No.	Item		Finishes / Design / Type	STD	OPT
1	Ceiling		Standard (CS-101S)	●	
2			DX-series (DX-12S)(DX-201S)(DX-23S)		●
3			SL/ EX-series (SL-102S)(EX-32S)(EX-403S)		●
4	Car wall (3 sides)		Painted sheet steel		●
5			Stainless steel hairline	●	
6			Stainless steel hairline etched (Hitachi standard pattern)		●
7	Front return panel & Transom panel		Stainless steel hairline	●	
8			Stainless steel hairline etched (Hitachi standard pattern)		●
9			Stainless steel hairline mirror		●
10	Door		Stainless steel hairline	●	
11			Stainless steel hairline etched (Hitachi standard pattern)		●
12			Stainless steel hairline mirror		●
13	Kickplate (3 sides)		Stainless steel hairline	●	
14	Sill		Extruded hard aluminum	●	
15	Operating panel	Position indicator	Stainless steel hairline with LCD indicator (*1) (OPE-10A) (*1)	●	
16			Stainless steel hairline with LCD indicator (OPE-10B)		●
17			Stainless steel hairline with dot-matrix indicator (OPS)		●
18		Button	Stainless steel face plate without Braille (TNS3)	●	
19			Stainless steel face plate without Braille (DMD3)		●
20			Stainless steel face plate with Braille (TNS7)(DMD7)		●
21			Plastic resin face plate without Braille (B95)(B98-1)		●

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 (*2)	Incorporated type	Surface-mount type (*3)	(VIB-10A) (VIB-10AD)	●	
17				(VIB-10B) (VIB-10BD)		●
18		Button	Surface-mount type (*3)	(BN)		●
19				(BL)		●
20		Indicator	LCD, surface-mount type	(HNLX)		●
21			LCD type	(HFLX)		●
22			Dot matrix type	(HSDX)		●
23	Hall button	Stainless steel surface plate without Braille		(TNS3)	●	
24		Stainless steel surface plate without Braille		(DMD3)		●
25		Stainless steel surface plate with Braille		(TNS7) (DMD7)		●
26		Plastic surface plate without Braille		(B95) (A98-1)		●
27	Hall lantern	Vertical type	Surface-mount type	(HYD-93) (HYD-94)		●
28				(VLS-115) (VLS-90S)		●
29		Horizontal type		(HLS-025S)		●

(*1) In case the number of floor buttons is more than 20, OPE-10**B**-TNS3 shall be applied.
(*2) Hall indicator is not recommended for FI-600 and FI-100 operations.
(*3) Only TNS3 and TNS7 buttons are applicable for surface-mount type.

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 Singapore

This modern manufacturing plant in Singapore boasts a complete team of local and Japanese engineers geared towards providing maximum flexibility in design and manufacturing to suit the customer requirements.

High accuracy and efficiency in planning of equipment layout is made possible by the most advanced CAD system.

Equipment is made to the highest standard of quality and reliability with modern CNC machinery.

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.

HITACHI

Inspire the Next

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