MITSUBISHI ELECTRIC

Changes for the Better

Quality in Motion™

DESIGN REFERENCE FOR ELEVATOR INSTALLATIONS

● Capacity and Speed *1

Rated capacity (kg)	Number of persons	Rated speed (m/sec)											EN81-1
		2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0	9.0	10.0	
750	10	○	○	○	○	○	○	○	○	○	○	○	☆
900	12	○	○	○	○	○	○	○	○	○	○	○	☆
1050	14	●	●	●	●	●	○	○	○	○	○	○	☆
1200	16	○	○	○	○	○	○	○	○	○	○	○	☆
1350	18	●	●	●	●	●	●	●	○	○	○	○	☆
1600	21	●	●	●	●	●	●	●	○	○	○	○	☆
1800	24	●	●	●	●	●	●	●	○	○	○	○	☆
2000	26	●	●	●	●	●	●	●	○	○	○	○	☆
2250	30	○	○	○	○	○	○	○	○	○	○		☆
2500	33	○	○	○	○	○							☆
3000	40	○	○	○	○	○							☆

Notes:
*1: The symbol ○ shown in the table indicates that a technical inquiry is required.
The symbol ● shown in the table indicates that a technical inquiry is required depending on conditions.
*2: Refer to page 5 to 12 for the hoistway and machine room layout plans for the models with specifications marked in gray (▭).
For the layouts for models with other specifications, please consult our local agents.

● Specifications *1

Rated speed (m/sec)		2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0	9.0	10.0
Maximum number of stops		64							Please consult our local agents.			
Maximum travel (m) *2	1050kg	150		250			Please consult our local agents.					
	1350kg	200		250					Please consult our local agents.			
	1600kg											
	1800kg											
	2000kg											
Minimum floor height (mm)		2500 *3										

Notes:
*1: Please consult our local agents if the maximum travel exceeds the values specified in the above table.
*2: For the rated capacity 2250kg to 3000kg, please consult our local agents for maximum travel.
*3: For some elevator specifications, the floor height (distance between floors) must be a minimum of 2500mm.
Please consult our local agents if the floor height is less than “Entrance height HH + 700mm”.

● Control, Door and Operation Systems

●: Applicable —: Not applicable

Number of elevators in a bank	Control system	Door system	Operation system			
			1-car selective collective (Standard)	2-car group control system (optional)	ΣAI-22 group control system (option)	ΣAI-2200C group control system (option)
1 car	VVVF control and Data Network System with multiple microprocessor modules (VFGH)	VVVF control with microprocessor, 2-panel center opening <CO> (Standard), 2-panel side opening <2S> (option), 4-panel center opening <2CO> (option)	● (1C-2BC)	—	—	—
2 cars			—	● (2C-2BC)	—	—
3 cars			—	—	● (3C-ΣAI-22)	● (3C-ΣAI-2200C)
4 cars			—	—	● (4C-ΣAI-22)	● (4C-ΣAI-2200C)
5 cars			—	—	—	● (5C-ΣAI-2200C)
6 cars			—	—	—	● (6C-ΣAI-2200C)
7 cars			—	—	—	● (7C-ΣAI-2200C)
8 cars			—	—	—	● (8C-ΣAI-2200C)

Selective collective (2BC)

The system consists of call buttons in the car, and a riser of up and down destination floor buttons installed at each elevator hall (single button at terminal floors), which connect electrically with microprocessors supervising floor selection and direction of travel. A car will respond to those car and hall calls that comply with its direction of service.
When there are no more calls registered for the car’s direction of travel, the car’s service direction is reversed.

ΣAI-22 & ΣAI-2200C Group Control Systems

The systems, which employ an intelligent expert system and fuzzy logic, are specially designed for group control of 3 to 8 elevators (as described above). Practical information required for group control is stored in the system's memory as a “Knowledge Database”. Drawing from this database, various traffic conditions are monitored and analyzed applying IF-THEN decision rules to maximize the effectiveness of each elevator operation.
The systems perform assignments to the most-used locations, and thereby provide superb efficiency and service.
In addition to the above, ΣAI-2200C system performs optimal car allocation using Dynamic Rule-set Optimizer.

Elevator traffic reaches a peak when people employed in the building arrive for work in the morning, when they break for lunch at midday, and when they leave for home in the evening. Obviously, the elevators must be capable of handling the increased traffic during these peaks. And during actual business hours, the elevators must be able to respond promptly to serve the people who are on the move inside the building as well as those who arrive at or leave the building. So that the elevators best suited to the conditions and environment at hand can be selected, we apply computer simulation, traffic computation, and other techniques based on a wealth of experience in this field to offer a wide range of elevator consulting services. Given below are reference data useful for general planning.

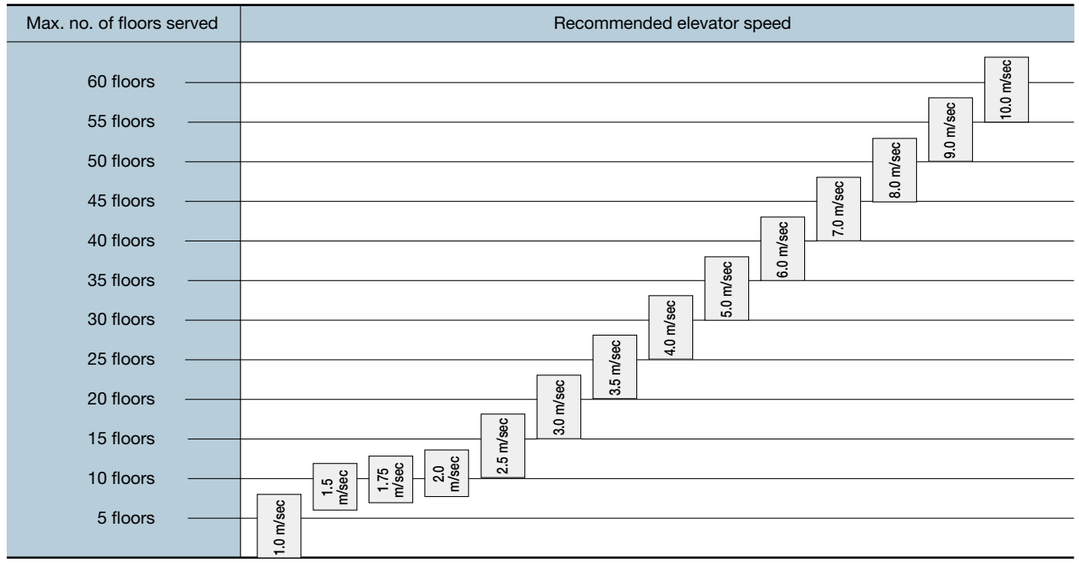
Selecting the Elevator Speed

The maximum number of floors served in a building serves as the criterion for selecting the speed at which the elevators should travel. To select elevators using the chart below, if the building has 23 floors, select elevators with a speed of 3.5m/sec or 4.0m/sec.

Note: The following chart shows the recommended elevator speed per maximum number of service floors. The best suited speed varies depending on the following factors:

*Building usage;
*Single-tenant building or multi-tenant building;
*Floor heights;
*Population in the building;
*Number of elevators in the group; or
*Capacity of the elevator.

Please consult our local agents for details.



Selecting the Operation System

Scale of building / Number of elevators / Operation system	Medium-scale office building			Large-scale office building				
	1	2	3	4	5	6	7	8
1-car selective collective (2BC)	◎							
2-car group control system (2BC)		◎						
ΣAI-22 group control system			◎					
ΣAI-2200C group control system				◎	◎	◎	◎	◎

Applicable system ◎ Recommended system

Notes on Installation Planning

Elevator Arrangement

- Elevator installations should be properly planned according to such factors as the size and nature or kind of the building, the traffic flow and peak traffic demand or conditions, the location of public transportation facilities and stores.
- Dispersing elevators in different areas of a building adversely affects their passenger-carrying efficiency. Therefore, elevators should, as far as possible, be concentrated in the center of the building.
- When two groups of elevators face each other, ample space should be left between the groups.
- The number of elevators in each group should be decided on the basis of the physical arrangement of the elevators and the floors served.
- As much as possible, all the floors served by one group of elevators should be functionally and structurally similar. Dissimilarity among the floors served will result in a drop in service level.
- In residential buildings, hotels, and the like, it is not desirable for the elevator hall to be located farther than 50 meters from any apartment or room.

Points Relating to the Hoistway

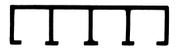
- In steel-reinforced concrete buildings, design the hoistways so that concrete walls are at least 120mm thick.
- Hoistways must be no more than 30mm out of plumb.
- No wiring or distribution panels should be built into or mounted on hoistway walls.
- It is forbidden under most building codes to install any conduit work or piping in hoistways except as required for the elevator itself.
- Pit-depth and overhead-height dimensions must always be at least the minimum shown in the drawings.
- If it proves necessary to make use of space below the pit, contact our local subcontractor.
- When the building is to be of steel construction, our local subcontractor should be brought into the discussion at the earliest possible moment.

Points Relating to the Machine Room

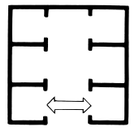
- Provide the recommended width and height to assure that there will be sufficient room for inspection and maintenance.
- Since the elevator drive equipment generates considerable heat, sufficient ventilation and or air-conditioning capacity must be provided to assure that the machine-room temperature does not exceed 40°C.
Refer to elevator site requirements at page 18 for details.
- When occupied areas of the building are in close proximity to the machine room, such as in the case of elevators for the low and middle floors of a high-rise building, it may be desirable to provide additional soundproofing or intervening walls.

Some Examples of Bank Arrangements

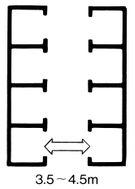
Desirable Plans



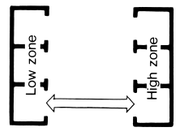
Bank of 4 elevators, in-line arrangement.



Group of 6 elevators, alcove arrangement.



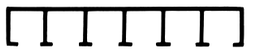
Group of 8 elevators, facing arrangement. Plan the building traffic flow to minimize through-traffic in the elevator hall.



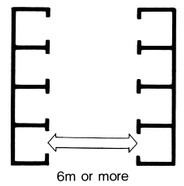
Two banks, facing arrangement.

Undesirable Plans

Two banks, in-line arrangement. Inconvenient because of confusion as to the dividing point.

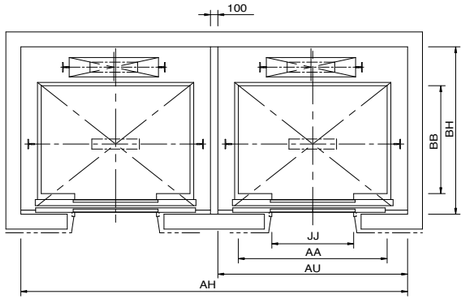


Bank of 6 elevators, in-line arrangement. Inconvenient because of increased walking distance and time.

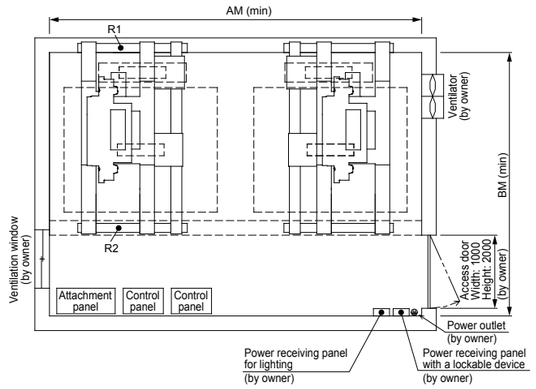


8 elevators in one bank set at too great a distance.

Layout example of in-line arrangement



Hoistway



Machine room

● Dimension table of car, hoistway and machine room

Rated speed (m/sec)	Code number	Rated capacity (kg)	Number of persons	Entrance width JJ (mm)	Car internal dimensions (mm)	Minimum hoistway dimensions (mm)		Minimum machine room dimensions (mm)
						Hoistway width/unit AU (mm)*1	In-line arrangement	
							2-unit installation*2	2-unit installation
					Width × Depth AA × BB		Width × Depth AH × BH	Width × Depth AM × BM
2.0 2.5 3.0	P14	1050	14	900	1600 × 1500	2100	4300 × 2300	4700 × 3605
	P18	1350	18	1100	2000 × 1500	2500	5100 × 2300	5100 × 3605
	P21	1600	21	1100	2000 × 1700	2500	5100 × 2500	5100 × 3805
	P24	1800	24	1100	2100 × 1750	2600	5300 × 2550	5400 × 4100
	P26	2000	26	1100	2100 × 1950	2600	5300 × 2750	5400 × 4300

Notes:
*1: The hoistway width per unit (AU) is for reference. A single-unit installation is not recommended.
*2: The hoistway width (AH) for 3- or 4-unit in-line installation can be calculated as follows:
AH = Hoistway width per unit (AU) x Number of car units in the shaft + Separator beam width 100mm x (Number of car units –1)

[Terms of the tables]
- The dimensional information herein is based on the requirements of EN81-1.
- This dimensions herein are standard specifications without the fireproof landing door and counterweight safety. Please consult our local agents for details.
- The minimum hoistway dimensions (AH and BH) shown in the table are after waterproofing of the pit and do not include plumb tolerance.

● Machine-room height (HM)

(Unit: mm)

Rated speed (m/sec)	Regulation
	EN81-1
2.0 2.5 3.0	2500

● Overhead-height (OH)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)				
		1050	1350	1600	1800	2000
2.0	TR≦100	5210				
	100<TR≦150	5360				
	150<TR≦200	–	5360			
2.5	TR≦100	5290				
	100<TR≦150	5440				
	150<TR≦200	–	5440			
3.0	TR≦100	5640				
	100<TR≦250	5790				

Note: The dimensions OH are calculated when the car frame height (HB) is 3450mm.

● Top clearance (TC)

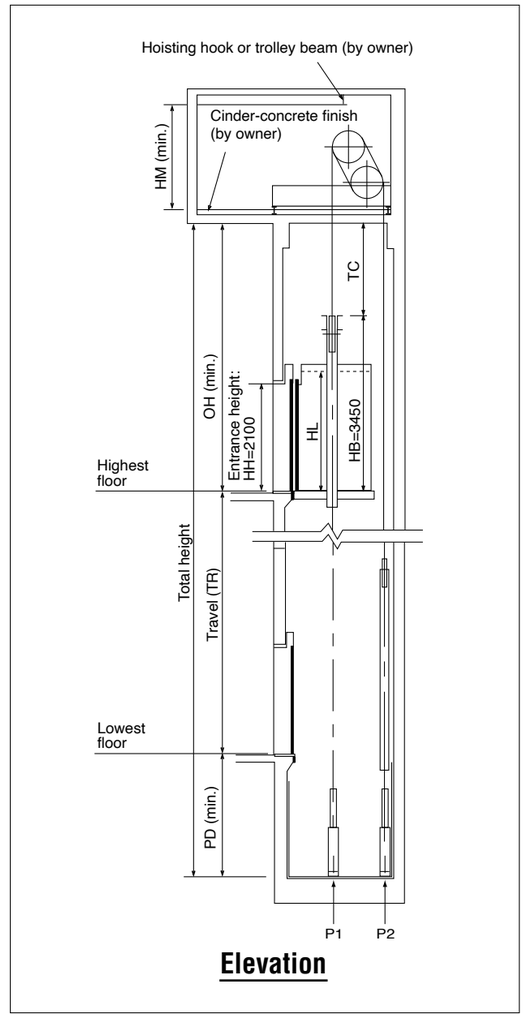
(Unit: mm)

Rated speed (m/sec)	Travel (TR) (m)	
	TR≦100	100<TR≦250
2.0	1760	1910
2.5	1840	1990
3.0	2190	2340

● Pit-depth (PD)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)				
		1050	1350	1600	1800	2000
2.0	TR≦100	2080			2800	
	100<TR≦150	2800		2950		
	150<TR≦200	–	3050			
2.5	TR≦100	2080			2950	
	100<TR≦150	2840		3100		
	150<TR≦200	–	3200			
3.0	TR≦100	2650			3200	
	100<TR≦150	3330		3350		
	150<TR≦200	3500				
	200<TR≦250	3600				



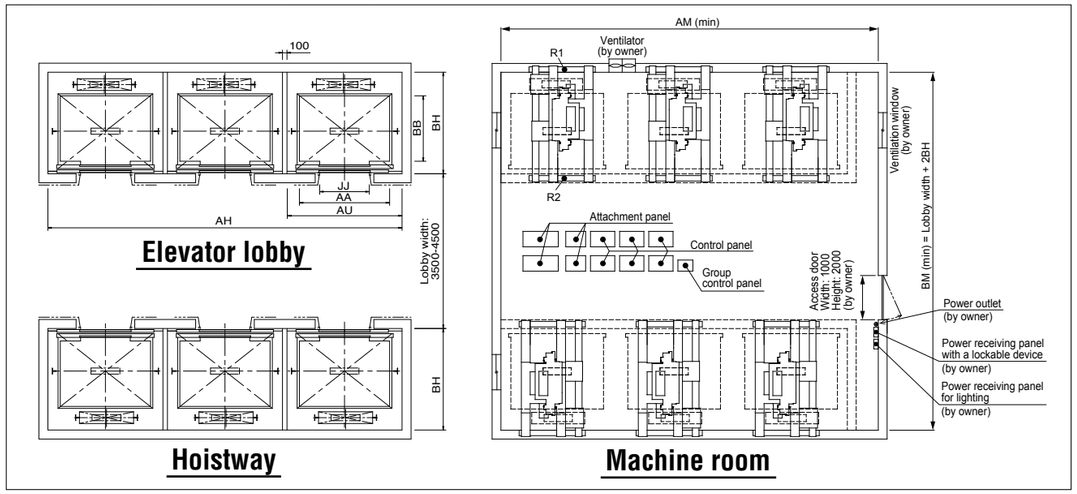
Elevation

● Reaction loads in machine room and pit

(Unit: kN)

Rated speed (m/sec)		Rated capacity (kg)				
		1050	1350	1600	1800	2000
2.0 2.5	R1	150	155	160	200	205
	R2	100	105	105	135	140
	P1	200	200	220	250	285
	P2	185	185	195	230	255
3.0	R1	165	170	160	210	205
	R2	110	115	105	140	140
	P1	210	220	220	250	285
	P2	195	195	190	220	255

Layout example of facing arrangement



● Dimension table of car, hoistway and machine room

Rated speed (m/sec)	Code number	Rated capacity (kg)	Number of persons	Entrance width JJ (mm)	Car internal dimensions (mm)	Minimum hoistway dimensions (mm)		Minimum machine room dimensions (mm)
						Hoistway width/unit AU (mm)*1	In-line arrangement	
							2-unit installation*2	2-unit installation
					Width × Depth AA × BB		Width × Depth AH × BH	Width × Depth AM × BM
3.5 4.0	P14	1050	14	900	1600 × 1500	2150	4400 × 2300	4750 × 3605
	P18	1350	18	1100	2000 × 1500	2550	5200 × 2300	5200 × 3605
	P21	1600	21	1100	2000 × 1700	2550	5200 × 2500	5200 × 3805
	P24	1800	24	1100	2100 × 1750	2650	5400 × 2550	5400 × 4100
	P26	2000	26	1100	2100 × 1950	2650	5400 × 2750	5400 × 4300

Notes:
*1: The hoistway width per unit (AU) is for reference. A single-unit installation is not recommended.
*2: The hoistway width (AH) for 3- or 4-unit in-line installation can be calculated as follows:
AH = Hoistway width per unit (AU) x Number of car units in the shaft + Separator beam width 100mm x (Number of car units –1)

[Terms of the tables]
- The dimensional information herein is based on the requirements of EN81-1.
- This dimensions herein are standard specifications without the fireproof landing door and counterweight safety. Please consult our local agents for details.
- The minimum hoistway dimensions (AH and BH) shown in the table are after waterproofing of the pit and do not include plumb tolerance.

● Machine-room height (HM)

(Unit: mm)

Rated speed (m/sec)	Regulation
	EN81-1
3.5 4.0	2500

● Overhead-height (OH)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)				
		1050	1350	1600	1800	2000
3.5	TR≦100	5970				
	100<TR≦250	6120				
4.0	TR≦250	6520				

Note: The dimensions OH are calculated when the car frame height (HB) is 3450mm.

● Top clearance (TC)

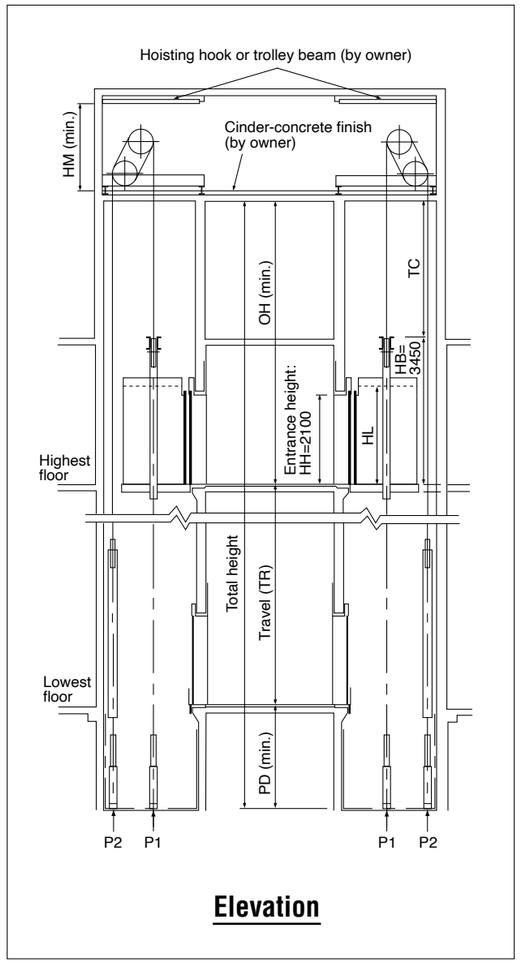
(Unit: mm)

Rated speed (m/sec)	Travel (TR) (m)		
	TR≦100	100<TR≦150	150<TR≦250
3.5	2520	2670	
4.0	3070		

● Pit-depth (PD)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)				
		1050	1350	1600	1800	2000
3.5	TR≦100	3020			3660	
	100<TR≦150	3370		3660		
	150<TR≦200	3660				
	200<TR≦250	3760				
4.0	TR≦200	3920				
	200<TR≦250	4020				

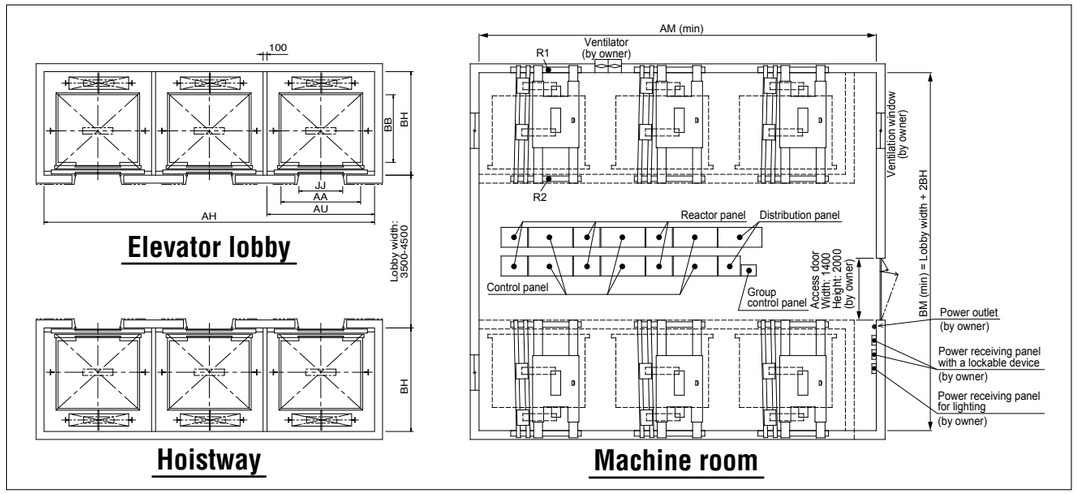


● Reaction loads in machine room and pit

(Unit: kN)

Rated speed (m/sec)		Rated capacity (kg)				
		1050	1350	1600	1800	2000
3.5	R1	165	170	160	215	205
	R2	110	115	105	145	140
	P1	215	220	220	250	295
	P2	200	200	195	230	260
4.0	R1	165	170	160	215	210
	R2	110	115	105	145	140
	P1	215	220	220	250	295
	P2	200	195	195	235	265

Layout example of facing arrangement



Dimension table of car, hoistway and machine room

Rated speed (m/sec)	Code number	Rated capacity (kg)	Number of persons	Entrance width JJ (mm)	Car internal dimensions (mm)	Minimum hoistway dimensions (mm)		Minimum machine room dimensions (mm)
						Hoistway width/unit AU (mm)*1	In-line arrangement	
							2-unit installation*2	2-unit installation
					Width × Depth AA × BB		Width × Depth AH × BH	Width × Depth AM × BM
5.0	P18	1350	18	1100	2000 × 1450	2700	5500 × 2250	5500 × 3850
	P21	1600	21	1100	2000 × 1700	2700	5500 × 2500	5500 × 4050
	P24	1800	24	1100	2100 × 1750	2800	5700 × 2600	5700 × 4150
	P26	2000	26	1100	2100 × 1950	2800	5700 × 2800	5700 × 4350

Notes:
*1: The hoistway width per unit (AU) is for reference. A single-unit installation is not recommended.
*2: The hoistway width (AH) for 3- or 4-unit in-line installation can be calculated as follows:
AH = Hoistway width per unit (AU) x Number of car units in the shaft + Separator beam width 100mm x (Number of car units –1)

[Terms of the tables]
- The dimensional information herein is based on the requirements of EN81-1.
- This dimensions herein are standard specifications without the fireproof landing door and counterweight safety. Please consult our local agents for details.
- The minimum hoistway dimensions (AH and BH) shown in the table are after waterproofing of the pit and do not include plumb tolerance.

Machine-room height (HM)

(Unit: mm)

Rated speed (m/sec)	Rated capacity (kg)			
	1350	1600	1800	2000
5.0	2500		2800	

Overhead-height (OH)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)			
		1350	1600	1800	2000
5.0	TR≦150	6650			
	150<TR≦250	7050			

Note: The dimensions OH are calculated when the car frame height (HB) is 3450mm.

Top clearance (TC)

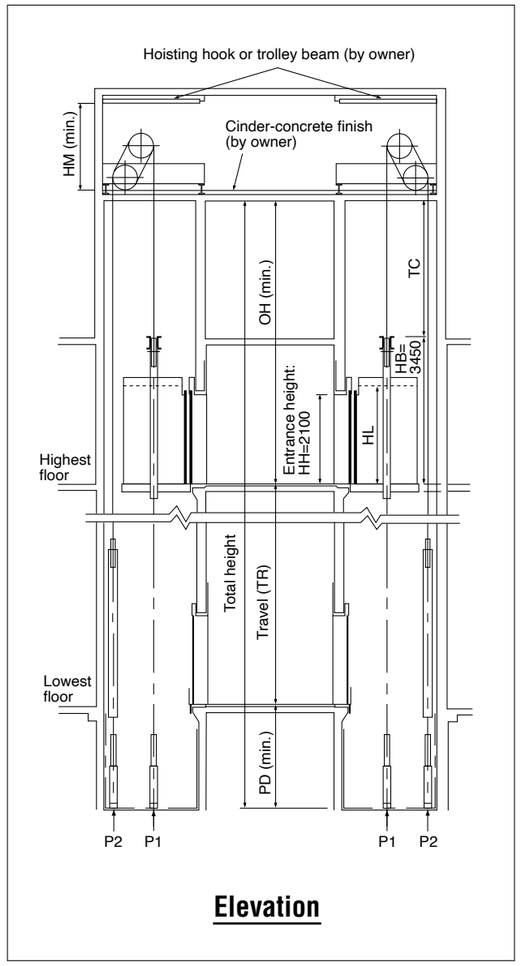
(Unit: mm)

Rated speed (m/sec)	Travel (TR) (m)	
	TR≦150	150<TR≦250
5.0	3200	3600

Pit-depth (PD)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)			
		1350	1600	1800	2000
5.0	TR≦150	4050			
	150<TR≦200	4350			
	200<TR≦250	4450			

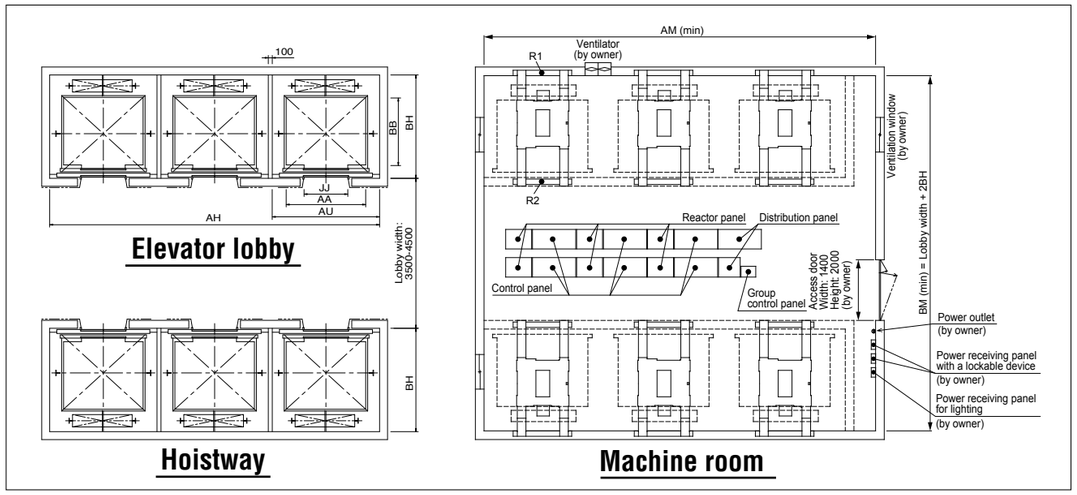


Reaction loads in machine room and pit

(Unit: kN)

Rated speed (m/sec)		Rated capacity (kg)			
		1350	1600	1800	2000
5.0	R1	190	210	205	205
	R2	125	145	140	135
	P1	220	250	245	250
	P2	210	235	220	230

Layout example of facing arrangement



● Dimension table of car, hoistway and machine room

Rated speed (m/sec)	Code number	Rated capacity (kg)	Number of persons	Entrance width JJ (mm)	Car internal dimensions (mm)	Minimum hoistway dimensions (mm)		Minimum machine room dimensions (mm)
						Hoistway width/unit AU (mm)*1	In-line arrangement	
							2-unit installation*2	2-unit installation
					Width × Depth AA × BB		Width × Depth AH × BH	Width × Depth AM × BM
6.0	P18	1350	18	1100	2000 × 1450	2700	5500 × 2250	5550 × 3900
	P21	1600	21	1100	2000 × 1700	2700	5500 × 2550	5550 × 4100
	P24	1800	24	1100	2100 × 1750	2800	5700 × 2600	5700 × 4150
	P26	2000	26	1100	2100 × 1950	2800	5700 × 2800	5700 × 4350

Notes:
*1: The hoistway width per unit (AU) is for reference. A single-unit installation is not recommended.
*2: The hoistway width (AH) for 3- or 4-unit in-line installation can be calculated as follows:
AH = Hoistway width per unit (AU) x Number of car units in the shaft + Separator beam width 100mm x (Number of car units –1)

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● Machine-room height (HM)

(Unit: mm)

Rated speed (m/sec)	Rated capacity (kg)			
	1350	1600	1800	2000
6.0	2800			

● Overhead-height (OH)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)			
		1350	1600	1800	2000
6.0	TR≦150	6650			
	150<TR≦250	7050			

Note: The dimensions OH are calculated when the car frame height (HB) is 3450mm.

● Top clearance (TC)

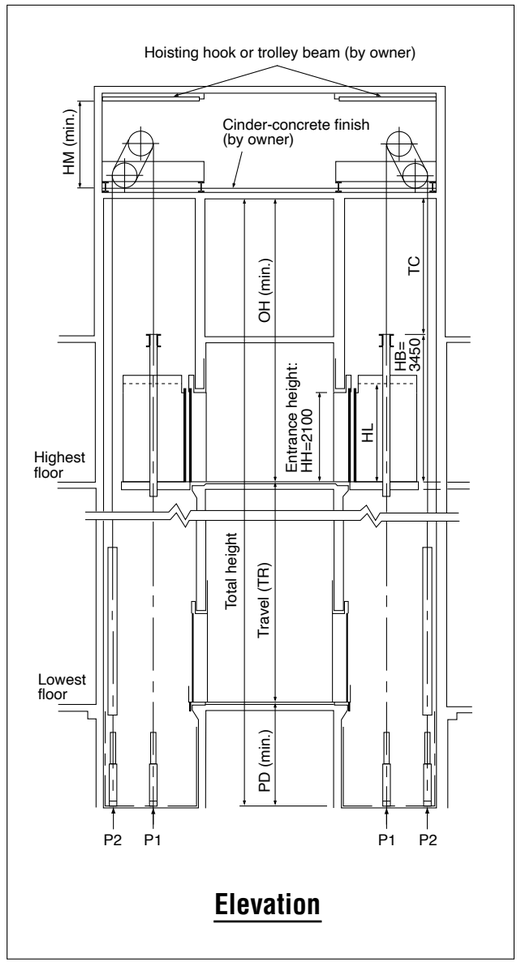
(Unit: mm)

Rated speed (m/sec)	Travel (TR) (m)	
	TR≦150	150<TR≦250
6.0	3200	3600

● Pit-depth (PD)

(Unit: mm)

Rated speed (m/sec)	Travel TR (m)	Rated capacity (kg)			
		1350	1600	1800	2000
6.0	TR≦150	4050			
	150<TR≦200	4350			
	200<TR≦250	4450			



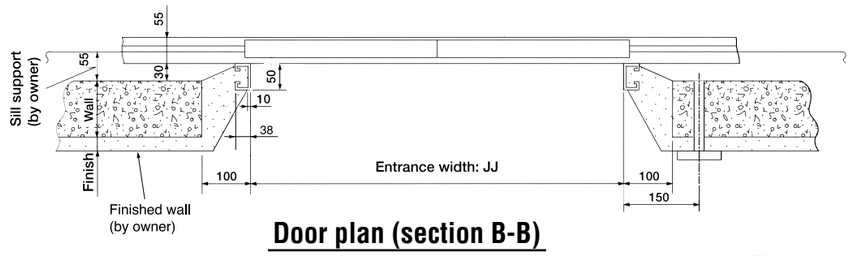
● Reaction loads in machine room and pit

(Unit: kN)

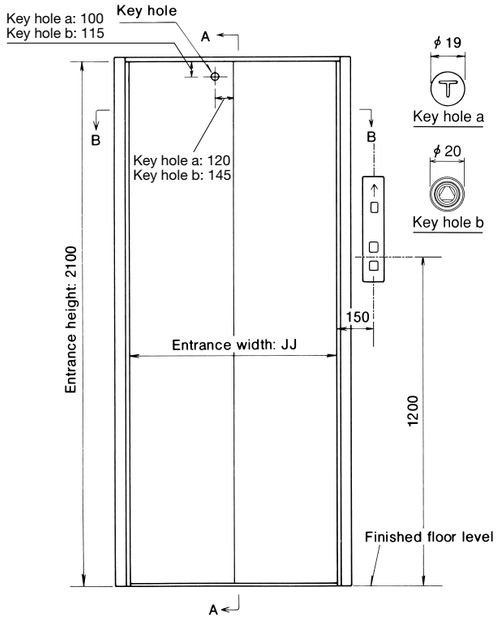
Rated speed (m/sec)		Rated capacity (kg)			
		1350	1600	1800	2000
6.0	R1	185	200	205	205
	R2	125	135	140	135
	P1	220	230	245	250
	P2	210	220	220	230

Type E-102 (Standard)

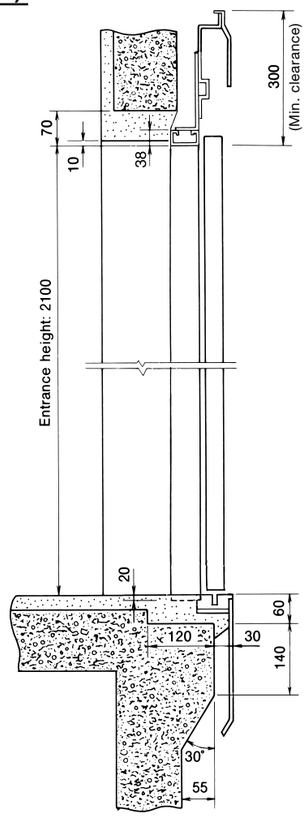
Center-Open doors



Door plan (section B-B)



Hoistway entrance



Door elevation (section A-A)

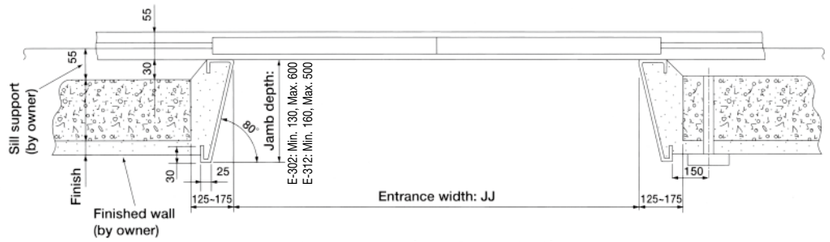
Building structure (by owner)

Wall and floor finishing (by owner)

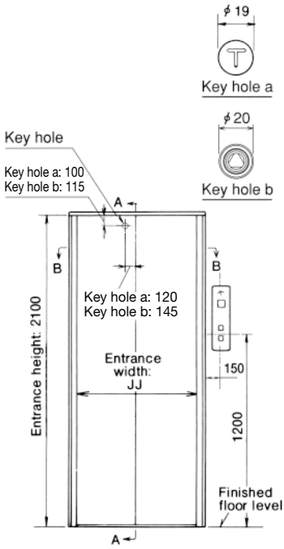
Notes: 1. A triangular key hole is required under EN81-1.
2. Sections A-A and B-B shows dimensions without a fireproof landing door.

Type E-302, E-312 (Option)

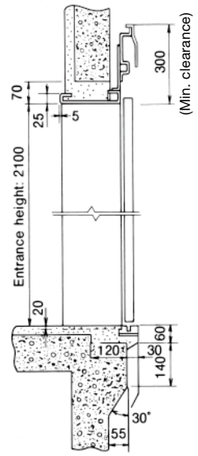
Center-Open doors



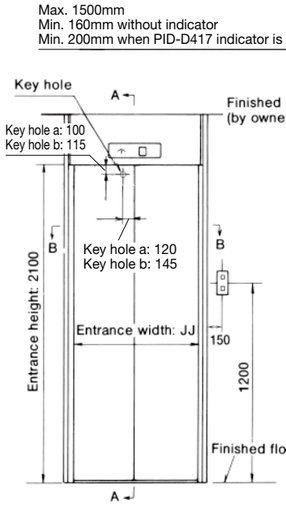
Door plan (section B-B)



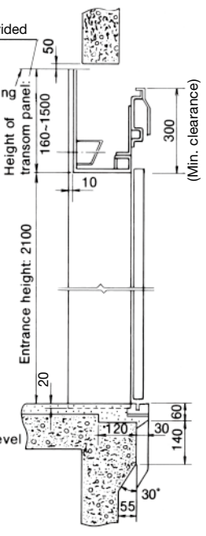
Hoistway entrance Type E-302



Door elevation (section A-A)



Hoistway entrance Type E-312



Door elevation (section A-A)

Building structure (by owner)

Wall and floor finishing (by owner)

Notes: 1. A triangular key hole is required under EN81-1.
2. Sections A-A and B-B shows dimensions without a fireproof landing door.

Power Feeder Data *1

Speed (m/sec)	Rated load (kg)	Traction motor (kW)	Current at 400V *2		Capacity of power supply (kVA)	NF in M/R at 400V system (A)	Heat emission (W)
			FLU (A)	FLAcc (A)			
2.0	1050	15	33	61	19	75	3260
	1350	20	41	72	23	75	4190
	1600	20	47	82	26	75	4970
	1800	23	57	98	31	100	5600
	2000	25	59	107	33	100	6210
2.5	1050	18	39	75	21	75	4070
	1350	25	48	88	25	75	5240
	1600	25	56	100	29	100	6210
	1800	28	67	121	34	100	7000
	2000	31	70	134	37	100	7800
3.0	1050	22	45	90	23	75	4890
	1350	30	56	105	28	100	6280
	1600	30	65	119	32	100	7450
	1800	34	76	143	40	125	8400
	2000	37	81	163	42	125	9400
3.5	1050	25	51	113	27	100	5700
	1350	35	63	131	33	100	7330
	1600	35	74	144	37	125	8690
	1800	39	92	174	46	125	9800
	2000	43	94	197	47	150	10860
4.0	1050	29	57	123	30	100	6520
	1350	40	71	143	36	125	8380
	1600	40	83	165	41	150	9930
	1800	45	102	196	49	150	11200
	2000	50	104	231	51	150	12410
5.0	1350	42	88	211	44	125	10500
	1600	50	103	238	50	150	12500
	1800	52	114	253	57	175	14000
	2000	58	126	274	62	200	15600
6.0	1350	56	102	252	50	150	12600
	1600	56	120	284	59	175	14900
	1800	63	133	304	65	200	16800
	2000	70	147	328	72	225	18700

FLU: current during upward operation with full load at power supply voltage of 400V.
FLAcc: current while accelerating with full load at power supply voltage of 400V.

Notes:
*1: The values in the table above are for the case where power supply voltage is 400V. If the power supply voltage is within the range of 380 to 440V (except for 400V), calculate values by referring to page 16. If the power supply voltage is not within the range of 380 to 440V, please consult our local agents.
*2: If power supply voltage (E) is a value other than 400V, FLU current and FLAcc current are obtained via the following formula.
(FLU/FLAcc current (A) at E (V)) = (Current at 400V) × (400/E (V))

Table 1

No. of elevators on common feeder	Diversity factor		
	For FLU	For FLAcc	
		Without express zone	With express zone
2	2.0	1.7	1.85
3	2.7	2.4	2.7
4	3.1	2.95	3.4
5	3.25	3.6	4.2
6	3.3	4.1	4.9
7	3.71	4.6	5.6
8	4.08	5.1	6.3
9	4.45	5.6	6.9
10	4.8	6.0	7.6

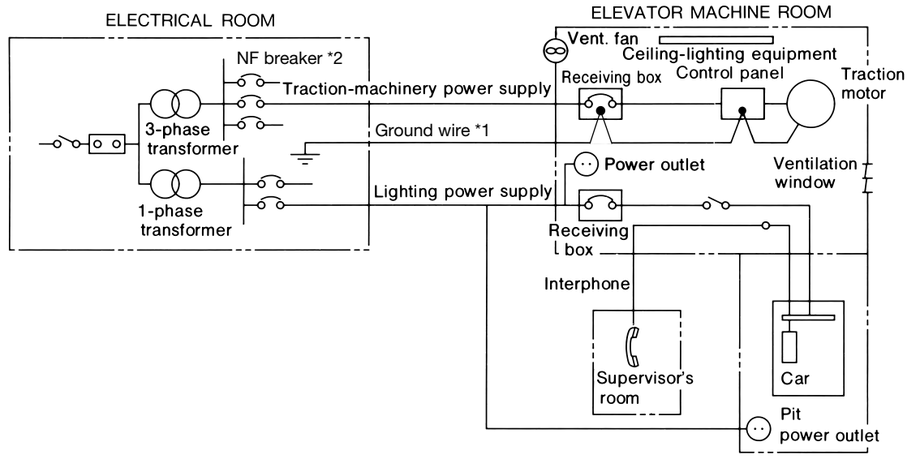
Feeder Size Calculation

- The feeder must be able to withstand continuous flow of the following current at an ambient temperature of 40°C.
  1.25 × FLU (A).....FLU ≦ 50 (A)
  1.10 × FLU (A).....FLU > 50 (A)

  (FLU (A): current during upward operation with full load at power supply voltage of 400V.)

- When power is supplied to multiple elevators in a group through a common feeder, the capacity of the power supply transformer, the size of the feeder, and the current rating of the no-fuse (NF) breaker for one elevator are each multiplied by the corresponding diversity factor at table 1.

● Electrical Equipment Required for Elevator Operation



Notes:
*1: The minimum size of ground wire is determined according to the ampere rating of the NF breaker installed at the power source side.
*2: The ampere rating of the power-source NF breaker should be of one step larger than of the receiving-box NF breaker installed in the elevator machine room.

Traction-Machinery Power Supply

It is necessary to install power-supply equipment of sufficient capacity to ensure the elevators accelerating smoothly and landing accurately.
The power supply should be kept within a voltage-fluctuation range of +5 ~ -10%, and a voltage-imbalance factor of 5%.
When selecting protective breakers on the power-supply side, be guided by voltage ratings of the no-fuse breakers supplied with the elevators.

Power Supply for Lighting

Lighting for the elevator cars and indicators, where possible, should be supplied via a separate circuit that will not be affected by power failures elsewhere.

Ventilation Equipment

A machine-room ventilation device having a sufficient capacity to keep the room temperature below 40°C is required.
A ventilation window should also be installed at the opposite side of ventilation fan.

Intercom (where necessary)

This is essential to establish the communication between elevator passengers and outside in case of emergency.
The master station transceiver is usually in a location readily accessible to the supervisor, in the central supervisor's room or elevator lobby. The wiring work between the master station and the elevator machine room is not included in the elevator contract.
To facilitate piping and wiring, it is desirable to decide on the position of the master station at the earliest stage of building design.

Lighting Equipment

The machine room should be fitted with good lighting for maintenance work. The light switch should be positioned close to the machine-room entrance.

Inspection Power Outlets

These should be installed in the machine room and pit for use during inspection and maintenance.

Work Not Included in Elevator Contract

The following items are excluded from our elevator installation work. Their conditions and other details are to be conformed to the statement of local laws or our elevator's requirements, on the responsibility of the building owner or general contractor.

- Construction of the elevator machine room with proper beams and slabs, equipped with a lock, complete with illumination, ventilation and waterproofing.
- Access to the elevator machine room sufficient to allow passage of the control panel and traction machine.
- Architectural finishing of the machine room floor, and the walls and floors in the vicinity of the entrance hall after installation has been completed.
- Construction of an illuminated, ventilated and waterproofed hoistway.
- The provision of a ladder to the elevator pit.
- The provision of openings and supporting members as required for equipment installation.
- The provision of separate beams when the hoistway dimensions markedly exceed the specifications, and intermediate beams and separator partitions when two or more elevators are installed.
- The provision of an emergency exit door, inspection door and pit access door, when required, and access to the doors.
- All other work related to building construction.
- The provision of the main power and power for illumination, and their electrical switch boxes in the machine room, and laying of the wiring from the electrical room.
- The provision of outlets and laying of the wiring in the machine room and the hoistway, plus the power from the electrical switch box.
- The laying of conduits and wiring between the elevator pit and the terminating point for the devices installed outside the hoistway, such as the emergency bell, intercom, monitoring and security devices.
- The power consumed in installation work and test operations.
- All the necessary building materials for grouting in of brackets, bolts, etc.
- The test provision and subsequent alteration as required, and eventual removal of the scaffolding as required by the elevator contractor, and any other protection of the work as may be required during the process.
- The provision of a suitable, locked space for the storage of elevator equipment and tools during elevator installation.
- The security system, such as a card reader, connected to our elevator controller, when supplied by the building owner or general contractor.

Note: Work responsibilities in installation and construction shall be determined according to local laws.

Elevator Site Requirements

- The temperature of the machine room and elevator hoistway shall be below 40℃.
- The following conditions are required for maintaining elevator performance.
  a. The relative humidity shall be below 90% on a monthly average and below 95% on a daily average.
  b. The machine room and the elevator hoistway shall be finished with mortar or other materials so as to prevent concrete dust.
  c. Prevention shall be provided against icing and condensation occurring due to a rapid drop in the temperature in the machine room and elevator hoistway.
- Voltage fluctuation shall be within a range of +5% to −10%.

Ordering Information

Please include the following information when ordering or requesting estimates:

- The desired number of units, speed and loading capacity.
- The number of stops or number of floors to be served.
- The total elevator travel and each floor-to-floor height.
- Operation system.
- Selected design and size of car.
- Entrance design.
- Signal equipment.
- A sketch of the part of the building where the elevators are to be installed.
- The voltage, number of phases, and frequency of the power source for the motor and lighting.

State-of-the-Art Factories…
For the Environment. For Product Quality.

Our elevators and escalators are currently operating in approximately 90 countries around the globe. Built placing priority on safety, our elevators, escalators and building system products are renowned for their excellent efficiency, energy savings and comfort.
The technologies and skills cultivated at the Inazawa Building Systems Works in Japan and 12 global manufacturing factories are utilized in a worldwide network that provides sales, installation and maintenance in support of maintaining and improving product quality.
As a means of contributing to the realization of a sustainable society, we consciously consider the environment in business operations, proactively work to realize a low-carbon, recycling-based society, and promote the preservation of biodiversity.

ISO9001/14001 certification

> Mitsubishi Electric Building Solutions Corporation Inazawa Building Systems Works has acquired ISO 9001 certification from the International Organization for Standardization based on a review of quality management. The plant has also acquired environmental management system standard ISO 14001 certification.

ISO 9001
BUREAU VERITAS
Certification

ISO 14001
JACO
EC98J2017
UKAS MANAGEMENT SYSTEMS
0051

MITSUBISHI ELECTRIC BUILDING SOLUTIONS CORPORATION
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www.MitsubishiElectric.com/elevator

⚠ **Safety Tips:** Be sure to read the instruction manual fully before using this product.

MS

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