

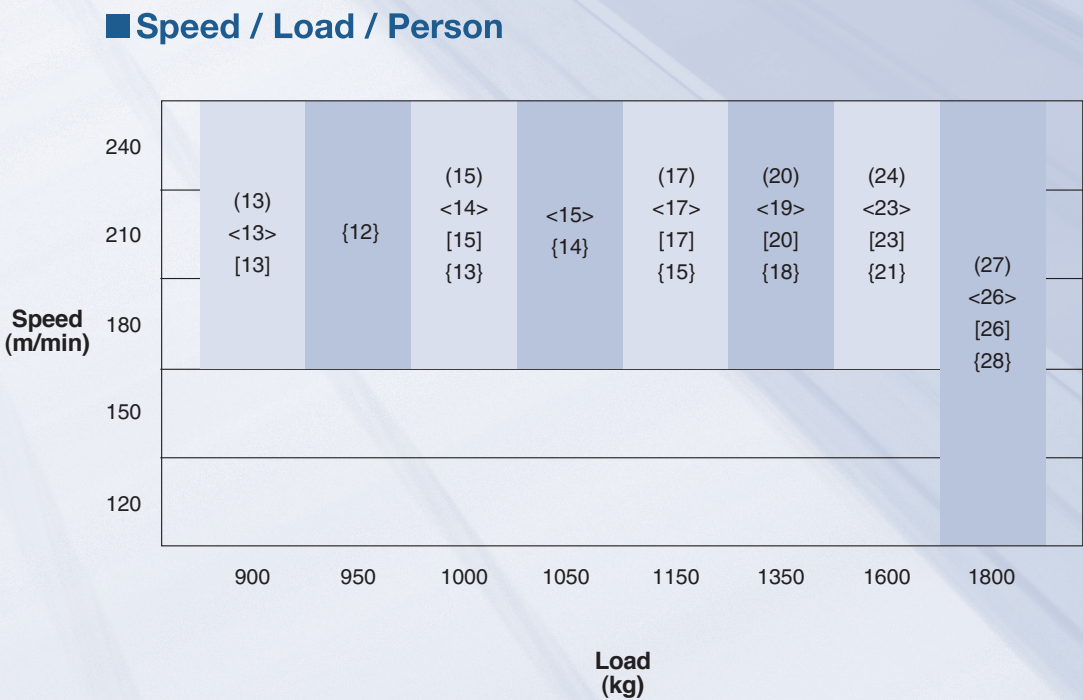
# High-Speed Elevators Planning Guide





# HIGH-SPEED ELEVATORS

Selecting the most suitable elevator configuration is the key to realizing an effective vertical transportation system in a building. Please use the information for Hitachi’s high-speed elevators contained herein to serve you in your overall plans for a building.



- Remarks
- 1. (   ) : Person capacity for Hitachi Standard
  - 2. <   > : Person capacity for India regulations
  - 3. [   ] : Person capacity for SS550 and Malaysia regulations
  - 4. {   } : Person capacity for EN81-1: 1998, HKG-COP and KFB regulations
  - 5. If your request is out of above map range, please consult Hitachi or local agent.

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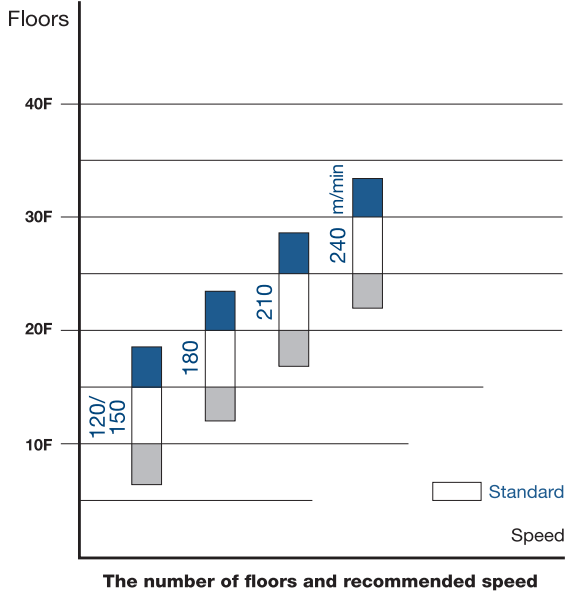


Quick Reference for Elevator Planning

The Number of elevators

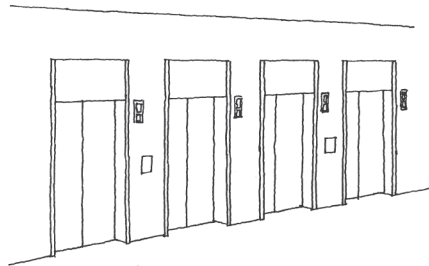
Type of building		Suitable number of Elevators	No. of passengers
Office	Rental office	Population:250 ~ 300persons/elevator Floor area:2,000 ~ 2,400m <sup>2</sup> /elevator	17, 20, 24
	Single tenant	Population:150 ~ 200 persons/elevator Floor area:1,200 ~ 1,600m <sup>2</sup> /elevator	
Hotel	Large	100 rooms/elevator	
	Medium	150 ~ 200 rooms/elevator	

Elevator speed

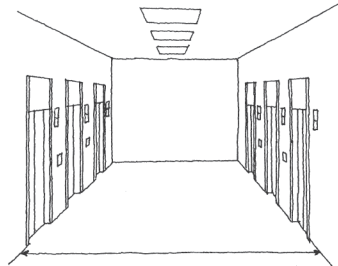


Arrangement

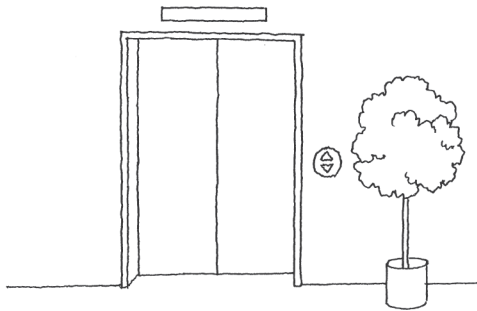
In a line arrangement, Hitachi recommends 4 elevators maximum.



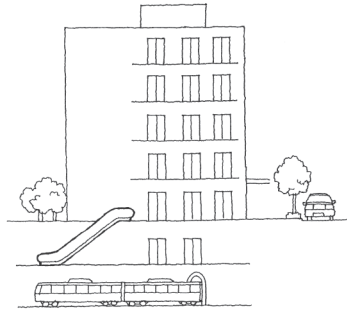
In a case of setting up 5 or more elevators, Hitachi recommends a face arrangement, and distance of opposite faces is 3.5~4.5m.



For single tenant building, please make sure to study whether VIP elevator is needed or not.



- It is not recommended to have multiple access floors in one group. (ex. Basement floor & Ground floor)
- It is not recommended for elevators in one group to have different service floors. (ex. some of elevators serve for Basement floor)

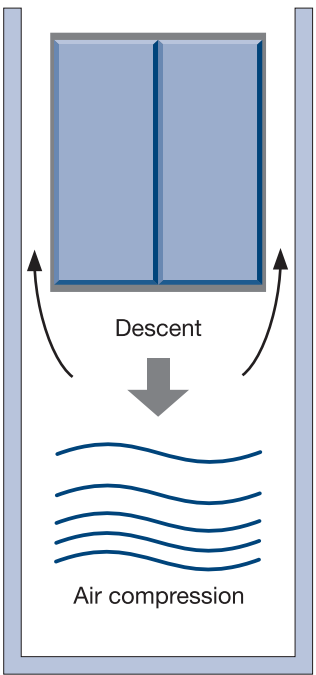


Noise inside the Car

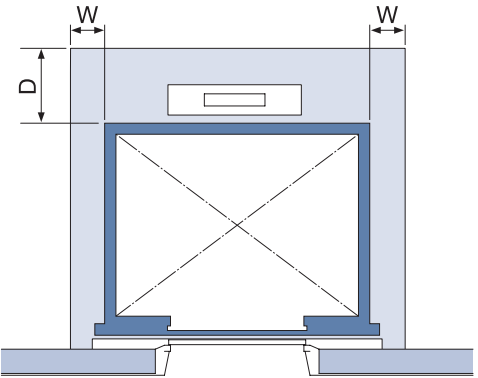
Wind Roar

As elevators travel inside narrow hoistways, noise inside the car becomes greater at higher speed due to swirling current around the car. This phenomenon is especially notable for elevators in single shafts. For elevators to be set in single shafts, please assure dimensions specified in figure and table.

Mechanism of Wind Roar



Hoistway Dimensions for Single Shaft Elevators



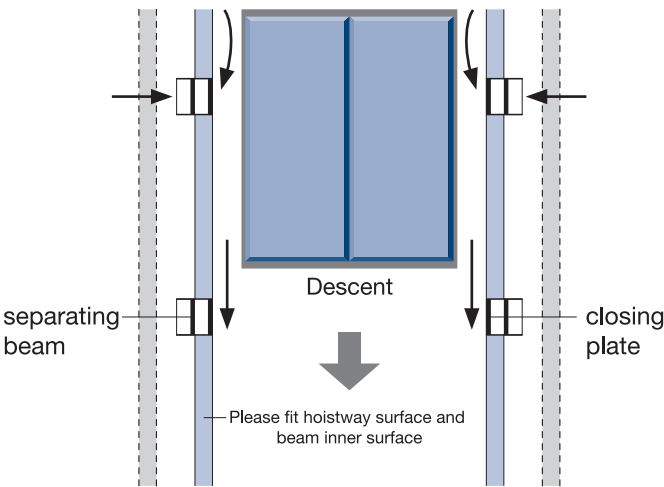
Speed [m/min]	180	210	240
D	≥450	≥450	≥500
W	≥350	≥400	≥400

\* Please consult to Hitachi or local agent when dimensions is less than the minimum specified.

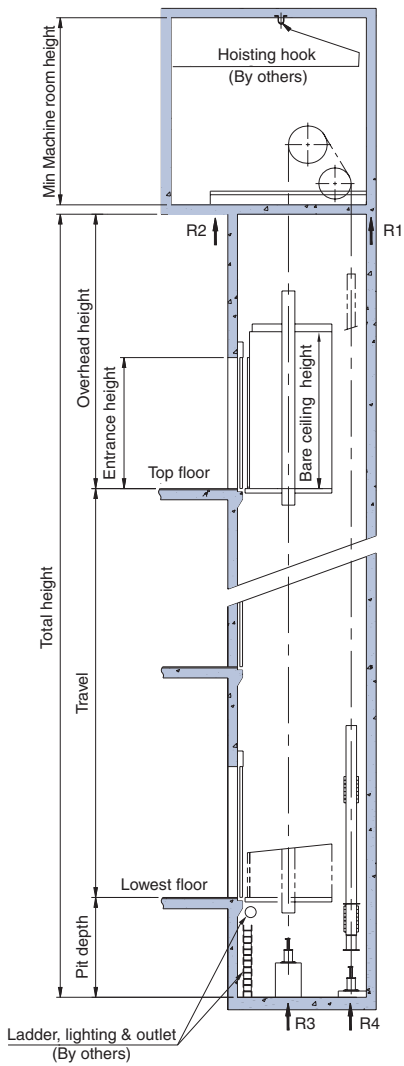
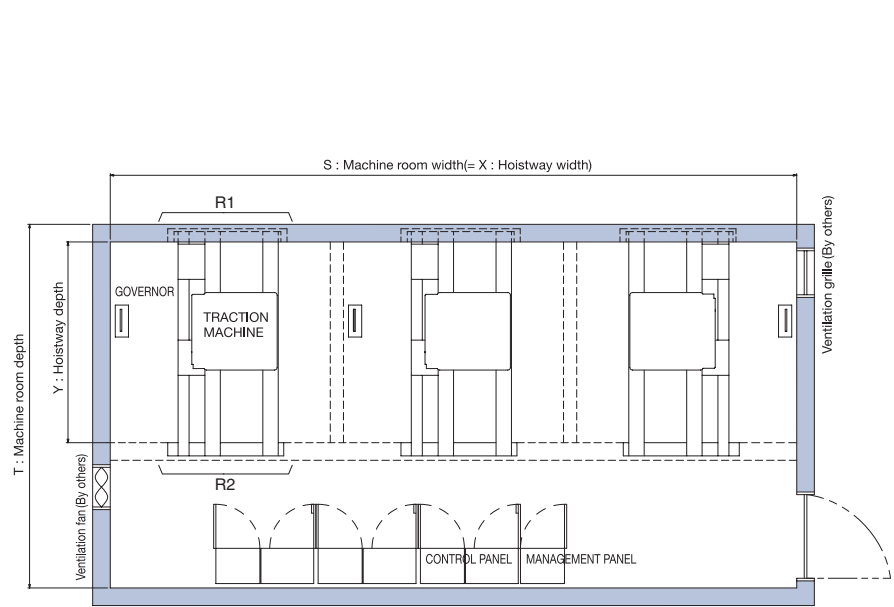
Intermittent Noise

Intermittent noise is caused by wind pressure on bumpy parts inside the hoistway, such as beams or separating beams. This can be prevented by designing smooth hoistway surface. It is also effective to set closing plates on beams and separating beams.

Mechanism of and Countermeasure for Intermittent Noise



# Hoistway and machine room plan



## Specification

No.	Rated load (kg)	Rated speed m/sec (m/min)	Entrance height (mm)	Maximum number of stops	Maximum travel height (m)	Minimum floor to floor height (mm)
1	900 ~ 1600	3.0 (180)	2100	48	200	2755 <sup>(*)</sup>
2		3.5 (210)				
3		4.0 (240)				
4	1800	2.0 (120)				
5		2.5 (150)				
6		3.0 (180)				
7		3.5 (210)				
8		4.0 (240)				

(\*) Please consult to Hitachi or local agent when dimension is less than the minimum specified.

## Minimum machine room height and hoisting hook capacity

No.	Rated load (kg)	Rated speed m/sec (m/min)	Min. Machine room height (mm)			Hoisting hook capacity (Ton)
			Hitachi Std/India/EN81-1/HKG COP/KFB	SS550	Malaysia	
1	900 ~ 1600	3.0 (180)	2350	2550	2800	5
2		3.5 (210)				
3		4.0 (240)				
4	1800	2.0 (120)	2450	2600	2900	
5		2.5 (150)				
6		3.0 (180)				
7		3.5 (210)				
8		4.0 (240)				

## Minimum dimensions for overhead height and pit depth

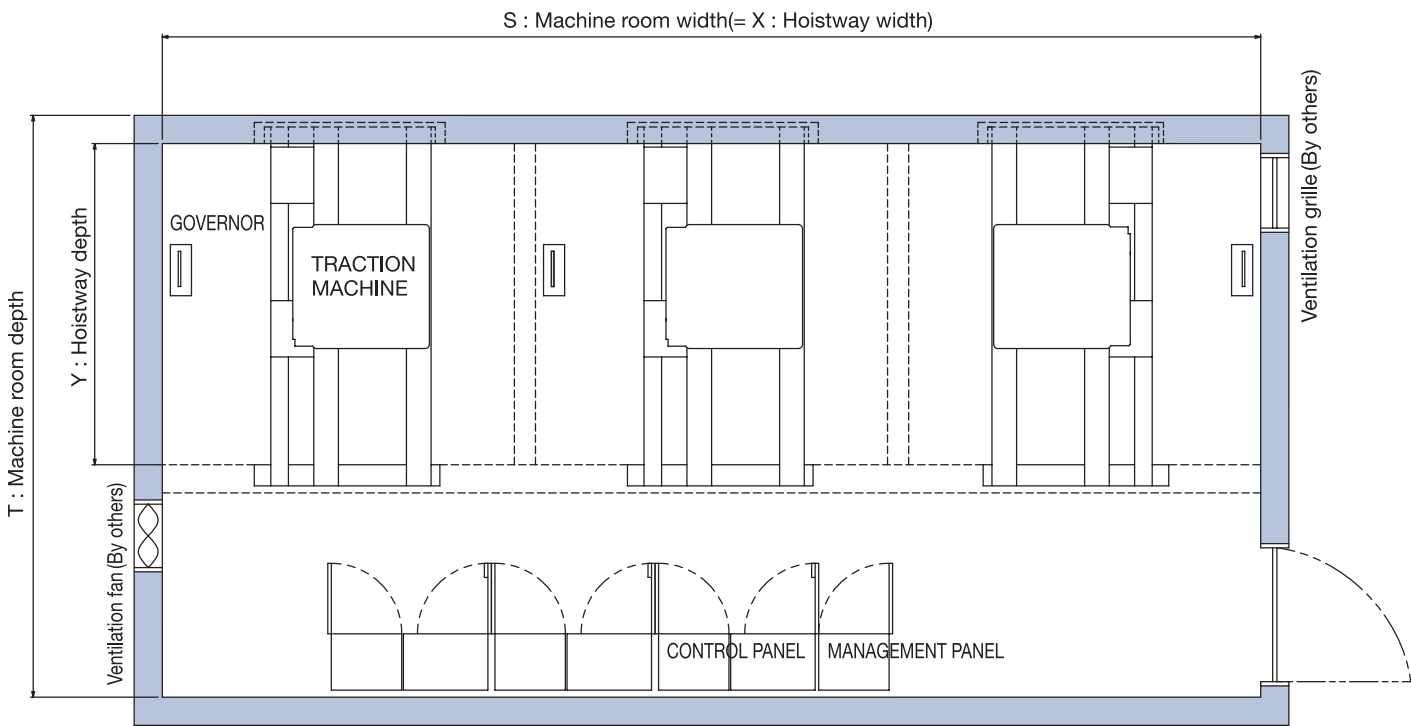
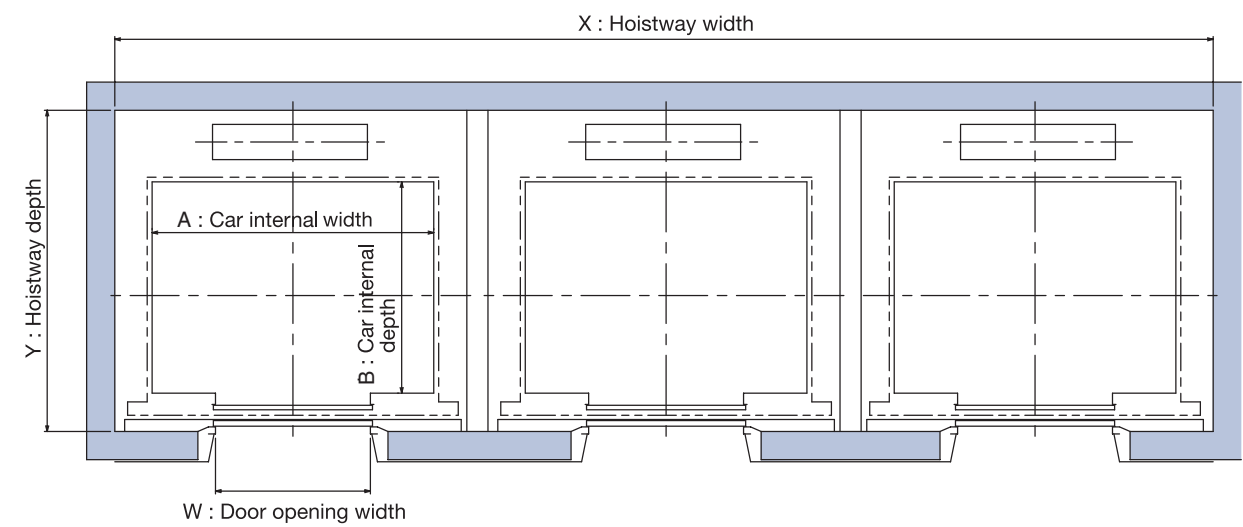
No.	Rated load (kg)	Rated speed m/sec (m/min)	Overhead height (mm) [Bare ceiling height: 2500mm]		Pit depth (mm)	
			Hitachi Std/India/SS550/HKG COP/KFB	EN81-1/Malaysia	Hitachi Std/India/SS550/HKG COP/KFB	EN81-1/Malaysia
1	900 ~ 1600	3.0 (180)	5950	5850	2950	3200
2		3.5 (210)	6350	6200	3150	3400
3		4.0 (240)	6950	6600	3850	4100
4	1800	2.0 (120)	5450	5300	2150	2100
5		2.5 (150)	5650	5500	2450	2250
6		3.0 (180)	5950	5850	3100	3350
7		3.5 (210)	6350	6200	3350	3600
8		4.0 (240)	6950	6600	4000	4250

## Reaction loading in machine room and pit

No.	Rated load (kg)	Rated speed m/sec (m/min)	Machine room reaction loading (kN)		Pit reaction loading (kN)	
			R1	R2	R3	R4
1	900	3.0 (180)	157	90.5	217	199
2		3.5 (210)				
3		4.0 (240)				
4	950	3.0 (180)	157	90.5	217	199
5		3.5 (210)				
6		4.0 (240)				
7	1000	3.0 (180)	160	90.5	221	201
8		3.5 (210)				
9		4.0 (240)				
10	1050	3.0 (180)	160	90.5	221	201
11		3.5 (210)				
12		4.0 (240)				
13	1150	3.0 (180)	160	91	223	200
14		3.5 (210)				
15		4.0 (240)				
16	1350	3.0 (180)	191.5	108	263	237
17		3.5 (210)				
18		4.0 (240)				
19	1600	3.0 (180)	195	108	269	238
20		3.5 (210)				
21		4.0 (240)				
22	1800	2.0 (120)	189	103	286	251
23		2.5 (150)				
24		3.0 (180)	199	109	306	270
25		3.5 (210)				
26		4.0 (240)				

# Hoistway and machine room plan

## Dimensions of hoistway and machine room [Based on Hitachi standard]



## Dimensions of hoistway [Based on Hitachi standard]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Hoistway, X x Y (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900	13	3.0 (180)	HVF-900-CO180	1600 x 1350	900	4400 x 2155	6620 x 2155	8840 x 2155
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000	15	3.0 (180)	HVF-1000-CO180	1600 x 1500	900	4400 x 2305	6620 x 2305	8840 x 2305
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 2305	7220 x 2305	9640 x 2305
8			3.5 (210)	HVF-1150-CO210					
9			4.0 (240)	HVF-1150-CO240					
10	1350	20	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 2305	7820 x 2305	10440 x 2305
11			3.5 (210)	HVF-1350-CO210					
12			4.0 (240)	HVF-1350-CO240					
13	1600	24	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 2555	7820 x 2555	10440 x 2555
14			3.5 (210)	HVF-1600-CO210					
15			4.0 (240)	HVF-1600-CO240					
16	1800	27	2.0 (120)	HVF-1800-CO120	2000 x 1900	1100	5200 x 2705	7820 x 2705	10440 x 2705
17			2.5 (150)	HVF-1800-CO150					
18			3.0 (180)	HVF-1800-CO180					
19			3.5 (210)	HVF-1800-CO210					
20			4.0 (240)	HVF-1800-CO240					

Remark: Above hoistway size shows minimum size based on building construction error within ± 25mm.

## Dimensions of machine room [Based on Hitachi standard]

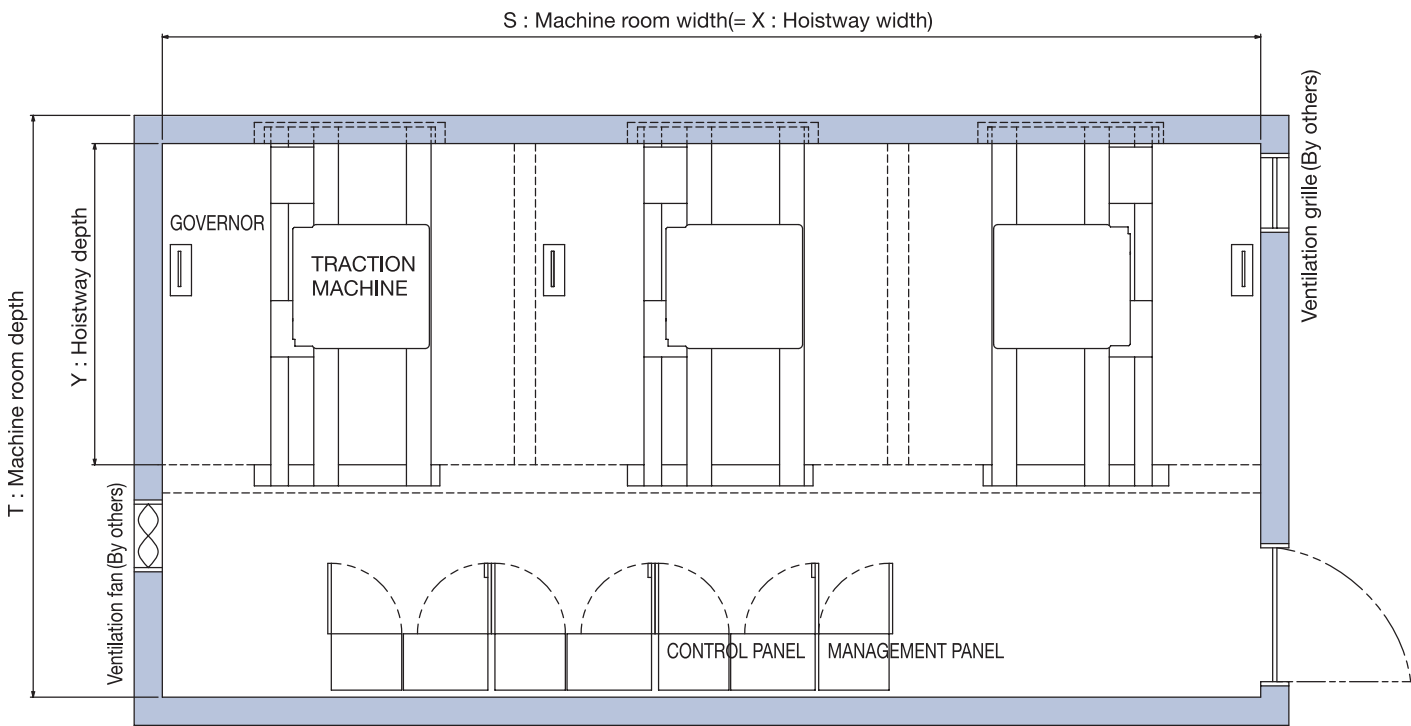
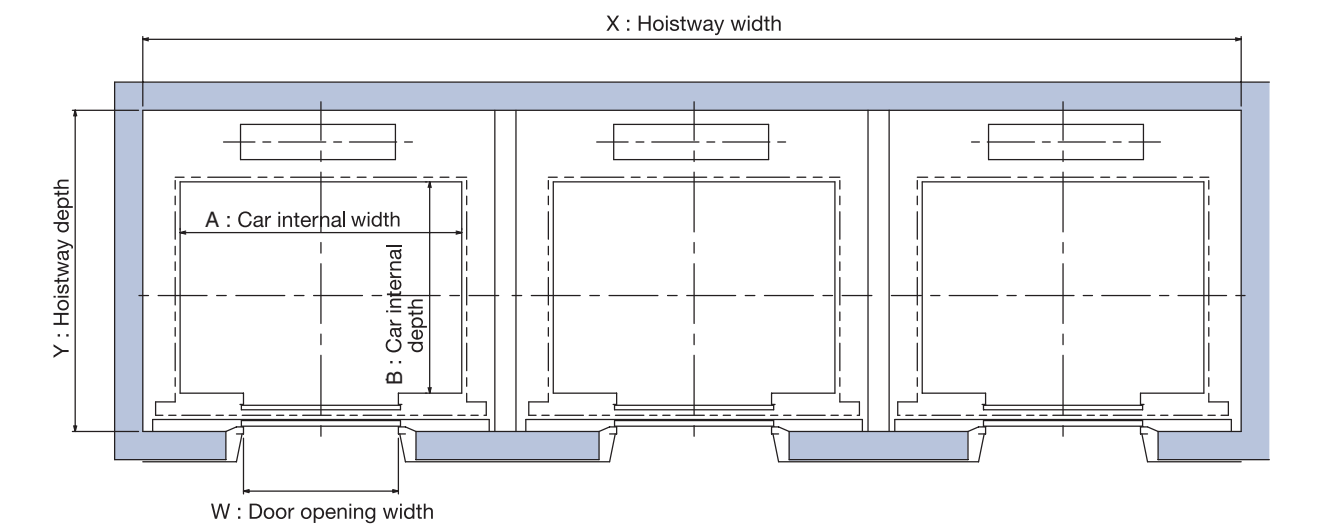
No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Machine room, S x T (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900	13	3.0 (180)	HVF-900-CO180	1600 x 1350	900	4400 x 3640	6620 x 3640	8840 x 3640
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000	15	3.0 (180)	HVF-1000-CO180	1600 x 1500	900	4400 x 3790	6620 x 3790	8840 x 3790
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 3790	7220 x 3790	9640 x 3790
8			3.5 (210)	HVF-1150-CO210					
9			4.0 (240)	HVF-1150-CO240					
10	1350	20	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 3790	7820 x 3790	10440 x 3790
11			3.5 (210)	HVF-1350-CO210					
12			4.0 (240)	HVF-1350-CO240					
13	1600	24	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 4040	7820 x 4040	10440 x 4040
14			3.5 (210)	HVF-1600-CO210					
15			4.0 (240)	HVF-1600-CO240					
16	1800	27	2.0 (120)	HVF-1800-CO120	2000 x 1900	1100	5200 x 4190	7820 x 4190	10440 x 4190
17			2.5 (150)	HVF-1800-CO150					
18			3.0 (180)	HVF-1800-CO180					
19			3.5 (210)	HVF-1800-CO210					
20			4.0 (240)	HVF-1800-CO240					

Remark: Above machine room size shows minimum size based on building construction error within ± 25mm.



# Hoistway and machine room plan

## Dimensions of hoistway and machine room [Based on India regulations]



## Dimensions of hoistway [Based on India regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Hoistway, X x Y (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900 <sup>(*)</sup>	13	3.0 (180)	HVF-900-CO180	1600 x 1350	900	4400 x 2155	6620 x 2155	8840 x 2155
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000 <sup>(*)</sup>	14	3.0 (180)	HVF-1000-CO180	1600 x 1400	900	4400 x 2205	6620 x 2205	8840 x 2205
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1050 <sup>(*)</sup>	15	3.0 (180)	HVF-1050-CO180	1600 x 1500	900	4400 x 2305	6620 x 2305	8840 x 2305
8			3.5 (210)	HVF-1050-CO210					
9			4.0 (240)	HVF-1050-CO240					
10	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 2305	7220 x 2305	9640 x 2305
11			3.5 (210)	HVF-1150-CO210					
12			4.0 (240)	HVF-1150-CO240					
13	1350 <sup>(*)</sup>	19	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 2305	7820 x 2305	10440 x 2305
14			3.5 (210)	HVF-1350-CO210					
15			4.0 (240)	HVF-1350-CO240					
16	1600 <sup>(*)</sup>	23	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 2555	7820 x 2555	10440 x 2555
17			3.5 (210)	HVF-1600-CO210					
18			4.0 (240)	HVF-1600-CO240					
19	1800 <sup>(*)</sup>	26	2.0 (120)	HVF-1800-CO120	2000 x 1900	1100	5200 x 2705	7820 x 2705	10440 x 2705
20			2.5 (150)	HVF-1800-CO150					
21			3.0 (180)	HVF-1800-CO180					
22			3.5 (210)	HVF-1800-CO210					
23			4.0 (240)	HVF-1800-CO240					

(\*)1 Complied with IS 14665  
Remark: Above hoistway size shows minimum size based on building construction error within ± 25mm.

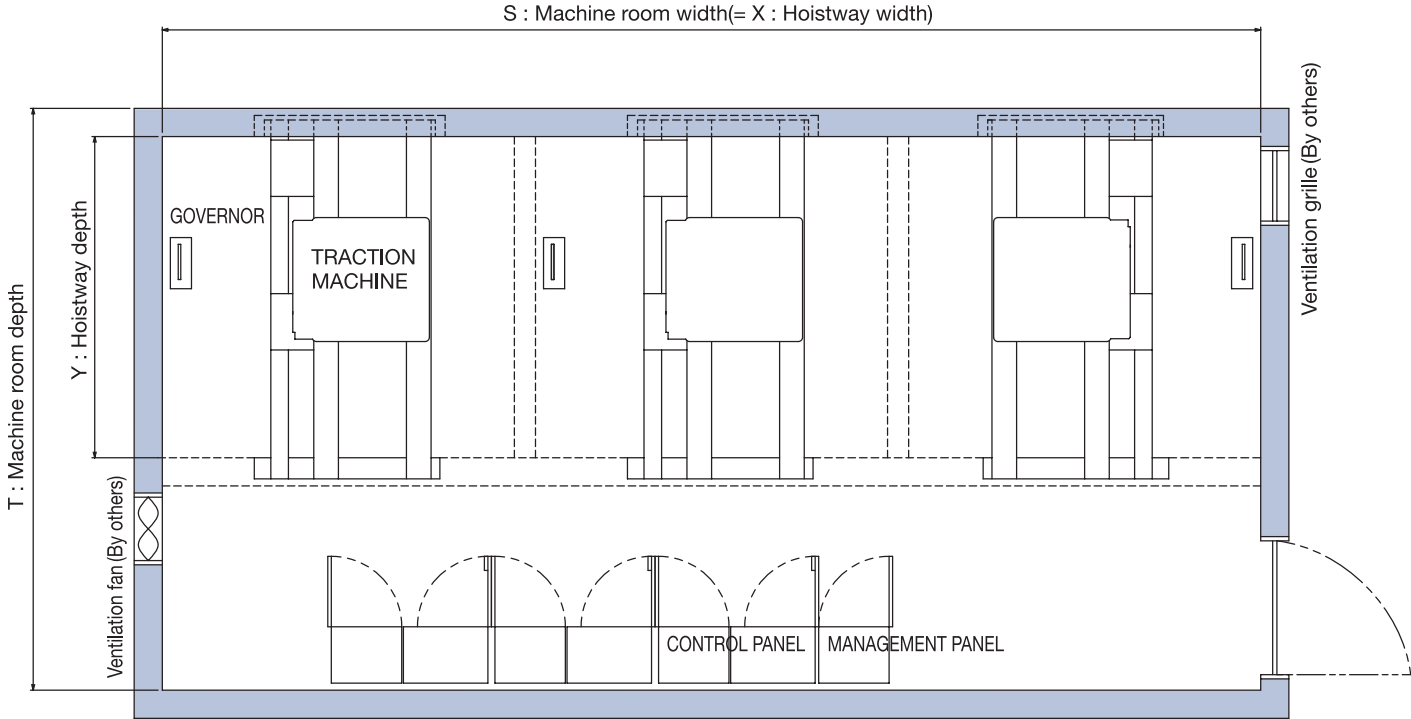
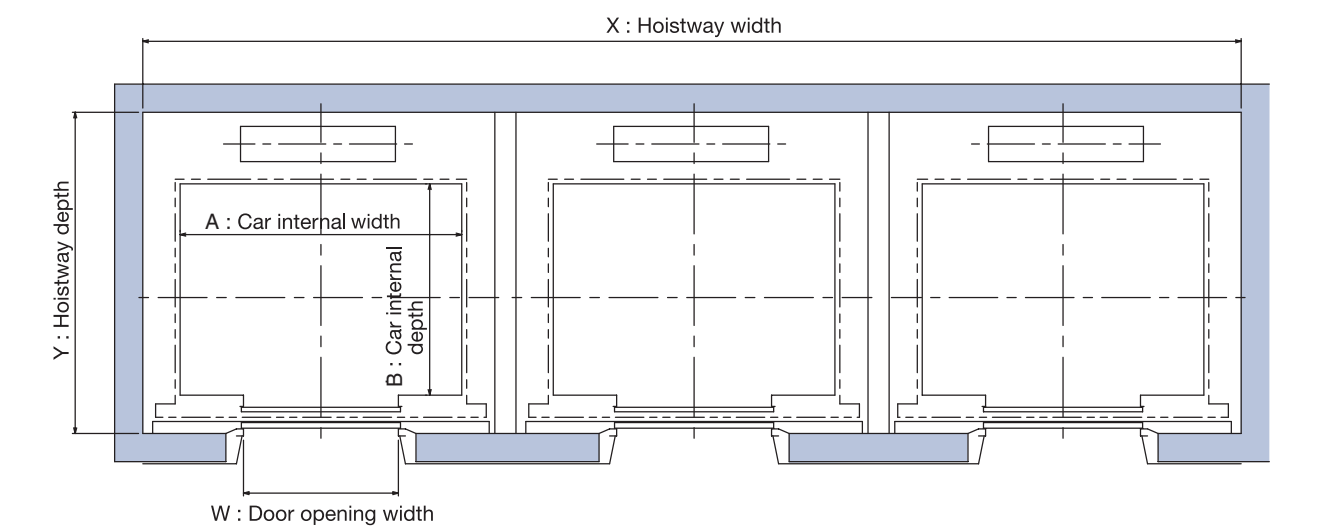
## Dimensions of machine room [Based on India regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Machine room, S x T (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900 <sup>(*)</sup>	13	3.0 (180)	HVF-900-CO180	1600 x 1350	900	4400 x 3640	6620 x 3640	8840 x 3640
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000 <sup>(*)</sup>	14	3.0 (180)	HVF-1000-CO180	1600 x 1400	900	4400 x 3690	6620 x 3690	8840 x 3690
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1050 <sup>(*)</sup>	15	3.0 (180)	HVF-1050-CO180	1600 x 1500	900	4400 x 3790	6620 x 3790	8840 x 3790
8			3.5 (210)	HVF-1050-CO210					
9			4.0 (240)	HVF-1050-CO240					
10	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 3790	7220 x 3790	9640 x 3790
11			3.5 (210)	HVF-1150-CO210					
12			4.0 (240)	HVF-1150-CO240					
13	1350 <sup>(*)</sup>	19	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 3790	7820 x 3790	10440 x 3790
14			3.5 (210)	HVF-1350-CO210					
15			4.0 (240)	HVF-1350-CO240					
16	1600 <sup>(*)</sup>	23	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 4040	7820 x 4040	10440 x 4040
17			3.5 (210)	HVF-1600-CO210					
18			4.0 (240)	HVF-1600-CO240					
19	1800 <sup>(*)</sup>	26	2.0 (120)	HVF-1800-CO120	2000 x 1900	1100	5200 x 4190	7820 x 4190	10440 x 4190
20			2.5 (150)	HVF-1800-CO150					
21			3.0 (180)	HVF-1800-CO180					
22			3.5 (210)	HVF-1800-CO210					
23			4.0 (240)	HVF-1800-CO240					

(\*)1 Complied with IS 14665  
Remark: Above machine room size shows minimum size based on building construction error within ± 25mm.

# Hoistway and machine room plan

## Dimensions of hoistway and machine room [Based on SS550 and Malaysia regulations]



## Dimensions of hoistway [Based on SS550 and Malaysia regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Hoistway, X x Y (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900	13	3.0 (180)	HVF-900-CO180	1600 x 1400	900	4400 x 2205	6620 x 2205	8840 x 2205
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000 [1025]	15	3.0 (180)	HVF-1000-CO180 [HVF-1025-CO180]	1600 x 1550	900	4400 x 2355	6620 x 2355	8840 x 2355
5			3.5 (210)	HVF-1000-CO210 [HVF-1025-CO210]					
6			4.0 (240)	HVF-1000-CO240 [HVF-1025-CO240]					
7	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 2305	7220 x 2305	9640 x 2305
8			3.5 (210)	HVF-1150-CO210					
9			4.0 (240)	HVF-1150-CO240					
10	1350	20	3.0 (180)	HVF-1350-CO180	2000 x 1550	1100	5200 x 2355	7820 x 2355	10440 x 2355
11			3.5 (210)	HVF-1350-CO210					
12			4.0 (240)	HVF-1350-CO240					
13	1600	23	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 2555	7820 x 2555	10440 x 2555
14			3.5 (210)	HVF-1600-CO210					
15			4.0 (240)	HVF-1600-CO240					
16	1800	26	2.0 (120)	HVF-1800-CO120	2000 x 1950	1100	5200 x 2755	7820 x 2755	10440 x 2755
17			2.5 (150)	HVF-1800-CO150					
18			3.0 (180)	HVF-1800-CO180					
19			3.5 (210)	HVF-1800-CO210					
20			4.0 (240)	HVF-1800-CO240					

[ ] : For Malaysia use only.  
Remark: Above hoistway size shows minimum size based on building construction error within ± 25mm.

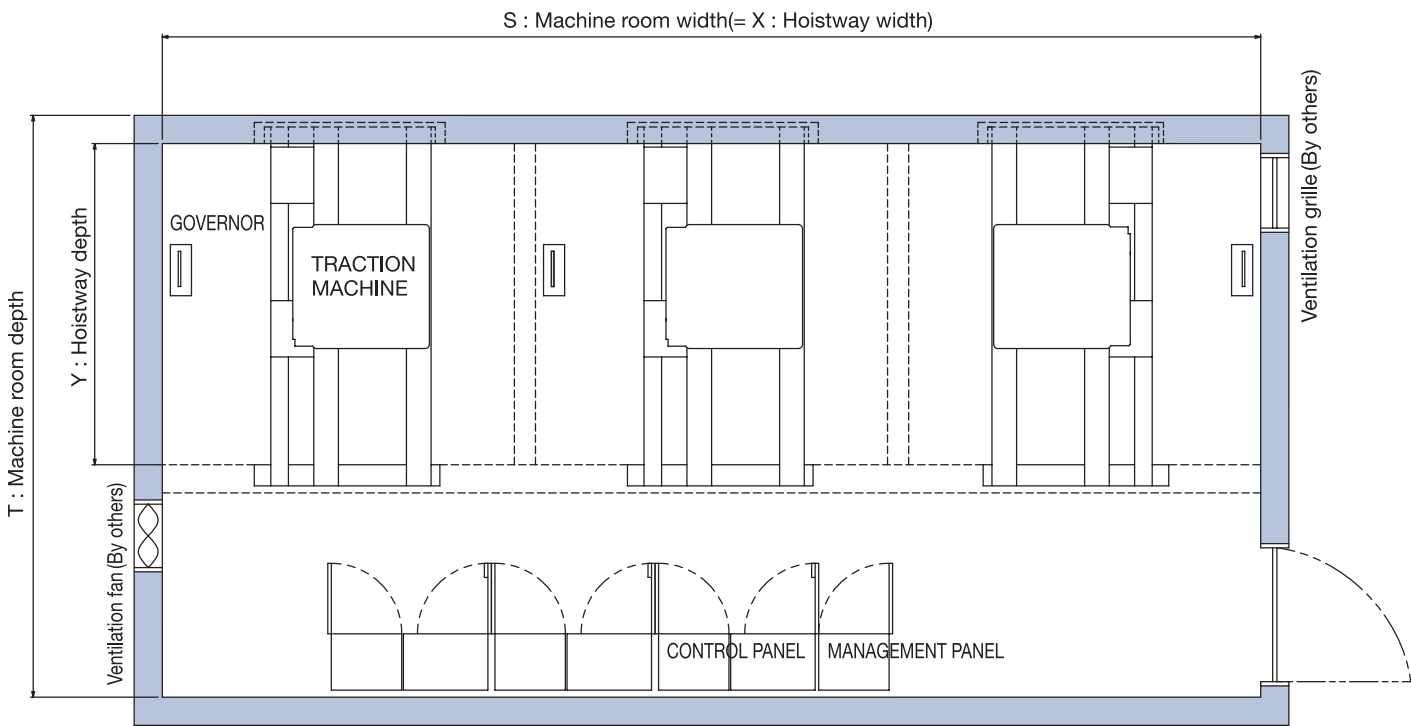
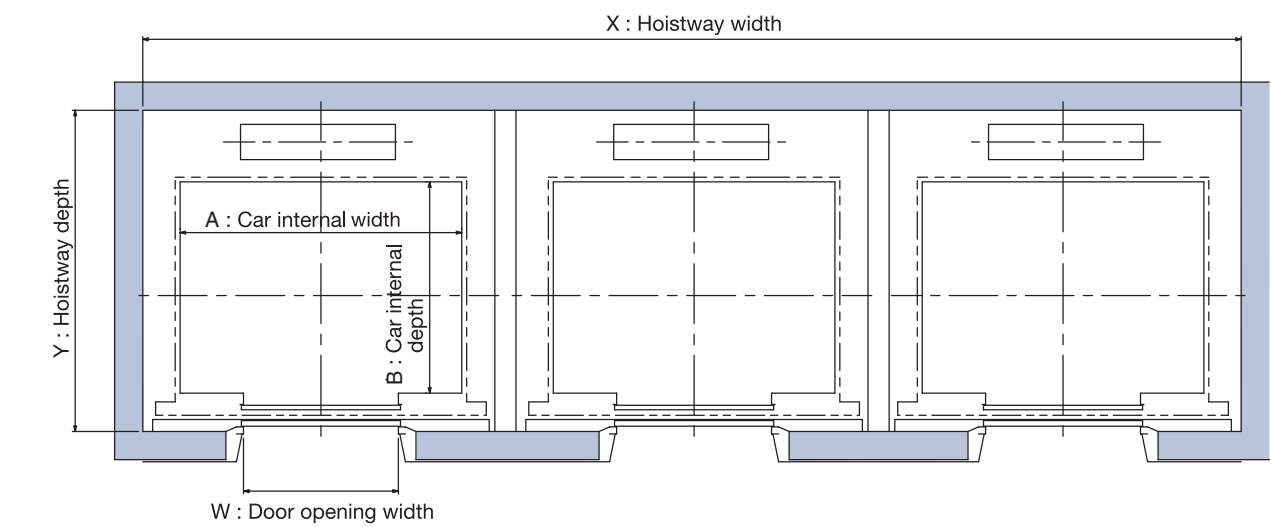
## Dimensions of machine room [Based on SS550 and Malaysia regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Machine room, S x T (mm)		
							In-line arrangement		
					A x B	W	2 cars	3 cars	4 cars
1	900	13	3.0 (180)	HVF-900-CO180	1600 x 1400	900	4400 x 3690	6620 x 3690	8840 x 3690
2			3.5 (210)	HVF-900-CO210					
3			4.0 (240)	HVF-900-CO240					
4	1000 [1025]	15	3.0 (180)	HVF-1000-CO180 [HVF-1025-CO180]	1600 x 1550	900	4400 x 3840	6620 x 3840	8840 x 3840
5			3.5 (210)	HVF-1000-CO210 [HVF-1025-CO210]					
6			4.0 (240)	HVF-1000-CO240 [HVF-1025-CO240]					
7	1150	17	3.0 (180)	HVF-1150-CO180	1800 x 1500	1000	4800 x 3790	7220 x 3790	9640 x 3790
8			3.5 (210)	HVF-1150-CO210					
9			4.0 (240)	HVF-1150-CO240					
10	1350	20	3.0 (180)	HVF-1350-CO180	2000 x 1550	1100	5200 x 3840	7820 x 3840	10440 x 3840
11			3.5 (210)	HVF-1350-CO210					
12			4.0 (240)	HVF-1350-CO240					
13	1600	23	3.0 (180)	HVF-1600-CO180	2000 x 1750	1100	5200 x 4040	7820 x 4040	10440 x 4040
14			3.5 (210)	HVF-1600-CO210					
15			4.0 (240)	HVF-1600-CO240					
16	1800	26	2.0 (120)	HVF-1800-CO120	2000 x 1950	1100	5200 x 4240	7820 x 4240	10440 x 4240
17			2.5 (150)	HVF-1800-CO150					
18			3.0 (180)	HVF-1800-CO180					
19			3.5 (210)	HVF-1800-CO210					
20			4.0 (240)	HVF-1800-CO240					

[ ] : For Malaysia use only.  
Remark: Above machine room size shows minimum size based on building construction error within ± 25mm.

Hoistway and machine room plan

Dimensions of hoistway and machine room  
[Based on EN81-1:1998, HKG-COP and KFB (Kuwait) regulations]



Dimensions of hoistway [Based on EN81-1:1998, HKG-COP and KFB (Kuwait) regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Hoistway, X x Y (mm)		
							In-line arrangement		
							A x B	W	
1	950	12	3.0 (180)	HVF-950-CO180	1600 x 1350	900	4400 x 2155	6620 x 2155	8840 x 2155
2			3.5 (210)	HVF-950-CO210					
3			4.0 (240)	HVF-950-CO240					
4	1000	13	3.0 (180)	HVF-1000-CO180	1600 x 1400	900	4400 x 2205	6620 x 2205	8840 x 2205
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1050	14	3.0 (180)	HVF-1050-CO180	1600 x 1500	900	4400 x 2305	6620 x 2305	8840 x 2305
8			3.5 (210)	HVF-1050-CO210					
9			4.0 (240)	HVF-1050-CO240					
10	1150	15	3.0 (180)	HVF-1150-CO180	1800 x 1450	1000	4800 x 2255	7220 x 2255	9640 x 2255
11			3.5 (210)	HVF-1150-CO210					
12			4.0 (240)	HVF-1150-CO240					
13	1350	18	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 2305	7820 x 2305	10440 x 2305
14			3.5 (210)	HVF-1350-CO210					
15			4.0 (240)	HVF-1350-CO240					
16	1600	21	3.0 (180)	HVF-1600-CO180	2000 x 1700	1100	5200 x 2505	7820 x 2505	10440 x 2505
17			3.5 (210)	HVF-1600-CO210					
18			4.0 (240)	HVF-1600-CO240					
19	1800	24	2.0 (120)	HVF-1800-CO120	2000 x 1850	1100	5200 x 2655	7820 x 2655	10440 x 2655
20			2.5 (150)	HVF-1800-CO150					
21			3.0 (180)	HVF-1800-CO180					
22			3.5 (210)	HVF-1800-CO210					
23			4.0 (240)	HVF-1800-CO240					

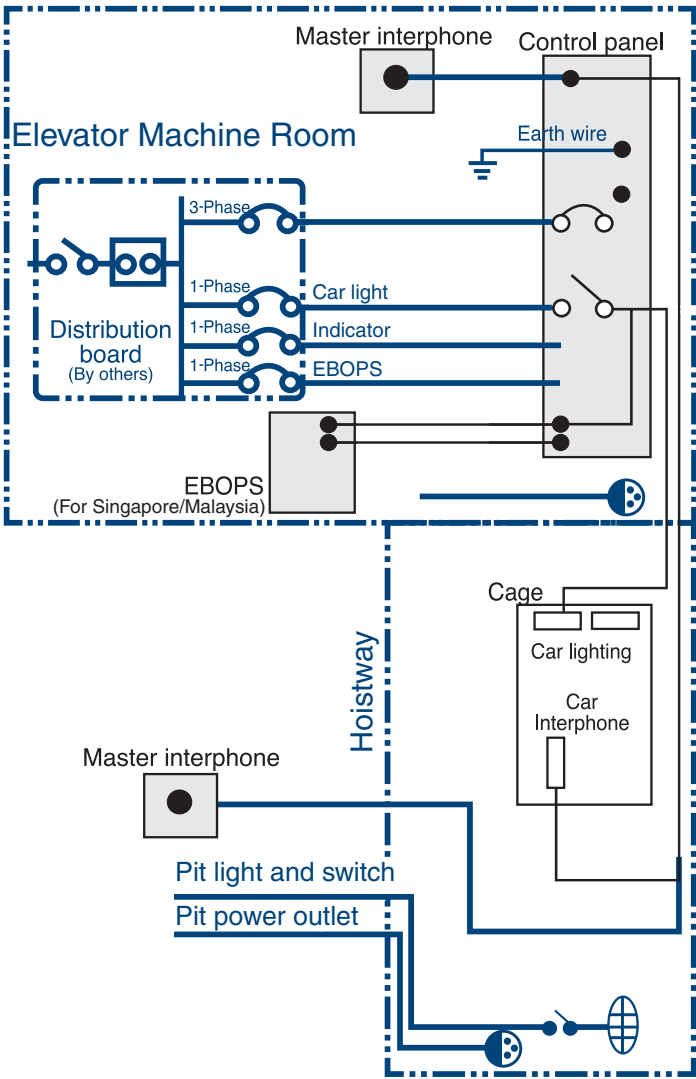
Remark: Above hoistway size shows minimum size based on building construction error within ± 25mm.

Dimensions of machine room [Based on EN81-1:1998, HKG-COP and KFB (Kuwait) regulations]

No.	Rated load (kg)	Persons	Rated speed m/sec (m/min)	Model	Car internal (mm)	Door opening width (mm)	Machine room, S x T (mm)		
							In-line arrangement		
							A x B	W	
1	950	12	3.0 (180)	HVF-950-CO180	1600 x 1350	900	4400 x 3640	6620 x 3640	8840 x 3640
2			3.5 (210)	HVF-950-CO210					
3			4.0 (240)	HVF-950-CO240					
4	1000	13	3.0 (180)	HVF-1000-CO180	1600 x 1400	900	4400 x 3690	6620 x 3690	8840 x 3690
5			3.5 (210)	HVF-1000-CO210					
6			4.0 (240)	HVF-1000-CO240					
7	1050	14	3.0 (180)	HVF-1050-CO180	1600 x 1500	900	4400 x 3790	6620 x 3790	8840 x 3790
8			3.5 (210)	HVF-1050-CO210					
9			4.0 (240)	HVF-1050-CO240					
10	1150	15	3.0 (180)	HVF-1150-CO180	1800 x 1450	1000	4800 x 3740	7220 x 3740	9640 x 3740
11			3.5 (210)	HVF-1150-CO210					
12			4.0 (240)	HVF-1150-CO240					
13	1350	18	3.0 (180)	HVF-1350-CO180	2000 x 1500	1100	5200 x 3790	7820 x 3790	10440 x 3790
14			3.5 (210)	HVF-1350-CO210					
15			4.0 (240)	HVF-1350-CO240					
16	1600	21	3.0 (180)	HVF-1600-CO180	2000 x 1700	1100	5200 x 3990	7820 x 3990	10440 x 3990
17			3.5 (210)	HVF-1600-CO210					
18			4.0 (240)	HVF-1600-CO240					
19	1800	24	2.0 (120)	HVF-1800-CO120	2000 x 1850	1100	5200 x 4140	7820 x 4140	10440 x 4140
20			2.5 (150)	HVF-1800-CO150					
21			3.0 (180)	HVF-1800-CO180					
22			3.5 (210)	HVF-1800-CO210					
23			4.0 (240)	HVF-1800-CO240					

Remark: Above machine room size shows minimum size based on building construction error within ± 25mm.





Wiring diagram

shows the works to be done by others. Pit lightings, including wiring and piping, are to be provided by others (minimum 200 lux at floor level). Power socket outlet, including wiring and piping in pit, are to be provided by others.

Item	Work to be provided by others
Main power supply <sup>(*)</sup>	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 <sup>(*)</sup>	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 <sup>2</sup> /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.	Rated Load (kg)	Rated Speed m/s (m/min)	Model	Electrical data (For 1 elevator unless specified)					
				Motor Capacity (kW)	Main Supply Voltage (3-phase) (V)	Circuit Breaker Capacity per unit (A)	Transformer Capacity per unit (kVA)	Starting Power per unit (kVA)	Calorific Value for 1 elevator (kcal/hr)
1	900	3.0 (180)	HVF-900-CO180	18	200~220 380~420	125 60	24	82	3600
2		3.5 (210)	HVF-900-CO210	22	200~220 380~420	150 75	28	98	4200
3		4.0 (240)	HVF-900-CO240	24	200~220 380~420	150 75	30	111	4800
4	950	3.0 (180)	HVF-950-CO180	18	200~220 380~420	125 60	24	82	3800
5		3.5 (210)	HVF-950-CO210	22	200~220 380~420	150 75	28	98	4440
6		4.0 (240)	HVF-950-CO240	24	200~220 380~420	150 75	30	111	5070
7	1000 [1025]	3.0 (180)	HVF-1000-CO180 [HVF-1025-CO180]	20	200~220 380~420	125 60	26	87	4000 [4100]
8		3.5 (210)	HVF-1000-CO210 [HVF-1025-CO210]	24	200~220 380~420	150 75	30	103	4670 [4790]
9		4.0 (240)	HVF-1000-CO240 [HVF-1025-CO240]	27	200~220 380~420	150 100	33	117	5340 [5470]
10	1050	3.0 (180)	HVF-1050-CO180	20	200~220 380~420	125 60	26	87	4200
11		3.5 (210)	HVF-1050-CO210	24	200~220 380~420	150 75	30	103	4900
12		4.0 (240)	HVF-1050-CO240	27	200~220 380~420	150 100	33	117	5600
13	1150	3.0 (180)	HVF-1150-CO180	24	200~220 380~420	150 75	30	93	4600
14		3.5 (210)	HVF-1150-CO210	27	200~220 380~420	150 100	33	106	5370
15		4.0 (240)	HVF-1150-CO240	33	200~220 380~420	175 125	39	122	6140
16	1350	3.0 (180)	HVF-1350-CO180	27	200~220 380~420	150 100	33	109	5400
17		3.5 (210)	HVF-1350-CO210	33	200~220 380~420	175 125	39	126	6300
18		4.0 (240)	HVF-1350-CO240	39	200~220 380~420	200 125	45	149	7200
19	1600	3.0 (180)	HVF-1600-CO180	33	200~220 380~420	175 125	39	117	6400
20		3.5 (210)	HVF-1600-CO210	39	200~220 380~420	200 125	45	138	7470
21		4.0 (240)	HVF-1600-CO240	43	200~220 380~420	225 125	49	156	8540
22	1800	2.0 (120)	HVF-1800-CO120	27	200~220 380~420	150 100	33	98	4800
23		2.5 (150)	HVF-1800-CO150	33	200~220 380~420	175 100	39	119	6000
24		3.0 (180)	HVF-1800-CO180	39	200~220 380~420	200 125	45	138	7200
25		3.5 (210)	HVF-1800-CO210	43	200~220 380~420	225 125	49	156	8400
26		4.0 (240)	HVF-1800-CO240	47	200~220	225	53	183	9600
					380~420	150			

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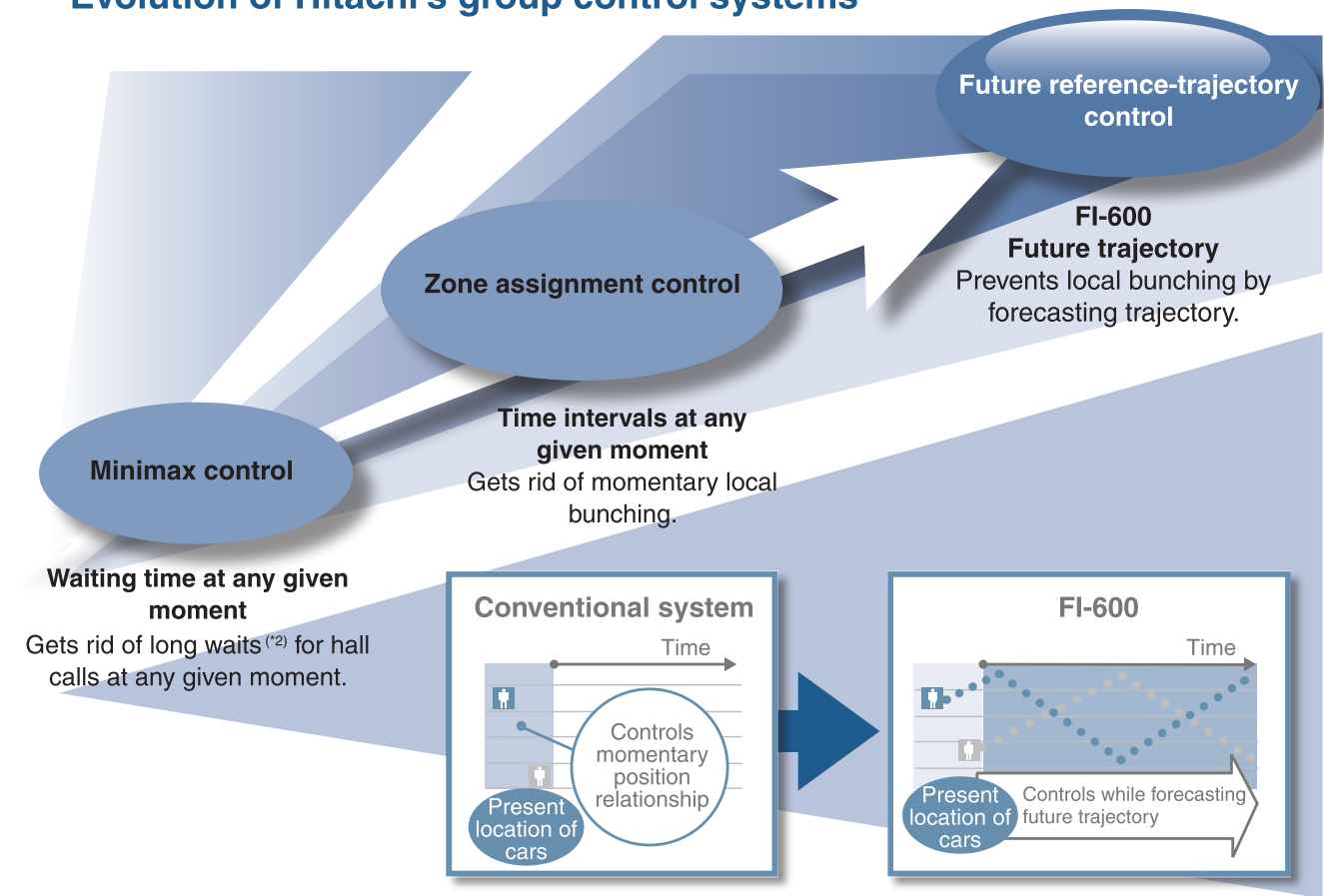
Hitachi’s new group control system, FI-600

Shortening waiting times and reducing the probability of a long wait<sup>(\*)</sup> 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.

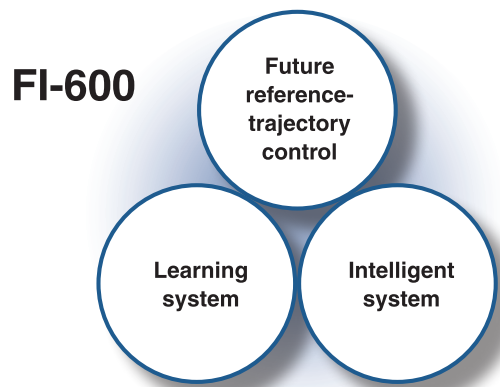
The probability of a long wait<sup>(\*)</sup> is minimized by operating elevator cars at equal time intervals while forecasting future trajectories.

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.

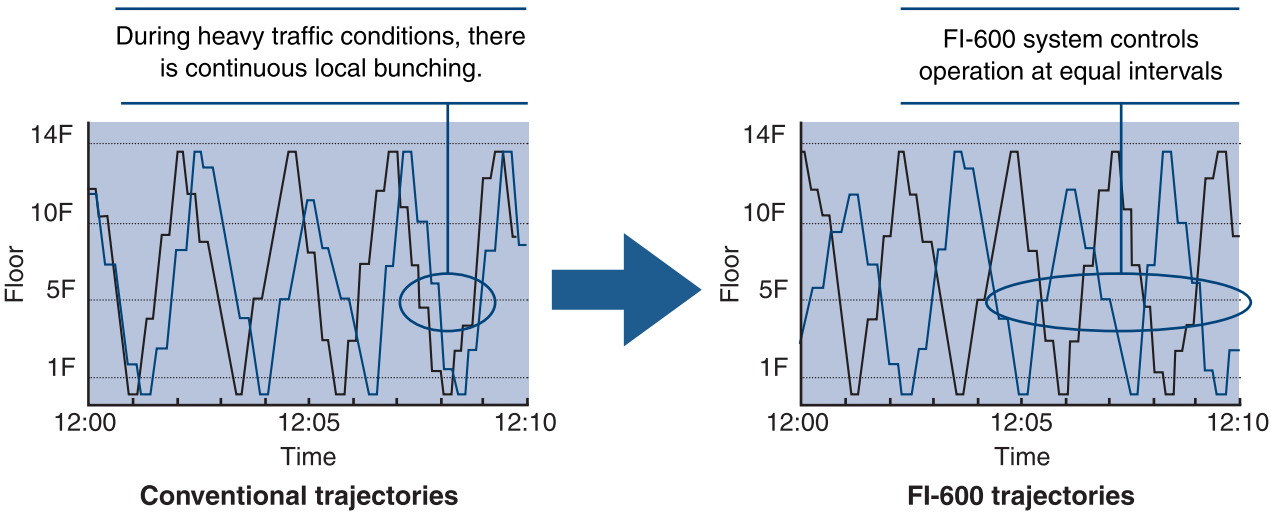
What is future reference-trajectory-control?

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<sup>(\*)</sup>.

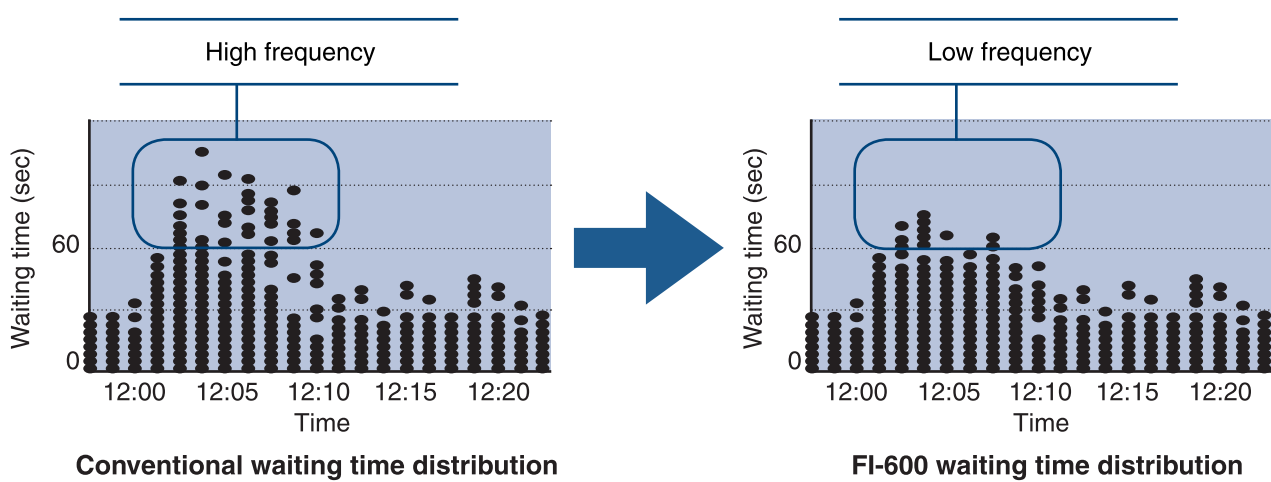
Major advantages of FI-600

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

Reduce average waiting time by as much as 10%<sup>(\*)</sup>



Reduce probability of a long wait<sup>(\*)</sup> by up to 12%<sup>(\*)</sup>



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



Basic functions

● Standard specification

▲ Optional specification

— Not applicable

			FI series		
No.	Function		600	100	10
1	Instantaneous reservation and service forecasting (FI-IRF)		●	—	—
2	Arrival notice indication (FI-ANI)		●	●	▲
3	Basic call assignment control	Future reference-trajectory control (FI-FRTC)	●	—	—
4		Reference-trajectory control (FI-RTC)	—	●	—
5		Ring control (FI-RC)	—	—	●
6	Bunching prevention (FI-BP)		●	●	—
7	Learning function	Collection of usage data (FI-CUD)	●	●	—
8		Recognition of traffic flow mode (FI-RTM)	● 40 mode	● 2 mode	—
9		Search for optimum operation program (FI-SOP)	●	●	—
10	Congested floor recognition (FI-CFR)		●	—	—
11	Service forecasting for hall call assignment (FI-SFH)		●	—	—
12	Intelligent function	Generation of new traffic flow modes (FI-GNT)	●	—	—
13		Generation of optimum operation programs (FI-GOP)	●	—	—
14	Energy-saving preference control (FI-ESC)		●	—	—
15	Floor standby control	Forecasting dynamic allocation control (FI-FDA)	●	—	—
16		Zone distribution control (FI-ZD)	—	●	—
17		Fixed floor distribution control (FI-FD)	—	—	●
18	Learning-based concentrated service (FI-LCS)		●	—	—
19	Automatic door open time control (FI-ADT)		●	●	—

Operating functions

● Standard specification

▲ Optional specification

— Not applicable

			FI series		
No.	Function		600	100	10
20	Centralized control for special floors (FI-CCF)		▲	—	—
21	Service floor selection (FI-SFS)		▲	▲	—
22	VIP service <sup>(*)</sup> (FI-VIP)		▲	▲	▲
23	Closest car priority service (FI-CPS)		▲	▲	—
24	Scheduled reservation system (FI-SRS)		▲	—	—
25	Zoning express service (FI-EZS)		▲	—	—
26	Independent automatic operation <sup>(*)</sup> (FI-IAO)		▲	▲	▲
27	Destination floor reservation system “FIBEE” (FI-DFRS)		▲	—	—

(\*)1 Not applicable for (FI-DFRS)

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 are responded to. When there are no more calls, the elevator will stop at 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 stand-by at the start floor while the other elevator will stay at the last floor served.		●
3	Group control	FI-600	This is a group control system used to operate three to eight elevators 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 elevators in a medium-sized building. This control 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 elevators. 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 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 disabledfor the elevator and it is reserved for exclusive use of the special passengers.		●

## 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	Automatic door open 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 passenger to cancel the selection of a floor which is accidentally pressed 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 stand-by.	●	
5	Car floor button flashing (CCBF)	The registered car destination floor button flashes when the car approaches the destination floor	●	
6	Door open prolong button(DOPB)	In the event that this button on the car operation board is pressed, the elevator doors remain open for a pre-set period of time.		●
7	Automatic bypass Operation(ABPO)	In the event that the elevator is fully loaded, this operation will not respond to any hall calls and will only respond to the car calls.		●
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 by a keypad system.		●
9	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.		●
10	Voice synthesizer (VSYs)	Preset standard messages are announced to the passengers by a voice synthesizer.		●
11	Arrival signal(ASGN)	An electronic chime (located at the top and bottom of the elevator) will be sound just before the arrival of the elevator.		●
12	Interfacing with BGM speaker (BGMS)	A speaker for background music and public announcements for the building can be installed in the elevator. (Music and announcement systems, including wiring, is to be provided by others)		●
13	Emergency Battery Operated Power Supply(EBOPS)	In the event of a power failure, this emergency supply will allows the operation of a light, fan and alarm bell.		●

## Safety functions

Legend   STD: Standard  
OPT: Optional

No.	Name	Description	STD	OPT
1	Multi-beam door sensor(MBDS)	In the event that the beam paths are obstructed, this sensor, installed at 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 and the master unit (in the supervisory panel, etc.).	●	
4	Car emergency lighting(CEML)	In the event of a power failure, an emergency light inside the elevator 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 signal to prevent the elevator from moving.	●	
7	Door safety edge (both sides or one side)(DSEB)	Mechanical safety units are installed on both sides or 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 reopen.		●
8	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		●
9	Abnormal speed protection function(ASPF)	In the event that the elevator is moving downwards at an abnormally high speed, the breakers will be automatically engaged and the elevator will cease operation.	●	
10	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.	●	
11	Overvoltage detection system, (OVDS)	When an abnormal increase in power supply to the elevator system is detected, the power supply will be cut off to prevent damages to the elevator equipment.		●
12	Fire rated landing door	2 hours fire rated landing door are available where required		●

## Emergency operations

Legend   STD: Standard  
OPT: Optional

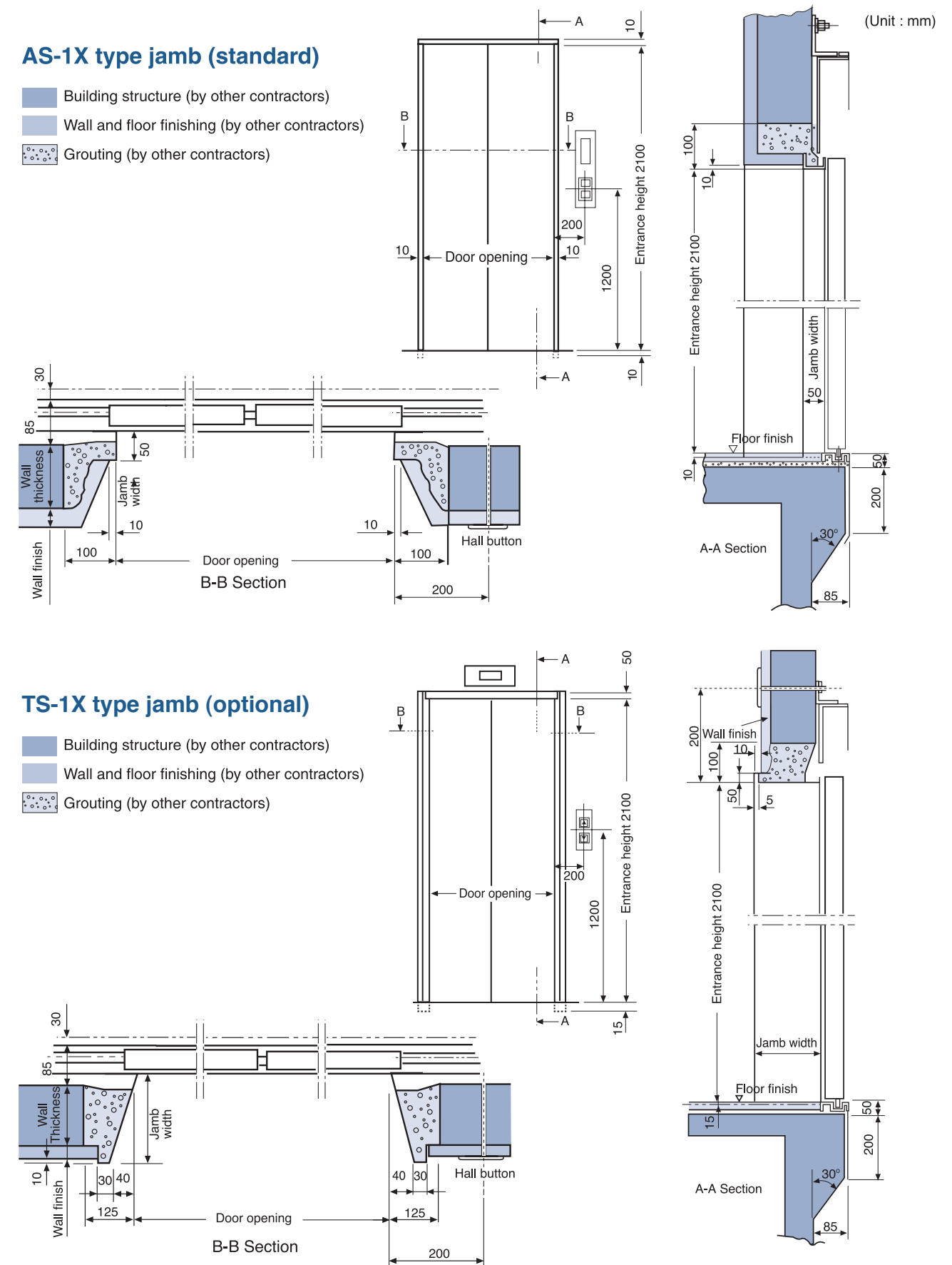
No.	Name	Description	STD	OPT
1	Earthquake emergency operation (EEMO)	In the event that an earthquake is detected, the elevator will stop at the nearest floor. (This function is not applicable to private lobby layouts.)		●
2	Fire emergency operation(FEMO)	In the event of fire, the elevator is automatically 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 itself to the nearest floor. (This function is not applicable to private lobby layout buildings.)		●
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.		●



## Management functions

Legend    STD: Standard  
              OPT: Optional

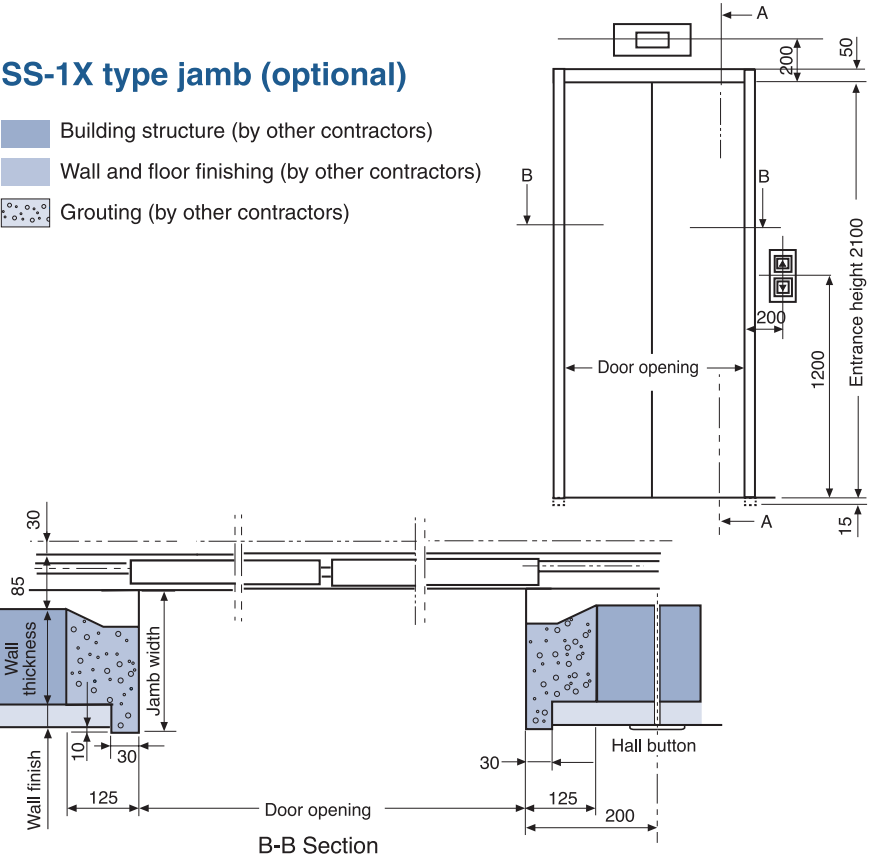
No.	Name	Description	STD	OPT
1	Automatic turn-off of elevator light and fan(ATFL)	In the event that the elevator is not in use, the light and ventilation fan in the elevator are automatically turned off to conserve energy.	●	
2	Maintenance operation(MTNO)	In the event that elevator maintenance is being carried out, the elevator operates at a lower speed.	●	
3	Parking operation(PKGO)	The elevator can be parked at the designated floor with a key switch.		●
4	Rush-hour schedule operation(RHSO)	All the elevators will automatically return to the start floor, after serving the last call during this preset rush-hour timing.		●
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, passengers can gain access to certain restricted floors.		●
7	Intelligent operation security system (IPSS)	This function allows controlled access to certain floors by means of a password or ID cards. 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-circuit TV (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.		●
11	Interfacing to building management system (BMS)	This interfacing shall be done by means of electrical dry contact to the building management system for their monitoring.		●
12	Regenerative system (RGNS)	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.		●



# Entrance details (For two panel center opening door)

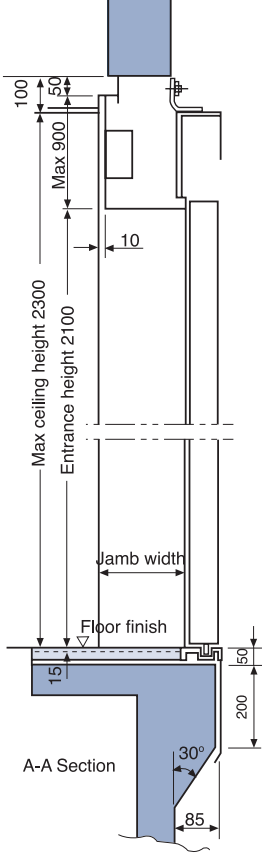
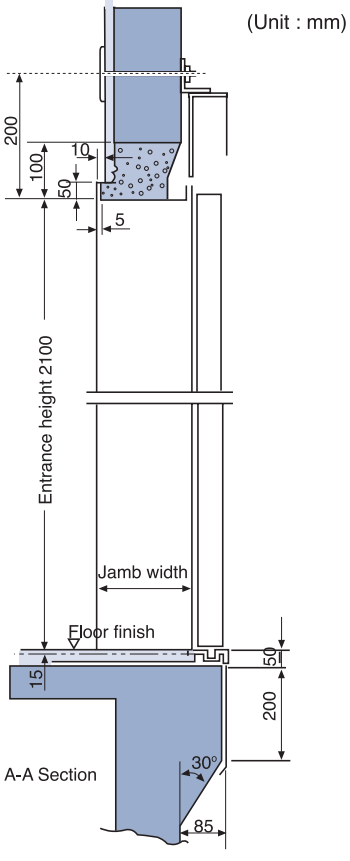
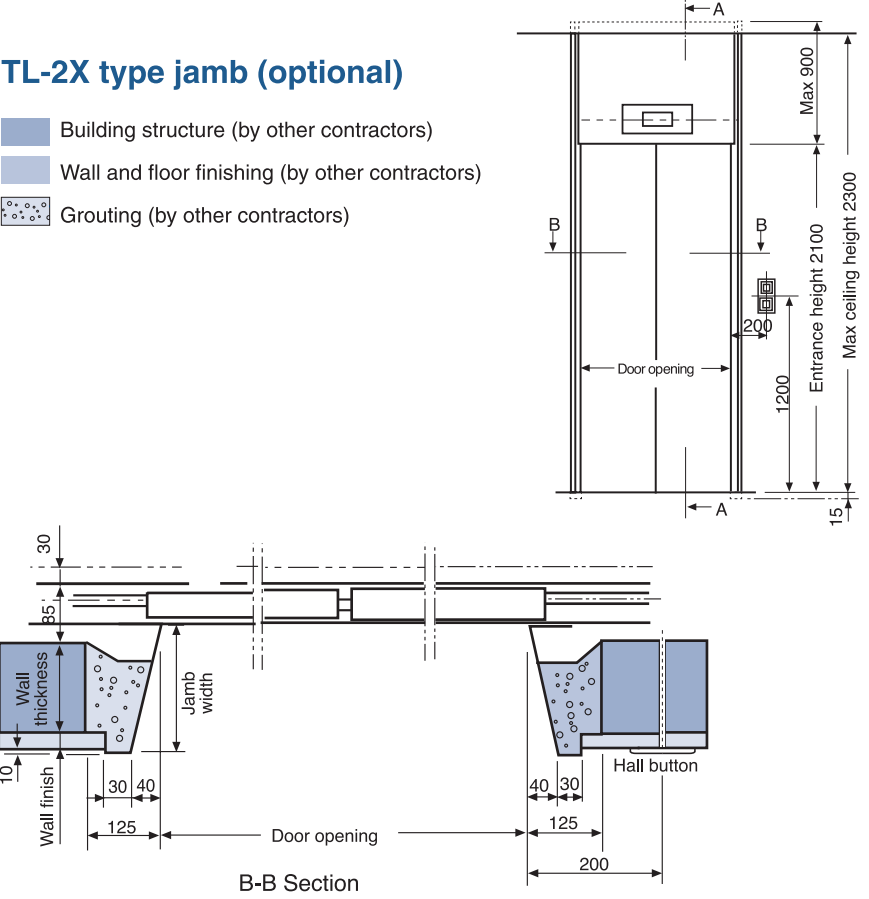
## SS-1X type jamb (optional)

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



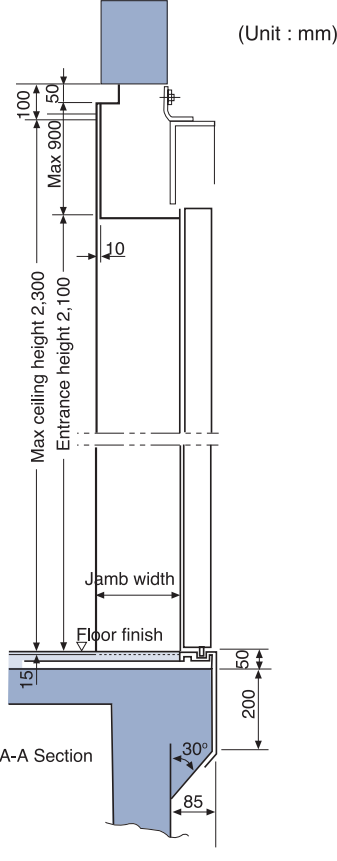
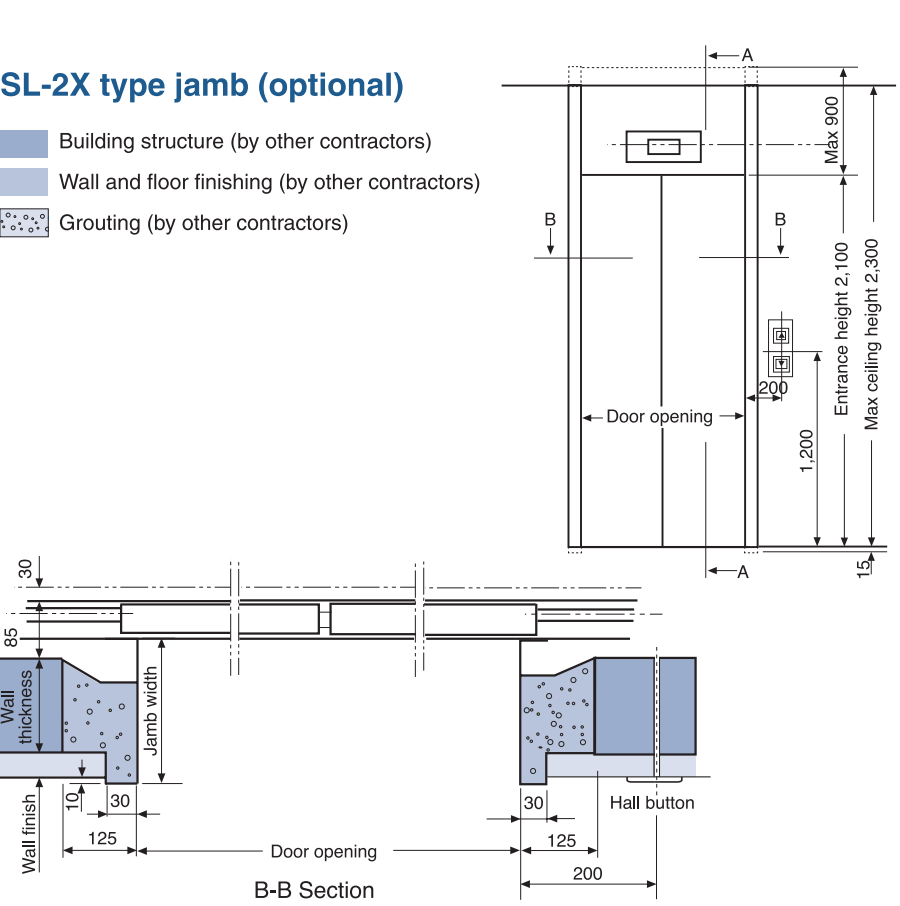
## TL-2X type jamb (optional)

- 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 in below table should be undertaken by building contractors in accordance with Hitachi drawings and in compliance with local or relevant codes and regulations.

1. Prepare hoistway with proper framing and enclosure, suitable pit of proper depth with drains and waterproofing 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 6 at top of the machine room.



# HITACHI

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