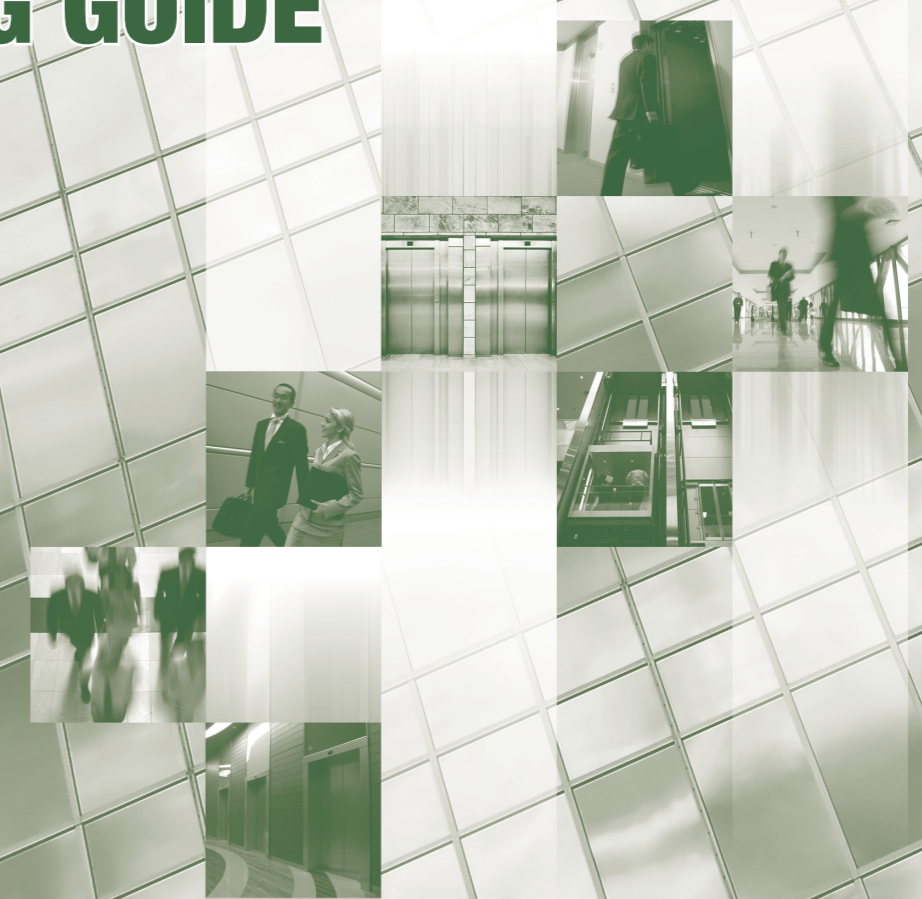


# ULTRAHIGH-SPEED ELEVATORS PLANNING GUIDE



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The information in this catalogue is subject to change without notice.



# ULTRAHIGH-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 ultrahigh-speed elevators contained herein to serve you in your overall plans for a building.

■ Speed / Load / Person



**Remarks**

- ( ) : Person capacity for JIS
- < > : Person capacity for EN / HKG COP / KFB
- [ ] : Person capacity for SS550 / MALAYSIA
- : If your request is out of above map range, please consult Hitachi or local agent.

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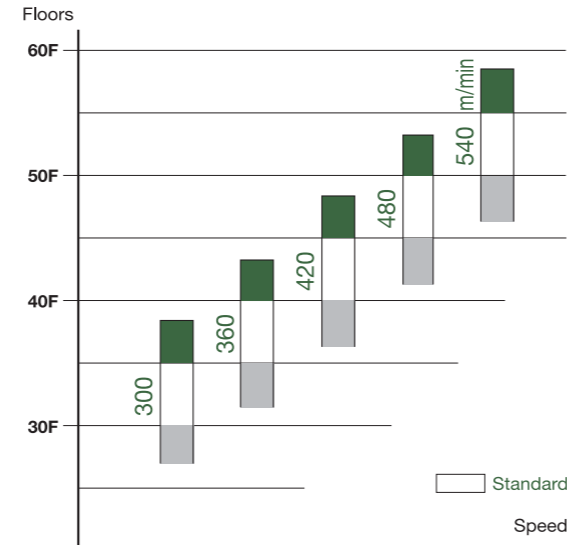
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Quick Reference for Elevator Planning

■ The Number of elevators

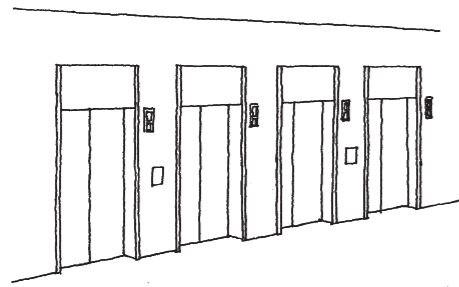
Type of building		Suitable number of Elevators	No. of passengers
Office	Rental office	Population:250 ~ 300 persons/elevator Floor area:2,000 ~ 2,400m <sup>2</sup> /elevator	17, 20, 24
	Single tenant	Population:150 ~ 200 persons/elevator Floor area:1,200 ~ 1,600m <sup>2</sup> /elevator	
Hotel	Large	100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

■ Elevator speed

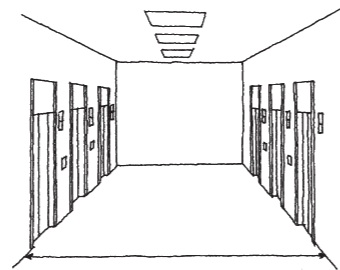


Arrangement

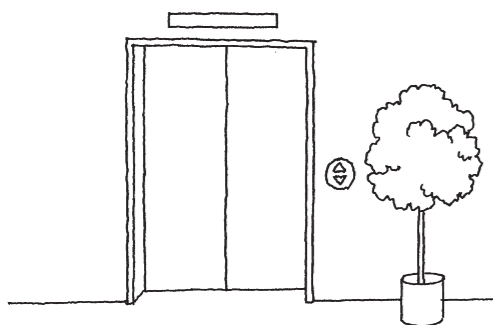
In a line arrangement, Hitachi recommends 4 elevators maximum.



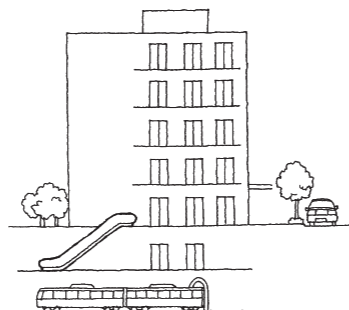
In a case of setting up 5 or more elevators, Hitachi recommends a face arrangement, and distance of opposite faces is 3.5~4.5m.



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)

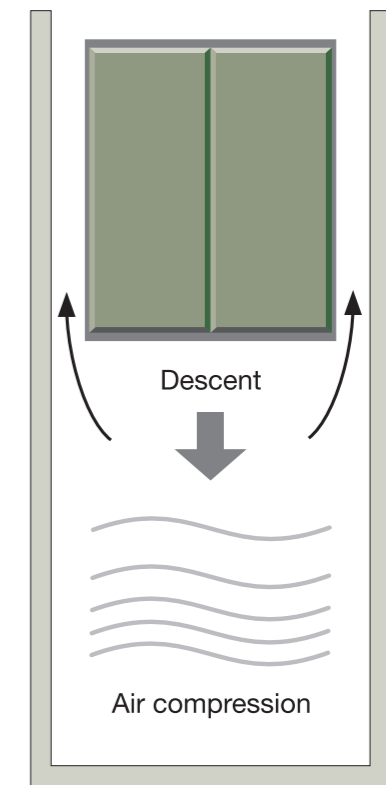


Noise inside the Car

■ 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 consult with Hitachi or local agent.

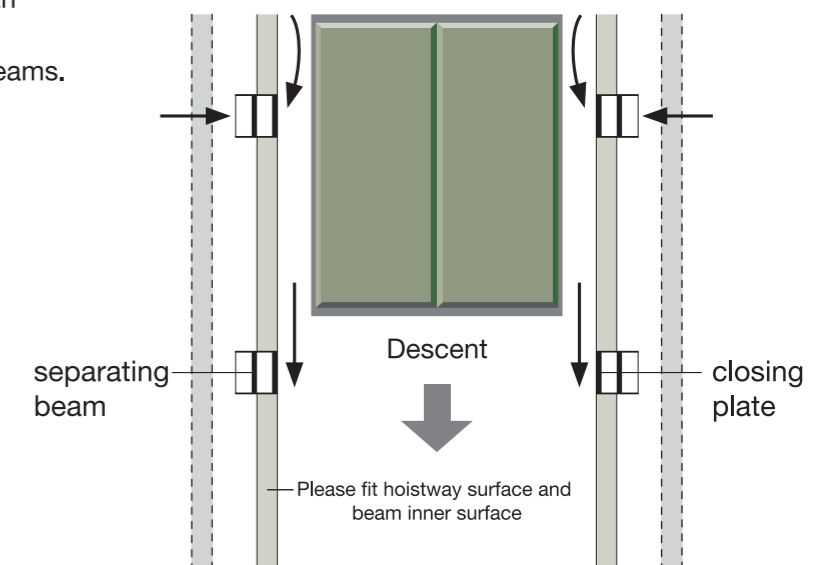
Mechanism of Wind Roar



■ 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



## ■ Specification

Maximum travel distance	200 m (300,360 m/min) 250 m (420~540 m/min)
Maximum number of stops	64 stops
Minimum floor height	EH + 650 mm
Applicable door type	2-Panels center opening 2-Panels side opening 3-Panels side opening 4-Panels center opening

## ■ Dimension for overhead height

Speed [m/min]	Minimum overhead height (OH) [mm]	
	JIS / HKG COP / KFB / SS550 / EN / MALAYSIA	
	Bare ceiling height : 2500mm	Bare ceiling height : 3000mm
300	8200	8200
360	8200	8350
420	8950	9000
480	8950	9000
540	10150	10150

## ■ Dimension for pit depth

Load [m/min]	Speed [m/min]	Minimum pit depth (P) [mm]	
		JIS / HKG COP / KFB / SS550	EN / MALAYSIA
1000 ≤ Load ≤ 1350	300	3700	3900
		3900	4100
1350 < Load ≤ 1800	360	4200	4200
		4200	4400
1150 ≤ Load ≤ 1800	420, 480	5950	
	540	7900	

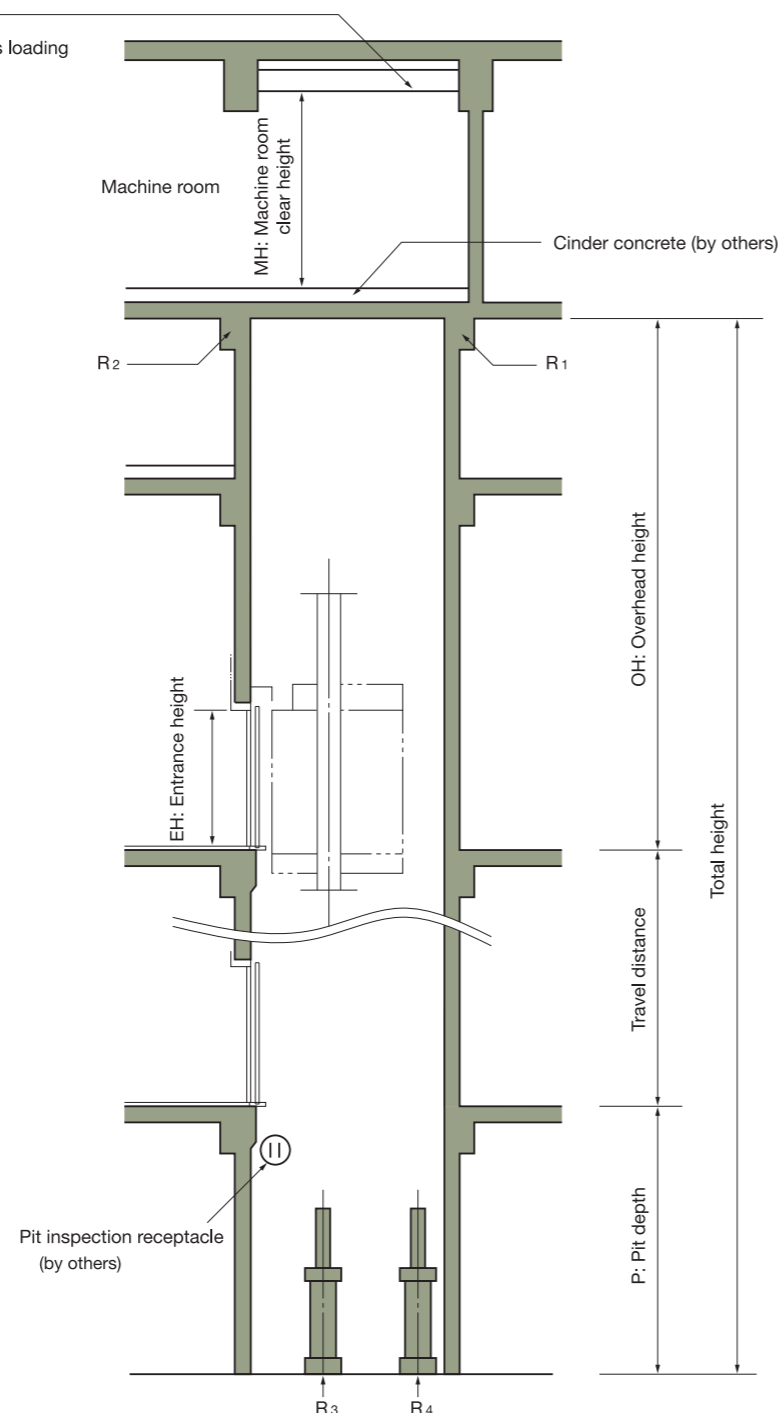
## ■ Reaction loading in machine room and pit

Load [kg]	Speed [m/min]	Machine room reaction loading [kN]		Pit reaction loading [kN]	
		R1	R2	R3	R4
1000	300, 360	243	152	259	254
	300, 360	247	155	267	257
1150	420, 480	279	172	294	290
	540	259	159	304	294
1350	300, 360	253	155	276	262
	420, 480	285	171	304	294
	540	265	159	304	295
1600	300, 360	258	158	288	268
	420, 480	281	170	301	286
	540	281	170	302	286
1800	300, 360	263	158	297	273
	420, 480	272	162	294	274
	540	274	162	294	274
2000	300, 360	279	165	308	278

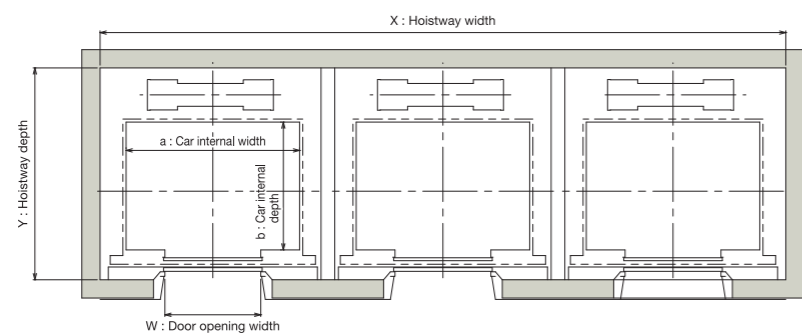
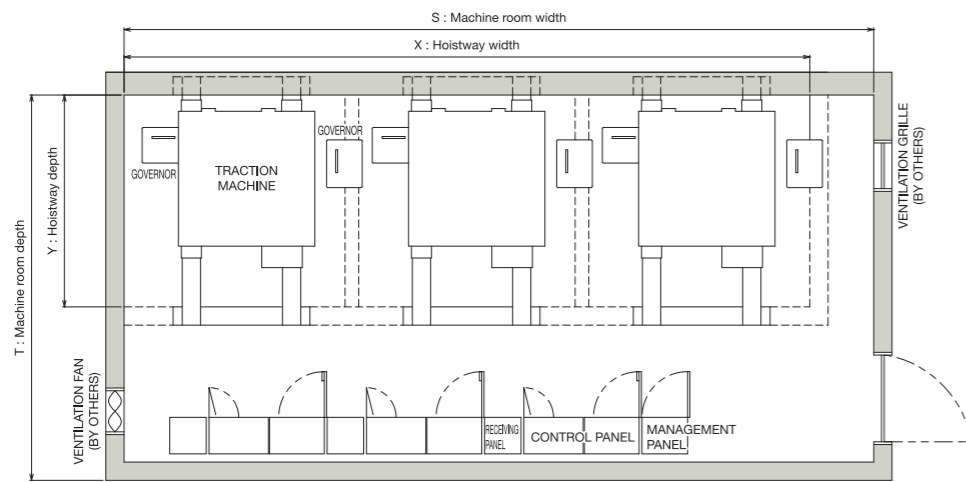
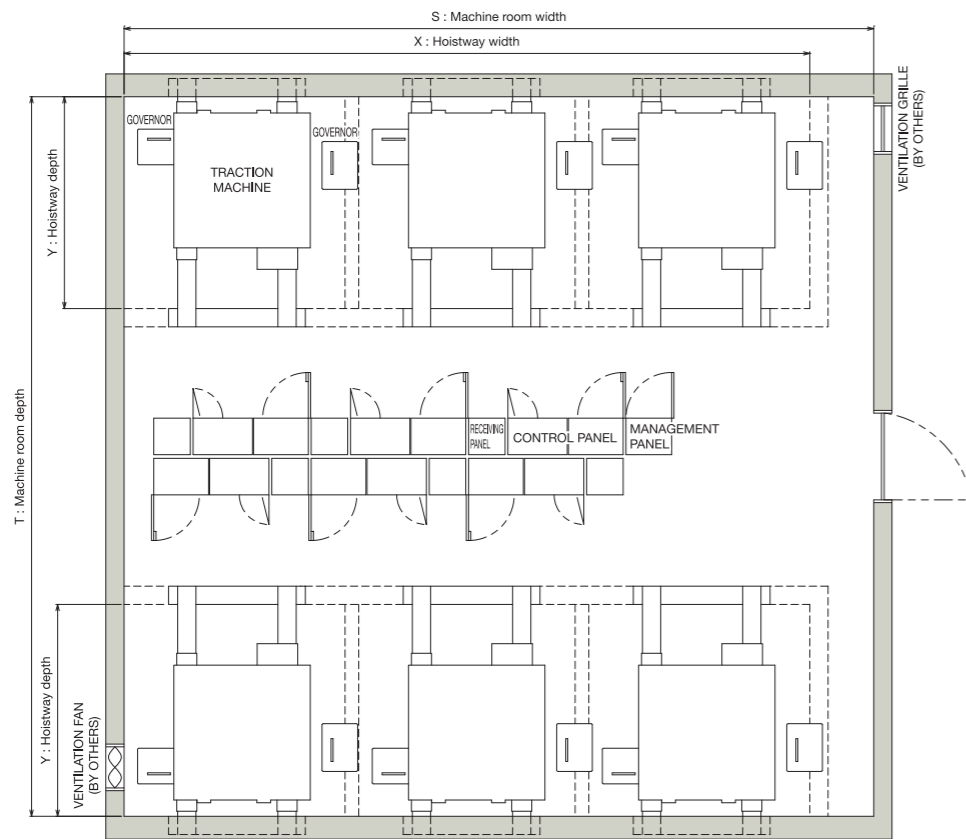
## ■ Dimension for machine room clear height

Speed [m/min]	Machine room height (MH) [mm]
	JIS / EN / HKG COP / KFB / MALAYSIA / SS550
300	3400
360	
420	3550
480	
540	

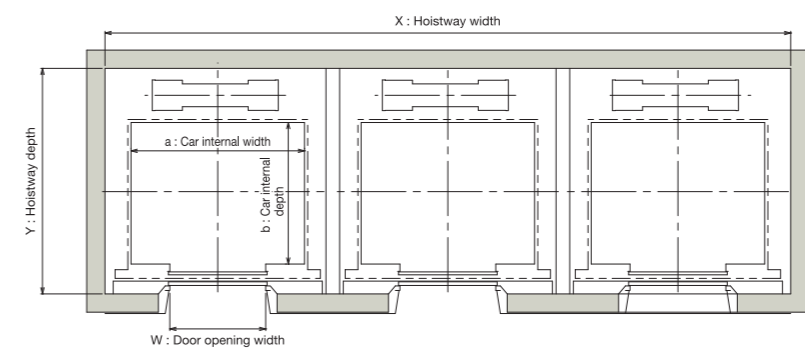
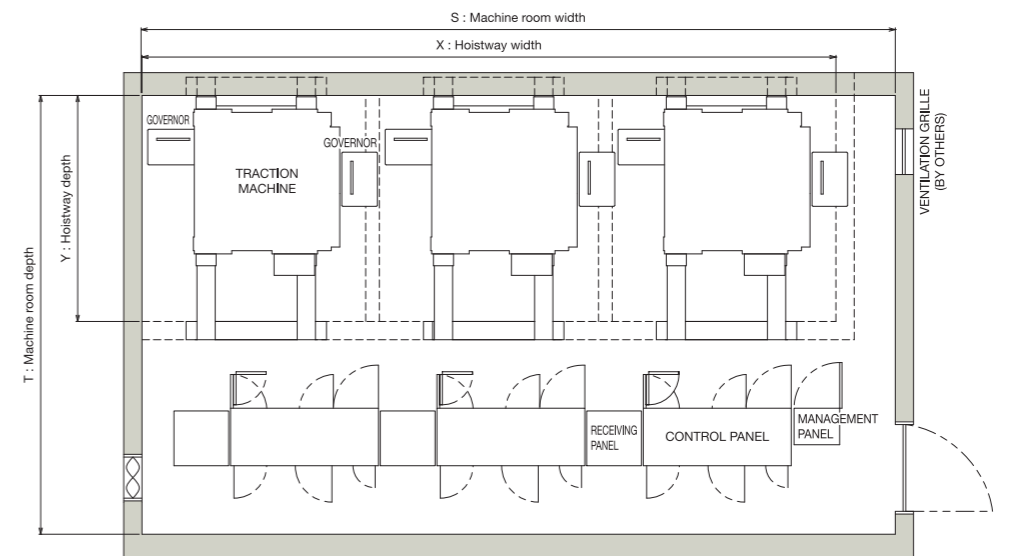
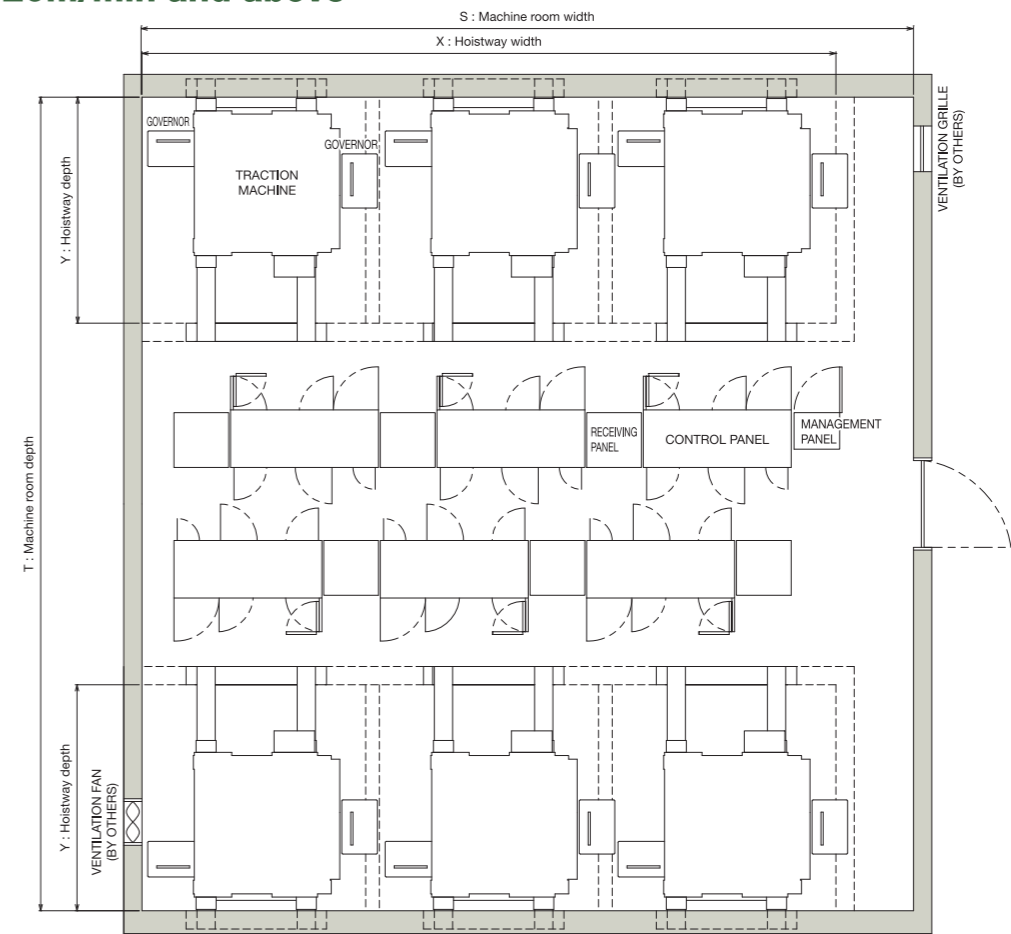
Hoisting beam or hook for below (by others)  
•300 ≤ speed ≤ 540m/min : 14-tons × 2, total 28-tons loading



- Speed 300,360m/min (Load 1000~1800kg)



- Speed 300,360m/min (Load 2000kg)
- Speed 420m/min and above



## ■ Dimension of hoistway [Based on JIS]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Hoistway X×Y [mm]		
				In-line arrangement		
				2 Cars	3 Cars	4 Cars
1000	300	1600 × 1500	900	4680 × 2390	6950 × 2390	9220 × 2390
	360					
1150	300	1800 × 1500	1000	4980 × 2390	7450 × 2390	9920 × 2390
	360					
	420			5040 × 2480	7540 × 2480	10040 × 2480
	480					
	540					
1350	300	2000 × 1500	1100	5280 × 2390	7950 × 2390	10620 × 2390
	360					
	420			5350 × 2480	8050 × 2480	10750 × 2480
	480					
	540					
1600	300	2000 × 1750	1100	5280 × 2640	7950 × 2640	10620 × 2640
	360					
	420			5350 × 2730	8050 × 2730	10750 × 2730
	480					
	540					
1800	300	2000 × 1900	1100	5280 × 2790	7950 × 2790	10620 × 2790
	360					
	420			5350 × 2880	8050 × 2880	10750 × 2880
	480					
	540					
2000	300	2000 × 2050	1100	5280 × 2940	7950 × 2940	10620 × 2940
	360					

## ■ Dimension of machine room [Based on JIS]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Machine Room S×T [mm]					
				In-line arrangement			Facing arrangement		
				2 Cars	3 Cars	4 Cars	4 Cars	6 Cars	8 Cars
1000	300	1600 × 1500	900	5380 × 3910	7650 × 3910	9920 × 3910	5600 × 7770	7650 × 7770	9920 × 7770
	360								
1150	300	1800 × 1500	1000	5680 × 3910	8150 × 3910	10620 × 3910	5680 × 7770	7640 × 7770	10620 × 7770
	360								
	420			5770 × 5160	8520 × 5160	10750 × 5160	6300 × 9350	8520 × 9350	10750 × 9350
	480								
	540								
1350	300	2000 × 1500	1100	5980 × 3910	8650 × 3910	11320 × 3910	5980 × 7770	8650 × 7770	11320 × 7770
	360								
	420			6050 × 5160	8750 × 5160	11450 × 5160	6300 × 9350	8750 × 9350	11450 × 9350
	480								
	540								
1600	300	2000 × 1750	1100	5980 × 4160	8650 × 4160	11320 × 4160	5980 × 8270	8650 × 8270	11320 × 8270
	360								
	420			6050 × 5410	8750 × 5410	11450 × 5410	6300 × 9850	8750 × 9850	11450 × 9850
	480								
	540								
1800	300	2000 × 1900	1100	5980 × 4310	8650 × 4310	11320 × 4310	5980 × 8570	8650 × 8570	11320 × 8570
	360								
	420			6050 × 5560	8750 × 5560	11450 × 5560	6300 × 10150	8750 × 10150	11450 × 10150
	480								
	540								
2000	300	2000 × 2050	1100	5980 × 5620	8650 × 5620	11320 × 5620	6300 × 10270	8650 × 10270	11320 × 10270
	360								

Remark : Necessary dimensions may vary according to the building conditions. Please consult with Hitachi or local agent for details.

Remark : Necessary dimensions may vary according to the building conditions. Please consult with Hitachi or local agent for details.

## ■ Dimension of hoistway [Based on EN/HKG COP/KFB regulations]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Hoistway X×Y [mm]		
				In-line arrangement		
				2 Cars	3 Cars	4 Cars
1000	300	1600 × 1400	900	4680 × 2320	6950 × 2320	9220 × 2320
	360					
1150	300	1800 × 1450	1000	4980 × 2340	7450 × 2340	9920 × 2340
	360					
	420			5040 × 2430	7540 × 2430	10040 × 2430
	480					
	540					
1350	300	2000 × 1500	1100	5280 × 2390	7950 × 2390	10620 × 2390
	360					
	420			5350 × 2480	8050 × 2480	10750 × 2480
	480					
	540					
1600	300	2000 × 1700	1100	5280 × 2590	7950 × 2590	10620 × 2590
	360					
	420			5350 × 2680	8050 × 2680	10750 × 2680
	480					
	540					
1800	300	2000 × 1850	1100	5280 × 2740	7950 × 2740	10620 × 2740
	360					
	420			5350 × 2830	8050 × 2830	10750 × 2830
	480					
	540					
2000	300	2000 × 2000	1100	5280 × 2890	7950 × 2890	10620 × 2890
	360					

## ■ Dimension of machine room [Based on EN/HKG COP/KFB regulations]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Machine Room S×T [mm]					
				In-line arrangement			Facing arrangement		
				2 Cars	3 Cars	4 Cars	4 Cars	6 Cars	8 Cars
1000	300	1600 × 1400	900	5380 × 3840	7650 × 3840	9920 × 3840	5600 × 7640	7650 × 7640	9920 × 7640
	360								
1150	300	1800 × 1450	1000	5680 × 3860	8150 × 3860	10620 × 3860	5680 × 7670	8150 × 7670	10620 × 7670
	360								
	420			5770 × 5110	8520 × 5110	10750 × 5110	6300 × 9250	8520 × 9250	10750 × 9250
	480								
	540								
1350	300	2000 × 1500	1100	5980 × 3910	8650 × 3910	11320 × 3910	5980 × 7770	8650 × 7770	11320 × 7770
	360								
	420			6050 × 5160	8750 × 5160	11450 × 5160	6300 × 9350	8750 × 9350	11450 × 9350
	480								
	540								
1600	300	2000 × 1700	1100	5980 × 4110	8650 × 4110	11320 × 4110	5980 × 8170	8650 × 8170	11320 × 8170
	360								
	420			6050 × 5360	8750 × 5360	11450 × 5360	6300 × 9750	8750 × 9750	11450 × 9750
	480								
	540								
1800	300	2000 × 1850	1100	5980 × 4260	8650 × 4260	11320 × 4260	5980 × 8470	8650 × 8470	11320 × 8470
	360								
	420			6050 × 5510	8750 × 5510	11450 × 5510	6300 × 10050	8750 × 10050	11450 × 10050
	480								
	540								
2000	300	2000 × 2000	1100	5980 × 5570	8650 × 5570	11320 × 5570	6300 × 10170	8650 × 10170	11320 × 10170
	360								

## Dimension of hoistway [Based on SS550/MALAYSIA regulations]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Hoistway X×Y [mm]		
				In-line arrangement		
				2 Cars	3 Cars	4 Cars
1000	300	1600 × 1550	900	4680 × 2440	6950 × 2440	9220 × 2440
	360					
1150	300	1800 × 1500	1000	4980 × 2390	7450 × 2390	9920 × 2390
	360					
	420			5040 × 2480	7540 × 2480	10040 × 2480
	480					
	540			5040 × 2480	7540 × 2480	10040 × 2480
1350	300	2000 × 1550	1100	5280 × 2440	7950 × 2440	10620 × 2440
	360					
	420			5350 × 2530	8050 × 2530	10750 × 2530
	480					
	540			5350 × 2530	8050 × 2530	10750 × 2530
1600	300	2000 × 1750	1100	5280 × 2640	7950 × 2640	10620 × 2640
	360					
	420			5350 × 2730	8050 × 2730	10750 × 2730
	480					
	540			5350 × 2730	8050 × 2730	10750 × 2730
1800 (Only SS550)	300	2000 × 1950	1100	5280 × 2840	7950 × 2840	10620 × 2840
	360					
	420			5350 × 2930	8050 × 2930	10750 × 2930
	480					
	540			5350 × 2930	8050 × 2930	10750 × 2930
1800 (Only MALAYSIA)	300	2000 × 1900	1100	5280 × 2790	7950 × 2790	10620 × 2790
	360					
	420			5350 × 2880	8050 × 2880	10750 × 2880
	480					
	540			5350 × 2880	8050 × 2880	10750 × 2880
2000	300	2000 × 2100	1100	5280 × 2990	7950 × 2990	10620 × 2990
	360					

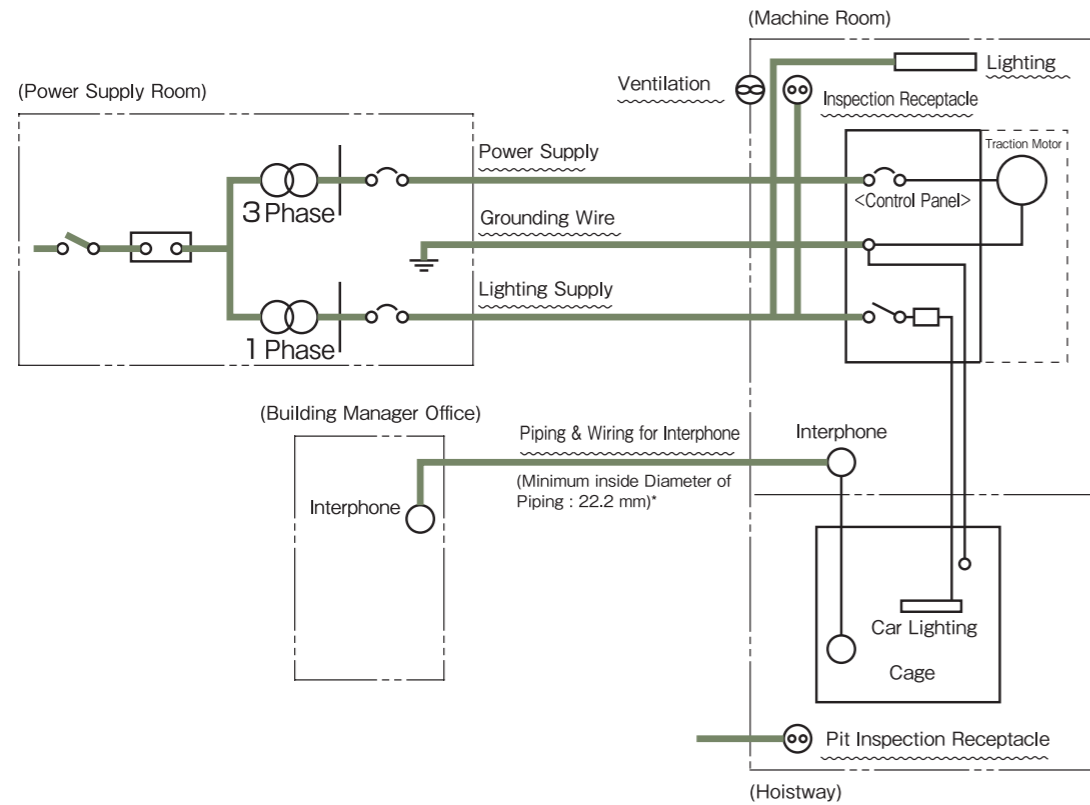
## Dimension of machine room [Based on SS550/MALAYSIA regulations]

Load [kg]	Speed [m/min]	Car Internal Size a×b [mm]	Door Opening Width W [mm]	Machine Room S×T [mm]					
				In-line arrangement			Facing arrangement		
				2 Cars	3 Cars	4 Cars	4 Cars	6 Cars	8 Cars
1000	300	1600 × 1550	900	5380 × 3960	7650 × 3960	9920 × 3960	5600 × 7870	7650 × 7870	9920 × 7870
	360								
1150	300	1800 × 1500	1000	5680 × 3910	8150 × 3910	10620 × 3910	5680 × 7770	8150 × 7770	10620 × 7770
	360								
	420			5770 × 5160	8520 × 5160	10750 × 5160	6300 × 9350	8520 × 9350	10750 × 9350
	480								
	540			5770 × 5160	8520 × 5160	10750 × 5160	6300 × 9350	8520 × 9350	10750 × 9350
1350	300	2000 × 1550	1100	5980 × 3960	8650 × 3960	11320 × 3960	5980 × 7870	8650 × 7870	11320 × 7870
	360								
	420			6050 × 5210	8750 × 5210	11450 × 5210	6300 × 9450	8750 × 9450	11450 × 9450
	480								
	540			6050 × 5210	8750 × 5210	11450 × 5210	6300 × 9450	8750 × 9450	11450 × 9450
1600	300	2000 × 1750	1100	5980 × 4160	8650 × 4160	11320 × 4160	5980 × 8270	8650 × 8270	11320 × 8270
	360								
	420			6050 × 5410	8750 × 5410	11450 × 5410	6300 × 9850	8750 × 9850	11450 × 9850
	480								
	540			6050 × 5410	8750 × 5410	11450 × 5410	6300 × 9850	8750 × 9850	11450 × 9850
1800 (Only SS550)	300	2000 × 1950	1100	5980 × 4360	8650 × 4360	11320 × 4360	5980 × 8670	8650 × 8670	11320 × 8670
	360								
	420			6050 × 5610	8750 × 5610	11450 × 5610	6300 × 10250	8750 × 10250	11450 × 10250
	480								
	540			6050 × 5610	8750 × 5610	11450 × 5610	6300 × 10250	8750 × 10250	11450 × 10250
1800 (Only MALAYSIA)	300	2000 × 1900	1100	5980 × 4310	8650 × 4310	11320 × 4310	5980 × 8570	8650 × 8570	11320 × 8570
	360								
	420			6050 × 5560	8750 × 5560	11450 × 5560	6300 × 10150	8750 × 10150	11450 × 10150
	480								
	540			6050 × 5560	8750 × 5560	11450 × 5560	6300 × 10150	8750 × 10150	11450 × 10150
2000	300	2000 × 2100	1100	5980 × 5670	8650 × 5670	11320 × 5670	6300 × 10370	8650 × 10370	11320 × 10370
	360								



## Wiring diagram

(~~~~) and (——) shows the works to be done by others.



\*In case bulding manager office has only one interphone unit.

<b>Main power supply</b>	Building contract installs facilities to ensure that power does not fluctuate outside the range of -10% to +10% of the normal voltage rating and to ensure that the unbalance factor of voltage does not exceed 5%. It should be noted that insufficient circuit breaker capacity and transformer capacity may adversely affect elevator control and/or cause trouble with electrical equipment installed in the building.
<b>Lighting power supply</b>	The lighting power supply for car lighting indicators and maintenance work shall be provided by others.
<b>Interphone</b>	Pipes and wires located outside machine room and hoistway shall be provided by others. Number of wiring from machine room to building manager office shall be "7+ Number of Elevators". (for 1 unit of master interphone) When the wire size is 0.9mm <sup>2</sup> , the length shall be 200m or less. When the wiring distance exceeds 200m, please consult Hitachi for details.
<b>Pit inspection receptacle</b>	10A power outlet for maintenance shall be provided under the entrance floor level.
<b>Machine room inspection receptacle</b>	10A power outlet for maintenance shall be provided near access door.
<b>Machine room lighting equipment</b>	The machine room lighting equipment shall be provided and the switch shall be near access door.

## Required capacity of circuit breaker, transformer & starting power at building side

Elevator Specification			Electrical Data							
Load [kg]	Speed [m/min]	Motor Capacity [kW]	Main supply Voltage [V]	Circuit breaker capacity [A]	Transformer Capacity [kVA]	Starting Power / unit [kVA]	Lead in wire size [mm <sup>2</sup> ]	Max. Length [m]	Earth wire [mm <sup>2</sup> ]	Calorific value /unit [kcal/hr]
1000	300	33	200~220	200	39	150	100-63	22	22	6670
			380	125			38-98			
			400~420	125			38-120			
	360	39	200~220	200	46	176	100-54			
			380	125			38-83			
			400~420	125			38-102			
1150	300	39	200~220	200	46	171	100-55	22	7700	
			380	125			38-86			
			400~420	125			60-98			
	360	43	43	200~220	225	50	188			150-68
				380	150					60-113
				400~420	125					60-138
	420	56	56	380	175	67	252			100-124
				400~420	175					100-151
				380	200					100-102
	480	68	68	400~420	175	77	305			100-125
				380	225					100-93
				400~420	200					100-113
1350	300	43	200~220	225	50	183	150-70	22	9000	
			380	125			60-117			
			400~420	125			60-142			
	360	51	51	200~220	300	61	216			150-59
				380	150					60-99
				400~420	150					60-121
420	62	62	380	175	74	262	100-119			
			400~420	175			100-145			
			380	225			100-98			
480	75	75	400~420	200	88	316	100-120			
			380	225			150-122			
			400~420	225			150-149			

Remark : If main supply voltage of 440V is applied, please consult with Hitachi or local agent.

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

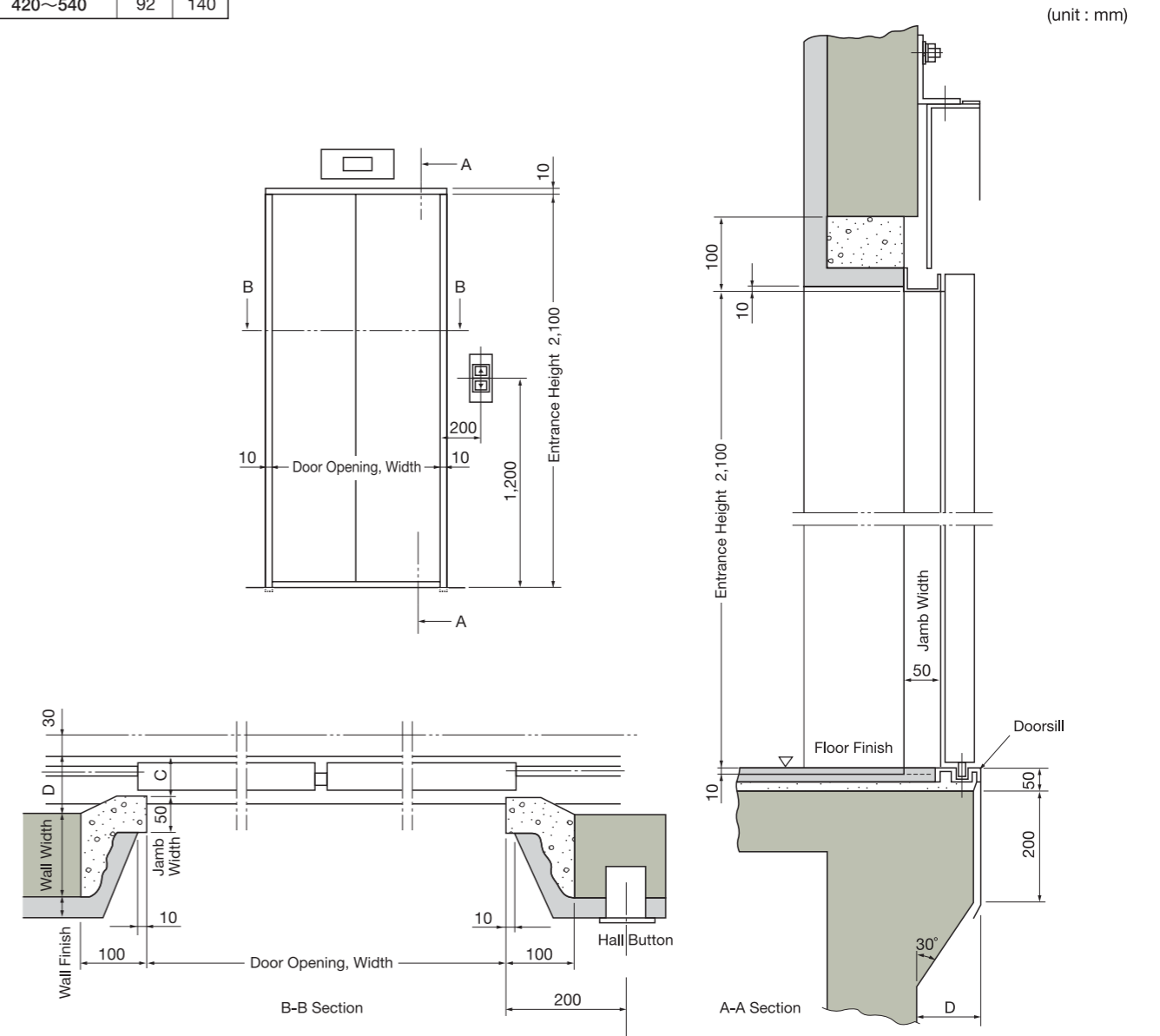
Elevator Specification			Electrical Data							
Load [kg]	Speed [m/min]	Motor Capacity [kW]	Main supply Voltage [V]	Circuit breaker capacity [A]	Transformer Capacity [kVA]	Starting Power / unit [kVA]	Lead in wire size [mm <sup>2</sup> ]	Max. Length [m]	Earth wire [mm <sup>2</sup> ]	Calorific value /unit [kcal/hr]
1600	300	47	200~220	250	56	187	150-68	22	22	10700
			380	150			60-114			
			400~420	150			60-139			
	360	56	200~220	350	66	222	200-71	100-140	100-117	12800
			380	175			100-140			
			400~420	175			100-117			
	420	75	380	225	88	297	100-105	22	22	15000
			400~420	200			100-128			
	480	82	380	225	96	324	150-130	22	22	17100
			400~420	225			150-158			
	540	91	380	250	106	359	150-117	22	22	19200
			400~420	250			150-143			
1800	300	56	200~220	350	65	205	150-62	22	22	12000
			380	175			60-101			
			400~420	175			60-123			
	360	68	200~220	350	77	248	250-72	100-126	100-154	14400
			380	200			100-126			
			400~420	175			100-154			
	420	82	380	225	97	299	150-141	22	22	16800
			400~420	225			150-172			
	480	91	380	250	107	331	150-127	22	22	19200
			400~420	250			150-155			
	540	110	380	350	128	399	200-131	22	22	21600
			400~420	300			200-160			
2000	300	68	380	200	77	247	100-50	22	22	13400
			400~420	200			100-50			
	360	82	380	225	92	296	100-50	22	22	16000
			400~420	225			100-50			

Remark : If main supply voltage of 440V is applied, please consult with Hitachi or local agent.

Type AS-1X Jamb (basic)

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

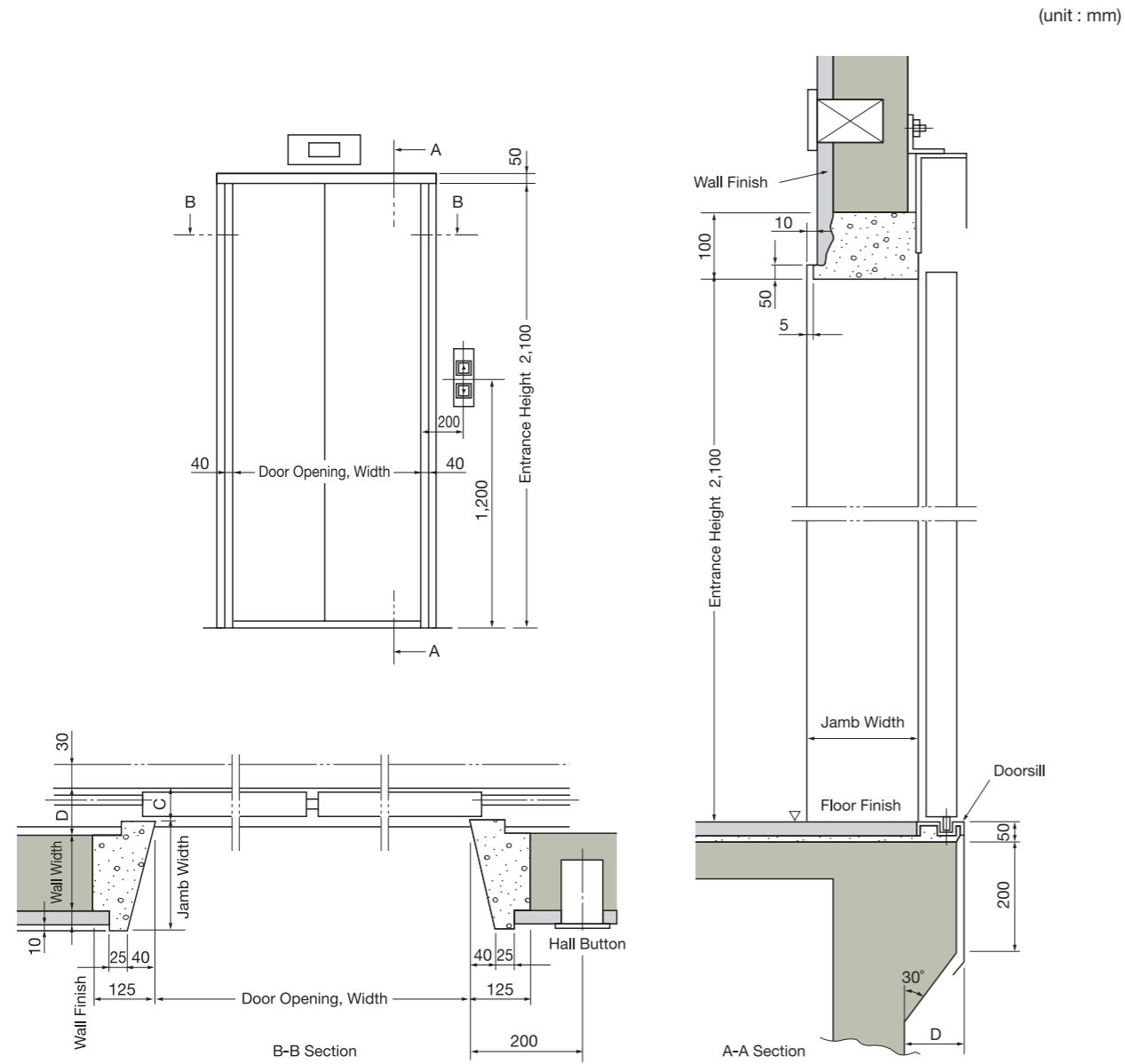
Speed (m/min)	C	D
~360	53	85
420~540	92	140



## Type TS-1X Jamb (Option)

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

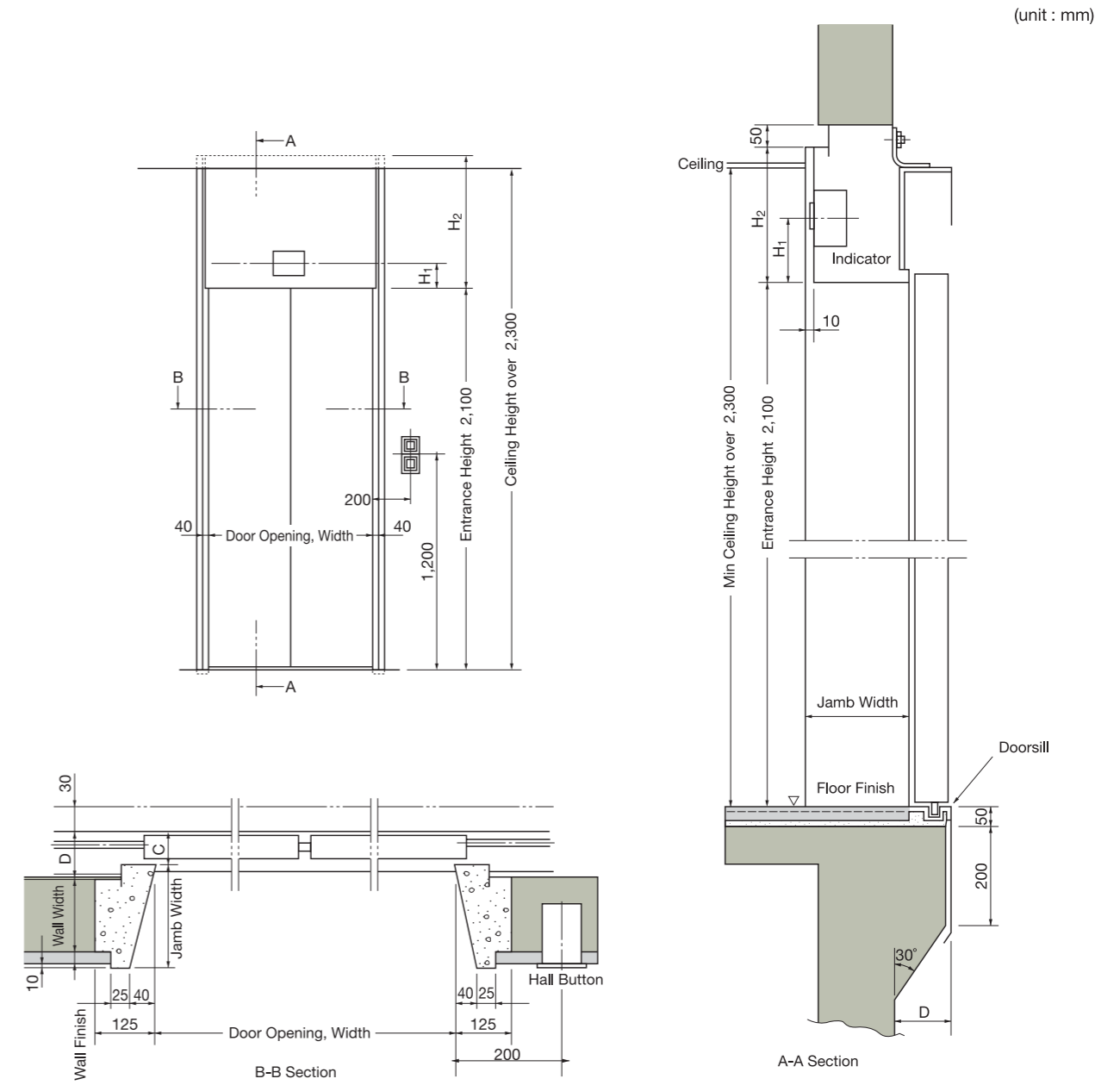
Speed (m/min)	C	D
~360	53	85
420~540	92	140



## Type TL-2X Jamb (Option)

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

Speed (m/min)	C	D
~360	53	85
420~540	92	140



Transam Height, H <sub>2</sub>	H <sub>1</sub>
200 ≤ H <sub>2</sub> ≤ 320	100
320 < H <sub>2</sub> ≤ 900	160

## Operating systems

No.	Name	Description	STD/OPT
1	<b>Simplex collective control (CCTL)</b>	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	<b>Duplex collective control (DCTL)</b>	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	<b>Group control (GC)</b>	<b>FIBEE</b> This is a destination floor reservation system used to operate three to eight elevators in a large-sized building. In this system, as passengers register their destination floor at the hall, the elevator car to be used by each passenger can be informed ahead of time to the passenger. And FIBEE improves handling capacity and saves energy by original technology.	◎
		<b>FI-600</b> 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".	◎
		<b>FI-100</b> 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".	◎
		<b>FI-10</b> 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.	◎
4	<b>Down collective control (DWCC)</b>	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.	◎
5	<b>Attendant operation (ATT)</b>	For this system, the stop floor is manually set by an attendant, such as in a department store.	◎
6	<b>Independent operation (INOC)</b>	This operation system is used when there is a need to serve special passengers. Under this operation, all hall calls are disabled and the elevator is reserved for exclusive use of the special passengers.	◎

## Safety Functions

No.	Name	Description	STD/OPT
1	<b>Multi-beam door sensor (MBDS)</b>	In the event that the beam paths are obstructed, this sensor, installed at the edge of the doors, will keep the doors open.	○
2	<b>Careful sensor (CS)</b>	In the event the sensor beam detects some obstructions, this sensor, installed at door machine, will keep the doors open. This is effective to prevent accidental trapping since this sensor will keep detecting the obstruction until just before the completion of door closing.	◎
3	<b>Overload return door system (ORS)</b>	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.	○
4	<b>Interphone system (INPS)</b>	An interphone system is between the elevator and the master unit (in the supervisory panel, etc.) is provided for emergency communication purposes.	○
5	<b>Car emergency lighting (CEML)</b>	In the event of a power failure, an emergency light inside the elevator will be automatically activated.	○
6	<b>Nearest landing operation for minor trouble (NLNO)</b>	In the unlikely event of temporary trouble during operation, the elevator automatically goes to the nearest floor at a low speed to prevent passengers from being trapped inside.	○
7	<b>Overload detection system (OLDS)</b>	In the event of overloading, this system will activate an audio/ visual signal to prevent the elevator from moving when it is overloaded.	○
8	<b>Door safety edge (both sides) (DSEB)</b>	Mechanical safety units are installed on both sides of the elevator doors. In the event of passengers coming into contact with the safety edges of closing doors, the doors will immediately reopen.	○
9	<b>Abnormal speed protection function (ASPF)</b>	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	<b>Out of door-open zone alarm (ASOZ)</b>	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.	○

## Service Functions

No.	Name	Description	STD/OPT
1	<b>Mischievous call cancellation (MCCC)</b>	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	<b>Door open time adjustment (DTAD)</b>	The duration of the door open timing is tailored to usage conditions, substantially improving operational efficiency.	○
3	<b>Floor "deselect" function (FDSF)</b>	This function allows you to cancel the selection of a floor you have pressed by mistake by pressing the button again. (This thus eliminates unnecessary stops.)	○
4	<b>Automatic return function (ARTF)</b>	After all the calls have been served, the elevator will return to the start floor for stand-by.	○
5	<b>Door open prolong button (DOPB)</b>	In the event that this button on the car operating panel is pressed, the elevator doors remain open for a pre-set period of time.	◎
6	<b>Automatic bypass operation (ABPO)</b>	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.	○
7	<b>Sub-operating panel (SOPB)</b>	Additional floor selection and door open/close buttons are located on the opposite side of the main operating panel in the elevator. This will be extremely convenient during rush hours.	◎
8	<b>Voice synthesizer (VSY)</b>	Preset standard messages are announced to the passengers by a voice synthesizer.	◎
9	<b>Arrival signal (ASGN)</b>	An electronic chime (located at the top and bottom of the elevator) will be sound just before the arrival of the elevator.	◎
10	<b>Interfacing with BGM speaker (BGMS)</b>	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.)	◎
11	<b>Air-conditioner (AIRC)</b>	Makes the inside of the car more comfortable by controlling the temperature. Discards the drain tank and hose.	◎

## Management Functions

No.	Name	Description	STD/OPT
1	<b>Automatic turn-off of elevator light and fan (ATFL)</b>	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	<b>Maintenance operation (MTNO)</b>	In the event that elevator maintenance is being carried out, the elevator operates at a lower speed.	○
3	<b>Parking operation (PKGO)</b>	The elevator can be parked at the designated floor with a key switch.	○
4	<b>Rush-hour schedule operation (RHSO)</b>	All the elevators will automatically return to the start floor, after serving the last call during this preset rush-hour timing.	◎
5	<b>Floor lock-out operation (FLLO)</b>	Specific service floors can be locked-out by activating the switch.	◎
6	<b>Floor lock-out operation by cipher code (ROCC)</b>	By inputting a pre-programmed code using the car operating panel floor buttons, passengers can gain access to certain restricted floors.	◎
7	<b>Intelligent operation security system (IPSS)</b>	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	<b>Interfacing with closed-circuit TV (CCTV)</b>	This device enables the security personnel to monitor the movement inside the elevator. This will be effective in preventing criminal and mischievous acts inside the elevator.	◎
9	<b>Supervisory panel (SVP)</b>	This panel provides various supervisory operations, including communication, and status monitoring.	◎
10	<b>Extensible elevator monitoring system (XEMS)</b>	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	<b>Independent automatic operation (INAO)</b>	To separate the particular elevator with hall button, the separated elevator changes to simplex operation.	◎
12	<b>Regenerative System (RGNS)</b>	Making use of the energy generated by an elevator when travelling 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.	○

■ Emergency Functions

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.	◎
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	Power failure for emergency operation by emergency power source (PFEO)	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 (ARD)	In the event of building power failure, this system automatically switches to battery power to bring the elevator to the nearest floor.	◎
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.	◎

**Work to be done by building contractors**

The preparatory work for elevator installation outlined below should be undertaken by building contractors in accordance with Hitachi drawings and 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 water-proofing if required.
2. Provide and/or cut all necessary holes, chasing, and openings and making good after equipment installation.
3. Supply and secure all supports, reinforced concrete slabs, etc., necessary for installation of the machinery, doors, buffers, etc.
4. Provide all grouting works for entrance jamb frames, sills, hall buttons, indicator, brackets, bolt, 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 for car lighting supply and lift pit lighting and power outlet to the hoistway, following the instructions of the elevator contractor on outlet position.
7. Provide, free of charge, a suitable theft-proof storage area for materials and tools during installation work.
8. Supply electric power for lighting of work area, installation work, elevator testing and spray painting.
9. Hoistway and machine room ventilation to be provided to maintain the hoistway temperature at below 40°C

Remark : Hitachi recommend the counter measure against stack effect in high-rise buildings.  
(e.g. Installation of a double set of doors in low floors.)