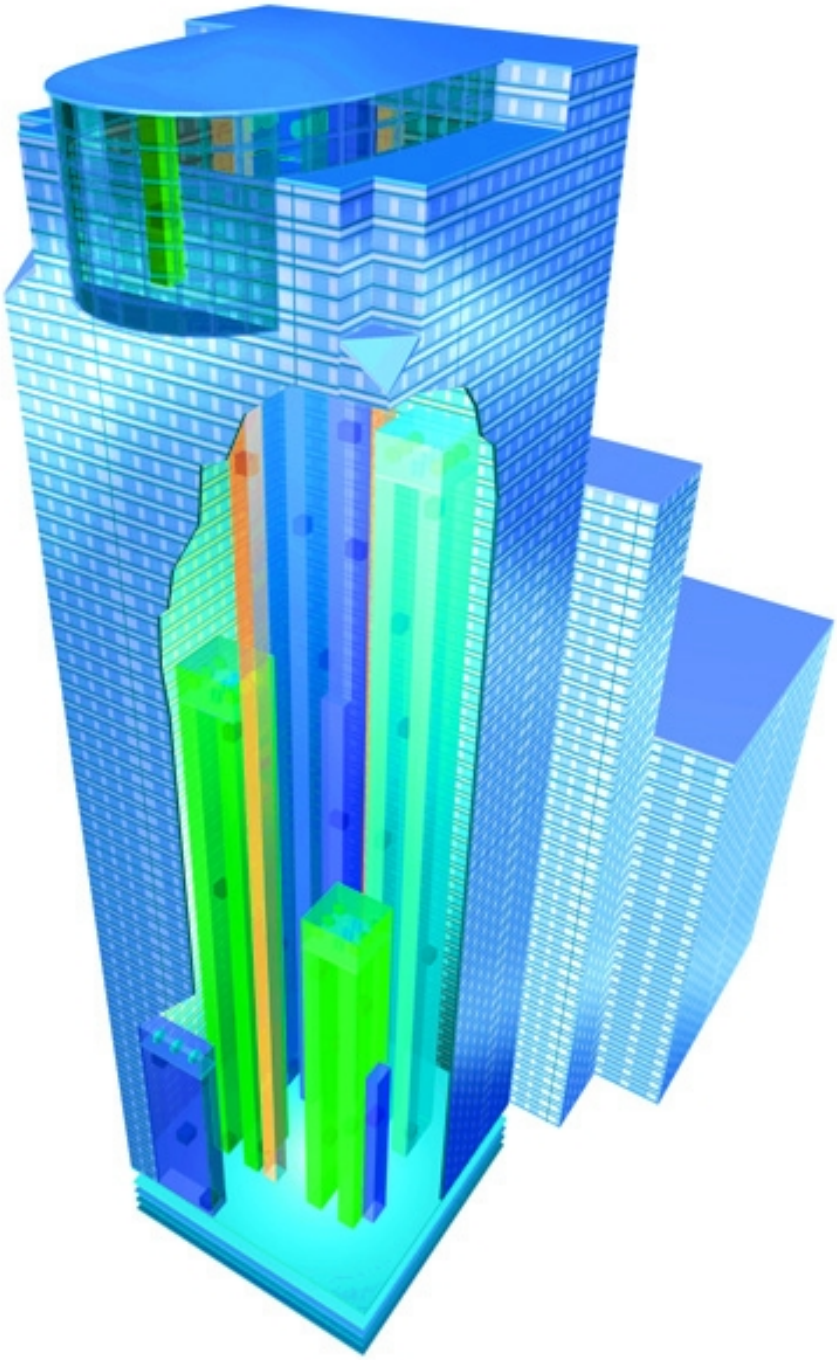
In a modern Elevator System we expect sufficient handling capacity with acceptable waiting times without excessively overcrowding lobbies and elevators.

This requires integration of the elevator system with the building design.

This guide is an aid to Architects, Engineers and other planners designing high quality mid- and high rise buildings.

For more detailed planning information, contact your local KONE representative.



KONE Alta™

1 KONE ALTA™ TRAFFIC CALCULATIONS

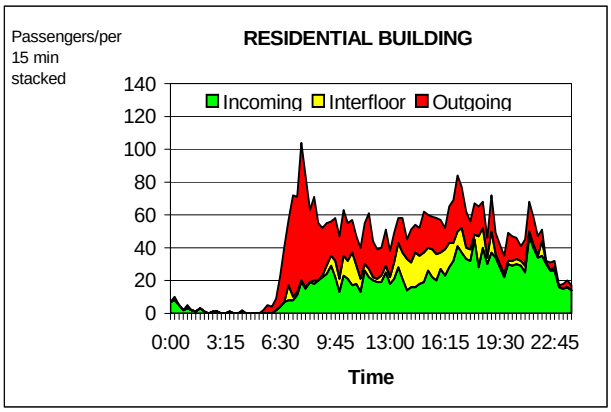
The guide is an aid to architects, engineers and other planners designing elevator systems for mid- and high rise buildings. With complex elevator arrangements your local KONE representative is ready to assist with their knowledge and experience in elevator planning.

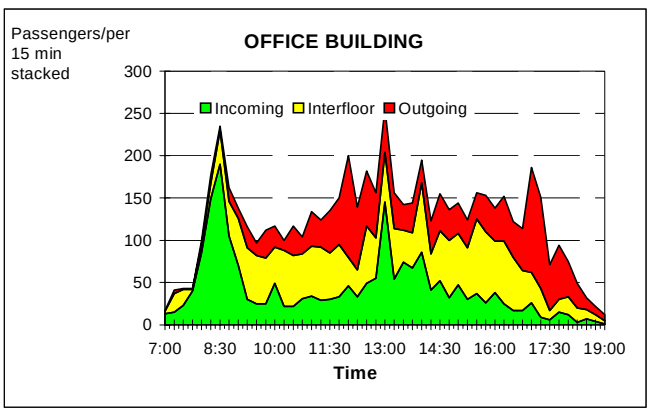
1.1 Introduction

Essential to the operation and image of modern high rise building is how well the passenger traffic circulation is handled. Elevator system is expected to have sufficient Handling Capacity with acceptable passenger waiting times, and without overcrowding lobbies. This requires an early integration of elevator planning with building design.

In the following, an overview is given how to plan an elevator system with good service level, and also with minimum core space and investment costs. The graphs are adjusted to the performance capability of KONE Alta™ Elevator System.

Figure 1. Measured traffic patterns from residential and single tenant office buildings.





1.2 Traffic planning

1.2.1 Passenger Traffic in a Building

Passenger traffic intensity and traffic patterns vary a lot in different types of buildings.

In **single tenant office buildings** there are sharp traffic peaks in the morning, lunch hour and evening. A lot of inter-floor traffic can be expected. If working hours are flexible, traffic intensity during peak hours is lighter.

In **diversified office buildings**, passenger traffic intensity during peak traffic hours is lighter. The peak traffic hour lasts longer, but clear traffic peaks in the morning and lunch hour can be distinguished.

In **hotels**, traffic is mostly two-way. Hotel guests travel to their rooms, and return to the entrance floor. A third traffic component is to restaurant or other feature floor. Extra elevator traffic is avoided if the restaurant is close to the entrance floor. In a hotel, clear traffic peak is in the morning when people have their breakfast, return their rooms and check out from the hotel.

In **residential buildings**, traffic is mostly two-way. Normally traffic intensity is high in the morning when people go to work, and in the evening when people return to their homes. Traffic intensity is much lighter than in offices and hotels. The resort and permanent residential buildings traffic patterns differ.

Elevators in offices are usually planned for the up-peak traffic. Planning criteria exists for up-peak traffic and two-way traffic in hotels and residential buildings. During up-peak, car loads are greater compared to other times of day. If an elevator group can handle an up-peak situation, with full collective control system it can handle about 1.2-1.8 times more traffic during lunch hour and down peak. In case of special control systems, such as temporary zoning of elevators in up-peak, or destination control system, this naturally is not true.

1.2.2 Building Considerations

In planning elevators to a building the following items have to be considered:

- Type and usage of the building

- Number of served floors by elevators

- Floor heights and travel of elevators

- Entrance floors

- Population at each floor

If the population is unknown, it has to be estimated. The net usable area per floor is a good basis for estimation. The net usable area does not include areas such as lift lift well, waiting areas, stairways, corridors, and other common areas. Roughly net usable area can be assumed to be about 75-85% of the total floor area. Guidelines for population estimation are shown in Table 1. The estimation depends very much on local conditions.

Table 1. population estimation

USAGE	POPULATION ESTIMATION	TYPICAL VALUE
Office Regular Prestige	 8-12 m^2 /person 12-25 m^2/person	 10 m^2 /person 14 m^2/person
Hotel	0.75-1.0 persons/bed	1.7 persons/quest room
Residential Building	2 persons / first bedroom + 1 person/additional bedrooms	1.5-1.9 persons/bedroom
Hospitals Staff Visitors	 1.5-3.0 persons/bed 1.0-3.0 visitors/bed	

1.2.3 Basic Planning Parameters

At the building design stage, future usage of the building has to be considered carefully since later on it often is not possible to change the elevator layout. Several features can be altered in an elevator specification:

- **Car Load**
- **Elevator Dimensions**
- **Elevator Speed**
- **Number of Elevators in Group**
- **Served Floors**
- **Location and Grouping of Elevators**
- **Control System and Control Features**

The following planning parameters are calculated:

- **Handling Capacity (persons/5 minutes, or % of population/5 minutes)**
- **Interval (s)**
- **Nominal Travel Time (s)**

Handling Capacity shows how many passengers the elevator system can transport in five minutes, normally in up-peak with 80% load factor. Usually Handling Capacity is given in relative units, percent of population in 5 minutes. Relative value of Handling Capacity is obtained by dividing the absolute value (persons/5 minutes) by the total population at the served floors.

Average **Interval** shows the average frequency how often an elevator leaves the lobby during up-peak. It is obtained by dividing the round trip time by the number of elevators in group.

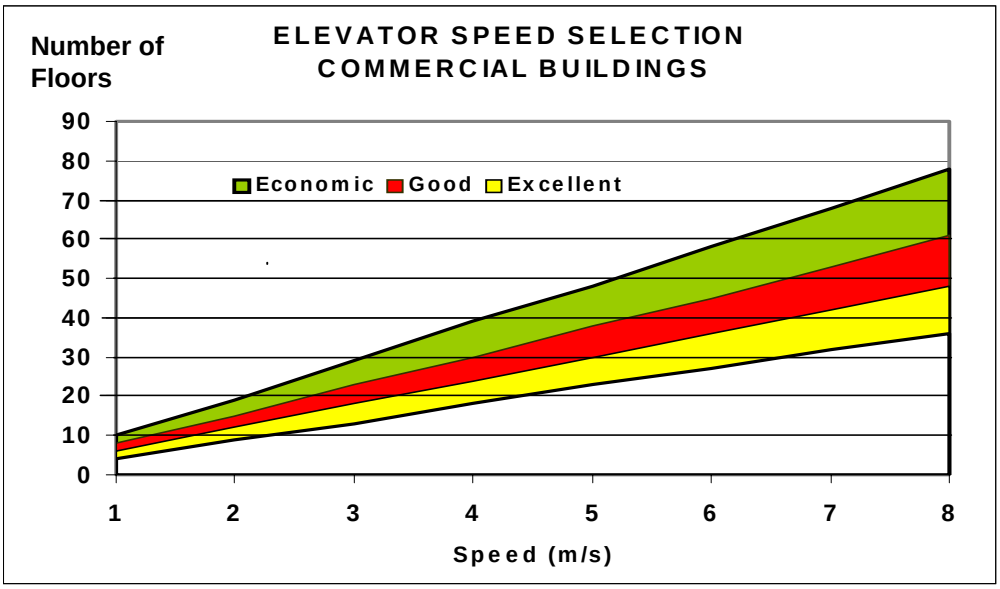
With **up-peak boosters**, all cars do not serve all floors, and Interval has different meanings. If the average round trip time is divided by the total number of elevators in group, then interval is called the Departure Interval. **Departure Interval** shows how often elevators leave the lobby, but it is not related to passenger waiting times and queuing. **Service Interval** relates to passenger waiting times. It is obtained by dividing the average round trip by the real number of elevators serving the passenger destination floor.

Nominal Travel Time is obtained by dividing the travel height by the elevator rated speed. It gives a rough estimation of the maximum time it takes to ride inside the car from the bottom floor to the top floor.

1.3 Speed Selection

Elevator speed depends on the travel height. In offices, for good performance, Nominal Travel Time should stay below 25 seconds, but Nominal Travel Times up to 32 seconds and below 20 seconds are acceptable.

Figure 2. Speed recommendations for commercial buildings. Assumed floor height is 3.3 m.



In residential buildings, Nominal Travel Time should stay below 32 seconds, but it is acceptable up to 50 seconds. Excellent value is below 25 seconds.

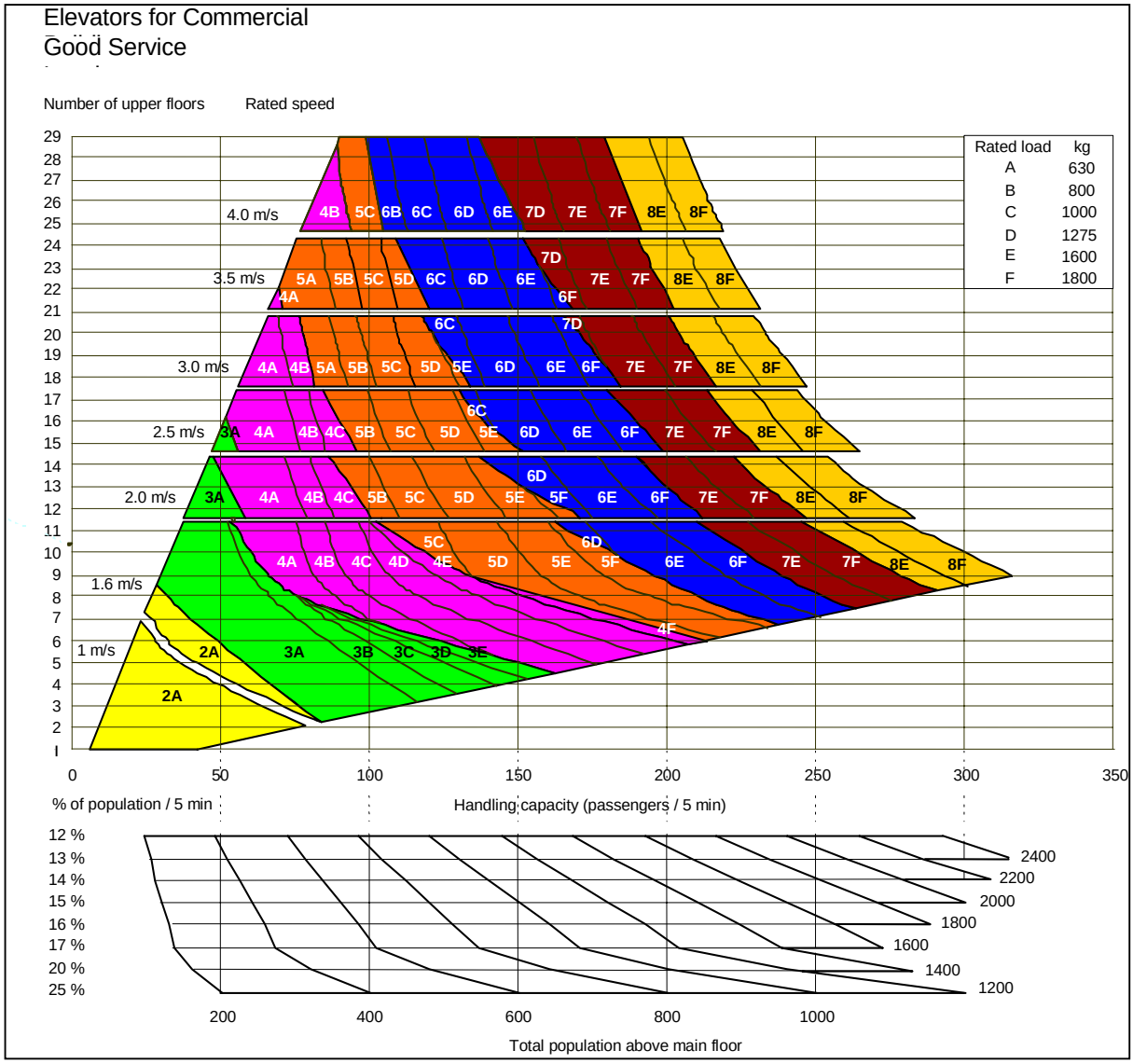
Figure 3. Speed recommendations for residential buildings. Assumed floor height is 3.0 m.

1.4 Elevator Group Selection

1.4.1 Commercial Buildings:

The selection of an elevator group for a commercial building depends on the building type. Each building type has its own recommendations for elevator up-peak performance (Table 2). Handling Capacity in commercial buildings should always exceed 12 % of population in five minutes, according to some local practices even 11 % in five minutes Handling Capacity is accepted. In Figure 4, selection of elevators with good Interval and Travel Time values is shown. Elevators are selected according to the number of served floors in the building, and the population above the main entrance. The point from the horizontal axes is selected according to the Handling Capacity recommendation and the population in the building. Selection of the minimum number of elevators according Handling Capacity recommendation for a building with given population.

Figure 4. Selection of the minimum number of elevators according Handling Capacity recommendation for a building with given population. The chart is drawn so that Interval and Travel Time values will be good.



An example selection: A multi tenant office building has 10 upper floors and population of 800 people. Recommended Handling Capacity should exceed 12 % in five minutes. After drawing a horizontal line at 10 upper floors, select the point of 12 % for 800 people and draw a vertical line. The vertical and horizontal lines cross at the area with a marking 4C which is the minimum acceptable elevator arrangement for this building. The marking means a quadruplex group with load of 1000 kg (13 persons). Speed is 1.6 m/s which can be seen on the left of the graph.

The following assumptions in the graph of Figure 4 are made:

- Good Service Level (Interval below 32 seconds, Nominal Travel Time below 25 seconds)
- Up-peak traffic
- One Entrance Floor in the Building
- Average Floor Height 3.3 m
- Equal Population on Each Upper Floor
- KONE Alta™ performance parameters

If assumptions of the building differ from the list above, the elevators can be selected by using the KONE TrafCal. KONE TrafCal is a sophisticated computer based planning tool to select a proper elevator arrangements. For KONE TrafCal calculations, contact your local KONE representative.

1.4.2 Hotels

For hotel guests, the graph of Figure 4 can be used for elevator selection. The up-peak Handling Capacity with 80 % car load factor should exceed 12 percent of the population in five minutes. Resort hotels usually have a higher occupancy rate than urban hotels which has to be taken into account in estimating the population.

Also two-way traffic can be used with 40% car load factor. Handling Capacity should exceed 12 % of population in five minutes. Load factor below 40 % is used if separate service elevators are not provided. However, separate freight or service elevators serving all floors are recommended. The number of service elevators should be about half of the number of hotel guest elevators.

Several hotel chains have recommendations for the minimum car sizes. The elevator should be large enough, e.g. for 17 to 20 persons to permit patrons to accompany their baggage without undue congestion in the car. Centre opening doors with clear openings no less than 1100 mm wide and 2100 mm high are recommended.

1.4.3 Residential Buildings

In residential buildings traffic is lighter, and Figure 4 cannot be used. In residential buildings Handling Capacity should exceed 7.5 % per five minutes of the population, and good value for the Interval is below 60 seconds. According to some local practices, Handling Capacity of 5 % in five minutes is accepted.

In some high rise residential buildings , especially in Hong Kong, **a double duplex system** is used. It consists of a group of three elevators where all the elevators stop at the entrance floors. The car in the middle serves all upper floors, one car serves even, and the other odd upper floors. Zoning increases Handling Capacity a little, but Interval and waiting times at the upper floors become longer. One advantage is that less landing doors are needed, however there is a restriction to flexibility of tenant movement throughout the building.

1.4.4 Hospitals

In a hospital, there is need for several type of vertical transportation, such as staff, visitors, patients, beds, food, and linen.

Figure 4 can be used to select elevator for the personnel and visitors. Handling Capacity should then exceed 12 % of the users in five minutes. The number of users of the passenger elevators can be estimated from Table 1.

A general Handling Capacity recommendation for the bed transportation is from 1.75% to 4.0 % of beds per five minutes. Interval should stay below 50-60 seconds. Special size elevators are used for bed transportation. The minimum car size is 1800 mm wide and 2700 mm deep. The door width is typically 1300 or 1400 mm with centre opening doors being the most efficient and needing least maintenance effort.

1.4.5 Shopping Centres

At shopping centres the circulation of traffic flow is heavy. Transportation capacity of elevators is small compared to escalators or inclined autowalks.

An example: In a five storey shopping centre, a 13 person elevator with speed 1 m/s can transport about 40-50 person in five minutes. An escalator with 1000 mm wide steps and speed of 0.5 m/s can transport about 600-750 persons in five minutes from one floor to another.

In low shopping Centre buildings, most of the traffic should be handled by escalators (autowalks). Elevators are needed to transport personnel, handicapped people and children. Same recommendations as for commercial buildings can be used for the personnel transportation. Separate freight elevators are required for goods transportation for provisioning of stores.

1.4.6 Planning Recommendations

Recommendations for the relative up-peak Handling Capacity and Interval, and to the Nominal Travel Time vary according to the building type, and the working hours in the offices. Table 2 shows performance recommendations for different building types.

Table 2. Performance recommendations for different building types.

Building type	Working hours	Handling capacity (% of population / 5 minutes)	Interval (s)	Travel time (s)
Office One company Diversified	 Common Flexible Common Flexible	 16-25 13-20 14-20 12-17	 15-32 20-32 20-32 25-40	 15-25 15-32 15-32 20-32
Hotel **** *** **		 12-17 12-17 10-15	 20-32 25-40 25-50	 15-32 15-32 15-32
Hospital personnel beds		 12-17 1.75-4.0 % of beds/5 min	 20-40 50-60	 20-32 20-40
Residential Building		5-7.5	40-90	20-40
Sky Lobby Shuttle		17-30	20-40	20-40

1.5 Mega High Rise Buildings

1.5.1 Zoning

Zoning is used in high rise buildings with typically 20-90 floors, or if a group of six to eight elevators does not provide sufficient Handling Capacity. With zoning, elevators serve only part of the floors in the building. The recommended number of elevators in a zone is typically from four to six.

Zoning often results in cost savings because of the lower rated speeds at the lower zones, and the decreased number of landing doors. Nett usable (rentable) area increases since less core space is needed for elevator lift well in the upper part of the building.

The number of floors for a zone is chosen so that Handling Capacity and Interval values will be about equal within each zone. Preferably, the handling capacity should be greater at the upper zones. Transfer floors are not recommended for buildings with more than two zones. For emergency situations separate fireman's elevators stopping at all floors are required.

1.5.2 Sky Lobby and Shuttle Elevators:

With sky lobby arrangements it is possible to reduce the elevator core space area in high rise buildings with typically 50-140 floors. Less core space is required compared to a solution where all the elevators leave from the ground floor.

Sky lobby is the main floor for local elevator groups serving the upper part of a tall building. Shuttle elevators make express runs from the ground floor to the sky lobby.

Shuttle elevators have to be able to handle the population of several local elevator groups. Shuttle elevators typically have two-three stops, and their Handling Capacity is the same in both directions. During down peak local elevator groups are able to transport about 1.5 times more passengers than during up peak To be prepared for a heavy down peak, the Handling Capacity criteria for shuttle elevators should be about 1.5 time greater than during up-peak, i.e. over 18 % in five minutes.

The shuttle elevators become large in size, and their rated speed high. To save more core space in the building, double deckers are often used as shuttle elevators. The number of double-deck elevators can be smaller compared to single deck elevators since their Handling Capacity is greater.

1.5.3 Up-Peak Boosters

In buildings where Handling Capacity is critical during up-peak, up-peak boosters can be used to increase transportation capacity temporarily. In TMS9900 GA, Concentrated Passenger Service (CPS), is used as an up-peak booster.

With an up-peak booster, the number of elevator stops decreases during an up trip which increases Handling Capacity. Service Interval and passenger waiting times become longer compared to a group serving all floors. Departure Interval becomes shorter since the round trip time becomes shorter.

Up-peak booster increases Handling Capacity temporarily. During mixed inter-floor traffic pattern, Handling Capacity remains unchanged. In office buildings, traffic intensity during lunch hour is often highest. To be able to handle the lunch hour traffic, elevator groups should always be dimensioned without an up-peak booster in the calculations.

1.6 Elevator Traffic Simulation

KONE ALTS (Advanced Lift Traffic Simulator) is used to find out passenger service times and elevator performance in customer defined building surroundings. KONE ALTS uses real group control algorithms, such as IFC - Interconnected Full Collective, ESP - Enhanced Spacing Principle (TMS9000 AI, TMS600, LCE), and Gene (TMS9900 GA) to predict traffic service level in the building before the building really exists, and to compare alternative elevator arrangements.

The result is a wealth of statistical information. Passenger waiting times and journey times are found out for up-peak and other traffic conditions. For KONE ALTS simulations contact your local KONE representative.

For commercial buildings, the call time distribution of Table 3 defines the service level throughout the day.

Table 3. Service level

Service level	Average call time (s)	% of calls Answered within 30s	60s	90s
Satisfactory	25	65	92	95
Good	20	70	95	98
Excellent	15	75	98	100

1.7 Elevator Layout

Elevator layout will have a big effect on how efficiently the building space is used. As a rule, lobby should be as wide as the elevators are deep, and with the elevators opposite to each other, from 1.5-2.0 times the depth of the elevator. Attention should be paid to the distance between the furthermost elevators. To keep the distance within reasonable limits, no more than four elevators should be in one row. The most commonly used layout arrangements are shown on page 52.

2 KONE ALTA™ LAYOUTS AND DIMENSIONS

2.1 Commercial Elevators - Machine Room on Top - CWT at Rear

2.1.1 Vertical Sections

CAR CLEAR HEIGHT CH (std.)
CH = 2700 mm

HEADROOM HEIGHT SH (mm) (Std. ceiling allowance = 200 mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	CH+2650					
3,0	CH+2950					
3,5	CH+3100					CH+3100, CH+3200 H>120 m
4,0	CH+3150				CH+3150, CH+3250 H>130	CH+3150, CH+3250 H≥100 m
5,0	CH+3150				CH+3150, H≤230 m CH+3200, H>230 m	CH+3150, H<200 m CH+3200, H≥200 m
6,0	CH+3250, H<100 m CH+3300, H≥100 m					
7,0	CH+3600, H<150 m CH+3700, H≥150 m		CH+3550, H≤120 m CH+3700, H >120 m	CH+3650, H≤160 m CH+3700, H>160 m	CH+3600, H≤130 m CH+3700, H≤230 m CH+3750, H>230 m	CH+3700, H≤180 m CH+3750, H>180 m
8,0	CH+5300, H≤180 m CH+5400, H>180 m		CH+5300, H≤180 m CH+5350, H≤220 m CH+5400, H >220 m	CH+5250, H≤170 m CH+5400, H>170 m	CH+5200, H≤140 m CH+5350, H≤220 m CH+5400, H>220 m	CH+5250, H≤170 m CH+5400, H>170 m

Note! Australian Standard AS-1735.2 requires in some cases even 30 % higher headroom than given in this table. To get exact headroom height, please contact local KONE

RECOMMENDED MINIMUM MACHINE ROOM HEIGHT MH (mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	2200			2600		
3	2200* / 2600					
3,5	2200*/ 2600		2700			
4,0	2700					
5...6	2700** / 3100			3200		
7...8	3100					

Lifting beam in machine room roof is recommended solution.

Lifting beam vertical space reservation is 200 mm with support lenght 3000 mm.

*) Depends on level of elevator acceleration.

**) Depends on size of machine.

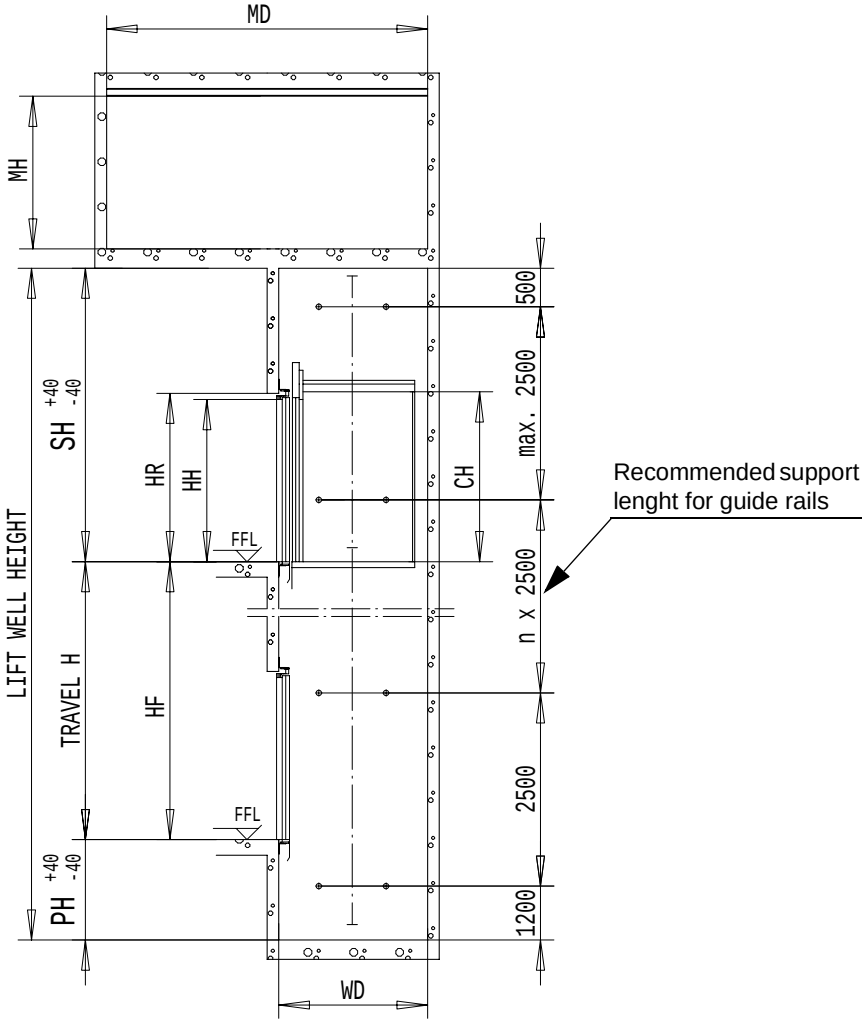
PIT DEPTH PH (Flooring thickness ss=30 mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	2200	2200, 2250 H≥110m		2200, 2250 H>70 m		2300 H>70 m
3,0	2650	2650, 2750 H≥110 m		2750		2800
3,5	3500, H≤90 m 3650, H≤130 m 3750, H>130 m	3500, H≤80 m 3600 H≤130 m 3750, H>130 m	3550, H≤100 m 3650 H≤130 m 3750, H>130 m	3600, H≤90 m 3700, H≤130 m 3800, H>130 m	3650, H≤100 m 3700, H≤130 m 3800, H>130 m	3650, H≤100 m 3700, H≤120 m 3850, H>120 m
4,0	3500, H≤80 m 3750, H≤180 m 3800, H>180 m	3550, H<100 m 3700, H≤150 m 3850, H>150 m	3550, H≤100 m 3700, H≤140 m 3850, H>140 m	3600, H<100 m 3700, H≤130 m 3850, H>130 m	3600, H≤100 m 3700, H≤130 m 3850, H>130 m	3650, H<100 m 3850, H≤150 m 3900, H>150 m
5,0	3550, H<100 m 3700, H≤150 m 3850, H>150 m	3550, H<100 m 3700, H≤150 m 3850, H>150 m	3600, H<100 m 3750, H≤140 m 3850, H>140	3600, H<100 m 3850, H>100 m	3650, H<100 m 3750, H≤150 m 3850 H>150 m	3650, H<100 m 3900, H≥100 m
6,0	3550, H<100 m 3700, H≤130 m 3850, H>130 m	3550, H<100 m 3750, H≤160 m 3850, H>160 m	3600, H<100 m 3700, H≤130 m 3750 H>130	3600, H<100 m 3850, H≥100 m	3600, H<100 m 3850, H≥100 m	3650, H<100 m 3900, H≥100 m
7,0	3950, H≤140 m 4100, H>140 m	4000, H≤150 m 4100, H>150 m	3900, H≤120 m 4100, H>120 m	4050, H≤160 m 4100, H>160 m	4050, H≤160 m 4100, H>160 m	4000, H≤130 m 4100, H≥170 m 4150, H>170 m
8,0	5250, H≤180 m 5300, H>180 m	5250, H≤180 m 5300, H>180 m	5250, H≤160 m 5300, H>160 m	5250, H≤160 m 5300, H>160 m	5250, H≤160 m 5300, H>160 m	5250, H≤160 m 5300, H>160 m

See explanations for the dimensions from next page.

Explanations for dimensions shown in tables for commercial elevators.

Figure 5. Vertical sections



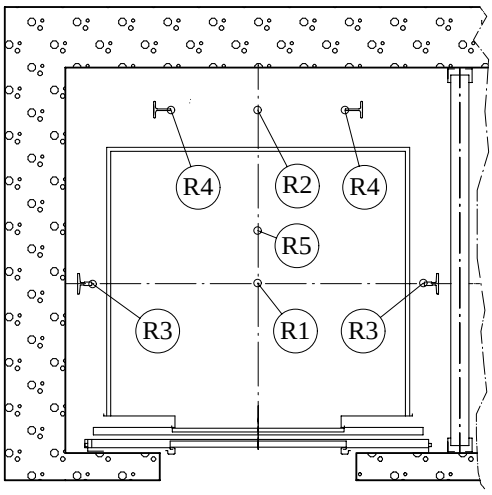
Abbreviations

BB = CAR WIDTH
DD = CAR DEPTH
CH = CAR CLEAR HEIGHT
FW= FRONT WALL WIDTH
HF = FLOOR TO FLOOR DISTANCE
HH = DOOR CLEAR OPENING HEIGHT
HR = DOOR RAW OPENING HEIGHT
LL = DOOR CLEAR OPENING WIDTH
LR = DOOR RAW OPENING WIDTH
MD = MACHINE ROOM DEPTH
MW = MACHINE ROOM WIDTH
MH = MACHINE ROOM HEIGHT (UNDER THE BEAM OR LIFTING HOOK)
H= TRAVEL HEIGHT
SH = HEADROOM HEIGHT
PH = PIT DEPTH
WD = WELL DEPTH
WB = LIFT WELL DIVIDING BEAM WIDTH
FFL = FINISHED FLOOR LEVEL

2.1.2 Reaction forces on the pit floor

REACTION FORCES (impact values)							
Speed v (m/s)	Rated Load Q (kg)	Travel Height (m)	REACTION FORCES ON THE PIT FLOOR (kN)				
			R1	R2	R3	R4	R5
2.5	1000	130	148	128	60	55	0
	1275		180	155	68	62	0
	1350		184	157	69	63	0
	1600		204	172	74	66	0
	1800		224	188	86	70	0
	2000		236	196	95	72	0
3	1000	130	152	132	61	56	0
	1275		180	155	68	62	0
	1350		188	161	70	64	0
	1600		204	172	74	66	0
	1800		224	188	86	70	0
	2000		236	196	95	72	0
3.5	1000	165	156	136	69	64	112
	1275		188	163	77	70	135
	1350		196	169	79	72	140
	1600		218	186	84	76	156
	1800		242	206	98	81	173
	2000		258	218	110	84	185
4	1000	200	164	144	77	72	117
	1275		188	163	83	77	135
	1350		196	169	85	78	140
	1600		216	184	99	82	155
	1800		240	204	106	87	172
	2000		258	218	120	91	185
5	1000	250	172	152	88	83	123
	1275		196	171	94	88	140
	1350		204	177	96	89	146
	1600		236	204	128	96	169
	1800		252	216	132	99	180
	2000		268	228	136	102	192
6	1000	250	172	152	88	83	123
	1275		196	171	106	88	140
	1350		204	177	108	89	146
	1600		236	204	128	96	169
	1800		252	216	132	99	180
	2000		268	228	136	102	192
7	1000	250	172	152	88	83	123
	1275		198	173	106	100	142
	1350		212	185	110	103	152
	1600		236	204	128	108	169
	1800		250	214	131	110	179
	2000	200	270	230	136	114	193
8	1000	250	176	156	89	84	126
	1275		212	187	110	103	152
	1350		220	193	112	105	158
	1600		242	210	129	109	173
	1800		258	222	133	112	185
	2000	200	276	236	138	116	198

Figure 6. Reaction forces on the pit floor

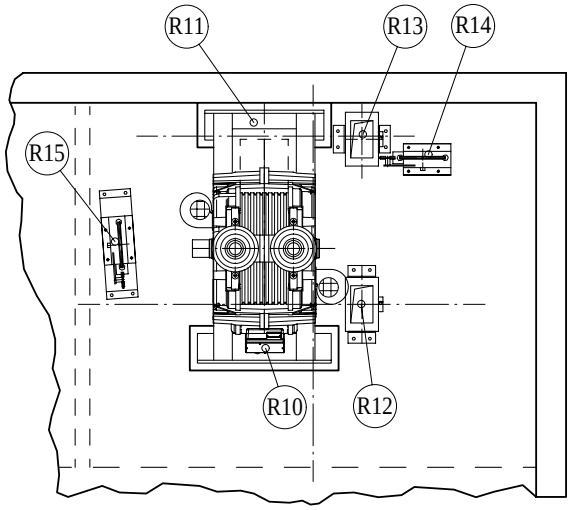


R1 = REACTION FORCE UNDER CAR BUFFER (kN)
R2 = REACTION FORCE UNDER CWT BUFFER (kN)
R3 = REACTION FORCE UNDER CAR GUIDE RAIL (kN)
R4 = REACTION FORCE UNDER CWT GUIDE RAIL (kN)
R5 = MAX. ROPE COMPENSATOR IMPACT FORCE ON THE PIT FLOOR (UPWARD)

2.1.3 Reaction forces on the machine room floor

REACTION FORCES (impact values)								
Speed v (m/s)	Rated Load Q (kg)	Travel Height (m)	REACTION FORCES IN MACHINE ROOM (kN)					
			R10	R11	R12	R13	R14	R15
2.5	1000	130	46	49	44	40	5	5
	1275		68	144	0	0	5	5
	1350		66	156	0	0	5	5
	1600		38	96	61	53	5	10
	1800		42	108	70	62	5	10
	2000		46	110	74	64	5	10
3	1000	130	56	126	0	0	5	10
	1275		70	150	0	0	5	10
	1350		66	156	0	0	5	10
	1600		38	96	61	53	5	10
	1800		42	108	70	62	5	10
	2000		46	110	74	64	5	10
3.5	1000	165	68	164	0	0	5	10
	1275		76	186	0	0	5	10
	1350		82	196	0	0	5	10
	1600		46	120	77	69	5	10
	1800		48	130	84	75	5	10
	2000		52	130	87	77	5	10
4	1000	200	74	178	0	0	5	10
	1275		120	172	0	0	5	10
	1350		86	206	0	0	5	10
	1600		48	126	81	73	5	10
	1800		50	132	87	77	5	10
	2000		52	132	90	80	5	10
5	1000	250	76	188	0	0	5	10
	1275		126	180	0	0	5	10
	1350		140	180	0	0	5	10
	1600		104	242	0	0	5	10
	1800		112	260	0	0	5	10
	2000		116	276	0	0	5	10
6	1000	250	76	188	0	0	5	10
	1275		126	180	0	0	5	10
	1350		140	180	0	0	5	10
	1600		106	244	0	0	5	10
	1800		106	262	0	0	5	10
	2000		118	278	0	0	5	10
7	1000	250	128	150	0	0	5	10
	1275		146	168	0	0	5	10
	1350		148	182	0	0	5	10
	1600		120	250	0	0	5	10
	1800		130	260	0	0	5	10
	2000	200	140	282	0	0	5	10
8	1000	250	132	154	0	0	5	10
	1275		152	176	0	0	5	10
	1350		152	186	0	0	5	10
	1600		124	256	0	0	5	10
	1800		132	264	0	0	5	10
	2000	200	142	286	0	0	5	10

Figure 7. Reaction forces on the machine room floor

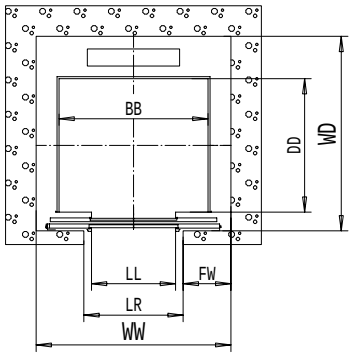


R10 = REACTION FORCE OF MACHINE AT CAR SIDE (kN)
R11 = REACTION FORCE OF MACHINE AT CWT SIDE (kN)
R12 = REACTION FORCE OF ROPE END AT CAR SIDE (VALID FOR ROPINGS 2:1) (kN)
R13 = REACTION FORCE OF ROPE END AT CWT SIDE (VALID FOR ROPINGS 2:1) (kN)
R14 = REACTION FORCE OF CWT OVERSPEED GOVERNOR (OPTIONAL) (kN)
R15 = REACTION FORCE OF CAR OVERSPEED GOVERNOR (kN)

2.1.4 ISO 4190-1 Cars: Speed 2.5 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 2.5 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, ISO 4190-1 CARS

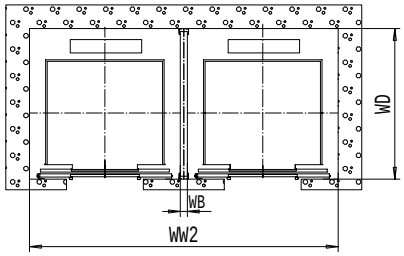
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to ISO 4190-1	Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2150	2200 x 2200
		1100	550	1600 x 1400	2400 x 2150	2400 x 2200
17	1275	1100	625	2000 x 1400	2550 x 2150	2600 x 2200 (2500 x 2200)
18	1350	1100	625	2000 x 1500	2550 x 2300	-
21	1600	1100	675	2100 x 1600	2650 x 2350	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2350	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2450	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK WW2=2*WW+140

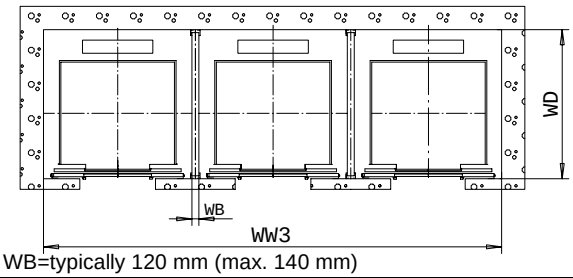
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2150
		1100	550	1600 x 1400	4940 x 2150
17	1275	1100	625	2000 x 1400	5240 x 2150
18	1350	1100	625	2000 x 1500	5240 x 2300
21	1600	1100	675	2100 x 1600	5440 x 2350
24	1800	1200	800	2350 x 1600	6140 x 2350
26	2000	1200	800	2350 x 1700	6140 x 2450



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK WW3=3*WW+2*140

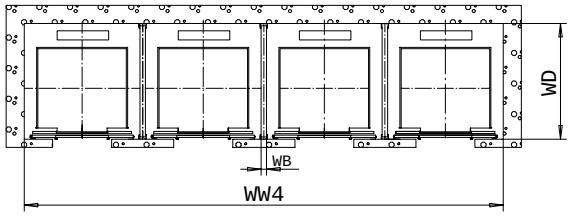
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6740 x 2150
		1100	550	1600 x 1400	7480 x 2150
17	1275	1100	625	2000 x 1400	7930 x 2150
18	1350	1100	625	2000 x 1500	7930 x 2300
21	1600	1100	675	2100 x 1600	8230 x 2350
24	1800	1200	800	2350 x 1600	9280 x 2350
26	2000	1200	800	2350 x 1700	9280 x 2450



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK WW4=4*WW+3*140

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2150
		1100	550	1600 x 1400	10020 x 2150
17	1275	1100	625	2000 x 1400	10620 x 2150
18	1350	1100	625	2000 x 1500	10620 x 2300
21	1600	1100	675	2100 x 1600	11020 x 2350
24	1800	1200	800	2350 x 1600	12420 x 2350
26	2000	1200	800	2350 x 1700	12420 x 2450



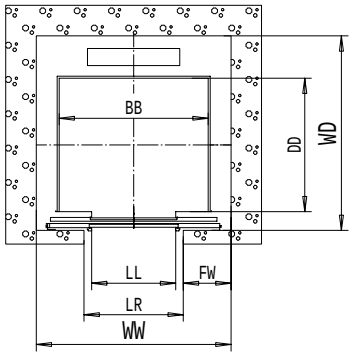
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.5 ISO 4190-1 Cars: Speed 3.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 3.0 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, ISO 4190-1 CARS

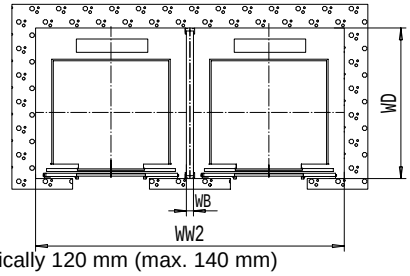
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to ISO 4190-1	Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2200	2300 x 2300
		1100	550	1600 x 1400	2400 x 2200	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2200	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2300	-
21	1600	1100	675	2100 x 1600	2650 x 2350	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2350	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2450	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

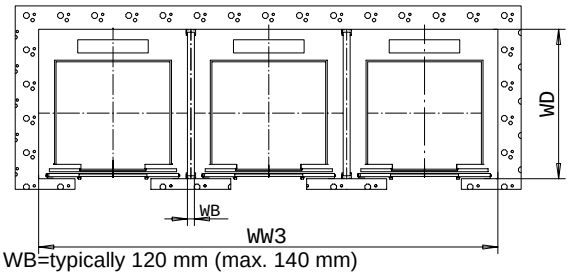
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2200
		1100	550	1600 x 1400	4940 x 2200
17	1275	1100	625	2000 x 1400	5240 x 2200
18	1350	1100	625	2000 x 1500	5240 x 2300
21	1600	1100	675	2100 x 1600	5440 x 2350
24	1800	1200	800	2350 x 1600	6140 x 2350
26	2000	1200	800	2350 x 1700	6140 x 2450



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

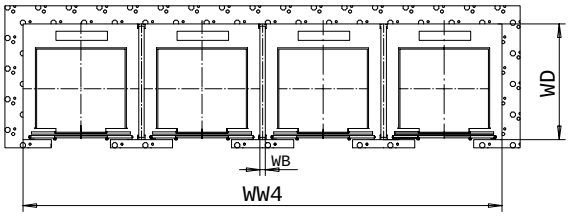
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6740 x 2200
		1100	550	1600 x 1400	7480 x 2200
17	1275	1100	625	2000 x 1400	7930 x 2200
18	1350	1100	625	2000 x 1500	7930 x 2300
21	1600	1100	675	2100 x 1600	8230 x 2350
24	1800	1200	800	2350 x 1600	9280 x 2350
26	2000	1200	800	2350 x 1700	9280 x 2450



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2200
		1100	550	1600 x 1400	10020 x 2200
17	1275	1100	625	2000 x 1400	10620 x 2200
18	1350	1100	625	2000 x 1500	10620 x 2300
21	1600	1100	675	2100 x 1600	11020 x 2350
24	1800	1200	800	2350 x 1600	12420 x 2350
26	2000	1200	800	2350 x 1700	12420 x 2450



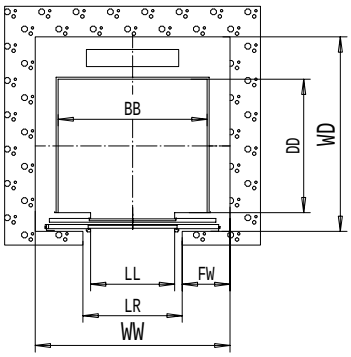
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.6 ISO 4190-1 Cars: Speed 3.5 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 3.5 m/s
MIN TRAVEL 50 m, MAX TRAVEL 165 m, ISO 4190-1 CARS

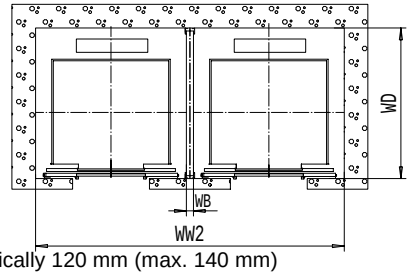
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to ISO 4190-1	Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2200	2300 x 2300
		1100	550	1600 x 1400	2400 x 2200	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2200	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2300	-
21	1600	1100	675	2100 x 1600	2650 x 2350	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2350	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2450	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

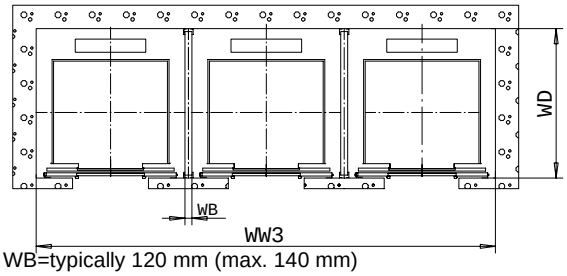
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2200
		1100	550	1600 x 1400	4940 x 2200
17	1275	1100	625	2000 x 1400	5240 x 2200
18	1350	1100	625	2000 x 1500	5240 x 2300
21	1600	1100	675	2100 x 1600	5440 x 2350
24	1800	1200	800	2350 x 1600	6140 x 2350
26	2000	1200	800	2350 x 1700	6140 x 2450



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

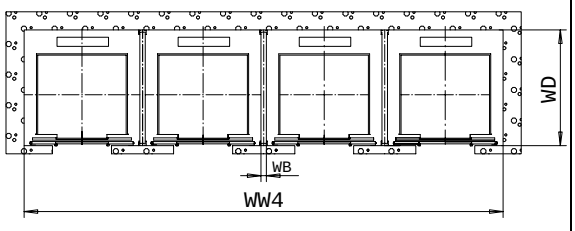
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6740 x 2200
		1100	550	1600 x 1400	7480 x 2200
17	1275	1100	625	2000 x 1400	7930 x 2200
18	1350	1100	625	2000 x 1500	7930 x 2300
21	1600	1100	675	2100 x 1600	8230 x 2350
24	1800	1200	800	2350 x 1600	9280 x 2350
26	2000	1200	800	2350 x 1700	9280 x 2450



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2200
		1100	550	1600 x 1400	10020 x 2200
17	1275	1100	625	2000 x 1400	10620 x 2200
18	1350	1100	625	2000 x 1500	10620 x 2300
21	1600	1100	675	2100 x 1600	11020 x 2350
24	1800	1200	800	2350 x 1600	12420 x 2350
26	2000	1200	800	2350 x 1700	12420 x 2450



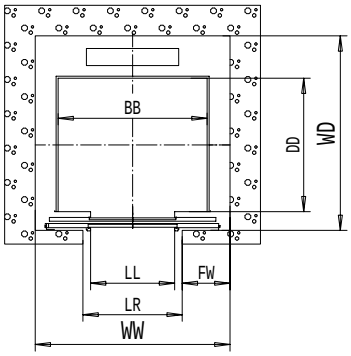
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.7 ISO 4190-1 Cars: Speed 4.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 4.0 m/s
MIN TRAVEL 60 m, MAX TRAVEL 200 m, ISO 4190-1 CARS

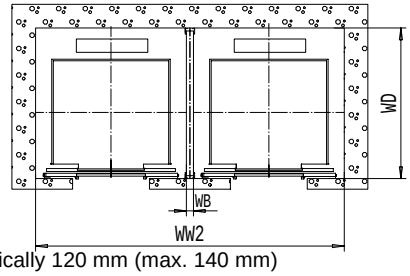
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to ISO 4190-1	Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2200	2300 x 2300
		1100	550	1600 x 1400	2400 x 2200	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2200	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2300	-
21	1600	1100	675	2100 x 1600	2650 x 2350	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2350	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2450	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK WW2=2*WW+140

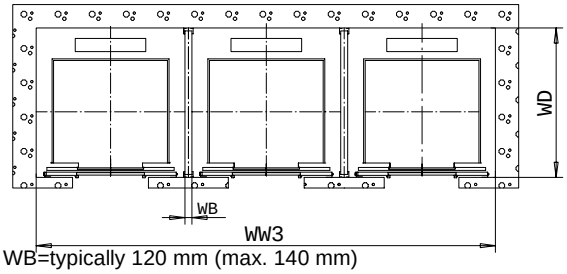
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2200
		1100	550	1600 x 1400	4940 x 2200
17	1275	1100	625	2000 x 1400	5240 x 2200
18	1350	1100	625	2000 x 1500	5240 x 2300
21	1600	1100	675	2100 x 1600	5440 x 2350
24	1800	1200	800	2350 x 1600	6140 x 2350
26	2000	1200	800	2350 x 1700	6140 x 2450



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK WW3=3*WW+2*140

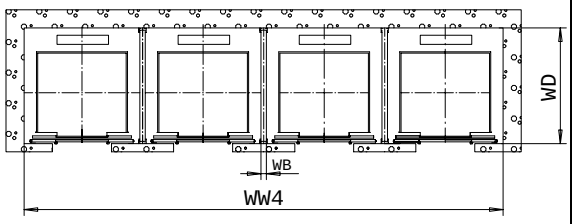
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6740 x 2200
		1100	550	1600 x 1400	7480 x 2200
17	1275	1100	625	2000 x 1400	7930 x 2200
18	1350	1100	625	2000 x 1500	7930 x 2300
21	1600	1100	675	2100 x 1600	8230 x 2350
24	1800	1200	800	2350 x 1600	9280 x 2350
26	2000	1200	800	2350 x 1700	9280 x 2450



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK WW4=4*WW+3*140

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2200
		1100	550	1600 x 1400	10020 x 2200
17	1275	1100	625	2000 x 1400	10620 x 2200
18	1350	1100	625	2000 x 1500	10620 x 2300
21	1600	1100	675	2100 x 1600	11020 x 2350
24	1800	1200	800	2350 x 1600	12420 x 2350
26	2000	1200	800	2350 x 1700	12420 x 2450



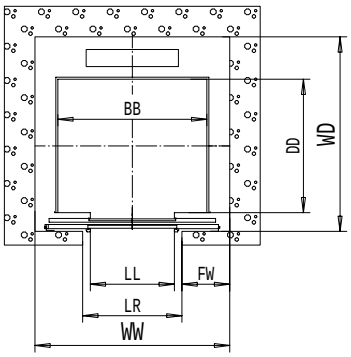
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.8 ISO 4190-1 Cars: Speed 5.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 5.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, ISO 4190-1 CARS

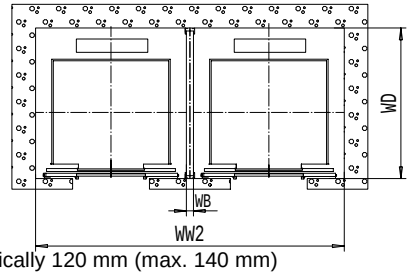
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to ISO 4190-1	Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2250	2300 x 2300
		1100	550	1600 x 1400	2400 x 2250	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2250	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2350	-
21	1600	1100	700	2100 x 1600	2700 x 2400	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2400	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2500	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK WW2=2*WW+140

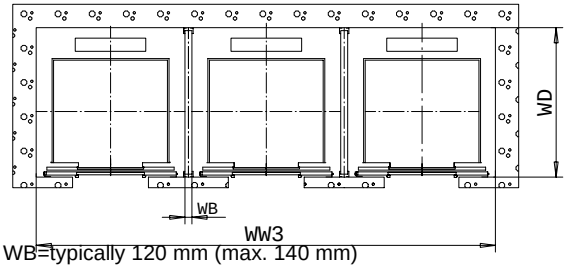
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2250
		1100	550	1600 x 1400	4940 x 2250
17	1275	1100	625	2000 x 1400	5240 x 2250
18	1350	1100	625	2000 x 1500	5240 x 2350
21	1600	1100	700	2100 x 1600	5540 x 2400
24	1800	1200	800	2350 x 1600	6140 x 2400
26	2000	1200	800	2350 x 1700	6140 x 2500



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK WW3=3*WW+2*140

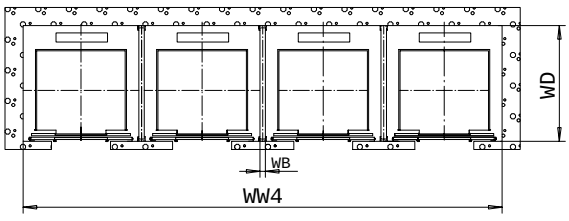
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6730 x 2250
		1100	550	1600 x 1400	7480 x 2250
17	1275	1100	625	2000 x 1400	7930 x 2250
18	1350	1100	625	2000 x 1500	7930 x 2350
21	1600	1100	700	2100 x 1600	8380 x 2400
24	1800	1200	800	2350 x 1600	9280 x 2400
26	2000	1200	800	2350 x 1700	9280 x 2500



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK WW4=4*WW+3*140

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2250
		1100	550	1600 x 1400	10020 x 2250
17	1275	1100	625	2000 x 1400	10620 x 2250
18	1350	1100	625	2000 x 1500	10620 x 2350
21	1600	1100	700	2100 x 1600	11220 x 2400
24	1800	1200	800	2350 x 1600	12420 x 2400
26	2000	1200	800	2350 x 1700	12420 x 2500



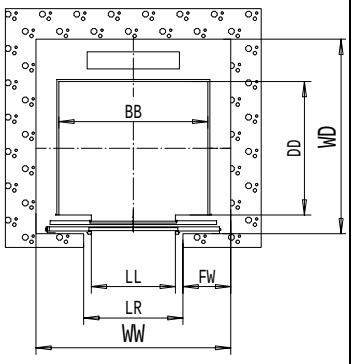
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.9 ISO 4190-1 Cars: Speed 6.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 6.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, ISO 4190-1 CARS

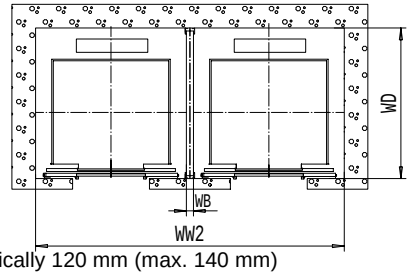
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2250	2300 x 2300
		1100	550	1600 x 1400	2400 x 2250	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2250	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2350	-
21	1600	1100	700	2100 x 1600	2700 x 2400	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2400	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2500	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK WW2=2*WW+140

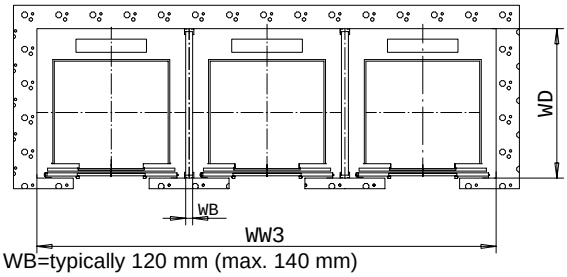
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2250
		1100	550	1600 x 1400	4940 x 2250
17	1275	1100	625	2000 x 1400	5240 x 2250
18	1350	1100	625	2000 x 1500	5240 x 2350
21	1600	1100	700	2100 x 1600	5540 x 2400
24	1800	1200	800	2350 x 1600	6140 x 2400
26	2000	1200	800	2350 x 1700	6140 x 2500



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK WW3=3*WW+2*140

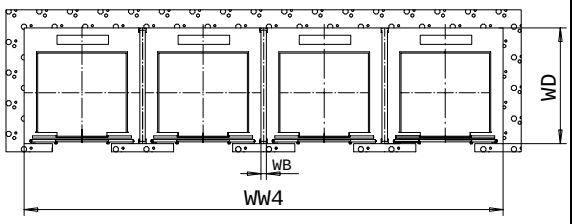
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6730 x 2250
		1100	550	1600 x 1400	7480 x 2250
17	1275	1100	625	2000 x 1400	7930 x 2250
18	1350	1100	625	2000 x 1500	7930 x 2350
21	1600	1100	700	2100 x 1600	8380 x 2400
24	1800	1200	800	2350 x 1600	9280 x 2400
26	2000	1200	800	2350 x 1700	9280 x 2500



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK WW4=4*WW+3*140

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2250
		1100	550	1600 x 1400	10020 x 2250
17	1275	1100	625	2000 x 1400	10620 x 2250
18	1350	1100	625	2000 x 1500	10620 x 2350
21	1600	1100	700	2100 x 1600	11220 x 2400
24	1800	1200	800	2350 x 1600	12420 x 2400
26	2000	1200	800	2350 x 1700	12420 x 2500



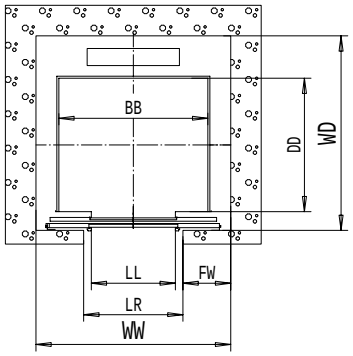
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.10 ISO 4190-1 Cars: Speed 7.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 7.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, ISO 4190-1 CARS

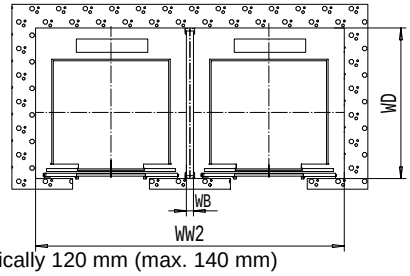
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE centre opening doors	Internal lift well dimensions Recommended by ISO 4190-1 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2300	2300 x 2300
		1100	550	1600 x 1400	2400 x 2300	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2300	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2450	-
21	1600	1100	700	2100 x 1600	2700 x 2500	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2500	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2600	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

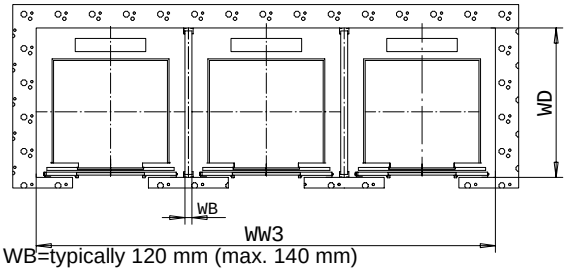
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2300
		1100	550	1600 x 1400	4940 x 2300
17	1275	1100	625	2000 x 1400	5240 x 2300
18	1350	1100	625	2000 x 1500	5240 x 2450
21	1600	1100	700	2100 x 1600	5540 x 2500
24	1800	1200	800	2350 x 1600	6140 x 2500
26	2000	1200	800	2350 x 1700	6140 x 2600



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

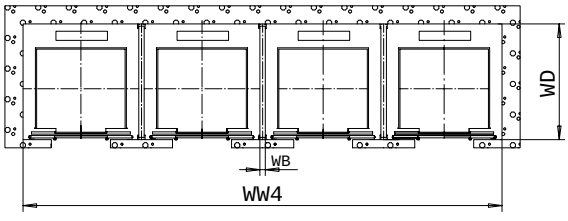
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6730 x 2300
		1100	550	1600 x 1400	7480 x 2300
17	1275	1100	625	2000 x 1400	7930 x 2300
18	1350	1100	625	2000 x 1500	7930 x 2450
21	1600	1100	700	2100 x 1600	8380 x 2500
24	1800	1200	800	2350 x 1600	9280 x 2500
26	2000	1200	800	2350 x 1700	9280 x 2600



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2300
		1100	550	1600 x 1400	10020 x 2300
17	1275	1100	625	2000 x 1400	10620 x 2300
18	1350	1100	625	2000 x 1500	10620 x 2450
21	1600	1100	700	2100 x 1600	11220 x 2500
24	1800	1200	800	2350 x 1600	12420 x 2500
26	2000	1200	800	2350 x 1700	12420 x 2600



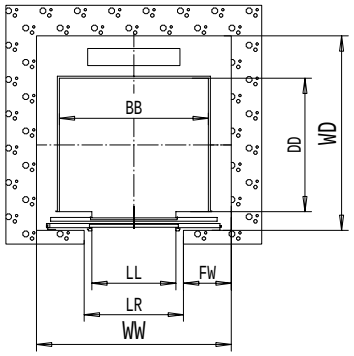
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.11 ISO 4190-1 Cars: Speed 8.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 8.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, ISO 4190-1 CARS

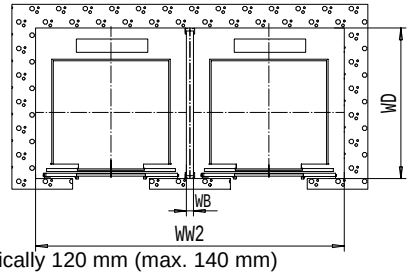
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE centre opening doors	Recommended by ISO 4190-1 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	525	1600 x 1400	2150 x 2300	2300 x 2300
		1100	550	1600 x 1400	2400 x 2300	2500 x 2300
17	1275	1100	625	2000 x 1400	2550 x 2300	2600 x 2300
18	1350	1100	625	2000 x 1500	2550 x 2450	-
21	1600	1100	700	2100 x 1600	2700 x 2500	2700 x 2500
24	1800	1200	800	2350 x 1600	3000 x 2500	3000 x 2500
26	2000	1200	800	2350 x 1700	3000 x 2600	3000 x 2600



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

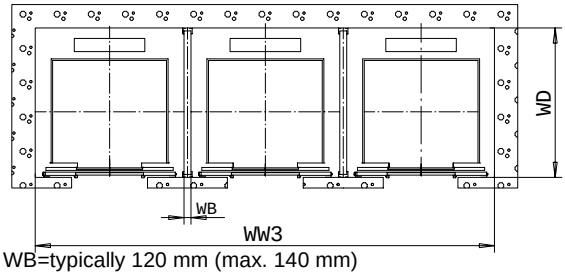
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	525	1600 x 1400	4440 x 2300
		1100	550	1600 x 1400	4940 x 2300
17	1275	1100	625	2000 x 1400	5240 x 2300
18	1350	1100	625	2000 x 1500	5240 x 2450
21	1600	1100	700	2100 x 1600	5540 x 2500
24	1800	1200	800	2350 x 1600	6140 x 2500
26	2000	1200	800	2350 x 1700	6140 x 2600



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

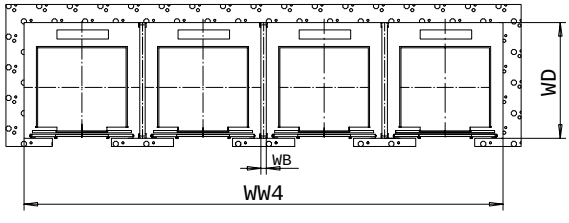
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	525	1600 x 1400	6730 x 2300
		1100	550	1600 x 1400	7480 x 2300
17	1275	1100	625	2000 x 1400	7930 x 2300
18	1350	1100	625	2000 x 1500	7930 x 2450
21	1600	1100	700	2100 x 1600	8380 x 2500
24	1800	1200	800	2350 x 1600	9280 x 2500
26	2000	1200	800	2350 x 1700	9280 x 2600



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	525	1600 x 1400	9020 x 2300
		1100	550	1600 x 1400	10020 x 2300
17	1275	1100	625	2000 x 1400	10620 x 2300
18	1350	1100	625	2000 x 1500	10620 x 2450
21	1600	1100	700	2100 x 1600	11220 x 2500
24	1800	1200	800	2350 x 1600	12420 x 2500
26	2000	1200	800	2350 x 1700	12420 x 2600



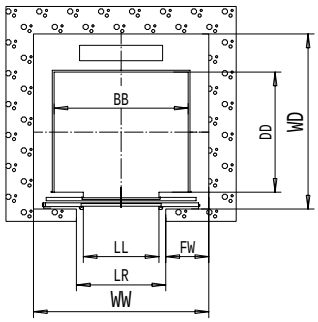
WB=typically 120 mm (max. 140 mm)

Note: - For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.12 JIS A 4301 Cars: Speed 2.5 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 2.5 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, JIS A 4301 CARS

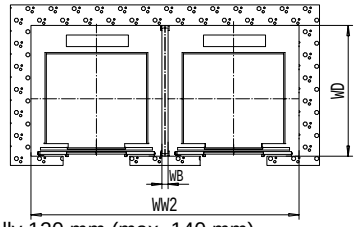
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to JIS A 4301	Recommended by KONE centre opening doors	Recommended by JIS A 4301 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2100	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2250	2250 x 2400
18	1224	1100	625	2000 x 1400	2550 x 2150	2650 x 2350
20	1360	1100	625	2000 x 1500	2550 x 2250	2650 x 2450
24	1632	1200	575	2000 x 1750	2550 x 2500	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2700	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

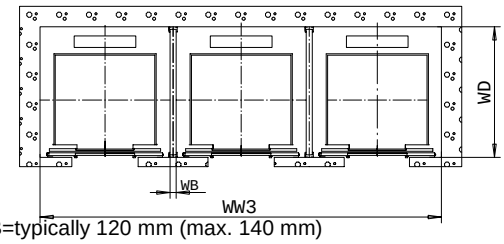
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2100
15	1020	900	525	1600 x 1500	4440 x 2250
18	1224	1100	625	2000 x 1400	5240 x 2150
20	1360	1100	625	2000 x 1500	5240 x 2250
24	1632	1200	575	2000 x 1750	5240 x 2500
26	1768	1200	650	2050 x 1950	5540 x 2700



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

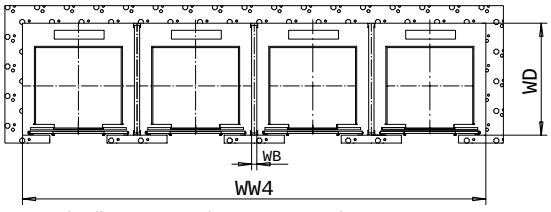
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2100
15	1020	900	525	1600 x 1500	6730 x 2250
18	1224	1100	625	2000 x 1400	7930 x 2150
20	1360	1100	625	2000 x 1500	7930 x 2250
24	1632	1200	575	2000 x 1750	7930 x 2500
26	1768	1200	650	2050 x 1950	8380 x 2700



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2100
15	1020	900	525	1600 x 1500	9020 x 2250
18	1224	1100	625	2000 x 1400	10620 x 2150
20	1360	1100	625	2000 x 1500	10620 x 2250
24	1632	1200	575	2000 x 1750	10620 x 2500
26	1768	1200	650	2050 x 1950	11220 x 2700



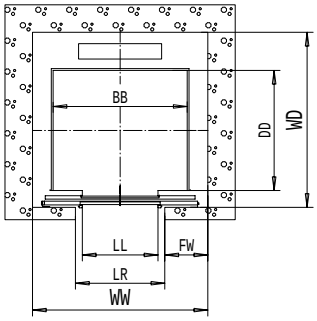
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.13 JIS A 4301 Cars: Speed 3.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 3.0 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, JIS A 4301 CARS

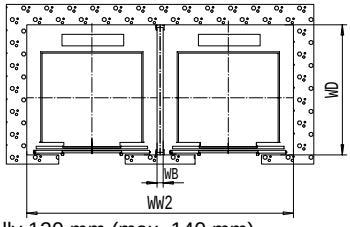
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to JIS A 4301	Recommended by KONE centre opening doors	Recommended by JIS A 4301 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2200	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2250	2250 x 2400
18	1224	1100	625	2000 x 1400	2550 x 2200	2650 x 2350
20	1360	1100	625	2000 x 1500	2550 x 2250	2650 x 2450
24	1632	1200	575	2000 x 1750	2550 x 2500	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2700	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

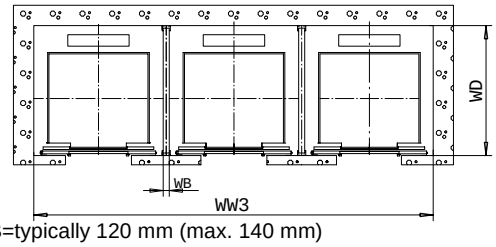
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2200
15	1020	900	525	1600 x 1500	4440 x 2250
18	1224	1100	625	2000 x 1400	5240 x 2200
20	1360	1100	625	2000 x 1500	5240 x 2250
24	1632	1200	575	2000 x 1750	5240 x 2500
26	1768	1200	650	2050 x 1950	5540 x 2700



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

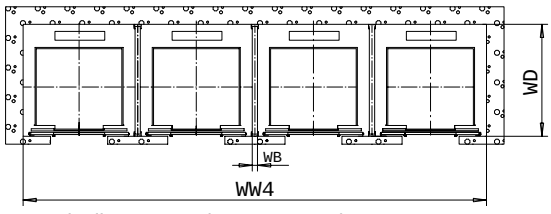
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2200
15	1020	900	525	1600 x 1500	6730 x 2250
18	1224	1100	625	2000 x 1400	7930 x 2200
20	1360	1100	625	2000 x 1500	7930 x 2250
24	1632	1200	575	2000 x 1750	7930 x 2500
26	1768	1200	650	2050 x 1950	8380 x 2700



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2200
15	1020	900	525	1600 x 1500	9020 x 2250
18	1224	1100	625	2000 x 1400	10620 x 2200
20	1360	1100	625	2000 x 1500	10620 x 2250
24	1632	1200	575	2000 x 1750	10620 x 2500
26	1768	1200	650	2050 x 1950	11220 x 2700



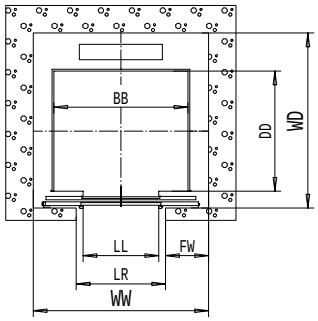
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.14 JIS A 4301 Cars: Speed 3.5 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 3.5 m/s
MIN TRAVEL 50 m, MAX TRAVEL 165 m, JIS A 4301 CARS

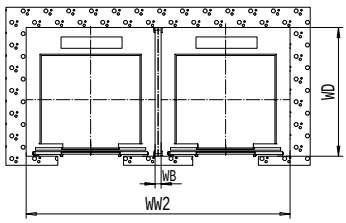
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to JIS A 4301	Recommended by KONE centre opening doors	Recommended by JIS A 4301 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2200	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2250	2250 x 2400
18	1224	1100	625	2000 x 1400	2550 x 2200	2650 x 2350
20	1360	1100	625	2000 x 1500	2550 x 2250	2650 x 2450
24	1632	1200	575	2000 x 1750	2550 x 2500	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2700	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

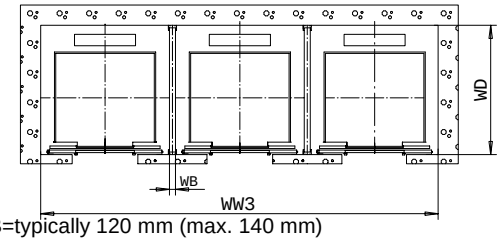
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2200
15	1020	900	525	1600 x 1500	4440 x 2250
18	1224	1100	625	2000 x 1400	5240 x 2200
20	1360	1100	625	2000 x 1500	5240 x 2250
24	1632	1200	575	2000 x 1750	5240 x 2500
26	1768	1200	650	2050 x 1950	5540 x 2700



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

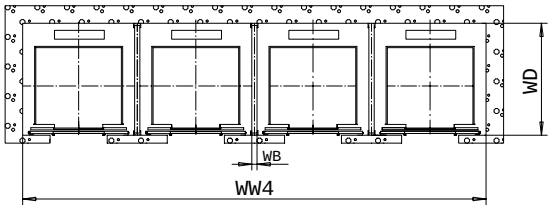
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2200
15	1020	900	525	1600 x 1500	6730 x 2250
18	1224	1100	625	2000 x 1400	7930 x 2200
20	1360	1100	625	2000 x 1500	7930 x 2250
24	1632	1200	575	2000 x 1750	7930 x 2500
26	1768	1200	650	2050 x 1950	8380 x 2700



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2200
15	1020	900	525	1600 x 1500	9020 x 2250
18	1224	1100	625	2000 x 1400	10620 x 2200
20	1360	1100	625	2000 x 1500	10620 x 2250
24	1632	1200	575	2000 x 1750	10620 x 2500
26	1768	1200	650	2050 x 1950	11220 x 2700



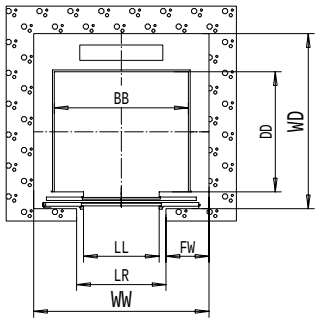
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.15 JIS A 4301 Cars: Speed 4.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 4.0 m/s
MIN TRAVEL 60 m, MAX TRAVEL 200 m, JIS A 4301 CARS

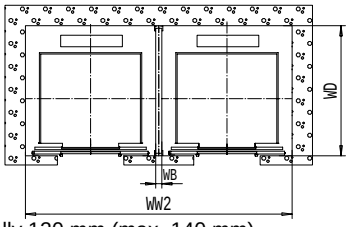
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to JIS A 4301	Recommended by KONE centre opening doors	Recommended by JIS A 4301 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2200	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2250	2250 x 2400
18	1224	1100	625	2000 x 1400	2550 x 2200	2650 x 2350
20	1360	1100	625	2000 x 1500	2550 x 2250	2650 x 2450
24	1632	1200	600	2000 x 1750	2600 x 2500	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2700	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

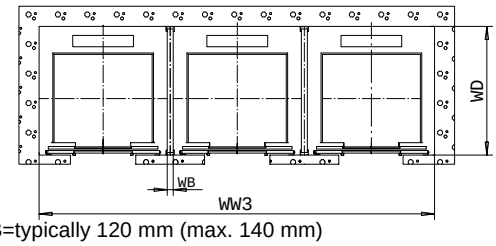
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2200
15	1020	900	525	1600 x 1500	4440 x 2250
18	1224	1100	625	2000 x 1400	5240 x 2200
20	1360	1100	625	2000 x 1500	5240 x 2250
24	1632	1200	600	2000 x 1750	5340 x 2500
26	1768	1200	650	2050 x 1950	5540 x 2700



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

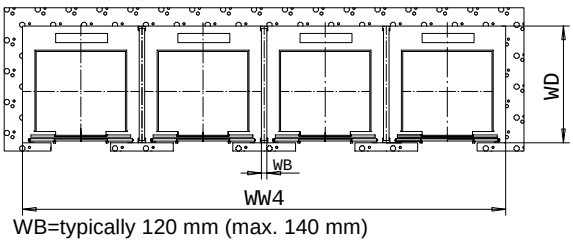
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2200
15	1020	900	525	1600 x 1500	6730 x 2250
18	1224	1100	625	2000 x 1400	7930 x 2200
20	1360	1100	625	2000 x 1500	7930 x 2250
24	1632	1200	600	2000 x 1750	8080 x 2500
26	1768	1200	650	2050 x 1950	8380 x 2700



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2200
15	1020	900	525	1600 x 1500	9020 x 2250
18	1224	1100	625	2000 x 1400	10620 x 2200
20	1360	1100	625	2000 x 1500	10620 x 2250
24	1632	1200	600	2000 x 1750	10820 x 2500
26	1768	1200	650	2050 x 1950	11220 x 2700



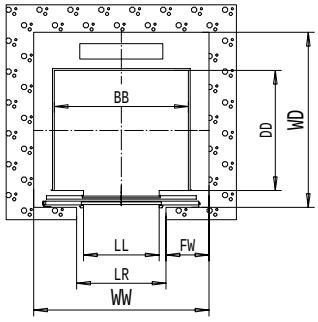
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.16 JIS A 4301 Cars: Speed 5.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 5.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, JIS A 4301 CARS

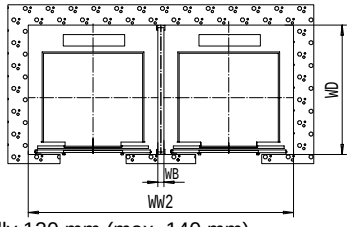
				Car dimensions	Internal lift well dimensions	
	Rated load			Recommended by KONE, equals to JIS A 4301	Recommended by KONE centre opening doors	Recommended by JIS A 4301 centre opening door
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2200	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2300	2250 x 2400
18	1224	1100	625	2000 x 1400	2550 x 2250	2650 x 2350
20	1360	1100	625	2000 x 1500	2550 x 2300	2650 x 2450
24	1632	1200	600	2000 x 1750	2600 x 2550	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2750	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

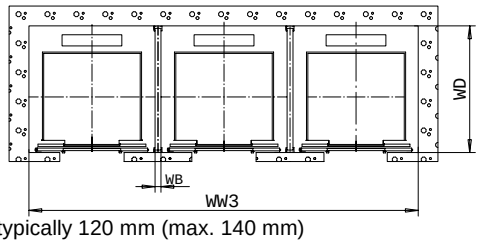
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2200
15	1020	900	525	1600 x 1500	4440 x 2300
18	1224	1100	625	2000 x 1400	5240 x 2250
20	1360	1100	625	2000 x 1500	5240 x 2300
24	1632	1200	600	2000 x 1750	5340 x 2550
26	1768	1200	650	2050 x 1950	5540 x 2750



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

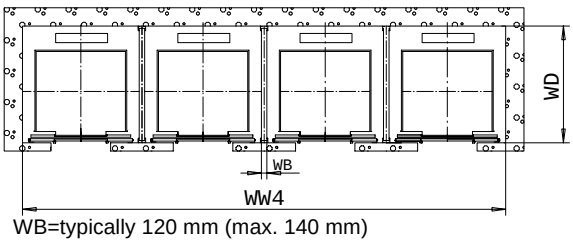
Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2200
15	1020	900	525	1600 x 1500	6730 x 2300
18	1224	1100	625	2000 x 1400	7930 x 2250
20	1360	1100	625	2000 x 1500	7930 x 2300
24	1632	1200	600	2000 x 1750	8080 x 2550
26	1768	1200	650	2050 x 1950	8380 x 2750



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

Nr. of persons	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2200
15	1020	900	525	1600 x 1500	9020 x 2300
18	1224	1100	625	2000 x 1400	10620 x 2250
20	1360	1100	625	2000 x 1500	10620 x 2300
24	1632	1200	600	2000 x 1750	10820 x 2550
26	1768	1200	650	2050 x 1950	11220 x 2750



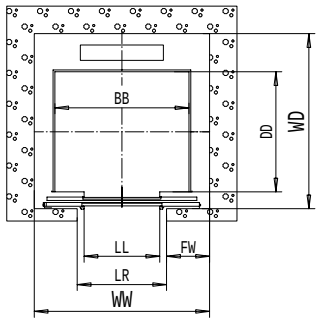
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.17 JIS A 4301 Cars: Speed 6.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 6.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, JIS A 4301 CARS

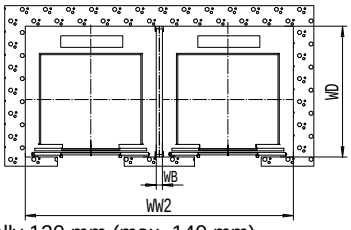
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to JIS A 4301	Internal lift well dimensions Recommended by KONE centre opening doors	Internal lift well dimensions Recommended by JIS A 4301 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2200	2250 x 2250
15	1020	900	525	1600 x 1500	2150 x 2300	2250 x 2400
18	1224	1100	650	2000 x 1400	2600 x 2250	2650 x 2350
20	1360	1100	650	2000 x 1500	2600 x 2300	2650 x 2450
24	1632	1200	600	2000 x 1750	2600 x 2550	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2750	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

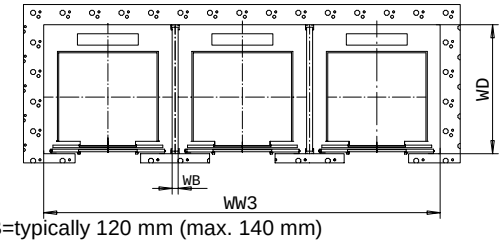
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2200
15	1020	900	525	1600 x 1500	4440 x 2300
18	1224	1100	650	2000 x 1400	5240 x 2250
20	1360	1100	650	2000 x 1500	5340 x 2300
24	1632	1200	600	2000 x 1750	5340 x 2550
26	1768	1200	650	2050 x 1950	5540 x 2750



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

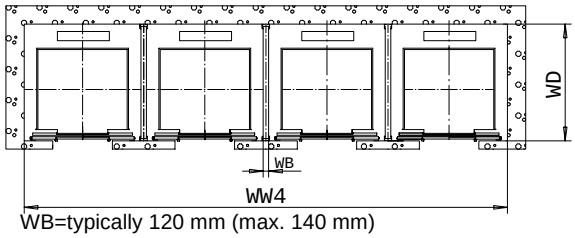
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2200
15	1020	900	525	1600 x 1500	6730 x 2300
18	1224	1100	650	2000 x 1400	8080 x 2250
20	1360	1100	650	2000 x 1500	8080 x 2300
24	1632	1200	600	2000 x 1750	8080 x 2550
26	1768	1200	650	2050 x 1950	8380 x 2750



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2200
15	1020	900	525	1600 x 1500	9020 x 2300
18	1224	1100	650	2000 x 1400	10820 x 2250
20	1360	1100	650	2000 x 1500	10820 x 2300
24	1632	1200	600	2000 x 1750	10820 x 2550
26	1768	1200	650	2050 x 1950	11220 x 2750



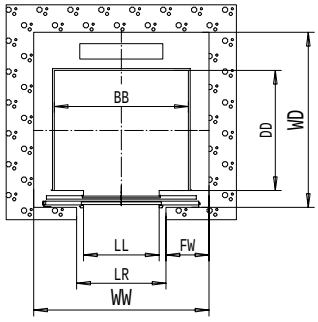
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.18 JIS A 4301 Cars: Speed 7.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 7.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, JIS A 4301 CARS

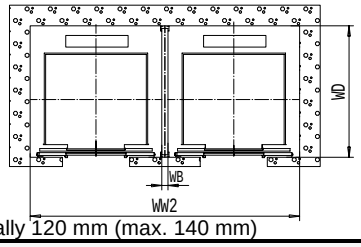
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to JIS A 4301	Internal lift well dimensions Recommended by KONE centre opening doors	Internal lift well dimensions Recommended by JIS A 4301 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	525	1600 x 1350	2150 x 2250	2250 x 2250
15	1020	900	525	1600 x 1500	2200 x 2300	2250 x 2400
18	1224	1100	650	2000 x 1400	2600 x 2250	2650 x 2350
20	1360	1100	650	2000 x 1500	2600 x 2300	2650 x 2450
24	1632	1200	600	2000 x 1750	2650 x 2550	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2800	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

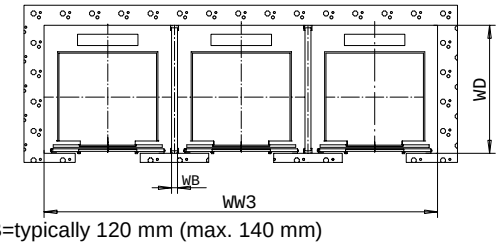
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	525	1600 x 1350	4440 x 2250
15	1020	900	525	1600 x 1500	4540 x 2300
18	1224	1100	650	2000 x 1400	5340 x 2250
20	1360	1100	650	2000 x 1500	5340 x 2300
24	1632	1200	600	2000 x 1750	5440 x 2550
26	1768	1200	650	2050 x 1950	5540 x 2800



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

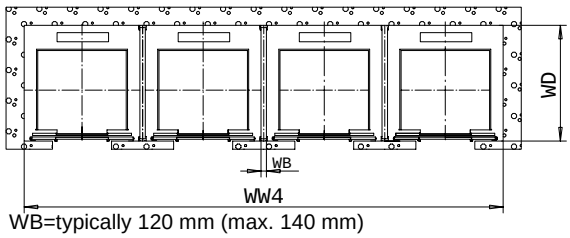
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	525	1600 x 1350	6730 x 2250
15	1020	900	525	1600 x 1500	6880 x 2300
18	1224	1100	650	2000 x 1400	8080 x 2250
20	1360	1100	650	2000 x 1500	8080 x 2300
24	1632	1200	600	2000 x 1750	8230 x 2550
26	1768	1200	650	2050 x 1950	8380 x 2800



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	525	1600 x 1350	9020 x 2250
15	1020	900	525	1600 x 1500	9220 x 2300
18	1224	1100	650	2000 x 1400	10820 x 2250
20	1360	1100	650	2000 x 1500	10820 x 2300
24	1632	1200	600	2000 x 1750	11020 x 2550
26	1768	1200	650	2050 x 1950	11220 x 2800



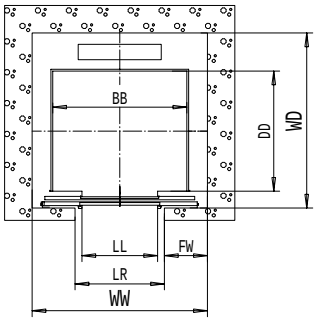
WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.1.19 JIS A 4301 Cars: Speed 8.0 m/s, Centre Opening Single Entrance

COMMERCIAL ELEVATORS WITH RATED SPEED 8.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, JIS A 4301 CARS

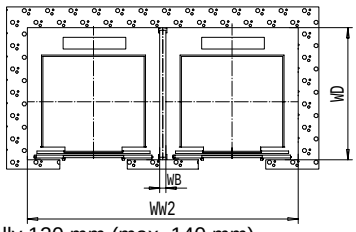
Nr. of persons	Rated load			Car dimensions Recommended by KONE, equals to JIS A 4301	Internal lift well dimensions Recommended by KONE centre opening doors	Internal lift well dimensions Recommended by JIS A 4301 centre opening door
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	884	900	550	1600 x 1350	2200 x 2250	2250 x 2250
15	1020	900	550	1600 x 1500	2200 x 2400	2250 x 2400
18	1224	1100	650	2000 x 1400	2600 x 2300	2650 x 2350
20	1360	1100	650	2000 x 1500	2600 x 2400	2650 x 2450
24	1632	1200	625	2000 x 1750	2650 x 2650	2650 x 2700
26	1768	1200	650	2050 x 1950	2700 x 2850	2700 x 2900



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

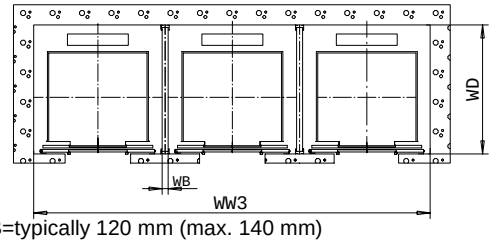
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW2 x WD (mm)
13	884	900	550	1600 x 1350	4540 x 2250
15	1020	900	550	1600 x 1500	4540 x 2400
18	1224	1100	650	2000 x 1400	5340 x 2300
20	1360	1100	650	2000 x 1500	5340 x 2400
24	1632	1200	625	2000 x 1750	5440 x 2650
26	1768	1200	650	2050 x 1950	5540 x 2850



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

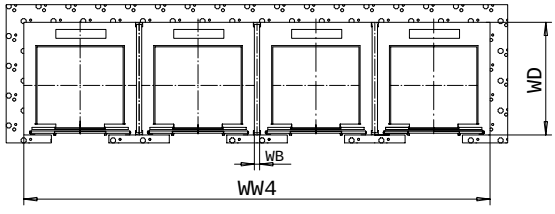
	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW3 x WD (mm)
13	884	900	550	1600 x 1350	6880 x 2250
15	1020	900	550	1600 x 1500	6880 x 2400
18	1224	1100	650	2000 x 1400	8080 x 2300
20	1360	1100	650	2000 x 1500	8080 x 2400
24	1632	1200	625	2000 x 1750	8230 x 2650
26	1768	1200	650	2050 x 1950	8380 x 2850



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW4 x WD (mm)
13	884	900	550	1600 x 1350	9220 x 2250
15	1020	900	550	1600 x 1500	9220 x 2400
18	1224	1100	650	2000 x 1400	10820 x 2300
20	1360	1100	650	2000 x 1500	10820 x 2400
24	1632	1200	625	2000 x 1750	11020 x 26550
26	1768	1200	650	2050 x 1950	11220 x 2850



WB=typically 120 mm (max. 140 mm)

Note: For steel structure buildings add 30 mm to lift well depth if counterweight safety gear needed.

2.2 Stretcher Elevators - Machine Room on Top - CWT at Side

2.2.1 Vertical Sections

CAR CLEAR HEIGHT CH (std.)
CH = 2700 mm

HEADROOM HEIGHT SH (mm) (Std. ceiling allowance = 200 mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	CH+2650					
3,0	CH+2950					
3,5	CH+3100					CH+3100, CH+3200 H>120 m
4,0	CH+3150				CH+3150, CH+3250 H>130	CH+3150, CH+3250 H≥100 m
5,0	CH+3150				CH+3150, H≤230 m CH+3200, H>230 m	CH+3150, H<200 m CH+3200, H≥200 m
6,0	CH+3250, H<100 m CH+3300, H≥100 m					
7,0	CH+3600, H<150 m CH+3700, H≥150 m		CH+3550, H≤120 m CH+3700, H >120 m	CH+3650, H≤160 m CH+3700, H>160 m	CH+3600, H≤130 m CH+3700, H≤230 m CH+3750, H>230 m	CH+3700, H≤180 m CH+3750, H>180 m
8,0	CH+5300, H≤180 m CH+5400, H>180 m		CH+5300, H≤180 m CH+5350, H≤220 m CH+5400, H >220 m	CH+5250, H≤170 m CH+5400, H>170 m	CH+5200, H≤140 m CH+5350, H≤220 m CH+5400, H>220 m	CH+5250, H≤170 m CH+5400, H>170 m

Note! Australian Standard AS-1735.2 requires in some cases even 30 % higher headroom than given in this table. To get exact headroom height, please contact local KONE

RECOMMENDED MINIMUM MACHINE ROOM HEIGHT MH (mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	2200			2600		
3	2200* / 2600					
3,5	2200*/ 2600		2700			
4,0	2700					
5...6		2700** / 3100		3200		
7...8	3100					

Lifting beam in machine room roof is recommended solution.

Lifting beam vertical space reservation is 200 mm with support lenght 3000 mm.

*) Depends on level of elevator acceleration.

**) Depends on size of machine.

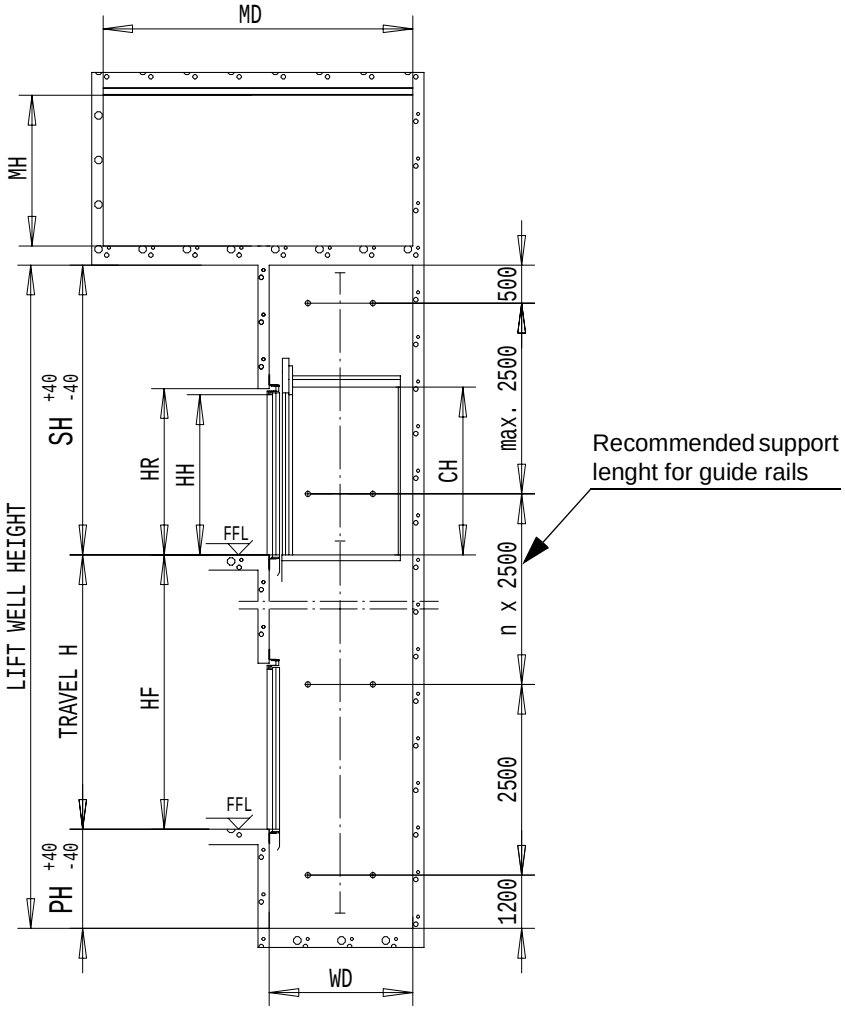
PIT DEPTH PH (Flooring thickness ss=30 mm)

Rated speed (m/s)	Rated load (kg) 1000	1275	1350	1600	1800	2000
2,5	2450	2450, 2500 H>100 m		2500, 2550 H>100 m		2550
3,0	2700	2700, 2750 H>100 m		2750		2800
3,5	4050, H≤90 m 4250, H≤130 m 4400, H>130 m	4100, H≤80 m 4250 H≤130 m 4400, H>130 m	4150, H≤100 m 4250 H≤130 m 4400, H>130 m	4150, H≤100 m 4250, H≤130 m 4400, H>130 m	4200, H≤100 m 4300, H≤130 m 4450, H>130 m	4250, H≤100 m 4350, H≤120 m 4550, H>120 m
4,0	4050, H≤80 m 4350, H≤160 m 4450, H>160 m	4150, H≤100 m 4350, H≤190 m 4450, H>150 m	4150, H≤100 m 4300, H≤140 m 4450, H>140 m	4150, H≤100 m 4400, H≤160 m 4500, H>160 m	4200, H≤130 m 4300, H≤130 m 4550, H>130 m	4250, H<100 m 4500, H≤150 m 4600, H>150 m
5,0	4300, H<100 m 4400, H≤160 m 4600, H>160 m	4300, H<100 m 4500, H≤160 m 4600, H>160 m	4300, H<100 m 4450, H≤140 m 4600 H>140 m	4350, H<100 m 4600, H≤180 m 4700 H>180 m	4400, H<100 m 4600, H≤150 m 4700 H>150 m	4450, H<100 m 4750, H≥100 m
6,0	4750, H<100 m 4850, H≤130 m 5000, H>130 m	4750, H<100 m 4850, H≤130 m 5000, H>130 m	4750, H<100 m 4850, H≤130 m 5000 H>130	4750, H<100 m 5000, H≤180 m 5050 H>180 m	4800, H<100 m 5000, H≤180 m 5050 H>180 m	4850, H<100 m 5150, H≥100 m
7,0	5150, H≤140 m 5300, H>140 m	5200, H≤150 m 5300, H>150 m	5100, H≤120 m 5350, H>120 m	5200, H≤160 m 5350, H>160 m	5150, H≤130 m 5350, H>130 m	5200, H≤130 m 5350, H≥170 m 5400, H>170 m
8,0	5700, H≤180 m 5900, H>180 m	5800, H≤160 m 5900, H≤200 m 5950 H>200 m	5800, H≤160 m 5900, H≤200 m 5950 H>200 m	5900, H≤170 m 5950, H>170 m	5800, H≤140 m 5950, H>140 m	5950, H≤170 m 6000, H>170 m

See explanations for the dimensions from next page.

Explanations for dimensions shown in tables for stretcher elevators.

Figure 8. Vertical sections



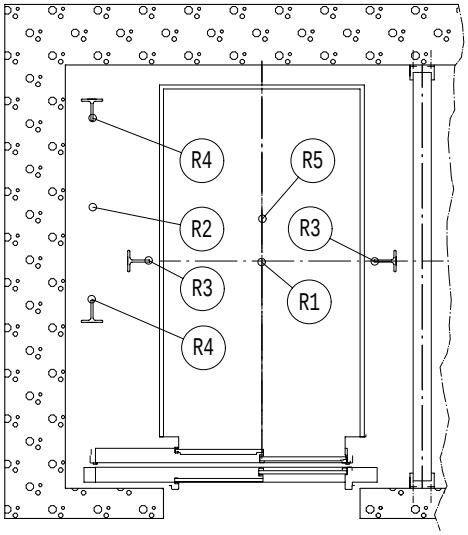
Abbreviations

BB = CAR WIDTH
DD = CAR DEPTH
CH = CAR CLEAR HEIGHT
FW= FRONT WALL WIDTH
HF = FLOOR TO FLOOR DISTANCE
HH = DOOR CLEAR OPENING HEIGHT
HR = DOOR RAW OPENING HEIGHT
LL = DOOR CLEAR OPENING WIDTH
LR = DOOR RAW OPENING WIDTH
MD = MACHINE ROOM DEPTH
MW = MACHINE ROOM WIDTH
MH = MACHINE ROOM HEIGHT (UNDER THE BEAM OR LIFTING HOOK)
H= TRAVEL HEIGHT
SH = HEADROOM HEIGHT
PH = PIT DEPTH
WD = WELL DEPTH
WB = LIFT WELL DIVIDING BEAM WIDTH
FFL = FINISHED FLOOR LEVEL

2.2.2 Reaction forces on the pit floor

REACTION FORCES (impact values)							
Speed v (m/s)	Rated Load Q (kg)	Travel Height (m)	REACTION FORCES ON THE PIT FLOOR (kN)				
			R1	R2	R3	R4	R5
2.5	1000	130	148	128	60	55	0
	1275		180	155	68	62	0
	1350		184	157	69	63	0
	1600		204	172	74	66	0
	1800		224	188	86	70	0
	2000		236	196	95	72	0
3	1000	130	152	132	61	56	0
	1275		180	155	68	62	0
	1350		188	161	70	64	0
	1600		204	172	74	66	0
	1800		224	188	86	70	0
	2000		236	196	95	72	0
3.5	1000	165	156	136	69	64	112
	1275		188	163	77	70	135
	1350		196	169	79	72	140
	1600		218	186	84	76	156
	1800		242	206	98	81	173
	2000		258	218	110	84	185
4	1000	200	164	144	77	72	117
	1275		188	163	83	77	135
	1350		196	169	85	78	140
	1600		216	184	99	82	155
	1800		240	204	106	87	172
	2000		258	218	120	91	185
5	1000	250	172	152	88	83	123
	1275		196	171	94	88	140
	1350		204	177	96	89	146
	1600		236	204	128	96	169
	1800		252	216	132	99	180
	2000		268	228	136	102	192
6	1000	250	172	152	88	83	123
	1275		196	171	106	88	140
	1350		204	177	108	89	146
	1600		236	204	128	96	169
	1800		252	216	132	99	180
	2000		268	228	136	102	192
7	1000	250	172	152	88	83	123
	1275		198	173	106	100	142
	1350		212	185	110	103	152
	1600		236	204	128	108	169
	1800		250	214	131	110	179
	2000	200	270	230	136	114	193
8	1000	250	176	156	89	84	126
	1275		212	187	110	103	152
	1350		220	193	112	105	158
	1600		242	210	129	109	173
	1800		258	222	133	112	185
	2000	200	276	236	138	116	198

Figure 9. Reaction forces on the pit floor

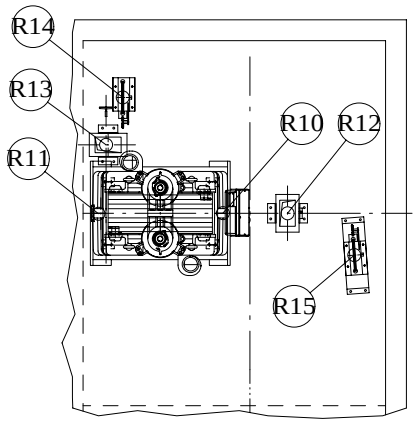


R1 = REACTION FORCE UNDER CAR BUFFER (kN)
R2 = REACTION FORCE UNDER CWT BUFFER (kN)
R3 = REACTION FORCE UNDER CAR GUIDE RAIL (kN)
R4 = REACTION FORCE UNDER CWT GUIDE RAIL (kN)
R5 = MAX. ROPE COMPENSATOR IMPACT FORCE ON THE PIT FLOOR (UPWARDS)

2.2.3 Reaction forces on the machine room floor

REACTION FORCES (impact values)								
Speed v (m/s)	Rated Load Q (kg)	Travel Height (m)	REACTION FORCES IN MACHINE ROOM (kN)					
			R10	R11	R12	R13	R14	R15
2.5	1000	130	48	62	48	43	5	5
	1275		72	152	0	0	5	5
	1350		76	152	0	0	5	5
	1600		40	100	66	58	5	10
	1800		44	110	73	64	5	10
	2000		48	120	80	70	5	10
3	1000	130	48	62	48	43	5	10
	1275		72	152	0	0	5	10
	1350		76	152	0	0	5	10
	1600		40	100	66	58	5	10
	1800		44	110	73	64	5	10
	2000		48	120	80	70	5	10
3.5	1000	165	78	178	0	0	5	10
	1275		142	170	0	0	5	10
	1350		142	168	0	0	5	10
	1600		46	128	81	74	5	10
	1800		48	144	91	82	5	10
	2000		55	150	100	90	5	10
4	1000	200	78	178	0	0	5	10
	1275		142	170	0	0	5	10
	1350		142	168	0	0	5	10
	1600		46	128	81	74	5	10
	1800		48	144	91	82	5	10
	2000		55	150	100	90	5	10
5	1000	250	84	196	0	0	5	10
	1275		148	180	0	0	5	10
	1350		158	188	0	0	5	10
	1600		174	204	0	0	5	10
	1800		186	216	0	0	5	10
	2000		195	225	0	0	5	10
6	1000	250	84	196	0	0	5	10
	1275		148	180	0	0	5	10
	1350		158	188	0	0	5	10
	1600		174	204	0	0	5	10
	1800		186	216	0	0	5	10
	2000		195	225	0	0	5	10
7	1000	250	90	200	0	0	5	10
	1275		150	185	0	0	5	10
	1350		160	190	0	0	5	10
	1600		180	210	0	0	5	10
	1800		190	220	0	0	5	10
	2000	200	200	230	0	0	5	10
8	1000	250	90	200	0	0	5	10
	1275		150	185	0	0	5	10
	1350		160	190	0	0	5	10
	1600		180	210	0	0	5	10
	1800		190	220	0	0	5	10
	2000	200	200	230	0	0	5	10

Figure 10.Reaction forces on the machine room floor

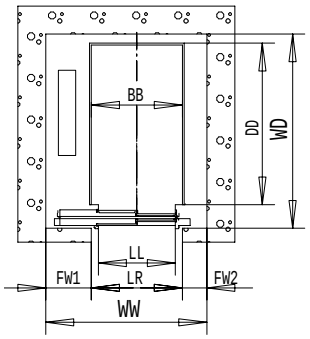


R10 = REACTION FORCE OF MACHINE AT CAR SIDE (kN)
R11 = REACTION FORCE OF MACHINE AT CWT SIDE (kN)
R12 = REACTION FORCE OF ROPE END AT CAR SIDE (VALID FOR ROPINGS 2:1) (kN)
R13 = REACTION FORCE OF ROPE END AT CWT SIDE (VALID FOR ROPINGS 2:1) (kN)
R14 = REACTION FORCE OF CWT OVERSPEED GOVERNOR (OPTIONAL) (kN)
R15 = REACTION FORCE OF CAR OVERSPEED GOVERNOR (kN)

2.2.4 ISO 4190-1 Stretcher Cars: Speed 2.5 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 2.5 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, ISO 4190-1 CARS. CWT AT SIDE

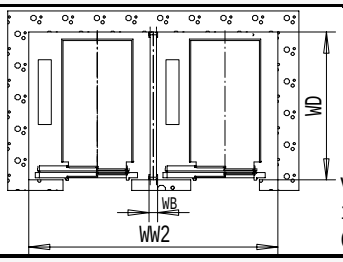
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	650	350	1100 x 2100	2100 x 2600	2000 x 2700
17	1275	1100	600	300	1200 x 2300	2200 x 2800	2100 x 2900
18	1350	1100	650	350	1300 x 2300	2300 x 2800	2200 x 2900
21	1600	1300	700	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	700	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	550	350	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

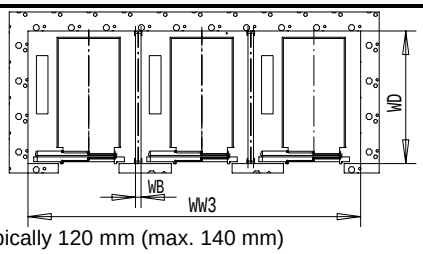
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	650	350	1100 x 2100	4340 x 2600
17	1275	1100	600	300	1200 x 2300	4540 x 2800
18	1350	1100	650	350	1300 x 2300	4740 x 2800
21	1600	1300	700	300	1400 x 2400	5140 x 2900
24	1800	1300	700	300	1400 x 2550	5140 x 3050
26	2000	1400	550	350	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

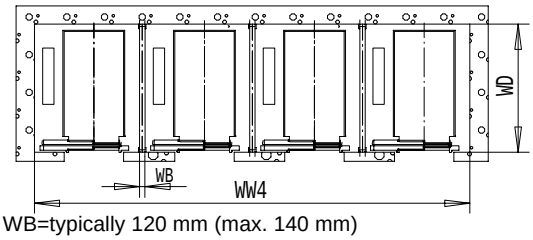
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	650	350	1100 x 2100	6580 x 2600
17	1275	1100	600	300	1200 x 2300	6880 x 2800
18	1350	1100	650	350	1300 x 2300	7180 x 2800
21	1600	1300	700	300	1400 x 2400	7780 x 2900
24	1800	1300	700	300	1400 x 2550	7780 x 3050
26	2000	1400	550	350	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	650	350	1100 x 2100	8820 x 2600
17	1275	1100	600	300	1200 x 2300	9220 x 2800
18	1350	1100	650	350	1300 x 2300	9620 x 2800
21	1600	1300	700	300	1400 x 2400	10420 x 2900
24	1800	1300	700	300	1400 x 2550	10420 x 3050
26	2000	1400	550	350	1500 x 2700	11020 x 3200

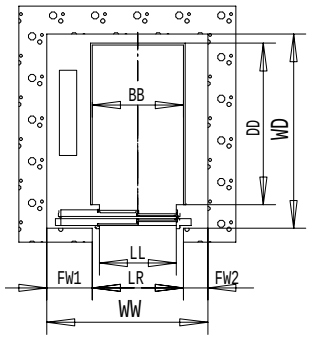


WB=typically 120 mm (max. 140 mm)

2.2.5 ISO 4190-1 Stretcher Cars: Speed 3.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 3.0 m/s
MIN TRAVEL 40 m, MAX TRAVEL 130 m, ISO 4190-1 CARS. CWT AT SIDE

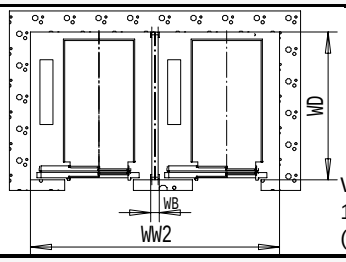
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	650	350	1100 x 2100	2100 x 2600	2000 x 2700
17	1275	1100	550	300	1200 x 2300	2200 x 2800	2100 x 2900
18	1350	1100	600	350	1300 x 2300	2300 x 2800	2200 x 2900
21	1600	1300	750	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	750	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	650	350	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

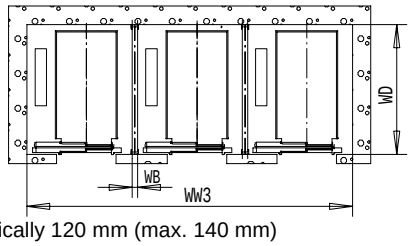
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	650	350	1100 x 2100	4340 x 2600
17	1275	1100	550	350	1200 x 2300	4540 x 2800
18	1350	1100	600	400	1300 x 2300	4740 x 2800
21	1600	1300	750	250	1400 x 2400	5140 x 2900
24	1800	1300	750	250	1400 x 2550	5140 x 3050
26	2000	1400	650	350	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

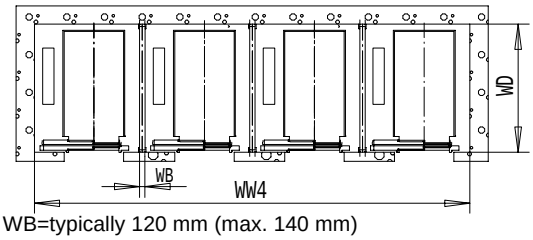
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	650	350	1100 x 2100	6580 x 2600
17	1275	1100	550	350	1200 x 2300	6880 x 2800
18	1350	1100	600	400	1300 x 2300	7180 x 2800
21	1600	1300	750	250	1400 x 2400	7780 x 2900
24	1800	1300	750	250	1400 x 2550	7780 x 3050
26	2000	1400	650	350	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	650	350	1100 x 2100	8820 x 2600
17	1275	1100	550	350	1200 x 2300	9220 x 2800
18	1350	1100	600	400	1300 x 2300	9620 x 2800
21	1600	1300	750	250	1400 x 2400	10420 x 2900
24	1800	1300	750	250	1400 x 2550	10420 x 3050
26	2000	1400	650	350	1500 x 2700	11020 x 3200

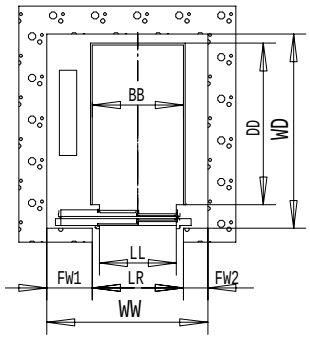


WB=typically 120 mm (max. 140 mm)

2.2.6 ISO 4190-1 Stretcher Cars: Speed 3.5 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 3.5 m/s
MIN TRAVEL 50 m, MAX TRAVEL 165 m, ISO 4190-1 CARS. CWT AT SIDE

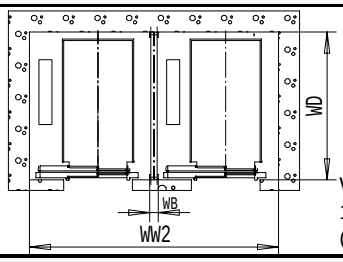
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	650	350	1100 x 2100	2100 x 2600	2000 x 2700
17	1275	1100	700	300	1200 x 2300	2300 x 2800	2100 x 2900
18	1350	1100	700	350	1300 x 2300	2350 x 2800	2200 x 2900
21	1600	1300	700	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	700	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	650	400	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

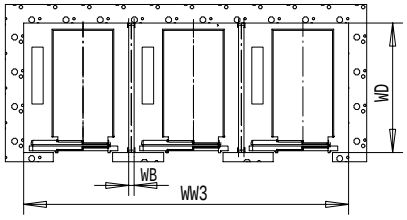
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	650	350	1100 x 2100	4340 x 2600
17	1275	1100	700	300	1200 x 2300	4640 x 2800
18	1350	1100	700	350	1300 x 2300	4840 x 2800
21	1600	1300	700	300	1400 x 2400	5140 x 2900
24	1800	1300	700	300	1400 x 2550	5140 x 3050
26	2000	1400	650	400	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

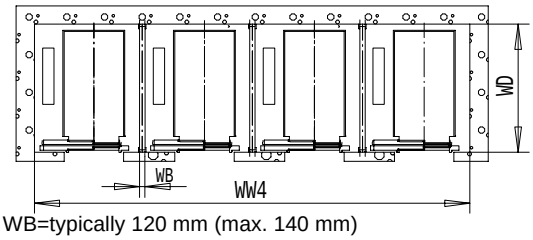
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	650	350	1100 x 2100	6580 x 2600
17	1275	1100	700	300	1200 x 2300	7030 x 2800
18	1350	1100	700	350	1300 x 2300	7330 x 2800
21	1600	1300	700	300	1400 x 2400	7780 x 2900
24	1800	1300	700	300	1400 x 2550	7780 x 3050
26	2000	1400	650	400	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	650	350	1100 x 2100	8820 x 2600
17	1275	1100	700	300	1200 x 2300	9420 x 2800
18	1350	1100	700	350	1300 x 2300	9820 x 2800
21	1600	1300	700	300	1400 x 2400	10420 x 2900
24	1800	1300	700	300	1400 x 2550	10420 x 3050
26	2000	1400	650	400	1500 x 2700	11020 x 3200

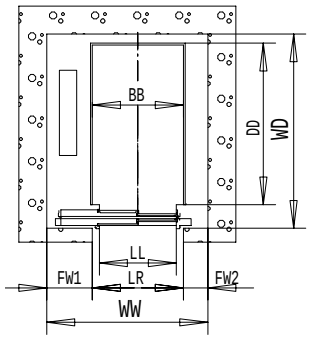


WB=typically 120 mm (max. 140 mm)

2.2.7 ISO 4190-1 Stretcher Cars: Speed 4.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 4.0 m/s
MIN TRAVEL 60 m, MAX TRAVEL 200 m, ISO 4190-1 CARS. CWT AT SIDE

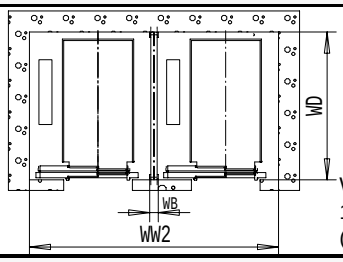
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	650	350	1100 x 2100	2100 x 2600	2000 x 2700
17	1275	1100	700	300	1200 x 2300	2250 x 2800	2100 x 2900
18	1350	1100	700	350	1300 x 2300	2350 x 2800	2200 x 2900
21	1600	1300	700	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	700	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	650	400	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

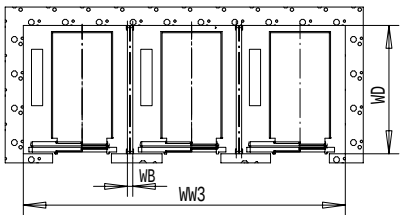
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	650	350	1100 x 2100	4340 x 2600
17	1275	1100	700	300	1200 x 2300	4640 x 2800
18	1350	1100	700	350	1300 x 2300	4840 x 2800
21	1600	1300	700	300	1400 x 2400	5140 x 2900
24	1800	1300	700	300	1400 x 2550	5140 x 3050
26	2000	1400	650	400	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

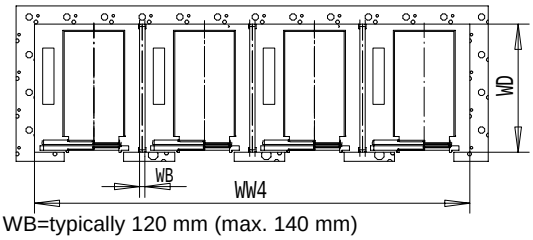
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	650	350	1100 x 2100	6580 x 2600
17	1275	1100	700	300	1200 x 2300	7030 x 2800
18	1350	1100	700	350	1300 x 2300	7330 x 2800
21	1600	1300	700	300	1400 x 2400	7780 x 2900
24	1800	1300	700	300	1400 x 2550	7780 x 3050
26	2000	1400	650	400	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	650	350	1100 x 2100	8820 x 2600
17	1275	1100	700	300	1200 x 2300	9420 x 2800
18	1350	1100	700	350	1300 x 2300	9820 x 2800
21	1600	1300	700	300	1400 x 2400	10420 x 2900
24	1800	1300	700	300	1400 x 2550	10420 x 3050
26	2000	1400	650	400	1500 x 2700	11020 x 3200

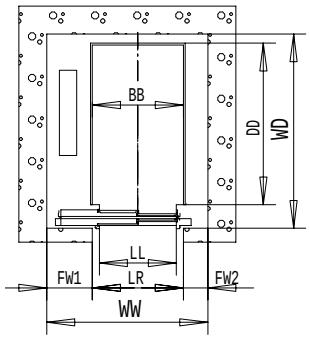


WB=typically 120 mm (max. 140 mm)

2.2.8 ISO 4190-1 Stretcher Cars: Speed 5.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 5.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, ISO 4190-1 CARS. CWT AT SIDE

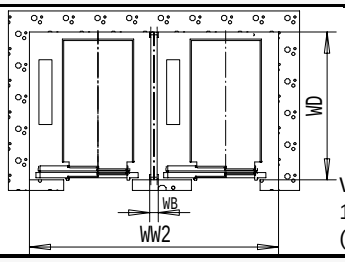
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	700	350	1100 x 2100	2150 x 2600	2000 x 2700
17	1275	1100	650	300	1200 x 2300	2250 x 2800	2100 x 2900
18	1350	1100	700	350	1300 x 2300	2350 x 2800	2200 x 2900
21	1600	1300	700	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	700	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	700	400	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

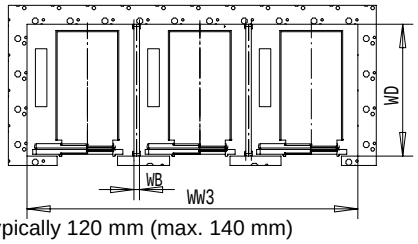
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	700	350	1100 x 2100	4440 x 2600
17	1275	1100	650	300	1200 x 2300	4640 x 2800
18	1350	1100	700	350	1300 x 2300	4840 x 2800
21	1600	1300	700	300	1400 x 2400	5140 x 2900
24	1800	1300	700	300	1400 x 2550	5140 x 3050
26	2000	1400	700	400	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

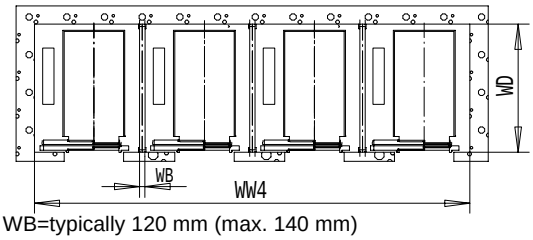
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	700	350	1100 x 2100	6730 x 2600
17	1275	1100	650	300	1200 x 2300	7030 x 2800
18	1350	1100	700	350	1300 x 2300	7330 x 2800
21	1600	1300	700	300	1400 x 2400	7780 x 2900
24	1800	1300	700	300	1400 x 2550	7780 x 3050
26	2000	1400	700	400	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	700	350	1100 x 2100	9020 x 2600
17	1275	1100	650	300	1200 x 2300	9420 x 2800
18	1350	1100	700	350	1300 x 2300	9820 x 2800
21	1600	1300	700	300	1400 x 2400	10420 x 2900
24	1800	1300	700	300	1400 x 2550	10420 x 3050
26	2000	1400	700	400	1500 x 2700	11020 x 3200

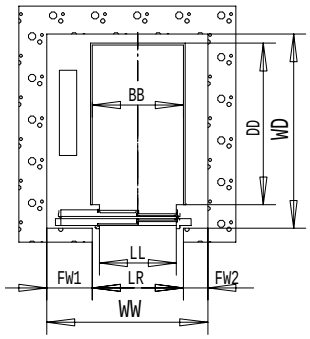


WB=typically 120 mm (max. 140 mm)

2.2.9 ISO 4190-1 Stretcher Cars: Speed 6.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 6.0 m/s
MIN TRAVEL 75 m, MAX TRAVEL 250 m, ISO 4190-1 CARS. CWT AT SIDE

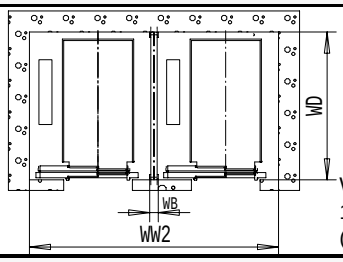
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	700	350	1100 x 2100	2150 x 2600	2000 x 2700
17	1275	1100	650	300	1200 x 2300	2250 x 2800	2100 x 2900
18	1350	1100	700	350	1300 x 2300	2350 x 2800	2200 x 2900
21	1600	1300	700	300	1400 x 2400	2500 x 2900	2400 x 3000
24	1800	1300	700	300	1400 x 2550	2500 x 3050	2400 x 3200
26	2000	1400	700	400	1500 x 2700	2650 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

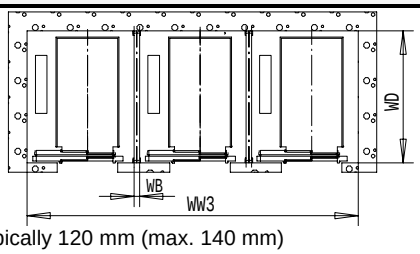
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	700	350	1100 x 2100	4440 x 2600
17	1275	1100	650	300	1200 x 2300	4640 x 2800
18	1350	1100	700	350	1300 x 2300	4840 x 2800
21	1600	1300	700	300	1400 x 2400	5140 x 2900
24	1800	1300	700	300	1400 x 2550	5140 x 3050
26	2000	1400	700	400	1500 x 2700	5440 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

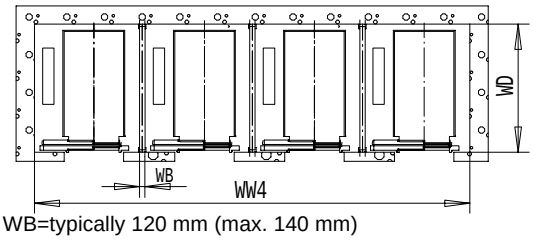
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	700	350	1100 x 2100	6730 x 2600
17	1275	1100	650	300	1200 x 2300	7030 x 2800
18	1350	1100	700	350	1300 x 2300	7330 x 2800
21	1600	1300	700	300	1400 x 2400	7780 x 2900
24	1800	1300	700	300	1400 x 2550	7780 x 3050
26	2000	1400	700	400	1500 x 2700	8230 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	700	350	1100 x 2100	9020 x 2600
17	1275	1100	650	300	1200 x 2300	9420 x 2800
18	1350	1100	700	350	1300 x 2300	9820 x 2800
21	1600	1300	700	300	1400 x 2400	10420 x 2900
24	1800	1300	700	300	1400 x 2550	10420 x 3050
26	2000	1400	700	400	1500 x 2700	11020 x 3200

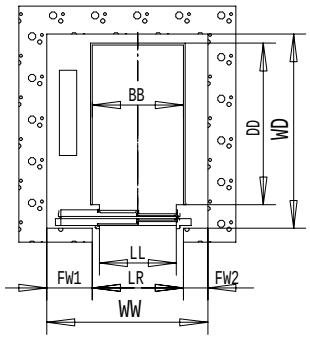


WB=typically 120 mm (max. 140 mm)

2.2.10 ISO 4190-1 Stretcher Cars: Speed 7.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 7.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, ISO 4190-1 CARS. CWT AT SIDE

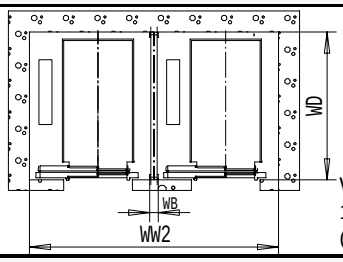
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	800	350	1100 x 2100	2250 x 2600	2000 x 2700
17	1275	1100	750	300	1200 x 2300	2350 x 2800	2100 x 2900
18	1350	1100	800	350	1300 x 2300	2450 x 2800	2200 x 2900
21	1600	1300	800	300	1400 x 2400	2600 x 2900	2400 x 3000
24	1800	1300	800	300	1400 x 2550	2600 x 3050	2400 x 3200
26	2000	1400	800	400	1500 x 2700	2750 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

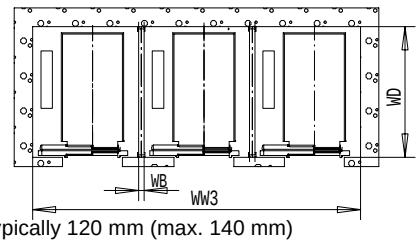
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	800	350	1100 x 2100	4640 x 2600
17	1275	1100	750	300	1200 x 2300	4840 x 2800
18	1350	1100	800	350	1300 x 2300	5040 x 2800
21	1600	1300	800	300	1400 x 2400	5340 x 2900
24	1800	1300	800	300	1400 x 2550	5340 x 3050
26	2000	1400	800	400	1500 x 2700	5640 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

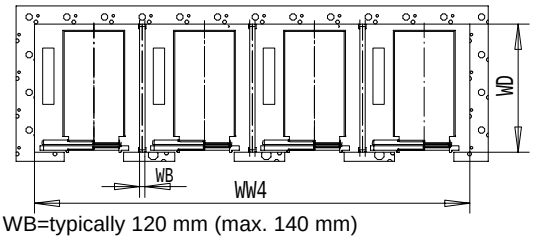
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	800	350	1100 x 2100	7030 x 2600
17	1275	1100	750	300	1200 x 2300	7330 x 2800
18	1350	1100	800	350	1300 x 2300	7630 x 2800
21	1600	1300	800	300	1400 x 2400	8080 x 2900
24	1800	1300	800	300	1400 x 2550	8080 x 3050
26	2000	1400	800	400	1500 x 2700	8530 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	800	350	1100 x 2100	9420 x 2600
17	1275	1100	750	300	1200 x 2300	9820 x 2800
18	1350	1100	800	350	1300 x 2300	10220 x 2800
21	1600	1300	800	300	1400 x 2400	10820 x 2900
24	1800	1300	800	300	1400 x 2550	10820 x 3050
26	2000	1400	800	400	1500 x 2700	11420 x 3200

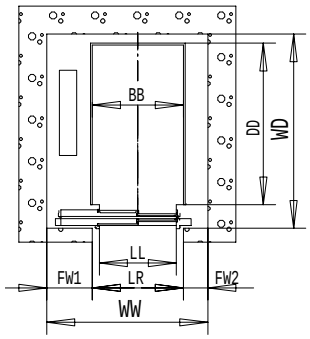


WB=typically 120 mm (max. 140 mm)

2.2.11 ISO 4190-1 Stretcher Cars: Speed 8.0 m/s, Side Opening Single Entrance

STRETCHER ELEVATORS WITH RATED SPEED 8.0 m/s
MIN TRAVEL 100 m, MAX TRAVEL 250 m, ISO 4190-1 CARS. CWT AT SIDE

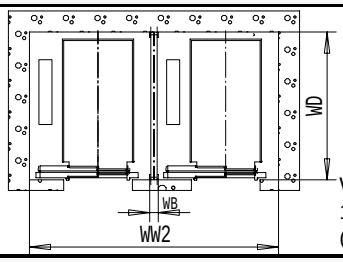
Nr. of persons	Rated load				Car dimensions Recommended by KONE, equals to ISO 4190-1	Internal lift well dimensions Recommended by KONE side opening door	Internal lift well dimensions Recommended by ISO 4190-1 side opening door
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW x WD (mm)	WW x WD (mm)
13	1000	900	800	350	1100 x 2100	2250 x 2600	2000 x 2700
17	1275	1100	750	300	1200 x 2300	2350 x 2800	2100 x 2900
18	1350	1100	800	350	1300 x 2300	2450 x 2800	2200 x 2900
21	1600	1300	800	300	1400 x 2400	2600 x 2900	2400 x 3000
24	1800	1300	800	300	1400 x 2550	2600 x 3050	2400 x 3200
26	2000	1400	800	400	1500 x 2700	2750 x 3200	2400 x 3300



LR=LL+200 when floor nr. is 20 or more

2 ELEVATORS IN BANK **WW2=2*WW+140**

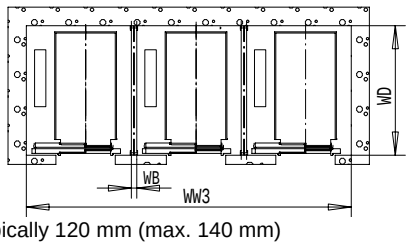
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW2 x WD (mm)
13	1000	900	800	350	1100 x 2100	4640 x 2600
17	1275	1100	750	300	1200 x 2300	4840 x 2800
18	1350	1100	800	350	1300 x 2300	5040 x 2800
21	1600	1300	800	300	1400 x 2400	5340 x 2900
24	1800	1300	800	300	1400 x 2550	5340 x 3050
26	2000	1400	800	400	1500 x 2700	5640 x 3200



WB=typically 120 mm (max. 140 mm)

3 ELEVATORS IN BANK **WW3=3*WW+2*140**

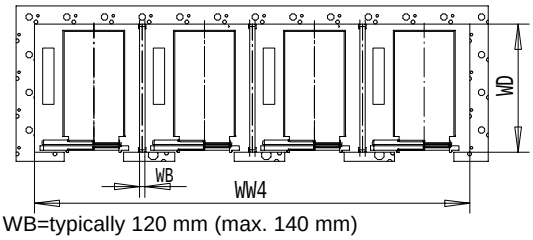
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW3 x WD (mm)
13	1000	900	800	350	1100 x 2100	7030 x 2600
17	1275	1100	750	300	1200 x 2300	7330 x 2800
18	1350	1100	800	350	1300 x 2300	7630 x 2800
21	1600	1300	800	300	1400 x 2400	8080 x 2900
24	1800	1300	800	300	1400 x 2550	8080 x 3050
26	2000	1400	800	400	1500 x 2700	8530 x 3200



WB=typically 120 mm (max. 140 mm)

4 ELEVATORS IN BANK **WW4=4*WW+3*140**

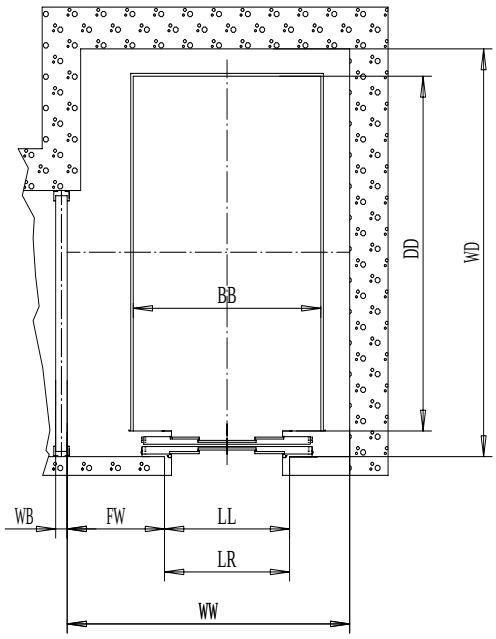
	(kg)	LL (mm)	FW1 (mm)	FW2 (mm)	BB x DD (mm)	WW4 x WD (mm)
13	1000	900	800	350	1100 x 2100	9420 x 2600
17	1275	1100	750	300	1200 x 2300	9820 x 2800
18	1350	1100	800	350	1300 x 2300	10220 x 2800
21	1600	1300	800	300	1400 x 2400	10820 x 2900
24	1800	1300	800	300	1400 x 2550	10820 x 3050
26	2000	1400	800	400	1500 x 2700	11420 x 3200



WB=typically 120 mm (max. 140 mm)

2.3 Goods passenger Elevators - Machine Room on Top - CWT at Side

2.3.1 Goods passenger cars: Speed 2.5m/s, Centre Opening Single Entrance

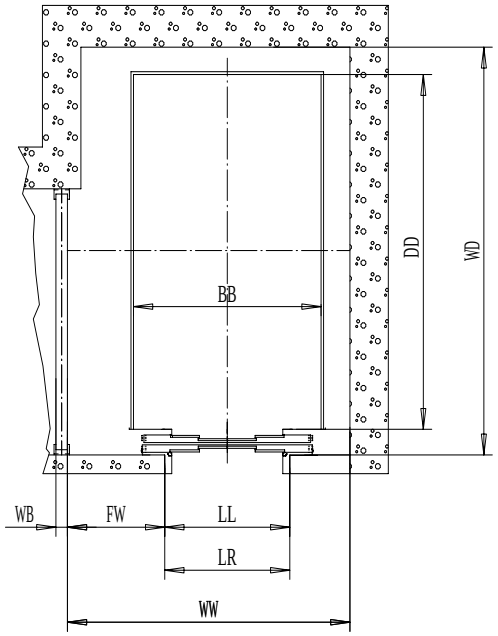


GOODS PASSENGER ELEVATORS WITH RATED SPEED 2.5 m/s MIN TRAVEL 40 m, MAX TRAVEL 200 m				
Rated load			Car dimensions Recommended by KONE, equals to ISO 4190-2	Internal lift well dimensions Recommended by KONE centre opening door
(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)
2000	1400	650	1500 x 2700	2600 x 3200
3000	1600	750	1800 x 3000	2950 x 3500
3500	1800	800	2100 x 3000	3250 x 3500

LL = DOOR CLEAR OPENING WIDTH
FW= FRONT WALL WIDTH
BB = CAR WIDTH
DD = CAR DEPTH
WW = WELL WIDTH
WD = WELL DEPTH
WB = DIVIDING BEAM WIDTH, TYPICALLY 120 mm
LR = DOOR RAW OPENING WIDTH

2.3.2 Goods passenger cars : Speed 3.5 and 4.0 m/s, Centre Opening Single Entrance

GOODS PASSENGER ELEVATORS WITH RATED SPEED 3.5 m/s and 4.0 m/s MIN TRAVEL 50 m, MAX TRAVEL 250 m				
			Car dimensions Recommended by KONE, equals to ISO 4190-2	Internal lift well dimensions Recommended by KONE centre opening door
Rated load				
(kg)	LL (mm)	FW (mm)	BB x DD (mm)	WW x WD (mm)
2000	1400	650	1500 x 2700	2600 x 3200
3000	1600	750	1800 x 3000	2950 x 3500
3500	1800	800	2100 x 3000	3250 x 3500

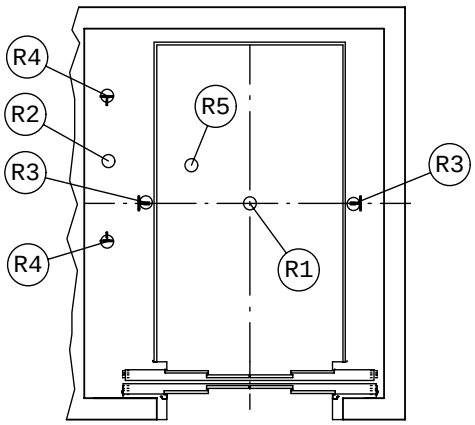


LL = DOOR CLEAR OPENING WIDTH
FW= FRONT WALL WIDTH
BB = CAR WIDTH
DD = CAR DEPTH
WW = WELL WIDTH
WD = WELL DEPTH
WB = DIVIDING BEAM WIDTH, TYPICALLY 120 mm
LR = DOOR RAW OPENING WIDTH

2.3.3 Reaction forces on the pit floor and machine room floor

REACTION FORCES (impact values)							
Speed v (m/s)	Travel Height (m)	Travel Height (m)	REACTION FORCES ON THE PIT FLOOR (kN)				
			R1	R2	R3	R4	R5
2.5	2000	200	234	194	94	84	0
	3000		332	272	128	113	0
	3500		368	298	137	120	0
3.5	2000	250	246	206	130	108	176
	3000		334	274	152	125	239
	3500		368	298	161	131	264
4	2000	250	246	206	130	108	176
	3000		334	274	152	125	239
	3500		368	298	161	131	264

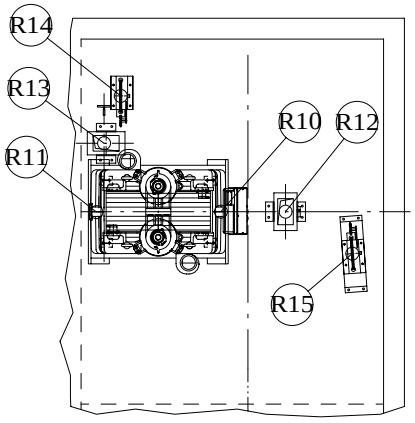
Reaction forces on the pit floor



R1 = REACTION FORCE UNDER CAR BUFFER (kN)
R2 = REACTION FORCE UNDER CWT BUFFER (kN)
R3 = REACTION FORCE UNDER CAR GUIDE RAIL (kN)
R4 = REACTION FORCE UNDER CWT GUIDE RAIL (kN)
R5 = MAX. ROPE COMPENSATOR IMPACT FORCE ON THE PIT FLOOR (UPWARDS)

REACTION FORCES (impact values)									
Speed v (m/s)	Rated Load Q (kg)	Travel Height (m)	REACTION FORCES ON THE MACHINE ROOM FLOOR (kN)						
			R10	R11	R12	R13	R14	R15
2.5	2000	200	50	124	82	71	5	5
	3000		68	148	106	92	5	5
	3500		138	122	120	100	5	5
3.5	2000	250	52	146	94	84	5	5
	3000		76	172	122	106	5	5
	3500		152	136	140	120	5	5
4	2000	250	52	146	94	84	5	5
	3000		76	172	122	106	5	5
	3500		152	136	140	120	5	5

Reaction forces on the machine room floor



R10 = REACTION FORCE OF MACHINE AT CAR SIDE (kN)
R11 = REACTION FORCE OF MACHINE AT CWT SIDE (kN)
R12 = REACTION FORCE OF ROPE END AT CAR SIDE (VALID FOR ROPINGS 2:1) (kN)
R13 = REACTION FORCE OF ROPE END AT CWT SIDE (VALID FOR ROPINGS 2:1) (kN)
R14 = REACTION FORCE OF CWT OVERSPEED GOVERNOR (OPTIONAL) (kN)
R15 = REACTION FORCE OF CAR OVERSPEED GOVERNOR (kN)

2.3.4 Vertical Sections for goods passenger cars

CAR CLEAR HEIGHT CH (std)
3000 mm

HEADROOM HEIGHT SH (mm) (Std. ceiling allowance = 150 mm)			
Rated speed (m/s)	Rated load (kg)		
	2000	3000	3500
2,5	CH+2600	CH+2700	CH+2800
3,5...4,0	CH+3200	CH+3250	CH+3300

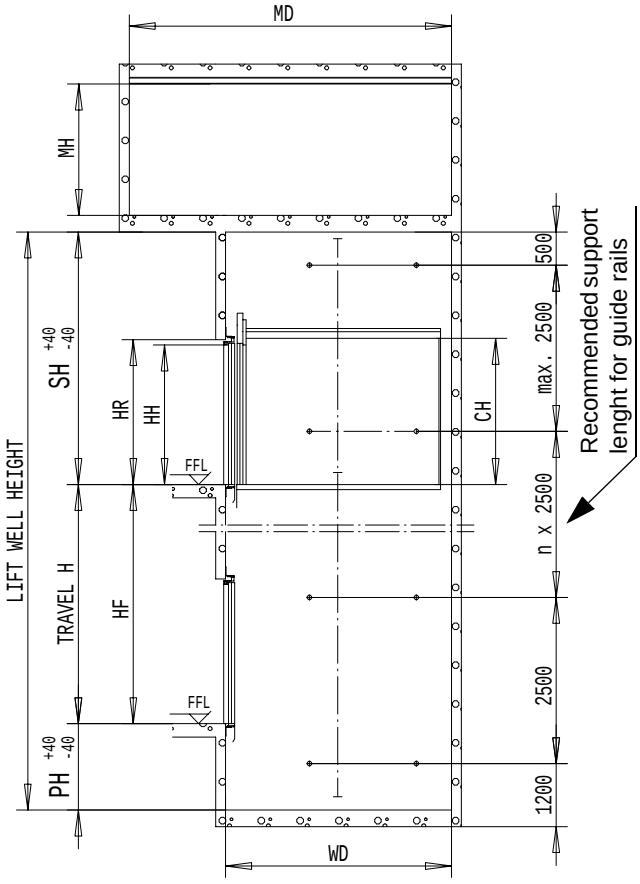
Note! Australian Standard AS-1735.2 requires in some cases even 30 % higher headroom than given in this table. To get exact headroom height, please contact local KONE

PIT DEPTH PH (Flooring thickness ss = 30 mm)			
Rated speed (m/s)	Rated load (kg)		
	2000	3000	3500
2,5	2500	2600	2600
3,5...4,0	4450, H≤160 m 4550, H>160 m	4500, H≤160 m 4600, H>160 m	4450, H≤140 m 4600, H≤160 m 5250, H>160 m

RECOMMENDED MINIMUM MACHINE ROOM HEIGHT MH (mm)			
Rated speed (m/s)	Rated load (kg)		
	2000	3000	3500
2,5 3,5...4,0	2600	2600	3100

Lifting beam in machine room roof is recommended solution.

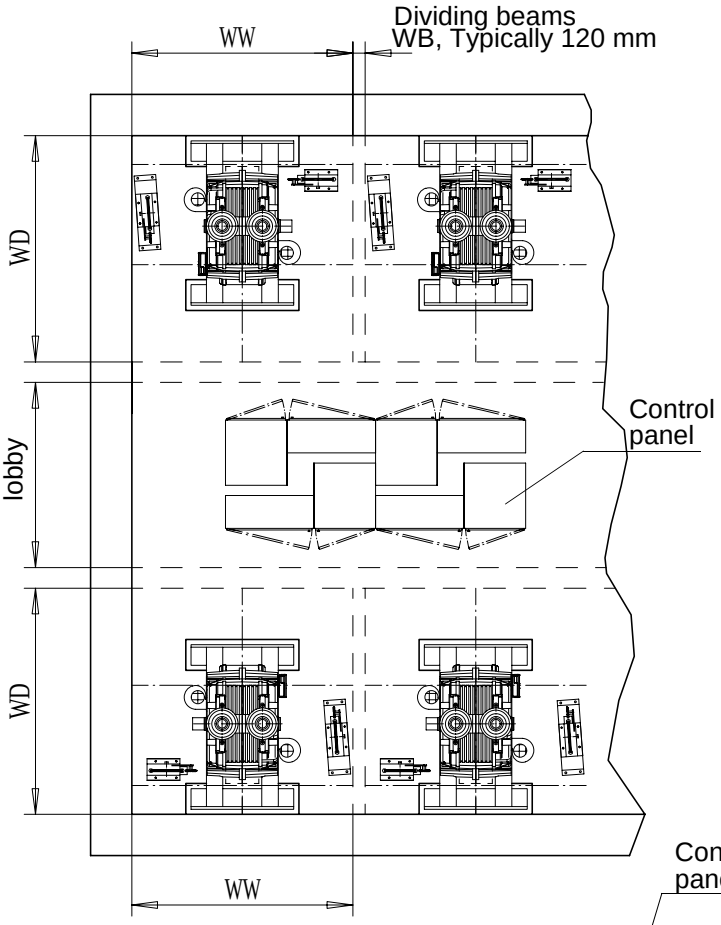
Recommended vertical space reservation for lifting beams is 200 mm with support lenght 3000 mm.



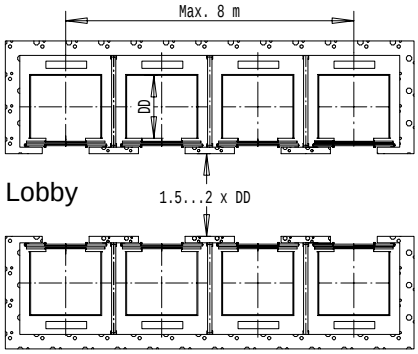
Abbreviations

BB = CAR WIDTH
DD = CAR DEPTH
CH = CAR CLEAR HEIGHT
FW= FRONT WALL WIDTH
HF = FLOOR TO FLOOR DISTANCE
HH = DOOR CLEAR OPENING HEIGHT
HR = DOOR RAW OPENING HEIGHT
LL = DOOR CLEAR OPENING WIDTH
LR = DOOR RAW OPENING WIDTH
MD = MACHINE ROOM DEPTHMW =MACHINE ROOM WIDTH
MH = MACHINE ROOM HEIGHT (UNDER THE BEAM OR LIFTING HOOK)
H = TRAVEL HEIGHT
SH = HEADROOM HEIGHT
PH = PIT DEPTH
WD = WELL DEPTH
WB = LIFT WELL DIVIDING BEAM WIDTH
FFL = FINISHED FLOOR LEVEL

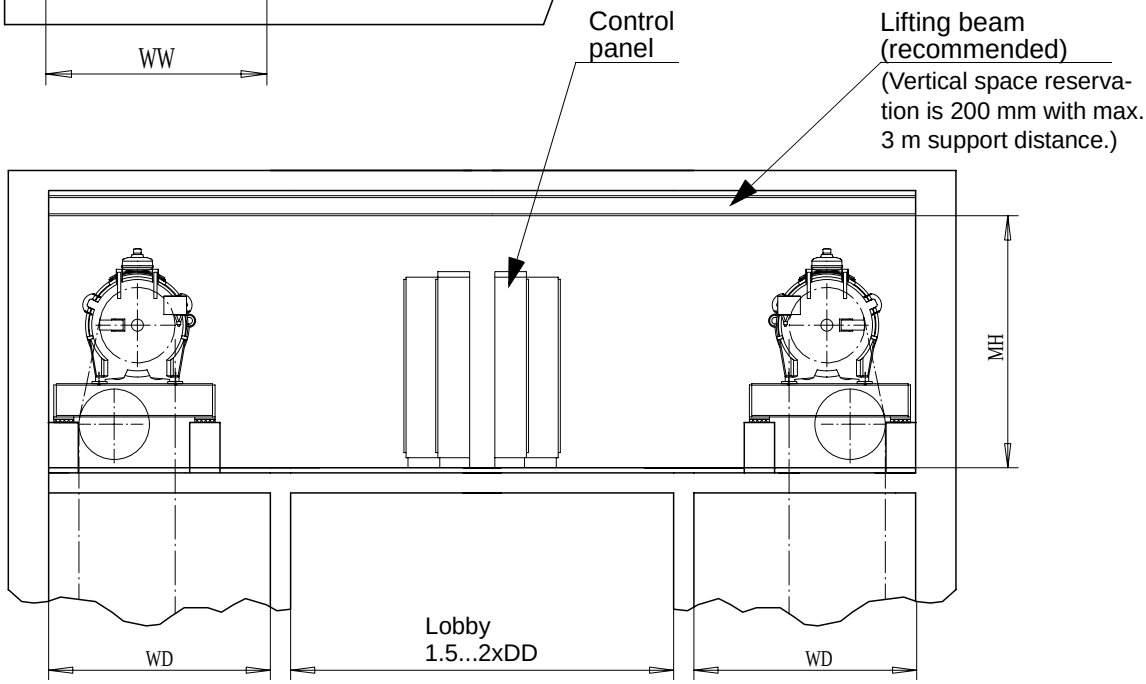
2.4 Typical machine room arrangements for commercial elevators



Typically there is lobby between elevator banks and machine room is above lift well and lobby. Dividing beams are used in lift well.

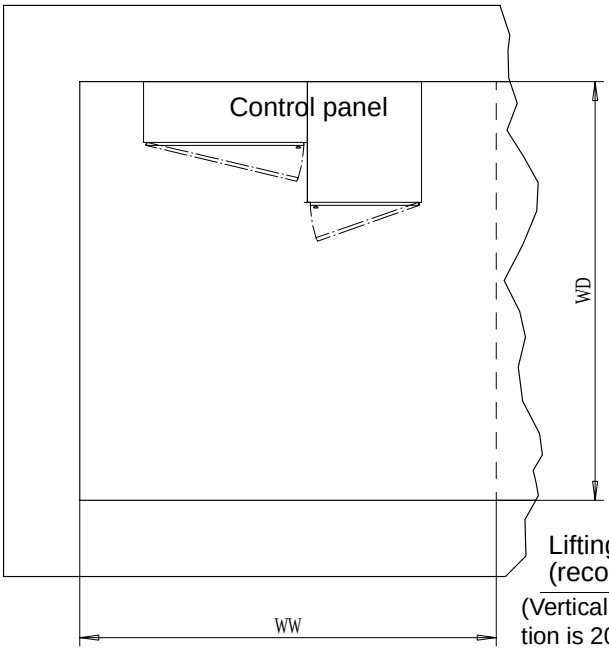


Max. 8 elevators



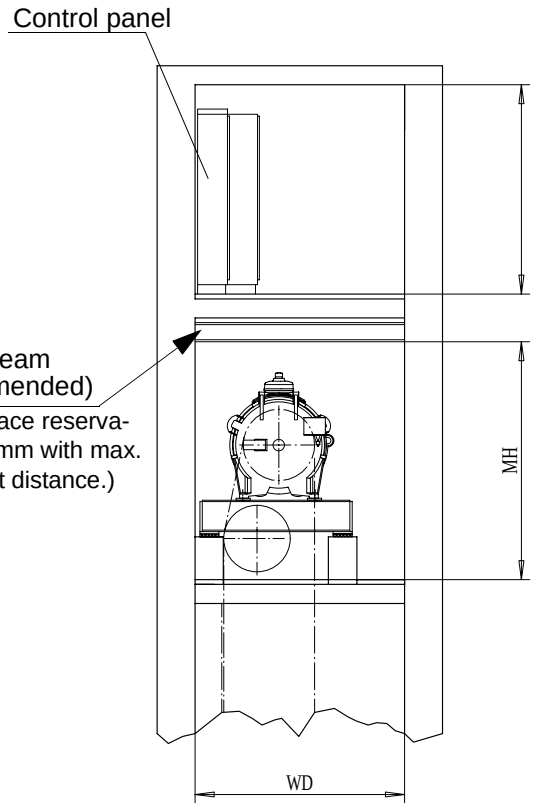
Note! Location of fire door or trap door and machine room trunking will be defined case by case.

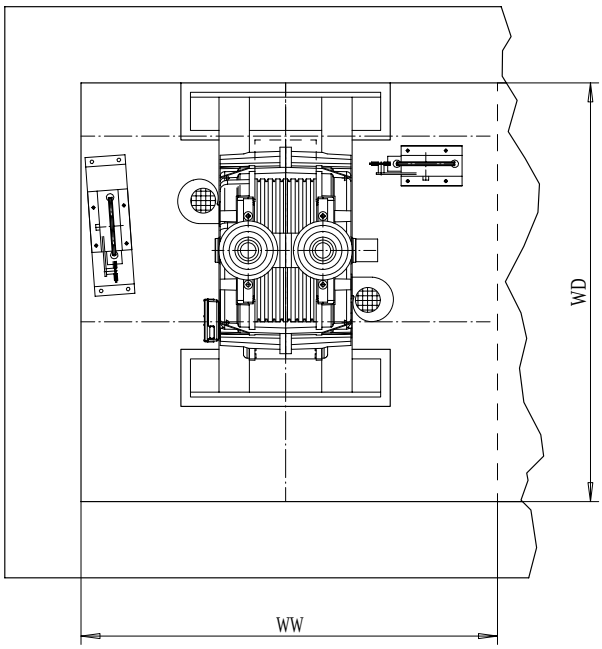
2.5 Alternative machine room arrangements for commercial elevators



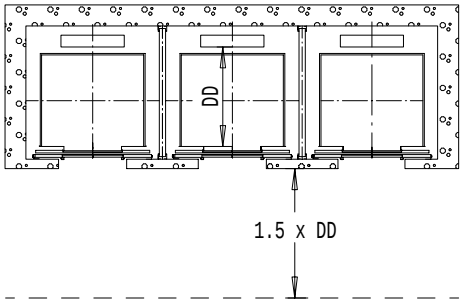
Upper floor for control panel

Machine room is in two floors, width and depth are according to lift well dimensions



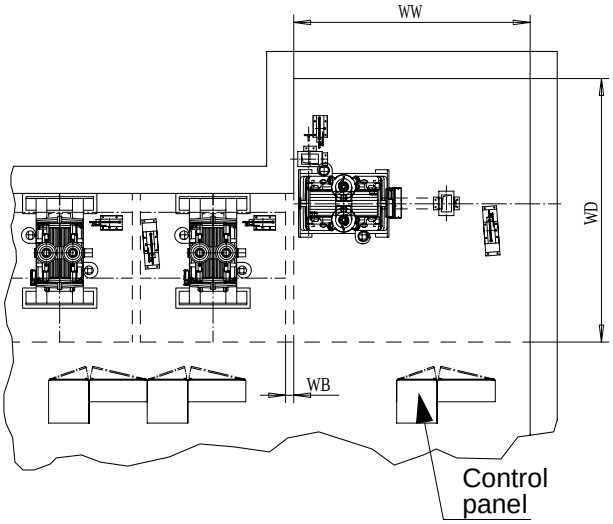


Lower floor for machinery

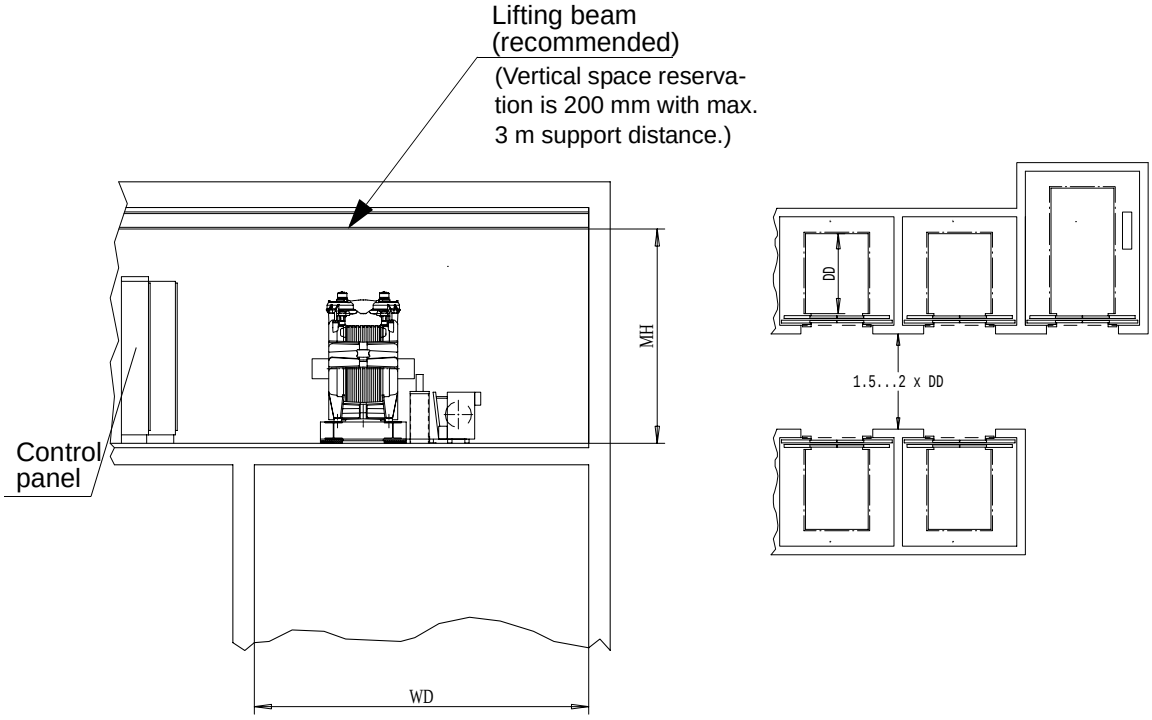


Note! Location of fire door or trap door and machine room trunking will be defined case by case.

2.6 Typical machine room arrangements for goods elevators enclosed to other end of passenger elevator group



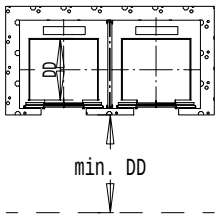
Typically goods elevator is in the same group with passenger elevators. Machine room is sheared.

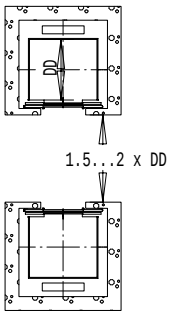


Note! Location of fire door or trap door and machine room trunking will be defined case by case.

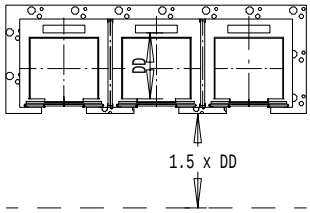
2.7 KONE Alta™ elevator grouping

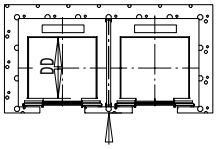
2 elevators

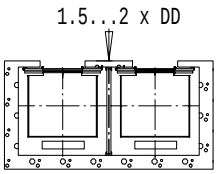




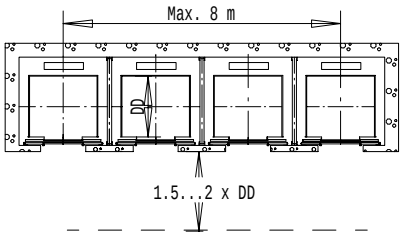
3 elevators



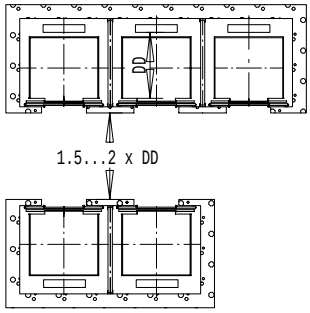




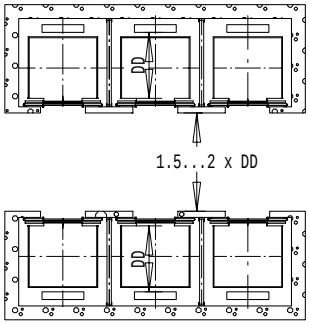
4 elevators



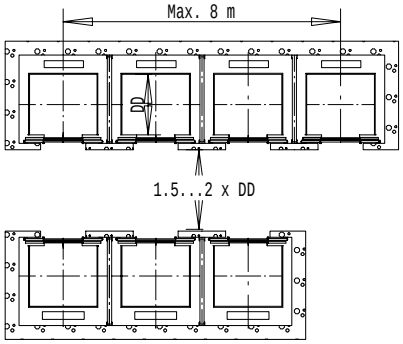
5 elevators



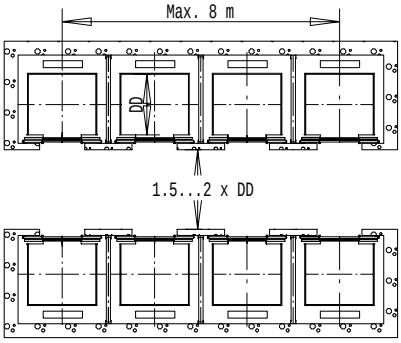
6 elevators



7 elevators



8 elevators



3 CONCRETE AND STEEL WELL

3.1 Dimension and layout drawings

In the accompanying dimension drawings and tables, the following information is given for each elevator type:

- Dimensions of elevator well
- Dimensions of well opening for the door
- Dimensions of the machine room
- Reaction forces in the machine room and in the pit
- Standard reaction forces

All drawings can be mirror-imaged if necessary. Door raw openings are shown according to KONE standard landing door with narrow frames. If frames or steel fronts are used, which are also available from KONE, please contact your KONE Alta™ Fast Response Drawing Service.

Building specific drawings from KONE Alta™ Fast Response Drawing Service contain the following building specific information:

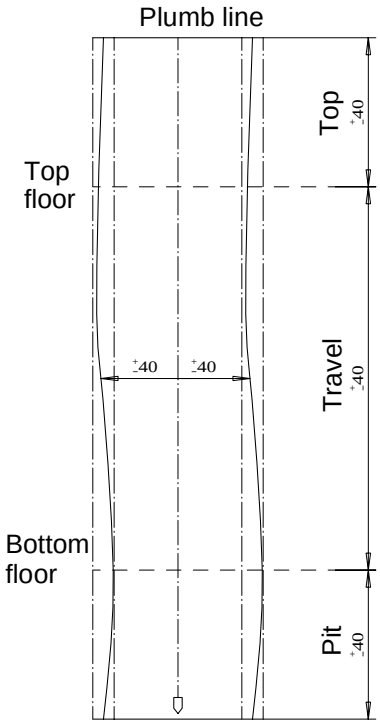
- Machine room openings
- Concrete inserts if needed
- Maximum car and counterweight guide fixing reaction loads on well walls
- Landing door openings

3.2 Well dimensions

The accompanying layout and dimension sheets give both ISO standard dimensions for elevator wells and the minimum well dimensions for KONE Alta™ elevators.

3.3 Tolerances

The elevator well plan dimensions include clear plumb tolerances. A tolerance of +/-40 mm out of plumb is allowed in elevator wells. The following illustration shows the principle.



Well Tolerances

3.4 Elevator well wall material and thickness

3.4.1 Concrete well:

In case that the elevator well is constructed from concrete, reinforced concrete K30 (30 MN/m^2, 150 mm cube) thickness 150 mm, is recommended. If a steel structure or other form of construction is used, please consult your KONE representative.

3.4.2 Steel well:

Please consult your KONE representative.