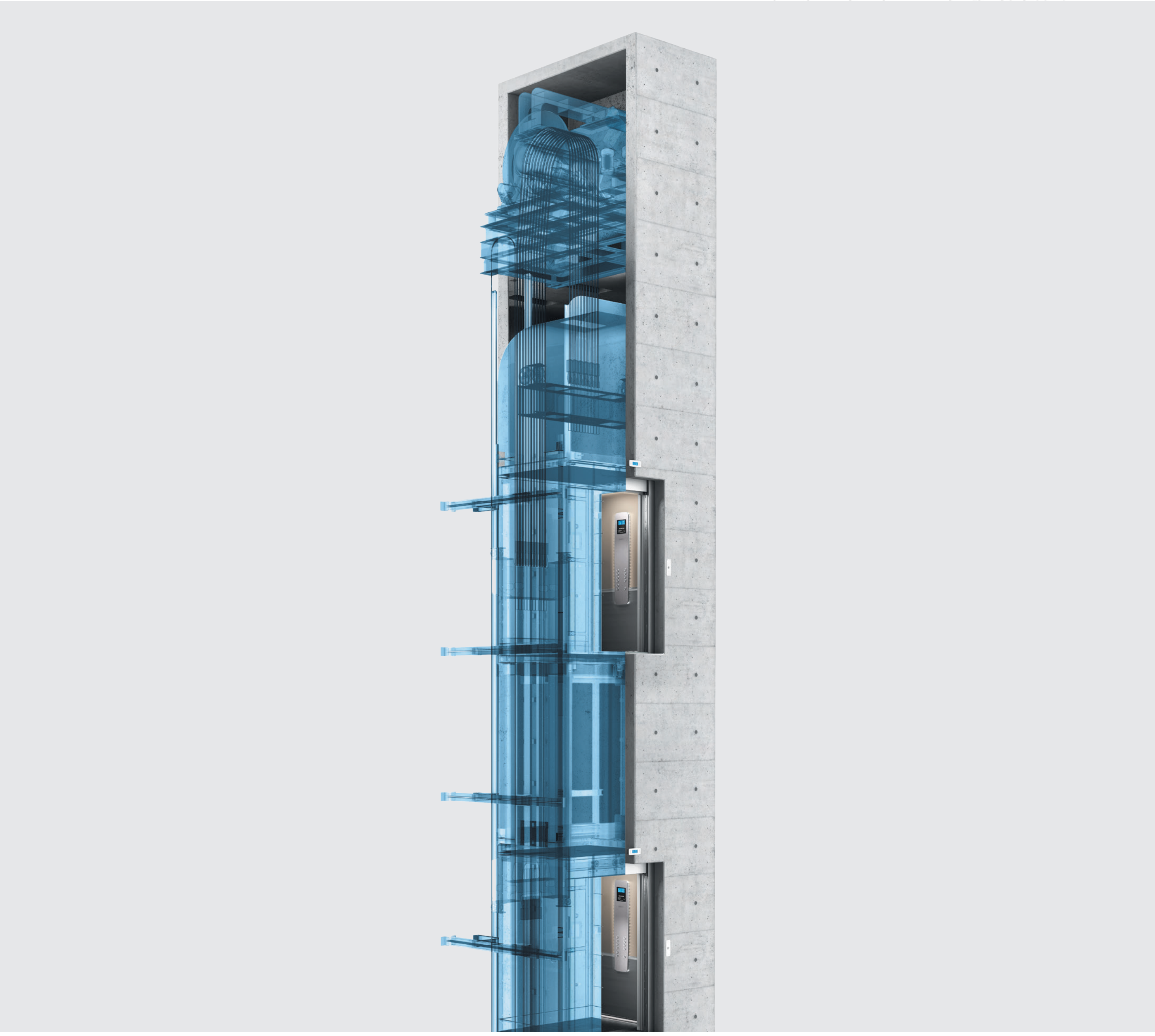
COUPL
Fact Sheet BD 61

Express elevator with two elevator cars as double-decker for the highest handling capacities. 2 x 1250 kg – 2000 kg at up to 10 m/s.



NEXT LEVEL
NEW INSTALLATION

ThyssenKrupp Aufzugswerke

ThyssenKrupp

Product benefits
Fact Sheet COUPL BD 61

Next Level Safety
- CE Type certified product
- System satisfies the regulations in accordance with elevator directive 95/16/EG as well as EN 81-1
- EN 81-A3 compliant

Next Level Efficiency
- Optimal use of shaft with elevator cars arranged one above the other
- Connection of two main landing levels with highest efficiency (for example shuttle operation between entrance and outdoor viewing platform or with another distributor level for high buildings)
- Handling of high traffic volume and short travel times between two main landing levels
- Simultaneous filling of both elevator cars

Next Level Design
- Individual design options of the elevator cars
- Lower space requirement for the elevators means scope for development in the structural design and more available area in the building

Next Level Innovation
- Ideal for combination with conventional elevators and the TWIN® system, with two independent elevator cars in one shaft
- DSC (Destination Selection Control) enables across-the-board intelligent traffic management for the groups of elevators

Next Level Ride Comfort
- Users' destinations are bundled by landing areas, thus reducing waiting times or increasing the handling capacity

Next Level Reliability
- The COUPL double-decker elevator has proven successful in heavily frequented buildings and is configured for very high traffic volumes.

Next Level Sustainable Efficiency
- Energy efficiency class "A" in accordance with VDI 4707 can be achieved with COUPL.

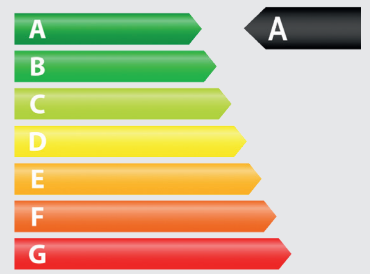
Next Level Flexibility
- Standardised preferred types permit reliable initial planning
- The system can be adapted to individual requirements and designed in wide variety of configurations

The COUPL is a double-decker elevator where two elevator cars arranged one above the other are firmly interconnected in one frame. This passenger elevator moves in a single shaft and ensures particularly high handling capacity in high buildings.

In combination with other elevator systems, the COUPL is frequently used as a shuttle elevator. It is particularly suitable for passenger transport from main entrance levels to defined terminal landings, for example outdoor viewing platforms or transfer landings, so-called sky lobbies.

The advantages come into their own when each of the landings in the access area or terminal landings are interconnected via escalators to split up the flows of passengers. In this case, both elevator cars can be loaded and unloaded simultaneously.

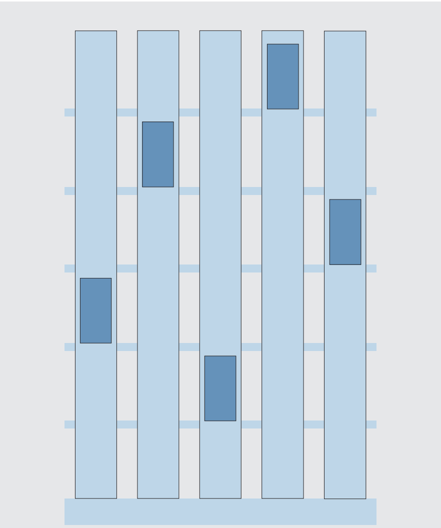
From the ground floor to the outdoor viewing platform – the COUPL can transport up to 26 persons per elevator car, i.e. a total of up to 52 persons with one run. The system enables rated loads up to 2 x 2000 kg, with speeds up to 10 m/s, i.e. 36 km/h, and travel heights above 250 m.



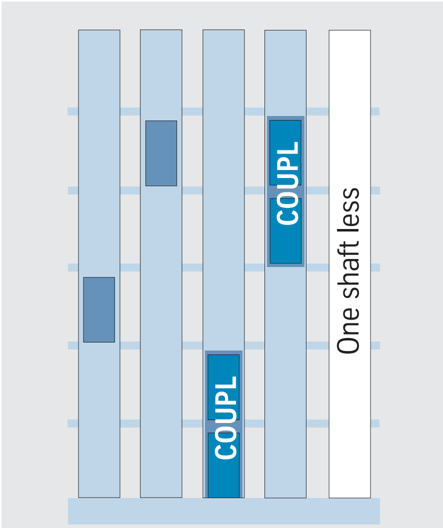
Energy efficiency class "A" in accordance with VDI 4707, part 1, certified by TÜV Rheinland in the reference project "Shanghai World Financial Center" with four COUPL (Q = 2 x 2000 kg, v = 10.0 m/s).

System advantages
Fact Sheet COUPL BD 61

Use COUPL to plan a leaner building



Group of conventional elevators



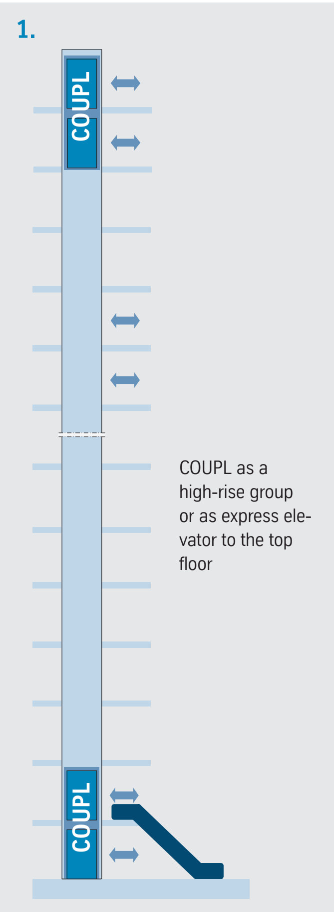
Group of elevators with COUPL

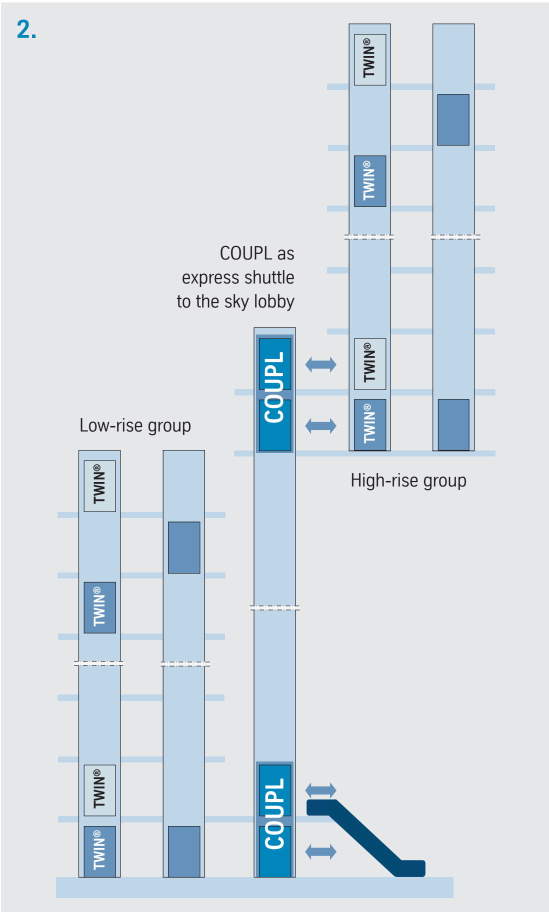
Thanks to its two cars, the COUPL can be used to effectively enhance the handling capacity of a group of elevators.

This allows savings with regard to elevator shafts and thus a noticeable increase in the usable or rentable area across all floors.

As an alternative, there is leeway for the design of leaner buildings with attractive architecture.

COUPL – the "highway" in the building





1. The high handling capacity means the COUPL is ideal as a high-rise group for the upper floors of a building.
The COUPL is also ideal for transporting large flows of passengers from the lobby to the top outdoor viewing platforms of the building.

2. The COUPL can be used to divide flows of passengers within the building.
As an express shuttle, the COUPL handles transport into the distributor floors (sky lobby). From there, they continue to the top floors with conventional elevators or with the TWIN® system

Technical overview I
Fact Sheet COUPL BD 61

Performance data and principal dimensions for rated load 2 x 1250 kg (CW x CD = 1850 mm x 1500 mm)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1250 kg							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 16							
Car width [2]	per elevator car	CW	[mm]	1850							
Car depth [2]	per elevator car	CD	[mm]	1500							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1100							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	2620	2720	2820	2820	2820	2860	2860	2860
Shaft depth [5]	without SG on CW	SD	[mm]	2500	2515	2600	2600	2600	2665	2665	2680
Shaft depth [5]	with SG on CW	SD	[mm]	2600	2615	2700	2700	2725	2750	2750	2800
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

Performance data and principal dimensions for rated load 2 x 1275 kg
(CW x CD = 2000 mm x 1400 mm; in accordance with ISO 4190-1)

ISO

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1275 kg (ISO)							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 16							
Car width [2]	per elevator car	CW	[mm]	2000							
Car depth [2]	per elevator car	CD	[mm]	1400							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	2770	2870	2970	2970	2970	3010	3010	3010
Shaft depth [5]	without SG on CW	SD	[mm]	2450	2465	2550	2550	2550	2615	2615	2615
Shaft depth [5]	with SG on CW	SD	[mm]	2550	2565	2650	2650	2650	2675	2675	2700
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

The following shaft tolerances are taken into account in the specified shaft dimensions:
travel height ≤ 100 m → shaft tolerance ± 25 mm; travel height ≤ 150 m → shaft tolerance ± 40 mm; travel height > 150 m → shaft tolerance ± 50 mm.

1) The shaft dimensions (shaft width, shaft depth, headroom height, pit depth) are calculated for the specified maximum travel height. With a lower travel height, the shaft dimensions can differ. The corresponding values are available on request. Greater travel heights are also possible on request.
2) The dimensions for car width and car depth include thicknesses of maximum 20 mm per wall for the elevator car equipment. Additional equipment can change the required shaft dimensions.
3) The raw car height CH is measured without suspended lighting ceilings. The clear car height is equal to the raw car height CH minus the height of the suspended ceiling of approx. 200mm. The car height CH must be at least 200 mm higher than the door height due to the suspended lighting ceiling.
4) The specified shaft width applies to a single elevator. Shaft width for two elevators = 2 x SW + 20 mm. Shaft width for three elevators = 3 x SW + 40 mm.
5) On request, the counterweight (CW) can be equipped with safety gears (SG), for example if there are accessible spaces below the path of the counterweight.
6) Tensioning device for rope compensation required for all speeds.
7) The landing distance must be identical in all landings to be approached by the COUPL system so that simultaneously loading and unloading is possible.
8) At a speed of 5.0 m/s with lower travel heights (for example up to 150 m), the rope suspension can be 2:1. In this case, however, the headroom height is enlarged. The corresponding values are available on request.

Technical overview II
Fact Sheet COUPL BD 61

Performance data and principal dimensions for rated load 2 x 1350 kg (CW x CD = 1950 mm x 1500 mm)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1350 kg							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 18							
Car width [2]	per elevator car	CW	[mm]	1950							
Car depth [2]	per elevator car	CD	[mm]	1500							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	2720	2820	2920	2920	2920	2960	2960	2960
Shaft depth [5]	without SG on CW	SD	[mm]	2500	2515	2600	2600	2600	2665	2665	2680
Shaft depth [5]	with SG on CW	SD	[mm]	2600	2615	2700	2700	2725	2750	2750	2800
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

Performance data and principal dimensions for rated load 2 x 1600 kg (CW x CD = 1950 mm x 1750 mm)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1600 kg							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 21							
Car width [2]	per elevator car	CW	[mm]	1950							
Car depth [2]	per elevator car	CD	[mm]	1750							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	2720	2820	2920	2920	2920	2960	2960	2960
Shaft depth [5]	without SG on CW	SD	[mm]	2650	2665	2720	2750	2775	2880	2880	2930
Shaft depth [5]	with SG on CW	SD	[mm]	2850	2865	2950	2950	2975	3000	3000	3050
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

The following shaft tolerances are taken into account in the specified shaft dimensions:
travel height ≤ 100 m → shaft tolerance ± 25 mm; travel height ≤ 150 m → shaft tolerance ± 40 mm; travel height > 150 m → shaft tolerance ± 50 mm.

1) The shaft dimensions (shaft width, shaft depth, headroom height, pit depth) are calculated for the specified maximum travel height. With a lower travel height, the shaft dimensions can differ. The corresponding values are available on request. Greater travel heights are also possible on request.
2) The dimensions for car width and car depth include thicknesses of maximum 20 mm per wall for the elevator car equipment. Additional equipment can change the required shaft dimensions.
3) The raw car height CH is measured without suspended lighting ceilings. The clear car height is equal to the raw car height CH minus the height of the suspended ceiling of approx. 200mm. The car height CH must be at least 200 mm higher than the door height due to the suspended lighting ceiling.
4) The specified shaft width applies to a single elevator. Shaft width for two elevators = 2 x SW + 20 mm. Shaft width for three elevators = 3 x SW + 40 mm.
5) On request, the counterweight (CW) can be equipped with safety gears (SG), for example if there are accessible spaces below the path of the counterweight.
6) Tensioning device for rope compensation required for all speeds.
7) The landing distance must be identical in all landings to be approached by the COUPL system so that simultaneously loading and unloading is possible.
8) At a speed of 5.0 m/s with lower travel heights (for example up to 150 m), the rope suspension can be 2:1. In this case, however, the headroom height is enlarged. The corresponding values are available on request.

Technical overview III
Fact Sheet COUPL BD 61

ISO

Performance data and principal dimensions for rated load 2 x 1600 kg
(CW x CD = 2100 mm x 1600 mm; in accordance with ISO 4190-1)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1600 kg (ISO)							
Speed		v	[m/s]	2.5	4.0	5.0 [8)]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1)]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 21							
Car width [2)]	per elevator car	CW	[mm]	2100							
Car depth [2)]	per elevator car	CD	[mm]	1600							
Car height [3)]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4)]		SW	[mm]	2870	2970	3070	3070	3070	3110	3110	3110
Shaft depth [5)]	without SG on CW	SD	[mm]	2550	2565	2650	2650	2650	2730	2730	2780
Shaft depth [5)]	with SG on CW	SD	[mm]	2700	2715	2800	2800	2825	2850	2850	2900
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6)]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

Performance data and principal dimensions for rated load 2 x 1800 kg (CW x CD = 1950 mm x 1900 mm)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1800 kg							
Speed		v	[m/s]	2.5	4.0	5.0 [8)]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1)]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 24							
Car width [2)]	per elevator car	CW	[mm]	1950							
Car depth [2)]	per elevator car	CD	[mm]	1900							
Car height [3)]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4)]		SW	[mm]	2720	2820	2920	2920	2920	2960	2960	2960
Shaft depth [5)]	without SG on CW	SD	[mm]	2800	2815	2900	2900	2925	3030	3030	3080
Shaft depth [5)]	with SG on CW	SD	[mm]	3000	3015	3100	3100	3125	3150	3150	3200
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6)]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

The following shaft tolerances are taken into account in the specified shaft dimensions:
travel height ≤ 100 m → shaft tolerance ± 25 mm; travel height ≤ 150 m → shaft tolerance ± 40 mm; travel height > 150 m → shaft tolerance ± 50 mm.

1) The shaft dimensions (shaft width, shaft depth, headroom height, pit depth) are calculated for the specified maximum travel height. With a lower travel height, the shaft dimensions can differ. The corresponding values are available on request. Greater travel heights are also possible on request.
2) The dimensions for car width and car depth include thicknesses of maximum 20 mm per wall for the elevator car equipment. Additional equipment can change the required shaft dimensions.
3) The raw car height CH is measured without suspended lighting ceilings. The clear car height is equal to the raw car height CH minus the height of the suspended ceiling of approx. 200mm. The car height CH must be at least 200 mm higher than the door height due to the suspended lighting ceiling.
4) The specified shaft width applies to a single elevator. Shaft width for two elevators = 2 x SW + 20 mm. Shaft width for three elevators = 3 x SW + 40 mm.
5) On request, the counterweight (CW) can be equipped with safety gears (SG), for example if there are accessible spaces below the path of the counterweight.
6) Tensioning device for rope compensation required for all speeds.
7) The landing distance must be identical in all landings to be approached by the COUPL system so that simultaneously loading and unloading is possible.
8) At a speed of 5.0 m/s with lower travel heights (for example up to 150 m), the rope suspension can be 2:1. In this case, however, the headroom height is enlarged. The corresponding values are available on request.

Technical overview IV
Fact Sheet COUPL BD 61

Performance data and principal dimensions for rated load 2 x 1800 kg
(CW x CD = 2350 mm x 1600 mm; in accordance with ISO 4190-1)

ISO

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 1800 kg (ISO)							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 24							
Car width [2]	per elevator car	CW	[mm]	2350							
Car depth [2]	per elevator car	CD	[mm]	1600							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	3120	3220	3320	3320	3320	3360	3360	3360
Shaft depth [5]	without SG on CW	SD	[mm]	2550	2565	2650	2650	2650	2730	2730	2780
Shaft depth [5]	with SG on CW	SD	[mm]	2700	2715	2800	2800	2825	2850	2850	2900
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

Performance data and principal dimensions for rated load 2 x 2000 kg (CW x CD = 1950 mm x 2050 mm)

Rated loads per COUPL (2 elevator cars, one above the other)				2 x 2000 kg							
Speed		v	[m/s]	2.5	4.0	5.0 [8]	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height [1]		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 26							
Car width [2]	per elevator car	CW	[mm]	1950							
Car depth [2]	per elevator car	CD	[mm]	2050							
Car height [3]	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width [4]		SW	[mm]	2720	2820	2920	2920	2920	2960	2960	2960
Shaft depth [5]	without SG on CW	SD	[mm]	2950	2965	3050	3050	3075	3180	3180	3230
Shaft depth [5]	with SG on CW	SD	[mm]	3150	3165	3250	3250	3275	3300	3300	3350
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth [6]		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance [7]		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

The following shaft tolerances are taken into account in the specified shaft dimensions:
travel height ≤ 100 m → shaft tolerance ± 25 mm; travel height ≤ 150 m → shaft tolerance ± 40 mm; travel height > 150 m → shaft tolerance ± 50 mm.

1) The shaft dimensions (shaft width, shaft depth, headroom height, pit depth) are calculated for the specified maximum travel height. With a lower travel height, the shaft dimensions can differ. The corresponding values are available on request. Greater travel heights are also possible on request.
2) The dimensions for car width and car depth include thicknesses of maximum 20 mm per wall for the elevator car equipment. Additional equipment can change the required shaft dimensions.
3) The raw car height CH is measured without suspended lighting ceilings. The clear car height is equal to the raw car height CH minus the height of the suspended ceiling of approx. 200mm. The car height CH must be at least 200 mm higher than the door height due to the suspended lighting ceiling.
4) The specified shaft width applies to a single elevator. Shaft width for two elevators = 2 x SW + 20 mm. Shaft width for three elevators = 3 x SW + 40 mm.
5) On request, the counterweight (CW) can be equipped with safety gears (SG), for example if there are accessible spaces below the path of the counterweight.
6) Tensioning device for rope compensation required for all speeds.
7) The landing distance must be identical in all landings to be approached by the COUPL system so that simultaneously loading and unloading is possible.
8) At a speed of 5.0 m/s with lower travel heights (for example up to 150 m), the rope suspension can be 2:1. In this case, however, the headroom height is enlarged. The corresponding values are available on request.

Technical overview V
Fact Sheet COUPL BD 61

ISO

Performance data and principal dimensions for rated load 2 x 2000 kg
(CW x CD = 2350 mm x 1700 mm; in accordance with ISO 4190-1)

Rated loads per COUPL (2 elevator cars, one above the other)				**2 x 2000 kg (ISO)**							
Speed		v	[m/s]	2.5	4.0	5.0 8)	6.0	7.0	8.0	9.0	10.0
Rope suspension				2:1		1:1					
Max. travel height 1)		TH	[m]	100	150	200	200	300	300	300	300
Dual entrance				No							
Number of passengers				2 x 26							
Car width 2)	per elevator car	CW	[mm]	2350							
Car depth 2)	per elevator car	CD	[mm]	1700							
Car height 3)	per elevator car, raw	CH	[mm]	2500 – 3000							
Door width	centre-opening	DW	[mm]	1200							
Door height		DH	[mm]	2100 – 2800							
Shaft width 4)		SW	[mm]	3120	3220	3320	3320	3320	3360	3360	3360
Shaft depth 5)	without SG on CW	SD	[mm]	2600	2615	2700	2700	2725	2830	2830	2880
Shaft depth 5)	with SG on CW	SD	[mm]	2800	2815	2900	2900	2925	2950	2950	3000
Headroom height		HH	[mm]	CH + 3500	CH + 3650	CH + 3350	CH + 3750	CH + 3950	CH + 5450	CH + 6050	CH + 6650
Pit depth 6)		PD	[mm]	3650	4700	5200	5350	6050	8050	8500	9400
Floor-to-floor distance 7		HST min.	[mm]	CH + 1000							
		HST max.	[mm]	6500							

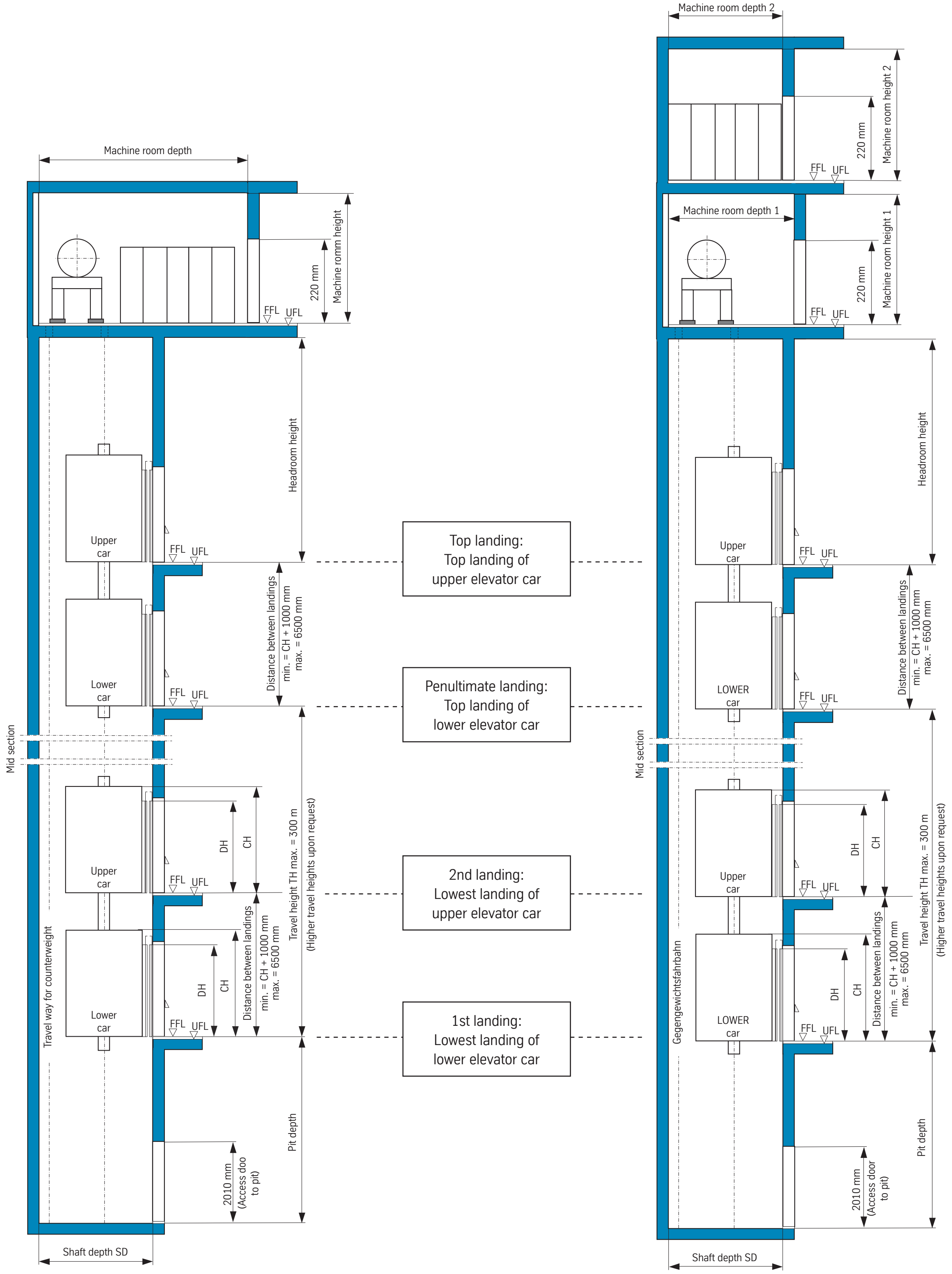
The following shaft tolerances are taken into account in the specified shaft dimensions:
travel height ≤ 100 m → shaft tolerance ± 25 mm; travel height ≤ 150 m → shaft tolerance ± 40 mm; travel height > 150 m → shaft tolerance ± 50 mm.

1) The shaft dimensions (shaft width, shaft depth, headroom height, pit depth) are calculated for the specified maximum travel height. With a lower travel height, the shaft dimensions can differ. The corresponding values are available on request. Greater travel heights are also possible on request.
2) The dimensions for car width and car depth include thicknesses of maximum 20 mm per wall for the elevator car equipment. Additional equipment can change the required shaft dimensions.
3) The raw car height CH is measured without suspended lighting ceilings. The clear car height is equal to the raw car height CH minus the height of the suspended ceiling of approx. 200mm. The car height CH must be at least 200 mm higher than the door height due to the suspended lighting ceiling.
4) The specified shaft width applies to a single elevator. Shaft width for two elevators = 2 x SW + 20 mm. Shaft width for three elevators = 3 x SW + 40 mm.
5) On request, the counterweight (CW) can be equipped with safety gears (SG), for example if there are accessible spaces below the path of the counterweight.
6) Tensioning device for rope compensation required for all speeds.
7) The landing distance must be identical in all landings to be approached by the COUPL system so that simultaneously loading and unloading is possible.
8) At a speed of 5.0 m/s with lower travel heights (for example up to 150 m), the rope suspension can be 2:1. In this case, however, the headroom height is enlarged. The corresponding values are available on request.

Shaft vertical section
Fact Sheet COUPL BD 61

Shaft vertical section 1
(with a larger machine room)

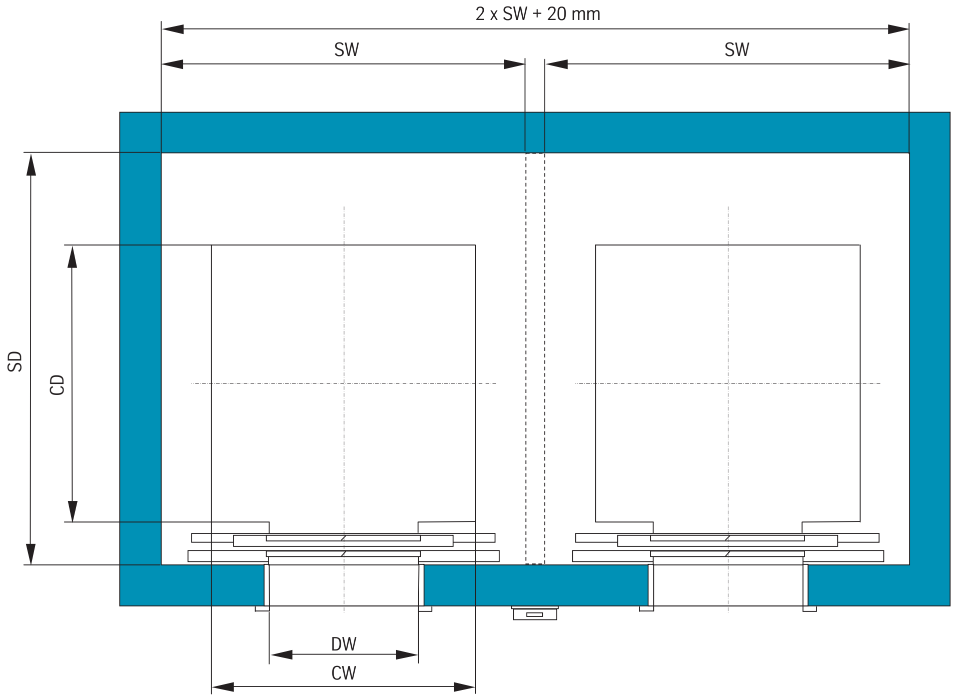
Shaft vertical section 2
(with two smaller machine rooms, one above the other)



For further details, see "Technical overviews" and "Planning information".

Shaft layout planning information
Fact Sheet COUPL BD 61

Shaft layout



The shaft layouts are shown as a group of 2 for the preferred types of the COUPL system with rated loads ranging from Q = 2 x 1250 to 2000 kg. COUPL can also be used in a single shaft in other arrangements with deviating car dimensions and with other shaft dimensions.

Planning Information

The planning information shown here has been compiled with the utmost care for your planning safety. However, not all aspects and influences can be addressed, which may result from various requirements and specific conditions of your project. So that the COUPL system can attain its full potential, we kindly request that you establish contact with our experienced planning experts at an early stage.

- The system is ideal if the building has two main entrance levels and two destination landings with the same landing distance. The two elevator cars of the COUPL can then be loaded and unloaded simultaneously. This doubles the handling capacity compared to a classical elevator with only one car.
- For the highest handling capacities and for energy-related reasons, we recommend the COUPL system as a shuttle system between two areas in the building. This can be the connection of the entrance area with outdoor viewing platforms or with transfer landings (sky lobbies) within the building.
- To service the intermediate landings using local groups of elevators, we recommend deployment of single elevators (for example of the type EVOLUTION® BLUE or UNIQ). A perfect supplement to the COUPL with two cars is the TWIN® system. TWIN® uses two independent elevator cars in one shaft to travel to all floors independently of changing floor-to-floor distances.
- We will be glad to provide you with detailed planning information on the installation of landing doors.

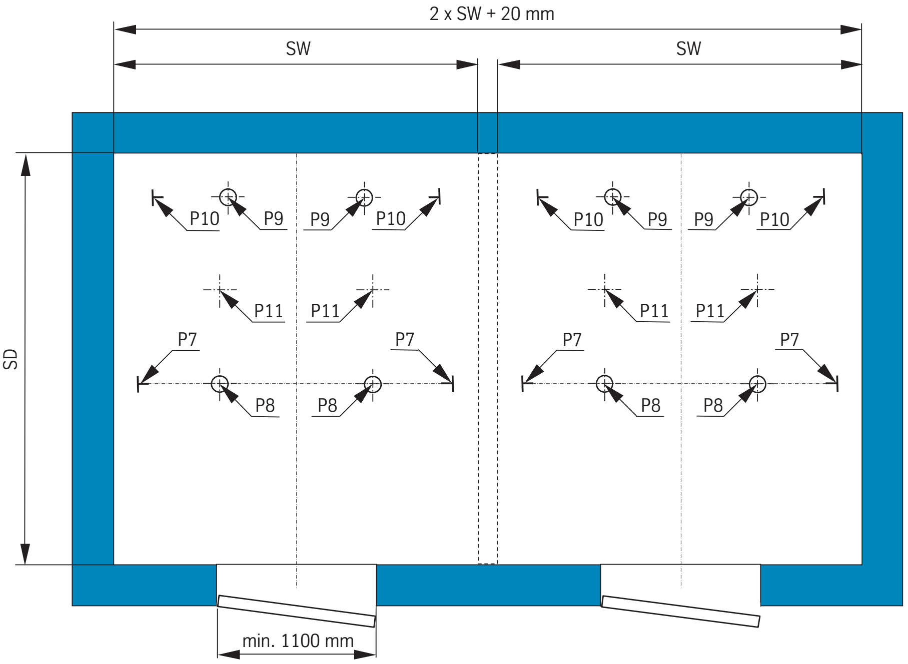
Additional points to be observed:
This documentation always depicts one group of lifts with two COUPL systems and thus a total of four elevator cars in two shafts. COUPL can also be implemented in a single shaft, in a group with a number of conventional elevators or as a system solution with other groups, for example also with TWIN® systems, in one building.

If required, passageways can also be provided in the shaft wall in the lower, middle and upper area of the shaft. These passageways can reduce air pressure differences and wind noises due to the fast elevator cars in the shafts. Dimensions and versions are determined in accordance with the cross-section ratios of the elevator cars to the shaft and the speeds and travel heights of the elevators.

During the planning phase, please consider all applicable regulations stipulated by the relevant notified body and all applicable national regulations.

Shaft pit
Fact Sheet COUPL BD 61

Layout and forces in the shaft pit



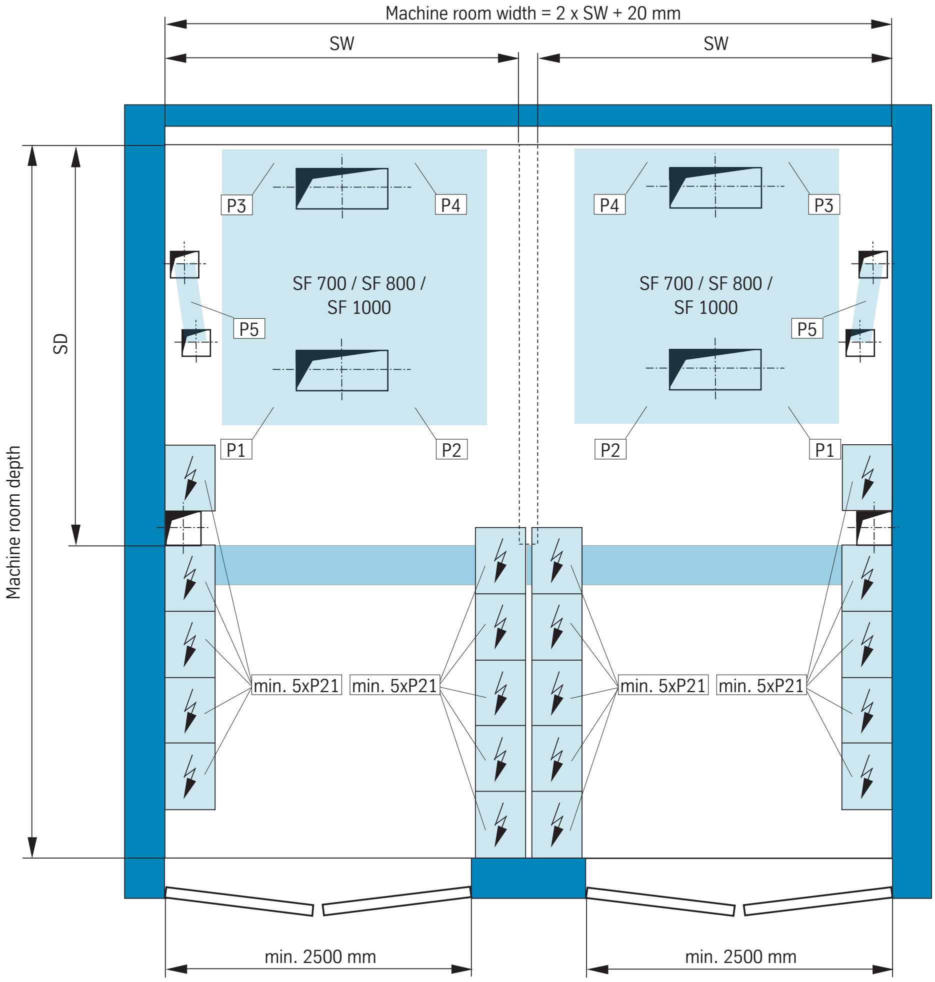
The precise location of the components and touchdown points in the pit vary depending on the rated load. The precise dimensions can be taken from the project planning drawings which are available on request.

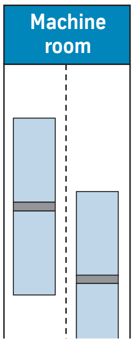
Load points P 7	Dynamic impact load per guide rail on activation of the safety gear of the elevator car (with both elevator cars) in downward direction.
Load points P 8	Dynamic impact load per buffer for activation of buffer of the elevator car (with both elevator cars) in downward direction.
Load points P 9	Dynamic impact load per buffer for activation of buffer of the counterweight in downward direction.
Load points P 10	Static load of each guide rail of the counterweight (without safety gears on the counterweight) or dynamic impact load of each guide rail on activation of the safety gear of the counterweight in downward direction.
Load points P 11	Load by the of the compensating rope of the elevator car (with both elevator cars) in upward direction..

We will be glad to provide you with the specified loads to assist in planning your preferred configuration.

Machine room on one level
Fact Sheet COUPL BD 61

Ground plan and forces in the machine room on one level



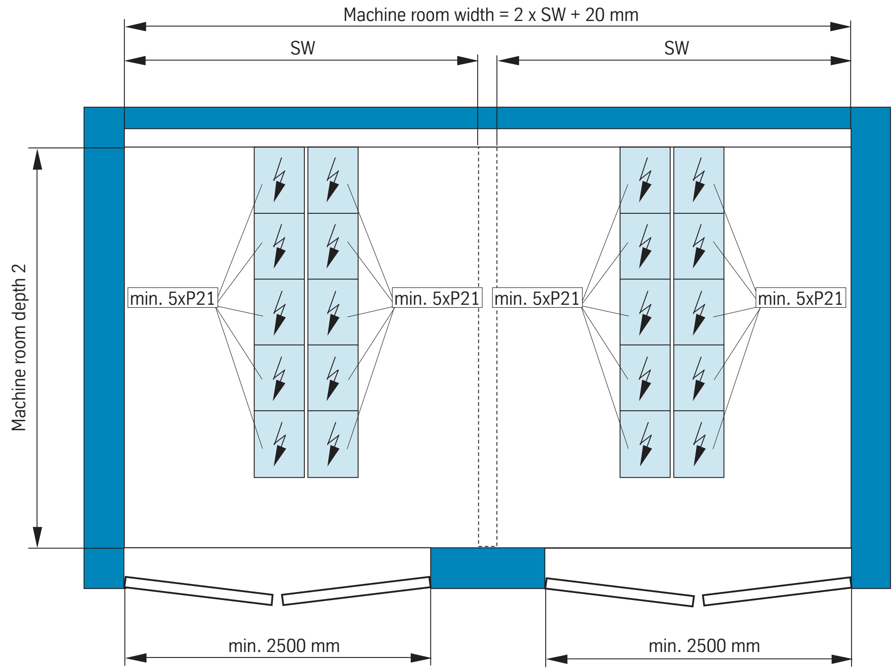


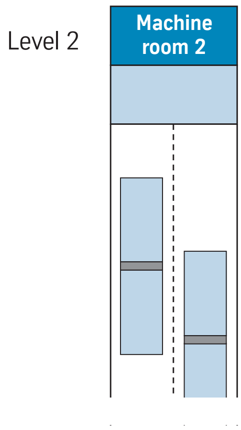
The exact position of the components in the machine room, the ceiling openings, the rope fixing points (only with suspension 2:1) and the wall openings vary depending on the rated load and speed. The precise dimensions can be taken from the project planning drawings which are available on request.

We will be glad to provide you with the machine room dimensions to assist in planning your preferred configuration.

Machine room on two levels
Fact Sheet COUPL BD 61

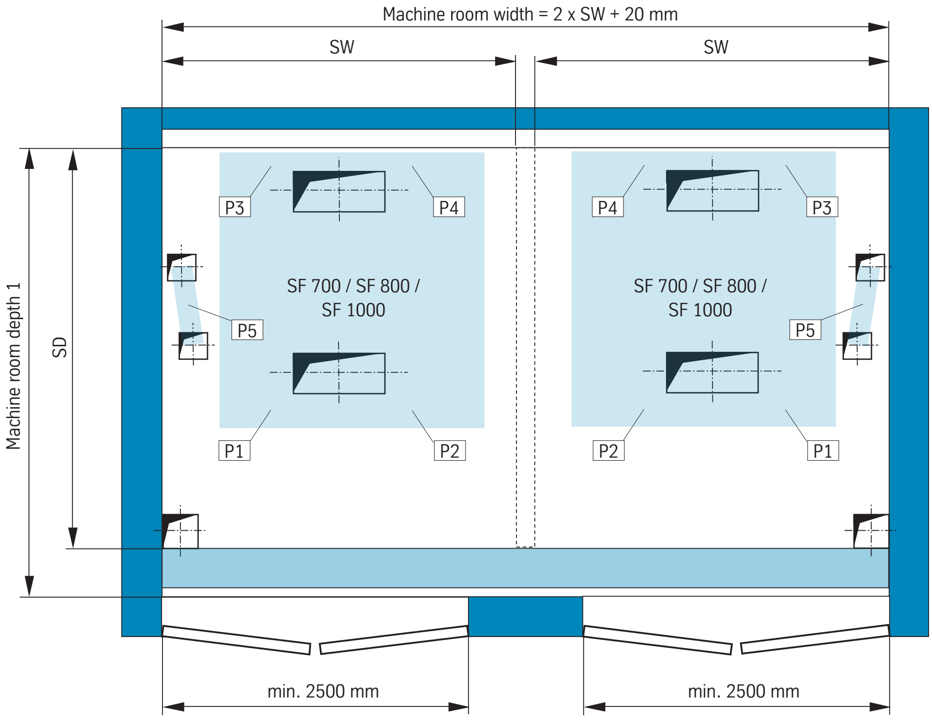
Ground plan and forces in the machine rooms on two levels – upper machine room

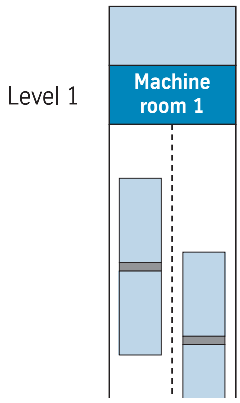




The precise location of the components in the machine room, the ceiling opening and the wall openings varies depending on the rated load and speed. The precise dimensions can be taken from the project planning drawings which are available on request.

Ground plan and forces in the machine rooms on two levels – lower machine room

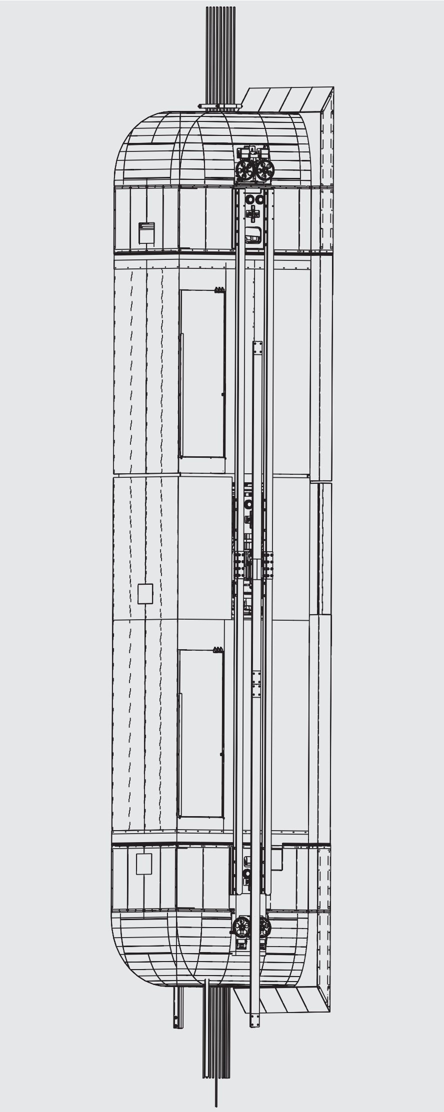




The exactly position of the components in the machine room, the ceiling openings, the rope fixing points (only with suspension 2:1) and the wall openings vary depending on the rated load and speed. The precise dimensions can be taken from the project planning drawings which are available on request.

We will be glad to provide you with the machine room dimensions to assist in planning your preferred configuration.

Technology I
Fact Sheet COUPL BD 61

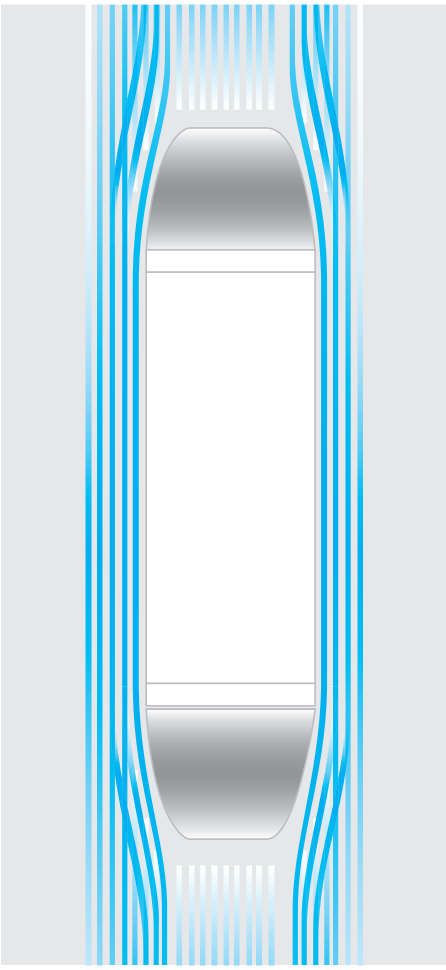


COUPL elevator cars
The centrepiece of the COUPL is the elevator car unit in which two elevator cars are arranged one above the other and firmly interconnected. This means the two elevator cars can only move jointly through the shaft.

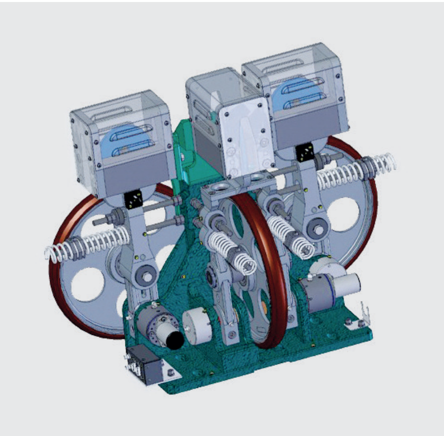
The distance between the floors in the building to which the COUPL is to travel determines the distance between the two COUPL cars. For better orientation, the following specification is frequently made: the lower COUPL car stops at landings with odd numbers and the upper COUPL car at landings with even numbers.

The very high distance between the roller guides of the elevator car unit enables excellent ride comfort. This also means that very high elevator speeds of more than 10 m/s (more than 36 km/h) can be achieved with very quiet running.

Aerodynamic measures
In order take high comfort demands into account, aerodynamic measures are required on the COUPL car unit and in the shaft at high speeds. These measures are based on the cross-section ratio of the COUPL car unit in relation to the shaft and the speed and travel height of the elevator. The air resistance is reduced and wind noise in the COUPL cars and in the building are reduced.



ThyssenKrupp always develops a complete concept, where aspects of flow dynamics are considered and optimally harmonized.



Active roller guide, ARG

Guide system
The guide system on elevators with very high speeds is mainly responsible for the quality of the running performance. During installation of the guide rails in the shaft, the latest measuring methods are used to ensure extreme precision.

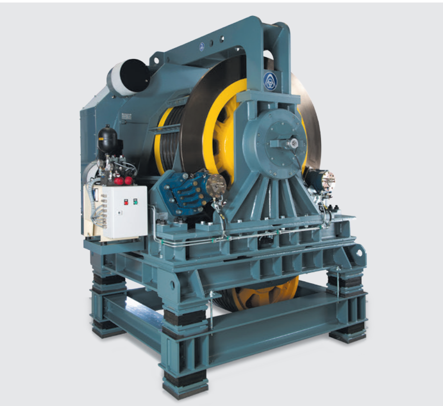
The deployment of high-quality, spring-loaded roller guides on the elevator car and on the counterweight is another very effective measure to optimise the travel quality of the elevator car and noise development.

Active roller guides can optionally be used to satisfy the highest demands in low vibration and low oscillaton. In the same way as a highly modern suspension, the corresponding software is used to adapt them precisely to the conditions in the shaft and the load conditions. This actively balances out even the smallest irregularities in the rail system that can occur in very high buildings.

Technology II
Fact Sheet COUPL BD 61

Destination selector controller, DSC

- On request, the COUPL is operated via the destination selector controller, DSC. Input terminals are mounted in the landings. The passengers can use these to enter their desired destination and are shown the assigned elevator which will take them to the destination landing fastest. An input of the destination is no longer required in the elevator car.
- The input terminals can be designed with touch screens of different sizes. Your individual requests are taken into consideration in the design of the user-friendly, graphic user interface. Alternatively, ten-key keyboards can also be used.
- These input terminals can be installed in the main access area and also in the passageways or beside the access control systems. Waiting times in front of elevators are thus reduced.
- The latest generation of the destination selector controller works with the intelligent algorithm of the **Dynamic Group Control, DGC.** Depending on the traffic situation, the destination requests are served perfectly by the COUPL systems and all other elevators in the group. The performance of the destination selector controller is increased by this intelligent and "forward-looking" allocation of the elevators and offers even more comfort for the passengers and higher handling capacity.



SF 1000 drive

Drives from a different league

In case of the COUPL, the car size is not the only component one size larger than for conventional elevator. Through the in-house developed drive machines, ThyssenKrupp Elevator consolidates its position as a leader in the premium and high-performance elevator market.

The low noise emissions of the drives combined with an installation-specific balanced mounting ensure optimal separation from the building. This is an important aspect that we satify with our technology and experience.

Frequency converter VVVF
with energy recovery

Power electronics

Frequency converters with active power regeneration are available for the higher range of performance. The generatoric energy created during the braking phase is returned to the supply network, contributing to economic efficiency. Their electrical layout ensures particularly low system perturbation.

High-performance technology at one stop

ThyssenKrupp covers the complete range of options in elevator technology for high-performance systems such as the COUPL with their own components. These are perfectly geared to one another, guaranteeing that the elevator systems meet the highest requirements and can achieve energy efficiency class "A".

Special planning aspects I
Fact Sheet COUPL BD 61

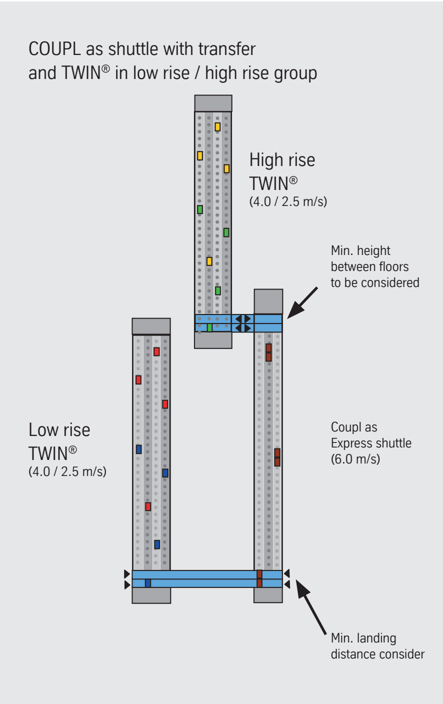
Vertical transportation concept
A vertical transportation concept is created taking into consideration the later utilisation of a building. If various types of use are planned (office, hotel, residential building), each type of use should be assigned separate elevators / groups of elevators. This results in a clear structure of the traffic flows and enables effective entry control for the building.
The double-decker COUPL can be used to move very large flows of passengers, for example from the entrance area to special levels from where the users reach their destination landings quickly with other elevators. This enables efficient splitting of the flows of traffic among a number of groups of elevators.

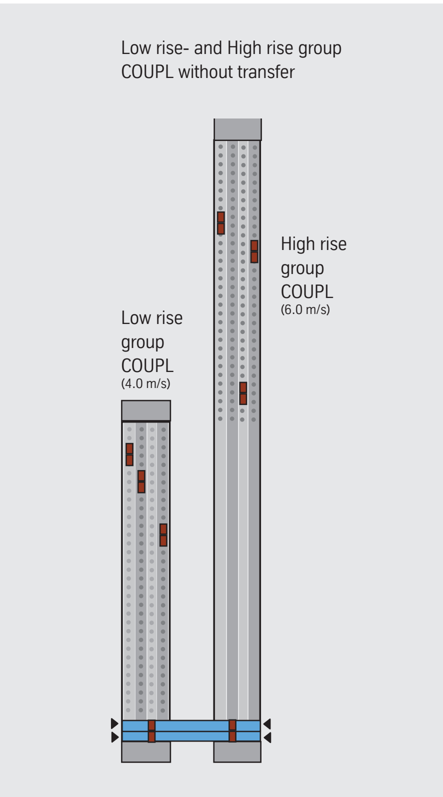
Handling capacity calculation
Alongside the verification of adequate handling capacity, the major aspects in creating vertical transportation concepts include determining the required number of elevators, assigning the function of the elevators / group, and selection of an appropriate car size, as well as the speed of the elevator cars.
ThyssenKrupp Elevator uses an independent and freely available simulation software to calculate the handling capacity. The software has been expanded for ThyssenKrupp users to include the algorithms developed in-house. It therefore enables, among other things, simulation of the COUPL system in its interplay with different elevator systems – for example with the EVOLUTION® BLUE, UNIQ, SONIC and TWIN® systems – and different configurations.

Car size
The ideal car size is determined in relation to the travel height or the number of approached landings within the framework of the handling capacity calculation.
As a rule, the most important factor in the COUPL system is a highly productive connection between two or more main areas in the building. Almost all passengers enter and exit at one landing, for example in the main entrance area (lobby) and in transfer landings (sky lobbies).
This is why larger elevator cars (rated loads) have been selected for the COUPL, making the possible number of passengers and handling capacity correspondingly high.

Speed
As the COUPL system is frequently deployed as a feeder system for high-rise elevator groups or as a shuttle to outdoor viewing platforms, time-consuming intermediate stops are eliminated. The maximum speed of the elevator can be reached at all times and reduces the travel time accordingly.
Higher travel speeds are selected for the COUPL to maximise the handling capacity.

Special planning aspects II
Fact Sheet COUPL BD 61





Group of elevators with COUPL

As a fundamental planning recommendation, the COUPL system should be planned for the transport of large flows of passengers to a few landings.

On the one hand, the COUPL is ideal as an express feeder system (shuttle) to change-over and distributor floors (sky lobbies). This means that large flows of passengers can be moved to the middle area of a building and distributed from there with conventional elevators or with the TWIN® system to the destination floors.

On the other hand, the COUPL used as a rapid high-rise elevator is the ideal connection between the entrance and the top area of a building. For example, large flows of passengers are moved from the entrance to the outdoor viewing platform. Aspects of entry control and building security can be taken into account very easily.

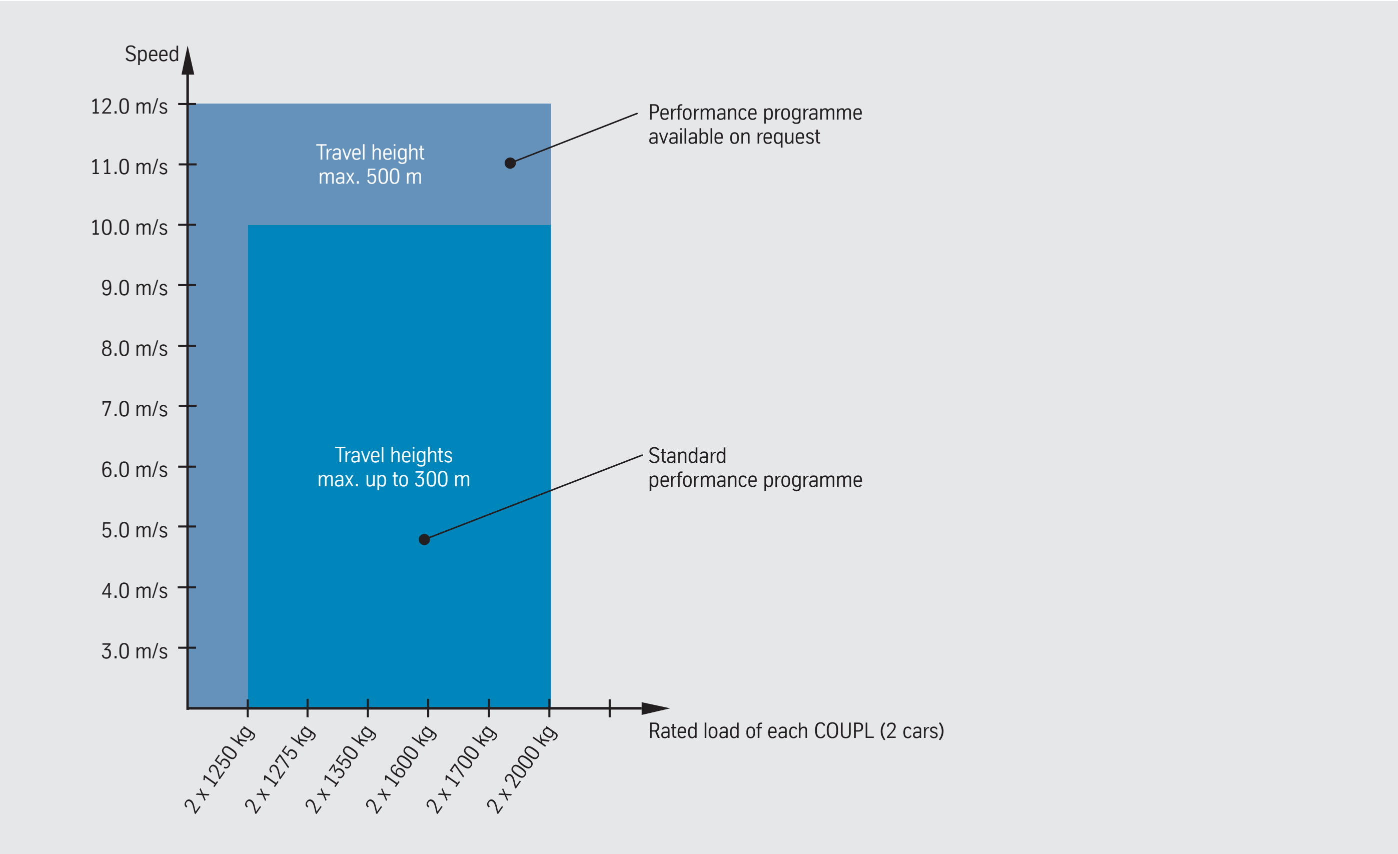
It is highly recommended for the COUPL system to plan two access levels connected by escalators, for example. This is the only way both elevator cars can be loaded and unloaded simultaneously. The division into two levels also minimises high concentrations of waiting passengers, as the area of the elevator lobby is doubled.

Grouping a number of elevators under the same control system requires that the elevators are positioned close together. The lobby in front of the access doors to each elevator must have the corresponding size in order to be able to handle crossing flows of traffic (persons entering and exiting). As a planning guide value, the CIBSE Guide D *) recommends applying 1.4 persons / m² to the lobby, whereby the total area should be able to handle the capacity of all elevators.

The above-mentioned planning manual provides a proposal for optimal elevator arrangements and recommends a minimum distance to walls or lifts on opposite sides of 1.5 to 2 times the car depth. Furthermore, elevator lobbies should not be planned and used for other functions, for example passageways.

*) Cf. CIBSE: Guide D:
Transportation systems in buildings (2010)

Options I
Fact Sheet COUPL BD 61



Standard performance programme

Service feature	Attribute
Rated loads per COUPL (2 elevator cars, one above the other)	2 x 1250 / 1275 / 1350 / 1600 / 1800 / 2000 kg per COUPL
Number of passengers per COUPL (2 elevator cars, one above the other)	2 x 16 / 17 / 18 / 21 / 24 / 26 per COUPL
Speeds	2.5 / 4.0 / 5.0 / 6.0 / 7.0 / 8.0 / 9.0 / 10.0 m/s
Travel heights	Up to 300 m
Floor-to-floor distance	HST min. = CH + 1000 mm; HST max = 6500 mm
Elevator car design	Basic design as well as customer-specific requests possible
Elevator control system	Functions of the TCM-MC1 control system

Optional performance programme

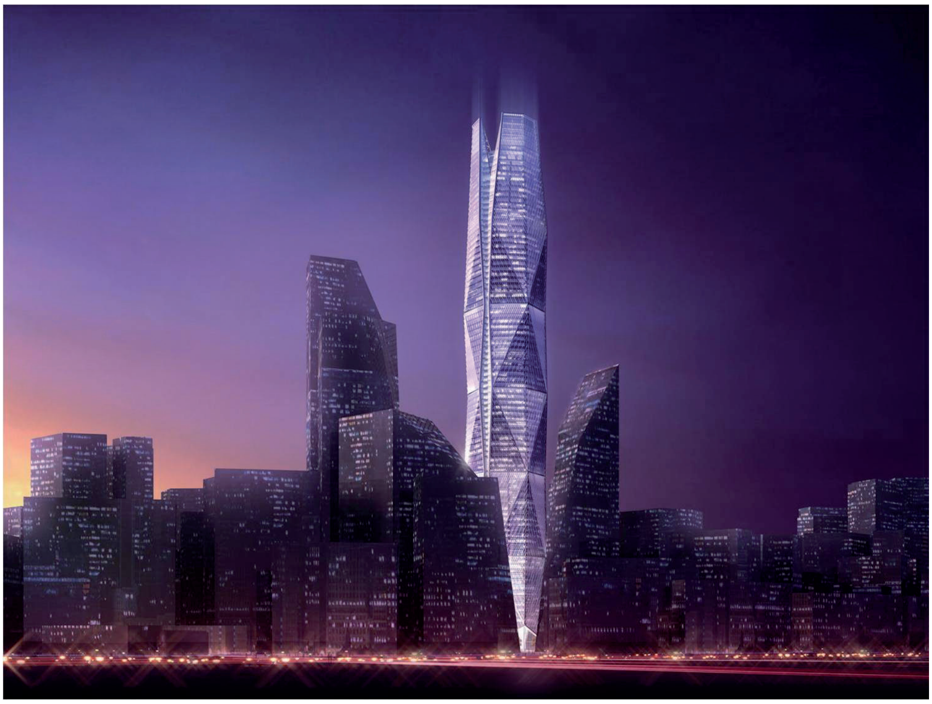
Service feature	Attribute
Group	up to 8 COUPL systems
Doors	Glass doors, special fire resistance tests etc.; door widths up to 1400 mm, door heights 2000 to 2700 mm
Car design	Liftscreen
Destination selection control	Operation via input terminals with 5.7", 10.4" or 15" touchscreen and user-friendly graphical user interface or numeric keypad; input terminals with wall fastening outside of the elevator car; landing display and verbal announcement in the elevator car

Options II
Fact Sheet COUPL BD 61

Performance programme available on request

Service feature	Attribute
Rated loads per COUPL (2 elevator cars, one above the other)	more than 2 x 2000 kg per COUPL
Number of passengers per COUPL (2 elevator cars, one above the other)	more than 2 x 26 persons per COUPL
Speeds	Available on request
Travel heights	above 500 m
Floor-to-floor distance	deviating dimensions
Shaft dimensions	deviating dimensions
Car dimensions per elevator car (per COUPL)	deviating dimensions
Doors	Available on request
Car design	Panoramic elevator
Special features	Alternative landing below the lowest landing in recessed pit or above the top landing in raised headroom

Reference
Fact Sheet COUPL BD 61



CMA Tower
Riad, Saudi Arabia

Virtually the entire range of products of ThyssenKrupp is installed in the 385-metre high CMA Tower in the Saudi Arabian capital Riad: eleven COUPL double-decker elevators, 17 TWIN®s with 34 elevator cars, twelve conventional elevators – including a number of machine-room-less installations – as well as twelve escalators.
The new administrative office is not only the tallest skyscraper in the country - the construction project which received large international investments is also the tallest building in the world that houses only offices. By the end of 2012 over 5,500 people are expected to work in the three underground and 79 above-ground floors with approx.185,000 square metres of available area. So that these people can reach their work station as quickly and safely as possible, architects and main contractors decided on a special innovative traffic control concept:

The COUPL double-decker elevators are used for shuttle operations and travel to various distributor levels at up to seven metres per second. The TWIN®s, each with two independent elevator cars in one shaft, then handle the subsequent transport to the desired floors.

<u>11 COUPL systems</u>
- 2 x 1600 kg rated load per COUPL
- Travel heights up to 354 m
- 5 landings each for both elevator cars
- Speeds up to 7 m/s

<u>Other elevator installations</u>
- 17 TWIN® systems
  with 1600 kg rated load per elevator car,
  a travel height of 123 m,
  24 landings and
  speeds of up to 5 m/s
- 1 SONIC as a firefighter's elevator
  with 5500 kg rated load,
  a travel height of 371 m,
  81 landings and a
  speed of 5 m/s
- Other quick single lifts
  SONIC with travel heights up to 359 m
  and speeds up to 5 m/s
- 8 EVOLUTION® BLUE
  (machine-room-less)
  with up to 2500 kg rated load,
  up to 26 m travel height,
  5 landings and
  speeds up to 1.6 m/s

Notes

Please contact:

BLUECOMPETENCE
Alliance Member
Partner of the Engineering Industry Sustainability Initiative

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