Technical Description
ALIMAK SCANDO 650
Construction Hoists

This manual is only applicable if the manufacturing number indicated below corresponds to the manufacturing number stamped on the identification sign of the equipment. Where there is a conflict contact your ALIMAK representative.

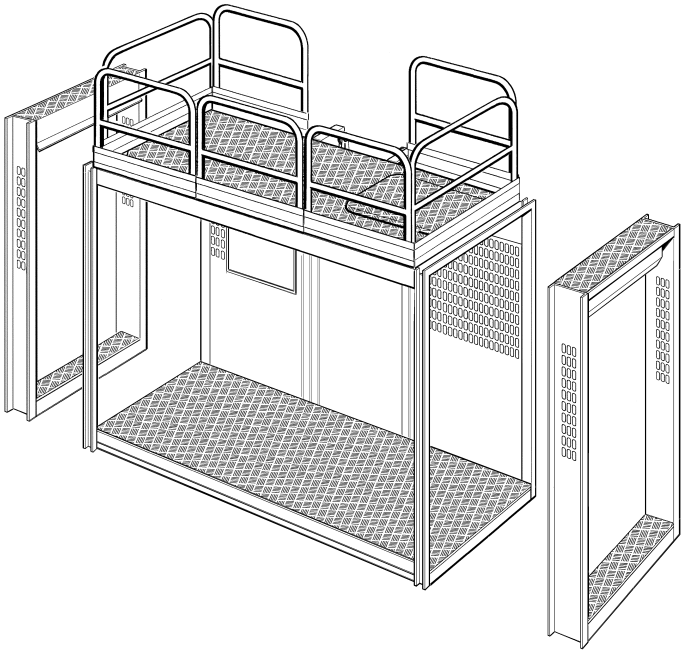
YOUR HOIST HAS:

Manufacturing No.:	**Year:**	Part No. 9100272 - 1 03 2006 - 01 - 30

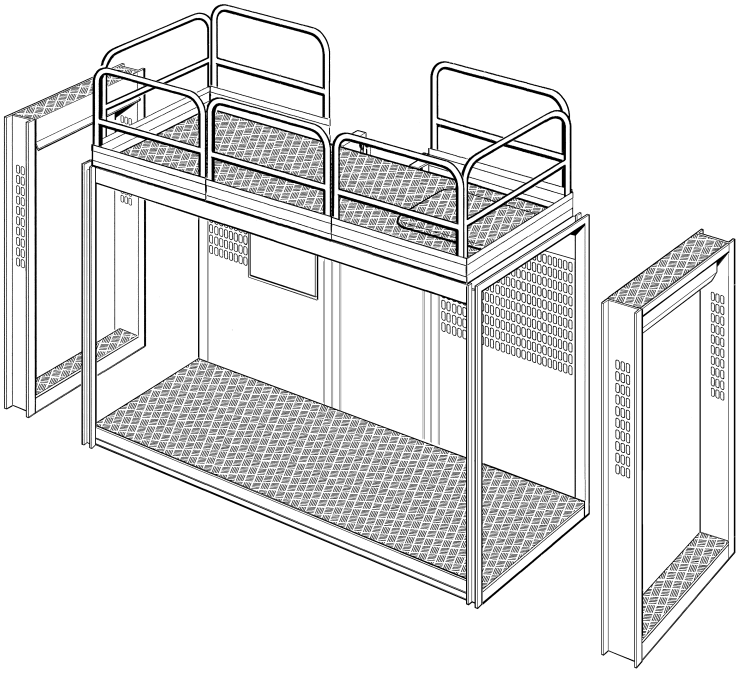
CONTENTS

See Operator’s Manual for chapter C, D, E and F.

2.8 m car base structure **(9’- 2 1/4’’)**



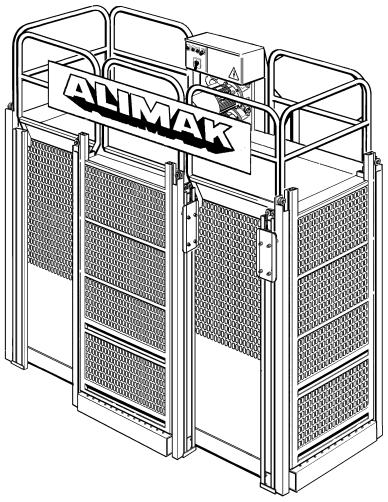
3.5 m car base structure **(11’- 5 3/4’’)**

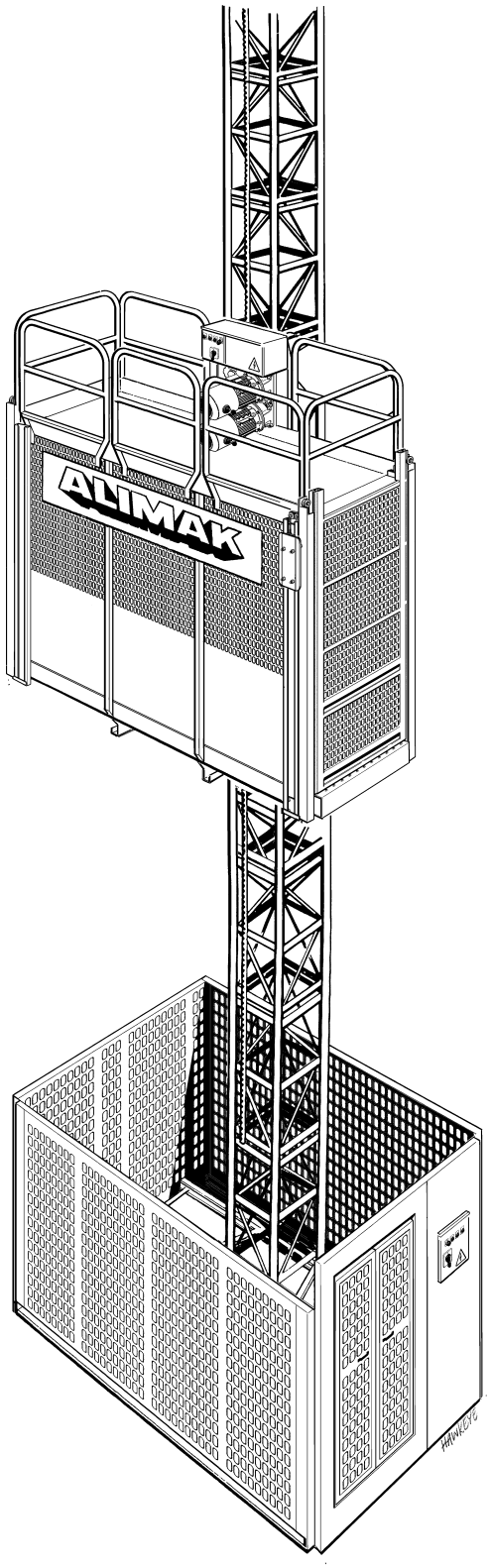


Technical description

General

The new SCANDO 650 hoists are construction hoists for personnel and materials transport. Two car base structures can be combined with different gate units and extensions to a number of different car lengths up to maximum 4.6 m **(15'- 1").** Car width 1.5 m **(4'- 11")** is fixed.
The car, as well as the ground enclosures doors/gates, can be positioned on any of the three sides away from mast.





The hoists have a lifting capacity of maximum 3200 kg **(7100 lbs.)** up to a lifting height of 200 m **(650 ft.)**.
Lifting speed is 38 m/min. **(125 fpm.)**.
alt. 42, 54 or maximum 65 m/min. **(135 , 175 or 215 fpm.)** with VFC-operation.
The SCANDO 650 construction hoist can be set up with single or dual cars.

The hoist is easily transported by truck, to and from the erection site and handled with forklift trucks or jib cranes on the site.
The SCANDO 650 construction hoist is a part of the SCANDO 650 access system and can be combined with other products, i.e. platforms or materials hoists.

Regulations

The hoist and its mechanical and electrical components are designed and dimensioned to conform to operating conditions on contruction sites and fulfil demands according to EN 12159 and ANSI/ASME. The hoists and its components have been thoroughly tested and conform to one or several of the following international/national standards: IEC, CEE, EN, DIN, UL, CSA, SS etc.

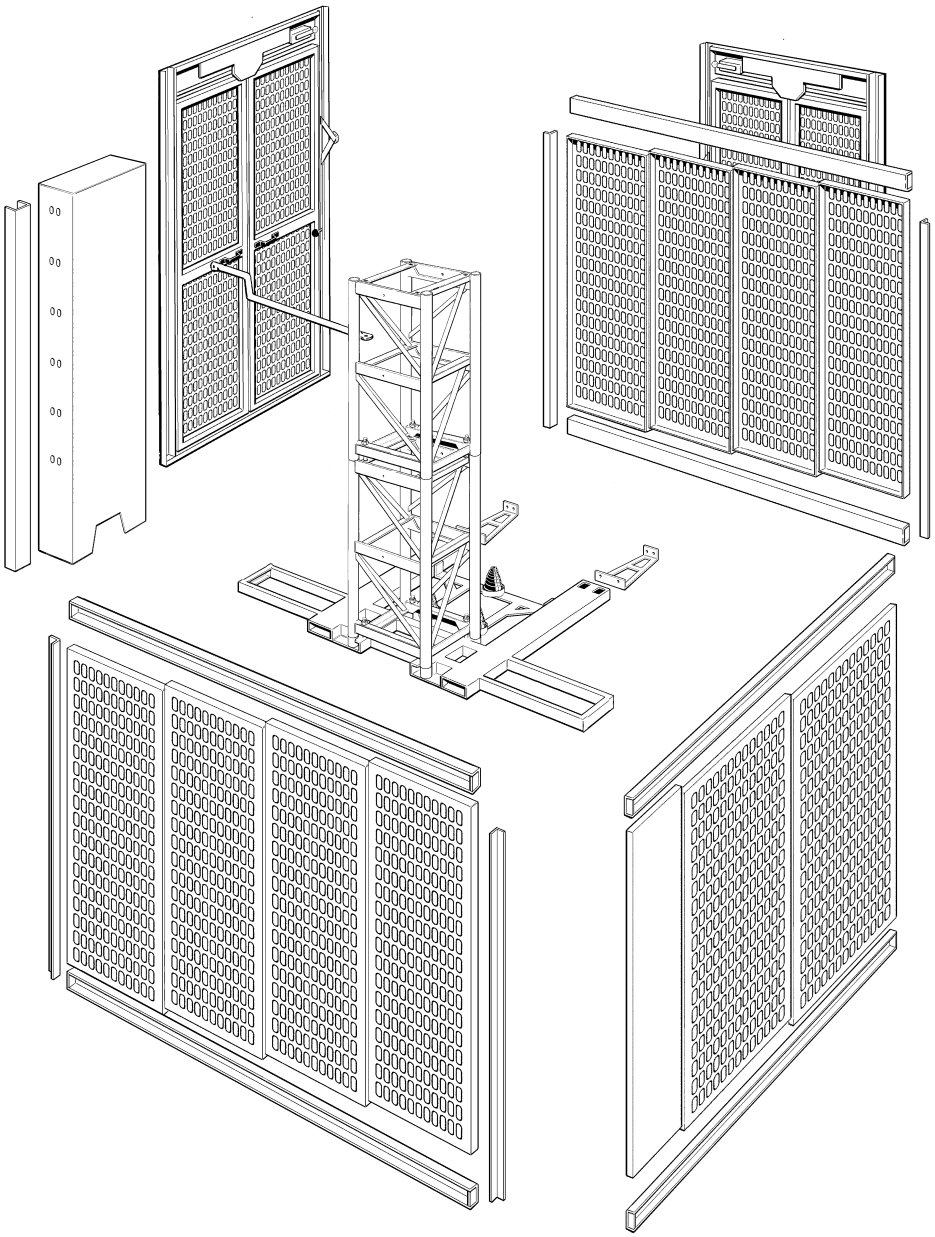
Necessary documents such as operator's manual, wiring diagrams, circuit diagrams and spare parts lists are delivered with the hoist.

Foundation

The foundation is a reinforced concrete slab and cast ”in place” in accordance with instructions given under **”Preparations before installation”** and **”Concrete slab dimensions”** in this manual.
A transportable sheet steel foundation or a precast concrete slab can also be used.

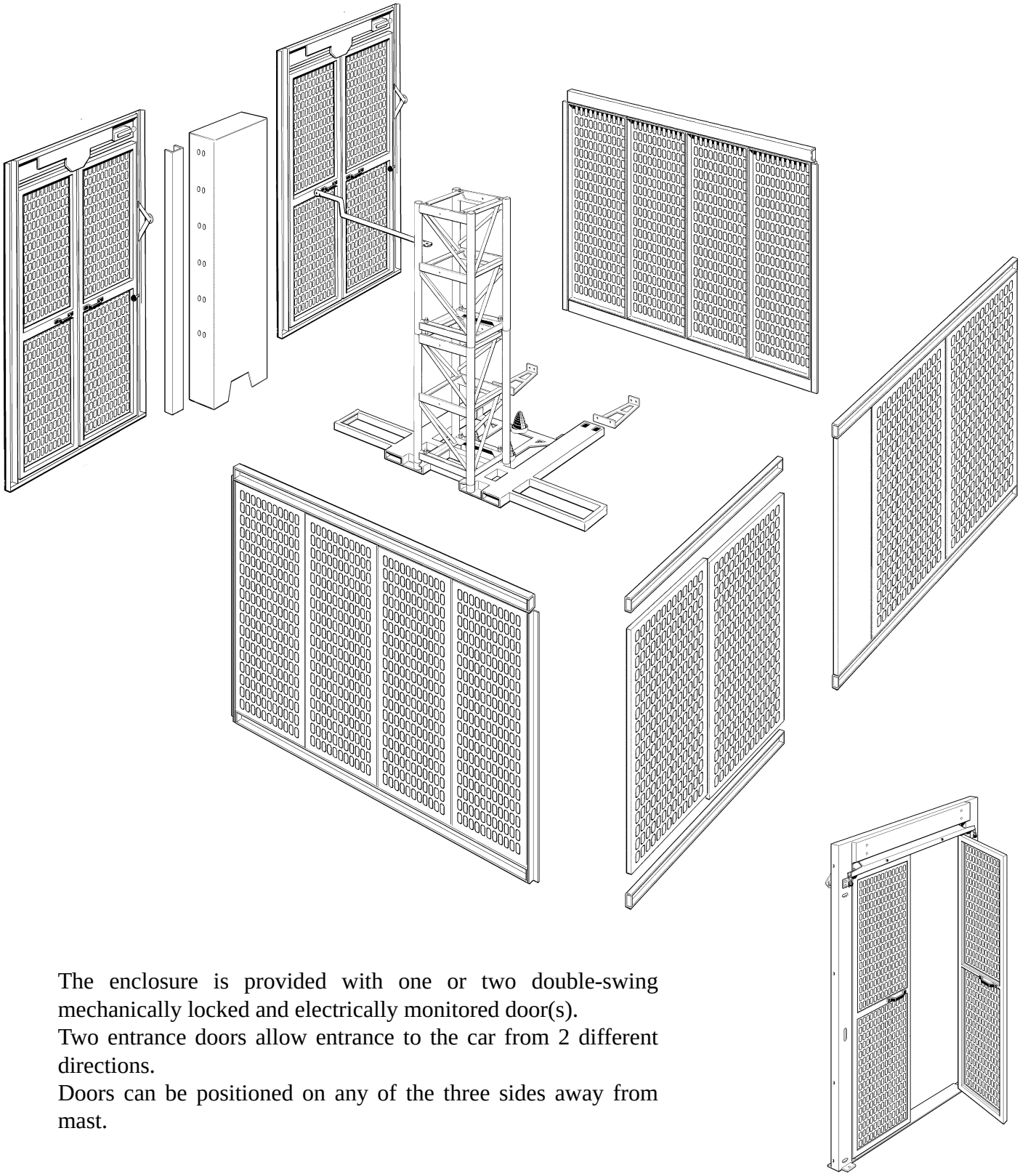
Base frame

The bottom mast section is bolted to the base frame, which incorporates 3 buffer positions, channels for fork lifting and 2 boltable outriggers to support the enclosure.
The hoist can be used freestanding, bolted to the transportable sheet steel foundation or the concrete slab.
With an additional buffer support the base frame also incorporates a dual car set up.

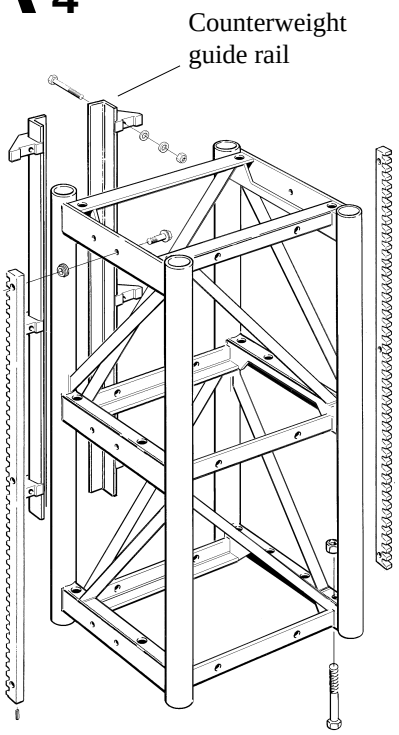


Ground enclosure

The foundation is enclosed by 2500 mm **(8'- 2 1/2")** high perforated steel sheet sections attached to the base frame.
The enclosure is built in modules and can easily be adapted for different lengths as well as twin car set ups. It can also be changed so that another SCANDO 650 modular system hoist/ platform can operate on the other side of the mast.



The enclosure is provided with one or two double-swing mechanically locked and electrically monitored door(s).
Two entrance doors allow entrance to the car from 2 different directions.
Doors can be positioned on any of the three sides away from mast.

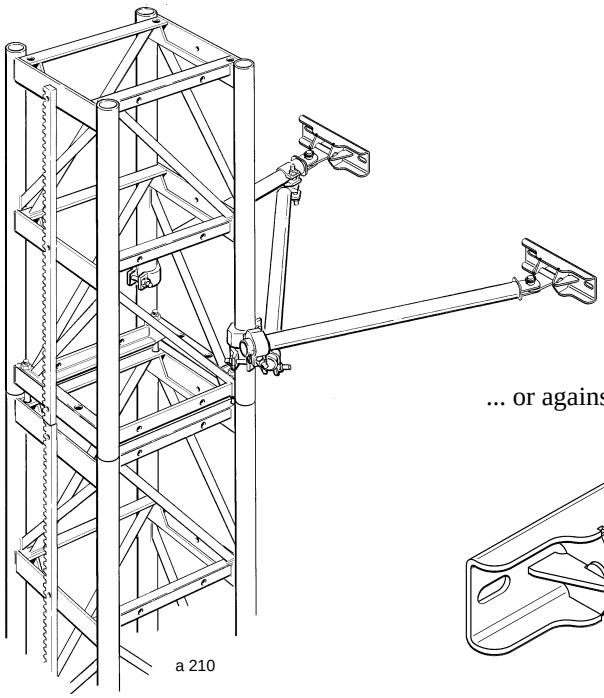


Hoist mast

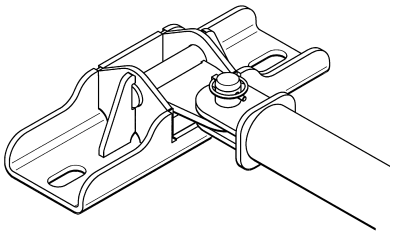
The square mast c/c 650 x 650 mm **(2'- 1 1/8" x 2'- 1 1/8")** is the mainstay of the SCANDO 650 access system. The mast is constructed of tubes and frames of high tensile steel and fabricated in lenghts of 1508 mm **(4'- 11 3/8")**. Each section is provided with one or two bolted rack(s) module 5 and the sections are bolted together with bolts and nuts.
The four guiding tubes and possibilities with two racks give dual car set up advantages. Counterweight guide rail can be bolted to all mast sections.

The ties are attached to the frames of the mast sections or alt. to the rear mast tubes. The other end to special brackets attached to the wall. The tie length is telescopic adjustable within different intervals. The ties can also be inclined from the horizontal. Specifications for each particular mast tie can be found in chapter H.

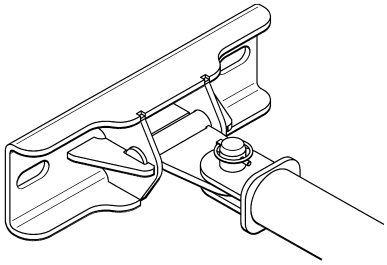
Mast sections and mast ties are hot dipped galvanized with the exception of the mast section rack.



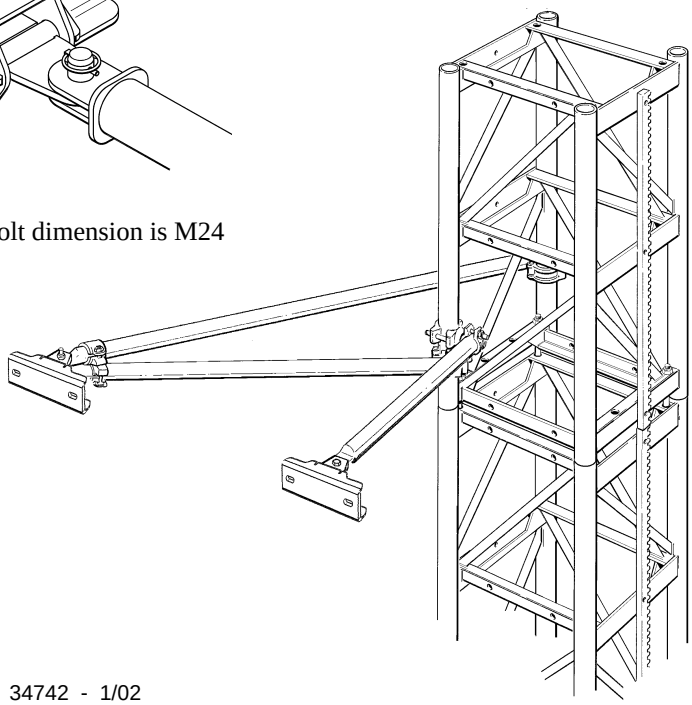
Corresponding wall
bracket can be installed
either on slab ...



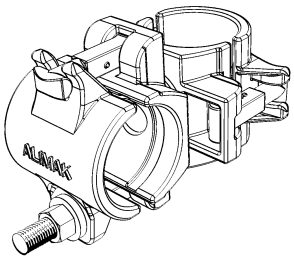
... or against wall



Wall bracket bolt dimension is M24

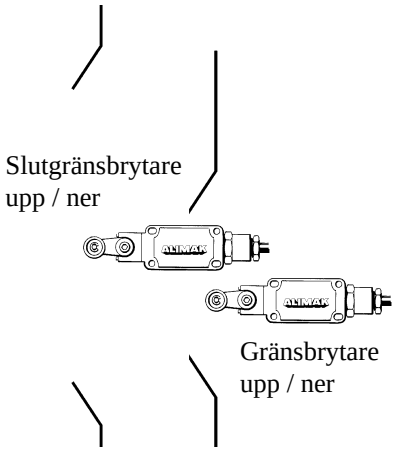


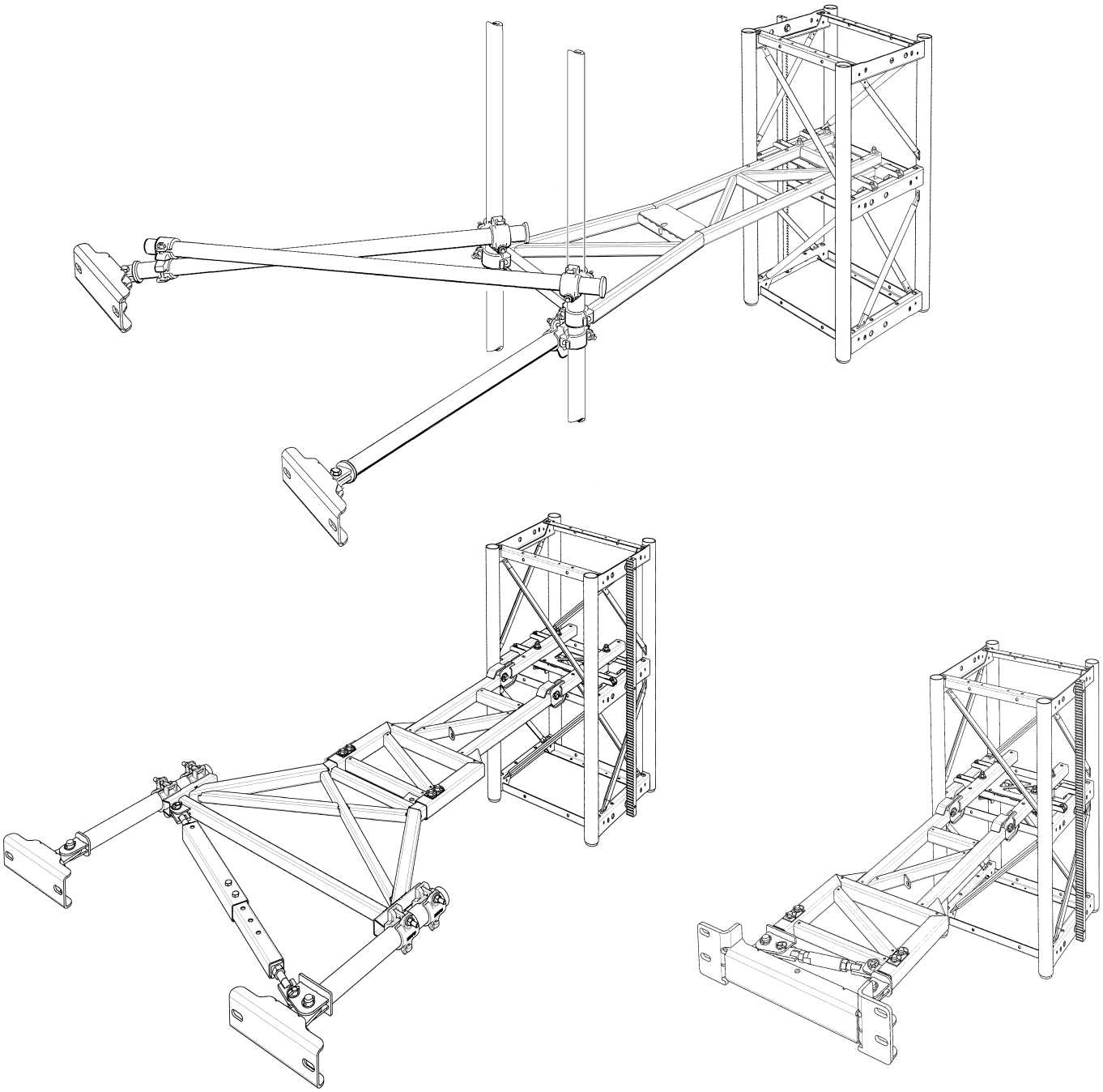
Alimak original dia. 76 mm
pivoted tube coupler



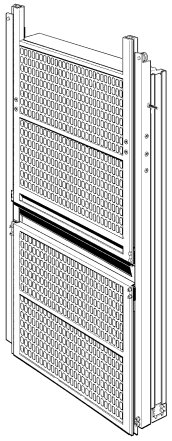
The hoist stops automatically at the top and bottom by means of cams attached to the hoist mast. The cams activate the normal limit switches located on the hoist car. Additionally there is a final limit switch activated by separate cams at the top and bottom of the hoistway.

The final limit switch controls a main contactor, which switches off all three phases of the main power supply to the drive motor(s).





Car



Car exit door in two parts

The car is sized to be suitable for ease of transport and is constructed of high quality steel for strength and weight reduction. The car walls are constructed of perforated steel sheeting allowing light to enter and also give the operator a clear view of the hoistway.

Individually adjustable ball bearing mounted guide roller assemblies guide the car on the mast.

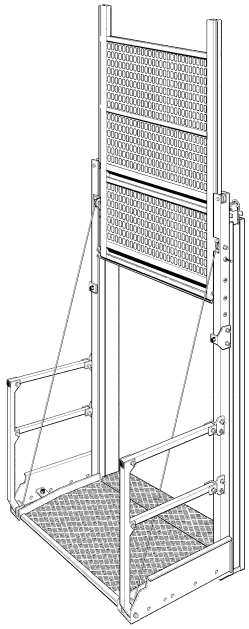
Car consists of multi layer built-up car floor with fire resistant plastic material on galvanized steel sheet and aluminium checker plate on top. The car roof is constructed of aluminium checker plate.

The car has mechanically locked and electrically monitored vertical guided entrance and exit doors.
The doors are modular for flexibility and in the SCANDO 650 access program, 4 different car doors are available. The lightweight moving door blades consist of aluminium profiles for ease of operation.
Normally the exit door is manufactured in two parts whereas the entrance door is in one part. (The entrance door is the one facing the door of the ground enclosure).

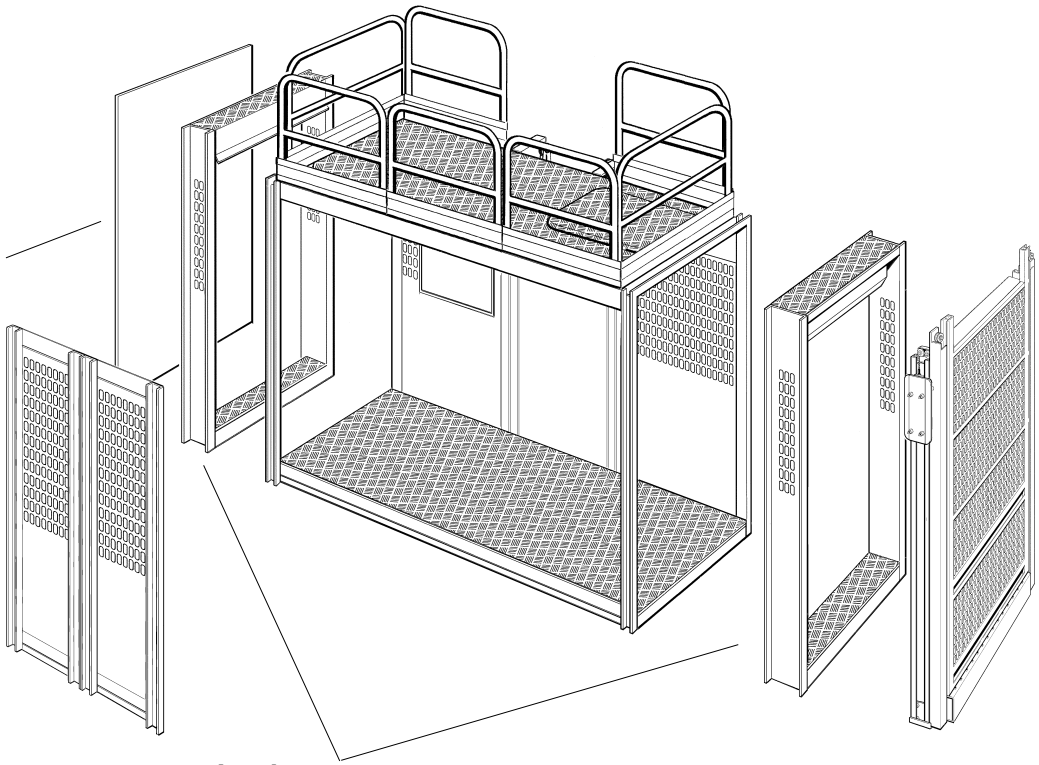
A 3.2 m **(10’- 6”)** wide full height entrance door with C-side location can be furnished for large cars with base structure length greather than 3.2 m.

The exit door can also be combined with a folding load ramp in 2 different versions;

Manual folding load ramp . . .



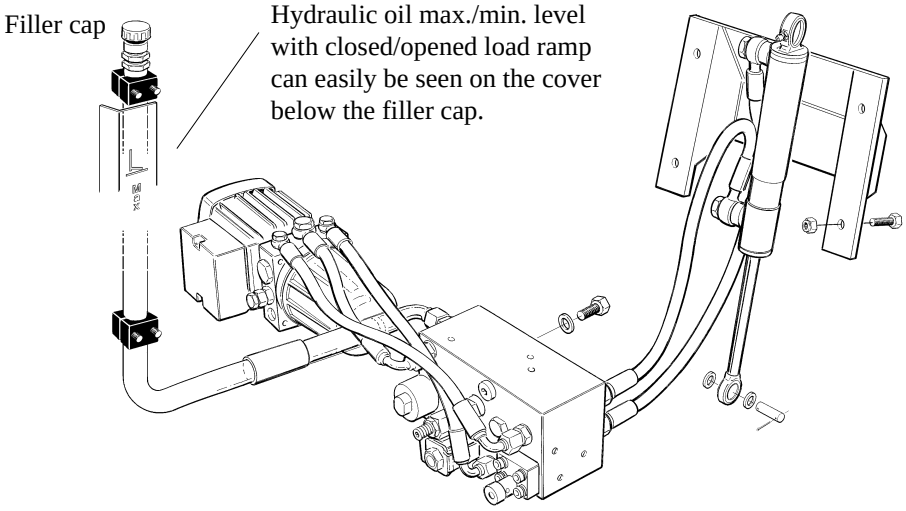
Manual folding load ramp

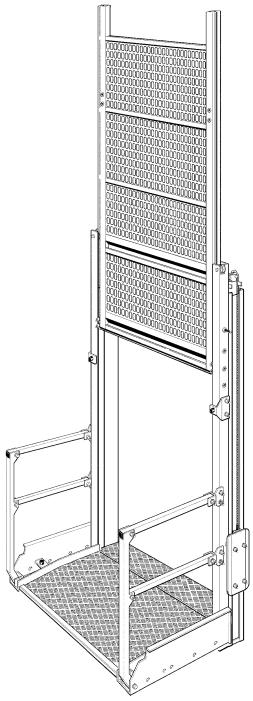


. . . or fully automatic electro hydraulic folding load ramp.

The hydraulic system double acting cylinder opens and closes the load ramp automatically at the landing and is operated by the automatic floor call selection system, ALC II.

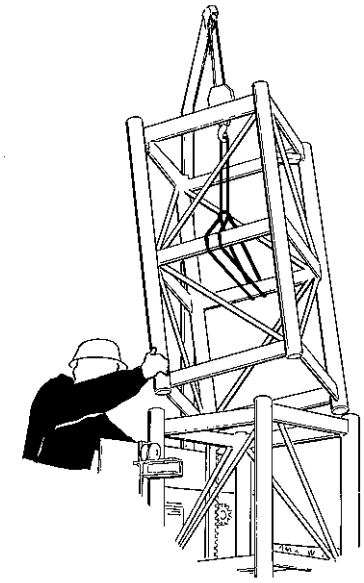
The electro hydraulic power pack is located on the floor portion





Fully automatic electro-hydraulic folding load ramp

of the gate/ramp section.



As the car roof serves as working platform during erection, it is provided with safety railing. There is also a trapdoor in the roof and a ladder in the car to gain entry to the roof for erection purposes.

Asymmetrical car configuration

The car length on each side of the mast shall be equal if possible. The difference may only be ***one*** extension section of 0.35 m **(1'- 1 3/4")**.

Although the hoist is asymmetrical it should be considered symmetrical and the longer end dictating the maximum allowable load.

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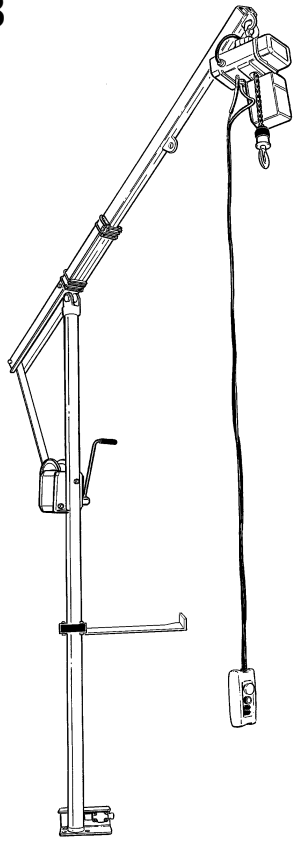


Erection crane, optional equipment

New type erection crane with manual adjustable jib equipped with electric winch can be furnished.

Payload capacity 250 kg **(550 lbs.)** = jib radius 570 – 1060 mm.
(1'- 10 1/2" – 3'- 5 3/4")
Payload capacity 170 kg **(370 lbs.)** = jib radius 350 – 1700 mm.
(1'- 1 3/4" – 5'- 7")

Weight approx. 40 kg **(88 lbs.)**, exclusive of electric winch.

Electric winch, 3 phase 440V, weight 13 kg **(29 lbs.)**.

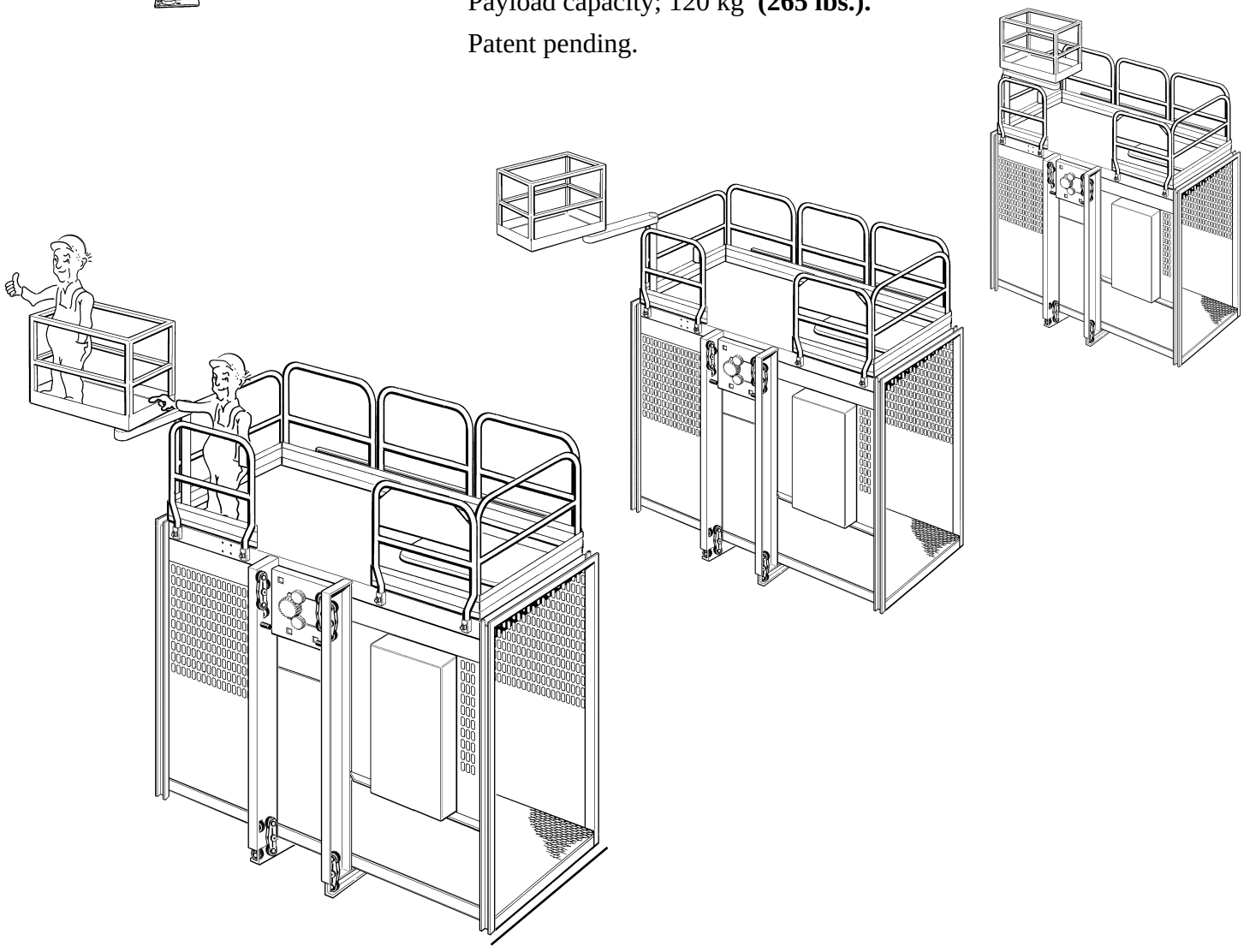
Movable erection platform, optional equipment

A manual movable erection platform to ease the mast section assembly and the mast tie installation can be furnished with the SCANDO 650 construction hoists.

Platform length adapted for different car lengths.
The platform reach is approximately 2 times its own length.

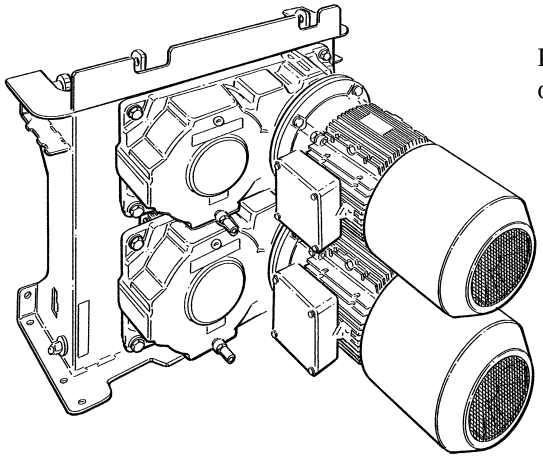
Payload capacity; 120 kg **(265 lbs.).**

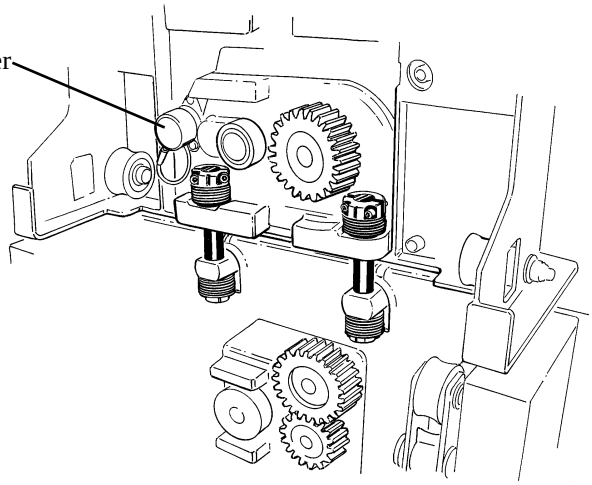
Patent pending.



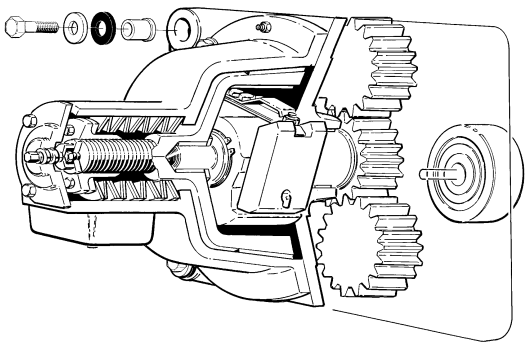
Drive unit

A compact unit with two or three pinions engages the rack of the mast. Each pinion is fitted to a high efficiency helical gear box driven by a flexible coupling, by a direct start or frequency controlled, squirrel cage induction motor with built-in electro-magnetic disc brake.
The drive unit is connected to the car by pull rods.
The connection between car and drive unit means that the hoist is prepared for an overload sensing system. (OSS).





The safety device is completely independent from the drive unit and installed inside the car with two pinions engaging the rack. The device is actuated by a centrifugal weight and stops the hoist when the normal rated speed is exceeded.



FC vs DOL

Frequency controlled electric motors give:

- better (softer) riding comfort when starting and stopping.
- better stopping accuracy.
- less brake wear.
- hoist speed can be reduced during installation and inspection procedures, which is not possible with direct on line (DOL) started electric motors.

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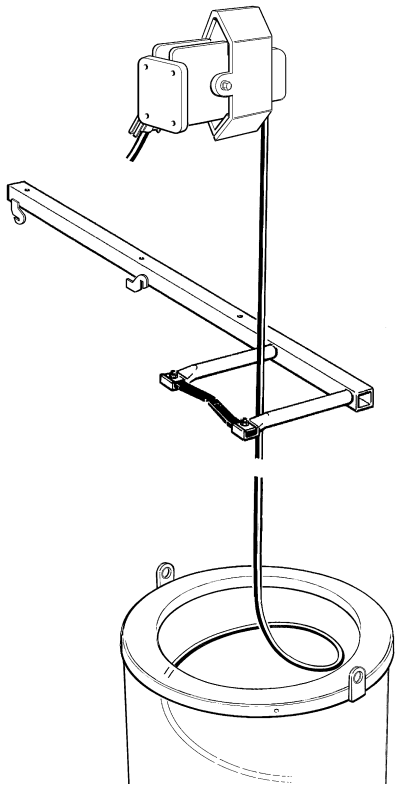
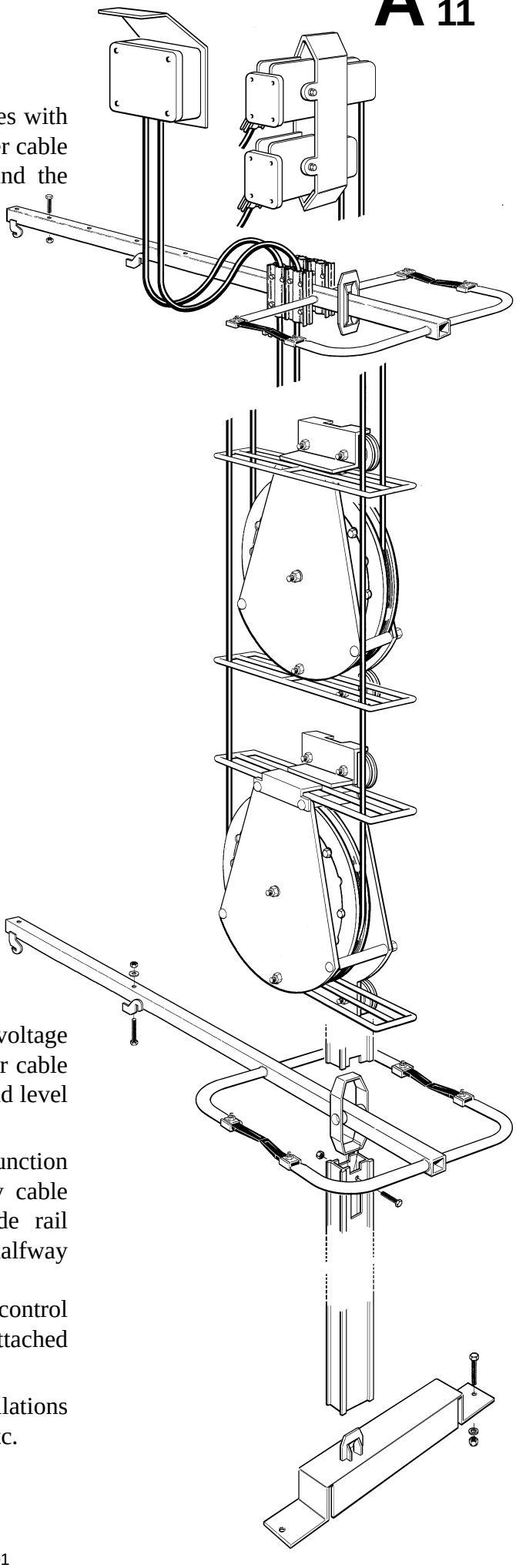
Cable guiding device

Type cable collecting basket

The trailing cable is coiled into a basket. U-shaped guides with plastic springs along the hoistway guide the trailing power cable between the cable collecting basket at ground level and the cable attachment on the car.





Type cable trolley on separate guide rail

To be able to control the cables and to overcome the voltage drop in the power cable at high lifting heights, the power cable and control cable are fixed firmly to the mast from ground level to a junction box in the mast halfway to the mast top.

The trailing power cable and the control cable from the junction box to the cable brackets on the car are tensioned by cable trollies. The cable trollies travel on a separate guide rail attached close to the mast from ground level to a point halfway to the mast top.
Differential expansion/contraction of the power and control cable requires that the two trollies are not mechanically attached to each other.

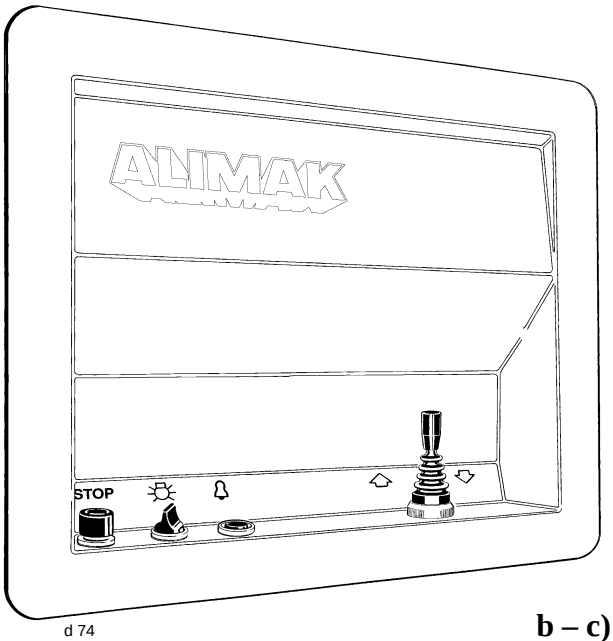
The method described above is also used for hoist installations in harsh surroundings with highwinds, low temperature etc.

Control system

Three different systems are available:

a) **Operator control system** from the car only by means of a joy-stick for travel up and down.

The system is automatic, i.e. the car stops as soon as the joy-stick has been released (dead man type control)



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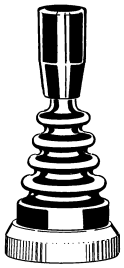


b – c) **ALIMAK Lift Control ALC**

The ALC is a microprocessor based control with a main software and two different control systems available:

b) **Semi-Automatic control system**

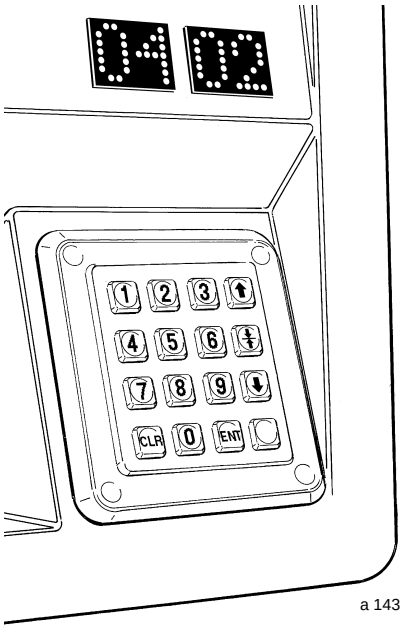
This is a common control system but now developed to work without any landing cams. The position of the hoist is determined by counting impulses generated by the pulse encoder attached to the gear box.

The machine can be operated from inside the hoist and if chosen, also from the landings by using Up, Down and Stop Next Landing push-buttons.
By pressing a button for up or down, the hoist starts travelling in the chosen direction. When the hoist approaches the desired landing, the button Stop Next Landing is pressed. The hoist will then stop automatically at the landing.

Calls/destinations from the landings transmit on three 230VAC control wires between the hoist and the landings through the base panel. A destination order from the hoist has three seconds priority over landing calls.

c) Collective control system

This is an advanced control system available in the ALC controller. The machine can be operated from inside the hoist by destination push-buttons or a keypad and if chosen, also called from the landings.



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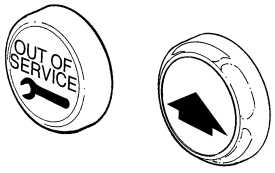
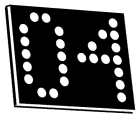
Each landing is provided with two Call buttons, one for Up and Down resp.



Push-button panels at landings

The actual position and the hoist destination is shown on displays inside the car.On these displays a fault indication is given.



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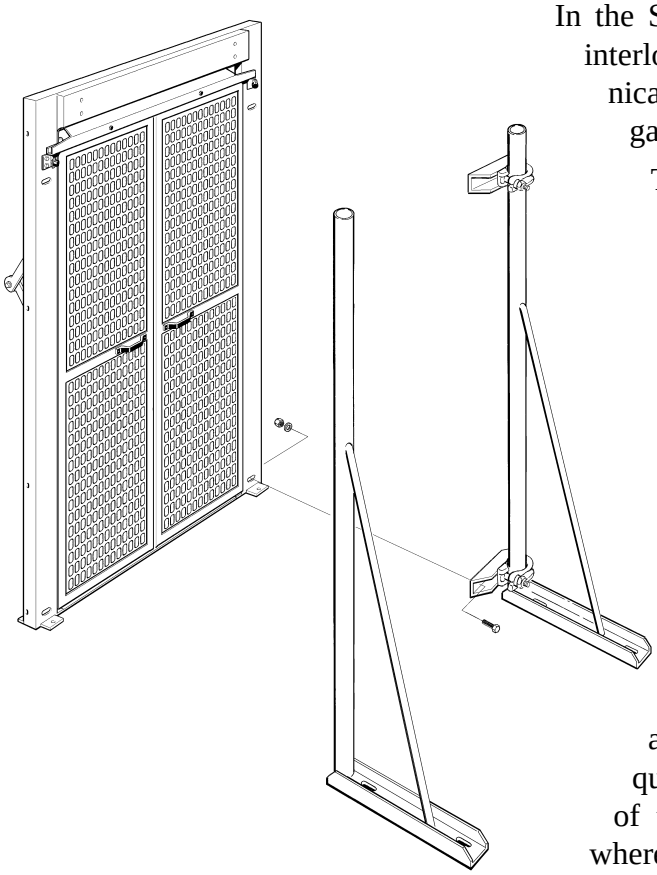
Landing equipment



In the SCANDO access system mechanically and electrically interlocked double-leaf swing doors are included. Or mechanically locked and electrically monitored horizontal sliding gates at the landings.

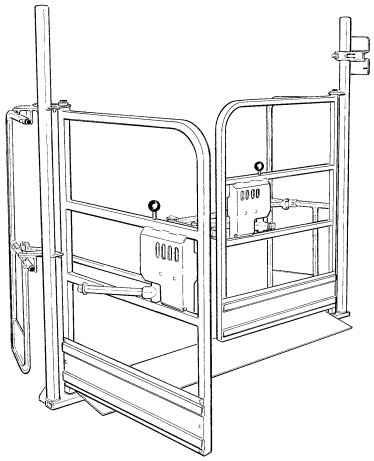
The landing equipment can be installed by connecting them to special brackets at the landings, in openings, on projections or facade scaffoldings. It can also be installed on vertical scaffold pipes parallel to the mast from the ground enclosure to the mast top.

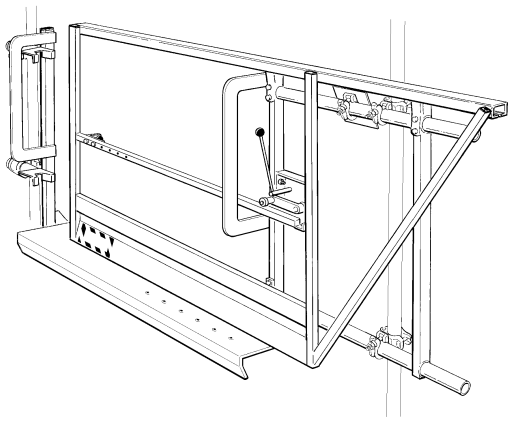
The electric interlocking of the landing equipment is connected to the control system of the hoist (stop circuit).

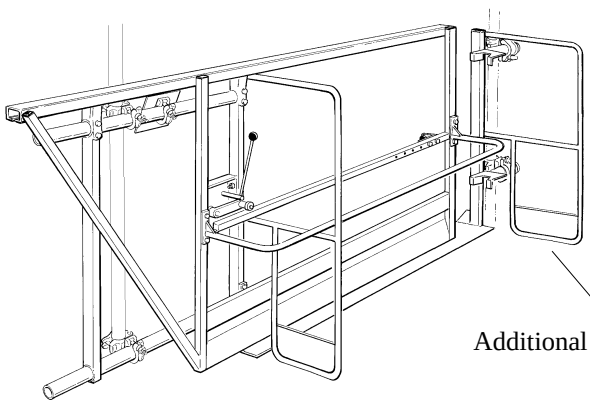
The landing el. equipment consists of a stainless steel box with necessary control push-buttons for calling the hoist. Connection cable as well as limit switch or electromechanical locks for monitoring of the landing door or alternatively the landing gate.

The equipment is provided with a 6-pole socket outlet and plug on the connection cable in order to achieve a quick, secure and proper connection to the control system of the hoist. 10-pole socket outlet and plug alternately, where ALC floor call selecting system occurs.

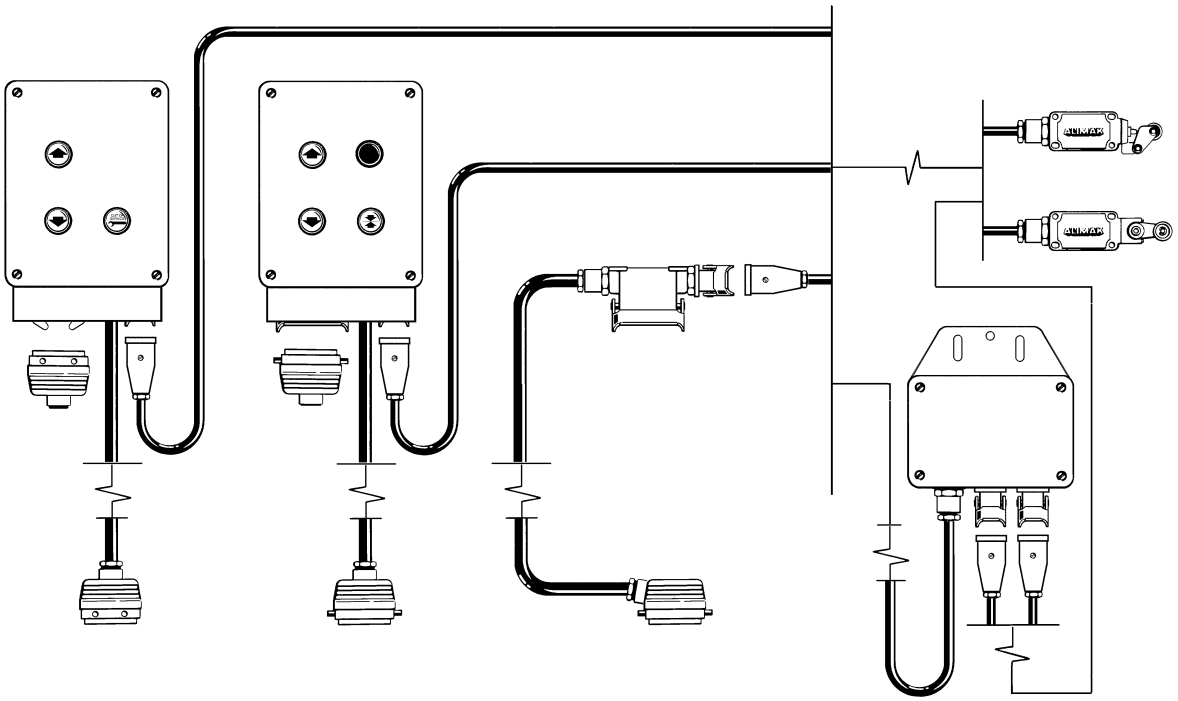
The electric equipment is delivered with connection cable in lengths of 7 or 15 meter **(23 or 49 ft.).**



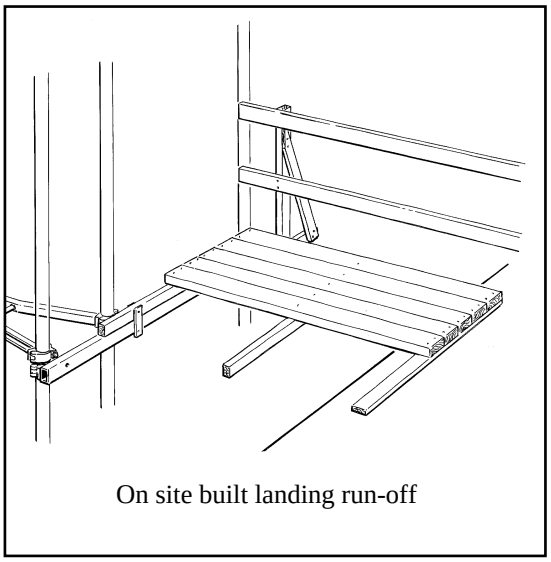




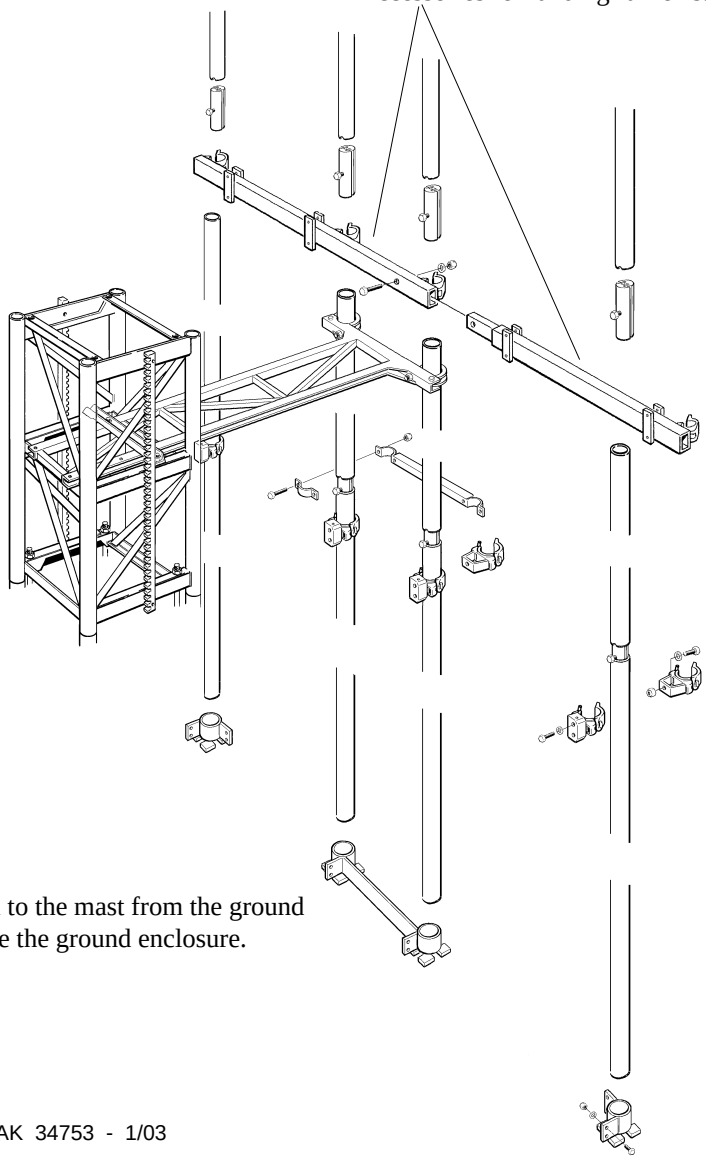
Included electric material is of protection class IP 54 or higher.



Accessories for landing run-offs.



On site built landing run-off



Vertical scaffold pipes parallel to the mast from the ground to the mast top attached outside the ground enclosure.

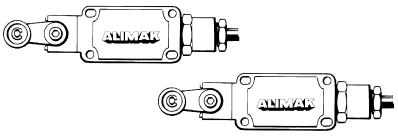
Safety equipment

Automatic stop at top and bottom landings

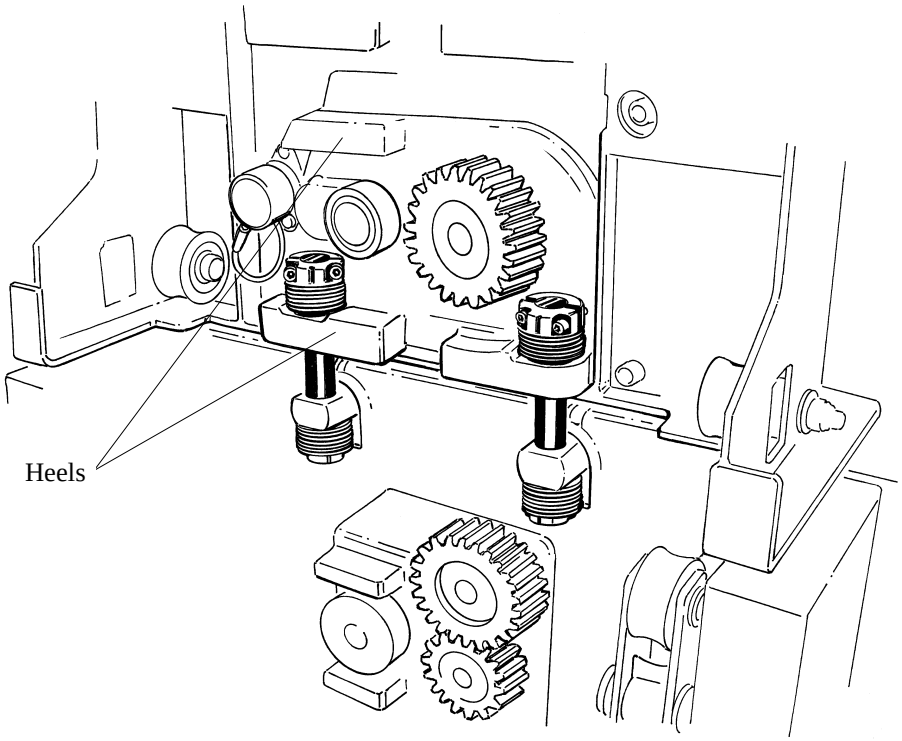
At top and bottom landings, limit cams are mounted on the mast. These cams activate the limit switches, which automatically stop the hoist. The functions for the Up and Down limit switches are backed up by a final limit switch with its own cams on the mast at top and bottom landings. This switch provides interruption of the three-phase power supply and stops the hoist should the normal limit switch fail.

Below the bottom landing level, close to the hoist mast, buffer springs are located for the hoist car. The buffer is designed to stop a descending hoist beyond its normal limit of travel.

Final limit switch up & down



Normal upper & lower limit switch



Safety details on machinery plate

On the machinery and safety device plates, heels keep the pinion of the machinery and safety device constantly engaged with the rack on the hoist mast, in case a counter roller or a guide roller on the cage comes off.

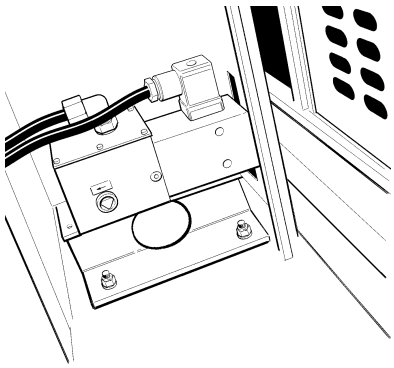
Safety hooks

To prevent the hoist from climbing off the mast during erection or dismantling, or to prevent the pinions from disengaging the rack in case a counter roller or guide roller comes off, safety hooks are mounted on the drive unit and on the car. The safety hooks are placed underneath the drive pinion of the machinery, preventing the hoist from falling off the mast should the drive pinion run off the top rack.

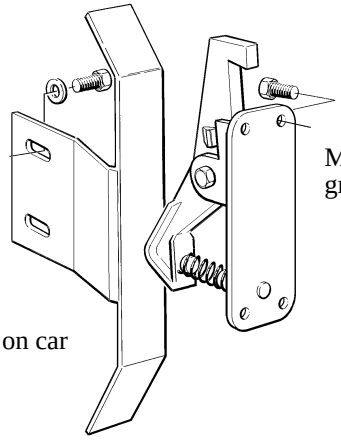
Door interlocks on hoist and landing doors

Hoist doors/ramps and/or landing doors/bars are all electrically interlocked. If any of the ”doors” are unlocked or opened, the hoist will not operate until the door is closed.

A mechanically interlocked car or landing door cannot be opened unless the hoist has stopped at the respective landing.

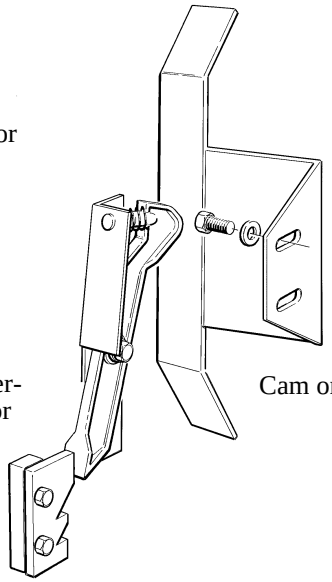


Car door lock of solenoid type with integrated electric switch



Mechanical interlock for ground enclosure door

Cam on car



Mechanical inter-lock for car door

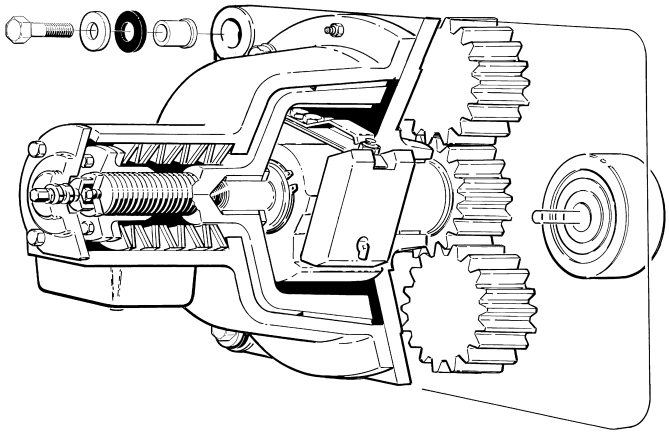
Cam on ground enclosure

Safety device

The hoist has a unique well proven safety device which smoothly stops the hoist on the mast should normal driving speed be exceeded.

The safety device has a shaft with a centrifugal weight and a pinion constantly engaged with the rack on the hoist mast. When the centrifugal weight activates, the brake cone is screwed in against a brake lining inside the safety housing. The hoist is brought to a smooth stop, and simultaneously the power to the drive motor is cut off.

In case of guide roller failure there are separate safety hooks provided which prevent the pinion of the safety device from disengagement with the rack.



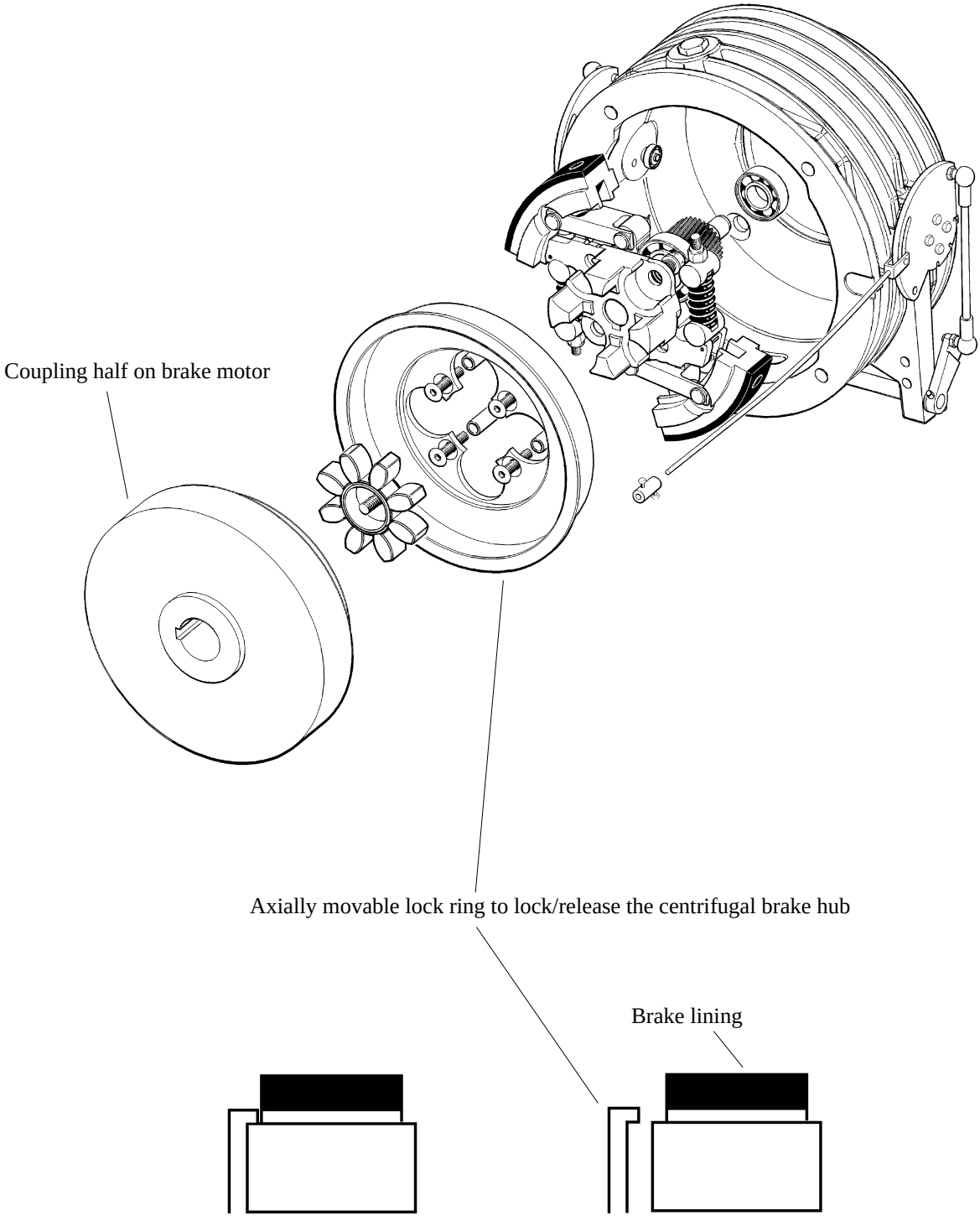
Phase failure relay

The electric equipment is protected by a phase failure relay, which means that the hoist can only be driven when correct phase sequence is connected.

Optional equipment

Optional centrifugal brake

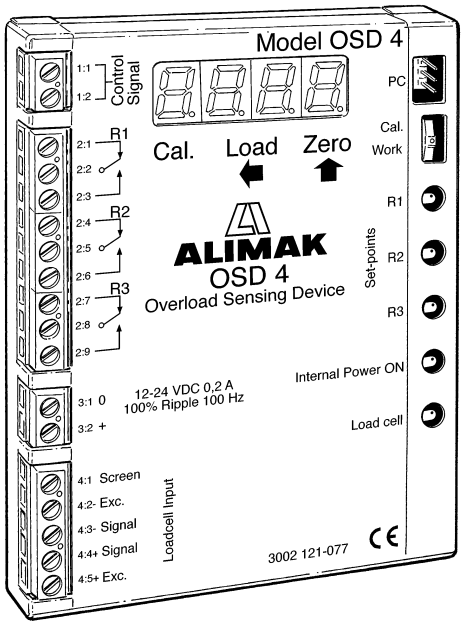
When lowering by gravity in case of a power failure, a centrifugal brake incorporated into the drive machinery will maintain a constant speed preventing the car from reaching governor tripping speed, and thereby activating the safety device.



Optional Overload Sensing Device

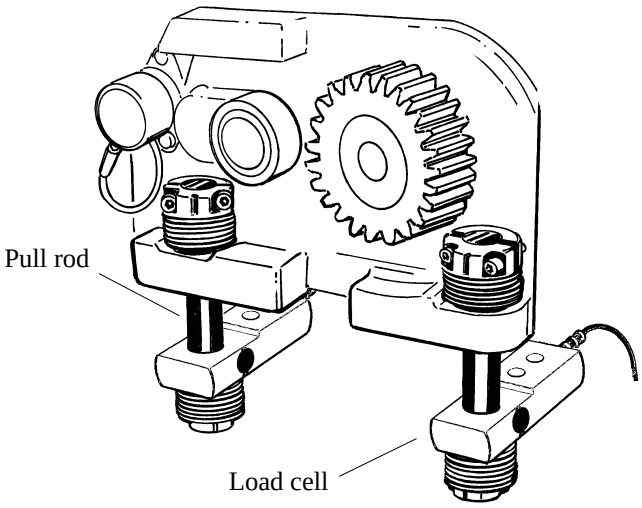
The hoist can be equipped with an overload sensing device. The system indicates when the car is fully loaded and prevents operation in an overload condition.

Load cells are built into the pull rods connecting the machinery to the car structure.



Signals from the load cells are transferred to the OSD 4 amplifier located in M-panel

Gear box rear side



When the rated load is exceeded the control circuit will be switched off to prevent the use of the hoist. At the same time a red LED lights.

Fault code F4 will be displayed where ALC floor call selecting device occurs.

Indication light ”Overload” in car

Optional prefabricated sheet steel foundation

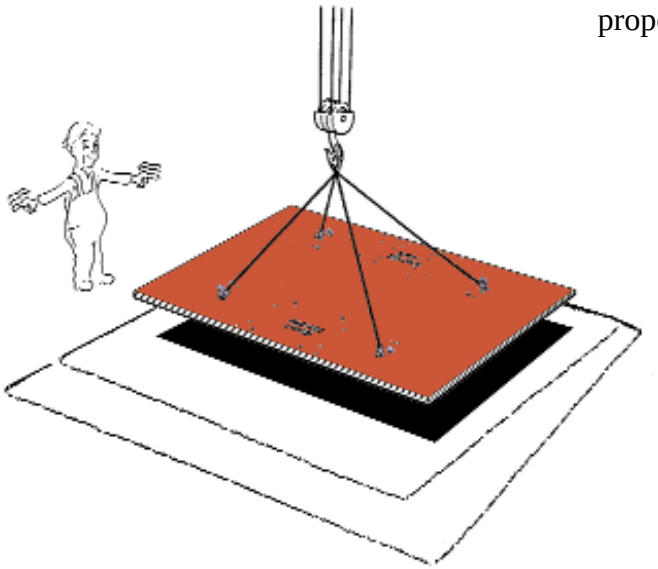
Use of prefabricated sheet steel foundation

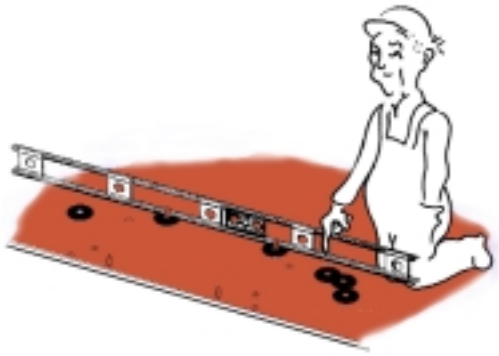
– Furnish a properly sized gravel bed where the base unit is to be installed.

– Level and compact the gravel bed.

  The gravel bed furnished should be of sufficient depth in order to preclude washout. Consideration shall be given to installing a plastic membrane below the gravel.

– Set the sheet steel plate onto the prepared gravel bed at its proper location.





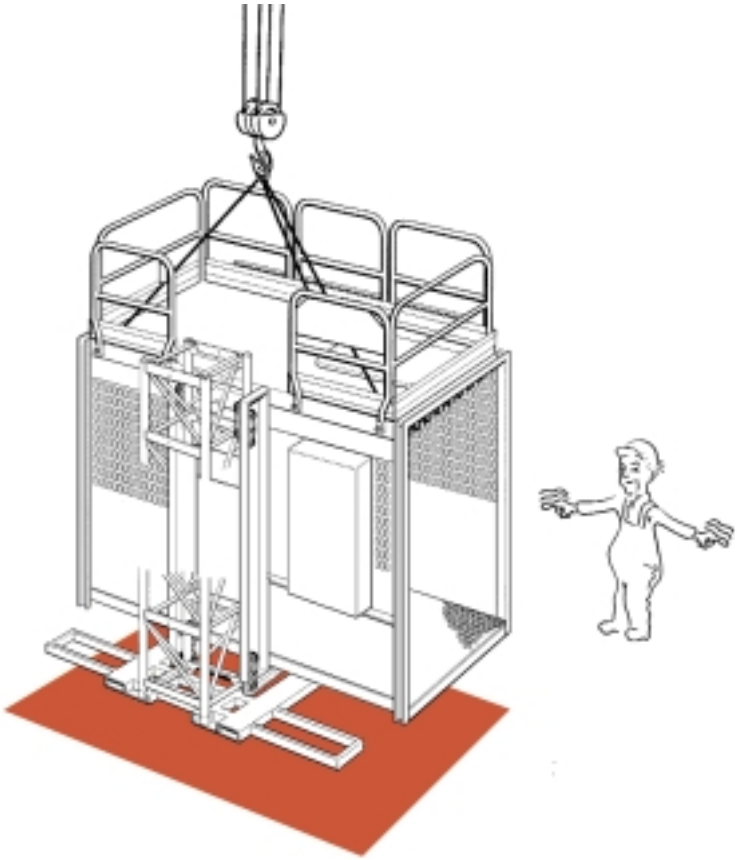
Alimak can supply manufacturing drawings of appropriate steel sheet foundation free of charge.

– Using a spirit level to locate the highest level guide pin.

– From the highest level guide pin use shim washers or pair of slotted shims to level remaining pins.

.

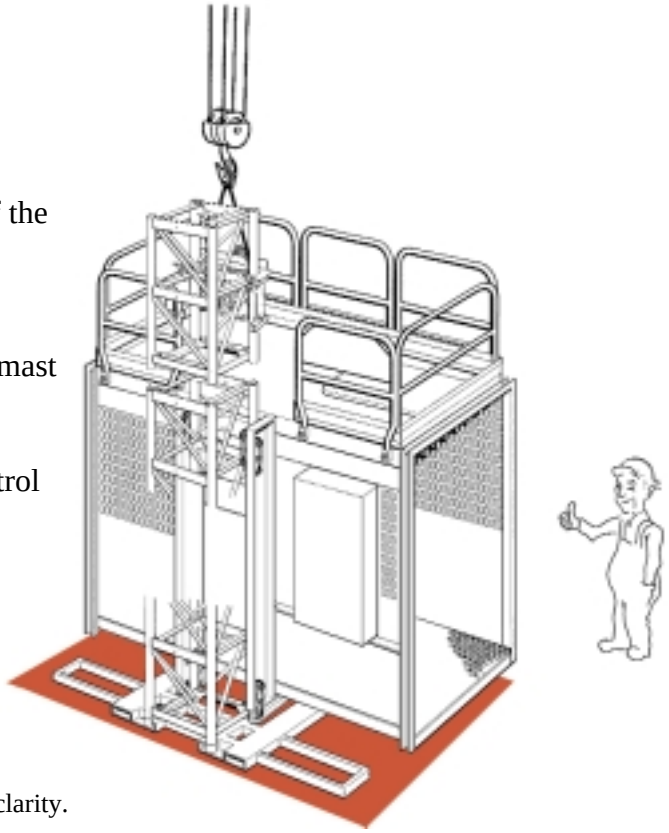
– Lift the base unit above the sheet steel foundation.
  Adjust the position of the base unit and lower it so the guide pins on the sheet steel foundation enter the holes (for the mast sections corner tubes) in the base frame.



– Assemble and tighten the bolts for the attachment of the mast's base frame to the steel sheet foundation with bolts intended for this purpose.

– Lift, lower and assemble the drive unit located on a mast section.

– Connect the machinery to the hoist's power and control circuits.



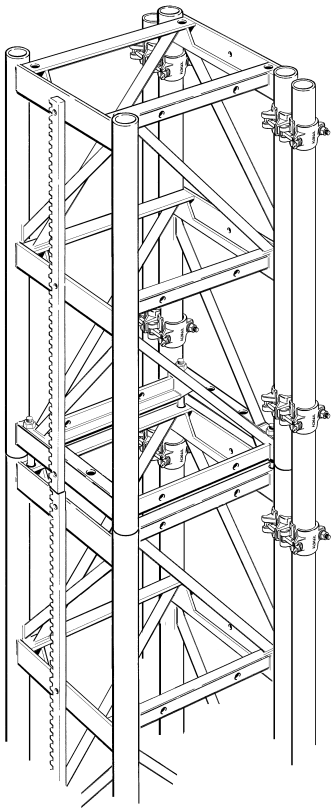
Note; Hoist components such as ground enclosure not shown for clarity.

Allowable freestanding heights when using pre-fabricated sheet steel foundation

Hoist installed on a sheet steel foundation (1 pce) or on two (2 pcs) sheet steel foundations bolted together on top of the other can be erected and used with freestanding mast heights according to the following table based on car length and maximum allowable payload.

Car length capacity	Car payload Single car	Freestandig in opeartion Dual cars	Single car	During erection*
Hoist installed on 1 pce steel sheet foundation				
Hoist installed on 2 pcs steel sheet foundations bolted together				
3.2 m **(10'- 6'')**	2000 kg **(4400 lbs.)**	15 meter **(50 ft.)**, zone C		24 meter **(79 ft.)**
	2000 kg **(4400 lbs.)**	13.5 meter **(45 ft.)**, zone C		
3.9 m **(12'- 9 1/2'')**				
4.6 m **(15'- 1'')**				

**** Maximum allowed freestanding with load reduced to maximum 8 pcs mast sections and 2 people in the car (1160 kg) and wind speed less than 12.5 m/s.***



Methods to increase the freestanding mast height

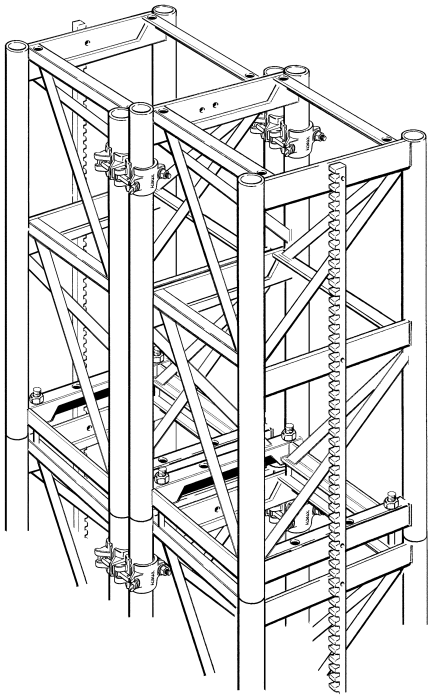
Tubes connected to the steel sheet foundation and assembled with tube couplers to the mast tower's rear mast tubes, up to the 6 meters' **(20 ft.)** level, will allow mast heights according to the following table based on car length and maximum allowable payload.

Reinforcement tubes dia. 76 mm are 3 **(10 ft.)** meter in length. Two pair of tube couplers are used on each mast section.

Car length	Payload	Freestandig in operation	During erection*
Hoist installed on 2 pce steel sheet foundation			
3.2 m **(10'- 6'')**	2000 kg **(4400 lbs.)**	22.5 meter, zone C	
3.9 m **(12'- 9 1/2'')**			
4.6 m **(15'- 1'')**			

Another method is to reinforce with a 2nd mast tower.

A concrete slab on the ground is preferable for this type of installation.

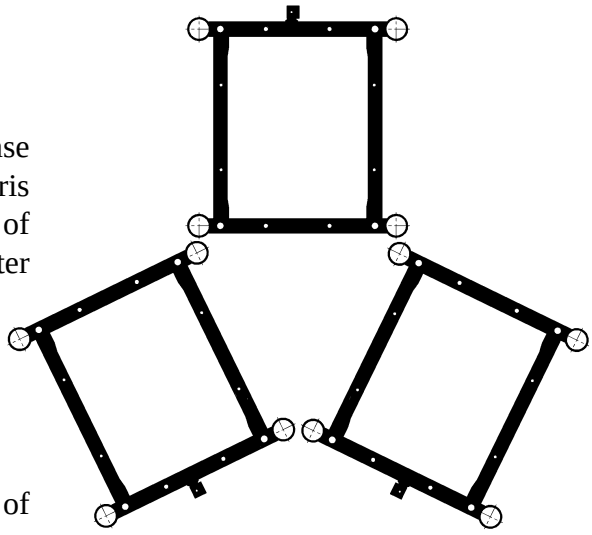


Example:

For a single 3.2 m **(10'- 6")** car with allowable payload capacity 2000 kg **(4400 lbs.)** the maximum freestanding mast height of 30 meter **(100 ft.)** can be reached with 2nd mast tower 20 meter **(60 ft.**) in height;

Estimated concrete slab dimensions:
3.5 x 2.5 meter **(11'- 5 '' x 8'- 5")**.
Concrete volume: 15 m^3 **(20 cu.yds)**.

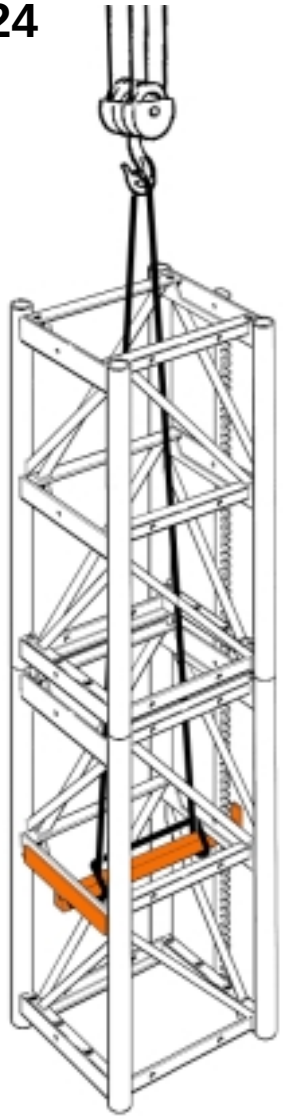
Please contact Alimak Calculation Department for advice.



It may be desirable to connect three mast towers to each other. This is a preferable method to achieve greater height to increase the distance to the top tie. (On the Eiffel Tower Project in Paris 55 meter **(180 ft.)** was achieved). By increasing the number of attached towers the overall hoist structure achieves greater rigidity.

A concrete slab on the ground is preferable for this type of installation.

Please contact Alimak Calculation Department for advice.



Optional lifting tool for use with on site cranes

The preferred method of assembling the lift system is the use of a crane with sufficient lifting height.

3 – 5 mast sections (never exceeding the mast's freestanding capability) can be assembled lying on the ground before being lifted to the mast top and assembled.

We recommend attaching the load according to the figure in order to avoid driving the car to the top of the mast in order to disconnect the load from the crane hook.

The user's own protective measures

Protection at the landings

It is recommended that overhead protection is furnished at landing entrances to protect against falling objects.

Scaffolds and other gangways close to the hoistway

Scaffolds and other gangways and platforms close to the hoistway shall be provided with enclosures according to local regulations.

Illumination of landings

Adequate site lighting shall be provided to illuminate the landings over the full height of travel of the hoist.

Landings erected at site

Landings built on site shall be equipped with safety railings and toe guards and shall meet applicable local regulations.

Each landing shall be designed for the maximum load of the hoist.

Load signs

Load sign showing maximum load and maximum number of passengers in the car, must be displayed inside the car and on each landing, according to EN 12159.
The sign must be durable and with minimum 25 mm **(1 in.)** height of the characters.

It is advisable to use hot seal laminating film for this purpose.

Data on load signs must be in accordance with technical data and additional technical information on pages B1 – B4 in this manual.

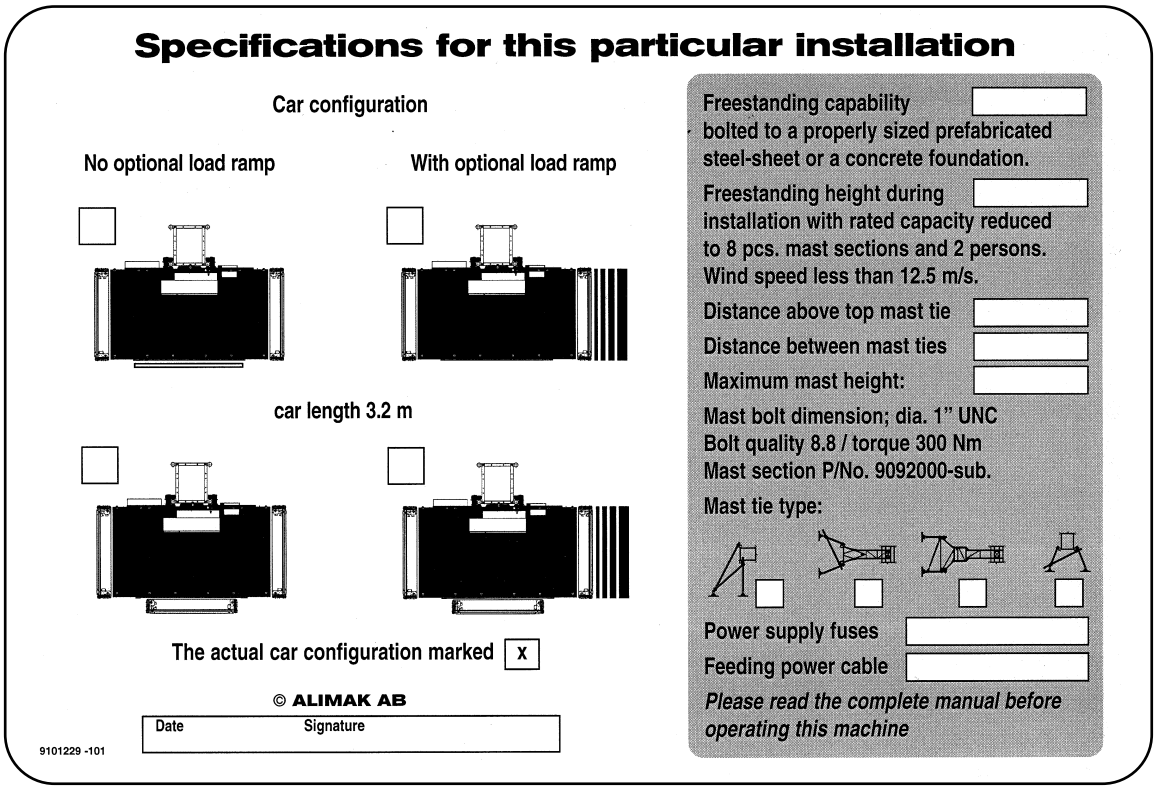
Print your own load sign. Click here; Acrobat PDF

Note: It is possible to copy text and paste into your own word processing program on your computer.

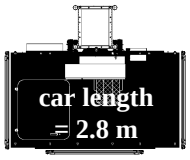
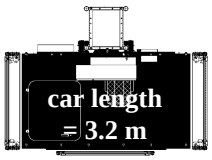
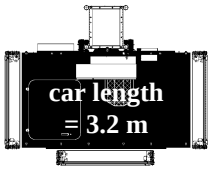
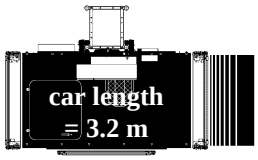
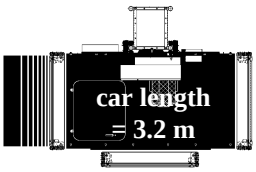
Sign inside the car showing specifications for the particular installation

It is possible to write /erase the sign inside the car showing specifications for the particular installation. The sign must be filled in and signed by a person responsible for the entire hoist installation.

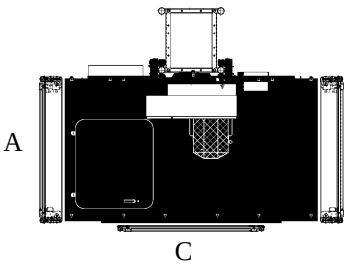
The intention with showing this sign is to ensure personnel using the hoist and inspectors from the responsible authorities that the hoist is correctly installed according to the person responsible for the entire hoist installation.

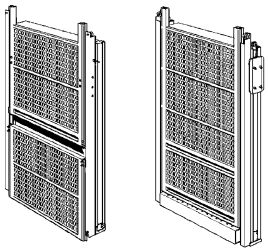


Product range, car length 2.8 – 3.2 m

Car configuration	50 Hz 2 x 11 kW DOL 0.63 m/s	60 Hz 2 x 11 kW DOL 0.63 m/s	Power / Speed 2 x 11 kW FC 0.7 m/s	2 x 11 kW FC 0.9 m/s	3 x 11 kW FC 0.9 m/s	3 x 11 kW FC 1.1 m/s
			Load capacity			
C10 	2200/2500 kg	2900 kg	2300/2700 kg	1300/200 kg	3100/3200 kg	2100/2700 kg
C22 	2100/2400 kg or 24 pers. No. 1202	2600 kg or 24 pers. No. 1204	2100/2400 kg or 24 pers. No. 1206	1200/1900 kg or 24 pers. No. 1210	2900/3200 kg or 29 pers. No. 1212	1900/2500 kg or 29 pers. No. 1214
C23 	2000/2300 kg or 24 pers. No. 1202	2500 kg or 24 pers. No. 1204	2000/2300 kg or 24 pers. No. 1206	1100/1800 or 24 pers. No. 1210	2800/3200 kg 24 pers. No. 1212	1800/2400 kg or 24 pers. No. 1214
C25 	1900/2300 kg or 24 pers. No. 1202	2400 kg or 24 pers. No. 1204	2000/2200 kg or 24 pers. No. 1206	1000 /1700 kg or 24 pers. No. 1210	2800/3200 kg or 24 pers. No. 1212	1800/2400 kg or 24 pers. No. 1214
 C26	1900/2200 kg or 22/24 pers. No. 1202	2200 kg or 24 pers No. 1204	1900/2000 kg or 24 pers. No. 1206	900/1700 kg or 24 pers. No. 1210	2700/3200 kg or 24 pers. No. 1212	1700/2300 kg or 24 pers. No. 1214

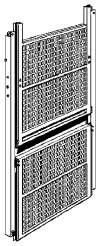
Click applicable datasheet No. above





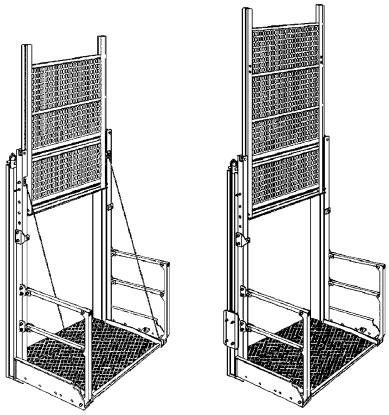
Vertical full height entrance door or exit door in two parts

possible location A, B or C



Vertical ”slim” exit door in two parts, width 1.5 m

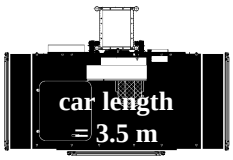
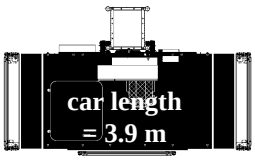
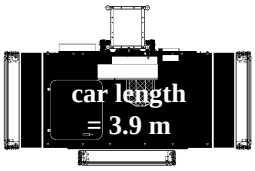
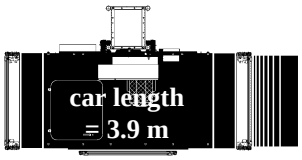
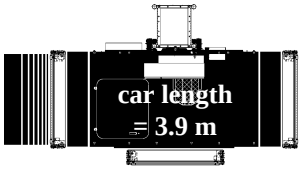
possible location CA, CB or CC



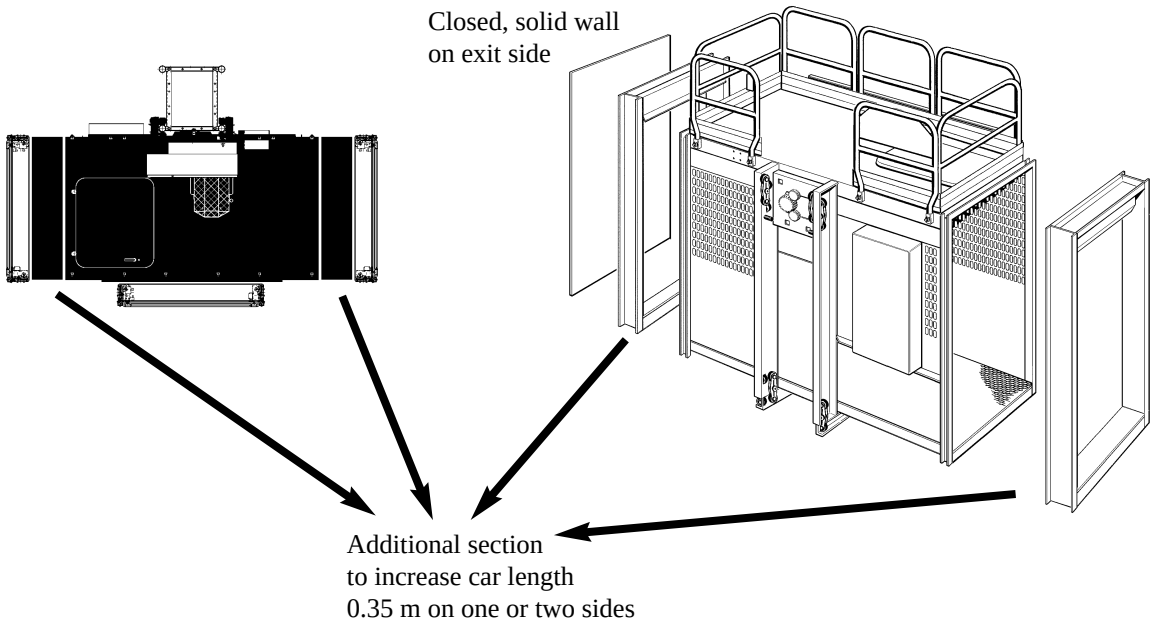
Exit door combined with optional electric / hydraulic or manual operated load ramp.

possible location A, B or C

Product range, extended car length 3.5 – 3.9 m

Car configuration	50 Hz 2 x 11 kW DOL 0.63 m/s	60 Hz 2 x 11 kW DOL 0.63 m/s	Power / Speed 2 x 11 kW FC 0.7 m/s	2 x 11 kW FC 0.9 m/s	3 x 11 kW FC 0.9 m/s	3 x 11 kW FC 1.1 m/s
			Load capacity			
C30 	2000/2400 kg	2600 kg	2100/2400 kg	1100/1800 kg	2900/3200 kg	1900/2500 kg
C42 	1900/2200 kg or 24 pers. No. 1203	2300 kg or 24 pers. No. 1205	1900/2100 kg or 24 pers. No. 1208	1000/1700 kg or 24 pers. No. 1211	2700/3200 kg or 29 pers. No. 1213	1700/2300 kg or 29 pers. No. 1215
C43 	1800/2100 kg or 22/24 pers No. 1203	2100 kg or 24 pers. No. 1205	1800/1900 kg or 22 pers. No. 1208	900/1600 kg or 24 pers. No. 1211	2600/3200 kg or 29 pers. No. 1213	1600/2200 kg or 29 pers. No. 1215
C45 	1800/2000 kg or 22/24 pers No. 1203	2000 kg or 24 pers. No. 1205	1800 kg or 22 pers. No. 1208	800/1600 kg or 24 pers. No. 1211	2600/3200 kg or 29 pers. No. 1213	1600/2200 kg or 29 pers. No. 1215
C46 	1700/1900 kg or 21 pers. No. 1203	1900 kg or 24 pers. No. 1205	1700 kg or 20 pers. No. 1208	800/1500 kg or 24 pers. No. 1211	2500/3200 kg or 29 pers. No. 1213	1500/2100 kg or 29 pers. No. 1215

Note: the doors can be located to meet site requirements.



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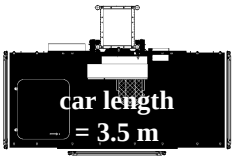
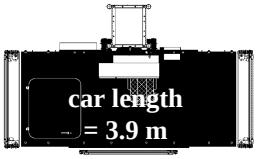
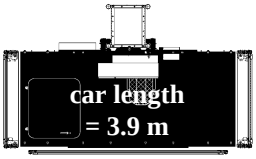
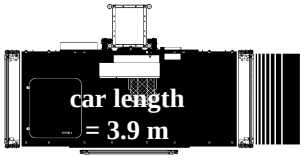
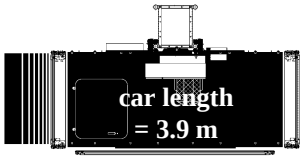
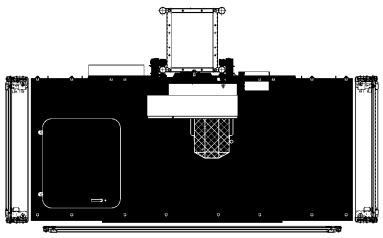
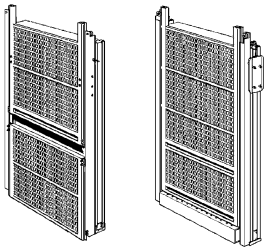
Product range, car length 3.5 – 3.9 m

Car configuration	50 Hz 2 x 11 kW DOL 0.63 m/s	60 Hz 2 x 11 kW DOL 0.63 m/s	Power / Speed 2 x 11 kW FC 0.7 m/s	2 x 11 kW FC 0.9 m/s	3 x 11 kW FC 0.9 m/s	3 x 11 kW FC 1.1 m/s
			Load capacity			
	NA	NA	NA	NA	NA	NA
C52 	1900/2300 kg or 24 pers. No. 1249	2400 kg or 24 pers. No. 1250	2000/2200 kg or 24 pers. No. 1254	1500/1700 kg or 24 pers. No. 1255	2800/3200 kg or 29 pers. No. 1218	1800/2400 kg or 29 pers. No. 1220
C53 	1900/2200 kg or 22/24 pers. No. 1249	2200 kg or 24 pers. No. 1250	1900/2000 kg or 22 pers. No. 1254	1400/1700 kg or 24 pers. No. 1255	2700/3200 kg or 29 pers. No. 1218	1700/2300 kg or 28 pers. No. 1220
C55 	1800/2100 kg or 22/24 pers. No. 1249	2100 kg or 24 pers. No. 1250	1900 kg or 22 pers. No. 1254	1400/1600 kg or 24 pers. No. 1255	2600/3200 kg or 29 pers. No. 1218	1700/2300 kg or 28 pers. No. 1220
 C56	1700/200 kg or 21 pers. No. 1249	2000 kg or 24 pers. No. 1250	1800 kg or 20 pers. No. 1254	1300/1500 kg or 24 pers. No. 1255	2600/3200 kg or 29 pers. No. 1218	1600/2200 kg or 27 pers. No. 1220

Click applicable datasheet No. above

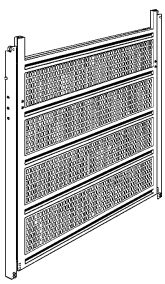
A  B

C



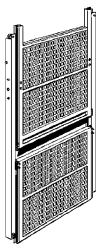
Vertical full height entrance door or exit door in two parts

possible location A, B or C



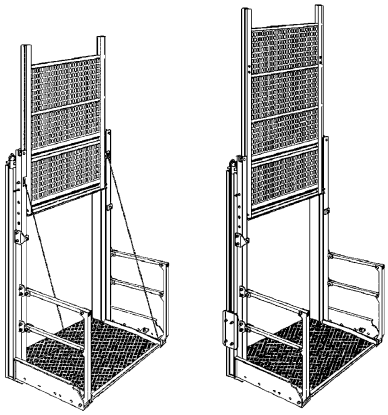
Vertical ”slim” full height entrance door width 3.2 m

possible location C



Vertical ”slim” exit door in two parts, width 1.5 m

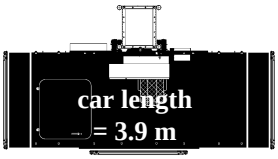
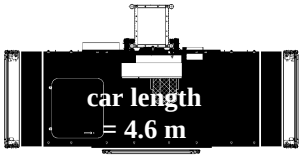
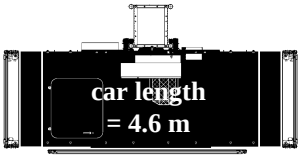
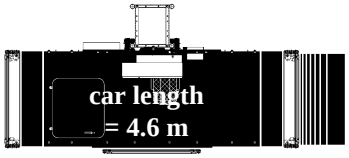
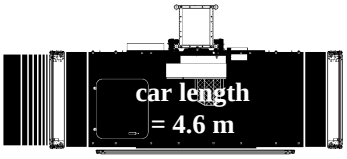
pos. location CA, CB or CC



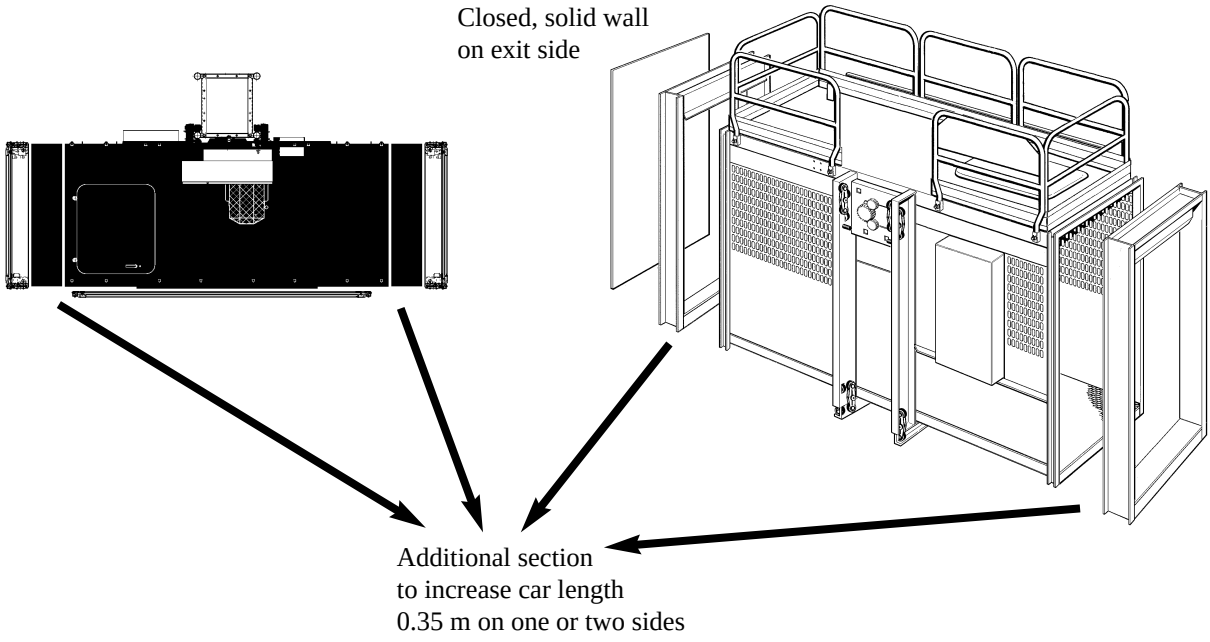
Exit door combined with optional electric / hydraulic or manual operated load ramp.

possible location A, B or C

Product range, extended car length 3.9 – 4.6 m

Car configuration	50 Hz 2 x 11 kW DOL 0.63 m/s	60 Hz 2 x 11 kW DOL 0.63 m/s	Power / Speed 2 x 11 kW FC 0.7 m/s	 2 x 11 kW FC 0.9 m/s	 3 x 11 kW FC 0.9 m/s	 3 x 11 kW FC 1.1 m/s
			Load capacity			
	NA	NA	NA	NA	NA	NA
C62 	NA	NA	NA	NA	2600/3200 kg or 29 pers. No. 1219	1600/2200 kg or 28 pers. No. 1221
C63 	NA	NA	NA	NA	2500/3000 kg or 29 pers. No. 1219	1500/2100 kg or 27 pers. No. 1221
C65 	NA	NA	NA	NA	2500/3000 kg or 29 pers. No. 1219	1500/2100 kg or 27 pers. No. 1221
 C66	NA	NA	NA	NA	2400/3000 kg or 29 pers. No. 1219	1400/2000 kg or 26 pers. No. 1221

Note: the doors can be located to meet site requirements.



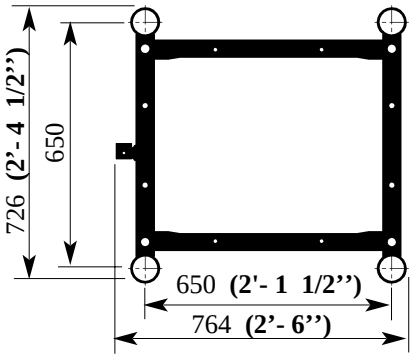
B 5

Technical data sheet

SCANDO 650 DOL .. /28 – 32	**50Hz**	**No. 1202**
SCANDO 650 DOL .. /35 – 39 ext.	**50Hz**	**No. 1203**
SCANDO 650 DOL .. /35 – 39	**50Hz**	**No. 1249**
SCANDO 650 DOL .. /28 – 32	**60Hz**	**No. 1204**
SCANDO 650 DOL .. /35 – 39 ext.	**60Hz**	**No. 1205**
SCANDO 650 DOL .. /35 – 39	**60Hz**	**No. 1250**
SCANDO 650 FC .. /28 – 32	**(0.7 m/s)**	**No. 1206**
SCANDO 650 FC .. /35 – 39 ext.	**(0.7 m/s)**	**No. 1208**
SCANDO 650 FC .. /35 – 39	**(0.7 m/s)**	**No. 1254**
SCANDO 650 FC .. /28 – 32	**(0.9 m/s)**	**No. 1210**
SCANDO 650 FC .. /35 – 39 ext.	**(0.9 m/s)**	**No. 1211**
SCANDO 650 FC .. /35 – 39	**(0.9 m/s)**	**No. 1255**
SCANDO 650 FC .. /28 – 32	**(0.9 m/s)**	**No. 1212**
SCANDO 650 FC .. /35 – 39 ext.	**(0.9 m/s)**	**No. 1213**
SCANDO 650 FC .. /28 – 32	**(1.1 m/s)**	**No. 1214**
SCANDO 650 FC .. /35 – 39 ext.	**(1.1 m/s)**	**No. 1215**
SCANDO 650 FC .. /35 – 39	**(0.9 m/s)**	**No. 1218**
SCANDO 650 FC .. /39 – 46 ext.	**(0.9 m/s)**	**No. 1219**
SCANDO 650 FC .. /35 – 39	**(1.1 m/s)**	**No. 1220**
SCANDO 650 FC .. /39 – 46 ext.	**(1.1 m/s)**	**No. 1221**

Dimensions, weight

Mast section



Length / height:	1508 mm	**(4'- 11 3/8'')**
Weight:	115 / 135 kg	**(254 / 298 lbs.)**
Mast bolt dimensions:	1'' UNC galv. – quality minimum 8.8 or	**(A325)**
Tightening torque:	300 Nm	**(220 lbf x ft)**

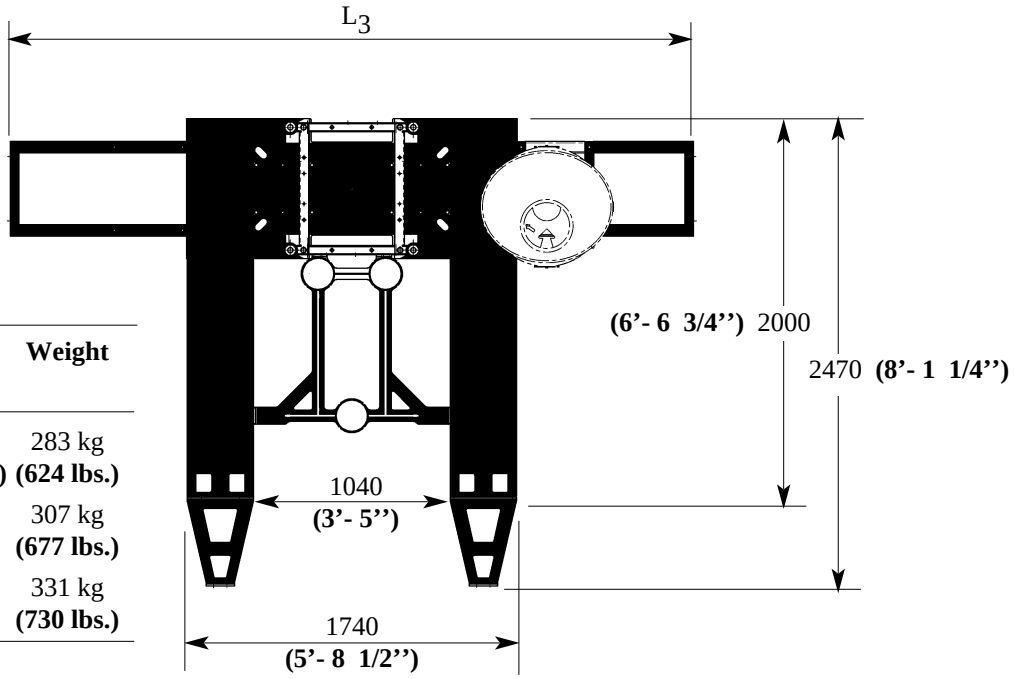
Mast expansion/contraction

The expansion/contraction of the mast is: 0.012 mm/m and degree °C **(or 0.000008 in./ft. and degree °F).**

Base frame

Scale 1 : 40

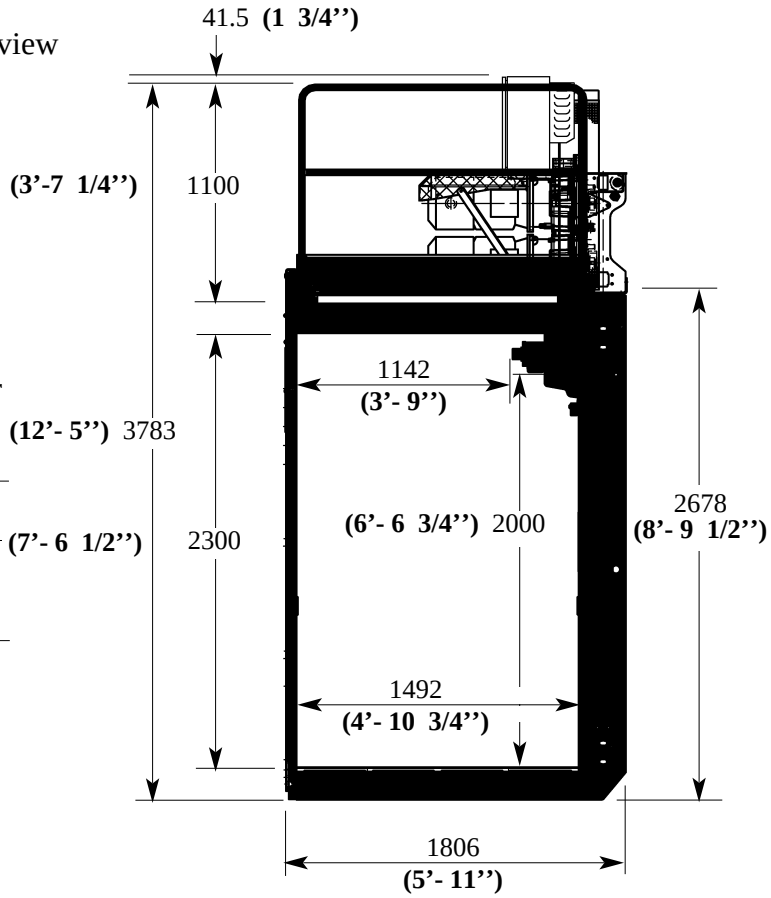
Main unit excl. outriggers
Height: 100 mm **(4'')**



Internal car length	L_3	Weight
3200 mm **(10'- 6'')**	3610 mm **(11'- 10 3/4'')**	283 kg **(624 lbs.)**
3900 mm **(12'- 9 1/2'')**	4310 mm **(14'- 1 3/4'')**	307 kg **(677 lbs.)**
4600 mm **(15'- 1'')**	5010 mm **(16'- 5 1/4'')**	331 kg **(730 lbs.)**

Hoist car

Inside height/width and outside dimensions plan view
Scale 1 : 40



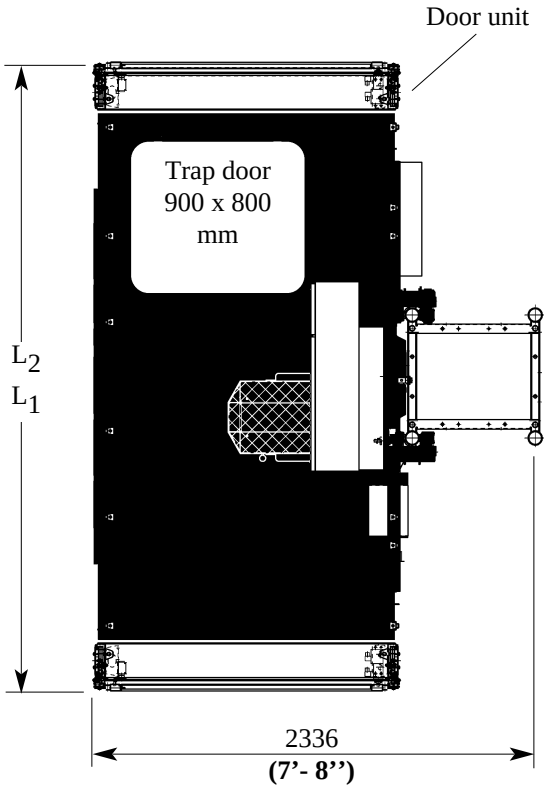
Allowable concentrated load on floor

Concentrated load on a dia. 100 mm **(4 in.)** roller with length 100 mm is;

Plywood floor	Multi-layer built-up aluminium floor
500 kg / roller **(1100 lbs. / roller)**	1000 kg / roller **(2200 lbs, / roller)**

Top view outside dimensions

Scale 1 : 40



Car length Internal L_1	External L_2	Weight *
2800 mm (9'- 2 1/4'') car base structure		
3.0 m **(9'- 10'')**	3100 mm **(10'- 2'')** eccentric	
3.2 m **(10'- 6'')**	3300 mm **(10'- 10'')**	1420 kg **(3150 lbs.)**
3.55 m **(11'- 7 3/4'')**	3650 mm **(11'- 11 3/4'')** eccentric	
3.9 m **(12'- 9 1/2'')**	4000 mm **(13'- 1 1/2'')**	
3500 mm (11'- 5 3/4'') car base structure		
3.7 m **(12'- 1 3/4'')**	3800 mm **(12'- 5 1/2'')** eccentric	
3.9 m **(12'- 9 1/2'')**	4000 mm **(13'- 1 1/2'')**	1600 kg **(3530 lbs.)**
4.25 m **(13'- 11 1/4'')**	4350 mm **(14'- 3 1/4'')** eccentric	
4.6 m **(15'- 1'')**	4700 mm **(15'- 5'')**	

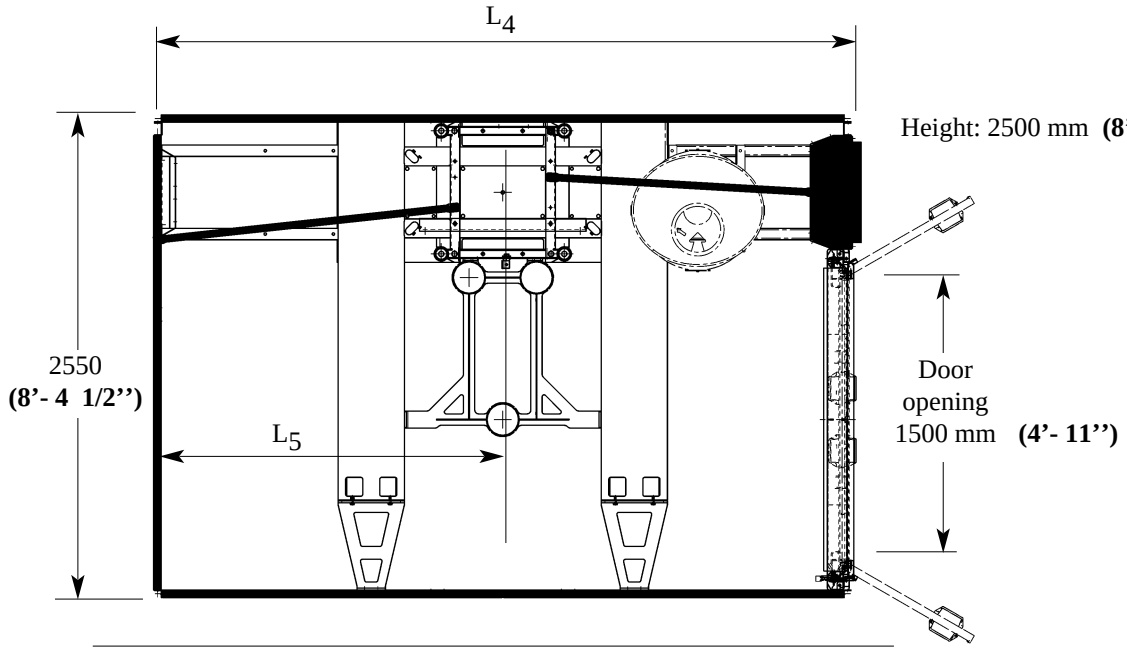
*** exclusive of drive unit and safety railing**

Minimum shaft dimensions:

Min. permissible "clearence" on all external dimensions is 100 mm **(4 in.)**

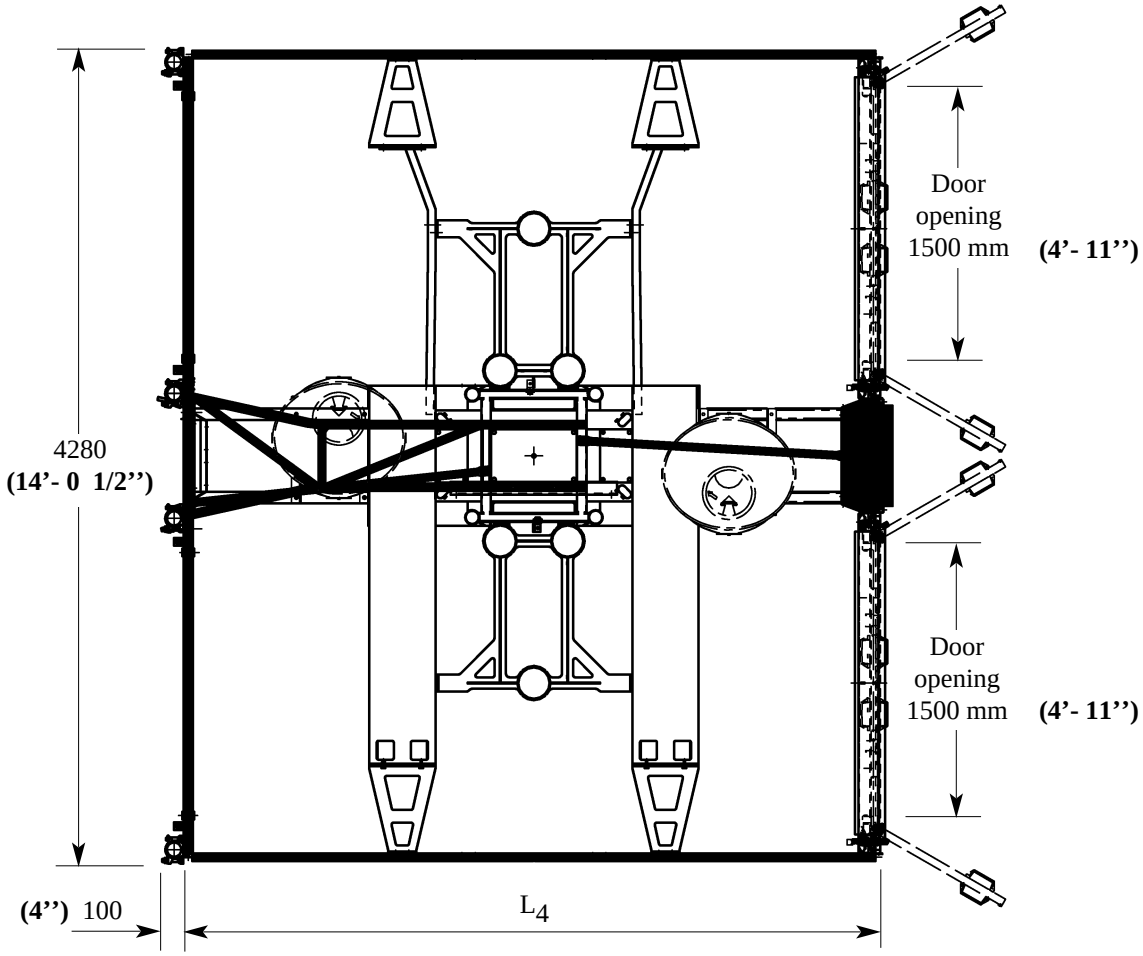
Ground enclosure for single and dual cars A/B door location

Top view, Scale 1 : 40



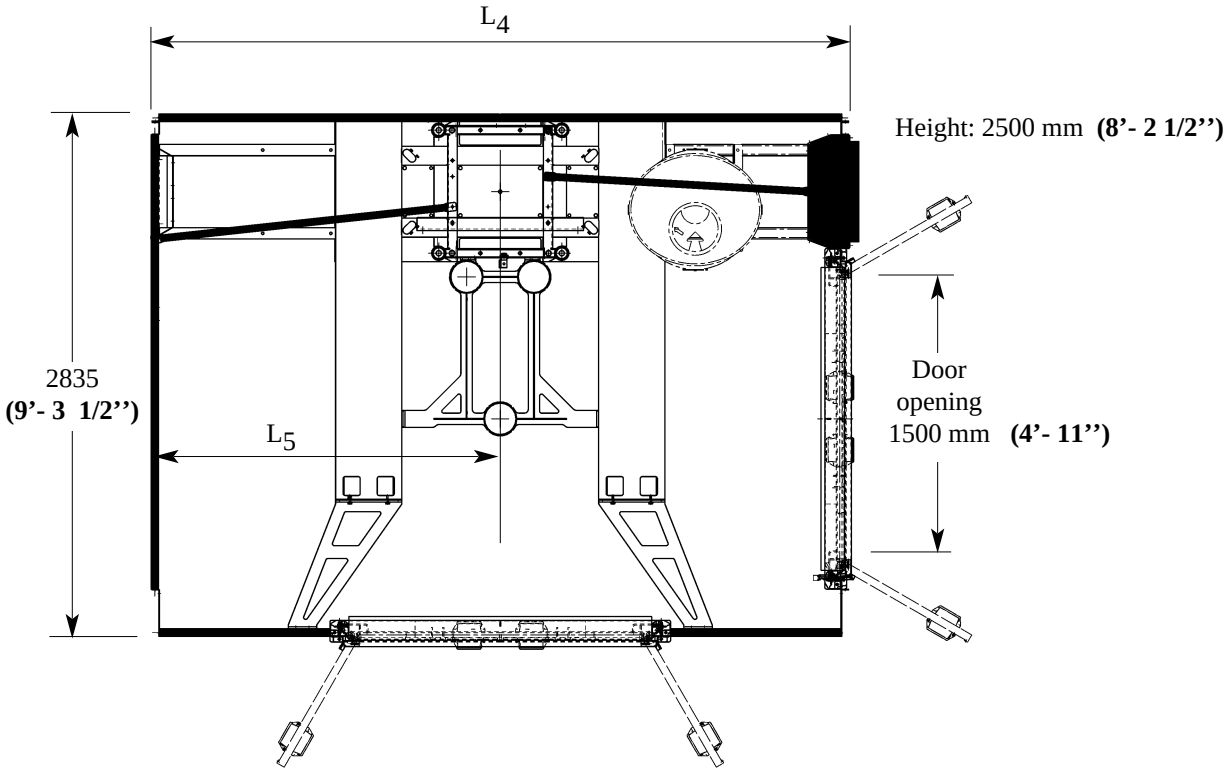
Car length	L_4*	External L_5
3.2 m (10'- 6'')	3720 mm (12'- 2 1/2'')	1845 mm (6'- 0 3/4'')
3.9 m (12'- 9 1/2'')	4420 mm (14'- 6'')	2195 mm (7'- 2 1/2'')
4.6 m (15'- 1'')	5120 mm (16'- 9 1/2'')	2545 mm (8'- 4 1/4'')

* Add additional 0.1 m **(4'')** where accessories for pipe support equipment are added to the ground enclosure. Add 0.1 + 0.1 m if added on both sides.



Ground enclosure for single car A/B and C door location

Top view, Scale 1 : 40



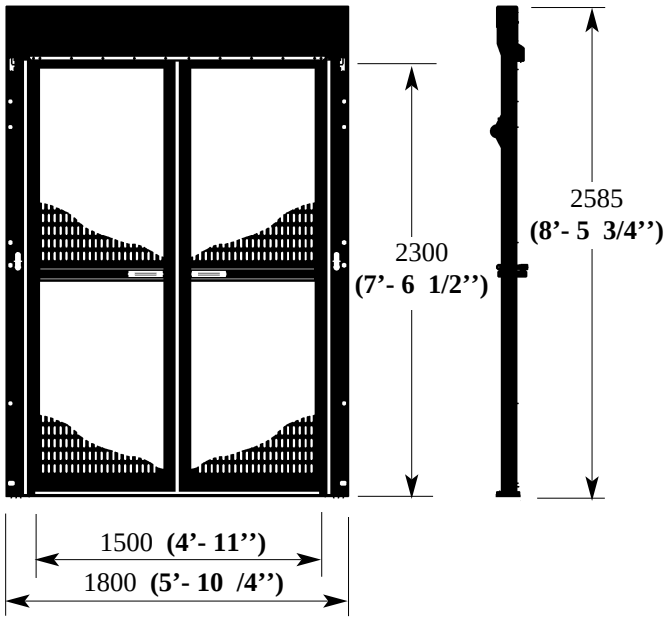
Car length	L_4*	External L_5
3.2 m **(10’- 6’’)**	3720 mm **(12’- 2 1/2’’)**	1845 mm **(6’- 0 3/4’’)**
3.9 m **(12’- 9 1/2’’)**	4420 mm **(14’- 6’’)**	2195 mm **(7’- 2 1/2’’)**
4.6 m **(15’- 1’’)**	5120 mm **(16’- 9 1/2’’)**	2545 mm **(8’- 4 1/4’’)**

* Add additional 0.1 m **(4’’)** where accessories for pipe support equipment are added to the ground enclosure. Add 0.1 + 0.1 m if added on both sides.

Double-leaf swing door for landings

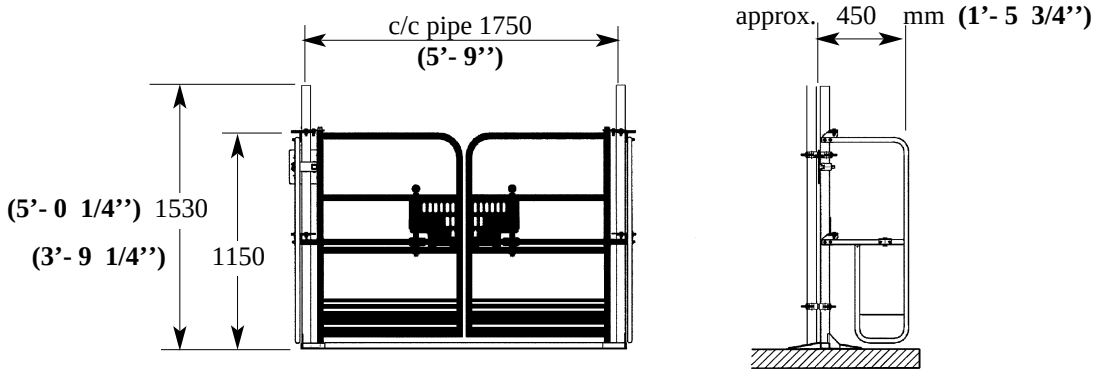
Scale 1 : 40

Weight: 115 kg **(254 lbs.)**

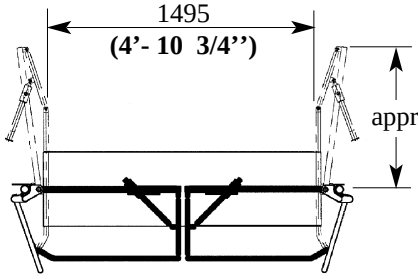


Double-leaf swing door for landings

Scale 1 : 40

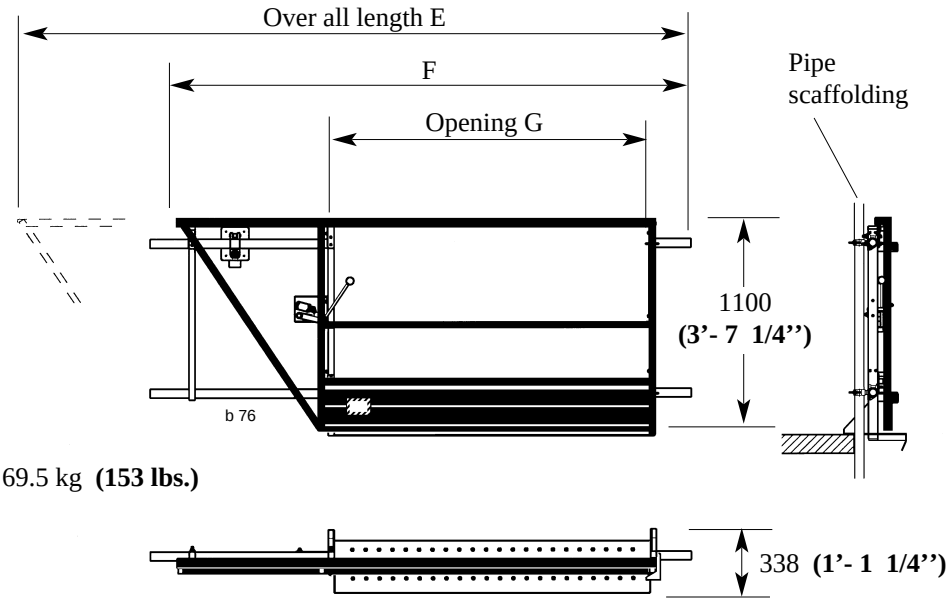


Weight: 60 kg **(132 lbs.)**



Horizontal sliding gates for landings
For installation on scaffolding OUTSIDE slab

Scale 1 : 40

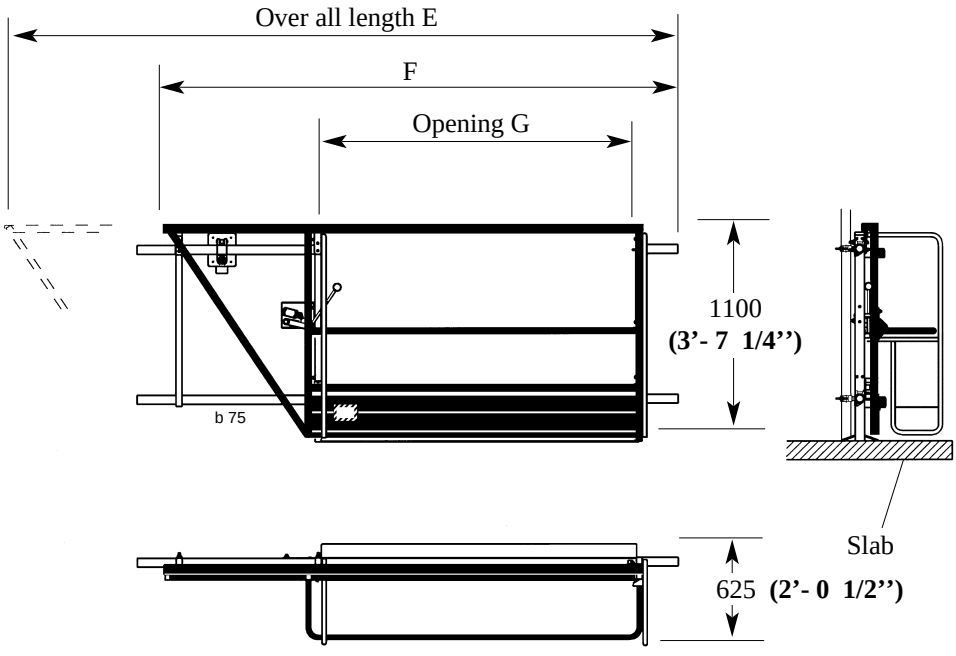


Weight: 69.5 kg **(153 lbs.)**

Over all length E	F	Opening G
4320 **(14'- 2'')**	2845 **(9'- 4'')**	1560 **(5'- 1 1/2'')**
4220 **(13'- 10 1/4'')**	2845 **(9'- 4'')**	1460 **(4'- 9 1/2'')**
4120 **(13'- 6 1/4'')**	2845 **(9'- 4'')**	1360 **(4'- 5 1/2'')**

Horizontal sliding gates for landings
For installation ON slab

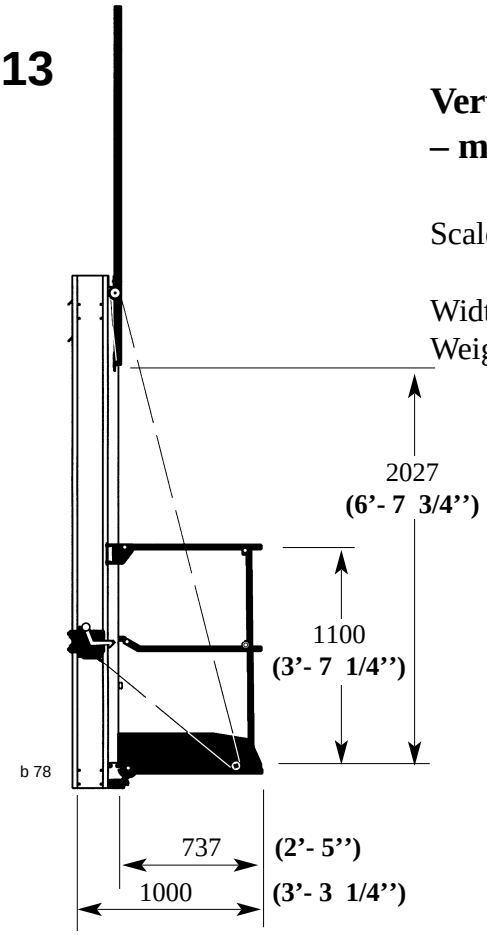
Scale 1 : 40



Vertical sliding bi-parting exit door with folding ramp – manually operated

Scale 1 : 40

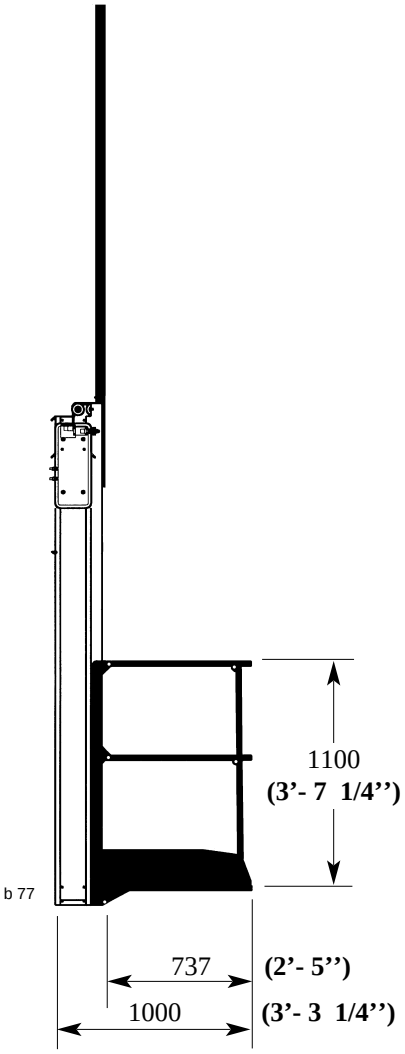
Width: internal 1492 mm **(4’- 10 3/4’’)**
Weight: 250 kg **(550 lbs.)**



Vertical sliding exit door with folding ramp – el. operated, EN Approved

Scale 1 : 40

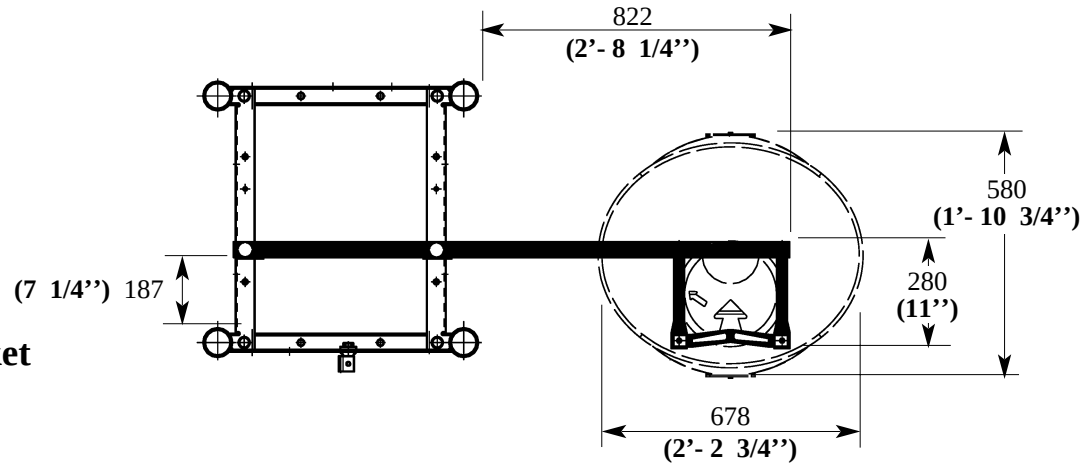
Width: internal 1400 mm **(4’- 7’’)**
Weight: 280 kg **(620 lbs.)**



Cable guides for trailing cable(s)

Scale 1 : 20

Weight: 7 kg **(15.5 lbs.)**



Cable collecting basket

Scale 1 : 20

Dia.: ø 580 / ø 678 mm **(dia. 1'- 10 3/4 / dia. 2'- 2 3/4'')**

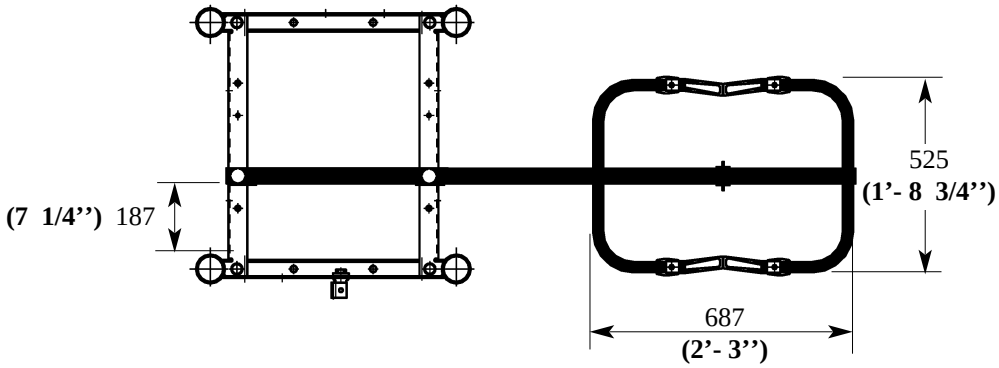
Height: 2000 mm **(6'- 6 3/4'')**

Weight: 28 kg **(62 lbs.)**

Cable guides for trolley and trailing cables

Scale 1 : 20

Weight: 9.5 kg **(21 lbs.)**



Tie distance and overhang

See chapter "Hoist mast".

Lubrication and lubrication volumes

See lubrication diagram in the chapter "Service and Maintenance"

Electric circuit diagram

See hoist document box.

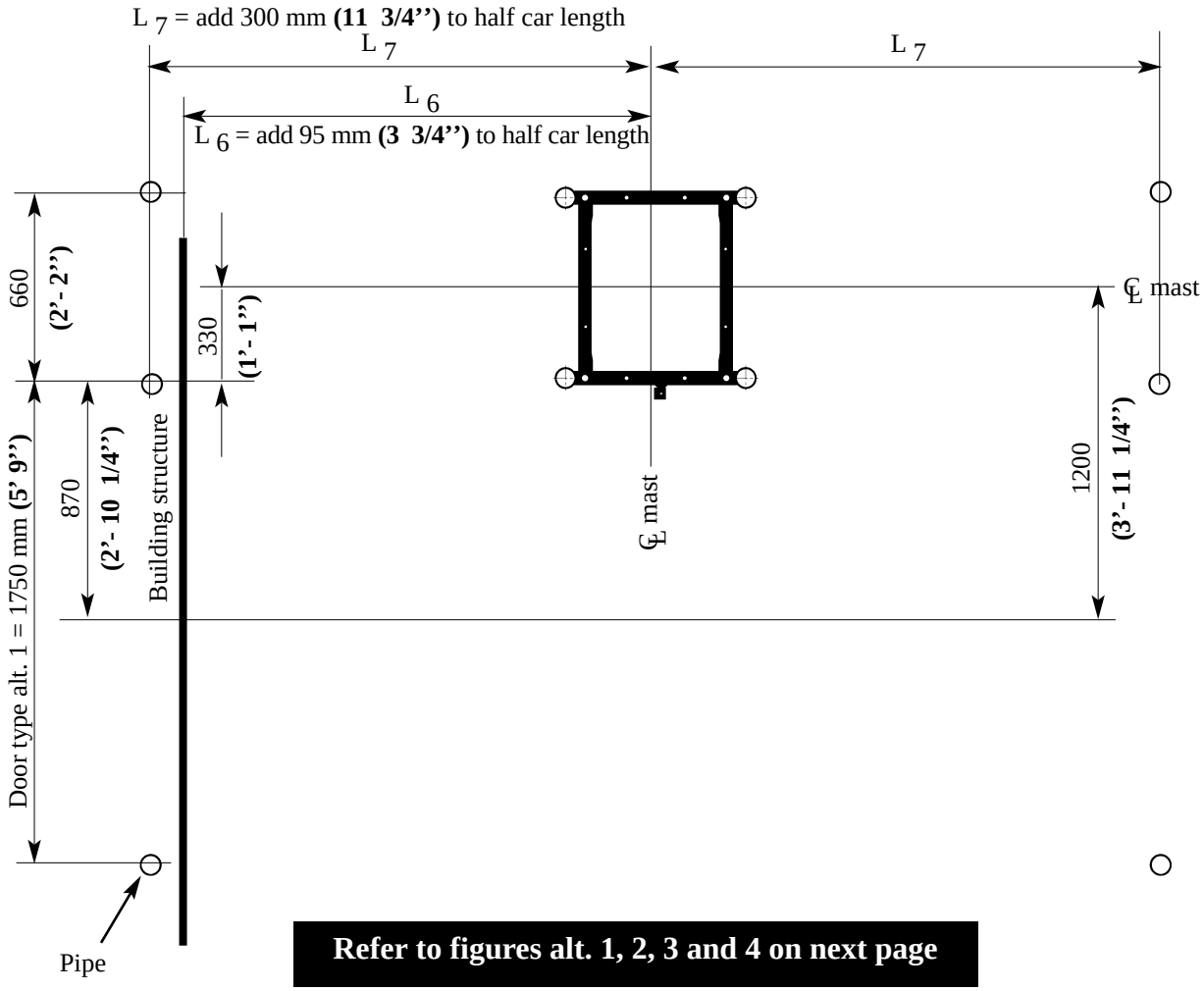
Noise level at operation

Measuring standard: IEC 651. Less than 85 dB(A).

Operating temperature range

+ 40°C / – 25°C **(+ 140°F / – 13°F)**.

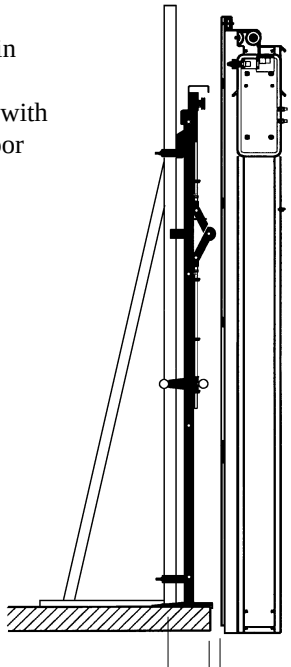
Location of landing door/gate



Refer to figures alt. 1, 2, 3 and 4 on next page

Car length mm	Door / gate type	Pipe dia. mm	Measure L_6 mm	Measure L_7 mm
3200 mm	Alt.1		1695 **(5'- 6 3/4'')**	1900 **(6'- 2 3/4'')**
(10'- 6'')	Alt.2	ø 76 **(3'')**	1695 **(5'- 6 3/4'')**	
	Alt.3	ø 76 **(3'')**	2640 **(8'- 8'')**	
	Alt.4	–	2100 – 3300 **(6'- 10 3/4 – 10'- 10'')** (see corresp. figure)	
3900 mm	Alt.1	ø 76 **(3'')**	2045 **(8'- 8 1/2'')**	2250 **(7'- 4 1/2'')**
(12'- 9 1/2'')	Alt.2	ø 76 **(3'')**	2045 **(8'- 8 1/2'')**	
	Alt.3	ø 76 **(3'')**	2990 **(9'- 9 3/4'')**	
	Alt.4	–	2450 – 4600 **(8'- 0 1/2'' – 15'- 1'')** (see corresp. figure)	
4600 mm	Alt.1	ø 76 **(3'')**	2395 **(7'- 10 1/4'')**	2600 **(8'- 6 1/4'')**
(15'- 1'')	Alt.2	ø 76 **(3'')**	2395 **(7'- 10 1/4'')**	
	Alt.3	ø 76 **(3'')**	3340 **(10'- 11 1/2'')**	
	Alt.4	–	2800 – 3000 **(9'- 2 1/4 – 9'- 10'')** (see corresp. figure)	

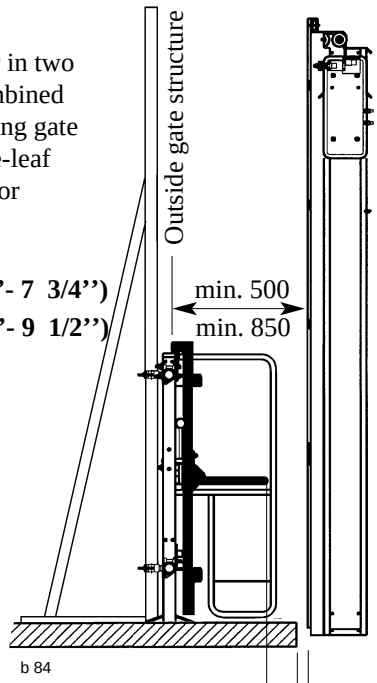
Alt. 1
Exit door in two parts combined with landing door



L 6 = add 95 mm **(3 3/4'')** to half car length]

L 7 = add 300 mm **(11 3/4'')** to half car length]

Alt. 2
Exit door in two parts combined with sliding gate or double-leaf swing door

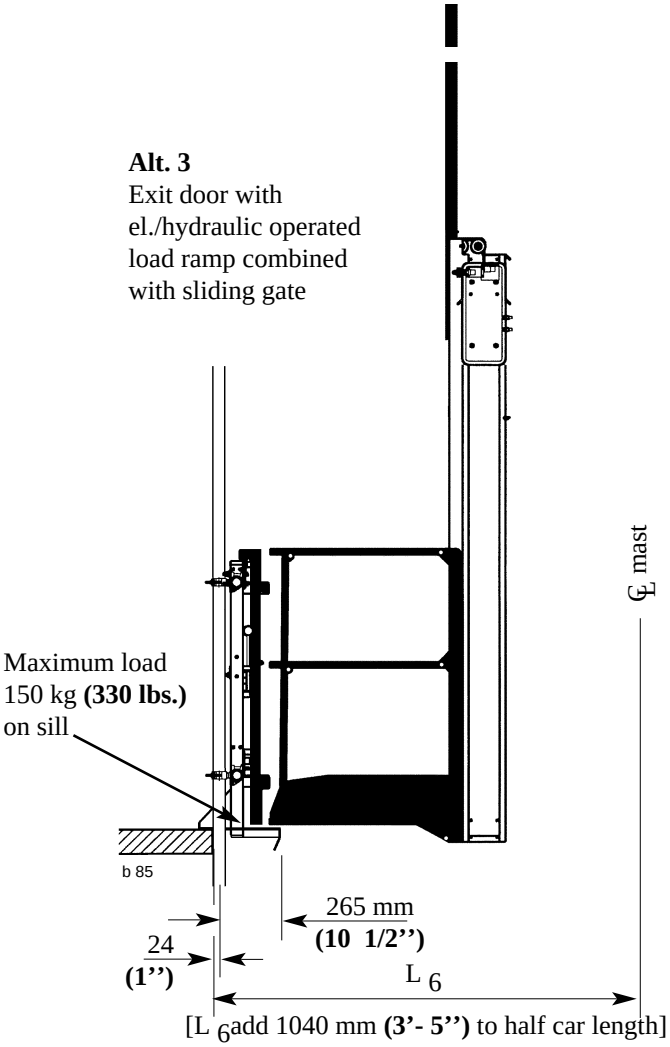


(min. 1'- 7 3/4'')
(min. 2'- 9 1/2'')

at speed v ≤ 0.7 m/s
at speed v > 0.7 m/s **(138 fpm)**

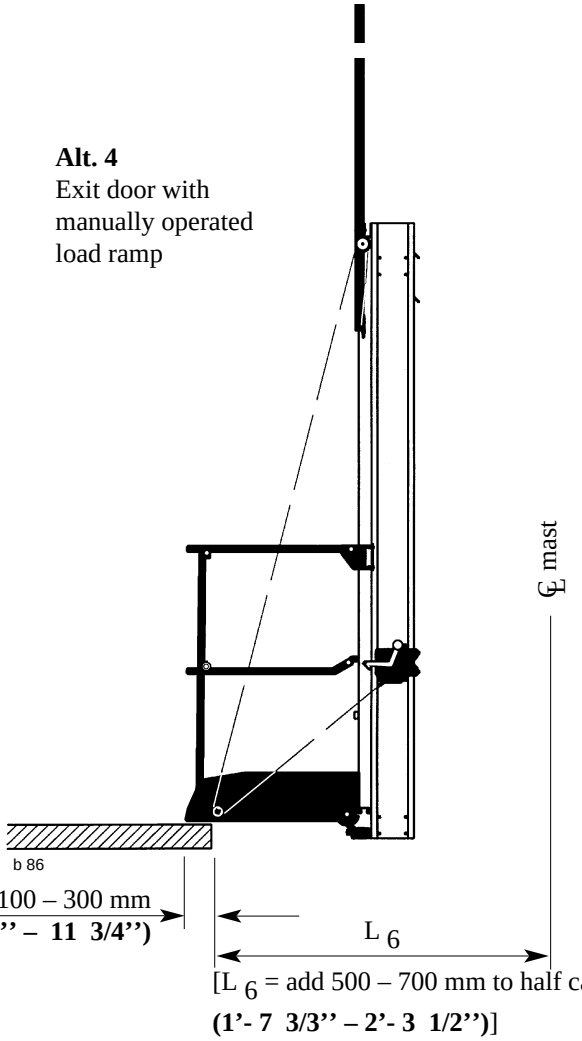
[L 6 = add 95mm **(3 3/4'')** to half car length]

Alt. 3
Exit door with el./hydraulic operated load ramp combined with sliding gate



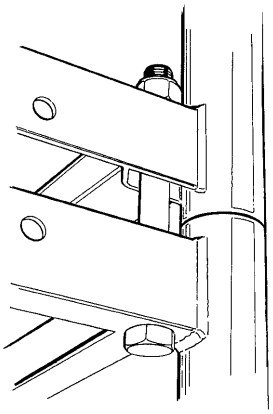
[L 6 add 1040 mm **(3'- 5'')** to half car length]

Alt. 4
Exit door with manually operated load ramp



[L 6 = add 500 – 700 mm to half car length **(1'- 7 3/3'' – 2'- 3 1/2'')**]

Tightening torque

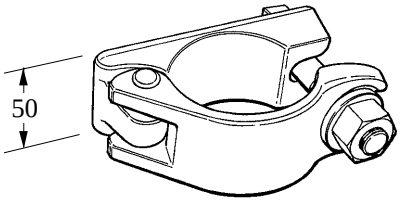


Recommendations according to the chart on the following page apply in general except for:

ALIMAK Mast bolt, dim. 1 ”UNC

– Torque : 350 Nm **(258 lbf x ft)**

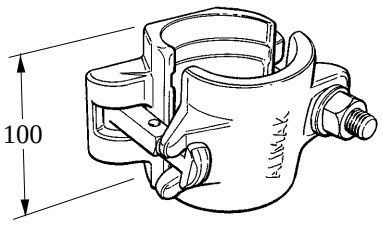
– Spanner size : 1 1/2”



ALIMAK Scaffold clamp Ø 76 mm

– Torque : 150 Nm **(110 lbf x ft)**

– Spanner size : 28 mm



ALIMAK Scaffold clamp Ø 76 mm

– Torque : 220 Nm **(163 lbf x ft)**

– Spanner size : 24 or 27 mm

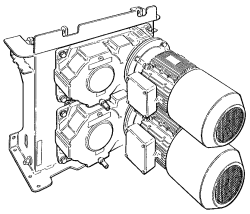
Recommended torques

The chart applies to galvanized bolt and nut of strength class 8.8 – dry surface.

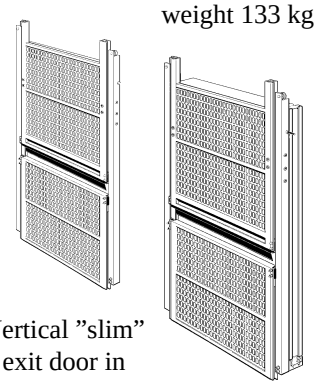
Dimension	Spanner size	Torque	
		Nm	lbf x ft
M 6	10 mm	10	7
M 8	13 mm	24	18
M 10	17 mm	47	35
M 12	19 mm	81	60
M 14	22 mm	128	95
M 16	24 mm	198	146
M 20	30 mm	386	285
M 24	36 mm	668	493

SCANDO 650 Modular System

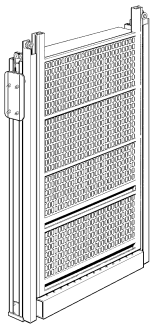
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg



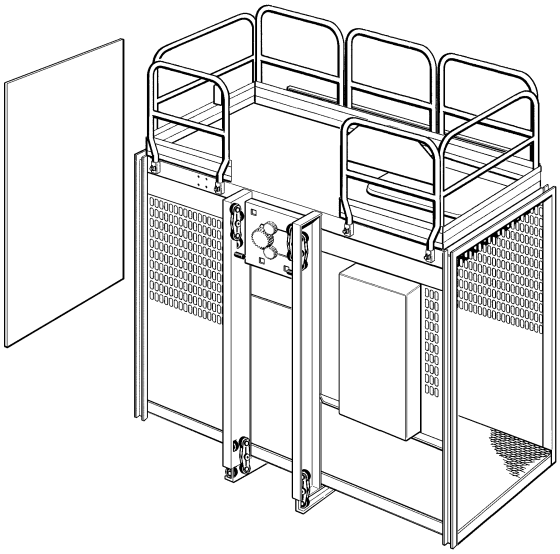
Vertical full height
entrance door, weight 155 kg

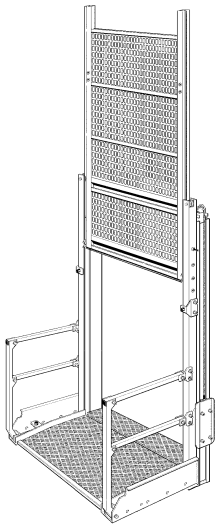


2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

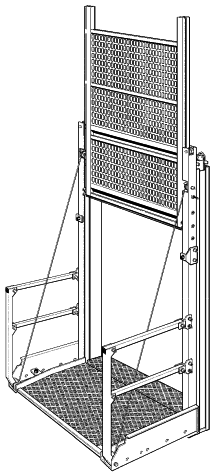
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



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SCANDO 650 DOL /32 50Hz

3.2 m car with two [1] vertical doors		**X**				**(C22)**
3.2 m car with three vertical doors			**X**			**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**		**(C25)**
3.2 m car with one load ramp and two vertical doors					**X**	**(C26)**
Pay-load capacity (fuse 63 A)	kg	2100	2000	1900	1900	
(fuse 80 A)	kg	2400	2300	2300	2200	
Average speed 50 Hz	m/min	38	38	38	38	
Max. lifting height	meter	200	200	200	200	
Increased lifting height on request						
No. of buffer springs	pcs.	3	3	3	3	
Safety device type GFD	P/no.		9101991-9009			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		380 – 420 V, 50 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 63 A)	kVA~	37
(fuse 80 A)	kVA~	40
Power cable guiding system		***Cable basket (≤ 100 m)***
Data for other voltages on request		

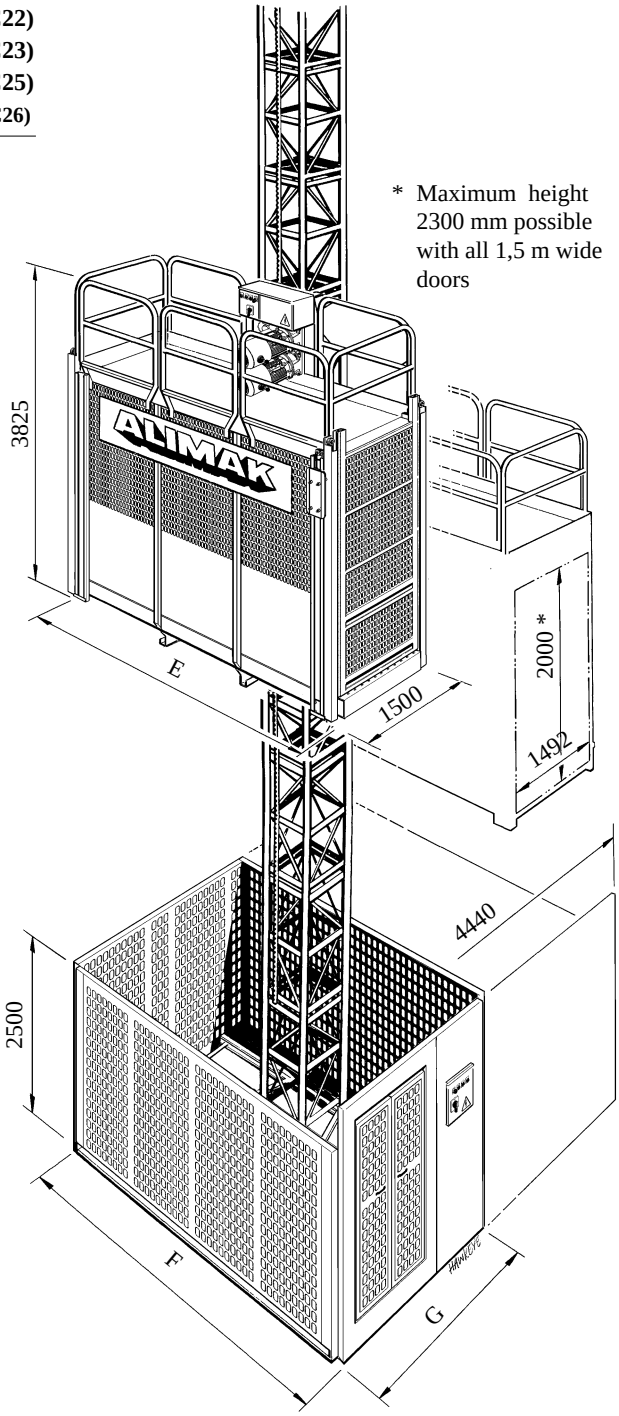
WEIGHTS

Base unit weight approx.	kg	2800	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

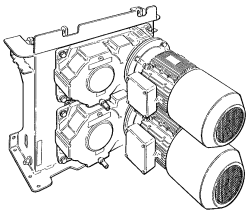
[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

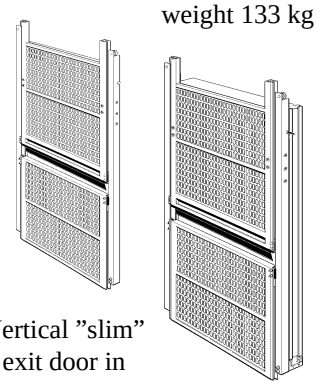
ALIMAK AB, P O Box 720, SE-931 27 Skellefteå, Sweden. Tel. +46 910 87000.
Fax +46 910 56690. E-mail: info@alimak.se. Web site: www.alimak.com.

SCANDO 650 Modular System

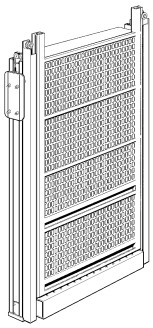
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg



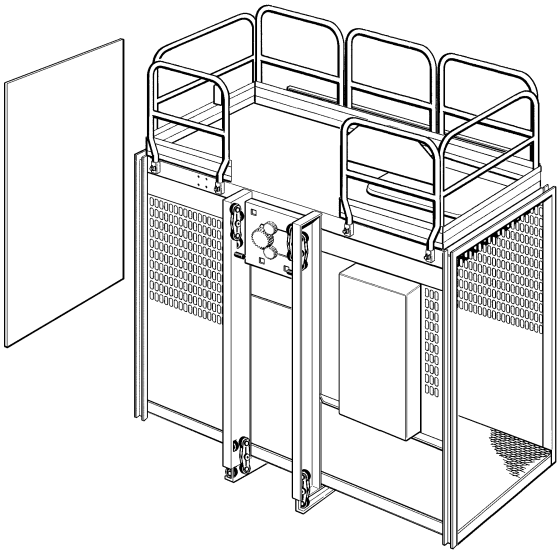
Vertical full height
entrance door, weight 155 kg

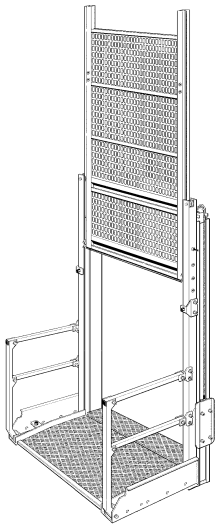


2.8 m car base structure incl. safety railings (85kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

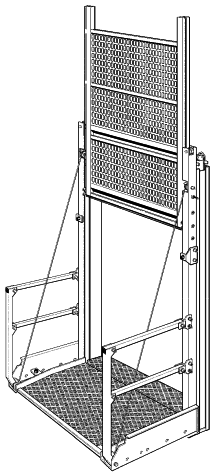
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



Printed in Sweden

SCANDO 650 DOL /32 60 Hz

3.2 m car with two [1] vertical doors		**X**				**(C22)**
3.2 m car with three vertical doors			**X**			**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**		**(C25)**
3.2 m car with one load ramp and two vertical doors					**X**	**(C26)**
Pay-load capacity (fuse 60 A)	kg	2600	2500	2400	2200	
Average speed 60 Hz	m/min	38	38	38	38	
Max. lifting height	meter	200	200	200	200	
Increased lifting height on request						
No. of buffer springs	pcs.	3	3	3	3	
Safety device type GFD	P/no.		9101991-9009			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		440 – 480 V, 60 Hz, 3 Phase
At 480 V/60 Hz:		
Power supply fuses	A~	60
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 60 A)	kVA~	41

Power cable guiding system ***Cable basket (≤ 100 m)***

Data for other voltages on request

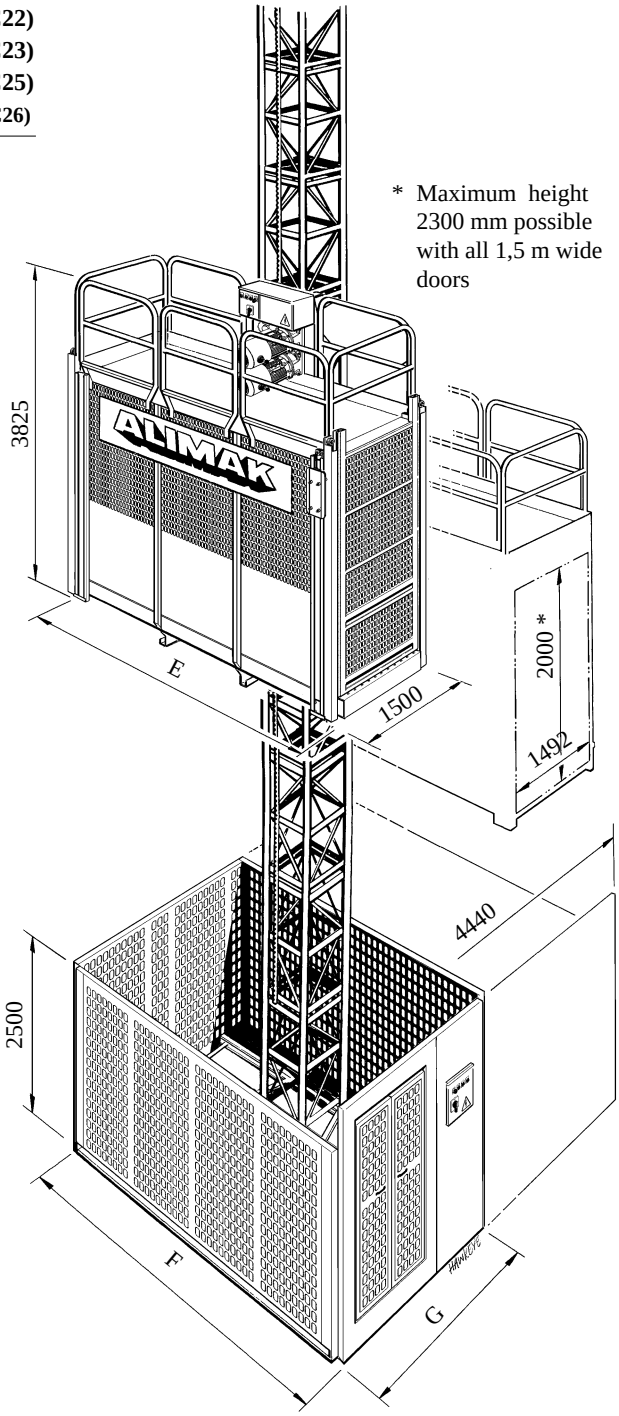
WEIGHTS

Base unit weight approx.	kg	2800	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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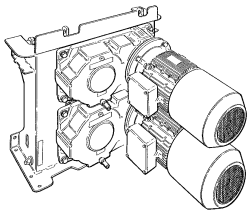
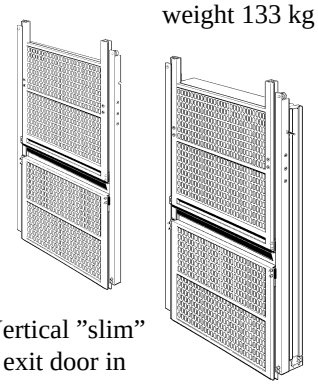
SCANDO 650 Modular System

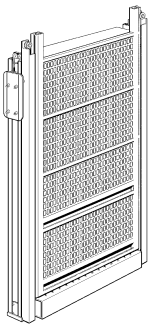
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg



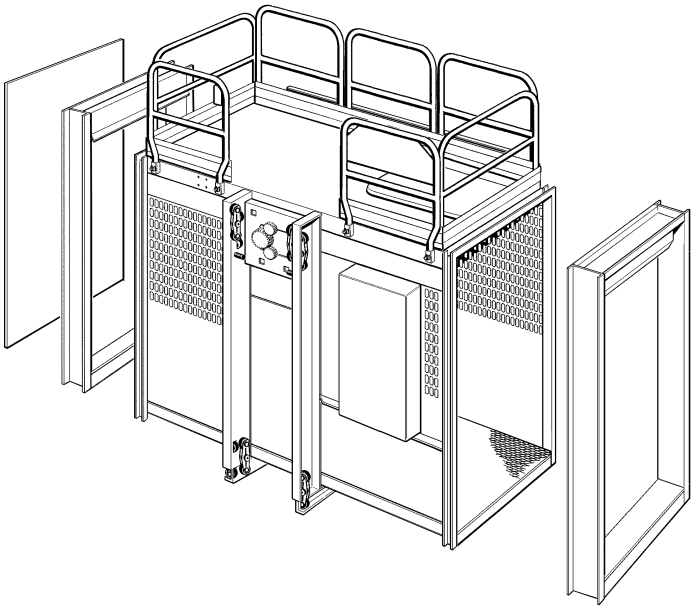
Vertical full height
entrance door, weight 155 kg



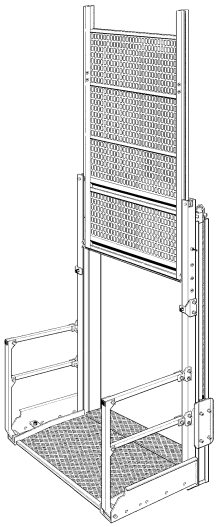
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

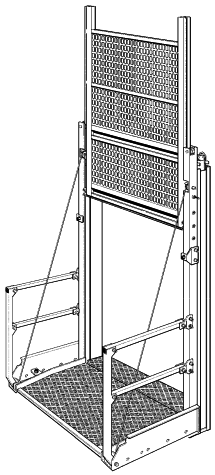


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 DOL /39 50 Hz

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door		**X**			**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**
Pay-load capacity (fuse 63 A)	kg	1900	1800	1800	1700
(fuse 80 A)	kg	2200	2100	2000	1900
Average speed 50 Hz	m/min	38	38	38	38
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9101991-9009		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		380 – 420 V, 50 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 63 A)	kVA~	37
(fuse 80 A)	kVA~	40
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

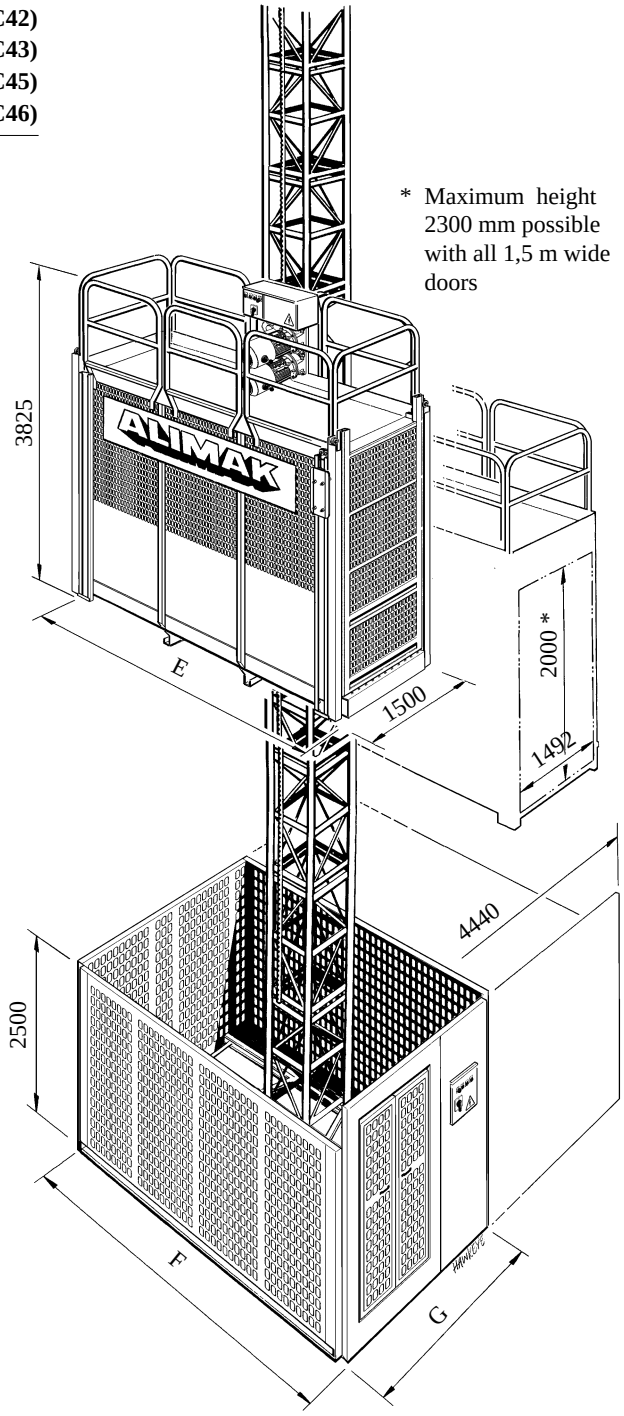
WEIGHTS

Base unit weight approx.	kg	3000	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A ”slim” 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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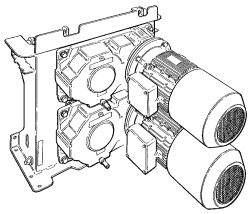
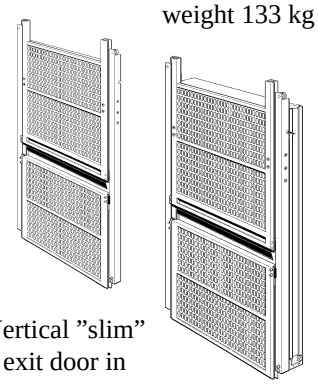
SCANDO 650 Modular System

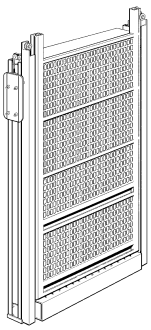
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg

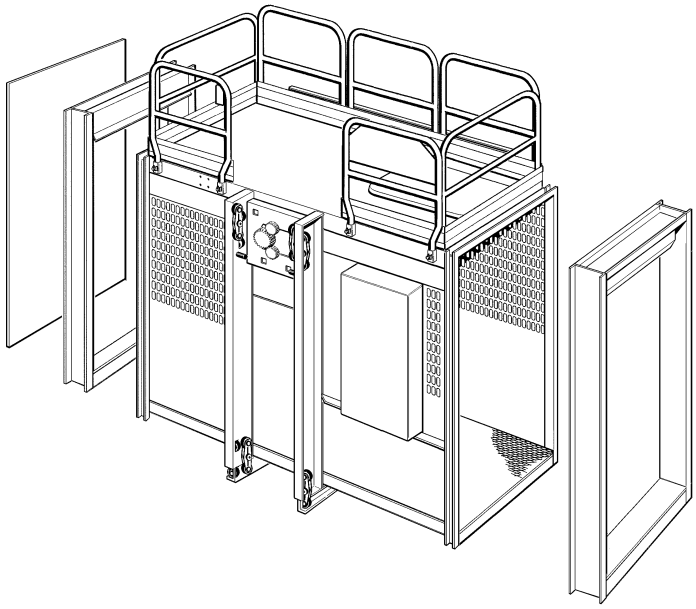


Vertical full height
entrance door, weight 155 kg



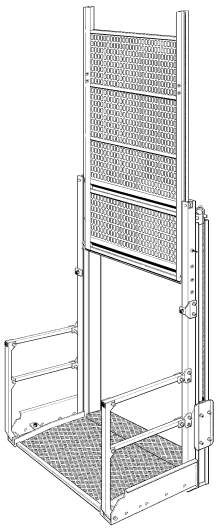
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg



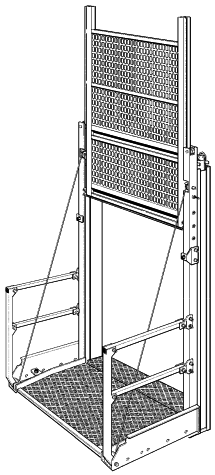
Closed, solid wall
on exit side,
weight 55 kg

Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 DOL /39 50Hz

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door				**X**	**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors					**X (C46)**

Pay-load capacity (fuse 63 A)	kg	1900	1900	1800	1700
(fuse 80 A)	kg	2300	2200	2100	2000
Average speed 50 Hz	m/min	38	38	38	38
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9101991-9009		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		380 – 420 V, 50 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 63 A)	kVA~	37
(fuse 80 A)	kVA~	40
Power cable guiding system		***Cable basket (≤ 100 m)***
Data for other voltages on request		

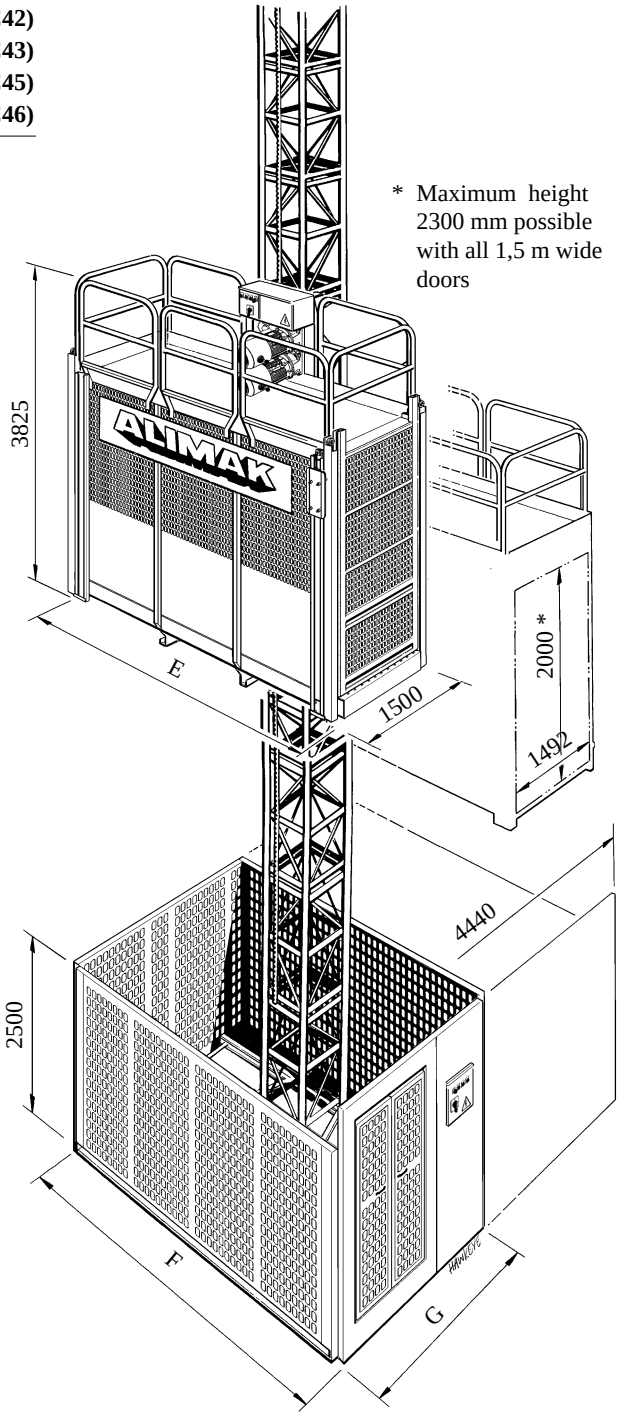
WEIGHTS

Base unit weight approx.	kg	3000	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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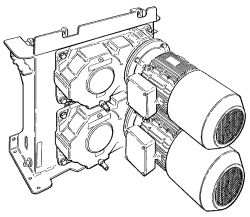
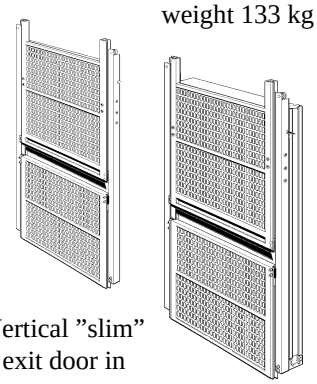
Fax +46 910 56690. E-mail: info@alimak.se. Web site: www.alimak.com.

SCANDO 650 Modular System

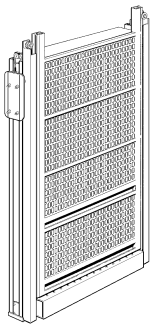
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg



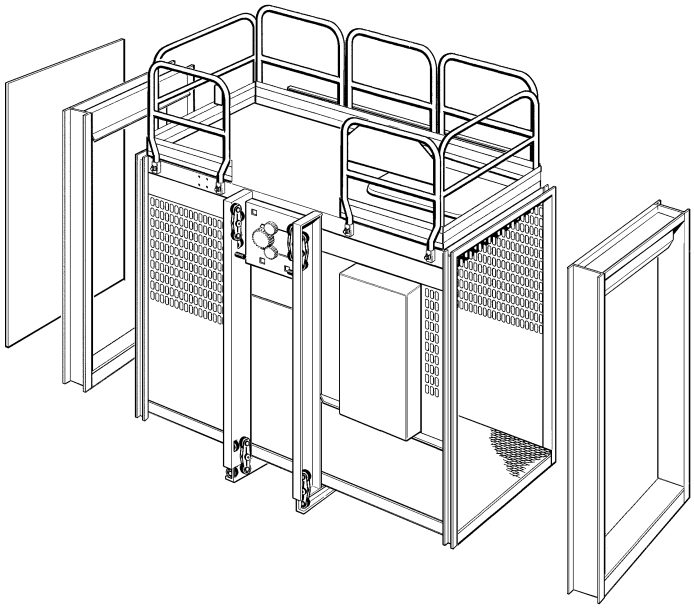
Vertical full height
entrance door, weight 155 kg



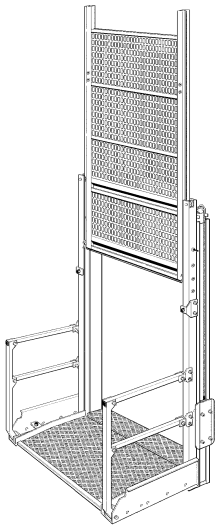
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

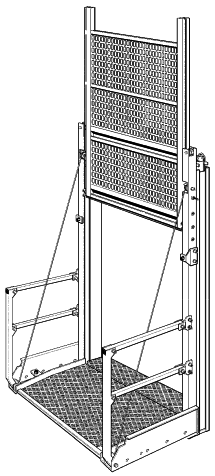


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 DOL /39 60Hz

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door				**X**	**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors					**X (C46)**

Pay-load capacity (fuse 60 A)	kg	2300	2100	2000	1900
Average speed 50 Hz	m/min	38	38	38	38
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9101991-9009		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		380 – 420 V, 60 Hz, 3 Phase
At 400 V/60 Hz:		
Power supply fuses	A~	60
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 66 A)	kVA~	41

Power cable guiding system ***Cable basket (≤ 100 m)***

Data for other voltages on request

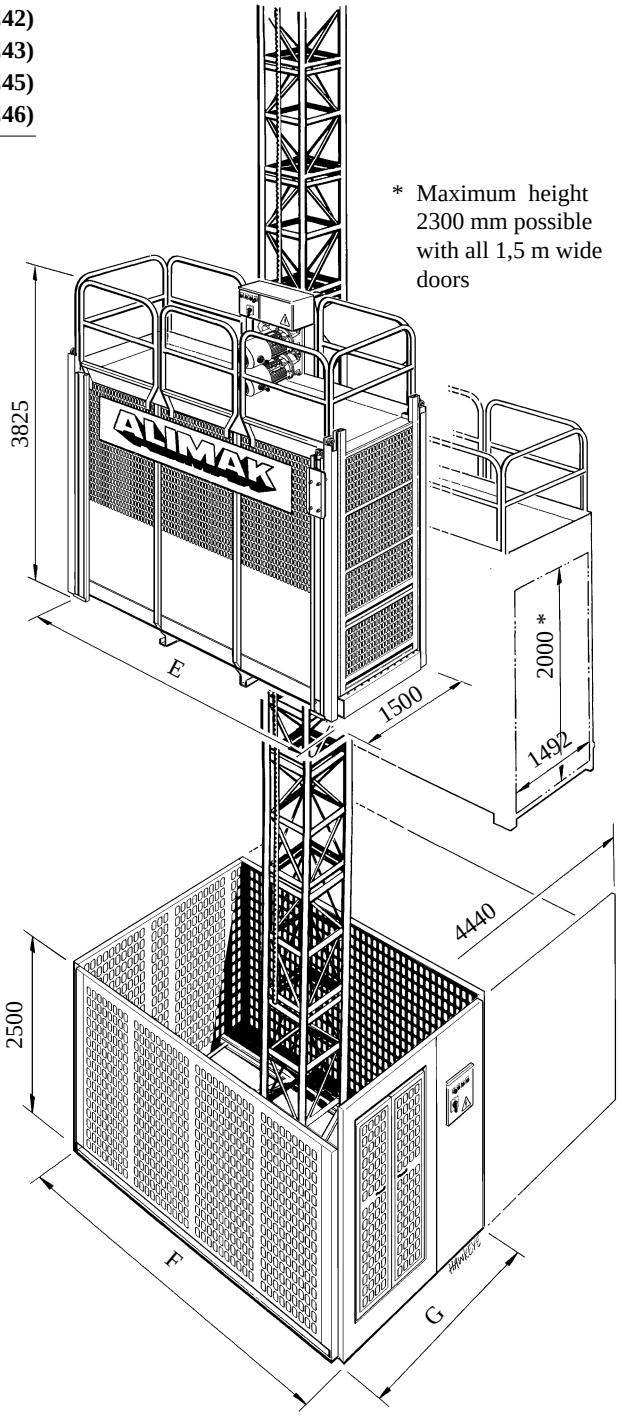
WEIGHTS

Base unit weight approx.	kg	3000	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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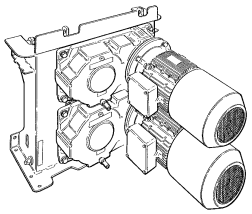
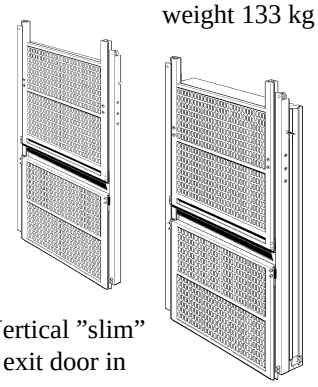
SCANDO 650 Modular System

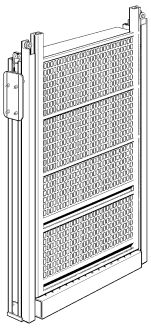
Dual motor machinery (DOL)
Weight 495 kg



Vertical exit door
in two parts,
weight 133 kg



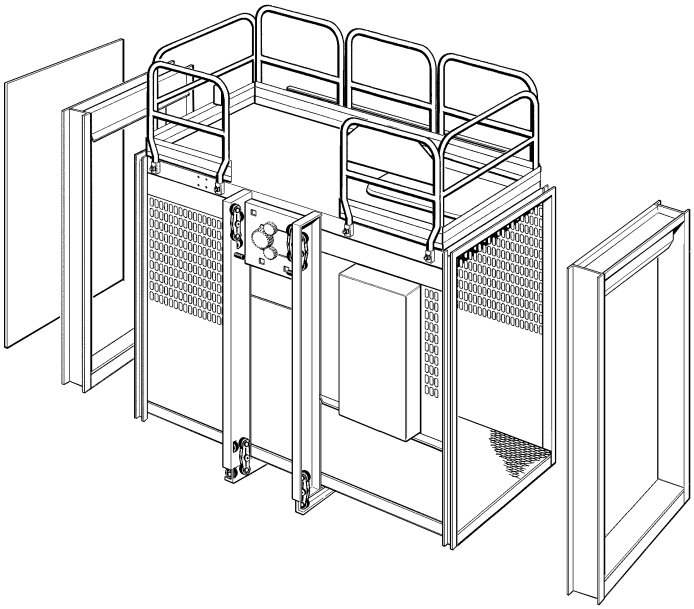
Vertical full height
entrance door, weight 155 kg



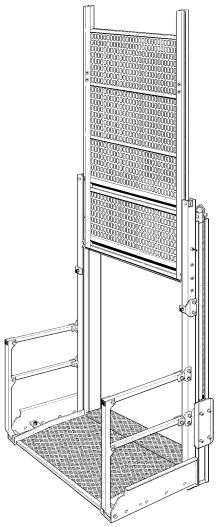
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

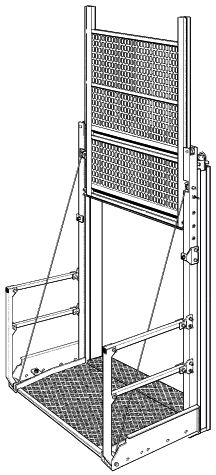


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 DOL /39 60 Hz

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door		**X**			**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**
Pay-load capacity (fuse 60 A)	kg	2300	2100	2000	1900
Average speed 60 Hz	m/min	38	38	38	38
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9101991-9009		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		440 – 480 V, 60 Hz, 3 Phase
At 400 V/60 Hz:		
Power supply fuses	A~	60
Dual motor machinery	kW	2 x 11
Starting current (DOL)	A~	289
Power consumpt. (fuse 60 A)	kVA~	41
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

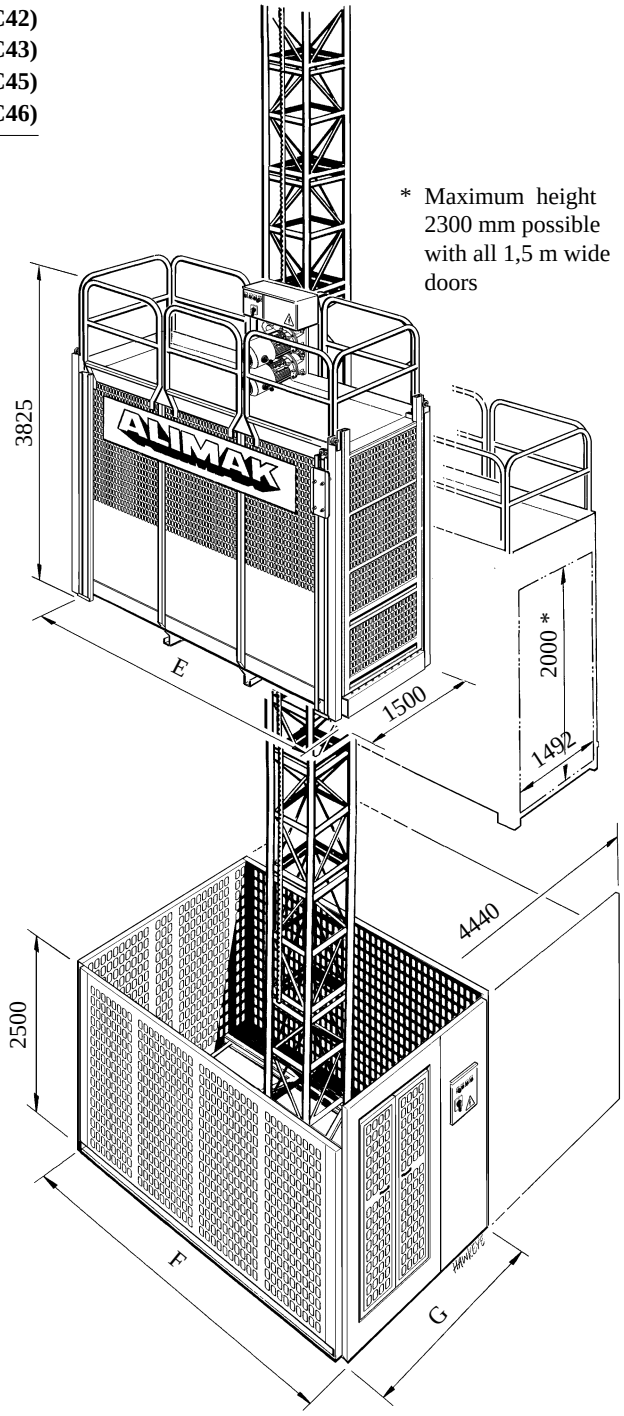
WEIGHTS

Base unit weight approx.	kg	3000	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A ”slim” 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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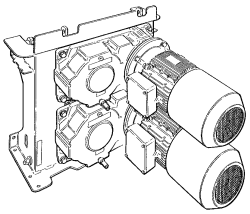
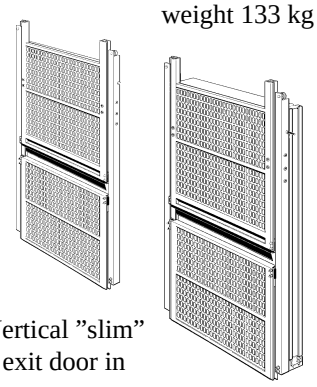
SCANDO 650 Modular System

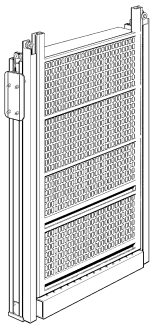
Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg



Vertical exit door
in two parts,
weight 133 kg



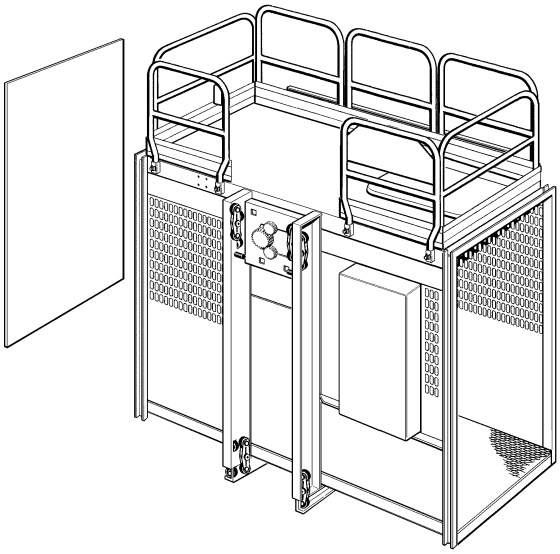
Vertical full height
entrance door, weight 155 kg

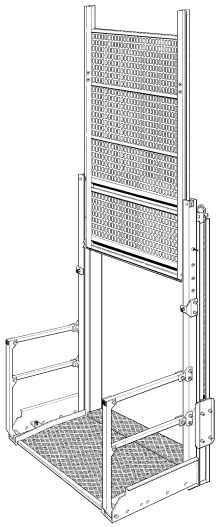


2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

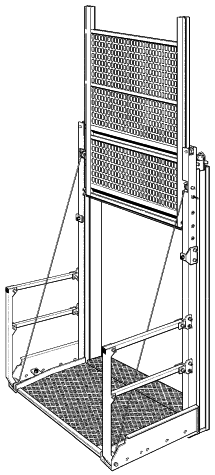
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



Printed in Sweden

SCANDO 650 FC /32

3.2 m car with two [1] vertical doors		**X**			**(C22)**
3.2 m car with three vertical doors			**X**		**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**	**(C25)**
3.2 m car with one load ramp and two vertical doors					**X (C26)**
Pay-load capacity (fuse 63 A)	kg	2100	2000	2000	1900
(fuse 80 A)	kg	2400	2300	2200	2000
Speed 50 Hz / 60 Hz	m/min	0 – 42	0 – 42	0 – 42	0 – 42
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	2	2	2	2
Safety device type GFD	P/no.		9101991-9010		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	60
(fuse 80 A)	A~	64
Power consumpt. (fuse 63 A)	kVA~	36
(fuse 80 A)	kVA~	39
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

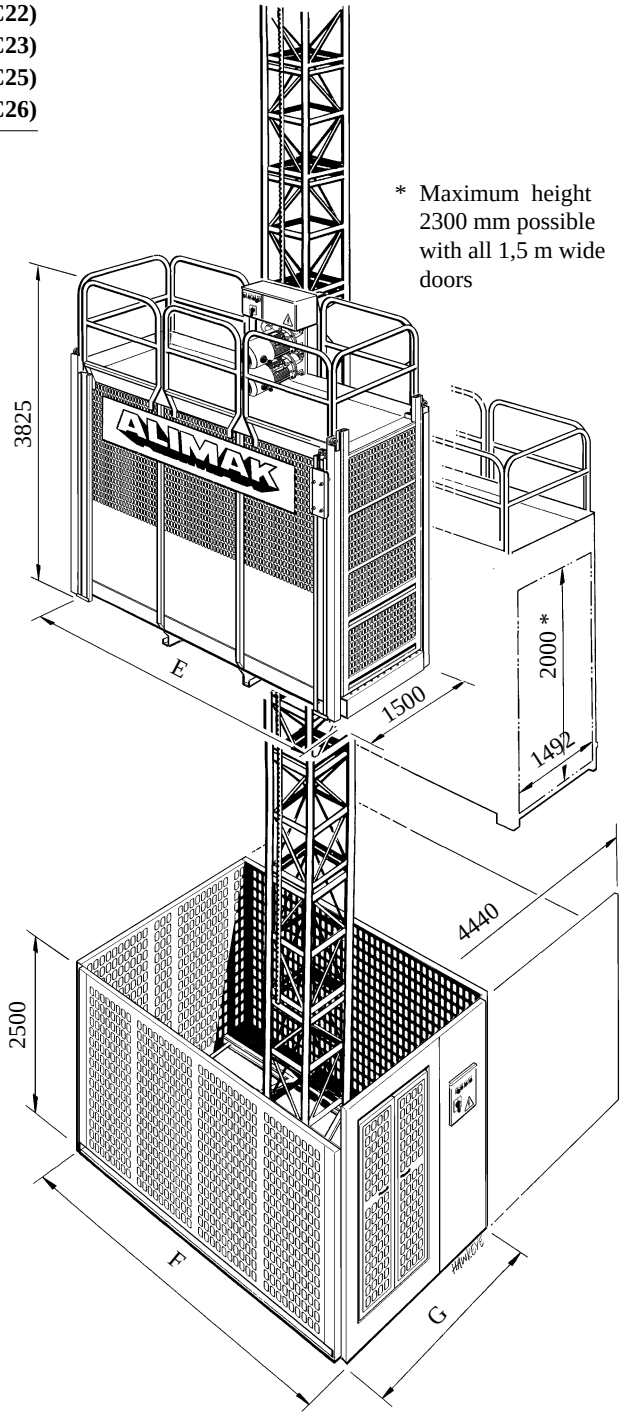
WEIGHTS

Base unit weight approx.	kg	2850	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[3] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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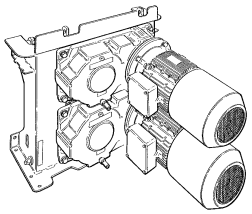
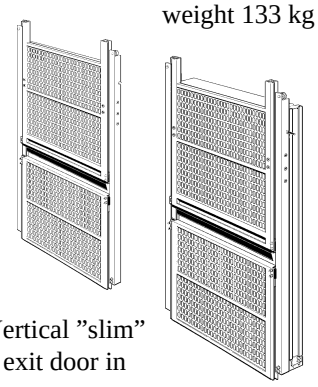
SCANDO 650 Modular System

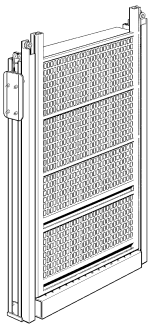
Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg



Vertical exit door
in two parts,
weight 133 kg



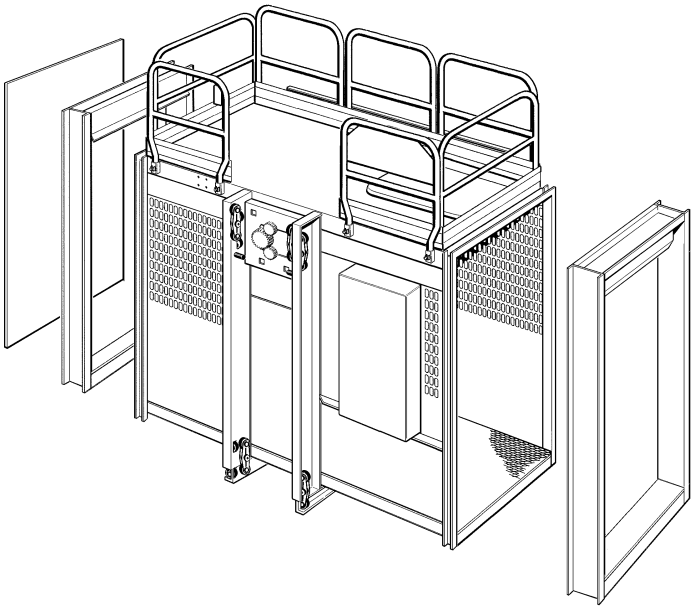
Vertical full height
entrance door, weight 155 kg



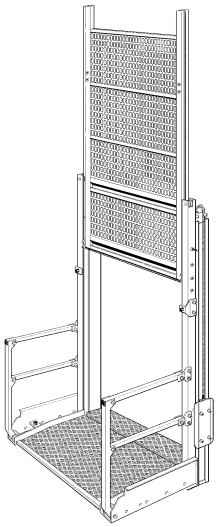
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

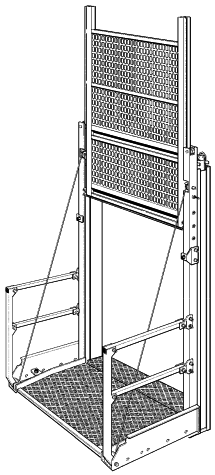


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 FC /39

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door		**X**			**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**
Pay-load capacity (fuse 63 A)	kg	1900	1800	1800	1700
(fuse 80 A)	kg	2100	1900	1800	1700
Speed 50 Hz / 60 Hz	m/min	0 – 42	0 – 42	0 – 42	0 – 42
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	2	2	2	2
Safety device type GFD	P/no.		9101991-9010		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	60
(fuse 80 A)	A~	64
Power consumpt. (fuse 63 A)	kVA~	36
(fuse 80 A)	kVA~	39
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

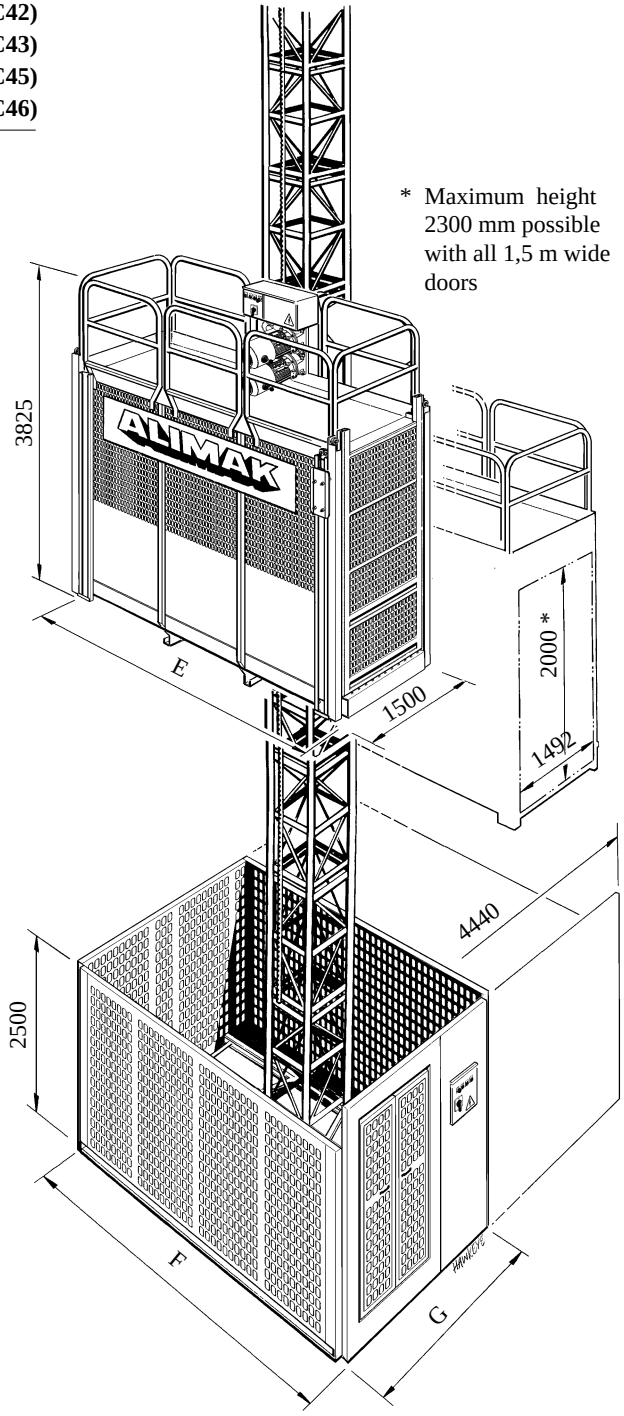
WEIGHTS

Base unit weight approx.	kg	3050	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

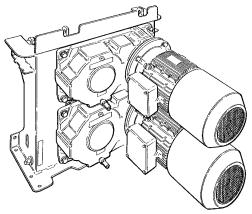
[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

ALIMAK AB, P O Box 720, SE-931 27 Skellefteå, Sweden. Tel. +46 910 87000.
Fax +46 910 56690. E-mail: info@alimak.se. Web site: www.alimak.com.

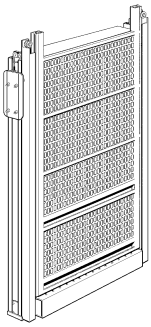
SCANDO 650 Modular System

Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg

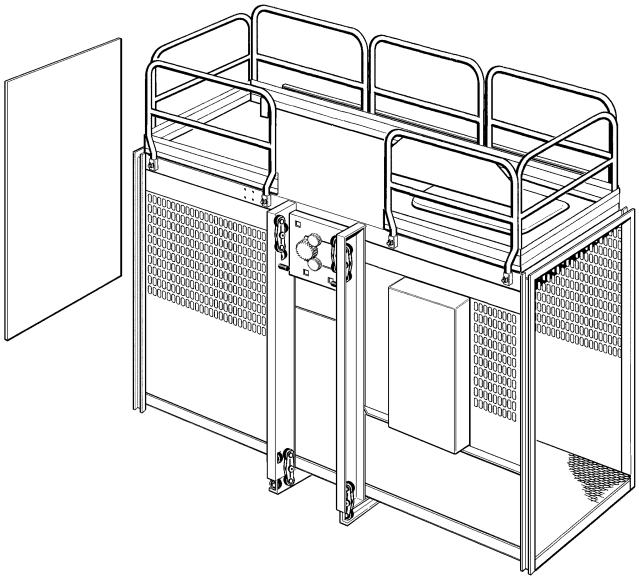


Vertical exit door
in two parts,
weight 133 kg

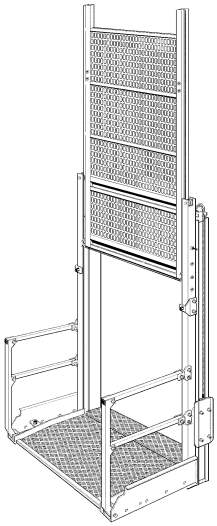
Vertical full height
entrance door, weight 155 kg



3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg

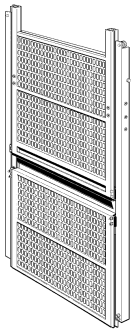


Closed, solid wall
on exit side,
weight 55 kg

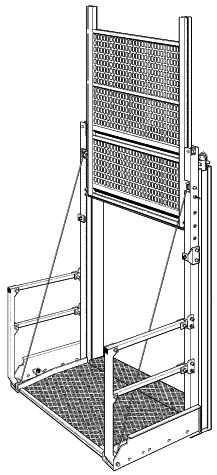


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /39

3.9 m car with two [1] vertical doors		**X**			**(C52)**
3.9 m car with three vertical doors			**X**		**(C53)**
3.9 m car with one load ramp and one [1] vertical door				**X**	**(C55)**
3.9 m car with one load ramp and two vertical doors					**X (C56)**
Pay-load capacity (fuse 63 A)	kg	2000	1900	1900	1800
(fuse 80 A)	kg	2200	2000	1900	1800
Speed 50 Hz / 60 Hz	m/min	0 – 42	0 – 42	0 – 42	0 – 42
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	2	2	2	2
Safety device type GFD	P/no.		9101991-9010		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	60
(fuse 80 A)	A~	64
Power consumpt. (fuse 63 A)	kVA~	36
(fuse 80 A)	kVA~	39
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

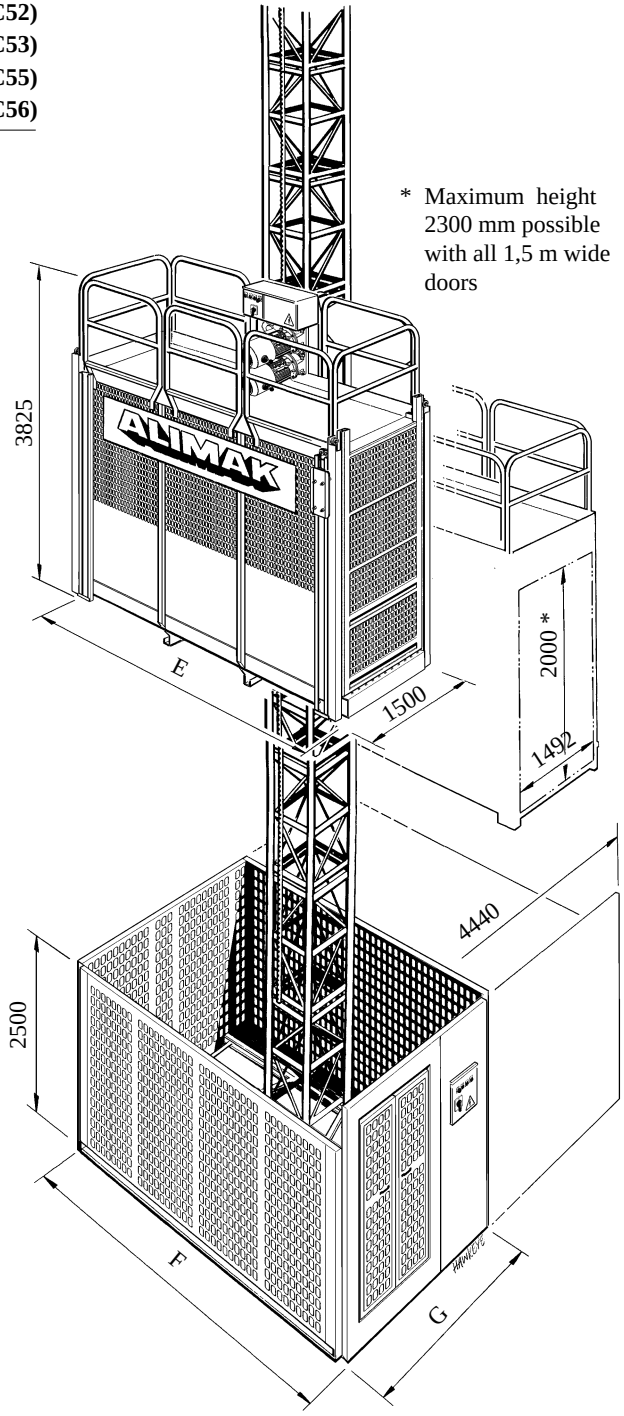
WEIGHTS

Base unit weight approx.	kg	3050	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height:	m	3.10	3.10	3.10	3.10
machinery excl.					



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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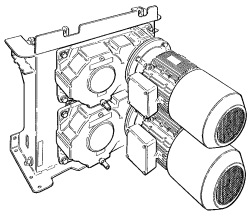
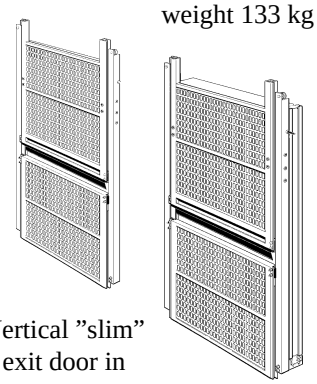
SCANDO 650 Modular System

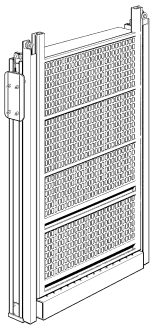
Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg



Vertical exit door
in two parts,
weight 133 kg



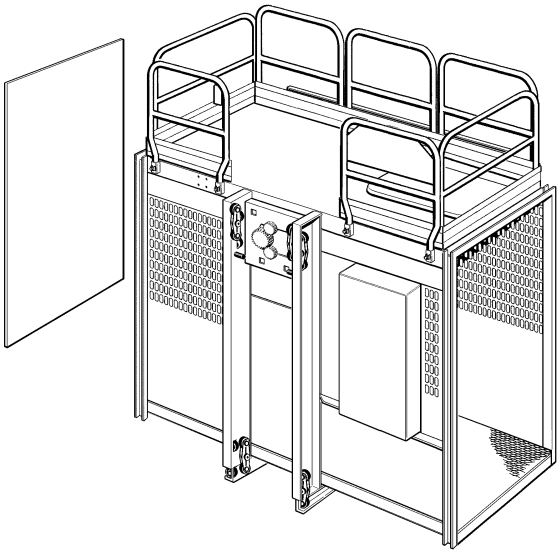
Vertical full height
entrance door, weight 155 kg

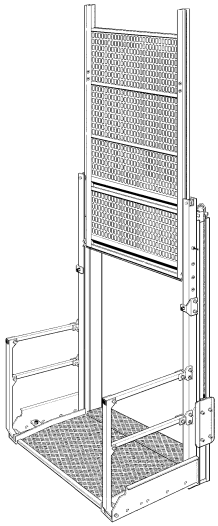


2.8 m car base structure incl. safety railings (85 kg),
length 2.8 m, weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

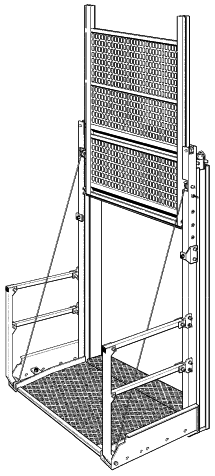
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



Printed in Sweden

No 1210 E Febr. -05.

SCANDO 650 FC /32

3.2 m car with two [1] vertical doors		**X**				**(C22)**
3.2 m car with three vertical doors			**X**			**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**		**(C25)**
3.2 m car with one load ramp and two vertical doors					**X**	**(C26)**
Pay-load capacity (fuse 63 A)	kg	1200	1100	1000	900	
(fuse 80 A)	kg	1900	1800	1700	1700	
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54	
Max. lifting height	meter	200	200	200	200	
Increased lifting height on request						
No. of buffer springs	pcs.	2	2	2	2	
Safety device type GFD	P/no.		9099255-8012			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	61
(fuse 80 A)	A~	74
Power consumpt.(fuse 63 A)	kVA~	37
(fuse 80 A)	kVA~	44
Power cable guiding system		***Cable trolley***

Data for other voltages on request

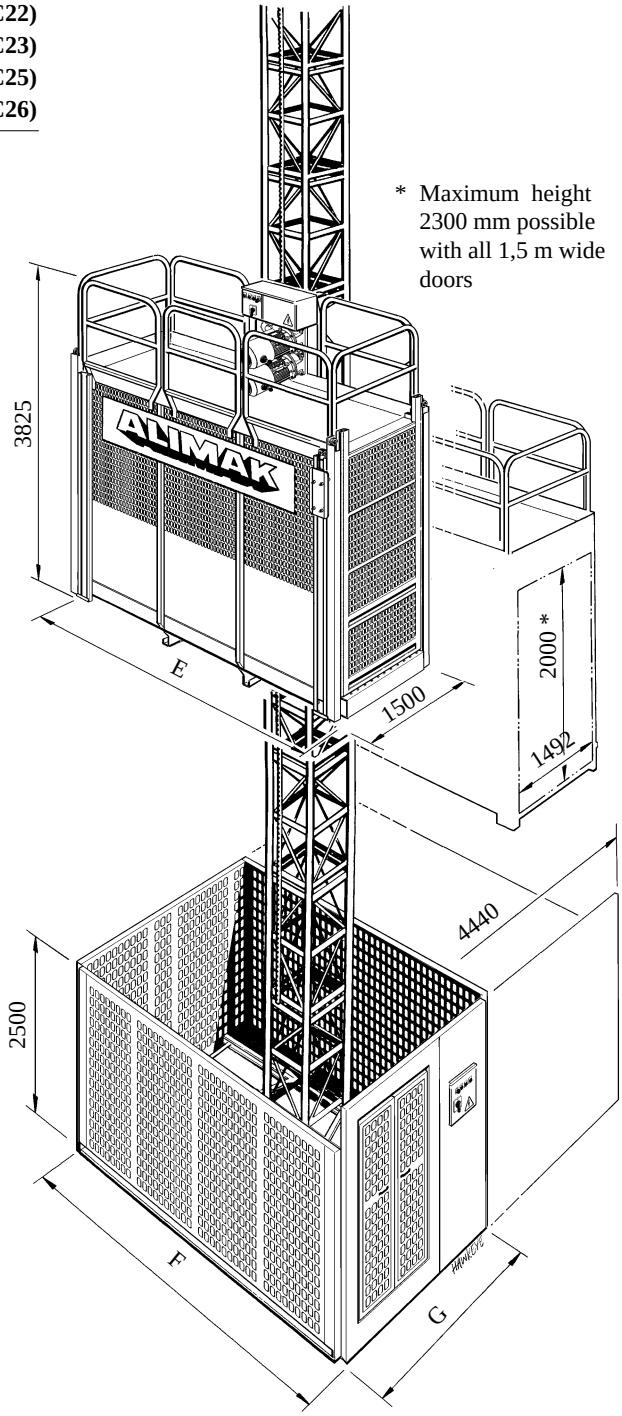
WEIGHTS

Base unit weight approx.	kg	2850	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height:	m	3.10	3.10	3.10	3.10
machinery excl.					



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A ”slim” 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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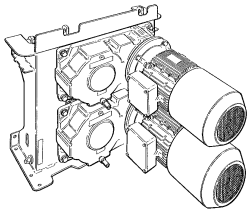
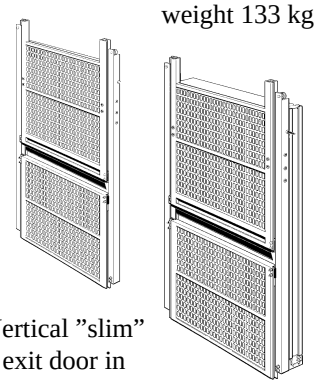
SCANDO 650 Modular System

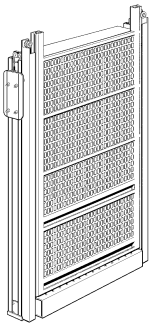
Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg



Vertical exit door
in two parts,
weight 133 kg



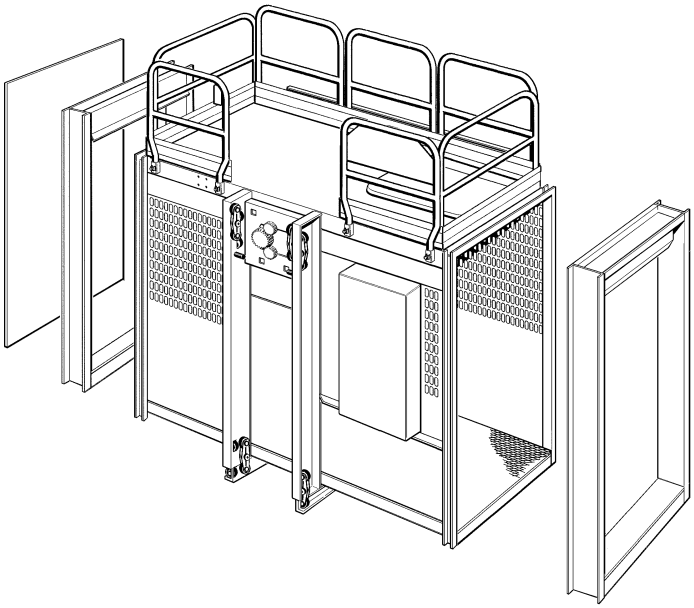
Vertical full height
entrance door, weight 155 kg



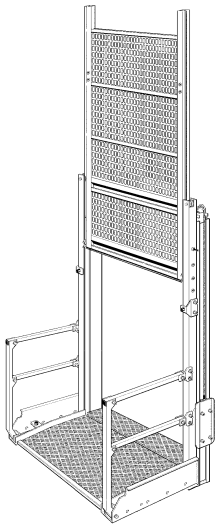
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

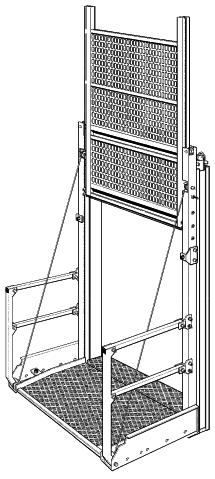


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 FC /39

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door		**X**			**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**
Pay-load capacity (fuse 63 A)	kg	1000	900	800	800
(fuse 80 A)	kg	1700	1600	1600	1500
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	2	2	2	2
Safety device type GFD	P/no.		9099255-8012		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	61
(fuse 80 A)	A~	74
Power consumpt.(fuse 63 A)	kVA~	37
(fuse 80 A)	kVA~	44
Power cable guiding system		***Cable trolley***

Data for other voltages on request

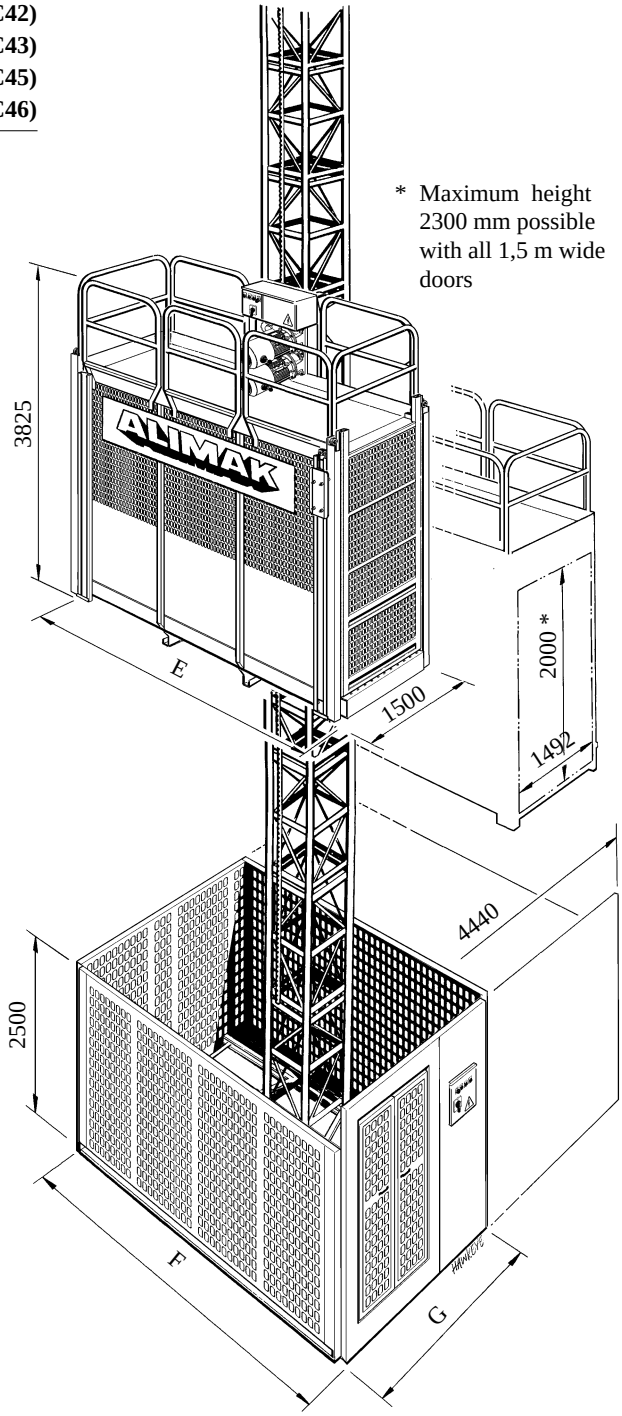
WEIGHTS

Base unit weight approx.	kg	3050	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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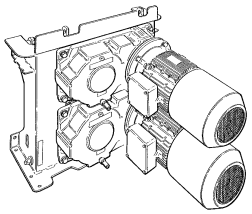
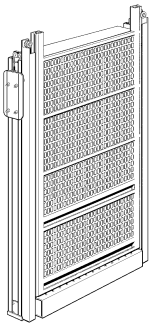
SCANDO 650 Modular System

Dual motor machinery (FC)
incl. VFC-panel (45 kW). Weight 590 kg

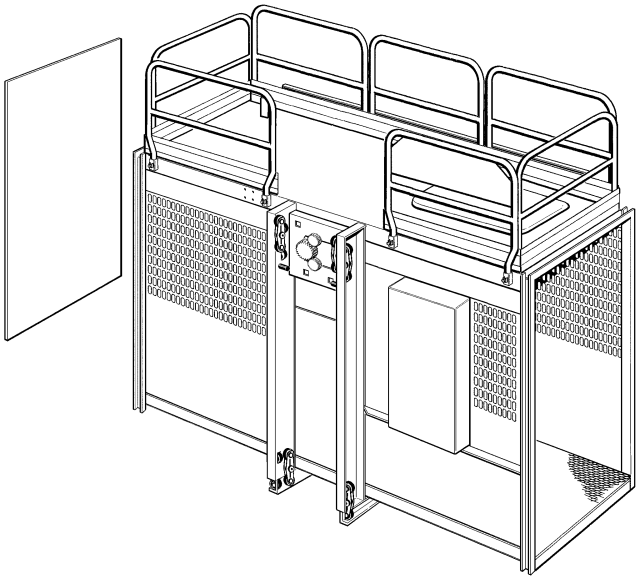


Vertical exit door
in two parts,
weight 133 kg

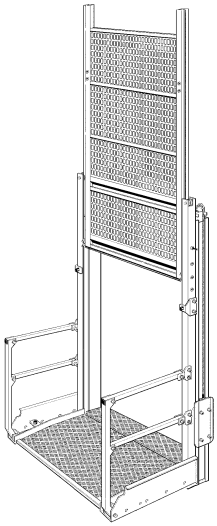
Vertical full height
entrance door, weight 155 kg



3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg

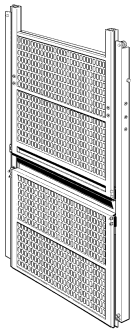


Closed, solid wall
on exit side,
weight 55 kg

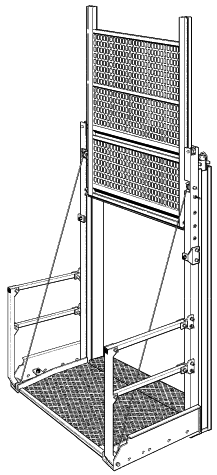


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /39

3.9 m car with two [1] vertical doors		**X**			**(C52)**
3.9 m car with three vertical doors			**X**		**(C53)**
3.9 m car with one load ramp and one [1] vertical door				**X**	**(C55)**
3.9 m car with one load ramp and two vertical doors					**X (C56)**
Pay-load capacity (fuse 63 A)	kg	1500	1400	1400	1300
(fuse 80 A)	kg	1700	1700	1600	1500
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	2	2	2	2
Safety device type GFD	P/no.		9099255-8012		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz:		
Power supply fuses	A~	63 or 80 alternatively
Dual motor machinery	kW	2 x 11
Starting current (fuse 63 A)	A~	57
(fuse 80 A)	A~	61
Power consumpt. (fuse 63 A)	kVA~	41
(fuse 80 A)	kVA~	44
Power cable guiding system		***Cable basket (≤ 100 m)***

Data for other voltages on request

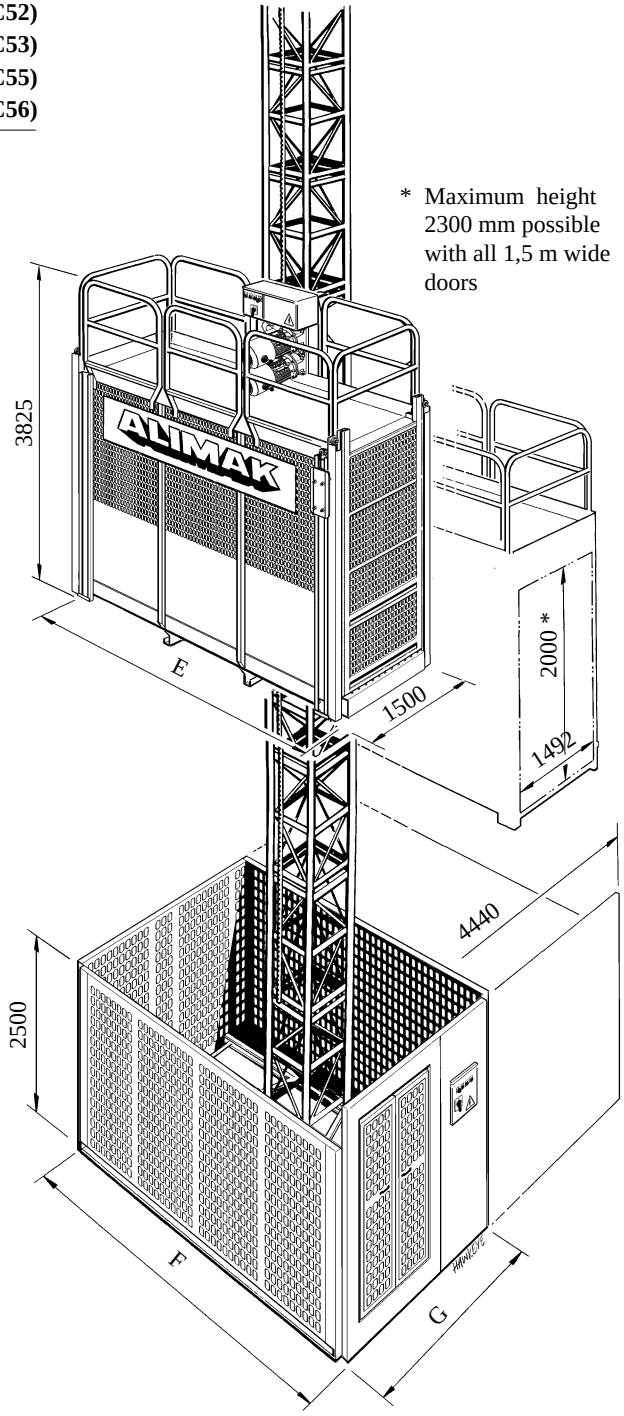
WEIGHTS

Base unit weight approx.	kg	3050	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height:	m	3.10	3.10	3.10	3.10
machinery excl.					



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add trailing power cable approximately 1.0 kg/meter where cable basket occurs. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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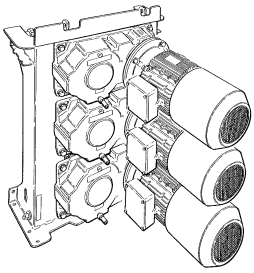
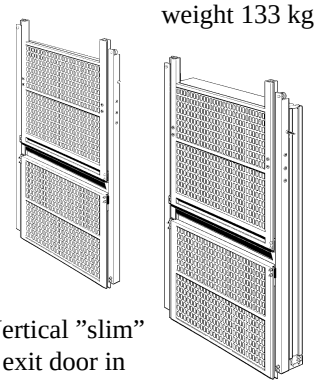
Fax +46 910 56690. E-mail: info@alimak.se. Web site: www.alimak.com.

SCANDO 650 Modular System

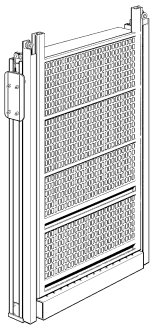
Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg



Vertical exit door
in two parts,
weight 133 kg



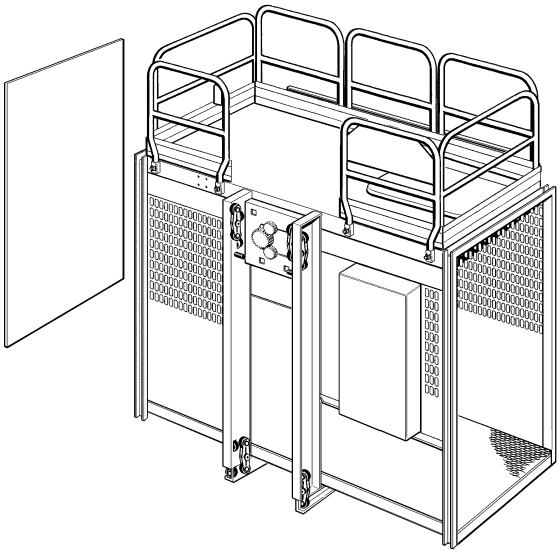
Vertical full height
entrance door, weight 155 kg

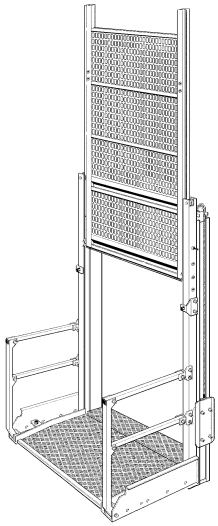


2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

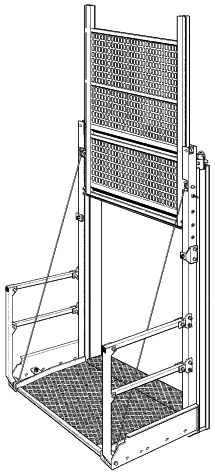
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



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SCANDO 650 FC /32

3.2 m car with two [1] vertical doors		**X**			**(C22)**
3.2 m car with three vertical doors			**X**		**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**	**(C25)**
3.2 m car with one load ramp and two vertical doors					**X (C26)**
Pay-load capacity (fuse 100 A)	kg	2900	2800	2800	2700
(fuse 125 A)	kg	3200	3200	3200	3200
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9099255-1212		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 175 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	98
(fuse 125 A)	A~	108
Power consumpt.(fuse 100 A)	kVA~	59
(fuse 125 A)	kVA~	59
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

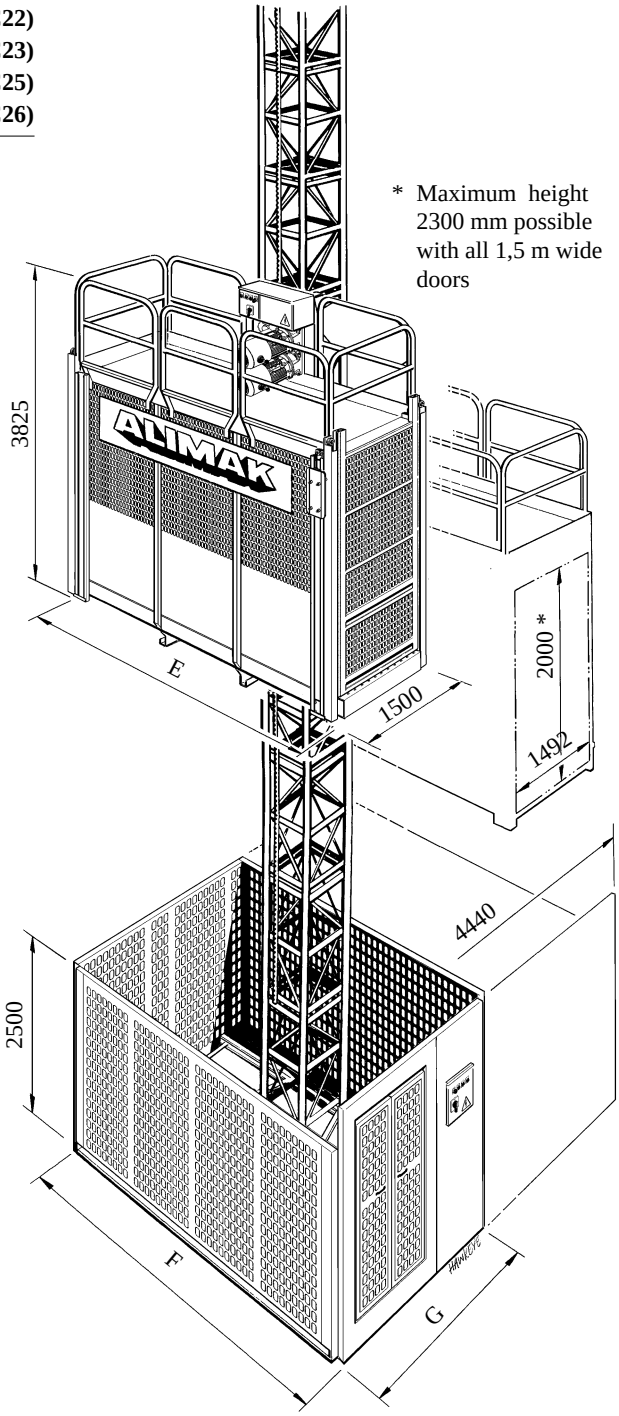
WEIGHTS

Base unit weight approx.	kg	3250	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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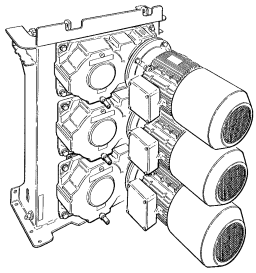
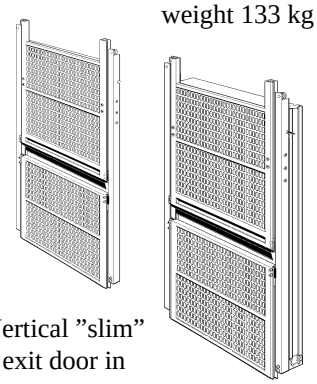
SCANDO 650 Modular System

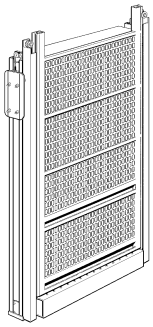
Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg



Vertical exit door
in two parts,
weight 133 kg



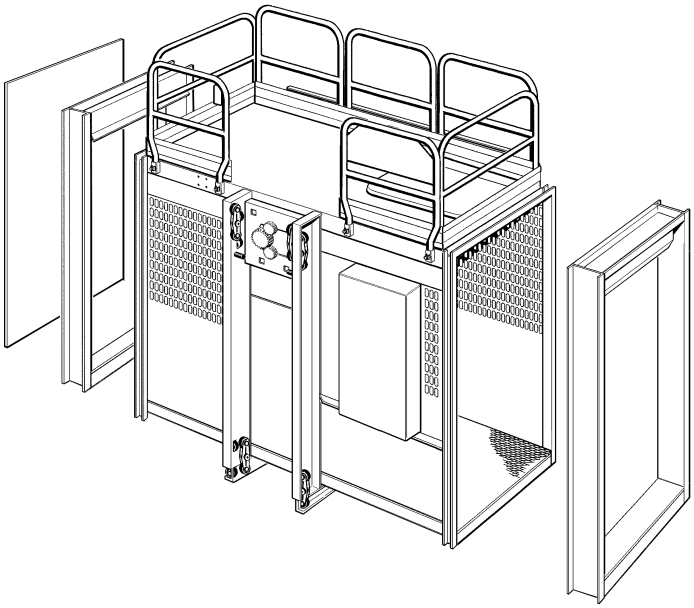
Vertical full height
entrance door, weight 155 kg



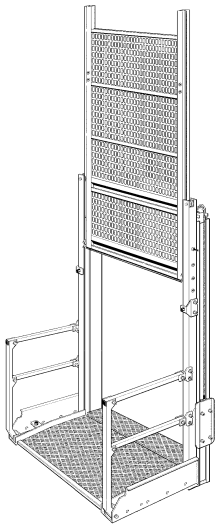
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

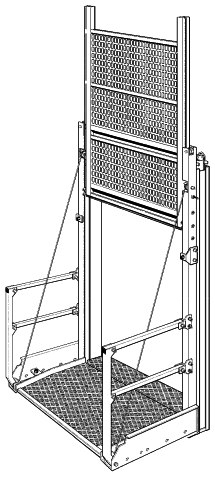


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 FC /39

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door		**X**			**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**
Pay-load capacity (fuse 100 A)	kg	2700	2600	2600	2500
(fuse 125 A)	kg	3200	3200	3200	3200
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.	9099255-1212			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 180 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	98
(fuse 125 A)	A~	108
Power consumpt.(fuse 100 A)	kVA~	59
(fuse 125 A)	kVA~	65
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

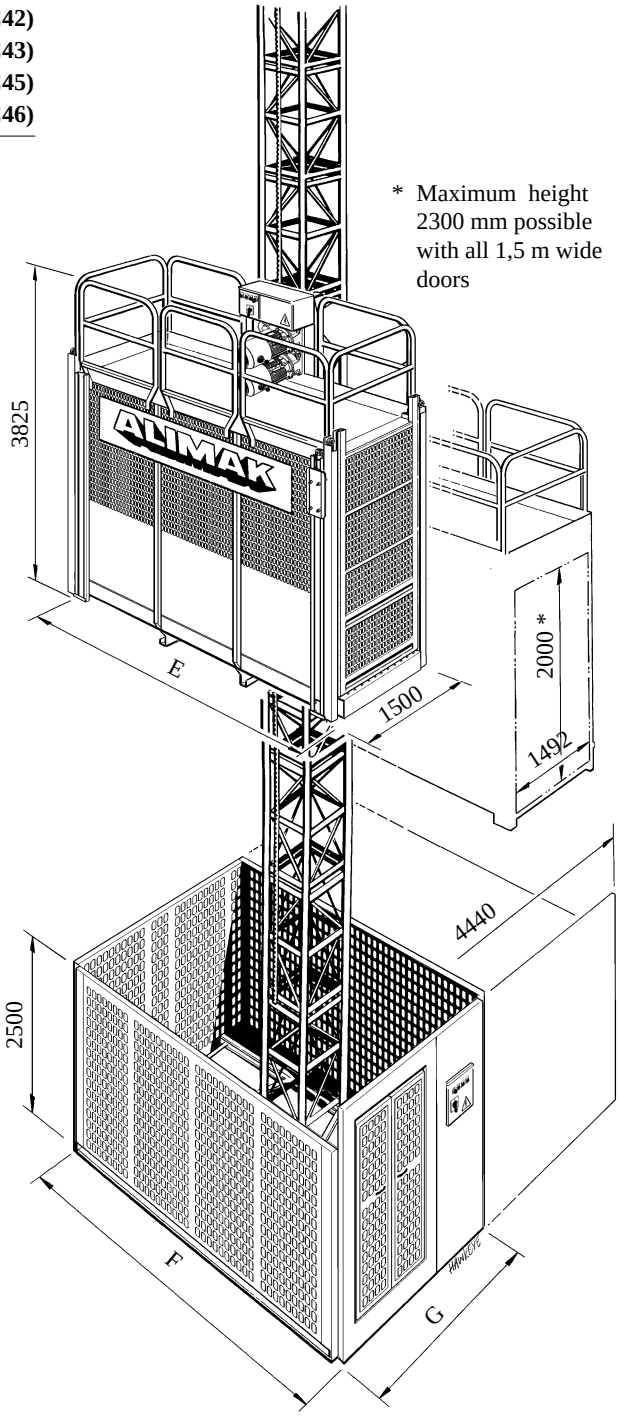
WEIGHTS

Base unit weight approx.	kg	3450	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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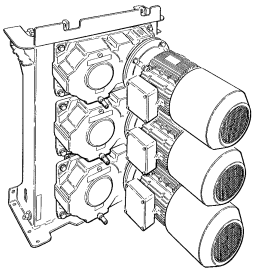
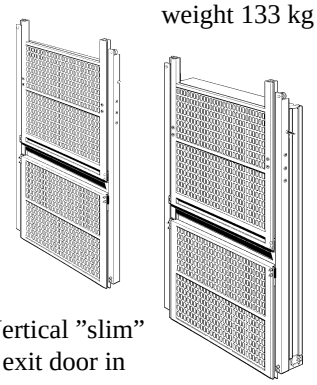
SCANDO 650 Modular System

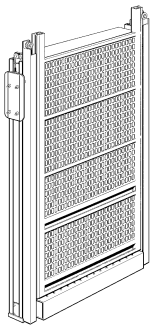
Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg



Vertical exit door
in two parts,
weight 133 kg



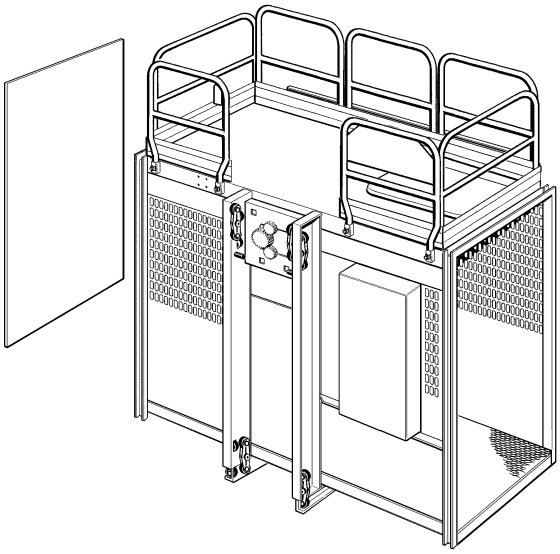
Vertical full height
entrance door, weight 155 kg

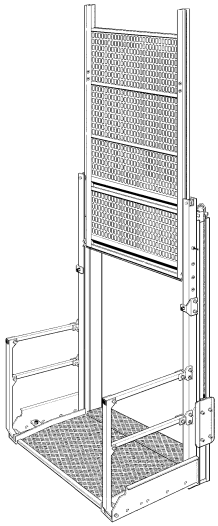


2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

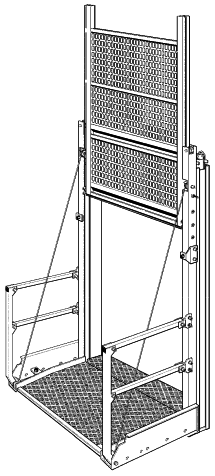
Closed, solid wall
on exit side,
weight 55 kg





Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load
ramp.
Weight 250 kg.
Add 117 kg when changed



Printed in Sweden

SCANDO 650 FC /32

3.2 m car with two [1] vertical doors		**X**			**(C22)**
3.2 m car with three vertical doors			**X**		**(C23)**
3.2 m car with one load ramp and one [1] vertical door				**X**	**(C25)**
3.2 m car with one load ramp and two vertical doors					**X (C26)**
Pay-load capacity (fuse 100 A)	kg	1900	1800	1800	1700
(fuse 125 A)	kg	2500	2400	2400	2300
Speed 50 Hz / 60 Hz	m/min	0 – 65	0 – 65	0 – 65	0 – 65
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9099255-1014		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.2	3.2	3.2	3.2
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 160 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	97
(fuse 125 A)	A~	110
Power consumpt.(fuse 100 A)	kVA~	58
Power consumpt.(fuse 125 A)	kVA~	66
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

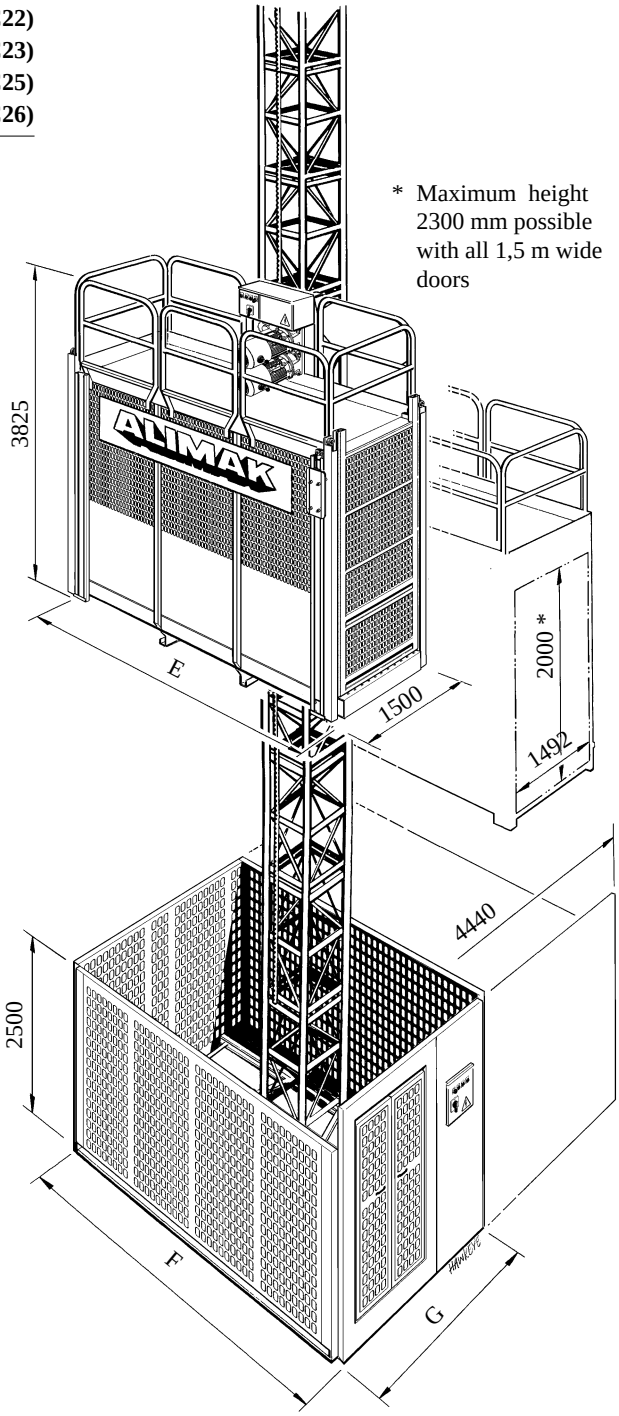
WEIGHTS

Base unit weight approx.	kg	3250	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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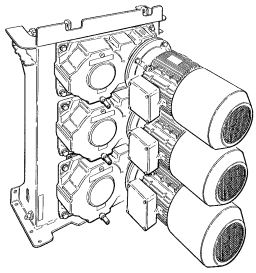
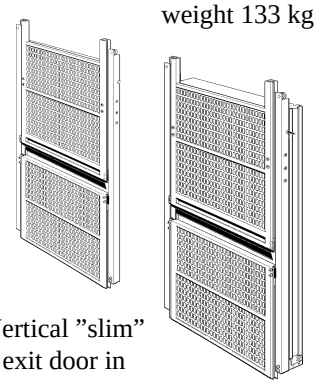
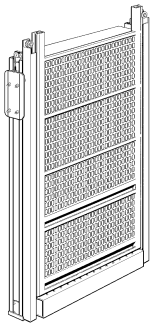
Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg



Vertical exit door
in two parts,
weight 133 kg



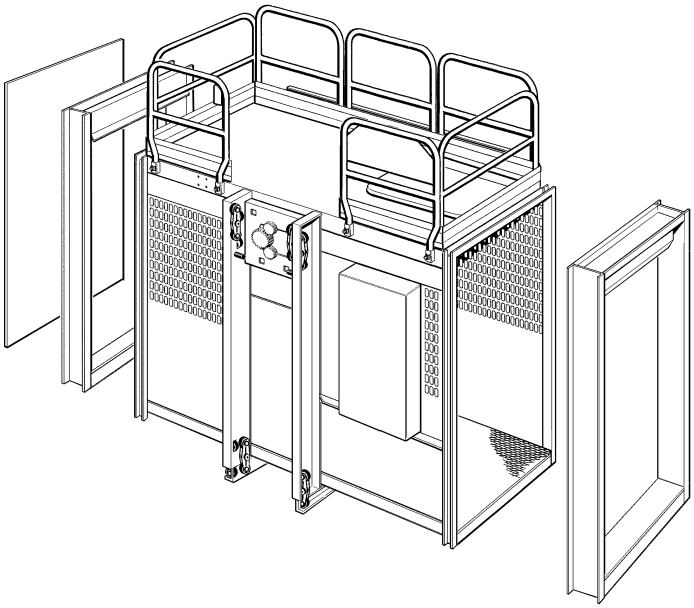
Vertical full height
entrance door, weight 155 kg



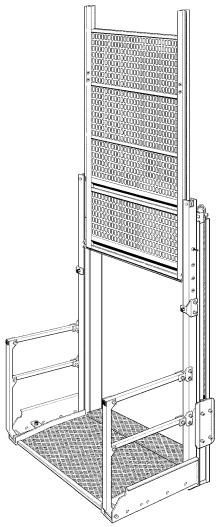
2.8 m car base structure incl. safety railings (85 kg),
weight 1500 kg

Vertical ”slim”
exit door in
two parts,
weight 77 kg

Closed, solid wall
on exit side,
weight 55 kg

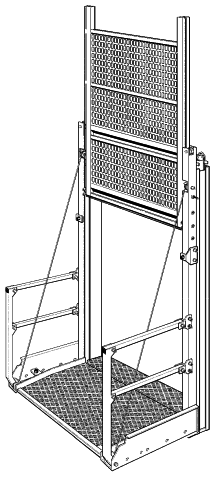


Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.



Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.



Printed in Sweden

SCANDO 650 FC /39

Extended 3.9 m car with two [1] vertical doors		**X**			**(C42)**
Extended 3.9 m car with three vertical doors			**X**		**(C43)**
Extended 3.9 m car with one load ramp and one [1] vertical door				**X**	**(C45)**
Extended 3.9 m car with one load ramp and two vertical doors				**X**	**(C46)**

Pay-load capacity (fuse 100 A)	kg	1700	1600	1600	1500
(fuse 125 A)	kg	2300	2200	2200	2100
Speed 50 Hz / 60 Hz	m/min	0 – 65	0 – 65	0 – 65	0 – 65
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9099255-1014		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 160 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	97
(fuse 125 A)	A~	110
Power consumpt.(fuse 100 A)	kVA~	58
(fuse 125 A)	kVA~	66
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

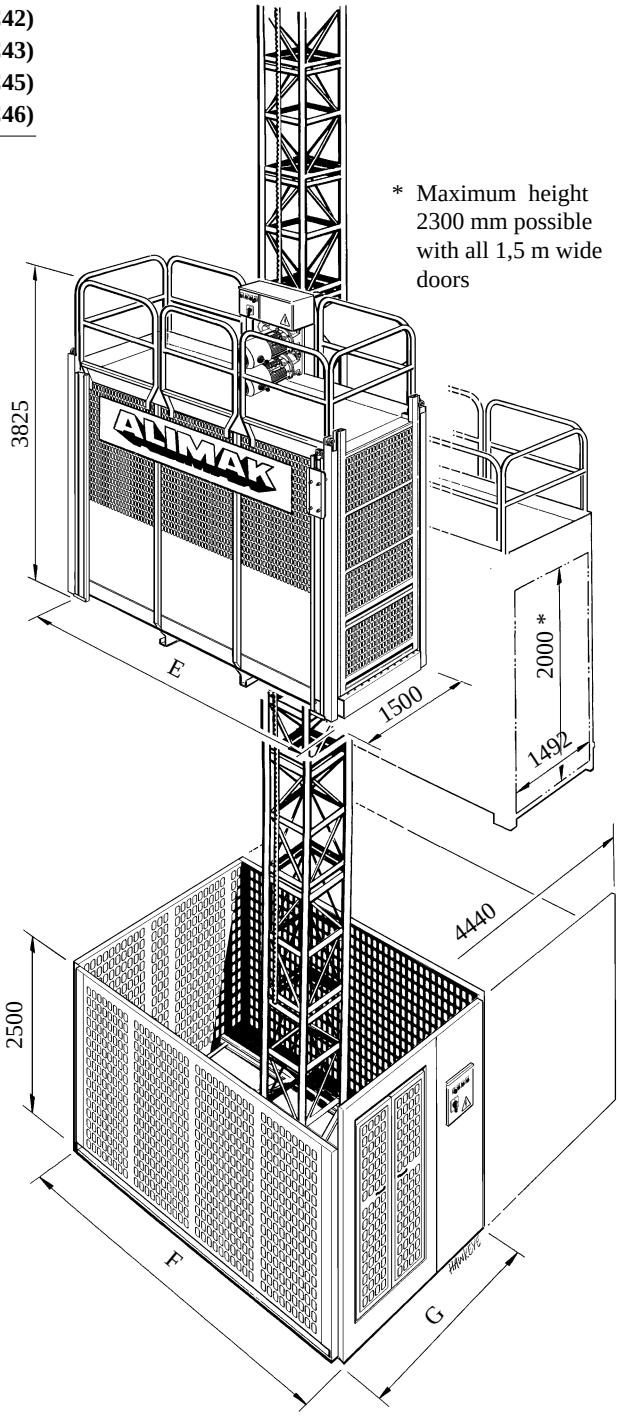
WEIGHTS

Base unit weight approx.	kg	3450	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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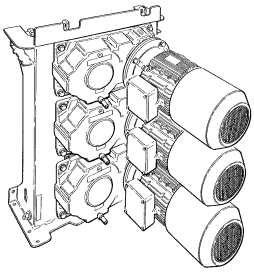
Fax +46 910 56690. E-mail: info@alimak.se. Web site: www.alimak.com.

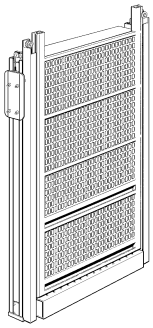
SCANDO 650 Modular System

Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg

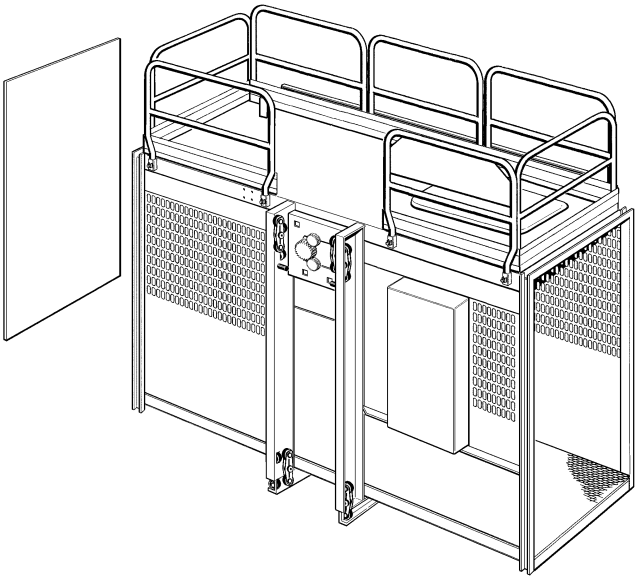


Vertical exit door
in two parts,
weight 133 kg

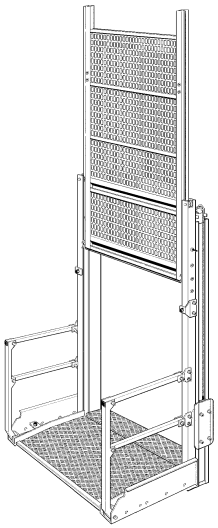
Vertical full height
entrance door, weight 155 kg



3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg

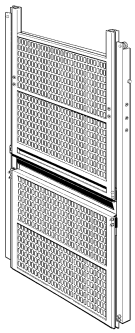


Closed, solid wall
on exit side,
weight 55 kg

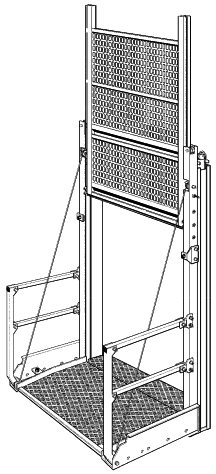


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /39

3.9 m car with two [1] vertical doors		**X**				**(C52)**
3.9 m car with three vertical doors			**X**			**(C53)**
3.9 m car with one load ramp and one [1] vertical door				**X**		**(C55)**
3.9 m car with one load ramp and two vertical doors					**X**	**(C56)**
Pay-load capacity (fuse 100 A)	kg	2700	2600	2600	2500	
(fuse 125 A)	kg	3200	3200	3200	3200	
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54	
Max. lifting height	meter	200	200	200	200	
Increased lifting height on request						
No. of buffer springs	pcs.	3	3	3	3	
Safety device type GFD	P/no.		90099255-1212			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 170 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	98
(fuse 125 A)	A~	108
Power consumpt.(fuse 100 A)	kVA~	59
(fuse 125 A)	kVA~	65
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

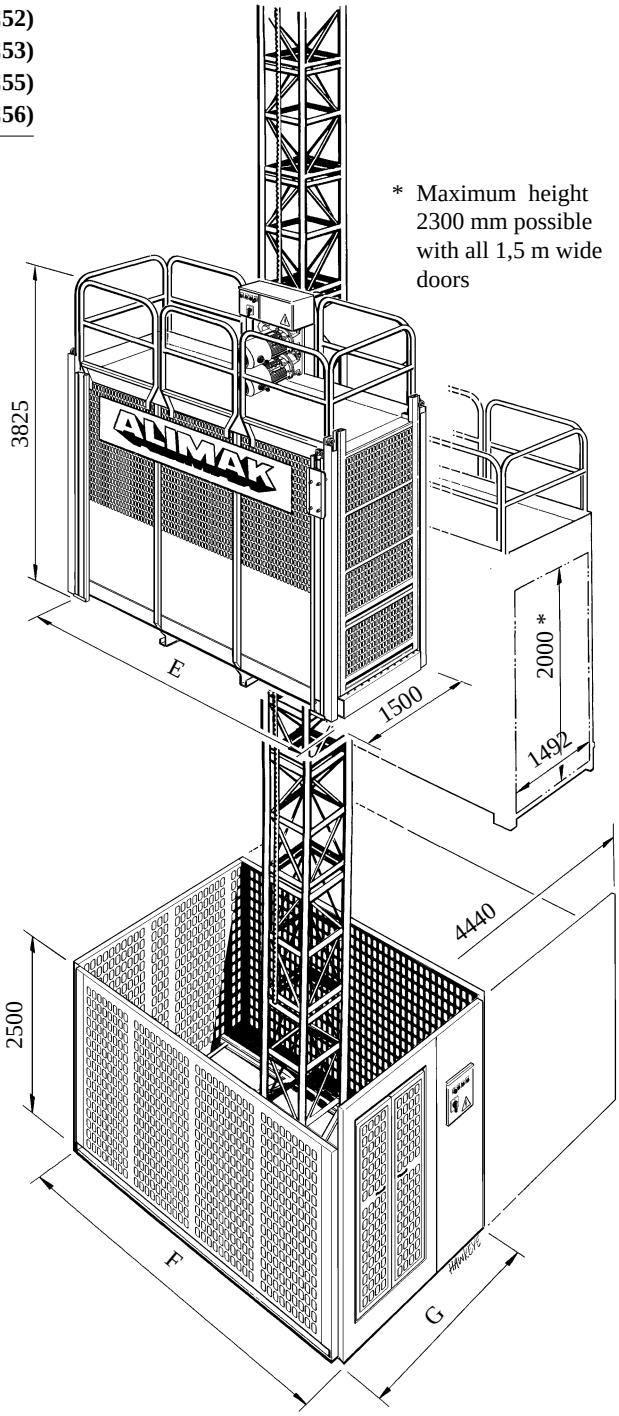
WEIGHTS

Base unit weight approx.	kg	3450	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A 1.5 m's "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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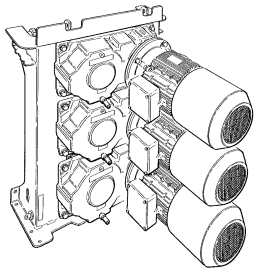
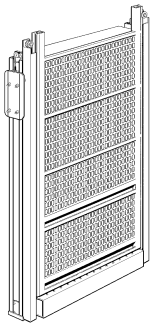
SCANDO 650 Modular System

Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg

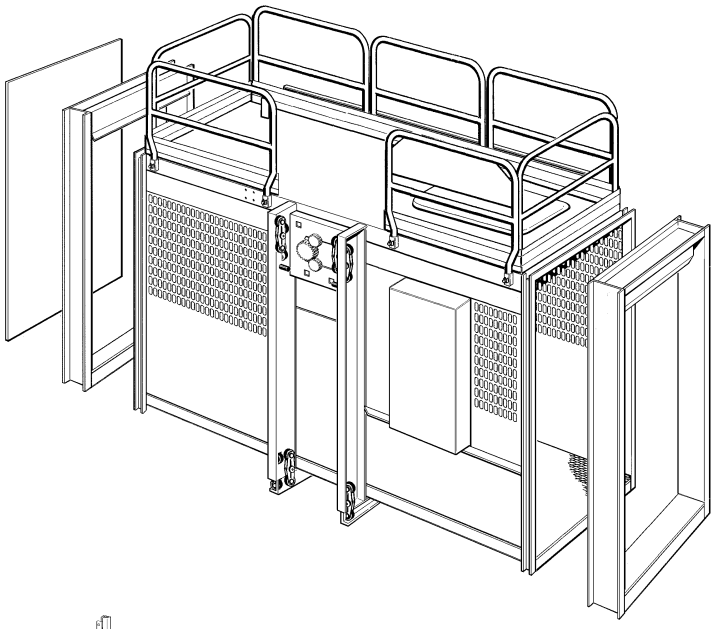


Vertical exit door
in two parts,
weight 133 kg

Vertical full height
entrance door, weight 155 kg

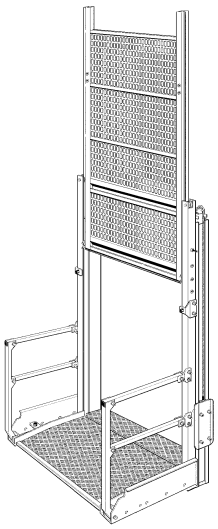


3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg



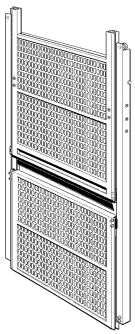
Closed, solid wall
on exit side,
weight 55 kg

Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.

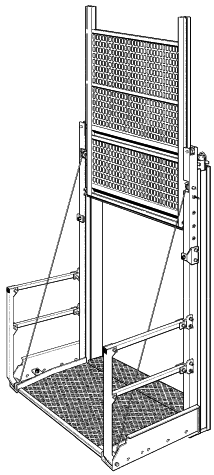


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /46

Extended 4.6 m car with two [1] vertical doors		**X**			**(C62)**
Extended 4.6 m car with three vertical doors			**X**		**(C63)**
Extended 4.6 m car with one load ramp and one [1] vertical door				**X**	**(C65)**
Extended 4.6 m car with one load ramp and two vertical doors				**X**	**(C66)**

Pay-load capacity (fuse 100 A)	kg	2600	2500	2500	2400
(fuse 125 A)	kg	3000	3000	3000	3000
Speed 50 Hz / 60 Hz	m/min	0 – 54	0 – 54	0 – 54	0 – 54
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9099255-1212		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	4.6	4.6	4.6	4.6
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 180 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	98
(fuse 125 A)	A~	108
Power consumpt.(fuse 100 A)	kVA~	59
(fuse 125 A)	kVA~	65
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

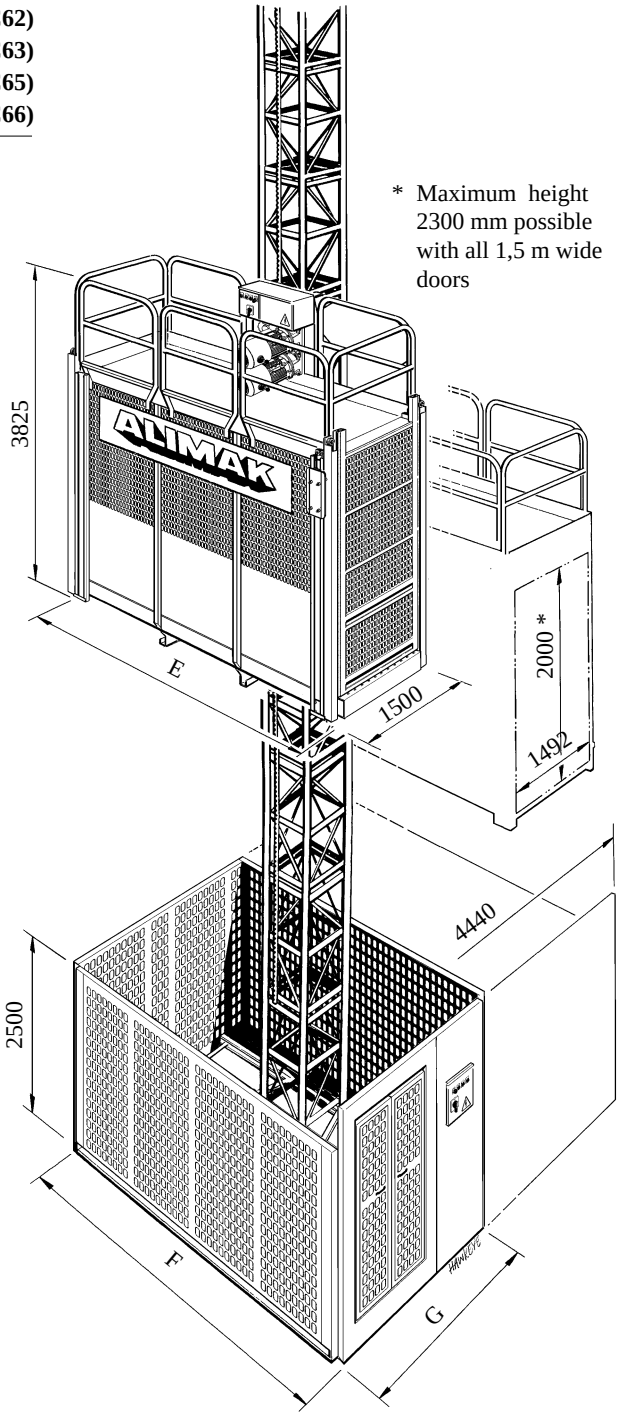
WEIGHTS

Base unit weight approx.	kg	3600	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A 1.5 m's "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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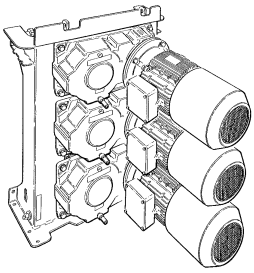
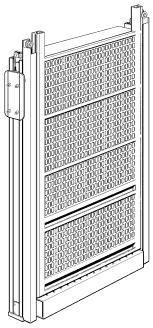
SCANDO 650 Modular System

Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg

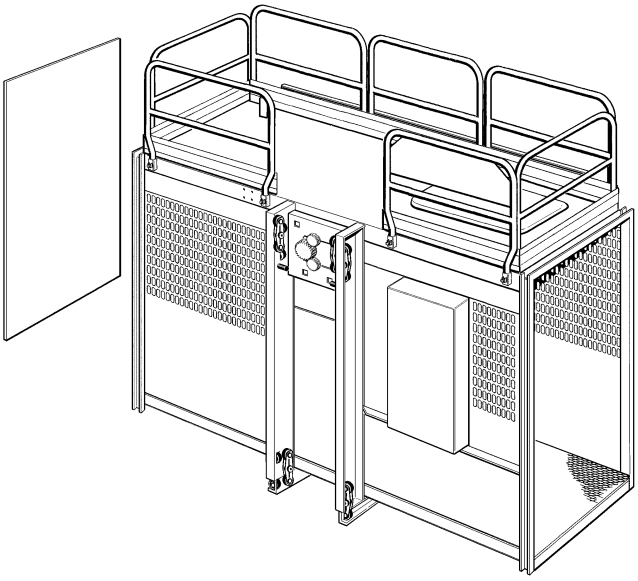


Vertical exit door
in two parts,
weight 133 kg

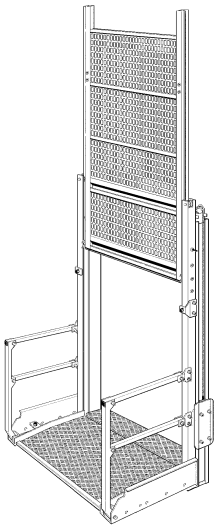
Vertical full height
entrance door, weight 155 kg



3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg

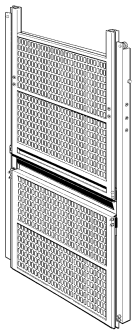


Closed, solid wall
on exit side,
weight 55 kg

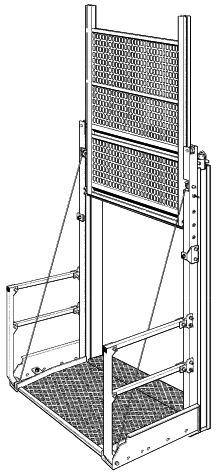


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /39

3.9 m car with two [1] vertical doors		**X**				**(C52)**
3.9 m car with three vertical doors			**X**			**(C53)**
3.9 m car with one load ramp and one [1] vertical door				**X**		**(C55)**
3.9 m car with one load ramp and two vertical doors					**X**	**(C56)**
Pay-load capacity (fuse 100 A)	kg	1800	1700	1700	1600	
(fuse 125 A)	kg	2400	2300	2300	2200	
Speed 50 Hz / 60 Hz	m/min	0 – 65	0 – 65	0 – 65	0 – 65	
Max. lifting height	meter	200	200	200	200	
Increased lifting height on request						
No. of buffer springs	pcs.	3	3	3	3	
Safety device type GFD	P/no.		9099255-1014			

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	3.9	3.9	3.9	3.9
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 160 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	97
(fuse 125 A)	A~	110
Power consumpt.(fuse 100 A)	kVA~	58
(fuse 125 A)	kVA~	66
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

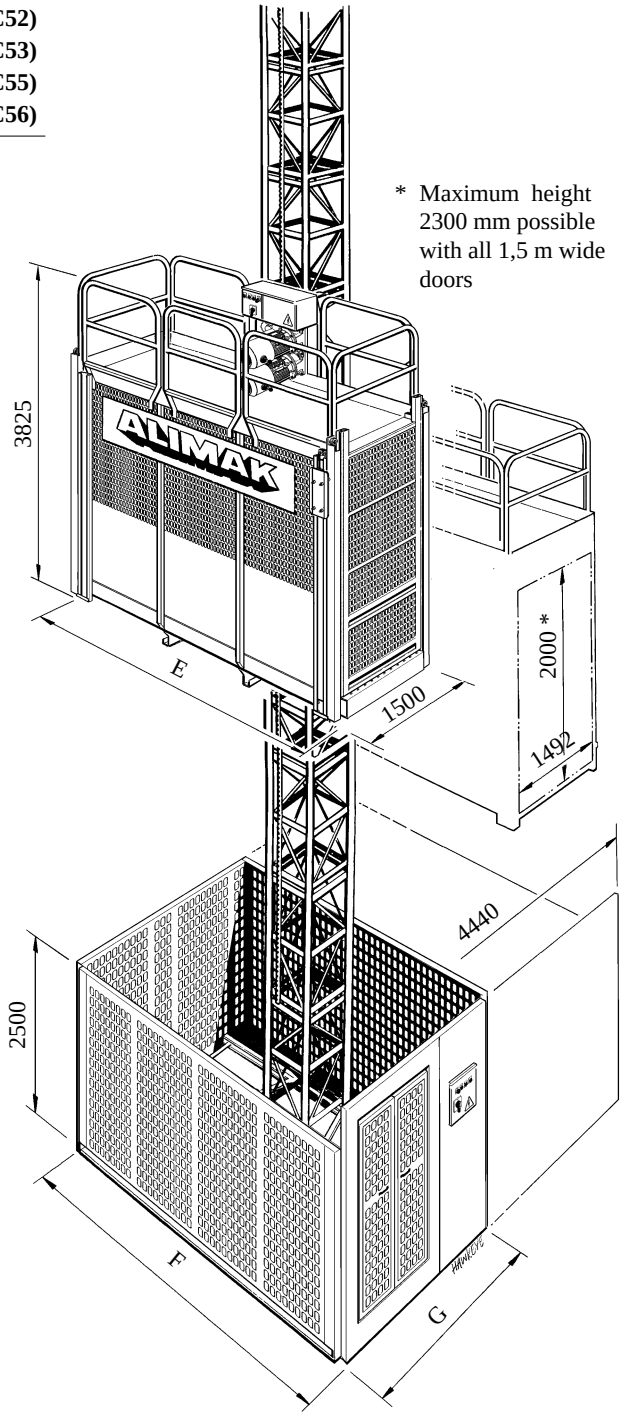
WEIGHTS

Base unit weight approx.	kg	3450	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A 1.5 m's "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door. Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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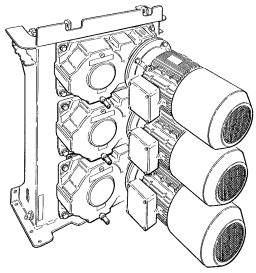
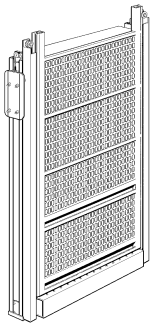
Triple motor machinery
incl. VFC-panel (75 kW). Weight 890 kg

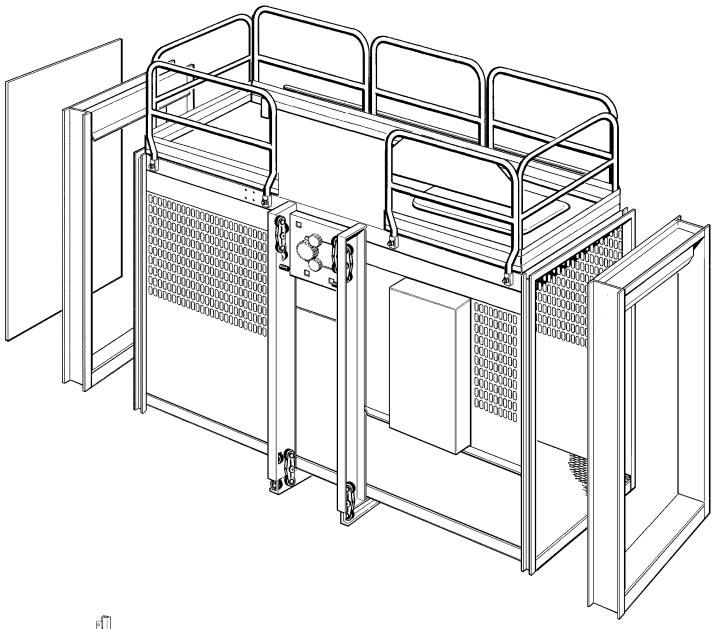


Vertical exit door
in two parts,
weight 133 kg

Vertical full height
entrance door, weight 155 kg

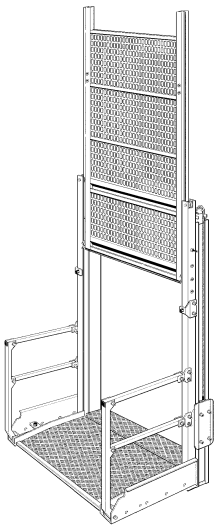


3.5 m car base structure incl. safety railings (100 kg)
weight 1700 kg



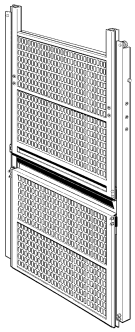
Closed, solid wall
on exit side,
weight 55 kg

Additional section
to increase car length
0.35 m in one or two
sides (0.35 + 0.35 m).
Weight 90 kg each.

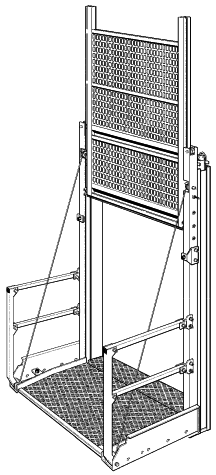


Exit door combined with
optional electric / hydraulic
operated load ramp.
Weight 280 kg.
Add 147 kg when changed
from standard exit door.

Vertical full height
”slim” 3.2 m entrance
door, weight 210 kg



Vertical ”slim” 1.5 m exit
door in two parts, weight
75 kg



Exit door combined with
optional manual load ramp.
Weight 250 kg.
Add 117 kg when changed
from standard exit door.

Printed in Sweden

SCANDO 650 FC /46

Extended 4.6 m car with two [1] vertical doors		**X**			**(C62)**
Extended 4.6 m car with three vertical doors			**X**		**(C63)**
Extended 4.6 m car with one load ramp and one [1] vertical door				**X**	**(C65)**
Extended 4.6 m car with one load ramp and two vertical doors					**X (C66)**

Pay-load capacity (fuse 100 A)	kg	1600	1500	1500	1400
(fuse 125 A)	kg	2200	2100	2100	2000
Speed 50 Hz / 60 Hz	m/min	0 – 65	0 – 65	0 – 65	0 – 65
Max. lifting height	meter	200	200	200	200
Increased lifting height on request					
No. of buffer springs	pcs.	3	3	3	3
Safety device type GFD	P/no.		9099255-1014		

CAR DIMENSIONS

Internal width	meter	1.5	1.5	1.5	1.5
Internal length	meter	4.6	4.6	4.6	4.6
External length (E)	meter	***add 0.12 m to internal length above***			
Internal height	meter	2.3	2.3	2.3	2.3
Door opening W x H	meter	***all equal = 1.5 x 2.0***			

ELECTRICAL DATA

Power supply range		400 – 500 V, 50 or 60 Hz, 3 Phase
At 400 V/50 Hz: ***(step-up transformer above 160 m required)***		
Power supply fuses	A~	100 or 125 alternatively
Triple motor machinery	kW	3 x 11
Starting current (fuse 100 A)	A~	97
(fuse 125 A)	A~	110
Power consumpt.(fuse 100 A)	kVA~	58
(fuse 125 A)	kVA~	66
Power cable guiding system		***Cable trolley***
Data for other voltages on request		

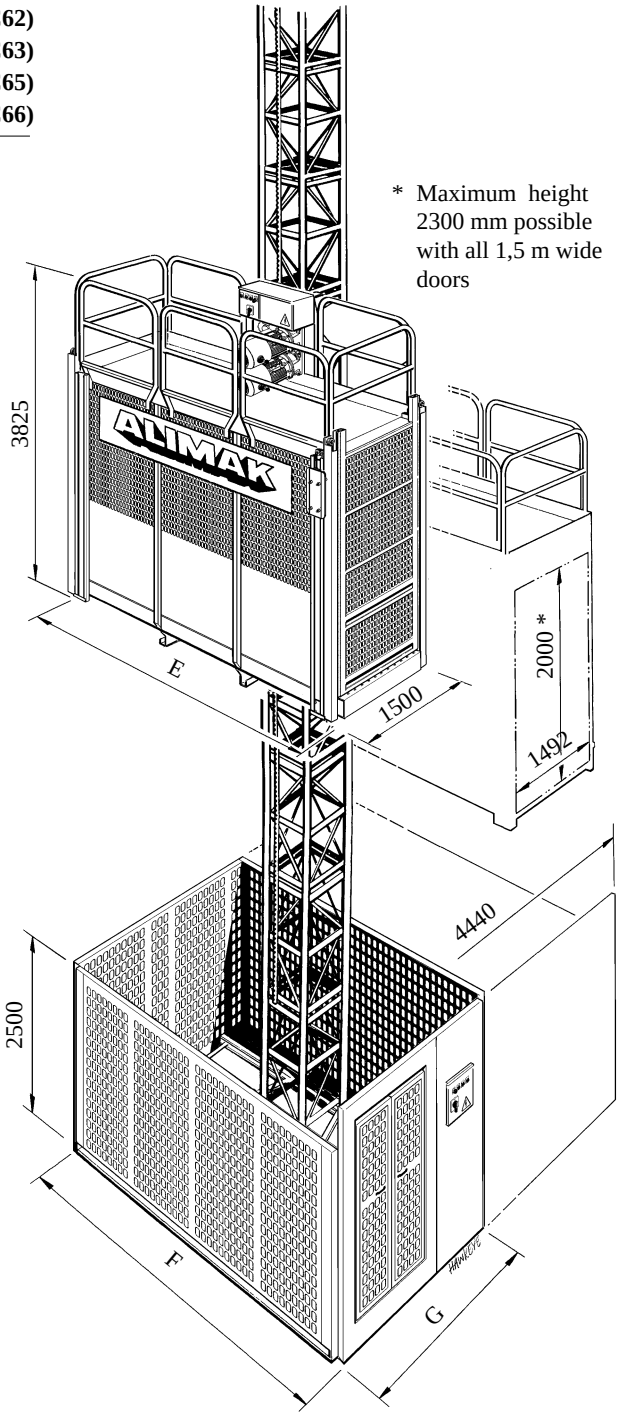
WEIGHTS

Base unit weight approx.	kg	3600	[2]	[2]	[2]
Mast section with one rack	kg	115	115	115	115
Mast section with two racks	kg	135	135	135	135
Mast section length	mm	1508	1508	1508	1508

TRANSPORT DIMENSIONS

Base unit incl. ground enclosure:

Length (F):	m	***add 0.50 [3] m to external length (E)***			
Width (G):	m	2.55	2.75	2.55	2.55
Maximum height: machinery excl.	m	3.10	3.10	3.10	3.10



* Maximum height 2300 mm possible with all 1,5 m wide doors

[1] A 1.5 m's "slim" 3rd exit door of type in two parts also possible.

[2] Weights indicated for base model including standard entrance and exit door.
Add additional 147 kg or 117 kg respectively, where optional load ramp occurs.

[3] Add additional 0.1 m where accessories for pipe support equipment are added to the ground enclosure.

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Foundation

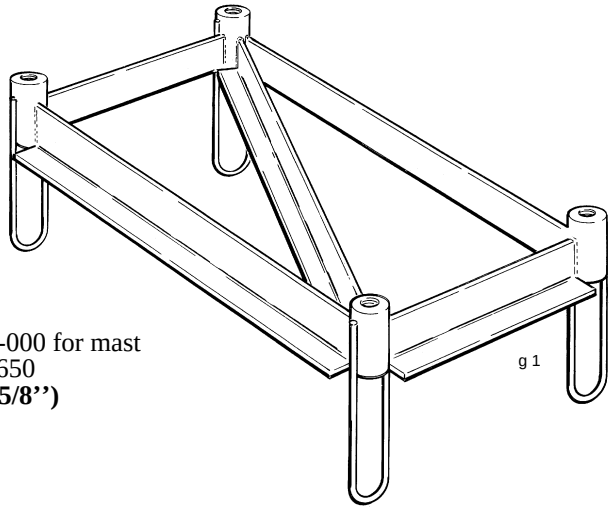
The hoist can be installed on a gravel bed, a concrete slab or in some cases a foundation pit is required.
What way to go depends on the circumstances and the National hoist regulations.

Concrete slab

A concrete slab is to be made according to the following instructions, and according to the actual model of hoist.

It is important that the mounting holes of the foundation frame are brought in level with the completed concrete surface, and that the concrete is vibrated thoroughly – especially around the foundation frame.

It is also important that the finished surface is plane and horizontal.

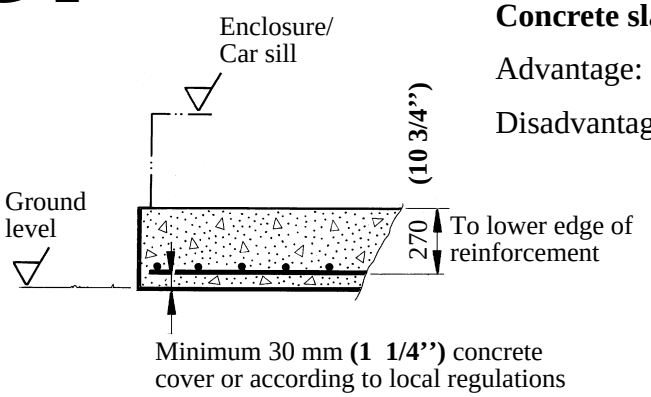


Foundation frame:

– part no. 9025 751-000 for mast section c/c 650 x 650
(2'-1 5/8'' x 2'-1 5/8'')

The foundation may be made in any of the following ways, depending upon the finished concrete level compared with the ground level.

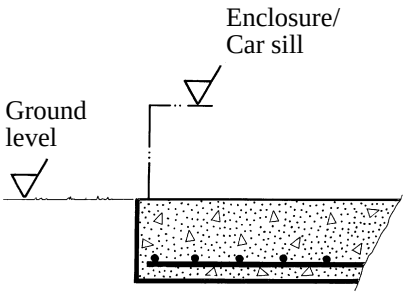
G 2



Concrete slab on the ground

Advantage: No drain required.

Disadvantage: High sill.

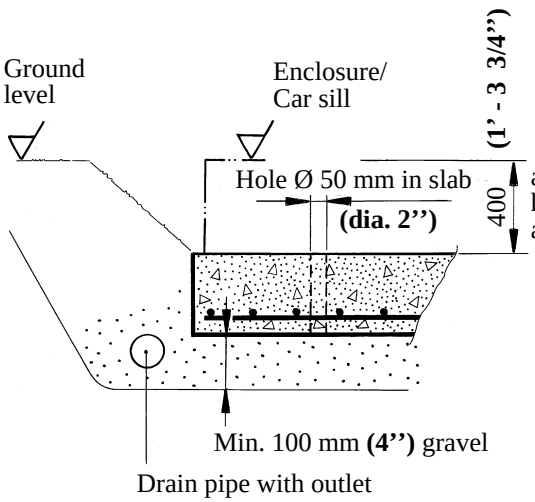


Concrete slab level with the ground

Advantage: No drain required.

Disadvantage: Sill.

A concrete slab level with the ground is the most common type of foundation. A ramp up to the level of the sill is usually made of fill, wood or steel.

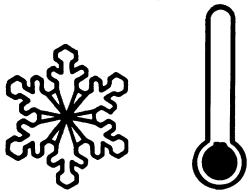


Concrete slab below ground level

Advantage: No sill between ground level and hoist car.

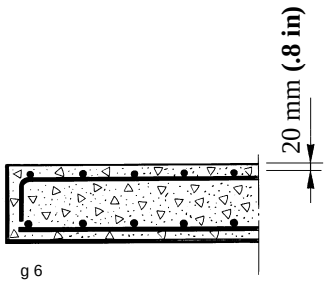
Disadvantage: Corrosion if water remains on the foundation and does not drain.

This alternative requires draining.



IMPORTANT: Please note that the foundation must always be isolated, or the surrounding soil prevented from freezing, if there is a risk of frost heave.

Extra reinforcement of concrete slab
– for hoist with landing equipment on vertical pipe support

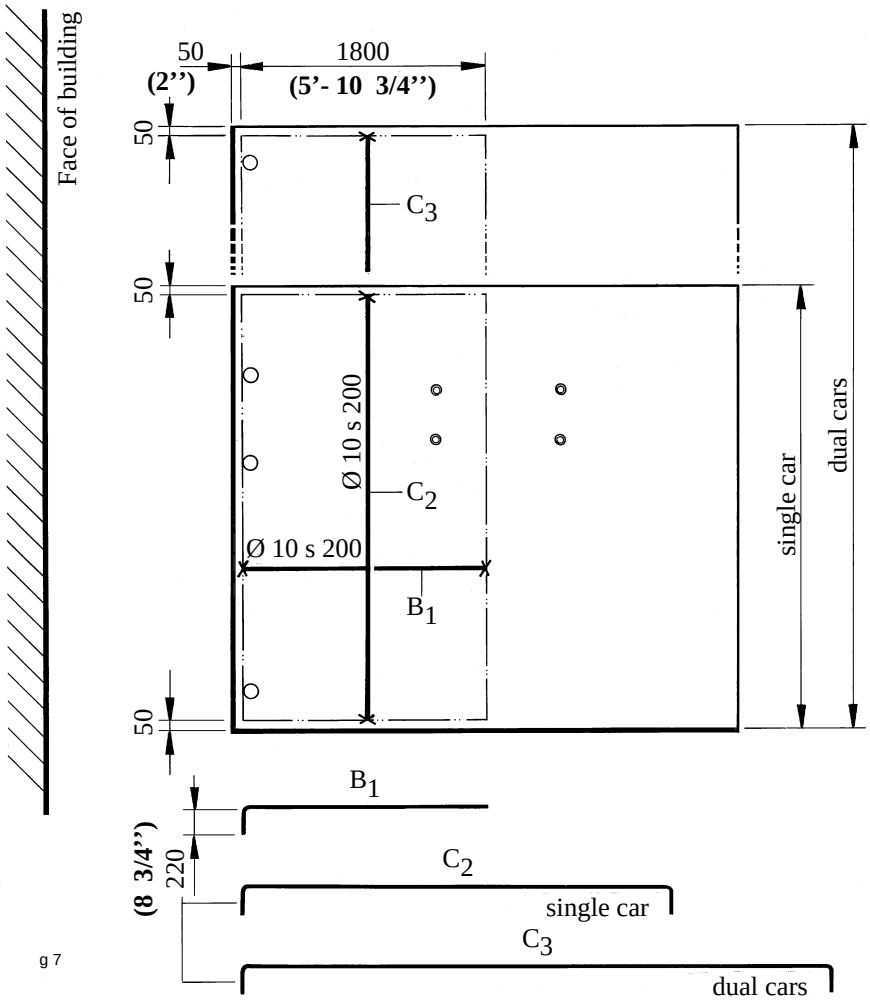


g 6

The concrete slab must have additional reinforcement in order to carry the extra load due to the vertical pipes, landing equipment and the extra load, due to the landings (people, buggies, materials, etc).

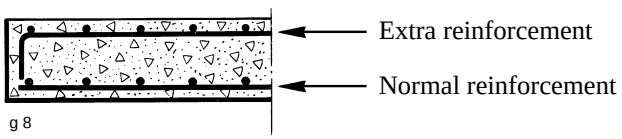
The extra reinforcement is only necessary within the areas shown in the picture below. The layer of reinforcement should be placed 20 mm **(.8 in.)** below the upper edge of the slab.

Note that a concrete slab which forms part of a foundation pit does not require this extra reinforcement.



g 7

Cross-section of concrete slab

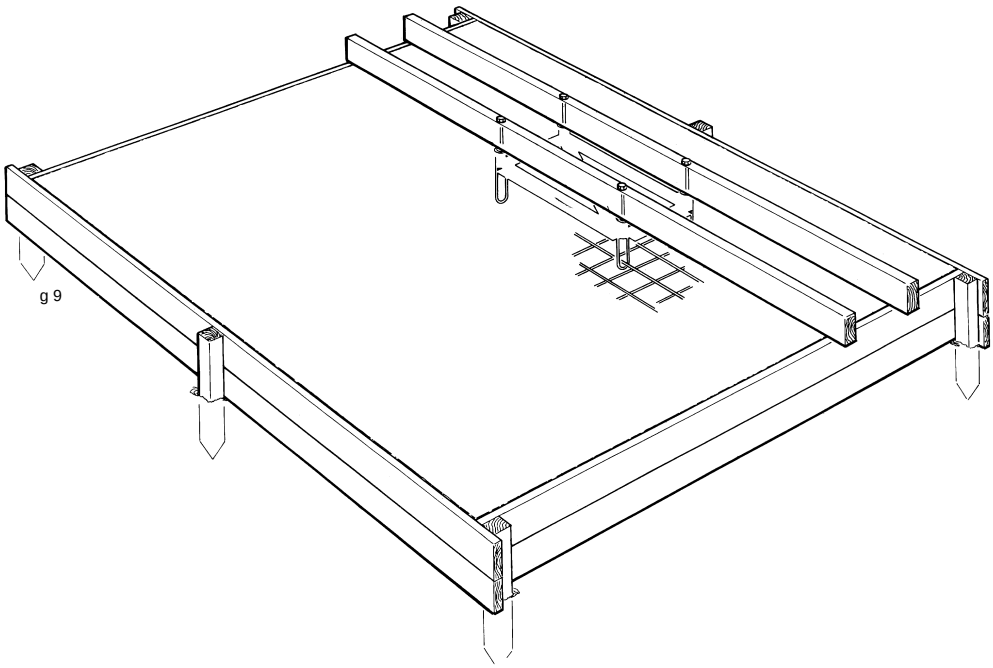


g 8

G 4

Formwork and fixing of foundation frame

This is done by means of crossbeams, to which the foundation frame is fastened with bolts.



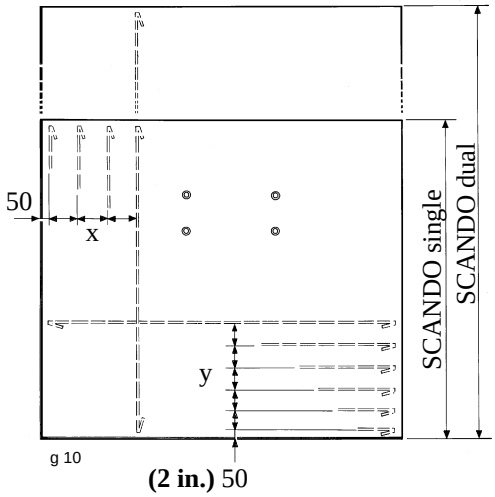
Conversion table:

Ø 10 mm ≈ **dia. 3/8 in.**
Ø 16 mm ≈ **dia. 5/8 in.**

s 140 mm ≈ **5 1/2 in.**
s 170 mm ≈ **6 1/2 in.**
s 180 mm ≈ **7 in.**
s 190 mm ≈ **7 1/2 in.**
s 200 mm ≈ **8 in.**
s 210 mm ≈ **8 1/2 in.**
s 220 mm ≈ **8 5/8 in**
s 230 mm ≈ **9 in.**
s 250 mm ≈ **10 in.**
s 280 mm ≈ **11 in.**
s 300 mm ≈ **12 in.**

Reinforcement for concrete slab

Reinforcement bar quality: minimum KS 400 (Yield strength = 390 N/mm² or **56550 psi**)



Lifting height lower than	150 m (500 ft).		150 – 250 m (500 – 820 ft.)	
Car dimension meter	**Reinforcement x**	**y**	**Reinforcement x**	**y**
Single car				
1.5 x 3.2	Ø10 s 300	Ø16 s 300	Ø10 s 230	Ø16 s 210
1.5 x 3.9	Ø10 s 250	Ø16 s 180	Ø10 s 180	Ø16 s 140
1.5 x 4.6	Ø10 s 250	Ø16 s 180	Ø10 s 180	Ø16 s 140
Dual cars				
1.5 x 3.2	Ø16 s 250	Ø16 s 250	Ø16 s 180	Ø16 s 180
1.5 x 3.9	Ø16 s 300	Ø16 s 300	Ø16 s 220	Ø16 s 220
1.5 x 4.6	Ø16 s 300	Ø16 s 300	Ø16 s 220	Ø16 s 220

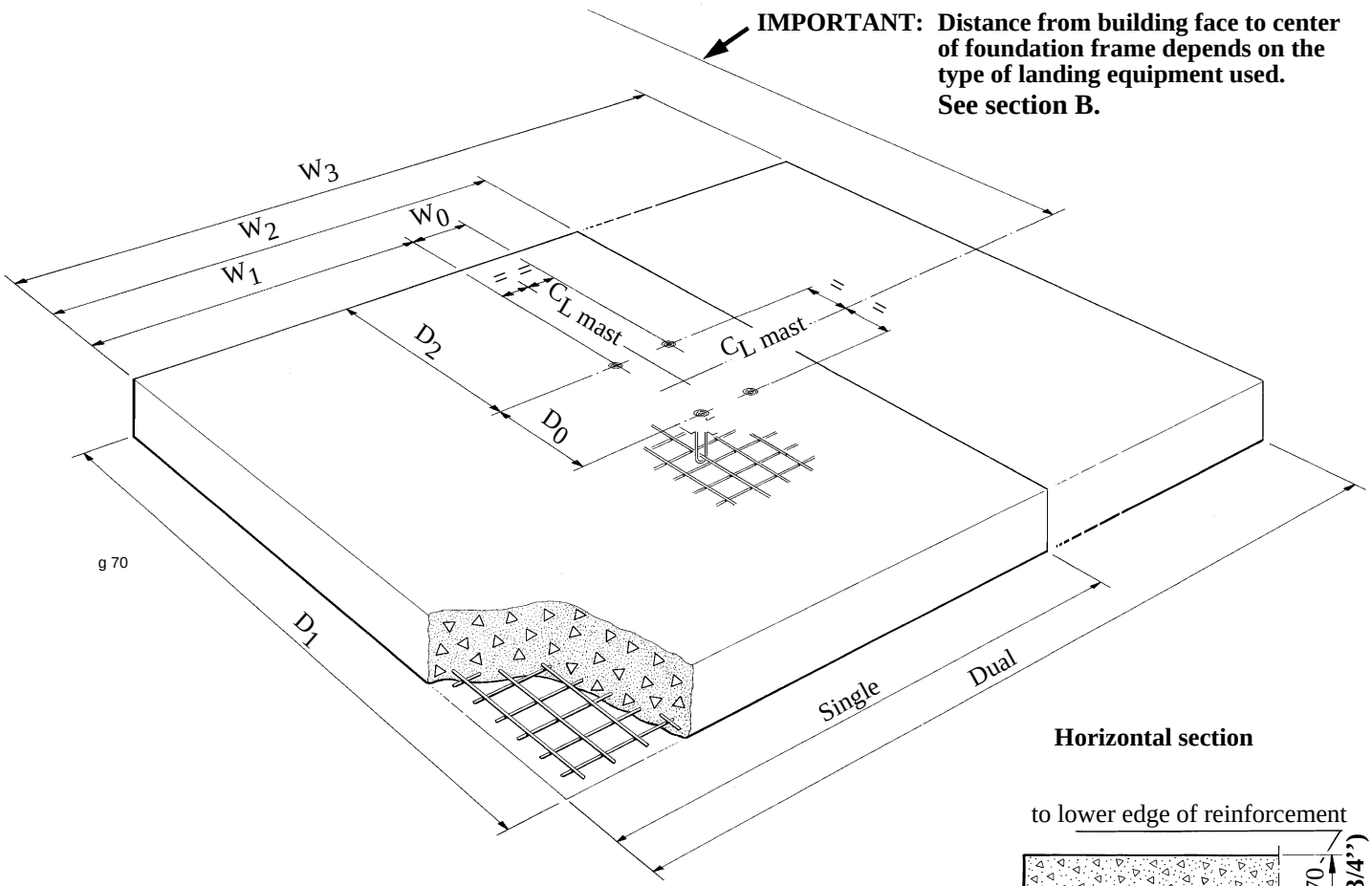
Concrete quality:

minimum K 25 (25 N/mm² or **3625 psi**) at 28 days.

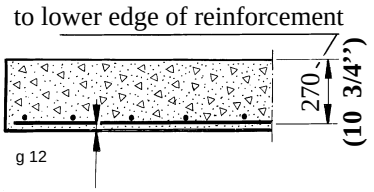
The concrete must reach 70% of the required compressive strength before the installation of the hoist may start.

This is usually obtained 7 days after placing the concrete.
If a shorter time is needed, higher strength concrete may be used.

Concrete slab dimensions



Horizontal section



Minimum 30 mm concrete cover or according to local regulations

Car dimension meter	D_0 mm	D_1 mm	D_2 mm	W_0 mm	W_1 mm	W_2 mm	W_3 mm	Concrete volume m^3
Single car								
1.5 x 3.2	960	3950	1495	380	2035	2800	–	3.32
(4'-11'' x 10'-6')	**(3'-1 3/4'')**	**(12'-11 1/2'')**	**(4'-10 3/4'')**	**(1'- 3'')**	**(6'- 8'')**	**(9'- 2 1/4'')**	**–**	**(4.34 cu.yds)**
1.5 x 3.9	960	4650	1845	380	2035	2800	–	3.91
(4'-11'' x 12'-9 1/2'')	**(3'-1 3/4'')**	**(15'- 3'')**	**(6'- 0 3/4'')**	**(1'- 3'')**	**(6'- 8'')**	**(9'- 2 1/4'')**	**–**	**(5.11 cu.yds)**
1.5 x 4.6	960	5350	2195	380	2035	2800	–	4.50
(4'-11'' x 15'-1'')	**(3'-1 3/4'')**	**(17'- 6 3/4'')**	**(7'- 2 1/2'')**	**(1'- 3'')**	**(6'- 8'')**	**(9'- 2 1/4'')**	**–**	**(5.88 cu.yds)**
Dual cars								
1.5 x 3.2	960	3950	1495	380	2035	–	4530	5.37
(4'-11'' x 10'-6')	**(3'-1 3/4'')**	**(12'-11 1/2'')**	**(4'-10 3/4'')**	**(1'- 3'')**	**(6'- 8'')**	**–**	**(14'- 10 1/4'')**	**(6.83 cu.yds)**
1.5 x 3.9	960	4650	1845	380	2035	–	4530	6.32
(4'-11'' x 12'-9 1/2'')	**(3'-1 3/4'')**	**(15'- 3'')**	**(6'- 0 3/4'')**	**(1'- 3'')**	**(6'- 8'')**	**–**	**(14'- 10 1/4'')**	**(7.02 cu.yds)**
1.5 x 4.6	960	5350	2195	380	2035	–	4530	7.27
(4'-11'' x 15'-1'')	**(3'-1 3/4'')**	**(17'- 6 3/4'')**	**(7'- 2 1/2'')**	**(1'- 3'')**	**(6'- 8'')**	**–**	**(14'- 10 1/4'')**	**(9.51 cu.yds)**

Components for attachments of enclosure

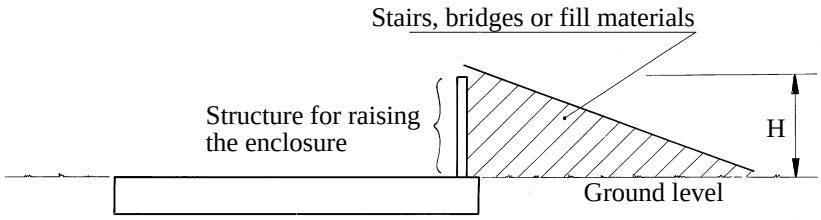
For the attachment of the enclosure on the foundation we recommend to use expansion bolts.
Please note that these items are not furnished with the hoist.

When extra safety space is required under the hoist car at the bottom landing

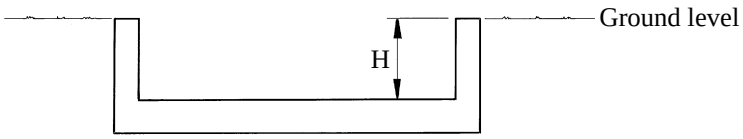
Some local hoist regulations require an extra safety space under the hoist car bottom landing. The same concrete slab as before can be used provided that the enclosure front is raised according to local hoist regulations.

See picture below.

H min. = 1060 mm **(3'-5 3/4")**



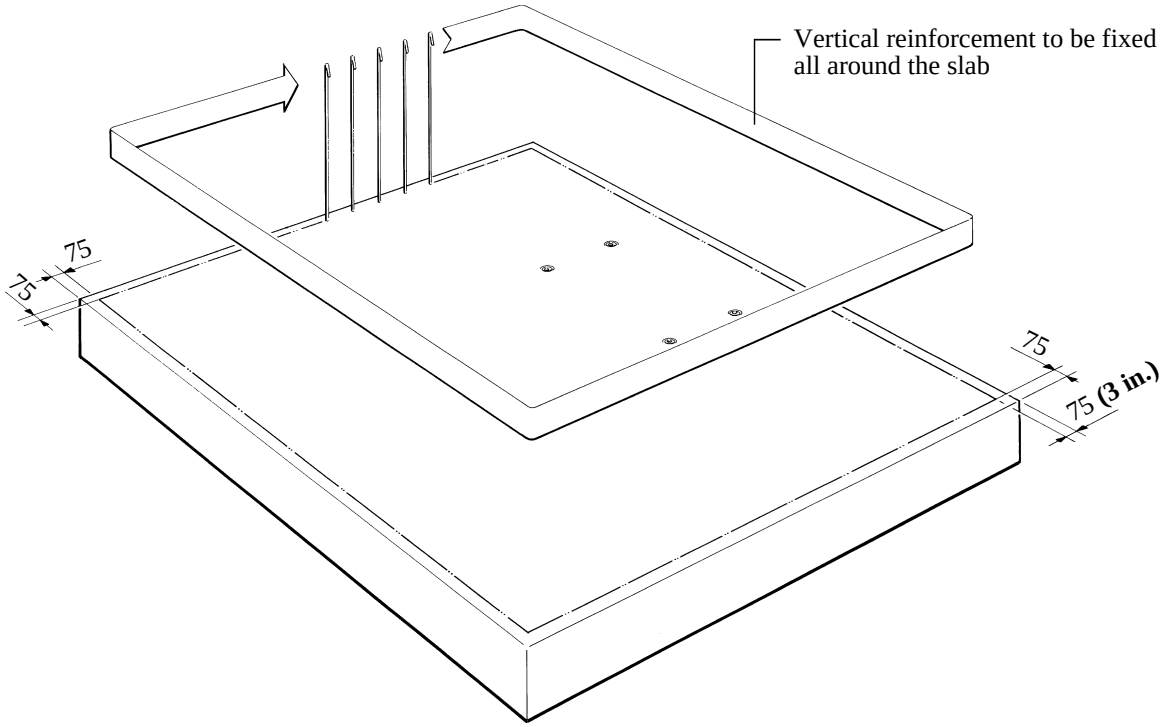
Alternatively a concrete pit can be made below ground level.



Foundation pit

The foundation pit is made as follows:

1. Make a concrete slab with additional vertical reinforcement for the pit walls, see figure. (Identical to one for a concrete slab level with the ground and for the hoist model in question).



2. When the base slab has cured, add the horizontal reinforcement, followed by formwork and completion of the walls of the foundation pit.

Concrete slab without foundation frame

In order to use a concrete slab without a foundation frame, the following requirements must be met:

– The procedures/specifications for preparing the concrete slab will be the same ones used for preparing a concrete slab with a foundation frame.

– The base frame must be attached with expansion bolts that can ***each*** withstand a pull-out force of at least 40 kN **(9000 lbf)**. The expansion bolts should be mounted in the holes normally used for attaching the base frame to the foundation frame.

– Installation is prohibited when wind speeds are in excess of 15 m/sec. **(33 mph)**.

– The maximum height allowed for the first tie is 6 meters **(20 ft)**.

– The type of installation must be approved by the local governing authorities.

Transportable foundation

In order to use a transportable steel foundation, the following requirements must be met:

– The steel foundation must conform to all of Alimak's specifications. (These can be ordered separately from an Alimak representative).

– The type of installation must be approved by the local governing authorities.

Load on foundation

The static load on the foundation consists of:

– The payload of the hoist (x 2 – for dual cars).

– Base unit dead weight. [For dual cars, add approx 2000 kg **(4400 lbs.)**].

– Counterweight if used (x 2 – for dual cars).

– Hoist mast dead weight.

– Add 10% of the total for mast ties, power cable, and cable guiding devices.

– Add a further 25% of the total for vertical pipe support, if used.

The dynamic load on the foundation consists of:

– 100% impact (or according to local regulations) on the pay-load and 2/3 of the base unit dead weight.

Example:

Static and dynamic load on the foundation (approx.)

Calculation of static load on the foundation for a dual car hoist SCANDO 650 DOL 22/32 with pipe support. Mast height 150 m **(492 ft.)**, equivalent to 100 mast sections. Weights according to specifications in the data sheets.

Payload = 2200 kg **(4850 lbs.)**		
2200 kg (2 pcs.)	4400 kg	**9700 lbs.**
Base unit dead weight = 2775 kg **(6118 lbs.)**		
+ 2050 kg for the 2nd car	4825 kg	**10637 lbs.**
Hoist mast 98 sections, 135 kg/each **(298 lbs.)** (2 sections included in the base unit)	12825 kg	**28274 lbs.**
	∑ = 22050 kg	**48611 lbs.**
Mast ties and cable guides		
Add 10% load	2205 kg	**4861 lbs.**
	∑ = 24255 kg	**53472 lbs.**
Vertical support and landing equipment. Add 25% load	6064 kg	**13368 lbs.**
	∑ = 30319 kg	**66840 lbs**
Dynamic load approx. 2 x 2200 kg		
+ 2/3 x (2775 + 2050)kg	7617 kg	**16792 lbs.**
	∑ = 37936 kg	**83632 lbs.**

37936 x 9.81 = 372152 N.

In round figures = 372 kN (**83632 lbs.)**

Ground pressure

Max. ground pressure under the concrete slabs is 0.15 MPa **(21.75 psi)** provided that the foundation has been reinforced and built up according to the given instructions.

Should the ground be able to stand higher pressures, it is possible to increase the load on the foundation. Please contact ALIMAK for information.

Examples of acceptable ground pressure according to SBN 1975 (Swedish Building Norms):

Moraine = 0.4 – 1.0 MPa **(58 – 145 psi)**

Fine sand = 0.2 MPa **(29 psi)**

The ground pressure due to the installation is calculated according to the following formula:

P_V is the sum of the static and the dynamic load and the dead weight of foundation in kN. Estimate approx. 24 kN/m^3 for concrete.

See ”Concrete slab dimensions” for D, W and concrete volume.

D x W is the concrete slab surface in m^2.

σ_{ground} = ground pressure (MPa)

Single car hoist

without pipe support : $\sigma_{ground} = \dfrac{2.3 \times P_V}{D_1 \times W_2 \times 1000}$ (MPa)

with pipe support : $\sigma_{ground} = \dfrac{3.5 \times P_V}{D_1 \times W_2 \times 1000}$ (MPa)

Dual car hoist

without pipe support : $\sigma_{ground} = \dfrac{P_V}{D_1 \times W_3 \times 1000}$ (MPa)

with pipe support : $\sigma_{ground} = \dfrac{1.6 \times P_V}{D_1 \times W_3 \times 1000}$ (MPa)

(MPa x 145 = **psi)**

Example:

Calculation of ground pressure for a twin car SCANDO 650 DOL 22/32 with vertical pipe support.

Static and dynamic load = 380 kN (according to example on previous page).

Concrete slab dimension is D_1 x W_3 = 3950 x 4530 mm or 3.95 x 4.53 meter and weight of concrete slab is 24 kN/m^3 x 5.37 m^3 = 129 kN.

P_V = 380 + 129 kN = 509 kN

$$\sigma_{ground} = \frac{1.6 \times P_V}{D_1 \times W_3 \times 1000} \quad \text{(MPa)}$$

$$\sigma_{ground} = \frac{1.6 \times 509}{3.95 \times 4.53 \times 1000} =$$

σ_{ground} = 0.045 MPa (MPa x 145 = **6.60 psi)**

Projecting hoist mast

Generally following selection process is used:

1. Type of mast section
2. Number of mast sections
3. Type of mast tie
4. Number of mast ties

Hoist model – i.e. load capacity and speed are assumed to be known.

1. Type of mast section

Determined by the capacity of the hoist and whether the mast will be provided with one or dual cars as well as the lifting height. See further information on following pages.

2. Number of mast sections

Determined by required lifting height (L_h) = $\frac{L_h}{1.508}$ meter and the necessary number of extra mast sections depending on:

Whether the hoist will be installed on a concrete slab at ground level.

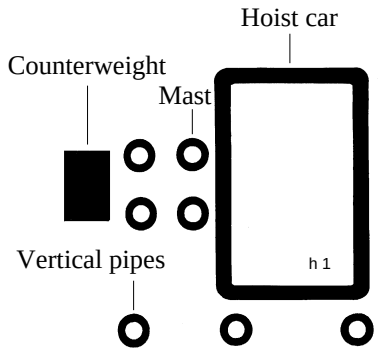
– without counterweight equipment = 3 extra mast sections.

– with counterweight equipment = 4 extra mast sections.

Whether the hoist will be installed with an extended enclosure or with a foundation pit below ground level.

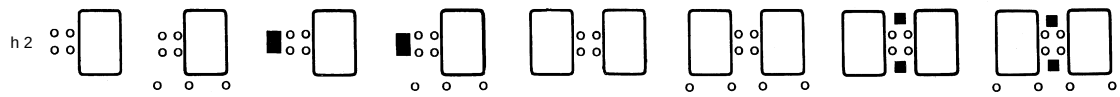
– without counterweight equipment = 4 extra mast sections.

– with counterweight equipment = 5 extra mast sections.



3. Type of mast ties

Determined by whether there will be a single or dual car hoist and whether counterweight equipment and/or vertical pipes will be used. See table below:

Mast tie								
Type S1A	X							
Type S2A		X		X		X		
Type S3A	X		X		X		X	
Type R2A	X							

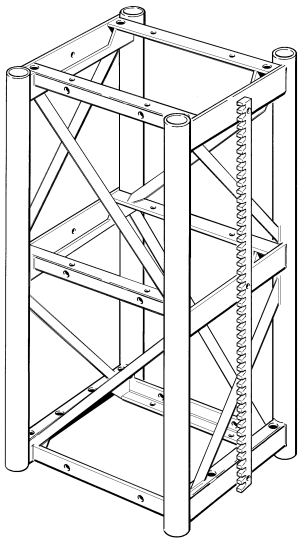
X = Possible combinations

The selection of ties depends also on the length of tie required tie distance.

For detailed specifications see heading ”Mast ties”.

4. Numbers of mast ties

Determined by tie distance and overhang at various maximum lifting height. See tables in the end of chapter.



Mast sections

With the exception of one or two racks, with or without counter-weight guide rail, there are mainly three different types of mast sections available:

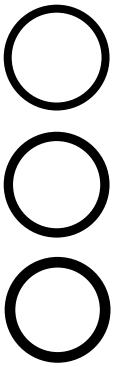
Standard mast with tube dimension:

Ø 76 x 4.2 mm **(3”x 11/64”)**. (outer diameter x thickness)

Reinforced mast with tube dimension:

Ø 76 x 8.0 mm **(3”x 5/16”)**.

Suitable mast section dimension for each hoist in question and actual lifting height is given in the tables at the end of this chapter.



Mast sections of different tube dimension can be combined

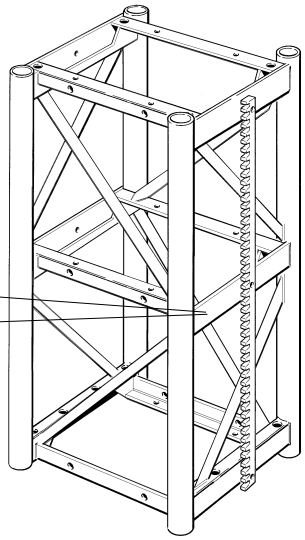
As can be seen from the following tables this is only necessary at extremely high lifting heights.

In such cases turn to Alimak Calculation Department who can optimize the installation so that as few reinforced mast sections as possible need to be used.

Identification

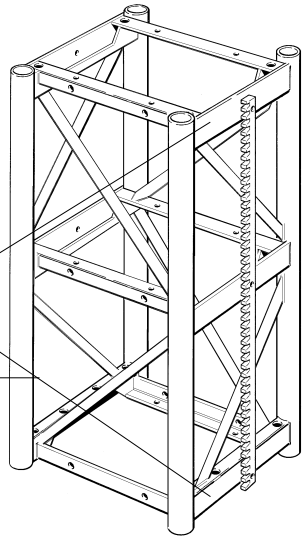
In order to easily identify the mast sections with different tube dimensions, the mast sections are colour-marked and weld marked corresponding to wall thickness as indicated below.

Tube dimension Ø 76 x 4.2	Tube dimension Ø 76 x 6.3	Tube dimension Ø 76 x 8.0
No marking	Blue	Yellow
No marking	Weld marked ”6”	Weld marked ”8”



Between the mast sections with different tube dimensions transition sections are used. These are marked as follows:

Tube dimension Ø 76 x 8.0 – Ø 76 x 6.3	Tube dimension Ø 76 x 6.3 – Ø 76 x 4.2
Blue	No marking
Yellow	Blue
Weld marked ”8” – ”6”	Weld marked ”6”



IMPORTANT:

A transition section or a reinforced mast section must always be used for connection against bottom frame.

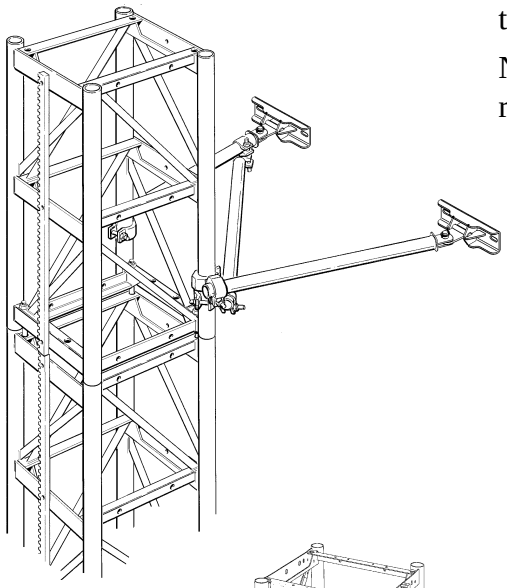
A transition section must always be used between mast sections with different tube thicknesses.

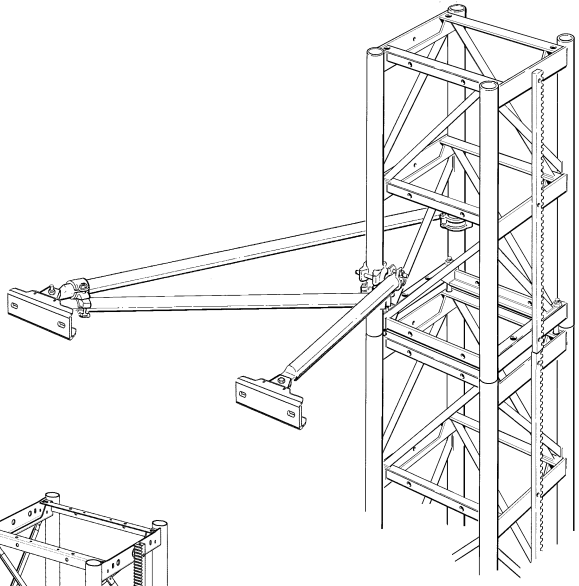
Reinforced mast sections must always be placed at the bottom of a mast installation.

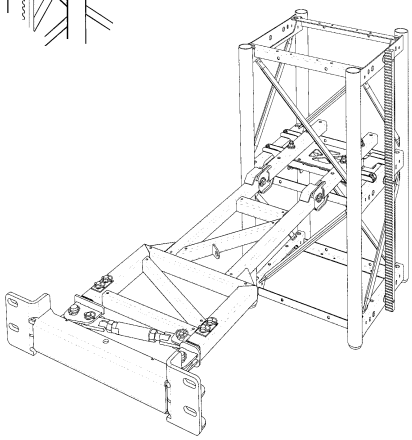
Mast ties

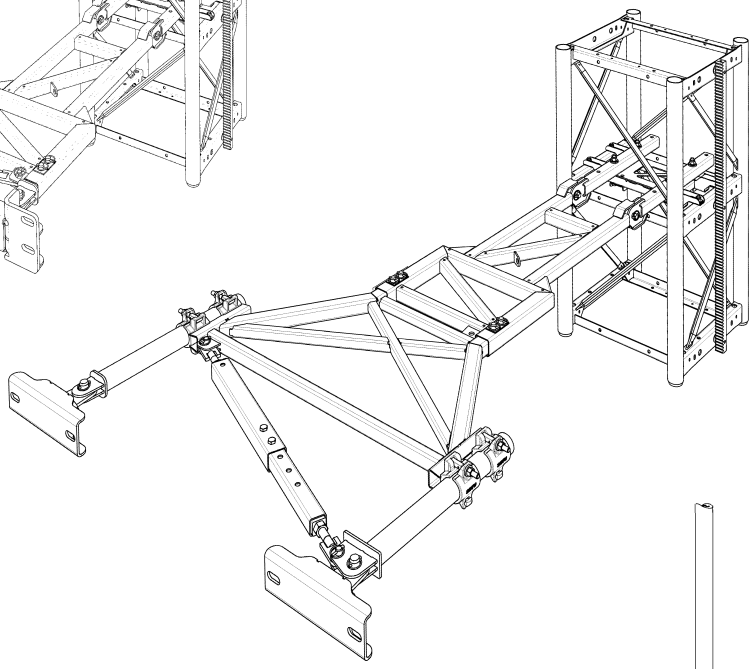
The ties are usually mounted with anchoring details or with bolts through bearing walls, e.g. archs, balconies, steel or concrete beams. If you intend to use embedment anchorings, these must be prepared well in advance before erection.

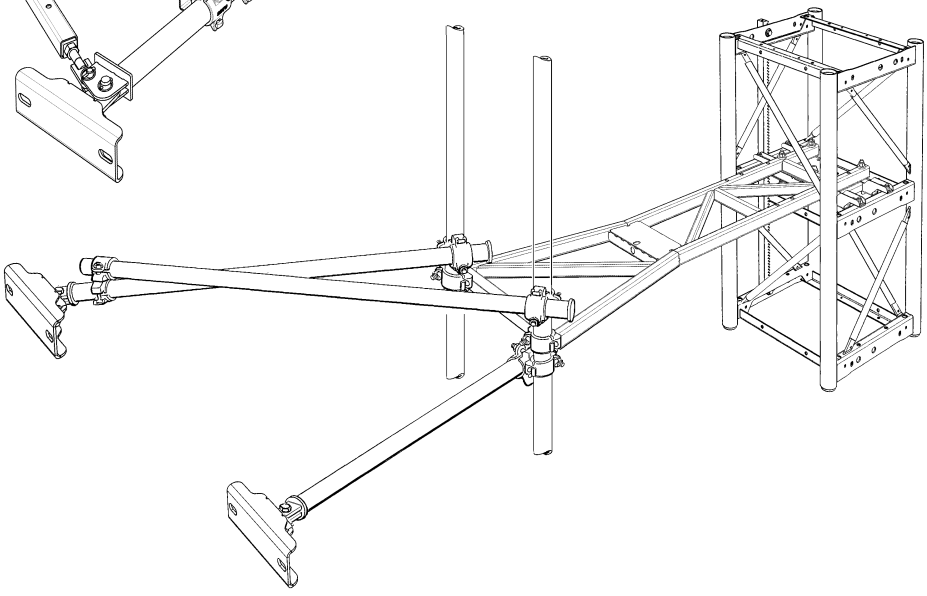
Note that the wall must always be dimensioned to take up the reaction forces of the ties.











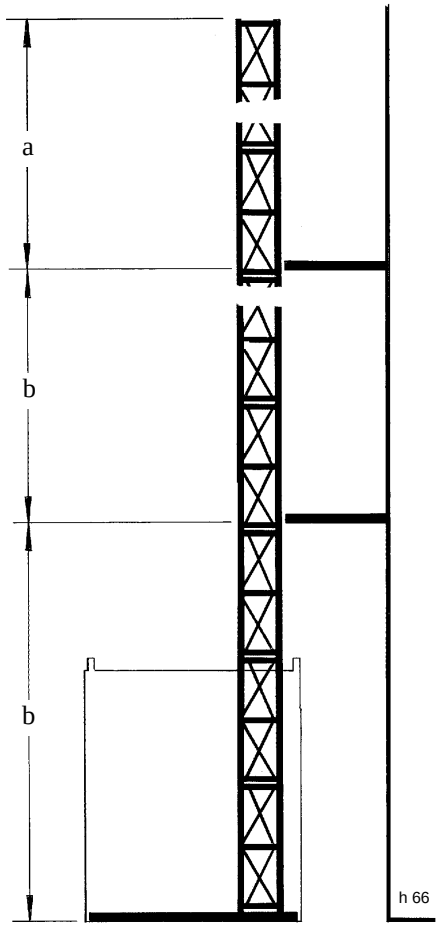
Tied hoist mast

Calculations according to EN 12159

Hoist with tied mast for a max. mast height of 150 m **(495 ft)**. Tie intervals and max free untied top / overhang as below:

Note: For mast tie type S1A, S2A and S3A only !
Contact Alimak representative where mast tie tubes of thinner type are intended to be used.

Car length	Max. load	Max. free, untied mast top a	Max. tie intervals b *
Single car			
3.2 meter	up to 2400 kg	15.0 m	15.0 m
	2401 – 2800 kg	13.5 m	15.0 m
	2801 – 3200 kg	12.0 m	15.0 m
3.9 meter	up to 2200 kg	13.5 m	15.0 m
	2201 – 2700 kg	13.5 m	15.0 m
	2701 – 3200 kg	12.0 m	15.0 m
4.6 meter	up to 2000 kg	13.5 m	15.0 m
	2001 – 3000 kg	12.0 m	15.0 m
Dual cars			
3.2 meter	up to 2400 kg	12.0 m	15.0 m
	2401 – 2800 kg	12.0 m	15.0 m
	2801 – 3200 kg	12.0 m	15.0 m
3.9 meter	up to 2200 kg	12.0 m	13.5 m
	2201 – 2700 kg	12.0 m	15.0 m
	2701 – 3200 kg	10.5 m	15.0 m
4.6 meter	up to 2000 kg	12.0 m	15.0 m
	2001 – 3000 kg	10.5 m	15.0 m



**** Increased mast tie distances are possible especially at low lifting heights. Kindly ask Alimak for information.***

IMPORTANT:

- Placing of landings must be avoided at max. free top and right between tie with long distances due to the deflection of the mast. If this is not possible an extra tie should be installed at the landing.
- In cases where required lifting height exceeds the max. allowable mast height, we kindly ask you to contact Alimak for advice.

Reaction forces

Reaction forces can be calculated by using various formulas depending on the type of mast tie selected:
Values for Rx and Ry according to the following.

Add additional 10% to the Rx value if the mast tie length **(L)** relative the tie width **(B)** is larger than 2.

Hoist in Service, single car

Overhang a		15.0 m		13.5 m		12.0 m		12.0 m		9.0 m		6.0 m	
Mast tie intervals	**b**	15.0 m		15.0 m		15.0 m		12.0 m		9.0 m		6.0 m	
		Rx kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN
CAR LENGTH 3.2 meter													
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;													
up to 2400 kg		14.3	9.0	13.6	8.3			14.7	8.0	15.8	7.0	19.0	5.7
(a = b / 2)		(10.8)	(5.5)	(10.8)	(5.5)			(11.6)	(4.9)	(13.1)	(4.3)	(14.7)	(3.4)
3-motor machinery, speed ≤ 1.1 m/s, payload capacity;													
up to 2400 kg		–	–	14.1	8.3			15.2	8.0	16.3	7.0	19.5	5.7
(a = b / 2)		–	–	(10.8)	(5.5)			(11.6)	(4.9)	(13.1)	(4.3)	(14.7)	(3.4)
between 2401 – 2800 kg		–	–	15.9	8.9			17.4	8.7	19.2	7.6	23.6	6.3
(a = b / 2)		–	–	(12.6)	(5.6)			(14.1)	(5.4)	(16.3)	(4.7)	(19.7)	(2.8)
between 2801 – 3200 kg		–	–	–	–			18.1	8.7	20.2	7.6	25.1	6.3
(a = b / 2)		–	–	–	–			(14.8)	(5.4)	(17.3)	(4.7)	(21.2)	(2.8)
CAR LENGTH 3.9 meter													
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;													
up to 2200 kg		–	–	14.9	9.0			16.2	8.8	17.5	7.7	21.1	6.3
(a = b / 2)		–	–	(11.6)	(5.7)			(12.8)	(5.4)	(14.6)	(4.7)	(16.3)	(3.8)
3-motor machinery, speed ≤ 1.1 m/s, payload capacity;													
between 2201 – 2700 kg		–	–	–	–	15.8	8.3	18.2	8.9	20.0	7.6	24.7	6.1
(a = b / 2)		–	–	–	–	(12.8)	(5.3)	(14.7)	(5.4)	(17.0)	(4.6)	(19.2)	(4.0)
between 2701 – 3200 kg		–	–	–	–	16.5	8.3	19.1	8.9	21.3	7.6	26.6	6.1
(a = b / 2)		–	–	–	–	(13.6)	(5.3)	(15.7)	(5.4)	(18.3)	(4.6)	(20.9)	(4.0)
CAR LENGTH 4.6 meter													
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;													
up to 2000 kg		–	–	–	–	16.2	9.0	17.7	8.9	19.4	7.5	23.7	5.9
(a = b / 2)		–	–	–	–	(12.8)	(5.6)	(14.2)	(5.3)	(16.4)	(4.5)	(18.3)	(4.1)
between 2001 – 3000 kg		–	–	–	–	16.4	8.2	19.0	8.8	21.2	7.6	26.4	6.0
(a = b / 2)		–	–	–	–	(13.5)	(5.3)	(15.6)	(5.3)	(18.2)	(4.5)	(20.8)	(4.1)

Hoist in Service, dual cars

Overhang a	15.0 m		13.5 m		12.0 m		12.0 m		9.0 m		6.0 m	
Mast tie intervals b	15.0 m		15.0 m		15.0 m		12.0 m		9.0 m		6.0 m	
	Rx kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN
CAR LENGTH 3.2 meter												
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;												
up to 2400 kg	–	–	15.2	15.1	14.0	14.0	15.4	15.4	14.7	14.7	17.5	17.5
(a = b / 2)	–	–	(10.4)	(10.4)	(9.9)	(9.9)	(10.5)	(10.5)	(11.7)	(7.4)	(17.5)	(7.5)
3-motor machinery, speed ≤ 1.1 m/s, payload capacity;												
up to 2400 kg	–	–	16.3	15.7	15.2	14.6	16.8	16.0	16.2	15.2	19.1	8.6
(a = b / 2)	–	–	(11.4)	(10.8)	(10.9)	(10.3)	(11.6)	(10.9)	(12.7)	(8.6)	(19.1)	(8.6)
between 2401 – 2800 kg	–	–	–	–	15.1	14.8	10.7	16.2	16.1	15.5	20.1	8.3
(a = b / 2)	–	–	–	–	(10.8)	(10.4)	(11.5)	(11.1)	(11.4)	(10.8)	(20.1)	(8.9)
between 2801 – 3200 kg	–	–	–	–	15.2	14.9	16.9	16.4	16.4	15.7	21.4	9.3
(a = b / 2)	–	–	–	–	(11.0)	(10.6)	(11.7)	(11.3)	(13.9)	(9.0)	(21.4)	(9.3)

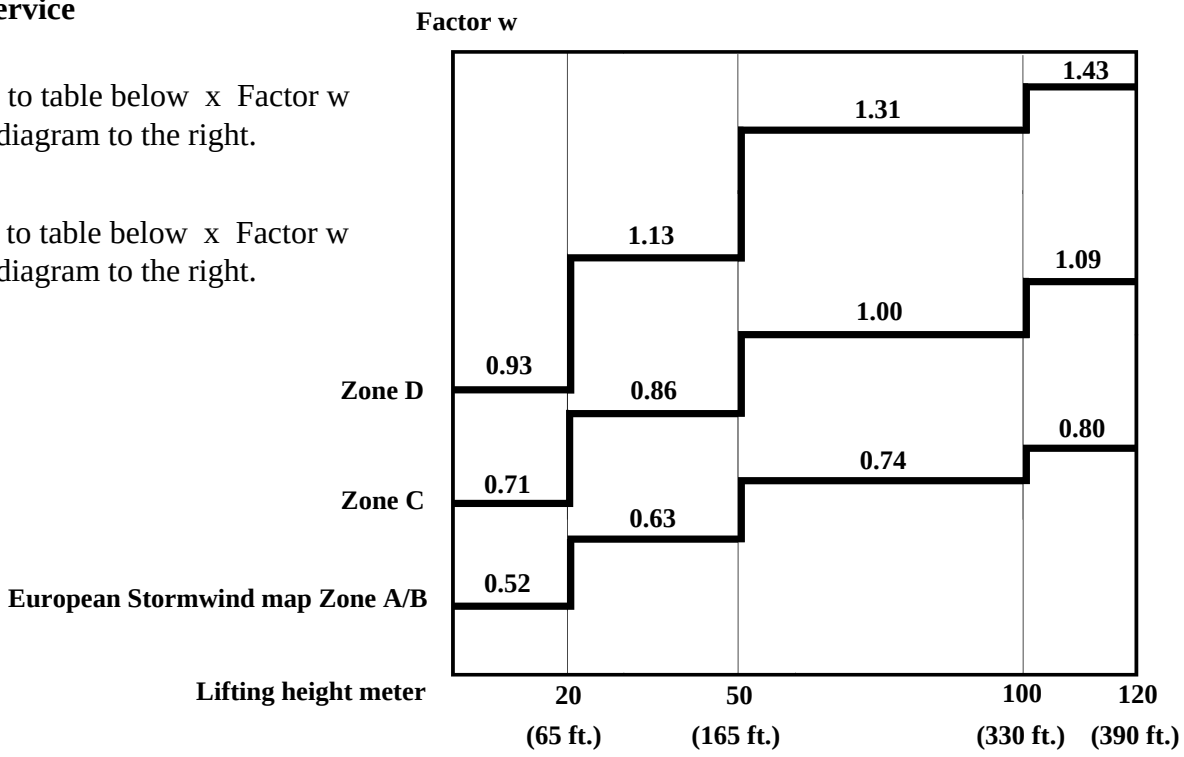
Overhang a	12.0 m		10.5 m		12.0 m		10.5 m		9.0 m		6.0 m	
Mast tie intervals b	15.0 m		15.0 m		12.0 m		12.0 m		9.0 m		6.0 m	
	Rx kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN	**Rx** kN	**Ry** kN
CAR LENGTH 3.9 meter												
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;												
up to 2400 kg	14.7	14.9	–	–	16.2	16.4	–	–	15.4	15.6	17.6	8.8
(a = b / 2)	(10.4)	(10.6)	–	–	(11.0)	(11.2)	–	–	(12.0)	(8.8)	(17.6)	(8.8)
3-motor machinery, speed ≤ 1.1 m/s, payload capacity;												
between 2201 – 2800 kg	15.9	15.7	–	–	17.6	17.4	–	–	16.9	16.7	21.1	9.7
(a = b / 2)	(11.4)	(11.2)	–	–	(12.2)	(12.0)	–	–	(14.0)	(9.3)	(21.1)	(9.7)
between 2701 – 3200 kg	–	–	15.0	14.8	–	–	16.4	16.3	17.3	17.1	22.8	10.3
(a = b / 2)	–	–	(11.1)	(10.9)	–	–	(11.8)	(11.6)	(14.9)	(9.6)	(22.0)	(10.3)
CAR LENGTH 4.6 meter												
2-motor machinery, speed ≤ 0.7 m/s, payload capacity;												
up to 2400 kg	16.1	15.7	–	–	17.8	17.3	–	–	17.2	16.5	20.0	9.5
(a = b / 2)	(11.5)	(11.1)	–	–	(12.4)	(11.8)	–	–	(13.5)	(9.1)	(20.0)	(9.5)
between 2001 – 3000 kg	–	–	14.9	15.1	–	–	16.4	16.6	17.3	17.5	22.7	11.0
(a = b / 2)	–	–	(11.0)	(11.2)	–	–	(11.8)	(12.0)	(14.8)	(10.1)	(22.7)	(11.0)

H_8

Hoist out of Service

Rx = Rx acc. to table below x Factor w acc. to diagram to the right.

Ry = Ry acc. to table below x Factor w acc. to diagram to the right.



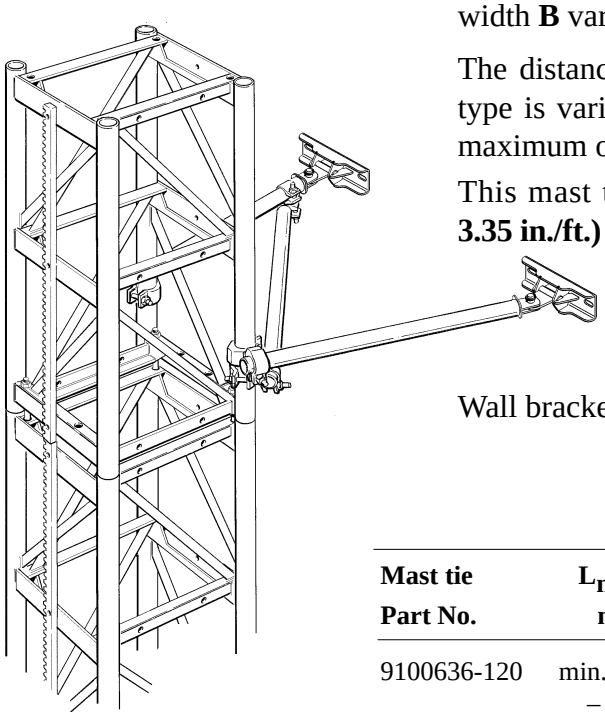
kN x 225 = **pound force**, **lbf.**

Overhang	**a**	15.0 m		12.0 m		9.0 m		6.0 m	
Mast tie intervals	**b**	15.0 m		12.0 m		9.0 m		6.0 m	
		Rx0	**Ry0**	**Rx0**	**Ry0**	**Rx0**	**Ry0**	**Rx0**	**Ry0**
Single car		22.8 kN	22.8 kN	18.2 kN	18.2 kN	13.7 kN	13.7 kN	9.1 kN	9.1 kN
a = b / 2 *		11.8 kN	11.8 kN	9.5 kN	9.5 kN	7.1 kN	7.1 kN	4.7 kN	4.7 kN
Dual cars		24.3 kN	24.3 kN	19.4 kN	19.4 kN	14.6 kN	14.6 kN	9.7 kN	9.7 kN
a = b / 2 *		12.6 kN	12.6 kN	10.1 kN	10.1 kN	7.6 kN	7.6 kN	5.0 kN	5.0 kN

* If overhang equal or less than half the tie distances the reaction forces in the remaining mast ties will ALWAYS be the same. They can never be less.

Values for distances above last mast tie larger than b / 2 can be interpolated.

Note: The most favourable reaction forces will always appear at mast tie distances = 12 m **(40 ft.).**



Mast tie type R2A-76 (tube dia. 76 mm or 3 in.)

The tie is telescopic variable in horizontal direction. The tie width **B** varies depending on the length of the tie selected.

The distance between the wall and the mast center for this tie type is variable from a minimum of 700 mm **(2'- 3 1/2")** to a maximum of 4000 mm **(13'- 1 1/2")**.

This mast tie may be inclined between ± 15° (270 mm/m or **3.35 in./ft.)** from the horizontal.

Wall bracket part. no. 9100631-000.

mm x 0.03937 = **inches**

kN x 225 = **pound force**, **lbf.**

Mast tie Part No.	**$L_{min.}$ mm**	**$L_{max.}$* mm**	**$B_{min.} - B_{max.}$ mm**	**P_{max} In service**	**Out of serv.**
9100636-120	min. 700		1100 –	32 kN	36 kN
	– " –		– 1500	27 kN	30 kN
		max. 1200	1100 –	44 kN	49 kN
		– " –	– 1500	35 kN	40 kN
9100636-160	min. 1200		1400 –	37 kN	42 kN
	– " –		– 1700	33 kN	37 kN
		max. 1600	1400 –	45 kN	50 kN
		– " –	– 1700	39 kN	44 kN
9100636-200	min. 1600		1400 –	45 kN	50 kN
	– " –		– 2000	35 kN	40 kN
		max. 2000	1400 –	52 kN	59 kN
		– " –	– 2000	40 kN	45 kN
9100636-250	min. 2000		1400 –	52 kN	59 kN
	– " –		– 2400	36 kN	41 kN
		max. 2500	1400 –	60 kN	67 kN
		– " –	– 2400	41 kN	46 kN
9100636-300	min. 2500		1600 –	55 kN	62 kN
	– " –		– 3200	34 kN	38 kN
		max. 3000	1600 –	60 kN	67 kN
		– " –	– 3200	38 kN	43 kN
9100636-350	min. 3000		1600 –	60 kN	67 kN
	– " –		– 3200	38 kN	43 kN
		max. 3500	1600 –	49 kN	55 kN
		– " –	– 3200	42 kN	48 kN
9100636-400	min. 3500		1600 –	49 kN	55 kN
	– " –		– 3200	43 kN	48 kN
		max. 4000	1600 –	34 kN	39 kN
		– " –	– 3200	33 kN	37 kN

* ***Note:*** Wall bracket turned for installation towards face of structure will give additional 75 mm **(3 in.)**.

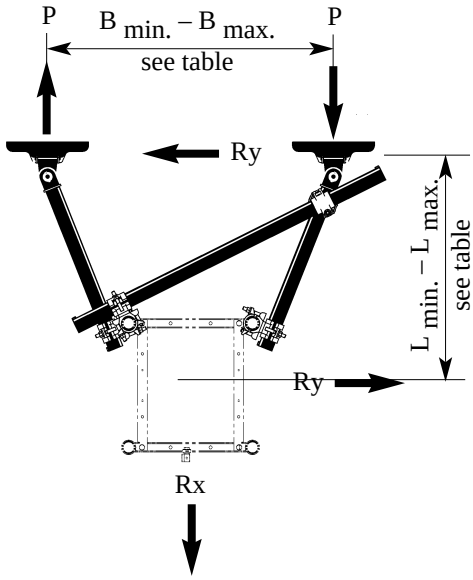
Reaction forces

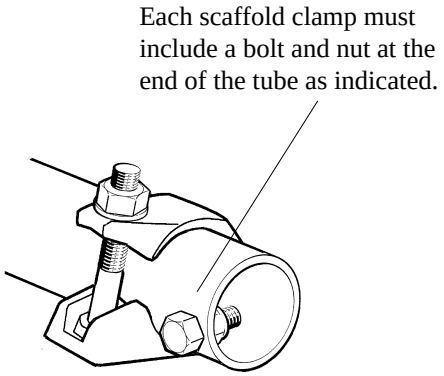
Maximum reaction force P in the wall anchorage of the tie can be calculated as follows:

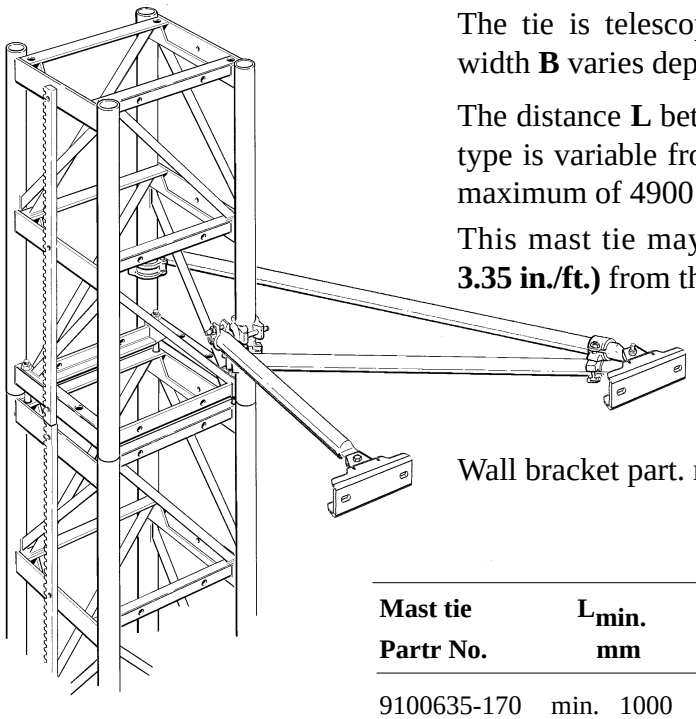
$$P = Ry \cdot \frac{L}{B} + \frac{Rx}{2}$$

Rx and Ry according to the table on page H6.

P must never exceed P_{max} stated for each size of mast tie according to table above.







Mast tie type S1A-76 (tube dia, 76 mm or 3 in.)
(for single car installation)

The tie is telescopic variable in horizontal direction. The tie width **B** varies depending on the length of the tie selected.

The distance **L** between the wall and the mast center for this tie type is variable from a minimum of 1000 mm **(3'- 3 1/4")** to a maximum of 4900 mm **(16'- 1")**.

This mast tie may be inclined between ± 15° (270 mm/m or **3.35 in./ft.)** from the horizontal.

Wall bracket part. no. 9100631-000.

mm x 0.03937 = **inches**

kN x 225 = **pound force**, **lbf.**

Mast tie Partr No.	**$L_{min.}$ mm**	**$L_{max.}$* mm**	**$B_{min.} - B_{max.}$ mm**	**P_{max} In service**	**P_{max} Out of serv.**
9100635-170	min. 1000		500 –	60 kN	67 kN
	– " –		– 850	60 kN	67 kN
		max. 1700	850 –	60 kN	60 kN
		– " –	– 1200	67 kN	67 kN
9100635-250	min. 1700		850 –	60 kN	60 kN
	– " –		– 1200	67 kN	67 kN
		max. 2500	1250 –	60 kN	60 kN
		– " –	– 1600	67 kN	67 kN
9100635-330	min. 2500		1250 –	60 kN	60 kN
	– " –		– 1600	67 kN	67 kN
		max. 3300	1650 –	36 kN	41 kN
		– " –	– 2000	34 kN	39 kN
9100635-410	min. 3300		1650 –	36 kN	41 kN
	– " –		– 2000	34 kN	39 kN
		max. 4100	2050 –	20 kN	23 kN
		– " –	– 2400	18 kN	21 kN
9100635-490	min. 4100		2050 –	20 kN	23 kN
	– " –		– 2400	18 kN	21 kN
		max. 4900	2450 –	11 kN	12 kN
		– " –	– 2800	10 kN	11 kN

***** ***Note:*** Wall bracket turned for installation towards face of structure will give additional 75 mm **(3 in.)**.

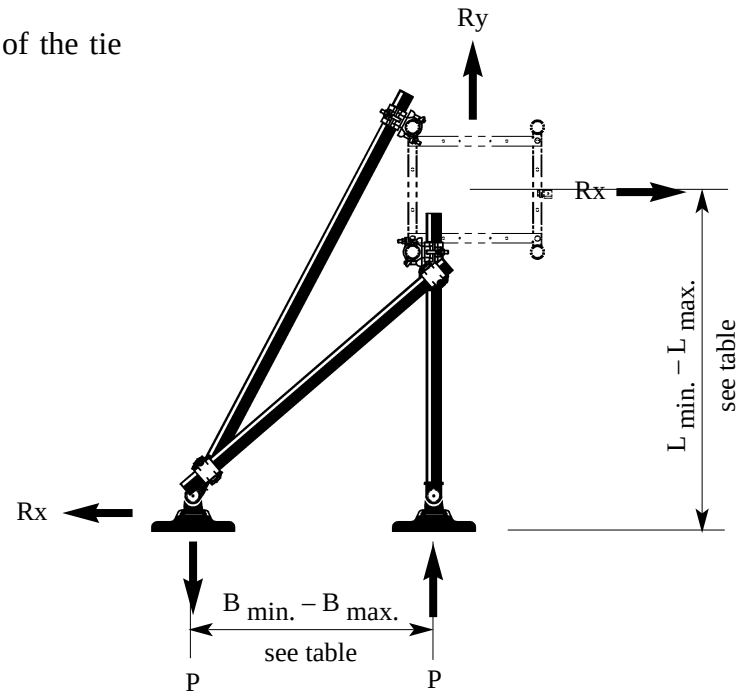
Reaction forces

Maximum reaction force P in the wall anchorage of the tie can be calculated as follows:

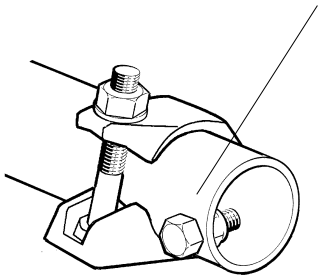
$$P = Rx \cdot \frac{L}{B} + Ry \cdot \frac{(B + 225)}{B}$$

Rx and Ry according to the table on page H6.

P must never exceed P_{max} indicated for each size of mast tie according to table above.



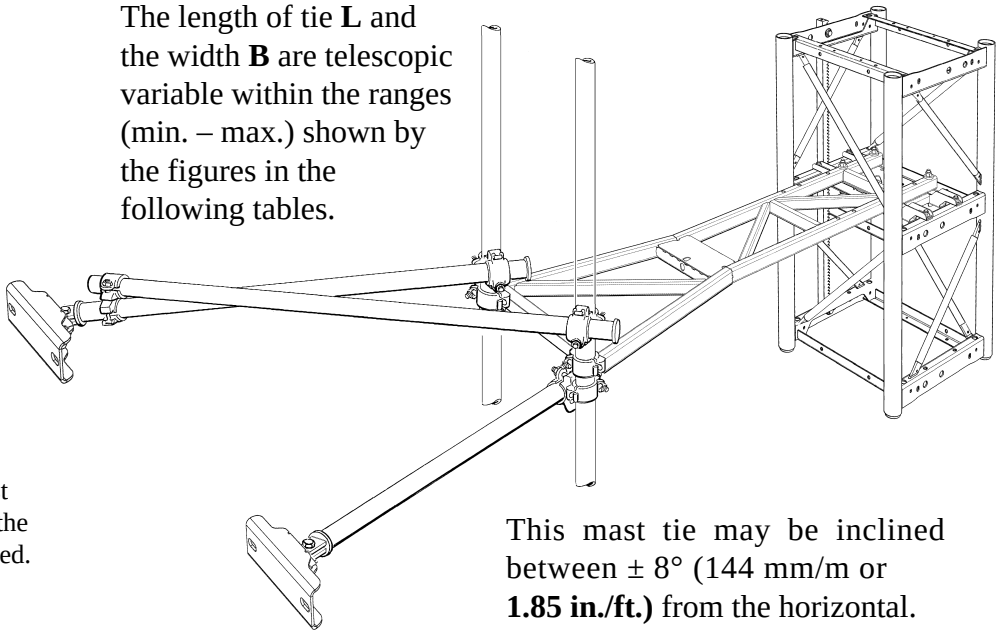
Each scaffold clamp must include a bolt and nut at the end of the tube as indicated.



Mast tie type S2A (for vertical pipes)

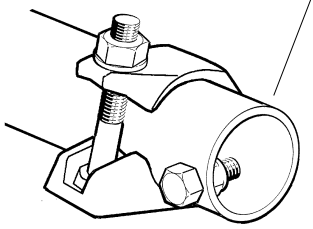
The tie is intended for both single and dual car hoists. The hoist ***must*** be equipped with vertical pipes for the landing equipment.

The length of tie **L** and the width **B** are telescopic variable within the ranges (min. – max.) shown by the figures in the following tables.



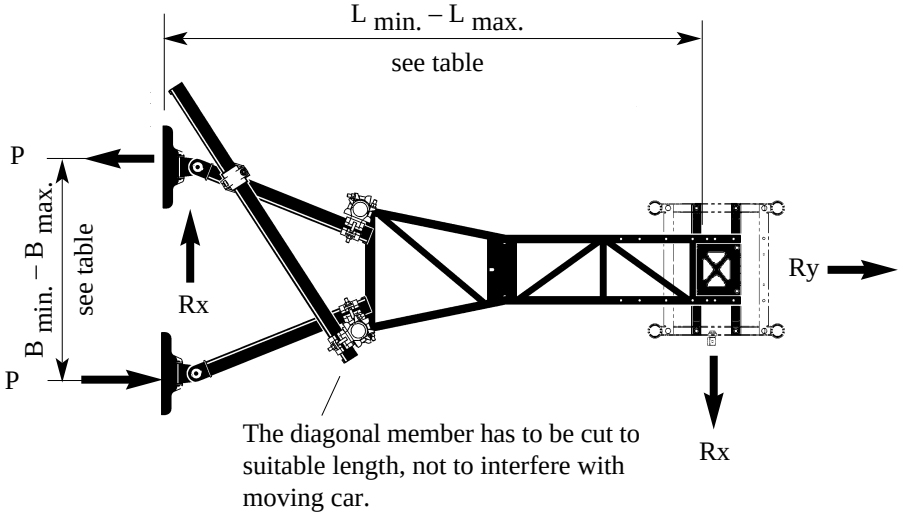
This mast tie may be inclined between ± 8° (144 mm/m or **1.85 in./ft.)** from the horizontal.

Each scaffold clamp must include a bolt and nut at the end of the tube as indicated.



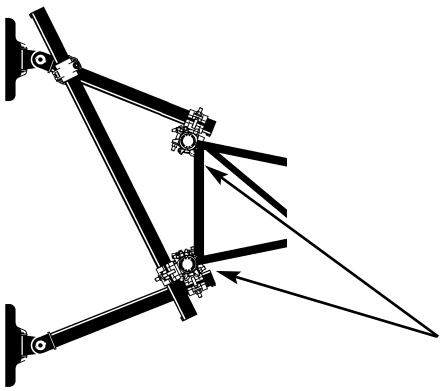
Reaction forces

Maximum reaction force P in the wall anchorage of the tie can be calculated as follows:



$$P = Rx \cdot \frac{L}{B} + \frac{Ry}{2}$$

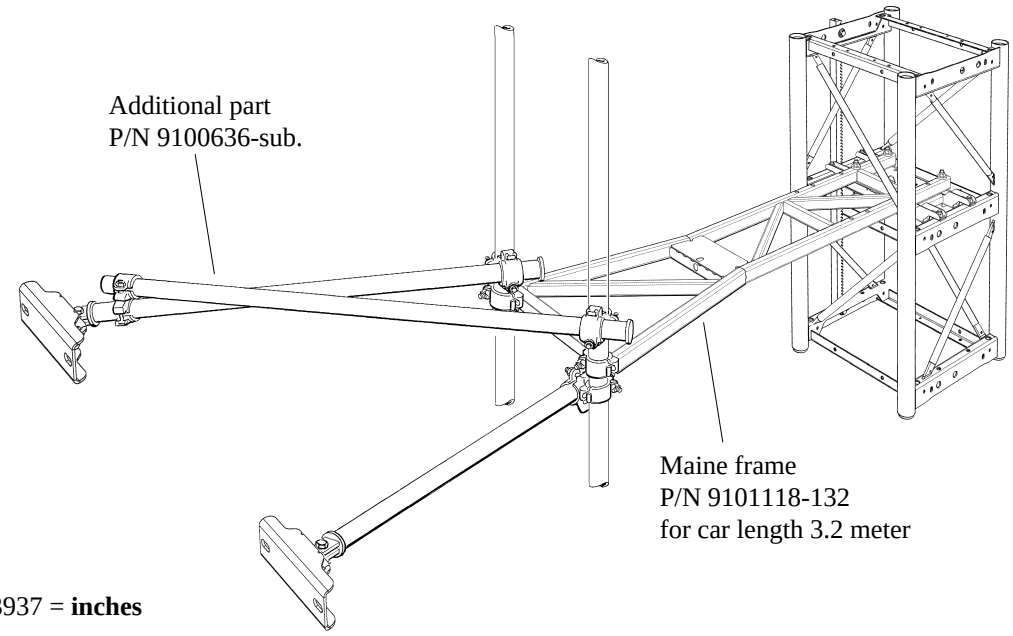
Rx and Ry according to the table on page H6.



P must never exceed P_{max} indicated for each size of mast tie according to table on previous page.

Values stated in brackets ( ) in the following tables indicates maximum allowable force P_{max} with tube couplers applied OUTSIDE the vertical scaffold tubes.

Mast tie type S2A with main frame P/N 9101118-132 (for vertical pipes)

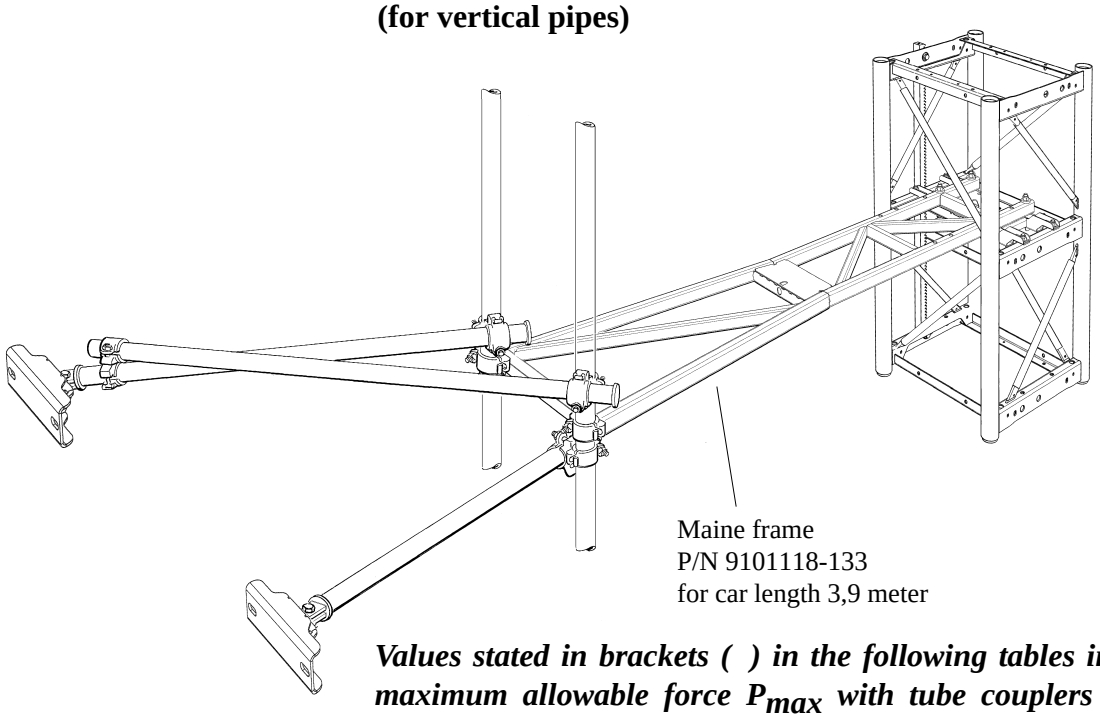


mm x 0.03937 = **inches**

kN x 225 = **pound force**, **lbf.**

Car length	Main frame Part No.	$L_{min.}$ mm	$L_{max.}$* mm	$B_{min.} – B_{max.}$ mm	Additional part * Part No	P_{max} In service	P_{max} Out of serv.
3.2 m	9101118-132	2275		1100 – 1500	9100636-120	21kN (60 kN)	24 kN (68 kN)
	– ” –	– ” –		– 1500	– ” –	10 kN (44 kN)	11 kN (50 kN)
	– ” –		2775	1100 –	– ” –	48 kN (60 kN)	54 kN (68 kN)
	– ” –		– ” –	– 1500	– ” –	33 kN (53 kN)	41 kN (60 kN)
	– ” –	2775		1400 –	9100636-160	36 kN (57 kN)	41 kN (64 kN)
	– ” –	– ” –		– 1700	– ” –	28 kN (47 kN)	31 kN (53 kN)
	– ” –		3175	1400 –	– ” –	44 kN (60 kN)	49 kN (68 kN)
	– ” –		– ” –	– 1700	– ” –	35 kN (54 kN)	40 kN (60 kN)
	– ” –	3175		1400 –	9100636-200	44 kN (60 kN)	49 kN (68 kN)
	– ” –	– ” –		– 2000	– ” –	29 kN (45 kN)	33 kN (51 kN)
	– ” –		3575	1400 –	– ” –	49 kN (60 kN)	56 kN (68 kN)
	– ” –		– ” –	– 2000	– ” –	34 kN (51 kN)	39 kN (57 kN)
	– ” –	3575		1400 –	9100636-250	49 kN (60 kN)	55 kN (68 kN)
	– ” –	– ” –		– 2400	– ” –	28 kN (42 kN)	31 kN (48 kN)
	– ” –		4075	1400 –	– ” –	55 kN (60 kN)	62 kN (68 kN)
	– ” –		– ” –	– 2400	– ” –	33 kN (48 kN)	37 kN (54 kN)
	– ” –	4075		1600 –	9100636-300	49 kN (60 kN)	55 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	24 kN (36 kN)	27 kN (41 kN)
	– ” –		4575	1600 –	– ” –	54 kN (60 kN)	61 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	28 kN (41 kN)	31 kN (46 kN)
	– ” –	4575		1600 –	9100636-350	54 kN (60 kN)	61 kN (67 kN)
	– ” –	– ” –		– 3200	– ” –	28 kN (41 kN)	31 kN (46 kN)
	– ” –		5075	1600 –	– ” –	51 kN (60 kN)	57 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	23 kN (37 kN)	26 kN (42 kN)
	– ” –	5075		1600 –	9100636-400	51 kN (60 kN)	57 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	23 kN (37 kN)	26 kN (42 kN)
	– ” –		5575	1600 –	– ” –	37 kN (60 kN)	42 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	18 kN (32 kN)	20 kN (36 kN)

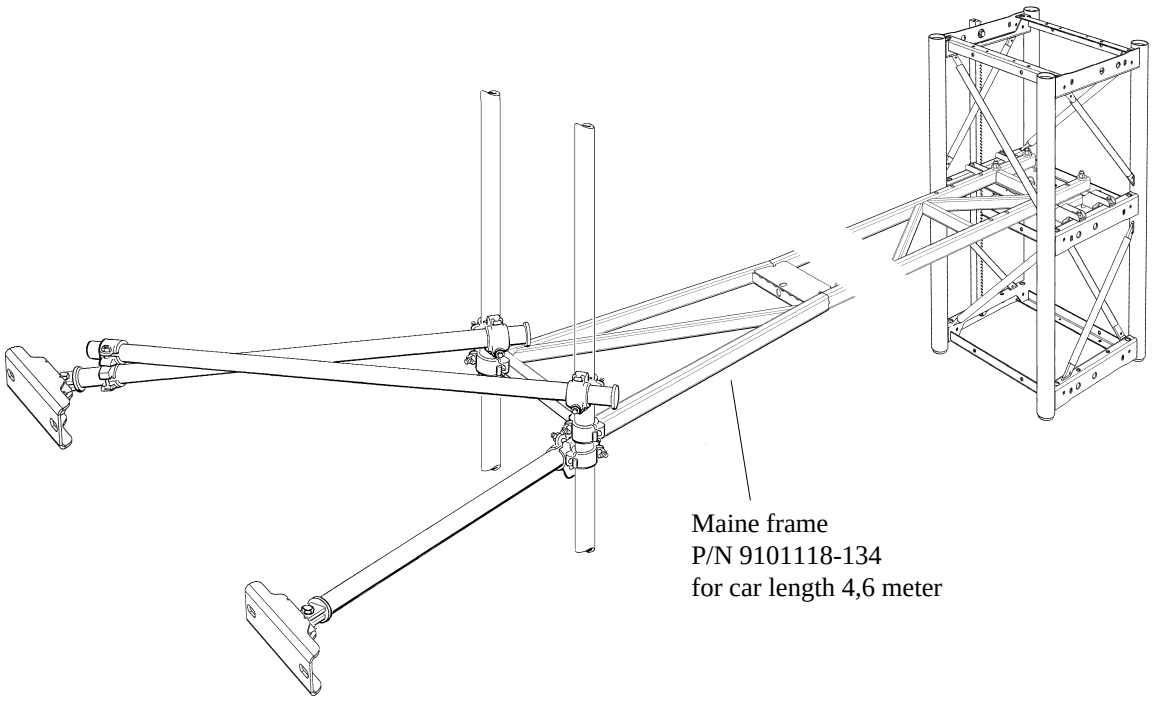
Mast tie type S2A with main frame P/N 9101118-133 (for vertical pipes)



Values stated in brackets ( ) in the following tables indicates maximum allowable force P_{max} with tube couplers applied OUTSIDE the vertical scaffold tubes.

Car length	Main frame Part No.	$L_{min.}$ mm	$L_{max.}$* mm	$B_{min.}$ – $B_{max.}$ mm	Additional part * Part No	P_{max} In service	P_{max} Out of serv.
3.9 m	9101118-133	2625		1100 – 1500	9100636-120	20 kN (60 kN)	23 kN (68 kN)
	– ” –	– ” –		– 1500	– ” –	9 kN (45 kN)	11 kN (51 kN)
	– ” –		3125	1100 –	– ” –	46 kN (60 kN)	52 kN (68 kN)
	– ” –		– ” –	– 1500	– ” –	25 kN (59 kN)	28 kN (67 kN)
	– ” –	3125		1400 –	9100636-160	35 kN (60 kN)	39 kN (68 kN)
	– ” –	– ” –		– 1700	– ” –	27 kN (51 kN)	30 kN (57 kN)
	– ” –		3525	1400 –	– ” –	41 kN (60 kN)	46 kN (68 kN)
	– ” –		– ” –	– 1700	– ” –	34 kN (59 kN)	38 kN (66 kN)
	– ” –	3525		1400 – 1500	9100636-200	41 kN (60 kN)	46 kN (68 kN)
	– ” –	– ” –		1100 – 2000	– ” –	28 kN (49 kN)	31 kN (55 kN)
	– ” –		3925	1400 – 1500	– ” –	46 kN (60 kN)	52 kN (68 kN)
	– ” –		– ” –	1100 – 2000	– ” –	32 kN (55 kN)	36 kN (62 kN)
	– ” –	3925		1400 –	9100636-250	46 kN (49 kN)	52 kN (55 kN)
	– ” –	– ” –		– 2400	– ” –	26 kN (45 kN)	29 kN (51 kN)
	– ” –		4425	1400 –	– ” –	52 kN (60 kN)	58 kN (68 kN)
	– ” –		– ” –	– 2400	– ” –	31 kN (52 kN)	35 kN (58 kN)
	– ” –	4425		1600 –	9100636-300	46 kN (60 kN)	52 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	22 kN (37 kN)	25 kN (42 kN)
	– ” –		4925	1600 –	– ” –	50 kN (60 kN)	57 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	25 kN (41 kN)	28 kN (46 kN)
	– ” –	4925		1600 –	9100636-350	50 kN (60 kN)	27 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	25 kN (41 kN)	28 kN (46 kN)
	– ” –		5425	1600 –	– ” –	46 kN (60 kN)	50 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	20 kN (33 kN)	23 kN (38 kN)
	– ” –	5425		1600 –	9100636-400	46 kN (60 kN)	50 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	20 kN (33 kN)	23 kN (38 kN)
	– ” –		5925	1600 –	– ” –	35 kN (60 kN)	40 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	17 kN (28 kN)	20 kN (32 kN)

Mast tie type S2A with main frame P/N 9101118-134 (for vertical pipes)



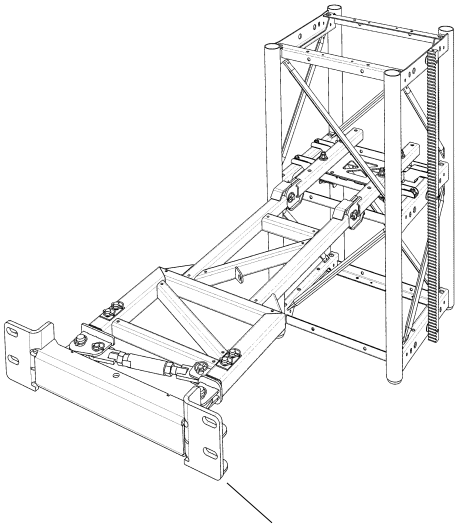
Car length	Main frame Part No.	$L_{min.}$ mm	$L_{max.}$* mm	$B_{min.}$ – $B_{max.}$ mm	Additional part * Part No	P_{max} In service	P_{max} Out of serv.
4.6 m	9101118-134	2975		1100 – 1500	9100636-120	20 kN (60 kN)	23 kN (68 kN)
	– ” –	– ” –		– 1500	– ” –	9 kN (44 kN)	10 kN (50 kN)
	– ” –		3475	1100 –	– ” –	44 kN (60 kN)	50 kN (68 kN)
	– ” –		– ” –	– 1500	– ” –	31 kN (53 kN)	35 kN (59 kN)
	– ” –	3475		1400 –	9100636-160	34 kN (56 kN)	38 kN (63 kN)
	– ” –	– ” –		– 1700	– ” –	26 kN (46 kN)	29 kN (52 kN)
	– ” –		3875	1400 –	– ” –	40 kN (60 kN)	45 kN (68 kN)
	– ” –		– ” –	– 1700	– ” –	32 kN (52 kN)	36 kN (58 kN)
	– ” –	3875		1400 –	9100636-200	40 kN (60 kN)	45 kN (68kN)
	– ” –	– ” –		– 2000	– ” –	26 kN (44 kN)	30 kN (49 kN)
	– ” –		4275	1400 –	– ” –	44 kN (60 kN)	50 kN (68 kN)
	– ” –		– ” –	– 2000	– ” –	31 kN (48 kN)	35 kN (54 kN)
	– ” –	4275		1400 –	9100636-250	44 kN (60 kN)	50 kN (68 kN)
	– ” –	– ” –		– 2400	– ” –	25 kN (40 kN)	28 kN (45 kN)
	– ” –		4775	1400 –	– ” –	49 kN (60 kN)	55 kN (68 kN)
	– ” –		– ” –	– 2400	– ” –	29 kN (45 kN)	33 kN (50 kN)
	– ” –	4775		1600 –	9100636-300	43 kN (60 kN)	49 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	21 kN (34 kN)	15 kN (38 kN)
	– ” –		5275	1600 –	– ” –	47 kN (60 kN)	53 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	23 kN (37 kN)	26 kN (42 kN)
	– ” –	5275		1600 –	9100636-350	47 kN (60 kN)	53 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	23 kN (37 kN)	26 kN (42 kN)
	– ” –		5775	1600 –	– ” –	42 kN (60 kN)	47 kN (68 kN)
	– ” –		– ” –	– 3200	– ” –	19 kN (31 kN)	21 kN (35 kN)
	– ” –	5775		1600 –	9100636-400	42 kN (60 kN)	47 kN (68 kN)
	– ” –	– ” –		– 3200	– ” –	23 kN (31 kN)	26 kN (35 kN)
	– ” –		6275	1600 –	– ” –	33 kN (59 kN)	37 kN (67 kN)
	– ” –		– ” –	– 3200	– ” –	10 kN (26 kN)	18 kN (29 kN)

Mast tie type S3A
with additional part P/N 9102800-sub. (for single or dual car installation)

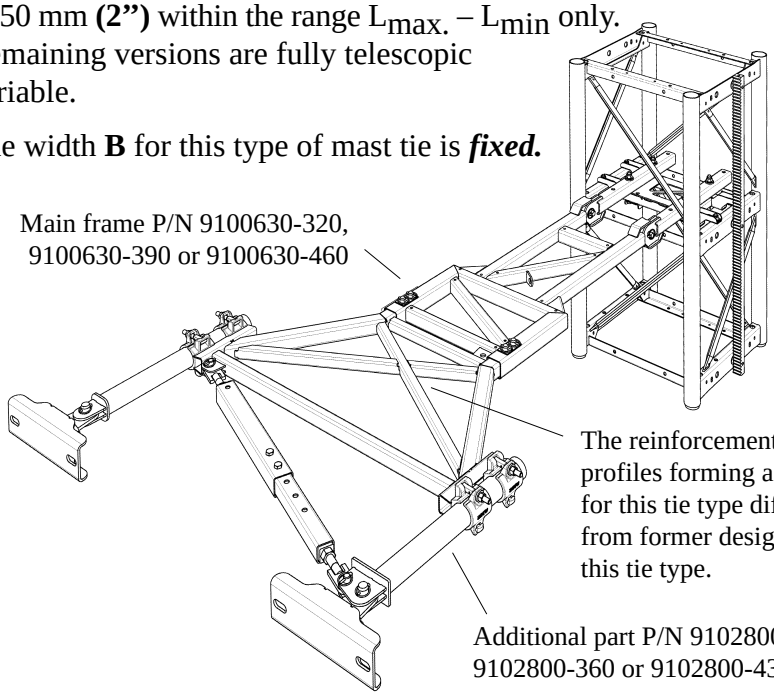
The tie is intended both for single and dual car hoists with or without counterweight. The hoist ***must not*** be equipped with vertical pipes for landing equipment.

The tie is available with 3 main sections with 4 different additional parts. The length of the tie **L** is variable within the range (max. – min.) shown by the figures in the table below.
The additional part P/N 9101500-200 is variable in increments of 50 mm **(2")** within the range $L_{max.} - L_{min}$ only.
Remaining versions are fully telescopic variable.

The width **B** for this type of mast tie is ***fixed.***



Additional part
P/N 9101500-210



This mast tie may be inclined between ± 8° (144 mm/m or **1.85 in./ft.)** from the horizontal.

Note: Allowable maximum force P_{max} for this tie type of former design is NOT in accordance with the following.

Car length	Main frame Part No.	$L_{min.}$ mm	$L_{max.}$* mm	B mm	Additional part Part No	P_{max} In service	P_{max} Out of serv.
3.2 m	9100630-320	1995	2190	890	9101500-210	65 kN	74 kN
	– " –	2690	3080	1420	9102800-310	58 kN	65 kN
	– " –	2990	3680	1720	9102800-360	57 kN	64 kN
	– " –	3590	4280	2020	9102800-430	57 kN	64 kN
3.9 m	9100630-390	2345	2540	890	9101500-210	76 kN	86 kN
	– " –	3040	3430	1420	9102800-310	64 kN	72 kN
	– " –	3340	4030	1720	9102800-360	62 kN	70 kN
	– " –	3940	4630	2020	9102800-430	61 kN	69 kN
4.6 m	9100630-460	2695	2890	890	9101500-210	86 kN	97 kN
	– " –	3390	3780	1420	9102800-310	71 kN	80 kN
	– " –	3690	4380	1720	9102800-360	68 kN	76 kN
	– " –	4290	4980	2020	9102800-430	66 kN	74 kN

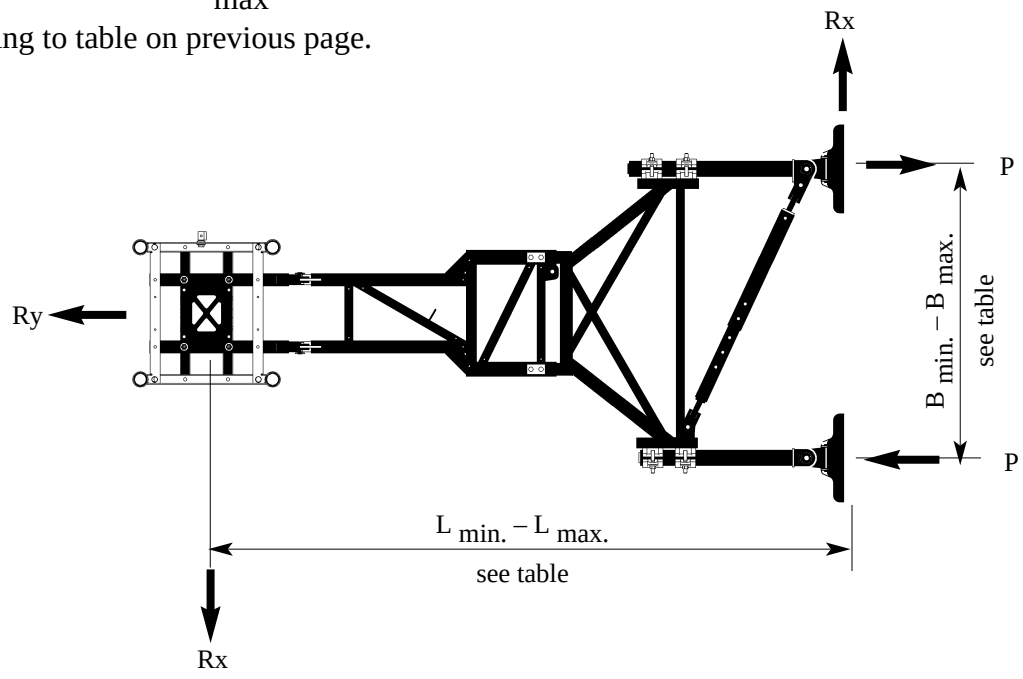
Reaction forces

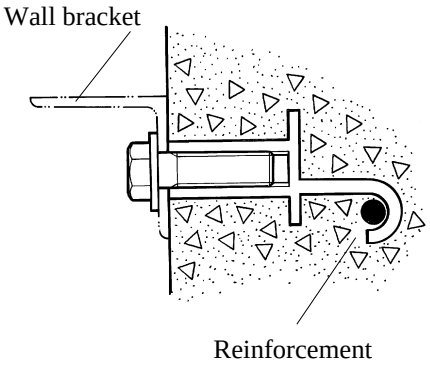
Maximum reaction force P in the wall anchorage of the tie can be calculated as follows:

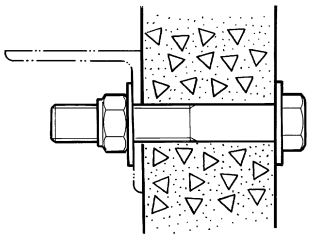
$$P = Rx \cdot \frac{L}{B} + \frac{Ry}{2}$$

Rx and Ry according to the table on page H6.

P must never exceed P_{max} indicated for each size of mast tie according to table on previous page.







h 16

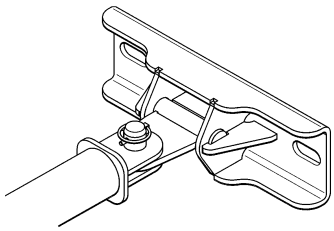
Attachment of ties

The ties are attached to the building by bolts, washers and nuts into the holes which are drilled at the installation or embedment sets or other approved suitable wall bracket attachments.

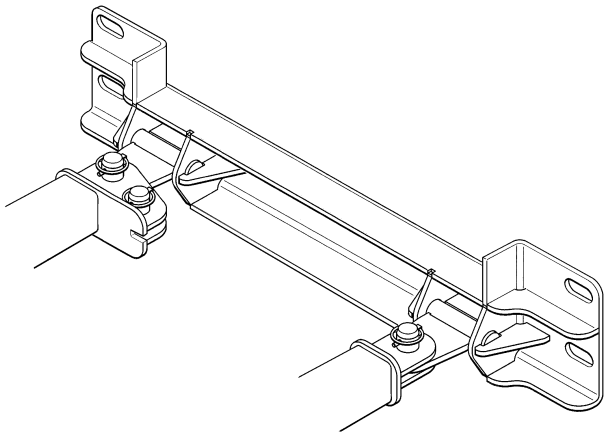
Cast in place inserts must be installed prior to the hoist installation in order for the concrete to cure properly and reach its proper strength. Concrete must be of suitable strength for calculated loads ***(See Reaction forces).*** Care must be taken in locating the inserts at their proper location ***(See type of mast tie).***

If other type of bolt is used such as epoxy cast in bolt or expansion bolt, it is important to choose an approved type which can take the calculated force in this application with a satisfactory safety factor.

Specifications for this type of attachment should follow the manufacturer's recommendations and be approved by the governing authority for their use.



Wall bracket P/N 9100631-000
Hole dia. 26 mm for bolt dimension M24
c/c between bolts 350 mm **(1'- 1 3/4")**



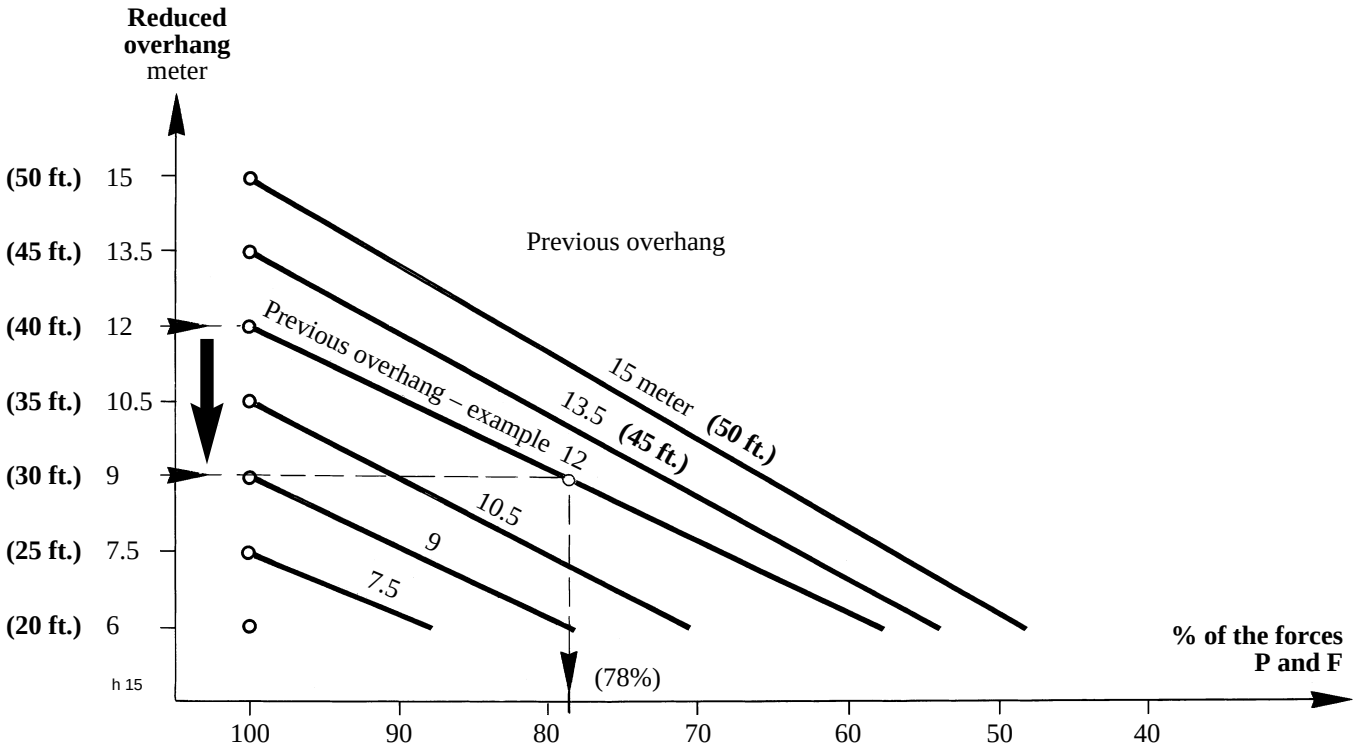
Wall bracket P/N 9101019-000
Hole dia. 26 mm for bolt dimension M24
c/c between bolts 890 mm **(2'- 11").**
Height between hole rows = 110 mm **(4 1/4").**

The reaction forces can be reduced by sortering the overhang

The following diagram shows roughly how the reaction forces **P** and **F** can be decreased by reducing the overhang – with tie distances remaining the same.

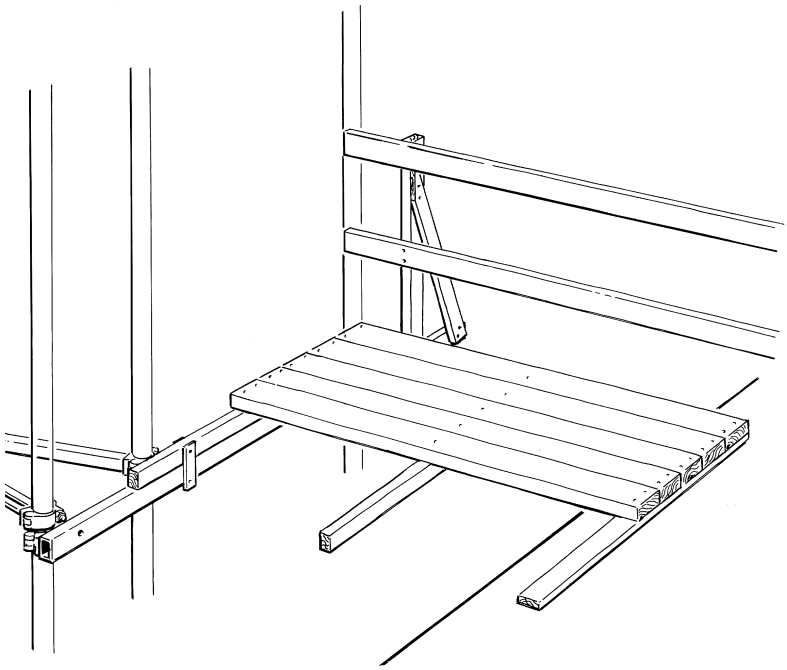
Example: As can be seen from the diagram below the reaction forces **P** and **F**, can be decreased from 100 to 78% if the overhang is shortened from 12 to 9 meter.

Newton [x 0.2248 = **lbf (pound force)**]



Landing run-offs in conjunction with vertical pipes

The sum of the vertical pipes', pipe supports', landing beams' and landing equipment's own weight means that the combined payload on the landing run-offs will be reduced with increasing mast height.



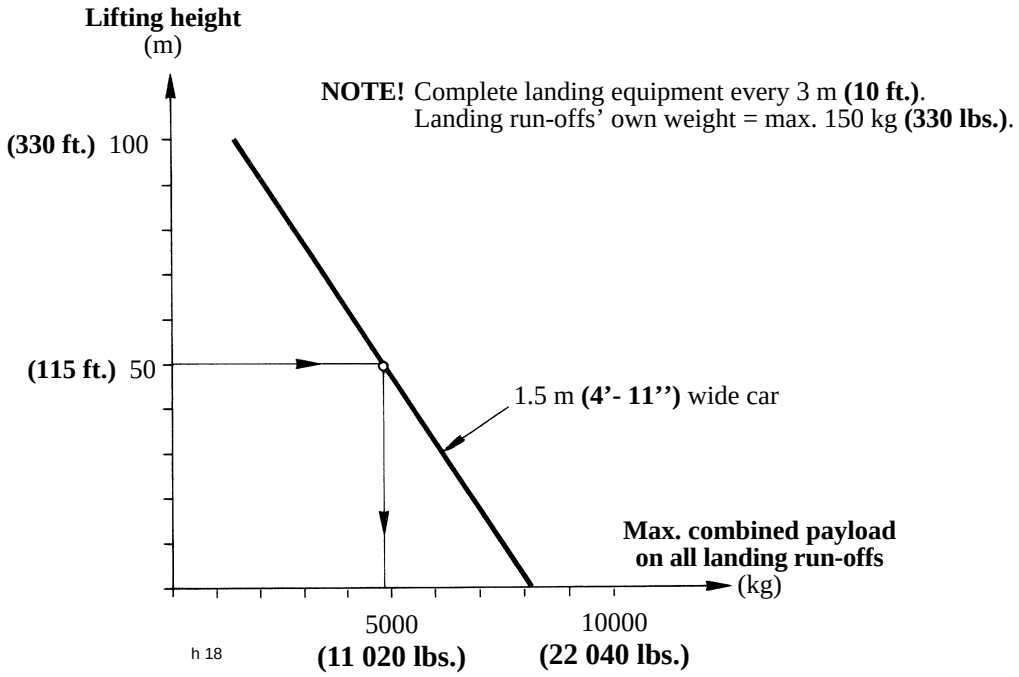
The maximum allowable payload on all the landings combined is shown on the diagram to the right. The load is understood to be equally distributed on the respective landing run-offs.

The allowable payload per landing run-of f may not exceed the hoist' s maximum capacity .

Example:

For a single car hoist type Scando 650 DOL 20/32 (car dimension 1.5 x 3.2) the maximum allowable payload for all the landing run-offs combined is 4800 kg **(10580 lbs.)** at a 50 m **(115 ft.)** lifting height.

The corresponding maximum allowable payload for a dual car hoist SCANDO 650 DOL 20/32 at 50 m lifting height is 2 x 4800 kg = 9600 kg **(21160 lbs.)**.



IMPORTANT:

- Except when loading or unloading the hoist it is advisable to avoid placing loads on the run-offs to avoid the risk of overloading.
- Exception must also be granted for personnel to call the hoist.
- Landing equipment for vertical pipes should be avoided at lifting heights greater than 100 m **(330 ft.).**

Preparations before installation

To install your rack and pinion hoist as efficiently and safely as possible and at lowest cost, it is important that the following preparations are made before the erector is called and the installation is started.

Permission

Make sure the chosen site of erection meets the requirements set out by local authorities for safety and inspection and that their permission, if necessary, to install the hoist has been obtained.

i 1

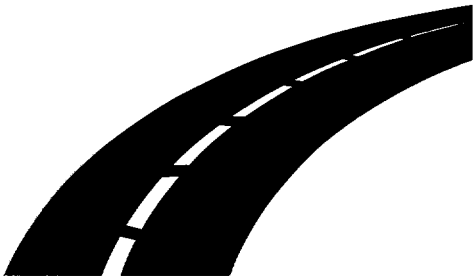
Erection place

Prepare the installation site so that electric power, light, lifting equipment and tools are available and there is adequate access for the lift transporter – beware of overhead obstructions.

If possible, prepare for the installation of ties and landing accessories such as supports, platforms and railing. Suitable places for attaching the ties are vaults, balconies or other concrete or steel structures. See applicable installation drawing.

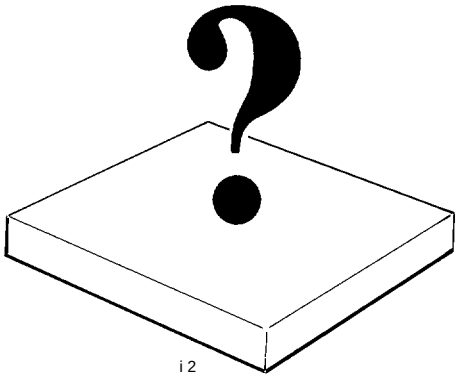
Remember that these structures must be strong enough to absorb the reaction forces of the ties and landing door assemblies.

All mast sections should be stored on dry firm ground and as close to the erection place as possible.



Foundation

Prepare the foundation with parts required for fixing the base frame of the mast. See chapter ”Foundation” in the manual Technical Description.


i 2

IMPORTANT!

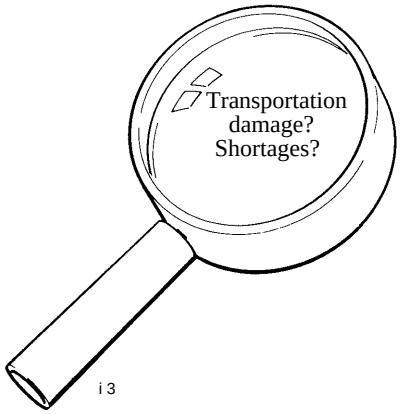
Make sure before casting the foundation that the measurement between the foundation frame and the face of the hoistway corresponds to the ties to be used.

Delivery check-up

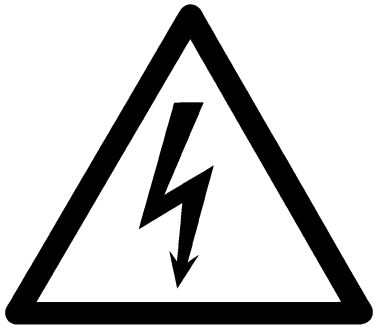
Check the delivery against shipping lists and look for transportation damage.

Should there be any damage, report the same to the responsible transportation insurance company within 7 days from the date of arrival of the goods.

Other claims should be made to ALIMAK representative within the same period.



i 3



i 4

Arrangement of power supply

Direct On Line (DOL) starting of electric motors results in a very high starting current. The current must overcome the resistance in the cables which results in a voltage drop. This voltage drop occurs not only in the trailing cables, but also in the power supply cable installed between the jobsite distribution board and the electric panel ”B” at the base. The total voltage drop is the sum of the voltage drop in all the cables. ***The consequence of the voltage drop is a substantial reduction in the output torque of the motor.***

In order to avoid starting problems it is of the utmost importance that the ***main power supply is adequately sized*** with respect to the starting current and the voltage drop. The following data should be noted:

– During starting conditions, in the upward direction with rated load, the voltage drop must not exceed 15% of the rated voltage when measured at the motor terminals. In the Base panel, the voltage drop of the incoming power supply terminals must not exceed 3% of the rated voltage during the starting conditions.

– Once the rated speed is established during upward travel with rated load, the voltage drop must not exceed 5% of the rated voltage when measured at the motor terminals. In the Base panel, the incoming power supply voltage should, in practice, not drop at all, i.e. not exceed 1 – 2 % drop.

– ***Except for the above mentioned supply voltage levels during start and running conditions, the quality of the main power supply to the lift/hoist must be in accordance with the requirements of EN 50160:1999.***

Client’s power supply

Supply cables to hoists with DOL or Y/D starting

f4

The 3-phase power supply cable from the jobsite distribution board to the ”B” panel at the base can be calculated from the formulas below. The formulas are applicable for the most common types of hoists having 1 or 2 motor drive machinery with ***DOL-starting at 400V, 50Hz and 460V, 60Hz***.

Note: If an earth leakage circuit breaker, ELCB, (ground fault circuit breaker) is to be used, the trip-out value should be chosen for equipment protection i.e. 500mA.

Use of 30mA ELCB is not recommended as it continuously trips due to the motor starting current.

No. of motors	Motor power continuous/25% intermittent 50 Hz	Motor power continuous/25% intermittent 60 Hz	Power supply cable to Base panel. Conductor area, copper	Minimum recommended Cu-Conductor area	Fuse at * 400V 50Hz 460V 60 Hz
1	11 / 13 kW	12.6 / 15 kW	a = L x 0.25 mm^2	10 mm^2	35 AT
2	11 / 13 kW	12.6 / 15 kW	a = L x 0.49 mm^2	16 mm^2	63 AT

a = Conductor area mm^2, Cu. To be rounded up to standard sizes, i.e. 10, 16, 25, 35 mm^2 etc.

L = Length in m of the 3-phase power supply cable from the jobsite distribution board to the Base panel

For conductor sizes in AWG Nos, see conversion table below.

* In order to avoid single phasing should a main fuse blow, we strongly recommend the power supply to be fused by means of a three-phase circuit breaker.

Supply cables to hoists and lifts with VFC (Variable Frequency Converter)

The size of the power supply cable must always comply with Rules and Regulations stipulated by the local Authority for electrical installations. Customer's power supply cable must also be sized to ensure that the voltage drop in the Base panel does not exceed 3% when starting with full load with the hoist moving in the upward direction.

The size of the power supply cable can be calculated by following formula:

a = L x P x 0.0056... ***...where***

a = Conductor area in mm^2 copper

L = Length in m of the power supply cable from distribution board to the Base panel

P = Drive motor power in kW on the hoist

Installed motor power kW	Minimum cable size (copper) mm^2
3 – 5.5	4
6 – 10	6
11 – 20	10
21 – 30	10
31 – 40	16
41 – 50	25
51 – 75	(35) 50

IMPORTANT! The power supply cable must be sized according to the drive motor power installed on the hoist. Minimum size of the supply cable is shown on the table above. The table refers to supply voltage 400V to 460V, 50/60Hz.

See note re: earth circuit breaker on previous page.

Power supply from generator set at jobsite

Required generator power

It is recommended that the generator is capable of providing a **starting current** of A amperes at rated voltage. If this is not possible, the guidelines below can be used.

For DOL starting of Alimak hoists having 1 or 2 drive motors we suggest the following generator sizes:

– 1 motor drive size 132M, 13 kW (15 kW) 100 kVA min.

– 2 motor drive size 132M, 13 kW (15 kW) 200 kVA min.

It should be noted that the recommended generator sizes are large due to the fact that the DOL starting of the motor(s) draws a large current resulting in a voltage drop which would cause the contactors to oscillate on and off. A smaller generator might be used but this can only be established by practical experience related to a specific make and model of the generator set.

For VFC (Variable Frequency Converter) operated hoists the generator size in kVA should be approximately 2 x the installed motor power in kW. (S3 = 25% ED).

Voltage drop in the power supply

Typical symptoms

– The hoist will not start with the full rated load.

– The brakes will not lift when starting in the Up-direction.

– The contactors oscillate on and off (”shatter”) when starting with full load in the Up-direction.

– The contacts of the Up and the main contactors are damaged.

Steps to be taken to overcome a voltage drop problem

The best method to avoid any voltage drop problem is to make a proper engineering review of the conditions at the job site ***before*** installing the hoist. When installed, the options are limited.

However, should a situation occur where the power supply seems to be insufficient, it is important to determine whether this depends on the voltage drop in the power supply or something else. Use an instrument to measure the incoming power supply voltage in both the B-panel at the base and the M-panel on/in the car. Take the readings ***during starting conditions*** in the

upward direction with rated load in the car. If the voltage drop exceeds the values given above, one or more of the following steps can be taken:

1. Increase the conductor size in the power supply cable from the jobsite distribution board to the B-panel at base.
2. Increase the conductor size in the trailing power cables between the Base panel and the car. Due to mechanical and performance reasons, the conductors in the trailing cable should not exceed 16 mm^2.

   The fixed cable to the junction box at 1/2 lifting height can be increased in size.
3. Reduce the rated load.
4. Install a step-up transformer xxx/690V in the power supply in order to increase the voltage.

   Note! Motor windings must be adaptable to this higher voltage. Otherwise the motor must be changed. To give the best possible advantage, the step-up transformer should preferably be located close to the jobsite distribution board.
5. Use some sort of soft start equipment.

If you have any questions regarding the power supply cables or the trailing cables, please contact Alimak for advice.

Conversion table mm^2 to AWG

AWG No. (American Wire Gauge)	mm^2	Nearest IEC std. mm^2
0000	107.2	95 alt. 120
000	85.03	70 alt. 95
00	67.43	70
0	53.48	50
1	42.41	35 alt. 50
2	33.63	35
4	21.15	16 alt. 25
6	13.3	10 alt. 16
8	8.366	6 alt. 10
10	5.261	4 alt. 6
12	3.309	2.5 alt. 4
14	2.081	1.5 alt. 2.5
16	1.309	1.5
18	0.8231	0.75 alt. 1.0

HOIST
capacity 2400 kg
or 24 passengers

9101286-101

HOIST

capacity _____ kg

or _____ passengers

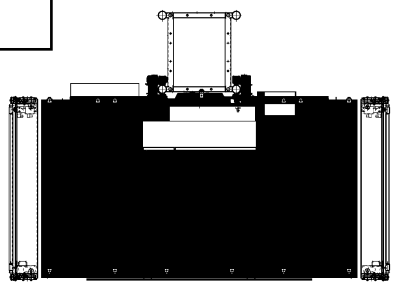
To enable re-use of this data sign it is advisable to insert the data with a lead pencil or an erasable felt pen.

9101286-101

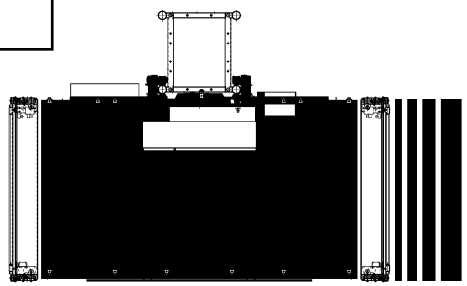
Specifications for this particular installation

Car configuration

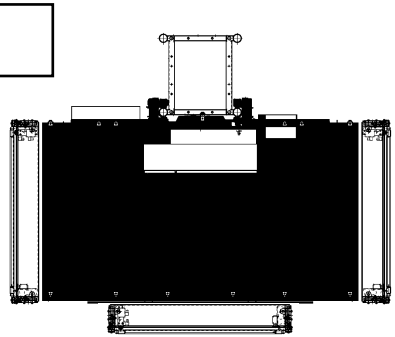
No optional load ramp

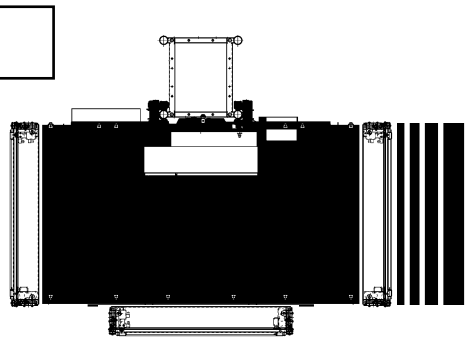


With optional load ramp



car length 3.2 m





The actual car configuration marked [x]

Date	Signature

9101229 -101

Freestanding capability [ ]
bolted to a properly sized prefabricated steel-sheet or a concrete foundation.

Freestanding height during installation with rated capacity reduced to 8 pcs. mast sections and 2 persons. Wind speed less than 12.5 m/s. [ ]

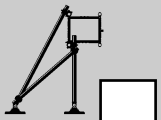
Distance above top mast tie [ ]

Distance between mast ties [ ]

Maximum mast height: [ ]

Mast bolt dimension; dia. 1” UNC
Bolt quality 8.8 / torque 300 Nm
Mast section P/No. 9092000-sub.

Mast tie type: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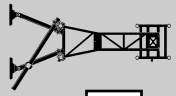
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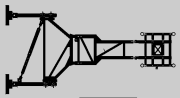

[ ]


[ ]

Power supply fuses [ ]

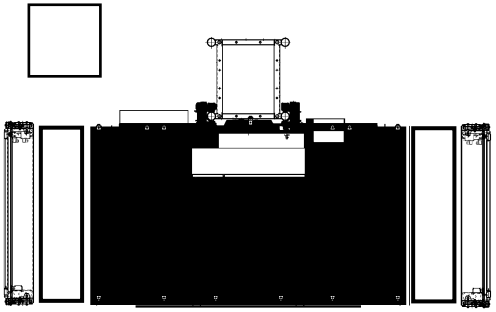
Feeding power cable [ ]

Please read the complete manual before operating this machine

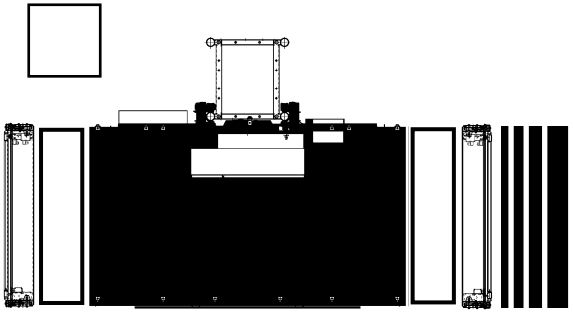
Specifications for this particular installation

Car configuration

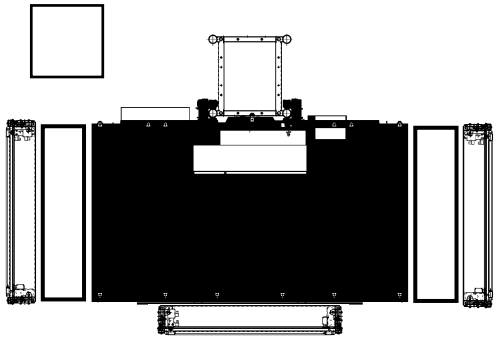
No optional load ramp

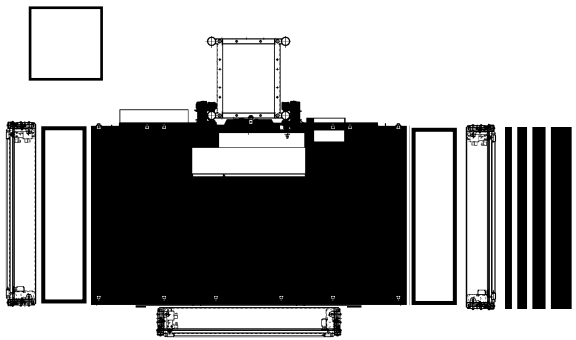


With optional load ramp



car length extended to 3.9 m





The actual car configuration marked [x]

Date	Signature

9101229 -101

Freestanding capability [ ]
bolted to a properly sized prefabricated steel-sheet or a concrete foundation.

Freestanding height during [ ]
installation with rated capacity reduced to 8 pcs. mast sections and 2 persons. Wind speed less than 12.5 m/s.

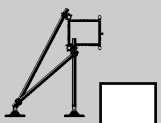
Distance above top mast tie [ ]

Distance between mast ties [ ]

Maximum mast height: [ ]

Mast bolt dimension; dia. 1” UNC
Bolt quality 8.8 / torque 300 Nm
Mast section P/No. 9092000-sub.

Mast tie type: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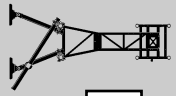
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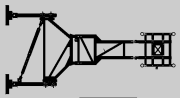
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[ ]

Power supply fuses [ ]

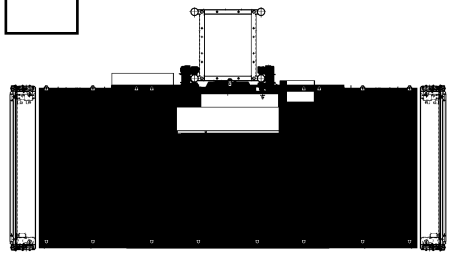
Feeding power cable [ ]

Please read the complete manual before operating this machine

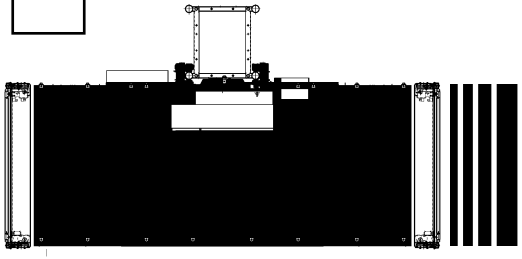
Specifications for this particular installation

Car configuration

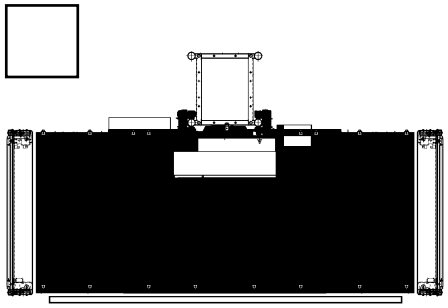
No optional load ramp

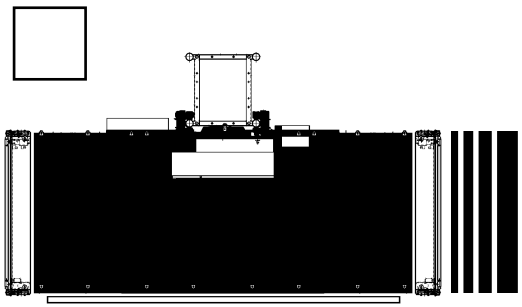


With optional load ramp



car length 3.9 m





The actual car configuration marked [X]

Date	Signature

9101229 -102

Freestanding capability [ ]
bolted to a properly sized prefabricated steel-sheet or a concrete foundation.

Freestanding height during [ ]
installation with rated capacity reduced to 8 pcs. mast sections and 2 persons. Wind speed less than 12.5 m/s.

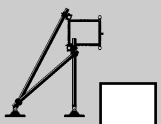
Distance above top mast tie [ ]

Distance between mast ties [ ]

Maximum mast height: [ ]

Mast bolt dimension; dia. 1” UNC
Bolt quality 8.8 / torque 300 Nm
Mast section P/No. 9092000-sub.

Mast tie type: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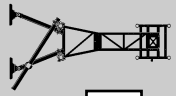
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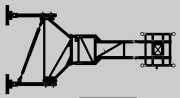

[ ]


[ ]

Power supply fuses [ ]

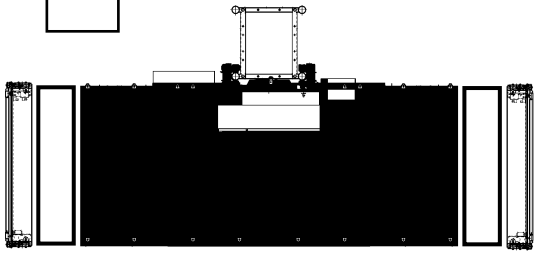
Feeding power cable [ ]

Please read the complete manual before operating this machine

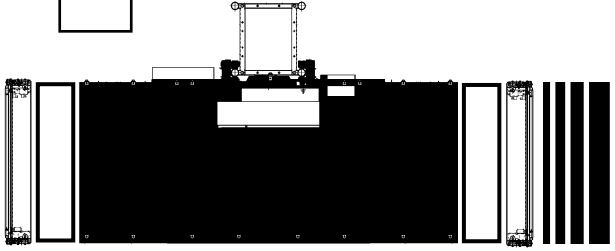
Specifications for this particular installation

Car configuration

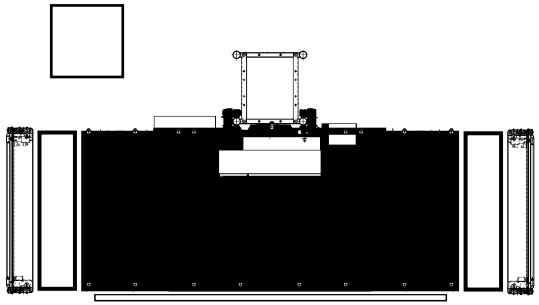
No optional load ramp

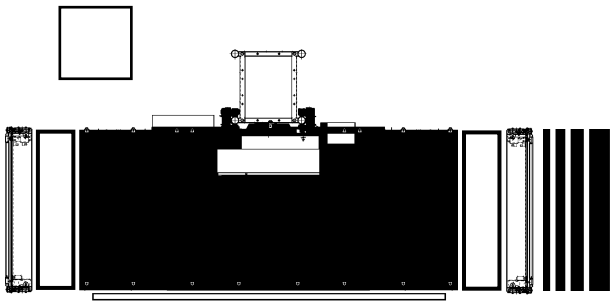


With optional load ramp



car length 4.6 m





The actual car configuration marked [X]

Date	Signature

9101229 -102

Freestanding capability [ ]
bolted to a properly sized prefabricated steel-sheet or a concrete foundation.

Freestanding height during [ ]
installation with rated capacity reduced to 8 pcs. mast sections and 2 persons. Wind speed less than 12.5 m/s.

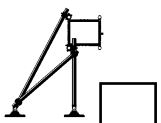
Distance above top mast tie [ ]

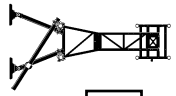
Distance between mast ties [ ]

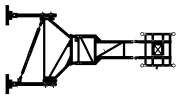
Maximum mast height: [ ]

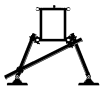
Mast bolt dimension; dia. 1” UNC
Bolt quality 8.8 / torque 300 Nm
Mast section P/No. 9092000-sub.

Mast tie type:









Power supply fuses [ ]

Feeding power cable [ ]

Please read the complete manual before operating this machine