



ELECTRIC LIFT MRL GEARLESS.

TECHNICAL INSTRUCTIONS

Characteristics & Components

SYMBIO

WWW.LC.LIFT.COM



GENERALE INDEX

TECHNICAL INSTRUCTIONS

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**ELECTRIC LIFT
MRL GEARLESS: SYMBIO
TECHNICAL INSTRUCTIONS**



1. INTRODUCTION

The scope of this documentation is to supply sufficient definitions and technical information about electric lift with gearless engine machine room-less SYMBIO. Some technical information concerning shaft dimensions and electric connections of the gearless machine will be supplied

2. GENERAL DESCRIPTION

- Electric lift machine room-less – MRL – with gearless machine.
- Nominal speed: 1 m/s regulated VVVF. Optional 1,6 m/s.
- Load: till 1000 Kg / 13 persons.
- Constructive solution with a traditional type cabin with rope 2:1. The idling pulleys are positioned under the cabin. The counterweight machine frame 2:1 is positioned next to the cabin.
- The gearless machine and frame machine are positioned in the aperture. The loads are on guides.
- Solution is valid for the installations with one entrance and with two entrances at 180° (2 entrances at 90° are possible only with rucksack car frame and suspension 1:1 or 2:1 see OPTIMUS line).

3. COMMERCIAL AND ENERGETIC ADVANTAGES

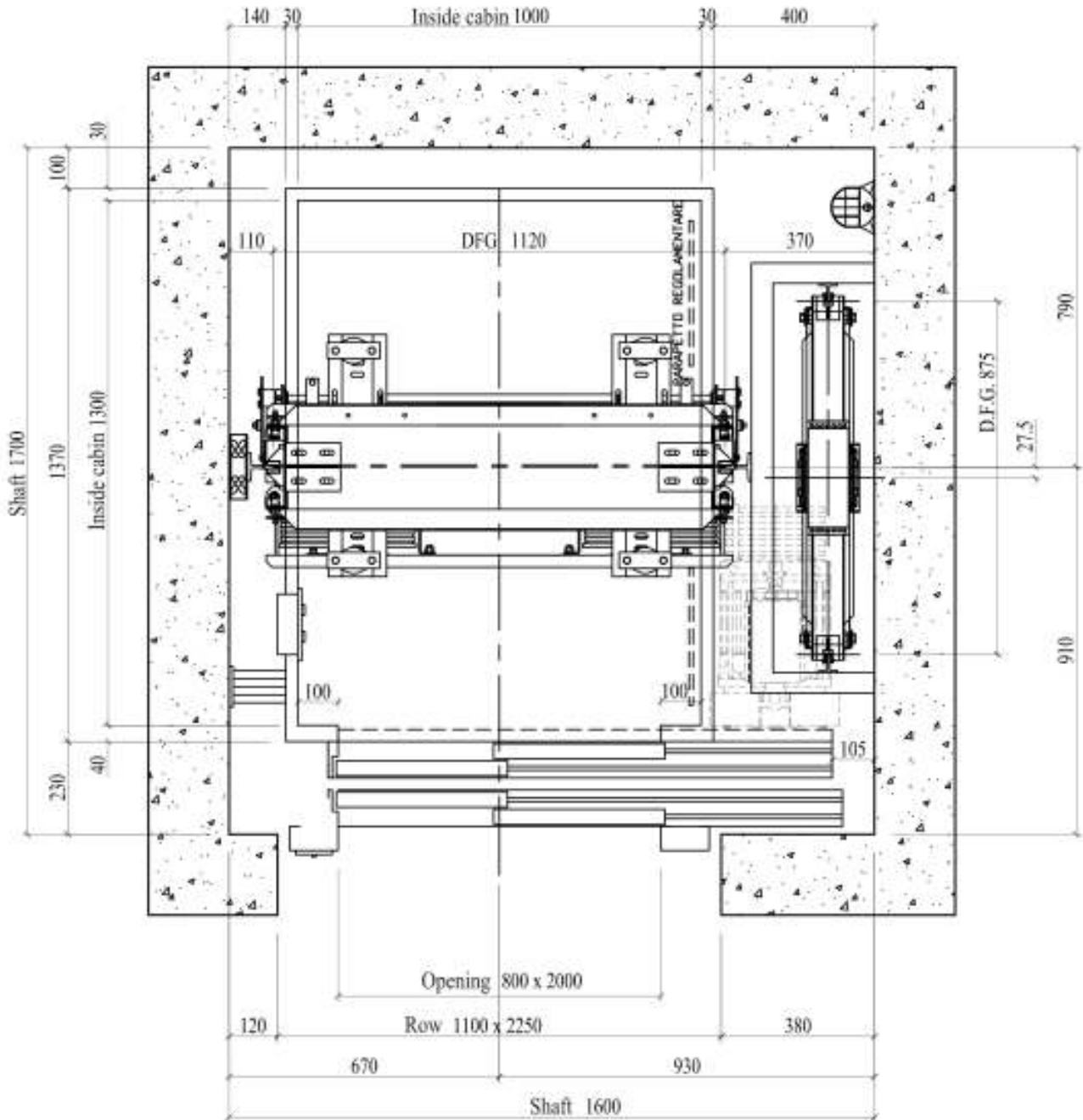
- Elevator machine room-less. With particular adaptation a 3000 mm headroom is possible.
- Machine frame gearless of a simple shape and easy assembling. All the loads are on the guides to avoid laying works. The gearless machine is very compact and of a very modest weight (around 125 Kg).
- Energetic spare: a comparison with other solutions (elevator for 6 people persons):

Machine	Watt consumption	Ampere consumption
House equipment of common use: Washing machine /Dishwasher / Air conditioner	2000 – 3000 W	9 – 14 A
Traditional traction machine	3700 – 4800 W	10 – 13 A
Gearless on the market	3300 W	8.3 A
Gearless SYMBIO	3000 W	7 A

- Environment: gearless machines don't need any oil. Autolubrificant guide runner is available to eliminate oil from the guides. No oil ecologic lift, the product must be recycled properly when exhausted.
- Environment: gearless machines don't produce any noise. Reduction of acoustic pollution in the building.
- Reliability: all the components request the minimum maintenance. Gearless machine, VVVF doors operator without mechanical arm, etc.
- Comfort: suspension 2:1 With traditional type rope car frame.
- Possibility of mono-phase supply (see paragraph 8 of this document).



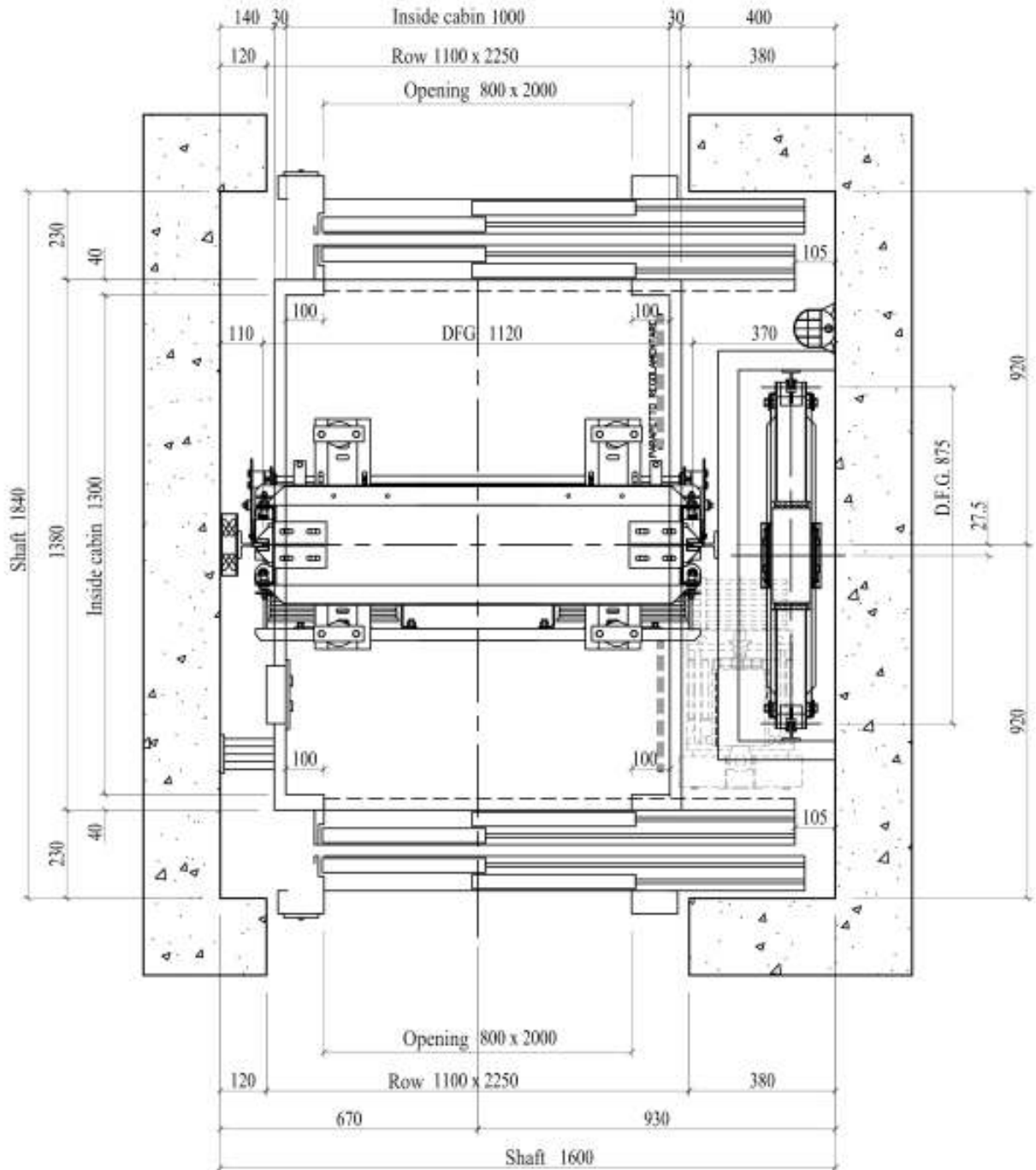
4. EXAMPLES OF PLANS



Q 480 Kg 1 Entrance



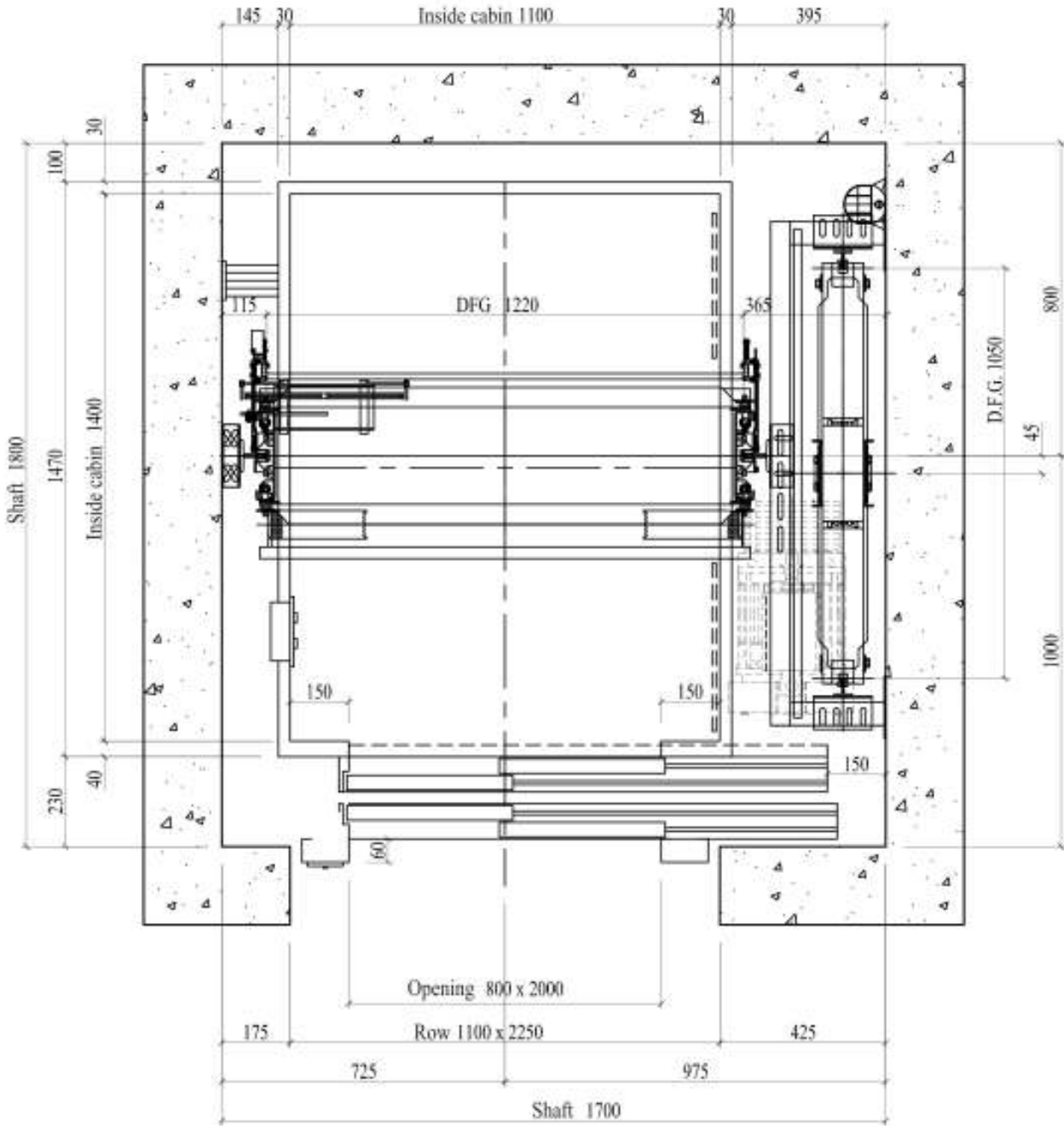
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Q 480 Kg 2 Entrances



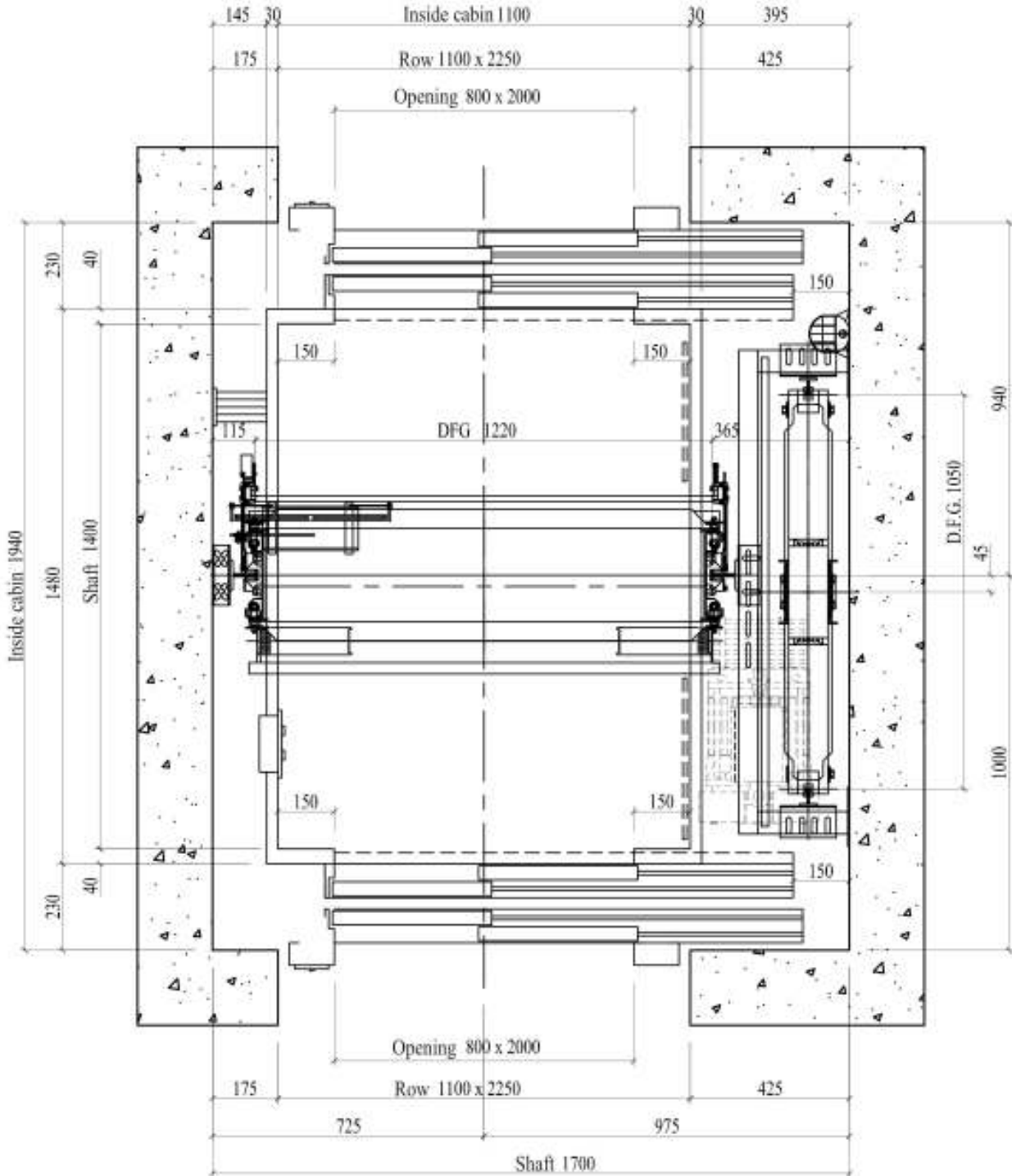
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Q 630 Kg 1 Entrance



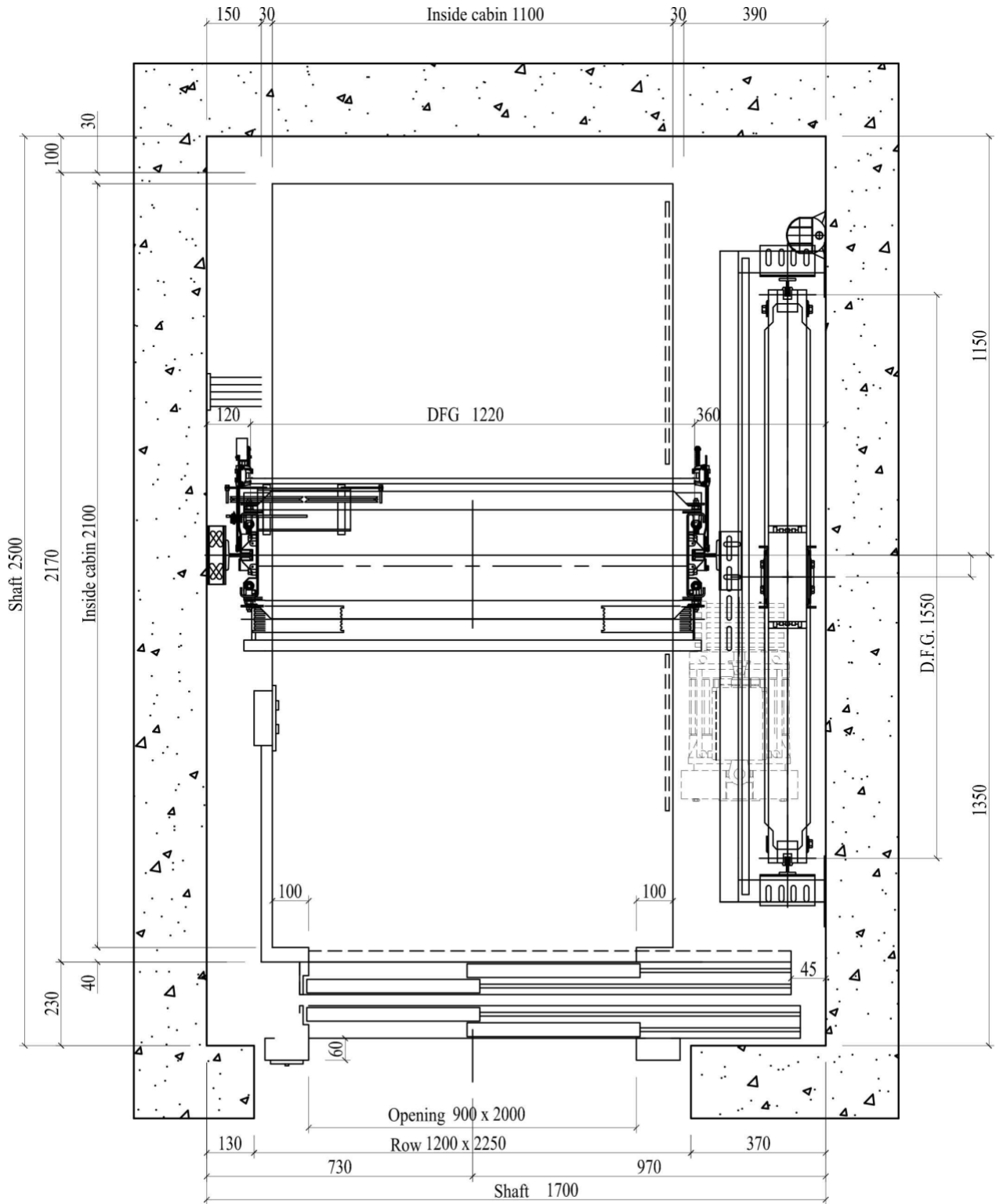
**ELECTRIC LIFT
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Q 630 Kg 2 Entrances



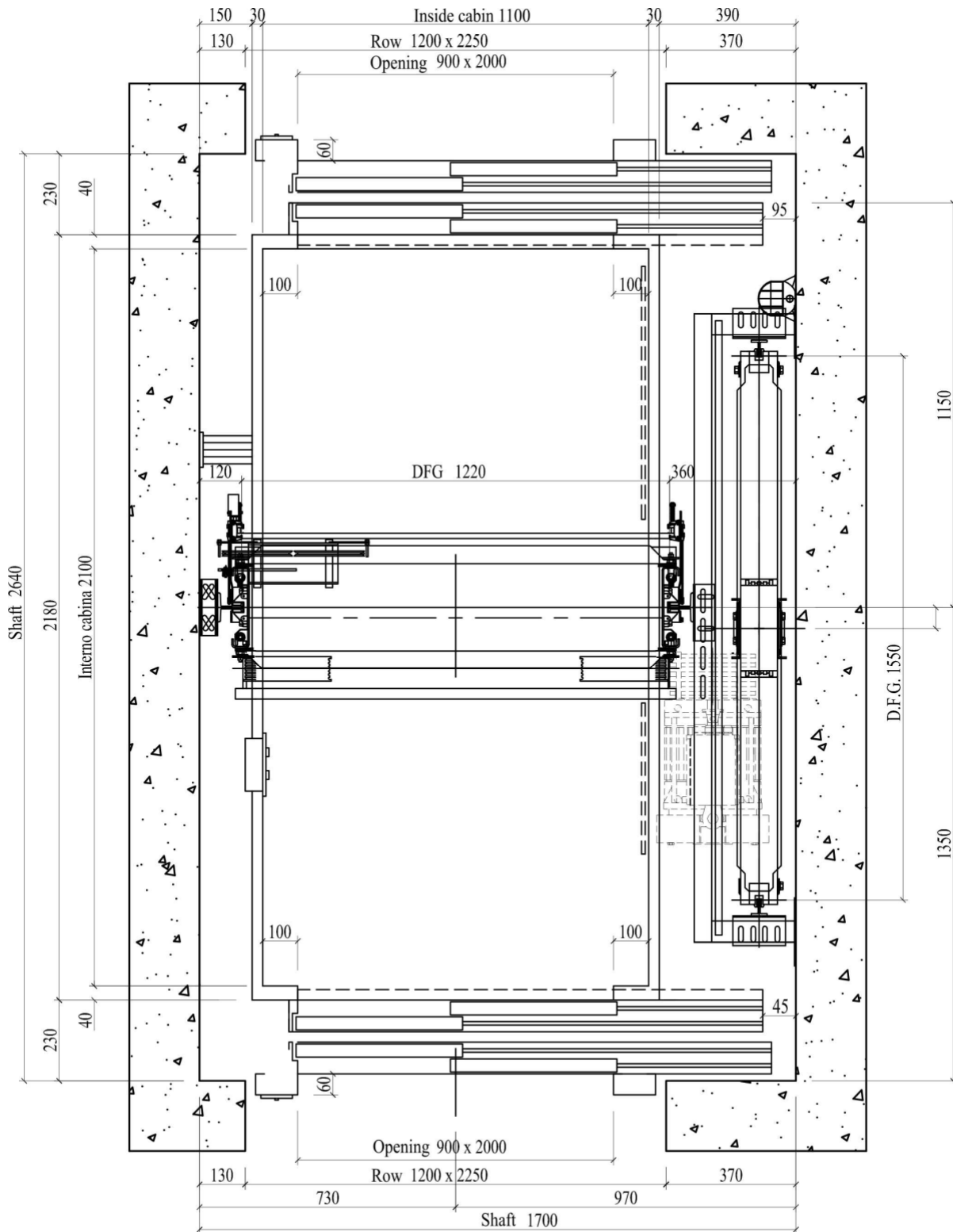
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Q 1000 Kg 1 Entrance



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Q 1000 Kg 2 Entrances

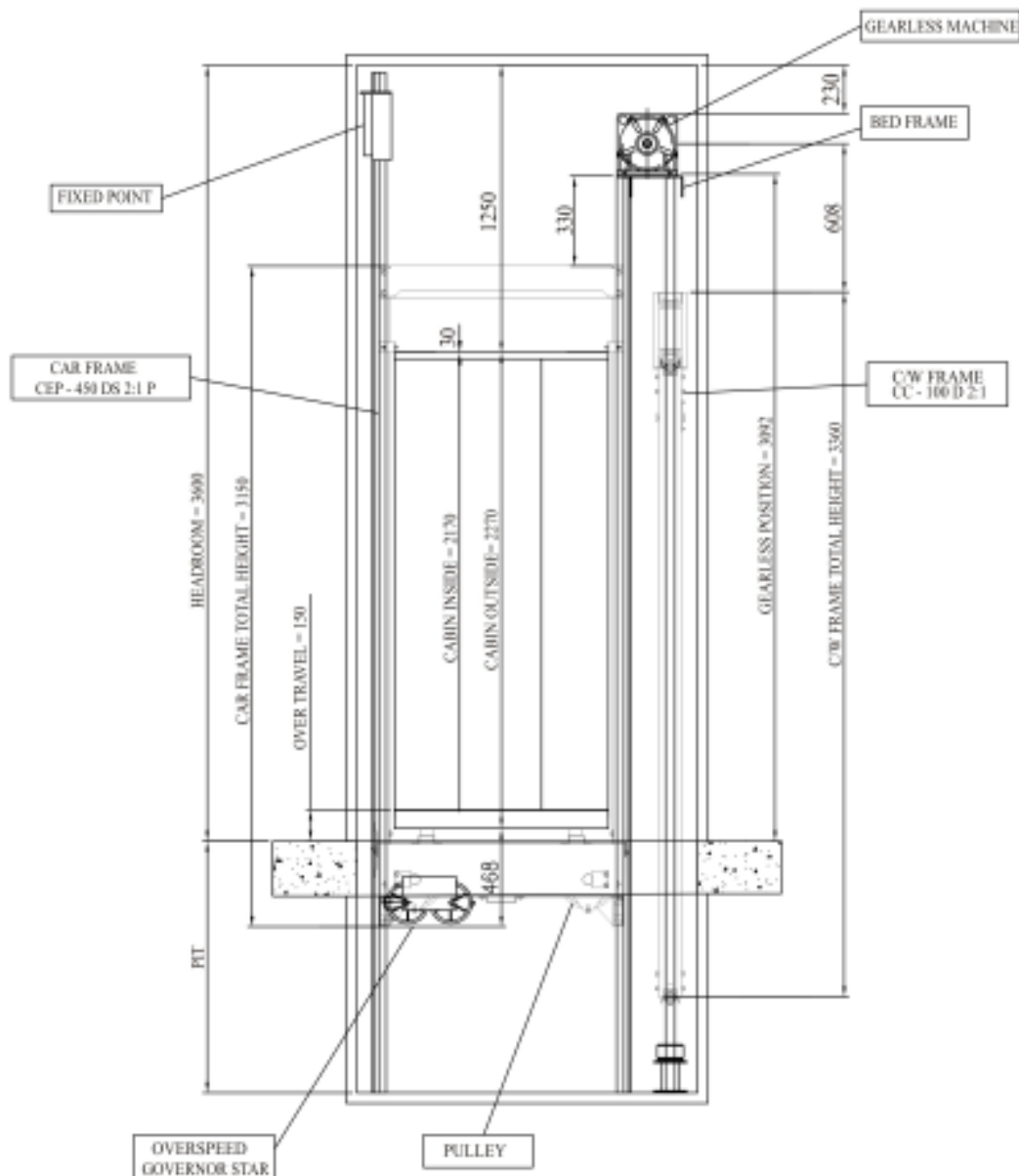


5. HEADROOMS AND PITS FOR 1,00 m/s SPEED

5.1 HEADROOM

Standard solutions for the different height headroom for lifts till 480 Kg/6 people.

**Standard Headroom 480 Kg
(cabin with height Standard)**



For the headrooms bigger than 3700 mm the space between the machine and shaft ceiling must be increased.



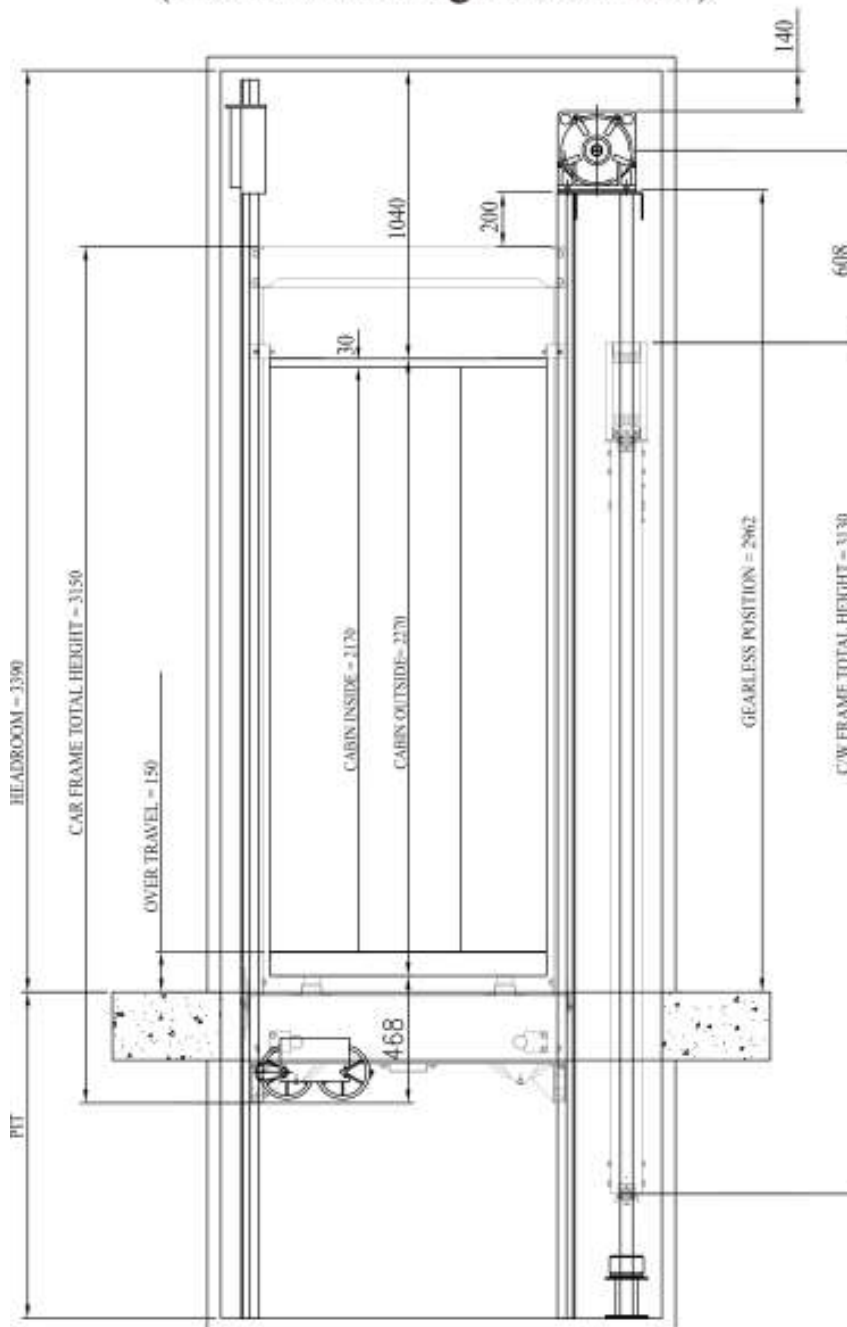
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For the headroom less than 3600 mm and bigger than 3470 mm the distance between the machine and car frame must be diminished in a proportional way; the counterweight weight must be also diminished according to the pit.

For the headroom between 3470 mm and 3390 mm, one faces a limited case as it has been illustrated (the machine will be always closer to the cabin ceiling).

Min. Headroom 480 Kg (cabin with height Standard)

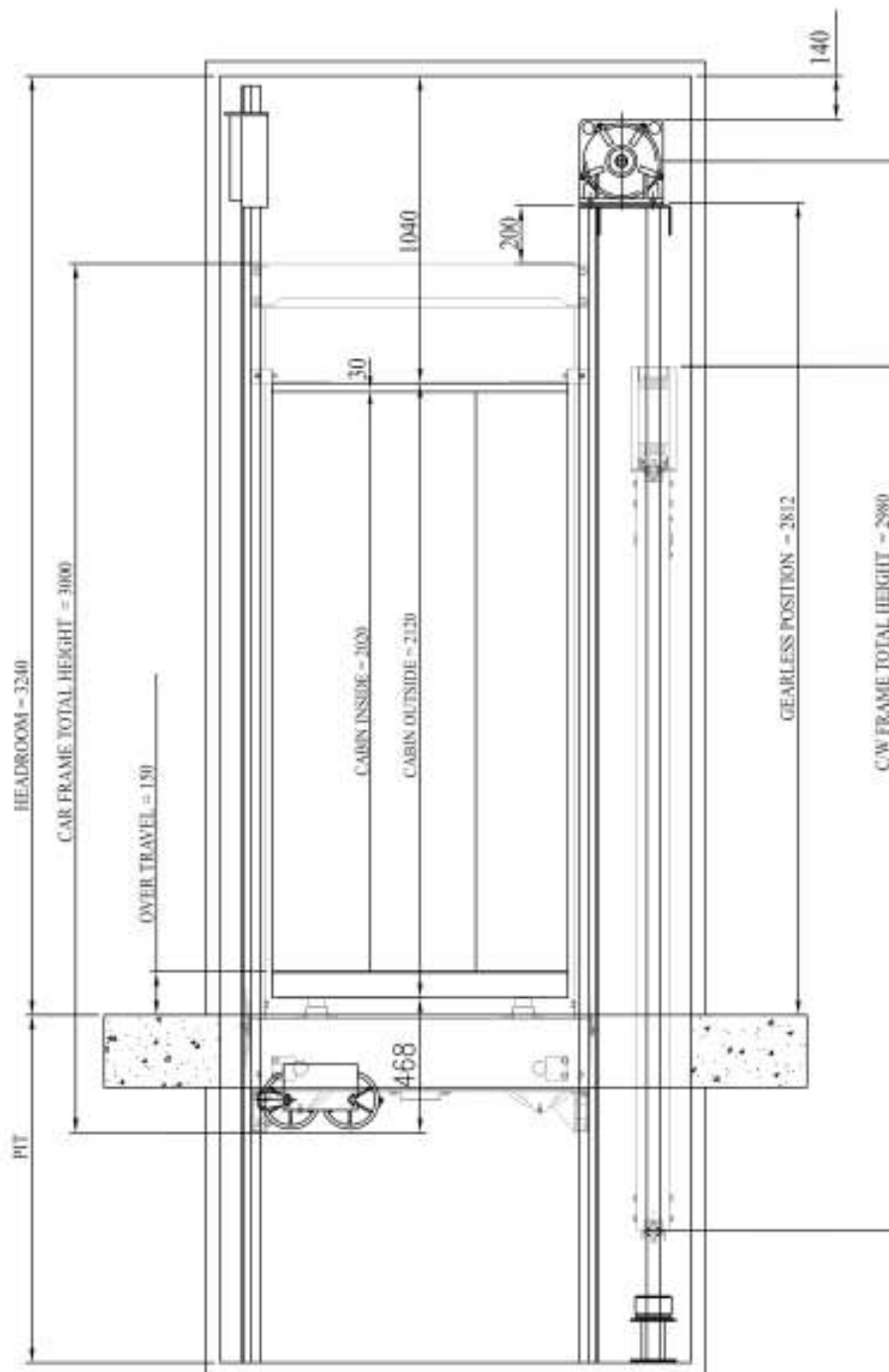




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TECHNICAL INSTRUCTIONS**

For headroom between 3390 mm e 3240 mm the cabin and the car frame support height will be reduced to avoid any type of variations. The cabins must have halogen lamps illumination that will be fixed directly on the roof as in the illustrated case:

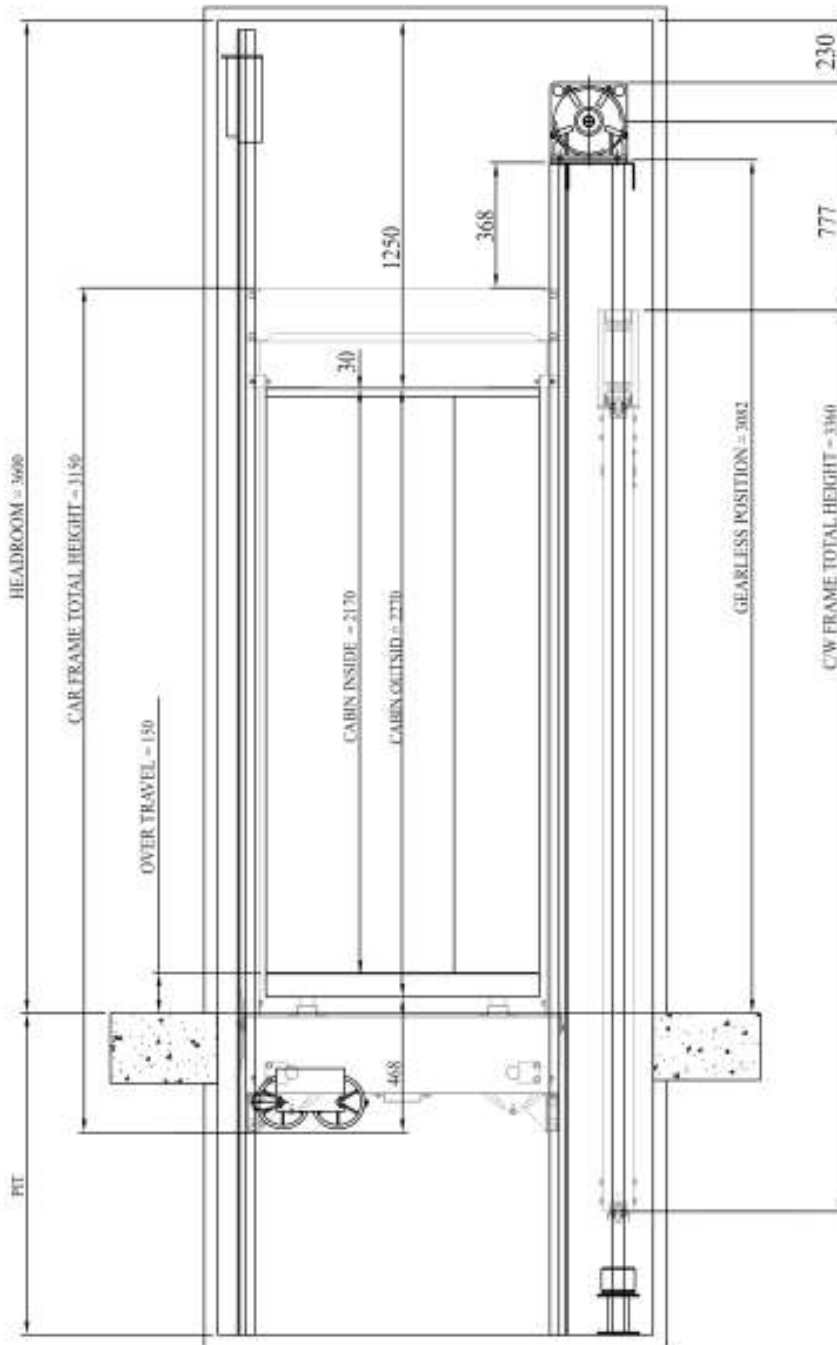
**Min. Headroom 480 Kg
(cabin with min. height; No Standard)**





Standard solutions for the different height headroom for lifts till 630 Kg / 8 people.

Standard Headroom 630 Kg (cabin with height Standard)



For the headroom over 3700 mm the distance between the shaft ceiling and the machine must be increased.



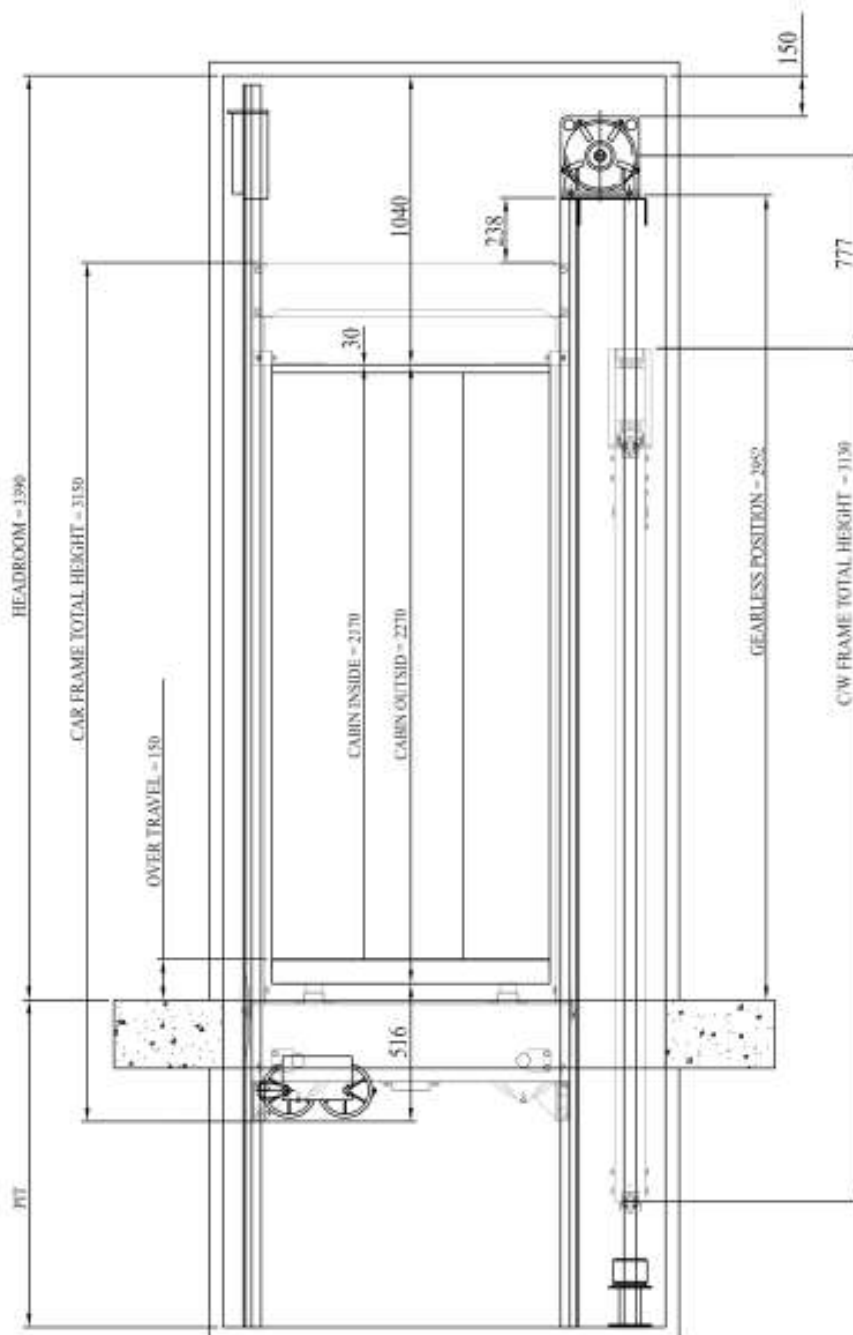
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For the headroom minor to 3600 mm and bigger than 3470 mm the distance between the machine and the car frame will be reduced in a proportional way; the counterweight height will be also reduced according to the pit.

For the headroom between 3470 mm and 3390 mm one faces the illustrated case (the machine will be always closer to the cabin ceiling).

Min. Headroom 630 Kg (cabin with height Standard)



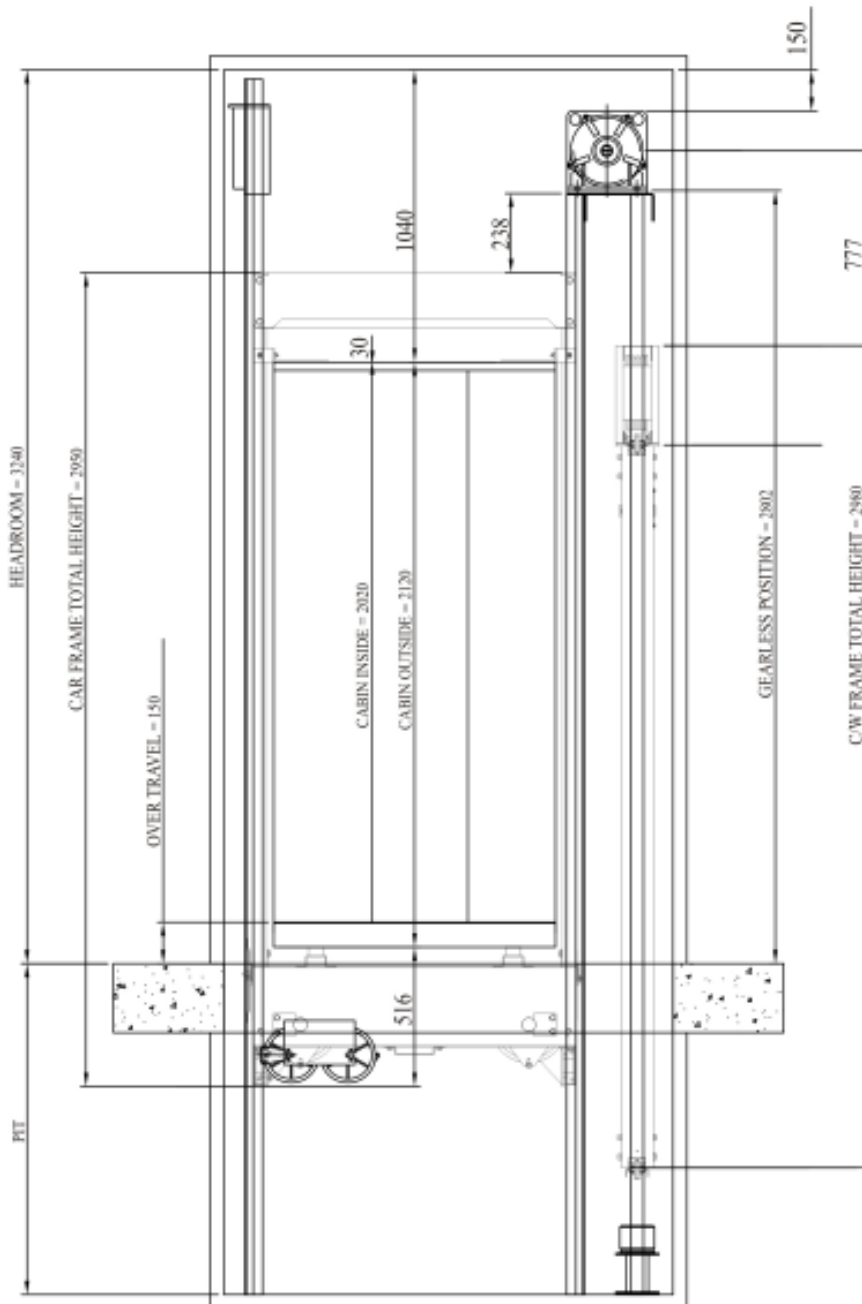


**ELECTRIC LIFT
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For headroom between 3390 mm e 3240 mm the cabin and the car frame support height will be reduced to avoid any type of variations. The cabins must have halogen lamps illumination that will be fixed directly on the roof as in the illustrated case:

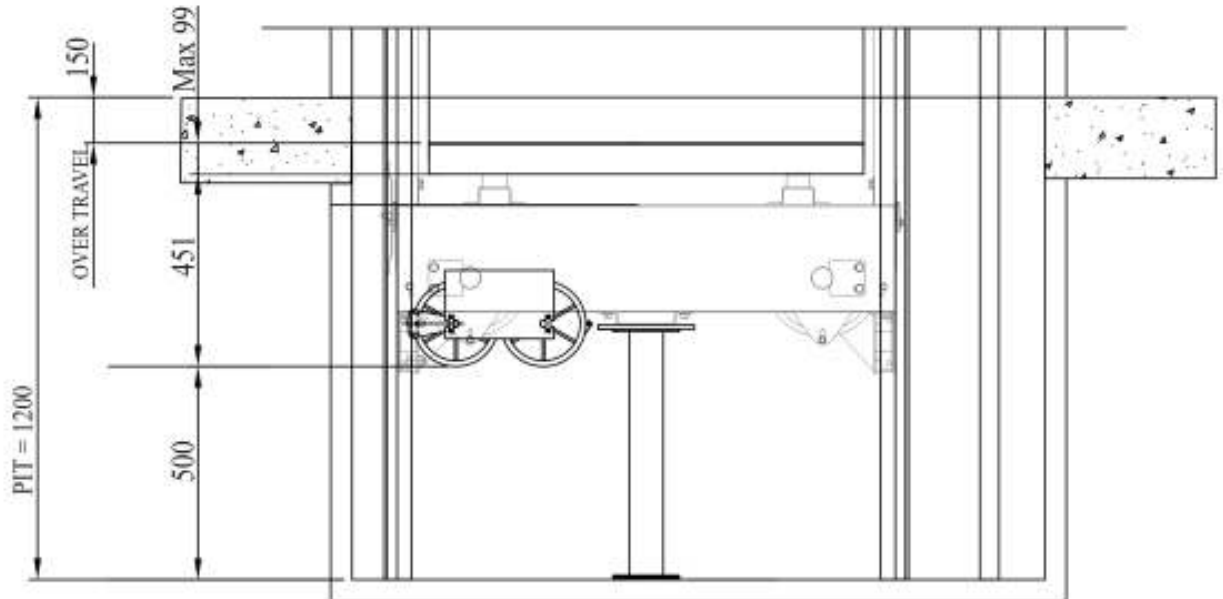
**Min. Headroom 630 Kg
(cabin with min. height; No Standard)**



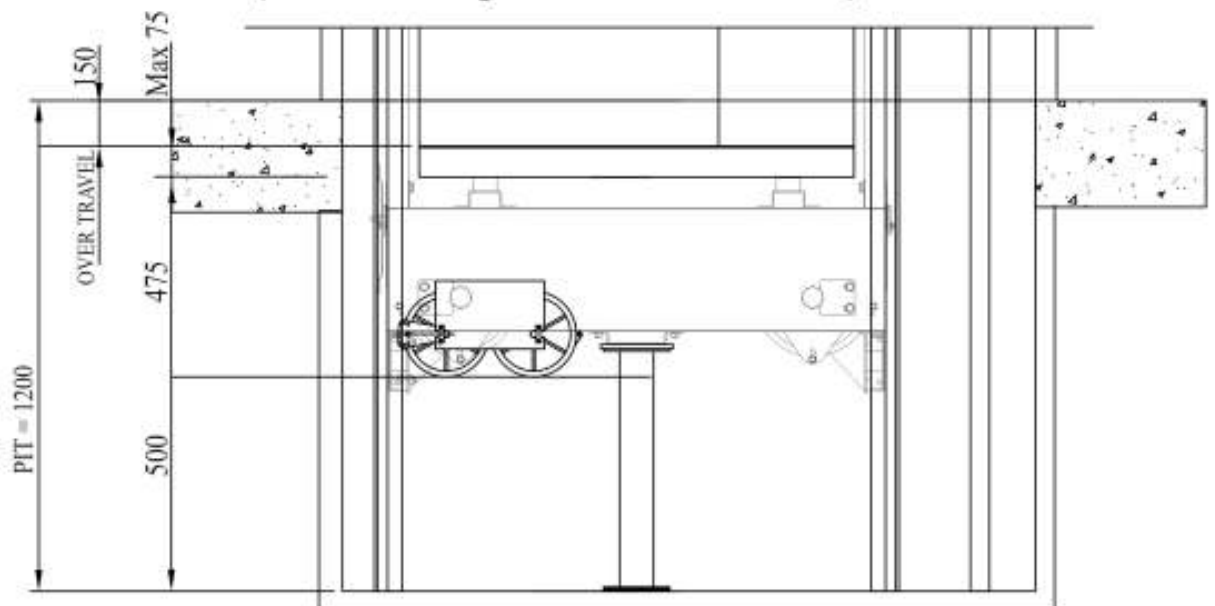


5.2 PIT

Min. Pit a 480 Kg
(cabin with platform h. max 99)



Min. Pit 630 Kg
(cabin with platform h. max 75)





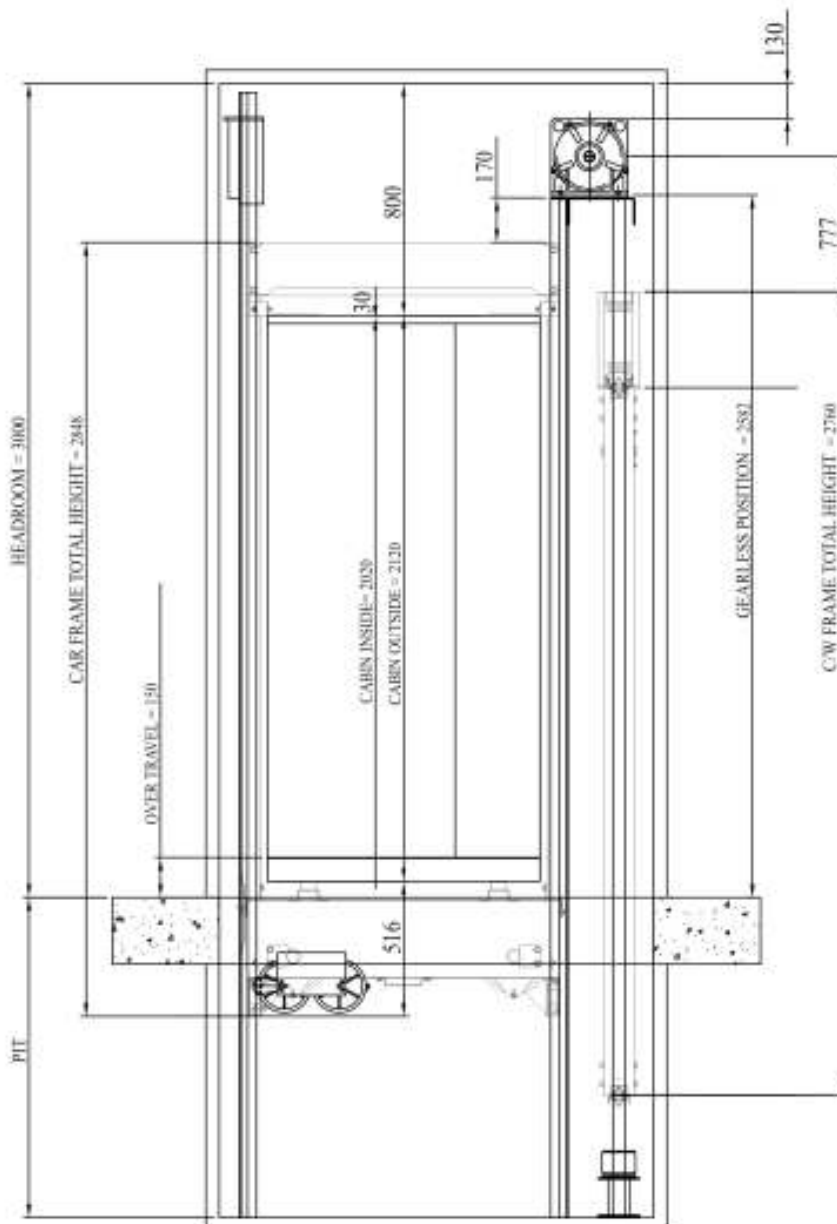
6. SPECIAL SOLUTIONS: REDUCED HEADROOM & PIT

6.1 HEADROOM

The minimum headroom possible is of 3000 mm.

ATTENTION: any single case must be studied in a specific way.

Min. Headroom according to EN81.21 630 Kg
(cabin with min. height - no Standard)

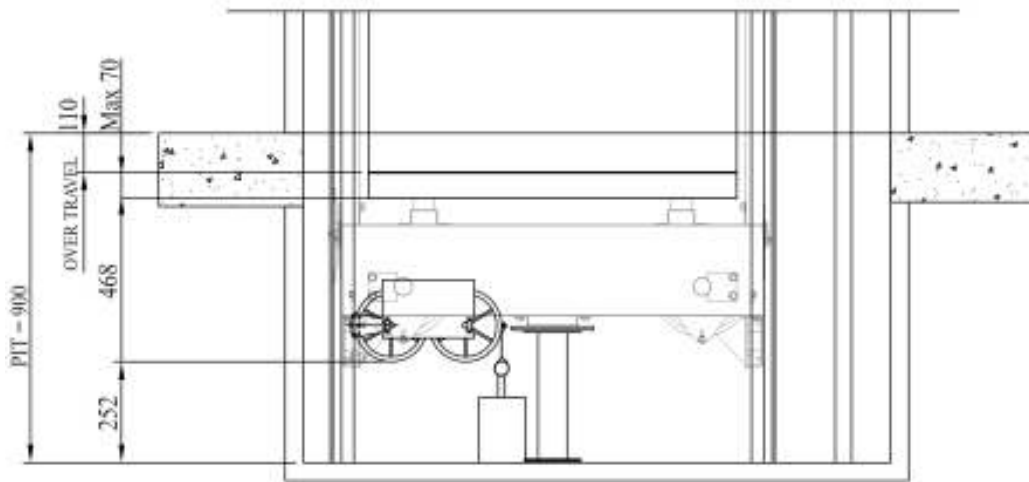




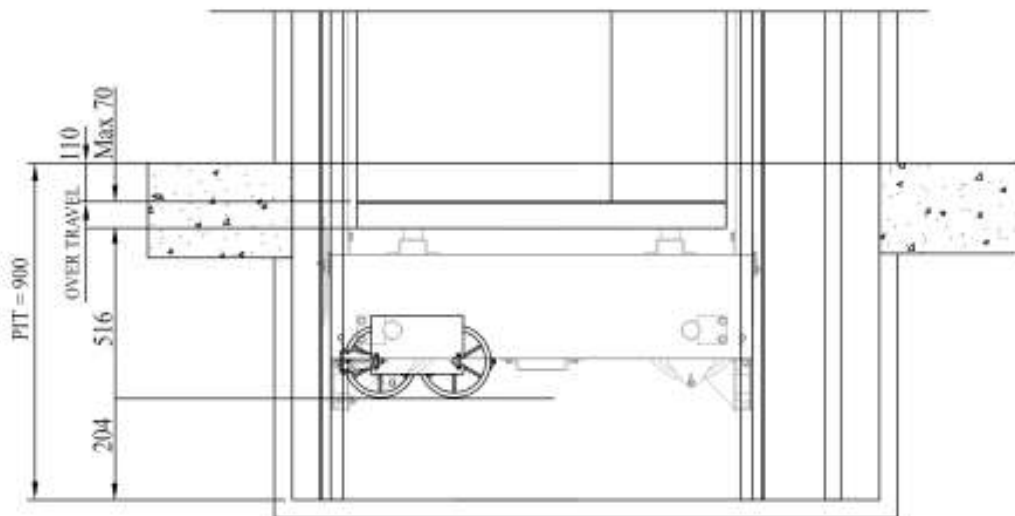
6.2 PIT

These are the minimum possible pits according to the load:

Min. Pit according to EN 81.21 480 Kg
(cabin with platform h. max 70)



Min. Pit according to EN 81.21 630 Kg
(cabin with platform h. max 70)





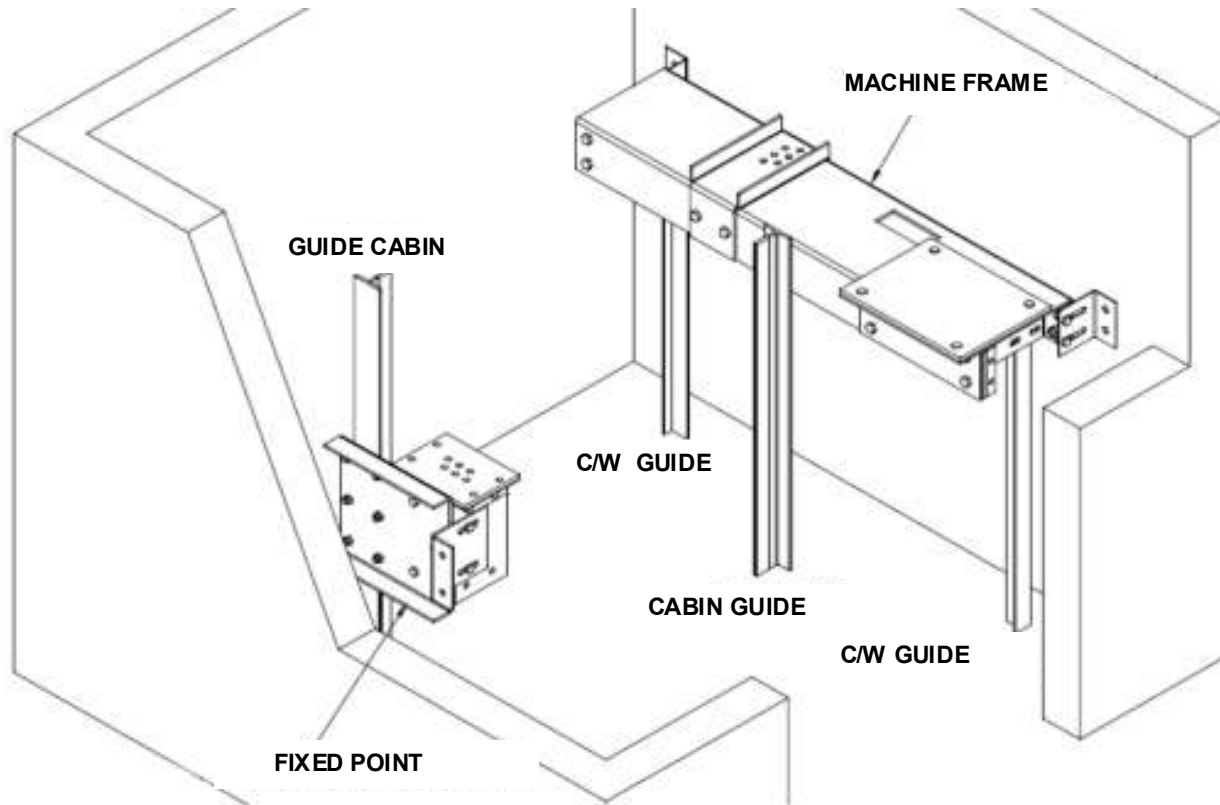
**ELECTRIC LIFT
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7. USED COMPONENTS

Lift	Standard shaft	Cabin (AxF)	Car frame type	Counter weight type	Pulleys and ropes	Cabin guide	Guide Counter weight
Q 480 Kg 1 entrance	1600 x 1700	1000 x 1300	CEP-450-DS 2:1 P	CC-1000 2:1	Ø 240 mm 5 Ø 6,5 mm	T 70/65/9	T 45/45/5
Q 480 Kg Double entrance 180°	1600 x 1840						
Q 630 Kg 1 entrance	1700 x 1800	1100 x 1400	CEP-750-DS 2:1 P	CC-1000 2:1	Ø 240 mm 6 Ø 6,5 mm	T 82/68/9	T 45/45/5
Q 630 Kg Double entrance 180°	1700 x 1940						
Q 900 Kg 1 entrance	2000 x 1900	1400 x 1500	CEP-750-DS 2:1 P	CC-1000 2:1	Ø 240 mm 9 Ø 6,5 mm	T 82/68/9	T 45/45/5
Q 1000 Kg Service lift 1 entrance	1700 x 2500	1100 x 2100	CEP-750-DS 2:1 P	CC-1000 2:1	Ø 240 mm 9 Ø 6,5 mm	T 82/68/9 (C/1500mm)	T 45/45/5 (C/1500mm)
Q 1000 Kg Service lift Double entrance 180°	1700 x 2640						



7.1 GUIDE & CAR FRAME POSITION



GUIDE POSITION

The guide position on a plan is a conventional one for the electric lift with a lateral counterweight. The following picture demonstrates the guide position from the lateral lift perspective.

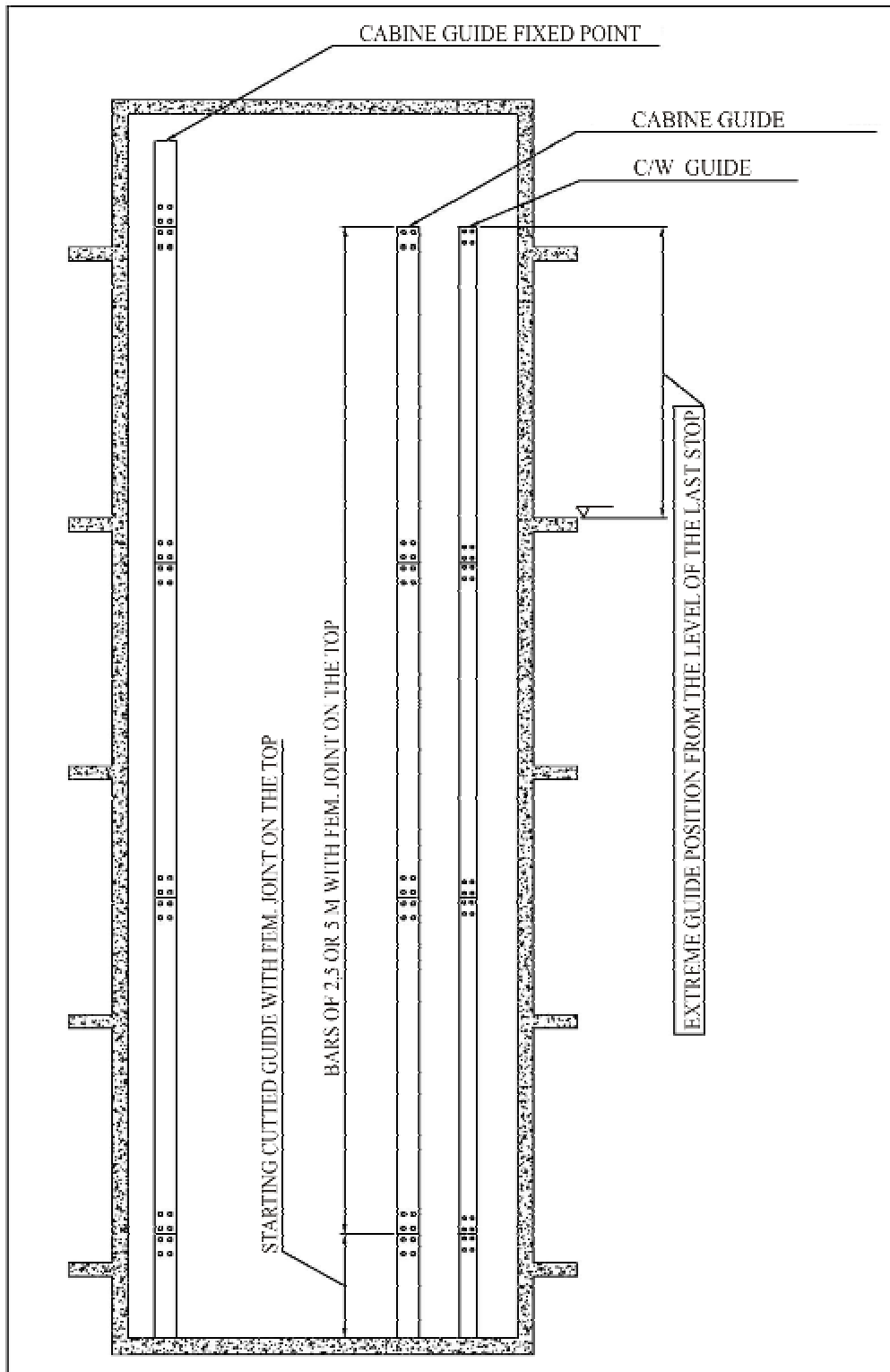
MAX DISTANCE BETWEEN THE ANCHORAGES OF THE GUIDES

2800 mm**

** **Note:** The measure could differ according to the lift. See technical instructions.



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ATTENTION: For the correct positioning of the gearless machine, the designed quote must be strictly respected. The quote changes from lift to lift.
For the cutted guides, the female joint must be positioned upwards.



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7.2 GEARLESS SYMBIO MACHINE: EXAMPLE WITH MACHINE XAP2M



GENERAL CHARACTERISTICS FOR 1 m/s 2:1

Pulley	Ø 240 mm
Max static load	2200 Kg
Poles quantity	16
Nominal couple	270 N·m
Max couple	415 N·m
Weight	125 Kg
Dimensions (mm)	288 x 288 x 483
Launching / hour	180
Machine noise level	<55 dB (A)
Encoder	ECN 413 (absolute)
Nominal tension	360 V
Revolutions	159 rpm
Operational frequency	21 Hz

BRAKE CHARACTERISTICS

Quantity of breaks	2
Max couple of each break	325 N·m
Break supply tension	90 Vdc
Maintenance tension	45 Vdc
Break power	204 W
Maintenance power	51 W

SOME SPECIFIC CHARACTERISTICS ACCORDING TO THE CAPACITY

Nominal capacity (Q)	450 Kg	630 Kg
Nominal power (*)	3.3 ÷ 4.0 kW	4.6 ÷ 5.4 kW
Nominal consumption (*)	6 ÷ 8 A	9 ÷ 10 A

(*)nominal corrected dates concerning power and consumption will be indicated in each single case.



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7.2.1 ENCODER CONNECTION

The encoder will be supplied together with a connector “SUB D 15 pins”, prepared for the frequency inverter SP (Control Techniques) [see connection schemes Endat ECN413 in case of the other inverter usage]. The inverter is always supplied with standard round connection.

ARTICLE : CODEUR_ECN413 / NUMERO DE PLAN : 2_103_176

BROCHE Pin N°	SIGNAL	Couleur Fil	Wire color
1	A	Vert/Noir	Green/Black
2	A/	Jaune/Noir	Yellow/Black
3	B	Bleu/Noir	Blue/Black
4	B/	Rouge/Noir	Red/Black
5	Data	Gris	Gray
6	Data/	Rose	Pink
7			
8			
9			
10			
11	Clock	Violet	Purple
12	Clock/	Jaune	Yellow
13	+5 Vcc	Brun/Vert	Brown/Green
14	0 V	Blanc/Vert	White/Green
15			

INDICE	DATE	MATIERE DE LA MODIFICATION	N° C.T.	NOM	VERIF B.E.	VERIF METH
A		X	03-07-19	Jean	-	-

Tolérances générales d'usinage ISO 2768 mt

Etat de version 4.3 premier neuf indications

Ref Ecablis Machine **GEARLESS X42**

Obs

Matiere

Modèle de Base

Version

Composant

Copie

Masse

Verification Méthodes

Code Article

A3

2_103_176

1/1

SPECIFICATIONS CODEUR

Tension d'alimentation / Voltage supply : +5 VDC

Température de travail / Running temperature : -40 °C+100 °C

Code de sortie / Output code : Binaire / Binary

Signaux de sortie / Output signals : Sinusoïdaux / Sinusoidal 1 VDC

Indice de protection / Index of protection : IP64



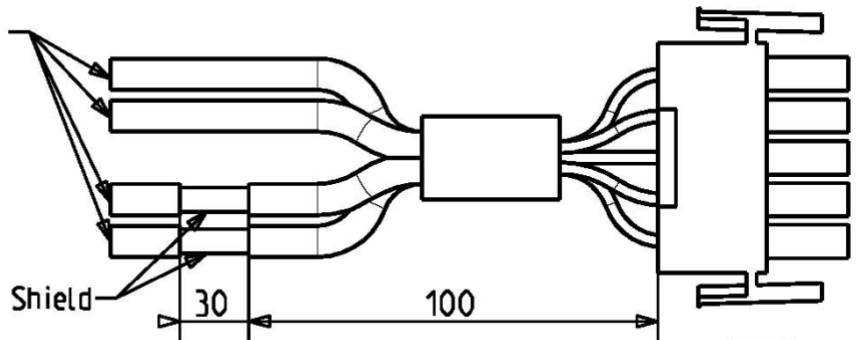
7.2.2 GEARLESS ELECTRIC CONNECTIONS

Gearless machine supply cables, break and encoder standard length is 2,8 metres.

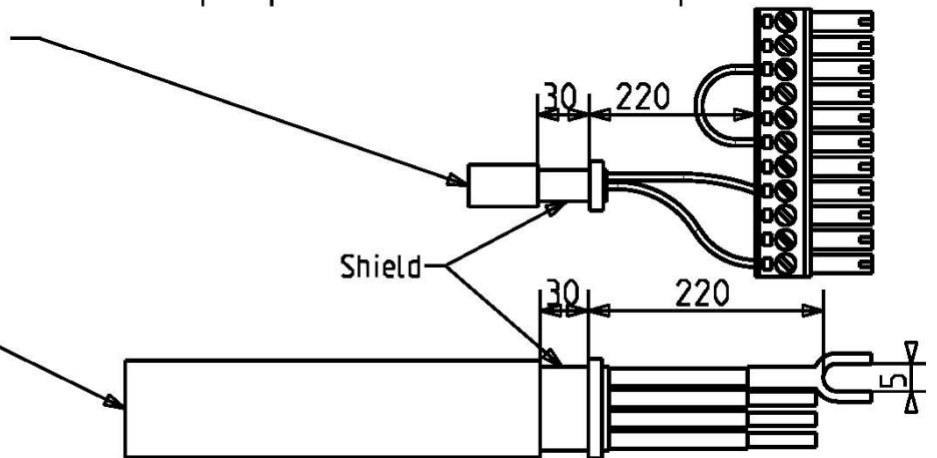
The supply cable will be supplied with a connector for a rapid connection with a frequencies inverter SP (Control Techniques). If another connector is used the cable must be cut and each phase must be connected separately.

For the brake cables, temperature sensor and micro contacts connection the scheme is attached. Micro contacts must be connected both to the frequencies inverter SP (Control Techniques) and to the operative box. These cables are supplied with connectors for a rapid connection to the frequencies inverter SP (Control Techniques). If another connector is used the cable must be cut and each phase must be connected separately.

Brakes cables 2m length
connector MAT-N-LOCK male
ref 350 809-1 "AMP"
Shielded cables 2x (2x0.5mm²)
pin 1 : supply -BM
pin 2 : mid-point
pin 3 : supply +BM
Standard cables 2x (2x0.5mm²)
pin 4 : micro-switch CM1
pin 5 : micro-switch CM2



Shielded cable for sensor
2 x 0.75mm² 2m length
connector 11 pins
Sp TOP1-11 unipolaire
pin 11 : motor probe
pin 8 : motor probe



Shielded cable for motor
4x2.5mm² 2m length



7.3 ELECTRIC INSTALLATION

The standard configuration for SYMBIO lift consists of:

Power operator placed inside the aperture on the head part.

This case contains:

- Frequency inverter / VVVF.
- Gearless engine, breaks, temperature sensor and encoder connections.
- Emergency supply.
- All the other components of the power part must not be used during the maintenance, emergency operation to carry out a functional test.
-

Control panel placed on the last floor

This case contains:

- The basic scheme with microprocessor and all the basic functional controls: out of order, maintenance, launching, etc.
- Frequency inverter programming console.
- Electric emergency manoeuvre.
- Devices to carry out safety gears interference.
- Differential switch.

Prewired electric installation.

Flexible cables, fixed lines, connections between two cases, shaft information, etc.

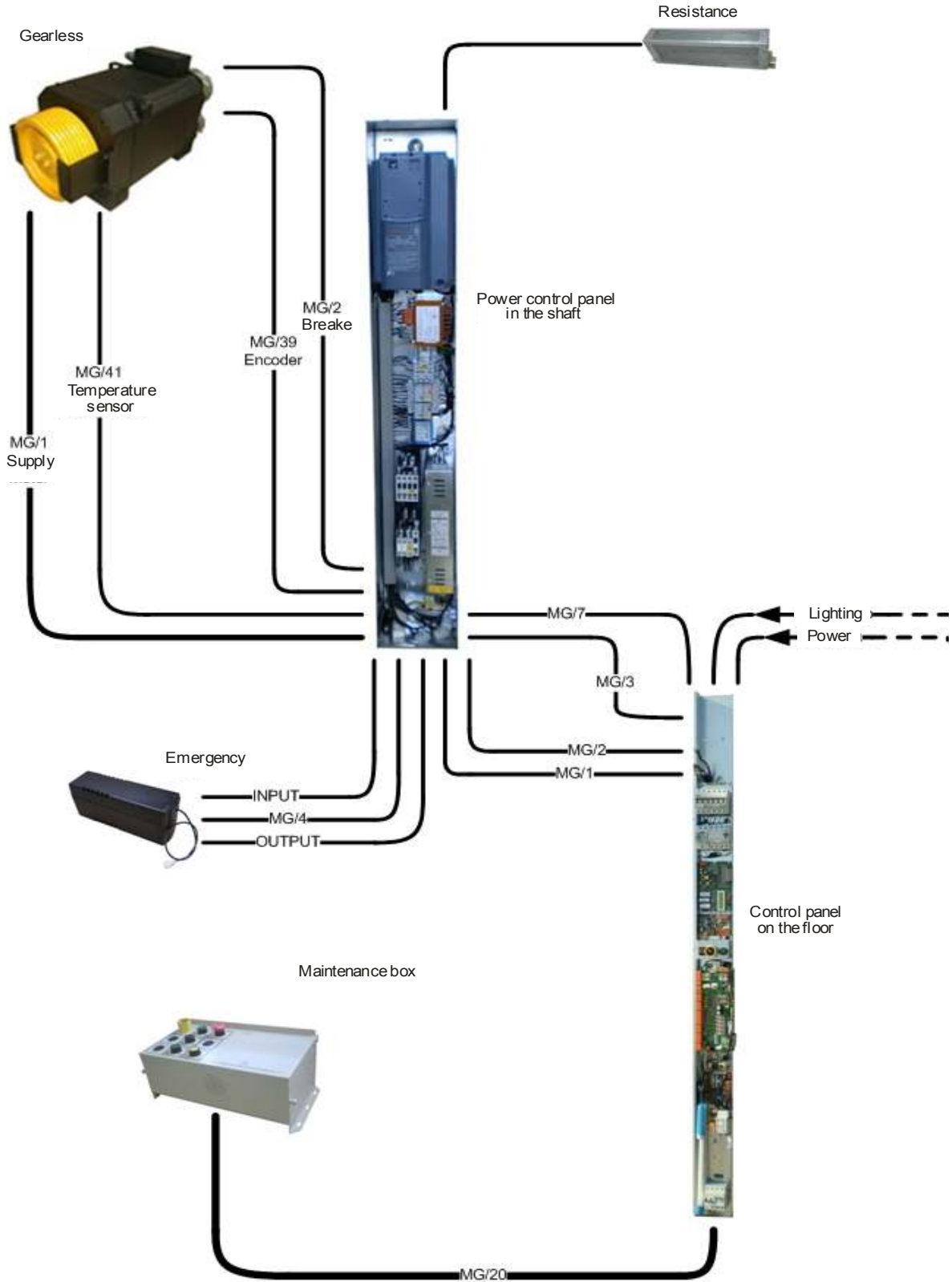
Topographic installation schemes are on the following pages.

N.B. : Other manoeuvre panels could be used for the SYMBIO lift.

Refer to the technical documentation for each single lift.



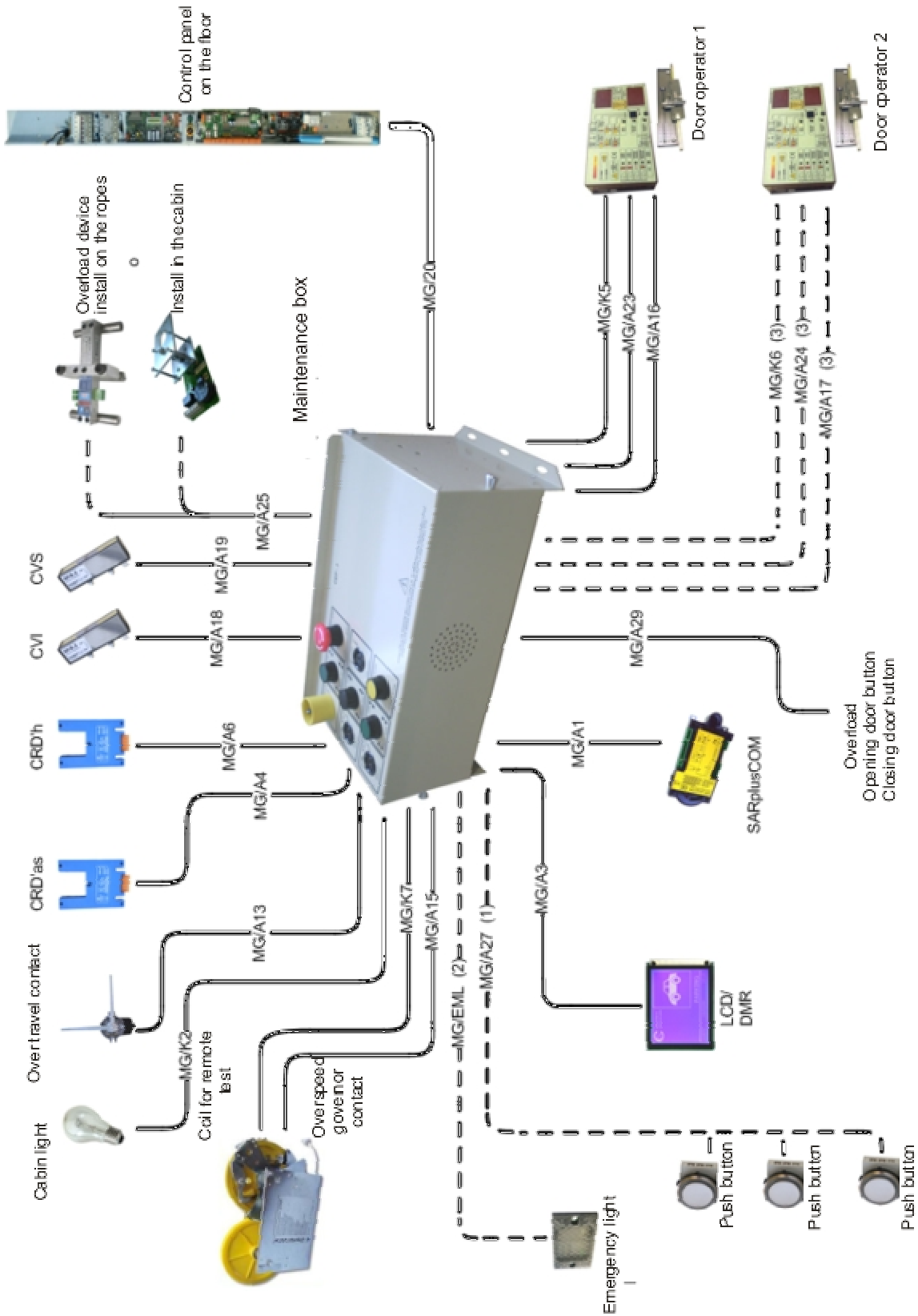
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**SYMBIO ELECTRICAL SYSTEM
GENERAL LAYOUT**



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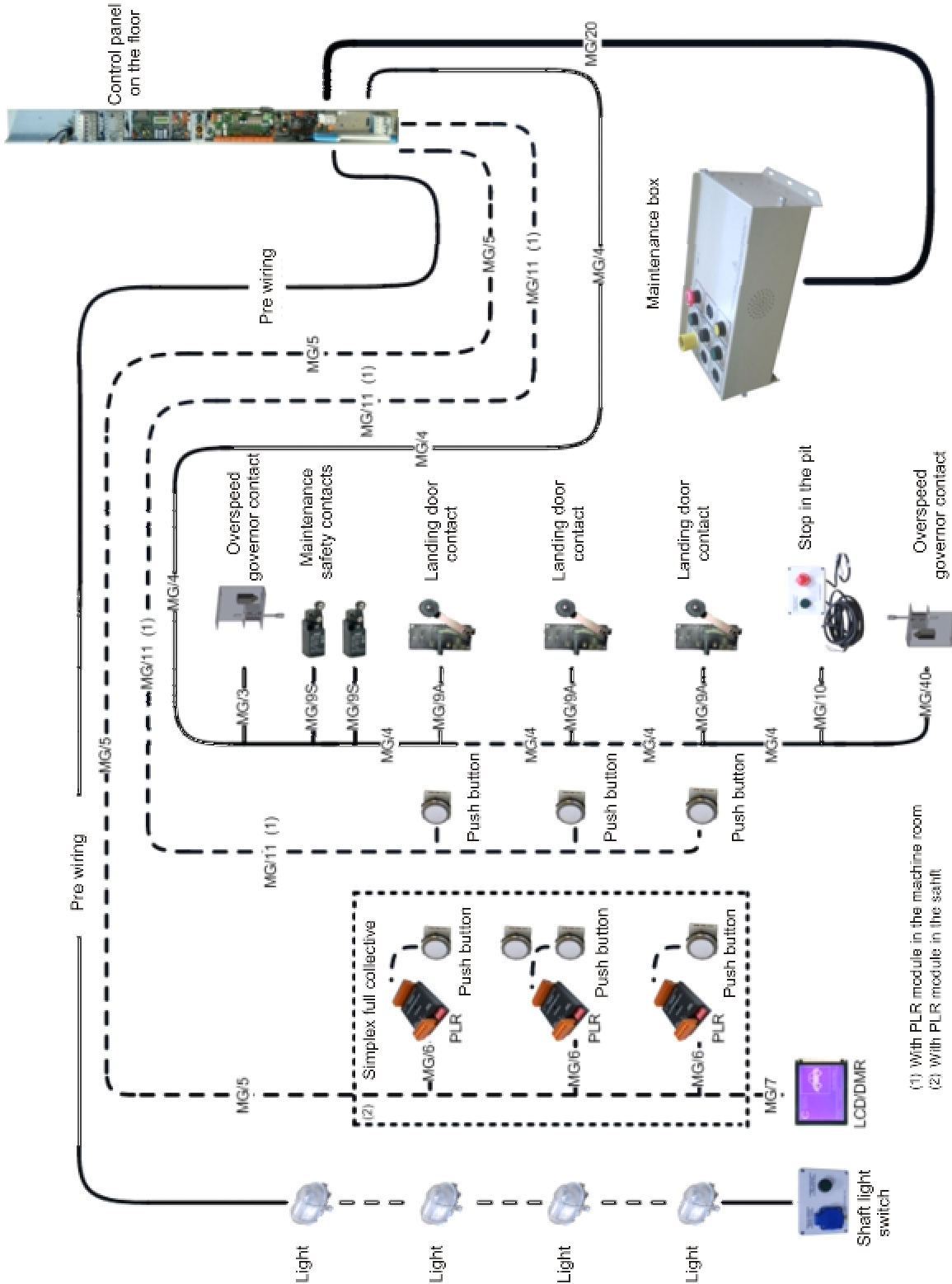


- (1) With PLR module
- (2) With emergency light
- (3) With 2 door operators

CABIN CONNECTIONS



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(1) With PLR module in the machine room
(2) With PLR module in the shaft

SHAFT CONNECTIONS



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8. SYMBIO – SINGLE PHASE POWER SUPPLY 220 V

The lift SYMBIO can be supplied by single phase tension 220V.

The technical solution provides for the contemporary usage of gearless XAP2-SYMBIO and frequency inverter SP0205 Control Techniques (the usage of other inverters types is impossible) VVVF is supplied from 220 V single phase net.

VVVF transforms the tension in 210 V three-phase to supplied a gearless.

Together gearless/VVVF can work with a maximum nominal tension of 7.5 A and acceleration/launching maximum tension 11.2 A. The maximum lift speed however corresponds with run and capacity.

The indicative titles for one 20-22 metres run and maximum speed that could be obtained in single phase function:

- Lift 300 Kg / 4 people → 0.7 m/s
- Lift 450 Kg / 6 people → 0.5 m/s
- Lift 600 Kg / 8 people → 0.37 m/s

9. NORMS

This lift has been produced in accordance with the following norms:

- EN 81-1: safety Rules for the construction and installation of the lifts. Part 1: Electrical lifts.
- Lift directive 95/16/CE.
- EN81-28: Emergency calls for lifts and elevators.

For specific cases some other norms could be applied:

- EN81-70: Access to the lifts.
- prEN81-21: New lifts in existing buildings.
- EN81-71: Antivandal lift.
- EN81-72: Fire-prevention lift.
- EN81-73: Lift exploitation in case of fire.

N.B. :

Technical characteristics are only approximate and could be changed without any notification.