



عمران مدرن  
بازار نوین ارتباطات ساختمانی

# نصب آسانسور و تهیه کلیه قطعات

سراسر کشور



با قیمت استثنایی و اکیپ متخصص

برای مشاوره رایگان تماس بگیرید

02162999675

Zalift - 20161219 - calculation 77392021

ZIEHL-ABEGG SE  
Künzelsau, Germany  
773 Date: 12/11/2017

Elevator calculation acc. EN81-20/50

21

**Elevator data**

Nominal load	Q	kg	1600	
Car weight	F	kg	1800	(1311 - 2788kg)
Counterweight	G	kg	2600	(50%)
Travelling speed	v	(V_3=) m/s	1.00	
Travel distance	H	m	30.0	
Suspension / (roping)	is		2 : 1	
Machine at the top, above				
Shaft efficiency	etaS	%	82	
Number of pulleys	(ball bearing)		3	
Type of rope	WOLF PAWO F7 s			
Number of ropes	z		10	
Rope diameter	ds	mm	8	
Rope weight	s	kg	84	(0.28 kg/m)
Compensation rope weight	su	kg	0	
Car cable weight	HK	kg	15	
Rope span weight	R	kg	0	
Min. rope breaking load	B	N	44600	
Traction sheave diameter	Dtr	mm	320	
Sheave width		mm	150	(number of grooves 10)
Groove distance		mm	14.0	Minimum distance
Angle of wrap minimum	min.	deg	180	
V-groove angle		deg	40	

Sheave profile: V-groove with min. 50 HRC

**Traction, rope pressure, rope safety**

Traction empty, on top, accelerating (1.33)  
2.0283 <= 2.2857

Traction 150% nominal load, below, not moving  
1.6800 <= 2.2857

Rope pressure k < permissible rope pressure  
2.00 < 2.00 N/mm<sup>2</sup>

Conditions according to EN81-1 or -20:

Load 125% 1.5262 <= 2.5056 (1)

Emergency stop 1.6938 <= 2.1500 (4)

with deceleration [m/s<sup>2</sup>] 0.500

Blocked car 13.338 > 6.2782 (4)

Real safety factor > Minimum safety factor for ropes  
25.48 > 12

Rope safety factor according to EN81-1 or -20:  
NEQUIV = 12.0 NEQUIVT = 10.0 NEQUIVP = 02.0

Pulleys >= 320 mm, pulleys NPR = 0 NPS = 2

Rope safety nue = 25.5 > 20.0 (minSF)

Rope certification EN81

Traction conditions are fulfilled.

Rope safety conditions are fulfilled.

**ZAlift - 20161219 - Machine dimensioning 77392021**

**Mechanical drive data**

Machine manufactured by Ziehl-Abegg  
 Machine type SM 210.60 Gearless synchronous  
 Machine version ZAtop \*

Traction sheave	mm	320 /150/14.0/10x8/HK40
Load output torque	Nm	921 (max. 1000)
Real statical axle load	kg	3091 (max. 4500)

Rope pull admissible only in direction of motor foot!

**Brake data**

brake Mayr ROBA-twinstop 1000, 2x1200 Nm, EU-BD 1014/1  
 Dual circuit disk brake, DC supply necessary  
 (760 Nm, 0.86 m/s<sup>2</sup>, 1 m, 11558 J, 316 W)  
 2 x 1200 Nm 207 V brake, with hand release, microswitch

**Machine load data in the installation**

Typical motor operating power	kW	7.9
Typ. operating current 31.2 A, Start. Current	45.1 A at acceleration	0.60 m/s <sup>2</sup>
Start. Current	47.4 A at acceleration	0.7 m/s <sup>2</sup>
Average power losses	1.7 kW =	6104.06 kJ/h
Output speed	rpm	119
Load torque	Nm	921.0(eff. 628.8)
Inertia of installation	kgm <sup>2</sup>	40.54

240 Starts per hour , 40 % required duty cycle at elevator operation  
 Max. static load pulleys 25505 N, pulley speed 1.00 m/s

**Selected ZIEHL-ABEGG motor**

Motor type SM210.60-20 - gearless

	Nameplate data	(Operating data)
Rated voltage	V	360
Rated frequency	Hz	20 ( 19.9)
Rated torque	Nm	850 ( 921.0)
Rated speed	rpm	120 ( 119.4)
Rated output power	kW	10.7 ( 11.5)
Rated current	A	28 ( 31.2)
Maximum torque	Nm	1450 ( 1450 )
Current at maximum torque	A	55 ( 55 )
Inertia of motor	kgm <sup>2</sup>	0.500
Possible acceleration	m/s <sup>2</sup>	1.03

(MKmax=630.0 Nm)

Without cooling (81)

Dimension sheet A-M-6670, Motor construction type IMB3

Motor with encoder ECN 1313-2048Endat

**Selected frequency inverter**

Inverter ZAdyn 4CS032, Rated inverter current 32 A  
 mains current 22.7 A, 400 V, 14.9 kW, Max. 1.03 m/s<sup>2</sup>, F\_amax 1.57 (1450 Nm)  
 Radio interference filter, integrated ; Line reactor, integrated  
 Brake resistance separate BR25-3 (or Recuperation: ZArec4C 026 + BR25-3)

ZAlift - 20161219 - 77392021

**Elevator data**

Elevator 1600kg-1.00m/s-2:1-30m  
 Machine type SM 210.60  
 Traction sheave 320/150/14.0/10x8/HK40  
 Inertia Traction sheave 1.125 kgm<sup>2</sup>

**Brake data**

Mayr ROBA-twinstop 1000, 2x1200, EU-BD 1014/1, 40 ms, 95 ms, 150 ms  
 2 x 1200 Nm 207 V brake, with hand release, microswitch

**Calculation of unintended movement (EN81-1/A3)**

**Values of elevator controller**

Detection distance 0.050 m  
 Dead time 50 ms  
 V Detector 0.000 m/s

**without short-circuit motor braking**

	a [m/s <sup>2</sup> ]	s [m]	v [m/s]	t [s]
1:	5.51	0.05	0.74	0.13
2:	5.51	0.09	1.02	0.18
3:	1.87	0.14	1.09	0.22
4:	0.94	0.17	1.12	0.26
5:	-0.80	0.21	1.10	0.29
6:	-1.59	0.59	0.00	0.98

Stopping distance (without influence of traction) 0.367 m, empty up  
 Max. stopping distance (depending on traction) 0.587 m, empty up  
 Max. stopping distance (depending on traction) 0.380 m, full down  
 Max. stopping distance (inverter off, empty car) 0.234 m, empty up  
 Max. test stopping distance (v= 0.150m/s) 0.103 m, empty up  
 Max. test stopping distance (v= 0.150m/s) 0.097 m, full down  
 Max. test stopping distance (a= 2.000 m/s<sup>2</sup>) 0.244 m, empty up  
 Max. test stopping distance (a= 2.000 m/s<sup>2</sup>) 0.219 m, full down

**We assume no liability for calculation results!**