

ZAlift - 20220211 - calculation f5792040

ZIEHL-ABEGG SE
Künzelsau, Germany
f57 4/18/2022

Elevator calculation acc. EN81

Elevator data

Nominal load	Q	kg	1200
Car weight	F	kg	1400 (1232 - 1994kg)
Counterweight	G	kg	2000 (50%)
Travelling speed	v (V_3=)	m/s	1.60
Travel distance	H	m	30.0
Suspension/roping	is		2 : 1
Machine at the top, above , without deflection pulley			
Shaft efficiency	etaS	%	82
Number of pulleys (ball bearing)			3
Type of rope			WOLF PAWO F7
Number of ropes	z		8
Rope diameter	ds	mm	8
Rope weight	s	kg	61 (0.258 kg/m)
Compensation rope weight	su	kg	90
Car cable weight	HK	kg	8
Rope span weight	R	kg	0
Min. rope breaking load	B	N	40600
Traction sheave diameter	Dtr	mm	320
Sheave width		mm	122 number of grooves (8)
Groove distance		mm	14.0 Minimum distance
Angle of wrap minimum	min. deg		180
Undercut angle	deg		100
Undercut width	b	mm	6.13
Groove angle	deg		30
Sheave profile: circular undercut groove			

Traction, rope pressure, rope safety

Traction empty, on top, accelerating
1.7395 <= 1.9023

Traction 150% nominal load, below, not moving
1.5904 <= 1.9023

Rope pressure k < permissible rope pressure
8.15 < 9.00 N/mm²

Conditions according to EN81:

Load 125% 1.4468 <= 1.9110 (1)

Emergency stop 1.5744 <= 1.6333 (4)

with deceleration [m/s²] 0.500

Blocked car 14.935 > 3.6518 (4)

Real safety factor > Minimum safety factor for ropes
24.31 > 12

Rope safety factor according to EN81: (0), Basis 0

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

Rope safety nue = 24.3 > 20.0 (minSF)

Rope certification EN81

Traction conditions are fulfilled.

Rope safety conditions are fulfilled.

ZAlift - 20220211 - Machine dimensioning f5792040

Mechanical drive data

Machine manufactured by Ziehl-Abegg

Machine type SM 200.45E Gearless synchronous

Machine version ZAtop *

Traction sheave mm 320 /122/14.0/8x8/U100

Permissible load output torque Nm 603 (max. 799)

Real statical axle load kg 2410 (max. 3600)

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Brake data

brake Mayr ROBA-twinstop RTW800, 2x800 Nm, EU-BD 1112

Dual circuit disc brake, DC supply necessary

(497 Nm, 0.76 m/s², 2 m, 22343 J, 264 W)

207 V brake, with hand release, microswitch

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Machine load data in the installation

Typical motor operating power kW 9.1

Typ. operating current 30.6 A, Start. Current 52.5 A at acceleration 0.80 m/s²

Start. Current 49.4 A at acceleration 0.7 m/s²

Average power losses 1.78 kW = 6395.04 kJ/h

Output speed rpm 191

Load torque Nm 603.1 (eff. 456.1)

Inertia of installation kgm² 31.60

240 Starts per hour , 40 % required duty cycle at elevator operation

Max. static load pulleys 20504 N, pulley speed 1.60 m/s

Selected ZIEHL-ABEGG motor

Motor type SM200.45E-20 - gearless

	Nameplate data		(Operating data)
Rated voltage	V	360	
Rated frequency	Hz	32	(31.8)
Rated torque	Nm	710	(603.1)
Rated speed	rpm	192	(191.0)
Rated output power	kW	14.3	(12.1)
Rated current	A	36	(30.6)
Maximum torque	Nm	1200	(1200)
Current at maximum torque	A	74	(74)
Inertia of motor	kgm ²	0.350	
Possible acceleration	m/s ²	1.49	

(MKmax=480.0 Nm)

Without cooling [PTC] (63)

Dimension sheet A-M-6762 / A-M-6778, Motor construction type IMB3

Motor with encoder ECN 1313-2048Endat

Selected frequency inverter

Inverter ZAdyn 4CS032, Rated inverter current 32 A
mains current 22.1 A, 400 V, 14.6 kW, Max. 0.97 m/s²

Radio interference filter, integrated ; Line reactor, integrated

Braking resistance BR25-3

Brake control module ohne

ASACOD