

ZAlift - 20220211 - calculation f5792037

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

Elevator calculation acc. EN81

Elevator data

Nominal load	Q	kg	1000
Car weight	F	kg	1200 (1172 - 2155kg)
Counterweight	G	kg	1700 (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 , without deflection pulley			
Shaft efficiency	etaS	%	82
Number of pulleys (ball bearing)			3
Type of rope			WOLF PAWO F7
Number of ropes	z		7
Rope diameter	ds	mm	8
Rope weight	s	kg	54 (0.258 kg/m)
Compensation rope weight	su	kg	0
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 (7)
Groove distance		mm	17.0 Standard
Angle of wrap minimum	min. deg		180
Undercut angle	deg		95
Undercut width	b	mm	5.90
Groove angle	deg		30
Sheave profile: circular undercut groove			

Traction, rope pressure, rope safety

Traction empty, on top, accelerating (1.18)
1.7627 <= 1.8399

Traction 150% nominal load, below, not moving
1.6520 <= 1.8399

Rope pressure k < permissible rope pressure
7.01 < 9.00 N/mm²

Conditions according to EN81:

Load 125% 1.5049 <= 1.8582 (1)

Emergency stop 1.6625 <= 1.6759 (4)

with deceleration [m/s²] 0.500

Blocked car 13.764 > 3.4528 (4)

Real safety factor > Minimum safety factor for ropes
25.10 > 12

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

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

Rope safety nue = 25.1 > 17.8 (minSF)

Rope certification EN81

Traction conditions are fulfilled.

Rope safety conditions are fulfilled.

ZAlift - 20220211 - Machine dimensioning f5792037

Mechanical drive data

Machine manufactured by Ziehl-Abegg

Machine type SM 200.40E Gearless synchronous

Machine version ZAtop *

Traction sheave mm 320 /122/17.0/7x8/U95

Permissible load output torque Nm 578 (max. 660)

Real statical axle load kg 2008 (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
(477 Nm, 0.97 m/s², 1 m, 6830 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 4.8

Typ. operating current 19.3 A, Start. Current 28.0 A at acceleration 0.60 m/s²

Average power losses 1.07 kW = 3836.23 kJ/h

Output speed rpm 119

Load torque Nm 578.8 (eff. 383.8)

Inertia of installation kgm² 26.34

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

Max. static load pulleys 16678 N, pulley speed 1.00 m/s

Selected ZIEHL-ABEGG motor

Motor type SM200.40E-20 - gearless

	Nameplate data		(Operating data)
Rated voltage	V	360	
Rated frequency	Hz	20	(19.9)
Rated torque	Nm	600	(578.8)
Rated speed	rpm	120	(119.4)
Rated output power	kW	7.5	(7.2)
Rated current	A	20	(19.3)
Maximum torque	Nm	1000	(1000)
Current at maximum torque	A	38	(38)
Inertia of motor	kgm ²	0.310	
Possible acceleration	m/s ²	1.26	

(MKmax=400.0 Nm)

Without cooling [PTC] (56)

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

Motor with encoder ECN 1313-2048Endat

Selected frequency inverter

Inverter ZAdyn 4CS023, Rated inverter current 23 A
mains current 14.6 A, 400 V, 9.6 kW, Max. 1.26 m/s²

Radio interference filter, integrated ; Line reactor, integrated

Braking resistance BR25-3

Brake control module ohne

ASACOD