

Zalift - 20220211 - calculation f5792035

ZIEHL-ABEGG SE
Künzelsau, Germany

Elevator calculation acc. EN81 f57 4/18/2022

Elevator data

Nominal load	Q	kg	750
Car weight	F	kg	950 (896 - 1954kg)
Counterweight	G	kg	1325 (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		6
Rope diameter	ds	mm	8
Rope weight	s	kg	46 (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	110 number of grooves (6)
Groove distance		mm	17.0 Standard
Angle of wrap minimum		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)
1.7427 <= 1.8399

Traction 150% nominal load, below, not moving
1.6361 <= 1.8399

Rope pressure k < permissible rope pressure
6.35 < 9.00 N/mm²

Conditions according to EN81:

Load 125% 1.4946 <= 1.8582 (1)

Emergency stop 1.6441 <= 1.6759 (4)

with deceleration [m/s²] 0.500

Blocked car 12.735 > 3.4528 (4)

Real safety factor > Minimum safety factor for ropes
27.70 > 12

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

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

Rope safety nue = 27.7 > 17.8 (minSF)

Rope certification EN81

Traction conditions are fulfilled.

Rope safety conditions are fulfilled.

ZAlift - 20220211 - Machine dimensioning f5792035

Mechanical drive data

Machine manufactured by Ziehl-Abegg

Machine type SM 200.30D Gearless synchronous

Machine version ZAtop *

Traction sheave mm 320 /110/17.0/6x8/U95

Permissible load output torque Nm 445 (max. 499)

Real statical axle load kg 1562 (max. 2850)

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Brake data

brake Mayr ROBA-twinstop RTW450, 2x500 Nm, EU-BD845/3

Dual circuit disc brake, DC supply necessary

(367 Nm, 0.51 m/s², 1 m, 8086 J, 186 W)

207 V brake, with hand release, microswitch

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Machine load data in the installation

Typical motor operating power kW 3.5

Typ. operating current 16.4 A, Start. Current 24.6 A at acceleration 0.60 m/s²

Average power losses 0.82 kW = 2950.38 kJ/h

Output speed rpm 119

Load torque Nm 445.2 (eff. 282.4)

Inertia of installation kgm² 20.55

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

Max. static load pulleys 12999 N, pulley speed 1.00 m/s

Selected ZIEHL-ABEGG motor

Motor type SM200.30D-20 - gearless

	Nameplate data		(Operating data)
Rated voltage	V	360	
Rated frequency	Hz	20	(19.9)
Rated torque	Nm	475	(445.2)
Rated speed	rpm	120	(119.4)
Rated output power	kW	6	(5.6)
Rated current	A	17.5	(16.4)
Maximum torque	Nm	820	(820)
Current at maximum torque	A	37	(37)
Inertia of motor	kgm ²	0.240	
Possible acceleration	m/s ²	1.44	

(MKmax=320.0 Nm)

Without cooling [PTC] (57)

Dimension sheet A-M-6761 / A-M-6778, Motor construction type IMB3
Motor with encoder ECN 1313-2048Endat

Selected frequency inverter

Inverter ZAdyn 4CS017, Rated inverter current 17 A
mains current 11.6 A, 400 V, 7.6 kW, Max. 1.01 m/s²
Radio interference filter, integrated ; Line reactor, integrated
Braking resistance BR17-3
Brake control module ohne

ASACOD