

Elevator calculation acc. EN81

Elevator data

Nominal load	Q	kg	1200	
Car weight	F	kg	1400	(1287 - 1899kg)
Counterweight	G	kg	2000	(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			
Number of ropes	z		8	
Rope diameter	ds	mm	8	
Rope weight	s	kg	61	(0.258 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	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	
Undercutangle		deg	100	
Undercutwidth	b	mm	6.13	
Groove angle		deg	30	
Sheave profile: circular undercut groove				

Traction, rope pressure, rope safety

Traction empty, on top, accelerating (1.18)
1.7675 <= 1.9023

Traction 150% nominal load, below, not moving
1.6619 <= 1.9023

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

Conditions according to EN81-1 or -20:

Load 125% 1.5119 <= 1.9110 (1)

Emergency stop 1.6669 <= 1.7154 (4)

with deceleration [m/s²] 0.500

Blocked car 14.106 > 3.6518 (4)

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

Rope safety factor according to EN81-1 or -20:
NEQUIV = 13.0 NEQUIVT = 10.0 NEQUIVP = 03.0

Pulleys >= 320 mm, pulleys NPR = 0 NPS = 3

Rope safety nue = 24.3 > 20.5 (minSF)

Rope certification EN81

Traction conditions are fulfilled.

Rope safety conditions are fulfilled.

ZAlift - 20171013 - Machine dimensioning d3293961

Mechanical drive data

Machine manufactured by Ziehl-Abegg

Machine type SM 200.45D Gearless synchronous
Machine version ZAtop *
Traction sheave mm 320 /122/14.0/8x8/U100
Load output torque Nm 688 (max. 799)
Real statical axle load kg 2369 (max. 3600)

Brake data

brake Warner ERS VAR07 SZ800/800, 2x800 Nm, EU-BD 819/2
Dual circuit disk brake, DC supply necessary
(568 Nm, 0.59 m/s², 1 m, 11180 J, 264 W)
207 V brake, with hand release, microswitch

Machine load data in the installation

Typical motor operating power kW 5.8
Typ. operating current 23.3 A, Start. Current 35.4 A at acceleration 0.60 m/s²
Start. Current 37.4 A at acceleration 0.7 m/s²
Average power losses 1.27 kW = 4564.43 kJ/h
Output speed rpm 119
Load torque Nm 688.7 (eff. 462.4)
Inertia of installation kgm² 31.02
240 Starts per hour, 50 % required duty cycle at elevator operation
Max. static load pulleys 19621 N, pulley speed 1.00 m/s

Selected ZIEHL-ABEGG motor

Motor type SM200.45D-20 - gearless

	Nameplate data	(Operating data)
Rated voltage	V 360	
Rated frequency	Hz 20	(19.9)
Rated torque	Nm 710	(688.7)
Rated speed	rpm 120	(119.4)
Rated output power	kW 8.9	(8.6)
Rated current	A 24	(23.3)
Maximum torque	Nm 1200	(1200)
Current at maximum torque	A 50	(50)
Inertia of motor	kgm ² 0.350	
Possible acceleration	m/s ² 1.30	
(MKmax=480.0 Nm)		
Without cooling	(76)	

Dimension sheet A-M-6665, Motor construction type IMB3
Motor with encoder ECN 1313-2048Endat

Selected frequency inverter

Inverter ZAdyn 4CS032, Rated inverter current 32 A
mains current 17.5 A, 400 V, 11.5 kW, Max. 1.30 m/s²
Radio interference filter, integrated ; Line reactor, integrated
Brake resistance separate BR25-3 (or Recuperation: ZAreC4C 013)