

Elevator calculation acc. EN81

**Elevator data**

Nominal load	Q	kg	1000	
Car weight	F	kg	1200	(1151 - 2028kg)
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				
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	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
7)				
Groove distance		mm	17.0	Standard
Angle of wrap minimum	min.	deg	180	
Undercutangle		deg	95	
Undercutwidth	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)  
1.7527 <= 1.8399  
Traction 150% nominal load, below, not moving  
1.6520 <= 1.8399  
Rope pressure k < permissible rope pressure  
7.01 < 9.00 N/mm<sup>2</sup>

Conditions according to EN81-1 or -20:  
Load 125% 1.5049 <= 1.8582 (1)  
Emergency stop 1.6530 <= 1.6759 (4)  
with deceleration [m/s<sup>2</sup>] 0.500  
Blocked car 13.843 > 3.4528 (4)

Real safety factor > Minimum safety factor for ropes  
25.10 > 12  
Rope safety factor according to EN81-1 or -20:  
NEQUIV = 09.7 NEQUIVT = 06.7 NEQUIVP = 03.0  
Pulleys >= 320 mm, pulleys NPR = 0 NPS = 3  
Rope safety nue = 25.1 > 18.5 (minSF)  
Rope certification EN81

Traction conditions are fulfilled.  
Rope safety conditions are fulfilled.

## ZAlift - 20171013 - Machine dimensioning d3293962

### Mechanical drive data

Machine manufactured by Ziehl-Abegg  
Machine type SM 200.40D Gearless synchronous  
Machine version ZAtop \*

Traction sheave	mm	320
/122/17.0/7x8/U95		
Load output torque	Nm	578 (max. 660)
Real statical axle load	kg	2011 (max. 3600)

### Brake data

brake Warner ERS VAR07 SZ800/800, 2x800 Nm, EU-BD 819/2  
Dual circuit disk brake, DC supply necessary  
(477 Nm, 0.97 m/s<sup>2</sup>, 1 m, 6830 J, 264 W)  
207 V brake, with hand release, microswitch

### 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/s <sup>2</sup>		
Start. Current 29.5 A at acceleration 0.7 m/s <sup>2</sup>		
Average power losses	1.07 kW = 3836.23 kJ/h	
Output speed	rpm	119
Load torque	Nm	578.8 (eff. 380.4)
Inertia of installation	kgm <sup>2</sup>	26.34
240 Starts per hour, 50 % required duty cycle at elevator operation		
Max. static load pulleys 16678 N, pulley speed 1.00 m/s		

### Selected ZIEHL-ABEGG motor

Motor type SM200.40D-20 - gearless

	Nameplate data	(Operating
data)		
Rated voltage	V	360
Rated frequency	Hz	( 19.9)
Rated torque	Nm	( 578.8)
Rated speed	rpm	( 119.4)
Rated output power	kW	( 7.2)
Rated current	A	( 19.3)
Maximum torque	Nm	( 1000 )
Current at maximum torque	A	( 38 )
Inertia of motor	kgm <sup>2</sup>	0.310
Possible acceleration	m/s <sup>2</sup>	1.26
(MKmax=400.0 Nm)		

Without cooling (68)

Dimension sheet A-M-6665, 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/s<sup>2</sup>

Radio interference filter, integrated ; Line reactor, integrated  
Brake resistance separate BR25-3 (or Recuperation: ZArec4C 013)

ASACOD.ir - 02144340048