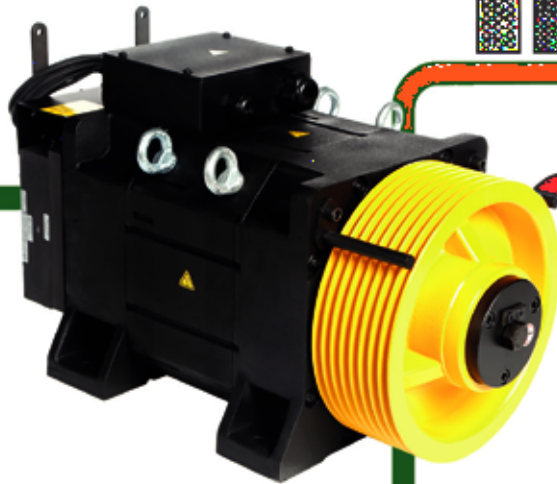


# Make a difference

## SQML Gearless Lift Motor

High Riding Comfort  
Smooth Start & Stop  
Quiet Operation  
Energy Saving  
66 - 88 poles



**EMF Motor®**

# EMF Motor

## *Only the Best wins ...*

Every solution comes from a real understanding of the challenges facing designers and users.

EMF Motor continues to be a company made of innovative individuals striving to design, create and build products and solutions that help to improve industrial technology. We design our products for durability and we test them rigorously to ensure the highest levels of reliability.

Our products are the **“next big thing”** in electric motors. Our patented technology provides the ground to attract world’s most talented and motivated engineers. EMF Motor products will benefit design engineers to innovate compact products that will respond to the increasing demand from customers.

**“Precise motion”** is our focus. SQM Torquemotor can distinctly differentiate your product, your efficiency and your operations and deliver a market place advantage by improving its performance. This means totally increased efficiency which is the expectation within every company. Perfectly deployed motion can make your product more reliable and efficient and enhance accuracy.

### **How is this all possible? What is so different about the SQM Torquemotor?**

SQM Torquemotor works with a patented motor principle that is most suitable for applications with high torque at low speed. SQM Torquemotor is a synchronous machine and the windings have no influence on the pole number. The high pole number is achieved by intelligent magnetic field.

As a result SQM Torquemotor, as a direct drive, offers great advantages in all performance criterias, such as very high energy efficiency, high dynamics, high overload capacity, quiet and practically maintenance free operation.

## SQML Gearless Lift Motor

- SQML Gearless Lift Motor uses Patented EMF Motor Technology
- The highest efficiency by far
- Excellent n

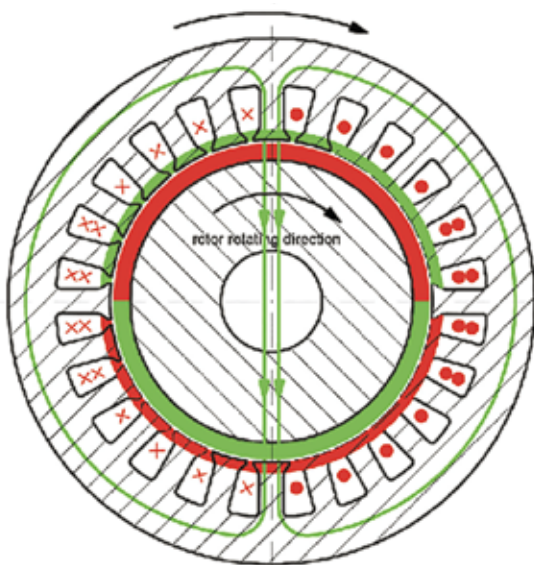


## The patented EMF Motor® Technology

### High pole number advantages:

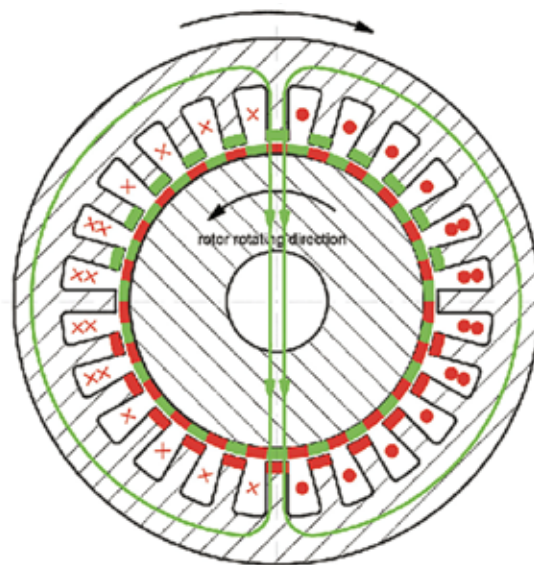
- Large frequency range
- 66 poles offer more than 4 times higher frequency range compared to a 16-pole motor.
- Excellent comfort even at 0,15 m/sec. at 1:1 suspension.
- Smooth and precise acceleration and deceleration

stator rotating direction



Standart lift motor principle

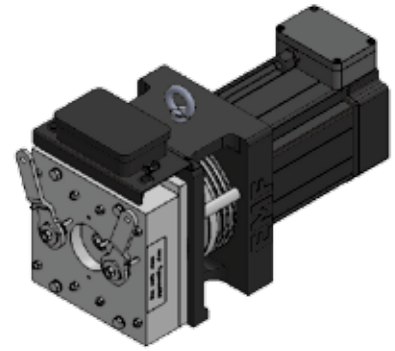
stator rotating direction



EMF Motor® lift motor principle

**SQML 73**

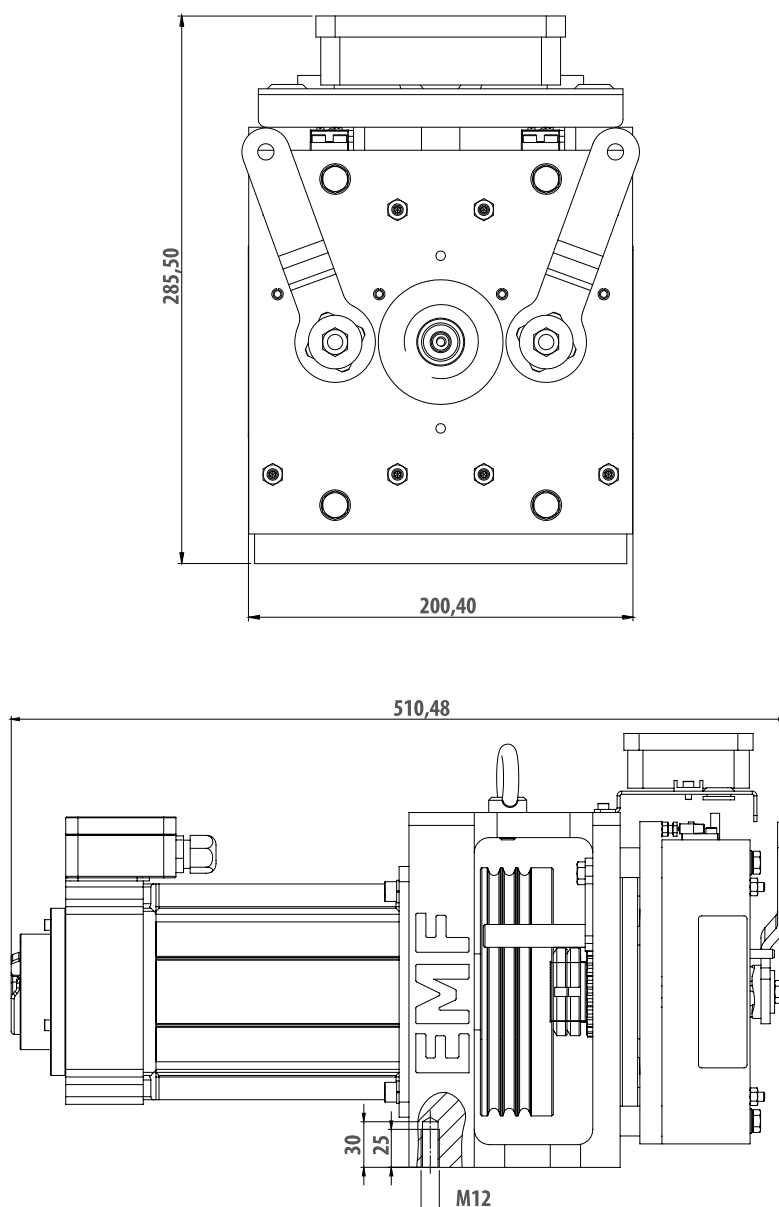
- World's smallest gearless lift motor
- 320 kg to 600 kg capacity
- 120 mm and 160 mm sheave option
- 220 V and 380 V option in the same motor. (via changing star-delta connection)
- 66 poles



Static Load 1.200 kg

Suspension	Voltage	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
2:1	380 V	73-160	320	0,15	120	3 x 6,5*	58	48	1,8	0,29
		73-160	320	0,3	120	3 x 6,5*	58	95	1,8	0,58
		73-160	320	0,5	120	3 x 6,5*	58	159	3,0	0,97
		73-160	400	0,15	120	3 x 6,5*	72	48	2,5	0,36
		73-160	400	0,3	120	3 x 6,5*	72	95	2,5	0,72
		73-160	400	0,5	120	3 x 6,5*	72	159	4,1	1,20
		73-160	480	0,15	120	3 x 6,5*	86	48	3,5	0,43
		73-160	480	0,3	120	3 x 6,5*	86	95	3,5	0,86
		73-160	480	0,5	120	3 x 6,5*	86	159	5,7	1,43
		73-160	600	0,15	120	3 x 6,5*	107	48	5,0	0,54
		73-160	600	0,3	120	3 x 6,5*	107	95	5,0	1,06
		73-160	600	0,5	120	3 x 6,5*	107	159	8,2	1,78
	220 V	73-160	320	0,15	120	3 x 6,5*	58	48	3,1	0,29
		73-160	320	0,3	120	3 x 6,5*	58	95	3,1	0,58
		73-160	320	0,5	120	3 x 6,5*	58	159	5,2	0,97
		73-160	400	0,15	120	3 x 6,5*	72	48	4,3	0,36
		73-160	400	0,3	120	3 x 6,5*	72	95	4,3	0,72
		73-160	400	0,5	120	3 x 6,5*	72	159	7,1	1,20
		73-160	480	0,15	120	3 x 6,5*	86	48	6,1	0,43
		73-160	480	0,3	120	3 x 6,5*	86	95	6,1	0,86
		73-160	480	0,5	120	3 x 6,5*	86	159	9,9	1,43
		73-160	600	0,15	120	3 x 6,5*	107	48	8,7	0,54
		73-160	600	0,3	120	3 x 6,5*	107	95	8,7	1,06
		73-160	600	0,5	120	3 x 6,5*	107	159	14,2	1,78
2:1	380 V	73-160	320	0,6	160	3 x 6,5*	78	143	4,4	1,17
		73-160	320	1	160	3 x 6,5*	78	239	7,3	1,95
		73-160	400	0,6	160	3 x 6,5*	96	143	6,1	1,44
		73-160	400	1	160	3 x 6,5*	96	239	10,2	2,40
		73-160	450	0,6	160	3 x 6,5*	107	143	7,5	1,60
		73-160	450	1	160	3 x 6,5*	107	239	12,6	2,68
	220 V	73-160	320	0,6	160	3 x 6,5*	78	143	7,6	1,17
		73-160	320	1	160	3 x 6,5*	78	239	12,6	1,95
		73-160	400	0,6	160	3 x 6,5*	96	143	10,6	1,44
		73-160	400	1	160	3 x 6,5*	96	239	17,7	2,40
		73-160	450	0,6	160	3 x 6,5*	107	143	13,0	1,60
		73-160	450	1	160	3 x 6,5*	107	239	21,8	2,68

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.



## Caution

- Plastic coated rope\*
- 85% lift shaft efficiency is considered for the calculations
- Travel distance 15 m
- Mayr Safety Brakes
- Brake supply voltage is 207 VDC.
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Duty cycle is S3 20%
- 90 start/hour for 120 mm sheave diameter and 180 starts/hour for 160 mm sheave diameter
- Counterweight 50 %
- Static Load : 1.200 kg

## SQML 100

- From 320 kg to 630 kg carrying capacity
- 160 mm, 210 mm and 240 mm traction sheave options
- Compact design
- 1:1 and 2:1 suspension options



Static Load 1.700 kg

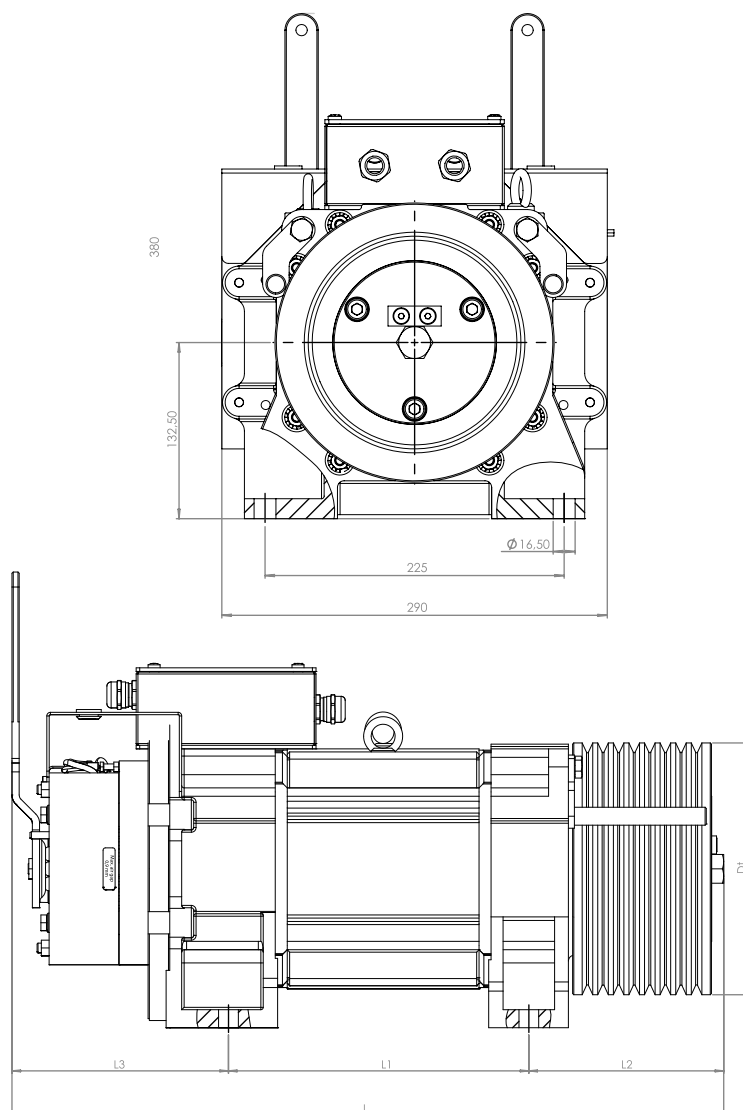
Suspension	Motor Nr.	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
1:1	a	100-160	320	1,0	Ø240	7 x 6,5	280	80	11	2,3
	b	100-160	320	1,6	Ø240	7 x 6,5	280	127	17	3,7
	c	100-160	320	1,0	Ø210	7 x 6,5	245	91	9,8	2,3
	d	100-160	320	1,6	Ø210	7 x 6,5	245	146	16,1	3,7
2:1	e	100-140	320	1,0	Ø210	4 x 6,5	120	182	6,4	2,3
	f	100-140	400	1,0	Ø210	5 x 6,5	150	182	10,5	2,9
	g	100-140	400	1,0	Ø240	5 x 6,5	175	159	11,7	2,9
	h	100-140	480	1,0	Ø210	6 x 6,5	170	182	12,7	3,2
	i	100-160	480	1,0	Ø240	5 x 6,5	192	159	13,5	3,2
	j	100-160	630	1,0	Ø210	7 x 6,5	225	182	16,9	4,3
	k	100-160	630	1,0	Ø240	6 x 6,5	250	159	17	4,2
	l	100-140	320	1,0	Ø160	3 x 6,5	90	239	5,9	2,3
	m	100-140	400	1,0	Ø160	3 x 6,5	115	239	7,7	2,9
	n	100-140	480	1,0	Ø160	3 x 6,5	130	239	10,5	3,3
	o	100-140	630	1,0	Ø160	4 x 6,5	170	239	16	4,3
	p	100-160	800	1,0	Ø160	5 x 6,5	210	239	19	5,3

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.

### Caution

- Certificated rope must be used
- Drako 250T rope type is considered for the calculations of motors with 210 mm and 240 mm sheave.
- Drako PTX300 5/6,5 ( $\mu=0,25/0,5$ ) is considered for the motors with 160 mm sheave
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Mayr Safety Brake
- Brake supply voltage is 207 VDC.
- 80% lift shaft efficiency is considered for the calculations.
- Compensation rope must be used over 24 m travel distance. Please contact us for applications without compensation rope
- Sheave groove angle is 50° for 210 mm and 240 mm diameter sheaves.
- Sheave channel type is U type for 160 mm sheave and channel angle is 45°.
- Hardness of the sheaves is 46-50 HRC

Please contact us for other load capacities.



Motor Nr.	L mm	L1 mm	L2 mm	L3 mm
a	593,5	250,5	162,5	180,5
b	593,5	250,5	162,5	180,5
c	593,5	250,5	162,5	180,5
d	593,5	250,5	162,5	180,5
e	573,5	230,5	162,5	180,5
f	573,5	230,5	162,5	180,5
g	573,5	230,5	162,5	180,5
h	573,5	230,5	162,5	180,5
i	573,5	230,5	162,5	180,5
j	593,5	250,5	162,5	180,5
k	593,5	250,5	162,5	180,5
l	573,5	230,5	162,5	180,5
m	573,5	230,5	162,5	180,5
n	573,5	230,5	162,5	180,5
o	573,5	230,5	162,5	180,5
p	593,5	250,5	162,5	180,5



## SQML 132

- Up to 1150 kg carrying capacity
- 210 mm, 240 mm and 320 mm traction sheave options
- 2 m/s speed options
- 1:1 and 2:1 suspension options



Static Load 2.200 kg

Suspension	Motor Nr.	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
1:1	a	132-140	400	1,0	Ø240	8 x 6,5	345	80	8,7	2,9
	b	132-140	400	1,6	Ø240	8 x 6,5	345	127	13,5	4,6
	c	132-140	400	1,0	Ø210	9 x 6,5	305	91	8,1	2,9
	d	132-140	400	1,6	Ø210	9 x 6,5	305	146	13	4,7
	e	132-140	480	1,0	Ø240	9 x 6,5	410	80	11,5	3,4
	f	132-140	480	1,6	Ø240	9 x 6,5	410	127	18	5,5
2:1	g	132-140	630	1,6	Ø240	6 x 6,5	251	255	17	6,7
	h	132-140	630	1,6	Ø320	4 x 8	335	191	20	6,7
	i	132-100	800	1,0	Ø210	8 x 6,5	280	182	17	5,3
	j	132-140	800	1,0	Ø240	7 x 6,5	316	159	16,7	5,3
	k	132-140	800	1,6	Ø240	7 x 6,5	316	255	24	8,4
	l	132-140	800	1,0	Ø320	5 x 8	410	119	19,2	5,1
	m	132-160	800	1,6	Ø320	5 x 8	410	191	24	8,2
	n	132-180	800	2,0	Ø320	6 x 8	410	239	31	10,3
	o	132-100 **	1000	1,0	Ø210	9 x 6,5	346	182	25,2	6,6
	p	132-160	1000	1,0	Ø240	9 x 6,5	398	159	18	6,6
	r	132-160	1000	1,6	Ø240	9 x 6,5	398	255	31,1	10,6
	s	132-160 ***	1150	1,0	Ø240	9 x 6,5	410	159	23,5	6,8
t	132-160 ***	1150	1,6	Ø240	9 x 6,5	410	255	32	10,9	

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.

### Caution

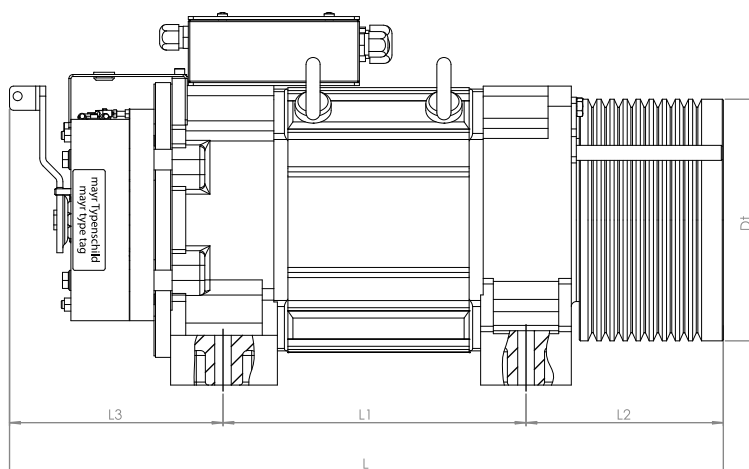
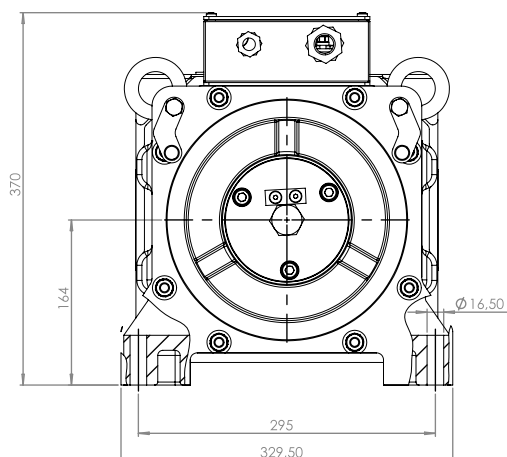
- 6.5 mm rope must be certified.
- Drako 250T rope is considered for the calculations
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Mayr Safety Brake
- Brake supply voltage is 207 VDC.
- 80% lift shaft efficiency is considered for the calculations.
- Compensation rope must be used over 24 m travel distance. Please contact us for applications without compensation rope.
- Travel distance is considered 35 - 45 m for 2 m/s and higher cabin speeds.
- Sheave groove angles are 50° for 210 mm and 240 mm sheave diameter and 45° for 320 mm sheave diameter.
- Hardness of the sheaves is 46-50 HRC

\*\* For this type maximum cabin weight must be 1050 kg.

\*\*\* Compensation chain must be used for this type.

**Please contact us for other load capacities.**





Motor Nr.	L mm	L1 mm	L2 mm	L3 mm
a	669	261	196	212
b	669	261	196	212
c	667	261	194	212
d	667	261	194	212
e	669	261	196	212
f	669	261	196	212
g	637	261	194	182
h	667	261	194	212
i	597	221	194	182
j	667	261	194	212
k	667	261	194	212
l	667	261	194	212
m	687	281	194	212
n	707	301	194	212
o	627	221	194	212
p	689	281	196	212
r	689	281	196	212
s	689	281	196	212
t	689	281	196	212

## SQML 160

- Up to 1250 kg carrying capacity
- 240 mm, 320 mm and 400 mm traction sheave options
- 1:1 and 2:1 suspension options



Static Load 2.800 kg

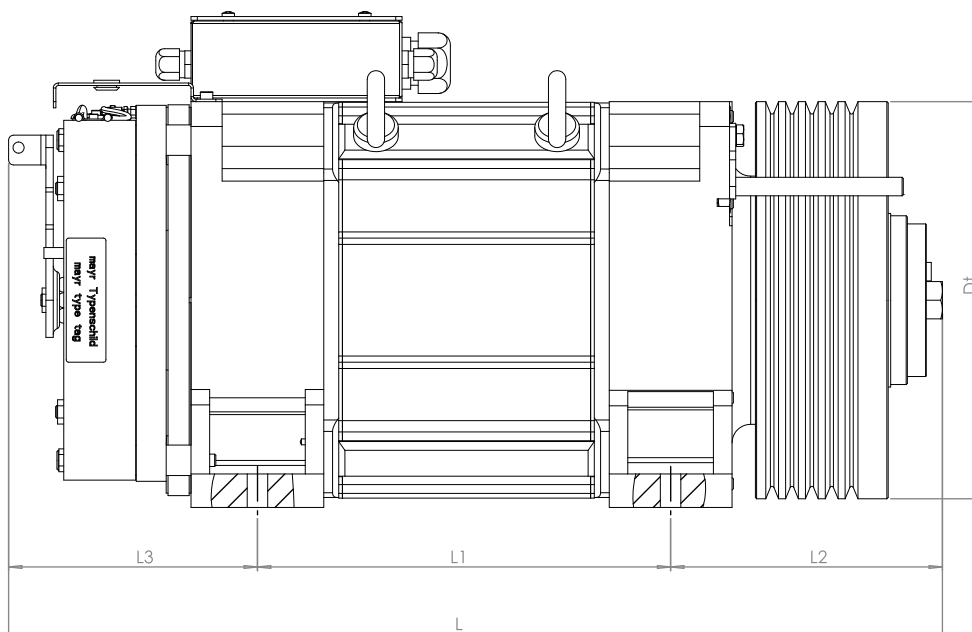
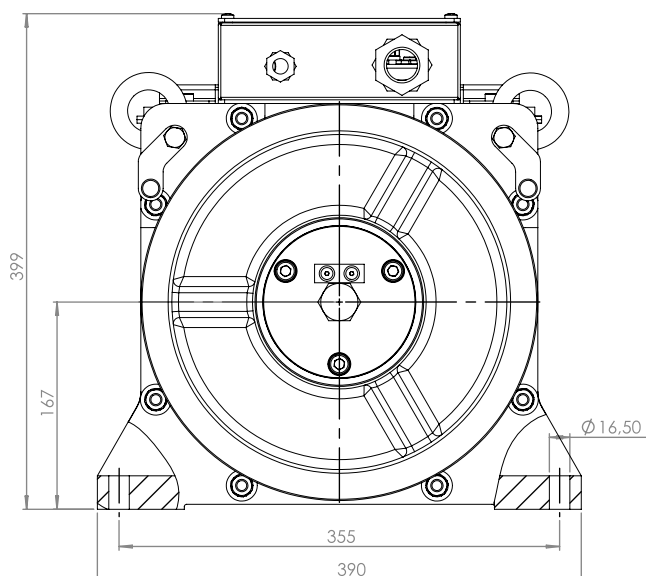
Suspension	Motor Nr.	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
1:1	a	160-200	630	1,0	Ø240	12 x 6,5	540	80	13,5	4,4
	b	160-200	630	1,6	Ø240	12 x 6,5	540	127	23,3	7,2
2:1	c	160-200	800	2,5	Ø400	4 x 10	540	239	43,5	13,5
	d	160-160	1000	1,0	Ø320	6 x 8	533	119	24,5	6,6
	e	160-200	1000	1,6	Ø320	6 x 8	533	191	34	10,7
	f	160-200	1250	1,0	Ø240	11 x 6,5	500	159	26	8,3
	g	160-200	1250	1,6	Ø240	11 x 6,5	500	255	40,4	13,4

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.

### Caution

- 6.5 mm rope must be certified.
- Drako 250T rope is considered for the calculations
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Mayr Safety Brake
- Brake supply voltage is 207 VDC.
- 80% lift shaft efficiency is considered for the calculations.
- Compensation rope must be used over 24 m travel distance. Please contact us for applications without compensation rope.
- Travel distance is considered 35 - 45 m for 2 m/s and higher cabin speeds.
- Sheave groove angles are 50° for 240 mm sheave diameter and 45° for 320 mm and 400 mm sheave diameter.
- Hardness of the sheaves is 46-50 HRC
- IP54 is optional

Please contact us for other load capacities.



Motor Nr.	L mm	L1 mm	L2 mm	L3 mm
a	761	333	227,5	200,5
b	761	333	227,5	200,5
c	752,5	333	219	200,5
d	712,5	293	219	200,5
e	752,5	333	219	200,5
f	761	333	227,5	200,5
g	761	333	227,5	200,5

## SQML 200

- Up to 3000 kg carrying capacity
- 320 mm and 400 mm traction sheave options
- 2,5 m/s speed options
- 1:1 and 2:1 suspension options



Static Load 5.700 kg

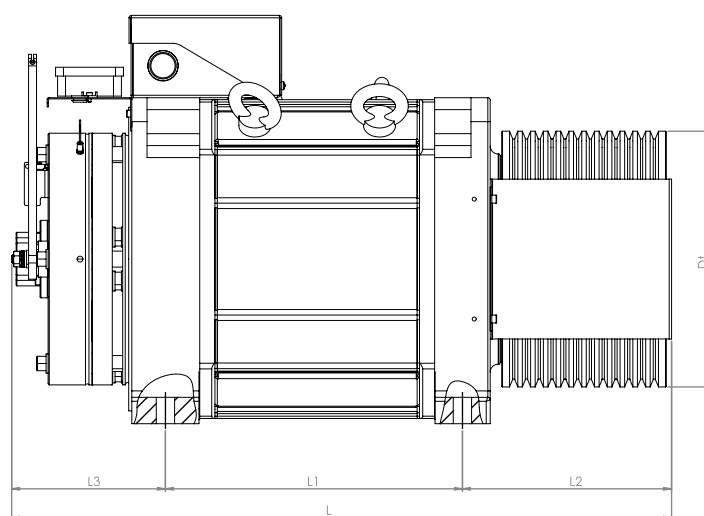
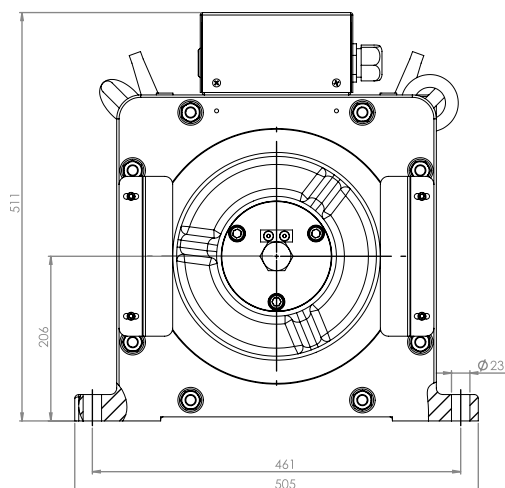
Suspension	Motor Nr.	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
2:1	a	200-150	1000	2,0	Ø320	7 x 8	533	239	35	13,3
	b	200-200	1000	2,5	Ø400	4 x 10	675	239	46,1	16,9
	c	200-150	1250	1,0	Ø320	8 x 8	671	119	26	8,4
	d	200-150	1250	1,6	Ø320	8 x 8	671	191	45	13,4
	e	200-200	1250	2,0	Ø320	9 x 8	671	239	46	16,8
	f	200-200	1250	2,5	Ø400	5 x 10	830	239	68	20,8
	g	200-150	1600	1,0	Ø320	9 x 8	852	119	35	10,6
	h	200-200	1600	1,6	Ø320	9 x 8	852	191	50	17,0
	i	200-250	1600	2,0	Ø320	10 x 8	852	239	59,5	21,3
	j	200-300	1600	2,5	Ø400	7 x 10	1068	239	70	26,7
	k	200-250	2000	1,0	Ø320	11 x 8	1052	119	40	13,1
	l	200-250	2000	1,6	Ø320	11 x 8	1052	191	65	21,0
	m	200-300	2000	2,0	Ø320	11 x 8	1052	239	68	26,3
	n	200-300	2000	2,5	Ø400	8 x 10	1325	239	101	33,2
	o	200-250	2500	1,0	Ø400	9 x 10	1638	95	63,7	16,3
	p	200-250	2500	1,6	Ø400	9 x 10	1638	153	105	26,2
	r	200-300	2500	2,0	Ø400	9 x 10	1638	191	125	32,8
s	200-300	3000	0,5	Ø400	12 x 10	1988	48	45,5	10,0	
t	200-300	3000	1,0	Ø400	12 x 10	1988	95	90	19,8	

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.

### Caution

- Drako 250 T rope type is considered for all calculations.
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Intorq - Kendrion Safety Brake
- Brake supply voltage is 104 VDC.
- 80% lift shaft efficiency is considered for the calculations.
- Compensation rope must be used over 24 m travel distance. Please contact us for applications without compensation rope.
- Travel distance is considered 35 - 45 m for 2 m/s and higher cabin speeds.
- Sheave angles for 320 mm and 400 mm sheave diameters are 45°.
- The hardness rate of our sheaves is 46-50 HRC.
- IP54 is optional

**Please contact us for other load capacities.**



Motor Nr.	L mm	L1 mm	L2 mm	L3 mm
a	726	271,75	261,75	192,5
b	764	321,75	249,75	192,5
c	726	271,75	261,75	192,5
d	726	271,75	261,75	192,5
e	776	321,75	261,75	192,5
f	764	321,75	249,75	192,5
g	726	271,75	261,75	192,5
h	776	321,75	261,75	192,5
i	826	371,75	261,75	192,5
j	881	421,75	249,75	209,5
k	843	371,75	261,75	209,5
l	843	371,75	261,75	209,5
m	893	421,75	261,75	209,5
n	881	421,75	249,75	209,5
o	946,5	371,75	249,75	325
p	946,5	371,75	249,75	325
r	996,5	421,75	249,75	325
s	1056,5	421,75	309,75	325
t	1056,5	421,75	309,75	325



## Let the elevator work without power!

Elevator can work more than 200\* rides at same comfort and speed when the power is cut

### System works as a hybrid elevator;

When the motor brakes, the generated energy charges the batteries

High Energy Saving by regenerative energy

The stored energy in the batteries provides very low energy consumption even power is on

When power is cut, the charged energy ensures full speed and load ride without interruption



**High  
Energy  
Saving  
(up to 70 %)**



**By power cut  
more than  
200\* rides  
at same comfort  
and speed**



**No Stop  
No Fear**

- By programming the system, the network energy can be used only at daily cheap tariff so the savings can be increased.
- Min. 200\* times operation without network energy! When there is power cut during travelling, there won't be interruption in the cabin and elevator will continue to be operated with same speed and comfort.
- No need regular UPS!
  - Batteries in the GM system have much longer life time compared to regular UPS since they are always outlive.

### The components of Green Motion

*In this system, the inverter must be single ph. 220 V and EMF Motor will be 3ph 220 V.*

- 3 ph x 220 V EMF Lift Motor
- Green Motion Card by EMF Motor
- Inverter 24 VDC to 220 VAC
- 22 x 12 V lead acid batteries
- 24 VDC power supply
- 1 ph x 220 V driver



*\* 200 times will be changed according to speed, load and battery capacity*

## Green Motion 220 V

- Up to 1.250 kg carrying capacity
- 240 mm and 320 mm traction sheave options
- 1:1 and 2:1 suspension options
- The motors are 3 phase 220 V and working with single phase 220 V driver.

Suspension	Motor Nr.	Motor Code	Load Capacity kg	Traveling Speed m/s	Traction Sheave mm	Rope Number x mm	Rated Torque nm	Rated Speed d/d	Rated Current A	Rated Power kW
1:1	a	132-160	400	1,0	Ø240	8 x 6,5	345	80	15	2,9
	b	132-160	480	1,0	Ø240	9 x 6,5	410	80	17	3,4
	c	160-200	630	1,0	Ø320	8 x 8	540	80	24,5	4,5
	d	160-200	630	1,6	Ø320	8 x 8	540	127	40,5	7,2
2:1	e	100-140	400	1,0	Ø240	5 x 6,5	175	159	17	2,9
	f	132-100	400	1,6	Ø240	5 x 6,5	175	255	20,3	4,7
	g	100-140	480	1,0	Ø240	5 x 6,5	192	159	22	3,2
	h	132-100	480	1,6	Ø240	5 x 6,5	192	255	23,7	5,1
	i	132-100	630	1,0	Ø240	6 x 6,5	251	159	22	4,2
	j	132-140	630	1,6	Ø240	6 x 6,5	251	255	29,7	6,7
	k	132-180	800	1,0	Ø240	7 x 6,5	316	159	23	5,3
	l	132-180	800	1,6	Ø240	7 x 6,5	316	255	37	8,5
	m	132-180	1000	1,0	Ø240	9 x 6,5	398	159	32	6,6
	n	160-200	1000	1,6	Ø240	9 x 6,5	398	255	48	10,6
	o	200-150	1250	1,0	Ø320	8 x 8	671	119	47	8,4
	p	200-200	1250	1,6	Ø320	8 x 8	671	191	67	13,4

EMF Motor reserves the right to amend dimensions, technical data and design specification without prior notification.

### Caution

- Motor dimensions are the same as 380 V versions, only the voltage is 3 phase 220 VAC.
- Used 6.5 mm rope must be certified.
- All calculations have been made due to Drako 250T rope type.
- Heidenhain ECN1313 EnDat encoder is standard. Please contact us for BiSS option
- Shaft efficiency is considered as 80 % in all calculations
- Compensation rope must be used over 24m travel distance. Please contact us for applications without comp. rope
- Travel distance is considered 35-45 m for 2 m/s and higher cabin speeds.
- Sheave angles for 210 mm and 240 mm are 50°, for 320 mm and 400 mm they are 45°.
- The hardness rate of our sheaves is 46-50 HRC.

Please contact us for other load capacities.





# EMF Motor®



Industry 4.0

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