

Synchronous reluctance motors

Power range
from 55 to 450kw

orange1.eu



ORANGE1
HOLDING



DIE CASTING
100 ml Turnover
4 Companies
720 Headcount

ELECTRIC MOTORS
125 ml Turnover
8 Companies
800 Headcount

TURNING PARTS
10 ml Turnover
2 Companies
80 Headcount

 **ORANGE1**
PRECISION

 **SICME** ORANGE1

 **ORANGE1**
FOUNDRY

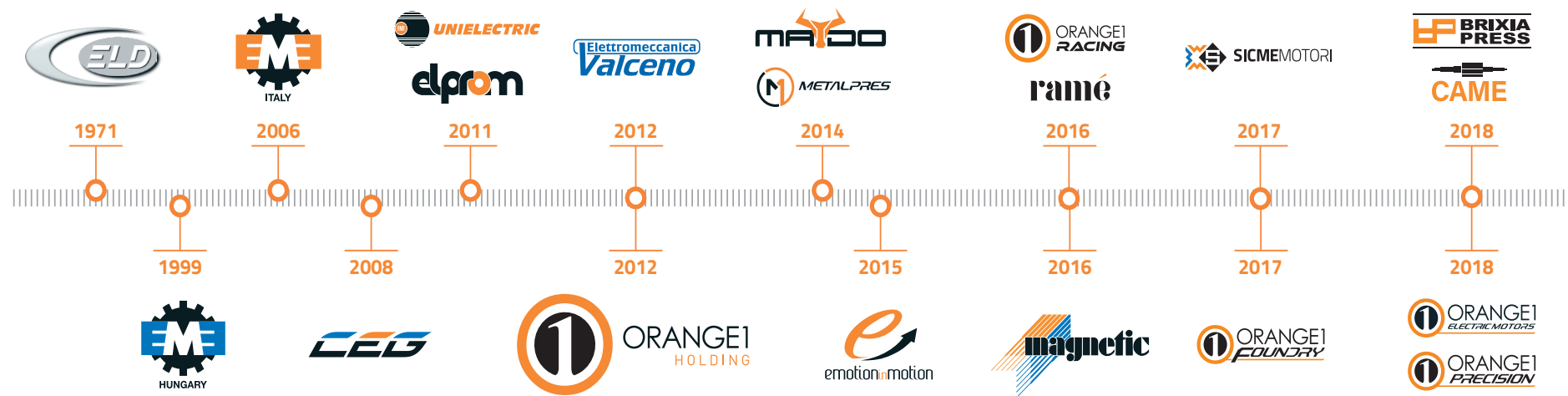


 **ORANGE1**
ELECTRIC MOTORS



A dynamic, strong and ambitious Group

Orange1 Holding is an international renown Group, one of the most important European manufacturers of single-phase and three-phase asynchronous electric motors. It has an annual capacity of more than 1 million motors and 5 million electric stators with an annual turnover of approx 235 million euro and more than 1600 workers in 15 production facilities. The group, established in 1971 by Leone Donazzan, chaired today by his son Armando Donazzan, is strongly focused on technological innovation, performance and customization to meet individual clients requirements.



€ 235.000.000 TURNOVER
15 COMPANIES
1600 HEADCOUNT



Elettromeccanica Leone Donazzan was established on 1971 in Bassano del Grappa. In 1983 the company turned into Eld Spa. In 1998 Armando Donazzan took over the running of the company; thanks to his determination and intuition he applied new financial and commercial policies which increased the level of reliability and visibility. In March 2006 the company changed its name to EME Spa and finally become Orange1 Electric Motors in 2018. The aim of O1EM is to manufacture custom made motors to meet clients and market expectations. The actual production covers a large range of AC and DC motors, as well as brushless motors and Variable Frequency Drives , to provide total solution. Starting from 2007 Orange1 Electric Motors, through the Sicme Motori Division has developed an innovative range of synchronous reluctance motors IE4 with a specific patent, designed to be operated by a frequency converter (inverter).



Combine the benefits of premium motor control and **synchronous reluctance technology**

Orange1 Electric Motors has an important experience on reluctance motors, which were manufactured and installed since 2007, with good performance and satisfaction of the customers.

Today's interest of the VSD world and the availability of specific converters for this type of machines has given to Orange1 Electric Motors the possibility to develop whole series of products using this technology, covered by a patented design, in order to give to the customers the opportunity to get the lowest energy consumption and highest flexibility for their variable speed applications.



*From size 250 up to 355.

IE4 Orange1 reluctance motor allows:

- Use of strong components as in the case of asynchronous motors
- Silent operation thanks to the geometry of the rotor laminations
- Reduced losses associated with the speed control system
- Easy maintenance thanks to the absence of magnets

SR2Ca motors

These motors are assembled using standard IEC 60072 mechanical parts, in order to guarantee 100% compatibility in case of retrofiting. The highly innovative active parts, synchronous reluctance, are designed to ensure the best efficiency, above all in terms at partial load conditions, in order to guarantee to the customer a quick payback when these drives are selected to replace standard induction solutions. Other important features are the synchronous speeds, important to have very precise speed regulation and a lower inertia, due to the fact that the rotor winding or cage are missing.

Noise level

The noise level of the motors of the SR series are within the limits imposed by the IEC 60034-9 and CEI EN 60034-9 Std (measurement with feed from inverter). Technical features are indicative and can be changed without notice. according to EN60034-9 Standards.

ENERGY Saving

Super premium efficiency IE4

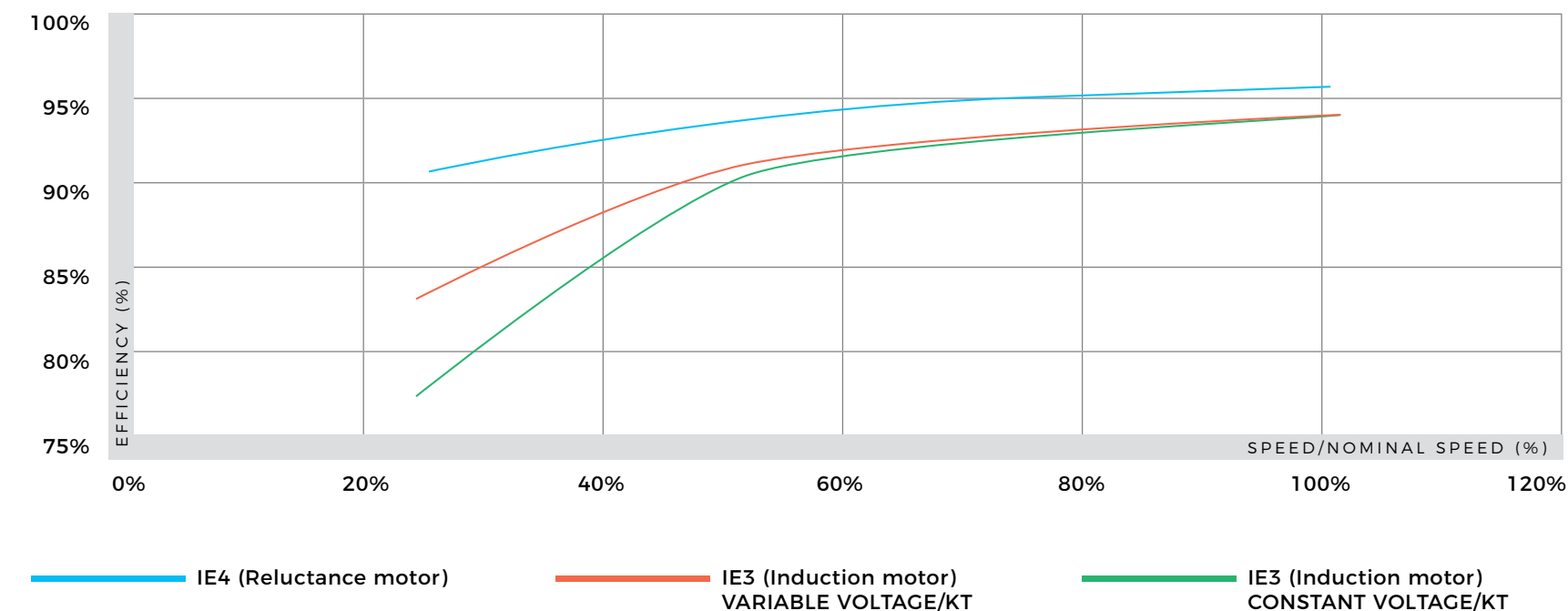
The important advantage of the SR2Ca machines, compared with a standard induction motor, is the highest efficiency, due to the elimination of the rotor losses, which is making the difference at variable-speed and partial-load conditions above all (refer to the graphic here below).

This brings to unbeatable energy savings in variable load applications, such as fluid motion. An example on a 55 kW 1500 rpm pump drive is presented here beside. The difference with an IE3 induction motor is clear, even when the latter is used with an optimization of the efficiency. The results are taken from tests run at Orange1 Electric Motors's laboratories, with measurement criteria according to IEC standards.

High Dynamic

The absence of the fundamental rotor losses can be used to reduce the size of the motor, at a given shaft power, due to the important reduction of the heat to be dissipated, and this brings to several advantages, which will be described in the part of this catalogue.

Efficiency comparison IE3 (induction motors) vs IE4 (reluctance motors) - Pump/Fan duty



What are the advantages of reluctance technology motors?

OVER 70% ENERGY SAVING

Orange1 Electric Motors with speed regulation allows a considerably lower energy consumption: the motor alone allows a 15% energy saving. Moreover you have to consider the already remarkable gain of 60% given by the speed regulation through inverter.

ADVANCED MOTOR

Energy performance levels according to ES(IEC/TS 60034-30-2) already achieved, this motor also achieves UE requirements even after 2017.

HIGHER ENVIRONMENTAL SUSTAINABILITY

Completely manufactured with no magnets, its total environmental impact is by far lower than the impact of permanent magnet synchronous motors and asynchronous motors.

STURDY

The use of non-critical and durable materials as well as the more than tested principle of reluctance motors make Orange1 Electric Motors reliable, over time durable and superior to other types of motor.

COMPATIBLE

Wherever a IE2 asynchronous motor is installed, Orange1 Electric Motors, that is dimensionally interchangeable, ensures an efficient performance.

Electrical Data & Performances

1500rpm rated speed at 50Hz - Duty cycle S1; protection level IP55; cooling IC411 - Thermal class F; temperature rise B

Type	Rated Power	Rated Torque	Rated Voltage	Rated current at 400V	Efficiency full load	Efficiency 3/4 load	Efficiency 1/2 load	Footed motor weight	Moment of inertia
	Pn	Mn	Vn	In	η	η	η	kg	kgm²
	kW	Nm	V	A	%	%	%		
SR2Ca 250M C4	55	350,1	380	112,3	95,2	95,0	94,2	460	0,50
SR2Ca 280S-M B4	75	477,5	380	154	95,4	95,3	95,0	623	0,75
SR2Ca 280S-M C4	90	573,0	360	193	95,5	95,3	95,1	650	0,88
SR2Ca 315S-M B4	110	700,3	380	219	95,5	95,4	95,2	875	1,59
SR2Ca 315S-M C4	132	840,3	380	261	95,9	95,6	95,3	955	1,82
SR2Ca 315M-L D4	160	1018,6	380	315	96,0	95,7	95,4	970	2,01
SR2Ca 315M-L E4	180	1145,9	380	354	96,1	95,8	95,5	1010	2,24
SR2Ca 315M-L F4	200	1273,2	400	373	96,2	95,9	95,6	1055	2,51
SR2Ca 355L B4	250	1591,5	380	511	96,6	96,3	95,9	1395	4,26
SR2Ca 355L C4	280	1782,5	380	570	96,7	96,4	96	1415	4,64
SR2Ca 355L D4	315	2005,4	380	640	96,9	96,5	96,1	1435	5,02
SR2Ca 355L E4	355	2260,0	380	726	97	96,6	96,2	1455	5,39
SR2Ca 355L F4	400	2546,5	370	829	97,1	96,7	96,3	1475	5,96
SR2Ca 355L G4	450	2864,8	355	980	97,2	96,8	96,4	1640	6,43

3000rpm rated speed at 50Hz - Duty cycle S1; protection level IP55; cooling IC411 - Thermal class F; temperature rise B

Type	Rated Power	Speed	Rated Torque	Rated Voltage	Rated current at 400V	Efficiency full load	Efficiency 3/4 load	Efficiency 1/2 load	Footed motor weight	Moment of inertia
	Pn	r/min	Mn	Vn	In	η	η	η	kg	kgm²
	kW		Nm	V	A	%	%	%		
SR2Ca 250M B4	75	3000	238,7	370	152	95,9	95,3	94,6	430	0,42
SR2Ca 280S-M B4	90	3000	286,5	375	188	95,3	94,9	94,5	623	0,75
SR2Ca 280S-M C4	110	3000	350,1	370	235	95,7	95,2	94,6	650	0,88
SR2Ca 315S-M A4	132	3000	420,2	380	265	95,4	95,1	94,5	795	1,37
SR2Ca 315S-M C4	160	3000	509,3	370	328	95,7	95,2	94,6	955	1,82
SR2Ca 315M-L D4	180	3000	573,0	380	362	95,9	95,5	94,9	970	2,01
SR2Ca 315M-L E4	200	3000	636,6	380	398	96,0	95,6	95,0	1010	2,24
SR2Ca 355L B4	250	3000	795,8	380	515	96,3	95,9	95,3	1395	4,26
SR2Ca 355L C4	280	3000	891,3	380	544	96,5	96,1	95,5	1415	4,64
SR2Ca 355L D4	315	3000	1002,7	350	667	96,7	96,3	95,7	1435	5,02
SR2Ca 355L E4	355	3000	1130,0	380	694	96,9	96,5	95,9	1455	5,39
SR2Ca 355L F4	400	3000	1273,2	355	845	97,0	96,6	96,0	1475	5,96
SR2Ca 355L G4	450	3000	1432,4	380	896	97,1	96,7	96,1	1640	6,43

Cast iron frame- IP55 - IC411

The technical drawing consists of three views of the motor:

- Front View (Left):** Shows the motor's profile. Key dimensions include a total width of 361 mm, a mounting bracket width of 198 mm, and a base width of 718 mm. The mounting holes are specified as n.2xM50+n.1xM12.
- Top View (Right):** Shows the motor from above. Key dimensions include a total width of 486 mm, a mounting bracket width of 198 mm, and a base width of 486 mm. The mounting holes are specified as n.2xM50+n.1xM12.
- Shaft View (Bottom Right):** Shows the shaft end. Key dimensions include a shaft diameter of $\varnothing 25$, a keyway width of 18 mm, and a key height of 11 mm. The shaft is specified as M20.

[illegible]

Technical drawing of the motor showing three views: front, top, and side. The front view shows a total length of 858 mm, a mounting flange diameter of 361 mm, and a shaft diameter of 450 mm. The top view shows a circular motor body with a diameter of 550 mm and a mounting flange diameter of 198 mm. The side view shows a mounting flange with a diameter of 65 mm and a mounting hole diameter of 11 mm. The motor is labeled with 'n.2xM50+n.1xM12' for the mounting holes.

Cast iron frame- IP55 - IC411

[illegible][illegible][illegible]

Technical drawing of the motor showing three views: front, top, and side. The front view shows a total length of 972 mm, with a mounting bracket width of 387 mm and a base width of 2212 mm. The top view shows a circular frame with a diameter of 500 mm and a mounting bracket diameter of 259 mm. The side view shows a total height of 398 mm and a base diameter of 450 mm. The motor is labeled with 'n.2xM50+1.n.1xM12' and 'M20'.

Cast iron frame- IP55 - IC411

[illegible][illegible]

Technical drawing of the 3000 series motor, showing front, top, and detail views with dimensions in mm.

Front View Dimensions:

- Total width: 1265
- Distance from mounting flange to center: 1110
- Motor body width: 940
- Distance from mounting flange to terminal box: 170
- Terminal box width: 453
- Terminal box height: 23
- Terminal box mounting hole diameter: 6
- Terminal box mounting hole pitch: $n.2 \times M6.3 + n.1 \times M12$
- Mounting flange outer diameter: $\varnothing 550 \text{ h}9 / -0.044$
- Mounting flange thickness: 10

Top View Dimensions:

- Terminal box width: 330
- Terminal box height: $\varnothing 660$
- Terminal box mounting hole pitch: $n.2 \times M6.3 + n.1 \times M12$
- Motor body outer diameter: $\varnothing 600$
- Motor body mounting hole pitch: $\varnothing 24$
- Motor body mounting hole diameter: 22.5
- Motor body mounting hole angle: 45°

Detail View Dimensions:

- Mounting flange outer diameter: $\varnothing 85 \text{ m}6 (+0.035 / +0.013)$
- Mounting flange thickness: 14
- Mounting flange hole diameter: M20
- Mounting flange hole pitch: 90

Cast iron frame- IP55 - IC411

Technical drawing of the 3000W motor showing front, side, and detail views with dimensions in mm.

Front View Dimensions:

- Total width: 453
- Top flange width: 330
- Terminal box mounting holes: $n \times M63 + n \times M12$
- Base mounting feet dimensions: 142, 70, 457, 508, 625, 156
- Base width: 1061
- Base height: 170
- Total base length: 1231

Side View Dimensions:

- Total height: 645
- Terminal box width: 330
- Terminal box height: 800
- Terminal box mounting holes: $n \times M63 + n \times M12$
- Base mounting feet dimensions: 315, 50, 126, 508, 610
- Base diameter: $\varnothing 28$

Detail View Dimensions:

- Mounting hole diameter: $\varnothing 85 \text{ m6} (+0.035 / +0.013)$
- Mounting hole depth: 22
- Mounting hole diameter: M20
- Mounting hole diameter: 14
- Mounting hole diameter: 90

[illegible]

Technical drawing of the motor showing front, top, and detail views with dimensions.

Front View Dimensions:

- Total width: 453
- Top mounting bracket width: 330
- Top mounting bracket height: 23
- Top mounting bracket thickness: 6
- Top mounting bracket holes: $n \cdot 2 \times M63 + n \cdot 1 \times M12$
- Motor body diameter: $\varnothing 550 \begin{smallmatrix} 0.002 \\ -0.044 \end{smallmatrix}$
- Motor body length: 1061
- Motor body mounting flange diameter: 1231
- Motor body mounting flange thickness: 170

Top View Dimensions:

- Motor body diameter: $\varnothing 660$
- Top mounting bracket width: 330
- Top mounting bracket height: 485
- Top mounting bracket thickness: 22
- Top mounting bracket holes: $M20$
- Top mounting bracket mounting flange diameter: $\varnothing 85 \begin{smallmatrix} +0.035 \\ +0.013 \end{smallmatrix}$
- Top mounting bracket mounting flange thickness: 14
- Top mounting bracket mounting flange hole diameter: $\varnothing 90$
- Top mounting bracket mounting flange hole position: 90
- Top mounting bracket mounting flange hole diameter: $\varnothing 24$
- Top mounting bracket mounting flange hole position: 45° and 22.5°

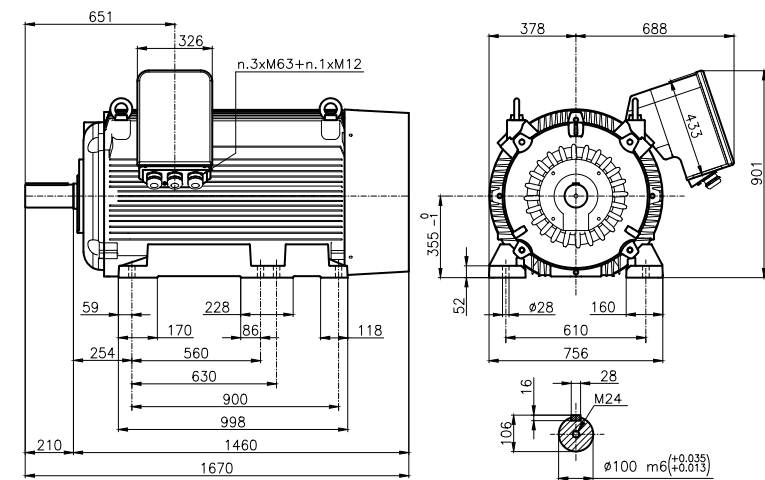
Technical drawing of the motor showing front, top, and detail views with dimensions:

- Front View:**
 - Total width: 453
 - Top flange width: 23
 - Flange thickness: 6
 - Motor body width: 330
 - Terminal box dimensions: $n.2 \times M6.3 + n.1 \times M12$
 - Shaft diameter: $\varnothing 550 \text{ h6 } \begin{smallmatrix} 0.0020 \\ -0.044 \end{smallmatrix}$
 - Base flange diameter: 170
 - Motor body length: 1061
 - Total length: 1231
 - Overall length including base: 1386
- Top View:**
 - Terminal box width: 330
 - Overall diameter: $\varnothing 660$
 - Height: 485
 - Flange diameter: $\varnothing 24$
 - Flange thickness: 22
 - Flange hole diameter: $\varnothing 600$
 - Flange hole spacing: 45°
- Detail View:**
 - Flange thickness: 14
 - Flange hole diameter: $\varnothing 85 \text{ m6 } \begin{smallmatrix} +0.035 \\ +0.013 \end{smallmatrix}$
 - Flange hole spacing: 90
 - Flange hole diameter: M20
 - Flange hole diameter: 22

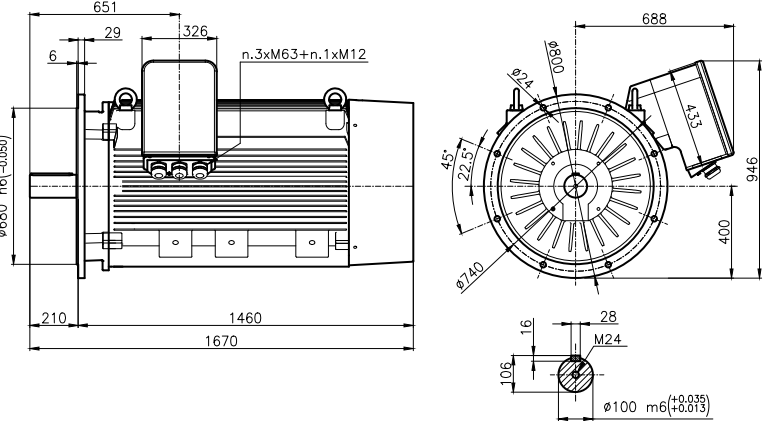
IEC355L - Motor Dimension

Cast iron frame- IP55 - IC411

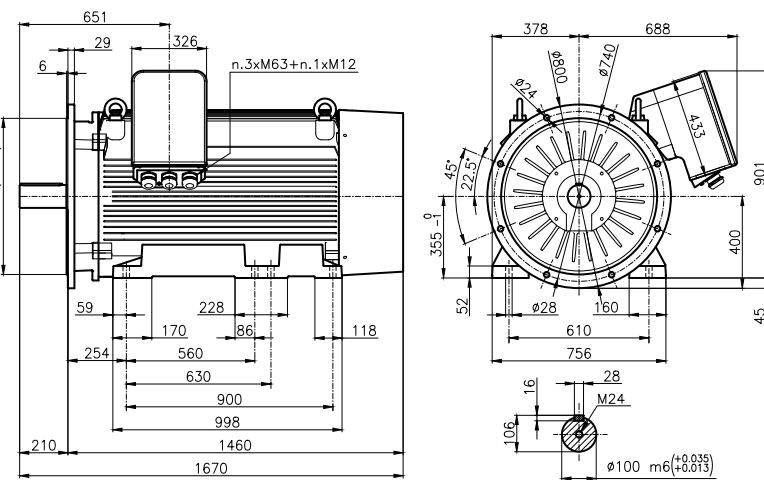
B3 - IM B3 (IM1001) - Horizontal position



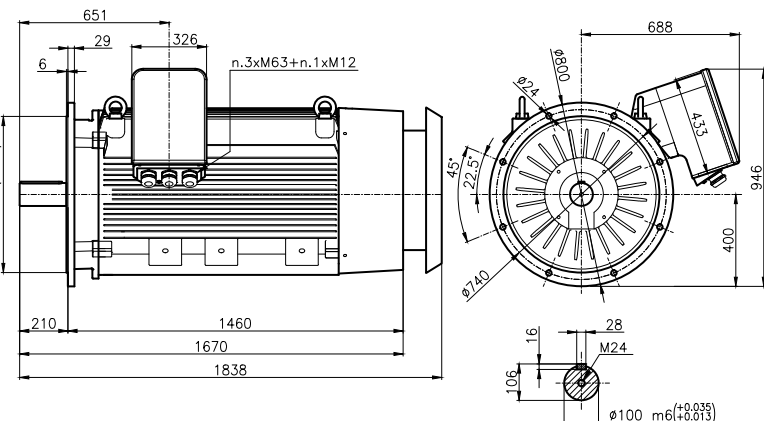
B5 - IM B5 (IM3001) - Horizontal position



B35- IM B35 (IM2001) - Horizontal position



B35 - IM V1 (IM3011) - Vertical position- Drive end down



Note

Note



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