

*High Efficiency*

## **SYNCHRONOUS RELUCTANCE MOTORS**

Power Range from 55 to 450 kW



## 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. 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.







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.

## PRODUCTION PLANTS

LOCATION	MOTORS PRODUCTION
<b>ARSIÈ - ITALY</b> 32030 (BL) Via A. Messedaglia 4	SINGLE AND THREE PHASE MOTORS HOLLOW SHAFT MOTORS IE2 AND IE3 MOTORS INVERTER AND MOTORINVERTER
<b>S. MAURO PASCOLI - ITALY</b> 47030 (FC) Via A. Grandi 23	GRADUAL BRAKE MOTORS HIGH TORQUE BRAKE MOTORS LOW CENTER MOTORS MOTORS FOR BURNERS
<b>PARMA - ITALY</b> 43122 (PR) Via Mantova 93	ATEX MOTORS HYDRAULIC MOTORS ENCAPSULATED WATERPROOF MOTORS OIL SUBMERGED MOTORS

# 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 315.

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## **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 retro-fitting. 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.



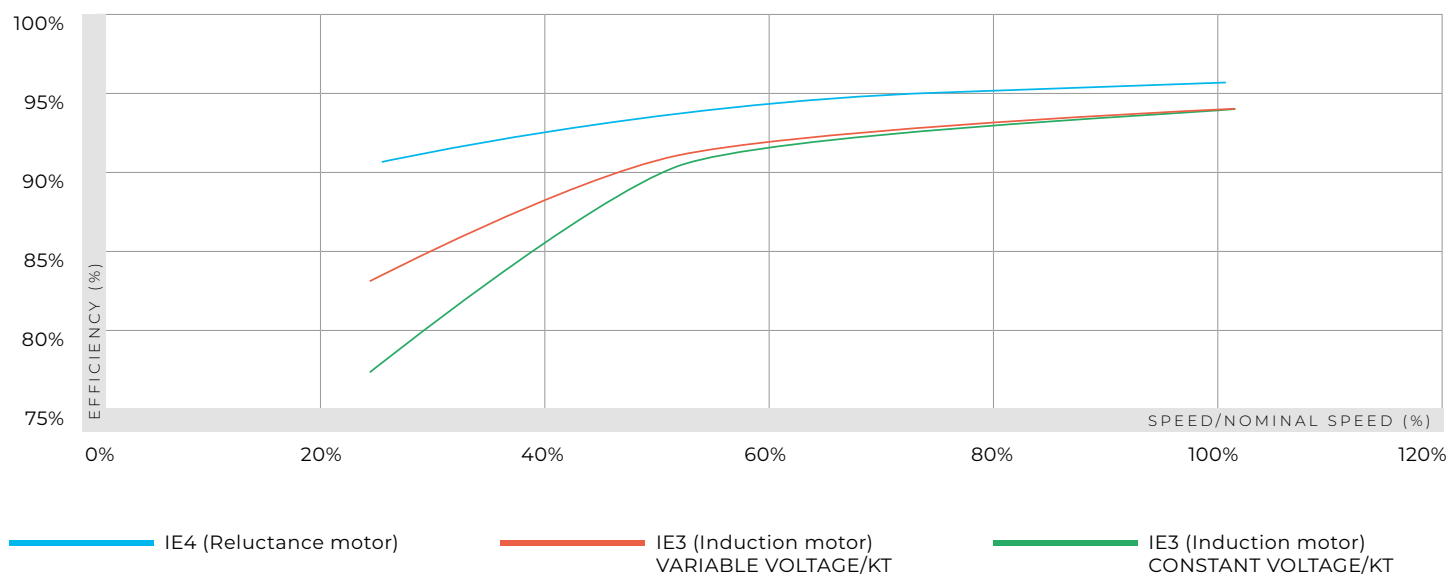
## Super premium efficiency IE4

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.

## Super premium efficiency IE4

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** - 4 Poles - 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	Power factor	Efficiency full load	Efficiency 3/4 load	Efficiency 1/2 load	Footed motor weight	Moment of inertia
	P <sub>n</sub>	M <sub>n</sub>	V <sub>n</sub>	I <sub>n</sub>	COS φ	η	η	η	kg	kgm <sup>2</sup>
	kW	Nm	V	A		%	%	%		
SR2Ca 250M 15 C4	55	350,1	380	112	0,78	95,8	95,6	95,2	460	0,50
SR2Ca 280S-M 15 B4	75	477,5	380	150	0,79	95,9	95,7	95,2	623	0,75
SR2Ca 280S-M 15 C4	90	573,0	360	193	0,78	96	95,8	95,3	650	0,88
SR2Ca 315S-M 15 B4	110	700,3	380	219	0,79	96,1	95,9	95,4	875	1,59
SR2Ca 315S-M 15 C4	132	840,3	380	261	0,8	96,4	95,6	95,3	955	1,82
SR2Ca 315M 15 D4	160	1018,6	380	317	0,79	96,5	95,7	95,4	970	2,01
SR2Ca 315M 15 E4	180	1145,9	380	356	0,8	96,5	95,8	95,5	1010	2,24
SR2Ca 315M 15 F4	200	1273,2	400	375	0,8	96,6	95,9	95,6	1055	2,51

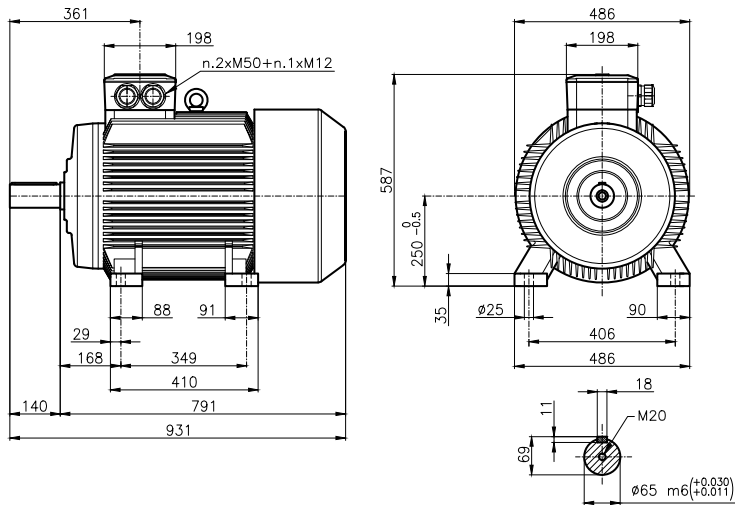
**3000rpm rated speed at 100Hz** - 4 Poles - Duty cycle S1; protection level IP55; cooling IC411 - Thermal class F; temperature rise B

Type	Rated Power	Rated Torque	Rated Voltage	Rated current at 400V	Power factor	Efficiency full load	Efficiency 3/4 load	Efficiency 1/2 load	Footed motor weight	Moment of inertia
	P <sub>n</sub>	M <sub>n</sub>	V <sub>n</sub>	I <sub>n</sub>	COS φ	η	η	η	kg	kgm <sup>2</sup>
	kW	Nm	V	A		%	%	%		
SR2Ca 250M 30 A4	55	175,1	370	115	0,78	95,8	95,2	94,6	430	0,42
SR2Ca 250M 30 B4	75	238,7	370	152	0,8	96,1	95,3	94,6	430	0,42
SR2Ca 280S-M 30 A4	75	238,7	370	159	0,77	95,9	94,8	94,4	623	0,75
SR2Ca 280S-M 30 B4	90	286,5	370	189	0,77	96	95,2	94,5	623	0,75
SR2Ca 280S-M 30 C4	110	350,1	370	236	0,76	96	95,2	94,6	650	0,88
SR2Ca 315S-M 30 A4	132	420,2	380	266	0,79	95,8	95,1	94,5	795	1,37
SR2Ca 315S-M 30 C4	160	509,3	370	330	0,79	96	95,2	94,6	955	1,82
SR2Ca 315M 30 D4	180	573,0	380	362	0,78	96,3	95,5	94,9	970	2,01
SR2Ca 315M 30 E4	200	636,6	380	401	0,79	96,4	95,6	95	1010	2,24

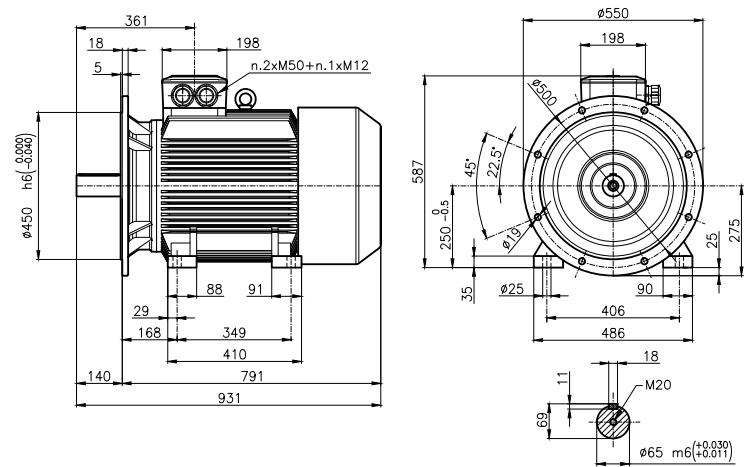
# IEC250M - Motor Dimension

Cast iron frame- IP55 - IC411

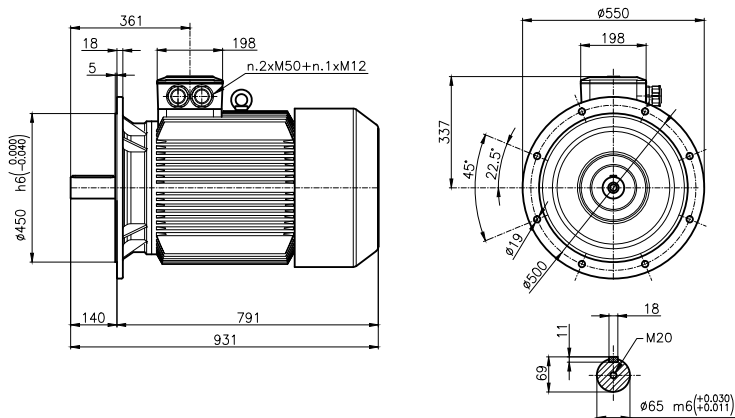
**B3 - IM B3 (IM1001)** - Horizontal position



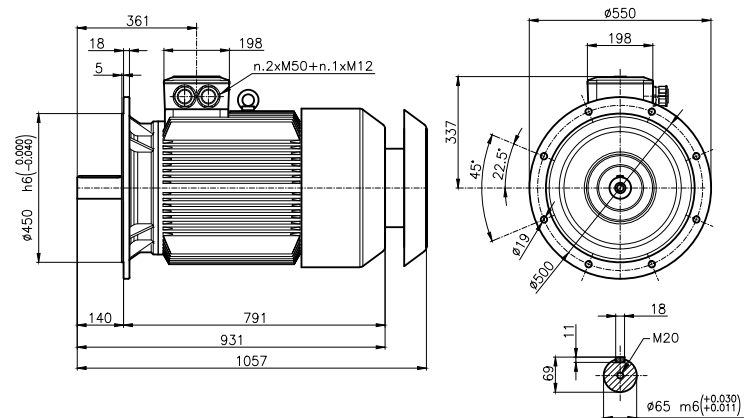
**B35- IM B35 (IM2001)** - Horizontal position



**B5 - IM B5 (IM3001)** - Horizontal position



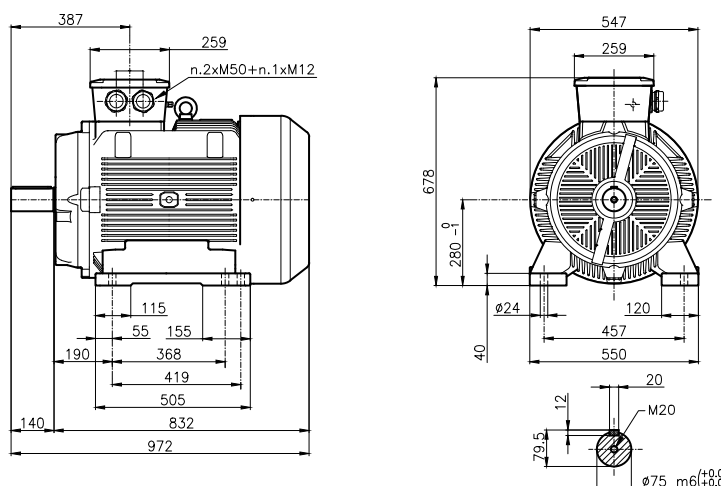
**B35 - IM V1 (IM3011)** - Vertical position  
Drive end down



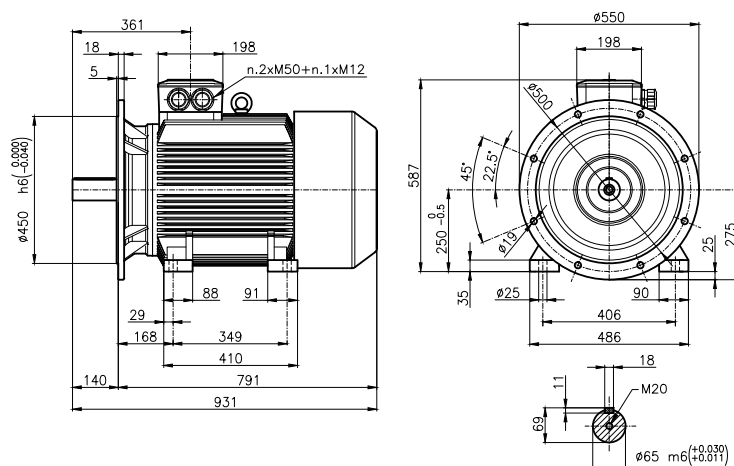
# IEC280S-M - Motor Dimension

Cast iron frame- IP55 - IC411

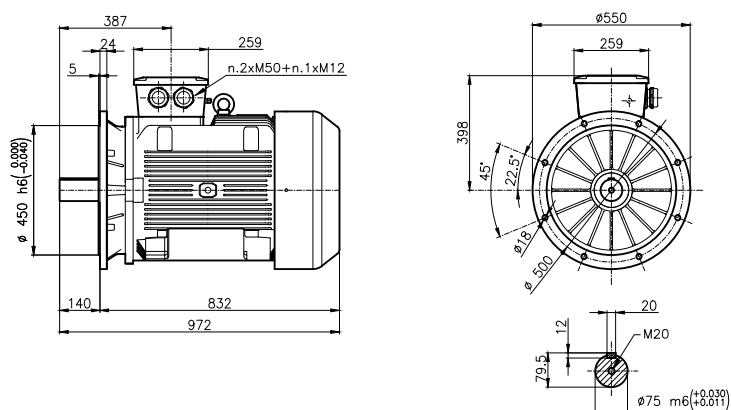
**B3 - IM B3 (IM1001)** - Horizontal position



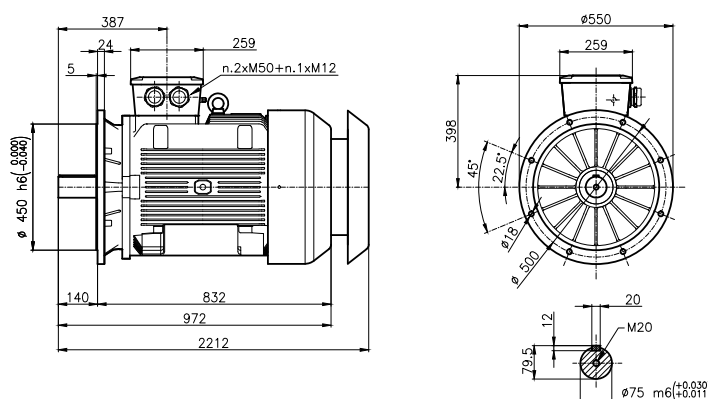
**B35- IM B35 (IM2001)** - Horizontal position



**B5 - IM B5 (IM3001)** - Horizontal position



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

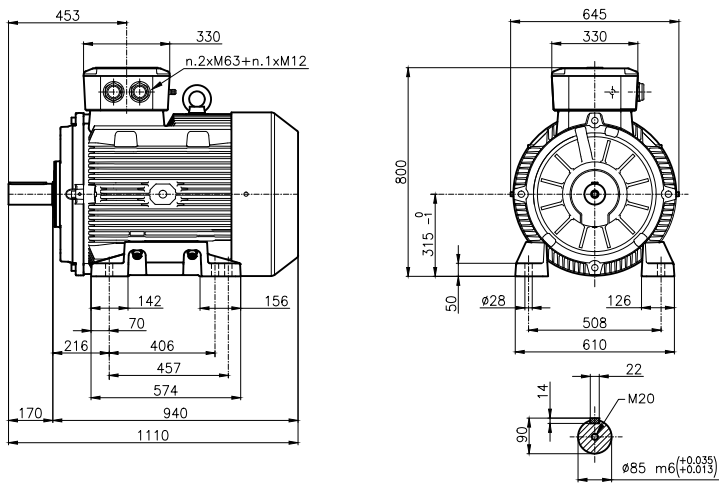




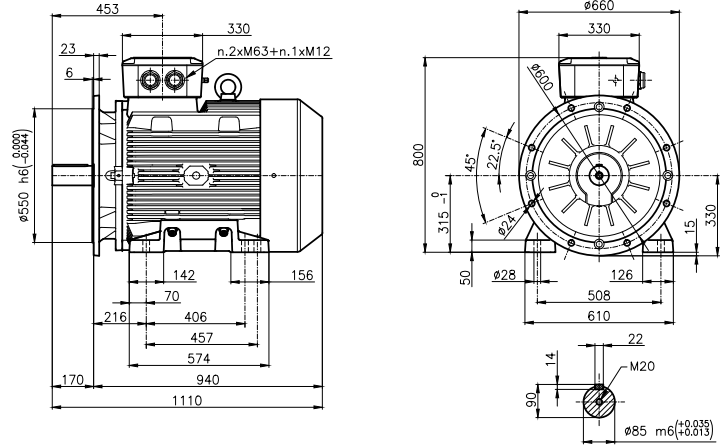
# IEC315S-M - Motor Dimension

Cast iron frame- IP55 - IC411

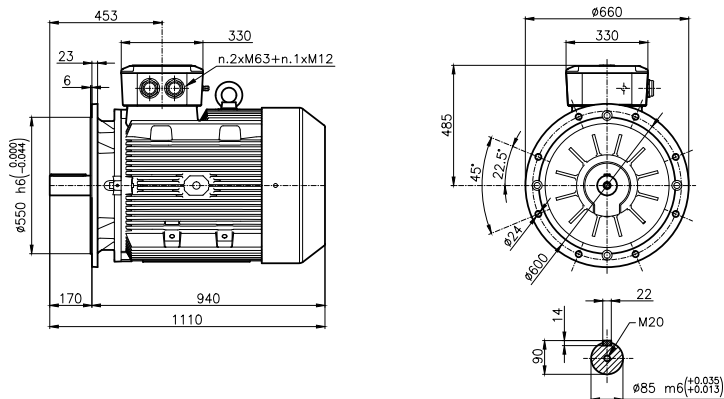
**B3 - IM B3 (IM1001)** - Horizontal position



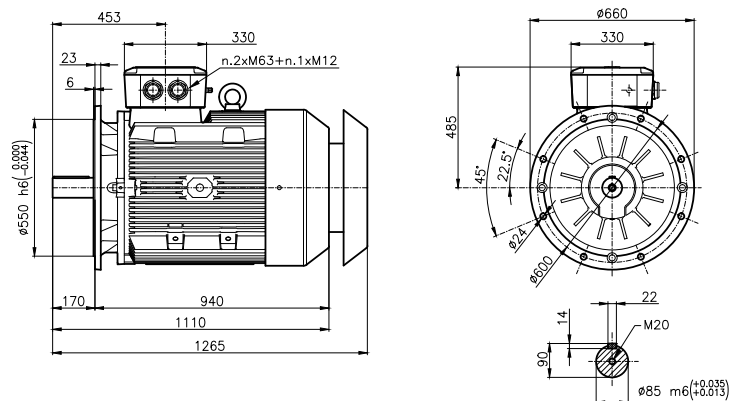
**B35- IM B35 (IM2001)** - Horizontal position



**B5 - IM B5 (IM3001)** - Horizontal position



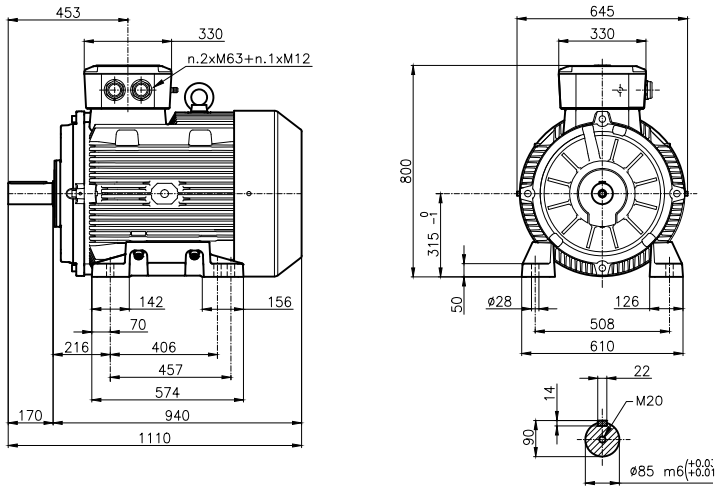
**B35 - IM V1 (IM3011)** - Vertical position  
Drive end down



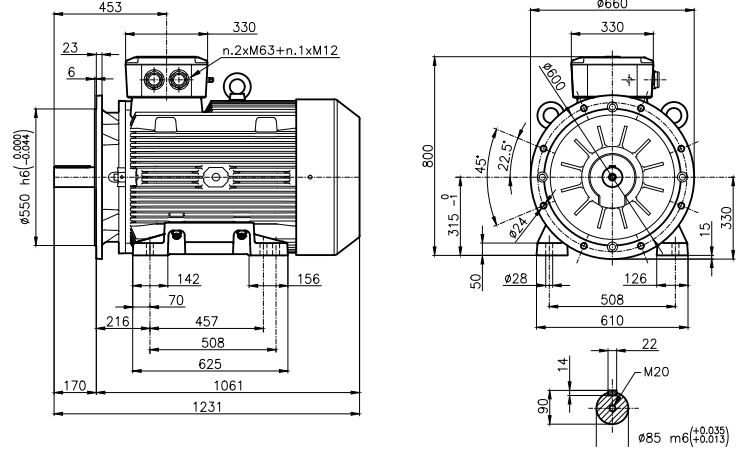
# IEC315M-L - Motor Dimension

Cast iron frame- IP55 - IC411

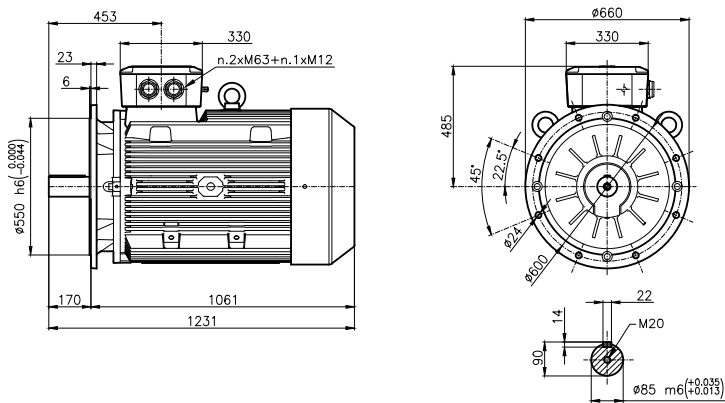
**B3 - IM B3 (IM1001)** - Horizontal position



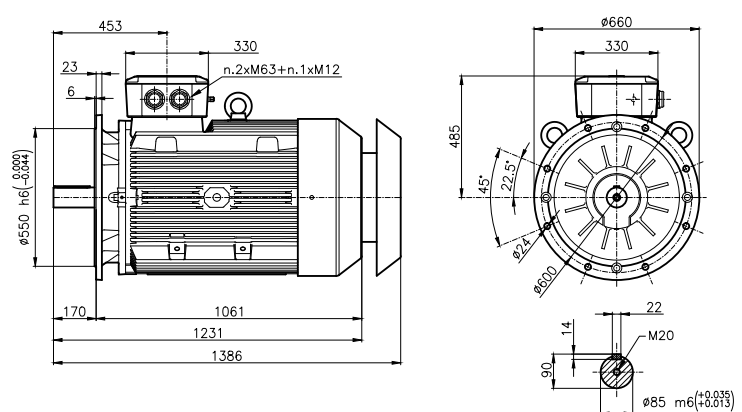
**B35- IM B35 (IM2001)** - Horizontal position



**B5 - IM B5 (IM3001)** - Horizontal position



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





**HIGHER ENVIRONMENTAL SUSTAINABILITY  
WITH ENERGY SAVING UP TO OVER 70%**



**ORANGE1**  
HOLDING





**ORANGE1**  
*Electric Motors Spa*

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