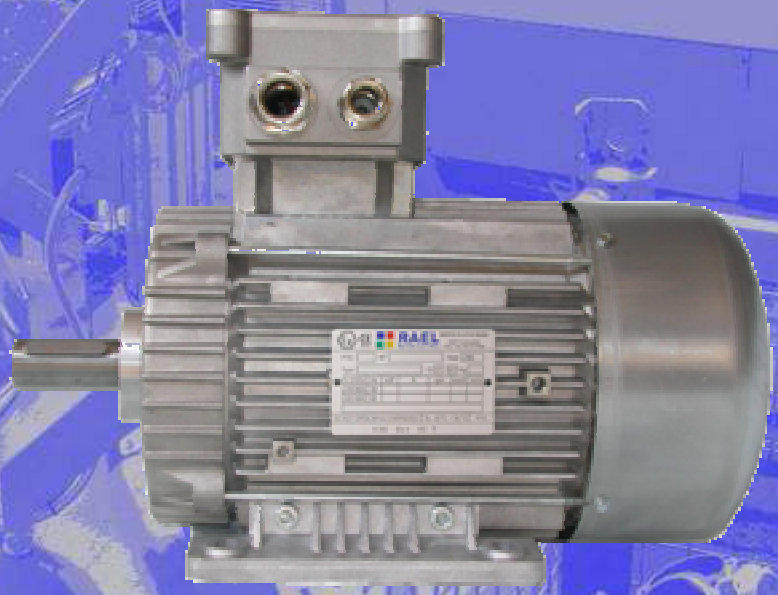
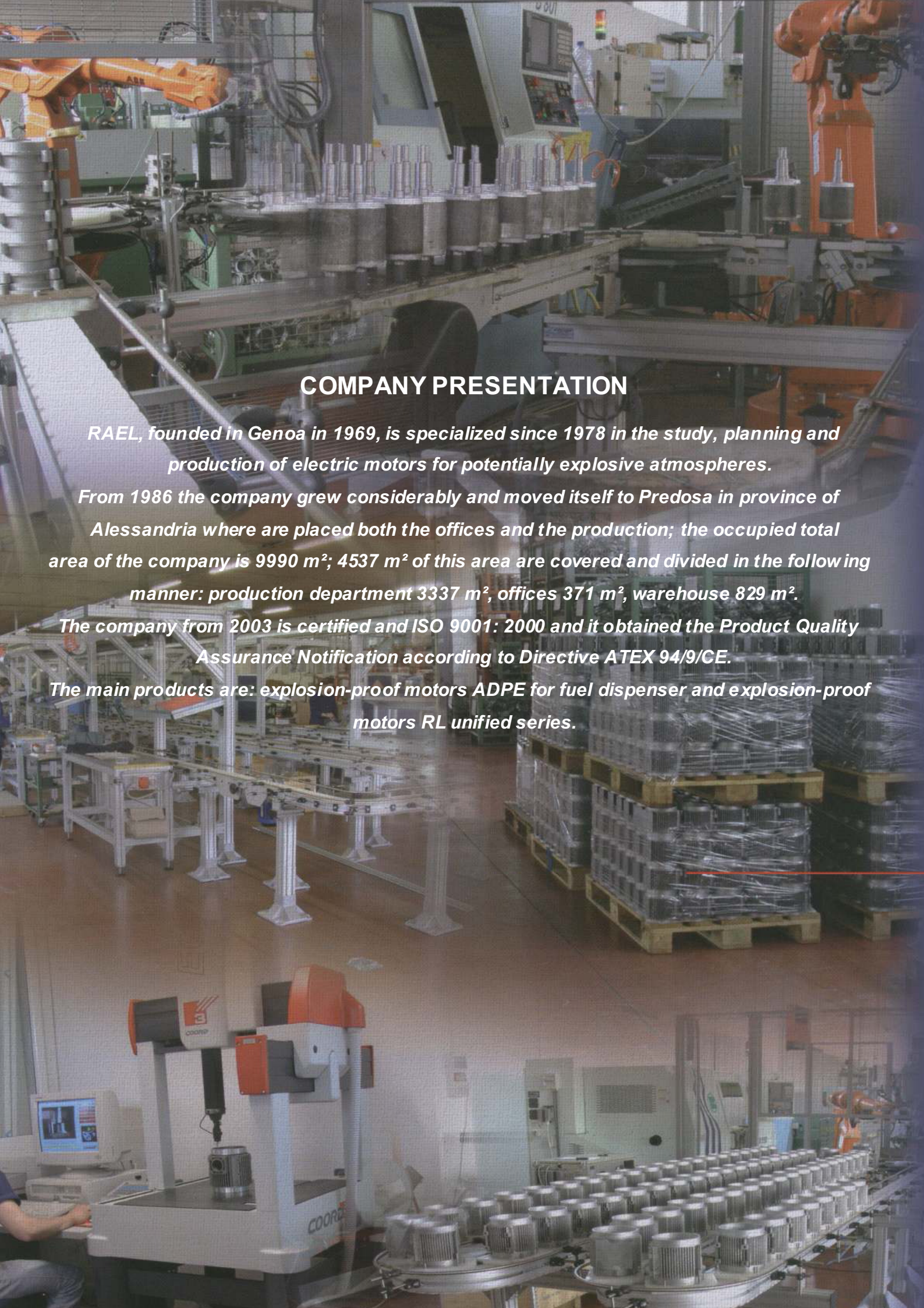
RAEL
MOTORI ELETTRICI

Flameproof motors

Ex d IIB
Ex d IIC
Ex de IIC



RL Series
ALUMINIUM
56 - 160



COMPANY PRESENTATION

RAEL, founded in Genoa in 1969, is specialized since 1978 in the study, planning and production of electric motors for potentially explosive atmospheres.

From 1986 the company grew considerably and moved itself to Predosa in province of Alessandria where are placed both the offices and the production; the occupied total area of the company is 9990 m²; 4537 m² of this area are covered and divided in the following manner: production department 3337 m², offices 371 m², warehouse 829 m².

The company from 2003 is certified and ISO 9001: 2000 and it obtained the Product Quality Assurance Notification according to Directive ATEX 94/9/CE.

The main products are: explosion-proof motors ADPE for fuel dispenser and explosion-proof motors RL unified series.

CONTENTS

1. INTRODUCTION 4
1.0 SI Units 4
1.1 Standards of reference 5
1.2 Tolerances 6
1.3 Hazardous places 7
1.4 Temperature Classes 9
1.5 Electric motor choice 12
2. GENERAL INFORMATION 13
2.1 Range of Motors 13
2.2 Main features 14
2.3 Main Options 14
3. TERMINAL BOX 16
3.1 Possible versions 16
3.2 Cable entries and terminals 17
3.3 Connecting diagrams 18
4. MECHANICAL CHARACTERISTIC 19
4.1 Mounting arrangements 19
4.2 Materials 20
5. ELECTRICAL DATA 21
5.1 Three phase motors - 1 speed 21
5.2 Three-phase Motors 2 speed – Constant Torque 26
(for general purpose) 26
5.3 Motori trifasi 2 velocità Coppia Quadratica 30
(For centrifugal machines) 30
5.4 Single-phase motors 34
6. OVERALL DIMENSIONS 35
6.1 Three-phase motors 35
6.2 Servo-Ventilated Motors 36
6.3 Single-phase motors 36
6.4 Terminal box 37
7. SPARE PARTS 38
7.1 Personnel qualification 38
7.2 List of spare parts 38

1. INTRODUCTION

1.0 SI Units

Base units

Base quantity	Base quantity symbol	SI Name	SI Symbol
length	*l*	meter	m
mass	*m*	kilogram	kg
time	*t*	second	s
electric current	*I, i*	ampere	A
thermodynamic temperature	*T*	Kelvin	K
amount of substance	*n*	mole	mol
luminous intensity	I_V	candela	cd

Derived units

Derived quantity	Derived quantity symbol	SI Name	SI symbol	Expression in terms of other SI units	Expression in terms of SI base units
frequency	hertz	Hz	-	-	s^{-1}
force	F	Newton	N	-	$kg \cdot m \cdot s^{-2}$
pressure, stress	p	Pascal	Pa	$N \cdot m^{-2}$	$kg \cdot m^{-1} \cdot s^{-2}$
energy, work, quantity of heat	E	joule	J	$N \cdot m$	$kg \cdot m^{2} \cdot s^{-2}$
power	P, W	watt	W	$J \cdot s^{-1}$	$kg \cdot m^{2} \cdot s^{-3}$
electric charge	q	coulomb	C		$A \cdot s$
electric potential difference, electromotive force	v	volt	V	$J \cdot C^{-1}$	$m^{2} \cdot kg \cdot s^{-3} \cdot A^{-1}$
electric resistance	R	ohm	Ω	$V \cdot A^{-1}$	$m^{2} \cdot kg \cdot s^{-3} \cdot A^{-2}$
electric conductance	G	siemens	S	$A \cdot V^{-1}$	$s^{3} \cdot A^{2} \cdot m^{-2} \cdot kg^{-1}$
capacitance	C	farad	F	$C \cdot V^{-1}$	$s^{4} \cdot A^{2} \cdot m^{-2} \cdot kg^{-1}$
magnetic flux density	B	tesla	T	$V \cdot s \cdot m^{-2}$	$kg \cdot s^{-2} \cdot A^{-1}$
magnetic flux	Φ(B)	Weber	Wb	$V \cdot s$	$m^{2} \cdot kg \cdot s^{-2} \cdot A^{-1}$
inductance	L	Henry	H	$V \cdot s \cdot A^{-1}$	$m^{2} \cdot kg \cdot s^{-2} \cdot A^{-2}$
Celsius temperature	T	degree Celsius	°C	K	
plane angle	φ,θ	radiant	rad	1	$m \cdot m^{-1}$
luminance		lux	lx	$cd \cdot sr \cdot m^{-2}$	

Other derived quantities

area	A				m^{2}
volume	V				m^{3}
speed, velocity	v				$m \cdot s^{-1}$
angular velocity	ω				s^{-1}
					$rad \cdot s^{-1}$
acceleration	a				$m \cdot s^{-2}$
Torque, moment of force	M			$N \cdot m$	$m^{2} \cdot kg \cdot s^{-2}$
moment of inertia	J				$Kg\ m^{2}$
mass density	ρ				$kg \cdot m^{-3}$
specific volume					$m^{3} \cdot kg^{-1}$
dynamic viscosity	ρ			$N \cdot s \cdot m^{-2}$	$m^{-1} \cdot kg \cdot s^{-1}$
				$Pa \cdot s$	

1.1 Standards of reference

RAEL motors are constructed in compliance with the following standard.

Title	EU CENELEC	International IEC
Rotating electrical machines Part 1: Rating and performance	EN 60034-1	IEC 60034-1
Rotating electrical machines Part 2-1:Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	EN 60034-2	IEC 60034-2
Rotating electrical machines. Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code). Classification	EN 60034-5	IEC 60034-5
Rotating electrical machines Part 6: Methods of cooling (IC Code)	EN 60034 -6	IEC 60034 -6
Rotating electrical machines Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code)	EN 60034-7	IEC 60034-7
Rotating electrical machines Part 9: Noise limits	EN 60034-9	IEC 60034-9
Rotating electrical machines Part 12: Starting performance of single-speed three-phase cage induction motors	EN 60034-12	IEC 60034-12
Rotating electrical machines Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity	EN 60034-14	IEC 60034-14
General purpose three-phase induction motors having standard dimensions and outputs. Frame numbers 56 to 315 and flange numbers 65 to 740	EN 50347	IEC 60072-1
Degrees of protection provided by enclosures (IP Code)	EN 60259	IEC 60529
Electrical apparatus for explosive gas atmospheres Part 0: General requirements	EN 60079-0	IEC 60079-0
Electrical apparatus for explosive gas atmospheres Part 1: Flameproof enclosures 'd'	EN 60079-1	IEC 60079-1
Electrical apparatus for explosive gas atmospheres Part 7: Increased safety "e"	EN 60079-7	IEC 60079-7
Electrical apparatus for use in the presence of combustible dust Part 0: General requirements	EN 61241-0	IEC 61241-0
Electrical apparatus for use in the presence of combustible dust Part 1: Protection by enclosures "tD"	EN 61241-1	IEC 61241-1

1.2 Tolerances

Mechanical tolerances following EN 50347 and IEC 60072-1:

Symbol	Description	Tolerance	
A	Distance between centre-lines of fixing holes (end view)	± 1 mm	
AB	Overall dimensions across the feet (end view)	+ 2 %	
AC	Diameter of the motor (without terminal box)	+ 2 %	
B	Distance between centre-lines of fixing holes (side view)	± 1 mm	
C - CA	Distance from the shaft end shoulder to the centre-line of nearest mounting holes in the feet	± 3 mm	
D - DA	Diameter of the shaft extension.	Ø 11 – 28 Ø 32 – 48 Ø ≥ 55	j6 k6 m6
E - EA	Length of the shaft extension from the shoulder	Ø < 55 mm Ø > 60 mm	- 0,3 mm + 0,5 mm
F - FA	Width of the key way of the shaft extension	h9	
GA - GC	Distance from the top of the key to the opposite surface of the shaft extension	+ 0,2 mm	
H	Distance between the centre-line of the shaft to the bottom of the feet	H ≤ 250 H ≥ 280	- 0,5 mm - 1 mm
HD	Distance from the top of the terminal box and to the bottom of the feet	+ 2 %	
K	Diameter of the holes or width of the slots in the feet of the motor	+ 3 %	
L	Overall length of the motor with a single shaft extension	+ 1 %	
M	Pitch circle diameter of the fixing holes	± 0,8 mm	
N	Diameter of the spigot	Ø < 230 j6 Ø ≥ 250 h6	
P	Outside diameter of the flange	± 1 mm	
R	Distance from the shaft shoulder to the mounting surface of the flange	± 3 mm	
S	Diameter of the fixing holes in the mounting flange or nominal diameter of thread	+ 3 %	
	Distance from the shaft shoulder to the mounting surface of the flange with locked bearing	± 0,5 mm	
	Mass of the motor	– 5 a + 10 %	

Tolerances electrical parameter following EN 60034-1 and IEC 60034-1:

Quantity	Tolerance
Efficiency **(η)**	- 0,15 (1-η) for $P_N \leq 50$ kW
Total losses	+10%
Power factor **(Cos φ)**	$\frac{1-\cos\varphi}{6}$ minimum absolute value 0,02 maximum absolute value 0,07
Slip **(rpm)** (at full load and working temperature)	± 30% per $P_N < 1$ kW ± 20% per $P_N \geq 1$ kW
Locked rotor current **(I_A)**	+ 20%
Locked rotor torque **(T_A)**	-15% a +25%
Breakdown torque **(T_{max})**	-10% (for this tolerance the value T_{max} / T_n should be at least 1,6)
Moment de Inertia **(J)**	±10%
Sound intensity level **(sound pressure)**	+3 dB (A)

1.3 Hazardous places

1.3.1 General information

DIRECTIVE 1999/92/EC on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.

'Explosive atmosphere' means a mixture with air, under atmospheric conditions, of flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

The directive gives information regarding '**Classification of places where explosive atmosphere may occur'.**

The classification of hazardous places in zones competes to the customer whose working centres and activities contain or give place to such dangers.

The safety against explosion can be only reached with the contribution, and the mutual informative exchange, both the manufacturer and the final users.

INDICATIONS REGARDING THECLASSIFICATION OF PLACES WHERE EXPLOSIVE ATMOSPHERES MAY OCCUR

For the classification of the areas reference to the relative harmonized technical norms regarding the specific fields:

- EN 60079-10 (IEC 60079-10) Electrical apparatus for explosive gas atmospheres.
  Part 10: Classification of hazardous areas.
- EN 61241-10 (IEC61241-10) Electrical apparatus for use in the presence of combustible dust
  Part 10: Classification of areas where combustible dusts are or may be present.

Zone 0
A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is present continuously or for long periods or frequently.
Note: In general, said conditions, when they present, they interest the inside of tanks, tubes and containers, etc.

Zone 1
A place in which an explosive atmosphere consisting of a mixture with air or flammable substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.
Note: such zone can also comprise:
- places in the immediate vicinities of zone 0;
- places in the immediate vicinities of the feeding openings;
- places in the immediate vicinities of the filling openings and emptying;
- places in the immediate vicinities of apparatuses, systems of protection and fragile components of glass, ceramics and analogous materials;
- places in the immediate vicinities of glands not sufficiently sealing, as an example on pumps and valves with glands.

Zone 2
A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.
Note: such zone can also comprise, surrounding places zones 0 or 1.

Zone 20
A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.
Note: In general, said conditions, when they present, they interest the inside of tanks, tubes and containers, etc.

Zone 21
A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.
Note: such zone can also comprise, for example, places in the immediate vicinities of loading points and powder emptying and places in which powder layers are formed or that, during the normal operation, could produce one explosive combustible powder concentration in mixture with the air.

Zone 22
A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.
Note: such zone can also comprise, places in proximity of apparatuses, systems of protection and components containing powders, from which the powders can leak out because of losses and to form layers of powders (for example salt from milling, in which the powder leak from the mills and it is deposited).

Notes:
1. Layers, deposits and heaps of combustible dust must be considered as any other source which can form an explosive atmosphere.
2. 'Normal operation' means the situation when installations are used within their design parameters.

1.3.2 Classification of the equipment for areas where explosive atmosphere may occur

GROUPS AND CATEGORIES OF APPARATUSES

Within the directive 94/9/CE, the apparatuses, comprised if necessary the devices and the components are divided in two groups.

Group I comprises equipment intended for use in the underground parts of mines, and to those parts of surface installations of such mines, likely to become endangered by firedamp and/or combustible dust.
It is sub-divided into 2 Categories, as shown below:

Category M1: very high level of protection
Category M2: high level of protection

Group II comprises equipment intended for use in other places likely to become endangered by explosive atmospheres.
It is sub-divided into 3 Categories, as shown below

Category 1: very high level of protection
Category 2: high level of protection
Category 3: normal level of protection

For the type of protection "d", "i", "nC" and "nL", the electrical apparatus of Group II are subdivided in IIA, IIB and IIC, like prescribed in the relative specific European Norms regarding these types of protection.

How much higher is the possibility that an explosive atmosphere can take place, much higher must be the level of the adopted safety measures.

CRITERIA FOR THE CHOICE OF THE APPARATUSES AND THE SYSTEMS OF PROTECTION

In case the document on the protection against explosion based on the risk assessment does not preview otherwise, in all the areas in which explosive atmospheres can be formed are used apparatuses and systems of protection correspondents to the categories as per directive 94/9/CEE.
In particular, in such areas the following categories of apparatuses are used, provided that adapted, to second of the cases, to gas, vapours or fogs and/or powders:

- in zone 0 or zone 20, apparatuses of category 1;
- in zone 1 or zone 21, apparatuses of category 2;
- in zone 2 or zone 22, apparatuses of category 3;

Below you can find an outline for the choice of means of protection in function of the use zone.

GRUOP	CATEGORY	Means of protection			Explosive atmosphere presence	Zone
		Level	Characteristic of protection (All. I)	Characteristic of protection (All. II)		
II	1	Very high	In case of breakdown of means of protection, the level of safety is guaranteed from at least a second independent mean of protection. Moreover, the level of safety is guaranteed even if two independent anomalies are manifested	They must be planned and manufactured so that the sources of ignition are not activated, not even in case of exceptional anomalies of the apparatus	continuously or for long periods	0 1 2 20 21 22
	2	High	The level of safety is guaranteed also in presence of recurrent anomalies or defects of operation of the apparatuses of which it is habitually necessary to hold account.	They must be planned and manufactured so as to avoid sources of ignition, also in case of recurrent anomalies or defects of operation of the apparatuses of which it is habitually necessary to hold account.	Intermediate situation between previous and the successive one	1 2 21 22
	3	Normal	The level of safety is guaranteed in the normal operation.	They must be planned and manufactured so as to avoid sources of ignition expectable during the normal operation.	Scarce probability and if it take place is of short duration	2 22

1.4 Temperature Classes

1.4.1 Explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist (GAS)

Ignition temperature of an explosive gas atmosphere

Lowest temperature of a heated surface which, under specified conditions according to IEC 60079-4, will ignite a flammable substance in the form of a gas or vapour mixture with air.

Maximum surface temperature

Highest temperature which is attained in service under the most adverse conditions (but within the specified tolerances) by any part or surface of an electrical apparatus, which would be able to produce an ignition of the surrounding explosive atmosphere.

Group II electrical apparatus, in function of their maximum surface temperature shall be marked either classified in a temperature class given in Table below:

Classification of maximum surface temperatures for Group II electrical apparatus

Temperature class	Maximum surface temperature (°C)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

The maximum surface temperature shall not exceed the lowest ignition temperature of the explosive atmospheres concerned.

As far as the electric motors the maximum surface temperature will be referred to the temperature of:

the **external surface** of the enclosure as far as the *Flameproof enclosures 'd'* (EN 60079-1, IEC 60079-1) and *Equipment protection by pressurized enclosures 'p'* (EN 60079-2, IEC 60079-2)

all the surfaces both external and internal as far as the *Increased safety "e"* (EN 60079-7, IEC60079-7) and the *Construction, test and marking of type of protection 'n' electrical apparatus* (EN 60079-15, IEC 60079-15).

Below there is a representing table of the main inflammable gaseous substances subdivided for group of gas with relative temperatures of ignition and classes of temperature.

Main inflammable substances subdivided for group of gas (IIA, IIB, IIC) and temperature of ignition.

Inflammable substance	Group of GAS	temperature of ignition	Class of Temperature (°C)	Inflammable substance	Group of GAS	temperature of ignition	Class of Temperature (°C)
2-Methylpentane	IIA	300	T2	Ethyl formate	IIA	440	T2
Amyl acetate	IIA	360	T2	Methyl formate	IIA	450	T1
Butyl-n acetate	IIA	425	T2	Natural gas	IIA	482	T1
Ethyl acetate	IIA	426	T2	Isobutane	IIA	460	T1
Isobutil acetate	IIA	420	T2	Isoheptane	IIA	220	T3
Methyl acetate	IIA	502	T1	Isohexane	IIA	264	T3
Propil acetate	IIA	430	T2	Isooctane	IIA	410	T2
Vinyl acetate	IIA	425	T2	Isoprene	IIA	220	T3
Acetone	IIA	465	T1	Methane	IIA	537	T1
Methanol	IIA	464	T1	Methylcyclopentane	IIA	258	T3
Bromethane	IIA	511	T1	Methylamine	IIA	430	T2
Butane	IIA	287	T3	Methylmetacrylate	IIA	430	T2
Butene - 1	IIA	384	T2	Paraldehyde	IIA	239	T3
Butene - 2	IIA	325	T2	Pentane	IIA	258	T3
Cycloexano	IIA	259	T3	Pyridine	IIA	483	T1
Cycloexanol	IIA	300	T2	Propane	IIA	470	T1
Cyclohexanone	IIA	419	T2	Propylamine	IIA	318	T2
Cyclohexene	IIA	244	T3	Propylbenzene	IIA	450	T1
Cyclopropane	IIA	498	T1	Propylene	IIA	455	T1
Cymene (p)	IIA	436	T2	Styrene	IIA	490	T1
Chloro-benzene	IIA	637	T1	Toluene	IIA	480	T1
Acetyl chloride	IIA	390	T2	m-Xylene	IIA	522	T1
Allyl chloride	IIA	390	T2	o-Xylene	IIA	464	T1
Chlorbutane	IIA	240	T3	p-Xilene	IIA	528	T1
Chloroethane	IIA	495	T1	1,2 Butadiene	IIB	430	T2
Vinyl chloride	IIA	472	T1	1,3 Butadiene	IIB	430	T2
Dichlorobenzene	IIA	648	T1	Dioxane	IIB	245	T3
Dichloroethylene 1,1	IIA	570	T1	Diethyl ether	IIB	160	T4
Dichloroethylene 1,2	IIA	441	T2	Ethyl vinyl ether	IIB	200	T3
Diethylamine	IIA	312	T2	Methyl vinyl ether	IIB	350	T2
Dimethylamine	IIA	400	T2	Acrylate ethyl	IIB	350	T2
Dimethylaniline	IIA	371	T2	Ethylene	IIB	425	T2
Dimethylbutane 2,3	IIA	405	T2	LPG	IIB	365	T2
Dimethylpentane 2,3	IIA	330	T2	Sulphurated Hydrogen	IIB	260	T3
Heptane	IIA	215	T3	Methylacrylate	IIB	415	T2
Hexane	IIA	233	T3	Carbon monoxide	IIB	605	T1
Heptane	IIA	515	T1	Ethylene oxide	IIB	435	T2
Ethylacetoacetate	IIA	350	T2	Propylene oxide	IIB	430	T2
Ethylamine	IIA	385	T2	Acetylene	IIC	305	T2
Ethylmercaptane	IIA	295	T3	Hydrogen	IIC	500	T1
Butyl formate	IIA	320	T2	Carbon disulfide	IIC	95	T6

1.4.2 Explosive atmosphere in the form of a cloud of combustible dust (DUST)

We take in consideration protection by enclosures "tD" (*Ex tD A)*. The ignition protection is based on the limitation of the maximum surface temperature of the enclosure and on other surfaces which could be in contact with dust and on the restriction of dust ingress into the enclosure by the use of "dust-tight" or "dust-protected" enclosures.

The choice of these constructions so to avoid primes due to excessive surface temperatures must be carried out in function of the limits of temperature of ignition for the presence of flammable dust both in form of clouds and layers.

In case of presence of flammable dust cloud, the maximum surface temperature will be

$T_{max(1)} = 2/3 \cdot T_{cl}$ with T_{cl} ignition temperature in °C of the dust cloud.

While in case of presence of a flammable dust layer:

$T_{max(2)} = T_l - 75$ °C with T_l ignition temperature in °C of a layer of dust 5 mm thick.

The surface temperature must be smaller or equal to the minimum value between $T_{max(1)}$ e $T_{max(2)}$.

Main inflammable substances (DUST) and their own maximum surface temperature

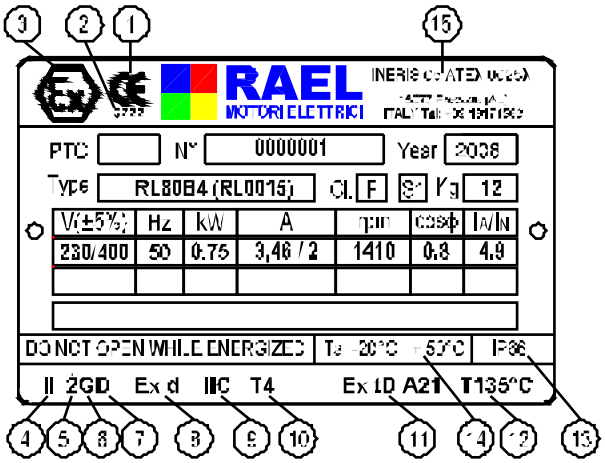
Substance	Medium largeness particles (µm)	LEL (g/m3)	Cloud ignition temperature T_{cl} (°C)	Layer 5mm thick ignition temperature T_l (°C)
Metals, alloys				
Aluminium	10	60	560	430
Bronze	18	750	390	260
Iron	12	500	580	>450
Graphite	7	30	600	680
Lamp-black (carbon black)	13	15	620	435
Sulphur	20	30	280	260
Wood, products of wood, fibres				
Paper		100	620	370
Cellulose (93% sweet wood, 6% hard wood)	14	15	420	335
wood flour	60		470	305
Wood (50% pear tree and 50% kernel)	35	100	500	340
Wood (beech)	61		490	310
Wood (pear tree)	27	100	500	320
Sawdust of wood	65		470	290
Cork	42	30	470	300
Agricultural products				
Cacao	3	125	460-540	245
Coffee	10	25	360	450
Cereals (mixed powders)	37	125	510	300
Wheat flour	56-125	60	480	>450
Soy flour	20	200	620	280
Gelatine	65	60	560	>450
Wheat		100	470	220
Dry milk	165	60	460	330
Milk sugar	22	60-125	450	>450
Rye			415-470	325
Buttermilk	400		450	420
Tobacco		60	485	290
Black tea	76	125	510	300
Sugar	32	30	360	>450
Powdered sugar	17	60	350	>450

1.5 Electric motor choice

After speaking about classification of areas with explosion atmosphere, motors groups and categories and classes of temperature, we can enter in the detail of the choice of the type of protection of the motor and the reading of the motor marking.

Explosive atmosphere type				Motor Marking					
	Area Classification	Presence of explosive atmosphere	Protection	Category	Group	Type of Protection	Gas Group	Temperature Class	IP degree
GAS	Zone 1	Probable	High	II	2G	Ex d (Ex de *on request*)	IIC IIB (d)	T4 (T5 e T6 *on request*)	-
GAS	Zone 2	Improbable	Normal	II	2G	Ex d (Ex de *on request*)	IIC IIB (d)	T4 (T5 e T6 *on request*)	-
POLVERI	Zone 21	Probable	High	II	2D	Ex tD A21	-	T135°C (T100°C e T85°C *on request*)	IP6x
POLVERI	Zone 22	Improbable	Normal	II	2D	Ex tD A21	-	T135°C (T100°C e T85°C *on request*)	IP6x

Description of the marking on motor plate



1	Marking of conformity in compliance with the European Directives
2	Number of Notified Body that gives the Product Quality Assurance Notification
3	Specific marking of explosion protection
4	Group (surface plants different from mines)
5	Category (high protection)
6	Explosive atmosphere for the presence of flammable gas, vapour or mist (GAS)
7	Explosive atmosphere for the presence of a cloud of combustible dust
8	Type of protection for explosive atmosphere for the presence of flammable gas
9	GAS Group
10	Temperature class of the motor (GAS)
11	Type of protection for explosive atmosphere for the presence of a cloud of combustible dust
12	Maximum surface temperature of the motor (DUST)
13	IP protection degree
14	Range of room Temperature
15	Type Certificate Number

a) RAEL motors for zones 21 and 22 have protection type Ex tD A21 (DUST) matched with protection type Ex d (or Ex de) (GAS).

b) On request is possible to have motors Ex de with motor 'd' and increased safety terminal box 'e'.

c) Motors marked with gas group IIC are suitable to be used also when are requested gas groups IIB e IIA.

d) Single-phase motors with internal capacitors can be marked IIC and IIB and are suitable also for IIA (see page 34) .

e) Motors with temperature class T4 (gas) are suitable to be used also when are requested temperature classes T3, T2, T1. (On request is possible to have temperature classes T5 e T6).

f) IP degree protection will be IP55 for GAS and IP66 for DUST.

g) Room temperature range is as follow:
-20° +50°C for temperature class T4 and surface temperature T135°C (on request is possible to have -20° +60°C)
-20° +50°C for temperature class T5 and surface temperature T100°C
-20° +40°C for temperature class T6 and surface temperature T85°C

2. GENERAL INFORMATION

2.1 Range of Motors

Motors RL series are manufactured in compliance with all the European standards concerning equipment and protective systems for potentially explosive atmosphere in compliance with the European Directive ATEX 94/9/CE (better known as ATEX).
As we just told in par. 2.0 to be in compliance with ATEX Directive are necessary:

- EC type Certificate
- Product Quality assurance Notification

Such certificates are issued by notified bodies qualified to release them.

Motors RL series group II category 2G (GAS) with IP%% protection are suitable for zone 1 and zone 2, while the motors group II category 2GD (GAS-DUST) with protection IP66 are suitable also for zone 21 and zone 22.

Version	Frame size (mm)	Power (kW)	Poles	GAS Group	Temperature Class 2G motors	Surface temperature 2GD motors	Ambient Temperature
Three phase - 1 speed 2 - 4 - 6 - 8 poles	56 – 160	0,06 – 18,5	2	IIC	T4 (a)	T 135 °C (a)	-20°C a +50°C (c)
		0,06 – 15	4				
		0,035 – 11	6				
		0,06 - 7,5	8				
Three phase – 2 speeds (Constant Torque), 2/4 - 4/8 – 4/6 – 6/8 poles	63 – 160	0,25/0,18 - 15/12	2/4	IIC	T4 (b)	T 135 °C (b)	-20°C a +50°C (c)
		0,18/0,09 – 10/6,6	4/8				
		0,2/0,1 – 8,8/5,9	4/6				
		0,08/0,12 – 5,5/4	6/8				
Three phase – 2 speeds (Quadratic Torque), 2/4 - 4/8 – 4/6 – 6/8 poles	63 – 160	0,25/0,06 – 16/4,4	2/4	IIC	T4 (b)	T 135 °C (b)	-20°C a +50°C (c)
		0,25/0,05 – 12/3,2	4/8				
		0,3/0,1 – 11/3,3	4/6				
		0,33/0,09 – 7,5/4	6/8				
Three-phase for Inverter 2 - 4 - 6 - 8 poles	56 – 160	0,06 – 18,5	2	IIC	T4	T 135 °C	-20°C a +50°C (c)
		0,06 – 15	4				
		0,035 – 11	6				
		0,06 – 7,5	8				
Single-phase 2 - 4 – 6 poles	56 - 100	0,06 - 3	2	IIB (d)	T4	T 135 °C	-20°C a +50°C (c)
		0,06 – 1,6	4				
		0,06 – 1,1	6				

(a) Available also in version T5 (T100°C) and T6 (T85°C) on request
(b) Available also in version T5 (T100°C) on request
(c) Available also range of ambient temperature -20°C to +60°C for T4 (T135°C) on request (for motor T6 (T85°C) the ambient temperature range is -20°C +40°C)
(d) Available also IIC (frame 56-63-71 see page 34)

2.2 Main features

Motors RL are in conformity with the Essential Health and Safety Requirements for potentially explosive atmospheres provided by European Standards: EN 60079-0, EN 60079-1, EN 60079-7, EN 61241-0, EN 61241-1, EN 60529.

- Three-phase and single-phase squirrel cage asynchronous induction motors.
- Aluminium modular motors, flanges and feet can be assembled and disassembled.
- Type of protection Ex d, Ex de, Ex tD.
- Overall dimensions comply with IEC 60072 and EN 50347.
- Ventilations **IC 418** (Self ventilated).
- Voltage 230/400 V ± 5% Δ/Y (56 - 112), 400/690 V ± 5% Δ/Y (132 - 160), frequency 50 Hz ± 2%.
- Insulation Class F.
- Protection degree IP55 for zone 1 and zone 2, IP66 for zone 21 and zone 22.
- Maximum noise level 80 dB (A).
- Terminal box (see 3.1):
    - Version Ex d IIC
    - Version Ex e IIC
    - Version without terminal box, motor comprehensive of cable
    - Version Ex d IIB terminal box **A**

      (for single-phase - 1 capacitor)
    - Version Ex d IIB terminal box **B**

      (for high torque single-phase - 2 capacitors, starting system, soft-starter, poles commutation system)
    - Version Ex d IIB terminal box **C**

      (Motor provided with contactor system for starting, soft-starter, contactor system for pole commutation)
- Fan cover in sheet steel.
- Low friction dust seals.

2.3 Main Options

Motors Versions

- Motors 2GD protection degree IP66 suitable for zone 21 and zone 22.
- Special Powers on frame 132 and 160
- Motors without ventilation (**IC 410**).
- Motors with servo-ventilation (**IC 416**).
- Single phase version Ex d IIB with high starting (1 run capacitor – 1 start capacitor).
- Motors with starting system inside the terminal board.

Electrical and mechanical variants

- Special voltage and frequency.
- Thermal protectors (probe PTC or PTO).
- Anticondesation heaters.
- Insulation class H.
- Motors tropicalized.
- Motors suitable for frequency invert drive.
- Double shaft motors.
- Special shaft for ENCODER.
- Special shafts.
- Special flanges.
- Motor without terminal box with cable (length on request).
- Terminal box on the side (right or left).
- Terminal box with special cable glands.
- Increased safety 'e' terminal box.
- Terminal box type A, B, C for special purpose (it is possible to have single-phase motors with frame 112 and box C).
- Protection IP66.
- Temperature class T5 e T6.
- Fan cover with roof.
- Special bearings.
- Locked front bearing.

Tests

All RAEL motors are 100% tested, both at the beginning (winding test) and the end of production (motor electric test).

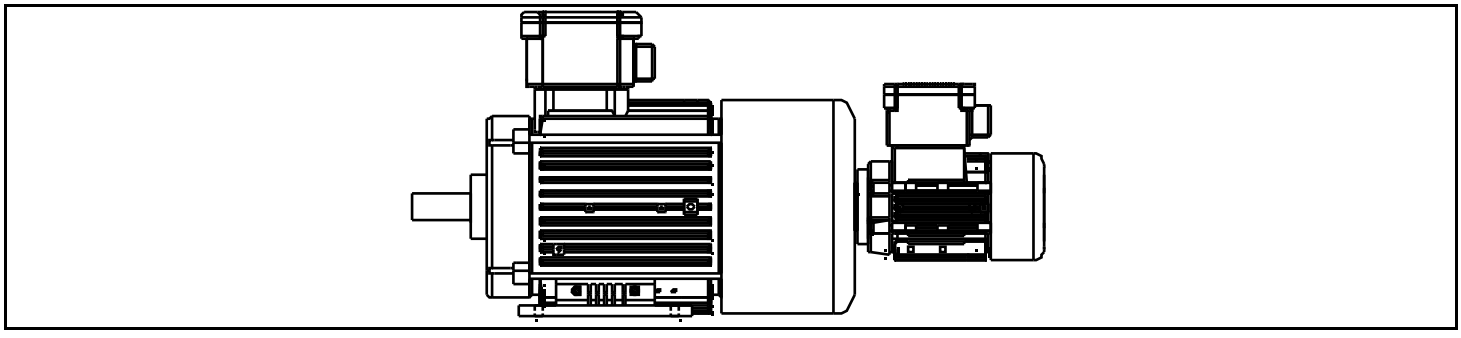
On request additional tests on the motors can be done:

- Standard test "Routine Test".
- Heating test.

Servo-Ventilation (IC416)

Cooling is provided by an auxiliary Ex motor, fitted on the back of the main motor. In RL series the auxiliary motor we use for this purpose is the size 56.

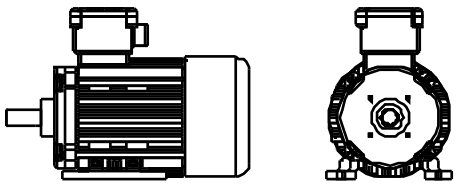
The user shall use an electric device that enables the main motor to run only when the auxiliary motor is already running.

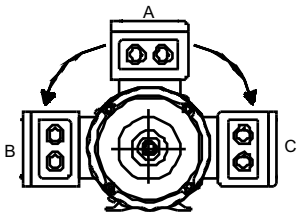


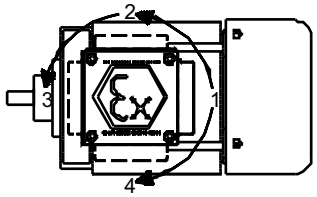
3. TERMINAL BOX

3.1 Possible versions

a. Three phase version Ex d IIC and three phase version Ex e IIC increased safety "e"



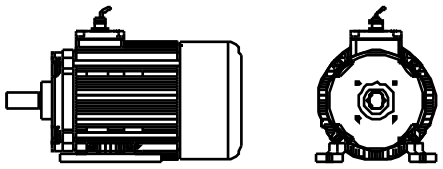


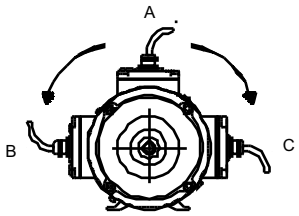


The standard position of terminal box is **A – 1** with box on the top and cable outlet in the back

It is possible to have the box on the sides (position **B** or **C**) and the cable outlet in the positions **2**, **3** e **4**

b. Motor without terminal box comprehensive of cable. Three phase version Ex d IIC

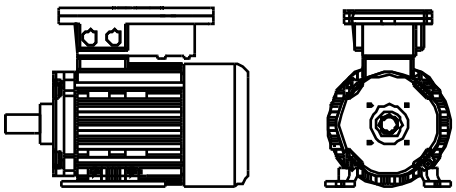


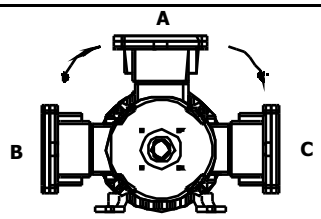


The standard position is **A** but It is possible to have the cable outlet on the side (**B** o **C**)

c. Motor with terminal box A Version Ex d IIB

Application: single phase motor with internal run capacitor

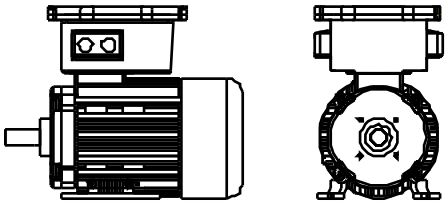


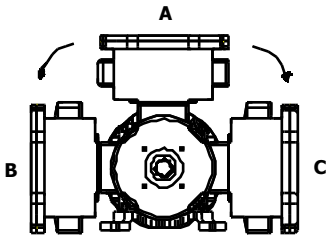


The standard position is **A** but It is possible to have the cable outlet on the side (**B** o **C**)

d. Motor with terminal box B Version Ex d IIB

Application:
- single phase motor with high starting torque with internal run and start capacitor
- motor provided with contactor system for starting, soft-starter, pole commutation system

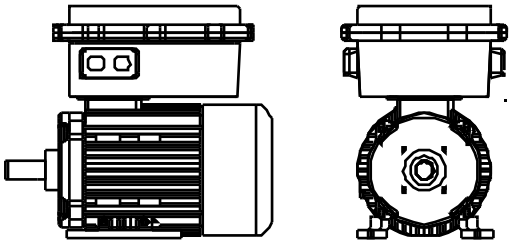


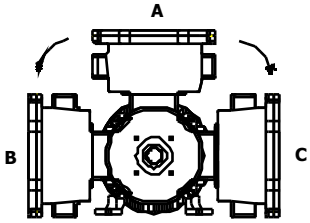


The standard position is **A** but It is possible to have the cable outlet on the side (**B** o **C**)

e. Motor with terminal box C Versione Ex d IIB

Application: motor provided with contactor system for starting, soft-starter, contactor system for pole commutation





The standard position is **A** but It is possible to have the cable outlet on the side (**B** o **C**)

3.2 Cable entries and terminals

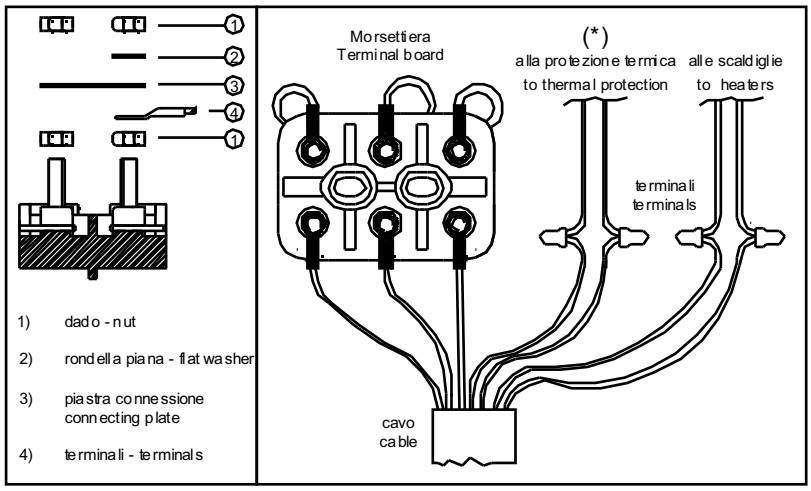
Motor version Ex ‘d’ must be provided with cable entries that comply with EN 60079-1.
Motor version Ex ‘de’ must be provided with cable entries that comply with EN 60079-7.
Motor version Ex tD must be provided with cable entries that comply with EN 61241-1.

		Cable entries			Terminals
		Frame	Standard	On request	
Three phase version	Mains	56 - 90	1 x M20	1 x NPT ½”	M4
		100 - 112	1 x M25	1 x NPT ¾”	M5
		132-160	2 x M32	2 x NPT 1”	M6
	Auxiliaries	56-160	1 x M20	1 x NPT ½”	See (1) and (2)
Version with increased terminal box A, B, C	-	56 – 112	Up to n.4 cable entries M20 o M25	Up to n.4 cable entries NPT ¾” o NPT 1”	

When the motor is provided with a thermal protection and/or heaters these must have a separate cable entry and the connection shall be done as shown below (depending on the type of terminal box):

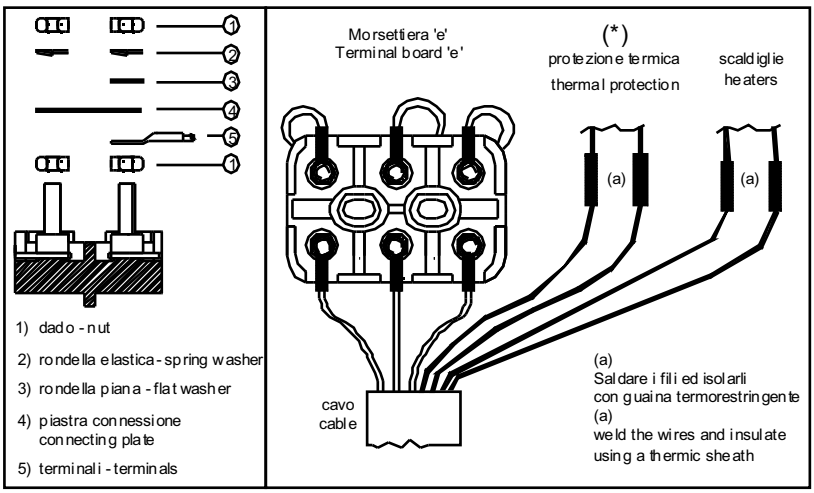
(1) Terminal box version Ex ‘d’

(Terminal board 6 pins)



(2) Terminal box version Ex ‘e’

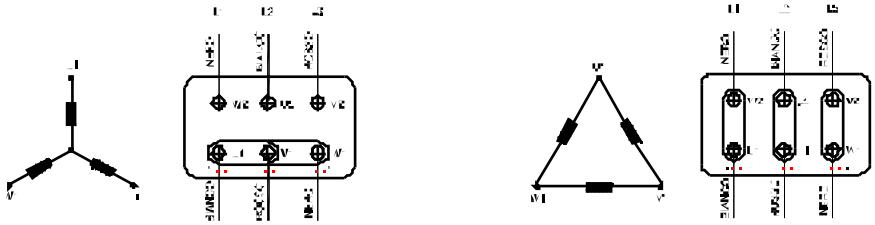
(Terminal board 6 pins increased safety ‘e’)



3.3 Connecting diagrams

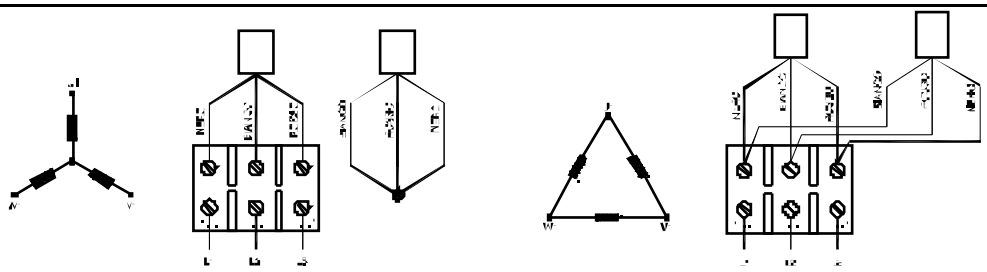
Three phase 1 speed – Star and delta connection

Standard



Star Delta

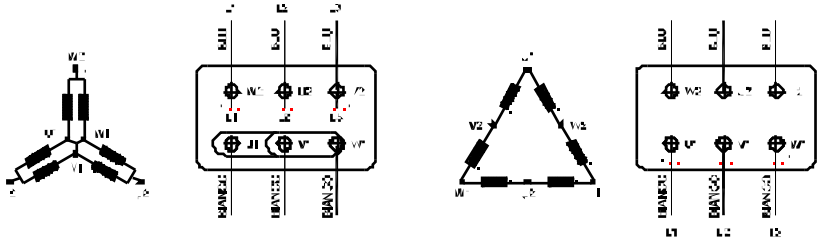
Without Terminal box



Star Delta

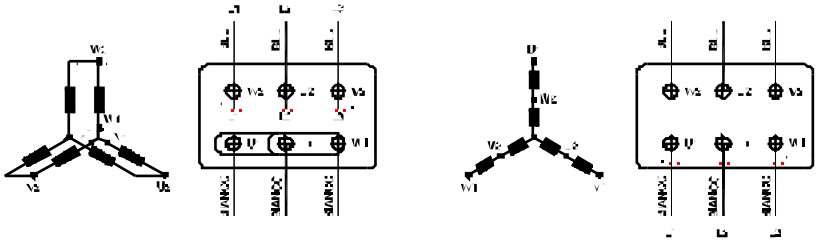
Three phase 2 speeds – Dahlander Connection - 2/4 - 4/8 poles

Costant Torque



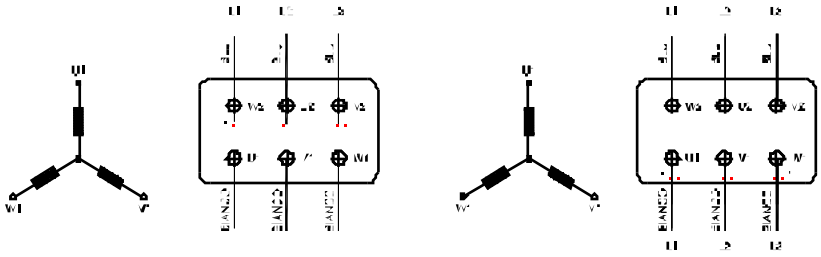
High speed Low speed

Quadratic Torque



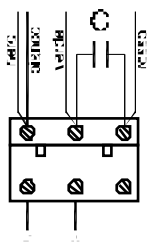
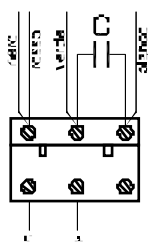
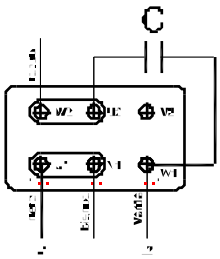
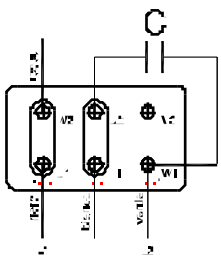
High speed Low speed

Three phase 2 speeds – 2 separate windings - 4/6 - 6/8 poles



High speed Low speed

Single phase

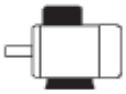
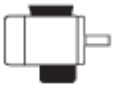
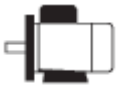
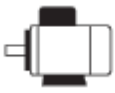
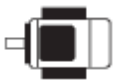
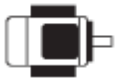
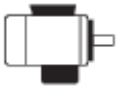
IIC Version (page 34)		IIB Version (page 34)	
			
Clockwise rotation	Conuterclockwise rotation	Clockwise rotation	Conuterclockwise rotation

4. MECHANICAL CHARACTERISTIC

4.1 Mounting arrangements

RL motors can be made in the mounting arrangements as shown in the table.
Such motors are designed and manufactured with modular feet and flanges, so to ease the change of mounting arrangement and to optimize the warehouse management.
The basic mounting arrangements are shown in the standard EN 60034-7. Motors with mounting arrangements IM B3, IM B5, IM B14 can also be used in different mounting positions.

IM B3 IM B6, IM B7, IM B8, IM V5 o IM V6.
IM B35 IM V15 o IM V36, IM 2051, IM 2061, IM 2071.
IM B34 IM 2111 O IM 2131, IM 2151, IM 2161, IM 2171.
IM B5 IM V1 o IM V3. (flange with passing holes).
IM B14 IM V18 o IM V19. (flange with theraded holes).

Basic mountings	Other mountings				
IM B3 **IM 1001**	**IM V5** **IM 1011**	**IM V6** **IM 1031**	**IM B6** **IM 1051**	**IM B7** **IM 1061**	**IM B8** **IM 1071**
					
IM B35 **IM 2001**	**IM V15** **IM 2011**	**IM V36** **IM 2031**	**-** **IM 2051**	**-** **IM 2061**	**-** **IM 2071**
					
IM B34 **IM 2101**	**-** **IM 2111**	**-** **IM 2131**	**-** **IM 2151**	**-** **IM 2161**	**-** **IM 2171**
					
IM B5 **IM 3001**	**IM V1** **IM 3011**	**IM V3** **IM 3031**			
IM B14 **IM 3601**	**IM V18** **IM 3611**	**IM V19** **IM 3631**			

4.2 Materials

Materials of the main components.

Type of material

Shield fames flanges terminal box	Shaft	Rotor	Fan	Fan cover	Tie rods	Screw	Cable glands	Motor Plate
Aluminium	Steel 35S20	Die-cast Aluminium (squirrel cage)	Thermoplastic material or Aluminium	Zinc-plated steel	Steel 4.8	Steel 8.8	nickel-plated brass	Anodized aluminium or *on request* stainless steel

Bearings

The 2Z series bearings are lubricated for life and required not further lubrication. Nevertheless, we recommend in case of continuous running, long time stop, low temperature, radial and/or axial load, frequency inverter used, to control some time to time the ball bearings (40 000 hours for 4,6,8 pole motors and 20 000 hours for the 2 pole motors).

Motor		Bearing		Lubrication
Frame	Poles	Drive-end shield	Rear shield	
56	2 - 4 - 6 - 8	6201 2Z	6201 2Z	It doesn't need lubrication
63	2 - 4 - 6 - 8	6202 2Z	6202 2Z	It doesn't need lubrication
71	2 - 4 - 6 - 8	6202 2Z	6202 2Z	It doesn't need lubrication
80	2 - 4 - 6 - 8	6204 2Z	6204 2Z	It doesn't need lubrication
90	2 - 4 - 6 - 8	6205 2Z	6205 2Z	It doesn't need lubrication
100	2 - 4 - 6 - 8	6206 2Z	6206 2Z	It doesn't need lubrication
112	2 - 4 - 6 - 8	6306 2Z	6306 2Z	It doesn't need lubrication
132	2 - 4 - 6 - 8	6308 2Z	6308 2Z	It doesn't need lubrication
160	2 - 4 - 6 - 8	6309 2Z	6309 2Z	It doesn't need lubrication

Rotary shaft seals

Motors RL series can be equipped with seals so to guarantee an IP66 degree protection. In such a way the motor is protected from the income of dust and polluting agents.
IP65 or IP66 protection degree is furthermore necessary to warranty the protection type Ex tD.

Motor		Rotary shaft seal (DIN 3760)	
Frame	Poles	Front	Rear
56	2 - 4 - 6 - 8	12x22x7A	12x22x7A
63	2 - 4 - 6 - 8	15x24x5A	15x24x5A
71	2 - 4 - 6 - 8	15x24x5A	15x24x5A
80	2 - 4 - 6 - 8	20x30x5A	20x30x5A
90	2 - 4 - 6 - 8	25x37x5A	25x37x5A
100	2 - 4 - 6 - 8	30x50x7A	30x50x7A
112	2 - 4 - 6 - 8	30x50x7A	30x50x7A
132	2 - 4 - 6 - 8	40x72x7A	40x72x7A
160	2 - 4 - 6 - 8	45x72x8A	45x72x8A

5. ELECTRICAL DATA

5.1 Three phase motors - 1 speed

The features of three phase motors for general purpose are as follow:

- Three phase asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", IP55, 400V - 50 Hz.
- Connections

Type	Δ	Y
56 – 112	230 V	400V
132 – 160	400 V	690 V
56-160 for INVERTER	230 V	400 V

- For temperature class T5 and T6 and ambient temperature see par 2.1

5.1.1 Motors for INVERTER duty

In case the motors are driven by **INVERTER** we have to point out some things:

- Motor must be equipped with PTC thermistor.
- Motor driven by inverter means not to have a perfect voltage and current sine wave with increase of losses and heating of the motor.
- Speed variation affects also the ventilation (in case of IC411).
- The stress on the bearings increases and they shall be checked more frequently; for this reason the operating period with a speed above 3600 rpm shall never exceed 10% of the complete working cycle.
- The **best connection** for motors driven by inverter is the **star connection 400V**.
- In case of **constant torque application and with frequency values above 60Hz** it is necessary to use a **delta connection**.

For all these reasons RAEL manufactures special motors for inverter duty so to minimize all the inconveniences described above.

These motors are electrically oversized so to minimize the electrical losses and also reduce the heating and are provided with thermistor PTC120°C for temperature class T4; for this reason the winding of the motor is made on a oversized stator and is fitted with phase-insulators (on request it is possible to have the version T5 with PTC90°C and T6 with PTC70°C).

In case of overheating it is possible to use the servoventilation option (see page 15).

All the bearings mounted on RAEL motors have the best quality for motors (V2 type).

In this paragraph we will show the rating of the 1 speed 3-phase motors and the rating of the motors for inverter duty.

The data tables of the motors for inverter duty give an idea of power and current values and are reliable only in the case that the inverter used to drive the motor is an high quality and an high performance one.

1 Speed 3000 — Rated data at 400V/50Hz – direct on line start — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Type	P kW	P Hp	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL0042	RL 56 A 2	0,06	0,08	2730	0,20	3,5	67	0,77	0,2	3,5	3,5	T4	INERIS 05 ATEX 0025X
RL0043	RL 56 A 2	0,09	0,12	2730	0,26	4,0	67	0,77	0,3	4,0	4,0	T4	INERIS 05 ATEX 0025X
RL0044	RL 56 B 2	0,12	0,16	2750	0,33	3,5	70	0,77	0,35	4,0	4,5	T4	INERIS 05 ATEX 0025X
RL0001	RL 63 A 2	0,12	0,16	2730	0,40	3.1	50	0.80	0,4	3.3	6.5	T4	INERIS 05 ATEX 0025X
RL0002	RL 63 A 2	0,18	0,25	2760	0,50	3.6	60	0.80	0,6	3.8	6.5	T4	INERIS 05 ATEX 0025X
RL0003	RL 63 B 2	0,25	0,34	2740	0,80	4.3	52	0.85	0,9	3.5	7,0	T4	INERIS 05 ATEX 0025X
RL0004	RL 71 A 2	0,37	0,50	2770	1,00	4.8	70	0.80	1,3	3,0	7,0	T4	INERIS 05 ATEX 0025X
RL0005	RL 71 B 2	0,55	0,75	2710	1,50	3.8	62	0.85	2,1	3,0	8,0	T4	INERIS 05 ATEX 0025X
RL0006	RL 80 A 2	0,75	1,00	2820	1,80	5,0	70	0.88	2,6	2.4	10,0	T4	INERIS 05 ATEX 0025X
RL0007	RL 80 B 2	1,10	1,50	2850	2,40	5.8	76	0.88	3,8	3,0	11,0	T4	INERIS 05 ATEX 0025X
RL0008	RL 90 S 2	1,50	2,00	2800	3,40	5,0	74	0.86	5,2	2.9	16,0	T4	INERIS 05 ATEX 0025X
RL0009	RL 90 L 2	2,20	3,00	2860	4,80	5.4	74	0.85	7,5	3,0	18,0	T4	INERIS 05 ATEX 0025X
RL0032	RL 100 LA 2	3,00	4,00	2845	6,50	6,0	79	0,84	10,2	2.6	23,0	T4	INERIS 05 ATEX 0025X
RL0033	RL 112 M 2	4,00	5,50	2910	8,40	5.8	80	0,86	13,2	2.6	30,0	T4	INERIS 05 ATEX 0025X
RL0049	RL 132 SA 2	5,50	7,50	2870	11,40	6,7	84	0,82	18,3	2,6	54	T4	INERIS 05 ATEX 0025X
RL0050	RL 132 SB 2	7,50	10,00	2880	14,00	6,9	85	0,90	24,7	2,9	59	T4	INERIS 05 ATEX 0025X
RL0051	RL 132 MB 2	9,00	12,00	2930	16,80	6,9	87	0,89	30,5	2,9	65	T4	INERIS 05 ATEX 0025X
RL0052	RL 132 ML 2	11,00	15,00	2930	20,20	6,8	89	0,89	36	2,8	71	T4	INERIS 05 ATEX 0025X
RL0053	RL 160 MA 2	11,00	15,00	2915	22,00	7,9	82	0,89	36	2,8	98,0	T4	INERIS 05 ATEX 0025X
RL0054	RL 160 MB 2	15,00	20,00	2910	28,30	8,4	84	0,91	49	3,1	110,0	T4	INERIS 05 ATEX 0025X
RL0055	RL 160 L 2	18,50	25,00	2925	34,00	8,0	87	0,90	60	3,1	115,0	T4	INERIS 05 ATEX 0025X

1 Speed 3000 — Motors for INVERTER - Rated data at 400V/50Hz — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Cooling	Selfventilated - (IC411)									Forced ventilation - (IC416)						Certificate
	Torque	Quandratic			Constant			Constant			Constant			Constant			
	Range Hz	5 - 50 Hz			5 - 50 Hz			5 - 87 Hz			5 - 50 Hz			5 - 87 Hz			
	speed	300 - 3000 rpm			300 - 3000 rpm			300 - 5220 rpm			300 - 3000 rpm			300 - 5220 rpm			
	Type	P (kW)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	
RL0642-I	RL 56 A 2	0,06	0,06	0,20	0,20	0,05	0,15	0,15	0,04	0,12	0,12	-	-	-	-	-	-	◆
RL0643-I	RL 56 A 2	0,09	0,09	0,30	0,26	0,07	0,23	0,20	0,05	0,18	0,16	-	-	-	-	-	-	◆
RL0644-I	RL 56 B 2	0,12	0,12	0,35	0,33	0,09	0,26	0,25	0,07	0,21	0,20	-	-	-	-	-	-	◆
RL0601-I	RL 63 A 2	0,12	0,12	0,40	0,40	0,09	0,30	0,30	0,07	0,24	0,24	0,11	0,36	0,36	0,10	0,32	0,32	◆
RL0602-I	RL 63 A 2	0,18	0,18	0,60	0,50	0,14	0,45	0,38	0,11	0,36	0,30	0,16	0,54	0,45	0,14	0,48	0,40	◆
RL0603-I	RL 63 B 2	0,25	0,25	0,90	0,80	0,19	0,68	0,60	0,15	0,54	0,48	0,23	0,81	0,72	0,20	0,72	0,64	◆
RL0604-I	RL 71 A 2	0,37	0,37	1,30	1,00	0,28	0,98	0,75	0,22	0,78	0,60	0,33	1,17	0,90	0,30	1,04	0,80	◆
RL0605-I	RL 71 B 2	0,55	0,55	2,10	1,50	0,41	1,58	1,13	0,33	1,26	0,90	0,50	1,89	1,35	0,44	1,68	1,20	◆
RL0606-I	RL 80 A 2	0,75	0,75	2,60	1,80	0,56	1,95	1,35	0,45	1,56	1,08	0,68	2,34	1,62	0,60	2,08	1,44	◆
RL0607-I	RL 80 B 2	1,10	1,10	3,80	2,40	0,83	2,85	1,80	0,66	2,28	1,44	0,99	3,42	2,16	0,88	3,04	1,92	◆
RL0608-I	RL 90 S 2	1,50	1,50	5,20	3,40	1,13	3,90	2,55	0,90	3,12	2,04	1,35	4,68	3,06	1,20	4,16	2,72	◆
RL0609-I	RL 90 LA 2	2,20	2,20	7,50	4,80	1,65	5,63	3,60	1,32	4,50	2,88	1,98	6,75	4,32	1,76	6,00	3,84	◆
RL0632-I	RL 100 LA 2	3,00	3,00	10,20	6,50	2,25	7,65	4,88	1,80	6,12	3,90	2,70	9,18	5,85	2,40	8,16	5,20	◆
RL0633-I	RL 112 M 2	4,00	4,00	13,20	8,40	3,00	9,90	6,30	2,40	7,92	5,04	3,60	11,88	7,56	3,20	10,56	6,72	◆
RL0649-I	RL 132 SA 2	5,50	5,50	18,30	11,40	4,13	13,73	8,55	3,30	10,98	6,84	4,95	16,47	10,26	4,40	14,64	9,12	◆
RL0650-I	RL 132 SB 2	7,50	7,50	24,70	14,00	5,63	18,53	10,50	4,50	14,82	8,40	6,75	22,23	12,60	6,00	19,76	11,20	◆
RL0651-I	RL 132 MB 2	9,00	9,00	30,50	16,80	6,75	22,88	12,60	5,40	18,30	10,08	8,10	27,45	15,12	7,20	24,40	13,44	◆
RL0652-I	RL 132 ML 2	11,00	11,00	36,00	20,20	8,25	27,00	15,15	6,60	21,60	12,12	9,90	32,40	18,18	8,80	28,80	16,16	◆
RL0653-I	RL 160 MA 2	11,00	11,00	36,00	22,00	8,25	27,00	16,50	6,60	21,60	13,20	9,90	32,40	19,80	8,80	28,80	17,60	◆
RL0654-I	RL 160 MB 2	15,00	15,00	49,00	28,30	11,25	36,75	21,23	9,00	29,40	16,98	13,50	44,10	25,47	12,00	39,20	22,64	◆
RL0655-I	RL 160 L 2	18,50	18,50	60,00	34,00	13,88	45,00	25,50	11,10	36,00	20,40	16,65	54,00	30,60	14,80	48,00	27,20	◆

◆ INERIS 05 ATEX 0025X

1 Speed 1500 — Rated data at 400V/50Hz – direct on line start — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Type	P kW	P Hp	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL0045	RL 56 A 4	0,06	0,08	1360	0,20	3,5	64	0,68	0,4	4,0	4	T4	INERIS 05 ATEX 0025X
RL0046	RL 56 B 4	0,09	0,12	1360	0,30	3,0	67	0,67	0,6	3,5	4,5	T4	INERIS 05 ATEX 0025X
RL0010	RL 63 A 4	0,12	0,16	1400	0.54	3.3	51	0.60	0,9	3,0	6	T4	INERIS 05 ATEX 0025X
RL0011	RL 63 B 4	0,18	0,25	1400	0.64	3.5	65	0.63	1,3	2.2	6.5	T4	INERIS 05 ATEX 0025X
RL0012	RL 71 A 4	0,25	0,34	1370	1,00	3,0	50	0.73	1,8	2.2	6.5	T4	INERIS 05 ATEX 0025X
RL0013	RL 71 B 4	0,37	0,50	1370	1.30	3.4	57	0.74	2,6	2.4	7.5	T4	INERIS 05 ATEX 0025X
RL0014	RL 80 A 4	0,55	0,75	1410	1.50	4.4	63	0.80	3,8	2.2	10	T4	INERIS 05 ATEX 0025X
RL0015	RL 80 B 4	0,75	1,00	1410	2,00	4.9	67	0.80	5,2	1.9	12	T4	INERIS 05 ATEX 0025X
RL0016	RL 90 S 4	1,10	1,50	1410	2.80	4.2	73	0.77	7,7	2.3	16	T4	INERIS 05 ATEX 0025X
RL0017	RL 90 L 4	1,50	2,00	1400	3.80	5,0	72	0.80	10,4	3,0	17.5	T4	INERIS 05 ATEX 0025X
RL0034	RL 100 LA 4	2,20	3,00	1410	4,80	5,0	80	0,84	15,1	2.3	23	T4	INERIS 05 ATEX 0025X
RL0035	RL 100 LB 4	3,00	4,00	1440	6,60	5,4	80	0,81	20,1	2.6	25	T4	INERIS 05 ATEX 0025X
RL0036	RL 112 M 4	4,00	5,50	1450	8,70	6,0	84	0,82	26,8	2.7	35	T4	INERIS 05 ATEX 0025X
RL0056	RL 132 SB 4	5,50	7,50	1440	11,40	6,1	85	0,82	36,0	2,4	60	T4	INERIS 05 ATEX 0025X
RL0057	RL 132 MB 4	7,50	10,00	1448	14,80	6,6	87	0,84	49,5	2,4	66	T4	INERIS 05 ATEX 0025X
RL0058	RL 132 ML 4	9,00	12,00	1460	17,90	6,7	84	0,86	58,0	2,5	71	T4	INERIS 05 ATEX 0025X
RL0059	RL 160 MB 4	11,00	15,00	1460	21,30	5,5	88	0,85	72,0	2,6	105	T4	INERIS 05 ATEX 0025X
RL0060	RL 160 L 4	15,00	20,00	1450	28,00	5,8	87	0,83	97,1	2,6	115	T4	INERIS 05 ATEX 0025X

1 Speed 1500 — Motors for INVERTER - Rated data at 400V/50Hz — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Cooling	Selfventilated - (IC411)									Forced ventilation - (IC416)						Certificato
	Torque	Quandratic			Constant			Constant			Constant			Constant			
	Range Hz	5 - 50 Hz			5 - 50 Hz			5 - 87 Hz			5 - 50 Hz			5 - 87 Hz			
	speed	150 - 1500 rpm			150 - 1500 rpm			150 - 2600 rpm			150 - 1500 rpm			150 - 2600 rpm			
	Type P (kW)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	
RL0645-I	RL 56 A 4	0,06	0,06	0,40	0,20	0,05	0,30	0,15	0,04	0,24	0,12	-	-	-	-	-	-	◆
RL0646-I	RL 56 B 4	0,09	0,09	0,60	0,30	0,07	0,45	0,23	0,05	0,36	0,18	-	-	-	-	-	-	◆
RL0610-I	RL 63 A 4	0,12	0,12	0,90	0.54	0,09	0,68	0,03	0,07	0,54	0,02	0,11	0,81	0,03	0,10	0,72	0,03	◆
RL0611-I	RL 63 B 4	0,18	0,18	1,30	0.64	0,14	0,98	0,03	0,11	0,78	0,03	0,16	1,17	0,04	0,14	1,04	0,04	◆
RL0612-I	RL 71 A 4	0,25	0,25	1,80	1,00	0,19	1,35	0,75	0,15	1,08	0,60	0,23	1,62	0,90	0,20	1,44	0,80	◆
RL0613-I	RL 71 B 4	0,37	0,37	2,60	1,30	0,28	1,95	0,98	0,22	1,56	0,78	0,33	2,34	1,17	0,30	2,08	1,04	◆
RL0614-I	RL 80 A 4	0,55	0,55	3,80	1,50	0,41	2,85	1,13	0,33	2,28	0,90	0,50	3,42	1,35	0,44	3,04	1,20	◆
RL0615-I	RL 80 B 4	0,75	0,75	5,20	2,00	0,56	3,90	1,50	0,45	3,12	1,20	0,68	4,68	1,80	0,60	4,16	1,60	◆
RL0616-I	RL 90 S 4	1,10	1,10	7,70	2,80	0,83	5,78	2,10	0,66	4,62	1,68	0,99	6,93	2,52	0,88	6,16	2,24	◆
RL0617-I	RL 90 L 4	1,50	1,50	10,40	3,80	1,13	7,80	2,85	0,90	6,24	2,28	1,35	9,36	3,42	1,20	8,32	3,04	◆
RL0634-I	RL 100 LA 4	2,20	2,20	15,10	4,80	1,65	11,33	3,60	1,32	9,06	2,88	1,98	13,59	4,32	1,76	12,08	3,84	◆
RL0635-I	RL 100 LB 4	3,00	3,00	20,10	6,60	2,25	15,08	4,95	1,80	12,06	3,96	2,70	18,09	5,94	2,40	16,08	5,28	◆
RL0636-I	RL 112 M 4	4,00	4,00	26,80	8,60	3,00	20,10	6,45	2,40	16,08	5,16	3,60	24,12	7,74	3,20	21,44	6,88	◆
RL0656-I	RL 132 SB 4	5,50	5,50	36,00	11,40	4,13	27,00	8,55	3,30	21,60	6,84	4,95	32,40	10,26	4,40	28,80	9,12	◆
RL0657-I	RL 132 MB 4	7,50	7,50	49,50	14,80	5,63	37,13	11,10	4,50	29,70	8,88	6,75	44,55	13,32	6,00	39,60	11,84	◆
RL0658-I	RL 132 ML 4	9,00	9,00	58,00	17,90	6,75	43,50	13,43	5,40	34,80	10,74	8,10	52,20	16,11	7,20	46,40	14,32	◆
RL0659-I	RL 160 MB 4	11,00	11,00	72,00	21,30	8,25	54,00	15,98	6,60	43,20	12,78	9,90	64,80	19,17	8,80	57,60	17,04	◆
RL0660-I	RL 160 L 4	15,00	15,00	97,10	28,00	11,25	72,83	21,00	9,00	58,26	16,80	13,50	87,39	25,20	12,00	77,68	22,40	◆

◆ INERIS 05 ATEX 0025X

1 Speed 1000 — Rated data at 400V/50Hz – direct on line start — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Type					P kW	P Hp	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL0018	RL	63	B	6		0,12	0,16	900	0.60	2.6	43	0.70	1,3	2.6	7	T4	INERIS 05 ATEX 0025X
RL0019	RL	71	A	6		0,18	0,25	900	0.80	2.8	46	0.70	2,0	2.4	7	T4	INERIS 05 ATEX 0025X
RL0020	RL	71	B	6		0,25	0,34	910	1.20	2.9	50	0.60	2,7	3.1	8	T4	INERIS 05 ATEX 0025X
RL0021	RL	80	A	6		0,37	0,50	935	1.40	3.9	62	0.65	3,8	2.6	10	T4	INERIS 05 ATEX 0025X
RL0022	RL	80	B	6		0,55	0,75	930	1.80	3.5	64	0.70	5,8	2.8	12	T4	INERIS 05 ATEX 0025X
RL0023	RL	90	S	6		0,75	1,00	930	2.20	3.5	71	0.70	7,9	2.3	16	T4	INERIS 05 ATEX 0025X
RL0024	RL	90	L	6		1,10	1,50	910	3.20	3.7	67	0.75	11,6	2.3	17.5	T4	INERIS 05 ATEX 0025X
RL0037	RL	100	LB	6		1,50	2,00	940	3,60	3.8	80	0,75	15,2	1.7	25	T4	INERIS 05 ATEX 0025X
RL0038	RL	112	M	6		2,20	3,00	940	4,90	4.7	82	0,80	22,4	1.8	35	T4	INERIS 05 ATEX 0025X
RL0061	RL	132	SB	6		3,00	4,00	945	6,70	4,5	86	0,75	30,3	1,7	62	T4	INERIS 05 ATEX 0025X
RL0062	RL	132	MB	6		4,00	5,50	950	9,10	4,5	82	0,77	39,0	1,8	65	T4	INERIS 05 ATEX 0025X
RL0063	RL	132	ML	6		5,50	7,50	950	12,30	4,6	81	0,80	55,0	1,8	71	T4	INERIS 05 ATEX 0025X
RL0064	RL	160	MB	6		7,50	10,00	965	14,80	4,5	85	0,86	75,6	1,8	106	T4	INERIS 05 ATEX 0025X
RL0065	RL	160	L	6		11,00	15,00	955	21,60	4,6	85	0,86	110,0	1,8	118	T4	INERIS 05 ATEX 0025X

1 Speed 1000 — Motors for INVERTER - Rated data at 400V/50Hz — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Cooling						Selfventilated - (IC411)									Forced ventilation - (IC416)						Certificato
	Torque						Quadratic			Constant			Constant			Constant			Constant			
	Range Hz						5 - 50 Hz			5 - 50 Hz			5 - 87 Hz			5 - 50 Hz			5 - 87 Hz			
	speed						150 - 1500 rpm			150 - 1500 rpm			150 - 2600 rpm			150 - 1500 rpm			150 - 2600 rpm			
	Type					P (kW)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	
RL0618-I	RL	63	B		6	0,12	0,12	1,30	0,60	0,09	0,98	0,45	0,07	0,78	0,36	0,11	1,17	0,54	0,10	1,04	0,48	◆
RL0619-I	RL	71	A		6	0,18	0,18	2,00	0,80	0,14	1,50	0,60	0,11	1,20	0,48	0,16	1,80	0,72	0,14	1,60	0,64	◆
RL0620-I	RL	71	B		6	0,25	0,25	2,70	1,20	0,19	2,03	0,90	0,15	1,62	0,72	0,23	2,43	1,08	0,20	2,16	0,96	◆
RL0621-I	RL	80	A		6	0,37	0,37	3,80	1,40	0,28	2,85	1,05	0,22	2,28	0,84	0,33	3,42	1,26	0,30	3,04	1,12	◆
RL0622-I	RL	80	B		6	0,55	0,55	5,80	1,80	0,41	4,35	1,35	0,33	3,48	1,08	0,50	5,22	1,62	0,44	4,64	1,44	◆
RL0623-I	RL	90	S		6	0,75	0,75	7,90	2,20	0,56	5,93	1,65	0,45	4,74	1,32	0,68	7,11	1,98	0,60	6,32	1,76	◆
RL0624-I	RL	90	L		6	1,10	1,10	11,60	3,20	0,83	8,70	2,40	0,66	6,96	1,92	0,99	10,44	2,88	0,88	9,28	2,56	◆
RL0637-I	RL	100	LB		6	1,50	1,50	15,20	3,90	1,13	11,40	3,00	0,90	9,12	2,46	1,35	13,68	3,54	1,20	12,16	3,98	◆
RL0638-I	RL	112	M		6	2,20	2,20	22,40	4,90	1,65	16,80	3,68	1,32	13,44	2,94	1,98	20,16	4,41	1,76	17,92	3,92	◆
RL0661-I	RL	132	SB		6	3,00	3,00	30,30	6,70	2,25	22,73	5,03	1,80	18,18	4,02	2,70	27,27	6,03	2,40	24,24	5,36	◆
RL0662-I	RL	132	MB		6	4,00	4,00	39,00	9,10	3,00	29,25	6,83	2,40	23,40	5,46	3,60	35,10	8,19	3,20	31,20	7,28	◆
RL0663-I	RL	132	ML		6	5,50	5,50	55,00	12,30	4,13	41,25	9,23	3,30	33,00	7,38	4,95	49,50	11,07	4,40	44,00	9,84	◆
RL0664-I	RL	160	MB		6	7,50	7,50	75,60	14,80	5,63	56,70	11,10	4,50	45,36	8,88	6,75	68,04	13,32	6,00	60,48	11,84	◆
RL0665-I	RL	160	L		6	11,00	11,00	110,0	21,60	8,25	82,50	16,20	6,60	66,00	12,96	9,90	99,00	19,44	8,80	88,00	17,28	◆

◆ INERIS 05 ATEX 0025X

1 Speed 750 — Rated data at 400V/50Hz – direct on line start — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Type					P kW	P Hp	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL0025	RL	63	B	8		0,06	0,08	660	0.40	2.3	34	0.63	0,9	2.8	7	T4	INERIS 05 ATEX 0025X
RL0026	RL	71	A	8		0,09	0,12	660	0.55	2.2	38	0.63	1,3	2.7	7	T4	INERIS 05 ATEX 0025X
RL0027	RL	71	B	8		0,12	0,16	640	0.65	2,0	39	0.7	1,8	2.3	8	T4	INERIS 05 ATEX 0025X
RL0028	RL	80	A	8		0,18	0,25	690	0.95	2.8	49	0.6	2,5	2.7	10	T4	INERIS 05 ATEX 0025X
RL0029	RL	80	B	8		0,25	0,34	700	1.20	2.9	55	0.55	3,6	2.8	12	T4	INERIS 05 ATEX 0025X
RL0030	RL	90	S	8		0,37	0,50	680	1.30	3,0	60	0.67	5,2	1.6	16	T4	INERIS 05 ATEX 0025X
RL0031	RL	90	L	8		0,55	0,75	690	1.90	3,0	65	0.65	7,7	2.4	17.5	T4	INERIS 05 ATEX 0025X
RL0039	RL	100	LA	8		0,75	1,00	700	2,60	3.4	65	0,65	10,0	2.3	23	T4	INERIS 05 ATEX 0025X
RL0040	RL	100	LB	8		1,10	1,50	700	3,60	3.7	63	0,69	15,2	2.2	25	T4	INERIS 05 ATEX 0025X
RL0041	RL	112	M	8		1,50	2,00	705	4,30	4.1	79	0,64	20,2	1.9	35	T4	INERIS 05 ATEX 0025X
RL0066	RL	132	SB	8		2,20	3,00	705	5,20	3,8	82	0,75	30,2	1,8	56	T4	INERIS 05 ATEX 0025X
RL0067	RL	132	MB	8		3,00	4,00	715	7,00	4,0	84	0,74	40,0	1,9	61	T4	INERIS 05 ATEX 0025X
RL0068	RL	160	MA	8		4,00	5,50	710	9,00	4,1	82	0,78	52,0	1,9	97	T4	INERIS 05 ATEX 0025X
RL0069	RL	160	MB	8		5,50	7,50	715	12,70	4,0	86	0,76	72,5	2,1	106	T4	INERIS 05 ATEX 0025X
RL0070	RL	160	L	8		7,50	10,00	720	15,90	4,2	86	0,79	99,8	2,3	118	T4	INERIS 05 ATEX 0025X

1 Speed 750 — Motors for INVERTER - Rated data at 400V/50Hz — II 2G - II 2GD - Ex d – Ex de - IIC

Part Number	Cooling						Selfventilated - (IC411)									Forced ventilation - (IC416)						Certificato
	Torque						Quadratic			Constant			Constant			Constant			Constant			
	Range Hz						5 - 50 Hz			5 - 50 Hz			5 - 87 Hz			5 - 50 Hz			5 - 87 Hz			
	speed						150 - 1500 rpm			150 - 1500 rpm			150 - 2600 rpm			150 - 1500 rpm			150 - 2600 rpm			
	Type					P (kW)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	P_n (kW)	M_n (Nm)	I_n (A)	
RL0625-I	RL	63	B		8	0,06	0,06	0,90	0,40	0,05	0,68	0,30	0,04	0,54	0,240	0,05	0,81	0,36	0,05	0,72	0,32	◆
RL0626-I	RL	71	A		8	0,09	0,09	1,30	0,55	0,07	0,98	0,41	0,05	0,78	0,330	0,08	1,17	0,50	0,07	1,04	0,44	◆
RL0627-I	RL	71	B		8	0,12	0,12	1,80	0,65	0,09	1,35	0,49	0,07	1,08	0,39	0,11	1,62	0,59	0,10	1,44	0,52	◆
RL0628-I	RL	80	A		8	0,18	0,18	2,50	0,95	0,14	1,88	0,71	0,11	1,50	0,57	0,16	2,25	0,86	0,14	2,00	0,76	◆
RL0629-I	RL	80	B		8	0,25	0,25	3,60	1,20	0,19	2,70	0,90	0,15	2,16	0,72	0,23	3,24	1,08	0,20	2,88	0,96	◆
RL0630-I	RL	90	S		8	0,37	0,37	5,20	1,30	0,28	3,90	0,98	0,22	3,12	0,78	0,33	4,68	1,17	0,30	4,16	1,04	◆
RL0631-I	RL	90	L		8	0,55	0,55	7,70	1,90	0,41	5,78	1,43	0,33	4,62	1,14	0,50	6,93	1,71	0,44	6,16	1,52	◆
RL0639-I	RL	100	LA		8	0,75	0,75	10,00	2,60	0,56	7,50	1,95	0,45	6,00	1,56	0,68	9,00	2,34	0,60	8,00	2,08	◆
RL0640-I	RL	100	LB		8	1,10	1,10	15,20	3,60	0,83	11,70	2,75	0,66	9,36	2,30	0,99	14,04	3,20	0,88	12,48	2,90	◆
RL0641-I	RL	112	M		8	1,50	1,50	20,20	4,30	1,13	15,15	3,23	0,90	12,12	2,58	1,35	18,18	3,87	1,20	16,16	3,44	◆
RL0666-I	RL	132	SB		8	2,20	2,20	30,20	5,20	1,65	22,65	3,90	1,32	18,12	3,12	1,98	27,18	4,68	1,76	24,16	4,16	◆
RL0667-I	RL	132	MB		8	3,00	3,00	40,00	7,00	2,25	30,00	5,25	1,80	24,00	4,20	2,70	36,00	6,30	2,40	32,00	5,60	◆
RL0668-I	RL	160	MA		8	4,00	4,00	52,00	9,00	3,00	39,00	6,75	2,40	31,20	5,40	3,60	46,80	8,10	3,20	41,60	7,20	◆
RL0669-I	RL	160	MB		8	5,50	5,50	72,50	12,70	4,13	54,38	9,53	3,30	43,50	7,62	4,95	65,25	11,43	4,40	58,00	10,16	◆
RL0670-I	RL	160	L		8	7,50	7,50	99,80	15,90	5,63	74,85	11,93	4,50	59,88	9,54	6,75	89,82	14,31	6,00	79,84	12,72	◆

◆ INERIS 05 ATEX 0025X

5.2 Three-phase Motors 2 speed – Constant Torque (for general purpose)

- Three phase asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", IP55, 400V- 50 Hz.
- Connections

Poles	Connections	High Speed	Low Speed
2/4 – 4/8	(Dahlander)	**YY** 400 V	Δ 400V
4/6 – 6/8	(2 Separate windings)	**Y** 400 V	**Y** 400V

- For ambient temperature see par 2.1

2 Speed 3000/1500 **CONSTANT TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL4001	RL	2CT	63	B	2/4		0,25	2800	1,00	3,5	52	0,70	0,9	1,7	6.5	T4	INERIS 05 ATEX 0025X
							0,18	1380	0,68	3,0	58	0,66	1,3	1,7			
RL4002	RL	2CT	71	A	2/4		0,30	2800	1,15	3,2	53	0,71	1,1	1,7	6.5	T4	INERIS 05 ATEX 0025X
							0,20	1400	0,85	3,0	57	0,66	1,4	1,5			
RL4003	RL	2CT	71	B	2/4		0,45	2805	1,52	3,8	60	0,70	1,6	1,8	7.5	T4	INERIS 05 ATEX 0025X
							0,30	1400	1,03	3,6	68	0,62	2,1	1,8			
RL4004	RL	2CT	80	A	2/4		0,55	2820	1,70	4,1	67	0,76	1,9	1,7	10	T4	INERIS 05 ATEX 0025X
							0,37	1390	1,49	3,9	68	0,625	2,6	1,7			
RL4005	RL	2CT	80	B	2/4		0,75	2830	2,10	4,4	72	0,81	2,6	1,8	12	T4	INERIS 05 ATEX 0025X
							0,55	1400	1,90	4,1	67	0,71	3,9	1,8			
RL4006	RL	2CT	90	S	2/4		1,25	2830	3,00	5,4	73	0,82	4,4	2,1	16	T4	INERIS 05 ATEX 0025X
							0,90	1405	2,60	4,6	69	0,72	6,4	1,9			
RL4007	RL	2CT	90	L	2/4		1,60	2820	4,05	4,4	70	0,81	5,6	2,1	17.5	T4	INERIS 05 ATEX 0025X
							1,20	1405	3,30	4,3	69	0,76	8,5	2,0			
RL4008	RL	2CT	100	LA	2/4		2,35	2820	4,85	6,4	77	0,85	8,3	2,4	23	T4	INERIS 05 ATEX 0025X
							1,85	1420	4,10	5,5	75	0,79	13,0	2,1			
RL4009	RL	2CT	100	LB	2/4		3,00	2840	6,43	7,0	77	0,84	10,5	2,2	25	T4	INERIS 05 ATEX 0025X
							2,40	1425	4,85	6,1	77	0,85	16,8	2,0			
RL4010	RL	2CT	112	M	2/4		4,00	2890	8,50	7,1	77	0,88	13,8	2,2	35	T4	INERIS 05 ATEX 0025X
							3,30	1430	7,00	6,2	78	0,87	23,0	2,2			
RL4036	RL	2CT	132	S	2/4		5,90	2850	12,00	7,1	84	0,85	19,5	2,2	60	T4	INERIS 05 ATEX 0025X
							4,80	1440	9,40	6,3	85	0,87	32,0	2,1			
RL4037	RL	2CT	132	MB	2/4		7,50	2880	13,80	7,3	87	0,91	25,0	2,1	66	T4	INERIS 05 ATEX 0025X
							5,50	1450	11,00	6,5	87	0,84	44,0	2,1			
RL4038	RL	2CT	132	L	2/4		8,00	2930	14,90	7,4	87	0,89	30,5	2,2	71	T4	INERIS 05 ATEX 0025X
							6,00	1460	12,00	6,2	85	0,86	50,0	2,1			
RL4039	RL	2CT	160	M	2/4		11,00	2915	22,00	7,2	82	0,89	36,0	2,2	105	T4	INERIS 05 ATEX 0025X
							8,80	1460	17,00	6,4	88	0,85	58,5	2,2			
RL4040	RL	2CT	160	L	2/4		15,00	2910	28,30	7,4	84	0,91	49,0	2,5	115	T4	INERIS 05 ATEX 0025X
							12,00	1450	23,70	6,5	87	0,84	79,0	2,4			

2 Speed 1500/750 **CONSTANT TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL4011	**RL**	**2CT**	**71**	**A**	**4/8**		**0,18**	1380	0,62	3,5	68	0,62	1,3	2,2	6,5	T4	INERIS 05 ATEX 0025X
							0,09	660	0,45	2,2	40	0,72	1,4	2,7			
RL4012	**RL**	**2CT**	**71**	**B**	**4/8**		**0,25**	1380	0,68	3,0	70	0,75	1,5	2,2	8	T4	INERIS 05 ATEX 0025X
							0,12	660	0,58	2,0	42	0,71	1,5	2,3			
RL4013	**RL**	**2CT**	**80**	**A**	**4/8**		**0,37**	1400	1,00	3,4	71	0,75	2,2	2,4	10	T4	INERIS 05 ATEX 0025X
							0,18	670	0,77	2,8	50	0,67	2,3	2,7			
RL4014	**RL**	**2CT**	**80**	**B**	**4/8**		**0,55**	1400	1,43	4,4	75	0,74	3,1	2,2	12	T4	INERIS 05 ATEX 0025X
							0,25	670	0,97	2,9	54	0,69	2,9	2,8			
RL4015	**RL**	**2CT**	**90**	**S**	**4/8**		**0,75**	1405	1,85	4,9	71	0,77	4,5	1,9	16	T4	INERIS 05 ATEX 0025X
							0,37	675	1,23	3,0	62	0,70	4,4	1,6			
RL4016	**RL**	**2CT**	**90**	**L**	**4/8**		**1,00**	1405	2,50	4,2	77	0,75	6,9	2,3	18	T4	INERIS 05 ATEX 0025X
							0,55	675	1,68	3,0	67	0,70	6,8	2,4			
RL4017	**RL**	**2CT**	**100**	**LA**	**4/8**		**1,30**	1420	3,10	4,5	79	0,77	9,1	3,0	23	T4	INERIS 05 ATEX 0025X
							0,70	700	2,10	4,9	70	0,68	8,9	1,9			
RL4018	**RL**	**2CT**	**100**	**LB**	**4/8**		**1,80**	1430	4,00	5,0	80	0,81	11,5	2,5	25	T4	INERIS 05 ATEX 0025X
							0,90	690	2,60	3,7	72	0,74	12,0	1,8			
RL4019	**RL**	**2CT**	**112**	**M**	**4/8**		**2,50**	1450	5,00	5,5	81	0,85	17,2	2,1	35	T4	INERIS 05 ATEX 0025X
							1,25	705	3,70	4,1	78	0,65	16,9	1,9			
RL4041	**RL**	**2CT**	**132**	**S**	**4/8**		**3,30**	1445	6,80	4,9	83	0,85	22,0	1,6	56	T4	INERIS 05 ATEX 0025X
							1,85	705	4,40	4,1	82	0,75	25,0	1,6			
RL4042	**RL**	**2CT**	**132**	**MB**	**4/8**		**4,80**	1430	10,00	5,2	85	0,82	32,0	1,7	61	T4	INERIS 05 ATEX 0025X
							2,40	710	5,50	4,3	82	0,76	33,0	1,7			
RL4043	**RL**	**2CT**	**132**	**L**	**4/8**		**5,50**	1440	11,50	5,5	85	0,82	36,0	1,8	71	T4	INERIS 05 ATEX 0025X
							3,00	715	7,00	4,5	84	0,74	39,7	1,8			
RL4044	**RL**	**2CT**	**160**	**M**	**4/8**		**7,50**	1450	17,10	5,7	87	0,84	49,0	1,9	106	T4	INERIS 05 ATEX 0025X
							4,80	715	10,70	4,7	86	0,76	63,0	1,8			
RL4045	**RL**	**2CT**	**160**	**L**	**4/8**		**10,00**	1450	20,70	6,8	83	0,84	66,0	1,9	118	T4	INERIS 05 ATEX 0025X
							6,60	720	12,80	5,6	86	0,87	88,0	1,9			

2 Speed 1500/1000 **CONSTANT TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL4020	**RL**	**2CT**	**71**	**B**	**4/6**		**0,20**	1400	0,55	3,3	70	0,75	1,3	1,4	8	T4	INERIS 05 ATEX 0025X
							0,10	900	0,38	2,4	53	0,71	1,1	1,4			
RL4021	**RL**	**2CT**	**80**	**A**	**4/6**		**0,40**	1400	1,10	3,4	71	0,75	2,9	1,4	10	T4	INERIS 05 ATEX 0025X
							0,20	905	0,65	2,5	62	0,72	2,1	1,5			
RL4022	**RL**	**2CT**	**80**	**B**	**4/6**		**0,50**	1405	1,38	3,6	71	0,74	3,4	1,5	12	T4	INERIS 05 ATEX 0025X
							0,30	910	0,90	3,1	66	0,73	3,0	1,5			
RL4023	**RL**	**2CT**	**90**	**S**	**4/6**		**0,65**	1405	1,65	5,8	76	0,75	4,5	1,6	16	T4	INERIS 05 ATEX 0025X
							0,45	910	1,26	4,3	70	0,73	4,6	1,5			
RL4024	**RL**	**2CT**	**90**	**L**	**4/6**		**0,95**	1410	2,36	5,5	77	0,76	6,3	1,5	18	T4	INERIS 05 ATEX 0025X
							0,60	910	1,66	3,6	70	0,74	6,4	1,6			
RL4025	**RL**	**2CT**	**100**	**LA**	**4/6**		**1,40**	1415	3,20	5,7	81	0,73	9,4	1,8	23	T4	INERIS 05 ATEX 0025X
							0,90	910	2,40	4,1	74	0,74	9,3	1,7			
RL4026	**RL**	**2CT**	**100**	**LB**	**4/6**		**1,85**	1415	4,10	5,8	80	0,81	12,4	1,6	25	T4	INERIS 05 ATEX 0025X
							1,10	910	2,90	3,9	74	0,74	12,1	1,6			
RL4027	**RL**	**2CT**	**112**	**M**	**4/6**		**2,40**	1420	4,95	6,1	82	0,85	16,2	1,8	35	T4	INERIS 05 ATEX 0025X
							1,60	940	3,66	4,3	81	0,77	16,5	1,7			
RL4046	**RL**	**2CT**	**132**	**S**	**4/6**		**3,00**	1440	6,00	5,9	82	0,87	20,0	1,9	55	T4	INERIS 05 ATEX 0025X
							2,00	945	4,46	3,9	81	0,80	20,2	1,6			
RL4047	**RL**	**2CT**	**132**	**MA**	**4/6**		**4,00**	1450	8,40	6,1	84	0,82	26,3	2,0	60	T4	INERIS 05 ATEX 0025X
							2,60	940	5,80	4,5	84	0,77	25,9	1,8			
RL4048	**RL**	**2CT**	**132**	**MB**	**4/6**		**4,40**	1445	9,00	6,3	83	0,89	29,0	1,9	66	T4	INERIS 05 ATEX 0025X
							3,00	965	6,60	4,4	80	0,8	30,3	1,7			
RL4049	**RL**	**2CT**	**132**	**L**	**4/6**		**5,15**	1450	10,70	6,8	85	0,82	33,5	1,9	71	T4	INERIS 05 ATEX 0025X
							3,30	945	7,30	4,7	86	0,76	33,0	1,7			
RL4050	**RL**	**2CT**	**160**	**M**	**4/6**		**6,60**	1460	13,40	6,8	86	0,83	43,0	1,9	106	T4	INERIS 05 ATEX 0025X
							4,40	950	9,90	4,4	82	0,79	43,9	1,8			
RL4051	**RL**	**2CT**	**160**	**L**	**4/6**		**8,80**	1460	18,20	6,8	83	0,84	57,7	1,9	118	T4	INERIS 05 ATEX 0025X
							5,90	950	13,20	4,9	81	0,80	58,0	1,8			

2 Speed 1000/750 **CONSTANT TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL4028	**RL**	**2CT**	**71**	**B**	**6/8**		**0,12**	900	0,53	2,4	50	0,71	1,3	1,4	8	T4	INERIS 05 ATEX 0025X
							0,08	690	0,44	2,2	49	0,61	1,1	1,3			
RL4029	**RL**	**2CT**	**80**	**A**	**6/8**		**0,15**	935	0,68	2,6	50	0,71	1,5	1,5	10	T4	INERIS 05 ATEX 0025X
							0,13	690	0,63	2,1	52	0,60	1,9	1,5			
RL4030	**RL**	**2CT**	**80**	**B**	**6/8**		**0,25**	930	1,00	3,2	52	0,72	2,7	1,5	12	T4	INERIS 05 ATEX 0025X
							0,15	685	0,82	2,2	49	0,60	2,2	1,4			
RL4031	**RL**	**2CT**	**90**	**S**	**6/8**		**0,35**	910	1,35	3,8	55	0,74	3,6	1,4	16	T4	INERIS 05 ATEX 0025X
							0,25	650	1,00	3,1	60	0,60	3,8	2,5			
RL4032	**RL**	**2CT**	**90**	**L**	**6/8**		**0,60**	935	2,00	3,8	60	0,76	6,1	1,5	18	T4	INERIS 05 ATEX 0025X
							0,30	685	1,35	3,4	61	0,60	4,3	1,6			
RL4033	**RL**	**2CT**	**100**	**LA**	**6/8**		**0,80**	920	2,35	4,0	65	0,77	8,2	1,5	23	T4	INERIS 05 ATEX 0025X
							0,55	700	1,90	3,6	68	0,63	7,4	1,6			
RL4034	**RL**	**2CT**	**100**	**LB**	**6/8**		**1,00**	930	2,90	4,1	67	0,75	10,5	1,6	25	T4	INERIS 05 ATEX 0025X
							0,65	700	2,20	3,7	68	0,66	8,8	1,6			
RL4035	**RL**	**2CT**	**112**	**M**	**6/8**		**1,50**	960	4,20	4,0	75	0,72	15	1,7	35	T4	INERIS 05 ATEX 0025X
							1,00	710	3,30	3,9	65	0,70	13,4	1,6			
RL4052	**RL**	**2CT**	**132**	**S**	**6/8**		**1,85**	960	5,20	4,1	74	0,71	18,4	1,6	60	T4	INERIS 05 ATEX 0025X
							1,30	720	4,10	4,0	68	0,65	17,5	1,8			
RL4053	**RL**	**2CT**	**132**	**MB**	**6/8**		**2,55**	965	6,90	4,2	74	0,73	25,1	1,8	66	T4	INERIS 05 ATEX 0025X
							1,85	720	5,90	4,1	69	0,67	24,6	1,8			
RL4054	**RL**	**2CT**	**132**	**L**	**6/8**		**3,00**	980	7,30	4,2	80	0,75	29,5	1,8	71	T4	INERIS 05 ATEX 0025X
							2,00	735	5,90	4,1	74	0,65	26,3	1,9			
RL4055	**RL**	**2CT**	**160**	**M**	**6/8**		**4,00**	980	9,40	4,3	82	0,75	39,3	1,9	106	T4	INERIS 05 ATEX 0025X
							2,80	725	7,50	4,2	78	0,70	37,2	1,9			
RL4056	**RL**	**2CT**	**160**	**L**	**6/8**		**5,50**	985	12,90	4,3	84	0,74	53,5	1,9	118	T4	INERIS 05 ATEX 0025X
							4,00	730	9,90	4,2	78	0,75	53,0	1,9			

5.3 Motori trifasi 2 velocità Coppia Quadratica (For centrifugal machines)

- Three phase asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", IP55, 400V- 50 Hz.
- Connections

Poles	Connections	High Speed	Low Speed
2/4 – 4/8	(Dahlander)	YY 400 V	Y 400V
4/6 – 6/8	(2 Separate windings)	Y 400 V	Y 400V

- For ambient temperature see par 2.1

2 Speed 3000/1500 **QUADRATIC TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P	rpm	In	I_a/I_n	η	Cos	M_n	M_a/M_n	m	Class	Certificate
							kW	min^{-1}	400 V Amp.		%	φ	Nm		Kg	T	
RL6001	RL	2QT	63	B	2/4		0,25	2780	0,90	3,3	52	0,70	0,9	2,0	7	T4	INERIS 05 ATEX 0025X
							0,06	1410	0,20	2,5	58	0,68	0,4	1,7			
RL6002	RL	2QT	71	A	2/4		0,37	2790	1,10	3,5	59	0,80	1,3	1,8	7	T4	INERIS 05 ATEX 0025X
							0,09	1410	0,40	2,8	33	0,70	0,6	1,8			
RL6003	RL	2QT	71	B	2/4		0,50	2800	1,90	3,6	60	0,70	1,7	1,8	8	T4	INERIS 05 ATEX 0025X
							0,14	1410	0,45	2,9	65	0,70	1,0	1,9			
RL6004	RL	2QT	80	A	2/4		0,75	2800	2,26	4	63	0,76	2,6	1,8	11	T4	INERIS 05 ATEX 0025X
							0,18	1415	0,50	3,5	66	0,79	1,2	2,2			
RL6005	RL	2QT	80	B	2/4		1,10	2810	3,00	4,1	66	0,81	3,7	1,8	13	T4	INERIS 05 ATEX 0025X
							0,25	1415	0,64	3,7	70	0,81	1,7	2,2			
RL6006	RL	2QT	90	S	2/4		1,50	2820	4,00	4,5	66	0,82	5,1	2,0	17,5	T4	INERIS 05 ATEX 0025X
							0,37	1420	1,00	3,9	64	0,81	2,5	2,2			
RL6007	RL	2QT	90	L	2/4		2,20	2860	5,00	4,4	70	0,89	7,5	1,9	19	T4	INERIS 05 ATEX 0025X
							0,55	1400	1,30	4,4	67	0,87	3,7	2,1			
RL6008	RL	2QT	100	LA	2/4		2,60	2820	5,30	5,6	77	0,92	8,8	2,1	25	T4	INERIS 05 ATEX 0025X
							0,62	1420	1,42	5,3	73	0,89	4,2	2,0			
RL6009	RL	2QT	100	LB	2/4		3,30	2800	6,64	5,6	78	0,92	11,3	2,1	27	T4	INERIS 05 ATEX 0025X
							0,75	1415	1,60	5	73	0,90	5,1	2,0			
RL6010	RL	2QT	112	M	2/4		4,40	2890	8,50	5,4	76	0,95	14,6	2,0	35	T4	INERIS 05 ATEX 0025X
							1,10	1440	2,30	5	76	0,90	7,4	1,9			
RL6035	RL	2QT	132	S	2/4		6,50	2900	12,40	6,1	84	0,92	21,4	2,2	60	T4	INERIS 05 ATEX 0025X
							2,00	1450	4,70	5,9	75	0,81	13,1	2,1			
RL6036	RL	2QT	132	M	2/4		8,50	2910	15,90	6,7	92	0,83	28,1	2,3	66	T4	INERIS 05 ATEX 0025X
							2,50	1450	4,90	6,4	90	0,80	16,4	2,3			
RL6037	RL	2QT	132	L	2/4		9,20	2900	17,40	6,8	89	0,85	30,5	2,4	71	T4	INERIS 05 ATEX 0025X
							2,80	1450	5,60	6,5	86	0,83	18,5	2,3			
RL6038	RL	2QT	160	M	2/4		12,00	2930	25,90	6,1	76	0,90	39,0	3,5	105	T4	INERIS 05 ATEX 0025X
							3,00	1450	7,90	4,3	69	0,82	19,6	2,2			
RL6039	RL	2QT	160	L	2/4		16,00	2930	28,40	7,3	86	0,94	52,0	2,1	115	T4	INERIS 05 ATEX 0025X
							4,40	14760	10,40	6,9	79	0,80	28,5	2,0			

2 Speed 1500/750 **QUADRATIC TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL6011	**RL**	**2QT**	**71**	**A**	**4/8**		**0,25**	1400	0,69	3,0	70	0,75	1,7	2,2	6.5	T4	INERIS 05 ATEX 0025X
							0,05	700	0,36	2,3	28	0,68	0,7	2,8			
RL6012	**RL**	**2QT**	**71**	**B**	**4/8**		**0,37**	1380	1,10	2,5	59	0,80	2,6	1,2	7.5	T4	INERIS 05 ATEX 0025X
							0,07	680	0,45	1,4	33	0,70	1,1	1,2			
RL6013	**RL**	**2QT**	**80**	**A**	**4/8**		**0,55**	1405	1,43	4,4	75	0,74	3,7	2,2	10	T4	INERIS 05 ATEX 0025X
							0,10	700	0,58	2,0	38	0,66	1,4	2,3			
RL6014	**RL**	**2QT**	**80**	**B**	**4/8**		**0,75**	1410	1,90	4,1	70	0,76	5,1	1,7	12	T4	INERIS 05 ATEX 0025X
							0,15	690	0,70	2,4	48	0,66	2,1	1,5			
RL6015	**RL**	**2QT**	**90**	**S**	**4/8**		**0,90**	1415	2,75	4,0	77	0,75	6,1	2,3	16	T4	INERIS 05 ATEX 0025X
							0,25	710	0,96	2,9	54	0,70	3,4	2,8			
RL6016	**RL**	**2QT**	**90**	**L**	**4/8**		**1,20**	1420	3,40	4,2	80	0,79	8,1	2,3	17.5	T4	INERIS 05 ATEX 0025X
							0,30	710	1,10	1,3	57	0,70	4,0	3,0			
RL6017	**RL**	**2QT**	**100**	**LA**	**4/8**		**1,90**	1390	4,10	5,0	80	0,80	13,1	3,0	23	T4	INERIS 05 ATEX 0025X
							0,45	710	1,60	3,0	61	0,68	6,1	2,0			
RL6018	**RL**	**2QT**	**100**	**LB**	**4/8**		**2,20**	1440	4,86	6,0	84	0,85	14,6	2,5	25	T4	INERIS 05 ATEX 0025X
							0,55	720	1,68	3,0	68	0,70	7,3	2,4			
RL6019	**RL**	**2QT**	**112**	**M**	**4/8**		**3,00**	1450	6,60	6,0	83	0,85	19,8	2,6	35	T4	INERIS 05 ATEX 0025X
							0,75	720	2,27	3,0	70	0,68	9,9	2,4			
RL6040	**RL**	**2QT**	**132**	**S**	**4/8**		**4,40**	1450	9,90	5,8	77	0,85	29,0	2,2	60	T4	INERIS 05 ATEX 0025X
							1,10	720	3,90	3,5	65	0,63	15,0	1,9			
RL6041	**RL**	**2QT**	**132**	**MB**	**4/8**		**5,90**	1445	11,90	6,2	87	0,84	39,0	2,1	66	T4	INERIS 05 ATEX 0025X
							1,50	705	4,33	3,9	79	0,64	20,0	1,8			
RL6042	**RL**	**2QT**	**132**	**L**	**4/8**		**7,50**	1440	15,90	6,7	84	0,83	50,0	2,1	71	T4	INERIS 05 ATEX 0025X
							1,85	710	6,10	4,3	73	0,61	25,0	1,9			
RL6043	**RL**	**2QT**	**160**	**M**	**4/8**		**8,80**	1450	19,40	6,8	78	0,86	58,3	2,2	106	T4	INERIS 05 ATEX 0025X
							2,50	730	8,50	3,9	65	0,67	32,8	2,9			
RL6044	**RL**	**2QT**	**160**	**L**	**4/8**		**12,00**	1460	23,30	6,8	88	0,85	78,6	2,2	118	T4	INERIS 05 ATEX 0025X
							3,20	715	7,48	4,0	83,5	0,74	42,2	2,1			

2 Speed 1500/1000 **QUADRATIC TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL6020	**RL**	**2QT**	**71**	**B**	**4/6**		**0,30**	1400	0,95	2,6	71	0,75	2,1	2,0	7.5	T4	INERIS 05 ATEX 0025X
							0,10	900	0,50	1,4	63	0,72	1,4	1,8			
RL6021	**RL**	**2QT**	**80**	**A**	**4/6**		**0,44**	1405	1.02	3,2	59	0,8	3,0	1,5	10	T4	INERIS 05 ATEX 0025X
							0,13	900	0,50	1,7	33	0,7	1,4	1,1			
RL6022	**RL**	**2QT**	**80**	**B**	**4/6**		**0,59**	1405	1,60	3,5	76	0,8	3,9	1,7	12	T4	INERIS 05 ATEX 0025X
							0,18	905	0,65	2,3	72	0,75	1,9	1,2			
RL6023	**RL**	**2QT**	**90**	**S**	**4/6**		**0,90**	1400	2,25	4,1	77	0,75	6,1	2,1	16	T4	INERIS 05 ATEX 0025X
							0,30	900	0,83	3,1	68	0,76	3,1	1,6			
RL6024	**RL**	**2QT**	**90**	**L**	**4/6**		**1,15**	1420	2,60	4,1	80	0,79	7,5	1,8	17.5	T4	INERIS 05 ATEX 0025X
							0,40	910	1,10	2,9	74	0,74	4,2	1,3			
RL6025	**RL**	**2QT**	**100**	**LA**	**4/6**		**1,80**	1410	3,67	5,1	80	0,83	12,1	2,1	23	T4	INERIS 05 ATEX 0025X
							0,60	930	1,44	3,9	80	0,75	6,1	1,8			
RL6026	**RL**	**2QT**	**100**	**LB**	**4/6**		**2,20**	1440	4,90	3,8	82	0,87	15,2	1,7	25	T4	INERIS 05 ATEX 0025X
							0,70	940	2,10	3,0	80	0,75	7,5	1,5			
RL6027	**RL**	**2QT**	**112**	**M**	**4/6**		**3,00**	1450	6,30	5,5	84	0,82	19,8	2,0	35	T4	INERIS 05 ATEX 0025X
							0,90	940	2,00	4,0	81	0,79	9,1	1,9			
RL6045	**RL**	**2QT**	**132**	**S**	**4/6**		**4,00**	1450	9,30	6,3	80	0,78	26,0	2,1	55	T4	INERIS 05 ATEX 0025X
							1,20	980	4,50	4,9	70	0,6	11,8	1,7			
RL6046	**RL**	**2QT**	**132**	**MA**	**4/6**		**4,80**	1460	11,30	6,6	75	0,81	31,2	1,9	60	T4	INERIS 05 ATEX 0025X
							1,40	970	5,00	5,2	69	0,6	14,0	1,9			
RL6047	**RL**	**2QT**	**132**	**MB**	**4/6**		**5,50**	1455	12,80	5,4	77	0,81	36,0	2,1	66	T4	INERIS 05 ATEX 0025X
							1,70	960	6,40	4,8	64	0,62	17,0	1,9			
RL6048	**RL**	**2QT**	**132**	**L**	**4/6**		**6,60**	1460	15,30	6,7	89	0,72	43,2	1,9	71	T4	INERIS 05 ATEX 0025X
							2,00	950	7,90	5,2	78	0,55	20,1	1,9			
RL6049	**RL**	**2QT**	**160**	**M**	**4/6**		**7,50**	1470	16,40	7,2	81	0,85	49,0	2,2	106	T4	INERIS 05 ATEX 0025X
							2,50	985	7,20	5,9	72	0,72	24,2	2,3			
RL6050	**RL**	**2QT**	**160**	**L**	**4/6**		**11,00**	1450	22,80	6,9	84	0,85	72,0	2,2	118	T4	INERIS 05 ATEX 0025X
							3,30	960	9,30	6,1	73	0,72	32,0	2,3			

2 Speed 1000/750 **QUADRATIC TORQUE – Rated data at 400V/50Hz** **II 2G - II 2GD - Ex d – Ex de - IIC**

Part Number	Type						P kW	rpm min^{-1}	In 400 V Amp.	I_a/I_n	η %	Cos φ	M_n Nm	M_a/M_n	m Kg	Class T	Certificate
RL6028	**RL**	**2QT**	**80**	**A**	**6/8**		**0,33**	920	1,32	3,1	55	0,70	3,4	1,8	10	T4	INERIS 05 ATEX 0025X
							0,09	680	0,40	1,9	57	0,62	1,3	1,4			
RL6029	**RL**	**2QT**	**80**	**B**	**6/8**		**0,40**	935	1,48	2,9	58	0,70	4,0	1,8	12	T4	INERIS 05 ATEX 0025X
							0,12	685	0,50	2,1	55	0,63	1,7	1,4			
RL6030	**RL**	**2QT**	**90**	**S**	**6/8**		**0,48**	925	1,78	3,1	61	0,65	4,8	1,9	16	T4	INERIS 05 ATEX 0025X
							0,19	690	0,85	2,1	55	0,62	2,7	1,5			
RL6031	**RL**	**2QT**	**90**	**L**	**6/8**		**0,66**	900	2,00	3,2	60	0,80	7,1	2,0	17.5	T4	INERIS 05 ATEX 0025X
							0,25	700	1,20	2,3	52	0,62	3,5	1,7			
RL6032	**RL**	**2QT**	**100**	**LA**	**6/8**		**0,90**	960	2,85	4,1	67	0,68	8,9	1,9	23	T4	INERIS 05 ATEX 0025X
							0,37	720	1,75	3,5	50	0,65	4,8	1,8			
RL6033	**RL**	**2QT**	**100**	**LB**	**6/8**		**1,10**	950	3,35	3,9	70	0,70	11,2	1,6	25	T4	INERIS 05 ATEX 0025X
							0,45	720	2,10	3,4	52	0,64	5,9	1,4			
RL6034	**RL**	**2QT**	**112**	**M**	**6/8**		**1,50**	970	3,90	4,4	75	0,74	15,1	2,1	35	T4	INERIS 05 ATEX 0025X
							0,75	720	2,80	3,5	61	0,68	10,1	1,7			
RL6051	**RL**	**2QT**	**132**	**S**	**6/8**		**2,20**	960	5,60	4,4	75	0,75	22,2	2,2	60	T4	INERIS 05 ATEX 0025X
							0,90	720	3,20	3,7	62	0,66	11,9	1,8			
RL6052	**RL**	**2QT**	**132**	**MA**	**6/8**		**3,00**	970	6,90	4,8	77	0,82	29,7	2,1	66	T4	INERIS 05 ATEX 0025X
							1,20	730	4,80	3,8	61	0,63	15,6	1,8			
RL6053	**RL**	**2QT**	**132**	**MB**	**6/8**		**3,70**	970	8,80	5,1	80	0,77	36,5	2,1	71	T4	INERIS 05 ATEX 0025X
							1,50	720	4,90	3,8	65	0,70	20,1	2,1			
RL6054	**RL**	**2QT**	**160**	**M**	**6/8**		**5,50**	980	12,30	5,5	88	0,75	53,5	2,2	106	T4	INERIS 05 ATEX 0025X
							2,50	730	6,70	4,2	84	0,65	32,5	2,3			
RL6055	**RL**	**2QT**	**160**	**L**	**6/8**		**7,50**	970	15,30	5,7	84	0,85	73,5	2,1	118	T4	INERIS 05 ATEX 0025X
							4,00	720	9,10	3,9	81	0,80	53,2	2,1			

5.4 Single-phase motors

- Single-phase asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", IP55, 230V - 50 Hz.
- For ambient temperature see par 2.1
- The motors considered in teh rating table are single-phase motors with 1 capacitor. In case of single-phase motors with high starting torque it is possible to have a start capacitor complete with electronic switch (on request mechanical).

Rated data at 230V/50Hz

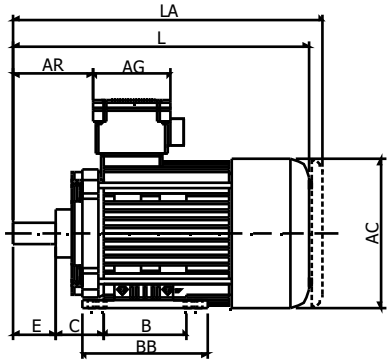
Part Number	Type					P		rpm	In	I_a/I_n	η	Cos	M_n	M_a/M_n	Cap.	m	Class	Certificate	
						kW	Hp	min^{-1}	Amp.		%	φ	Nm		µF	Kg	T		
RL8001	RL	56	A	2		**0,06**	0,08	2710	0,60	2,8	42	0,88	0,15	0,6	2,5	4	T4	❶	❷
RL8002	RL	56	B	2		**0,09**	0,12	2720	0,84	3,0	43	0,90	0,2	0,6	3	4,5	T4	❶	❷
RL8003	RL	63	A	2		**0,12**	0,16	2770	1,23	3,2	50	0,90	0,3	0,7	6,3	6	T4	❶	❷
RL8004	RL	63	B	2		**0,18**	0,25	2780	1,76	3,7	51	0,86	0,55	0,7	6,3	6.5	T4	❶	❷
RL8005	RL	71	A	2		**0,25**	0,34	2785	1,91	3,6	60	0,93	0,75	0,8	8	6.5	T4	❶	❷
RL8006	RL	71	B	2		**0,37**	0,50	2800	2,71	2,6	62	0,97	1,5	0,8	10	7.5	T4		❷
RL8007	RL	80	A	2		**0,55**	0,75	2800	3,79	2,4	61	0,97	1,95	0,7	16	10	T4		❷
RL8008	RL	80	B	2		**0,75**	1,00	2840	4,82	4,4	62	0,94	2,7	0,9	20	12	T4		❷
RL8009	RL	90	S	2		**1,10**	1,50	2850	7,60	4,3	67	0,89	3,9	0,8	25	16	T4		❷
RL8010	RL	90	L	2		**1,50**	2,00	2850	9,25	4,8	67	0,94	5,0	0,8	30	17.5	T4		❷
RL8011	RL	100	LA	2		**2,20**	3,00	2840	13,10	4,9	69	0,93	7,4	0,7	35	23	T4		❷
RL8012	RL	100	LB	2		**3,00**	4,00	2810	17,50	4,9	72	0,95	10,1	0,7	50	25	T4		❷
RL8013	RL	56	B	4		**0,06**	0,08	1285	0,68	2,7	49	0,90	0,4	0,6	3,5	4,5	T4	❶	❷
RL8014	RL	63	A	4		**0,09**	0,12	1360	0,88	3,1	51	0,88	0,6	0,7	5	6	T4	❶	❷
RL8015	RL	63	B	4		**0,12**	0,16	1380	1,15	2,9	53	0,86	1,1	0,7	6,3	6.5	T4	❶	❷
RL8016	RL	71	A	4		**0,18**	0,25	1410	1,54	3,1	61	0,83	1,8	0,8	8	6.5	T4	❶	❷
RL8017	RL	71	B	4		**0,25**	0,34	1385	2,04	3,2	63	0,85	2,3	0,8	8	7.5	T4	❶	❷
RL8018	RL	80	A	4		**0,37**	0,50	1385	2,66	2,7	63	0,94	2,9	0,8	12,5	10	T4		❷
RL8019	RL	80	B	4		**0,55**	0,75	1380	3,87	3,7	64	0,96	3,8	0,8	16	12	T4		❷
RL8020	RL	90	S	4		**0,75**	1,00	1380	5,27	3,1	69	0,90	5,1	0,95	20	16	T4		❷
RL8021	RL	90	L	4		**1,10**	1,50	1380	7,71	3,9	69	0,90	7,2	0,7	25	17.5	T4		❷
RL8022	RL	100	LA	4		**1,30**	1,75	1385	8,25	3,2	71	0,96	9,0	0,55	32	23	T4		❷
RL8023	RL	100	LB	4		**1,60**	2,20	1440	10,45	2,6	75	0,90	11,1	0,55	45	25	T4		❷
RL8024	RL	63	A	6		**0,06**	0,08	900	0,80	2,4	50	0,85	0,6	0,5	6,3	6	T4	❶	❷
RL8025	RL	63	B	6		**0,09**	0,12	890	1,00	2,3	60	0,82	0,8	0,5	8	6.5	T4	❶	❷
RL8026	RL	71	A	6		**0,12**	0,16	910	1,30	2,5	61	0,83	1,2	0,6	8	6.5	T4	❶	❷
RL8027	RL	71	B	6		**0,18**	0,25	930	1,60	2,7	61	0,91	1,8	0,6	12,5	7.5	T4	❶	❷
RL8028	RL	80	A	6		**0,25**	0,34	920	2,40	2,8	62	0,92	2,2	0,6	16	10	T4		❷
RL8029	RL	80	B	6		**0,37**	0,50	920	2,90	2,9	65	0,85	3,2	0,7	20	12	T4		❷
RL8030	RL	90	S	6		**0,55**	0,75	910	4,20	2,9	65	0,85	5,9	0,7	25	16	T4		❷
RL8031	RL	90	L	6		**0,75**	1,00	920	5,90	3,1	68	0,90	8,1	0,7	32	17.5	T4		❷
RL8032	RL	100	LA	6		**1,10**	1,50	920	8,10	3,1	69	0,90	11,5	0,7	45	23	T4		❷

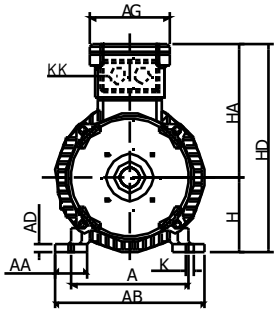
❶ **II 2G - II 2GD - Ex d – IIC** **Certificate INERIS 05 ATEX 0025X**

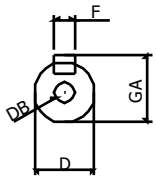
❷ **II 2G - II 2GD - Ex d – IIB** **Certificate INERIS 08 ATEX 0005X**

6. OVERALL DIMENSIONS

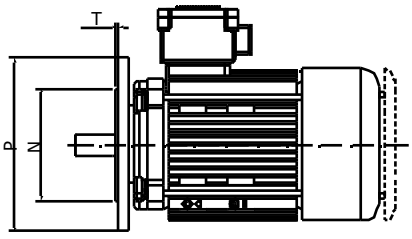
6.1 Three-phase motors

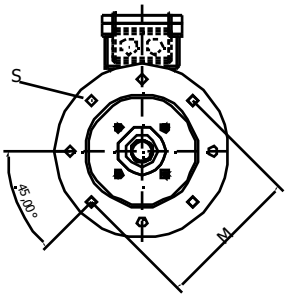


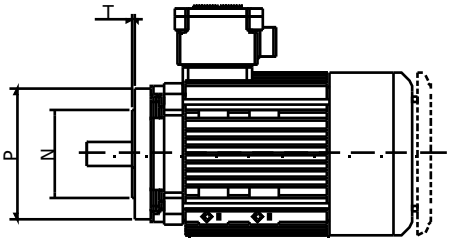


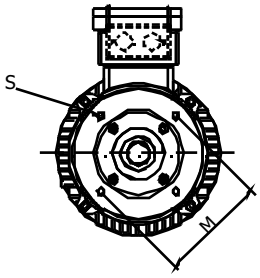


Mounting B3																		Shaft				
Tipo	A	AA	AB	AC	AD	AG	AR	B	BB	C	K	KK	H	HA	HD	L	LA	D	DB	E	F	GA
56	90	24	108	110	9	94,2	46,9	71	84	36	6,2	M20x1,5	56	125	181	211,5	223	9j6	M3	20	3	10,2
63	100	25	125	131	6	94,2	63,4	80	108	40	7,0	M20x1,5	63	142	205	270,8	283	11j6	M4	23	4	12,5
71	112	30	142	138	8	94,2	64,4	90	120	45	7,0	M20x1,5	71	142	213	271,8	284	14j6	M5	30	5	16
80	125	30	155	156	8	4,2	80,4	100	125	50	9,0	M20x1,5	80	151	231	299	314	19j6	M6	40	6	21,5
90S	140	40	180	176	10	94,2	93,4	100	150	56	9,0	M20x1,5	90	158	248	350	368	24j6	M8	50	8	27
90L	140	40	180	176	10	94,2	93,4	125	150	56	9,0	M20x1,5	90	158	248	350	368	24j6	M8	50	8	27
100	160	40	200	197	12	123,5	107	140	180	63	12,0	M25x1,5	100	188	288	404	416	28j6	M10	60	8	31
112	190	40	230	218	12	123,5	112,3	140	180	70	12,0	M25x1,5	112	198	310	418	442	28j6	M10	60	8	31
132S	216	63	248	257	16	168	93	140	213	89	12	M32X1,5	132	247	379	553	566	38k6	M12	80	10	41
132M	216	63	248	257	16	168	93	178	213	89	12	M32X1,5	132	247	379	633	646	38k6	M12	80	10	41
160M	254	70	255	310	20	168	215	210	300	108	14	M32X1,5	160	275	435	670	688	42k6	M16	110	12	45
160L	254	70	255	310	20	168	215	254	300	108	14	M32X1,5	160	275	435	750	768	42k6	M16	110	12	45









Mounting B5					
4 (8) holes - 45°					
Tipo	P	N	M	S	T
56	120	80j6	100	7	3
63	140	95j6	115	9	3
71	160	110j6	130	10	3,5
80	200	130j6	165	12	3,5
90S	200	130j6	165	12	3,5
90L	200	130j6	165	12	3,5
100	250	180j6	215	15	4
112	250	180j6	215	15	4
132S	300	230j6	265	15	4
132M	300	230j6	265	15	4
160M	350	250h6	300	18	5
160L	350	250h6	300	18	5

Mounting B14					
4 holes - 45°					
Tipo	P	N	M	S	T
56	76	50j6	65	M4	2,5
63	90	60j6	75	M5	2,5
71	105	70j6	85	M6	2,5
80	120	80j6	100	M6	3
90S	140	95j6	115	M8	3
90L	140	95j6	115	M8	3
100	160	110j6	130	M8	3,5
112	160	110j6	130	M8	3,5
132S	200	130j6	165	M10	3,5
132M	200	130j6	165	M10	3,5
160M	250	180h6	215	M12	4
160L	250	180h6	215	M12	4

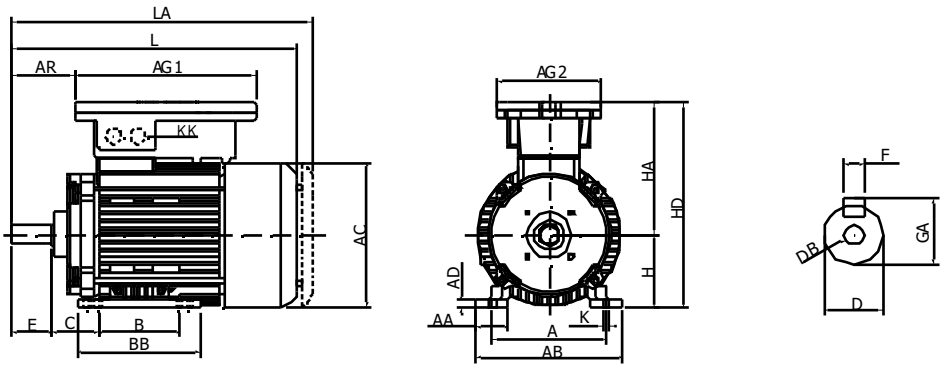
6.2 Servo-Ventilated Motors

Lenght of motors complete with servo-ventilation (auxiliary motor frame 56)

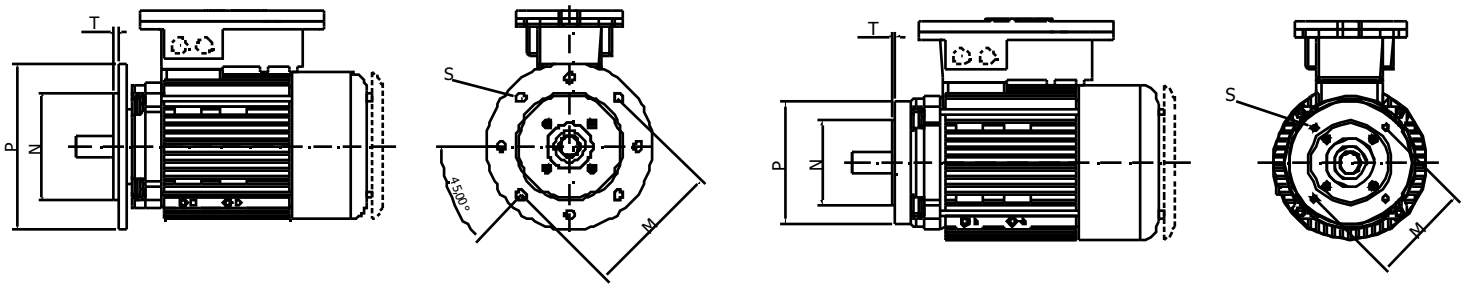
Frame	63	71	80	90S	90L	100	112	132S	132M	160M	160L
L	519,5	520,5	574	624	624	678	698	865	945	994	1074

* On request is possible to have shorter lengths depending on the type of application.

6.3 Single-phase motors



Mounting B3																	Shaft				
Tipo	A	AA	AB	AC	AD	AG1 AG2	AR	B	BB	C	K	KK	H	HA	HD	L	LA	D	DB	E	F	GA
56 (IIB)	90	24	108	110	9	223 128	46,9	71	84	36	6,2	M20x1,5	56	125	181	211,5	220	9j6	M3	20	3	10,2
56 (IIC)	90	24	108	110	9	94,2	46,9	71	84	36	6,2	M20x1,5	56	125	181	211,5	223	9j6	M3	20	3	10,2
63 (IIB)	100	25	125	131	6	223 128	46,5	80	108	40	7,0	M20x1,5	63	146,5	209,5	270,8	283	11j6	M4	23	4	12,5
63 (IIC)	100	25	125	131	6	94,2	63,4	80	108	40	7,0	M20x1,5	63	142	205	270,8	283	11j6	M4	23	4	12,5
71 (IIB)	112	30	142	138	8	223 128	47,5	90	120	45	7,0	M20x1,5	71	146,5	217,5	271,8	284	14j6	M5	30	5	16
71 (IIC)	112	30	142	138	8	94,2	64,4	90	120	45	7,0	M20x1,5	71	142	213	271,8	284	14j6	M5	30	5	16
80	125	30	155	156	8	223 128	63,5	100	125	50	9,0	M20x1,5	80	155,5	235,5	299	314	19j6	M6	40	6	21,5
90S	140	40	180	176	10	223 128	76,5	100	150	56	9,0	M20x1,5	90	162,5	252,5	350	368	24j6	M8	50	8	27
90L	140	40	180	176	10	223 128	76,5	125	150	56	9,0	M20x1,5	90	162,5	252,5	350	368	24j6	M8	50	8	27
100	160	40	200	197	12	206 190	96,0	140	180	63	12,0	M20x1,5	100	208	308	404	416	28j6	M10	60	8	31

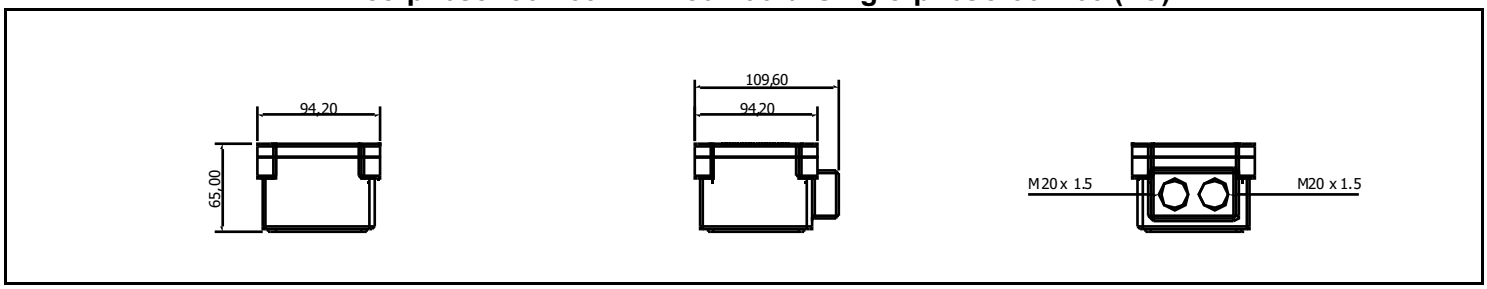


Mounting B5					
4 (8) holes - 45°					
Tipo	P	N	M	S	T
56	120	80j6	100	7	3
63	140	95j6	115	9	3
71	160	110j 6	130	10	3,5
80	200	130j 6	165	12	3,5
90S	200	130j 6	165	12	3,5
90L	200	130j 6	165	12	3,5
100	250	180j 6	215	15	4

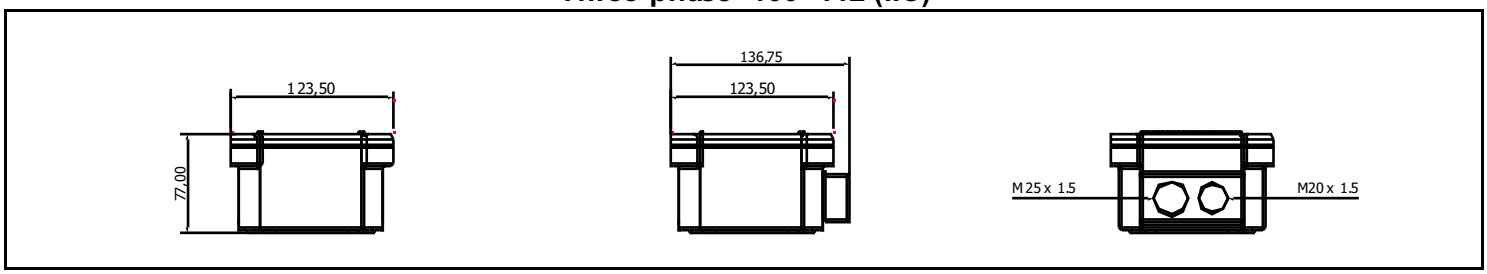
Mounting B14					
4 holes - 45°					
Tipo	P	N	M	S	T
56	76	50j6	65	M4	2,5
63	90	60j6	75	M5	2,5
71	105	70j6	85	M6	2,5
80	120	80j6	100	M6	3
90S	140	95j6	115	M8	3
90L	140	95j6	115	M8	3
100	160	110j 6	130	M8	3,5

6.4 Terminal box

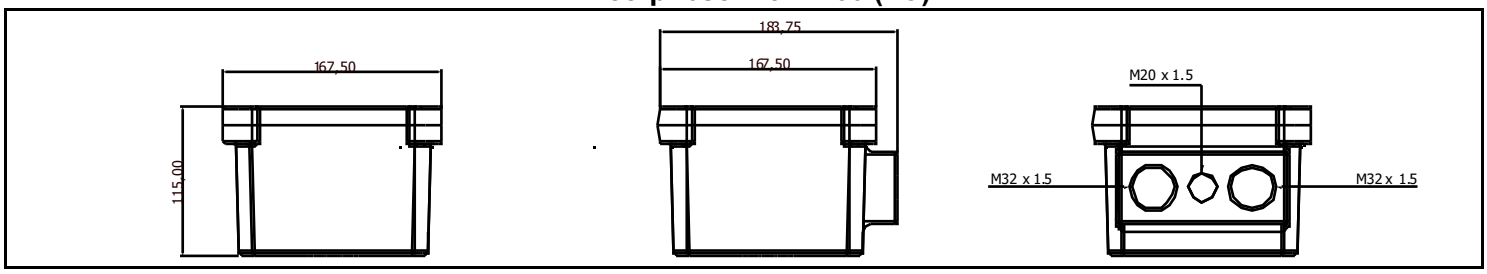
Three-phase 56 - 63 - 71 - 80 - 90 / Single-phase 56 – 63 (IIC)



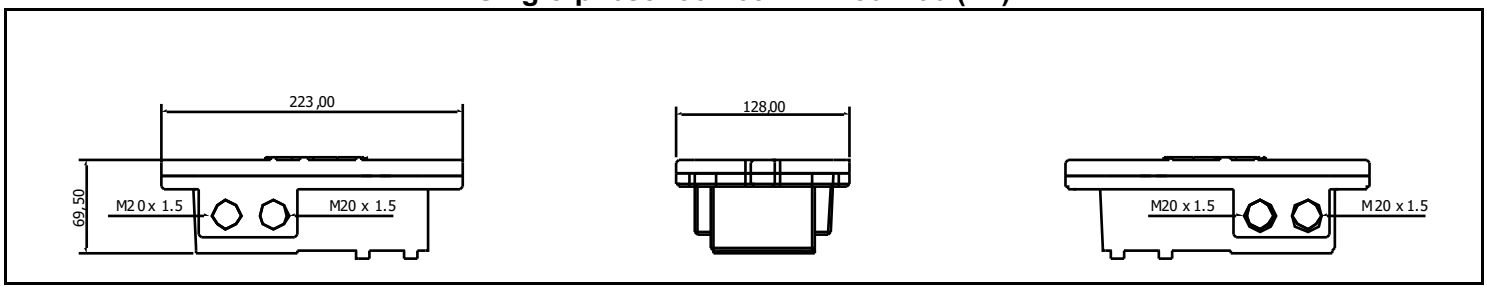
Three-phase 100 -112 (IIC)



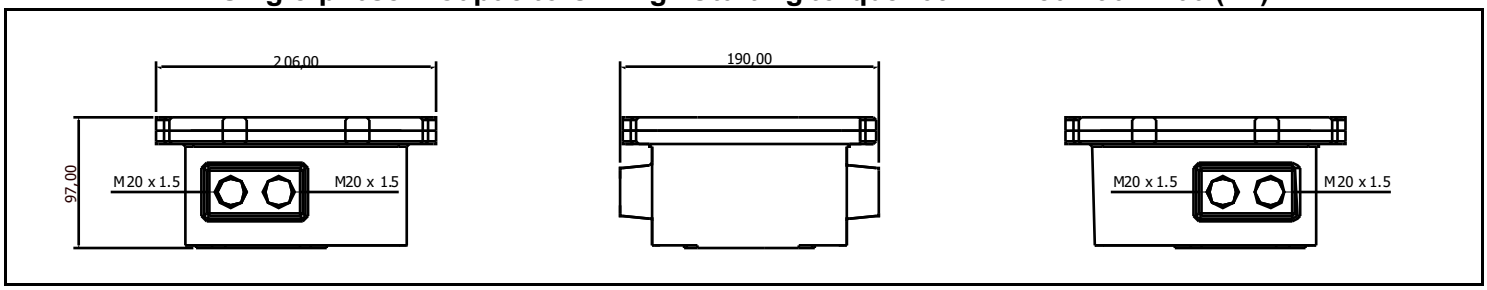
Three-phase 132 -160 (IIC)



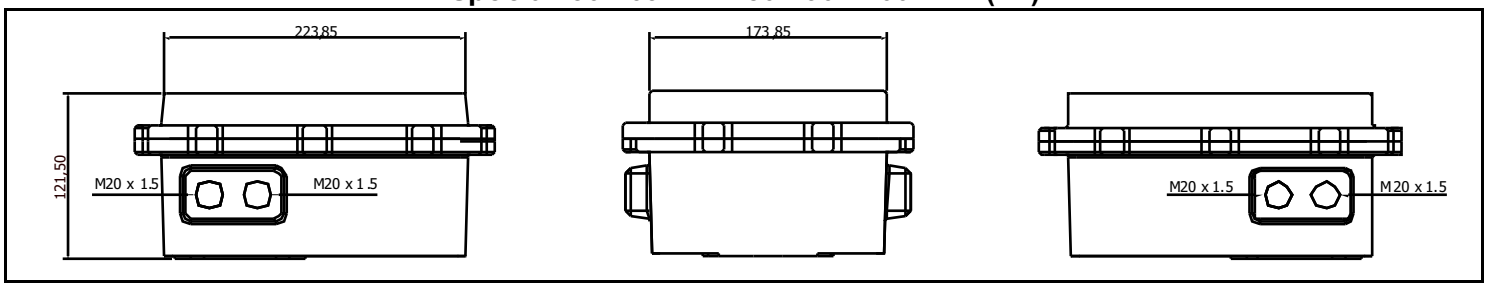
Single-phase 56 - 63 - 71 - 80 – 90 (IIB)



Single-phase 2 Capacitors – High starting torque 63 - 71 - 80 - 90 – 100 (IIB)



Special 56 - 63 - 71 - 80 - 90 - 100 -112 (IIB)



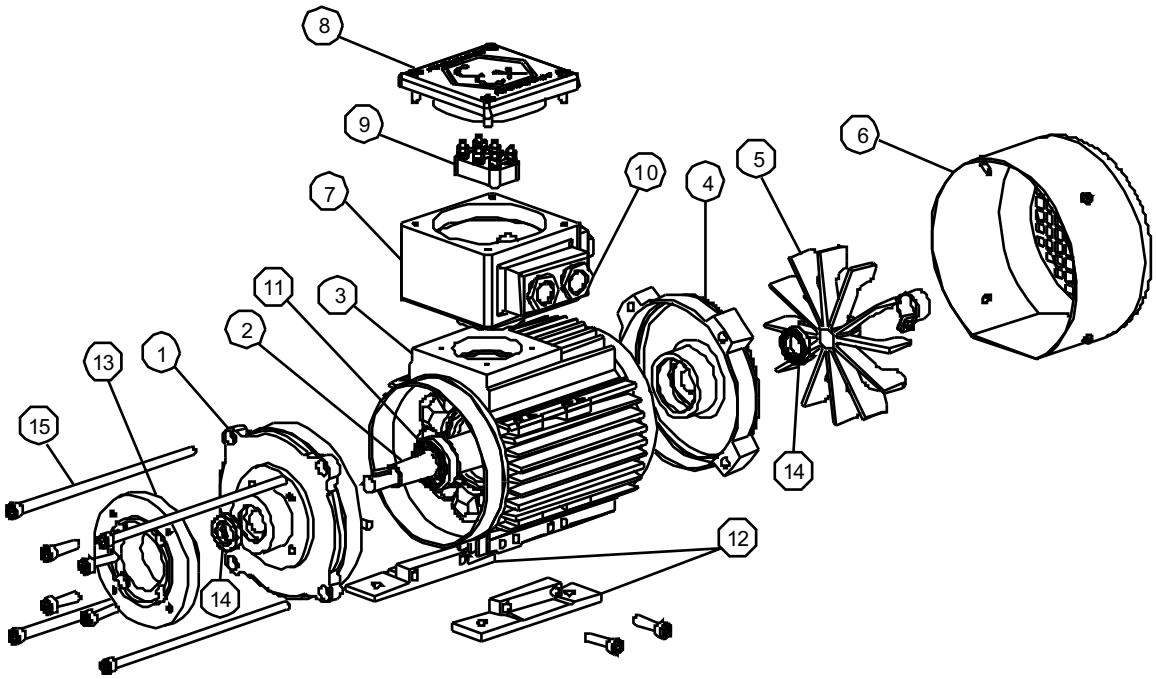
7. SPARE PARTS

7.1 Personnel qualification

Overhauls and repairs must be only realised by qualified people in accordance with the standards EN 60079-17 or national standards (last edition). Qualified people must have knowledge about explosion protection.
Repairs must be made regarding the rules as define in EN 60079-19 standards.
These repairs can only be done under the control or agreement with RAEL Motori Elettrici by a repair shop designed by RAEL or a recognized laboratory.
In case these rules are not respected, RAEL liability is released.

7.2 List of spare parts

All motors components must be replaced by original spare parts. In these cases please contact RAEL directly and give the serial number of the motor so to ask the authorization to repair the motor too.



1	DRIVE END SHIELD	6	FAN COVER	11	BALL BEARINGS
2	SHAFT WITH ROTOR	7	TERMINAL BOX	12	MOTOR FEET
3	FRAME	8	TERMINAL BOX COVER	13	FLANGE B14 (or B5)
4	NO-DRIVE END SHIELD	9	TERMINAL BLOCK	14	ABY ANGULAR BEARING
5	COOLING FAN	10	CABLE GLAND	15	TIE RODS (quality 4.8)

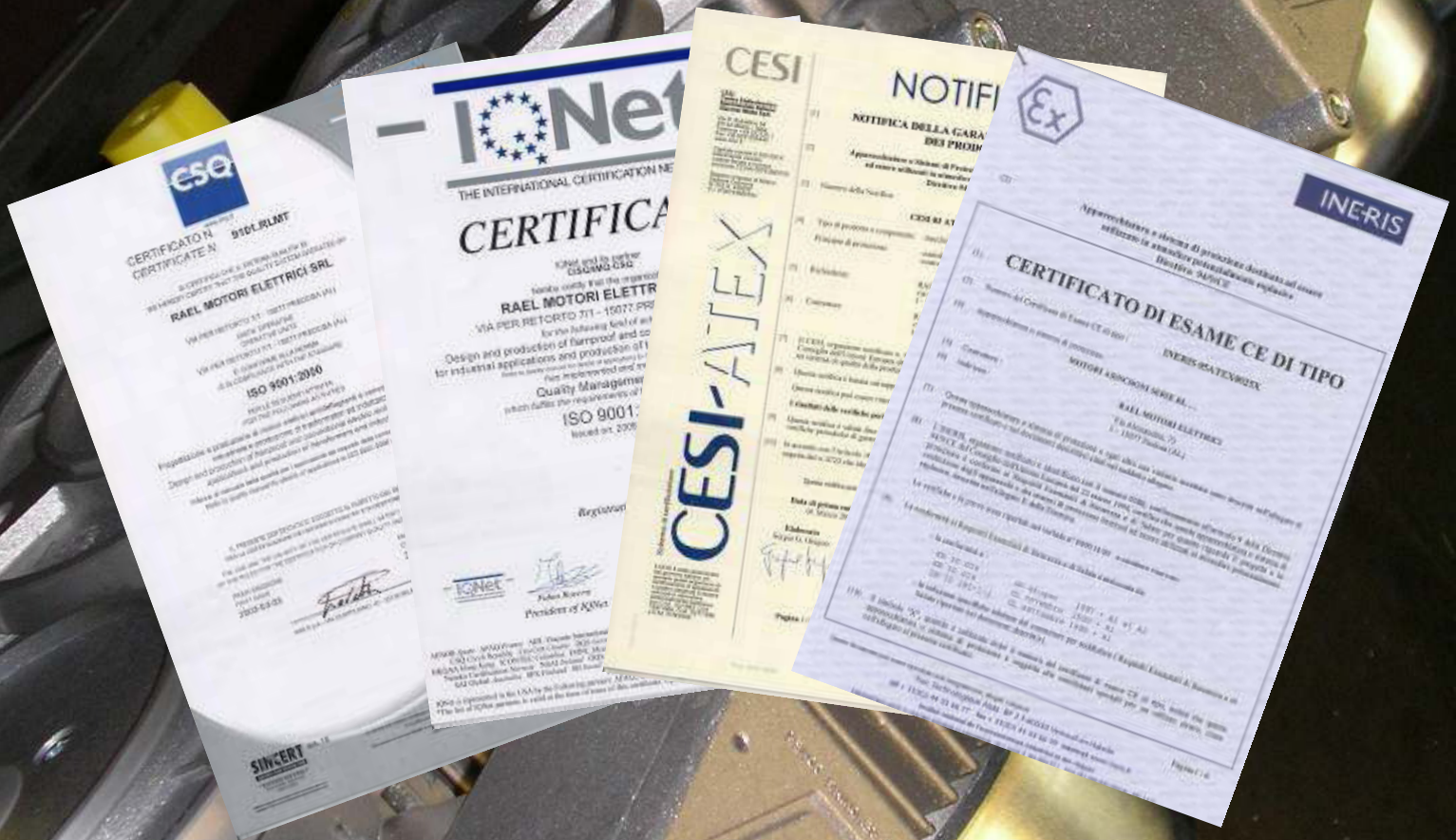
SCREWS
Screws quality 8.8

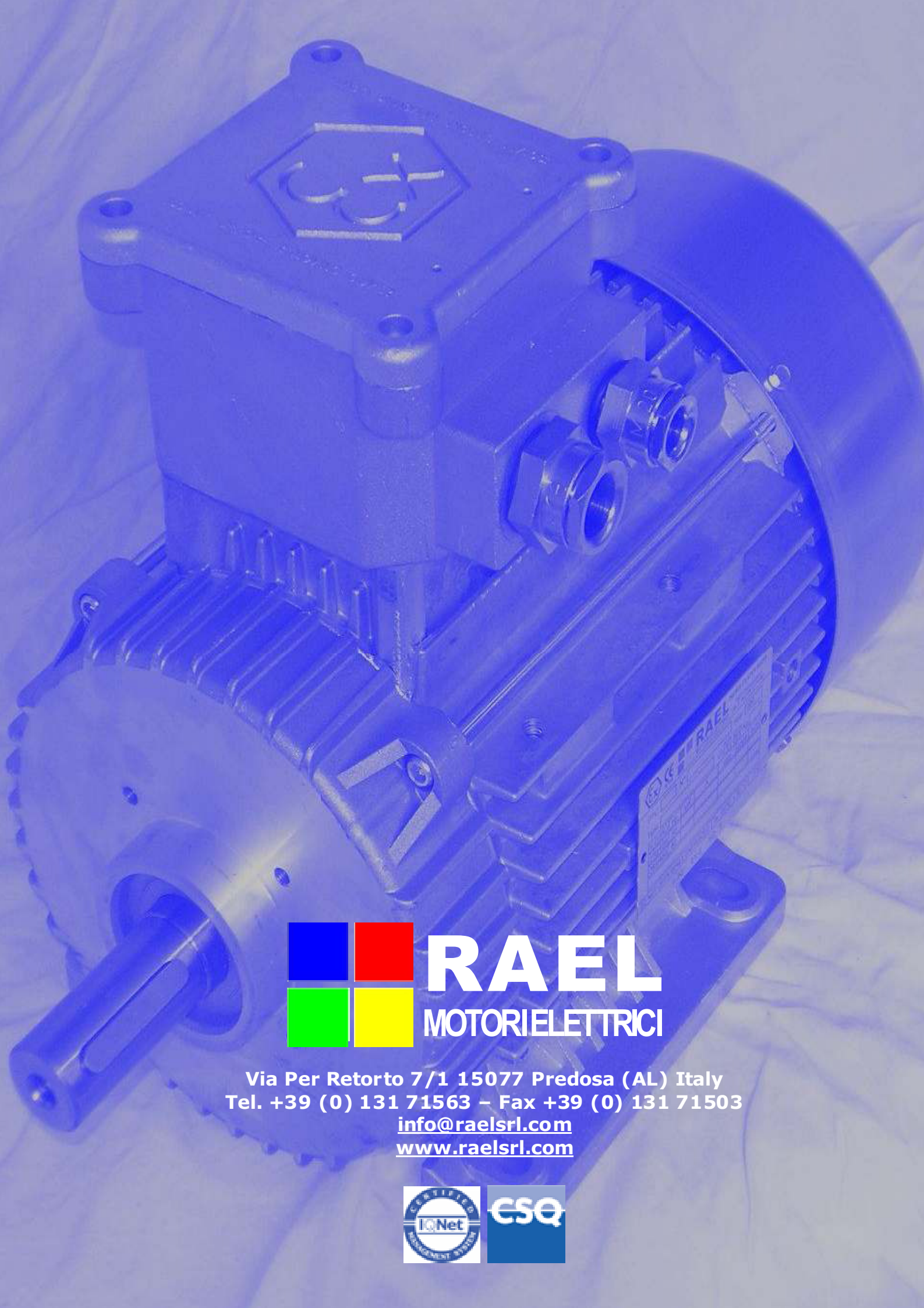
	56	63	71	80	90	100	112	132	160
FLANGE B14 (o B5)	M5x14	M6x20	M6x16	M6x16	M6x20	M6x20	M6x20	M8x25	M8x25
MOTOR FEET	M5x10	M6x12	M6x14	M6x16	M6x16	M8x20	M8x25	M8x20	M8x25
TERMINAL BOX COVER	M5x14	M5x14	M5x14	M5x14	M5x14	M5x20	M5x20	M8x20	M8x20

	M4	M5	M6	M8	M10
TIGHTENING TORQUE (Nm)	2	3.2	5	12	18

Certificates

RAEL Motori Elettrici S.r.l. is certified ISO9001:2000 from February 2003 and as we manufacture motors complying with Directive 94/9/CE we also have both the 'Product Quality Assurance Notification' and the CE certificates regarding motors RL series.





RAEL
MOTORI ELETTRICI

Via Per Retorto 7/1 15077 Predosa (AL) Italy
Tel. +39 (0) 131 71563 – Fax +39 (0) 131 71503
info@raelsrl.com
www.raelsrl.com