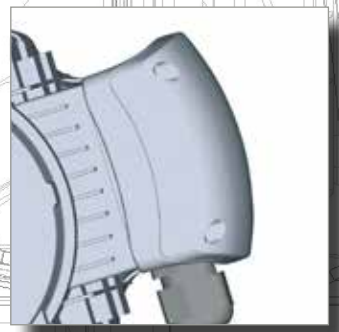
GENERAL CATALOGUE

DELPHI SERIES ASYNCHRONOUS THREE-PHASE ELECTRIC MOTORS

motive®






CERTIFICATO

Nr 50 100 1185 - Rev. 06

Si attesta che / This is to certify that

IL SISTEMA QUALITÀ DI
THE QUALITY SYSTEM OF

MOTIVE S.r.l.

motive

SEDE LEGALE E OPERATIVA:
VIA LE GHISELLE 20
I-25014 CASTENEDOLO (BS)

È CONFORME AI REQUISITI DELLA NORMA
HAS BEEN FOUND TO COMPLY WITH THE REQUIREMENTS OF

UNI EN ISO 9001:2008

Riferirsi al manuale della qualità per eventuali dettagli delle esclusioni ai requisiti della norma ISO 9001:2008
Refer to quality manual for possible details of exclusions of requirements of the norm ISO 9001:2008

Questo certificato è valido per il seguente campo di applicazione
This certificate is valid for the following product or service range

Progettazione e fabbricazione di motori elettrici e riduttori meccanici per la trasmissione di potenza (EA 19, 18)
Design and manufacture of electrical motors and reduction gears for power transmission (EA 19, 18)

ACCREDIA

Per l'Organismo di Certificazione
For the Certification Body
TÜV Italia S.r.l.

Andrea Vivi
Amministratore Delegato – CEO

Data di emissione / Issue date
2012-04-23

Data di scadenza / Expiry date
2013-03-02

Organizzazione certificata per la prima volta in data 2001-07-20

"La validità del presente certificato è subordinata a sorveglianza periodica a 12 mesi e al riesame completo del sistema di gestione aziendale con periodicità triennale"
"The validity of the present certificate depends on the annual surveillance every 12 months and on the complete review of company's management system after three years"

TÜV Italia S.r.l. • Gruppo TÜV SÜD • Via Carducci 125, Pd. 23 • 20099 Sesto San Giovanni (MI) • Italia • www.tuv.it

ZERTIFIKAT ◆ CERTIFICATE ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

VISIT AND KNOW MOTIVE THANKS TO THE MOVIE ON WWW.MOTIVE.IT

INDEX

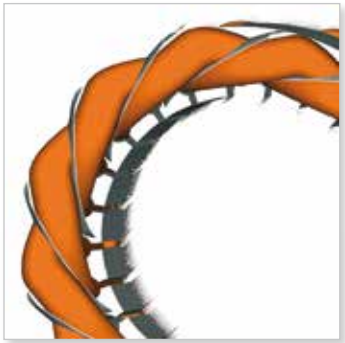
TECHNICAL CHARACTERISTICS

Motive motors are built according to international standard regulations; each size throughout the construction forms is calculated with reference to the tables of standard IEC 72-1.

Motive asynchronous three-phase delphi series motors are closed, and externally ventilated.
The frame, up to 132 included, is made in die casting aluminium alloy, from size 160 up to 355 the frame is made in cast iron.

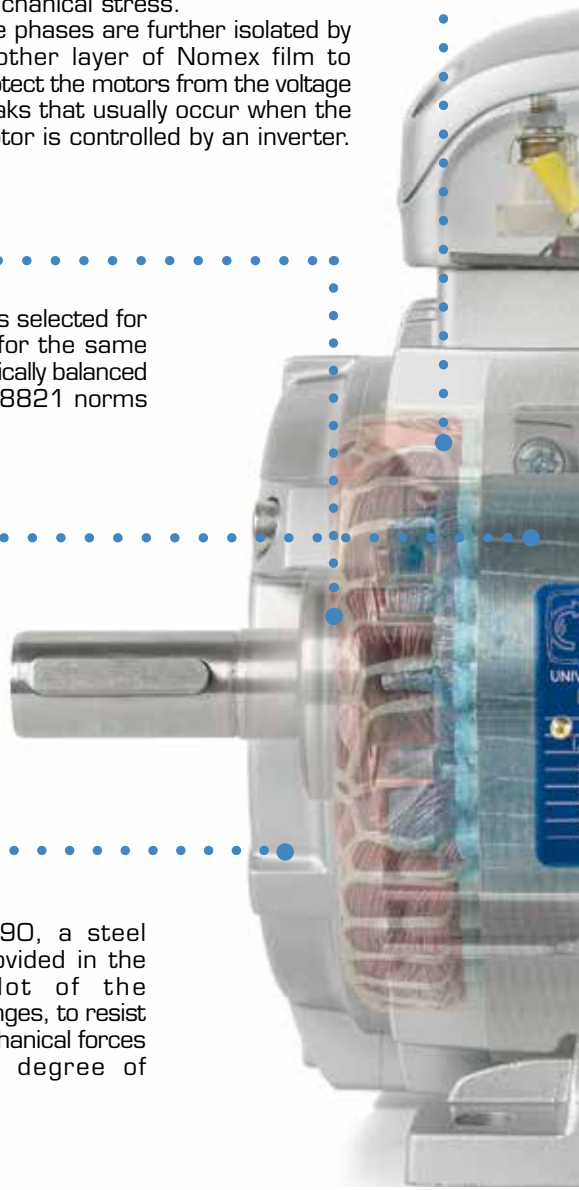
All motors are
- multiple voltage
- multi-frequency 50/60Hz,
- F class insulation, (H on request)
- S1 continuous duty service,
- IP55 protection (IP56, 66, 67, and 68 on request)
- IE2 or IE3 efficiency class (IEC 60034-30)
- tropicalized winding
- suitable for inverter power supply

IE2, high efficiency class IE 60034-30
IE3, premium efficiency class IE 60034-30



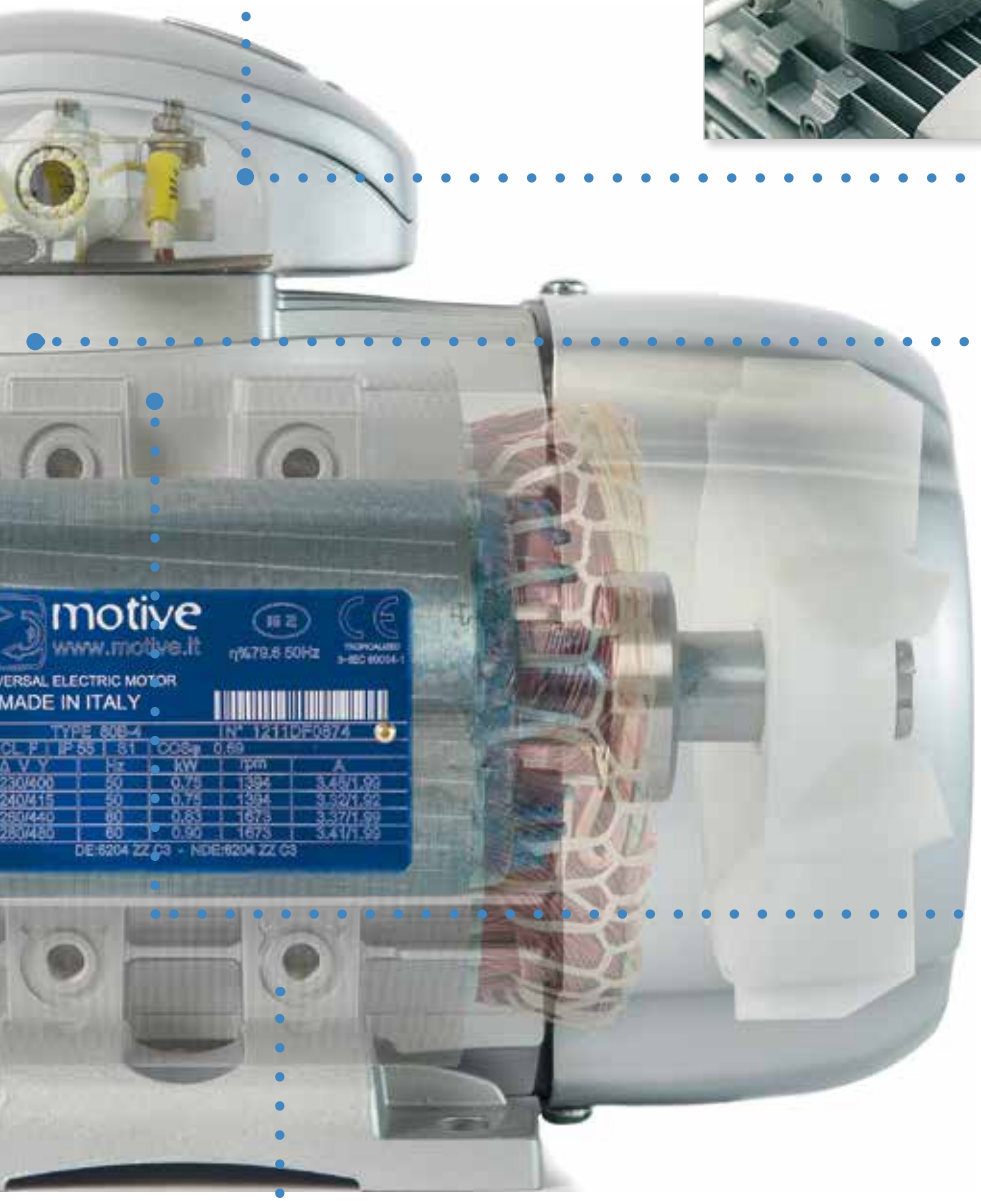
The copper is impregnated with a double layer of H class insulating enamel to ensure high resistance to electrical, thermal and mechanical stress.
The phases are further isolated by another layer of Nomex film to protect the motors from the voltage peaks that usually occur when the motor is controlled by an inverter.

motive motors adopt only bearings selected for their silence and reliability and, for the same objectives, the cage rotor is dynamically balanced according to IEC 34-14 and ISO 8821 norms



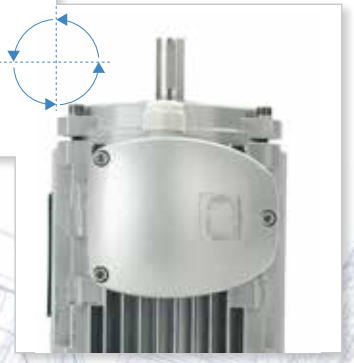
From type 90, a steel insert is provided in the bearing slot of the aluminum flanges, to resist to radial mechanical forces with a fair degree of security

REGISTERED DESIGN



Aiming the maximum protection, the motors are equipped with important details like the pull-resistant cable press and the combination of bearings with two shields each with rubber seal rings

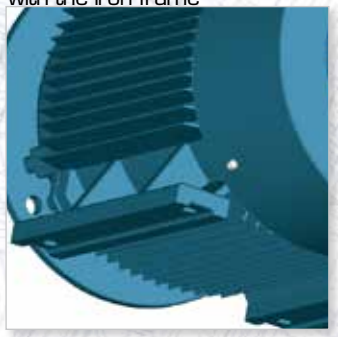
Cable gland can be easily moved on both the sides of the connection box, thanks to the screw cap



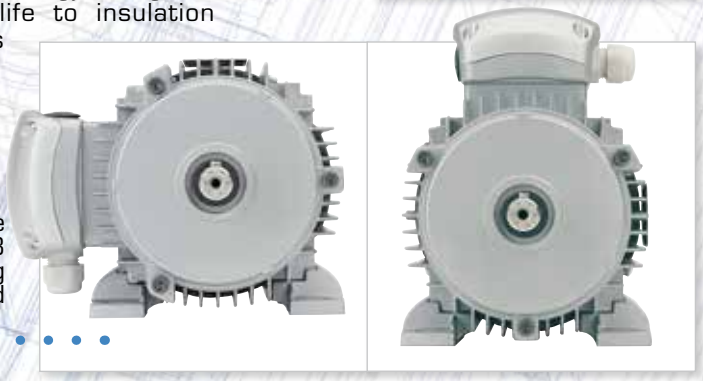
The connection box can be rotated of 360° with steps of 90°

To protect them by the rust, motive motors are painted in silver RAL9006 colour

From size 160 and up, due to the high torque, the motors are fixed by feet that are die-casted with the iron frame



Performance excellence is granted by the low loss CRNO "FeV" magnetic laminations adoption,instead then the usual Semi Processed/Decarb "FePO1". FeV laminations provide higher efficiency, lower heating, energy saving and longer life to insulation materials



From size 56 to size 132, feet are detachable, and can be fixed on 3 sides of the housing, thus permittig the terminal box to be positioned up, right or left.

Worldwide there are several classification systems of induction motors efficiencies. In order to create a common system, IEC (International Electrotechnical Commission) issued in October 2008 the norm IEC 60034-30 "Rotating electrical machines – Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors (IE-code)". It's a classification sytem of efficiency that replaces the CEMEP one (to be clear, the one of "Eff.1, Eff.2, ed Eff.3" motors) and that, furthermore, recalls a new measuring and calculation way of efficiency, the one of the norm IEC 60034-2-1 (Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests), of September 2007.

In Europe it's a step ahead in the application of the Eco-design Directive for Energy-related Products (ErP) 2009/125/EC. It's based on such a normative picture and on the Regulation (EC) nr 640/2009 of 22 July 2009 that:
- From June 2011, the motors with efficiency lower than IE-2 have been forbidden
- From 2015, the minimum efficiency for motors from 7,5 to 375kW will be l'IE-3, and
- From 2017, the obligation of IE-3 will be extended to the motors from 0,75kW to 5,5kW

IEC classification and CEMEP classification

KW	Hp	efficiency classes IEC 60034-30:2008 (at 50Hz)									efficiency classes CEMEP voluntary agreement					
		IE-1 standard efficiency			IE-2 high efficiency			IE-3 premium efficiency			Eff.3		Eff.2		Eff.1	
		2 poles	4 poles	6 poles	2 poles	4 poles	6 poles	2 poles	4 poles	6 poles	2 poles	4 poles	2 poles	4 poles	2 poles	4 poles
0,75	1	72,1	72,1	70,0	77,4	79,6	75,9	80,7	82,5	78,9	-	-	-	-	-	-
1,1	1,5	75,0	75,0	72,9	79,6	81,4	78,1	82,7	84,1	81,0	<76,2	<76,2	≥76,2	≥76,2	>82,8	>83,8
1,5	2	77,2	77,2	75,2	81,3	82,8	79,8	84,2	85,3	82,5	<78,5	<78,5	≥78,5	≥78,5	>84,1	>85,0
2,2	3	79,7	79,7	77,7	83,2	84,3	81,8	85,9	86,7	84,3	<81,0	<81,0	≥81,0	≥81,0	>85,6	>86,4
3	4	81,5	81,5	79,7	84,6	85,5	83,3	87,1	87,7	85,6	<82,6	<82,6	≥82,6	≥82,6	>86,7	>87,4
4	5,5	83,1	83,1	81,4	85,8	86,6	84,6	88,1	88,6	86,8	<84,2	<84,2	≥84,2	≥84,2	>87,6	>88,3
5,5	7,5	84,7	84,7	83,1	87,0	87,7	86,0	89,2	89,6	88,0	<85,7	<85,7	≥85,7	≥85,7	>88,6	>89,2
7,5	10	86,0	86,0	84,7	88,1	88,7	87,2	90,1	90,4	89,1	<87,0	<87,0	≥87,0	≥87,0	>89,5	>90,1
11	15	87,6	87,6	86,5	89,4	89,8	88,7	91,2	91,4	90,3	<88,4	<88,4	≥88,4	≥88,4	>90,5	>91,0
15	20	88,7	88,7	87,7	90,3	90,6	89,7	91,9	92,3	91,2	<89,4	<89,4	≥89,4	≥89,4	>91,3	>91,8
18,5	25	89,3	89,3	88,6	90,9	91,2	90,4	92,4	92,6	91,7	<90,0	<90,0	≥90,0	≥90,0	>91,8	>92,2
22	30	89,9	89,9	89,2	91,3	91,6	90,9	92,7	93,0	92,2	<90,5	<90,5	≥90,5	≥90,5	>92,2	>92,6
30	40	90,7	90,7	90,2	92,0	92,3	91,7	93,3	93,6	92,9	<91,4	<91,4	≥91,4	≥91,4	>92,9	>93,2
37	50	91,2	91,2	90,8	92,5	92,7	92,2	93,7	93,9	93,3	<92,0	<92,0	≥92,0	≥92,0	>93,3	>93,6
45	60	91,7	91,7	91,4	92,9	93,1	92,7	94,0	94,2	93,7	<92,5	<92,5	≥92,5	≥92,5	>93,7	>93,9
55	75	92,1	92,1	91,9	93,2	93,5	93,1	94,3	94,6	94,1	<93,0	<93,0	≥93,0	≥93,0	>94,0	>94,2
75	100	92,7	92,7	92,6	93,8	94,0	93,7	94,7	95,0	94,6	<93,6	<93,6	≥93,6	≥93,6	>94,6	>94,7
90	120	93,0	93,0	92,9	94,1	94,2	94,0	95,0	95,2	94,9	<93,9	<93,9	≥93,9	≥93,9	>95,0	>95,0
110	150	93,3	93,3	93,3	94,3	94,5	94,3	95,2	95,4	95,1	-	-	-	-	-	-
132	180	93,5	93,5	93,5	94,6	94,7	94,6	95,4	95,6	95,4	-	-	-	-	-	-
160	220	93,8	93,8	93,8	94,8	94,9	94,8	95,6	95,8	95,6	-	-	-	-	-	-
200	270	94,0	94,0	94,0	95,0	95,1	95,0	95,8	96,0	95,8	-	-	-	-	-	-
250	335	94,0	94,0	94,0	95,0	95,1	95,0	95,8	96,0	95,8	-	-	-	-	-	-
315	423	94,0	94,0	94,0	95,0	95,1	95,0	95,8	96,0	95,8	-	-	-	-	-	-
355	483	94,0	94,0	94,0	95,0	95,1	95,0	95,8	96,0	95,8	-	-	-	-	-	-

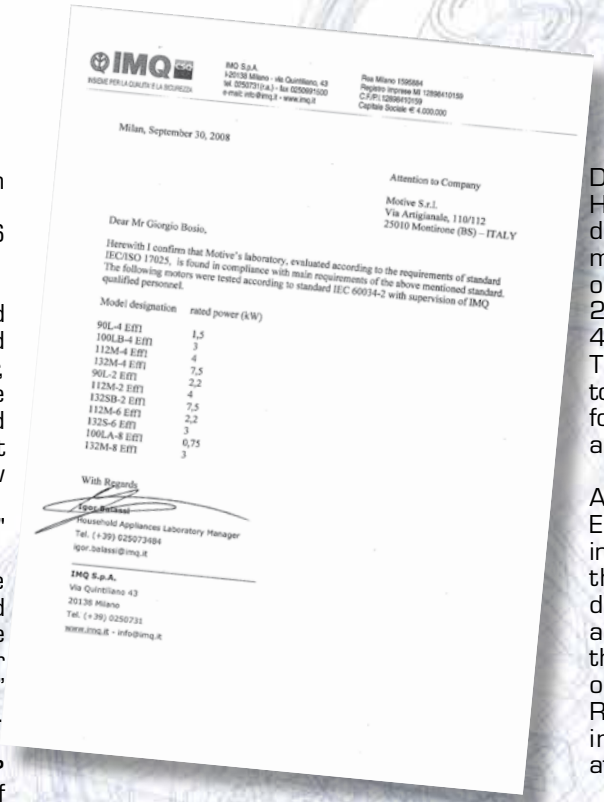
The following chart tries to synthesize a comparison between yesterday and today.

EFFICIENCY >>	world IEC 600034-30	Europe (50Hz) CEMEP	USA (60HZ) Epact	Further classification
	IE-3 premium efficiency		Identical to NEMA Premium efficiency	AS in Australia NBR in Brasile BG/T in China IS in India JIS in Japan MEPS in Korea
	IE-2 high efficiency	comparable to Eff.1	Identical to NEMA energy efficiency/EPACT	
	IE-1 standard efficiency	comparable to Eff.2		

In our field, we list 5 main changes in Europe :
- The classification is now extended to 6 poles motors
- The powers range is wider
- In a direct comparison between Eff.2" and "IE-1" or between "Eff.1" and "IE-2" , we find that the first, the CEMEP values, are higher, but this is also a consequence of the
- Change in the measurement and calculation system of such values, that must now be made with the method of the new norm IEC 60034-2-1:2007, and
- Introduction of the IE3 "Premium efficiency" level.

Nevertheless, local legislations of some Countries inside and outside Europe, and the specific requirements of some associations, maintain often incentivized or even compulsory those motors called "Eff.1" according to the CEMEP system.

What did Motive do in this scenario?
- The measuring and calculation system of Motive motors efficiency is conform to the norm 60034-2-1:2007. That's the one behind the data declared in the probative test-reports uploaded in motive web-site (each declared data, we remind it, is in fact supported, detailed and proven by such test reports)
- This, together with the fact that Eff.2 Motive motors were often offering an efficiency abundantly above the min allowed level, permitted us to reach easily IE2 efficiency with a two years long R&D plan before June 2011. From June 2011, IE1 motors are not produced anymore.
- IE3 "premium efficiency" motors are also available.
- The testing system, test reports, and data truth of Motive motors has been certified by IMQ, the main Italian certification body for electrical appliances. The same, in fact, in September 2008 has firstly inspected


IMQ

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Registro Imprese MI 12896410159
C.F./P.I. 12896410159
Capitale Sociale € 4.000.000

Milan, September 30, 2008

Attention to Company

Motive S.r.l.
Via Artigianale, 110/112
25010 Montirone (BS) – ITALY

Dear Mr Giorgio Bosio,

Herewith I confirm that Motive's laboratory, evaluated according to the requirements of standard IEC/ISO 17025, is found in compliance with main requirements of the above mentioned standard. The following motors were tested according to standard IEC 60034-2 with supervision of IMQ qualified personnel.

Model designation	rated power (kW)
90L-4 Eff1	1,5
100LB-4 Eff1	3
112M-4 Eff1	4
132M-4 Eff1	7,5
90L-2 Eff1	2,2
112M-2 Eff1	4
132SB-2 Eff1	7,5
112M-6 Eff1	2,2
132S-6 Eff1	3
100LA-8 Eff1	0,75
132M-8 Eff1	3

With Regards,

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Household Appliances Laboratory Manager
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and qualified our internal laboratory according to the norm IEC/ISO17025, and then supervised the internal tests on a sampling list of Eff.1 motors, including some 6 and 8 poles in order to enclose further values that, out of CEMEP classifications, were already established by some Countries laws.

Clients benefits are of many kinds: B I L L EFFECTS
The purchase cost of a motor is about 2-3% of the total costs of its life. The balance is energy consumption costs. Comparing Eff.1 motors to Eff.2, the purchase price difference is recovered in about one year of energy saving. Of course, such period length depends by the specific motor, the use of it and the local energy costs of each Country. Motive can give you a tool in xls format to support you in this calculation.

DURABILITY EFFECTS
Higher efficiency motors heat less, slowing down the aging cycle of the insulating materials and living longer. Average operating life of Eff.2 motive motors is: 2500 hours/ year for motors up to 15kW 4000 hours/year for bigger motors. The average life is approximately from 25 to 30.000 hours for the first and 50,000 for the second ones. Eff.1 motors can live approx 40% longer than Eff.2 motors.

AMBIENT EFFECTS
Electric motors use 65% of all electricity in industry. Higher efficiency motors have the further objective of sustainable development, reduction of CO_2 emissions and consequent improvement of the quality of the atmosphere with an objective of sustainable development, Reduction of CO_2 emissions and consequent improvement of the quality of the atmosphere.

How to make a more efficient motor?
High efficiency can be seen in many ways: like the relation between output power and input absorbed power, or like a measure of the losses that born when converting the electric power in mechanical energy. From another perspective, high efficiency motors consume less energy to produce the same torque on the shaft. Basically, an high efficiency motor is the result of precise machining, lower frictions, a dynamically balanced rotor, smaller space between rotor and stator and of the use of better materials. The main factors for the design are based on the choice of the type of lamination sheets and windings with a greater turns number and a bigger diameter wire.
Among all materials that compose a motor, laminations have the highest influence on performance.

Motive motors are made with CRNO "FeV" magnetic lamination sheets, rather than the customary iron lamination sheets.
Further than raw material, the sheets thickness is another performance source .
In fact, the thinner is the sheet, the higher are the performances.
The Semi Processed/Decarb lamination sheets "Fe P01" can reach up to 1mm thickness.
FeV magnetic lamination sheets have a 0,5mm maximum thickness.
Composition and thickness give to magnetic lamination sheets a very low W/Kg loosing factor:
Lower specific losses mean less magnetising current for the same Power and torque (thus less heating).
Instead, no standard prescribes a maximum loosing factor for Fe P01 lamination sheets; not even this data can be guaranteed. This is a source of potential performance diversities between motor and motor.

The main advantages given by the adoption of silicon magnetic laminations are:
higher efficiency
better guarantees on the quality consistency, assured by tolerances reported in international norms.

CE MARKING

CE marking is referred to:

- Low Voltage 06/95 EEC
- EMC Electromagnetic Compatibility 04/108/EEC
- Eco-design Directive for Energy-related Products (ErP) 2009/125/EC

Note: The Machinery Directive (MD) 2006/42/EC excludes from its scope the electric motors (Art.1, comma 2)

CE marking is put by Motive as a visible sign of the product compliance with the requirements of above mentioned directives. In order to reach this conformity, Motive products respect the following product standards:

- EN 60034-1 (last issue). Rotating electrical machines. Part 1: rating and performance
- EN 60034-5 (last issue). Rotating electrical machines. Part 5: classification of degrees of protection
- EN 60034-6 (last issue). Rotating electrical machines. Part 6: methods of cooling (IC code)
- EN60034-7 Rotating Electrical Machines - Part 7: Classification of Types of Construction, Mounting Arrangements and Terminal Box Position (IM Code)
- EN60034-8 Rotating electrical machines–Part 8: Terminal markings and direction of rotation
- EN60034-2-1 (last issue). Rotating electrical machines. Standard methods for determining losses and efficiency from tests
- EN60034-30 (last issue). Rotating electrical machines - Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors
- EN50347 General purpose three-phase induction motors having standard dimensions and outputs. Frame numbers 56 to 315 and flange numbers 65 to 740
- EN60335-1 Household and similar electrical appliances – Safety
- EN61000-6-4 Electromagnetic compatibility (EMC) - Part 6: Generic standards - Section 4: Emission standard for industrial environments
- EN 60034-9 (last issue). Rotating electrical machines. Part 9: noise limits


motive

Conformity Declaration

Motive s.r.l. whose Head Office is situated in Montirone (BS) - Italy

declares, under its own exclusive responsibility,

that its whole range of

asynchronous electric motors of the series "Delphi" from IEC/ec 56 to 400

is conform to the following international norms (last issue):

EN60034-1 Rotating Electrical Machines - Part 1: Rating and performance

EN60034-4 Rotating Electrical Machines - Part 6: Methods of cooling (IC code)

EN60034-7 Rotating Electrical Machines - Part 7: Classification of Types of Construction, Mounting Arrangements and Terminal Box Position (IM Code)

EN60034-8 Rotating electrical machines – Part 8: Terminal markings and direction of rotation

EN60034-2-1 Rotating electrical machines. Standard methods for determining losses and efficiency from tests

EN60034-30 Rotating electrical machines - Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors

EN50347 General purpose three-phase induction motors having standard dimensions and outputs. Frame numbers 56 to 315 and flange numbers 65 to 740

EN60335-1 Household and similar electrical appliances – Safety

EN61000-6-4 Electromagnetic compatibility (EMC) - Part 6: Generic standards - Section 4: Emission standard for industrial environments

IEC 72-1 Dimensions and output series for rotating electrical machines Part 1: frame numbers 56 to 400 and flange numbers 55 to 1080

following the provisions of the Directives

Low Voltage 06/95 EEC
EMC Electromagnetic Compatibility 04/108/EEC
Eco-design Directive for Energy-related Products (ErP) 2009/125/EC

1 January 2011

The Legal Representative Giorgio Bosio

SERIE DELPHI EX


DNV - MODULO UNO

ATTESTATO DI ESAME DI TIPO

ATE.20.0001.18/0151

MOTIVE S.r.l.

CE

Ex II 3 GD Ex nA T4
Ex tD A22 IP65 125°C

ATEX is the conventional name of the Directive 94/9/EC for the equipment intended for use in potentially explosive atmospheres. The name comes from the words ATmosphères and EXplosibles. It became compulsory in all the European Union from 1st March 1996, imposing the evaluation of the risk for all the equipment operating in such environments. It classifies several levels of "danger" (zones): to every zone it corresponds a different typology of explosive atmosphere, according to its composition and to its probability and time of appearance. The client is responsible of the choice of the right motor based on the criteria described in the norm EN 61241-14.

Motive delphi Ex motors are designed to be used in the zone 22 (II 3 D T125°') and/or zone 2 (II 3 G T125°'), according to the classification stated in the plate, and for the voltage and frequency field A described by the norm EN 60034 part 1 Cap. 6.3.

- EN60079-0 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
- EN60079-15 Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection, "n" electrical apparatus
- EN60079-31 Explosive atmospheres
  Part 31: Equipment dust ignition protection by enclosure “t”
- EN50281-2-1 Electrical apparatus for use in the presence of combustible dust. Test methods. Methods of determining minimum ignition temperatures

PROTECTION TYPE

The protection against people accidental contacts and/or the entry of corps and/or the entry of water is expressed at international level (EN60529) by a symbolic acronym composed by a group of 2 letters and 2 numbers.

IP index of protection reference letters

1° num. Protection of people against contacts and protection against the entry of solid corps

2° num. Protection against harmful entry of water

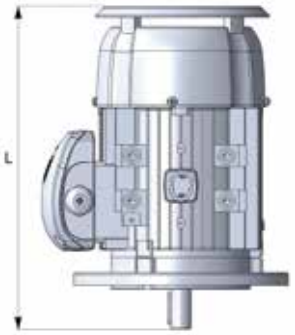
Motive motors are IP55 protected

	1° number	2° number
0	no protection	no protection
1	protection against solid corps bigger than 50mm	protection against vertical water drops
2	protection against solid corps bigger than 12mm	protection against water drops fall up to 15° of inclination
3	protection against solid corps bigger than a 2,5mm	protection against water drops up to 60° of inclination
4	protection against solid corps bigger than 1 mm	protection against water sprayed by all directions
5	protection against harmful dust deposits	protection against water launched by a nozzle of 6,3mm D with a water capacity 12,5lt/min at a distance of maximum 3 mt for 3 min
6	complete protection against the total penetration of dust	protection against water projections similar to sea waves
7		protection from temporary submersion in water, up to 1 meter in depth
8		protection from extended periods of immersion, up to a specific depth

STANDARD
OPTIONAL
OPTIONAL
OPTIONAL

RAIN SHIELD OR CLEAN FLOW FAN COWL FOR TEXTILE INDUSTRY

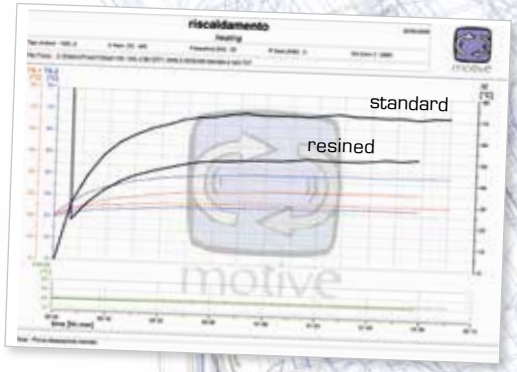
For outdoor applications with V5 - V18 - V1 - V15 installation, we recommend to mount a rain shield. This configuration may also be used in textiles processing industry.



TYPE	L
63	215
71	323
80	369
90S	403
90L	428
100	469
112	453
132S	573
132M	613
160M	770
160L	825
180M	915
180L	955
200L	1025
225S	1155
225M	1160
250M	1220
280S	1265
280M	1315
315S	1540
315M	1570
315L	1680
355M	1840
355L	1870
400	2290

TOTAL SEALING

Resin coated stator is a safe solution to the presence of very strong humidity or aggressive environments (for instance, carwash systems or chemical plants). It offers also a lower heating thanks to the thermal dissipation capacity of the resin.

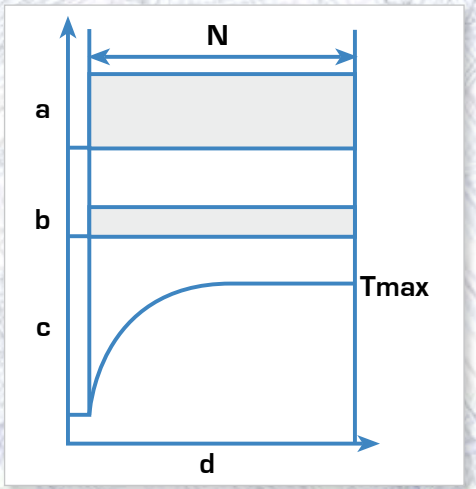


The ideal combination is the resin-filled terminal box. In this case, according to the customer needs, the terminal block can be partially immersed, or totally immersed in such insulating and protective resin. In alternative, the terminal box and block can be taken off and the motor frame be closed by a sealed plate from which a cable can come out.

Note: rotors are painted against oxidation as a standard

DUTY SERVICE

All Motive motors shown in this catalogue are made for S1 continuous duty service, as per IEC 34-1 norm. The duty service class is shown on the rating plate.
Below are described the various types of service:
S1 - Continuous service: operating at constant load of duration N in order to reach a thermal balance.



a = load
b = electric losses
c = temperature
d = time
N = steady load operating time
Tmax = max temperature achieved

S2 - Limited-duration service.
S3 - Periodic intermittent service.
S4 - Periodic intermittent service with start-up.
S5 - Periodic intermittent service with electric braking.
S6 - Uninterrupted periodic service with intermittent load.
S7 - Uninterrupted periodic service with electric braking.
S8 - Uninterrupted periodic service with correlated load and velocity variations.
S9 - Service with non-periodic variations in load and speed.

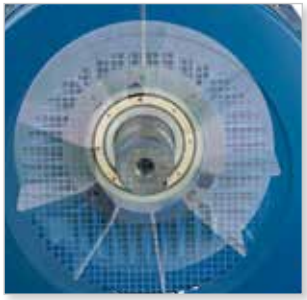
WORKING CONDITIONS

HUMIDITY:
The electrical equipment must be able to work with a relative humidity between 30 and 95% (without condensation). Damaging effects of occasional condensation must be avoided by adequate equipment design or, if necessary, by additional measures (for example, Motive offers anti-condensation heaters, drain holes, resin coated stators, and resin filled terminal boxes).

ALTITUDE AND TEMPERATURE:
the powers indicated are intended for regular use at altitudes below 1000 mt above sea level and a room temperature between +5°C and +40°C for motors having a rated power below 0.6 kW, or between -15°C and 40°C for motors having a rated power equal to or greater than 0.6 kW (IEC 34-1): For working conditions
rather than those specified (higher altitude and/or temperature) the power decreases of 10% each 10°C of higher temperature, and of 8% for each 1000 mt of higher altitude.
It is not necessary to reduce the rated power if at an altitude higher than 1000mt and lower than 2000mt there is a max ambient temperature of 30°C or, in altitudes from 2000 mt to 3000mt there is a max ambient temperature of 19°C.

VOLTAGE - FREQUENCY:
The admitted variation of supply voltage and frequency is established by the norm EN60034-1
Within this tolerance delphi motors provide the rated power reported in the plate.

INSULATION:
The copper is impregnated with a double layer of H class insulating enamel to ensure high resistance to electrical, thermal and mechanical stress.
A NOMEX film that wraps entirely around the coil side insulates the copper and iron from one another.
The phases are further isolated by another layer of NOMEX to protect the motors from voltage peaks that usually occur when the motor is controlled by inverter.



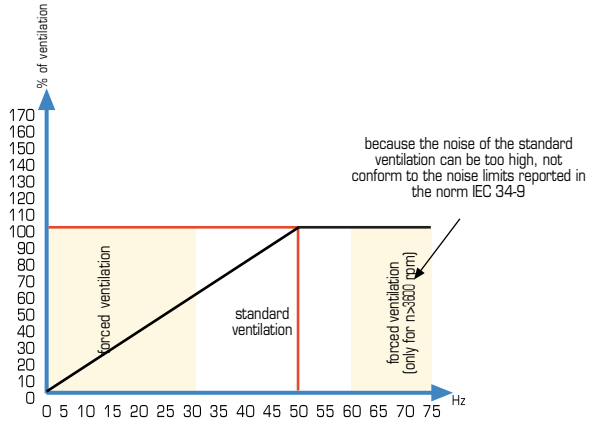
In case that motors with more than 75kW are controlled by inverter, we recommend to request the electrically insulated bearing on the non drive end.
Its purpose is to open the electric circuit between the rotor and the motor frame, thus preventing that the shaft currents go through the bearings and damage their balls surface and roll tracks.

The section "technical data" of this catalogue shows the max operating temperatures according to the Class insulation shown on the plate.

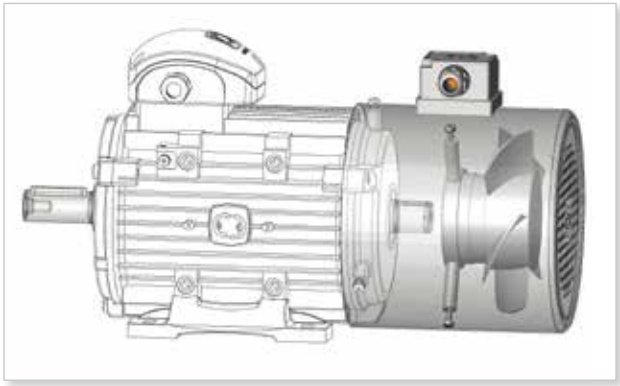
Delphi motors are designed to conserve wide margins against eventual overloads, having a temperature rise that is, at rated power, much lower than the operating temperature limit given by their insulation class. This fact increases considerably the motors life lenght. Such "ΔT" values are evidenced in the following performance charts. (see further details about temperature rise in the "technical data" section of this catalogue)

ASSISTED POWER COOLING

For application with a power supply at certain frequencies (see following graph), a power cooling system (IC-416) must be used.

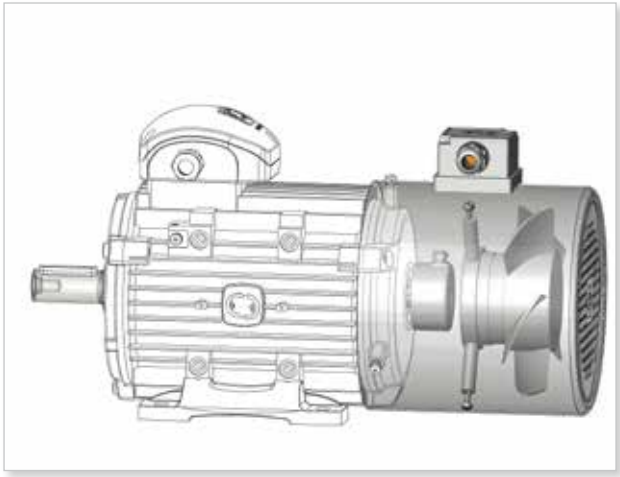


Motive power cooling systems are three-phase 400/50 400/60, IP 55, and with separate terminal box. Upon request, single phase and special voltage power cooling systems are also available.



ENCODER

Motors with encoder or special shaft configurations for encoder mounting are available upon request. In this case, assisted power cooling is also available, supported by brackets on the fan cover



Protections must be chosen based on the specific running conditions, according to standards EN 60204-1

External protections

- Protection against overloads. A thermal cut-out relay, which automatically controls a knife switch.

- Protection against peak currents by magnetic relay that controls an automatic knife switch, or by fuses; these must be set to the locked rotor current.

- If the application requires, protection against excessive speed of the electric motor, for example if the mechanical load may drive the electric motor itself and thereby create a hazardous situation.

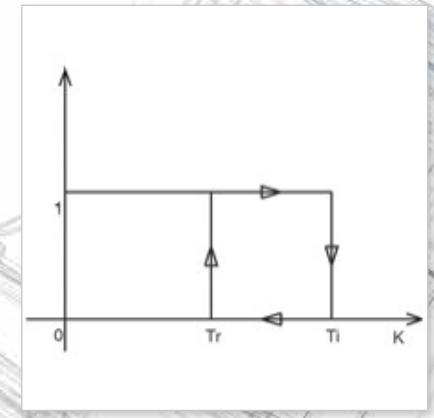
- If special conditions or synchronised operation with other machines or parts of machines require it, protection against power failures or dips by means of a minimum voltage relay that controls an automatic power knife switch.

Inner thermal overload cut-out switches (per CEI 2-3/IEC 34-1)

The electrical protections on the motor power line may not be sufficient to protect against overloads. If the cooling conditions worsen, the motor overheats but the electrical conditions do not change, which inhibits line protections. Installing built-in protections on the windings solves this problem:

- **bimetallic device "PTO"**

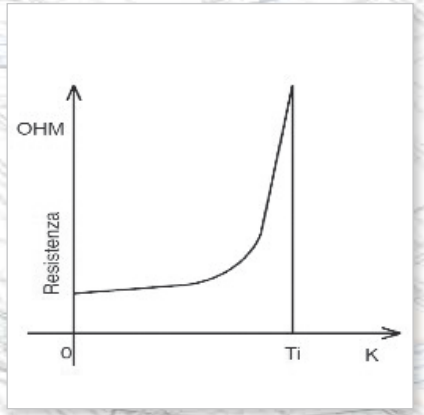
this is a normally-closed electromechanical device that opens when the threshold temperature is reached; it automatically resets when the temperature falls below the threshold level. Bimetallic devices are available with various intervention temperatures and without automatic reset, per EN 60204-1.



Tr= Opening temperature (motor stops)
Ti= Re-closing temperature (motor works again)

- **PTC thermistor device**

this device promptly, positively adjusts its resistance once the threshold temperature is reached.



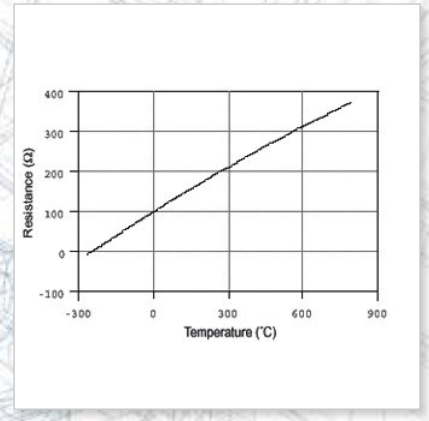
Ti= activating temperature

Motors "Delphi Ex - II 3G Ex nA" and all motors from type 160 to type 355L are equipped with 3 PTC thermistors in the winding, with temperature intervention of 120-130°C in Class F motors (standard) (150-160°C in H Class motors, not delphi Ex)

Types 160-400
Cable gland for PTC

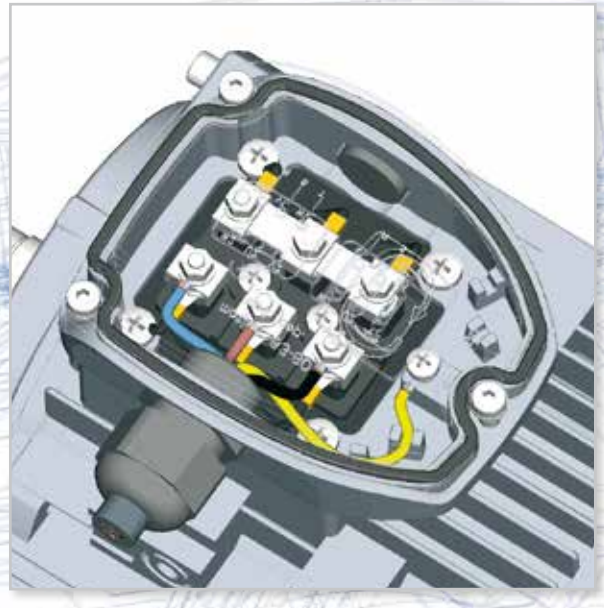
- **PT100 device**

this is a device that continuously, increasingly adjusts its resistance according to the temperature. It is useful for constant measuring of the winding temperatures using electronic

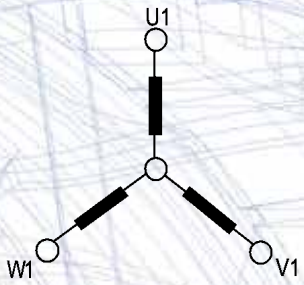


WIRING DIAGRAMS

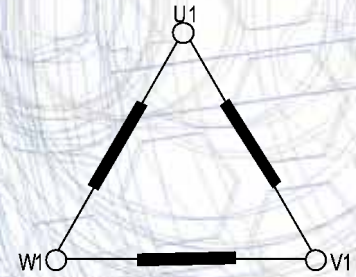
Motive three phase motors can be connected “Star” or “Delta”.

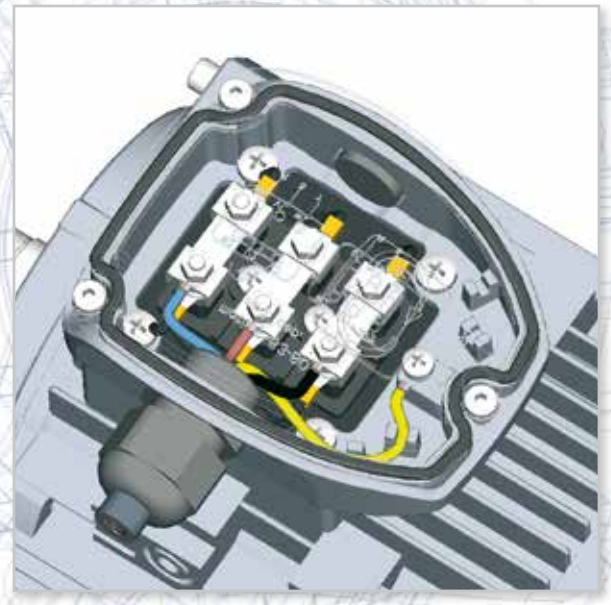


STAR CONNECTION
Star connection is obtained by connecting together the terminals W2, U2, V2 and supplying the terminals U1, V1, W1.
The phase current and voltage are respectively:
Iph = In
Uph = Un / 3 -2
where In is the supply line current and Un is the supply line voltage of Star connection



DELTA CONNECTION
Delta connection is obtained by connecting the end of a phase with the beginning of the following one. The phase current Iph and the phase voltage Uph are repectively:
Iph = In / 3 -2
Uph = Un
where In and Un are referred to Delta connection.



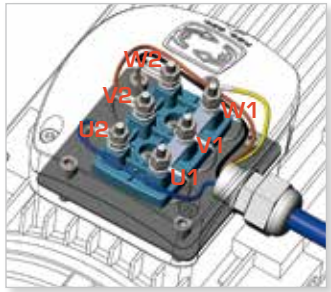


the following voltages and frequencies are inside the standard power supply of all three-phase motive motors, under S1 duty service:

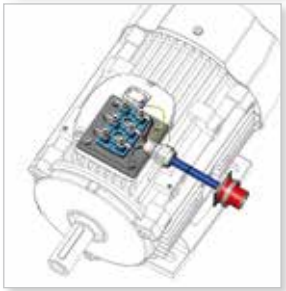
		Volts	
Size	Hz	Δ	Y
56-132	50 ±5%	230	400
		220	380
		240	415
	60 ±5%	260	440
		220	380
		265	460
		280	480
132-355	50 ±5%	400	690
		380	660
		415	720
	60 ±5%	440	760
		380	660
		460	795
		480	830

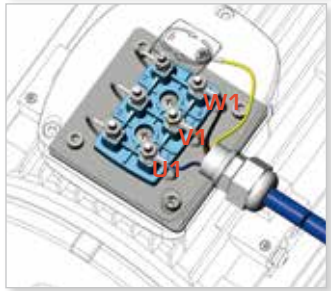
Double polarity motor, single winding (dahlander)

High-speed connection



Low-speed connection

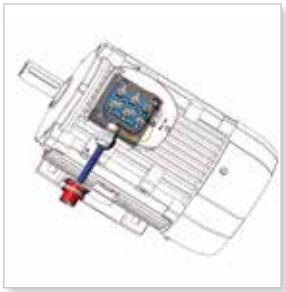


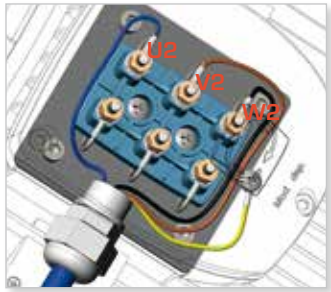


To use the 2 speeds, you must adopt a 6+1 wires cable and connect an external switch

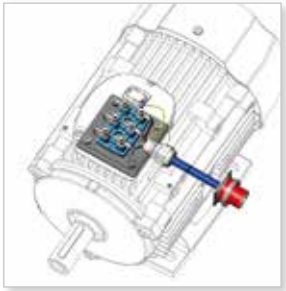
Double polarity motor, with double winding

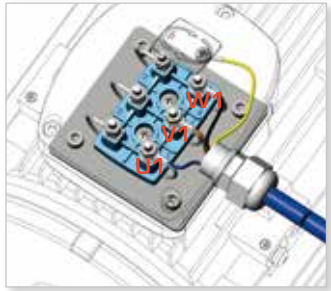
High-speed connection





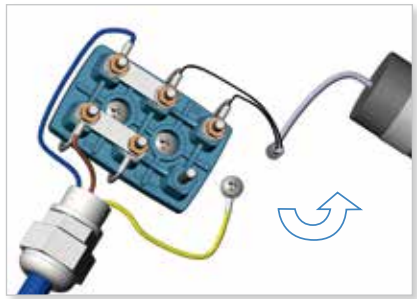
Low-speed connection

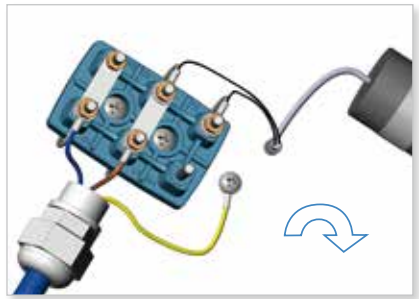


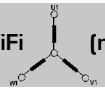


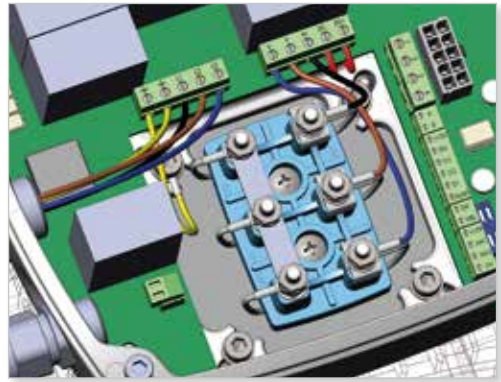
To use the 2 speeds, you must adopt a 6+1 wires cable and connect an external switch

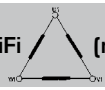
Single phase motors

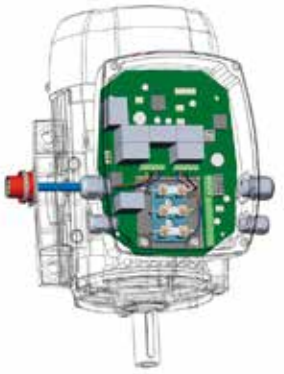


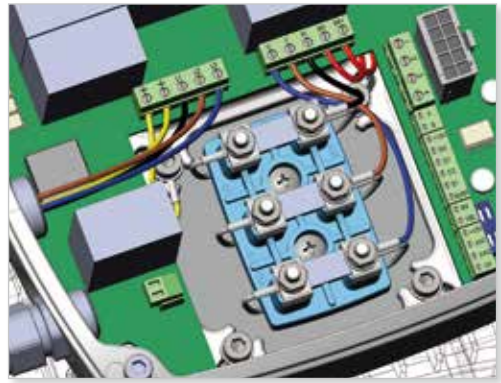


NEO-WiFi  (motor 230VΔ/400VY)

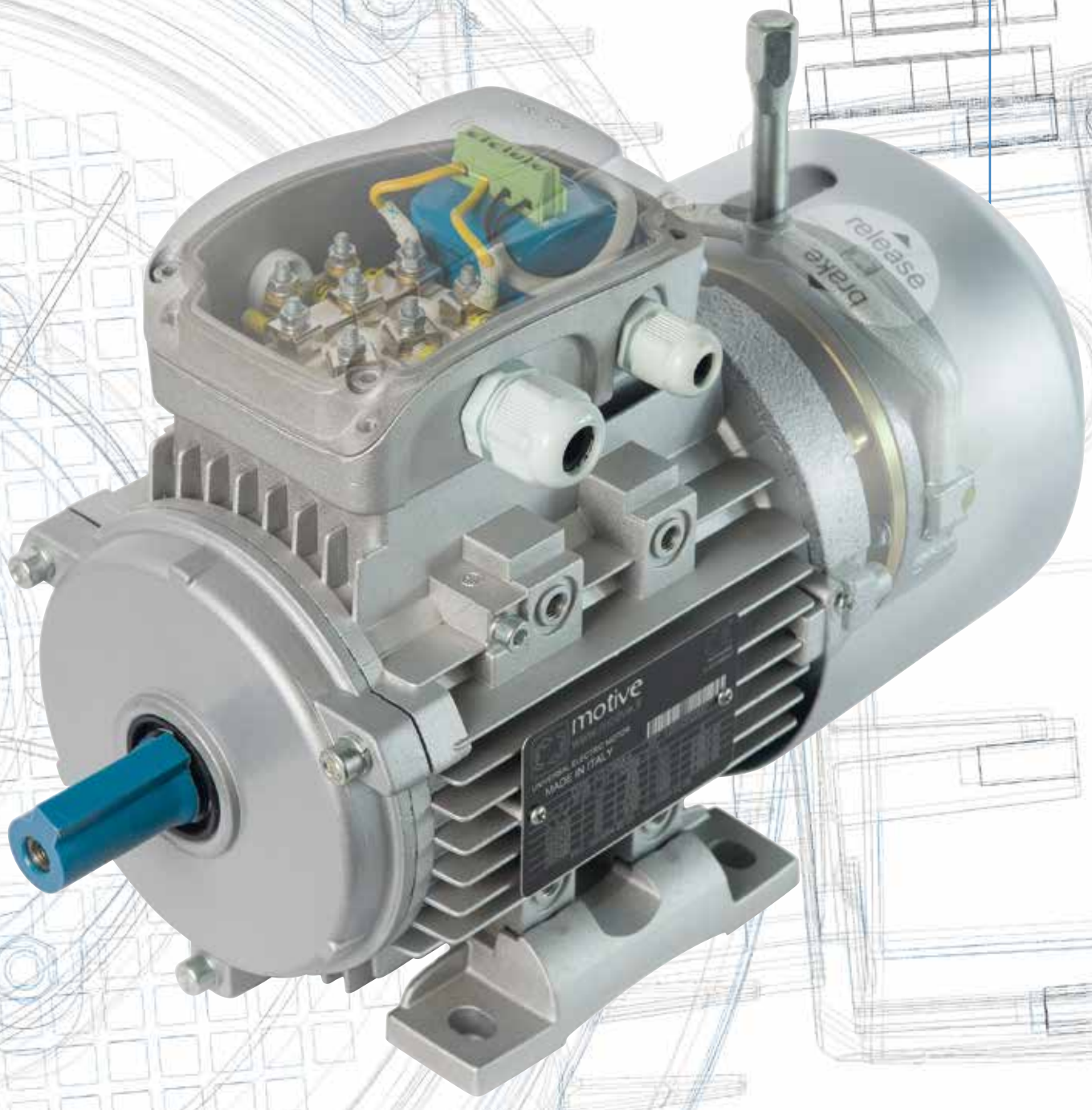


NEO-WiFi  (motor 400VΔ/690VY)





THREE-PHASE SELF-BRAKING MOTORS SERIES DELPHI AT

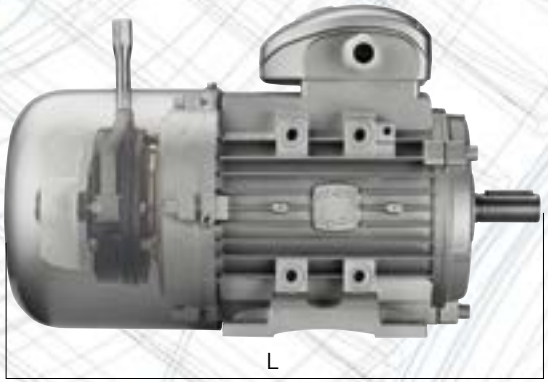


DELPHI AT

Delphi ATDC, AT24, ATTD and ATTD24 series self-braking motors use one or 2 spring-pressure brakes, firmly spliced onto a cast iron shield at the back of the motor.
These motors include a series of characteristics normally considered options by other brands, like:
-The standard hand lever permits to release the brake, making it possible to move manually he shaft,
-The PTO thermal protectors in the winding are a standard up to size 132. PTC are a standard from size 160 and up
-Easy separate connection of the brake in case that the motor is connected to an inverter.
On ATDC and ATTD, the separate brake power supply is achieved, whenever needed, by connecting directly to the brake terminal board located inside the motor terminal box.
On AT24 and ATTD24, the 24Vdc single or double brakes are designed to be directly connected to an inverter (usually having a 24Vdc plug)

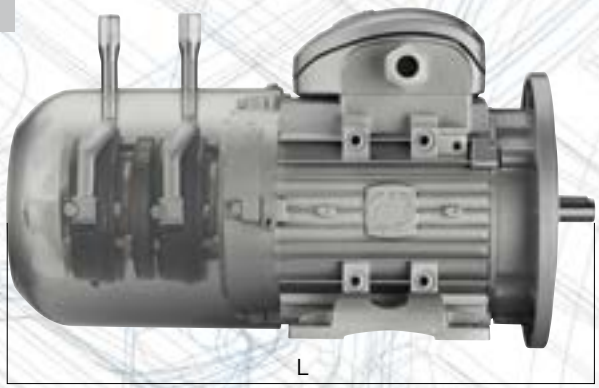
On request, the brakes can be modified to be extremely silent for usage in special environments like theatres

ATDC/AT24



L

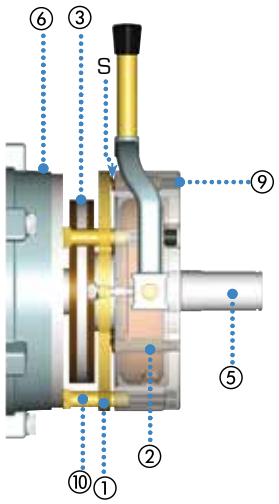
ATTD/ATTD24

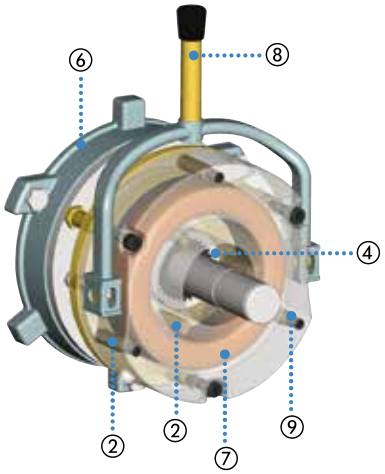


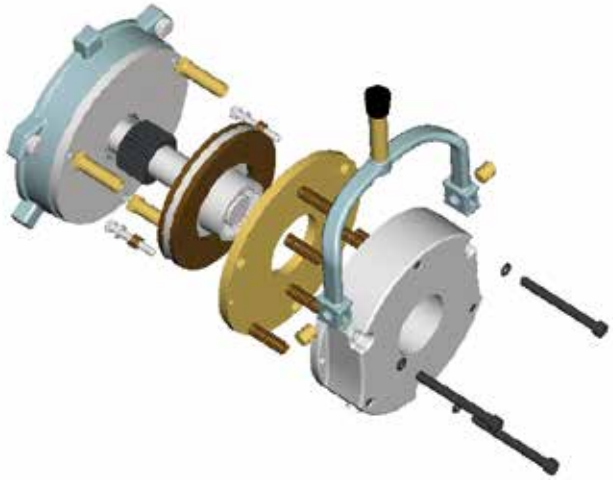
L

	ATDC						AT24				ATDC AT24	ATTD ATTD24
IEC Type	Static max braking torque [Nm]	standard vers. braking time no-load [Sec]	"TA version" braking time no-load [Sec]	input voltage on rectifier [Vac]	output voltage to brake [Vdc]	brake power [W]	Static max braking torque [Nm]	Static min braking torque [Nm]	Braking time no-load [Sec]	brake power [W]	extra Kg on std	extra Kg on std
AT..63	4,5	0,15	<0,05	220-280 (opt. 380-480)	99-126 (opt. 171-216)	20	4,5	4,0	0,06	20	+4	+3,5
AT..71	8,0	0,15	<0,05	220-280 (opt. 380-480)	99-126 (opt. 171-216)	28	4,5	4,0	0,06	20	+5	+9
AT..80	12,5	0,20	<0,05	220-280 (opt. 380-480)	99-126 (opt. 171-216)	30	10,0	9,0	0,09	25	+5,5	+10
AT..90	20,0	0,25	<0,05	220-280 (opt. 380-480)	99-126 (opt. 171-216)	45	16,0	12,0	0,11	45	+6	+11
AT..100	38,0	0,30	<0,05	220-280 (opt. 380-480)	99-126 (opt. 171-216)	60	32,0	28,0	0,14	60	+7	+12,5
AT..112	55,0	0,35	<0,05	380-480	171-216	65	65,0	55,0	0,15	65	+10	+19
AT..132	90,0	0,40	<0,05	380-480	171-216	90	90,0	80,0	0,16	85	+12	+23
AT..160	160,0	0,50	<0,05	380-480	171-216	110	160,0	130,0	0,21	105	+22	+42
AT..180	250,0	0,50	<0,05	380-480	171-216	130					+32	+62
AT..200	420,0	0,50	<0,05	380-480	171-216	140					+40	+77
AT..225	450,0	0,50	<0,05	380-480	171-216	160					+52	+100
AT..250	550,0	0,50	<0,05	380-480	171-216	170					+80	+155
AT..280	900,0	0,50	<0,05	380-480	171-216	360					+106	+209
ATTD/ATTD24	ATTD= ATDCx2					ATTD= ATDCx2	ATTD24= AT24 x 2			ATTD24= AT24 x 2		

ATDC







① Mobile armature
② springs
③ Brake disc
④ Driver
⑤ Motor shaft
⑥ Motor flange
⑦ Electromagnet
⑧ Release lever
⑨ Adjuster screws
⑩ Threaded bush
⑪ braking torque setting knob
⑫ ATTD connection plate

S Air gap

BRAKE DESCRIPTION

The delphi AT... series brakes are electromagnetic brakes with negative operation, whose braking action is exercised in the absence of power supply.
The brakes insulation class is F.
The brakes lining is asbestos-free.
The rectifier is of relays type, with protection varistors at the entry and the exit. All brake assemblies are protected against corrosion by painting or heat galvanizing and resined winding. The parts most subject to wear are treated in special atmospheres that provide considerable wear resistance to the parts.

BRAKE OPERATION

When the power supply is interrupted, the excitation coil ⑦ is no longer powered and therefore doesn't exert the magnetic force necessary to restrain the mobile armature ①, hwich, pushed by the pressure springs ②, compresses the brake disk ③ against the motor flange ⑥ on one side and the armature itself on the other, thereby creating a braking action.

ADJUSTMENT

Two different types of adjustment are possible

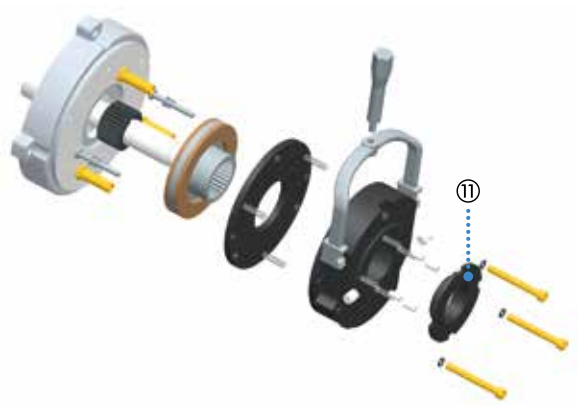
S air gap adjustment
For proper operation, the air gap S between electromagnet ⑦ and the mobile armature ① must be between the following indicated limits:

MOTOR TYPE	S AIR GAP (mm)
63~71	0.40~0.50
80~160	0.50~0.60

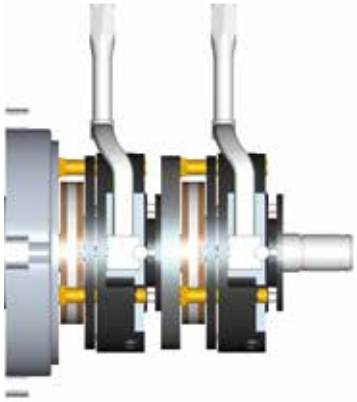
The adjustment is made by using the threaded bushes ⑩, using a thickness gauge to make sure that the wished air gap is reached.

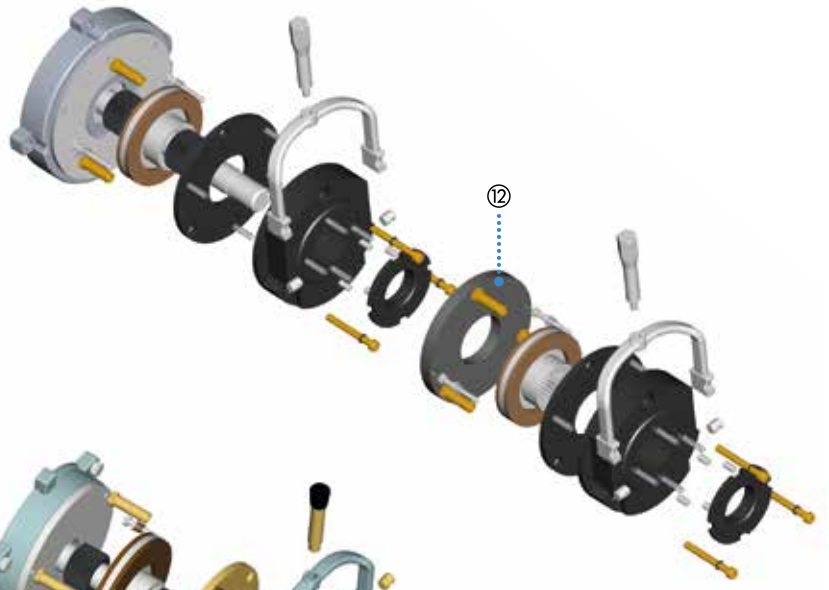
Braking torque adjustment
The braking torque is set to its max level by Motive, but it can be decreased by acting on the adjuster screws ⑨ (ATDC and ATTD motors) or on the knob ⑪ (AT24 and ATTD24).

AT24

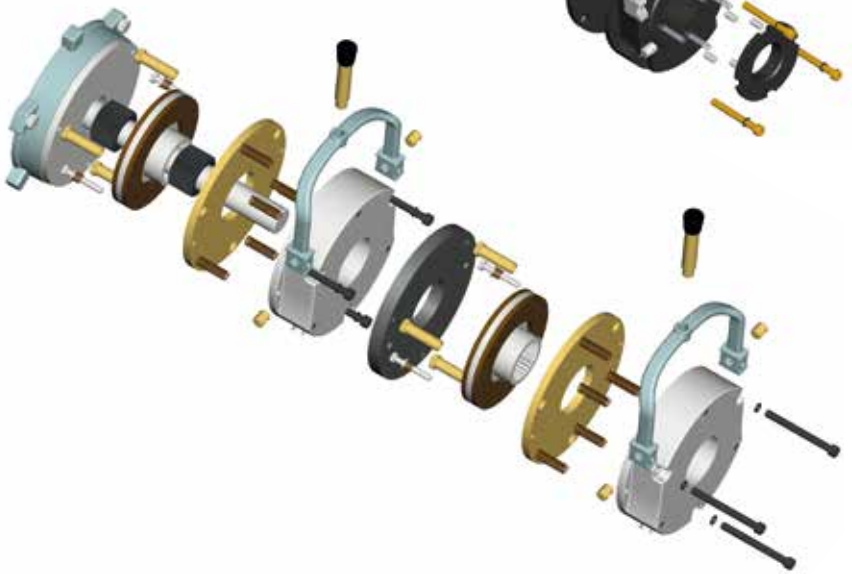


ATTD24





ATTD



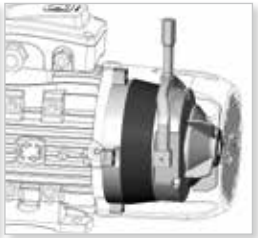
MANUAL RELEASE

Motive brake motors are supplied with the manual release lever in their standard version. If not wished, the lever is like a screw, that can be taken away simply turning it.
ATTD and ATTD24 tandem brake motors, from size 180 up to sized 280, cannot have the manual release.

IP

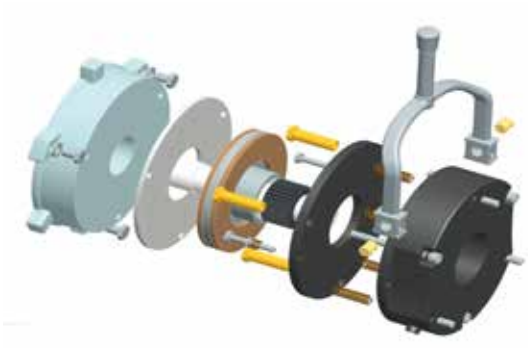
AT.. brakes are IP66 under an electrical point of view, but mechanically, in case of an outdoor use, they should be protected by rust and by disc adhesion effects given by humidity. In such a case, we suggest to use our protective rubber ring seals
This device prevents the exit or ingress of dust, humidity, dirt, etc., out of or into the braking area.
It is inserted into the groove on the stator. If your brake doesnít have such a groove, you must order a specifically machined brake for that.

In order to safeguard the braking torque, it is necessary to clean periodically the parts inside the rubber ring seal by the dust created by the disc lining.



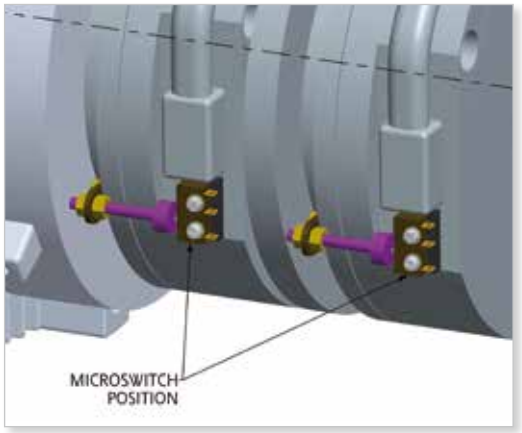
STAINLESS STEEL BRAKING SURFACE

When high humidity in the air can rust fastly the contact surface between the brake disc and the cast-iron NDE shield of the motor, you can request to motive to add a stainless steel shield.

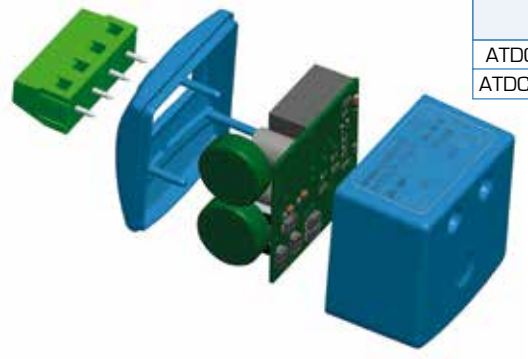


MICRO-SWITCHES TO DETECT BRAKE POSITION

Optional.



POWER SUPPLY



ATDC brakes are DC brakes power supplied by a rectifier installed inside the motor main terminal box.

The performance of all brakes, in terms of Watt, Nm and speed in mSec are shown in motive web-site .

The following tablechart shows the tensions on the rectifier and the brake of ATDC model

Type	input voltage on rectifier [Vac]	output voltage to brake [Vdc]
ATDC 63-100	220-280	99-126
ATDC 112-280	380-480	171-216

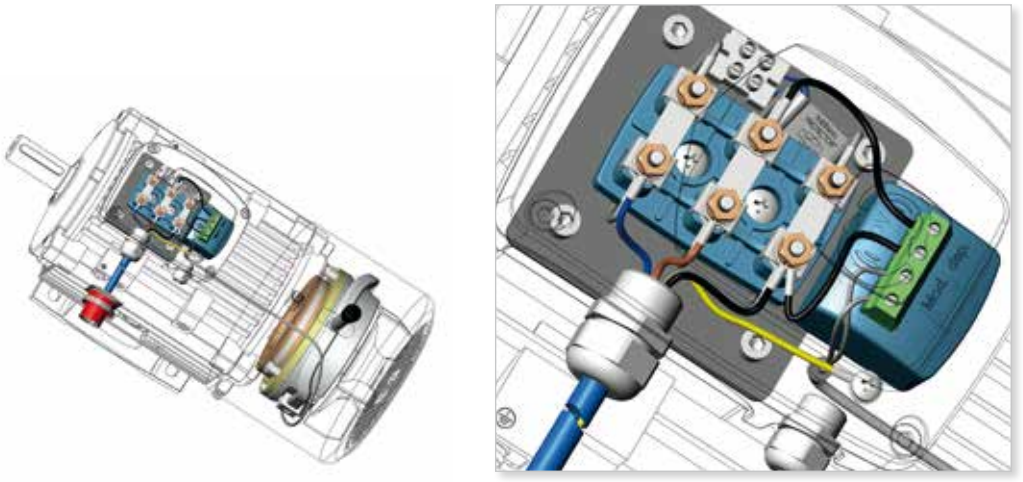
Unless there's a different request of the client, motive supplies ATDC brake motors with the rectifier already connected directly to the main terminal block of the motor (fig. 1, 2, 3 and 4), in order to permit to the motor switching to act at the same time on the brake.

In case that the motor is power supplied by a frequency inverter (fig. 5a and 5b), or at a special voltage*, or at a low tension during the start, or in case that the motor is used to move loads which can have an inertial movement, like lifted weights (such inertial movement can move the motor when the power is switched off, and the motor can act like a generator on the rectifier avoiding the brake locking), disconnect the motor main terminal board from the rectifier, and connect separately the rectifier (ATDC) (fig. 5a, 5b, 6 and 7).
TA special rectifier permits to solve the problem of inertial movements with no need for a separate power supply to the rectifier (fig 3 and 4)

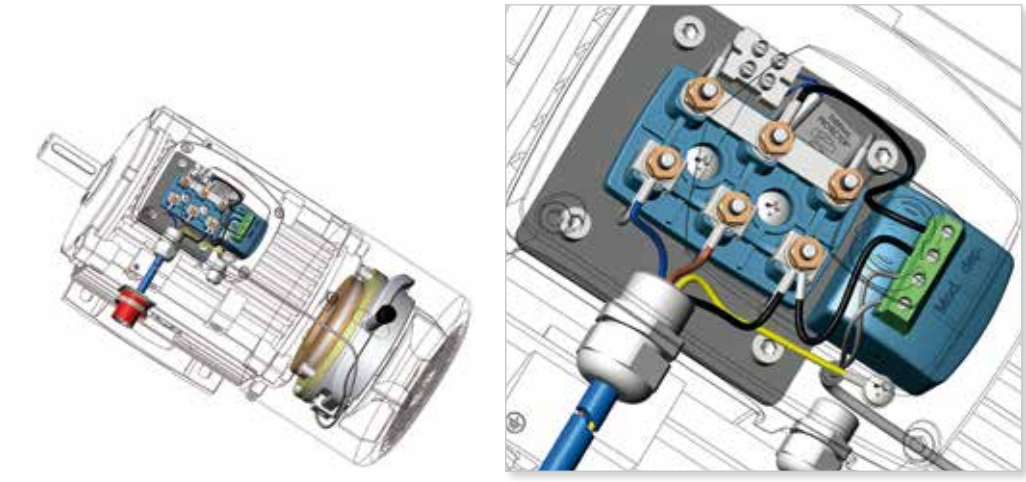
This exclusive rectifier offers the following innovations:
- double semi-wave technology.
- special vibration proof 6 Ampere relays (like the ones used on Ducati race motorbikes).
- electric arcs ultra resistant contacts in silver alloy.
- relays system instead of normal mosfets system, thus more resistant against tension peaks, even if impulsive.
- an in-built current reading system which controls the current sinusoid and the relay commutation time.

What's the advantage? Rectifier is normally the "brain" and the fragile point of any dc brake motor. This rectifier is stronger against disturbs coming from power line, much stronger than what required by European EMC rules for industrial environment; they are more resistant against vibrations; and they are faster.

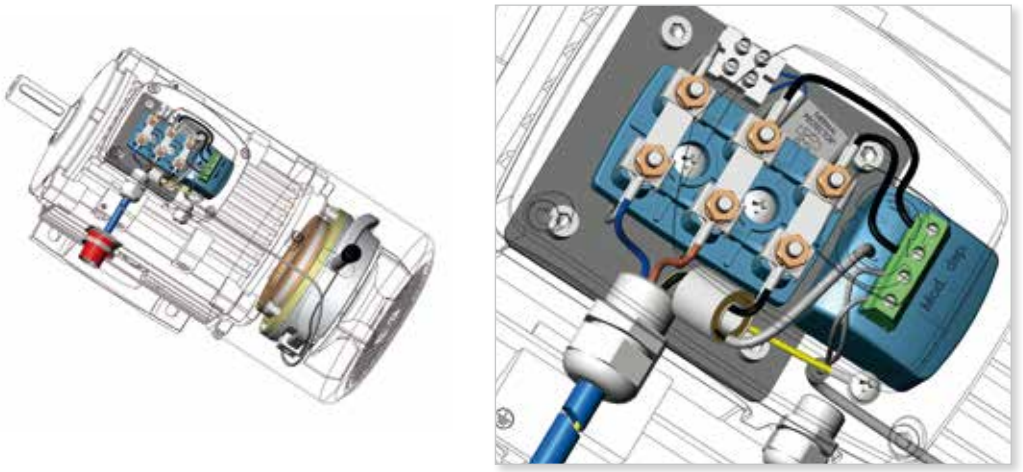
ATDC 112-280 /_ - 400Vac/180Vdc rectifier (Ill.1)



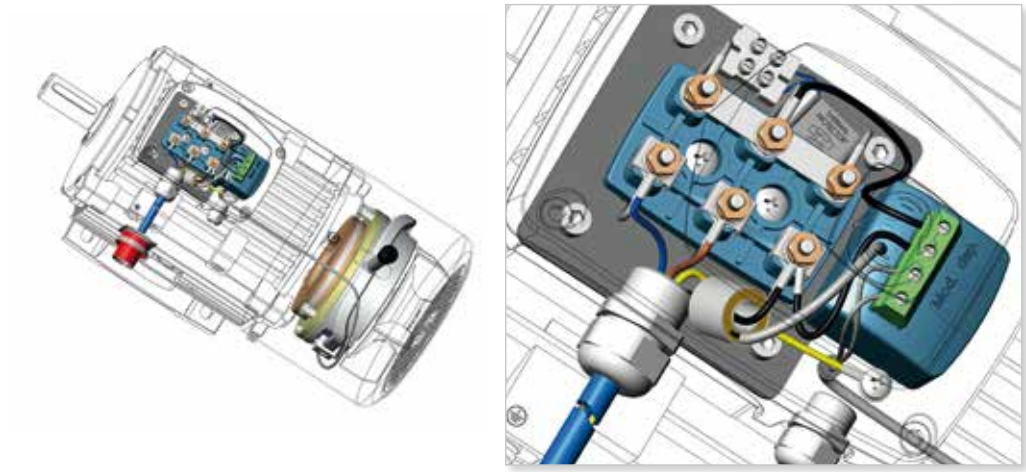
ATDC 63-100 Y - 230Vac/104Vdc rectifier (Ill.2)



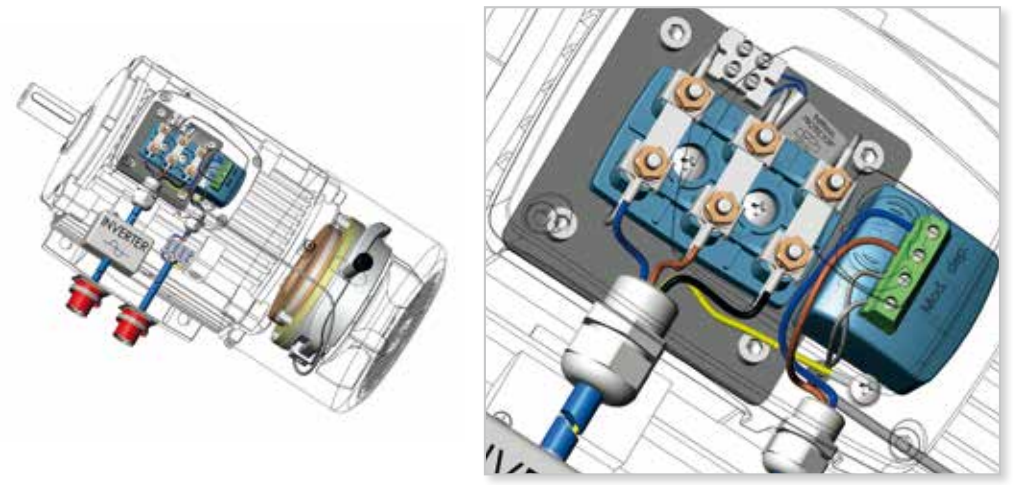
ATDC 112-280 /_ 400Vac/180Vdc TA rectifier (Ill.3)



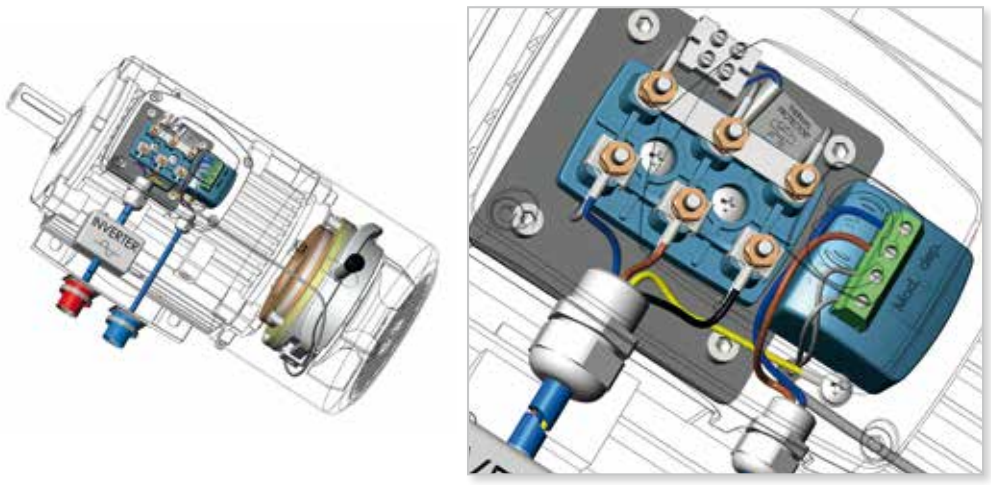
ATDC 63-100 Y + 230Vac/104Vdc TA rectifier (Ill.4)



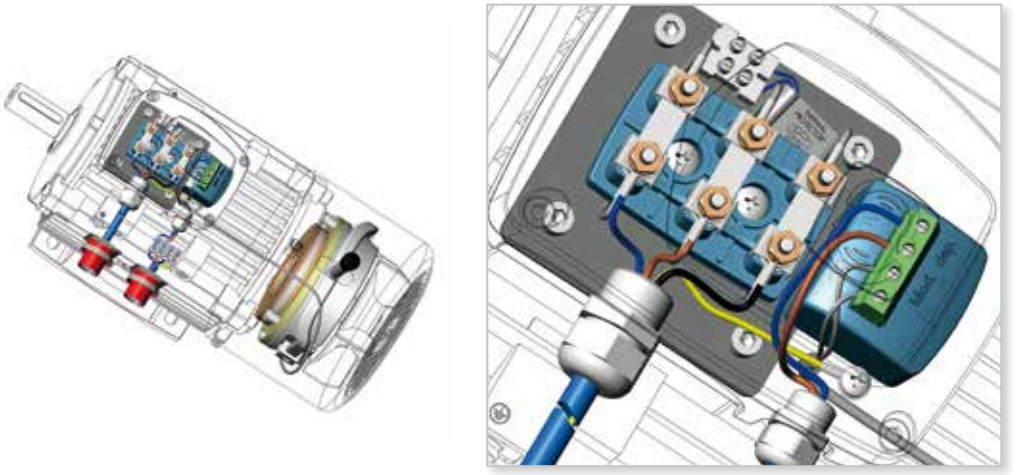
ATDC 112-280 Δ (separate 400Vac/180Vdc rectifier) + inverter (fig. 5)



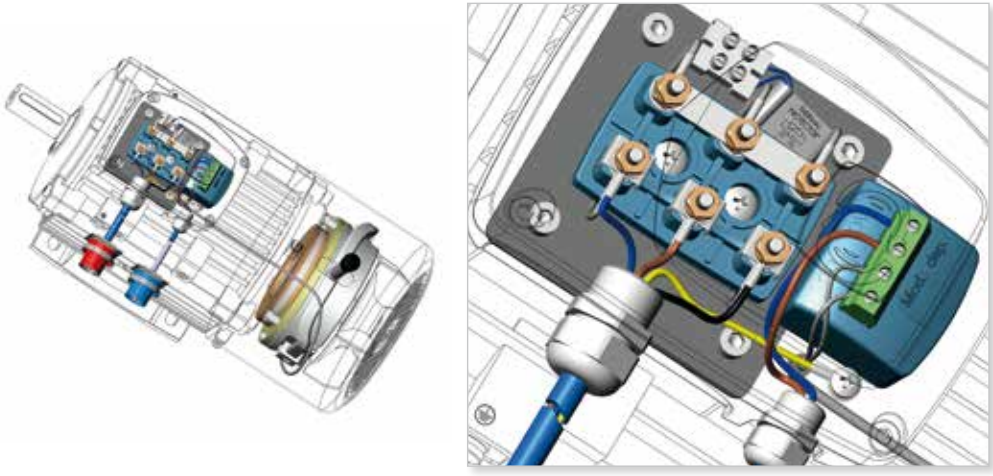
ATDC 63-100 Y (separate rectifier 230Vac/104Vdc) + inverter (fig. 5b)



ATDC 112-280 Δ + separate 400Vac/180Vdc rectiifer connection (fig. 6)



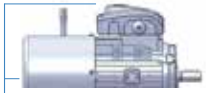
ATDC 63-100 Y + separate 230/104Vdc rectifier connection (fig. 7)



MOTOR CONFIGURATIONS AND INSTALLATION POSITIONS (IEC 34-7)

MOTORS WITH FEET B3		FLANGE-MOUNTED MOTORS B5	FLANGE-MOUNTED MOTORS B14
 IM1051 (IM B6)	 IM1001 (IM B3)	 IM3001 (IM B5)	 IM3601 (IM B14)
 IM1061 (IM B7)	 IM1011 (IM V5)	 IM3011 (IM V1)	 IM3611 (IM V18)
 IM1071 (IM B8)	 IM1031 (IM V6)	 IM3031 (IM V3)	 IM3631 (IM V19)
B3/B5  IM2001 (IM B35)	B3/B14  IM2101 (IM B34)	V1/V5  IM2011 (IM V15)	V3/V6  IM2031 (IM V36)

no ATDC



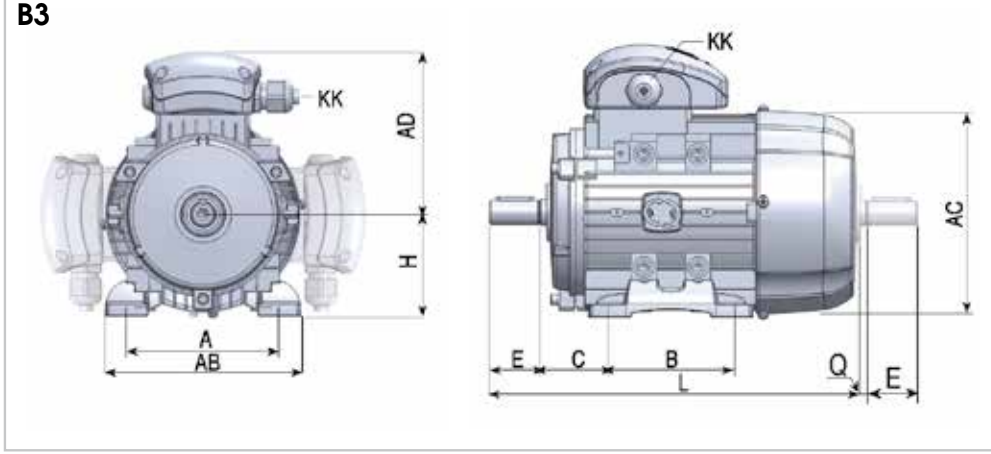
ATDC

														B3					B5						B14						B5R/B14B					
TYPE	POLES	AC	AD		H	KK	L	D	DH	E	Q	F	G	A	AB	B	C	K	M	N	P	R	S	T	M	N	P	R	S	T	M	N	P	R	S	T
56	2-8	120	102	-	56	M16	198	9	M4x12	20	3	3	7,2	90	111	71	36	5,8	100	80	120	0	7x4	3	65	50	80	0	M5	2,5	-	-	-	-	-	-
63	2-8	130	107	116	63	M20	217	11	M4x12	23	3	4	8,5	100	123	80	40	7	115	95	140	0	10x4	3	75	60	90	0	M5	2,5	100	80	120	0	M6	2,5
71	2-8	145	119	124	71	M20	244	14	M5X12	30	3	5	11,0	112	138	90	45	7	130	110	160	0	10x4	3,5	85	70	105	0	M6	2,5	115	95	140	0	M8	3,0
80	2-8	155	130	139	80	M20	283	19	M6X16	40	3	6	15,5	125	157	100	50	10	165	130	200	0	12x4	3,5	100	80	120	0	M6	3,0	130	110	160	0	M8	3,5
90S	2-8	175	145	146	90	M20	310	24	M8X19	50	5	8	20,0	140	173	100	56	10	165	130	200	0	12x4	3,5	115	95	140	0	M8	3,0	130	110	160	0	M8	3,5
90L	2-8	175	145	146	90	M20	338	24	M8X19	50	5	8	20,0	140	173	125	56	10	165	130	200	0	12x4	3,5	115	95	140	0	M8	3,0	130	110	160	0	M8	3,5
100	2-8	215	157	161	100	M20	373	28	M10X22	60	5	8	24,0	160	196	140	63	12	215	180	250	0	15x4	4	130	110	160	0	M8	3,5	165	130	200	0	M10	3,5
112M	2-8	240	177	177	112	M25	390	28	M10X22	60	5	8	24,0	190	227	140	70	12	215	180	250	0	15x4	4	130	110	160	0	M8	3,5	165	130	200	0	M10	3,5
132S	2-8	275	197	195	132	M32	460	38	M12X28	80	5	10	33,0	216	262	140	89	12	265	230	300	0	15x4	4	165	130	200	0	M10	3,5	215	180	250	0	M12	4,0
132M	2-8	275	197	195	132	M32	496	38	M12X28	80	5	10	33,0	216	262	178	89	12	265	230	300	0	15x4	4	165	130	200	0	M10	3,5	215	180	250	0	M12	4,0
160M	2-8	330	255	255	160	2xM40	615	42	M16X36	110	5	12	37,0	254	320	210	108	15	300	250	350	0	19x4	5	215	180	250	0	M12	4,0						
160L	2-8	330	252	252	160	2xM40	670	42	M16X36	110	5	12	37,0	254	320	254	108	15	300	250	350	0	19x4	5	215	180	250	0	M12	4,0						
180M	2-8	380	270	270	180	2xM40	700	48	M16X36	110	8	14	42,5	279	355	241	121	15	300	250	350	0	19x4	5												
180L	2-8	380	270	270	180	2xM40	740	48	M16X36	110	8	14	42,5	279	355	279	121	15	300	250	350	0	19x4	5												
200L	2-8	420	303	303	200	2xM50	770	55	M20X42	110	12	16	49,0	318	395	305	133	19	350	300	400	0	19x4	5												
225S	2-8	470	312	312	225	2xM50	815	60	M20X42	140	12	18	53,0	356	435	286	149	19	400	350	450	0	19x8	5												
225M	2	470	312	312	225	2xM50	820	55	M20X42	110	12	16	49,0	356	435	311	149	19	400	350	450	0	19x8	5												
225M	4-8	470	312	312	225	2xM50	850	60	M20X42	140	12	18	53,0	356	435	311	149	19	400	350	450	0	19x8	5												
250M	2	510	355	355	250	2xM63	910	60	M20X42	140	12	18	53,0	406	490	349	168	24	500	450	550	0	19x8	5												
250M	4-8	510	355	355	250	2xM63	910	65	M20X42	140	12	18	58,0	406	490	349	168	24	500	450	550	0	19x8	5												
280S	2	550	398	398	280	2xM63	985	65	M20X42	140	12	18	58,0	457	550	368	190	24	500	450	550	0	19x8	5												
280S	4-8	550	398	398	280	2xM63	985	75	M20X42	140	12	20	67,5	457	550	368	190	24	500	450	550	0	19x8	5												
280M	2	550	398	398	280	2xM63	1035	65	M20X42	140	12	18	58,0	457	550	419	190	24	500	450	550	0	19x8	5												
280M	4-8	550	398	398	280	2xM63	1035	75	M20X42	140	12	20	67,5	457	550	419	190	24	500	450	550	0	19x8	5												
315S	2	615	530	-	315	2xM63	1160	65	M20X42	140	15	18	58,0	508	630	406	216	28	600	550	660	0	24x8	6												
315S	4-8	615	530	-	315	2xM63	1270	80	M20X42	170	15	22	71,0	508	630	406	216	28	600	550	660	0	24x8	6												
315M	2	625	530	-	315	2xM63	1190	65	M20X42	140	15	18	58,0	508	630	457	216	28	600	550	660	0	24x8	6												
315M	4-8	625	530	-	315	2xM63	1300	80	M20X42	170	15	22	71,0	508	630	457	216	28	600	550	660	0	24x8	6												
315L	2	625	530	-	315	2xM63	1320	65	M20X42	140	15	18	58,0	508	630	508	216	28	600	550	660	0	24x8	6												
315L	4-8	625	530	-	315	2xM63	1350	80	M20X42	170	15	22	71,0	508	630	508	216	28	600	550	660	0	24x8	6												
355M	2	710	655	-	355	2xM63	1500	75	M20X42	140	15	20	67,5	610	730	560/630	254	28	740	680	800	0	24x8	6												
355M	4-8	710	655	-	355	2xM63	1530	95	M20X42	170	15	25	86,0	610	730	560/630	254	28	740	680	800	0	24x8	6												
355L	2	710	655	-	355	2xM63	1500	75	M20X42	140	15	20	67,5	610	730	560/630	254	28	740	680	800	0	24x8	6												
355L	4-8	710	655	-	355	2xM63	1530	95	M20X42	170	15	25	86,0	610	730	560/630	254	28	740	680	800	0	24x8	6												
400S/M/L	4-8	860	680	-	400	3xM63	1945	110	M24X50	210	-	28	100,0	686	810	630/710	280	36																		

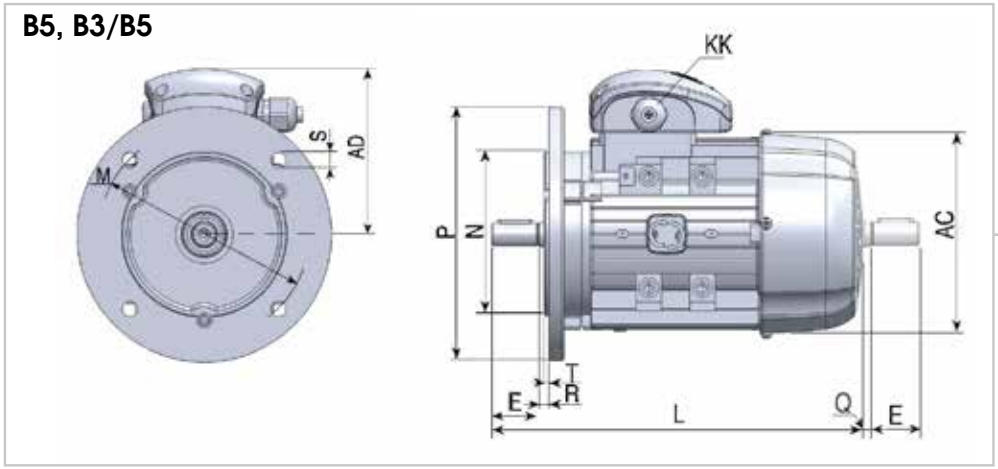
		SV	ATDC AT24	ATDC+SV AT24+SV	ATTD ATTD24	ATTD+SV ATTD24+SV
TYPE	POLES	L	L	L	L	L
56	2-8	-	-	-	-	-
63	2-8	301	261	361	321	421
71	2-8	341	295	411	365	481
80	2-8	388	340	428	417	508
90S	2-8	420	385	464	472	554
90L	2-8	445	410	485	500	575
100	2-8	452	450	507	503	617
112M	2-8	525	475	584	563	674
132S	2-8	590	550	678	640	768
132M	2-8	625	590	715	678	805
160M	2-8	765	720	819	830	929
160L	2-8	810	755	862	865	972
180M	2-8	805	810	954	957	1104
180L	2-8	845	850	992	997	1142
200L	2-8	960	890	1013	1055	1178
225S	2-8	955	935	1090	1115	1125
225M	2	955	935	1090	1115	1125
225M	4-8	985	965	1120	1145	1255
250M	2	1045	1075	1211	1327	1466
250M	4-8	1045	1075	1211	1327	1466
280S	2	1105	1175	1274	1345	1444
280S	4-8	1105	1175	1274	1345	1444
280M	2	1160	1230	1329	1400	1499
280M	4-8	1160	1230	1329	1400	1499
315S	2	1400				
315S	4-8	1430				
315M	2	1500				
315M	4-8	1530				
315L	2	1500				
315L	4-8	1530				
355M	2	1740				
355M	4-8	1770				
355L	2	1740				
355L	4-8	1770				
400S/M/L	4-8	2213				

you can download 2D and 3D drawings from www.motive.it

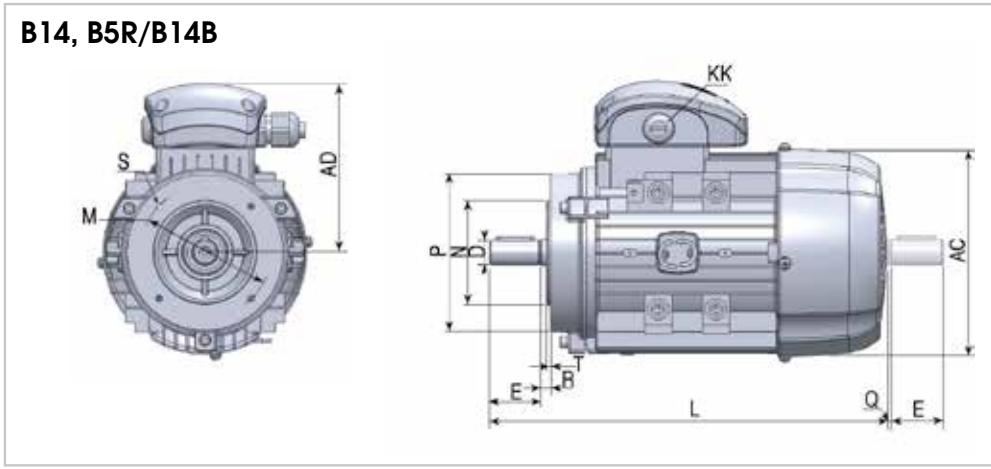
B3

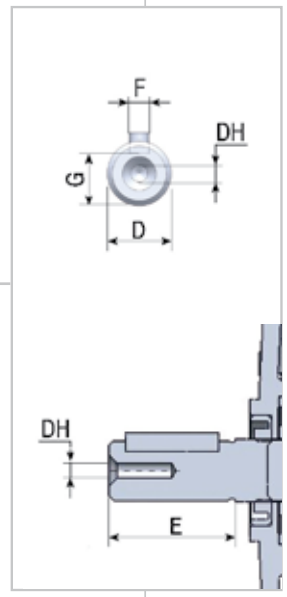


B5, B3/B5



B14, B5R/B14B





The general electrical specifications are listed in the performance charts that follow. To understand their contents, the following general definitions are provided.

Rated Power:
it is the mechanical power measured at the shaft expressed, according to the latest indications of international Standards Committees, in Watts or Kwatts. However, in the engineering sector it is still common to refer to power in terms of HP

Rated Voltage:
the voltage to be applied to the motor terminals in accordance with the specifications in the following tables

Frequency:
All electrical data in this catalogue refer to three-phase wound motors at 50 Hz. These may be connected to 60 Hz, taking into account the multiplier coefficients in the table below

rated voltage at 50Hz	Volt at 60Hz	rated power W	In (A)	Cn (Nm)	rpm	Is (A)	Cs (Nm)	Cmax (Nm)
230 ± 10%	230 ± 5%	1	1	0,83	1,2	0,83	0,83	0,83
230 ± 10%	230 ± 10%	1	0,95	0,83	1,2	0,83	0,83	0,83
230 ± 10%	240 ± 5%	1,05	1	0,87	1,2	0,87	0,87	0,87
400 ± 10%	380 ± 5%	1	1	0,83	1,2	0,83	0,83	0,83
400 ± 10%	400 ± 10%	1	0,95	0,83	1,2	0,83	0,83	0,83
400 ± 10%	415 ± 10%	1,05	1	0,87	1,2	0,87	0,87	0,87
400 ± 10%	440 ± 10%	1,10	1	0,90	1,2	0,93	0,93	0,93
400 ± 10%	460 ± 5%	1,15	1	0,96	1,2	0,96	0,96	0,96
400 ± 10%	480 ± 5%	1,20	1	1	1,2	1	1	1

for further information, see chapter "wiring diagrams" at page 12

Synchronous speed:
is expressed in rpm and it is obtained by the formula

f 120/p

f= supply frequency Hz

p= number of poles pairs

Rated Current:
"In" is the Rated Current, expressed in Ampere, absorbed by the motor when supplied at Rated Voltage Vn (V) and giving the Rated Power Pn (W) and it is obtained by the formula

$$In = \frac{Pn}{\sqrt{3} \cdot V_n \cdot \eta \cdot \cos\varphi} \ (A)$$

In the following tables, the rated currents are referred to a Voltage supply of 400V. For other voltage supplies the absorbed rated current can be considered inversely proportional to the voltage supply. EX:

Volt	230	380	400	440	690
In	1,74	1,05	1,00	0,91	0,64

Motive motors can face also temporary overloads, with Current increases of 1.5 times the rated current for at least 2 minutes.

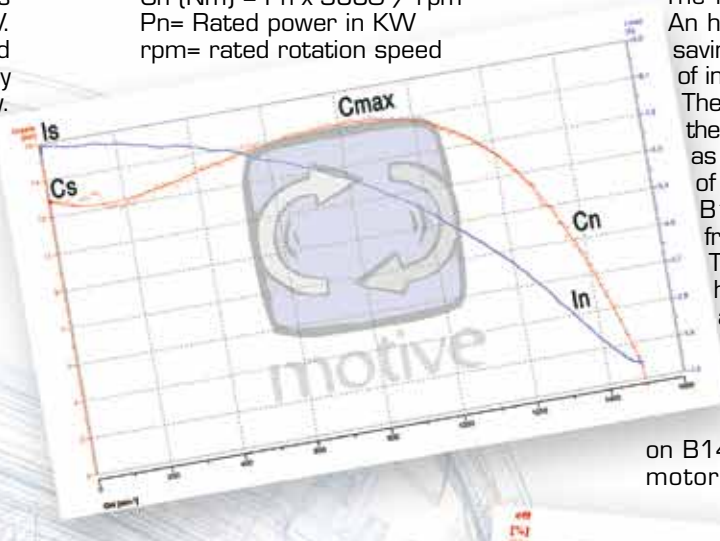
Starting current (or locked rotor current):
(you see diagram)

Rated torque:
Cn is expressed in Nm, and it corresponds to the rated power and rated rpm. It is given by the multiplication of the force for the arm (distance) and it is measured in Nm because the force is expressed in in Newton and the distance in metres. The rated torque value is obtained by the formula

Cn (Nm) = Pn x 9550 / rpm

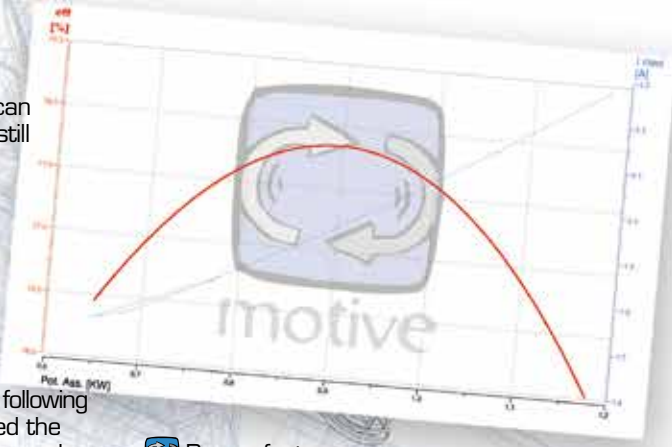
Pn= Rated power in KW

rpm= rated rotation speed



Starting torque (or locked rotor torque):
Cs is the torque that the motor can provide with the rotor at a standstill and the rated power supply.

Maximum torque:
Cmax is the maximum torque developed by the motor at the rated power supply, at a certain speed. It represents also the value of the resistant torque after which the motor stops.In the following performance charts, it is indicated the relation between maximum torque and rated torque and maximum torque

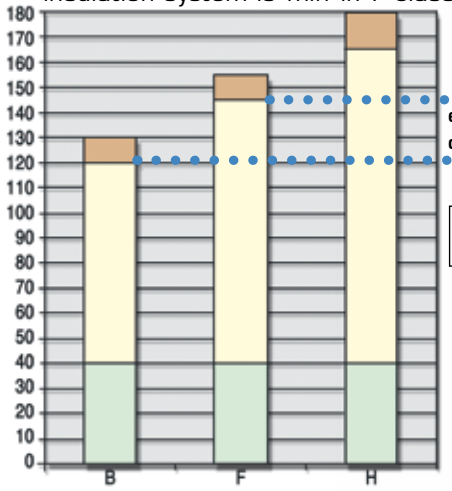


Efficiency:
η is expressed in % and it is given by the relation between the output Power and the addition of output Power and the electric losses of the motor, that is the input power absorbed by the motor. The electric motors losses are mainly of two kinds: for joule effect (rotor and stator) and iron losses. The latest cause essentially heat. An higher efficiency means energy savings, lower heating, longer life of insulating materials.
The smaller a motor is, the more the presence of a double lip oil seal as the ones used on the drive end of delphi flanged motors (B5 or B14) may affect, following the friction generated, performance. The motors B3 up to size 132, however, have V-rings with an almost non existent level of friction. For simplicity, the following performance tables indicate the levels of absorption and performance measured on B14 motors for size 56 and B3 motors for size 63 and above.

Power factor or **cos**φ:
it represents the coseno of the voltage and current gap angle.

temperature rise ΔT:
The temperature rise "ΔT" is the change in temperature of the entire winding of the motor, including the wire placed deep inside the stator slots, when it is being operated at full load.
For example: if a motor is located in a room with a temperature of 40°C, and then is started and operated continuously at the rated power, the winding temperature would rise from 40°C to a higher temperature. The difference between its starting temperature and the final inner elevated temperature, is the ΔT. Almost all our motors are designed to offer a temperature rise of B class or even lower, while their insulation system is min in F class.

Class	amb T (°C)	ΔT (°C)	hot spot allowance (°C)	Tmax (°C)
A	40	60	5	105
E	40	75	5	120
B	40	80	5	130
F	40	105	10	155
H	40	125	15	180



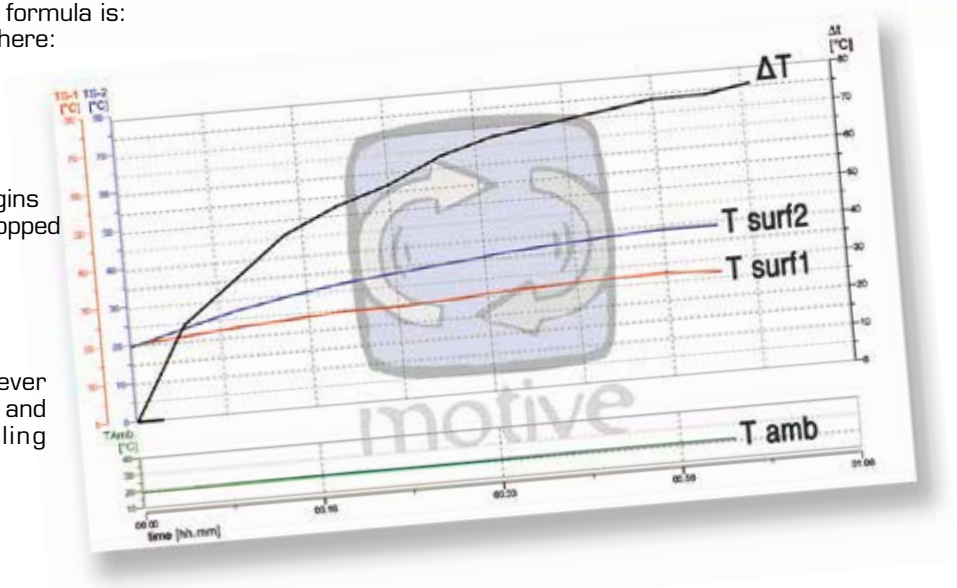
example of overload capability (=life bonus) of an F class motor, with B class temperature rise

This extra margin gives the motor a "life bonus". As a rule of thumb, insulation life will be doubled for each 10 degrees of unused insulation temperature capability.
The most common method of measuring the temperature rise of a motor is based on the differences between the cold and hot ohmic resistance of the winding.
The formula is:

ΔT [°C] = (R2-R1)/R1 *(234,5+T1)-(T2-T1) Where:
R1 = Cold winding resistence in Ohms (just before that the test begins)
R2= Hot winding resistance in Ohms (when the motor has reached its thermal equilibrium)
T1= ambient temperature in °C when test begins
T2= ambient temperature in °C when test is stopped

To change ΔT from Centigrade to Fahrenheit:
°C (ΔT) x 1,8

Note: The motor surface temperature will never exceeed the internal temperature of the motor, and will depend upon the design and cooling arrangements.



Noise:
The noise is expressed in dB(A). The measures must be taken in accordance with the standard ISO 1680-2, in order to find the Sound Power level LwA measured at 1m of distance from the perimeter of the machine.
EN 60034-9 standard describes the acoustic Power limits to be respected, indicating the maximum sound power level **LwA**. The noise values indicated in the performance charts that follow are referred to a no-load motor working, supplied at 50Hz and with a tolerance of +3 dB(A).

The moment of inertia can be calculated in this way:
J = (1/2) x M x (R^2)
Where M [Kg] is the rotation mass, while R [m] is the ray of the volume at cylindrical symmetry.

TOLERANCES

The data of each motor are specified in this catalogue like requested by the norm IEC 34-1. This describes, in particular, the following tolerances:

Efficiency (Output Power input Power)	-15% di (1- η)
Power factor	1/ 6 of (1- cosφ) min. 0.02 max 0.07
Locked rotor torque	-15% of the guaranteed torque +25% of the guaranteed torque
Maximum torque	-10% -of the guaranteed torque, if torque is not less than 1,5- 1,6 the rated torque
Noise	+3dB
ΔT	+10°C

The test reports on which the following tables are based can be downloaded from the website www.motive.it

2 Poles asynchronous speed 3000 rpm

IE2, high efficiency class IE 60034-30

KW	HP	Type	rpm	In (A)	Is (A)	Is/In	Cn (Nm)	Cs (Nm)	Cs/Cn	Cmax (Nm)	Cmax/Cn	η % 100%	η % 75%	η % 50%	min IE2	Pwr. Fact.cosφ 100%	Pwr. Fact.cosφ 75%	Pwr. Fact.cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,09	0,12	56A-2	2700	0,25	0,93	3,8	0,32	0,90	2,8	0,90	2,8	63,4	59,0	50,0	-	0,83	0,76	0,60	26	60	0,00008	3,5
0,13	0,18	56B-2	2635	0,36	1,06	3,0	0,47	0,95	2,0	0,94	2,0	65,5	65,3	63,0	-	0,81	0,64	0,50	15	60	0,00010	3,6
0,18	0,25	63A-2	2808	0,47	2,03	4,3	0,61	1,60	2,6	1,68	2,7	71,8	70,8	67,0	-	0,77	0,68	0,56	27	61	0,00021	4,5
0,25	0,35	63B-2	2780	0,63	2,81	4,5	0,86	2,30	2,7	2,40	2,8	74,6	70,9	65,0	-	0,77	0,54	0,45	55	61	0,00030	4,7
0,37	0,5	63C-2	2791	0,93	4,13	4,5	1,27	3,60	2,8	3,67	2,9	76,4	76,3	72,8	-	0,76	0,65	0,51	51	61	0,00043	5,7
0,37	0,5	71A-2	2820	0,94	4,33	4,6	1,25	2,90	2,3	3,53	2,8	74,0	73,7	69,1	-	0,77	0,67	0,53	43	64	0,00055	6,0
0,55	0,75	71B-2	2844	1,27	6,94	5,5	1,85	5,60	3,0	5,56	3,0	82,1	83,6	82,0	-	0,76	0,68	0,52	51	64	0,00060	6,3
0,75	1	71C-2	2819	1,69	9,06	5,4	2,54	7,70	3,0	7,72	3,0	79,7	80,5	78,8	77,4	0,81	0,70	0,58	61	64	0,00068	7,3
0,75	1	80A-2	2890	1,76	10,64	6,1	2,48	5,90	2,4	7,80	3,1	80,0	79,0	75,2	77,4	0,77	0,70	0,56	42	67	0,00075	10,0
1,1	1,5	80B-2	2875	2,36	14,18	6,0	3,65	16,60	4,5	11,70	3,2	83,8	84,8	84,0	79,6	0,80	0,73	0,61	48	67	0,00090	11,0
1,5	2	80C-2	2876	3,17	19,72	6,0	4,98	22,80	2,5	13,45	2,7	82,5	82,6	80,1	81,3	0,83	0,76	0,64	54	67	0,00105	12,5
1,5	2	90S-2	2864	3,17	18,62	5,9	5,00	12,30	2,5	15,32	3,1	82,1	82,1	79,7	81,3	0,83	0,76	0,64	62	72	0,00120	13,0
2,2	3	90L-2	2859	4,51	28,31	6,3	7,35	22,30	3,0	23,16	3,2	83,6	85,0	83,9	83,2	0,84	0,78	0,66	70	72	0,00140	14,0
3	4	100L-2	2882	5,94	38,10	6,4	9,94	23,70	2,4	19,75	2,0	84,7	85,4	83,0	84,6	0,86	0,81	0,70	78	76	0,00290	25,0
4	5,5	100LB-2	2863	7,61	47,90	6,3	13,34	34,00	2,5	40,23	3,0	85,9	87,3	86,6	85,8	0,88	0,84	0,76	80	76	0,00420	27,0
4	5,5	112M-2	2887	7,49	46,28	6,2	13,23	28,70	2,2	41,00	3,1	85,8	86,8	85,9	85,8	0,90	0,86	0,77	72	77	0,00550	28,0
5,5	7,5	112MB-2	2883	9,85	67,11	6,8	18,22	45,40	2,5	53,64	2,9	87,1	89,1	89,0	87,0	0,93	0,90	0,82	98	77	0,00833	34,0
5,5	7,5	132SA-2	2908	10,21	67,42	6,6	18,06	35,80	2,0	54,18	3,0	87,2	88,4	87,0	87,0	0,89	0,84	0,76	74	80	0,01115	40,0
7,5	10	132SB-2	2897	13,50	91,05	6,7	24,72	52,40	2,1	73,09	3,0	88,2	89,2	88,8	88,1	0,91	0,87	0,80	89	80	0,12800	45,5
9,2	12,5	132MA-2	2906	16,16	126,72	7,8	30,23	77,40	2,6	90,70	3,0	89,3	90,0	89,9	88,8	0,92	0,90	0,87	72	81	0,02000	53,0
11	15	132MB-2	2895	19,03	146,56	7,7	36,29	90,72	2,5	108,86	3,0	89,5	90,4	89,9	89,4	0,93	0,92	0,89	91	81	0,02500	55,0
11	15	160MA-2	2932	19,82	127,63	6,4	35,83	78,40	2,2	56,10	1,6	89,5	89,3	87,3	89,4	0,90	0,87	0,81	56	86	0,03770	110,0
15	20	160MB-2	2925	26,91	151,67	5,6	48,97	111,20	2,3	75,73	1,5	90,4	90,5	88,3	90,3	0,89	0,85	0,79	91	86	0,04990	120,0
18,5	25	160L-2	2928	32,46	210,47	6,5	60,34	136,40	2,3	65,93	1,1	91,1	91,5	89,8	90,9	0,90	0,88	0,83	95	86	0,05500	135,0
22	30	180M-2	2959	39,26	278,51	7,1	71,00	174,50	2,5	220,80	3,1	91,4	90,8	88,4	91,3	0,89	0,86	0,80	60	89	0,07500	165,0
30	40	200LA-2	2952	52,18	391,37	7,5	97,05	194,11	2,0	223,22	2,3	92,2	91,9	90,4	92,0	0,90	0,87	0,82	70	92	0,12400	217,0
37	50	200LB-2	2949	64,57	484,25	7,5	119,82	239,64	2,0	275,59	2,3	92,5	92,4	91,0	92,5	0,89	0,88	0,81	77	92	0,13900	243,0
45	60	225M-2	2969	78,55	589,12	7,5	144,75	289,49	2,0	332,92	2,3	93,5	93,1	91,6	92,9	0,88	0,86	0,80	79	92	0,23300	320,0
55	75	250M-2	2970	96,61	724,60	7,5	176,85	353,70	2,0	406,76	2,3	93,5	93,0	91,3	93,2	0,88	0,89	0,85	76	93	0,31200	390,0
75	100	280S-2	2970	128,01	960,09	7,5	241,16	482,32	2,0	554,67	2,3	94,4	94,2	93,1	93,8	0,90	0,89	0,86	69	94	0,57900	540,0
90	125	280M-2	2970	153,26	1149,43	7,5	289,39	578,79	2,0	665,61	2,3	94,2	93,8	92,4	94,1	0,90	0,89	0,86	78	94	0,67500	590,0
110	150	315S-2	2980	185,05	1313,83	7,1	352,52	634,53	1,8	775,54	2,2	94,4	93,8	92,0	94,3	0,91	0,90	0,84	80	96	1,18000	880,0
132	180	315MA-2	2980	218,75	1553,14	7,1	423,02	761,44	1,8	930,64	2,2	95,0	94,4	93,0	94,6	0,92	0,91	0,90	75	96	1,82000	1000,0
160	215	315LA-2	2980	262,63	1864,69	7,1	512,75	922,95	1,8	1128,05	2,2	95,0	94,4	92,9	94,8	0,93	0,91	0,86	75	99	2,08000	1055,0
200	270	315LB-2	2980	334,84	2377,36	7,1	640,94	1153,69	1,8	1410,07	2,2	95,6	95,1	93,9	95,0	0,90	0,89	0,85	80	99	2,38000	1110,0
250	335	355M-2	2985	410,72	2916,11	7,1	799,83	1279,73	1,6	1759,63	2,2	95,6	95,1	93,8	95,0	0,92	0,91	0,88	70	103	3,00000	1900,0
315	423	355L-2	2985	524,82	3726,23	7,1	1007,79	1612,46	1,6	2217,14	2,2	95,2	94,9	94,0	95,0	0,91	0,89	0,87	75	103	3,50000	2300,0

4 Poles asynchronous speed 1500 rpm

IE2, high efficiency class IE 60034-30

KW	HP	Type	rpm	In (A)	Is (A)	Is / In	Cn (Nm)	Cs (Nm)	Cs / Cn	Cmax (Nm)	Cmax / Cn	η % 100%	η % 75%	η % 50%	min IE2	Pwr. Fact. cosφ 100%	Pwr. Fact. cosφ 75%	Pwr. Fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,06	0,09	56A-4	1332	0,23	0,65	2,8	0,43	1,20	2,8	1,20	2,8	56,0	52,0	49,0	-	0,67	0,56	0,50	25	52	0,00015	3,5
0,09	0,12	56B-4	1346	0,33	0,97	2,9	0,64	1,80	2,8	1,80	2,8	60,7	58,0	43,0	-	0,65	0,54	0,36	36	52	0,00015	3,6
0,13	0,18	63A-4	1355	0,40	1,28	3,2	0,92	2,10	2,3	2,10	2,3	64,7	63,9	62,0	-	0,72	0,62	0,59	30	52	0,00030	4,5
0,18	0,25	63B-4	1393	0,56	2,02	3,6	1,23	2,90	2,4	3,10	2,5	68,2	65,9	58,0	-	0,68	0,55	0,40	38	52	0,00040	4,7
0,25	0,35	63C-4	1380	0,72	2,41	3,3	1,73	4,10	2,4	4,00	2,3	71,0	71,3	67,6	-	0,70	0,60	0,47	51	52	0,00045	5,7
0,25	0,35	71A-4	1400	0,69	2,90	4,2	1,71	4,30	2,5	4,57	2,7	72,7	72,0	68,0	-	0,72	0,62	0,50	41	55	0,00050	6,0
0,37	0,5	71B-4	1366	1,04	3,72	3,6	2,59	6,00	2,3	6,10	2,4	71,5	72,0	61,2	-	0,72	0,63	0,41	65	55	0,00081	6,3
0,55	0,75	71C-4	1400	1,47	5,78	3,9	3,75	6,90	1,8	6,60	1,8	74,9	75,3	72,0	-	0,72	0,65	0,50	80	55	0,00150	7,3
0,55	0,75	80A-4	1391	1,49	6,46	4,3	3,78	9,10	2,4	10,20	2,7	75,0	75,4	73,0	-	0,71	0,61	0,50	50	58	0,00182	10,0
0,75	1	80B-4	1394	1,99	7,57	3,8	5,14	12,50	2,4	12,65	2,5	79,6	79,4	74,0	79,6	0,69	0,61	0,46	77	58	0,00212	11,0
1,1	1,5	80C-4	1390	2,85	11,03	3,9	7,56	18,70	2,5	12,70	1,7	81,5	81,7	77,9	81,4	0,68	0,56	0,44	86	58	0,00222	12,5
1,1	1,5	90S-4	1378	2,50	9,89	4,0	7,62	16,20	2,1	17,53	2,3	81,4	83,2	81,5	81,4	0,78	0,64	0,54	78	61	0,00242	13,0
1,5	2	90L-4	1413	3,54	18,44	5,2	10,14	27,60	2,7	31,05	3,1	82,9	84,0	82,8	82,8	0,74	0,64	0,53	46	61	0,00303	14,0
1,9	2,6	90LB-4	1415	4,47	23,24	5,2	12,82	24,61	1,9	26,50	2,1	84,3	84,6	82,0	84,3	0,73	0,63	0,49	55	61	0,00414	16,0
2,2	3	100LA-4	1435	4,80	25,82	5,4	14,64	33,20	2,3	41,87	2,9	84,4	84,5	82,1	84,3	0,78	0,67	0,55	68	64	0,00545	23,0
3	4	100LB-4	1407	6,39	27,93	4,4	20,36	41,20	2,0	30,12	1,5	85,5	87,9	87,1	85,5	0,79	0,70	0,55	94	64	0,00677	25,0
4	5,5	112M-4	1415	7,75	39,24	5,1	27,00	51,40	1,9	40,79	1,5	86,6	89,0	86,8	86,6	0,86	0,80	0,72	76	65	0,00960	28,0
5	6,8	112MB-4	1445	10,02	63,50	6,3	33,04	82,70	2,5	71,14	2,2	87,7	88,7	87,9	87,7	0,82	0,75	0,64	77	65	0,01515	35,0
5,5	7,5	132S-4	1446	10,74	61,43	5,7	36,32	69,00	1,9	74,88	2,1	87,8	89,5	88,5	87,7	0,84	0,78	0,66	83	71	0,02161	45,0
7,5	10	132M-4	1450	14,38	91,41	6,4	49,40	97,00	2,0	99,00	2,0	88,8	89,7	70,0	88,7	0,85	0,80	0,70	92	71	0,02990	47,0
9,2	12,5	132MB-4	1426	16,71	95,09	5,7	61,61	123,30	2,0	97,88	1,6	89,9	92,2	92,6	89,8	0,88	0,85	0,78	96	72	0,03131	55,0
11	15	132MC-4	1461	21,96	170,43	7,8	71,90	196,40	2,7	186,95	2,6	89,8	89,8	87,8	89,8	0,81	0,77	0,61	80	73	0,04040	57,0
11	15	160M-4	1460	21,67	134,07	6,2	71,95	153,40	2,1	208,66	2,9	89,8	89,4	87,6	89,8	0,82	0,78	0,65	70	75	0,06161	118,0
15	20	160L-4	1456	28,12	178,96	6,4	98,39	197,10	2,0	245,96	2,5	90,8	91,7	90,6	90,6	0,85	0,81	0,72	72	75	0,09272	132,0
18,5	25	180M-4	1476	34,45	215,02	6,2	119,70	220,90	1,8	334,30	2,8	91,2	91,1	89,9	91,2	0,85	0,81	0,72	51	76	0,14039	164,0
22	30	180L-4	1470	39,17	293,78	7,5	142,93	314,44	2,2	328,73	2,3	91,6	91,4	90,0	91,6	0,89	0,85	0,75	80	76	0,15958	182,0
30	40	200L-4	1480	53,60	385,91	7,2	193,58	425,88	2,2	445,24	2,3	92,3	92,4	91,5	92,3	0,88	0,85	0,77	85	79	0,26462	245,0
37	50	225S-4	1480	65,40	470,85	7,2	238,75	525,25	2,2	549,13	2,3	92,8	92,3	90,4	92,7	0,88	0,86	0,78	75	81	0,41006	258,0
45	60	225M-4	1480	78,42	564,64	7,2	290,37	638,82	2,2	667,85	2,3	93,3	93,3	92,1	93,1	0,89	0,86	0,80	80	81	0,47369	290,0
55	75	250M-4	1480	95,30	686,17	7,2	354,90	780,78	2,2	816,27	2,3	93,7	93,5	92,3	93,5	0,89	0,88	0,84	75	83	0,66660	388,0
75	100	280S-4	1480	128,82	927,49	7,2	483,95	1064,70	2,2	1113,09	2,3	94,0	93,6	92,2	94,0	0,89	0,88	0,84	80	86	1,30000	510,0
90	120	280M-4	1485	152,28	1096,41	7,2	578,79	1273,33	2,2	1331,21	2,3	94,7	94,7	94,0	94,2	0,90	0,89	0,85	70	86	1,49000	606,0
110	150	315S-4	1485	187,88	1296,35	6,9	707,41	1485,56	2,1	1556,30	2,2	95,1	95,0	94,2	94,5	0,89	0,88	0,83	75	93	3,13000	910,0
132	180	315M-4	1485	225,10	1553,17	6,9	848,89	1782,67	2,1	1867,56	2,2	95,2	95,1	94,0	94,7	0,89	0,87	0,81	65	93	3,65000	1000,0
160	220	315LA-4	1485	276,24	1906,08	6,9	1028,96	2160,81	2,1	2263,70	2,2	95,0	94,5	94,0	94,9	0,88	0,85	0,80	80	97	4,11200	1055,0
200	270	315LB-4	1481	339,92	2345,45	6,9	1289,67	2708,31	2,1	2837,27	2,2	95,1	94,7	93,8	95,1	0,89	0,89	0,84	75	97	4,81000	1128,0
250	335	355M-4	1483	420,03	2898,23	6,9	1609,91	3380,82	2,1	3541,81	2,2	95,6	95,4	94,7	95,1	0,90	0,90	0,87	80	101	6,53000	1700,0
315	423	355L-4	1490	524,91	3621,87	6,9	2018,96	4239,82	2,1	4441,71	2,2	95,7	95,5	94,7	95,1	0,91	0,88	0,82	70	101	8,24000	1900,0
355	483	400M-4	1485	598,04	4066,65	6,8	2283,00	4337,69	1,9	5022,59	2,2	95,2	95,1	95,0	95,1	0,90	0,89	0,88	80	111	14,70000	2860,0
400	544	400MA-4	1490	673,63	4580,70	6,8	2563,76	4871,14	1,9	5640,27	2,2	96,3	96,2	96,1	-	0,89	0,88	0,87	80	111	14,98000	2980,0
455	620	400MB-4	1490	766,26	5210,55	6,8	2916,28	5540,92	1,9	6415,81	2,2	96,3	96,2	96,0	-	0,89	0,88	0,87	80	111	15,80000	3080,0
500	675	400LA-4	1490	842,04	5725,88	6,8	3204,70	6088,93	1,9	7050,34	2,2	96,3	96,2	96,0	-	0,89	0,88	0,86	80	111	18,50000	3348,0
560	760	400LB-4	1490	943,09	6412,98	6,8	3589,26	6819,60	1,9	7896,38	2,2	96,3	96,2	96,1	-	0,89	0,88	0,87	80	111	19,90000	3400,0
630	857	400LC-4	1490	1060,97	7214,60	6,8	4037,92	7672,05	1,9	8883,42	2,2	96,3	96,2	96,1	-	0,89	0,88	0,87	80	112	21,50000	3590,0

6 Poles asynchronous speed 1000 rpm

IE2, high efficiency class IE 60034-30

KW	HP	Type	rpm	In (A)	Is (A)	Is / In	Cn (Nm)	Cs (Nm)	Cs / Cn	Cmax (Nm)	Cmax / Cn	η % 100%	η % 75%	η % 50%	min IE2	Pwr. fact. cosφ 100%	Pwr. fact. cosφ 75%	Pwr. fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,18	0,25	71A-6	921	0,66	1,93	2,9	1,87	4,20	2,3	4,30	2,3	62,7	61,1	53,7	-	0,63	0,54	0,42	41	51	0,00110	6,0
0,25	0,35	71B-6	910	0,87	2,62	3,0	2,62	6,00	2,3	6,00	2,3	64,0	62,5	57,1	-	0,65	0,55	0,43	54	51	0,00140	6,3
0,37	0,5	80A-6	928	1,20	3,58	3,0	3,81	6,80	1,8	8,10	2,1	67,3	66,0	60,9	-	0,66	0,56	0,45	58	53	0,00160	10,0
0,55	0,75	80B-6	917	1,71	4,72	2,8	5,73	10,40	1,8	10,60	1,9	70,5	71,4	67,7	-	0,66	0,57	0,44	80	53	0,00190	11,0
0,75	1	90S-6	915	2,01	5,98	3,0	7,83	13,00	1,7	9,97	1,3	76,0	77,9	75,2	75,9	0,71	0,61	0,48	69	57	0,00290	13,0
1,1	1,5	90L-6	915	2,74	9,93	3,6	11,48	22,10	1,9	16,57	1,4	78,3	80,2	79,3	78,1	0,74	0,65	0,56	67	57	0,00350	14,0
1,5	2	100L-6	944	3,91	16,15	4,1	15,17	29,39	1,9	35,09	2,3	79,9	80,3	77,6	79,8	0,69	0,61	0,48	71	58	0,00690	23,0
2,2	3	112M-6	951	5,45	25,84	4,7	22,09	45,40	2,1	57,79	2,6	81,9	82,7	80,4	81,8	0,71	0,61	0,48	74	61	0,01400	25,0
3	4	132S-6	969	6,95	38,23	5,5	29,57	62,40	2,1	81,20	2,7	84,5	84,6	82,1	83,3	0,74	0,71	0,54	63	64	0,02860	28,0
4	5,5	132MA-6	969	8,85	56,55	6,4	39,42	89,90	2,3	121,80	3,1	84,7	84,5	82,0	84,6	0,77	0,69	0,57	76	64	0,03570	45,0
5,5	7,5	132MB-6	966	12,38	65,09	5,3	54,37	103,20	1,9	95,28	1,8	87,0	87,5	87,0	86,0	0,74	0,65	0,55	64	64	0,04510	55,0
7,5	10	160M-6	978	16,97	88,24	5,2	73,24	109,85	1,5	146,47	2,0	88,6	89,2	88,5	87,2	0,72	0,67	0,60	50	71	0,00810	118,0
11	15	160L-6	970	22,87	148,66	6,5	108,30	227,43	2,1	227,43	2,1	89,0	89,5	89,3	88,7	0,78	0,73	0,70	70	71	0,11600	125,0
15	20	180L-6	970	30,51	213,56	7,0	147,68	310,13	2,1	310,13	2,1	89,8	89,0	87,9	89,7	0,79	0,75	0,67	75	73	0,20700	160,0
18,5	25	200LA-6	970	34,33	240,34	7,0	182,14	382,49	2,1	382,49	2,1	91,0	90,8	89,7	90,4	0,86	0,81	0,72	70	76	0,31500	217,0
22	30	200LB-6	970	42,51	297,56	7,0	216,60	454,86	2,1	454,86	2,1	91,1	90,1	89,0	90,9	0,82	0,78	0,75	80	76	0,36000	244,0
30	40	225M-6	983	55,95	391,68	7,0	291,45	582,91	2,0	612,05	2,1	91,8	91,3	89,5	91,7	0,84	0,81	0,73	80	76	0,54700	295,0
37	50	250M-6	980	64,07	448,52	7,0	360,56	757,18	2,1	757,18	2,1	92,6	93,0	92,4	92,2	0,90	0,89	0,83	65	78	0,84300	365,0
45	60	280S-6	988	79,63	557,43	7,0	434,97	913,44	2,1	913,44	2,1	93,1	93,0	91,9	92,7	0,88	0,86	0,80	60	80	1,39000	500,0
55	75	280M-6	980	101,51	710,58	7,0	535,97	1125,54	2,1	1125,54	2,1	93,1	92,5	92,0	93,1	0,84	0,85	0,82	60	80	1,65000	545,0
75	100	315S-6	986	133,74	936,17	7,0	726,42	1452,84	2,0	1452,84	2,0	94,5	94,7	94,1	93,7	0,86	0,85	0,80	75	85	4,11000	810,0
90	125	315MA-6	985	159,67	1069,81	6,7	872,59	1745,18	2,0	1745,18	2,0	94,6	94,5	93,6	94,0	0,86	0,83	0,77	75	85	4,78000	900,0
110	150	315LA-6	985	195,78	1311,71	6,7	1066,50	2132,99	2,0	2132,99	2,0	94,3	93,9	93,7	94,3	0,86	0,84	0,82	80	85	5,45000	1010,0
132	180	315LB-6	985	233,94	1567,40	6,7	1279,80	2559,59	2,0	2559,59	2,0	94,7	94,2	93,7	94,6	0,86	0,84	0,81	80	85	6,12000	1140,0
160	220	355MA-6	990	279,71	1874,08	6,7	1543,43	2932,53	1,9	3086,87	2,0	94,9	94,2	93,3	94,8	0,87	0,87	0,85	80	92	9,50000	1550,0
200	270	355MB-6	990	341,43	2287,55	6,7	1929,29	3665,66	1,9	3858,59	2,0	95,0	94,5	94,0	95,0	0,89	0,87	0,85	80	92	10,40000	1600,0
250	335	355L-6	990	431,63	2891,93	6,7	2411,62	4582,07	1,9	4823,23	2,0	95,0	95,0	94,0	95,0	0,88	0,86	0,84	80	92	12,40000	1700,0

8 Poles asynchronous speed 750 rpm

KW	HP	Type	rpm	In (A)	Is (A)	Is / In	Cn (Nm)	Cs (Nm)	Cs / Cn	Cmax (Nm)	Cmax / Cn	η % 100%	η % 75%	η % 50%	Pwr. fact. cosφ 100%	Pwr. fact. cosφ 75%	Pwr. fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,13	0,18	71B-8	651	0,71	1,48	2,1	1,91	3,80	2,0	3,93	2,1	48,2	44,9	39,0	0,55	0,46	0,39	76	52	0,00080	6,3
0,18	0,25	80A-8	694	0,83	2,01	2,4	2,48	4,70	1,9	5,50	2,2	56,1	51,0	44,7	0,56	0,46	0,39	54	52	0,00180	10,0
0,25	0,35	80B-8	691	1,10	2,62	2,4	3,46	6,90	2,1	7,06	2,2	61,0	58,2	52,2	0,54	0,45	0,37	56	52	0,00190	11,0
0,37	0,5	90S-8	670	1,41	5,65	4,0	5,27	10,55	2,0	10,55	2,0	62,0	61,0	54,0	0,61	0,55	0,35	40	54	0,00210	13,0
0,55	0,75	90L-8	701	2,04	6,25	3,1	7,49	15,50	2,1	18,00	2,4	68,3	66,0	58,1	0,57	0,49	0,37	22	54	0,00240	14,0
0,75	1	100LA-8	712	2,24	8,66	3,9	10,06	21,70	2,2	25,09	2,5	75,9	75,1	70,3	0,64	0,55	0,43	47	57	0,00900	23,0
1,1	1,5	100LB-8	702	3,38	12,14	3,6	14,96	31,30	2,1	35,91	2,4	73,9	73,4	68,5	0,64	0,52	0,40	65	57	0,01000	25,0
1,5	2	112M-8	711	4,21	16,94	4,0	20,15	43,80	2,2	50,70	2,5	79,2	79,8	79,0	0,65	0,55	0,50	48	61	0,02450	28,0
2,2	3	132S-8	710	5,54	33,23	6,0	29,59	53,26	1,8	59,18	2,0	81,9	82,2	80,0	0,70	0,66	0,48	80	64	0,03140	45,0
3	4	132M-8	716	7,25	31,48	4,3	40,01	71,90	1,8	93,01	2,3	83,0	83,9	82,2	0,72	0,65	0,49	63	64	0,03950	55,0
4	5,5	160MA-8	720	9,32	55,94	6,0	53,06	100,81	1,9	106,11	2,0	86,0	85,8	84,0	0,72	0,64	0,60	75	68	0,07530	110,0
5,5	7,5	160MB-8	720	12,22	53,10	4,3	72,95	145,90	2,0	145,90	2,0	86,6	87,3	85,0	0,75	0,71	0,61	75	68	0,09310	120,0
7,5	10	160L-8	720	16,33	70,97	4,3	99,48	198,96	2,0	198,96	2,0	87,2	88,1	85,0	0,76	0,74	0,72	75	68	0,12600	135,0
11	15	180L-8	730	23,48	129,17	5,5	143,90	287,81	2,0	287,81	2,0	87,8	87,9	87,5	0,77	0,70	0,65	80	70	0,20300	160,0
15	20	200L-8	730	31,03	204,78	6,6	196,23	392,47	2,0	392,47	2,0	89,5	89,4	87,8	0,78	0,71	0,58	75	73	0,33900	235,0
18,5	25	225S-8	730	38,48	253,99	6,6	242,02	459,84	1,9	484,04	2,0	91,3	91,5	90,5	0,76	0,72	0,68	80	73	0,49100	242,0
22	30	225M-8	730	44,84	295,97	6,6	287,81	546,84	1,9	575,62	2,0	91,3	91,6	90,6	0,78	0,73	0,61	70	73	0,54700	285,0
30	40	250M-8	730	59,32	391,51	6,6	392,47	745,68	1,9	784,93	2,0	92,4	92,3	91,0	0,79	0,76	0,72	80	75	0,84300	390,0
37	50	280S-8	730	74,02	488,53	6,6	484,04	919,68	1,9	968,08	2,0	92,5	92,4	91,0	0,78	0,73	0,67	80	76	1,93000	500,0
45	60	280M-8	740	89,93	593,51	6,6	580,74	1045,34	1,8	1161,49	2,0	92,6	92,6	89,7	0,78	0,73	0,68	80	76	1,65000	580,0
55	75	315S-8	740	104,10	687,05	6,6	709,80	1277,64	1,8	1419,59	2,0	93,0	93,0	92,0	0,82	0,76	0,65	80	82	4,79000	790,0
75	100	315M-8	740	142,91	943,23	6,6	967,91	1742,23	1,8	1935,81	2,0	93,4	92,8	91,1	0,81	0,74	0,61	70	82	5,58000	970,0
90	125	315LA-8	740	168,57	1112,56	6,6	1161,49	2090,68	1,8	2322,97	2,0	93,8	93,3	91,6	0,82	0,77	0,64	75	82	6,37000	1055,0
110	150	315LB-8	740	205,82	1317,24	6,4	1419,59	2555,27	1,8	2839,19	2,0	94,4	94,1	92,7	0,82	0,75	0,63	80	82	7,23000	1118,0
132	180	355MA-8	740	247,97	1587,01	6,4	1703,51	3066,32	1,8	3407,03	2,0	93,7	93,7	93,1	0,82	0,82	0,76	80	82	7,60000	2000,0
160	220	355MB-8	740	298,97	1913,44	6,4	2064,86	3716,76	1,8	4129,73	2,0	94,2	94,2	93,5	0,82	0,82	0,76	80	82	7,70000	2150,0
200	270	355L-8	740	368,04	2355,48	6,4	2581,08	4645,95	1,8	5162,16	2,0	94,5	94,5	93,0	0,83	0,83	0,79	80	82	8,20000	2250,0
250	335	355LB-8	740	467,15	2989,75	6,4	3226,35	5807,43	1,8	6452,70	2,0	94,2	94,2	93,1	0,82	0,82	0,78	80	82	8,30000	2350,0

To get the data double polarity motors, contact our export office.

KW	HP	Type	rpm	In (A)	Is (A)	Is/In	Cn (Nm)	Cs (Nm)	Cs/Cn	Cmax (Nm)	Cmax/Cn	η % 100%	η % IE	η % 75%	η % 50%	min IE3	Pwr. fact. cosφ 100%	Pwr. fact. cosφ 75%	Pwr. fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,75	1	80A-2	2892	1,74	11,84	6,8	2,48	8,60	3,5	9,18	3,7	80,9	IE3	79,6	76,4	80,7	0,77	0,70	0,57	35	65	0,00080	17,0
1,1	1,5	80B-2	2885	2,26	16,74	7,4	3,64	10,90	3,0	12,74	3,5	84,5	IE3	84,7	82,8	82,7	0,83	0,77	0,65	41	65	0,00090	18,0
1,5	2	90S-2	2894	3,22	23,78	7,4	4,95	20,10	4,1	18,78	3,8	85,3	IE3	85,2	83,7	84,2	0,79	0,71	0,59	37	71	0,00120	23,0
2,2	3	90L-2	2891	4,58	35,20	7,7	7,27	30,30	4,2	30,83	4,2	86,2	IE3	86,4	84,7	85,9	0,81	0,71	0,61	43	71	0,00140	26,0
3	4	100L-2	2898	5,80	44,87	7,7	9,89	30,80	3,1	35,98	3,6	87,1	IE3	87,7	86,8	87,1	0,86	0,81	0,69	51	75	0,00300	35,0
4	5,5	112M-2	2894	7,48	59,55	7,0	13,20	33,05	2,8	37,02	3,5	89,6	IE3	90,5	90,2	88,1	0,86	0,81	0,72	52	77	0,00570	43,0
5,5	7,5	132SA-2	2940	10,14	70,59	7,0	17,87	37,70	2,1	35,79	2,0	91,0	IE3	89,7	87,4	89,2	0,86	0,84	0,76	48	78	0,01190	66,0
7,5	10	132SB-2	2925	13,35	95,00	7,1	24,49	53,50	2,2	78,50	3,2	91,6	IE3	92,4	92,9	90,1	0,89	0,85	0,76	60	78	0,01470	73,0
11	15	160MA-2	2937	19,72	123,05	6,2	35,77	73,32	2,1	100,15	2,8	91,4	IE3	91,2	89,7	91,2	0,88	0,86	0,81	49	81	0,03845	112,2
15	20	160MB-2	2938	26,29	150,23	5,7	48,76	95,08	2,0	121,89	2,5	92,0	IE3	92,6	91,8	91,9	0,90	0,88	0,84	61	81	0,05090	122,4
18,5	25	160L-2	2942	32,15	192,92	6,0	60,05	124,31	2,1	179,00	2,1	93,0	IE3	93,7	93,0	92,4	0,89	0,88	0,83	58	81	0,05610	137,7
22	30	180M-2	2950	37,53	304,03	8,1	71,22	163,81	2,3	220,80	3,1	94,0	IE3	93,9	93,0	92,7	0,90	0,88	0,87	41	83	0,07650	168,3
30	40	200LA-2	2940	51,51	386,34	7,5	97,45	224,13	2,3	223,37	2,3	93,4	IE3	93,1	91,6	93,3	0,90	0,87	0,82	65	84	0,12648	221,3
37	50	200LB-2	2960	63,26	474,46	7,5	119,38	274,56	2,3	275,49	2,3	93,8	IE3	93,7	92,2	93,7	0,90	0,88	0,82	65	84	0,14178	247,9
45	60	225M-2	2960	76,69	582,87	7,6	145,19	333,93	2,3	332,80	2,3	94,1	IE3	93,6	92,2	94,0	0,90	0,88	0,82	65	86	0,23766	326,4
55	75	250M-2	2970	94,39	707,92	7,5	176,85	406,76	2,3	406,76	2,3	94,5	IE3	94,0	92,3	94,3	0,89	0,90	0,86	65	89	0,31824	397,8
75	100	280S-2	2970	127,01	876,39	6,9	241,16	530,56	2,2	554,67	2,3	94,7	IE3	94,5	93,5	94,7	0,90	0,90	0,86	55	91	0,59058	550,8
90	125	280M-2	2970	151,93	1078,73	7,1	289,39	636,67	2,2	665,61	2,3	95,0	IE3	94,6	93,2	95,0	0,90	0,89	0,86	65	91	0,68850	601,8

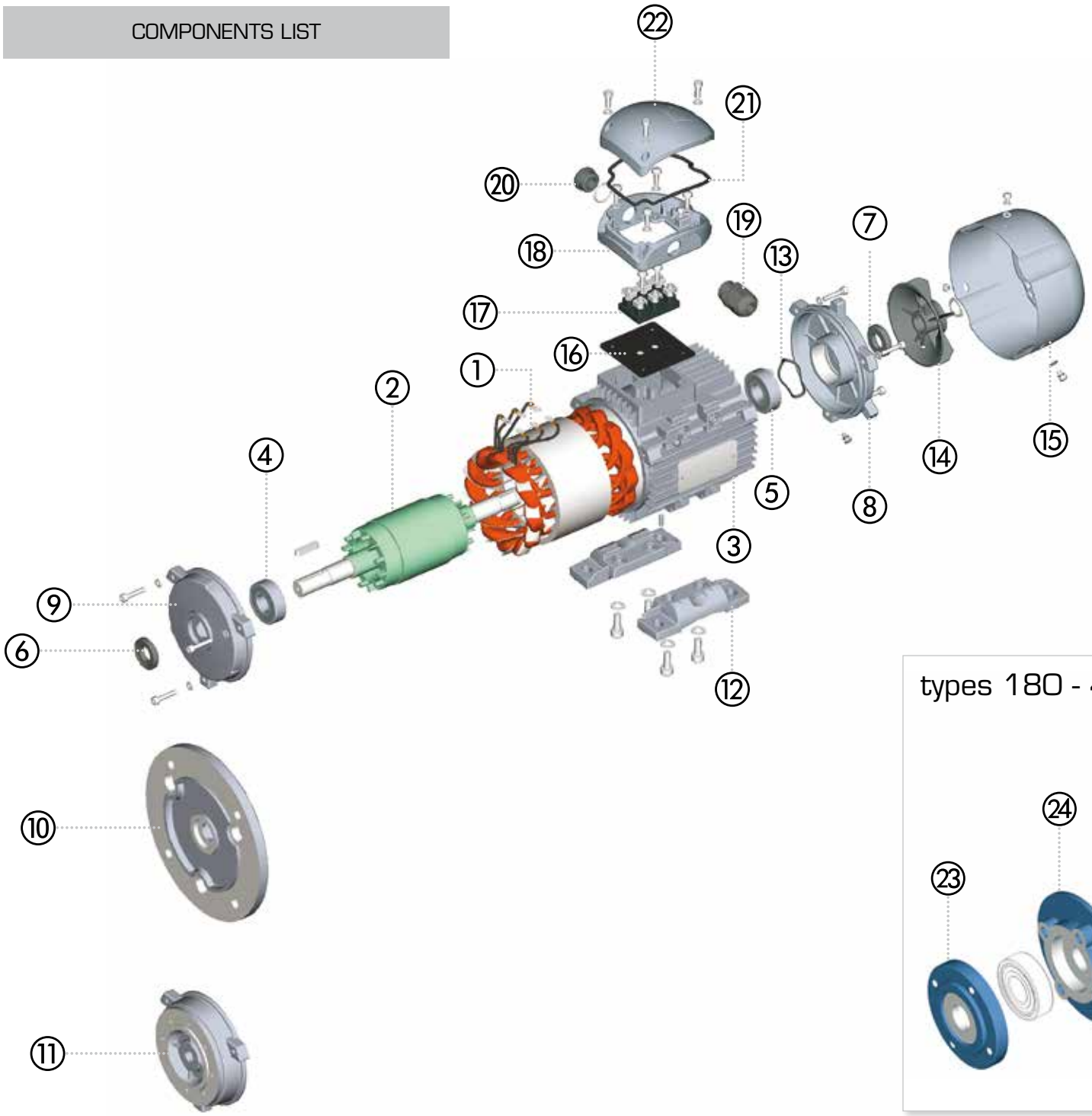
KW	HP	Type	rpm	In (A)	Is (A)	Is/In	Cn (Nm)	Cs (Nm)	Cs/Cn	Cmax (Nm)	Cmax/Cn	η % 100%	η % IE	η % 75%	η % 50%	min IE3	Pwr. fact. cosφ 100%	Pwr. fact. cosφ 75%	Pwr. fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,75	1	80B-4	1430	1,74	11,24	6,0	5,01	16,90	3,4	12,80	2,6	82,9	IE3	82,6	79,2	82,5	0,70	0,60	0,45	38	56	0,00190	18,0
1,1	1,5	90S-4	1431	2,26	15,83	6,2	7,34	25,60	3,5	24,50	3,3	84,8	IE3	86,2	85,5	84,1	0,74	0,66	0,52	44	61	0,00240	25,0
1,5	2	90L-4	1438	3,22	19,62	5,8	9,96	32,11	3,2	34,90	3,5	85,9	IE3	86,3	85,1	85,3	0,75	0,66	0,57	47	61	0,00280	30,0
2,2	3	100LA-4	1425	4,58	34,15	7,8	14,74	41,27	2,8	41,27	2,8	86,7	IE3	86,9	86,0	86,7	0,84	0,78	0,70	53	64	0,00550	36,0
3	4	100LB-4	1450	5,80	46,83	7,7	19,76	54,30	2,7	56,31	2,8	89,0	IE3	89,3	88,0	87,7	0,80	0,72	0,70	57	64	0,00690	40,0
4	5,5	112M-4	1442	7,48	54,51	6,9	26,49	74,03	2,9	74,22	3,3	89,1	IE3	90,3	90,5	88,6	0,82	0,76	0,64	53	65	0,01000	46,0
5,5	7,5	132S-4	1454	10,14	68,01	6,4	36,12	75,86	2,1	101,15	2,8	89,9	IE3	92,1	92,4	89,6	0,83	0,77	0,68	61	71	0,02200	70,0
7,5	10	132M-4	1460	13,35	94,37	6,6	49,06	91,80	1,9	132,46	2,7	90,5	IE3	90,8	89,9	90,4	0,83	0,79	0,70	46	71	0,02820	81,0
11	15	160M-4	1468	19,72	121,31	5,8	71,56	121,50	1,7	193,21	2,7	91,8	IE3	91,7	90,4	91,4	0,83	0,79	0,68	52	73	0,06222	122,7
15	20	160L-4	1460	26,29	140,97	5,0	98,12	166,60	1,7	255,10	2,6	92,3	IE3	93,1	92,3	92,3	0,83	0,78	0,68	61	75	0,05202	137,3
18,5	25	180M-4	1481	32,15	215,02	6,4	119,29	220,90	1,9	334,30	2,8	92,6	IE3	92,3	89,6	92,6	0,85	0,84	0,75	60	76	0,09551	170,6
22	30	180L-4	1470	37,53	297,13	7,5	142,93	314,44	2,2	328,73	2,3	93,2	IE3	91,7	91,0	93,0	0,86	0,82	0,72	80	76	0,14462	189,3
30	40	200L-4	1480	51,51	385,07	7,2	193,58	425,88	2,2	445,24	2,3	93,6	IE3	93,8	92,8	93,6	0,87	0,84	0,76	80	79	0,16438	254,8
37	50	225S-4	1480	63,26	470,68	7,2	238,75	525,25	2,2	549,13	2,3	93,9	IE3	92,7	92,0	93,9	0,87	0,85	0,77	75	81	0,27258	268,3
45	60	225M-4	1480	76,69	557,21	7,2	290,37	638,82	2,2	667,85	2,3	94,3	IE3	93,3	92,8	94,2	0,89	0,86	0,80	80	81	0,42240	301,6
55	75	250M-4	1480	94,39	676,02	7,2	354,90	780,78	2,2	816,27	2,3	95,0	IE3	94,2	93,5	94,6	0,89	0,88	0,84	75	83	0,48795	403,5
75	100	280S-4	1480	127,01	920,88	7,2	483,95	1064,70	2,2	1113,09	2,3	95,1	IE3	93,5	91,0	95,0	0,89	0,88	0,84	70	86	0,68666	530,4
90	120	280M-4	1485	151,93	1116,44	7,2	578,79	1273,33	2,2	1331,21	2,3	95,2	IE3	93,5	92,0	95,2	0,88	0,87	0,83	65	86	1,16525	630,2

KW	HP	Type	rpm	In (A)	Is (A)	Is / In	Cn (Nm)	Cs (Nm)	Cs / Cn	Cmax (Nm)	Cmax / Cn	η % 100%	η % IE	η % 75%	η % 50%	min IE3	Pwr. fact. cosφ 100%	Pwr. fact. cosφ 75%	Pwr. fact. cosφ 50%	ΔT (°C)	LwA (dB)	J Kgm²	Kg
0,75	1	90S-6	941	1,96	8,60	4,4	7,61	18,20	2,4	19,03	2,5	79,1	IE3	79,2	75,9	78,9	0,70	0,57	0,48	40	55	0,00300	23,0
1,1	1,5	90L-6	936	2,86	12,10	4,2	11,22	27,40	2,4	29,18	2,6	81,1	IE3	81,2	77,7	81,0	0,69	0,57	0,44	53	55	0,00360	26,0
1,5	2	100L-6	949	3,53	17,03	4,8	15,09	32,90	2,2	37,74	2,5	83,0	IE3	83,8	82,4	82,5	0,74	0,65	0,53	52	60	0,00850	35,0
2,2	3	112M-6	955	5,28	25,56	4,8	22,00	47,60	2,2	57,20	2,6	84,8	IE3	85,6	84,3	84,3	0,71	0,63	0,50	59	62	0,01600	44,0
3	4	132S-6	971	6,99	38,51	5,5	29,51	58,10	2,0	76,71	2,6	87,6	IE3	88,0	86,7	85,6	0,71	0,61	0,51	39	68	0,02930	67,0
4	5,5	132MA-6	974	9,34	58,39	6,3	39,22	90,90	2,3	125,50	3,2	88,2	IE3	88,0	86,1	86,8	0,70	0,61	0,48	51	68	0,03720	75,0
5,5	7,5	132MB-6	972	12,46	72,99	5,9	54,04	124,90	2,3	156,71	2,9	90,0	IE3	90,1	89,2	88,0	0,71	0,61	0,49	63	69	0,04780	86,0

IE3 motors can be distinguished by the colour of their terminal box cap and the plate data

The technical files with all performance data and PDF drawings of each motor, can be downloaded from ww.motive.it “datasheet creator” section

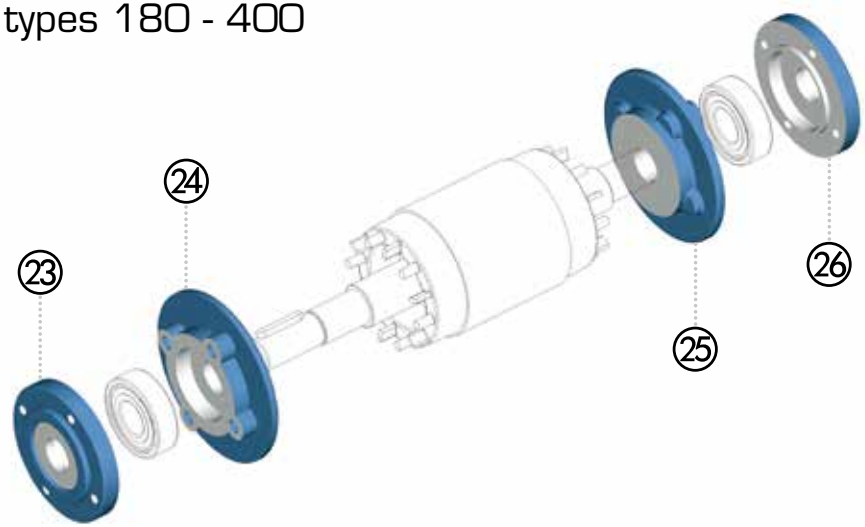
NOTE: motors can be improved in any moment. The data in www.motive.it can be more updated.
Each data is even more detailed and proven by the type test reports loaded in www.motive.it



N°	CODE
1	3PNSTA
2	3PNROT
3	3PNFRA
4	3PNFBE
5	3PNBBE
6	3PNFOS
7	3PNBOS
8	3PNBSH
9	3PNBO3
10	3PNBO5
11	3PNB14
12	3PNFEE
13	3PNWAV

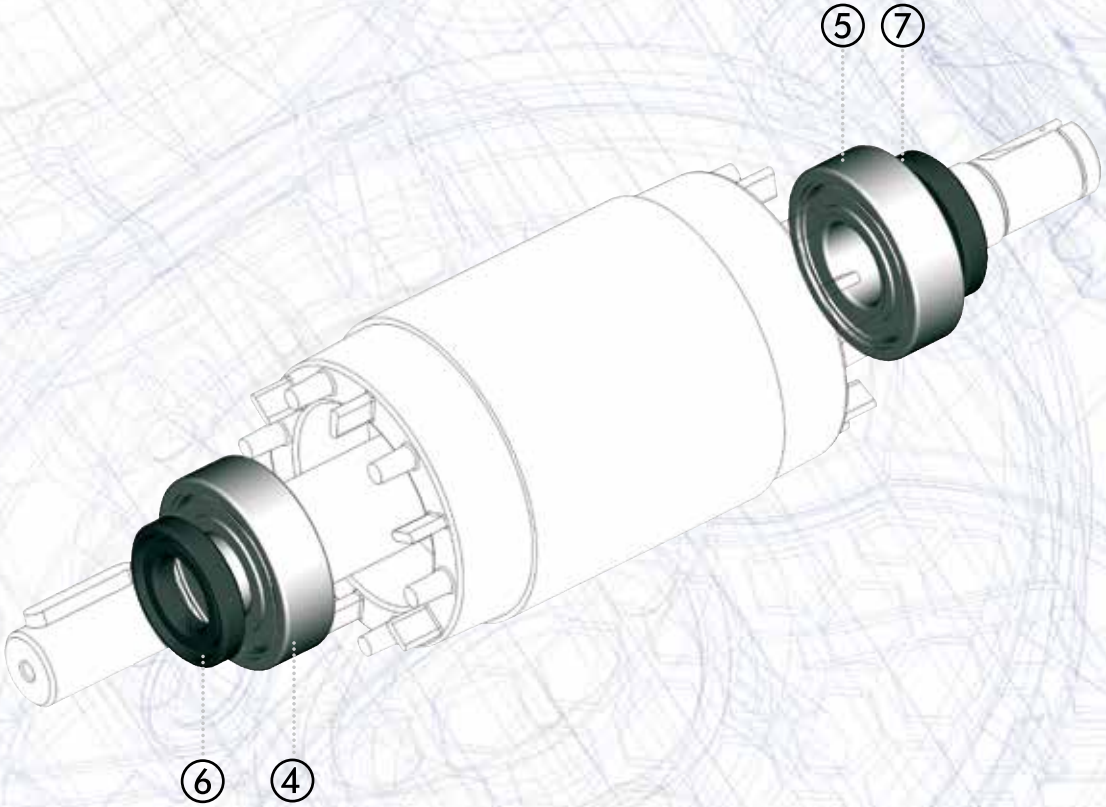
N°	CODE
14	3PNFAN
15	3PNFCV
16	3PNUCB
17	3PNTER
18	3PNBCB
19	3PNCMP
20	3PNCAP
21	3PNSCB
22	3PNCCB
23	3PNFOB
24	3PNFIB
25	3PNBIB
26	3PNBOB

types 180 - 400

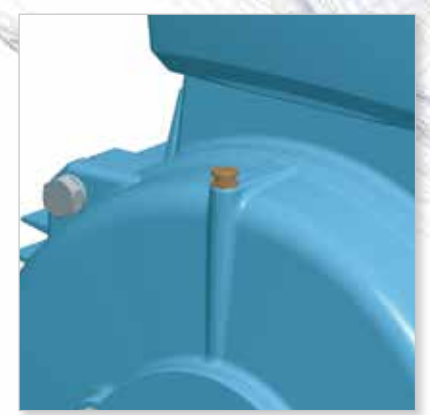


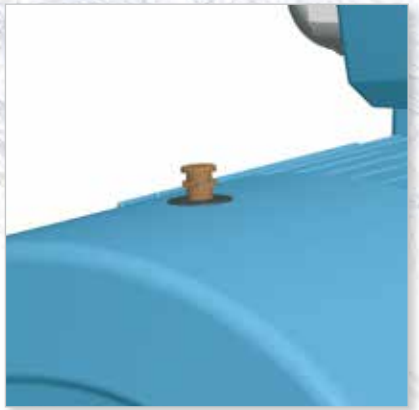
RUBBER SEAL RINGS AND BEARINGS

FRAME SIZE	POLES NUMBER	RUBBER SEAL RING ⑥	RUBBER SEAL RING ⑦	BEARINGS ④	BEARINGS ⑤
56	2 – 8	12x25x7	12x25x7	6201 ZZ	6201 ZZ
63	2 – 8	12x25x7	12x25x7	6201 ZZ	6201 ZZ
71	2 – 8	15x30x7	15x26x7	6202 ZZ	6202 ZZ
80	2 – 8	20x35x7	20x35x7	6204 ZZ	6204 ZZ
90	2 – 8	25x40x7	25x40x7	6205 ZZ	6205 ZZ
100	2 – 8	30x47x7	30x47x7	6206 ZZ	6206 ZZ
112	2 – 8	30x47x7	30x47x7	6206 ZZ	6206 ZZ
132	2 – 8	40x62x8	40x62x8	6208 ZZ	6208 ZZ
160	2 – 8	45x62x8	45x62x8	6309 ZZ	6309 ZZ
180	2 – 8	55x72x8	55x72x8	6311-C3	6311-C3
200	2 – 8	60x80x8	60x80x8	6312-C3	6312-C3
225	2 – 8	65x80x10	65x80x10	6313-C3	6313-C3
250	2 – 8	70x90x10	70x90x10	6314-C3	6314-C3
280	2	70x90x10	70x90x10	6314-C3	6314-C3
280	4 – 8	85x100x12	85x100x12	6317-C3	6317-C3
315	2	85x110x12	85x110x12	6317-C3	6317-C3
315	4 – 8	95x120x12	95x120x12	NU 319-C3	6319-C3
355	2	95x120x12	95x120x12	6319-C3	6319-C3
355	4 – 8	110x130x12	110x130x12	NU 322-C3	6322-C3
400	4 – 8	130X160X12	130X160X12	NU 326-C3	6326-C3



2 bearings lubrication devices on the front and the back shield are provided in motors from size 180 and up.
Other motors mount staunch bearings pre-lubricated for life.
Motors 180-400 are already supplied with lithium grease.





"bearing lubrication devices" are an optional on motors size 56-160.

TERMS OF SALE AND GUARANTEE

ARTICLE 1
GARANTEE

1.1. Barring written agreements, entered into between the parties hereto each time, Motive hereby guarantees compliance of products supplied and compliance with specific agreements. The guarantee for defects shall be restricted to product defects following design, materials or manufacturing defects leading back to Motive.

The Guarantee shall not include:

- faults or damages ensuing from transport., faults or damages ensuing from installation defects; incompetent use of the product, or any other unsuitable use.
- tampering or damages ensuing from use by non - authorised staff and/or use of non - original parts and/or spare parts;
- Defects and/or damages ensuing from chemical agents and/or atmospheric phenomena (e.g. burnt out material, etc.);routine maintenance and required action or checks;
- Products lacking a plate or having a tampered plate.

1.2. Returns to credit or replace will be accepted only in exceptional cases; However returns of goods already used to credit or replace won't be accepted in any case. The guarantee shall be effective for all Motive products, with a term of validity of 12 months, starting from the date of shipment. The guarantee shall be subject to specific written request for Motive to take action,according to statements, as described at the paragraphs hereinbelow. By virtue of aforesaid approval, and as regards the claim, Motive shall be bound, at its discretion, and within a reasonable time-limit,to alternatively take the following action:

a) To supply the Buyer with products of the same type and quality as those having proven defective and not complying with agreements, free ex-works; in aforesaid case, Motive shall have the right to request, at the Buyer's charge, early return of defective goods, which shall become Motive's property;

b) To repair, at its charge, the defective product or to modify the product which does not comply with agreements, by performing aforesaid action at its facilities; in aforesaid cases, all costs regarding product transport shall be sustained by the Buyer.

c) To send spare parts free of charge: all costs regarding product transport shall be sustained by the Buyer.

1.3 The guarantee herein shall assimilate and replace legal guarantees for defects and discrepancies, and shall exclude any other eventual Motive liability, however caused by supplied products; in particular, the Buyer shall have no right to submit any further claims. Motive shall not be liable for the enforcement of any further claims, as of the date the guarantee's term of validity expires.

ARTICLE 2
CLAIMS

2.1. Without prejudice to the application of provisions in Law, dated June 21, 1971, and as per Article 1:
Claims, regarding quantity, weight, gross weight and colour, or claims regarding faults and defects in quality or compliance, and which the Buyer may discover on goods delivery, shall be submitted by a max. 7 days of aforesaid discovery, under penalty of nullity.

ARTICLE 3
DELIVERY

3.1. Any liability for damages ensuing from total or partial delayed or failed delivery, shall be excluded.

3.2. Unless differently communicated by written to the Client, the transport terms have to be intended ex-works

ARTICLE 4
PAYMENT

4.1. Any delayed or irregular payments shall entitle Motive to cancel ongoing agreements, including agreements which do not regard the payments at issue, as well as entitling Motive to claim damages, if any. Motive shall, however, have the right, as of the payment's due date and without placing in arrears, to claim interest for arrears, to the extent of the discount rate in force in Italy, increased by 5 points. Motive shall also have the right to withhold material under repair for replacement. In the case of failed payment, Motive shall have the right to cancel all guarantees on materials, as regards the insolvent Client.

4.2. The Buyer shall be bound to complete payment, including cases whereby claims or disputes are underway.

ALL DATA HAVE BEEN WRITTEN AND CHECKED WITH THE GREATEST CARE. WE DO NOT TAKE ANY RESPONSIBILITY FOR POSSIBLE ERRORS OR OMISSIONS. MOTIVE CAN CHANGE THE CHARACTERISTICS OF THE SOLD ITEMS ON HIS FIRM OPINION AND IN EVERY MOMENT.

You can download each motor or gearbox final test report from www.motive.it, starting from its serial number

final test report

motive

General characteristics

Type	63C-2	kW 0.37	
Serial Number	1203DF3437		
Tested	400V 50Hz		

Final test results

Earth	56.26 mΩ		
Winding resistance	R1 38.42 Ω	R2 38.39 Ω	R3 38.32 Ω
Dieletric strength	2.86 mA	2.4 kV	
Insulation resistance	1000 MΩ		
No load dynamic test			
Tension	389 V	389 V	389 V
Current	0.7 A	0.7 A	0.7 A
Power	0.09 kW		

Made by ENRICO SANDRO GIORGIO

Tested by ALEX

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