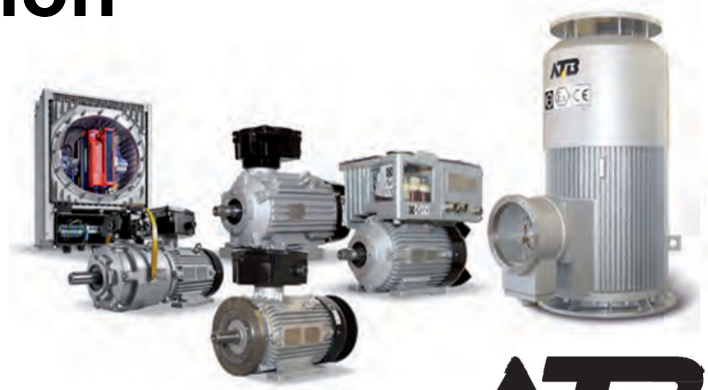
Technical
Documentation

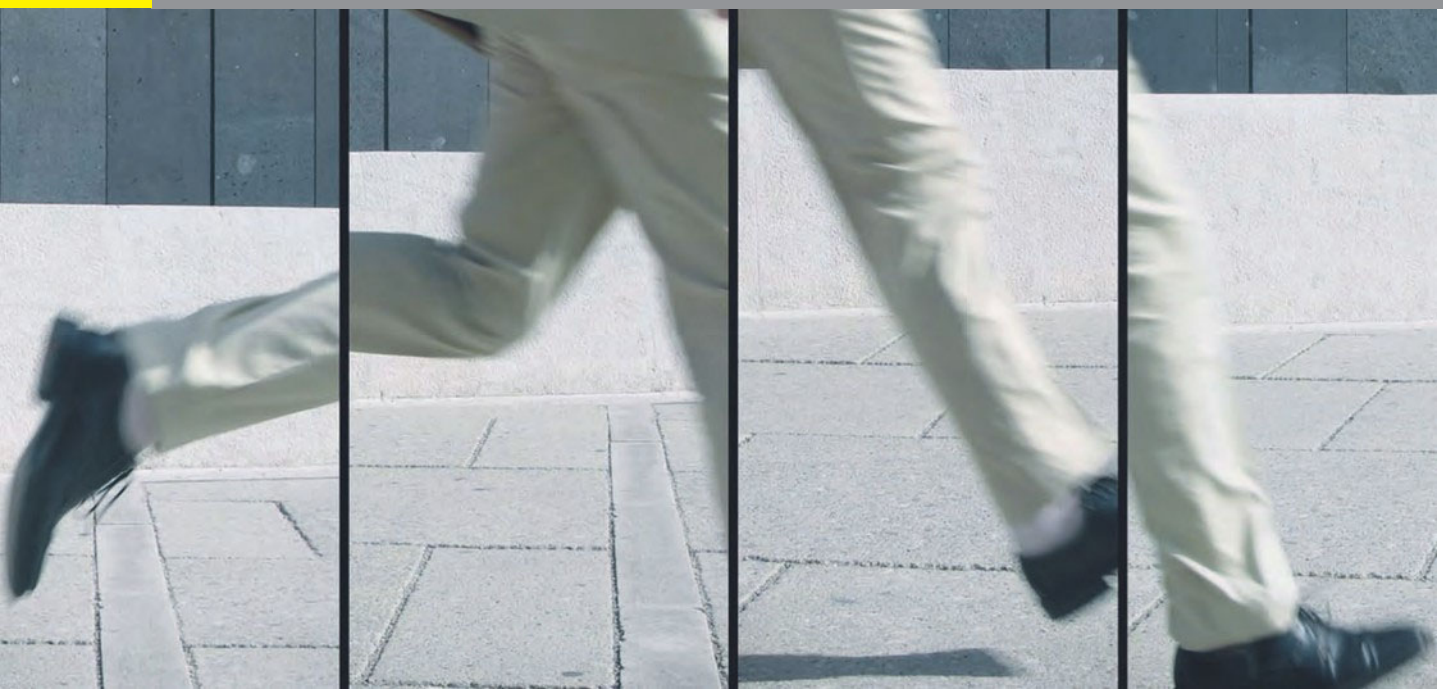
NORDENHAM

# Technology in motion

## THREE-PHASE MOTORS WITH FLAMEPROOF ENCLOSURES



ATB
Technology in Motion



We move your ideas. We don't just manufacture motors - we turn our customers' ambitious ideas into modern, innovative and reliable products that are unique and trend-setting. We take our customers to their goal with reliability, creativity and flexibility.

# Register

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## General Information



## Structural designs



## Electrical design



## Operating characteristics



## Operating data, low-voltage motors

**Mains operation and inverter operation**



## Partial load data

## Operating data, high voltage motors



## Dimensions



## Conversion of technical units of Measurement

The idea of safety, durability and environmental friendliness has always been rooted in our company philosophy. This led us to develop energy-saving motors at an early stage, irrespective of the latest European directives concerning careful and responsible use of energy and resources.

**IEC 60034-30**
In order to bring together the many different national efficiency requirements that have arisen to date, the international IEC 60034-30 standard is the first step towards globally uniform efficiency classes for three-phase
low-voltage motors within the output range from 0.75 kW to 375 kW.
The abbreviation IE for International Efficiency is used to define efficiency classes IE1, IE2 , IE3, .... The new edition of IEC 60034-30-1:2014 for mains operation adds another class (IE4) and extends the output range to 0.12 KW to 1000 kW. Values for class IE5 are mentioned informatively.
Inverter operation is now regulated in IEC 60034-30-2.

The main difference between the old voluntary commitment of the European Sector Committee for Electric Drives CEMEP from 1998 and today's globally uniform requirements, apart from the reversed order of the numbering, also lies in the obligation to measure the degrees of efficiency in accordance with the new procedures of IEC 60034-2-1.

The scope of IEC 60034-30-1 includes motors with the following characteristics:
- 50 Hz and/or 60 Hz
- Rated voltage up to 1000 V
- Rated output from 0.12 kW to 1000 kW
- Number of poles 2, 4, 6 or 8
- S1 - Continuous operation and other modes where the motor is suitable for continuous operation at the rated output.
- Ambient temperature: -20 °C to +60 °C
- Installation altitude up to 4000 m

**EuP Directive 2005/32/EC and**
**ErP Directive 2009/125/EC**
In Europe, the legal basis for the implementation of environmental policy goals to reduce CO2 emissions is the EuP Directive (2005/32/EC, Energy using Products). It was extended in a new version in 2009, in order to cover the eco-design of all energy-related products (ErP directive; 2009/125/EC).

The directive provides the framework for numerous different, product-related implementing regulations.

**Motor Regulation No. 2019/1781 and 2021/341**
Regulation 640/2009 established requirements for the environmentally compatible design ("ecodesign") of electric motors and the use of electronic speed control systems with regard to placement on the market and commissioning for the first time.
The requirements also apply when the motors are installed in other products.
As of July 1, 2021, successor regulations 2019/1781 and 2021/341 apply.

Compared to 640/2009 and the IEC 60034-30 standard some of the scope has changed, and a schedule for implementing the requirements is provided.
Staggered according to different deadlines, some of the previous exemptions have been removed, such as:
- FI operation and brake motors now come under the efficiency requirements.
- Explosion-proof motors in the sense of directive 2014/34/EU (ATEX) of groups II and III must be taken into consideration (only Ex e motors remain an exception until 6/2023).
- As of July 1, 2023, 2-, 4- and 6-pole motors within the ofrange 75 - 200 kW must be supplied in accordance with IE4.

Excluded from the ErP engine regulation, for example, were motors:
- with rated voltages <= 50 V.
- which are an integral part of a power unit, compact drive or brake motor and cannot be tested independently.
- which reach operating temperatures above 400 °C .
- which operate at ambient temperatures below -30 °C .
- whose coolant temperatures at the inlet of a product are below 0 °C or above 32 °C .
- which are completely immersed in liquid.
- which are completely enclosed and self-cooled (TENV).
- which act as replacements for identical engines integrated into products which were placed on the market before July 1, 2021 (Ex d) or July 1, 2023 (Ex e).

The legal requirements only concern the first placement of a motor on the market by the European manufacturer or importer in the EU area.
Motors that were already placed on the market may continue to be sold and put into operation after the cut-off dates.

Although it will not be mandatory for explosion-proof motors until 7/2021, our motors have complied with the efficiency classes specified by the IEC 60034-30-1 standard, among others, since 2006.
Depending on the design, the following requirements are achieved:

1. Class IE2 - High efficiency in accordance with IEC 60034-30-1
2. Class IE3 - Premium efficiency in accordance with IEC 60034-30-1
3. Level 2 + 3 - China Energy Label in accordance with GB 18613-2020

**Marking**
Motors of this version contain the letter "Y" in the type designation, and are marked with the associated efficiency class IE and the efficiency, e.g. CD 80M1-2Y3 IE3 - 82.8 %.

The high efficiencies are achieved by:

1. Increasing the diameter and lengthening the plate packages, while maintaining the axle height-related IEC mounting dimensions
2. Increasing the use of copper
3. Using higher quality dynamo plate
4. Using lower-loss shaft seals for protection class IP 55 and IP 56
5. Adjusting the ventilation system for standard and low-noise version (CD...A)

| **Output** | **IEC IE2** CD…Y2 | **IEC IE3** CD…Y3 | **IEC IE2** CD…Y2 | **IEC IE3** CD…Y3 | **IEC IE2** CD…Y2 | **IEC IE3** CD…Y3 | **IEC IE2** CD…Y2 | **IEC IE3** CD…Y3 |
|---|---|---|---|---|---|---|---|---|
| **[kW]** | **2-pole** | | **4-pole** | | **6-pole** | | **8-pole** | |
| **0,12** | 53,6 | 60,8 | 59,1 | 64,8 | 50,6 | 57,7 | 40,1 | 50,9 |
| **0,18** | 60,4 | 65,9 | 64,7 | 69,9 | 56,6 | 63,9 | 48,7 | 58,4 |
| **0,2** | 61,9 | 67,2 | 65,9 | 71,1 | 58,2 | 65,4 | 50,9 | 60,4 |
| **0,25** | 64,8 | 69,7 | 68,5 | 73,5 | 61,6 | 68,6 | 55,4 | 64,4 |
| **0,37** | 69,5 | 73,8 | 72,7 | 77,3 | 67,6 | 73,5 | 62,8 | 70,4 |
| **0,4** | 70,4 | 74,6 | 73,5 | 78 | 68,8 | 74,4 | 64,1 | 71,3 |
| **0,55** | 74,1 | 77,8 | 77,1 | 80,8 | 73,1 | 77,2 | 69,1 | 73,9 |
| **0,75** | 77,4 | 80,7 | 79,6 | 82,5 | 75,9 | 78,9 | 71,9 | 76,4 |
| **1,1** | 79,6 | 82,7 | 81,4 | 84,1 | 78,1 | 81 | 74,7 | 78,8 |
| **1,5** | 81,3 | 84,2 | 82,8 | 85,3 | 79,8 | 82,5 | 76,8 | 80,7 |
| **2,2** | 83,2 | 85,9 | 84,3 | 86,7 | 81,8 | 84,3 | 79,3 | 82,8 |
| **3** | 84,6 | 87,1 | 85,5 | 87,7 | 83,3 | 85,6 | 81,2 | 84,3 |
| **4** | 85,8 | 88,1 | 86,6 | 88,6 | 84,6 | 86,8 | 82,8 | 85,6 |
| **5,5** | 87 | 89,2 | 87,7 | 89,6 | 86 | 88 | 84,5 | 87 |
| **7,5** | 88,1 | 90,1 | 88,7 | 90,4 | 87,2 | 89,1 | 86 | 88,2 |
| **11** | 89,4 | 91,2 | 89,8 | 91,4 | 88,7 | 90,3 | 87,7 | 89,6 |
| **15** | 90,3 | 91,9 | 90,6 | 92,1 | 89,7 | 91,2 | 88,9 | 90,6 |
| **18,5** | 90,9 | 92,4 | 91,2 | 92,6 | 90,4 | 91,7 | 89,7 | 91,2 |
| **22** | 91,3 | 92,7 | 91,6 | 93 | 90,9 | 92,2 | 90,3 | 91,7 |
| **30** | 92 | 93,3 | 92,3 | 93,6 | 91,7 | 92,9 | 91,3 | 92,5 |
| **37** | 92,5 | 93,7 | 92,7 | 93,9 | 92,2 | 93,3 | 91,9 | 93 |
| **45** | 92,9 | 94 | 93,1 | 94,2 | 92,7 | 93,7 | 92,4 | 93,4 |
| **55** | 93,2 | 94,3 | 93,5 | 94,6 | 93,1 | 94,1 | 92,9 | 93,8 |
| **75** | 93,8 | 94,7 | 94 | 95 | 93,7 | 94,6 | 93,5 | 94,3 |
| **90** | 94,1 | 95 | 94,2 | 95,2 | 94 | 94,9 | 93,9 | 94,6 |
| **110** | 94,3 | 95,2 | 94,5 | 95,4 | 94,3 | 95,1 | 94,2 | 94,9 |
| **132** | 94,6 | 95,4 | 94,7 | 95,6 | 94,6 | 95,4 | 94,4 | 95,1 |
| **160** | 94,8 | 95,6 | 94,9 | 95,8 | 94,8 | 95,6 | 94,6 | 95,4 |
| **≥200** | 95 | 95,8 | 95,1 | 96 | 95 | 95,8 | 94,8 | 95,6 |

# Certificates and standards



We apply the strictest quality standards, which are checked annually by official bodies.
Quality assurance certification first took place in 1992.
We now have certificates according to:

- **DIN EN ISO 9001:2015** for the quality management system as well as
- ATEX in accordance with 2014/34/EU for the production of motors with flameproof enclosures.

The need to preserve our environment by pushing environmentally friendly manufacturing methods, materials and chemicals in energy-saving motors and drives was recognized at an early stage, and incorporated into the products. These activities, up to and including the use of VOC-optimized paints, led to certification in accordance with:

- **DIN EN ISO 14001:2015** for the environmental management system


In order to be prepared for the universal use of the motors in the world's future markets, test certificates have been issued for the motors by various domestic and foreign certification authorities.

- **Explosion protection approvals e.g.:**
  - PTB ATEX for Europe
  - TR CU for Russia
  - TR CU for Belarus
  - TR CU for Kazakhstan
  - C C C for China
  - TestSafe for Australia
  - PTB IECEx worldwide


- **Ship classification societies e.g.:**
  - DNV Germanischer Lloyd (GL)
  - Lloyd's Register
  - Bureau Veritas

All of the motors comply with the following international norms and standards.

In addition to these guidelines, of course, numerous customer specifications from the chemical and petrochemical industries as well as the mechanical engineering area are also fulfilled.

By request, the motors can also be supplied in accordance with the recommendations of the VIK, the Verband der Industriellen Energie- und Kraftwirtschaft e.V. (Association of the Industrial Energy and Power Industry). This makes the motors ideally suited for the special operating Conditions.
E.G.: Of the basic materials industry or refineries. Motors of this type are marked VIK on the rating plate.

**Standards**

| **Country**<br>Title | **International**<br>**IEC** International Electrotechnical Commission | **Europe**<br>**EN** - CENELEC European Committee for Electrotechnical Standardization | **Germany**<br>**DIN/VDE**<br>German industry Standard/Association German electrical engineers |
|---|---|---|---|
| Rotating electrical machines<br>Dimensioning and operating behavior | IEC 60034-1 | EN 60034-1 | DIN EN 60034-1/<br>VDE 0530 Teil 1 |
| Procedure for determining the losses and efficiency of rotating electrical machines from tests | IEC 60034-2-1 | EN 60034-2-1 | DIN EN 60034-2-1<br>VDE 0530 Teil 2 |
| Degrees of protection based on the overall design of rotating electrical machines (IP code) - Introduction | IEC 60034-5 | EN 60034-5 | DIN EN 60034-5/<br>VDE 0530 Teil 5 |
| Classification of cooling methods (IC code) | IEC 60034-6 | EN 60034-6 | DIN EN 60034-6/<br>VDE 0530 Teil 6 |
| Classification of types of construction, types of installation and the terminal box position (IM code) | IEC 60034-7 | EN 60034-7 | DIN EN 60034-7/<br>VDE 0530 Teil 7 |
| Connection designations and direction of rotation | IEC 60034-8 | EN 60034-8 | DIN EN 60034-8/<br>VDE 0530 Teil 8 |
| Noise limits | IEC 60034-9 | EN 60034-9 | DIN EN 60034-9/<br>VDE 0530 Teil 9 |
| Starting behavior of three-phase motors with squirrel-cage rotors, except pole-changing motors | IEC 60034-12 | EN 60034-12 | DIN EN 60034-12/<br>VDE 0530 Teil 12 |
| Mechanical vibration of certain machines with an axle height of 56 mm and higher; measurement, evaluation and limits of the vibration intensity | IEC 60034-14 | EN 60034-14 | DIN EN 60034-14/<br>VDE 0530 Teil 14 |
| Efficiency classification of three-phase motors with squirrel-cage rotors, except pole-changing motors (IE code) | IEC 60034-30 | EN 60034-30 | DIN EN 60034-30/<br>VDE 0530 Teil 30 |
| Balancing quality | ISO 1940 | - | DIN ISO 1940 |
| IEC standard voltages | IEC 60038 | - | DIN IEC 60038 |
| Evaluation and classifications of electrical insulations in accordance with their thermal behavior | IEC 60085 | - | DIN IEC 60085 |
| Three-phase asynchronous motors for general use with standardized dimensions and power ratings | IEC 60072-11) | EN 50347 2) | DIN EN 503472) |
| Potentially explosive atmosphere - Part 0: General requirements for devices | IEC 60079-0 | EN 60079-0 | DIN EN 60079-0<br>VDE 0170 Teil 1 |
| Potentially explosive atmosphere - Part 1: Equipment protection by means of flameproof enclosure "d" | IEC 60079-1 | EN 60079-1 | DIN EN 60079-1<br>VDE 0170 Teil 5 |
| Potentially explosive atmosphere - Part 7: Device protection by means of increased safety "e" | IEC 60079-7 | EN 60079-7 | DIN EN 60079-7<br>VDE 0170 Teil 6 |
| Explosive atmPotentially esphere - Part 31:<br>Equipment dust explosion protection by means of housing "t" | IEC 60079-31 | IEC 60079-31 | DIN EN 60079-31<br>VDE 0170-15-1 |

| Ignition protection type<br>Code letter | Building regulation | Protection idea | Applicable to type of the electric machine |
|---|---|---|---|
| Flameproof enclosure "d"<br>  | EN 60079-1, VDE 0170 Part 5<br><br>Equipment for zone 1+2[1)] | All parts which are potential ignition sources are surrounded by a flameproof enclosure whose unavoidable sealing surfaces are designed as ignition-proof gaps so that if an explosive atmosphere inside the enclosure explodes, this is not transferred to the explosive atmosphere surrounding the enclosure. | All motor types, e.g.<br>- Squirrel cage motors,<br>- Slip ring motors,<br>- Collector motors.<br>For all operating modes S1 to S10, for difficult starting conditions and drives with controllable rotation speed, e.g. by means of a frequency inverter. |
| Increased safety "e"<br>  | EN 60079-7, VDE 0170 Part 6<br><br>Equipment for zone 1+2[1)] | In this case, measures must be taken to reliably prevent the occurrence of sparks, arcing and non-ermissible heating when the equipment is being operated properly and for its intended purpose. | Only squirrel-cage motors with an adapted motor protection switch. $t_E$ time condition! |
| Protection type "n"<br>  | EN 60079-15, VDE 0170 Part 16 Electrical equipment for potentially explosive atmospheres.<br><br>Equipment for zone 2[1)] (zone 2 - equipment) | Protection type for electrical equipment with which it is ensured that the equipment is not capable of ignitng a surrounding potentially explosive atmosphere during normal operation and under certain abnormal conditions.<br><br>The usual protection methods for motors are:<br>- non-sparking equipment "nA" which is designed to minimize the risk of arcing or sparks occurring;<br>- vapour-proof enclosures "nR" which are designed to restrict the ingress of gas, vapours and mist. | Squirrel-cage motors with IP20 protection for enclosed spaces. For outdoor installation, IP44 protection or an IPW24 motor protection switch.<br><br>All motor types e.g.<br>- Slip ring motors<br>- Collector motors etc. with motor protection switches and overpressure monitoring.<br><br>Preventing the escape of operationally generated sparks. Manufacturer's information concerning these measures. |
| Dust protection<br>  | EN 60079-31,<br>VDE 0170 part 15-1<br><br>Operating equipment for zones 21 + 22[1)] | This ignition protection type is based on limiting the maximum surface temperature of the enclosure and limiting dust ingress by using "dust-tight" or "dust-protected" enclosures. | All electric motors protected by enclosures with of surface temperature limitation. |

Notes
1) DIN EN 60 079-14, VDE 0165 Part 1, Project planning, selection and installation of electrical systems

**Explosion protection of flameproof motors**
The motors are tested and certified by PTB in accordance with the new European Directive 2014/34/EU (ATEX). They therefore comply with the latest European regulations. The directive regulates the condition of equipment and protective systems for use in potentially explosive areas, and has been applicable to all equipment placed on the market throughout Europe since June 30, 2003.

Certificates according to the IECEx scheme are also available for all motors for international applications.

The three-phase motors of the dBD, CD and BD model series are explosion-proof in ignition protection type "flameproof enclosure", in accordance with IEC 60079-1, for groups IIC or IIB and temperature classes T3 to T6.

The standard version of the motors in the CD model series corresponds to the highest group IIC and temperature class T4, which include all lower groups and temperature classes. The standard version of the BD and dBD series model correspond to group IIB and temperature class T4.

The test certificate that is issued does not contain any electrical data for the engine concerned. It confirms the explosion safety provided by the ignition-proof design of the engine. The manufacturer is solely responsible for defining the electrical data. Compliance with the temperature limits is verified by means of appropriate testing.

Based on their size, motors in temperature class T4 provide the same output as non-explosion-proof standard motors. The rated output of motors in temperature classes T5 and T6 must be adjusted with regard to the permissible enclosure temperatures.
The terminal compartment is designed with explosion protection type "Increased safety" (motor designation Ex de) as standard. In order to adapt to the different installation methods in the individual countries, delivery with a terminal compartment with "flameproof enclosure" ignition protection type is also possible (motor designation Ex d). For this purpose, the terminal compartment is designed in the same explosion group as the motor.

In both versions, the motor compartment and terminal compartment are separated from each other in an explosion-proof manner. The winding leads are led into the terminal compartment via flameproof cable leadthroughs.

Due to their high degree of explosion protection, our motors can be used in all potentially explosive locations in zones 1 and 2 under all operating conditions.

They can be used in potentially explosive atmospheres where, in accordance with the local and operational conditions, gases and vapours that form potentially explosive mixtures with air can accumulate in hazardous quantities. Due to their design, the motors are protected against water, electrical, chemical, thermal and mechanical influences in such a way that explosion protection is maintained during use for their intended purpose.

Marking on the motor, e.g.:

CE 0044 Ex II 2G Ex db eb IIC T4 Gb

Protection against dust ingress EN 60079-31

| | | Device group | | |
|---|---|---|---|---|
| | | conductive dust | non-conductive dust | Lint |
| **Application** | **Protection level** | **IIIC** | **IIIB** | **IIIA** |
| Zone 20 | ta | IP6X | IP6X | IP6X |
| Zone 21 | tb | IP6X | IP6X | IP5X |
| Zone 22 | tc | IP6X | IP5X | IP5X |

**Dust explosion protection**

The dust explosion protected motors are certified by the PTB in accordance with the new directive 2014/34/EU and are compliant with DIN EN 60079-31.

An essential feature of dust explosion protection is the IP protection class. Depending on the ambient conditions, different demands are made on the dust-tightness of the motor. It is also important for dust explosion protection to limit the surface temperature of the motors to a value that is below the ignition and glow temperature of the dust that occurs.

The user must determine the category, the protection level and the maximum permissible surface temperature according to the frequency and probability of occurrence and the type of dust.

Marking on the motor:

CE 0044 Ex II 2D Ex tb IIIC T120°C Db

The motors can also be designed to be dust or gas explosion proof at the same time.

**Information concerning the introduction of directive 2014/34/EU (ATEX)**

The regulations for the construction and operation of electrical equipment in potentially explosive atmospheres were defined in the European Directive 76/117/EEC and various supplements for many years. The transition to the two new directives, 2014/34/EU (ATEX) for manufacturers and 99/92/EC (ATEX) for operators, represents a fundamental reorganization of the European regulatory framework.

Directive 2014/34/EU (formerly 94/9/EC) harmonises the national legislation for the quality requirements of devices and protective systems, which previously differed. This will achieve the objectives of reducing trade barriers and standardising the basic safety aspects within the EC. In specialist circles, the abbreviation "ATEX" (letter abbreviation of the French title of the directive) is often used.

The installation requirements for operation in potentially explosive atmospheres are regulated by directive 99/92/EC (ATEX).

The directives were implemented into German law in 1996 in the same two-part structure via the Equipment Safety Act with the Explosion Protection Ordinance (ExVO) for ATEX and by the Industrial Safety and Health Ordinance (BetrSichV) for ATEX. A whole series of old regulations, including the ElexV, therefore ceased to be valid.

An essential feature of ATEX is an additional classification and marking of equipment and protective systems into categories and equipment protection levels. These categories and protection levels were defined based on the zoning of the operating sites that

takes place due to the probability of occurrence of potentially explosive atmospheres. This makes direct assignment of the operating resources for use in the individual zones of the operating facilities easier.

The external marking of the motors that comply with the new directive is the CE mark, and the indication of the device group and category, e.g. "II 2G" and the device protection level e.g. "b" for zone 1 devices in the gas area on the nameplate. The prerequisites for affixing the CE mark and issuing the declaration of conformity, which comes from the manufacturer are:

The manufacturer must provide evidence of a certified quality assurance system in accordance with ISO 9001 with an additional certificate for the quality assurance of the production of explosion-proof equipment in accordance with ATEX.

An EU type examination certificate issued by a recognized inspection body must be available. (Not required for category 3 devices)

Until the end of the transition period (June 30, 2003), manufacturers and operators had the option of proceeding in accordance with both the old and the new law.

**Permissible temperatures of electrical equipment**

| | **DIN EN 60079, VDE 0170 Explosion group IIA; IIB; IIC** | |
|---|---|---|
| Ignition temperature of the medium to the limit temperature | Temperature class | Permissible surface temperature of the equipment including 40 °C (limit temperature) with individual testing of the ambient temperature |
| above 450 °C | T1 | 450 °C |
| 300–450 °C | T2 | 300 °C |
| 200–300 °C | T3 | 200 °C |
| 135–200 °C | T4 | 135 °C |
| 100–135 °C | T5 | 100 °C |
| 85–100 °C | T6 | 85 °C |

Since July 1, 2003, all new products that are placed on the market must comply with the new ATEX directive.
Spare parts for all versions are available by request.

Existing systems may continue to be operated, but since 30.06.2006 they must fulfil the minimum requirements of ATEX.

| Device group | Device category | Device protection level | Zoning | Definition in accordance with BetrSichV | Certification obligation |
|---|---|---|---|---|---|
| | | | | **for flammable gases, vapours and mists** | |
| II | 1G* | a | 0 | Zone 0 includes areas in which a potentially explosive atmosphere consisting of a mixture of air and gases, vapours or mists is present continuously, for long periods or frequently. | yes |
| II | 2G | b | 1 | Zone 1 includes areas in which a potentially explosive atmosphere consisting of gases, vapours or mists is likely to occur occasionally. | yes |
| II | 3G | c | 2 | Zone 2 includes areas in which a potentially explosive atmosphere consisting of gases, mists or vapours is not expected to occur, but if it does occur, it is likely to only occur infrequently and for a short period of time. | no |
| | | | | **for combustible dusts** | |
| III | 1D* | a | 20 | Zone 20 includes areas in which a potentially explosive atmosphere consisting of dust/air mixtures is present continuously, for long periods or frequently. | yes |
| III | 2D | b | 21 | Zone 21 includes areas in which a potentially explosive atmosphere consisting of dust/air mixtures is likely to occur occasionally. | yes |
| III | 3D | c | 22 | Zone 22 includes areas in which a potentially explosive atmosphere caused by whirled-up dust is not expected to occur, but if it does occur, it is likely to occur only very rarely and for a short period of time. | no |

* not usual for electric motors

| | Group | Temperature classes<br>T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|---|
| Firedamp protection | I | Methane<br>(Firedamp) | - | - | - | - | - |
| Explosion protection | IIA | Acetone, ammonia,<br>Benzene, acetic acid<br>Ethan,<br>Ethyl acetate, ethyl chloride<br>Carbon oxide<br>Methane<br>(Firedamp)<br>Methanol, methyl chloride, propane,<br>Toluene | I-amyl acetate,<br>n-Butane,<br>n-Butyl alcohol<br>Cyclohexanone<br>Acetic<br>acid anhydride,<br>Natural gas,<br>Liquid gas | Hexane, benzines,<br>Diesel fuels,<br>Jet fuels,<br>Heating oil,<br>crude oil1) | Acetate dehyd,<br>Ether | - | - |
| | IIB | Coke oven gas,<br>Water gas<br>(carburized) | Butadiene-1,3<br>Ethyl alcohol,<br>Ethylene,<br>Ethylene oxide | Petroleum[1)],<br>isoprene,<br>Hydrogen<br>hydrogen | Ethyl ether | - | - |
| | IIC | Hydrogen | Acetylene | - | - | - | Carbon disulphide |

Note
1) Depending on the composition

Flammable gases and vapours are classified into groups and temperature classes, which are identified by abbreviated symbols consisting of numbers and letters.
The letters from IIA to IIC define the group which determines the formation of the flameproof gap in the machines.
The letter T with the assignment of digits 1-6 indicates the temperature class, which defines the permissible surface temperature of the machine.

Extracts of the groups/temperature classes assigned for the gases and vapours are summarised in the table shown above.

Note concerning the table:
More examples can be found in the publication "Sicherheits- technische Kennzahlen brennbarer Gase und Dämpfe" (Technical safety codes for flammable gases and vapours) by Nabert/Schön, Deutscher Eichverlag, Berlin.

List of test certificates

| Size/ Series | CD ... [1] | | | BD ... [2] | BD ... B(R) [3] | BD ... Y3B) [4] | CEIGL ... [5] | CM ... [8] | |
|---|---|---|---|---|---|---|---|---|---|
| 63 | 13 ATEX 1012 X | IECEx PTB 12.0036 X | 2020312301002337 | 17 ATEX 1007 X | | | | | |
| 71 | 13 ATEX 1012 X | IECEx PTB 12.0036 X | 2020312301002337 | 17 ATEX 1007 X | | | | | |
| 71Y | 14 ATEX 1001 X | IECEx PTB 14.0001 X | 2020312301002336 | 17 ATEX 1008 X | | | | | |
| 80 | 14 ATEX 1001 X | IECEx PTB 14.0001 X | 2020312301002336 | 17 ATEX 1008 X | 08 ATEX 1110 X | 21 ATEX 1006 X | 08 ATEX 1111 X | 19 ATEX 1002 X | IECEx PTB 19.0022 X |
| 90 | 14 ATEX 1001 X | IECEx PTB 14.0001 X | | 17 ATEX 1008 X | 08 ATEX 1110 X | 21 ATEX 1006 X | 08 ATEX 1111 X | 19 ATEX 1002 X | IECEx PTB 19.0022 X |
| 90 Y*_2 | 14 ATEX 1010 X | IECEx PTB 14.0014 X | 2020312301002336 | 17 ATEX 1009 X | | 21 ATEX 1006 X | | | |
| 100 | 14 ATEX 1010 X | IECEx PTB 14.0014 X | 2020312301002336 | 17 ATEX 1009 X | 08 ATEX 1110 X | | 08 ATEX 1111 X | 17 ATEX 1001 X | IECEx PTB 16.0003 X |
| 112 | 14 ATEX 1010 X | IECEx PTB 14.0014 X | 2020312301002336 | 17 ATEX 1009 X | 08 ATEX 1110 X | | 08 ATEX 1111 X | 17 ATEX 1001 X | IECEx PTB 16.0003 X |
| 112Y | 15 ATEX 1005 X | IECEx PTB 15.0011 X | 2020312301002336 | 17 ATEX 1010 X | | | | | |
| 132 | 15 ATEX 1005 X | IECEx PTB 15.0011 X | 2020312301002335 | 17 ATEX 1010 X | 08 ATEX 1110 X | | 08 ATEX 1111 X | 14 ATEX 1013 X | IECEx PTB 14.0026 X |
| 160 | 16 ATEX 1022 X | IECEx PTB 16.0040 X | 2020312301002335 | 09 ATEX 1011 X | | | | 15 ATEX 1012 X | IECEx PTB 15.0030 X |
| 180 | 08 ATEX 1056 X | IECEx PTB 06.0022 | 2020312301002334 | 09 ATEX 1012 X | | | | | |
| 200 | 08 ATEX 1081 X | IECEx PTB 06.0023 | 2020312301002334 | 09 ATEX 1013 X | | | | | |
| 225 | 08 ATEX 1087 X | IECEx PTB 06.0009 | 2020312301002333 | 09 ATEX 1011 X | | | | | |
| 250 | 08 ATEX 1087 X | IECEx PTB 06.0009 | 2020312301002333 | 09 ATEX 1011 X | | | | | |
| 280 | 08 ATEX 1087 X | IECEx PTB 06.0009 | 2020312301002333 | 09 ATEX 1011 X | | | | | |
| 315 | 08 ATEX 1087 X | IECEx PTB 06.0009 | 2020312301002332 | 09 ATEX 1011 X | | | | | |
| 355 | 08 ATEX 1082 X | IECEx PTB 06.0024 | 2020312301002331 | 09 ATEX 1014 X | | | | | |
| 400 | 08 ATEX 1083 X | IECEx PTB 06.0036 | 2020312301002331 | 09 ATEX 1015 X | | | | | |
| 450 | 08 ATEX 1085 X | IECEx PTB 06.0037 | 2020312301002331 | 09 ATEX 1006 X | | | | | |
| 500 [5] | | | | 09 ATEX 1008 X | | | | | |

Notes concerning ATEX marking

1) Standard series Group IIC: II 2G Ex db eb IIC T3...T6 Gb or Ex db IIC T3...T6 Gb and/or II 2D Ex tb IIIC T120 °C Db or Ex de IIC T3...T6 Gb or Ex de IIC T3...T6 Gb or Ex tD A21 IP6X T85 °C ...T200 °C
2) Standard series Group IIB: II 2G Ex db eb IIB T3...T6 Gb or Ex db IIB T3...T6 Gb and/or II 2D Ex tb IIIB T120 °C Db
3) Motors with built-in brake/encoder group IIB incl. hydrogen: II 2G Ex de IIB+H2 T3...T6 Gb or Ex d IIB+H2 T3...T6 Gb and/or III 2D Ex tb IIIB T120 °C Db
4) Motors with built-in brake/encoder group IIB incl. hydrogen: II 2G Ex db eb IIB+H2 T4...T6 Gb or Ex d IIB+H2 T4...T6 Gb and/or III 2D Ex tb IIIB T120 °C Db
5) Inverter box of the compact drive
6) Type dBD
7) IECEx certification: Dust marking only possible with size 63-160+280
8) Mounting brake type CM..

**Test certificate for ignition protection type "flameproof enclosure", temperature class T3...T6 and dust protection by housing**

Type examination certificates according to Directive 2014/34/EU (ATEX) and certificates according to the IECEx scheme are available for the CD..., BD..., dBD... and BD...B/R, EU (EC) series. These certificates, which are issued up to temperature class T6 for three-phase asynchronous motors of ignition protection type "d", do not contain any rated data for the motor type concerned. They confirm the explosion safety due to the tested ignition-proof and dust-tight design of the motor. The following design variants of the rated data are also certified, which must be confirmed by the manufacturer by mentioning them on the motor rating plate:

- Rated voltages up to 1000 V.
  From size 355 up to 6600 V.
- Rated frequency below or above 50 Hz, e.g. 60 Hz.
- Pole-changing motors, e.g. 4/2 or 6/4 pol.
- Ambient temperatures -55 °C to 60 °C.
- Less than -20 °C, also without heating.
- Installation altitudes higher than 1000 m above sea level.
- Installation of TF (thermistors in accordance with DIN 44081) as the sole protection against non-permissible heating with operating mode S1, S2, S3, S4, S5, S6, S7, S8, S9 or S10. The sole protection is achieved only by a combination of TF and tripping devices with test mark II (2)G.
- With TF installed as the sole protection, power can be supplied from any variable frequency drive for motor speed control.
- Temperature classes T3 to T6.
- Dust protection II 2D for zone 21 and II 3D for zone 22.

**Type code**

| Example: | C | D | 112 | M | - | 2 | S |
|---|---|---|---|---|---|---|---|
| | 1 2 | 3 | 4 | 5 | - | 6 | 7 |
| | 1 2 3 | 4 5 6 | 7 8 9 | 10 11 | 12 | 13 14 15 16 17 18 | 19 20 21 ... |

| Number | Feature | Characteristic | Meaning |
|---|---|---|---|
| 1 | Explosion | d | Flameproof enclosure |
| | (optional) | B | B-series |
| | | C | C-series |
| 2 | Explosion | C | Flameproof enclosure IIC |
| | | CE | Flameproof enclosure IIC + increased safety |
| | | B | Flameproof enclosure IIB |
| | | e (E) | Increased safety |
| | | n | Non-sparking design |
| 3 | Motor type | AR | Connection room |
| | | D | Tthree-phase AC motor, Nordenham production site |
| | | DP | Three-phase AC motor, Tamel production site, Poland |
| | | FG | Field frequency inverter housing |
| | | IGL | Lenze integrated inverter housing |
| | | M | Mounting brake type ATB |
| 4 | Size | - 63 | Size 63 |
| | | - 71 | etc. |
| | | ... | |
| 5 | Package | K, S | Short package length |
| | | M | Medium package length |
| | | L | Long package length |
| | | L1 | etc. |
| | | ... | |
| - | Hyphen | | |
| 6 | Number of | 4 | 4-pole |
| | | 8/4 | 8/4-pole |
| | | 12/8/4 | 12/8/4 pole |
| | | ... | |
| 7 | Version | ***The order must be adhered to as follows when naming the motors:*** | |
| | | X | Increased performance |
| | | Y | High efficiency in accordance with the Australian MEPS standard |
| | | Y2 | High efficiency IE2 in accordance with EN 60034-30 |
| | | Y2.1 | High efficiency IE2 in accordance with EN 60034-30 (version .1) |
| | | Y2.7 | High efficiency IE2 in accordance with EN 60034-30, max 7-fold starting current |
| | | Y3 | Premium efficiency IE3 in accordance with EN 60034-30 |
| | | Y3.1 | High efficiency IE3 in accordance with EN 60034-30 (version .1) |
| | | Y4P | Premium efficiency IE4 in accordance with EN 60034-30 (permanent magnet motor) |
| | | YT | High efficiency in accordance with the Australian HEPS standard |
| | | H | High voltage motor |
| | | A | Axial fan, depending on the direction of rotation, noise class 2 |
| | | AR | Axial fan reduced, noise class 3 |
| | | W | Water cooling, noise class 4 |
| | | B | Built-in brake (spring pressure principle) |
| | | D | Terminal box - flameproof |
| | | E | Terminal box - increased safety |
| | | F | Externally driven axial fan |
| | | G | Encoder attachment |
| | | I | Integrated inverter (compact drive) |
| | | IT | Integrated inverter (compact drive) for IT network |
| | | K | Direct cable entry |
| | | N | Only in conjunction with mounted brake type CM - NS closed |
| | | O | Without ventilation |
| | | R | Built-in encoder (resolver) |
| | | S | Special brake, type Kendrion (NS attachment) |
| | | SM | Special brake, type ATB CM (DS attachment) |
| | | SMN | Special brake, type ATB CM (NS attachment) |
| | | SV | Special brake, type VIS (DS attachment) |
| | | SVN | Special brake, type VIS (NS attachment) |
| | | U | Peak voltage strength 2.15 |
| | | 0, 1, 2, ... | Design status |

Individual items may be omitted if not required.

Up to size 355 - all numbers of poles - the bearing arrangement of the motors is designed in such a way that they can be used as follows without additional measures on the motor:

– IM B3 as IM B6, IM B7, IM B8, IM V5*, IM V6*

– IM B5 as IM V1*, IM V3*

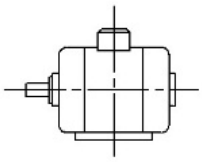
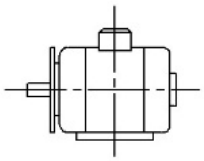
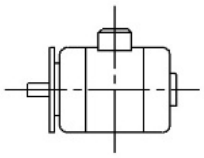
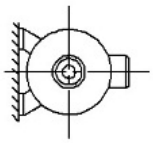
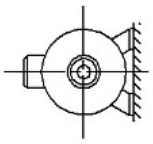
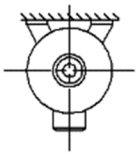
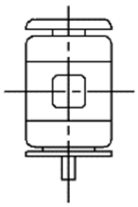
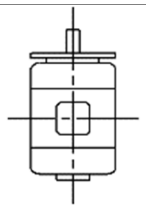
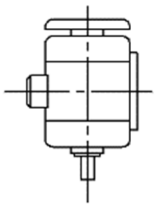
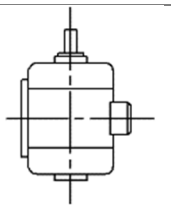
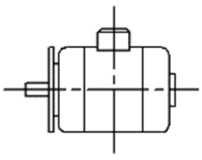
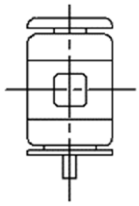
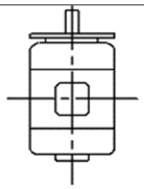
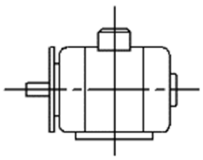
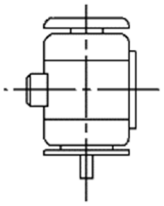
– IM B35 as IM V15*, IM V35*

– IM B14 as IM V18, IM V19

Up to size 355 - all numbers of poles - the bearing arrangement of the motors is designed in such a way that they can be used as follows without additional measures on the motor:

Exception: Vertical designs marked with * must be equipped with protection against dripping water and vertical falling in of foreign bodies

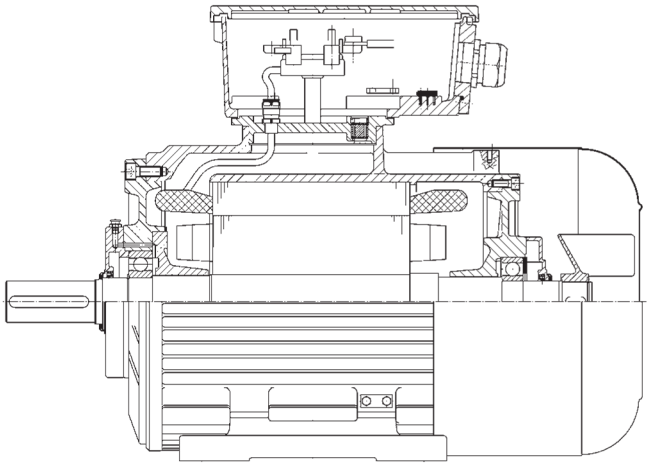
High-voltage motors from size 400 are available in IM B3, IM B35 and IM V1.

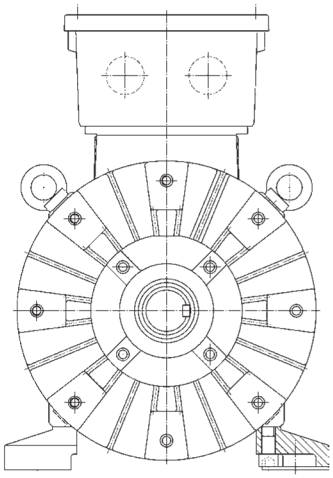
| **Available types in accordance with DIN IEC 60034 part 7** | | | | | **other types by request** |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| IEC code I<br>IEC code II<br>Explanation | IM B3<br>IM 1001<br>Foot mounting, feet at bottom | IM B35<br>IM 2001<br>Foot mounting, feet at bottom, with additional flange mounting, with access from housing side | IM B5<br>IM 3001<br>Flanged end shield at drive side, with access from housing side | IM B6<br>IM 1051<br>Foot mounting, feet on left (seen from drive side) | IM B7<br>IM 1061<br>Foot mounting, feet on right (viewed from drive side) |
| |  |  |  |  |  |
| IEC code I<br>IEC code II<br>Explanation | IM B8<br>IM 1071<br>Foot mounting, feet on top | IM V1<br>IM 3011<br>Flange mounting at drive side of flange, with access from housing side, drive side at bottom | IM V3<br>IM 3031<br>Flange mounting at drive side of flange, with access from housing side, drive side on top | IM V5<br>IM 1011<br>Foot mounting, drive side at bottom | IM V6<br>IM 1031<br>Foot mounting, drive side on top |
| |  |  |  |  |  |
| IEC code I<br>IEC code II<br>Explanation | IM B14<br>IM 3601<br>Flange mounting at drive side of flange, no access from housing side | IM V18<br>IM 3611<br>Flange mounting oatdrive side of flange, no access from housing side, drive side at bottom | IM V19<br>IM 3631<br>Flange mounting at drive side of flange, no access from housing side, drive side on top | IM B34<br>IM 2101<br>Foot installation, feet at bottom, with additional flange attachment at drive side of flange, no access from housing side | IN V15 / IN V35<br>IN 2011 / IN 2031<br>Foot mounting, with additional flange mounting at drive side of flange, drive side at bottom / on top, with access from housing side |

# Materials, signage

18

for housing, end shields, terminal compartment, ventilation





Materials for housing, end shields, terminal compartment, ventilation

| Size | Housing version | | End shield | Terminal compartment | | Fan guard | Radial fan | | Axial fan |
|---|---|---|---|---|---|---|---|---|---|
| | Housing | Feet | | Ex e | Ex d | | 2-pole | 4, 6, 8-pole | |
| 63 | Grey cast iron | Steel | Grey cast iron | Cast iron, screwed on | Cast iron, screwed on | Sheet steel | Plastic[1] | Plastic[1] | |
| 71 | | Cast iron, screwed on | | | | | | | |
| 80 | | | | | | | | | |
| 90 | | | | | | | | | |
| 100 | | | | | | | | | |
| 112 | | | | | | | | | |
| 132 | | | | | | | | | Plastic |
| 160 | | | | | | | | | |
| 180 | | | | | | | | | |
| 200 | | | | | | | | | |
| 225 | | | | | | | Cast aluminum alloy[2] | Cast aluminum alloy[2] | |
| 250 | | | | | | | | | |
| 280 | | | | | | | | | |
| 315 | | | | | | | | | |
| 355 | | | | | Steel, welded | | Steel, welded | Steel, welded | |
| 400 | Steel, welded | Steel, welded | Steel, welded | | | | | | |
| 450 | | | | | | | | | |

Note

1)For special operating conditions, e.g. low temperatures, fans in cast aluminum alloy or steel can also be supplied for the size range from 63 to 160.

2)Steel fan by request.

**Signage**

The rating plate and the test plate are combined into one plate and attached to the housing. There is a duplicate in the Ex e terminal compartment cover for motors, in accordance with the VIK regulation.

The plates are made from stainless steel (material 1.4300).

As standard, the motors are suitable for installation outdoors, in dusty and humid atmospheres (industrial climate) at ambient temperatures from -20 °C to +40 °C. Special versions are available for an increased ambient temperature range of -55 °C to +60°C. In these cases, an appropriate marking is made on the test plate.

At ambient temperatures above +30 °C, the motors must not be placed in direct sunlight. For this purpose, the motors can be equipped with a sunshield.

At ambient temperatures above +40 °C, the power may be reduced depending on the version of the motor (see page 53).

For temperatures lower than -20 °C, the motors are supplied in two versions, with or without stationary heating, according to the tables opposite.
For versions with stationary heating, the heating must be used to prevent the motor temperature from dropping below -20 °C (see page 50). Heating takes place via the motor winding.

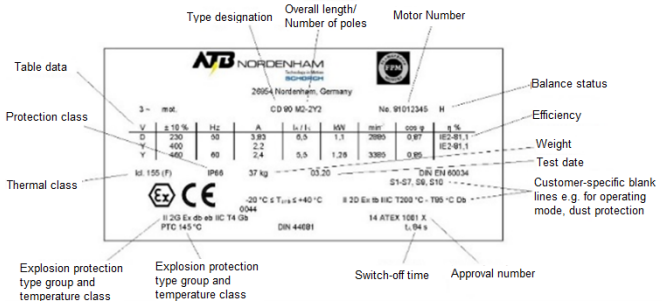
Motors for installation on board ships and in offshore areas can be designed in accordance with the regulations of the relevant classification societies. To ensure safe operation when they are used on the top deck, the motors are equipped with a number of additional structural measures (see page 37).
Type approval certificates from various ship classification societies, e.g. Germanischer Lloyd, are available for motors of this type.

Use at low temperatures with stationary heating via the motor winding

| Component | -40 °C |
|---|---|
| Marking | normal |
| Stationary heating | required |
| Fan | special |
| Cable entry | special |
| Closing plug | special |
| Temperature | special |

Use at low temperatures without stationary heating via the motor winding

| Component | -40 °C | -55 °C |
|---|---|---|
| Marking | special | special |
| Component routine | increased | increased |
| Steel components | special | special |
| Fastening screws | special | special |
| Fan | special | special |
| Eyebolts | special | special |
| Shaft seal | normal | special |
| Bearing grease | normal | special |
| Bearing | normal | special |
| Cable entry | special | special |
| Closing plug | special | special |
| Paint | normal | special |



| Paint systems | Standard paint | Standard paint Special colors in accordance with RAL | Special interior painting | Acid protection + Inshore | Offshore standard (ST) | Offshore special (SP) | Offshore in acc. with NORSOK (NO) |
|---|---|---|---|---|---|---|---|
| **Protective effect in accordance with ISO 12944** | **C2 medium C3 low** | **C2 medium C3 low** | **C2 medium** | **C3 high C4 low** | **C5-M low C4 medium** | **C5-M medium C4 high** | **C5-M high** |
| Pretreatment of the parts | all surfaces clean and grease-free, sandblasted in accordance with SA 2.5 ISO 8501-1 | | | | | | |
| 1. Primer | Cast surfaces | | | | | Two-component zinc epoxy paint min. 70 µm | Two-component zinc-epoxy primer with high zinc content, min. 75 µm |
| | Single-component alkyd resin primer, min. 20 µm | | | | | | |
| | Steel surfaces | | | | | | |
| | Single-component product based on polyvinyl butyral, min. 25 µm | | | | | | |
| 2. Primer | | | Two-component Polyacrylic based low solvent, | | Two-component epoxy primer, | Two-component polyacrylic based, low solvent content, | Two-component epoxy primer/ top coat with high solid content, |
| | | | min. 60 µm | | min. 120 µm | min. 60 µm | min. 175 µm |
| Top coat | Two-component acrylic resin single-coat paint, min. 60 µm | Two-component acrylic resin single-coat paint, min. 60 µm | | Two-component acrylic resin single-coat paint min. 80 µm | | | Two-component acrylic top coat min. 60 µm |
| Paint thickness | min. 80 µm | min. 80 µm | min. 80 µm | min. 160 µm | min. 200 µm | min. 210 µm | min. 310 µm |
| Colour | RAL 5009 | RAL | | RAL 7031, 7032 ... | | | RAL 7038 |
| Mechanical strength | non-abrasive, elastic, scratch-resistant, impact-resistant | | | | | | |
| Corrosion resistance | resistant to water, water vapour and salt water | | | | high resistance to water, water vapour and salt water | | |
| Chemical resistance | resistant to solvents, chemicals, synthetic coolants, hydraulic fluids, cleaning agents | | | | high resistance to solvents, chemicals, synthetic coolants, hydraulic fluids, cleaning agents | | |
| Temperature range | -40 °C to +130°C | | -55 °C to +130 °C | | | | |

Note: Other coatings, also isocyanate-free and certified in accordance with Frosio Level III, are available by request.

### Available protection classes in accordance with DIN IEC 60034-5

| Temperature class<br>Size | T4<br>RT ≤ 40 °C | T4<br>RT > 40 ≤ 60 °C | T6<br>RT ≤ 40 °C |
|---|---|---|---|
| 63–450 | IP55 | IP55[2)] | IP55 |
| 63–450 | IP56 | - | - |
| 63–355[3)] | IP66[1)] | - | - |
| 63–315[4)] | IP55 | IP55[2)] | - |

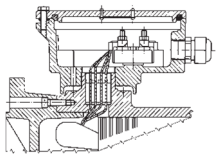
Notes:
1) IP66 not provided for in DIN EN 60034 Part 5
2) Power adjustment required
3) Bigger motors by request
4) Series CD...X

### Tropicalized design

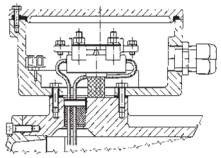
For use under the special climatic influences of the tropics, we recommend the following version:

- Protection class IP56
- Stainless steel screws
- Double stator winding impregnation
- Special interior painting
- Inshore painting

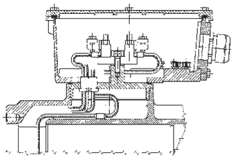
This provides optimum protection against moisture and mould infestation.



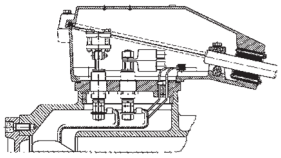
Size 63-112



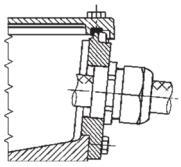
Size 132-160



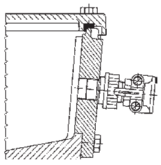
Size 180-280 (450) from size 315 with bolt leadthrough



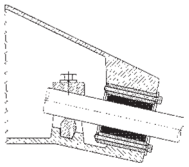
Size 250-315 (450)
Size 250 and 280 with terminal board like size 180-280



Version 1
Cable entry in accordance with EN 60079-7
(stuffing box gland) for introducing fixed cables



Version 3
Cable entry gland in accordance with EN 600
Version 3
Cable entry gland in accordance with EN 600
Version 3



Version 9
Divided terminal box with strain relief clamp inside, cable entry in accordance with EN 60079-7

**Protection class**
The terminal compartments comply with ignition protection type "Increased safety" Ex e II for gas explosion protection in accordance with EN 60079-7 and protection type IP56 in accordance with DIN EN 60034 Part 5 or protection typw Ex d IIC in accordance with EN 60079-1.
For dust explosion protection, they are designed in protection type IP 66 in accordance with EN 60079-31.
With igniton protection type Ex e II and dust explosion protection, they are equipped with a cable entry which and an oil-resistant cover seal which are correspond to the protection type. The cover screws are protected against corrosion and captive (not with high voltage).
Cable entries for ignition protection type Ex d IIC available by request.

**Position and twistability**
The terminal compartments are located on top of the motors as standard. They can also be located at the side by request. From size 63 and above they can each be rotated by 4 x 90 degrees to allow connection from all directions.
A universal housing is also available for sizes 80 to 180 so that the terminal compartment can also be converted at a later date from top to side, for example. From size 132 and above, this can be done without turning the leadthrough plate. Additionally mounted auxiliary terminal compartments may restrict the rotation of the main terminal compartment.

**Cable leadthroughs and connecting terminals**
The winding leads are routed into the terminal compartment via flameproof cable leadthroughs.
With low-voltage motors, multiple or single leadthroughs are used for AC voltage up to at least 690 V.
Special versions for 1100 V are possible (additional price). High-voltage motors are provided with individual leadthroughs in accordance with the rated voltage. Sizes 315-450 have terminals for cable-shoe-less connection placed directly on the leadthrough connectors.

**Terminal compartments, standard version Ex e II**
The terminal compartments of the low-voltage motors are provided with metric threads, assigned in accordance with DIN 42 925 with cable entries in accordance with DIN EN 50 262, and certified in accordance with DIN EN 60079-7. From size 180, they are equipped with a screw-on plate. Longitudinally divided terminal compartments are also available for sizes 250 and larger.
An additional terminal compartment for thermal monitoring or stationary heating is available by request from size 80. It is screwed to the engine terminal compartment. Additional terminal compartments with two terminals are possible up to size 112, and from size 132 four and more terminals can be implemented. For sizes 355 to 450, it is fitted to the housing.
Terminal compartments for high-voltage motors correspond to DIN 42 962. The neutral point is implemented in a second terminal compartment by request. The boxes comply with protection type "Increased safety" Ex e II in accordance with EN 60079-7 and are supplied in version 9. The different cable entry parts (additional price) and the assignment of the threads to the cable entry parts can be found in the table on page 22.

### Entries of the mains supply lines for Ex e terminal compartments

| Ver-sion | Size | 63 71 80 90 | 100 112 132 | 160 180 | 200 225 | 250 280 315 | 355 400-450 | High Voltage |
|---|---|---|---|---|---|---|---|---|
| 1 | Thread version | M25 x1.5 | M32 x1.5 | M40 x1.5 | M50 x1.5 | M63 x1.5 | M75x1,5 | M63 x1.5 |
| | for cable outer Ø mm | 8-17.5 | 14-21 | 19-28 | 24-35 | 29-48 | 50-65 | 29-48 |
| 3 | Thread version | M25 x1.5 | M32 x1.5 | M40 x1.5 | M50 x1.5 | M63 x1.5 | by request | by request |
| | for cable outer Ø mm | 11-16 | 15-20 | 19-27 | 28-34 | 38-46 | by request | by request |
| 9 | for cable outer Ø mm | unavailable | | | | 1x Ø 48-70<br>2x Ø 24-54 | 1x Ø 48-70<br>2x Ø 48-70 | 1x Ø 24-54 |

Notes

= Normal version

From size 132 in pole-changing version orY/Δstart-up 2 mains entries each.
For thermal monitoring in all versions, 1x additional cable entry M25 x1.5.
For heating in all versions, 1x additional cable entry M25 x1.5.
For rated currents greater than 400 A, the terminal compartments have with 2 mains entries.

### Clampable cross sections with Ex e for low voltage

| Size | Rated cross-section max. mm² | Rated current max. [A] | Terminal type | Number of terminals | Connection thread |
|---|---|---|---|---|---|
| **63-112** | 4 | 25 | U-clamp[2)] | 6 | M5 |
| **132, 160** | 10 | 63 | U-clamp[2)] | 6 | M6 |
| **180-225** | 70 | 100 | Strap clamp[2)] | 6 | M8 |
| **250-280** | 120 | 250 | Strap clamp[2)] | 6 | M12 |
| **315 S, M, L1** | 150 | 3151[1)] | Round clamp[2)] | 6 | M12 |
| **315 L2, L3-450** | 300 | 400[1)] | Round clamp[2)] | 6 | M16 |
| **355-450** | 400 | 630[1)] | Universal terminal[3)] | 6 | M20 |

Note
1) Material: Cu
2) Connection with cable shoe without terminal possible
3) suitable for connection with cable lug

**Terminal compartment Ex d IIC**
The terminal compartments correspond with protection type "Ex d IIC" in accordance with EN 60079-1. In the standard version, the terminal compartments are provided with a threaded hole in accordance with DIN-ISO-13. Different thread versions such as NPT can also be supplied by request. The thread dimensions must be specified when ordering.

**Note:** Cable entry parts in enclosures with type of protection Ex d IIC must also correspond to EN 60079-1 and be certified.
These parts are not included in the scope of delivery.
Flameproof terminal compartments are also available for high voltage motors.

### Entry thread for Ex d terminal compartments for low-voltage motors

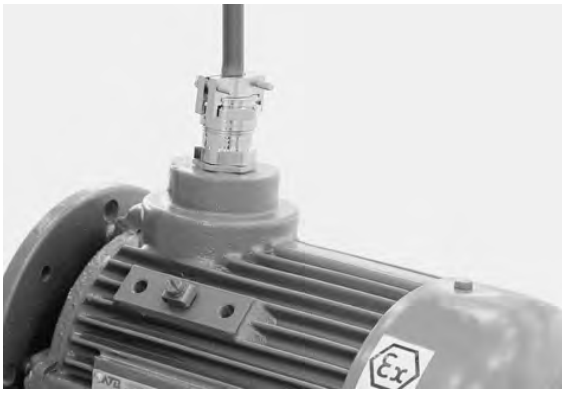
| Size | 63 71 80 90 | 100 112 132 | 160 180 | 200 225 | 250 280 315 | 355–450 |
|---|---|---|---|---|---|---|
| **Thread version ISO-DIN 13** | M25 x1,5 | M32 x1,5 | M40 x1,5 | M50 x 1,5 | M63 x1,5 | M75 x1.5 |
| **Nema-Version NPT** | 3/4'' | 1'' | 1 1/4'' | 1 1/2'' | 2" | 3" |

**3 ends 400V[1)], 6 ends 400/690V[1)] - cableNSSHöu[1)]**

| Size | Number of poles | **3 winding leads + PE - Direct connection** without temperature monitoring | with temperature monitoring | **6 Winding leads + PE -Y / Δ Start-up - pole-changing** without temperature monitoring | with temperature monitoring |
|---|---|---|---|---|---|
| 63 | 2-4 | 1 cable<br>4 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 13 mm | 1 cable<br>7 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 17.5 mm | 1 cable<br>7 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 17.5 mm | 1 cable<br>10 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 19.5 mm |
| 71 | 2-8 | | | | |
| 80 | 2-8 | | | | |
| 90 | 2-8 | | | | |
| 100 | 2-8 | | | | |
| 112 | 2-8 | | | | |
| 132 | 2-8 | 1 cable<br>4 cores<br>Cross section 4 mm²<br>max. 36 A<br>Outer Ø approx. 18 mm | 2nd additional<br>cable with 4 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 13 mm | 2 cables<br>4 cores each<br>Cross section 6 mm²<br>max. 36 A<br>Outer Ø approx. 18.8 mm | |
| 160 | 2-8 | | | | |
| 180 | 2-8 | 1 cable<br>4 cores<br>Cross section 10 mm²<br>max. 265 A<br>Outer Ø approx. 23 mm | | | 3rd additional<br>cable with 4 cores<br>Cross section 1.5 mm²<br>max. 20 A<br>Outer Ø approx. 13 mm |
| 200 | L1-2 | | | | |
| | 4-8 | | | | |
| | L2-2 | | | | |
| 225 | 2-4 | 1 cable<br>4 cores<br>Cross section 16 mm²<br>max. 87 A<br>Outer Ø approx. 28 mm | | 2 cables<br>4 cores each<br>Cross section 16 mm²<br>max. 87 A<br>Outer Ø approx. 28 mm | |
| 250 | 2-4 | for 500 V only<br>1 cable<br>4 cores<br>Cross section 16 mm²<br>max. 87 A<br>Outer Ø approx. 28 mm | | | |
| 280 | 2–8 | for 690 V only | | | |

Notes:
Cable included in scope of delivery. Cable length 1.5 m. Special lengths possible by request.

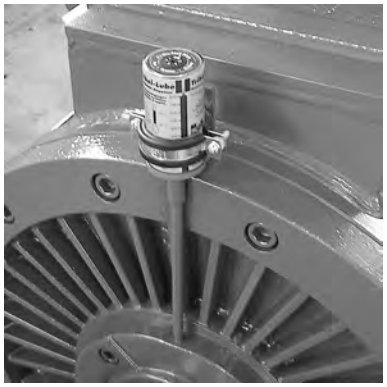
1) Standard power 50 Hz. In the event of deviating data, the permissible currents of the cables must be observed.
Other cable types such as Ölflex or MPRXCX available by request.



Motor with direct cable entry

**Bearing seal**
The external bearing sealing of the motors taks place using a radial or axial seal. Vertical designs with a shaft pointing upwards can be supplied with a combined radial and axial seal by request. This prevents water from entering the bearing housing along the shaft. The seals have good abrasion resistance and temperature resistance. They are resistant to mineral oils, salt solutions and diluted acids. Seals for media which have not been mentioned by request.

**Lubrication**
The bearings of the motors up to size 280 have lifetime lubrication. The grease filling with polyurea grease that is required for the deep groove ball bearing that is sealed at both sides has already been provided by the bearing manufacturer. Measures have therefore been taken to achieve a maintenance-free run time in accordance with the top table on page 31.



Long-term dispenser

**Relubrication and relubrication intervals**

Motors from size 315 are equipped with relubrication devices with a grease distributor. Grease relubrication devices are also provided for motors of size 225 and bigger which have to be equipped with roller bearings for load reasons.

Bearing arrangements with a relubrication device receive a filling consisting of lithium saponified grease. The relubrication times can be found in the table on page 31.

In the case of a vertical design (V design), the relubrication times must be halved.

Relubrication must be carried out with the same type of grease, i.e. the same saponification component and the same consistency. For this purpose, ATB uses a lithium saponified rolling bearing grease with a

drip point > 185 °C (e.g. Mobil Unirex N 3), see also information plate on motor.

The collection space in the bearing cover for the escaping used grease is designed to be large enough to accommodate the quantity of grease that will be produced during the nominal service life. Flat grease nipples to DIN 3404 with an M10x1 thread are used as grease nipples.

It is possible to use long-term dispensers for relubrication. Depending on the application, a maintenance-free period of up to 12 months can be achieved. The dispensers are designed with protection type II 2G Ex ib IIC T6.

**Nominal service life**

The calculated service life is more than 50,000 operating hours in pure coupling operation.

The max. permissible radial and axial loads are specified in the tables on pages 27 to 29. A roller bearing service life of

20,000 hrs was taken as the basis for the calculation.

Drives with higher radial loads, such as belt drives, can be equipped with roller bearings at additional cost, see page 29. It should be noted that the specified minimum radial load must always be present to ensure that proper rolling takes place in the bearing. Special solutions are available by request for higher axial loads, such as the ones which may occur with helical gearing.

## IE1 version

| Series CD .. | Number of poles | DS bearing, all types Standard (fixed bearing) | | reinforced bearing [2] | NS bearing all designs (floating bearing) |
|---|---|---|---|---|---|
| 63 | 2, 4 | 6202 2Z | - | - | 6004 2Z |
| 71 | 2, 4, 6, 8 | 6202 2Z | - | - | 6004 2Z |
| 80 | 2, 4, 6, 8 | 6204 2Z | - | - | 6204 2Z |
| 90 | 2, 4, 6, 8 | 6205 2Z | - | - | 6205 2Z |
| 100 | 2, 4, 6, 8 | 6206 2Z C3 | - | NU 206 | 6206 2Z C3 |
| 112 | 2, 4, 6, 8 | 6306 2Z C3 | - | NU 306 | 6206 2Z C3 |
| 132 | 2, 4, 6, 8 | 6308 2Z C3 | - | NU 308 | 6308 2Z C3 |
| 160 | 2, 4, 6, 8 | 6309 2Z C3 | - | NU 309 | 6309 2Z C3 |
| 180 | 2, 4, 6, 8 | 6310 2Z C3 | - | NU 310 | 6310 2Z C3 |
| 200 | 2, 4, 6, 8 | 6312 2Z C3 | - | NU 312 | 6312 2Z C3 |
| 225 | 2, 4, 6, 8 | 6313 2Z C3 | - | NU 313 | 6313 2Z C3 |
| 250 | 2, 4, 6, 8 | 6315 2Z C3 | - | NU 315 | 6313 2Z C3 |
| 280 | 2, 4, 6, 8 | 6316 2Z C3 | - | NU 316 | 6315 2Z C3 |
| 315 | 2 | 6316 C3 | - | NU 316 | 6316 C3 |
| | 4, 6, 8 | 6318 C3 | - | NU 318 | 6316 C3 |
| 355 | 2 | 6318 C3 | - | NU 318 | 6318 C3 |
| | 4, 6, 8 | 6320 C3 | - | NU 320 | 6318 C3 |
| | | | **Design only V1 [1], V3 [1]** | | **Design B3, B5** |
| 400 | 2 | 6318 C3 | 7318 B | NU 318 | by request |
| | 4, 6, 8 | 6322 C3 | 7322 B | NU 322 | by request |
| 450 | 2 | 6318 C3 | 7318 B | NU 318 | by request |
| | 4, 6, 8 | 6324 C3 | 7324 B | NU 324 | by request |

**Note**
1) only suitable for vertical operation
2) Minimum radial load required, see page 29, NS designed as fixed bearing

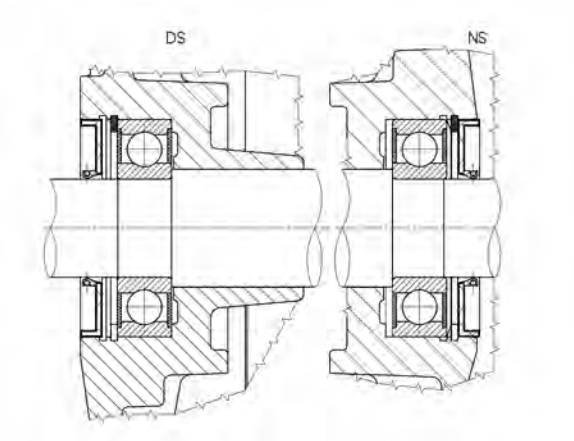
### Bearing type explanation:

Example 6315.2Z.WT,C3
6315 = Bearing size
2Z (2ZR) = non-abrasive double seal
C3 = bearing clearance
WT = polyurea grease

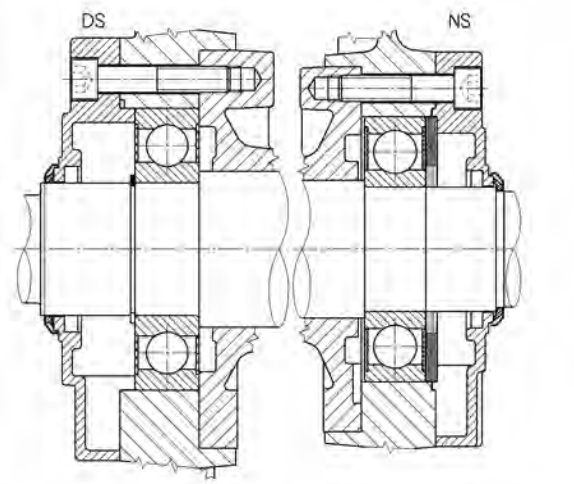
## IE2, IE3 and MEPS version

| Series CD ... Y2, Y3, Y | Number of poles | DS bearing, all types Standard (fixed bearing) | reinforced bearing [2] | NS bearing CD ... Y2, Y3, Y |
|---|---|---|---|---|
| 71 | 2, 4, 6, 8 | 6202 2ZR | | 71 |
| 80 | 2, 4, 6, 8 | 6205 2Z | | 80 |
| 90 | 2, 4, 6, 8 | 6206 2Z C3 | | 90 |
| 100 | 2, 4, 6, 8 | 6306 2Z C3 | NU 306 | 100 |
| 112 | 2, 4, 6, 8 | 6308 2Z C3 | NU 308 | 112 |
| 132 | 2, 4, 6, 8 | 6308 2Z C3 | NU 308 | 132 |
| 160 | 2, 4, 6, 8 | 6309 2Z C3 | NU 309 | 160 |
| 180 | 2, 4, 6, 8 | 6310 2Z C3 | NU 310 | 180 |
| 200 | 2, 4, 6, 8 | 6312 2Z C3 | NU 312 | 200 |
| 225 | 2, 4, 6, 8 | 6313 2Z C3 | NU 313 | 225 |
| 250 | 2, 4, 6, 8 | 6315 2Z C3 | NU 315 | 250 |
| 280 | 2, 4, 6, 8 | 6316 2Z C3 | NU 316 | 280 |
| 315 | 2 | 6316 C3 | NU 316 | 315 |
| | 4, 6, 8 | 6318 C3 | NU 318 | |
| 355 | 2 | 6318 C3 | NU 318 | 355 |
| | 4, 6, 8 | 6320 C3 | NU 320 | |

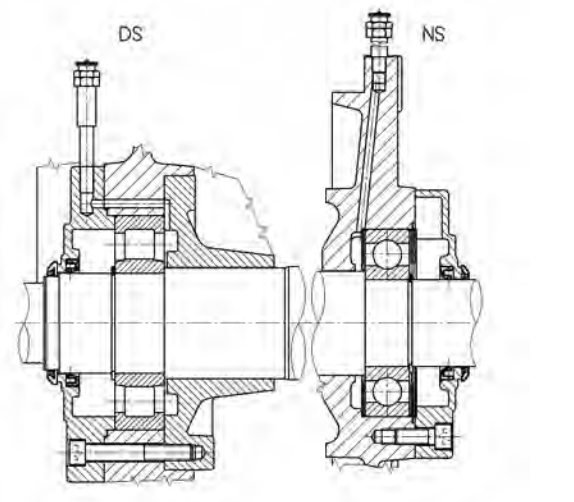
| Series CD ...XY | Number of poles | DS bearing, all types Standard (fixed bearing) | reinforced bearing [2] | NS bearing CD ...XY |
|---|---|---|---|---|
| 250S | 2, 4, 6, 8 | 6315 2Z C3 | NU 315 | 250S |
| 250M | 2, 4, 6, 8 | 6316 2Z C3 | NU 316 | 250M |
| 280S | 2, 4, 6, 8 | 6316 2Z C3 | NU 316 | 280S |
| 280M | 2 | 6316 C3 | NU 316 | 280M |
| | 4, 6, 8 | 6318 C3 | NU 318 | |
| 315 | 2 | 6316 C3 | NU 316 | 315 |
| | 4, 6, 8 | 6318 C3 | NU 318 | |



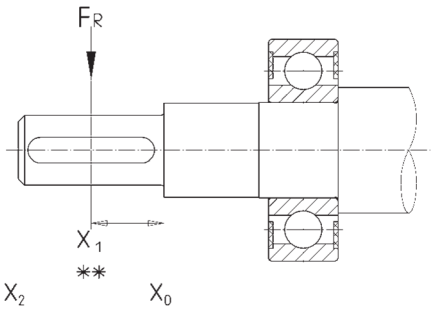

DS fixed bearing with radialy shaft seal, standard for sizes 63 to 160




DS fixed bearing with axial shaft seal, standard from size 180




DS reinforced bearing (floating bearing; optional from size 100) with relubrication (optional from size 225) and combination seal (optional from size 80)




The distance of the point of application of the force $F_R$ from the shaft shoulder should not exceed the length of the shaft end.

$F_R$ = max. radial axial force (e.g. belt pull + weight of pulley) [N]

$$F = Belt\ pull\ [N] = \frac{2 \times K \times M}{D}$$

$$M = Torque\ [Nm] = \frac{9550 \times P}{n}$$

P = Nominal motor power [kW]
n = Nominal motor speed [rpm]
D = Pulley diameter [m]
K = Pretension factor, which depends on the belt type, it is approximately assumed as follows

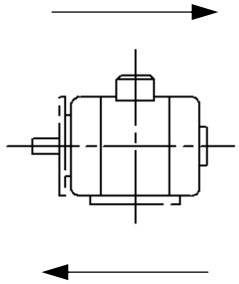
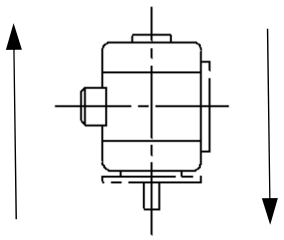
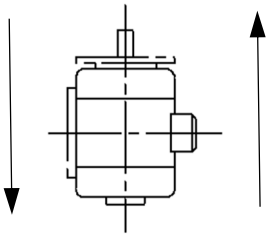
K = 3 for normal flat belts without tensioner pulley
K = 2 for normal flat belts with tensioner pulley
K = 2.2 for V-belts or special flat belts

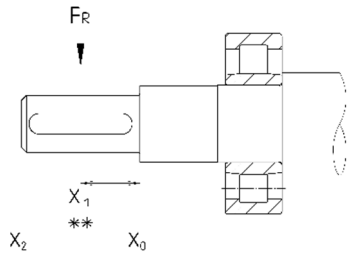
Specifications for size 400 and larger apply to horizontal shaft only.

Permissible radial bearing load $F_R$ [N] (deep groove ball bearing). 50 Hz

| Size | Number of poles | $x_2$ | $x_1$ | $x_0$ |
|---|---|---|---|---|
| **63** | 2 | 400 | 420 | 450 |
| | 4 | 500 | 540 | 570 |
| **71** | 2 | 390 | 420 | 450 |
| | 4 | 490 | 530 | 570 |
| | 6 | 560 | 600 | 650 |
| | 8 | 610 | 660 | 720 |
| **80** | 2 | 650 | 710 | 780 |
| | 4 | 830 | 900 | 980 |
| | 6 | 940 | 1020 | 1120 |
| | 8 | 1040 | 1130 | 1240 |
| **80 Y** | 2 | 700 | 770 | 840 |
| **90** | 4 | 880 | 970 | 1060 |
| | 6 | 1010 | 1100 | 1220 |
| | 8 | 1110 | 1220 | 1340 |
| **90 Y** | 2 | 950 | 1050 | 1160 |
| **100** | 4 | 1200 | 1310 | 1460 |
| | 6 | 1360 | 1500 | 1670 |
| | 8 | 1510 | 1660 | 1840 |
| **100 Y** | 2 | 1400 | 1540 | 1700 |
| **112** | 4 | 1760 | 1930 | 2130 |
| | 6 | 2010 | 2200 | 2440 |
| | 8 | 2220 | 2430 | 2690 |
| **112 Y** | 2 | 1960 | 2160 | 2400 |
| **132 (Y)** | 4 | 2450 | 2700 | 3000 |
| | 6 | 2810 | 3090 | 3430 |
| | 8 | 3110 | 3430 | 3810 |
| **160 (Y)** | 2 | 2340 | 2590 | 2890 |
| | 4 | 2960 | 3270 | 3650 |
| | 6 | 3370 | 3730 | 4160 |
| | 8 | 3720 | 4110 | 4590 |
| **180 (Y)** | 2 | 3180 | 3530 | 3970 |
| | 4 | 3970 | 4410 | 4960 |
| | 6 | 4550 | 5060 | 5700 |
| | 8 | 5010 | 5570 | 6270 |
| **200 (Y)** | 2 | 3900 | 4280 | 4700 |
| | 4 | 4930 | 5410 | 6000 |
| | 6 | 5650 | 6190 | 6900 |
| | 8 | 6210 | 6800 | 7500 |
| **225 (Y)** | 2 | 4400 | 4800 | 5200 |
| | 4 | 5300 | 5800 | 6500 |
| | 6 | 6000 | 6700 | 7500 |
| | 8 | 6700 | 7400 | 8300 |
| **250 (Y)** | 2 | 5300 | 5800 | 6400 |
| | 4 | 6600 | 7200 | 8000 |
| | 6 | 7600 | 8300 | 9200 |
| | 8 | 8300 | 9100 | 10100 |
| **280 (Y)** | 2 | 5800 | 6200 | 6800 |
| **250M XY** | 4 | 7200 | 7800 | 8500 |
| | 6 | 8400 | 9100 | 9900 |
| | 8 | 7700 | 8700 | 10000 |
| **315 (Y)** | 2 | 5200 | 5600 | 5900 |
| **280M XY** | 4 | 7500 | 8100 | 8800 |
| | 6 | 8400 | 9100 | 9900 |
| | 8 | 7600 | 8232 | 8979 |
| **355 (Y)** | 2 | 6300 | 6600 | 7000 |
| | 4 | 9200 | 9800 | 10400 |
| | 6 | 10300 | 10900 | 11700 |
| | 8 | 10280 | 10941 | 11692 |
| **400** | 2 | 5100 | 5400 | 5700 |
| | 4 | 9300 | 10000 | 10800 |
| | 6 | 10500 | 11300 | 12100 |
| | 8 | 11400 | 12200 | 13100 |
| **450** | 2 | 4100 | 4400 | 4600 |
| | 4 | 8300 | 8800 | 9500 |
| | 6 | 9200 | 9900 | 10600 |
| | 8 | 10100 | 10700 | 11500 |

Permissible axial bearing load $F_A$ [N]. 50Hz

| for designs | Size | 3000 rpm Load according to | | 1500 rpm Load according to | | 1000 rpm Load according to | | 750 rpm Load according to | |
|---|---|---|---|---|---|---|---|---|---|
| | | ← N | N → | ← N | N → | ← N | N → | ← N | N → |
| IM B3, IM B5, IM B35 | **63** | 200 | 500 | 300 | 600 | - | - | - | - |
|  | **71** | 200 | 500 | 300 | 600 | 400 | 700 | 500 | 800 |
| | **80** | 500 | 700 | 700 | 800 | 800 | 1000 | 1000 | 1100 |
| | **80 Y / 90** | 500 | 700 | 700 | 900 | 900 | 1100 | 1000 | 1200 |
| | **90 Y / 100** | 900 | 1000 | 1200 | 1300 | 1400 | 1500 | 1500 | 1700 |
| | **100 Y / 112** | 1300 | 1400 | 1700 | 1800 | 200 | 2200 | 2300 | 2400 |
| | **112 Y / 132 (Y)** | 1700 | 2100 | 2300 | 2700 | 2800 | 3200 | 3100 | 3600 |
| | **160 (Y)** | 2100 | 2700 | 3000 | 3500 | 3500 | 4100 | 4000 | 4600 |
| | **180 (Y)** | 2500 | 3200 | 3400 | 4100 | 4100 | 4800 | 4600 | 5400 |
| | **200 (Y)** | 3200 | 4100 | 4400 | 5300 | 5300 | 6200 | 6100 | 6900 |
| | **225 (Y)** | 3400 | 4900 | 4800 | 6300 | 5700 | 7300 | 6600 | 8100 |
| | **250 (Y)** | 4300 | 5800 | 5900 | 7400 | 7100 | 8600 | 8100 | 9600 |
| | **280 (Y)** | 4500 | 6300 | 6200 | 8000 | 7600 | 9400 | 8500 | 10300 |
| | **315 (Y)** | 4100 | 5900 | 6600 | 8600 | 7800 | 9800 | 9100 | 11100 |
| | **355 (Y)** | 4700 | 6700 | 6800 | 10400 | 8400 | 12000 | 9900 | 13500 |
| | **400** | 4200 | 6200 | 7300 | 11300 | 8700 | 12700 | 9900 | 13900 |
| | **450** | 3700 | 5700 | 6300 | 10700 | 7900 | 13200 | 9100 | 13500 |
| | | ↓N | N ↑ | ↓N | N ↑ | ↓N | N ↑ | ↓N | N ↑ |
| IM V1, IM V5, IM V15 | **63** | 200 | 500 | 600 | 400 | - | - | - | - |
|  | **71** | 200 | 500 | 300 | 600 | 400 | 700 | 500 | 800 |
| | **80** | 500 | 700 | 700 | 900 | 800 | 1000 | 900 | 1200 |
| | **80 Y / 90** | 500 | 800 | 700 | 1000 | 800 | 1200 | 900 | 1300 |
| | **90 Y / 100** | 800 | 1100 | 1100 | 1400 | 1300 | 1600 | 1400 | 1800 |
| | **100 Y / 112** | 1200 | 1500 | 1600 | 2000 | 1900 | 2400 | 2200 | 2600 |
| | **112 Y / 132 (Y)** | 1500 | 2300 | 2100 | 3000 | 2500 | 3500 | 2900 | 3900 |
| | **160 (Y)** | 1800 | 3100 | 2600 | 4000 | 3100 | 4700 | 3500 | 5200 |
| | **180 (Y)** | 2100 | 3700 | 2800 | 4900 | 3400 | 5600 | 4000 | 6300 |
| | **200 (Y)** | 2600 | 4900 | 3700 | 6300 | 4500 | 7300 | 5100 | 8200 |
| | **225 (Y)** | 2600 | 5900 | 3700 | 7700 | 4500 | 8900 | 5400 | 9800 |
| | **250 (Y)** | 3300 | 7100 | 4500 | 9300 | 5500 | 10700 | 6300 | 12000 |
| | **280 (Y)** | 3000 | 8300 | 4100 | 10800 | 5500 | 12100 | 6100 | 13700 |
| | **315 (Y)** | 600 | 10400 | 1800 | 14900 | 2000 | 17600 | 3300 | 18900 |
| | **355 (Y)** | 100 | 12800 | 700 | 18800 | 1100 | 21900 | 2500 | 23400 |
| | **400** | 7300 | 0 | 19400 | 0 | 22100 | 0 | 23600 | 0 |
| | **450** | 4800 | 0 | 14700 | 0 | 16900 | 0 | 18000 | 0 |
| | | ↓N | N ↑ | ↓N | N ↑ | ↓N | N ↑ | ↓N | N ↑ |
| IM V3, IM V6, IM V35 | **63** | 500 | 200 | 600 | 400 | - | - | - | - |
|  | **71** | 500 | 200 | 600 | 400 | 700 | 500 | 700 | 500 |
| | **80** | 600 | 500 | 800 | 700 | 900 | 900 | 1100 | 1000 |
| | **80 Y / 90** | 700 | 600 | 900 | 800 | 1000 | 1000 | 1100 | 1100 |
| | **90 Y / 100** | 900 | 900 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 |
| | **100 Y / 112** | 1300 | 1400 | 1700 | 1900 | 2000 | 2200 | 2300 | 2500 |
| | **112 Y / 132 (Y)** | 2000 | 1900 | 2500 | 2600 | 2900 | 3100 | 3300 | 3400 |
| | **160 (Y)** | 2400 | 2600 | 3100 | 3500 | 3600 | 4200 | 4000 | 4700 |
| | **180 (Y)** | 2800 | 3000 | 3600 | 4100 | 4200 | 4900 | 4700 | 5600 |
| | **200 (Y)** | 3500 | 4100 | 4600 | 5400 | 5300 | 6500 | 5900 | 7300 |
| | **225 (Y)** | 4100 | 4400 | 5200 | 6200 | 6000 | 7400 | 6900 | 8300 |
| | **250 (Y)** | 4800 | 5600 | 6100 | 7700 | 7100 | 9200 | 7800 | 10500 |
| | **280 (Y)** | 4800 | 6500 | 5900 | 900 | 7300 | 10300 | 7900 | 11900 |
| | **315 (Y)** | 2400 | 8600 | 3800 | 12900 | 4000 | 15600 | 5300 | 16900 |
| | **355 (Y)** | 2100 | 10800 | 4300 | 15200 | 4700 | 18300 | 6100 | 19800 |
| | **400** | 7300 | 0 | 19400 | 0 | 22100 | 0 | 23600 | 0 |
| | **450** | 4800 | 0 | 14700 | 0 | 16900 | 0 | 18000 | 0 |




The distance of the point of application of the force $F_R$ from the shaft shoulder should not exceed the length of the shaft end.

$F_R$ = max. radial axial force (e.g. belt pull + weight of pulley) [N]

$$F = Belt\ pull\ [N] = \frac{2 \times K \times M}{D}$$

$$M = Torque\ [Nm] = \frac{9550 \times P}{n}$$

P = Nominal motor power [kW]
n = Nominal motor speed [rpm]
D = Pulley diameter [m]
K = Pretension factor, which depends on the belt type, it is approximately assumed as follows
K = 3 for normal flat belts without tensioner pulley
K = 2 for normal flat belts with tensioner pulley
K = 2.2 for V-belts or special flat belts

Specifications for size 400 and larger apply to horizontal shaft only.

**Minimum load $F_R$ min with $x_0$**
Due to their reinforced design, the bearings must be loaded with at least the forces specified in the table. Even an unloaded test run can lead to damage.

Permissible radial bearing load $F_R$ [N] (cylindrical roller bearing), minimum load.

| Size | Number of poles | $x_2$ | $x_1$ | $x_0$ | $F_{R\,min}$ with $x_0$ |
|---|---|---|---|---|---|
| **100** | 2 | 2759 | 3033 | 3367 | 220 |
| | 4 | 3392 | 3729 | 4139 | 205 |
| | 6 | 3826 | 4206 | 4669 | 200 |
| | 8 | 4176 | 4590 | 5095 | 198 |
| **100 Y** | 2 | 3702 | 4054 | 4480 | 277 |
| **112** | 4 | 3766 | 4984 | 5507 | 255 |
| | 6 | 3766 | 5621 | 6212 | 248 |
| | 8 | 3766 | 6137 | 6780 | 245 |
| **112 Y** | 2 | 5782 | 6363 | 7073 | 475 |
| **132 (Y)** | 4 | 6451 | 7814 | 8686 | 428 |
| | 6 | 6451 | 8818 | 9802 | 412 |
| | 8 | 6451 | 9641 | 10717 | 404 |
| **160 (Y)** | 2 | 3900 | 5582 | 7958 | 599 |
| | 4 | 3900 | 5582 | 9803 | 536 |
| | 6 | 3900 | 5582 | 9803 | 515 |
| | 8 | 3900 | 5582 | 9803 | 505 |
| **180 (Y)** | 2 | 7912 | 8735 | 9749 | 748 |
| | 4 | 8900 | 10715 | 11959 | 662 |
| | 6 | 8900 | 12108 | 13513 | 633 |
| | 8 | 8900 | 13196 | 14727 | 619 |
| **200 (Y)** | 2 | 10869 | 11918 | 13191 | 1102 |
| | 4 | 12180 | 14680 | 16248 | 957 |
| | 6 | 12180 | 16575 | 18345 | 909 |
| | 8 | 12180 | 18050 | 19978 | 885 |
| **225 (Y)** | 2 | 12850 | 14319 | 15672 | 1302 |
| | 4 | 12850 | 17158 | 19220 | 1124 |
| | 6 | 12850 | 19377 | 21706 | 1065 |
| | 8 | 12850 | 19392 | 23719 | 1035 |
| **250 (Y)** | 2 | 12300 | 18385 | 20871 | 1795 |
| | 4 | 12300 | 18385 | 25620 | 1519 |
| | 6 | 12300 | 18385 | 28920 | 1427 |
| | 8 | 12300 | 18385 | 31497 | 1381 |
| **280 (Y)** | 2 | 15300 | 20423 | 22313 | 2060 |
| | 4 | 15300 | 22611 | 27359 | 1733 |
| | 6 | 15300 | 22611 | 31044 | 1624 |
| | 8 | 15300 | 22611 | 31044 | 1570 |
| **315 (Y)** | 2 | 9800 | 14183 | 21892 | 2060 |
| L2, L3 | 2 | 5800 | 8394 | 15187 | 2060 |
| **315 (Y)** | 4 | 13500 | 20566 | 32744 | 2228 |
| L2, L3 | 4 | 8500 | 12949 | 27171 | 2228 |
| **315 (Y)** | 6,8 | 12500 | 19043 | 36426 | 2073 |
| L2, L3 | 6,8 | 7600 | 11578 | 24294 | 2073 |
| **355 (Y)** | 2 | 16800 | 24127 | 25751 | 2692 |
| L3 | 2 | 15000 | 21542 | 25481 | 2692 |
| **355 (Y)** | 4 | 12400 | 18475 | 36219 | 2930 |
| L3 | 4 | 12000 | 17879 | 35051 | 2930 |
| **355 (Y)** | 6 | 10280 | 15316 | 30027 | 2698 |
| | 8 | 10280 | 15316 | 30027 | 2698 |
| **400** | 2 | 22171 | 23265 | 24472 | 2581 |
| | 4 | 20000 | 30096 | 45197 | 3675 |
| | 6 | 19000 | 28591 | 50501 | 3369 |
| | 8 | 18000 | 27087 | 54618 | 3216 |
| **450** | 2 | 20598 | 21823 | 23202 | 2692 |
| | 4 | 40000 | 47774 | 51495 | 4409 |
| L2 | 4 | 34200 | 47537 | 50949 | 4409 |
| ***450*** | *6* | *32500* | *49311* | *56917* | *4023* |
| | 8 | 31000 | 47034 | 61566 | 3829 |

Values for high-voltage motors by request.

## Rotor weights for CD ...(Y2,Y3,Y) series

**Rotor weights [kg]**

| Size | | Type Y | 2p = 2<br>3000 rpm | 2p = 4<br>1500 rpm | 2p = 6<br>1000 rpm | 2p = 8<br>750 rpm |
|---|---|---|---|---|---|---|
| **63 Y2,Y3,Y** | M1 | | by request | 1,6 | --- | --- |
| | M2 | | by request | 1,9 | --- | --- |
| **63** | M1 | | 1,5 | 1,8 | | |
| | M2 | | 1,5 | 1,8 | | |
| **71** | M1 | | 1,4 | 1,5 | | |
| | M2 | | 1,6 | 1,9 | 2,6 | 2,6 |
| **80** | M1 | | 2,2 | 2,7 | 3,7 | 3,7 |
| | M2 | | 2,7 | 3,3 | 4,5 | 4,5 |
| **90** | S | 80M1…Y2,Y3,Y | 3 | 3,7 | 4,5 | 4,5 |
| | L | 80M2…Y2,Y3,Y | 3,5 | 4,4 | 5,8 | 5,8 |
| **100** | L | | 4,9 | | 8,4 | |
| | L1 | 90S…Y2,Y3,Y | 4,9 | 5,8 | 6,9 | 6,9 |
| | L2 | 90L…Y2,Y3,Y | 5,6 | 6,8 | 8,4 | 8,4 |
| **112** | M | 100L…Y2,Y3,Y | 6,5 | 9,9 | 12,1 | 12,1 |
| **132** | S | 112M…Y2,Y3,Y | | 15,2 | 19 | 17,6 |
| | S1 | 112M…Y2,Y3,Y | 10,7 | | | |
| | S2 | | 12,4 | | | |
| | | 132S2…Y2,Y3,Y | 15,7 | | | |
| | M | 132S…Y2,Y3,Y | | 16,7 | 17,3 | 16 |
| | | 132M…Y2,Y3,Y | | 23,7 | | 19,2 |
| | M1 | 132M…Y2,Y3,Y | | | 19,4 | |
| | M2 | 132M2…Y2,Y3,Y | | | 22,2 | |
| | | 132M2…Y2,Y3,Y | | 24,5 | | |
| **160** | M | | | 31,9 | 38,1 | |
| | | …Y2,Y3,Y | | 33 | 40,9 | |
| | M1 | …Y2,Y3,Y | 20,8 | | | 28,7 |
| | M2 | …Y2,Y3,Y | 24,7 | | | 34,3 |
| | L | | 27,5 | 33 | 40,9 | |
| | | …Y2 | 27,5 | 34,1 | 40,9 | |
| | | …Y3, Y | 27,5 | 37,3 | 46,2 | 42,7 |
| **180** | M | | 38,5 | 48,5 | | |
| | | …Y2,Y3,Y | 38,5 | 51,6 | | |
| | L | | | 51,6 | 61,4 | 67,6 |
| | | …Y2 | | 51,6 | 61,4 | 67,6 |
| | | …Y3, Y | | 55,9 | 61,4 | 67,6 |
| **200** | L | …Y2,Y3,Y | | 74 | | 95,9 |
| | L1 | …Y2,Y3,Y | 50,4 | | 51,1 | |
| | L2 | …Y2,Y3,Y | 61,4 | | 84,4 | |
| **225** | S | …Y2,Y3,Y | --- | 93,7 | 104,3 | |
| | M | …Y2,Y3,Y | 76 | 108 | 122 | 122 |
| **250** | M | …Y2,Y3,Y | 99 | 136 | 156 | 176 |
| **280** | S | …Y2,Y3,Y | 109 | 144 | 148 | 179 |
| | M | …Y2,Y3,Y | 122 | 163 | 171 | 207 |
| **315** | S | …Y2,Y3,Y | 155 | 215 | 269 | 250 |
| | M | …Y2,Y3,Y | 181 | 261 | 300 | 290 |
| | L1 | …Y2,Y3,Y | 208 | 293 | 360 | 338 |
| | L2 | …Y2,Y3,Y | 260 | 338 | 491 | 452 |
| | L3 | …Y2,Y3,Y | 340 | 465 | 576 | 576 |
| **355** | M | | | | 582,5 | 629 |
| | L1 | | 450 | 605 | 727 | 727 |
| | L2 | | 486 | 656 | 879 | 880 |
| | L3 | | 548 | 737 | | |
| **400** | M | | | 856 | 1006 | 1147 |
| | L | | 688 | 936 | 1107 | 1264 |
| **450** | M | | | 1066 | 1237 | 1399 |
| | L | | | 1148 | 1340 | 1541 |
| **500** | by request | | | | | |

### Maintenance-free run time with lifetime lubrication and coupling operation for horizontal designs

| Motors with standard power | | | Motors with increased power (...X, ...W) | | |
|---|---|---|---|---|---|
| Size | Number of poles | RT 40 °C | Size | Number of Poles | RT 40 °C |
| **63–71** | 2 | 20000 h | **63–71** | 2 | 20000 h |
| | 4, 6, 8 | 40000 h | | 4, 6, 8 | 40000 h |
| **80–90** | 2 | 20000 h | **80–90** | 2 | 15000 h |
| | 4, 6, 8 | 40000 h | | 4, 6, 8 | 30000 h |
| **100–132** | 2 | 20000 h | **100–132** | 2 | 10000 h |
| | 4, 6, 8 | 40000 h | | 4, 6, 8 | 20000 h |
| **160–280** | 2 | 20000 h | **160–280** | 2 | 7500 h |
| | 4, 6, 8 | 40000 h | | 4, 6, 8 | 15000 h |

### Relubrication times for horizontal designs

| | Relubrication time for motors with standard power | | Relubrication time for motors with increased power (...X, ...W) | |
|---|---|---|---|---|
| | Speed | | | Speed |
| Room temperature | up to 1800 rpm | up to 3600 rpm | Room temperature | up to 1800 rpm |
| 40 °C | 5000 h | 2500 h | 5000 h | 2500 h |
| 50 °C | 2500 h | 1000 h | 2500 h | 1000 h |
| 60 °C | 2000 h | 500 h | - | - |

Vibration transducer and box

**Bearing monitoring**

For condition monitoring of the bearing, the motors can be equipped with temperature sensors, shock pulse transducers and vibration transducers.

PT100 temperature sensors are mounted inside the flameproof enclosure at the bearing points. Standard version withn 2-wire circuit, 3 or 4-wire circuit optional. The connection is made either in the main terminal compartment or in separate additional compartments, which are attached to the main box or the motor housing, depending on the design. The wiring and design of the boxes can be implented with the Ex d, Ex e or Ex i protection type, as required.

For wear condition monitoring, shock pulse nipples can be mounted on the outside of the end shields from size 132. This makes monitoring with mobile recording devices possible. For remote monitoring, it is also possible to use hard-wired shock pulse or vibration transducers. The individual transducers are brought together in a separate terminal compartment. The connection takes place with protection type Ex ia IIC T4.

**Bearing currents, isolated bearings**

A voltage along the shaft can occur in mains-fed motors because of magnetic unbalances. This shaft voltage leads to equalizing currents between the rotor and the stator, which flow through the roller bearings. If the voltage exceeds a peak value of
500 mV, the bearings can be damaged. This risk is only present with bigger axle heights.

Operation on the frequency converter can intensify these effects. The design of the inverter has a decisive influence in this case. Pulse inverters generate extremely high-frequency voltages and currents depending on the clock frequency and the pulse modulation.
These effects are minimized by output filters in the inverters.

To avoid bearing damage, an insulated bearing is therefore always installed at the counter drive side of motors for inverter operation from size 315. The operator must also provide wide-area grounding of the motor housing so that the currents circulating between the inverter and the stator can flow away via this.

High-voltage motors are always fitted with an insulated bearing at the counter drive side.

**Mechanical limit speeds**

When the motors are being operated above the rated speed, the limits of the roller bearings, the strength of the rotating parts, critical rotor speeds and the peripheral speed of the fans must be observed. The limiting speeds specified in the adjacent table may already require measures such as special fans, special bearings or special balancing.

The speeds specified in the operating data starting on page 62 for inverter operation, are
achieved with the standard motor..

**Mechanical limit speeds**

| Number of poles | Assembly | 63/71 | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355 | 400 | 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | [rpm] | 30000 | 19000 | 15000 | 12000 | 12000 | 10000 | 9000 | 6000 | 5220 | 6500 | 7300 | 6300 | 5300 | 3600 | 3600 | 3600 |
| | [Hz] | 500 | 317 | 250 | 200 | 200 | 167 | 150 | 100 | 87 | 108 | 120 | 105 | 88 | 60 | 60 | 60 |
| 4 | [rpm] | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4000 | 4000 | 4000 | 3600 | 3000 | 3000 | 3000 | 3000 | 3000 |
| | [Hz] | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 133 | 133 | 133 | 120 | 100 | 100 | 100 | 100 | 100 |
| 6 | [rpm] | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 3600 | 3600 | 3000 | 3000 | 2500 | 2500 | 2500 | 2000 | 2000 |
| | [Hz] | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 180 | 180 | 150 | 150 | 125 | 125 | 125 | 100 | 100 |
| 8 | [rpm] | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 3600 | 3600 | 3000 | 3000 | 2500 | 2500 | 2500 | 1500 | 1500 |
| | [Hz] | 267 | 267 | 267 | 267 | 267 | 267 | 267 | 240 | 240 | 200 | 200 | 167 | 167 | 167 | 100 | 100 |

### Shaft ends

The motors are normally provided with a free shaft end whose dimensions correspond with EN 50347.

From size 63, the shaft ends have a female thread in accordance with DIN 332 type "D". The feather keys are designed in accordance with DIN 6885 sheet 1.

By request, motors with a special shaft or/and a second shaft end can be supplied at additional cost (not for motors with axial fan and motors with attachments at the N side, e.g. speedometer attachment).

### Concentricity of the shaft ends

The concentricity of the shaft ends corresponds to EN 50347. If desired, the values can be reduced by 50%.

### Balancing

The motors are dynamically balanced with half a feather key. The balance quality corresponds to

DIN ISO 1940, at least G2.5. Special versions, balanced with a whole feather key or without a feather key, are optionally available.

The motors are marked in the shaft mirror as follows in accordance with DIN ISO 8821:

H = half wedge balancing

F = Full wedge balancing

N = Balancing without feather key

### Vibration severity

The mechanical vibrations in accordance with EN 60034-14 correspond to level A as standard. In the case of special mechanical running smoothness requirements, the low-vibration version level B (reduced) can be supplied.

**Vibration severity with free suspension**

| | Size | | |
|---|---|---|---|
| $v_{eff}$ [mm/s] | 63–132 | 160–280 | 315–450 |
| Level A | 1,6 | 2,2 | 2,8 |
| Level B | 0,7 | 1,1 | 1,8 |

### Direct gearbox attachment

The motors in the "oil-protected flange" version are suitable for direct mounting to gearboxes. The sealing at the shaft is provided by radial sealing rings in accordance with DIN 3760. The available flanges can be found in the table on page 38.

The sealing ring must be lubricated by spray oil or oil mist.

Motors up to size 450 have the fixed bearing at the drive side to limit the thermal expansion of the rotor in relation to the gearbox.

### Foundations

The foundations must comply with the requirements and assessments of DIN ISO 10816-3. They must be either rigid or elastic as defined in the standard.

The restriction to max. 2.8 mm/s applies for motors with a flameproof enclosure.

# Operating noise, cooling air volume

## Operating noise

The noise limits of EN 60034-9 are undershot by a long way. Noise measurements are performed in accordance with EN ISO 1680 and EN 21680 according to accuracy class 2 in an anechoic chamber.

In the operating data sheets, the sound pressure level “Lp" and the sound power level “Lw" are specified in dB(A) for the individual sizes. They apply for a nominal load at 50 Hz, plus a tolerance of +3 dB(A).

For the design types of low-noise motors, see Page 35 and 36.

## Cooling air volume and permissible back pressure

If the motors are to be operated via pipe systems or under sound insulation hoods, the minimum cooling air quantities listed in the table below must be adhered to. The maximum back pressures must not be exceeded to ensure that the self-ventilation functions properly.

Cooling in the external air flow is possible. A cooling air flow of at least 15 m/s to the cooling fins is required.

## Cooling air volumes and permissible back pressure

| Size | 3000 rpm | | 1500 rpm | | 1000 rpm | | 750 rpm | |
|---|---|---|---|---|---|---|---|---|
| | Cooling air volume $m^3/s$ | permissible counter pressure Pa | Cooling air volume $m^3/s$ | permissible counter pressure Pa | Cooling air volume $m^3/s$ | permissible counter pressure Pa | Cooling air volume $m^3/s$ | permissible counter pressure Pa |
| **71** | 0.01 | 20 | 0.01 | 10 | 0.01 | 5 | 0.01 | 3 |
| **80** | 0.03 | 30 | 0.03 | 10 | 0.02 | 5 | 0.01 | 3 |
| **90** | 0.05 | 40 | 0.03 | 10 | 0.02 | 6 | 0.01 | 4 |
| **100** | 0.07 | 50 | 0.07 | 12 | 0.03 | 8 | 0.02 | 4 |
| **112** | 0.08 | 50 | 0.06 | 12 | 0.03 | 8 | 0.02 | 5 |
| **132** | 0.1 | 70 | 0.1 | 18 | 0.07 | 10 | 0.05 | 5 |
| **160** | 0.2 | 90 | 0.2 | 30 | 0.1 | 15 | 0.08 | 8 |
| **180** | 0.4 | 100 | 0.3 | 40 | 0.15 | 20 | 0.1 | 10 |
| **200** | 0.5 | 120 | 0.3 | 50 | 0.2 | 25 | 0.15 | 12 |
| **225** | 0.6 | 120 | 0.6 | 50 | 0.3 | 30 | 0.23 | 15 |
| **250** | 0.7 | 140 | 0.5 | 60 | 0.33 | 35 | 0.28 | 20 |
| **280** | 0.7 | 160 | 0.7 | 80 | 0.45 | 45 | 0.33 | 25 |
| **315** | 1 | 160 | 1 | 80 | 0.6 | 45 | 0.45 | 25 |
| **355** | 1.5 | 160 | 1.2 | 80 | 1 | 45 | 0.8 | 25 |
| **400** | 2.2 | 180 | 1.9 | 100 | 1.7 | 55 | 1.5 | 35 |
| **450** | 2.9 | 200 | 2.5 | 120 | 2.2 | 65 | 2 | 45 |

**Noise class 1 standard version**
For the standard version, radial fans are used which are suitable for both directions of rotation. The fans that are used transport large volumes of air with good efficiency and low noise.

**Noise class 2 axial fan,**
**Type series ...A - low-noise**
For higher demands, the low-noise version with the axial fan that is dependent on the direction of rotation is recommended. These fans are available for 2-pole motors from size 112 and for 4-pole motors from size 132.
The aerodynamic design of the fan blades and the optimum angle of attack allow the noise of the 2-pole motors to be reduced by up to 10 dB(A) in comparison to the standard version.

**Noise class 3 axial fan in special design,**
**series ...AR - very low noise**
If particularly high demands are being made of having a low-noise design, we have developed a very quiet surface-cooled three-phase motor. Compared to the standard version with radial fan, these motors are approx. 12 dB(A) quieter in the 2-pole version and achieve a further noise reduction compared to the low-noise version with an axial fan.

Tables with operating data for classes 1 to 3 can be found on pages 62 and 64.

An overview of the low-noise motors can be found on page 36.

**Noise class 4 water cooling,**
**series ...W - version with the least noise**
The water-cooled motors have the following advantages:
– Reduction of the noise level due to omission of the fan
– Avoidance of air turbulence in dusty operating areas (dust explosion hazard)
– Performance increase by an additional type compared to EN 50347
– The mounting dimensions of the IEC sizes remain unchanged
– Good heat dissipation without room heating
– Good prerequisite for utilizing the heat loss via heat exchangers

The motor housing is welded from steel and is double-walled for water cooling. The water jacket has several coats of plastic on the inside to prevent corrosion damage.

The specified capacities relate to a maximum water inlet temperature of 30 °C. A suspension content of max. 30 mg/l in the cooling water is permissible.

All motors generally have PTC thermistor temperature sensors as overload protection. Flow monitors for monitoring the cooling water are there not required.

Tables containing operating data can be found on page 119.

**Frequency inverter operation**
All systems are suitable for inverter operation without restrictions.

Centrifugal fan, independent of direction of rotation (noise class 1)

Axial fan, fan guard with inlet nozzle, dependent on direction of rotation (noise class 2 and 3)

Water-cooled motor (noise class 4)

## Sound level

| Noise class | | 1 | | 2 | | 3 | | 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Standard version (radial fan) | | Type series ...A low noise version (axial fan) | | Type series ...AR extremely low-noise design (axial fan) | | Type series ...W extremely low-noise design, water-cooled | | |
| | | Temperature class T4, 50Hz | | Temperature class T4, 50Hz | | Temperature class T4, 50Hz | | Temperature class T4, 50Hz | | |
| Size | Output | Sound pressure level | Sound power level | Sound pressure level | Sound power level | Sound pressure level | Sound power level | Output | Sound pressure level | Sound power level |
| | $P_2$ | $L_P$ | $L_W$ | $L_P$ | $L_W$ | $L_P$ | $L_W$ | $P_2$ | $L_P$ | $L_W$ |
| | | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] | [dB (A)] |
| **ns = 3000 rpm, 2p = 2** | | | | | | | | | | |
| **112 M-2** | **4** | 63 | 75 | 55 | 67 | - | - | **-** | - | - |
| **112 M-2Y** | **4** | 63 | 76 | 55 | 68 | - | - | **-** | - | - |
| **132 S1-2 (Y)** | **5,5** | 63 | 76 | 55 | 68 | 54 | 67 | **-** | - | - |
| **132 S2-2 (Y)** | **7,5** | 63 | 76 | 55 | 68 | 54 | 67 | **-** | - | - |
| **160 M1-2 (Y)** | **11** | 66 | 79 | 56 | 69 | 54 | 67 | **15** | 50 | 63 |
| **160 M2-2 (Y)** | **15** | 66 | 79 | 56 | 69 | 54 | 67 | **18,5** | 50 | 63 |
| **160 L-2 (Y)** | **18,5** | 66 | 79 | 56 | 69 | 54 | 67 | **22** | 50 | 63 |
| **180 M-2 (Y)** | **22** | 69 | 82 | 58 | 71 | 57 | 70 | **30** | 51 | 64 |
| **200 L1-2 (Y)** | **30** | 71 | 85 | 60 | 74 | 58 | 72 | **37** | 52 | 66 |
| **200 L2-2 (Y)** | **37** | 71 | 85 | 60 | 74 | 58 | 72 | **45** | 52 | 66 |
| **225 M-2 (Y)** | **45** | 72 | 86 | 60 | 74 | 59 | 73 | **55** | 54 | 68 |
| **250 M-2 (Y)** | **55** | 75 | 89 | 64 | 78 | 62 | 76 | **75** | 57 | 71 |
| **280 S-2 (Y)** | **75** | 76 | 90 | 66 | 80 | 64 | 78 | **90** | 59 | 73 |
| **280 M-2 (Y)** | **90** | 76 | 90 | 66 | 80 | 64 | 78 | **110** | 59 | 73 |
| **315 S-2 (Y)** | **110** | 76 | 91 | 66 | 81 | 64 | 79 | **132** | 60 | 75 |
| **315 M-2 (Y)** | **132** | 76 | 91 | 66 | 81 | 64 | 79 | **160** | 60 | 75 |
| **315 L1-2 (Y)** | **160** | 76 | 91 | 66 | 81 | 64 | 79 | **200** | 60 | 75 |
| **315 L2-2 (Y)** | **200** | 76 | 91 | 66 | 81 | 65 | 80 | **250** | 60 | 75 |
| **315 L3-2 (Y)** | **250** | 76 | 91 | 66 | 81 | 65 | 80 | **315** | 60 | 75 |
| **355 L1-2 (Y)** | **315** | 81 | 96 | 68 | 84 | 66 | 82 | **355** | 60 | 76 |
| **355 L2-2 (Y)** | **355** | 81 | 96 | 68 | 84 | 66 | 82 | **400** | 60 | 76 |
| **355 L3-2 (Y)** | **400** | 81 | 96 | 68 | 84 | 66 | 82 | **-** | - | - |
| **ns = 1500 rpm, 2p = 4** | | | | | | | | | | |
| **132 S-4 (Y)** | **5,5** | 57 | 70 | 55 | 68 | - | - | **-** | - | - |
| **132 M-4 (Y)** | **7,5** | 57 | 70 | 55 | 68 | - | - | **-** | - | - |
| **160 M-4 (Y)** | **11** | 62 | 75 | 56 | 69 | - | - | **-** | - | - |
| **160 L-4 (Y)** | **15** | 62 | 75 | 56 | 69 | - | - | **-** | - | - |
| **180 M-4 (Y)** | **18,5** | 60 | 73 | 57 | 70 | 56 | 69 | **22** | 51 | 64 |
| **180 L-4 (Y)** | **22** | 60 | 73 | 57 | 70 | 56 | 69 | **27** | 51 | 64 |
| **200 L-4 (Y)** | **30** | 61 | 75 | 58 | 72 | 57 | 71 | **37** | 51 | 65 |
| **225 S-4 (Y)** | **37** | 63 | 77 | 59 | 73 | 58 | 72 | **45** | 52 | 66 |
| **225 M-4 (Y)** | **45** | 63 | 77 | 59 | 73 | 58 | 72 | **55** | 52 | 66 |
| **250 M-4 (Y)** | **55** | 65 | 79 | 64 | 78 | 63 | 77 | **70** | 56 | 70 |
| **280 S-4 (Y)** | **75** | 68 | 82 | 66 | 80 | 65 | 79 | **90** | 58 | 72 |
| **280 M-4 (Y)** | **90** | 68 | 82 | 66 | 80 | 65 | 79 | **110** | 58 | 72 |
| **315 S-4 (Y)** | **110** | 69 | 84 | 66 | 81 | 65 | 80 | **132** | 57 | 72 |
| **315 M-4 (Y)** | **132** | 69 | 84 | 66 | 81 | 65 | 80 | **160** | 57 | 72 |
| **315 L1-4 (Y)** | **160** | 69 | 84 | 66 | 81 | 65 | 80 | **200** | 57 | 72 |
| **315 L2-4 (Y)** | **200** | 69 | 84 | 66 | 81 | 65 | 80 | **250** | 57 | 72 |
| **315 L3-4 (Y)** | **250** | 69 | 84 | 66 | 81 | 65 | 80 | **315** | 57 | 72 |
| **355 L1-4 (Y)** | **315** | 72 | 88 | 68 | 84 | 67 | 83 | **355** | 58 | 74 |
| **355 L2-4 (Y)** | **355** | 72 | 88 | 68 | 84 | 67 | 83 | **400** | 58 | 74 |
| **355 L3-4 (Y)** | **400** | 72 | 88 | 68 | 84 | 67 | 83 | **400** | 58 | 74 |

On board ships, particularly when installed on the upper deck, on drilling platforms, in harbour facilities and also in wastewater technology, e.g. in sewage treatment plants, the corrosion resistance of electrical machines is under severe stress from high humidity, salty air and short-term flooding. The same applies to fan motors in cooling systems and cooling towers.

Motors with a special corrosion-protected design have been developed for these applications. In addition to the well-known features of the industrial motor series such as

– long life
– long maintenance intervals
– high efficiency and power factor
– low noise pollution of the environment

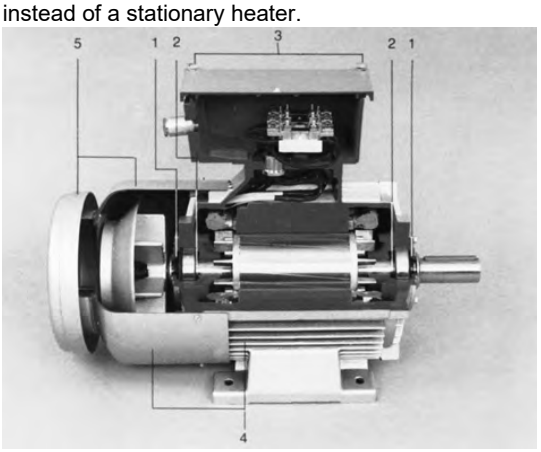
they are characterized by a series of corrosion and water protection measures in the surface protection, sealing and ventilationm areas.

Type examination certificates from various classification societies such as DNV GL, Nippon Kaiji Kyokai and Lloyd's Register, are available for this special motor design. This certifies the special suitability for the maritime area.

To prevent heavy dew formation on the stator winding in the event of large temperature fluctuations and load changes,
e.g. for periodic downtimes, the motors can be equipped with a stationary heater.

This can be fitted to the winding heads either in the form of heating tapes or by feeding the stator winding with a reduced voltage.

Potting of the winding heads is possible as another protective measure. This measure can be applied instead of a stationary heater.




1. Salt water-resistant double seals
2. Stainless steel corrosion resistant shafts
3. Stainless steel fastening screws
4. Salt water-resistant multiple special coating, also with zinc primer
5. Reinforced fan guard with canopy and baffle plate to protect the fan in heavy seas

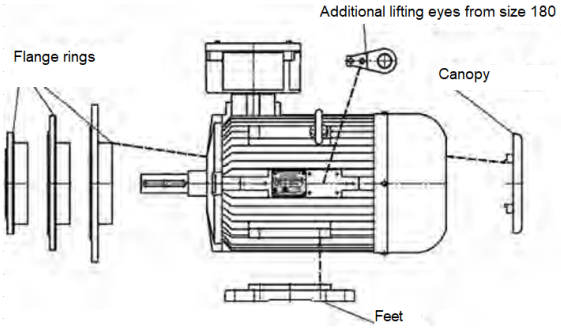
Special designs for upper deck installation

| Components | Measures |
|---|---|
| Motor protection class and terminal compartment | IP56 in accordance with DIN EN 60 034 part 5 |
| Shafts | the motors have stainless steel shafts |
| Sealing in the shaft area at the D-side and the N-side | radial shaft seals in accordance with DIN 3760 are used up to size 160, and from size 180 the motors have a combined seal consisting of a radial seal and an axial seal |
| Fan guard, canopy | reinforced fan cowls for size 71 to 160; material thickness 2mm from size 180 for all designs Fan cowls with protective roof and baffle plate; material thickness ≤3mm |
| Fan | Fan in salt water-resistant Al alloy or steel |
| Fastening screws | General use of stainless steel screws (A 2-70) |
| Cable entry | When supplied with cable glands, metal glands certified in accordance with DIN EN 60079 are used |
| Paint | Special coating with zinc primer |

The Universal Chemistry Motor was designed to realize cost-saving warehousing by means of universal use of a motor.

The picture shows how to replace the flanges, the feet, the lifting lugs and the canopy. This means that all possible designs in accordance with EN 60034-7 can be realized from the starting point of a basic motor.

All of these operations can be performed without opening the flameproof compartment. Authorization by an expert is not required for recommissioning. The conversion is reversible, meaning that a motor can be used successively in different locations.




The basic version includes:
- PTC thermistor protection and an identification plate for operation on any frequency inverter
- VIK version
- IE3 version in accordance with EN 60079-30

### Flanges available

| Size | FF-flanges Ø in mm[1] | | | | | | | | | | | | FT-flanges Ø in mm[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100 | 115 | 130 | 165 | 215 | 265 | 300 | 350 | 400 | 500 | 600 | 740 | 65 | 75 | 85 | 100 | 115 | 130 | 165 | 215 |
| | A-flanges Ø in mm[1] | | | | | | | | | | | | C-flanges Ø in mm[1] | | | | | | | |
| | 120 | 140 | 160 | 200 | 250 | 300 | 350 | 400 | 450 | 550 | 660 | 800 | 80 | 90 | 105 | 120 | 140 | 160 | 200 | 250 |
| **63** | O | X | O | O | O | O | O | O | O | O | O | O | O | X | O | 0 | O | O | O | O |
| **71** | O | O | X | O | O | O | O | O | O | O | O | O | O | O | X | O | O | O | O | O |
| **80** | O | O | O | X | O | O | O | O | O | O | O | O | O | O | O | X | O | O | O | O |
| **80 Y** | | O | O | X | O | O | O | O | O | O | O | O | O | O | O | X | O | O | O | O |
| **90 (Y)** | | O | O | X | O | O | O | O | O | O | O | O | | | O | O | X | O | O | O |
| **100 (Y)** | | | O | O | X | O | O | O | O | O | O | O | | | | O* | O | X | O | O |
| **112 (Y)** | | | O | O | X | O | O | O | O | O | O | O | | | | | | X | O | O |
| **132 (Y)** | | | | | O | X | O | O | O | O | O | O | | | | | | O | X | O |
| **160 (Y)** | | | | | O | O | X | O | O | O | O | O | | | | | | | | X |
| **180 (Y)** | | | | | O | O | X | O | O | O | O | O | | | | | | | | |
| **200 (Y)** | | | | | | | O | X | O | O | O | O | | | | | | | | |
| **225 (Y)** | | | | | | | | O | X | O | O | O | | | | | | | | |
| **250 (Y)** | | | | | | | | | O | X | O | O | | | | | | | | |
| **280 (Y)** | | | | | | | | | O | X | O | O | | | | | | | | |
| **315 (Y)** | | | | | | | | | | O | X | O | | | | | | | | |
| **355 (Y)** | | | | | | | | | | | O | X | | | | | | | | |

X = standard
* = not available for design Y
O = Special flange (additional price)
All other versions require an intermediate ring (additional price).

**Notes**

[1] new marking in accordance with EN 50347
old marking in accordance with DIN 42948

Our motors are designed for a wide range of applications. A number of attachments and built-in components have been developed to fulfil the different applications. The standardized mounting or installation of brakes, tachometers, pulse generators and backstops is therefore particularly cost-effective.
Combinations of different designs can easily be realized by installing one component.

The possibility of attachment exists from size 80. The explosion-proof equipment is mounted on a reinforced fan guard and connected to the motor shaft either directly or by means of a backlash-free coupling.
In the case of IE2 and IE3 motors, the axial dimension may be exceeded during installation due to the design.

For sizes 80 - 132 of the IE1 version, it is also possible to install brakes or encoders directly in the flameproof motor enclosure.

**Speed sensor**

Actual value transmitters are used for electrical remote measurement and for controlling the motor speed. These devices convert the “speed” input variable into an analog or digital electrical signal.

Attached devices are connected in a separate terminal box.

For motors with a built-in encoder (series ...R) the connection is made in the main terminal compartment of the motor.

Motor with built-in incremental encoder

**Backstop**

When transport systems or pumps are being operated, the backstop prevents backwashing after switching off the motor.

For sizes 80 to 100 it is possible to install a blocking ball bearing. This is particularly recommended if this design is going to be combined with another attachment. Although the locking elements are integrated in the bearing, the load carrying capacity of the bearing is only marginally reduced compared to a normal bearing. However, since the blocking elements come into contact with the raceways, the maximum speed is limited to 1500 rpm, and the service life of the bearing will be reduced.

From size 90, the backstop can also be mounted on a reinforced fan guard directly on the extended motor shaft. This backstop is designed so that the clamping pieces are lifted up from the stationary outer race by centrifugal force, whereby the minimum speed is maintained. There are therefore no additional frictional forces or noises with this design.

**Technical data of the backstop**

| Size | Blocking Bearing DS type | Nominal torque [Nm] | Service life with 1500 rpm [h] |
|---|---|---|---|
| **80** | ZZ 6204 L | 32 | 3800 |
| **80 Y / 90** | FC 6205 | 40 | 5600 |
| **90 Y / 100** | ZZ 6206 M | 110 | 1900 |
| **Size** | **Backstop Type** | **Nominal torque [Nm]** | **Lift-off speed [rpm]** |
| **90** | FXM 31-17 NX | 100 | 890 |
| **100** | FXM 38-17 NX | 150 | 860 |
| **112** | FXM 38-17 NX | 150 | 860 |
| **132** | FXM 38-17 NX | 150 | 860 |
| **160** | FXM 66-25 NX | 800 | 700 |
| **180** | FXM 66-25 NX | 800 | 700 |
| **200** | FXM 86-25 NX | 1350 | 630 |
| **225** | FXM 86-25 NX | 1350 | 630 |
| **250** | by request | | |
| **280** | by request | | |

Our motors can be supplied with several variants of spring-applied brakes with a flameproof enclosure. Mounted in a flanged version at the drive side (type...SM and SV) or on a reinforced fan guard at the non-drive side of the motor (type ...SMN, SVN and S). The electrical connection is made in a separate terminal compartment on the brake.

**Series ...SM and ...SMN**

The SM and SMN brakes are available for sizes 71 to 160. The brake can be mounted at the drive side (SM) as well as the NDE (SMN) to a reinforced fan guard. The electrical connection is made optionally in an Ex eb or Ex db terminal compartment that can be rotated in steps of 90°.

This brake is available in the following versions:

- Size 71 - 160
- 4 - 150 Nm depending on size
- 24 - 207 VDC
- 230 - 460 VAC
- Category 2G / 2D/ 2GD
- Protection class Ex db / Ex db eb
- Protection group IIC
- Temperature class T3 / T4 / T5 / T6
- Max. surface temperature
  200 °C / 135 °C / 100 °C / 85 °C
- Protection class IP66
- Ambient temperature -20 °C to + 40 °C /
- -60 °C to + 60 °C
- Thermal protection via PTC thermistor temperature sensor
- Manual release (optional)
- Release control via microswitch or initiator (optional)
- Wear control via microswitch
- Anti-condensation heating (optional)
- Special flange or special shaft by request

Motor with attached brake type CD...SM

## Braking torques[1)], wear values

| Size | Braking tourqes $M_2$ | Friction work $Qr_{0,1}$ | $Qr_{ges}$ |
|---|---|---|---|
| CD…SM(N) | [Nm] | [J] | [J] |
| **71** | 5 | $8x10^6$ | $20x10^6$ |
| | 4[1)] | $8x10^6$ | $20x10^6$ |
| | 3 | $8x10^6$ | $20x10^6$ |
| | 2 | $8x10^6$ | $20x10^6$ |
| **80** | 11,8 | $20x10^6$ | $100x10^6$ |
| | 8[1)] | $20x10^6$ | $100x10^6$ |
| | 6,8 | $20x10^6$ | $100x10^6$ |
| | 5,5 | $20x10^6$ | $100x10^6$ |
| **90** | 20 | $20x10^6$ | $100x10^6$ |
| | 16[1)] | $20x10^6$ | $100x10^6$ |
| | 13,5 | $20x10^6$ | $100x10^6$ |
| | 11,8 | $20x10^6$ | $100x10^6$ |
| **112** | 60 | $29x10^6$ | $159x10^6$ |
| | 50[1)] | $29x10^6$ | $159x10^6$ |
| | 42 | $29x10^6$ | $159x10^6$ |
| | 30 | $29x10^6$ | $159x10^6$ |
| **132** | 125 | $29x10^6$ | $159x10^6$ |
| | 100[1)] | $29x10^6$ | $159x10^6$ |
| | 85 | $29x10^6$ | $159x10^6$ |
| | 70 | $29x10^6$ | $159x10^6$ |
| | 50 | $29x10^6$ | $159x10^6$ |
| **160** | 180 | $47x10^6$ | $282x10^6$ |
| | 150[1)] | $47x10^6$ | $282x10^6$ |
| | 125 | $47x10^6$ | $282x10^6$ |
| | 100 | $47x10^6$ | $282x10^6$ |
| | 75 | $47x10^6$ | $282x10^6$ |

**Notes:**

[1)] Standard torque

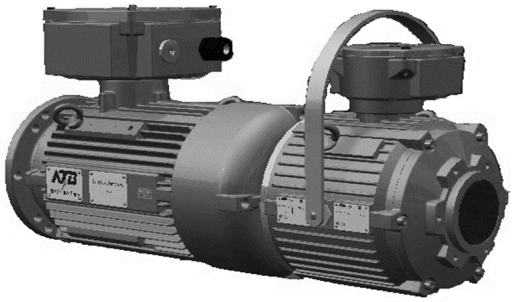
Holding brakes with higher braking torque and friction power by request

The possible friction work Qr can be calculated in accordance with the following formulas. Please refer to the table for the wear limits.

$$Q_r = \frac{J \times n^2}{182.4} \times \frac{M_2}{M_v} \text{ [J]}$$

Mv = M2 + [-]* ML

* Sign in brackets [-] applies with load braked downwards

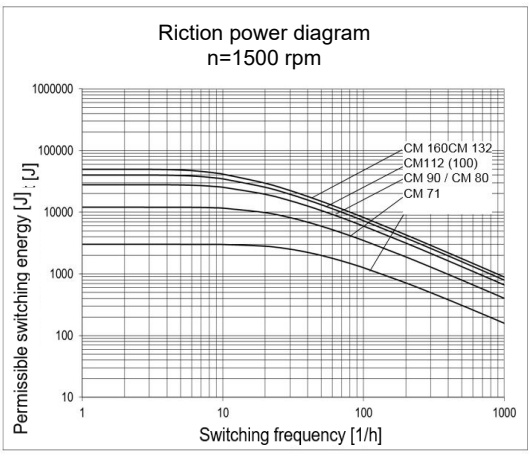


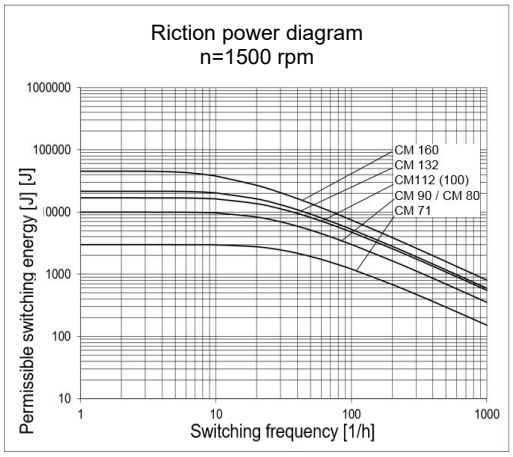
Motor with mounted brake type CD...SMN

### Switching times, after-run revolutions

| Size<br>CD…SM(N) | Nominal torque<br>[Nm] | Link time<br>t1 =<br>[ms] | Link time<br>t1 ~<br>[ms] | Response - time<br>$t_{11}$ =<br>[ms] | Response - time<br>$t_{11}$ ~<br>[ms] | After-run AC side - disconnection<br>Revolutions | DC side - disconnection -<br>Revolutions |
|---|---|---|---|---|---|---|---|
| **71M1-2** | 4 | 18 | 160 | 12 | 130 | 4,6 | 11,1 |
| **71M2-2** | 4 | 18 | 160 | 12 | 130 | 5,0 | 11,5 |
| **80M1-2** | 8 | 55 | 300 | 40 | 250 | 8,1 | 19,4 |
| **80M2-2** | 8 | 55 | 300 | 40 | 250 | 9,1 | 20,4 |
| **90S-2** | 16 | 55 | 300 | 40 | 250 | 8,0 | 19,4 |
| **90L-2** | 16 | 55 | 300 | 40 | 250 | 9,0 | 20,4 |
| **100L-2** | 50 | 55 | 500 | 35 | 400 | 6,8 | 27,0 |
| **112M-2** | 50 | 55 | 450 | 50 | 400 | 8,3 | 27,0 |
| **132S1-2** | 100 | 68 | 640 | 50 | 400 | 7,9 | 30,9 |
| **132S2-2** | 100 | 68 | 640 | 50 | 400 | 8,7 | 31,8 |
| **160M1-2** | 150 | 80 | 730 | 40 | 400 | 9,4 | 34,7 |
| **160M2-2** | 150 | 80 | 730 | 40 | 400 | 10,6 | 35,8 |
| **160L-2** | 150 | 80 | 730 | 40 | 400 | 11,5 | 36,8 |
| **71M1-4** | 4 | 18 | 160 | 12 | 130 | 2,1 | 5,4 |
| **71M2-4** | 4 | 18 | 160 | 12 | 130 | 2,3 | 5,5 |
| **80M1-4** | 8 | 55 | 300 | 40 | 250 | 3,1 | 8,7 |
| **80M2-4** | 8 | 55 | 300 | 40 | 250 | 4,0 | 9,7 |
| **90S-4** | 16 | 55 | 300 | 40 | 250 | 3,6 | 9,3 |
| **90L-4** | 16 | 55 | 300 | 40 | 250 | 3,9 | 9,6 |
| **100L1-4** | 50 | 85 | 450 | 50 | 400 | 3,9 | 12,8 |
| **100L2-4** | 50 | 85 | 450 | 50 | 400 | 3,9 | 12,8 |
| **112M-4** | 50 | 85 | 450 | 50 | 400 | 4,8 | 13,7 |
| **132S-4** | 100 | 68 | 640 | 38 | 400 | 3,9 | 15,5 |
| **132M-4** | 100 | 68 | 640 | 38 | 400 | 4,3 | 16,0 |
| **160M-4** | 150 | 80 | 730 | 40 | 450 | 5,0 | 18,2 |
| **160L-4** | 150 | 80 | 730 | 40 | 450 | 5,3 | 18,6 |
| **71M2-6** | 4 | 18 | 160 | 12 | 130 | 1,6 | 3,8 |
| **80M1-6** | 8 | 55 | 300 | 40 | 250 | 2,1 | 5,9 |
| **80M2-6** | 8 | 55 | 300 | 40 | 250 | 2,2 | 6,0 |
| **90S-6** | 16 | 55 | 300 | 40 | 250 | 2,5 | 6,3 |
| **90L-6** | 16 | 55 | 300 | 40 | 250 | 2,7 | 6,5 |
| **100L-6** | 50 | 85 | 450 | 50 | 400 | 2,6 | 8,6 |
| **112M-6** | 50 | 85 | 450 | 50 | 400 | 3,1 | 9,0 |
| **132S-6** | 100 | 68 | 640 | 38 | 400 | 2,3 | 10,1 |
| **132M1-6** | 100 | 68 | 640 | 38 | 400 | 2,4 | 10,2 |
| **132M2-6** | 100 | 68 | 640 | 38 | 400 | 2,6 | 10,4 |
| **160M-6** | 150 | 80 | 730 | 40 | 450 | 3,3 | 12,1 |
| **160L-6** | 150 | 80 | 730 | 40 | 450 | 3,5 | 12,4 |
| **71M2-8** | 4 | 18 | 160 | 12 | 130 | 1,1 | 2,7 |
| **80M1-8** | 8 | 55 | 300 | 40 | 250 | 1,5 | 4,3 |
| **80M2-8** | 8 | 55 | 300 | 40 | 250 | 1,6 | 4,4 |
| **90S-8** | 16 | 55 | 300 | 40 | 250 | 1,4 | 4,3 |
| **90L-8** | 16 | 55 | 300 | 40 | 250 | 1,5 | 4,4 |
| **100L1-8** | 50 | 85 | 450 | 50 | 400 | 1,8 | 6,3 |
| **100L2-8** | 50 | 85 | 450 | 50 | 400 | 1,8 | 6,3 |
| **112M-8** | 50 | 85 | 450 | 50 | 400 | 2,1 | 6,5 |
| **132S-8** | 100 | 68 | 640 | 38 | 400 | 1,6 | 7,4 |
| **132M-8** | 100 | 68 | 640 | 38 | 400 | 1,7 | 7,5 |
| **160M1-8** | 150 | 80 | 730 | 40 | 450 | 1,8 | 8,5 |
| **160M2-8** | 150 | 80 | 730 | 40 | 450 | 2,1 | 8,7 |
| **160L-8** | 150 | 80 | 730 | 40 | 450 | 2,3 | 8,9 |

| Size<br>CD…SM(N)<br>Y2, Y3, Y | Nominal torque<br>[Nm] | Link time<br>t1 =<br>[ms] | Link time<br>t1 ~<br>[ms] | Response delay<br>$t_{11}$ =<br>[ms] | Response delay<br>$t_{11}$ ~<br>[ms] | After-run - DC side - disconnection<br>Revolutions | AC side - disconnection<br>Revolutions |
|---|---|---|---|---|---|---|---|
| **80M1-2** | 8 | 55 | 300 | 40 | 250 | 9 | 20 |
| **80M2-2** | 8 | 55 | 300 | 40 | 250 | 10 | 21 |
| **90S-2** | 16 | 55 | 300 | 40 | 250 | 8 | 20 |
| **90L-2** | 16 | 55 | 300 | 40 | 250 | 9 | 21 |
| **100L-2** | 50 | 85 | 450 | 50 | 400 | 8 | 26 |
| **112M-2** | 50 | 85 | 450 | 50 | 400 | 10 | 27 |
| **132S1-2** | 100 | 68 | 640 | 38 | 400 | 8 | 31 |
| **132S2-2** | 100 | 68 | 640 | 38 | 400 | 9 | 32 |
| **160M1-2** | 150 | 80 | 730 | 40 | 450 | 10 | 36 |
| **160M2-2** | 150 | 80 | 730 | 40 | 450 | 11 | 38 |
| **160L-2** | 150 | 80 | 730 | 40 | 450 | 12 | 38 |
| **80M2-4** | 8 | 55 | 300 | 40 | 250 | 4 | 8 |
| **90S-4** | 16 | 55 | 300 | 40 | 250 | 4 | 10 |
| **90L-4** | 16 | 55 | 300 | 40 | 250 | 4 | 10 |
| **100L1-4** | 50 | 85 | 450 | 50 | 400 | 4 | 13 |
| **100L2-4** | 50 | 85 | 450 | 50 | 400 | 4 | 13 |
| **112M-4** | 50 | 85 | 640 | 38 | 400 | 5 | 17 |
| **132S-4** | 100 | 68 | 640 | 38 | 400 | 4 | 16 |
| **132M-4** | 100 | 68 | 640 | 38 | 400 | 5 | 16 |
| **160M-4** | 150 | 80 | 730 | 40 | 450 | 5 | 19 |
| **160L-4** | 150 | 80 | 730 | 40 | 450 | 6 | 19 |
| **90S-6** | 16 | 55 | 300 | 40 | 250 | 3 | 7 |
| **90L-6** | 16 | 55 | 300 | 40 | 250 | 3 | 7 |
| **100L-6** | 50 | 85 | 450 | 50 | 400 | 3 | 9 |
| **112M-6** | 50 | 85 | 450 | 50 | 400 | 4 | 9 |
| **132S-6** | 100 | 68 | 640 | 38 | 400 | 3 | 11 |
| **132M1-6** | 100 | 68 | 640 | 38 | 400 | 3 | 11 |
| **132M2-6** | 100 | 68 | 640 | 38 | 400 | 3 | 11 |
| **160M-6** | 150 | 80 | 730 | 40 | 450 | 4 | 13 |
| **160L-6** | 150 | 80 | 730 | 40 | 450 | 4 | 13 |
| **100L1-8** | 50 | 85 | 450 | 50 | 400 | 2 | 7 |
| **100L2-8** | 50 | 85 | 450 | 50 | 400 | 2 | 7 |
| **112M-8** | 50 | 85 | 450 | 50 | 400 | 3 | 7 |
| **132S-8** | 100 | 68 | 640 | 38 | 400 | 2 | 8 |
| **132M-8** | 100 | 68 | 640 | 38 | 400 | 2 | 8 |
| **160M1-8** | 150 | 80 | 730 | 40 | 450 | 3 | 9 |
| **160M2-8** | 150 | 80 | 730 | 40 | 450 | 3 | 9 |
| **160L-8** | 150 | 80 | 730 | 40 | 450 | 3 | 10 |



**Type series ...SV and ...SVN**

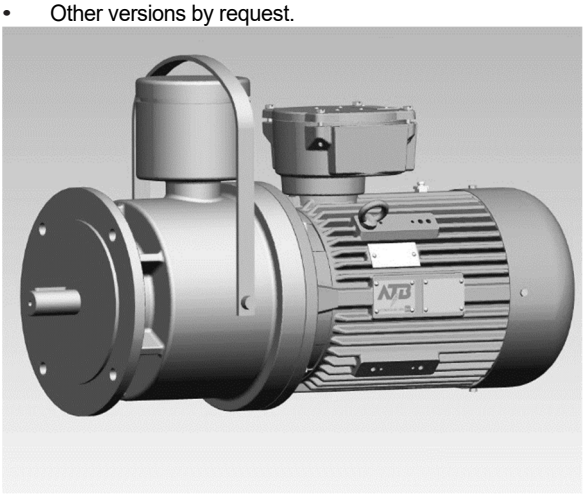
For flange motors of size 180 to 280, e.g. type B5 or B14, it is recommended to fit this brake directly to the drive-side shaft end and the flange of the motor.

The brake then has the IEC connection dimensions for the shaft and flange that are suitable for the motor size for attaching the work machine (type ... SV).

With foot-mounted motors, it is advisable to fit the brake to a reinforced fan guard at the non-drive side of the motor (type ... SVN).

This brake is available in the following versions

- Size 180 - 225 only 4,6,8 pole or 2-pole S3 40 %,
- Size 250 - 280 only 4,6,8 pole
- Terminal compartment Ex d
- 250 to 1200 Nm depending on size
- Standard assignment see page 143
- 24 to 690 VAC 1~, 50/60 Hz, 24 to 300 VDC
- Category 2G /2D/ 2GD
- Protection class Ex d/ Ex tb Protection group IIB/ IIC
- Temperature class T3/T4/T5
- Maximum surface temperature T200 °C/T135°C/T100 °C
- Protection class IP66
- Ambient temperature -20 to +40 °C/-50 to +55°C
- Thermal protection via thermoswitch (optional additional PTC thermistor)
- Manual release (optional; not for 250/280)
- Microswitch (optional)
- Anti-condensation heating (optional)
- Special flange or special shafts by request
- Other versions by request.



Motor with attached brake type CD...SV

**Series ...S**

This brake is always fitted to a reinforced fan guard at the non-drive side of the motor. It has the following characteristics:

- Size 180 - 200
- Terminal compartment Ex e
- 72 - 270 Nm depending on size (for standard assignment see page 111)
- 110 to 400 VAC 1~, 50/60 Hz, 12 to 356 VDC
- Category 2 G / 2D / 2GD
- Protection class Ex de / Ex tb
- Protection group IIC
- Temperature class T5
- Maximum surface temperature T100 °C
- Protection class IP67
- Ambient temperature -20 to +40 °C
- Thermal protection via thermoswitch
- Manual release (optional)
- Microswitch (optional)

Other versions by request.

Motor with attached brake type CD...S

**Type series BD...Y3B**

**Structural design**
With sizes 80-132, the brake is installed in a flameproof enclosure and
joined with the motor to form a single unit at the N side.
The ignition protection type is II 2G Ex d(e) IIB + H2T4 or II 2D Ex tD A21 IP65 T120ºC.
The system is maintenance-free until the brake pads wear out.

**Connection**
The brake coil is excited by a silicon rectifier, which is accommodated inside the ignition-proof enclosure. The brake is switched at the AC or DC side.

For DC-side disconnection, a brake coil connection is led into the terminal compartment. A protective resistor is also built into the motor. If this version is to be used for AC-side switching of the brake, the connection in the terminal box is not required. Instead, the connection shown in the circuit diagram must be made. For pole-changing and inverter-fed motors, the brake coil must be supplied from an external voltage source.

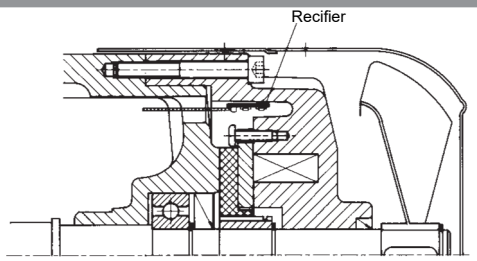
**Motor voltages**
Sizes 80-112: 230 V to 690 V
Size 132: 400 V to 690 V

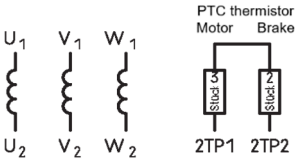
**Brake voltages**
For coil data, see page 117. Special voltages at additional cost.

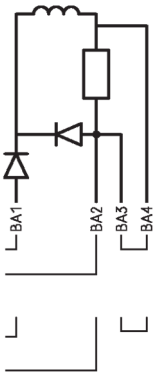
**Protective devices**
As protection for the motor, in accordance with EN 60 079-14,
VDE 0165 against non-permissible heating, 3 PTC thermistor temperature sensors connected in series are installed in the winding head (warmest point) of the 3 strands of the stator winding.

Aach motor is also fitted with a PTC thermistor temperature sensor in the brake coil and on the end shield at non-drive side.

All temperature sensors are connected in series and protect the motor and brake from overloading and excessive heating.



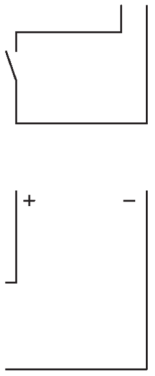




The BA1 and BA2 terminals can be connected directly to the motor terminals to supply the brake. Please compare the motor/brake voltage as to whether the connection must be made to U1/U2 or U1/V1. Terminals BA3 and BA4 must be bridged.

An external voltage can also be applied to terminals BA1 and BA2. Please observe the voltage specification on the type plate. Terminals BA3 and BA4 must be bridged.

For fast brake application (DC-side disconnection), the bridge of BA3 and BA4 can be replaced by a contact, which must open simultaneously with the voltage supply of the brake.

For emergency brake release, e.g. to turn the motor by hand, terminals BA1 and BA4 can be connected to a
DC voltage (remove other wiring beforehand and pay attention to the polarity).
Voltage U= = U~ x 0.45.
Voltage U~ see rated voltage on nameplate.




**Operating data**
The electrical values of the motors which are not mentioned in the operating data (page 113), particularly the magnitudes and the trend of the torques, can be found in the data for three-phase motors (see page 62 ff.).

**Switching times, after-run revolutions**
Guide values for the response and recovery times and also the afterrun revolutions after switching off are listed in the table on the following page, and were obtained from series measurements.

| Size<br>BD...Y3B | Response time AC side disconnection<br>t11 ~<br>[ms] | DC side discon-nection<br>t11 =<br>[ms] | Discon-nection time<br>t2 =<br>[ms] | After-run[1] AC side disconnection<br>Revolutions | DC side discon-nection<br>Revolutions |
|---|---|---|---|---|---|
| **90S-2** | 300 | 50 | 150 | 19 | 3 |
| **90L-2** | 300 | 50 | 150 | 19 | 3 |
| **100L-2** | 300 | 50 | 150 | 24 | 3 |
| **112M-2** | 350 | 50 | 230 | 25 | 4 |
| **132S1-2** | 350 | 50 | 230 | 25 | 4 |
| **132S2-2** | 350 | 90 | 230 | 27 | 4 |
| **80M1-4** | 250 | 45 | 110 | 5 | 1 |
| **80M2-4** | 250 | 45 | 110 | 5 | 1 |
| **90S-4** | 300 | 50 | 150 | 6 | 1 |
| **90L-4** | 300 | 50 | 150 | 7 | 1 |
| **100L1-4** | 300 | 50 | 170 | 11 | 1 |
| **100L2-4** | 300 | 50 | 170 | 11 | 1 |
| **112M-4** | 350 | 90 | 230 | 12 | 2 |
| **132S-4** | 350 | 90 | 230 | 12 | 2 |
| **132M-4** | 350 | 90 | 230 | 13 | 2 |
| **80M1-6** | 250 | 45 | 110 | 4 | 1 |
| **80M2-6** | 250 | 45 | 110 | 4 | 1 |
| **90S-6** | 300 | 50 | 150 | 6 | 1 |
| **90L-6** | 300 | 50 | 150 | 6 | 1 |
| **100L-6** | 300 | 50 | 150 | 7 | 1 |
| **112M-6** | 350 | 90 | 230 | 7 | 1 |
| **132S-6** | 350 | 90 | 230 | 7 | 1 |
| **132M1-6** | 350 | 90 | 230 | 8 | 2 |
| **132M2-6** | 350 | 90 | 230 | 8 | 2 |
| **80M1-8** | 250 | 45 | 110 | 2 | 1 |
| **80M2-8** | 250 | 45 | 110 | 2 | 1 |
| **90S-8** | 300 | 50 | 150 | 3 | 1 |
| **90L-8** | 300 | 50 | 150 | 3 | 1 |
| **100L1-8** | 300 | 50 | 150 | 3 | 1 |
| **100L2-8** | 300 | 50 | 150 | 4 | 1 |
| **112M-8** | 350 | 90 | 230 | 6 | 2 |
| **132S-8** | 350 | 90 | 230 | 7 | 2 |
| **132M-8** | 350 | 90 | 230 | 7 | 2 |

**Notes**

[1] The after-run of the motors was measured without additional flywheel mass.

## Brake components, wear values

The adjacent braking torques can be set by combining different pressure springs and brake disks (see table).

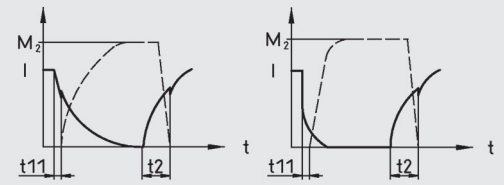
## Braking torques[1], wear values

| Size<br>BD...Y3B | Nominal torque<br>$M_2$<br>[Nm] | Wear value<br>Qr $_{0,1}$<br>[J] | Qr $_{ges}$<br>[J] | Brake disk Thickness new<br>[mm] |
|---|---|---|---|---|
| **80** | 16 | $100x10^6$ | $500x10^6$ | 8 |
| | 20[2] | $100x10^6$ | $500x10^6$ | 8 |
| | 23 | $20x10^6$ | $20x10^6$ | 8 |
| | 32 | $20x10^6$ | $20x10^6$ | 8 |
| **90** | 32 | $130x10^6$ | $600x10^6$ | 10,4 |
| | 40 | $130x10^6$ | $600x10^6$ | 10,4 |
| | 46[2] | $30x10^6$ | $45x10^6$ | 10,4 |
| | 64 | $30x10^6$ | $45x10^6$ | 10,4 |
| **100** | 32 | $130x10^6$ | $600x10^6$ | 10,4 |
| | 40 | $130x10^6$ | $600x10^6$ | 10,4 |
| | 46[2] | $30x10^6$ | $45x10^6$ | 10,4 |
| | 64 | $30x10^6$ | $45x10^6$ | 10,4 |
| **112** | 60 | $130x10^6$ | $700x10^6$ | 11,15 |
| | 75 | $130x10^6$ | $700x10^6$ | 11,15 |
| | 86[2] | $65x10^6$ | $130x10^6$ | 11,15 |
| | 100 | $65x10^6$ | $130x10^6$ | 11,15 |
| **132** | 60 | $130x10^6$ | $700x10^6$ | 11,15 |
| | 75 | $130x10^6$ | $700x10^6$ | 11,15 |
| | 86[2] | $65x10^6$ | $130x10^6$ | 11,15 |
| | 100 | $65x10^6$ | $130x10^6$ | 11,15 |

**Notes:**

[1] Tolerance –20 %/+40 % at 1m/s friction speed

[2] Standard torque




AC-side disconnection disconnection

DC-side

t11 = response delay during linking t2 = disconnection time

The possible friction work Qr can be calculated according to the following formulas. The wear limits can be found in the table.

$$Q_r = \frac{J \times n^2}{182,4} \times \frac{M_2}{M_v} \text{ [J]}$$

$M_v = M_2 + [-]^* M_L$

Qr [J] = available friction work per braking operation
Qr 0.1 [J] = Friction work per 0.1 mm wear
Qr tot [J] = Friction work until brake disk replacement
J [kgm²] = Mass moment of inertia
n [rpm] = Speed
M2 [Nm] = Nominal torque
Mv [Nm] = Deceleration torque
ML [Nm] = Load torque

* Sign in brackets [-] applies with load braked downwards

# Three-phase asynchronous motors with integrated frequency converter



**Type series CD...I Y3 and CD...I**

Compact drives with ignition protection type II 2G Ex db eb IIC T4 or II 2D Ex tb IIIC T120°C Db consist of a flameproof motor, type CD..., with an attached frequency inverter, type CEIGL, which is also in a flameproof enclosure. It is suitable for speed-controlled applications in potentially explosive areas in zones 1 and 21.

**Frequency range**

The approval covers a frequency range from 2 to 100 Hz. Compact drives can therefore be used for drive solutions up to 6000 rpm. Above 50 Hz, the drive is designed for operation in the field weakening range, i.e. with constant output.

**Monitoring**

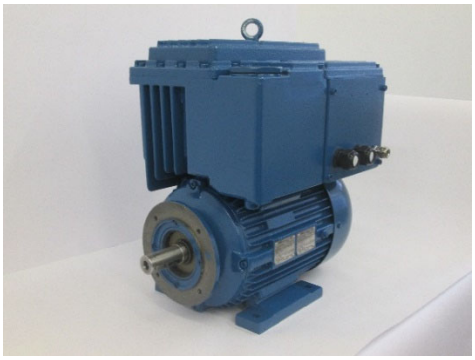
Thermal monitoring of the motor and the inverter is carried out by PTC thermistor temperature sensors. A certified PTC triggering device and a line contactor are optionally installed in the converter housing. In the event of a fault, the compact drive with galvanic isolation can therefore provide the necessary circuitry for use in potentially explosive areas without additional switchgear.

**Frequency inverter**

A frequency inverter from LENZE, type i550 with full power spectrum is used.
This operates the motor with field-oriented vector control and a clock frequency of 4 kHz. This results in very good concentricity and control characteristics over the entire speed and torque range. The adaptation of the inverter to the motor with recording of the motor parameters as well as basic parameterization of the frequency inverter is already carried out during the final test.

**Control**

The compact drive is controlled via different, interchangeable frequency inverter function modules, depending on the operator's specifications.
These function modules are available for bus systems such as PROFIBUS-DP, Applications I/O, Profibus with standard I/O or as I/O modules for conventional control via an analog setpoint and ON/OFF contacts.



Compact drive

**Technical data**

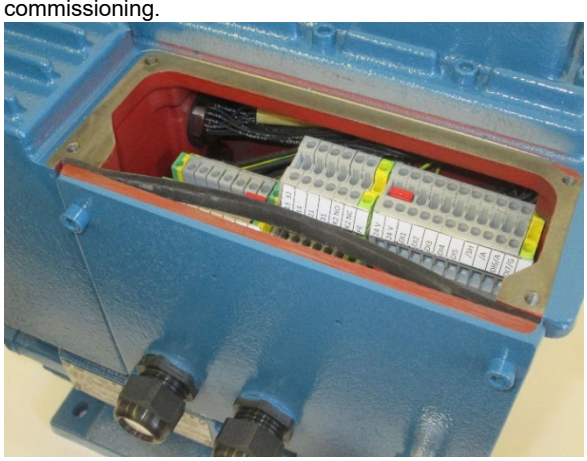
| | |
|---|---|
| **Ignition protection type** | **Flameproof enclosure / dust protection**<br>**II 2G Ex db eb IIC T4 Gb**<br>**II 2D Ex tD IIIC T120 °C Db** |
| **Type examination certificate Inverter housing** | **PTB 08 ATEX 1111X** |
| Sizes | 80 to 132 |
| Supply voltage | AC 340 V to 528 V, 45 Hz to 65 Hz |
| Output range | 0.55 to 5.5 kW (FI 1.5 to 5.5 kW) |
| Maximum current | 150 % In for 60 s in 10 min |
| Leakage current against PE | > 3.5 mA |
| (according to DIN EN 50178) | Fixed installation required,<br>with double PE |
| Output frequency<br>Frequency resolution absolute | 2 to 50/100 Hz<br>0.02 Hz |
| Protective insulation from Control circuits | Safe isolation PELV in accordance with DIN EN 50178 |
| EMC | Compliance with the requirements in accordance with EN 61000-3-2 |

**EMC**

Operation on public networks is permitted for 1.5-5.5 kW inverters without further measures.
This means that the compact drive fulfils the requirements of the EMC Directive 2014/30/EU and the Low Voltage Directive 2014/35/EU, i.e. conformity with DIN EN 61800-3/A11 and adherence to limit value class A in accordsnce with DIN EN 55011.

**Connections**

The power supply and control connections are made in an Ex e terminal compartment of the inverter housing. A handheld terminal with keypad and LCD display is available for displaying operating data, parameterization and diagnostics. This "keypad" is connected to the frequency inverter via a connector in the Ex d compartment, where it is accessible via the screw connection in the M63 housing. However, it is not Ex-protected and is therefore only intended for short-term commissioning.



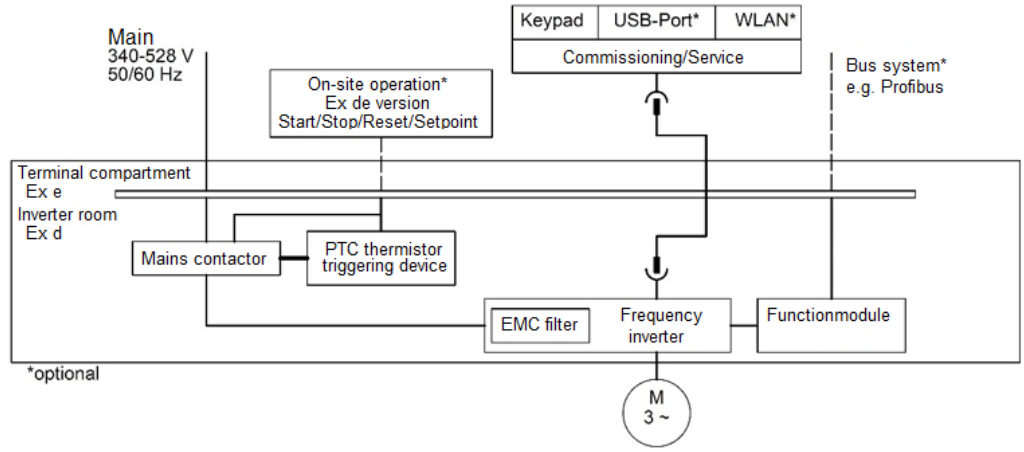
Compact driver terminal compartment

**Power supply line entry**

| Size | 80 | 90 | 100 | 112 |
|---|---|---|---|---|
| Threaded outlet for cable outer -Ø mm | 2x M25x1,5<br>1x M16x1,5<br>8–17<br>6–11 | | | |

Due to the compact connection of a motor with Frequency inverters for use in almost all potentially explosive areas, the user has the following advantages:

- Approval in accordance with ATEX and IECEx allows use in zones 1 and 21 throughout Europe – without further national approvals.
- Simplified planning process
- No additional project planning of control cabinet and switchgear
- Cost reduction due to short supply cable to the motor, a design with shielded cables is not required.
- Supply line to the compact drive without EMC problems by using mains and EMC filters on the motor.
- Fewer individual parts and therefore cost reduction by using one converter wide voltage unit for a mains voltage of 400 V to 480 V.
- No design restrictions, since an Ex d motor with a flameproof enclosure in list version is used.
- The version as a universal chemical motor is possible. Tables with operating data can be found on page 118.




Functional diagram

**Series CD...H**

The high-voltage three-phase motors are explosion-protected in the "flameproof enclosure" ignition protection type in accordance with DIN EN 60079-1 for groups IIC and temperature classes T3 to T6.

**Winding**
Depending on the design, round wire mush windings or conventional preformed coils are used. The thermal utilization corresponds to thermal class B. Only in special cases is the class F limit slightly exceeded.

**Version**
- Series CD 355...H to CD 450...H
- Acceptance for category II 2G for use in zones 1 and 2
- Acceptance for category II 2D for use in zones 21 and 22
- Temperature class T3 to T6
- Ouput range from 160 to approx. 700 kW (in relation to 1500 rpm)
- Rated voltage from 3 kV to 6.6 kV
- 50 Hz for 2- to 8-pole and 60 Hz for 4- to 8-pole
- Self-cooling (IC411) with direction of rotation-independent fans
- Low-noise version with direction of rotation-dependent axial fans
- Anti-condensation heating
- Low temperature of up to -55˚C without heating
- Ambient temperatures of up to 60˚C
- Installation altitudes above 1000 m above sea level
- Installation of temperature sensors such as PT 100, PTC thermistors or KTY in windings and bearings as additional protection

Customized special versions Tables with operating data can be found on page 115.


High voltage motor Ex d IIC

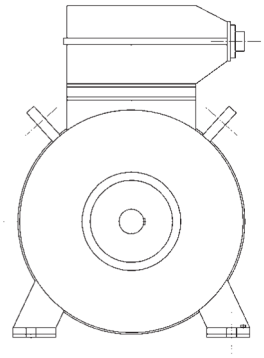
**Connection**

The motors are connected optionally via terminal boxes with ignition protection type "increased safety" or "flameproof enclosure" for a rated voltage of up to 6.6 kV. The box is located at the top in the standard. Lateral versions are possible. The boxes can each be rotated by 4 x 90° to allow connection from any direction. This is possible without turning the connection terminals.

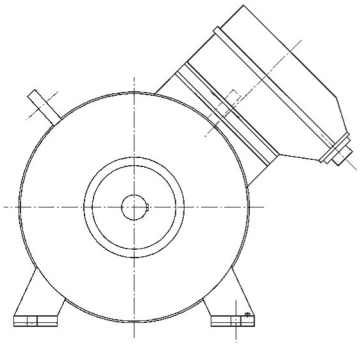
The neutral point can be routed to a second terminal compartment by request. The main and star point boxes are then arranged on a flameproof encapsulated intermediate connecting piece, which is mounted on the motor connecting piece. Because of the fact that the terminals can be exchanged between the two boxes, dual voltage is also possible.

**Bearing**

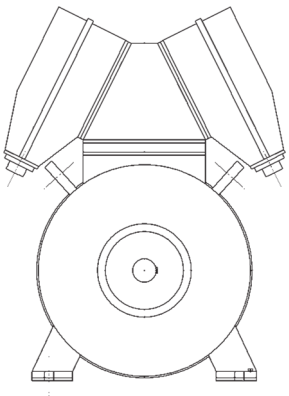
All high-voltage motors are equipped with an insulated bearing at the counter-drive side.



Standard version



Version with main terminal chamber less than 45˚



Version with main and neutral point terminal compartment

**Protective device**

In accordance with IEC/EN 60079-14, VDE 0165-1, the motors must be protected at all poles against non-permissible heating due to overloading by motor protection switches or equivalent devices.
An equivalent protective device is, for example, winding temperature monitoring using PTC thermistor temperature sensors in accordance with DIN 44081 in combination with an approved tripping device. 2-pole and 4-pole motors up to 200 kW, 6-pole motors up to 160 kW and 8-pole motors with 132 kW can be equipped with such a device for protection.

Temperature sensors for additional motor protection as well as the motor circuit breaker can be used for all motors.

Protection by temperature monitoring alone is mandatory for all operating modes deviating from S1 operation such as inverter operation, short-term operation, switching operation, long-term start-up etc. It also provides protection in the event of reduced cooling air flow and excessive ambient temperature. Motors certified for S1 to S7 as well as S9 and S10 operating modes with temperature sensors for protection are therefore also approved for operation with any frequency inverter (for operating data, see page 62 ff.).

Motors with temperature sensors as additional protection are also generally approved for operation on the frequency inverter. The overload protection is taken care of by the temperature sensor in this case. In this case, the short-circuit protection must be provided by the frequency inverter and/or a motor protection switch.

In the case of protection using temperature sensors, three PTC thermistors connected in series are installed in the winding head (warmest point) of the three strands of the stator winding of the motor. For motors with up to 3 separate windings, 3 temperature sensors are used per winding, all of which are connected in series.
The designations of the temperature sensor terminals in the terminal compartment are .TP1 and .TP2. If the protection is to be provided by the temperature sensors, they must be connected to an approved triggering device marked II(2) G.

Versions with additional temperature sensors, e.g. for prewarning or as reserve, are available by request.

**Stationary heating**

Stationary heaters are used to prevent condensation or to protect against motor temperatures of less than -20 °C. Heating to prevent condensate can be implemented via the motor winding or separate heating tapes, and heating for protection against motor temperatures of less than -20 °C is only possible via the motor winding.

**Motor winding**

Stationary heating via the motor winding is possible down to -40 °C, and is achieved by feeding via two terminals U1 and V1 with a reduced AC voltage. The specification of the heating voltage in the adjacent table applies to 50 and 60 Hz, with a star or delta motor circuit as well as for all overall lengths of the respective sizes for number of poles 2p = 2 to 2p = 8. The specified apparent power is a minimum value, i.e. the next higher unit rating must be selected as the transformer rating. For precise adaptation, voltage taps of ± 10 % must be provided on the transformer. It must be ensured that motor voltage and heating voltage cannot be present at the same time.

The heater ratings can be found in the adjacent table.

When using the heater to protect against motor temperatures of less than -20°C, it must be noted that the heater itself is not explosion-proof. It must not be used to heat up the motor from temperatures of less than -20°C to at least -20°C, since the flameproof enclosure loses its approval at motor temperatures of less than -20 °C and therefore does not provide explosion protection. The heater is only suitable for preventing the motor temperature from dropping below -20 °C when stationary.

For applications that require motor temperatures of less than -20 °C (up to max. -55 °C), we provide a specially designed version without a stationary heater, see also page 19.

**Heating tapes**

If the heating is designed to protect against condensation, heating tapes protected by temperature switches are used. This ensures that the winding has optimum protection against damage.

Two voltage ranges are available:
110 V +/- 10 % or 280 V +/- 10 %.

The heater ratings can be found in the adjacent table.

## Stationary heater data

| Size | for preventing condensation with heating tape Output[1] | via motor winding Output | Heating voltage | | | | | for protection at temperatures below -20 °C to -40 °C via motor winding Output | Heating voltage | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | per heating tape (total) | | with rated motor voltage | | | | | | with rated motor voltage | | | | |
| | [W] | [VA] | 230 V [V] | 400 V [V] | 460 V [V] | 500 V [V] | 690 V [V] | [VA] | 230 V [V] | 400 V [V] | 460 V [V] | 500 V [V] | 690 V [V] |
| **63** | 28 (28) | 25 | 45 | 75 | 90 | 100 | 130 | 65 | 70 | 120 | 140 | 160 | 210 |
| **71 (Y)** | 28 (28) | 40 | 35 | 65 | 75 | 85 | 110 | 100 | 60 | 100 | 120 | 135 | 175 |
| **80 (Y)** | 28 (28) | 50 | 30 | 55 | 65 | 75 | 100 | 125 | 50 | 90 | 100 | 115 | 155 |
| **90 (Y)** | 28 (28) | 70 | 25 | 45 | 50 | 60 | 80 | 175 | 40 | 70 | 80 | 95 | 125 |
| **100 (Y)** | 28 (28) | 100 | 25 | 40 | 50 | 55 | 70 | 250 | 40 | 65 | 75 | 85 | 115 |
| **112** | 28 (28) | 150 | 20 | 40 | 45 | 50 | 65 | 375 | 35 | 60 | 70 | 80 | 105 |
| **132 (Y) und 112 Y** | 28 (56) | 200 | 20 | 35 | 40 | 45 | 60 | 500 | 30 | 55 | 65 | 70 | 90 |
| **160 (Y)** | 28 (56) | 300 | 17 | 30 | 35 | 40 | 50 | 750 | 25 | 45 | 55 | 60 | 80 |
| **180 (Y)** | 44 (88) | 400 | 15 | 25 | 30 | 35 | 45 | 1000 | 25 | 40 | 50 | 55 | 70 |
| **200 (Y)** | 44 (88) | 500 | 13 | 20 | 25 | 30 | 40 | 1250 | 20 | 35 | 40 | 45 | 60 |
| **225 (Y)** | 59 (118) | 650 | 13 | 20 | 25 | 30 | 40 | 1650 | 20 | 35 | 40 | 45 | 60 |
| **250 (Y)** | 59 (118) | 800 | | 20 | 25 | 30 | 35 | 2000 | | 35 | 40 | 45 | 60 |
| **280 (Y)** | 125 (250) | 1200 | | 20 | 20 | 25 | 30 | 3000 | | 30 | 35 | 40 | 50 |
| **315 (Y)** | 125 (250) | 1600 | | 17 | 20 | 25 | 30 | 4000 | | 30 | 35 | 40 | 50 |
| **355 (Y)** | 100 (400) | 2300 | | 15 | 18 | 20 | 25 | 5700 | | 25 | 28 | 30 | 40 |
| **400 (Y)** | 150 (600) | 3000 | | 12 | 14 | 16 | 20 | 7500 | | 20 | 22 | 25 | 30 |
| **450 (Y)** | 125 (1000) | 4000 | | 10 | 12 | 13 | 17 | 10000 | | 15 | 18 | 20 | 20 |

Notes
1) Output for temperatures as low as -55 °C by request

### Rated voltage

Explosion-proof, flameproof enclosed three-phase motors are generally available for the following rated voltages:

Rated voltage

| | | |
|---|---|---|
| **50 Hz** | 230/400 V | Delta/Star[1)] |
| | 400/690 V | Delta/Star[2)] |
| | 500 V | Star[3)] |
| | 500 V | Delta |
| **60 Hz** | 266/460 V | Delta/Star[1)] |
| | 460 V | Delta[2)] |

Notes:
1) Standard up to size 112
2) Standard from size 132
3) Standard tolerances in accordance with IEC/EN 60034-1. Special voltages by request.

### Insulation

All materials used for insulating the winding and the winding leads correspond to thermal class F. Insulation corresponding to thermal class H can be provided at an extra charge by request.
The utilization of the permissible overtemperature limit in continuous operation S1 corresponds to thermal class B for motors with a single-speed design.
Motors in the ...X series with increased power and pole-changing motors are utilized in accordance with thermal class F.
The permissible excess temperature limit for a winding that is insulated in accordance with thermal class F is 105 K at an ambient temperature of 40 °C according to IEC/EN 60034-1.
When utilized in accordance with thermal class B, the permissible winding heating is 80 K at an ambient temperature of 40 °C according to IEC/EN 60034-1.
The use of high-quality insulation system materials provides optimal protection against the influence of chemically aggressive gases, vapors, dust, oil and humidity.

### Winding leads

The motors are given 6 winding leads with the designations U1, V1, W1, U2, V2, W2. In the case of more powerful motors, 2 parallel mains supply lines are required with a delta circuit with a rated current of 400 A or above, due to the permissible current strength of the connecting terminals.
In the case of a delta circuit with 690 A or above and a star circuit with a rated current of 400 A or above, the start of each winding is doubled. The 3 connections of the motor with the 6 connecting terminals then have the designations U, U; V, V; W, W. Here, too, 2 parallel mains supply lines are required in each case.

### Pole-changing motors

The design and dimensions of the pole-changing motors correspond to those of the single-speed three-phase motors. The special features of pole-changing motors are described below.

### Sizes

| | |
|---|---|
| **80–355** | 4/2-pole |
| **90–355** | 8/4-pole |
| **90–355** | 6/4-pole |

Other pole number combinations and sizes by request.

In the standard version, the pole-changing motors are designed for approximately the same torque (see page 106 ff.). For motors with a Dahlander circuit, this corresponds to the Δ/YY circuit.
For special applications, e.g. fans, centrifugal pumps, etc., the pole-changing motors are designed for approximately quadratic torque (see page 109 ff.). For motors with a Dahlander circuit, this corresponds to the Y/YY circuit.
The motors are available for rated voltages of 400, 500 and 690 V for a rated frequency of
50 Hz. With special winding, these motors can also be designed for any voltage within the voltage range of 400-690 Volts.
Other voltages and frequencies by request.

The thermal utilization of the motors corresponds to the thermal class "F" that is used.

### Insulation system

| Thermal class in accordance with IEC/EN 60034 | Insulation system<br>Wire / surface insulation | Impregnation |
|---|---|---|
| F | Enameled wires in accordance with EN 60317-13, Temperature index 200 surface insulating materials based on polyester and aromatic polyamides | Impregnation resins in thermal class F in accordance with DIN EN 60464-2 cured using the continuous impregnation method, using the roller burnishing method from a size of 225 |

**Efficiency, power factor**

The information in the tables regarding efficiency and power factor apply to operation with rated power, rated voltage and rated frequency. The efficiency values are determined in accordance with IEC/EN 60034-2-1; tolerances in accordance with IEC/EN 60034-1.

Partial load values for the efficiency and the power factor can be found on pages 96 to 101. The values apply to the rated power at 50 Hz.

**Power, operating mode**

The performance information in the tables applies to the rated voltage and the rated speed for continuous operation S1 up to a coolant temperature of 40 °C and at installation altitudes of up to 1000 m above sea level.

For higher ambient temperatures and installation altitudes above 1000 m, power reductions are required. The following tables apply to motors with the standard design (temperature class T4).

| Coolant temperature [°C] | Reduction of the rated power to about | |
|---|---|---|
| 40 | 100% | see „operating data“ |
| 45 | 94% | |
| 50 | 91% | |
| 55 | 88% | |
| 60 | 84% | |
| **Height above sea level [m]** | **Reduction of the rated power to about** | |
| 1000 | 100% | see „operating data“ |
| 1500 | 97% | |
| 2000 | 94% | |

If the coolant temperature is reduced at installation altitudes of greater than 1000 m above sea level, no power reduction is required in accordance with the allocation in the following table. See also IEC/EN 60034-1.

| Installation height above sea level [m] | | Highest coolant temperature [°C] |
|---|---|---|
| 0 | bis 1000 | 40 |
| 1000 | 1500 | 35 |
| 1500 | 2000 | 30 |

Motors with a coolant temperature which deviates from 40 °C and with an installation altitude which deviates from 1000 m above sea level and a modified power allocation compared to the standard version may require additional testing.

Special acceptance tests are also required for operating modes other than S1 in accordance with IEC/EN 60034-1. For this purpose, we request that you provide us with the necessary information in accordance with paragraphs 4 and 6 of these provisions for the design of the motor when you are making inquiries.

Optimum utilization of the motor and safe protection is provided by winding temperature monitoring from PTC thermistors (see page 50).

**Overload, starting current**

The motors can be overloaded in accordance with the IEC/EN 60034-1 regulations. They can withstand 1.5 times the rated current for 2 minutes at the operating temperature without damage, and can be loaded with 1.6 times the rated torque for 15 seconds.

The overcurrent relays to be provided in accordance with the installation regulations for electrical systems in hazardous areas only allow limited start-up times. This results in limited mass moments of inertia to be accelerated. The permissible start-up times are shown in the table on page 54. Up to size 315, 2 successive start-ups are possible, and 1 start-up from size 355.

# Permissible start-up times for standard motors
## Temperature class T4
## Protection by PTC thermistor temperature sensor

**Starting current, apparent startup power**
The values of the starting current as a multiple of the rated current that are specified in the operating data are measured quantities of the type sample. From the values of the starting current ratio, the ratio of the apparent starting power to the rated power of the motor results from the relationship

$$\frac{S_A}{P_2} = I_A/I_N \quad \frac{1}{\eta \times \cos\varphi}$$

**Torque**
The motors have squirrel-cage rotors, whose cages are manufactured in accordance with the list in the size range of 63-315L2, 2-pole to 8-pole in die-cast aluminum and also in hard-soldered copper high-bar design and are designed for immediate switch-on. The starting and breakdown torques that occur here - as multiples of the rated-load torques - can be found in the technical tables. The specifications are measured values of the type specimen.
If the voltage deviates from the rated value, the torques (starting torque, the ramp-up torque and the breakdown torque) change approximately in the ratio of the squares of the voltages.

**Direction of rotation**
The motors can generally be used for both directions of rotation. Motors with a self-driven axial fan (series ...A, ...AR) are an exception. These fans are dependent on the direction of rotation. The direction of rotation is indicated by an arrow on the fan shroud. Binding wiring diagrams are enclosed with the motors on delivery.

| Rated power | 2p = 2 permissible start-up time[1] | | 2p = 4 permissible start-up time[1] | | 2p = 6 permissible start-up time[1] | | 2p = 8 permissible start-up time[1] | |
|---|---|---|---|---|---|---|---|---|
| | cold | warm | cold | warm | cold | warm | cold | warm |
| $P_2$ | t | t | t | t | t | t | t | t |
| [kW] | [s] | [s] | [s] | [s] | [s] | [s] | [s] | [s] |
| 0,12 | - | - | 90 | 62 | - | - | 100 | 59 |
| 0,18 | 60 | 40 | 90 | 62 | - | - | 100 | 59 |
| 0,25 | 60 | 40 | 90 | 62 | 80 | 63 | 100 | 59 |
| 0,37 | 60 | 40 | 90 | 62 | 79 | 62 | 100 | 59 |
| 0,55 | 60 | 40 | 90 | 62 | 55 | 40 | 100 | 59 |
| 0,75 | 50 | 36 | 75 | 50 | 85 | 55 | 95 | 56 |
| 1,1 | 47 | 31 | 60 | 38 | 80 | 50 | 108 | 69 |
| 1,5 | 45 | 27 | 46 | 26 | 73 | 42 | 108 | 81 |
| 2,2 | 45 | 20 | 46 | 25 | 65 | 46 | 104 | 72 |
| 3 | 42 | 20 | 46 | 22 | 51 | 39 | 80 | 50 |
| 4 | 35 | 19 | 39 | 23 | 46 | 34 | 85 | 55 |
| 5,5 | 30 | 19 | 43 | 25 | 45 | 29 | 84 | 54 |
| 7,5 | 35 | 19 | 42 | 22 | 35 | 22 | 87 | 58 |
| 11 | 35 | 19 | 39 | 23 | 38 | 19 | 81 | 45 |
| 15 | 41 | 21 | 46 | 24 | 43 | 22 | 59 | 41 |
| 18,5 | 39 | 20 | 46 | 23 | 46 | 27 | 46 | 29 |
| 22 | 39 | 20 | 52 | 24 | 43 | 21 | 59 | 40 |
| 30 | 39 | 20 | 52 | 25 | 60 | 31 | 57 | 33 |
| 37 | 53 | 21 | 56 | 28 | 57 | 28 | 66 | 45 |
| 45 | 69 | 32 | 62 | 26 | 75 | 45 | 74 | 44 |
| 55 | 74 | 29 | 45 | 25 | 80 | 56 | 77 | 48 |
| 75 | 85 | 39 | 56 | 23 | 64 | 36 | 61 | 40 |
| 90 | 84 | 42 | 59 | 25 | 49 | 22 | 60 | 30 |
| 110 | 97 | 45 | 62 | 23 | 60 | 30 | 60 | 30 |
| 132 | 103 | 48 | 63 | 26 | 60 | 30 | 60 | 30 |
| 160 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 200 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 250 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 315 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 355 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 400 | 100 | 50 | 60 | 30 | 60 | 30 | 60 | 30 |
| 450 | - | - | 60 | 30 | 60 | 30 | - | - |

**Note**
[1] These times can only be achieved with winding temperature monitoring with PTC thermistor temperature sensors

## Switching frequencies

For motors with the standard design (temperature class T4), the start-ups specified in the table are permissible if heat class "F" is used and the winding temperature is monitored by PTC thermistors.

A distinction is made between:

1. Number of starts against a constant load torque.

2. Number of starts against a load torque the increases quadratically with the speed up to the nominal point.

The specified values apply to the inertia factor FI = 1, i.e. without taking the external moment of inertia into consideration. The external moments of inertia can be taken into consideration done via the FI-factor, according to the relationship

$S = \frac{S_{list}}{FI}$ [S/h] with $FI = \frac{J_{add.} + J_{mot.}}{J_{mot.}}$

In contrast to the no-load switching frequency, the switching frequencies specified for the loaded motor are pure ramp-ups.
If the motors are braked by countercurrent, the values must be divided by the K-factor.

This K-factor is:

K = 2.5 for constant counter torque
K = 3.2 for quadratically increasing counter torque

This results in the relationship:

$$S = \frac{S_{list}\ [S/h]}{FI \times K}$$

[S/h] Switchings per hour

## Startups per hour

| **Rated power** $P_2$ [kW] | **2p = 2** Startups per hr. FI = 1 Counter torque const. [S/h] | quadr. [S/h] | **2p = 4** Startups per hr. FI = 1 Counter torque const. [S/h] | quadr. [S/h] | **2p = 6** Startups per hr. FI = 1 Counter torque const. [S/h] | quadr. [S/h] | **2p = 8** Startups per hr. FI = 1 Counter torque const. [S/h] | quadr. [S/h] |
|---|---|---|---|---|---|---|---|---|
| 0,12 | - | - | 11000 | 12000 | - | - | 6000 | 10200 |
| 0,18 | 8000 | 11000 | 11000 | 12000 | - | - | 6000 | 10200 |
| 0,25 | 8000 | 11000 | 11000 | 12000 | 10800 | 11450 | 6000 | 10200 |
| 0,37 | 8000 | 11000 | 11000 | 12000 | 10800 | 11450 | 5000 | 8500 |
| 0,55 | 8000 | 11000 | 10800 | 11500 | 10800 | 11450 | 5000 | 8500 |
| 0,75 | 7850 | 10500 | 10800 | 11550 | 6300 | 10590 | 4000 | 6800 |
| 1,1 | 5700 | 7560 | 6200 | 9550 | 5900 | 8880 | 6100 | 9900 |
| 1,5 | 3260 | 4410 | 3420 | 6480 | 2950 | 4580 | 9200 | 10500 |
| 2,2 | 1410 | 1960 | 2960 | 4400 | 2800 | 4100 | 4500 | 6930 |
| 3 | 980 | 1260 | 1930 | 2690 | 2600 | 3780 | 3900 | 5500 |
| 4 | 820 | 1200 | 2600 | 3490 | 2400 | 3460 | 2750 | 4530 |
| 5,5 | 610 | 880 | 1520 | 2050 | 2300 | 3150 | 2420 | 3480 |
| 7,5 | 780 | 1040 | 1000 | 1360 | 1340 | 1800 | 2190 | 3180 |
| 11 | 300 | 400 | 990 | 1360 | 720 | 1000 | 1100 | 1640 |
| 15 | 240 | 320 | 510 | 750 | 630 | 860 | 1330 | 1850 |
| 18,5 | 180 | 240 | 460 | 620 | 540 | 820 | 770 | 1040 |
| 22 | 130 | 170 | 130 | 180 | 400 | 540 | 1080 | 1430 |
| 30 | 65 | 100 | 300 | 400 | 290 | 380 | 410 | 560 |
| 37 | 55 | 75 | 230 | 310 | 170 | 240 | 370 | 560 |
| 45 | 50 | 65 | 110 | 170 | 200 | 280 | 205 | 305 |
| 55 | 40 | 55 | 95 | 130 | 220 | 310 | 270 | 305 |
| 75 | 30 | 45 | 70 | 100 | 100 | 170 | 220 | 330 |
| 90 | 25 | 35 | 40 | 65 | 90 | 150 | 120 | 180 |
| 110 | 18 | 27 | 23 | 30 | 80 | 125 | 170 | 230 |
| 132 | 16 | 25 | 30 | 55 | 70 | 100 | 150 | 190 |
| 160 | 12 | 22 | 30 | 45 | 55 | 85 | 150 | 190 |
| 200 | 8 | 20 | 22 | 35 | 50 | 75 | 150 | 190 |
| 250 | 8 | 18 | 18 | 30 | 40 | 60 | - | - |
| 315 | 8 | 18 | 18 | 30 | - | - | - | - |

**Notes**

Size 355 to 450 by request

Switching operation can only take place if there is winding temperature monitoring using a PTC thermistor temperature sensor.

**Frequencies above the nominal frequency of 50 Hz**
If the frequency is increased further above the nominal point of the drive, appropriately faster speeds will occur.

The speeds corresponding to the maximum frequencies must not exceed the limit speeds of the motors. If the motors are operated above the nominal frequency, attention must be paid to the additional noise development.

To reduce the noise levels, it is advisable to use a motor with externally driven external fan.

For operation above the nominal frequency (50 Hz) there are two basic methods of operation:

**Three-phase motors with operation on a frequency converter with constant flux up to 87 Hz**
If the motor is operated above the mains frequency with a voltage that increases linearly with the frequency increase, the magnetic flux remains constant. Due to the disproportionate increase in iron losses with the frequency, the maximum torque is reduced compared to 50 Hz (see torque curve diagrams on pages 58 and 61).
The technical tables contain the power specification in relation to 87 Hz or the maximum frequency with 2-pole motors. When the voltage is being increased linearly with the frequency, make sure that the voltage limits are not exceeded (see permissible voltage stress).

**Three-phase motors when operated on the frequency converter with constant voltage above 50 Hz**
If the motor is operated above the mains frequency with constant voltage, field weakening operation is present in this range.

The flux of the motor decreases inversely proportional to the increase in frequency. The power of the motor remains almost constant in the range above the nominal frequency (50 Hz) up to 87 Hz, i.e. the torque decreases in inverse proportion to the frequency (see torque curve on pages 58 and 59).

The maximum frequency for 2-pole motors can be found in the technical tables.

**Power and torques**
The power ratings for inverter operation shown in the operating data tables apply to continuous operation S1 at an ambient temperature of up to 40 °C and an installation altitude of up to 1000 m. Power ratings for higher ambient temperatures and installation altitudes are available by request.

The power rating are in relation to inverters with
– DC link (I inverter)
– DC link with block-shaped or pulsed voltage (U inverter)

The thermal utilization of the motors corresponds to the thermal class F that is used.

Torque curves can be found on pages 58 and 59.

**Noise of the three-phase motors during operation at the frequency inverter**
With inverter operation, the noise increases due to the harmonics compared to mains operation. The increase is approx. 7-15 dB(A) at the U inverter without using a sinusoidal phase filter, i.e. approx. 3 dB(A) at the I inverter.

With the filter on the U inverter, the noise values at frequencies ≤ 50 Hz do not exceed the values with mains operation.

The noise increase for self-ventilated motors and frequencies > 50 Hz is shown in the table below.

Guide values for the increase in sound pressure level due to the increase in fan noise.

| F [Hz] | Δ LP [dB(A)] |
|---|---|
| 50 | 0 |
| 60 | ≤ 5 |
| 70 | ≤ 9 |
| 80 | ≤ 12 |
| 87 | ≤ 15 |

For low-noise drives with inverters we provide special motors in accordance with page 35.

**Motors with externally driven external fans**
Motors with externally driven external fans are preferably used with drives with bigger control ranges and constant counter-torque and for operation above 50 Hz to avoid an increase in noise.

The fan motor corresponds to the "flameproof enclosure" ignition protection type.

The electrical control system must ensure that the main motor can only be operated with the forced cooling switched on.

**Installation note**
If the inverter output with current limiting is not galvanically isolated from the mains, the requirements of DIN EN 50178, VDE 0160 (Electronic equipment for use in power installations) must be observed for the overload protection of the protective conductor.

When the protective device in the phase conductors is being dimensioned, it must be taken into consideration that in the event of a fault, the protective conductor current may be greater than the phase conductor current. The protective earth conductor must then be designed for this fault current.

All of the inverter manufacturer’s information concerning this error case must be observed.

**Permissible stress load**
When the motors are being operated on frequency converters, the switching operations cause voltage peaks which additionally put the terminals and the winding insulation under stress. In an extreme way, this is the case when pulse inverters with very steep edges excite oscillations on the lines, which can also overlap in unfavorable cases.

The following values of the permissible voltage load capacity caused by voltage peaks (limit values of the terminals and the winding insulation) are safely controlled.

1. **Connection terminals** have clearances and creepage distances which are designed for an effective rated voltage of 690 V on the basis of DIN EN 60079-7 - Equipment protection by increased safety "e".
   The permissible transient overvoltage in frequency converter operation of the motors is 2.15 kV phase to phase and phase to ground.

2. **Standard windings** for effective rated voltages of 230/400 V and 500 V have a peak electric strength of 1.6 kV phase to phase and phase to ground with continuous heating in accordance with thermal class F. These motors are suitable for frequency converters without an additional filter.

3. **Standard windings** for an effective rated voltage of 400/690 V have a peak electric strength of 1.6 kV phase to phase and phase to ground with continuous heating in accordance with thermal class F. These motors are suitable for frequency converters with an additional filter.

4. **Special windings** for an effective rated voltage of 690 V have a peak electric strength of 2.15 kV phase to phase and phase to ground with continuous heating in accordance with thermal class F. These motors are suitable for frequency converters without additional filters. They are marked with a "U" at the end of the type designation of the motor. This special winding is available from size 315 and requires a power reduction. The efficiencies correspond to the manufacturer's standard.

Torque curve at frequency inverter, 50 Hz mains
Temperature class T4
2p = 2

Diagram 1: Size 63–160

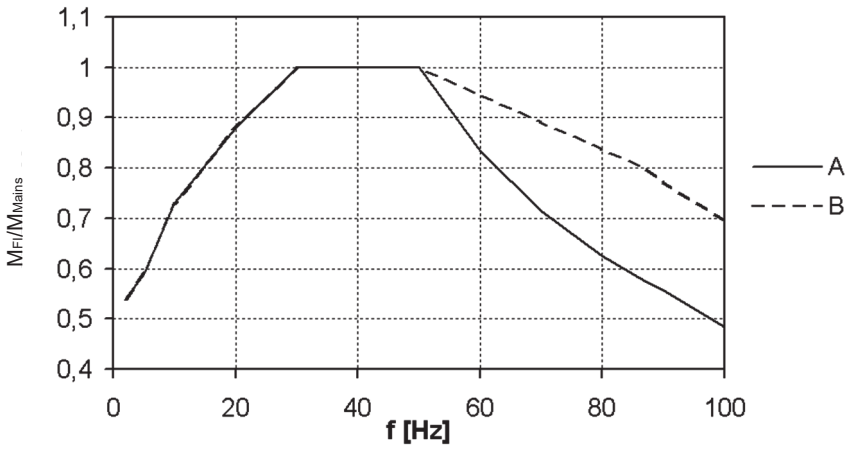



Diagram 2: Size 180–225

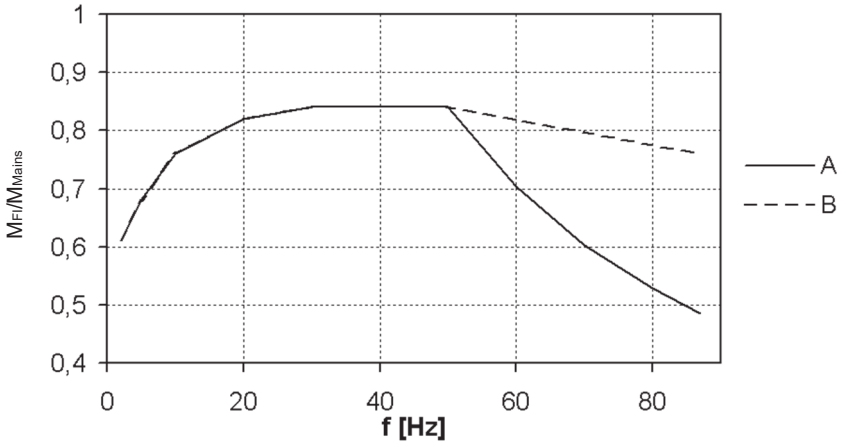
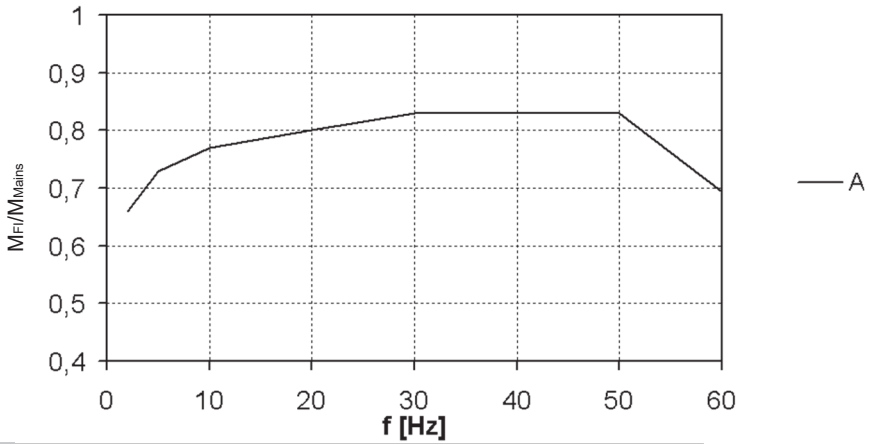



Diagram 3: Size 250–400




Curve A: Field weakening range from 50 Hz
Curve B: Field weakening range from 87 Hz

Diagram 4: Size 63–160

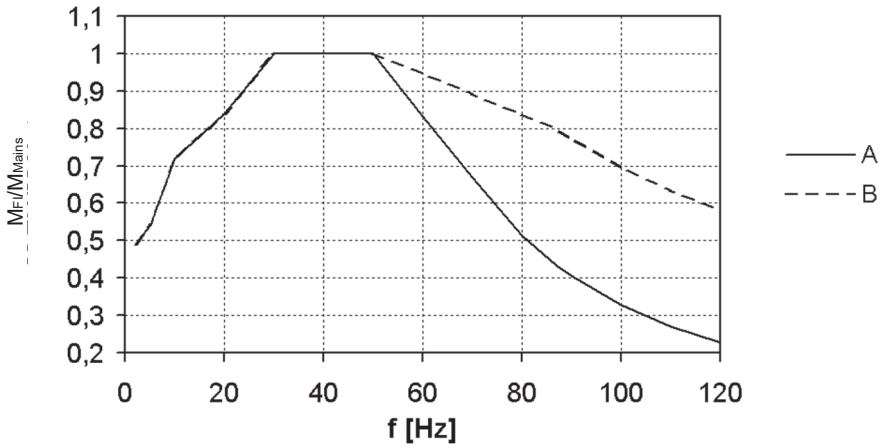



Diagram 5: Size 180–225

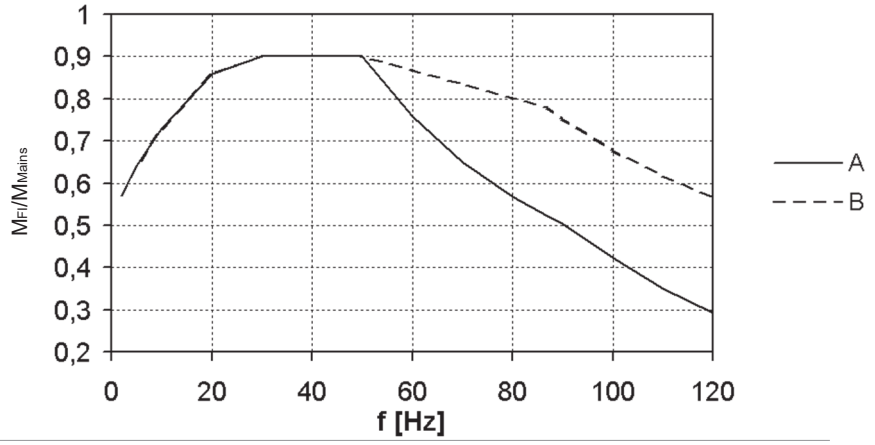
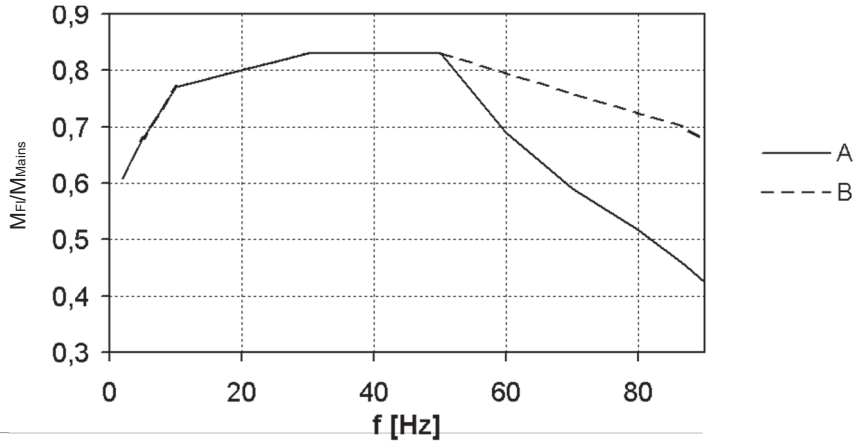



Diagram 6: Size 250–400




Curve A: Field weakening range from 50 Hz
Curve B: Field weakening range from 87 Hz

# Operation at frequency inverter

60

Torque curve at frequency inverter, 60 Hz mains
Temperature class T4
2p = 2

Diagram 1: Size 63–160

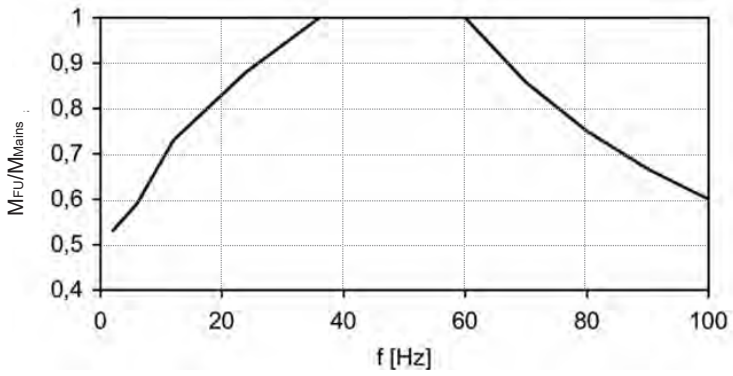



Diagram 2: Size 180–225

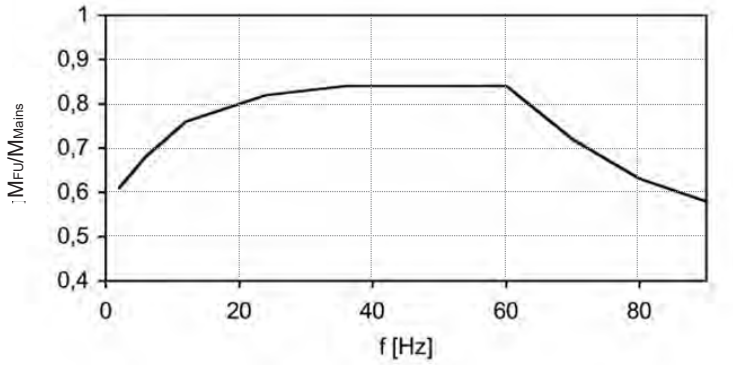
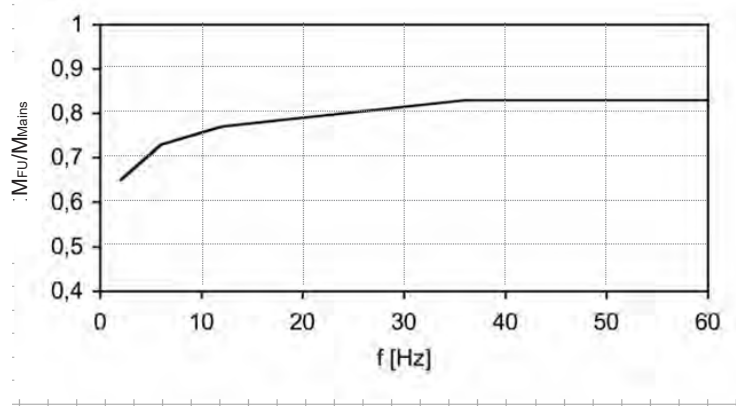



Diagram 3: Size 250–400




Curve A: Field weakening range from 60 Hz

Diagram 4: Size 63–160

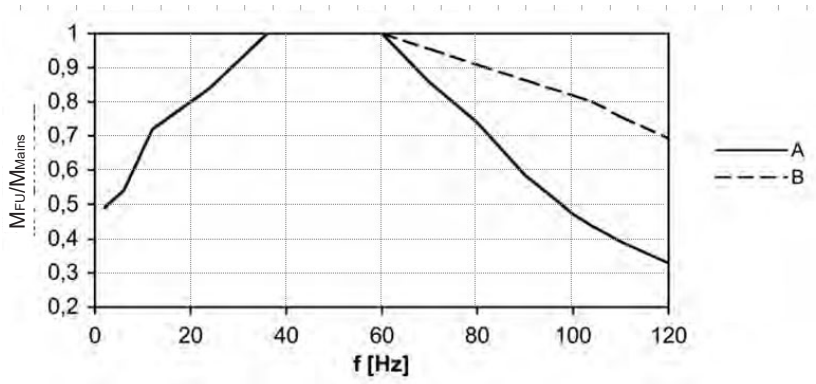



Diagram 5: Size 180–225

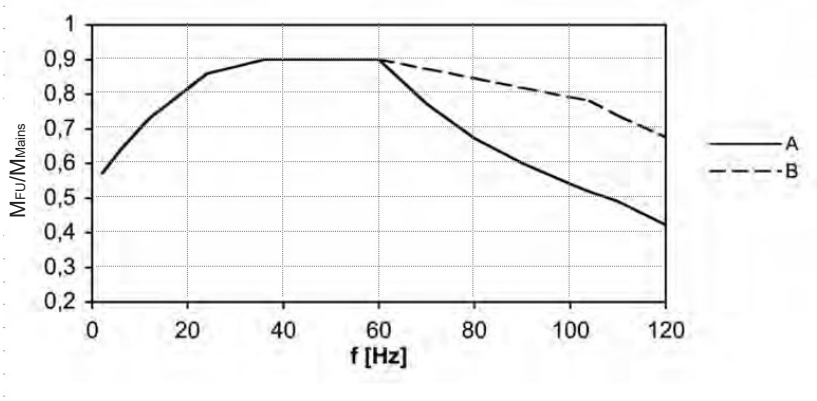
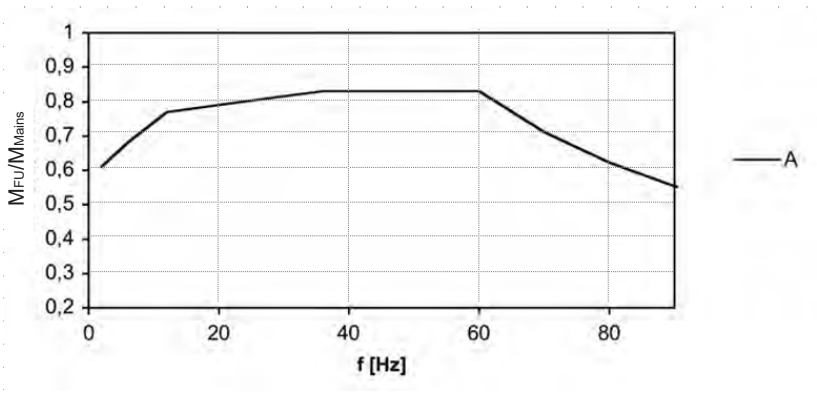



Diagram 6: Size 250–400




Curve A: Field weakening range from 60 Hz
Curve B: Field weakening range from 104 Hz

| Size | Output | Rated current at | | Speed | Effi-ciency level | Per-forma-nce factor | Torque | Starting torque | Starting current | Break-down torque | Mass-moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ | 400 V I | 500 V I | n | η | cos φ | M | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J | m | $L_P$ | $L_W$ | $L_P$ | $L_W$ |
| | [kW] | [A] | [A] | [rpm] | [%] | | [Nm] | | | | [kgm²] | [kg] | [dB(A)] | [dB(A)] | [dB(A)] | [dB(A)] |
| **CD…Y3** | | | | | **IE3** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-2** | 0.18 | 0.45 | 0.36 | 2835 | 70 | 0.83 | 0.61 | 3.2 | 6 | 4.7 | 0.00028 | 16 | 49 | 61 | - | - |
| **63M2-2** | 0.25 | 0.6 | 0.48 | 2825 | 73 | 0.83 | 0.85 | 3.1 | 5.8 | 4.5 | 0.00028 | 16 | 49 | 61 | - | - |
| **71M1-2** | 0.37 | 0.83 | 0.66 | 2825 | 74 | 0.87 | 1.25 | 2.6 | 5.7 | 3.4 | 0.00058 | 24 | 51 | 63 | - | - |
| **71M2-2** | 0.55 | 1.17 | 0.94 | 2830 | 78 | 0.87 | 1.86 | 2.7 | 6.1 | 3.6 | 0.00080 | 25 | 51 | 63 | - | - |
| **80M1-2** | 0.75 | 1.5 | 1.20 | 2890 | 82.8 | 0.87 | 2.48 | 3 | 6.6 | 3.6 | 0.0013 | 31 | 55 | 67 | - | - |
| **80M2-2** | 1.1 | 2.2 | 1.74 | 2885 | 83.7 | 0.87 | 3.64 | 3.2 | 7.1 | 3.5 | 0.0018 | 35 | 55 | 67 | - | - |
| **90S-2** | 1.5 | 2.9 | 2.3 | 2895 | 84.7 | 0.88 | 4.95 | 3 | 6.8 | 3.5 | 0.0029 | 45 | 60 | 72 | - | - |
| **90L-2** | 2.2 | 4.2 | 3.35 | 2900 | 86.4 | 0.88 | 7.2 | 3 | 6.9 | 3.6 | 0.0039 | 48 | 60 | 72 | - | - |
| **100L-2** | 3 | 5.6 | 4.45 | 2910 | 88.1 | 0.88 | 9.8 | 2.5 | 6.9 | 2.9 | 0.0051 | 53 | 63 | 75 | - | - |
| **112M-2** | 4 | 7.5 | 6 | 2930 | 88.4 | 0.87 | 13 | 2.8 | 6.9 | 3.6 | 0.0089 | 95 | 63 | 76 | 55 | 67 |
| **132S1-2** | 5.5 | 10 | 8 | 2925 | 89.5 | 0.89 | 18 | 2.5 | 7 | 3.3 | 0.0125 | 103 | 63 | 76 | 55 | 68 |
| **132S2-2** | 7.5 | 13.5 | 10.8 | 2930 | 90.3 | 0.89 | 24.4 | 2.7 | 7.1 | 3.5 | 0.0177 | 115 | 63 | 76 | 55 | 68 |
| **160M1-2** | 11 | 20 | 16 | 2940 | 91.3 | 0.87 | 35.7 | 3 | 7.3 | 3.6 | 0.032 | 163 | 66 | 79 | 56 | 69 |
| **160M2-2** | 15 | 26 | 21 | 2940 | 92 | 0.9 | 48.7 | 2.8 | 7.2 | 3.2 | 0.043 | 173 | 66 | 79 | 56 | 69 |
| **160L-2** | 18.5 | 31.5 | 25.5 | 2940 | 92.5 | 0.91 | 60 | 2.7 | 7.2 | 3.1 | 0.052 | 188 | 66 | 79 | 56 | 69 |
| **180M-2** | 22 | 37.5 | 30 | 2945 | 92.9 | 0.91 | 71 | 2.6 | 7.5 | 3.2 | 0.075 | 196 | 69 | 82 | 58 | 71 |
| **200L1-2** | 30 | 51 | 41 | 2955 | 93.5 | 0.9 | 97 | 2.7 | 7.5 | 3.1 | 0.13 | 254 | 71 | 85 | 60 | 74 |
| **200L2-2** | 37 | 63 | 51 | 2955 | 93.8 | 0.9 | 120 | 2.8 | 7.6 | 3.2 | 0.16 | 278 | 71 | 85 | 60 | 74 |
| **225M-2** | 45 | 77 | 61 | 2960 | 94.2 | 0.9 | 145 | 2.7 | 7.3 | 3 | 0.24 | 400 | 72 | 86 | 60 | 74 |
| **250M-2** | 55 | 96 | 76 | 2970 | 94.4 | 0.88 | 177 | 2.8 | 7.5 | 3.1 | 0.4 | 545 | 75 | 89 | 64 | 78 |
| **280S-2** | 75 | 130 | 103.8 | 2975 | 94.8 | 0.88 | 241 | 2.3 | 7.1 | 2.8 | 0.65 | 700 | 76 | 90 | 66 | 80 |
| **280M-2** | 90 | 157 | 126 | 2980 | 95.1 | 0.87 | 288 | 2.4 | 7.4 | 2.9 | 0.78 | 762 | 76 | 90 | 66 | 80 |
| **315S-2** | 110 | 187 | 150 | 2975 | 95.4 | 0.89 | 353 | 2.2 | 7.1 | 2.6 | 1.4 | 960 | 76 | 91 | 66 | 81 |
| **315M-2** | 132 | 220 | 177 | 2975 | 95.8 | 0.9 | 424 | 2.1 | 6.8 | 2.5 | 1.6 | 1025 | 76 | 91 | 66 | 81 |
| **315L1-2** | 160 | 270 | 215 | 2980 | 95.9 | 0.9 | 514 | 2.4 | 7.4 | 2.7 | 1.7 | 1065 | 76 | 91 | 66 | 81 |
| **315L2-2** | 200 | 335 | 265 | 2980 | 96 | 0.9 | 614 | 2.3 | 6.9 | 2.6 | 2.2 | 1270 | 76 | 91 | 66 | 81 |
| **315L3-2** | 250 | 410[1] | 325 | 2980 | 96 | 0.92 | 801 | 1.7 | 7.2 | 2.7 | 2.8 | 1420 | 76 | 91 | 66 | 81 |
| **355L1-2** | 315 | 510[1] | 410[1] | 2980 | 96.6 | 0.92 | 1009 | 1.5 | 6.7 | 2.8 | 4.5 | 1900 | 81 | 97 | 68 | 84 |
| **355L2-2** | 355 | 570[1] | 455[1] | 2985 | 96.8 | 0.93 | 1136 | 1.4 | 6.9 | 2.7 | 5 | 2050 | 81 | 97 | 68 | 84 |
| **355L3-2** | 400 | 640[1] | 515[1] | 2985 | 96.8 | 0.93 | 1280 | 1.3 | 7 | 2.8 | 5.5 | 2350 | 81 | 97 | 68 | 84 |
| **400L-2** | 450 | 710[1] | 570[1] | 2990 | 97 | 0.94 | 1437 | 1.1 | 7.2 | 2.8 | 8.5 | 2910 | 81 | 97 | - | - |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass-moment of inertia | Weight[2)] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | **IE3** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-4** | 0.12 | 0.37 | 0.29 | 1430 | 68 | 0.69 | 0.80 | 3.4 | 5.3 | 3.7 | 0.00046 | 16 | 44 | 56 | - | - |
| **63M2-4** | 0.18 | 0.51 | 0.41 | 1425 | 72 | 0.71 | 1.21 | 2.8 | 5.2 | 3.4 | 0.00063 | 17 | 44 | 56 | - | - |
| **71M1-4** | 0.25 | 0.68 | 0.54 | 1445 | 73.8 | 0.72 | 1.65 | 3.1 | 5.7 | 3.7 | 0.00092 | 24 | 45 | 57 | - | - |
| **71M2-4** | 0.37 | 0.97 | 0.78 | 1435 | 77.5 | 0.71 | 2.46 | 3.6 | 6.3 | 3.9 | 0.0013 | 25 | 45 | 57 | - | - |
| **80M1-4** | 0.55 | 1.24 | 0.99 | 1440 | 81 | 0.79 | 3.65 | 2.9 | 6.8 | 3.5 | 0.0021 | 31 | 46 | 58 | - | - |
| **80M2-4** | 0.75 | 1.68 | 1.34 | 1445 | 82.6 | 0.78 | 5 | 3.2 | 6.8 | 4.2 | 0.0029 | 35 | 46 | 58 | - | - |
| **90S-4** | 1.1 | 2.35 | 1.89 | 1455 | 84.2 | 0.8 | 7.2 | 2.4 | 6.8 | 3.1 | 0.0046 | 44 | 49 | 61 | - | - |
| **90L-4** | 1.5 | 3.15 | 2.5 | 1450 | 85.5 | 0.81 | 9.9 | 2.5 | 6.9 | 3.2 | 0.0056 | 46 | 49 | 61 | - | - |
| **100L1-4** | 2.2 | 4.35 | 3.45 | 1450 | 87.1 | 0.84 | 14.5 | 2.9 | 7.3 | 3.3 | 0.011 | 59 | 52 | 64 | - | - |
| **100L2-4** | 3 | 5.9 | 4.7 | 1450 | 87.8 | 0.84 | 18.8 | 3.1 | 7.4 | 3.6 | 0.011 | 59 | 52 | 64 | - | - |
| **112M-4** | 4 | 7.8 | 6.3 | 1460 | 88.7 | 0.83 | 26.2 | 3 | 7.2 | 3.4 | 0.022 | 100 | 54 | 66 | - | - |
| **132S-4** | 5.5 | 10.4 | 8.3 | 1460 | 89.6 | 0.85 | 36 | 3.2 | 7.1 | 3.5 | 0.03 | 113 | 57 | 70 | 55 | 68 |
| **132M-4** | 7.5 | 13.9 | 11.1 | 1460 | 90.5 | 0.86 | 49 | 3.1 | 7.4 | 3.3 | 0.041 | 125 | 57 | 70 | 55 | 68 |
| **160M-4** | 11 | 20.5 | 16.3 | 1470 | 91.5 | 0.85 | 71 | 2.8 | 7.1 | 3.1 | 0.079 | 184 | 62 | 75 | 59 | 69 |
| **160L-4** | 15 | 28.5 | 22.5 | 1470 | 92.1 | 0.83 | 97 | 3.1 | 7.4 | 3.4 | 0.092 | 208 | 62 | 75 | 59 | 69 |
| **180M-4** | 18.5 | 34.5 | 28 | 1470 | 92.7 | 0.83 | 120 | 3.3 | 7.4 | 3.4 | 0.155 | 217 | 60 | 73 | 57 | 70 |
| **180L-4** | 22 | 38.5 | 32.8 | 1470 | 93.2 | 0.83 | 143 | 3.2 | 7.3 | 3.4 | 0.25 | 244 | 60 | 73 | 57 | 70 |
| **200L-4** | 30 | 54 | 43.5 | 1470 | 93.8 | 0.85 | 195 | 3.1 | 7.6 | 3.3 | 0.25 | 274 | 61 | 75 | 58 | 72 |
| **225S-4** | 37 | 67 | 54 | 1475 | 93.9 | 0.85 | 240 | 3 | 7.1 | 2.9 | 0.4 | 372 | 63 | 77 | 59 | 73 |
| **225M-4** | 45 | 80 | 64 | 1475 | 94.3 | 0.86 | 291 | 3.1 | 7.2 | 3 | 0.48 | 402 | 63 | 77 | 59 | 73 |
| **250M-4** | 55 | 95 | 76 | 1475 | 94.6 | 0.88 | 356 | 3.1 | 7.3 | 3 | 0.75 | 588 | 65 | 79 | 64 | 78 |
| **280S-4** | 75 | 134 | 107 | 1480 | 95.2 | 0.85 | 484 | 3 | 7.4 | 2.8 | 1.25 | 740 | 68 | 82 | 66 | 80 |
| **280M-4** | 90 | 160 | 128 | 1485 | 95.3 | 0.85 | 579 | 3.2 | 7.8 | 3 | 1.48 | 820 | 68 | 82 | 66 | 80 |
| **315S-4** | 110 | 198 | 158 | 1485 | 95.6 | 0.84 | 707 | 2.7 | 6.9 | 2.7 | 2.2 | 1040 | 69 | 84 | 66 | 81 |
| **315M-4** | 132 | 235 | 189 | 1485 | 95.8 | 0.84 | 849 | 2.7 | 7 | 2.7 | 2.7 | 1120 | 69 | 84 | 66 | 81 |
| **315L1-4** | 160 | 285 | 230 | 1490 | 96 | 0.84 | 1026 | 2.8 | 7.4 | 2.8 | 3.1 | 1210 | 69 | 84 | 66 | 81 |
| **315L2-4** | 200 | 355 | 285 | 1490 | 96.1 | 0.85 | 1286 | 2.6 | 6.9 | 2.6 | 3.9 | 1430 | 69 | 84 | 66 | 81 |
| **315L3-4** | 250 | 430[1)] | 345 | 1490 | 96.2 | 0.87 | 1602 | 1.7 | 7.3 | 2.7 | 4.6 | 1565 | 69 | 84 | 66 | 81 |
| **355L1-4** | 315 | 525[1)] | 420[1)] | 1490 | 96.3 | 0.90 | 2019 | 1.5 | 6.9 | 2.7 | 6.1 | 2050 | 72 | 88 | 68 | 84 |
| **355L2-4** | 355 | 590[1)] | 470[1)] | 1490 | 96.6 | 0.90 | 2275 | 1.6 | 6.9 | 2.8 | 6.7 | 2200 | 72 | 88 | 68 | 84 |
| **355L3-4** | 400 | 665[1)] | 530[1)] | 1490 | 97 | 0.90 | 2564 | 1.5 | 7 | 2.8 | 7.4 | 2430 | 72 | 88 | 68 | 84 |
| **400M-4** | 450 | 735[1)] | 590[1)] | 1495 | 97 | 0.91 | 2875 | 1.1 | 7.3 | 2.7 | 18 | 2850 | 78 | 94 | | |
| **400L-4** | 500 | 815[1)] | 655[1)] | 1495 | 97.1 | 0.91 | 3194 | 1.1 | 7.3 | 2.7 | 20 | 3230 | 78 | 94 | | |
| **450M-4** | 560 | 915[1)] | 730[1)] | 1495 | 97.2 | 0.91 | 3577 | 1 | 6.8 | 2.7 | 26 | 3500 | 79 | 95 | | |
| **450L-4** | 630 | 1025[1)] | 820[1)] | 1495 | 97.4 | 0.91 | 4024 | 1 | 6.8 | 2.7 | 31 | 3800 | 79 | 95 | | |
| **500…** | by request | | | | | | | | | | | | | | | |

**Note**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break-down torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | **IE3** | **Efficiency according to IEC 60034-30** | | | | | | | | |
| **71M2-6** | 0.25 | 0.75 | 0.60 | 935 | 69 | 0.70 | 2.55 | 2.5 | 4.4 | 3.2 | 0.0025 | 25 | 44 | 56 |
| **80M1-6** | 0.37 | 1.02 | 0.82 | 950 | 73.8 | 0.71 | 3.70 | 1.7 | 4.4 | 3 | 0.0033 | 31 | 44 | 56 |
| **80M2-6** | 0.55 | 1.41 | 1.12 | 945 | 77.4 | 0.73 | 5.3 | 1.8 | 4.5 | 3.1 | 0.0046 | 35 | 44 | 56 |
| **90S-6** | 0.75 | 1.96 | 1.56 | 955 | 79.1 | 0.70 | 7.5 | 2.7 | 5.5 | 3.1 | 0.0080 | 44 | 47 | 59 |
| **90L-6** | 1.1 | 2.7 | 2.15 | 955 | 81.4 | 0.72 | 11 | 2.8 | 5.9 | 3.1 | 0.0095 | 46 | 47 | 59 |
| **100L-6** | 1.5 | 3.65 | 2.9 | 965 | 83.5 | 0.71 | 14.8 | 3 | 6.8 | 3.3 | 0.017 | 59 | 50 | 62 |
| **112M-6** | 2.2 | 4.75 | 3.8 | 965 | 85.5 | 0.78 | 21.8 | 2.6 | 6.8 | 3.1 | 0.031 | 100 | 53 | 65 |
| **132S-6** | 3 | 6.8 | 5.5 | 970 | 85.7 | 0.74 | 29.5 | 3.2 | 7.1 | 3.7 | 0.031 | 100 | 56 | 69 |
| **132M1-6** | 4 | 8.7 | 7 | 965 | 87 | 0.76 | 39.6 | 2.9 | 6.9 | 3.7 | 0.037 | 104 | 56 | 69 |
| **132M2-6** | 5.5 | 11.5 | 9.2 | 965 | 88.3 | 0.78 | 54 | 2.9 | 7.2 | 3.7 | 0.048 | 117 | 56 | 69 |
| **160M-6** | 7.5 | 14.4 | 11.5 | 970 | 89.4 | 0.84 | 74 | 2.8 | 7.5 | 3.8 | 0.12 | 190 | 58 | 71 |
| **160L-6** | 11 | 21 | 16.7 | 975 | 90.5 | 0.84 | 108 | 3 | 7.6 | 3.9 | 0.14 | 220 | 58 | 71 |
| **180L-6** | 15 | 29 | 23 | 975 | 91.5 | 0.82 | 147 | 2.7 | 7.4 | 3.8 | 0.19 | 215 | 58 | 71 |
| **200L1-6** | 18.5 | 35 | 28 | 975 | 92 | 0.83 | 181 | 2.5 | 7 | 3.5 | 0.28 | 270 | 58 | 71 |
| **200L2-6** | 22 | 41 | 32.5 | 975 | 92.4 | 0.84 | 215 | 2.2 | 6.9 | 3.2 | 0.31 | 280 | 58 | 72 |
| **225M-6** | 30 | 56 | 45 | 985 | 93 | 0.83 | 291 | 3 | 6.9 | 2.7 | 0.69 | 404 | 58 | 72 |
| **250M-6** | 37 | 69 | 55 | 985 | 93.5 | 0.83 | 359 | 3 | 6.8 | 2.7 | 1.03 | 570 | 58 | 76 |
| **280S-6** | 45 | 84 | 67 | 990 | 93.9 | 0.82 | 434 | 2.8 | 6.6 | 2.4 | 1.35 | 720 | 62 | 77 |
| **280M-6** | 55 | 104 | 83 | 985 | 94.4 | 0.81 | 533 | 2.8 | 6.5 | 2.4 | 1.7 | 770 | 62 | 77 |
| **315S-6** | 75 | 130 | 104 | 990 | 94.9 | 0.88 | 723 | 3 | 7.2 | 2.7 | 4.3 | 995 | 65 | 79 |
| **315M-6** | 90 | 155 | 124 | 990 | 95.2 | 0.88 | 868 | 3.2 | 7.7 | 2.8 | 5 | 1050 | 65 | 79 |
| **315L1-6** | 110 | 189 | 151 | 990 | 95.5 | 0.88 | 1061 | 3.3 | 7.8 | 2.8 | 6 | 1145 | 69 | 84 |
| **315L2-6** | 132 | 225 | 181 | 990 | 95.6 | 0.88 | 1273 | 3.2 | 7.7 | 2.8 | 7.3 | 1265 | 69 | 84 |
| **315L3-6** | 160 | 275 | 220 | 990 | 95.8 | 0.88 | 1543 | 3.3 | 7.8 | 2.8 | 8.3 | 1440 | 69 | 84 |
| **355M-6** | 200 | 345 | 275 | 990 | 95.9 | 0.87 | 1929 | 1.8 | 6.7 | 2.7 | 11.3 | 1750 | 74 | 90 |
| **355L1-6** | 250 | 430[1)] | 345 | 990 | 95.9 | 0.88 | 2411 | 1.8 | 6.7 | 2.7 | 13.8 | 1950 | 74 | 90 |
| **355L2-6** | 315 | 540[1)] | 430[1)] | 990 | 96 | 0.88 | 3039 | 1.7 | 6.9 | 2.6 | 17.6 | 2300 | 74 | 90 |
| **400M-6** | 355 | 595[1)] | 475[1)] | 994 | 96.6 | 0.89 | 3411 | 1.1 | 6.6 | 2.7 | 27 | 2850 | 78 | 94 |
| **400L-6** | 400 | 670[1)] | 535[1)] | 994 | 96.6 | 0.89 | 3843 | 1.1 | 6.8 | 2.6 | 31 | 3230 | 78 | 94 |
| **450M-6** | 450 | 755[1)] | 605[1)] | 995 | 96.6 | 0.89 | 4319 | 1.2 | 6.8 | 2.8 | 46 | 3500 | 78 | 94 |
| **450L-6** | 500 | 835[1)] | 670[1)] | 995 | 97 | 0.89 | 4799 | 1.1 | 6.8 | 2.7 | 51 | 3800 | 78 | 94 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break-down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | | **IE3 Efficiency according to IEC 60034-30** | | | | | | | | |
| **71M2-8** | 0.12 | 0.45 | 0.36 | 700 | 62.5 | 0.61 | 1.64 | 2.2 | 3.5 | 2.7 | 0.0025 | 25 | 41 | 53 |
| **80M1-8** | 0.18 | 0.71 | 0.57 | 705 | 63 | 0.58 | 2.43 | 1.9 | 3.2 | 2.7 | 0.0033 | 31 | 42 | 54 |
| **80M2-8** | 0.25 | 0.90 | 0.72 | 710 | 67 | 0.60 | 3.35 | 1.7 | 3.3 | 2.5 | 0.0046 | 35 | 42 | 54 |
| **90S-8** | 0.37 | 1.16 | 0.93 | 715 | 72 | 0.64 | 4.95 | 1.7 | 4.4 | 3 | 0.008 | 44 | 46 | 58 |
| **90L-8** | 0.55 | 1.68 | 1.34 | 715 | 74 | 0.64 | 7.3 | 1.8 | 4.5 | 3.1 | 0.0095 | 46 | 46 | 58 |
| **100L1-8** | 0.75 | 2.25 | 1.80 | 720 | 76 | 0.64 | 9.9 | 2.3 | 5 | 2.9 | 0.008 | 44 | 49 | 61 |
| **100L2-8** | 1.1 | 3.1 | 2.5 | 715 | 78 | 0.67 | 14.7 | 2.2 | 4.8 | 2.7 | 0.0095 | 46 | 49 | 61 |
| **112M-8** | 1.5 | 3.5 | 2.8 | 705 | 80.6 | 0.77 | 20.3 | 2 | 4.9 | 2.6 | 0.017 | 59 | 52 | 64 |
| **132S-8** | 2.2 | 5.4 | 4.3 | 710 | 82 | 0.72 | 29.6 | 2.8 | 6.3 | 3.2 | 0.029 | 97 | 53 | 66 |
| **132M-8** | 3 | 7.2 | 5.8 | 715 | 83.5 | 0.72 | 40 | 2.7 | 6.3 | 3.1 | 0.036 | 113 | 53 | 66 |
| **160M1-8** | 4 | 8.8 | 7 | 725 | 85.5 | 0.77 | 53 | 1.9 | 5.6 | 2.6 | 0.071 | 157 | 54 | 67 |
| **160M2-8** | 5.5 | 12 | 9.7 | 725 | 86.5 | 0.76 | 72 | 2.3 | 6 | 3.1 | 0.105 | 170 | 54 | 67 |
| **160L-8** | 7.5 | 16.6 | 13.3 | 725 | 87.9 | 0.74 | 99 | 2.4 | 6.5 | 3.2 | 0.136 | 190 | 54 | 67 |
| **180L-8** | 11 | 23 | 18.3 | 725 | 89.2 | 0.78 | 145 | 2.6 | 6.9 | 3.3 | 0.22 | 215 | 56 | 69 |
| **200L-8** | 15 | 31 | 25 | 730 | 90.3 | 0.77 | 196 | 2.4 | 7.1 | 3.3 | 0.4 | 280 | 56 | 70 |
| **225S-8** | 18.5 | 37.5 | 30 | 735 | 90.7 | 0.78 | 240 | 2.3 | 7.1 | 3.4 | 0.56 | 372 | 57 | 71 |
| **225M-8** | 22 | 44.5 | 35.5 | 735 | 91.2 | 0.78 | 286 | 2.4 | 7.2 | 3.5 | 0.69 | 404 | 57 | 71 |
| **250M-8** | 30 | 59 | 47 | 735 | 92.5 | 0.8 | 390 | 2.5 | 7.1 | 3.4 | 1.2 | 550 | 58 | 72 |
| **280S-8** | 37 | 70 | 56 | 735 | 92.7 | 0.82 | 481 | 2 | 6.5 | 2.9 | 1.9 | 740 | 61 | 75 |
| **280M-8** | 45 | 85 | 68 | 740 | 92.9 | 0.82 | 581 | 2.2 | 6.7 | 2.9 | 2.3 | 800 | 61 | 75 |
| **315S-8** | 55 | 103 | 82 | 740 | 93.2 | 0.83 | 710 | 2.7 | 6 | 2.5 | 4.3 | 995 | 68 | 83 |
| **315M-8** | 75 | 139 | 111 | 740 | 93.6 | 0.83 | 968 | 2.8 | 6.3 | 2.6 | 5 | 1050 | 68 | 83 |
| **315L1-8** | 90 | 166 | 133 | 740 | 94.1 | 0.83 | 1161 | 2.9 | 6.6 | 2.7 | 6 | 1145 | 68 | 83 |
| **315L2-8** | 110 | 205 | 164 | 740 | 94.5 | 0.82 | 1420 | 2.9 | 6.8 | 2.7 | 7.3 | 1265 | 68 | 83 |
| **315L3-8** | 132 | 245 | 196 | 740 | 94.6 | 0.82 | 1704 | 2.8 | 6.3 | 2.6 | 8.3 | 1440 | 68 | 83 |
| **355M-8** | 160 | 290 | 235 | 745 | 95.4 | 0.83 | 2051 | 1.7 | 6.4 | 2.6 | 11.4 | 1750 | 70 | 86 |
| **355L1-8** | 200 | 370 | 295 | 745 | 95.6 | 0.82 | 2564 | 1.6 | 6.6 | 2.6 | 13.9 | 1950 | 70 | 86 |
| **355L2-8** | 250 | 460[1] | 370 | 745 | 95.6 | 0.82 | 3205 | 1.4 | 6.1 | 2.6 | 17.7 | 2300 | 70 | 86 |
| **400M-8** | 315 | 570[1] | 455[1] | 745 | 96.2 | 0.83 | 4038 | 1.2 | 6.2 | 2.7 | 30 | 3100 | 73 | 89 |
| **400L-8** | 355 | 640[1] | 515[1] | 745 | 96.3 | 0.83 | 4551 | 1 | 6.1 | 2.6 | 34 | 3440 | 73 | 89 |
| **450M-8** | 400 | 710[1] | 570[1] | 745 | 96.6 | 0.84 | 5128 | 1 | 6.1 | 2.8 | 51 | 3750 | 74 | 90 |
| **450L-8** | 450 | 800[1] | 640[1] | 745 | 96.7 | 0.84 | 5768 | 1 | 6.1 | 2.8 | 57 | 4050 | 74 | 90 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass-moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A$ / MN | IA / IN | $M_K$ / $M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | | **IE3 Efficiency according to IEC 60034-30** | | | | | | | | |
| **63M1-2** | 0.18 | 0.4 | 0.26 | 3465 | 71.5 | 0.79 | 0.5 | 3.7 | 7 | 5.5 | 0.00028 | 16 | 53 | 65 |
| **63M2-2** | 0.25 | 0.52 | 0.35 | 3455 | 74 | 0.81 | 0.69 | 3.6 | 6.7 | 5.3 | 0.00028 | 16 | 53 | 65 |
| **71M1-2** | 0.37 | 0.73 | 0.49 | 3440 | 75.5 | 0.84 | 1.03 | 3 | 6.7 | 3.9 | 0.00058 | 24 | 56 | 68 |
| **71M2-2** | 0.55 | 1.03 | 0.67 | 3445 | 79.5 | 0.84 | 1.52 | 3.1 | 7.1 | 4.2 | 0.00080 | 25 | 56 | 68 |
| **80M1-2** | 0.75 | 1.4 | 0.94 | 3490 | 79.9 | 0.84 | 2.11 | 3.3 | 7.7 | 4.2 | 0.0013 | 31 | 60 | 72 |
| **80M2-2** | 1.1 | 1.93 | 1.31 | 3490 | 84 | 0.85 | 3.64 | 3.5 | 7.9 | 4.3 | 0.0018 | 35 | 60 | 72 |
| **90S-2** | 1.5 | 2.55 | 1.71 | 3505 | 85.6 | 0.87 | 4.1 | 3.4 | 8.5 | 3.8 | 0.0029 | 45 | 65 | 77 |
| **90L-2** | 2.2 | 3.6 | 2.45 | 3505 | 87 | 0.88 | 6 | 3.4 | 8.5 | 3.9 | 0.0039 | 48 | 65 | 77 |
| **100L-2** | 3 | 4.85 | 3.35 | 3520 | 89.5 | 0.87 | 8.1 | 2.9 | 8.2 | 3.4 | 0.0051 | 53 | 68 | 80 |
| **112M-2** | 4 | 6.4 | 4.4 | 3530 | 89.5 | 0.87 | 10.8 | 3.2 | 8.3 | 4 | 0.0089 | 95 | 68 | 80 |
| **132S1-2** | 5.5 | 8.7 | 5.9 | 3520 | 89.5 | 0.89 | 14.9 | 2.9 | 8.3 | 3.7 | 0.0125 | 103 | 68 | 81 |
| **132S2-2** | 7.5 | 11.7 | 7.9 | 3525 | 90.5 | 0.89 | 20.3 | 3.1 | 8.4 | 4 | 0.0177 | 115 | 68 | 81 |
| **160M1-2** | 11 | 18.1 | 12.1 | 3540 | 91 | 0.84 | 29.7 | 3.3 | 8.5 | 4 | 0.032 | 163 | 71 | 84 |
| **160M2-2** | 15 | 23 | 15.6 | 3545 | 91.5 | 0.89 | 40.5 | 3.6 | 8.5 | 4 | 0.043 | 173 | 71 | 84 |
| **160L-2** | 18.5 | 27.5 | 18.6 | 3545 | 92 | 0.91 | 49.8 | 3.3 | 8.4 | 3.9 | 0.052 | 188 | 71 | 84 |
| **180M-2** | 22 | 34 | 23 | 3560 | 92.2 | 0.88 | 59 | 3.2 | 8.6 | 3.8 | 0.075 | 196 | 75 | 88 |
| **200L1-2** | 30 | 45 | 30.5 | 3555 | 92.5 | 0.9 | 81 | 3.1 | 8.4 | 3.6 | 0.13 | 254 | 77 | 91 |
| **200L2-2** | 37 | 55 | 37 | 3560 | 93 | 0.9 | 99 | 3.3 | 8.6 | 3.8 | 0.16 | 278 | 77 | 91 |
| **225M-2** | 45 | 68 | 45 | 3555 | 93.6 | 0.89 | 121 | 3 | 8.4 | 3.3 | 0.24 | 400 | 78 | 92 |
| **250M-2** | 55 | 85 | 57 | 3575 | 93.6 | 0.87 | 147 | 3 | 8.3 | 3.3 | 0.4 | 545 | 81 | 95 |
| **280S-2** | 75 | 115 | 77 | 3570 | 94.1 | 0.87 | 201 | 2.7 | 8.2 | 3.1 | 0.65 | 700 | 82 | 96 |
| **280M-2** | 90 | 137 | 92 | 3570 | 95.1 | 0.87 | 241 | 3.1 | 8.4 | 3.4 | 0.78 | 762 | 82 | 96 |
| **315S-2** | 110 | 163 | 109 | 3575 | 95.1 | 0.89 | 294 | 2.7 | 8.2 | 3.1 | 1.4 | 960 | 82 | 96 |
| **315M-2** | 132 | 193 | 129 | 3575 | 95.4 | 0.9 | 353 | 2.9 | 8.5 | 3.2 | 1.6 | 1025 | 82 | 96 |
| **315L1-2** | 160 | 235 | 156 | 3580 | 95.4 | 0.9 | 427 | 2.8 | 8.6 | 3 | 1.7 | 1065 | 82 | 96 |
| **315L2-2** | 200 | 290 | 195 | 3580 | 95.8 | 0.9 | 533 | 2.6 | 8 | 3 | 2.2 | 1270 | 82 | 96 |
| **315L3-2** | 250 | 360 | 240 | 3580 | 95.8 | 0.91 | 667 | 2 | 8.4 | 3.1 | 2.8 | 1420 | 82 | 96 |
| **355L1-2** | 345 | 490[1] | 325 | 3575 | 96.1 | 0.92 | 922 | 1.6 | 7.1 | 3 | 4.5 | 1900 | 87 | 103 |
| **355L2-2** | 390 | 545[1] | 365 | 3580 | 96.3 | 0.93 | 1040 | 1.5 | 7.3 | 2.8 | 5 | 2050 | 87 | 103 |
| **355L3-2** | 440 | 615[1] | 410[1] | 3580 | 96.3 | 0.93 | 1174 | 1.4 | 7.4 | 2.8 | 5.5 | 2350 | 87 | 103 |
| **400L-2** | 495 | 685[1] | 455[1] | 3585 | 96.5 | 0.94 | 1319 | 1.15 | 7.6 | 3 | 8.5 | 2910 | 87 | 103 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass-moment of inertia | Weight[2)] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A$ / MN | IA / IN | $M_K$ / $M_N$ | J [kgm$^2$] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | **IE3** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-4** | 0.12 | 0.33 | 0.22 | 1745 | 69.5 | 0.66 | 0.66 | 3.9 | 6.1 | 4.3 | 0.00046 | 16 | 48 | 60 | - | - |
| **63M2-4** | 0.18 | 0.44 | 0.29 | 1735 | 74 | 0.69 | 0.99 | 3.3 | 6.1 | 3.9 | 0.00063 | 17 | 48 | 60 | - | - |
| **71M1-4** | 0.25 | 0.62 | 0.41 | 1750 | 74.5 | 0.68 | 1.36 | 3.6 | 6.6 | 4.3 | 0.00092 | 24 | 49 | 61 | - | - |
| **71M2-4** | 0.37 | 0.86 | 0.57 | 1745 | 78.5 | 0.69 | 2 | 4.2 | 7.3 | 4.5 | 0.0013 | 25 | 49 | 61 | - | - |
| **80M1-4** | 0.55 | 1.08 | 0.72 | 1755 | 82 | 0.78 | 3 | 3.4 | 7.9 | 4.1 | 0.0021 | 31 | 50 | 62 | - | - |
| **80M2-4** | 0.75 | 1.48 | 0.99 | 1750 | 83.5 | 0.77 | 4.1 | 3.7 | 7.8 | 4.8 | 0.0029 | 35 | 50 | 62 | - | - |
| **90S-4** | 1.1 | 2.05 | 1.37 | 1760 | 86.5 | 0.78 | 6 | 3 | 8.2 | 3.7 | 0.0056 | 44 | 53 | 65 | - | - |
| **90L-4** | 1.5 | 2.8 | 1.88 | 1760 | 86.5 | 0.79 | 8.1 | 3 | 8.3 | 3.8 | 0.0056 | 46 | 53 | 65 | - | - |
| **100L1-4** | 2.2 | 3.85 | 2.55 | 1775 | 89.5 | 0.79 | 11.8 | 2.9 | 8.9 | 4.5 | 0.011 | 59 | 57 | 69 | - | - |
| **100L2-4** | 3 | 5.4 | 3.6 | 1770 | 89.5 | 0.83 | 16.2 | 2.3 | 8.4 | 4 | 0.011 | 59 | 57 | 69 | - | - |
| **112M-4** | 4 | 7.1 | 4.8 | 1765 | 89.5 | 0.8 | 21.6 | 3.6 | 8.6 | 4.1 | 0.022 | 100 | 59 | 71 | - | - |
| **132S-4** | 5.5 | 9.5 | 6.3 | 1775 | 91.5 | 0.82 | 29.6 | 4.2 | 8.9 | 4.5 | 0.041 | 113 | 62 | 75 | 59 | 72 |
| **132M-4** | 7.5 | 12.4 | 8.3 | 1775 | 91.5 | 0.81 | 40.4 | 4.3 | 8.9 | 4.6 | 0.041 | 125 | 62 | 75 | 59 | 72 |
| **160M-4** | 11 | 17.8 | 11.9 | 1770 | 92.4 | 0.85 | 59 | 3.8 | 8.4 | 4 | 0.079 | 184 | 67 | 80 | 60 | 73 |
| **160L-4** | 15 | 24.5 | 16.3 | 1770 | 93 | 0.84 | 81 | 3.4 | 8.5 | 3.6 | 0.083 | 208 | 67 | 80 | 60 | 73 |
| **180M-4** | 18.5 | 32 | 21 | 1772 | 93.6 | 0.83 | 100 | 3.6 | 8.9 | 3.6 | 0.164 | 217 | 65 | 78 | 61 | 74 |
| **180L-4** | 22 | 35.5 | 23.5 | 1770 | 93.6 | 0.84 | 119 | 3.8 | 9 | 3.8 | 0.164 | 244 | 65 | 78 | 61 | 74 |
| **200L-4** | 30 | 50 | 33 | 1770 | 94.1 | 0.82 | 162 | 3.5 | 8.5 | 3.8 | 0.25 | 274 | 66 | 80 | 62 | 76 |
| **225S-4** | 37 | 59 | 39 | 1780 | 94.5 | 0.87 | 199 | 3.5 | 8.1 | 3.3 | 0.48 | 372 | 68 | 82 | 64 | 78 |
| **225M-4** | 45 | 70 | 47 | 1781 | 95 | 0.85 | 241 | 3.8 | 8.4 | 3.6 | 0.48 | 402 | 68 | 82 | 64 | 78 |
| **250M-4** | 55 | 84 | 56 | 1787 | 95.4 | 0.84 | 294 | 2.7 | 8.3 | 3.5 | 0.75 | 588 | 70 | 84 | 68 | 82 |
| **280S-4** | 75 | 120 | 80 | 1780 | 95.4 | 0.83 | 402 | 3.7 | 8.1 | 3.5 | 1.48 | 740 | 74 | 88 | 71 | 85 |
| **280M-4** | 90 | 140 | 93 | 1787 | 95.4 | 0.85 | 481 | 3.7 | 8.1 | 3.5 | 1.48 | 820 | 74 | 88 | 71 | 85 |
| **315S-4** | 110 | 173 | 115 | 1785 | 95.8 | 0.84 | 589 | 3 | 8 | 2.8 | 2.2 | 1040 | 76 | 91 | 72 | 87 |
| **315M-4** | 132 | 205 | 138 | 1786 | 96.2 | 0.84 | 706 | 3 | 8.1 | 2.8 | 2.7 | 1120 | 76 | 91 | 72 | 87 |
| **315L1-4** | 160 | 250 | 165 | 1786 | 96.2 | 0.85 | 856 | 3.4 | 8.2 | 3.2 | 3.1 | 1210 | 76 | 91 | 72 | 87 |
| **315L2-4** | 200 | 310 | 210 | 1788 | 96.2 | 0.84 | 1068 | 3.2 | 7.7 | 3 | 3.9 | 1430 | 76 | 91 | 72 | 87 |
| **315L3-4** | 250 | 370 | 250 | 1792 | 96.3 | 0.88 | 1337 | 2 | 8.5 | 3.1 | 4.6 | 1565 | 76 | 91 | 72 | 87 |
| **355L1-4** | 345 | 505[1)] | 335 | 1790 | 96.3 | 0.89 | 1841 | 1.6 | 7.3 | 2.8 | 6.1 | 2050 | 78 | 94 | 74 | 90 |
| **355L2-4** | 390 | 570[1)] | 380 | 1790 | 96.6 | 0.89 | 2081 | 1.7 | 7.3 | 3 | 6.7 | 2200 | 78 | 94 | 74 | 90 |
| **355L3-4** | 440 | 635[1)] | 420[1)] | 1790 | 97 | 0.9 | 2347 | 1.6 | 7.4 | 3 | 7.4 | 2430 | 78 | 94 | 74 | 90 |
| **400M-4** | 495 | 705[1)] | 470[1)] | 1794 | 97 | 0.91 | 2635 | 1.15 | 7.7 | 2.8 | 18.0 | 2850 | 84 | 100 | - | - |
| **400L-4** | 550 | 780[1)] | 520[1)] | 1794 | 97.1 | 0.91 | 2928 | 1.15 | 7.7 | 2.8 | 20.0 | 3230 | 84 | 100 | - | - |
| **450M-4** | 610 | 865[1)] | 575[1)] | 1794 | 97.2 | 0.91 | 3247 | 1.05 | 7.2 | 2.8 | 26.0 | 3500 | 85 | 101 | - | - |
| **450L-4** | 690 | 975[1)] | 650[1)] | 1794 | 97.4 | 0.91 | 3673 | 1.05 | 7.2 | 2.8 | 31.0 | 3800 | 85 | 101 | - | - |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

Temperature class T4
ns = 1200 rpm, 2p = 6

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | **IE3** | **Efficiency according to IEC 60034-30** | | | | | | | | |
| **71M2-6** | 0.25 | 0.67 | 0.45 | 1147 | 69 | 0.68 | 2.1 | 2.9 | 5.1 | 3.7 | 0.00250 | 25 | 48 | 60 |
| **80M1-6** | 0.37 | 0.96 | 0.64 | 1158 | 75.5 | 0.64 | 3.05 | 2.5 | 4.9 | 3.2 | 0.00330 | 31 | 48 | 60 |
| **80M2-6** | 0.55 | 1.33 | 0.88 | 1153 | 76.5 | 0.68 | 4.6 | 2.1 | 5.3 | 3.6 | 0.00460 | 35 | 48 | 60 |
| **90S-6** | 0.75 | 1.76 | 1.17 | 1165 | 82.5 | 0.65 | 6.1 | 3.2 | 6.4 | 3.6 | 0.00800 | 44 | 51 | 63 |
| **90L-6** | 1.1 | 2.3 | 1.52 | 1170 | 87.5 | 0.69 | 9 | 3 | 7.1 | 4.1 | 0.017 | 59 | 54 | 66 |
| **100L-6** | 1.5 | 3.2 | 2.1 | 1170 | 88.5 | 0.67 | 12.2 | 3.5 | 7.8 | 4.4 | 0.017 | 59 | 54 | 66 |
| **112M-6** | 2.2 | 4.15 | 2.8 | 1170 | 89.5 | 0.74 | 19 | 3 | 7.9 | 3.6 | 0.031 | 100 | 58 | 70 |
| **132S-6** | 3 | 5.8 | 3.9 | 1170 | 89.5 | 0.72 | 24.5 | 3.7 | 8.2 | 4.3 | 0.031 | 100 | 61 | 74 |
| **132M1-6** | 4 | 7.5 | 5 | 1170 | 89.5 | 0.75 | 32.6 | 3.4 | 7.9 | 4.3 | 0.037 | 104 | 61 | 74 |
| **132M2-6** | 5.5 | 10.5 | 7 | 1174 | 91 | 0.72 | 44.7 | 3.6 | 8.3 | 4.7 | 0.057 | 127 | 61 | 74 |
| **160M-6** | 7.5 | 13.1 | 8.7 | 1177 | 91 | 0.79 | 61 | 3.1 | 8.6 | 4.5 | 0.12 | 190 | 63 | 76 |
| **160L-6** | 11 | 19.3 | 12.9 | 1177 | 91.7 | 0.78 | 89 | 3.2 | 8.8 | 4.6 | 0.14 | 220 | 63 | 76 |
| **180L-6** | 15 | 26 | 17.3 | 1179 | 91.7 | 0.79 | 122 | 3.1 | 8.8 | 4.7 | 0.19 | 215 | 63 | 76 |
| **200L1-6** | 18.5 | 31 | 21 | 1182 | 93 | 0.8 | 149 | 3 | 8.8 | 4.2 | 0.28 | 270 | 63 | 77 |
| **200L2-6** | 22 | 37 | 24.5 | 1181 | 93 | 0.8 | 178 | 3 | 8.8 | 4.2 | 0.31 | 280 | 63 | 77 |
| **225M-6** | 30 | 52 | 34.5 | 1190 | 94.4 | 0.77 | 241 | 2.3 | 7.8 | 2.9 | | 404 | 67 | 81 |
| **250M-6** | 37 | | by request | | 94.1 | | | | | by request | | | | |
| **280S-6** | 45 | | by request | | 94.5 | | | | | by request | | | | |
| **280M-6** | 55 | 92 | 62 | 1187 | 94.5 | 0.79 | 443 | 3.3 | 7.6 | 2.8 | 1.7 | 770 | 70 | 84 |
| **315S-6** | 75 | 115 | 77 | 1190 | 95 | 0.86 | 602 | 3.6 | 8.7 | 3.3 | 4.3 | 995 | 75 | 90 |
| **315M-6** | 90 | 135 | 90 | 1190 | 95 | 0.88 | 722 | 3.6 | 8.6 | 3.3 | 5 | 1050 | 75 | 90 |
| **315L1-6** | 110 | | | 1190 | | | | | | | 6 | | | |
| **315L2-6** | 132 | 199 | 133 | 1190 | 95.8 | 0.87 | 1059 | 3.5 | 8.5 | 3.3 | 7.3 | 1265 | 75 | 90 |
| **315L3-6** | 160 | 240 | 159 | 1190 | 95.8 | 0.88 | 1284 | 3.6 | 8.7 | 3.3 | 8.3 | 1440 | 75 | 90 |
| **355M-6** | 220 | 330 | 220 | 1190 | 95.8 | 0.88 | 1766 | 1.9 | 7.1 | 2.8 | 11.3 | 1750 | 80 | 96 |
| **355L1-6** | 275 | 410 | 275 | 1190 | 95.9 | 0.88 | 2207 | 1.9 | 7.1 | 2.8 | 13.8 | 1950 | 80 | 96 |
| **355L2-6** | 345 | 515 | 340 | 1190 | 96 | 0.88 | 2769 | 1.05 | 6.9 | 2.7 | 23 | 2650 | 80 | 96 |
| **400M-6** | 390 | 570 | 380 | 1193 | 96.6 | 0.89 | 3122 | 1.15 | 7 | 2.8 | 27 | 2850 | 84 | 100 |
| **400L-6** | 440 | 640 | 430 | 1193 | 96.6 | 0.89 | 3522 | 1.15 | 7.2 | 2.7 | 31 | 3230 | 84 | 100 |
| **450M-6** | 495 | 725 | 480 | 1194 | 96.6 | 0.89 | 3959 | 1.3 | 7.2 | 3 | 46 | 3500 | 84 | 100 |
| **450L-6** | 550 | 800 | 535 | 1194 | 97 | 0.89 | 4399 | 1.15 | 7.2 | 2.8 | 51 | 3800 | 84 | 100 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ | 400 V I | 500 V I | n | η | cos φ | M | $M_A$ / MN | IA / IN | $M_K$ / $M_N$ | J | m | $L_P$ | $L_W$ |
| | [kW] | [A] | [A] | [rpm] | [%] | | [Nm] | | | | [kgm$^2$] | [kg] | [dB(A)] | [dB(A)] |
| **CD...Y3** | | | | | | | | **IE3 Efficiency according to IEC 60034-30** | | | | | | |
| **71M2-8** | 0.12 | | | | | | | by request | | | | | | |
| **80M1-8** | 0.18 | | | | | | | by request | | | | | | |
| **80M2-8** | 0.25 | | | | | | | by request | | | | | | |
| **90S-8** | 0.37 | | | | | | | by request | | | | | | |
| **90L-8** | 0.55 | | | | | | | by request | | | | | | |
| **100L1-8** | 0.75 | | | | | | | by request | | | | | | |
| **100L2-8** | 1.1 | | | | | | | by request | | | | | | |
| **112M-8** | 1.5 | | | | | | | by request | | | | | | |
| **132S-8** | 2.2 | 4.6 | 3.1 | 869 | 85.5 | 0.7 | 24 | 2.9 | 5.9 | 3.5 | 0.029 | 97 | | |
| **132M-8** | 3 | | | | | | | by request | | | | | | |
| **160M1-8** | 4 | | | | | | | by request | | | | | | |
| **160M2-8** | 5.5 | 11.1 | 7.4 | 879 | 86.5 | 0.72 | 60 | 2.6 | 6.2 | 3.3 | 0.105 | 170 | 60 | 73 |
| **160L-8** | 7.5 | | | | | | | by request | | | | | | |
| **180L-8** | 11 | | | | | | | by request | | | | | | |
| **200L-8** | 15 | | | | | | | by request | | | | | | |
| **225S-8** | 18.5 | | | | | | | by request | | | | | | |
| **225M-8** | 22 | | | | | | | by request | | | | | | |
| **250M-8** | 30 | | | | | | | by request | | | | | | |
| **280S-8** | 37 | | | | | | | by request | | | | | | |
| **280M-8** | 45 | 76 | 51 | 888 | 92.4 | 0.8 | 483.6 | 2.44 | 8 | 3.88 | 2.3 | 800 | | |
| **315S-8** | 55 | 98 | 65 | 890 | 94.2 | 0.75 | 588 | 3.88 | 7.91 | 3.79 | 4.3 | 995 | 68 | 83 |
| **315M-8** | 75 | | | | | | | by request | | | | | | |
| **315L1-8** | 90 | | | | | | | by request | | | | | | |
| **315L2-8** | 110 | | | | | | | by request | | | | | | |
| **315L3-8** | 132 | | | | | | | by request | | | | | | |
| **355M-8** | 176 | 280 | 187 | 890 | 95.1 | 0.83 | 1889 | 2 | 6.5 | 2.5 | 11.4 | 1750 | 76 | 92 |
| **355L1-8** | 220 | 350 | 230 | 895 | 95.5 | 0.83 | 2347 | 1.8 | 7 | 2.5 | 13.9 | 1950 | 76 | 92 |
| **355L2-8** | 275 | 440 | 295 | 895 | 95.6 | 0.82 | 2934 | 1.8 | 7 | 2.5 | 17.7 | 2300 | 76 | 92 |
| **400M-8** | 345 | 535 | 355 | 895 | 96.2 | 0.84 | 3681 | 1.3 | 6.5 | 2.5 | 30 | 3100 | 79 | 95 |
| **400L-8** | 390 | 610 | 410 | 895 | 96.3 | 0.83 | 4161 | 1.05 | 6.4 | 2.3 | 34 | 3440 | 80 | 96 |
| **450M-8** | 440 | 680 | 455 | 895 | 96.6 | 0.84 | 4695 | 1.05 | 6.4 | 2.3 | 51.0 | 3750 | 80 | 96 |
| **450L-8** | 495 | 765 | 510 | 895 | 96.7 | 0.84 | 5282 | 1.05 | 6.4 | 2.3 | 57.0 | 4050 | 80 | 96 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

Temperature class T4,
ns = 3000 rpm, 2p = 2

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | | | | | **IE1** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-2** | 0.18 | 0.59 | 0.47 | 2905 | 66 | 0.67 | 0.59 | 4.6 | 6.8 | 6.5 | 0.00028 | 16 | 49 | 61 | - | - |
| **63M2-2** | 0.25 | 0.69 | 0.55 | 2860 | 70 | 0.75 | 0.83 | 3.4 | 5.8 | 4.7 | 0.00028 | 16 | 49 | 61 | - | - |
| **71M1-2** | 0.37 | 0.89 | 0.71 | 2800 | 71.5 | 0.84 | 1.26 | 2.7 | 5.2 | 3.5 | 0.00028 | 16 | 51 | 63 | - | - |
| **71M2-2** | 0.55 | 1.34 | 1.08 | 2810 | 72 | 0.82 | 1.87 | 2.8 | 5.5 | 3.6 | 0.00039 | 17 | 51 | 63 | - | - |
| **80M1-2** | 0.75 | 1.73 | 1.38 | 2790 | 74.5 | 0.84 | 2.57 | 2.7 | 4.8 | 3.3 | 0.00058 | 24 | 55 | 67 | - | - |
| **80M2-2** | 1.1 | 2.5 | 1.99 | 2820 | 78 | 0.82 | 3.73 | 2.8 | 5.5 | 3.5 | 0.0008 | 25 | 55 | 67 | - | - |
| **90S-2** | 1.5 | 3.25 | 2.6 | 2840 | 77.8 | 0.86 | 5 | 2.9 | 5.9 | 3.2 | 0.0013 | 31 | 60 | 72 | - | - |
| **90L-2** | 2.2 | 4.55 | 3.65 | 2850 | 82 | 0.85 | 7.4 | 3 | 6.3 | 3.5 | 0.0018 | 35 | 60 | 72 | - | - |
| **100L-2** | 3 | 6.1 | 4.85 | 2850 | 82 | 0.87 | 10.1 | 2.7 | 6.8 | 3.3 | 0.0029 | 45 | 63 | 75 | - | - |
| **112M-2** | 4 | 7.7 | 6.2 | 2880 | 85 | 0.88 | 13.3 | 2.3 | 6.5 | 3.1 | 0.0051 | 53 | 63 | 75 | 55 | 67 |
| **132S1-2** | 5.5 | 10.7 | 8.5 | 2880 | 85.5 | 0.87 | 18.2 | 2.5 | 6.4 | 3.3 | 0.0089 | 95 | 63 | 76 | 55 | 68 |
| **132S2-2** | 7.5 | 14.4 | 11.5 | 2910 | 86.5 | 0.87 | 24.6 | 2.7 | 6.8 | 3.5 | 0.0125 | 100 | 63 | 76 | 55 | 68 |
| **160M1-2** | 11 | 20 | 16 | 2925 | 89 | 0.89 | 36 | 2.8 | 6.6 | 3.2 | 0.032 | 163 | 66 | 79 | 56 | 69 |
| **160M2-2** | 15 | 26.5 | 21.5 | 2920 | 89 | 0.91 | 49 | 2.8 | 6.8 | 3.2 | 0.043 | 173 | 66 | 79 | 56 | 69 |
| **160L-2** | 18.5 | 32 | 25.5 | 2925 | 90.5 | 0.92 | 60 | 2.6 | 6.8 | 3.1 | 0.052 | 188 | 66 | 79 | 56 | 69 |
| **180M-2** | 22 | 38 | 30.5 | 2925 | 91.2 | 0.92 | 72 | 2.5 | 6.9 | 3 | 0.075 | 196 | 69 | 82 | 58 | 71 |
| **200L1-2** | 30 | 52 | 42 | 2955 | 92 | 0.90 | 97 | 2.6 | 7.2 | 2.9 | 0.13 | 254 | 71 | 85 | 60 | 74 |
| **200L2-2** | 37 | 79 | 51 | 2955 | 92.5 | 0.91 | 120 | 2.7 | 7.2 | 3 | 0.16 | 278 | 71 | 85 | 60 | 74 |
| **225M-2** | 45 | 79 | 63 | 2960 | 92.8 | 0.89 | 145 | 2.5 | 7.1 | 3 | 0.24 | 400 | 72 | 86 | 60 | 74 |
| **250M-2** | 55 | 96 | 77 | 2970 | 93.2 | 0.89 | 177 | 2.4 | 7.1 | 2.8 | 0.4 | 545 | 75 | 89 | 64 | 78 |
| **280S-2** | 75 | 130 | 104 | 2970 | 93.6 | 0.89 | 241 | 2.2 | 6.8 | 2.7 | 0.65 | 700 | 76 | 90 | 66 | 80 |
| **280M-2** | 90 | 154 | 123 | 2970 | 93.8 | 0.90 | 289 | 2.4 | 6.8 | 2.8 | 0.78 | 762 | 76 | 90 | 66 | 80 |
| **315S-2** | 110 | 190 | 152 | 2975 | 94 | 0.89 | 353 | 2 | 6.5 | 2.4 | 1.4 | 960 | 76 | 91 | 66 | 81 |
| **315M-2** | 132 | 225 | 182 | 2975 | 94.3 | 0.89 | 424 | 2.1 | 6.8 | 2.5 | 1.6 | 1025 | 76 | 91 | 66 | 81 |
| **315L1-2** | 160 | 270 | 215 | 2975 | 94.5 | 0.90 | 514 | 2.4 | 6.9 | 2.7 | 1.9 | 1065 | 76 | 91 | 66 | 81 |
| **315L2-2** | 200 | 340 | 270 | 2980 | 94.7 | 0.90 | 641 | 2.3 | 6.9 | 2.6 | 2.2 | 1270 | 76 | 91 | 66 | 81 |
| **315L3-2** | 250 | 410[1] | 325 | 2980 | 96 | 0.92 | 801 | 1.7 | 7.2 | 2.7 | 2.8 | 1420 | 76 | 91 | 66 | 81 |
| **355L1-2** | 315 | 510[1] | 410[1] | 2980 | 96.6 | 0.92 | 1009 | 1.5 | 6.7 | 2.8 | 4.5 | 1900 | 81 | 97 | 68 | 84 |
| **355L2-2** | 355 | 570[1] | 455[1] | 2985 | 96.8 | 0.93 | 1136 | 1.4 | 6.9 | 2.7 | 5 | 2050 | 81 | 97 | 68 | 84 |
| **355L3-2** | 400 | 640[1] | 515[1] | 2985 | 96.8 | 0.93 | 1280 | 1.3 | 7 | 2.8 | 5.5 | 2350 | 81 | 97 | 68 | 84 |
| **400L-2** | 450 | 710[1] | 570[1] | 2990 | 97 | 0.94 | 1437 | 1.1 | 7.2 | 2.8 | 8.5 | 2910 | 81 | 97 | - | - |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 300-3000 rpm | | 1200-3000 rpm | | 600-3000 rpm | | 300-3000 rpm | | 3000-5220 rpm | | 300-5220 rpm | |
| Power/torque CD.. | P2 [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **63M1-2** | 0.18 | 0.18 | 0.59 | 0.16 | 0.52 | 0.14 | 0.46 | 0.12 | 0.39 | 0.25 | 0.47 | - | - |
| **63M2-2** | 0.25 | 0.25 | 0.83 | 0.22 | 0.73 | 0.19 | 0.63 | 0.15 | 0.49 | 0.37 | 0.7 | - | - |
| **71M1-2** | 0.37 | 0.37 | 1.25 | 0.35 | 1.2 | 0.3 | 1 | 0.22 | 0.74 | 0.55 | 1 | - | - |
| **71M2-2** | 0.55 | 0.55 | 1.9 | 0.52 | 1.8 | 0.45 | 1.5 | 0.33 | 1.1 | 0.8 | 1.5 | - | - |
| **80M1-2** | 0.75 | 0.75 | 2.57 | 0.7 | 2.4 | 0.6 | 2 | 0.5 | 1.7 | 1.1 | 2 | - | - |
| **80M2-2** | 1.1 | 1.1 | 3.73 | 1 | 3.4 | 0.9 | 3 | 0.75 | 2.5 | 1.6 | 2.9 | - | - |
| **90S-2** | 1.5 | 1.5 | 5 | 1.4 | 4.7 | 1.2 | 4 | 1 | 3.3 | 2.2 | 4 | - | - |
| **90L-2** | 2.2 | 2.2 | 7.4 | 2 | 6.7 | 1.7 | 5.7 | 1.4 | 4.7 | 3.3 | 6 | - | - |
| **100L-2** | 3 | 3 | 10.1 | 2.7 | 8.9 | 2.2 | 7.2 | 1.8 | 5.9 | 4.5 | 8.2 | - | - |
| **112M-2** | 4 | 4 | 13.3 | 3.7 | 12 | 3.2 | 11 | 2.5 | 8.2 | 6 | 11 | - | - |
| **132S1-2** | 5.5 | 5.5 | 18.2 | 5 | 16 | 4.5 | 15 | 3.7 | 12 | 8 | 15 | 5.5 | 8 |
| **132S2-2** | 7.5 | 7.5 | 24.6 | 7 | 23 | 6 | 20 | 5 | 16 | 11 | 20 | 7.5 | 10.5 |
| **160M1-2** | 11 | 11 | 36 | 10 | 32 | 9 | 29 | 7.5 | 24 | 16 | 29 | 11 | 15 |
| **160M2-2** | 15 | 14.5[2] | 47 | 13 | 42 | 12 | 39 | 10 | 32 | 21 | 38 | 14.5 | 20 |
| **160L-2** | 18.5 | 17.5[2] | 57 | 16 | 52 | 15 | 49 | 12.5 | 41 | 26 | 48 | 17.5 | 25 |
| **180M-2** | 22 | 21[2] | 68 | 20 | 65 | 18 | 58 | 15 | 49 | 30 | 55 | 21 | 29 |
| **200L1-2** | 30 | 28[2] | 90 | 27 | 87 | 24 | 77 | 22 | 71 | 40 | 73 | 28 | 38 |
| **200L2-2** | 37 | 32[2] | 103 | 31 | 100 | 28 | 90 | 27 | 87 | 49 | 90 | 32 | 45 |
| **225M-2** | 45 | 38[2] | 123 | 37 | 119 | 34 | 110 | 32 | 103 | 60 | 110 | 38 | 55 |
| **Frequency** | | | | | | | | | | 50-60 Hz[1] | | 5-60 Hz[1] | |
| **Speed range** | | | | | | | | | | 3000-3600 rpm | | 300-3600 rpm | |
| **250M-2** | 55 | 47[2] | 151 | 45 | 145 | 43 | 138 | 41 | 132 | 47 | 126 | 47 | 47 |
| **280S-2** | 75 | 62[2] | 199 | 60 | 193 | 58 | 186 | 55 | 177 | 62 | 166 | 62 | 62 |
| **280M-2** | 90 | 75[2] | 241 | 73 | 234 | 70 | 225 | 67 | 215 | 75 | 201 | 75 | 75 |
| **315S-2** | 110 | 95[2] | 304 | 90 | 288 | 88 | 282 | 85 | 272 | 95 | 258 | 95 | 95 |
| **315M-2** | 132 | 115 | 369 | 110 | 353 | 105 | 336 | 100 | 320 | 115 | 307 | 115 | 115 |
| **315L1-2** | 160 | 140 | 449 | 135 | 433 | 128 | 410 | 120 | 385 | 140 | 374 | 140 | 140 |
| **315L2-2** | 200 | 175 | 560 | 165 | 528 | 160 | 512 | 150 | 480 | 175 | 467 | 175 | 175 |
| **315L3-2** | 250 | 215 | 688 | 205 | 656 | 200 | 640 | 185 | 592 | 215 | 574 | 215 | 215 |
| **355L1-2** | 315 | 270 | 865 | 260 | 832 | 250 | 800 | 235 | 752 | 270 | 813 | 270 | 270 |
| **355L2-2** | 355 | 305 | 976 | 295 | 944 | 285 | 912 | 265 | 848 | 305 | 918 | 305 | 305 |
| **355L3-2** | 400 | 345 | 1104 | 335 | 1072 | 320 | 1024 | 300 | 960 | 345 | 1038 | 345 | 345 |
| **400L-2** | 450 | 390 | 1245 | 375 | 1197 | 360 | 1149 | 340 | 1085 | 390 | 201 | 390 | - |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 58

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE1
# Mains operation 50 Hz



Temperature class T4,
ns = 1500 rpm, 2p = 4

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | | | | | **IE1** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-4** | 0.12 | 0.43 | 0.34 | 1445 | 67 | 0.60 | 0.79 | 3.9 | 5.6 | 3.9 | 0.00046 | 16 | 44 | 56 | - | - |
| **63M2-4** | 0.18 | 0.53 | 0.42 | 1415 | 70 | 0.70 | 1.21 | 2.7 | 4.7 | 2.7 | 0.00046 | 16 | 44 | 56 | - | - |
| **71M1-4** | 0.25 | 0.66 | 0.53 | 1370 | 68.5 | 0.80 | 1.74 | 2 | 3.9 | 2.3 | 0.00046 | 16 | 45 | 57 | - | - |
| **71M2-4** | 0.37 | 0.94 | 0.75 | 1380 | 71 | 0.80 | 2.56 | 2.2 | 3.9 | 2.3 | 0.00063 | 17 | 45 | 57 | - | - |
| **80M1-4** | 0.55 | 1.38 | 1.10 | 1380 | 72 | 0.80 | 3.8 | 2 | 3.8 | 2.3 | 0.00092 | 24 | 46 | 58 | - | - |
| **80M2-4** | 0.75 | 1.81 | 1.45 | 1400 | 75.5 | 0.79 | 5.1 | 2.1 | 4.5 | 2.5 | 0.0013 | 25 | 46 | 58 | - | - |
| **90S-4** | 1.1 | 2.55 | 2.05 | 1400 | 76 | 0.83 | 7.5 | 2.1 | 4.8 | 2.5 | 0.0021 | 31 | 49 | 61 | - | - |
| **90L-4** | 1.5 | 3.35 | 2.65 | 1405 | 79 | 0.82 | 10.2 | 2.3 | 5 | 2.7 | 0.0029 | 35 | 49 | 61 | - | - |
| **100L1-4** | 2.2 | 4.95 | 3.95 | 1420 | 80 | 0.80 | 14.8 | 2.4 | 5.4 | 2.8 | 0.0046 | 44 | 52 | 64 | - | - |
| **100L2-4** | 3 | 6.5 | 5.2 | 1415 | 81.7 | 0.82 | 20.2 | 2.3 | 5.5 | 2.7 | 0.0056 | 46 | 52 | 64 | - | - |
| **112M-4** | 4 | 8.1 | 6.5 | 1435 | 85 | 0.84 | 26.6 | 2.7 | 6.8 | 3.2 | 0.0110 | 59 | 54 | 66 | - | - |
| **132S-4** | 5.5 | 10.8 | 8.6 | 1440 | 86.5 | 0.85 | 36.5 | 2.5 | 6.4 | 2.7 | 0.0220 | 100 | 57 | 70 | 55 | 68 |
| **132M-4** | 7.5 | 14.3 | 11.4 | 1440 | 88 | 0.86 | 50 | 2.7 | 6.5 | 2.8 | 0.030 | 110 | 57 | 70 | 55 | 68 |
| **160M-4** | 11 | 21 | 16.7 | 1460 | 89.5 | 0.85 | 72 | 2.5 | 6.6 | 2.8 | 0.057 | 168 | 62 | 75 | 56 | 69 |
| **160L-4** | 15 | 28 | 22.5 | 1455 | 90 | 0.86 | 98 | 2.8 | 6.7 | 3.1 | 0.079 | 184 | 62 | 75 | 56 | 69 |
| **180M-4** | 18.5 | 35 | 28 | 1460 | 91 | 0.84 | 121 | 2.9 | 6.7 | 3 | 0.13 | 198 | 60 | 73 | 57 | 70 |
| **180L-4** | 22 | 41.5 | 33 | 1460 | 91.5 | 0.84 | 144 | 3 | 6.9 | 3 | 0.155 | 217 | 60 | 73 | 57 | 70 |
| **200L-4** | 30 | 53 | 42.5 | 1460 | 92.2 | 0.88 | 196 | 2.6 | 6.8 | 2.9 | 0.25 | 274 | 61 | 75 | 58 | 72 |
| **225S-4** | 37 | 66 | 52 | 1465 | 92.6 | 0.88 | 241 | 2.7 | 6.7 | 2.6 | 0.4 | 372 | 63 | 77 | 59 | 73 |
| **225M-4** | 45 | 80 | 64 | 1470 | 92.8 | 0.88 | 292 | 2.7 | 6.5 | 2.6 | 0.48 | 402 | 63 | 77 | 59 | 73 |
| **250M-4** | 55 | 96 | 77 | 1470 | 93.2 | 0.89 | 357 | 2.9 | 7.1 | 2.9 | 0.75 | 573 | 65 | 79 | 64 | 78 |
| **280S-4** | 75 | 134 | 107 | 1480 | 93.8 | 0.86 | 484 | 2.6 | 6.8 | 2.5 | 1.25 | 740 | 68 | 82 | 66 | 80 |
| **280M-4** | 90 | 161 | 129 | 1480 | 94 | 0.86 | 581 | 2.8 | 6.9 | 2.6 | 1.48 | 820 | 68 | 82 | 66 | 80 |
| **315S-4** | 110 | 198 | 159 | 1485 | 94.2 | 0.85 | 707 | 2.5 | 6.7 | 2.5 | 2.2 | 1040 | 69 | 84 | 66 | 81 |
| **315M-4** | 132 | 235 | 190 | 1485 | 94.4 | 0.85 | 849 | 2.6 | 6.8 | 2.6 | 2.7 | 1120 | 69 | 84 | 66 | 81 |
| **315L1-4** | 160 | 285 | 225 | 1485 | 94.7 | 0.86 | 1029 | 2.7 | 6.9 | 2.6 | 3.1 | 1210 | 69 | 84 | 66 | 81 |
| **315L2-4** | 200 | 355 | 285 | 1485 | 94.9 | 0.86 | 1286 | 2.7 | 6.9 | 2.6 | 3.9 | 1430 | 69 | 84 | 66 | 81 |
| **315L3-4** | 250 | 430[1] | 345 | 1490 | 96.2 | 0.87 | 1602 | 1.7 | 7.3 | 2.7 | 4.6 | 1565 | 69 | 84 | 66 | 81 |
| **355L1-4** | 315 | 525[1] | 420[1] | 1490 | 96.3 | 0.90 | 2019 | 1.5 | 6.9 | 2.7 | 6.1 | 2050 | 72 | 88 | 68 | 84 |
| **355L2-4** | 355 | 590[1] | 470[1] | 1490 | 96.6 | 0.90 | 2275 | 1.6 | 6.9 | 2.8 | 6.7 | 2200 | 72 | 88 | 68 | 84 |
| **355L3-4** | 400 | 665[1] | 530[1] | 1490 | 97 | 0.90 | 2564 | 1.5 | 7 | 2.8 | 7.4 | 2430 | 72 | 88 | 68 | 84 |
| **400M-4** | 450 | 735[1] | 590[1] | 1495 | 97 | 0.91 | 2875 | 1.1 | 7.3 | 2.7 | 18 | 2850 | 78 | 94 | - | - |
| **400L-4** | 500 | 815[1] | 655[1] | 1495 | 97.1 | 0.91 | 3194 | 1.1 | 7.3 | 2.7 | 20 | 3230 | 78 | 94 | - | - |
| **450M-4** | 560 | 915[1] | 730[1] | 1495 | 97.2 | 0.91 | 3577 | 1 | 6.8 | 2.7 | 26 | 3500 | 79 | 95 | - | - |
| **450L-4** | 630 | 1025[1] | 820[1] | 1495 | 97.4 | 0.91 | 4024 | 1 | 6.8 | 2.7 | 31 | 3800 | 79 | 95 | - | - |
| **500…** | by request | | | | | | | | | | | | | | | |

**Note**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 150-1500 rpm | | 600-1500 rpm | | 300-1500 rpm | | 150-1500 rpm | | 1500-2610 rpm | | 150-2610 rpm | |
| Power/torque CD.. | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **63M1-4** | 0.12 | 0.12 | 0.79 | 0.11 | 0.73 | 0.09 | 0.59 | 0.08 | 0.53 | 0.18 | 0.68 | - | - |
| **63M2-4** | 0.18 | 0.18 | 1.2 | 0.16 | 1.08 | 0.14 | 0.94 | 0.11 | 0.79 | 0.25 | 0.96 | - | - |
| **70M1-4** | 0.25 | 0.25 | 1.74 | 0.22 | 1.5 | 0.19 | 1.25 | 0.15 | 1 | 0.37 | 1.4 | - | - |
| **71M2-4** | 0.37 | 0.37 | 2.56 | 0.33 | 2.2 | 0.28 | 1.9 | 0.22 | 1.5 | 0.55 | 2 | - | - |
| **80M1-4** | 0.55 | 0.55 | 3.8 | 0.52 | 3.5 | 0.45 | 3 | 0.33 | 2.2 | 0.8 | 2.9 | - | - |
| **80M2-4** | 0.75 | 0.75 | 5.1 | 0.7 | 4.8 | 0.6 | 4 | 0.5 | 3.3 | 1.1 | 4 | - | - |
| **90S-4** | 1.1 | 1.1 | 7.5 | 1 | 6.7 | 0.9 | 6 | 0.75 | 5 | 1.6 | 5.9 | - | - |
| **90L-4** | 1.5 | 1.5 | 10.2 | 1.4 | 9.5 | 1.2 | 8 | 1 | 6.7 | 2.2 | 8 | - | - |
| **100L1-4** | 2.2 | 2.2 | 14.8 | 2 | 13 | 1.7 | 11 | 1.4 | 9.3 | 3.3 | 12 | - | - |
| **100L2-4** | 3 | 3 | 20.2 | 2.8 | 19 | 2.2 | 15 | 1.8 | 12 | 4.5 | 16 | - | - |
| **112M-4** | 4 | 4 | 26.6 | 3.6 | 24 | 3 | 20 | 2.5 | 16 | 6 | 22 | - | - |
| **132S-4** | 5.5 | 5.5 | 36.5 | 5 | 33 | 4.4 | 29 | 3.7 | 24 | 8 | 29 | 5.5 | 8 |
| **132M-4** | 7.5 | 7.5 | 50 | 7 | 46 | 6 | 39 | 5 | 33 | 11 | 40 | 7.5 | 10.5 |
| **160M-4** | 11 | 11 | 72 | 10 | 65 | 9 | 58 | 7.5 | 49 | 16 | 59 | 11 | 15 |
| **160L-4** | 15 | 15 | 98 | 13.5 | 88 | 12 | 78 | 10 | 65 | 21 | 79 | 15 | 20 |
| **180M-4** | 18.5 | 18[2] | 118 | 98 | 111 | 15 | 97 | 12.5 | 81 | 26 | 95 | 18 | 25 |
| **180L-4** | 22 | 21[2] | 137 | 20 | 130 | 18 | 117 | 15 | 97 | 30 | 110 | 21 | 29 |
| **200L-4** | 30 | 28[2] | 183 | 27 | 176 | 24 | 156 | 21 | 136 | 40 | 146 | 28 | 37 |
| **225S-4** | 37 | 32[2] | 208 | 31 | 201 | 29 | 188 | 26 | 168 | 49 | 179 | 32 | 45 |
| **225M-4** | 45 | 38[2] | 247 | 37 | 240 | 35 | 227 | 32 | 207 | 60 | 220 | 38 | 55 |
| **250M-4** | 55 | 46[2] | 298 | 45 | 291 | 43 | 278 | 41 | 265 | 70 | 256 | 46 | 65 |
| **280S-4** | 75 | 62[2] | 400 | 60 | 386 | 58 | 373 | 55 | 354 | 95 | 348 | 62 | 88 |
| **280M-4** | 90 | 75[2] | 482 | 73 | 470 | 70 | 450 | 66 | 424 | 110 | 402 | 75 | 105 |
| **315S-4** | 110 | 95[2] | 610 | 90 | 577 | 88 | 564 | 83 | 532 | 140 | 512 | 95 | 130 |
| **315M-4** | 132 | 115 | 737 | 110 | 705 | 105 | 673 | 100 | 641 | 165 | 604 | 115 | 157 |
| **315L1-4** | 160 | 140 | 897 | 135 | 865 | 128 | 820 | 120 | 769 | 200 | 732 | 140 | 190 |
| **315L2-4** | 200 | 175 | 1122 | 165 | 1058 | 160 | 1026 | 150 | 961 | 250 | 915 | 175 | 240 |
| **315L3-4** | 250 | 215 | 1378 | 205 | 1314 | 200 | 1282 | 185 | 1186 | 310 | 1134 | 215 | 305 |
| **355L1-4** | 315 | 270 | 1731 | 260 | 1666 | 250 | 1602 | 235 | 1506 | 395 | 1445 | 270 | 385 |
| **355L2-4** | 355 | 305 | 1955 | 295 | 1891 | 285 | 1827 | 265 | 1698 | 440 | 1610 | 305 | 425 |
| **355L3-4** | 400 | 345 | 2209 | 335 | 2145 | 320 | 2048 | 300 | 1920 | 495 | 1820 | 345 | 480 |
| **400M-4** | 450 | 390 | 2500 | 375 | 2405 | 360 | 2307 | 340 | 2179 | 560 | 2050 | 390 | 540 |
| **400L-4** | 500 | 435 | 2778 | 415 | 2650 | 400 | 2553 | 380 | 2425 | 620 | 2274 | 435 | 600 |
| **450M-4** | 560 | 485 | 3097 | 465 | 2969 | 450 | 2873 | 425 | 2713 | 695 | 2549 | 485 | 670 |
| **450L-4** | 630 | 545 | 3480 | 525 | 3352 | 505 | 3224 | 475 | 3032 | 785 | 2879 | 545 | 755 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 59

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE1
# Mains operation 50 Hz



Temperature class T4,
ns = 1000 rpm, 2p = 6

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | | | | | **IE1** | **Efficiency according to IEC60034-30** | | | | | | | | |
| **71M2-6** | **0.25** | 0.82 | 0.66 | 920 | 62 | 0.71 | 2.6 | 2.2 | 3.5 | 2.6 | 0.0012 | 17 | 44 | 56 |
| **80M1-6** | **0.37** | 1.12 | 0.90 | 925 | 67 | 0.71 | 3.8 | 2.5 | 4.1 | 2.8 | 0.0019 | 24 | 44 | 56 |
| **80M2-6** | **0.55** | 1.6 | 1.28 | 925 | 69 | 0.72 | 5.7 | 2.4 | 4 | 2.7 | 0.0025 | 25 | 44 | 56 |
| **90S-6** | **0.75** | 2.15 | 1.72 | 910 | 70.2 | 0.75 | 7.9 | 1.8 | 3.4 | 2.1 | 0.0033 | 31 | 47 | 59 |
| **90L-6** | **1.1** | 3.05 | 2.45 | 920 | 73 | 0.73 | 11.4 | 2 | 3.7 | 2.2 | 0.0046 | 35 | 47 | 59 |
| **100L-6** | **1.5** | 3.75 | 3 | 945 | 77 | 0.75 | 15.2 | 2.5 | 4.9 | 3 | 0.0095 | 46 | 50 | 62 |
| **112M-6** | **2.2** | 5.2 | 4.2 | 950 | 81 | 0.75 | 22.1 | 2.7 | 5.6 | 3.1 | 0.017 | 59 | 53 | 65 |
| **132S-6** | **3** | 6.7 | 5.4 | 965 | 82.6 | 0.78 | 29.7 | 2.7 | 6.3 | 3.1 | 0.031 | 100 | 56 | 69 |
| **132M1-6** | **4** | 8.7 | 7 | 965 | 83.6 | 0.79 | 39.6 | 2.6 | 6 | 3 | 0.037 | 104 | 56 | 69 |
| **132M2-6** | **5.5** | 11.6 | 9.3 | 960 | 84.6 | 0.81 | 55 | 2.6 | 6.4 | 3 | 0.043 | 112 | 56 | 69 |
| **160M-6** | **7.5** | 14.8 | 11.8 | 960 | 86.1 | 0.85 | 75 | 2.5 | 6.8 | 3.3 | 0.087 | 170 | 58 | 71 |
| **160L-6** | **11** | 21 | 16.9 | 965 | 87.5 | 0.86 | 109 | 2.5 | 6.7 | 3.2 | 0.12 | 190 | 58 | 71 |
| **180L-6** | **15** | 29 | 23 | 965 | 89.1 | 0.84 | 148 | 2.4 | 6.9 | 3.2 | 0.19 | 215 | 58 | 71 |
| **200L1-6** | **18.5** | 35.5 | 28.5 | 975 | 89.7 | 0.84 | 181 | 1.9 | 6.3 | 2.7 | 0.28 | 270 | 58 | 71 |
| **200L2-6** | **22** | 41.5 | 33 | 970 | 90.4 | 0.85 | 217 | 2.2 | 6.8 | 3 | 0.31 | 280 | 58 | 72 |
| **225M-6** | **30** | 57 | 45.5 | 975 | 90.9 | 0.84 | 294 | 2.8 | 6.6 | 2.5 | 0.69 | 404 | 58 | 72 |
| **250M-6** | **37** | 70 | 56 | 980 | 91.4 | 0.84 | 361 | 2.8 | 6.6 | 2.6 | 1.03 | 570 | 58 | 76 |
| **280S-6** | **45** | 85 | 68 | 985 | 92.4 | 0.83 | 436 | 2.8 | 5.8 | 2.4 | 1.35 | 720 | 62 | 77 |
| **280M-6** | **55** | 105 | 84 | 985 | 92.5 | 0.82 | 533 | 2.7 | 5.8 | 2.3 | 1.7 | 770 | 62 | 77 |
| **315S-6** | **75** | 134 | 107 | 990 | 93 | 0.87 | 723 | 2.6 | 6.4 | 2.4 | 4.3 | 995 | 65 | 79 |
| **315M-6** | **90** | 158 | 127 | 990 | 93.3 | 0.88 | 868 | 2.6 | 6.5 | 2.4 | 5 | 1050 | 65 | 79 |
| **315L1-6** | **110** | 193 | 154 | 990 | 93.6 | 0.88 | 1061 | 2.7 | 6.5 | 2.5 | 6 | 1145 | 69 | 84 |
| **315L2-6** | **132** | 230 | 185 | 990 | 93.8 | 0.88 | 1273 | 2.7 | 6.7 | 2.5 | 7.3 | 1265 | 69 | 84 |
| **315L3-6** | **160** | 280 | 225 | 990 | 94.3 | 0.88 | 1543 | 2.6 | 6.8 | 2.5 | 8.3 | 1440 | 69 | 84 |
| **355M-6** | **200** | 345 | 275 | 990 | 94.8 | 0.88 | 1929 | 1.8 | 6.7 | 2.7 | 11.3 | 1750 | 74 | 90 |
| **355L1-6** | **250** | 430[1)] | 345 | 990 | 95.9 | 0.88 | 2411 | 1.8 | 6.7 | 2.7 | 13.8 | 1950 | 74 | 90 |
| **355L2-6** | **315** | 540[1)] | 430[1)] | 990 | 96 | 0.88 | 3039 | 1.7 | 6.9 | 2.6 | 17.6 | 2300 | 74 | 90 |
| **400M-6** | **355** | 595[1)] | 475[1)] | 994 | 96.6 | 0.89 | 3411 | 1.1 | 6.6 | 2.7 | 27 | 2850 | 78 | 94 |
| **400L-6** | **400** | 670[1)] | 535[1)] | 994 | 96.6 | 0.89 | 3843 | 1.1 | 6.8 | 2.6 | 31 | 3230 | 78 | 94 |
| **450M-6** | **450** | 755[1)] | 605[1)] | 995 | 96.6 | 0.89 | 4319 | 1.2 | 6.8 | 2.8 | 46 | 3500 | 78 | 94 |
| **450L-6** | **500** | 835[1)] | 670[1)] | 995 | 97 | 0.89 | 4799 | 1.1 | 6.8 | 2.7 | 51 | 3800 | 78 | 94 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment EAR

The values are also valid for series BD..

# Inverter operation 50 Hz



40 °C Umgebungstemperatur, Wicklungserwärmung innerhalb der Wärmeklasse F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 100-1000 rpm | | 400-1000 rpm | | 200-1000 rpm | | 100-1000 rpm | | 1000-1740 rpm | | 100-1740 rpm | |
| Power/torque CD.. | P2 [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **71M2-6** | 0.25 | 0.25 | 2.6 | 0.22 | 2.2 | 0.18 | 1.8 | 0.16 | 1.6 | 0.37 | 2 | - | - |
| **80M1-6** | 0.37 | 0.37 | 3.8 | 0.33 | 3.4 | 0.27 | 2.7 | 0.22 | 2.2 | 0.55 | 3 | - | - |
| **80M2-6** | 0.55 | 0.55 | 5.7 | 0.5 | 5.1 | 0.4 | 4 | 0.33 | 3.3 | 0.8 | 4.4 | - | - |
| **90S-6** | 0.75 | 0.75 | 7.9 | 0.65 | 6.7 | 0.55 | 5.5 | 0.42 | 4.2 | 1.1 | 6 | - | - |
| **90L-6** | 1.1 | 1.1 | 11.4 | 0.9 | 9.2 | 0.8 | 8 | 0.6 | 6 | 1.6 | 8.8 | - | - |
| **100L-6** | 1.5 | 1.5 | 15.2 | 1.4 | 14 | 1.1 | 11 | 0.9 | 9 | 2.2 | 12 | - | - |
| **112M-6** | 2.2 | 2.2 | 22.1 | 2 | 20 | 1.7 | 17 | 1.3 | 13 | 3.3 | 18 | - | - |
| **132S1-6** | 3 | 3 | 29.7 | 2.7 | 27 | 2.2 | 22 | 1.8 | 18 | 4.5 | 25 | 3 | 4.2 |
| **132M1-6** | 4 | 4 | 40 | 3.5 | 35 | 3 | 30 | 2.5 | 25 | 6 | 33 | 4 | 5.5 |
| **132M2-6** | 5.5 | 5.5 | 55 | 4.8 | 48 | 4 | 40 | 3.3 | 33 | 8 | 44 | 5.5 | 7.6 |
| **160M-6** | 7.5 | 7.5 | 75 | 7 | 69 | 6 | 59 | 5 | 49 | 11 | 60 | 7.5 | 10.5 |
| **160L-6** | 11 | 11 | 109 | 10 | 98 | 9 | 88 | 7.5 | 73 | 16 | 88 | 11 | 15 |
| **180L-6** | 15 | 15 | 148 | 13 | 128 | 12 | 118 | 10 | 98 | 21 | 115 | 15 | 20 |
| **200L1-6** | 18.5 | 17.5[2] | 171 | 16 | 157 | 14 | 137 | 12 | 118 | 26 | 143 | 17.5 | 24 |
| **200L2-6** | 22 | 20[2] | 196 | 19 | 186 | 17 | 167 | 15 | 147 | 30 | 165 | 20 | 28 |
| **225M-6** | 30 | 27[2] | 262 | 25 | 242 | 23 | 223 | 21 | 204 | 40 | 220 | 27 | 37 |
| **250M-6** | 37 | 33[2] | 320 | 31 | 301 | 29 | 281 | 26 | 252 | 49 | 269 | 33 | 45 |
| **280S-6** | 45 | 40[2] | 386 | 37 | 357 | 35 | 338 | 32 | 309 | 60 | 329 | 40 | 55 |
| **280M-6** | 55 | 47[2] | 453 | 45 | 434 | 43 | 415 | 41 | 396 | 70 | 384 | 47 | 65 |
| **315S-6** | 75 | 65[2] | 627 | 62 | 598 | 58 | 559 | 56 | 540 | 95 | 521 | 65 | 88 |
| **315M-6** | 90 | 78[2] | 752 | 73 | 704 | 70 | 675 | 68 | 656 | 110 | 604 | 78 | 105 |
| **315L1-6** | 110 | 95[2] | 916 | 90 | 868 | 88 | 849 | 85 | 820 | 140 | 768 | 95 | 130 |
| **315L2-6** | 132 | 115 | 1109 | 110 | 1061 | 105 | 1013 | 100 | 965 | 165 | 906 | 115 | 157 |
| **315L3-6** | 160 | 140 | 1351 | 135 | 1302 | 128 | 1235 | 120 | 1158 | 200 | 1098 | 140 | 190 |
| **355M-6** | 200 | 170 | 1640 | 165 | 1592 | 160 | 1543 | 150 | 1447 | 250 | 1372 | 170 | 240 |
| **355L1-6** | 250 | 215 | 2074 | 205 | 1978 | 200 | 1929 | 190 | 1833 | 310 | 1701 | 215 | 305 |
| **355L2-6** | 315 | 270 | 2605 | 260 | 2508 | 250 | 2412 | 235 | 2267 | 395 | 2168 | 270 | 385 |
| **400M-6** | 355 | 305 | 2942 | 295 | 2846 | 285 | 2749 | 265 | 2556 | 440 | 2115 | 305 | 425 |
| **400L-6** | 400 | 345 | 3328 | 335 | 3232 | 320 | 3087 | 300 | 2894 | 495 | 2717 | 345 | 480 |
| **450M-6** | 450 | 390 | 3762 | 375 | 3617 | 360 | 3473 | 340 | 3280 | 560 | 3074 | 390 | 540 |
| **450L-6** | 500 | 435 | 4196 | 415 | 4003 | 400 | 3859 | 375 | 3618 | 620 | 3404 | 435 | 600 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 59

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE1
# Mains operation 50 Hz



Temperature class T4,
ns = 750 rpm, 2p = 8

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | | | | | **IE1 Efficiency according to IEC 60034-30** | | | | | | | | | |
| **71M2-8** | 0.12 | 0.54 | 0.43 | 680 | 49.5 | 0.65 | 1.7 | 1.9 | 2.6 | 2.4 | 0.0012 | 17 | 41 | 53 |
| **80M1-8** | 0.18 | 0.74 | 0.59 | 690 | 54 | 0.65 | 2.5 | 2.2 | 3.2 | 2.6 | 0.0019 | 24 | 42 | 54 |
| **80M2-8** | 0.25 | 0.96 | 0.77 | 690 | 58.5 | 0.64 | 3.5 | 2.2 | 3.2 | 2.5 | 0.0025 | 25 | 42 | 54 |
| **90S-8** | 0.37 | 1.36 | 1.10 | 690 | 60 | 0.65 | 5.1 | 1.8 | 3 | 2.2 | 0.0033 | 31 | 46 | 58 |
| **90L-8** | 0.55 | 1.94 | 1.55 | 690 | 63 | 0.65 | 7.6 | 1.8 | 3.1 | 2.2 | 0.0046 | 35 | 46 | 58 |
| **100L1-8** | 0.75 | 2.45 | 1.96 | 710 | 67 | 0.66 | 10.1 | 2.4 | 4 | 2.6 | 0.008 | 44 | 49 | 61 |
| **100L2-8** | 1.1 | 3.15 | 2.5 | 695 | 69 | 0.73 | 15.1 | 2 | 3.8 | 2.4 | 0.0095 | 46 | 49 | 61 |
| **112M-8** | 1.5 | 4.15 | 3.3 | 710 | 76 | 0.67 | 20.2 | 2.2 | 4.6 | 2.8 | 0.017 | 59 | 52 | 64 |
| **132S-8** | 2.2 | 5.2 | 4.2 | 695 | 77 | 0.79 | 30 | 2 | 4.1 | 2.3 | 0.029 | 97 | 53 | 66 |
| **132M-8** | 3 | 7 | 5.6 | 705 | 80.5 | 0.77 | 41 | 2.4 | 4.6 | 2.7 | 0.036 | 113 | 53 | 66 |
| **160M1-8** | 4 | 8.8 | 7.1 | 715 | 83.8 | 0.78 | 53 | 1.8 | 4.6 | 2.3 | 0.071 | 157 | 54 | 67 |
| **160M2-8** | 5.5 | 12.2 | 9.7 | 720 | 84.7 | 0.77 | 73 | 2.1 | 5.4 | 2.8 | 0.105 | 170 | 54 | 67 |
| **160L-8** | 7.5 | 16.5 | 13.2 | 720 | 85.2 | 0.77 | 99 | 2.2 | 5.6 | 2.9 | 0.136 | 190 | 54 | 67 |
| **180L-8** | 11 | 23 | 18.5 | 725 | 87.1 | 0.79 | 145 | 2.4 | 6.4 | 3 | 0.22 | 215 | 56 | 69 |
| **200L-8** | 15 | 30.5 | 24.5 | 730 | 88.5 | 0.80 | 196 | 2.4 | 6.9 | 3.2 | 0.4 | 280 | 56 | 70 |
| **225S-8** | 18.5 | 38 | 30.5 | 730 | 89 | 0.79 | 242 | 2.2 | 6.3 | 3 | 0.56 | 372 | 57 | 71 |
| **225M-8** | 22 | 45 | 36 | 730 | 89.5 | 0.79 | 288 | 2.2 | 6.6 | 3 | 0.69 | 404 | 57 | 71 |
| **250M-8** | 30 | 59 | 47 | 735 | 90.1 | 0.82 | 390 | 2 | 6.8 | 3 | 1.2 | 550 | 58 | 72 |
| **280S-8** | 37 | 71 | 57 | 735 | 91.1 | 0.82 | 481 | 2.1 | 6.2 | 2.8 | 1.9 | 740 | 61 | 75 |
| **280M-8** | 45 | 87 | 69 | 735 | 91.3 | 0.82 | 585 | 2 | 6.3 | 2.6 | 2.3 | 800 | 61 | 75 |
| **315S-8** | 55 | 104 | 83 | 740 | 91.8 | 0.83 | 710 | 2.7 | 6 | 2.5 | 4.3 | 995 | 68 | 83 |
| **315M-8** | 75 | 141 | 113 | 740 | 92.6 | 0.83 | 968 | 2.8 | 6.3 | 2.6 | 5 | 1050 | 68 | 83 |
| **315L1-8** | 90 | 169 | 135 | 740 | 92.8 | 0.83 | 1161 | 2.9 | 6.6 | 2.7 | 6 | 1145 | 68 | 83 |
| **315L2-8** | 110 | 210 | 167 | 740 | 93 | 0.82 | 1420 | 2.9 | 6.8 | 2.7 | 7.3 | 1265 | 68 | 83 |
| **315L3-8** | 132 | 250 | 200 | 735 | 93.1 | 0.82 | 1715 | 2.8 | 6.3 | 2.6 | 8.3 | 1440 | 68 | 83 |
| **355M-8** | 160 | 295 | 235 | 740 | 95.1 | 0.83 | 2065 | 1.7 | 6.4 | 2.7 | 11.4 | 1750 | 70 | 86 |
| **355L1-8** | 200 | 370 | 295 | 745 | 95.6 | 0.82 | 2564 | 1.6 | 6.6 | 2.6 | 13.9 | 1950 | 70 | 86 |
| **355L2-8** | 250 | 460[1)] | 370 | 745 | 95.6 | 0.82 | 3205 | 1.4 | 6.1 | 2.6 | 17.7 | 2300 | 70 | 86 |
| **400M-8** | 315 | 570[1)] | 455[1)] | 745 | 96.2 | 0.83 | 4038 | 1.2 | 6.2 | 2.7 | 30 | 3100 | 73 | 89 |
| **400L-8** | 355 | 640[1)] | 515[1)] | 745 | 96.3 | 0.83 | 4551 | 1 | 6.1 | 2.6 | 34 | 3440 | 73 | 89 |
| **450M-8** | 400 | 710[1)] | 570[1)] | 745 | 96.6 | 0.84 | 5128 | 1 | 6.1 | 2.8 | 51 | 3750 | 74 | 90 |
| **450L-8** | 450 | 800[1)] | 640[1)] | 745 | 96.7 | 0.84 | 5768 | 1 | 6.1 | 2.8 | 57 | 4050 | 74 | 90 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

# Inverter operation 50 Hz



40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 100-1000 rpm | | 400-1000 rpm | | 200-1000 rpm | | 100-1000 rpm | | 1000-1740 rpm | | 100-1740 rpm | |
| Power/torque CD.. | P2 [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **71M2-8** | 0.12 | 0.12 | 1.7 | 0.11 | 1.5 | 0.1 | 1.4 | 0.08 | 1.1 | 0.18 | 1.3 | - | - |
| **80M1-8** | 0.18 | 0.18 | 2.5 | 0.16 | 2.2 | 0.13 | 1.7 | 0.11 | 1.5 | 0.25 | 1.8 | - | - |
| **80M2-8** | 0.25 | 0.25 | 3.5 | 0.22 | 3 | 0.18 | 2.4 | 0.16 | 2.2 | 0.37 | 2.7 | - | - |
| **90S-8** | 0.37 | 0.37 | 5.1 | 0.33 | 4.4 | 0.27 | 3.6 | 0.22 | 3 | 0.55 | 4 | - | - |
| **90L-8** | 0.55 | 0.55 | 7.6 | 0.5 | 6.7 | 0.4 | 5.4 | 0.33 | 4.4 | 0.8 | 5.9 | - | - |
| **100L1-8** | 0.75 | 0.75 | 10.1 | 0.65 | 8.7 | 0.55 | 7.4 | 0.42 | 5.6 | 1.1 | 8 | - | - |
| **100L2-8** | 1.1 | 1.1 | 15.1 | 0.9 | 12 | 0.8 | 11 | 0.6 | 8.1 | 1.6 | 12 | - | - |
| **112M-8** | 1.5 | 1.5 | 20.2 | 1.4 | 19 | 1.1 | 15 | 0.9 | 12 | 2.2 | 16 | - | - |
| **132S-8** | 2.2 | 2.2 | 30 | 2 | 27 | 1.7 | 23 | 1.3 | 17 | 3.3 | 24 | 2.2 | 3.1 |
| **132M-8** | 3 | 3 | 41 | 2.7 | 36 | 2.2 | 29 | 1.8 | 24 | 4.5 | 33 | 3 | 4.2 |
| **160M1-8** | 4 | 4 | 53 | 3.5 | 46 | 3 | 40 | 2.5 | 33 | 6 | 44 | 4 | 5.5 |
| **160M2-8** | 5.5 | 5.5 | 73 | 4.8 | 64 | 4 | 52 | 3.3 | 44 | 8 | 59 | 5.5 | 7.6 |
| **160L-8** | 7.5 | 7.5 | 99 | 7 | 92 | 5.5 | 72 | 4.5 | 59 | 11 | 80 | 7.5 | 10.5 |
| **180L-8** | 11 | 11 | 145 | 10 | 131 | 8 | 104 | 7 | 91 | 16 | 117 | 11 | 15 |
| **200L-8** | 15 | 15 | 196 | 13 | 170 | 11 | 143 | 10 | 130 | 21 | 154 | 15 | 20 |
| **225S-8** | 18.5 | 18.5 | 242 | 16 | 208 | 14 | 181 | 12 | 155 | 26 | 190 | 18.5 | 25 |
| **225M-8** | 22 | 22 | 288 | 19 | 245 | 17 | 219 | 15 | 194 | 30 | 220 | 22 | 29 |
| **250M-8** | 30 | 27[2] | 348 | 25 | 323 | 23 | 297 | 21 | 271 | 40 | 293 | 27 | 37 |
| **280S-8** | 37 | 33[2] | 426 | 31 | 400 | 29 | 374 | 26 | 336 | 49 | 359 | 33 | 45 |
| **280M-8** | 45 | 40[2] | 516 | 37 | 478 | 35 | 452 | 32 | 413 | 60 | 439 | 40 | 55 |
| **315S-8** | 55 | 48[2] | 619 | 45 | 581 | 43 | 555 | 41 | 529 | 70 | 512 | 48 | 65 |
| **315M-8** | 75 | 65[2] | 839 | 62 | 800 | 58 | 749 | 56 | 723 | 95 | 695 | 65 | 88 |
| **315L1-8** | 90 | 78[2] | 1007 | 73 | 942 | 70 | 903 | 68 | 878 | 110 | 805 | 78 | 105 |
| **315L2-8** | 110 | 95[2] | 1226 | 90 | 1161 | 88 | 1136 | 85 | 1097 | 140 | 1025 | 95 | 130 |
| **315L3-8** | 132 | 115 | 1484 | 110 | 1420 | 105 | 1309 | 100 | 1247 | 165 | 1027 | 115 | 157 |
| **355M-8** | 160 | 140 | 1807 | 135 | 1743 | 128 | 1596 | 120 | 1496 | 200 | 1464 | 140 | 190 |
| **355L1-8** | 200 | 170 | 2194 | 165 | 2129 | 160 | 1994 | 150 | 1870 | 250 | 1830 | 170 | 240 |
| **355L2-8** | 250 | 215 | 2775 | 205 | 2646 | 200 | 2493 | 190 | 2368 | 310 | 2269 | 215 | 305 |
| **400M-8** | 315 | 270 | 3484 | 260 | 3355 | 250 | 3116 | 235 | 2929 | 395 | 2891 | 270 | 385 |
| **400L-8** | 355 | 305 | 3935 | 295 | 3807 | 285 | 3553 | 265 | 3303 | 440 | 3220 | 305 | 425 |
| **450M-8** | 400 | 345 | 4452 | 335 | 4323 | 320 | 3989 | 300 | 3740 | 495 | 3622 | 345 | 480 |
| **450L-8** | 450 | 390 | 5033 | 375 | 4839 | 360 | 4488 | 340 | 4239 | 560 | 4098 | 390 | 540 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 59

Overload protection via temperature sensor

Temperature class T4,
ns = 3600 rpm, 2p = 2

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 460 V I [A] | 690 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | | | |
| **63M1-2** | 0.21 | 0.6 | 0.4 | 3485 | 66 | 0.67 | 0.59 | 4.6 | 6.8 | 6.5 | 0.00028 | 16 | 53 | 65 | - | - |
| **63M2-2** | 0.29 | 0.69 | 0.46 | 3430 | 70 | 0.75 | 0.83 | 3.4 | 5.8 | 4.7 | 0.00028 | 16 | 53 | 65 | - | - |
| **71M1-2** | 0.44 | 0.92 | 0.61 | 3360 | 71.5 | 0.84 | 1.26 | 2.7 | 5.2 | 3.5 | 0.00028 | 16 | 56 | 68 | - | - |
| **71M2-2** | 0.65 | 1.38 | 0.92 | 3370 | 72 | 0.82 | 1.87 | 2.8 | 5.5 | 3.6 | 0.00039 | 17 | 56 | 68 | - | - |
| **80M1-2** | 0.86 | 1.72 | 1.15 | 3350 | 74.5 | 0.84 | 2.57 | 2.7 | 4.8 | 3.3 | 0.00058 | 24 | 60 | 72 | - | - |
| **80M2-2** | 1.26 | 2.45 | 1.65 | 3385 | 78 | 0.82 | 3.73 | 2.8 | 5.5 | 3.5 | 0.0008 | 25 | 60 | 72 | - | - |
| **90S-2** | 1.8 | 3.5 | 2.25 | 3410 | 77.8 | 0.86 | 5 | 2.9 | 5.9 | 3.2 | 0.0013 | 31 | 65 | 77 | - | - |
| **90L-2** | 2.5 | 4.5 | 3 | 3420 | 82 | 0.85 | 7.4 | 3 | 6.3 | 3.5 | 0.0018 | 35 | 65 | 77 | - | - |
| **100L-2** | 3.6 | 6.3 | 4.2 | 3420 | 82 | 0.87 | 10.1 | 2.7 | 6.8 | 3.3 | 0.0029 | 45 | 68 | 80 | - | - |
| **112M-2** | 4.8 | 8.1 | 5.4 | 3455 | 85 | 0.88 | 13.3 | 2.3 | 6.5 | 3.1 | 0.0051 | 53 | 68 | 80 | - | - |
| **132S1-2** | 6.6 | 11.1 | 7.4 | 3470 | 85.5 | 0.87 | 18.2 | 2.5 | 6.4 | 3.3 | 0.0089 | 95 | 68 | 81 | 60 | 73 |
| **132S2-2** | 9 | 15 | 10 | 3490 | 86.5 | 0.87 | 24.6 | 2.7 | 6.8 | 3.5 | 0.0125 | 100 | 68 | 81 | 60 | 73 |
| **160M1-2** | 12.8 | 20.5 | 13.5 | 3510 | 89 | 0.89 | 36 | 2.8 | 6.6 | 3.2 | 0.032 | 163 | 71 | 84 | 61 | 74 |
| **160M2-2** | 17.5 | 27 | 18.1 | 3505 | 89 | 0.91 | 49 | 2.8 | 6.8 | 3.2 | 0.043 | 173 | 71 | 84 | 61 | 74 |
| **160L-2** | 22 | 33 | 22 | 3510 | 91 | 0.92 | 60 | 2.6 | 6.8 | 3.1 | 0.052 | 188 | 71 | 84 | 61 | 74 |
| **180M-2** | 26 | 39 | 26 | 3510 | 91.2 | 0.92 | 72 | 2.5 | 6.9 | 3 | 0.075 | 196 | 75 | 88 | 64 | 77 |
| **200L1-2** | 36 | 55 | 36.5 | 3545 | 92 | 0.90 | 97 | 2.6 | 7.2 | 2.9 | 0.13 | 254 | 77 | 91 | 65 | 79 |
| **200L2-2** | 43 | 64 | 42.5 | 3545 | 92.5 | 0.91 | 120 | 2.7 | 7.2 | 3 | 0.16 | 278 | 77 | 91 | 65 | 79 |
| **225M-2** | 52 | 79 | 53 | 3550 | 92.8 | 0.89 | 145 | 2.5 | 7.1 | 3 | 0.24 | 400 | 78 | 92 | 66 | 80 |
| **250M-2** | 64 | 97 | 65 | 3565 | 93.2 | 0.89 | 177 | 2.4 | 7.1 | 2.8 | 0.4 | 545 | 81 | 95 | 70 | 84 |
| **280S-2** | 87 | 131 | 87 | 3565 | 93.6 | 0.89 | 241 | 2.2 | 6.8 | 2.7 | 0.65 | 700 | 82 | 96 | 72 | 86 |
| **280M-2** | 105 | 156 | 104 | 3565 | 93.8 | 0.90 | 289 | 2.4 | 6.8 | 2.8 | 0.78 | 762 | 82 | 96 | 72 | 86 |
| **315S-2** | 121 | 182 | 121 | 3570 | 94 | 0.89 | 353 | 2.1 | 6.8 | 2.5 | 1.4 | 960 | 82 | 96 | 73 | 88 |
| **315M-2** | 145 | 215 | 145 | 3570 | 94.3 | 0.89 | 424 | 2.2 | 7.2 | 2.6 | 1.6 | 1025 | 82 | 96 | 73 | 88 |
| **315L1-2** | 176 | 260 | 173 | 3570 | 94.5 | 0.90 | 514 | 2.5 | 7.3 | 2.8 | 1.9 | 1065 | 82 | 96 | 73 | 88 |
| **315L2-2** | 220 | 325 | 215 | 3575 | 94.7 | 0.90 | 641 | 2.4 | 7.3 | 2.7 | 2.2 | 1270 | 82 | 96 | 73 | 88 |
| **315L3-2** | 275 | 395 | 260 | 3575 | 95.5 | 0.92 | 801 | 1.8 | 7.6 | 2.8 | 2.8 | 1420 | 82 | 96 | 73 | 88 |
| **355L1-2** | 345 | 490[1)] | 325 | 3575 | 96.1 | 0.92 | 1009 | 1.6 | 7.1 | 3 | 4.5 | 1900 | 87 | 103 | 75 | 91 |
| **355L2-2** | 390 | 545[1)] | 365 | 3580 | 96.3 | 0.93 | 1136 | 1.5 | 7.3 | 2.8 | 5 | 2050 | 87 | 103 | 75 | 91 |
| **355L3-2** | 440 | 615[1)] | 410[1)] | 3580 | 96.3 | 0.93 | 1280 | 1.4 | 7.4 | 2.8 | 5.5 | 2350 | 87 | 103 | 75 | 91 |
| **400L-2** | 495 | 685[1)] | 455[1)] | 3585 | 96.5 | 0.94 | 1437 | 1.15 | 7.6 | 3 | 8.5 | 2910 | 87 | 103 | 81 | 97 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | |
| Frequency | 60 Hz | 6-60 Hz | | 24-60 Hz | | 12-60 Hz | | 6-60 Hz | | 6-60 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | |
| Speed range | - | 360-3600 rpm | | 1440-3600 rpm | | 720-3600 rpm | | 360-3600 rpm | | 360-3600 rpm | |
| Power/torque CD.. | $P_2$ [kW] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] |
| **63M1-2** | 0.21 | 0.21 | 0.58 | 0.19 | 0.52 | 0.16 | 0.44 | 0.14 | 0.38 | - | - |
| **63M2-2** | 0.29 | 0.29 | 0.81 | 0.26 | 0.72 | 0.22 | 0.61 | 0.17 | 0.46 | - | - |
| **71M1-2** | 0.44 | 0.44 | 1.25 | 0.42 | 1.19 | 0.36 | 1.01 | 0.26 | 72 | - | - |
| **71M2-2** | 0.65 | 0.65 | 1.83 | 0.61 | 1.72 | 0.53 | 1.48 | 0.39 | 1.08 | - | - |
| **80M1-2** | 0.86 | 0.86 | 2.45 | 0.8 | 2.25 | 0.69 | 1.94 | 0.57 | 1.59 | - | - |
| **80M2-2** | 1.26 | 1.26 | 3.55 | 1.15 | 3.25 | 1.03 | 2.85 | 0.86 | 2.4 | - | - |
| **90S-2** | 1.8 | 1.8 | 5 | 1.7 | 4.75 | 1.4 | 3.85 | 1.2 | 3.3 | - | - |
| **90L-2** | 2.5 | 2.5 | 7 | 2.3 | 6.4 | 1.9 | 5.2 | 1.6 | 4.4 | - | - |
| **100L-2** | 3.6 | 3.6 | 10.1 | 3.2 | 8.9 | 2.6 | 7.2 | 2.2 | 6 | - | - |
| **112M-2** | 4.8 | 4.8 | 13.3 | 4.4 | 12.1 | 3.8 | 10.4 | 3 | 8.2 | - | - |
| **132S1-2** | 6.6 | 6.6 | 18.2 | 6 | 16.5 | 5.4 | 14.8 | 4.4 | 12 | 6.6 | 18.2 |
| **132S2-2** | 9 | 9 | 24.6 | 8.4 | 23 | 7.2 | 19.6 | 6 | 16.2 | 9 | 24.6 |
| **160M1-2** | 12.8 | 12.8 | 34.8 | 11.6 | 31.5 | 10.5 | 28.5 | 8.7 | 23.5 | 12.8 | 34.8 |
| **160M2-2** | 17.5 | 16.9[2] | 46 | 15.2 | 41.5 | 14 | 38 | 11.7 | 31.5 | 16.9 | 46 |
| **160L-2** | 22 | 20.8[2] | 57 | 19 | 52 | 17.8 | 48 | 14.9 | 40 | 20.8 | 57 |
| **180M-2** | 26 | 25[2] | 68 | 24 | 65 | 21 | 57 | 18 | 48.5 | 25 | 68 |
| **200L1-2** | 36 | 34[2] | 92 | 32 | 86 | 29 | 78 | 26 | 70 | 34 | 92 |
| **200L2-2** | 43 | 37[2] | 99 | 36 | 97 | 33 | 89 | 31 | 83 | 37 | 99 |
| **225M-2** | 52 | 44[2] | 118 | 43 | 115 | 39 | 105 | 37 | 99 | 44 | 118 |
| **250M-2** | 64 | 55[2] | 147 | 52 | 139 | 50 | 134 | 48 | 128 | 55 | 147 |
| **280S-2** | 87 | 72[2] | 193 | 70 | 187 | 67 | 179 | 64 | 171 | 72 | 193 |
| **280M-2** | 105 | 88[2] | 235 | 85 | 227 | 82 | 219 | 78 | 208 | 88 | 235 |
| **315S-2** | 121 | 105[2] | 281 | 99 | 264 | 97 | 259 | 94 | 251 | 105 | 281 |
| **315M-2** | 145 | 126 | 337 | 121 | 323 | 115 | 307 | 110 | 294 | 126 | 337 |
| **315L1-2** | 176 | 154 | 412 | 149 | 398 | 141 | 377 | 132 | 352 | 154 | 412 |
| **315L2-2** | 220 | 193 | 515 | 182 | 486 | 176 | 469 | 165 | 440 | 193 | 515 |
| **315L3-2** | 275 | 237 | 632 | 226 | 603 | 220 | 587 | 204 | 544 | 237 | 632 |
| **355L1-2** | 345 | 296 | 790 | 285 | 760 | 274 | 731 | 257 | 685 | 296 | 790 |
| **355L2-2** | 390 | 335 | 893 | 324 | 863 | 313 | 834 | 291 | 775 | 335 | 893 |
| **355L3-2** | 440 | 380 | 1013 | 369 | 983 | 352 | 938 | 330 | 879 | 380 | 1013 |
| **400L-2** | 495 | 429 | 1142 | 412 | 1097 | 396 | 1054 | 374 | 995 | 429 | 1142 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 60

Overload protection via temperature sensor

# IE1
# Mains operation 60 Hz



Temperature class T4,
ns = 1800 rpm, 2p = 4

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass-moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 460 V | 690 V | | | | | | | | | | | | | |
| | $P_2$ [kW] | I [A] | I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | Efficiency according to manufacturer's standard | | | | | | | | | | | | | | | |
| **63M1-4** | 0.14 | 0.44 | 0.29 | 1735 | 67 | 0.60 | 0.77 | 3.9 | 5.6 | 3.9 | 0.00046 | 16 | 48 | 60 | - | - |
| **63M2-4** | 0.21 | 0.54 | 0.36 | 1700 | 70 | 0.70 | 1.18 | 2.7 | 4.7 | 2.7 | 0.00046 | 16 | 48 | 60 | - | - |
| **71M1-4** | 0.3 | 0.69 | 0.46 | 1645 | 68.5 | 0.80 | 1.74 | 2 | 3.9 | 2.3 | 0.00046 | 16 | 49 | 61 | - | - |
| **71M2-4** | 0.44 | 0.97 | 0.65 | 1655 | 71 | 0.80 | 2.54 | 2.2 | 3.9 | 2.3 | 0.00063 | 17 | 49 | 61 | - | - |
| **80M1-4** | 0.63 | 1.37 | 0.92 | 1655 | 72 | 0.80 | 3.6 | 2 | 3.8 | 2.3 | 0.00092 | 24 | 50 | 62 | - | - |
| **80M2-4** | 0.86 | 1.81 | 1.21 | 1680 | 75.5 | 0.79 | 4.9 | 2.1 | 4.5 | 2.5 | 0.0013 | 25 | 50 | 62 | - | - |
| **90S-4** | 1.3 | 2.6 | 1.72 | 1680 | 76 | 0.83 | 7.4 | 2.1 | 4.8 | 2.5 | 0.0021 | 31 | 53 | 65 | - | - |
| **90L-4** | 1.8 | 3.5 | 2.3 | 1685 | 79 | 0.82 | 10.2 | 2.3 | 5 | 2.7 | 0.0029 | 35 | 53 | 65 | - | - |
| **100L1-4** | 2.6 | 5.1 | 3.4 | 1705 | 80 | 0.80 | 14.6 | 2.4 | 5.4 | 2.8 | 0.0046 | 44 | 57 | 69 | - | - |
| **100L2-4** | 3.6 | 6.7 | 4.5 | 1700 | 81.7 | 0.82 | 20.2 | 2.3 | 5.5 | 2.7 | 0.0056 | 46 | 57 | 69 | - | - |
| **112M-4** | 4.8 | 8.4 | 5.6 | 1720 | 85 | 0.84 | 26.7 | 2.7 | 6.8 | 3.2 | 0.0110 | 59 | 59 | 71 | - | - |
| **132S-4** | 6.6 | 11.3 | 7.5 | 1730 | 86.5 | 0.85 | 36.4 | 2.5 | 6.4 | 2.7 | 0.0220 | 100 | 62 | 75 | 59 | 72 |
| **132M-4** | 8.5 | 14.1 | 9.4 | 1730 | 88 | 0.86 | 47 | 2.7 | 6.5 | 2.8 | 0.030 | 110 | 62 | 75 | 59 | 72 |
| **160M-4** | 12.6 | 21 | 13.9 | 1750 | 89.5 | 0.85 | 69 | 2.5 | 6.6 | 2.8 | 0.057 | 168 | 67 | 80 | 60 | 73 |
| **160L-4** | 17.2 | 28 | 18.6 | 1745 | 90 | 0.86 | 94 | 2.8 | 6.7 | 3.1 | 0.079 | 184 | 67 | 80 | 60 | 73 |
| **180M-4** | 22 | 36 | 24 | 1750 | 91 | 0.84 | 120 | 2.9 | 6.7 | 3 | 0.13 | 198 | 65 | 78 | 61 | 74 |
| **180L-4** | 26 | 44 | 28.5 | 1750 | 91.5 | 0.84 | 142 | 3 | 6.9 | 3 | 0.155 | 217 | 65 | 78 | 61 | 74 |
| **200L-4** | 34.5 | 53 | 35.5 | 1750 | 92.2 | 0.88 | 188 | 2.6 | 6.8 | 2.9 | 0.25 | 274 | 66 | 80 | 62 | 76 |
| **225S-4** | 43 | 65 | 44 | 1760 | 92.6 | 0.88 | 233 | 2.7 | 6.7 | 2.6 | 0.4 | 372 | 68 | 82 | 64 | 78 |
| **225M-4** | 52 | 80 | 53 | 1765 | 92.8 | 0.88 | 281 | 2.7 | 6.5 | 2.6 | 0.48 | 402 | 68 | 82 | 64 | 78 |
| **250M-4** | 64 | 97 | 65 | 1765 | 93.2 | 0.89 | 346 | 2.9 | 7.1 | 2.9 | 0.75 | 573 | 70 | 84 | 68 | 82 |
| **280S-4** | 87 | 135 | 90 | 1775 | 93.8 | 0.86 | 468 | 2.6 | 6.8 | 2.5 | 1.25 | 740 | 74 | 88 | 71 | 85 |
| **280M-4** | 105 | 163 | 109 | 1775 | 94 | 0.86 | 565 | 2.8 | 6.9 | 2.6 | 1.48 | 820 | 74 | 88 | 71 | 85 |
| **315S-4** | 121 | 190 | 126 | 1780 | 94.2 | 0.85 | 649 | 2.6 | 7.2 | 2.6 | 2.2 | 1040 | 76 | 91 | 72 | 87 |
| **315M-4** | 145 | 225 | 151 | 1780 | 94.4 | 0.85 | 778 | 2.7 | 7.2 | 2.7 | 2.7 | 1120 | 76 | 91 | 72 | 87 |
| **315L1-4** | 176 | 270 | 181 | 1780 | 94.7 | 0.86 | 944 | 2.8 | 7.3 | 2.7 | 3.1 | 1210 | 76 | 91 | 72 | 87 |
| **315L2-4** | 220 | 340 | 225 | 1780 | 94.9 | 0.87 | 1180 | 2.8 | 7.3 | 2.7 | 3.9 | 1430 | 76 | 91 | 72 | 87 |
| **315L3-4** | 275 | 410[1] | 275 | 1785 | 96.2 | 0.87 | 1471 | 1.8 | 7.7 | 2.8 | 4.6 | 1565 | 76 | 91 | 72 | 87 |
| **355L1-4** | 345 | 500[1] | 335 | 1790 | 96.3 | 0.90 | 1841 | 1.5 | 7.3 | 2.8 | 6.1 | 2050 | 78 | 94 | 74 | 90 |
| **355L2-4** | 390 | 565[1] | 375 | 1790 | 96.6 | 0.90 | 2081 | 1.6 | 7.3 | 3 | 6.7 | 2200 | 78 | 94 | 74 | 90 |
| **355L3-4** | 440 | 635[1] | 420[1] | 1790 | 97 | 0.90 | 2347 | 1.5 | 7.4 | 3 | 7.4 | 2430 | 78 | 94 | 74 | 90 |
| **400M-4** | 495 | 705[1] | 470[1] | 1794 | 97 | 0.91 | 2635 | 1.1 | 7.7 | 2.8 | 18 | 2850 | 84 | 100 | - | - |
| **400L-4** | 550 | 780[1] | 520[1] | 1794 | 97.1 | 0.91 | 2928 | 1.1 | 7.7 | 2.8 | 20 | 3230 | 84 | 100 | - | - |
| **450M-4** | 610 | 865[1] | 575[1] | 1794 | 97.2 | 0.91 | 3247 | 1 | 7.2 | 2.8 | 26 | 3500 | 85 | 101 | - | - |
| **450L-4** | 690 | 975[1] | 650[1] | 1794 | 97.4 | 0.91 | 3673 | 1 | 7.2 | 2.8 | 31 | 3800 | 85 | 101 | - | - |
| **500..** | by request | | | | | | | | | | | | | | | |

**Note**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | |
| Frequency | 60 Hz | 6-60 Hz | | 24-60 Hz | | 12-60 Hz | | 6-60 Hz | | 6-60 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | |
| Speed range | - | 180-1800 rpm | | 720-1800 rpm | | 360-1800 rpm | | 180-1800 rpm | | 180-1800 rpm | |
| Power/torque CD.. | $P_2$ [kW] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] |
| **63M1-4** | 0.14 | 0.14 | 0.77 | 0.13 | 0.71 | 0.11 | 0.6 | 0.09 | 0.49 | - | - |
| **63M2-4** | 0.21 | 0.21 | 1.18 | 0.19 | 1.06 | 0.16 | 0.89 | 0.13 | 0.71 | - | - |
| **70M1-4** | 0.3 | 0.3 | 1.74 | 0.26 | 1.49 | 0.23 | 1.31 | 0.18 | 1.01 | - | - |
| **71M2-4** | 0.44 | 0.44 | 2.55 | 0.39 | 2.25 | 0.33 | 1.86 | 0.26 | 1.45 | - | - |
| **80M1-4** | 0.63 | 0.63 | 3.65 | 0.6 | 3.45 | 0.52 | 2.95 | 0.38 | 2.1 | - | - |
| **80M2-4** | 0.86 | 0.86 | 4.9 | 0.8 | 4.55 | 0.69 | 3.85 | 0.57 | 3.15 | - | - |
| **90S-4** | 1.3 | 1.3 | 7.4 | 1.2 | 6.8 | 1.1 | 6.2 | 0.9 | 5 | - | - |
| **90L-4** | 1.8 | 1.8 | 10.2 | 1.7 | 9.6 | 1.4 | 7.8 | 1.2 | 6.6 | - | - |
| **100L1-4** | 2.6 | 2.6 | 14.6 | 2.4 | 13.4 | 2 | 11.1 | 1.7 | 9.3 | - | - |
| **100L2-4** | 3.6 | 3.6 | 20 | 3.4 | 19 | 2.6 | 14.4 | 2.2 | 12.1 | - | - |
| **112M-4** | 4.8 | 4.8 | 26.5 | 4.3 | 24 | 3.6 | 19.8 | 3 | 16.4 | - | - |
| **132S-4** | 6.6 | 6.6 | 36.5 | 6 | 33 | 5.3 | 29 | 4.4 | 24 | 6.6 | 36.5 |
| **132M-4** | 8.5 | 8.5 | 47 | 7.9 | 43.5 | 6.8 | 37 | 5.7 | 31 | 8.5 | 47 |
| **160M-4** | 12.6 | 12.6 | 69 | 11.5 | 63 | 10.3 | 56 | 8.6 | 46.5 | 12.6 | 69 |
| **160L-4** | 17.2 | 17.2 | 94 | 15.5 | 85 | 13.8 | 75 | 11.5 | 62 | 17.2 | 94 |
| **180M-4** | 22 | 121.4[2] | 117 | 20.2 | 109 | 17.8 | 97 | 14.9 | 81 | 21.4 | 117 |
| **180L-4** | 26 | 24.8[2] | 136 | 23.6 | 128 | 21.3 | 117 | 17.7 | 96 | 24.8 | 136 |
| **200L-4** | 34.5 | 32.2[2] | 174 | 31.1 | 169 | 27.6 | 149 | 24.2 | 130 | 32.2 | 174 |
| **225S-4** | 43 | 37[2] | 200 | 36 | 195 | 34 | 184 | 30 | 162 | 37 | 200 |
| **225M-4** | 52 | 44[2] | 237 | 43 | 232 | 40 | 215 | 37 | 199 | 44 | 237 |
| **250M-4** | 64 | 54[2] | 291 | 52 | 280 | 50 | 269 | 48 | 258 | 54 | 291 |
| **280S-4** | 87 | 72[2] | 386 | 70 | 376 | 67 | 359 | 64 | 343 | 72 | 386 |
| **280M-4** | 105 | 88[2] | 472 | 85 | 456 | 82 | 440 | 77 | 413 | 8 | 472 |
| **315S-4** | 121 | 105[2] | 563 | 99 | 530 | 97 | 519 | 91 | 487 | 105 | 563 |
| **315M-4** | 145 | 126 | 675 | 121 | 648 | 115 | 616 | 110 | 589 | 126 | 675 |
| **315L1-4** | 176 | 154 | 825 | 149 | 798 | 141 | 755 | 132 | 703 | 154 | 825 |
| **315L2-4** | 220 | 193 | 1034 | 182 | 975 | 176 | 942 | 165 | 883 | 193 | 1034 |
| **315L3-4** | 275 | 237 | 1267 | 226 | 1207 | 220 | 1175 | 204 | 1089 | 237 | 1267 |
| **355L1-4** | 345 | 296 | 1578 | 285 | 1519 | 274 | 1460 | 257 | 1369 | 296 | 1578 |
| **355L2-4** | 390 | 335 | 1786 | 324 | 1727 | 313 | 1668 | 291 | 1550 | 335 | 1786 |
| **355L3-4** | 440 | 380 | 2026 | 369 | 1967 | 352 | 1876 | 330 | 1758 | 380 | 2026 |
| **400M-4** | 495 | 429 | 2283 | 413 | 2197 | 396 | 2107 | 374 | 1989 | 429 | 2283 |
| **400L-4** | 550 | 479 | 2549 | 457 | 2431 | 440 | 2341 | 418 | 2223 | 479 | 2549 |
| **450M-4** | 610 | 528 | 2809 | 507 | 2697 | 490 | 2607 | 463 | 2463 | 528 | 2809 |
| **450L-4** | 690 | 597 | 3177 | 575 | 3059 | 553 | 2942 | 520 | 2766 | 597 | 3177 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 61

Overload protection via temperature sensor

# IE1
# Mains operation 60 Hz

Temperature class T4,
ns = 1200 rpm, 2p = 6

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Break-down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 460 V I [A] | 690 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | | | | | | **Efficiency according to manufacturer's standard** | | | | | | | | |
| **71M2-6** | 0.3 | 0.86 | 0.57 | 1105 | 62 | 0.71 | 2.6 | 2.2 | 3.5 | 2.6 | 0.0012 | 17 | 48 | 60 |
| **80M1-6** | 0.42 | 1.11 | 0.74 | 1110 | 67 | 0.71 | 3.6 | 2.5 | 4.1 | 2.8 | 0.0019 | 24 | 48 | 60 |
| **80M2-6** | 0.64 | 1.62 | 1.08 | 1110 | 69 | 0.72 | 5.5 | 2.4 | 4 | 2.7 | 0.0025 | 25 | 51 | 60 |
| **90S-6** | 0.9 | 2.15 | 1.43 | 1090 | 70.2 | 0.75 | 7.9 | 1.8 | 3.4 | 2.1 | 0.0033 | 31 | 51 | 63 |
| **90L-6** | 1.3 | 3.05 | 2.05 | 1105 | 73 | 0.73 | 11.2 | 2 | 3.7 | 2.2 | 0.0046 | 35 | 51 | 63 |
| **100L-6** | 1.8 | 3.9 | 2.6 | 1135 | 77 | 0.75 | 15.1 | 2.5 | 4.9 | 3 | 0.0095 | 46 | 54 | 66 |
| **112M-6** | 2.6 | 5.4 | 3.6 | 1140 | 81 | 0.75 | 21.8 | 2.7 | 5.6 | 3.1 | 0.017 | 59 | 58 | 70 |
| **132S-6** | 3.6 | 7 | 4.7 | 1160 | 82.6 | 0.78 | 29.6 | 2.7 | 6.3 | 3.1 | 0.031 | 100 | 61 | 74 |
| **132M1-6** | 4.8 | 9.1 | 6.1 | 1150 | 93.6 | 0.79 | 40 | 2.6 | 6 | 3 | 0.037 | 104 | 61 | 74 |
| **132M2-6** | 6.6 | 12.1 | 8.1 | 1150 | 84.6 | 0.81 | 55 | 2.6 | 6.4 | 3 | 0.043 | 112 | 61 | 74 |
| **160M-6** | 8.6 | 14.7 | 9.8 | 1150 | 86.1 | 0.85 | 71 | 2.5 | 6.8 | 3.3 | 0.087 | 170 | 63 | 76 |
| **160L-6** | 12.6 | 21 | 14 | 1160 | 87.5 | 0.86 | 104 | 2.5 | 6.7 | 3.2 | 0.12 | 190 | 63 | 76 |
| **180L-6** | 18 | 30 | 20.1 | 1160 | 89.1 | 0.84 | 148 | 2.4 | 6.9 | 3.2 | 0.19 | 215 | 63 | 76 |
| **200L1-6** | 21.3 | 35.5 | 23.5 | 1170 | 89.7 | 0.84 | 174 | 1.9 | 6.3 | 2.7 | 0.28 | 270 | 63 | 77 |
| **200L2-6** | 26 | 42.5 | 28.5 | 1165 | 90.4 | 0.85 | 213 | 2.2 | 6.8 | 3 | 0.31 | 280 | 63 | 77 |
| **225M-6** | 35 | 58 | 38.5 | 1170 | 90.9 | 0.84 | 286 | 2.8 | 6.6 | 2.5 | 0.69 | 404 | 67 | 81 |
| **250M-6** | 44 | 72 | 48 | 1175 | 91.4 | 0.84 | 358 | 2.8 | 6.6 | 2.6 | 1.03 | 570 | 68 | 82 |
| **280S-6** | 52 | 85 | 57 | 1180 | 92.4 | 0.83 | 421 | 2.8 | 5.8 | 2.4 | 1.35 | 720 | 70 | 84 |
| **280M-6** | 64 | 106 | 71 | 1180 | 92.5 | 0.82 | 518 | 2.7 | 5.8 | 2.3 | 1.7 | 770 | 70 | 84 |
| **315S-6** | 87 | 135 | 90 | 1190 | 93 | 0.87 | 698 | 2.6 | 6.4 | 2.4 | 4.3 | 995 | 75 | 90 |
| **315M-6** | 105 | 161 | 107 | 1190 | 93.3 | 0.88 | 842 | 2.6 | 6.5 | 2.4 | 5 | 1050 | 75 | 90 |
| **315L1-6** | 121 | 184 | 123 | 1190 | 93.6 | 0.88 | 971 | 2.8 | 6.9 | 2.6 | 6 | 1145 | 75 | 90 |
| **315L2-6** | 145 | 220 | 147 | 1190 | 93.8 | 0.88 | 1164 | 2.8 | 7.1 | 2.6 | 7.3 | 1265 | 75 | 90 |
| **315L3-6** | 176 | 265 | 177 | 1190 | 94.3 | 0.88 | 1421 | 2.7 | 7.2 | 2.6 | 8.3 | 1440 | 75 | 90 |
| **355M-6** | 220 | 330 | 220 | 1190 | 94.8 | 0.88 | 1766 | 1.9 | 7.1 | 2.8 | 11.3 | 1750 | 80 | 96 |
| **355L1-6** | 275 | 410[1] | 275 | 1190 | 95.9 | 0.88 | 2207 | 1.9 | 7.1 | 2.8 | 13.8 | 1950 | 80 | 96 |
| **355L2-6** | 345 | 515[1] | 340 | 1190 | 96 | 0.88 | 2769 | 1.8 | 7.3 | 2.7 | 17.6 | 2300 | 80 | 96 |
| **400M-6** | 390 | 570[1] | 380 | 1193 | 96.6 | 0.89 | 3122 | 1.15 | 7 | 2.8 | 27 | 2850 | 84 | 100 |
| **400L-6** | 440 | 640[1] | 430[1] | 1193 | 96.6 | 0.89 | 3522 | 1.15 | 7.2 | 2.7 | 31 | 3230 | 84 | 100 |
| **450M-6** | 495 | 725[1] | 480[1] | 1194 | 96.6 | 0.89 | 3959 | 1.3 | 7.2 | 3 | 46 | 3500 | 84 | 100 |
| **450L-6** | 550 | 800[1] | 535[1] | 1194 | 97 | 0.89 | 4399 | 1.15 | 7.2 | 2.8 | 51 | 3800 | 84 | 100 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

# Inverter operation 60 Hz



40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | |
| Frequency | 60 Hz | 6-60 Hz | | 24-60 Hz | | 12-60 Hz | | 6-60 Hz | | 6-60 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | |
| Speed range | - | 120-1200 rpm | | 480-1200 rpm | | 240-1200 rpm | | 120-1200 rpm | | 120-1200 rpm | |
| Power/torque CD.. | $P_2$ [kW] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] |
| **71M2-6** | 0.3 | 0.3 | 2.6 | 0.26 | 2.2 | 0.22 | 1.86 | 0.19 | 1.59 | - | - |
| **80M1-6** | 0.42 | 0.42 | 3.6 | 0.37 | 3.15 | 0.31 | 2.6 | 0.25 | 2.1 | - | - |
| **80M2-6** | 0.64 | 0.64 | 5.5 | 0.58 | 4.95 | 0.47 | 3.95 | 0.38 | 3.15 | - | - |
| **90S-6** | 0.9 | 0.9 | 7.9 | 0.78 | 6.7 | 0.66 | 5.6 | 0.5 | 4.2 | - | - |
| **90L-6** | 1.3 | 1.3 | 11.2 | 1.06 | 9 | 0.95 | 8 | 0.71 | 5.9 | - | - |
| **100L-6** | 1.8 | 1.8 | 15.1 | 1.7 | 14.3 | 1.3 | 10.8 | 1.1 | 9.1 | - | - |
| **112M-6** | 2.6 | 2.6 | 22 | 2.4 | 20 | 2 | 16.6 | 1.5 | 12.3 | - | - |
| **132S1-6** | 3.6 | 3.6 | 29.5 | 3.2 | 26 | 2.6 | 21 | 2.2 | 17.9 | 3.6 | 29.5 |
| **132M1-6** | 4.8 | 4.8 | 40 | 4.2 | 34.5 | 3.6 | 29.5 | 3 | 24.5 | 4.8 | 40 |
| **132M2-6** | 6.6 | 6.6 | 55 | 5.8 | 48 | 4.8 | 39.5 | 4 | 32.5 | 6.6 | 55 |
| **160M-6** | 8.6 | 8.6 | 71 | 8 | 66 | 6.9 | 57 | 5.7 | 46.5 | 8.6 | 71 |
| **160L-6** | 12.6 | 12.6 | 104 | 11.5 | 94 | 10.3 | 84 | 8.6 | 70 | 12.6 | 104 |
| **180L-6** | 18 | 18 | 148 | 16 | 131 | 14 | 114 | 12 | 98 | 18 | 148 |
| **200L1-6** | 21.3 | 20[2] | 163 | 18 | 146 | 16 | 130 | 14 | 113 | 20 | 163 |
| **200L2-6** | 26 | 24[2] | 196 | 22 | 180 | 20 | 163 | 18 | 146 | 24 | 196 |
| **225M-6** | 35 | 32[2] | 261 | 29 | 236 | 27 | 219 | 25 | 203 | 32 | 261 |
| **250M-6** | 44 | 39[2] | 316 | 37 | 300 | 34 | 275 | 31 | 250 | 39 | 316 |
| **280S-6** | 52 | 46[2] | 372 | 43 | 357 | 40 | 322 | 37 | 298 | 46 | 372 |
| **280M-6** | 64 | 55[2] | 444 | 52 | 420 | 50 | 403 | 48 | 387 | 55 | 444 |
| **315S-6** | 87 | 75[2] | 601 | 72 | 577 | 67 | 537 | 65 | 521 | 75 | 601 |
| **315M-6** | 105 | 91[2] | 729 | 85 | 681 | 82 | 657 | 79 | 633 | 91 | 729 |
| **315L1-6** | 121 | 105[2] | 842 | 99 | 793 | 97 | 777 | 94 | 753 | 105 | 842 |
| **315L2-6** | 145 | 126 | 1010 | 121 | 970 | 115 | 921 | 110 | 881 | 126 | 1010 |
| **315L3-6** | 176 | 154 | 1235 | 149 | 1194 | 141 | 1130 | 132 | 1057 | 154 | 1235 |
| **355M-6** | 220 | 187 | 1499 | 182 | 1458 | 176 | 1410 | 165 | 1321 | 187 | 1499 |
| **355L1-6** | 275 | 237 | 1900 | 226 | 1811 | 220 | 1763 | 209 | 1674 | 237 | 1900 |
| **355L2-6** | 345 | 296 | 2373 | 285 | 2284 | 274 | 2195 | 257 | 2058 | 296 | 2373 |
| **400M-6** | 390 | 335 | 2679 | 324 | 2591 | 313 | 2503 | 291 | 2326 | 335 | 2679 |
| **400L-6** | 440 | 380 | 3039 | 369 | 2951 | 352 | 2814 | 330 | 2638 | 380 | 3039 |
| **450M-6** | 495 | 429 | 3429 | 413 | 3301 | 396 | 3164 | 374 | 2988 | 429 | 3429 |
| **450L-6** | 550 | 479 | 3829 | 457 | 3652 | 440 | 3516 | 413 | 3299 | 479 | 3829 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 61

Overload protection via temperature sensor

# IE1
# Mains operation 60 Hz



Temperature class T4,
ns = 900 rpm, 2p = 8

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 460 V I [A] | 690 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm$^2$] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD..** | **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | |
| **71M2-8** | 0.14 | 0.54 | 0.36 | 815 | 49.5 | 0.65 | 1.64 | 1.9 | 2.6 | 2.4 | 0.0012 | 17 | 45 | 57 |
| **80M1-8** | 0.21 | 0.75 | 0.50 | 830 | 54 | 0.65 | 2.4 | 2.2 | 3.2 | 2.6 | 0.0019 | 24 | 46 | 58 |
| **80M2-8** | 0.3 | 1.01 | 0.67 | 830 | 58.5 | 0.64 | 3.45 | 2.2 | 3.2 | 2.5 | 0.0025 | 25 | 46 | 58 |
| **90S-8** | 0.44 | 1.41 | 0.94 | 850 | 60 | 0.65 | 4.9 | 1.8 | 3 | 2.2 | 0.0033 | 31 | 50 | 62 |
| **90L-8** | 0.64 | 1.96 | 1.31 | 835 | 63 | 0.65 | 7.3 | 1.8 | 3.1 | 2.2 | 0.0046 | 35 | 50 | 62 |
| **100L1-8** | 0.9 | 2.55 | 1.70 | 850 | 67 | 0.66 | 10.1 | 2.4 | 4 | 2.6 | 0.008 | 44 | 53 | 65 |
| **100L2-8** | 1.3 | 3.25 | 2.15 | 835 | 69 | 0.73 | 14.9 | 2 | 3.8 | 2.4 | 0.0095 | 46 | 53 | 65 |
| **112M-8** | 1.8 | 4.45 | 3.0 | 850 | 76 | 0.67 | 20.2 | 2.2 | 4.6 | 2.8 | 0.017 | 59 | 57 | 69 |
| **132S-8** | 2.6 | 5.4 | 3.6 | 835 | 77 | 0.79 | 29.7 | 2 | 4.1 | 2.3 | 0.029 | 97 | 58 | 71 |
| **132M-8** | 3.6 | 7.3 | 4.85 | 845 | 80.5 | 0.77 | 41 | 2.4 | 4.6 | 2.7 | 0.036 | 113 | 58 | 71 |
| **160M1-8** | 4.6 | 8.8 | 5.9 | 860 | 83.8 | 0.78 | 51 | 1.8 | 4.6 | 2.3 | 0.071 | 157 | 59 | 72 |
| **160M2-8** | 6.5 | 12.5 | 8.3 | 865 | 84.7 | 0.77 | 72 | 2.1 | 5.4 | 2.8 | 0.105 | 170 | 59 | 72 |
| **160L-8** | 9 | 17.2 | 11.5 | 865 | 85.2 | 0.77 | 99 | 2.2 | 5.6 | 2.9 | 0.136 | 190 | 59 | 72 |
| **180L-8** | 13.2 | 24 | 16.1 | 870 | 87.1 | 0.79 | 145 | 2.4 | 6.4 | 3 | 0.22 | 215 | 61 | 74 |
| **200L-8** | 18 | 32 | 21.5 | 875 | 88.5 | 0.80 | 196 | 2.4 | 6.9 | 3.2 | 0.4 | 280 | 61 | 75 |
| **225S-8** | 22 | 39.5 | 26 | 875 | 89 | 0.79 | 242 | 2.2 | 6.3 | 3 | 0.56 | 372 | 62 | 76 |
| **225M-8** | 26 | 46 | 31 | 875 | 89.5 | 0.79 | 284 | 2.2 | 6.6 | 3 | 0.69 | 404 | 62 | 76 |
| **250M-8** | 36 | 61 | 41 | 880 | 90.1 | 0.82 | 391 | 2 | 6.8 | 3 | 1.2 | 550 | 63 | 77 |
| **280S-8** | 44 | 74 | 49.5 | 880 | 91.1 | 0.82 | 478 | 2.1 | 6.2 | 2.8 | 1.9 | 740 | 66 | 80 |
| **280M-8** | 52 | 87 | 58 | 880 | 91.3 | 0.82 | 564 | 2 | 6.3 | 2.6 | 2.3 | 800 | 66 | 80 |
| **315S-8** | 61 | 100 | 67 | 885 | 91.8 | 0.83 | 658 | 2.7 | 6 | 2.5 | 4.3 | 995 | 74 | 89 |
| **315M-8** | 87 | 142 | 95 | 885 | 92.6 | 0.83 | 939 | 2.8 | 6.3 | 2.6 | 5 | 1050 | 74 | 89 |
| **315L1-8** | 105 | 171 | 114 | 885 | 92.8 | 0.83 | 1133 | 2.9 | 6.6 | 2.7 | 6 | 1145 | 74 | 89 |
| **315L2-8** | 121 | 199 | 133 | 885 | 93 | 0.82 | 1306 | 3.1 | 7.2 | 2.8 | 7.3 | 1265 | 74 | 89 |
| **315L3-8** | 145 | 240 | 159 | 885 | 93.1 | 0.82 | 1574 | 2.9 | 6.6 | 2.7 | 8.3 | 1440 | 74 | 89 |
| **355M-8** | 176 | 280 | 187 | 890 | 95.1 | 0.83 | 1889 | 2 | 6.5 | 2.5 | 11.4 | 1750 | 76 | 92 |
| **355L1-8** | 220 | 350 | 235 | 895 | 95.6 | 0.82 | 2347 | 1.8 | 7 | 2.5 | 13.9 | 1950 | 76 | 92 |
| **355L2-8** | 275 | 440[1] | 295 | 895 | 95.6 | 0.82 | 2934 | 1.5 | 6.5 | 2.5 | 17.7 | 2300 | 76 | 92 |
| **400M-8** | 345 | 540[1] | 360 | 895 | 96.2 | 0.83 | 3681 | 1.3 | 6.5 | 2.5 | 30 | 3100 | 79 | 95 |
| **400L-8** | 390 | 610[1] | 410[1] | 895 | 96.3 | 0.83 | 4161 | 1.05 | 6.4 | 2.3 | 34 | 3440 | 79 | 95 |
| **450M-8** | 440 | 680[1] | 455[1] | 895 | 96.6 | 0.84 | 4695 | 1.05 | 6.4 | 2.3 | 51 | 3750 | 80 | 96 |
| **450L-8** | 495 | 765[1] | 510[1] | 895 | 96.7 | 0.84 | 5282 | 1.05 | 6.4 | 2.3 | 57 | 4050 | 80 | 96 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | |
| Frequency | 60 Hz | 6-60 Hz | | 24-60 Hz | | 12-60 Hz | | 6-60 Hz | | 6-60 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | |
| Speed range | - | 90-900 rpm | | 360-900 rpm | | 180-900 rpm | | 90-900 rpm | | 90-900 rpm | |
| Power/torque CD.. | $P_2$ [kW] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] | $P_U$ [kW] 60 Hz | $M_U$ [Nm] |
| **71M2-8** | 0.14 | 0.14 | 1.64 | 0.13 | 1.51 | 0.12 | 1.39 | 0.09 | 1.02 | - | - |
| **80M1-8** | 0.21 | 0.21 | 2.4 | 0.19 | 2.15 | 0.15 | 1.69 | 0.13 | 1.45 | - | - |
| **80M2-8** | 0.3 | 0.3 | 3.45 | 0.26 | 2.95 | 0.22 | 2.5 | 0.19 | 2.1 | - | - |
| **90S-8** | 0.44 | 0.44 | 4.95 | 0.39 | 4.35 | 0.32 | 3.55 | 0.26 | 2.85 | - | - |
| **90L-8** | 0.64 | 0.64 | 7.3 | 0.58 | 6.6 | 0.47 | 5.3 | 0.38 | 4.2 | - | - |
| **100L1-8** | 0.9 | 0.9 | 10.1 | 0.8 | 8.9 | 0.7 | 7.8 | 0.5 | 5.5 | - | - |
| **100L2-8** | 1.3 | 1.3 | 14.9 | 1.1 | 12.4 | 0.9 | 10.1 | 0.7 | 7.7 | - | - |
| **112M-8** | 1.8 | 1.8 | 20 | 1.7 | 19 | 1.3 | 14.4 | 1.1 | 12.1 | - | - |
| **132S-8** | 2.6 | 2.6 | 29.5 | 2.4 | 27.5 | 2 | 25.5 | 1.5 | 16.6 | 2.6 | 29.5 |
| **132M-8** | 3.6 | 3.6 | 40.5 | 3.2 | 36 | 2.6 | 29 | 2.2 | 24.5 | 3.6 | 40.5 |
| **160M1-8** | 4.6 | 4.6 | 51 | 4 | 44 | 3.5 | 38.5 | 2.9 | 31.5 | 4.6 | 51 |
| **160M2-8** | 6.5 | 6.5 | 72 | 5.7 | 63 | 4.7 | 51 | 3.6 | 42.5 | 6.5 | 72 |
| **160L-8** | 9 | 9 | 99 | 8.4 | 92 | 6.6 | 72 | 5.4 | 59 | 9 | 99 |
| **180L-8** | 13.2 | 13.2 | 145 | 12 | 131 | 9.6 | 104 | 8.4 | 91 | 13.2 | 145 |
| **200L-8** | 18 | 18 | 196 | 16 | 174 | 13 | 141 | 12 | 130 | 18 | 196 |
| **225S-8** | 22 | 22 | 242 | 19 | 207 | 17 | 184 | 14 | 151 | 22 | 242 |
| **225M-8** | 26 | 26 | 284 | 22 | 239 | 20 | 217 | 18 | 195 | 26 | 284 |
| **250M-8** | 36 | 32[2] | 346 | 30 | 324 | 28 | 302 | 25 | 269 | 32 | 346 |
| **280S-8** | 44 | 39[2] | 422 | 37 | 400 | 34 | 367 | 31 | 334 | 39 | 422 |
| **280M-8** | 52 | 46[2] | 498 | 43 | 465 | 40 | 432 | 37 | 399 | 46 | 498 |
| **315S-8** | 61 | 453[2] | 571 | 50 | 538 | 48 | 516 | 45 | 483 | 53 | 571 |
| **315M-8** | 87 | 75[2] | 807 | 72 | 775 | 67 | 720 | 65 | 698 | 75 | 807 |
| **315L1-8** | 105 | 91[2] | 980 | 85 | 914 | 82 | 882 | 79 | 849 | 91 | 980 |
| **315L2-8** | 121 | 105[2] | 1131 | 99 | 1065 | 97 | 1043 | 94 | 1011 | 105 | 1131 |
| **315L3-8** | 145 | 126 | 1363 | 121 | 1308 | 115 | 1242 | 110 | 1187 | 126 | 1363 |
| **355M-8** | 176 | 154 | 1650 | 149 | 1596 | 141 | 1510 | 132 | 1412 | 154 | 1650 |
| **355L1-8** | 220 | 187 | 1994 | 182 | 1940 | 176 | 1876 | 165 | 1758 | 187 | 1994 |
| **355L2-8** | 275 | 237 | 2527 | 226 | 2409 | 220 | 2345 | 209 | 2227 | 237 | 2527 |
| **400M-8** | 345 | 296 | 3156 | 285 | 3038 | 274 | 2920 | 257 | 2738 | 296 | 3156 |
| **400L-8** | 390 | 335 | 3572 | 324 | 3454 | 313 | 3336 | 291 | 3101 | 335 | 3572 |
| **450M-8** | 440 | 380 | 4052 | 369 | 3934 | 352 | 3752 | 330 | 3516 | 380 | 4052 |
| **450L-8** | 495 | 429 | 4574 | 413 | 4403 | 396 | 4221 | 374 | 3985 | 429 | 4574 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.


Output during operation at the inverter (guide values) torque curves page 61


Overload protection via temperature sensor

# IE2
# Mains operation 50 Hz



Temperature class T4,
ns = 3000 rpm, 2p = 2

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakdown torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y2** | | | | | | | | | **IE2 Efficiency according to IEC 60034-30** | | | | | | | |
| **63M1-2** | 0.18 | 0.47 | 0.38 | 2835 | 66 | 0.83 | 0.61 | 3.2 | 6 | 4.7 | 0.00028 | 16 | 49 | 61 | - | - |
| **63M2-2** | 0.25 | 0.62 | 0.50 | 2825 | 70 | 0.83 | 0.85 | 3.1 | 5.8 | 4.5 | 0.00028 | 16 | 49 | 61 | - | - |
| **71M1-2** | 0.37 | 0.84 | 0.67 | 2825 | 73 | 0.87 | 1.25 | 2.6 | 5.7 | 3.4 | 0.00058 | 24 | 51 | 63 | - | - |
| **71M2-2** | 0.55 | 1.19 | 0.95 | 2830 | 77 | 0.87 | 1.86 | 2.7 | 6.1 | 3.6 | 0.00080 | 25 | 51 | 63 | - | - |
| **80M1-2** | 0.75 | 1.58 | 1.26 | 2890 | 79 | 0.87 | 2.48 | 3 | 6.6 | 3.6 | 0.0013 | 31 | 55 | 67 | - | - |
| **80M2-2** | 1.1 | 2.25 | 1.80 | 2885 | 81.1 | 0.87 | 3.64 | 3.2 | 7.1 | 3.5 | 0.0018 | 35 | 55 | 67 | - | - |
| **90S-2** | 1.5 | 3 | 2.4 | 2895 | 82.7 | 0.88 | 4.95 | 3 | 7.1 | 3.5 | 0.0029 | 45 | 60 | 72 | - | - |
| **90L-2** | 2.2 | 4.25 | 3.4 | 2900 | 84.5 | 0.88 | 7.2 | 3 | 7.3 | 3.6 | 0.0039 | 48 | 60 | 72 | - | - |
| **100L-2** | 3 | 5.7 | 4.6 | 2910 | 85.8 | 0.88 | 9.8 | 2.5 | 6.9 | 2.9 | 0.0051 | 53 | 63 | 75 | - | - |
| **112M-2** | 4 | 7.6 | 6.1 | 2930 | 86.9 | 0.87 | 13 | 2.8 | 6.9 | 3.6 | 0.0089 | 95 | 63 | 76 | 55 | 67 |
| **132S1-2** | 5.5 | 10.1 | 8.1 | 2925 | 88.1 | 0.89 | 18 | 2.5 | 7 | 3.3 | 0.0125 | 103 | 63 | 76 | 55 | 68 |
| **132S2-2** | 7.5 | 13.7 | 10.9 | 2930 | 89.1 | 0.89 | 24.4 | 2.7 | 7.1 | 3.5 | 0.0177 | 115 | 63 | 76 | 55 | 68 |
| **160M1-2** | 11 | 20 | 16.2 | 2940 | 90.3 | 0.87 | 35.7 | 3 | 7.3 | 3.6 | 0.032 | 163 | 66 | 79 | 56 | 69 |
| **160M2-2** | 15 | 26.5 | 21 | 2940 | 91.1 | 0.9 | 48.7 | 2.8 | 7.2 | 3.2 | 0.043 | 173 | 66 | 79 | 56 | 69 |
| **160L-2** | 18.5 | 32 | 25.5 | 2940 | 91.6 | 0.91 | 60 | 2.7 | 7.2 | 3.1 | 0.052 | 188 | 66 | 79 | 56 | 69 |
| **180M-2** | 22 | 38 | 30.5 | 2945 | 92 | 0.91 | 71 | 2.6 | 7.5 | 3.2 | 0.075 | 196 | 69 | 82 | 58 | 71 |
| **200L1-2** | 30 | 52 | 41.5 | 2955 | 92.7 | 0.9 | 97 | 2.7 | 7.5 | 3.1 | 0.13 | 254 | 71 | 85 | 60 | 74 |
| **200L2-2** | 37 | 64 | 51 | 2955 | 93.1 | 0.9 | 120 | 2.8 | 7.6 | 3.2 | 0.16 | 278 | 71 | 85 | 60 | 74 |
| **225M-2** | 45 | 77 | 62 | 2960 | 93.4 | 0.9 | 145 | 2.7 | 7.3 | 3 | 0.24 | 400 | 72 | 86 | 60 | 74 |
| **250M-2** | 55 | 96 | 77 | 2970 | 93.8 | 0.88 | 177 | 2.8 | 7.5 | 3.1 | 0.4 | 545 | 75 | 89 | 64 | 78 |
| **280S-2** | 75 | 131 | 104 | 2970 | 94.2 | 0.88 | 241 | 2.3 | 7.1 | 2.8 | 0.65 | 700 | 76 | 90 | 66 | 80 |
| **280M-2** | 90 | 158 | 126 | 2970 | 94.5 | 0.87 | 289 | 2.4 | 7.4 | 2.9 | 0.78 | 762 | 76 | 90 | 66 | 80 |
| **315S-2** | 110 | 188 | 150 | 2975 | 94.8 | 0.89 | 353 | 2.2 | 7.1 | 2.6 | 1.4 | 960 | 76 | 91 | 66 | 81 |
| **315M-2** | 132 | 225 | 180 | 2975 | 95 | 0.9 | 424 | 2.1 | 6.8 | 2.5 | 1.6 | 1025 | 76 | 91 | 66 | 81 |
| **315L1-2** | 160 | 270 | 215 | 2975 | 95.2 | 0.9 | 514 | 2.4 | 7.4 | 2.7 | 1.7 | 1065 | 76 | 91 | 66 | 81 |
| **315L2-2** | 200 | 335 | 270 | 2980 | 95.4 | 0.9 | 614 | 2.3 | 6.9 | 2.6 | 2.2 | 1270 | 76 | 91 | 66 | 81 |
| **315L3-2** | 250 | 410[1)] | 325 | 2980 | 96 | 0.92 | 801 | 1.7 | 7.2 | 2.7 | 2.8 | 1420 | 76 | 91 | 66 | 81 |
| **355L1-2** | 315 | 510[1)] | 410[1)] | 2980 | 96.6 | 0.92 | 1009 | 1.5 | 6.7 | 2.8 | 4.5 | 1900 | 81 | 97 | 68 | 84 |
| **355L2-2** | 355 | 570[1)] | 455[1)] | 2985 | 96.8 | 0.93 | 1136 | 1.4 | 6.9 | 2.7 | 5 | 2050 | 81 | 97 | 68 | 84 |
| **355L3-2** | 400 | 640[1)] | 515[1)] | 2985 | 96.8 | 0.93 | 1280 | 1.3 | 7 | 2.8 | 5.5 | 2350 | 81 | 97 | 68 | 84 |
| **400L-2** | 450 | 710[1)] | 570[1)] | 2990 | 97 | 0.94 | 1437 | 1.1 | 7.2 | 2.8 | 8.5 | 2910 | 81 | 97 | - | - |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

# Inverter operation 50 Hz



40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 300-3000 rpm | | 1200-3000 rpm | | 600-3000 rpm | | 300-3000 rpm | | 3000-5220 rpm | | 300-5220 rpm | |
| Power/torque CD...Y2 | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **63M1-2** | 0.18 | 0.18 | 0.59 | 0.16 | 0.52 | 0.14 | 0.46 | 0.12 | 0.39 | 0.25 | 0.47 | - | - |
| **63M2-2** | 0.25 | 0.25 | 0.83 | 0.22 | 0.73 | 0.19 | 0.63 | 0.15 | 0.49 | 0.37 | 0.7 | - | - |
| **71M1-2** | 0.37 | 0.37 | 1.25 | 0.35 | 1.2 | 0.3 | 1 | 0.22 | 0.74 | 0.55 | 1 | - | - |
| **71M2-2** | 0.55 | 0.55 | 1.9 | 0.52 | 1.8 | 0.45 | 1.5 | 0.33 | 1.1 | 0.8 | 1.5 | - | - |
| **80M1-2** | 0.75 | 0.75 | 2.57 | 0.7 | 2.4 | 0.6 | 2 | 0.5 | 1.7 | 1.1 | 2 | - | - |
| **80M2-2** | 1.1 | 1.1 | 3.73 | 1 | 3.4 | 0.9 | 3 | 0.75 | 2.5 | 1.6 | 2.9 | - | - |
| **90S-2** | 1.5 | 1.5 | 5 | 1.4 | 4.7 | 1.2 | 4 | 1 | 3.3 | 2.2 | 4 | - | - |
| **90L-2** | 2.2 | 2.2 | 7.4 | 2 | 6.7 | 1.7 | 5.7 | 1.4 | 4.7 | 3.3 | 6 | - | - |
| **100L-2** | 3 | 3 | 10.1 | 2.7 | 8.9 | 2.2 | 7.2 | 1.8 | 5.9 | 4.5 | 8.2 | - | - |
| **112M-2** | 4 | 4 | 13.3 | 3.7 | 12 | 3.2 | 11 | 2.5 | 8.2 | 6 | 11 | - | - |
| **132S1-2** | 5.5 | 5.5 | 18.2 | 5 | 16 | 4.5 | 15 | 3.7 | 12 | 8 | 15 | 5.5 | 8 |
| **132S2-2** | 7.5 | 7.5 | 24.6 | 7 | 23 | 6 | 20 | 5 | 16 | 11 | 20 | 7.5 | 10.5 |
| **160M1-2** | 11 | 11 | 36 | 10 | 32 | 9 | 29 | 7.5 | 24 | 16 | 29 | 11 | 15 |
| **160M2-2** | 15 | 14.5[2] | 47 | 13 | 42 | 12 | 39 | 10 | 32 | 21 | 38 | 14.5 | 20 |
| **160L-2** | 18.5 | 17.5[2] | 57 | 16 | 52 | 15 | 49 | 12.5 | 41 | 26 | 48 | 17.5 | 25 |
| **180M-2** | 22 | 21[2] | 68 | 20 | 65 | 18 | 58 | 15 | 49 | 30 | 55 | 21 | 29 |
| **200L1-2** | 30 | 28[2] | 90 | 27 | 87 | 24 | 77 | 22 | 71 | 40 | 73 | 28 | 38 |
| **200L2-2** | 37 | 32[2] | 103 | 31 | 100 | 28 | 90 | 27 | 87 | 49 | 90 | 32 | 45 |
| **225M-2** | 45 | 38[2] | 123 | 37 | 119 | 34 | 110 | 32 | 103 | 60 | 110 | 38 | 55 |
| Frequency<br>Speed range | | | | | | | | | | 50-60 Hz[1]<br>3000-3600 rpm | | 5-60 Hz[1]<br>300-3600 rpm | |
| **250M-2** | 55 | 47[2] | 151 | 45 | 145 | 43 | 138 | 41 | 132 | 47 | 126 | 47 | 47 |
| **280S-2** | 75 | 62[2] | 199 | 60 | 193 | 58 | 186 | 55 | 177 | 62 | 166 | 62 | 62 |
| **280M-2** | 90 | 75[2] | 241 | 73 | 234 | 70 | 225 | 67 | 215 | 75 | 201 | 75 | 75 |
| **315S-2** | 110 | 95[2] | 304 | 90 | 288 | 88 | 282 | 85 | 272 | 95 | 258 | 95 | 95 |
| **315M-2** | 132 | 115 | 369 | 110 | 353 | 105 | 336 | 100 | 320 | 115 | 307 | 115 | 115 |
| **315L1-2** | 160 | 140 | 449 | 135 | 433 | 128 | 410 | 120 | 385 | 140 | 374 | 140 | 140 |
| **315L2-2** | 200 | 175 | 560 | 165 | 528 | 160 | 512 | 150 | 480 | 175 | 467 | 175 | 175 |
| **315L3-2** | 250 | 215 | 688 | 205 | 656 | 200 | 640 | 185 | 592 | 215 | 574 | 215 | 215 |
| **355L1-2** | 315 | 270 | 865 | 260 | 832 | 250 | 800 | 235 | 752 | 270 | 813 | 270 | 270 |
| **355L2-2** | 355 | 305 | 976 | 295 | 944 | 285 | 912 | 265 | 848 | 305 | 918 | 305 | 305 |
| **355L3-2** | 400 | 345 | 1104 | 335 | 1072 | 320 | 1024 | 300 | 960 | 345 | 1038 | 345 | 345 |
| **400L-2** | 450 | 390 | 1245 | 375 | 1197 | 360 | 1149 | 340 | 1085 | 390 | 201 | 390 | 390 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 58
Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE2
# Mains operation 50 Hz



Temperature class T4,
ns = 1500 rpm, 2p = 4

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y2** | | | | | | | | **IE2 Efficiency according to IEC 60034-30** | | | | | | | | |
| **63M1-4** | 0.12 | 0.37 | 0.30 | 1430 | 67 | 0.69 | 0.80 | 3.4 | 5.3 | 3.7 | 0.00046 | 16 | 44 | 56 | - | - |
| **63M2-4** | 0.18 | 0.52 | 0.42 | 1425 | 70 | 0.71 | 1.21 | 2.8 | 5.2 | 3.4 | 0.00063 | 17 | 44 | 56 | - | - |
| **71M1-4** | 0.25 | 0.69 | 0.55 | 1445 | 72.5 | 0.72 | 1.65 | 3.1 | 5.7 | 3.7 | 0.0092 | 24 | 45 | 57 | - | - |
| **71M2-4** | 0.37 | 0.98 | 0.79 | 1435 | 76.5 | 0.71 | 2.46 | 3.6 | 6.3 | 3.9 | 0.0013 | 25 | 45 | 57 | - | - |
| **80M1-4** | 0.55 | 1.26 | 1.01 | 1440 | 79.5 | 0.79 | 3.65 | 2.9 | 6.8 | 3.5 | 0.0021 | 31 | 46 | 58 | - | - |
| **80M2-4** | 0.75 | 1.71 | 1.37 | 1445 | 81 | 0.78 | 5 | 3.2 | 6.8 | 4.2 | 0.0029 | 35 | 46 | 58 | - | - |
| **90S-4** | 1.1 | 2.4 | 1.92 | 1455 | 82.7 | 0.8 | 7.2 | 2.4 | 6.8 | 3.1 | 0.0046 | 44 | 49 | 61 | - | - |
| **90L-4** | 1.5 | 3.2 | 2.55 | 1450 | 84 | 0.81 | 9.9 | 2.5 | 6.9 | 3.2 | 0.0056 | 46 | 49 | 61 | - | - |
| **100L1-4** | 2.2 | 4.4 | 3.55 | 1450 | 85.5 | 0.84 | 14.5 | 2.9 | 7.3 | 3.3 | 0.011 | 59 | 52 | 64 | - | - |
| **100L2-4** | 3 | 6.0 | 4.75 | 1450 | 86.6 | 0.84 | 18.8 | 3.1 | 7.4 | 3.6 | 0.011 | 59 | 52 | 64 | - | - |
| **112M-4** | 4 | 7.9 | 6.4 | 1460 | 87.6 | 0.83 | 26.2 | 3 | 7.2 | 3.4 | 0.022 | 100 | 54 | 66 | - | - |
| **132S-4** | 5.5 | 10.5 | 8.4 | 1460 | 88.6 | 0.85 | 36 | 3.2 | 7.1 | 3.5 | 0.03 | 113 | 57 | 70 | 55 | 68 |
| **132M-4** | 7.5 | 14.1 | 11.3 | 1460 | 89.5 | 0.86 | 49 | 3.1 | 7.4 | 3.3 | 0.041 | 125 | 57 | 70 | 55 | 68 |
| **160M-4** | 11 | 20.5 | 16.5 | 1470 | 90.6 | 0.85 | 71 | 2.8 | 7.1 | 3.1 | 0.079 | 184 | 62 | 75 | 59 | 69 |
| **160L-4** | 15 | 28.5 | 23 | 1470 | 91.3 | 0.83 | 97 | 3 | 7.4 | 3.3 | 0.083 | 187 | 62 | 75 | 59 | 69 |
| **180M-4** | 18.5 | 35 | 28 | 1470 | 91.9 | 0.83 | 120 | 3.3 | 7.4 | 3.4 | 0.155 | 217 | 60 | 73 | 57 | 70 |
| **180L-4** | 22 | 41.5 | 33 | 1470 | 92.3 | 0.81 | 143 | 3.2 | 7.3 | 3.4 | 0.164 | 225 | 60 | 73 | 57 | 70 |
| **200L-4** | 30 | 55 | 44 | 1470 | 92.9 | 0.85 | 195 | 3.1 | 7.6 | 3.3 | 0.25 | 274 | 61 | 75 | 58 | 72 |
| **225S-4** | 37 | 67 | 54 | 1475 | 93.3 | 0.85 | 240 | 3 | 7.1 | 2.9 | 0.4 | 372 | 63 | 77 | 59 | 73 |
| **225M-4** | 45 | 81 | 65 | 1475 | 93.6 | 0.86 | 291 | 3.1 | 7.2 | 3 | 0.48 | 402 | 63 | 77 | 59 | 73 |
| **250M-4** | 55 | 96 | 77 | 1475 | 94 | 0.88 | 356 | 3.1 | 7.3 | 3 | 0.75 | 588 | 65 | 79 | 64 | 78 |
| **280S-4** | 75 | 135 | 108 | 1480 | 94.5 | 0.85 | 484 | 3 | 7.4 | 2.8 | 1.25 | 740 | 68 | 82 | 66 | 80 |
| **280M-4** | 90 | 161 | 129 | 1485 | 94.7 | 0.85 | 579 | 3.2 | 7.8 | 3 | 1.48 | 820 | 68 | 82 | 66 | 80 |
| **315S-4** | 110 | 199 | 159 | 1485 | 94.9 | 0.84 | 707 | 2.7 | 6.9 | 2.7 | 2.2 | 1040 | 69 | 84 | 66 | 81 |
| **315M-4** | 132 | 240 | 191 | 1485 | 95.1 | 0.84 | 849 | 2.7 | 7 | 2.7 | 2.7 | 1120 | 69 | 84 | 66 | 81 |
| **315L1-4** | 160 | 290 | 230 | 1485 | 95.3 | 0.84 | 1026 | 2.8 | 7.4 | 2.8 | 3.1 | 1210 | 69 | 84 | 66 | 81 |
| **315L2-4** | 200 | 355 | 285 | 1485 | 95.5 | 0.85 | 1286 | 2.6 | 6.9 | 2.6 | 3.9 | 1430 | 69 | 84 | 66 | 81 |
| **315L3-4** | 250 | 430[1] | 345 | 1490 | 96.2 | 0.87 | 1602 | 1.7 | 7.3 | 2.7 | 4.6 | 1565 | 69 | 84 | 66 | 81 |
| **355L1-4** | 315 | 525[1] | 420[1] | 1490 | 96.3 | 0.90 | 2019 | 1.5 | 6.9 | 2.7 | 6.1 | 2050 | 72 | 88 | 68 | 84 |
| **355L2-4** | 355 | 590[1] | 470[1] | 1490 | 96.6 | 0.90 | 2275 | 1.6 | 6.9 | 2.8 | 6.7 | 2200 | 72 | 88 | 68 | 84 |
| **355L3-4** | 400 | 665[1] | 530[1] | 1490 | 97 | 0.90 | 2564 | 1.5 | 7 | 2.8 | 7.4 | 2430 | 72 | 88 | 68 | 84 |
| **400M-4** | 450 | 735[1] | 590[1] | 1495 | 97 | 0.91 | 2875 | 1.1 | 7.3 | 2.7 | 18 | 2850 | 78 | 94 | - | - |
| **400L-4** | 500 | 815[1] | 655[1] | 1495 | 97.1 | 0.91 | 3194 | 1.1 | 7.3 | 2.7 | 20 | 3230 | 78 | 94 | - | - |
| **450M-4** | 560 | 915[1] | 730[1] | 1495 | 97.2 | 0.91 | 3577 | 1 | 6.8 | 2.7 | 26 | 3500 | 79 | 95 | - | - |
| **450L-4** | 630 | 1025[1] | 820[1] | 1495 | 97.4 | 0.91 | 4024 | 1 | 6.8 | 2.7 | 31 | 3800 | 79 | 95 | - | - |
| **500..** | by request | | | | | | | | | | | | | | | |

**Note**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 150-1500 rpm | | 600-1500 rpm | | 300-1500 rpm | | 150-1500 rpm | | 1500-2610 rpm | | 150-2610 rpm | |
| Power/torque CD...Y2 | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **63M1-4** | 0.12 | 0.12 | 0.79 | 0.11 | 0.73 | 0.09 | 0.59 | 0.08 | 0.53 | 0.18 | 0.68 | - | - |
| **63M2-4** | 0.18 | 0.18 | 1.2 | 0.16 | 1.08 | 0.14 | 0.94 | 0.11 | 0.79 | 0.25 | 0.96 | - | - |
| **70M1-4** | 0.25 | 0.25 | 1.74 | 0.22 | 1.5 | 0.19 | 1.25 | 0.15 | 1 | 0.37 | 1.4 | - | - |
| **71M2-4** | 0.37 | 0.37 | 2.56 | 0.33 | 2.2 | 0.28 | 1.9 | 0.22 | 1.5 | 0.55 | 2 | - | - |
| **80M1-4** | 0.55 | 0.55 | 3.8 | 0.52 | 3.5 | 0.45 | 3 | 0.33 | 2.2 | 0.8 | 2.9 | - | - |
| **80M2-4** | 0.75 | 0.75 | 5.1 | 0.7 | 4.8 | 0.6 | 4 | 0.5 | 3.3 | 1.1 | 4 | - | - |
| **90S-4** | 1.1 | 1.1 | 7.5 | 1 | 6.7 | 0.9 | 6 | 0.75 | 5 | 1.6 | 5.9 | - | - |
| **90L-4** | 1.5 | 1.5 | 10.2 | 1.4 | 9.5 | 1.2 | 8 | 1 | 6.7 | 2.2 | 8 | - | - |
| **100L1-4** | 2.2 | 2.2 | 14.8 | 2 | 13 | 1.7 | 11 | 1.4 | 9.3 | 3.3 | 12 | - | - |
| **100L2-4** | 3 | 3 | 20.2 | 2.8 | 19 | 2.2 | 15 | 1.8 | 12 | 4.5 | 16 | - | - |
| **112M-4** | 4 | 4 | 26.6 | 3.6 | 24 | 3 | 20 | 2.5 | 16 | 6 | 22 | - | - |
| **132S-4** | 5.5 | 5.5 | 36.5 | 5 | 33 | 4.4 | 29 | 3.7 | 24 | 8 | 29 | 5.5 | 8 |
| **132M-4** | 7.5 | 7.5 | 50 | 7 | 46 | 6 | 39 | 5 | 33 | 11 | 40 | 7.5 | 10.5 |
| **160M-4** | 11 | 11 | 72 | 10 | 65 | 9 | 58 | 7.5 | 49 | 16 | 59 | 11 | 15 |
| **160L-4** | 15 | 15 | 98 | 13.5 | 88 | 12 | 78 | 10 | 65 | 21 | 79 | 15 | 20 |
| **180M-4** | 18.5 | 18[2] | 118 | 98 | 111 | 15 | 97 | 12.5 | 81 | 26 | 95 | 18 | 25 |
| **180L-4** | 22 | 21[2] | 137 | 20 | 130 | 18 | 117 | 15 | 97 | 30 | 110 | 21 | 29 |
| **200L-4** | 30 | 28[2] | 183 | 27 | 176 | 24 | 156 | 21 | 136 | 40 | 146 | 28 | 37 |
| **225S-4** | 37 | 32[2] | 208 | 31 | 201 | 29 | 188 | 26 | 168 | 49 | 179 | 32 | 45 |
| **225M-4** | 45 | 38[2] | 247 | 37 | 240 | 35 | 227 | 32 | 207 | 60 | 220 | 38 | 55 |
| **250M-4** | 55 | 46[2] | 298 | 45 | 291 | 43 | 278 | 41 | 265 | 70 | 256 | 46 | 65 |
| **280S-4** | 75 | 62[2] | 400 | 60 | 386 | 58 | 373 | 55 | 354 | 95 | 348 | 62 | 88 |
| **280M-4** | 90 | 75[2] | 482 | 73 | 470 | 70 | 450 | 66 | 424 | 110 | 402 | 75 | 105 |
| **315S-4** | 110 | 95[2] | 610 | 90 | 577 | 88 | 564 | 83 | 532 | 140 | 512 | 95 | 130 |
| **315M-4** | 132 | 115 | 737 | 110 | 705 | 105 | 673 | 100 | 641 | 165 | 604 | 115 | 157 |
| **315L1-4** | 160 | 140 | 897 | 135 | 865 | 128 | 820 | 120 | 769 | 200 | 732 | 140 | 190 |
| **315L2-4** | 200 | 175 | 1122 | 165 | 1058 | 160 | 1026 | 150 | 961 | 250 | 915 | 175 | 240 |
| **315L3-4** | 250 | 215 | 1378 | 205 | 1314 | 200 | 1282 | 185 | 1186 | 310 | 1134 | 215 | 305 |
| **355L1-4** | 315 | 270 | 1731 | 260 | 1666 | 250 | 1602 | 235 | 1506 | 395 | 1445 | 270 | 385 |
| **355L2-4** | 355 | 305 | 1955 | 295 | 1891 | 285 | 1827 | 265 | 1698 | 440 | 1610 | 305 | 425 |
| **355L3-4** | 400 | 345 | 2209 | 335 | 2145 | 320 | 2048 | 300 | 1920 | 495 | 1820 | 345 | 480 |
| **400M-4** | 450 | 390 | 2500 | 375 | 2405 | 360 | 2307 | 340 | 2179 | 560 | 2050 | 390 | 540 |
| **400L-4** | 500 | 435 | 2778 | 415 | 2650 | 400 | 2553 | 380 | 2425 | 620 | 2274 | 435 | 600 |
| **450M-4** | 560 | 485 | 3097 | 465 | 2969 | 450 | 2873 | 425 | 2713 | 695 | 2549 | 485 | 670 |
| **450L-4** | 630 | 545 | 3480 | 525 | 3352 | 505 | 3224 | 475 | 3032 | 785 | 2879 | 545 | 755 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values). torque curves page 59

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE2
# Mains operation 50 Hz



Temperature class T4,
ns = 1000 rpm, 2p = 6

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y2** | | | | | | **IE2 Efficiency according to IEC60034-30** | | | | | | | | |
| **71M2-6** | 0.25 | 0.76 | 0.61 | 935 | 67.5 | 0.70 | 2.55 | 2.5 | 4.4 | 3.2 | 0.0025 | 25 | 44 | 56 |
| **80M1-6** | 0.37 | 1.04 | 0.83 | 950 | 72.5 | 0.71 | 3.7 | 1.7 | 4.4 | 3 | 0.0033 | 31 | 44 | 56 |
| **80M2-6** | 0.55 | 1.43 | 1.14 | 945 | 76 | 0.73 | 5.6 | 1.8 | 4.5 | 3.1 | 0.0046 | 35 | 44 | 56 |
| **90S-6** | 0.75 | 2 | 1.60 | 955 | 77.4 | 0.70 | 7.5 | 2.7 | 5.5 | 3.1 | 0.0080 | 44 | 47 | 59 |
| **90L-6** | 1.1 | 2.75 | 2.2 | 955 | 79.5 | 0.72 | 11 | 2.8 | 5.9 | 3.1 | 0.0095 | 46 | 47 | 59 |
| **100L-6** | 1.5 | 3.75 | 3.0 | 965 | 81.1 | 0.71 | 14.8 | 3 | 6.8 | 3.3 | 0.017 | 59 | 50 | 62 |
| **112M-6** | 2.2 | 4.9 | 3.9 | 965 | 83 | 0.78 | 21.8 | 2.6 | 6.8 | 3.1 | 0.031 | 100 | 53 | 65 |
| **132S-6** | 3 | 6.9 | 5.5 | 970 | 84.4 | 0.74 | 29.5 | 3.2 | 7.1 | 3.7 | 0.031 | 100 | 56 | 69 |
| **132M1-6** | 4 | 8.9 | 7.1 | 965 | 85.7 | 0.76 | 39.6 | 2.9 | 6.9 | 3.7 | 0.037 | 104 | 56 | 69 |
| **132M2-6** | 5.5 | 11.7 | 9.4 | 965 | 87 | 0.78 | 54 | 2.9 | 7.2 | 3.7 | 0.048 | 117 | 56 | 69 |
| **160M-6** | 7.5 | 14.6 | 11.7 | 970 | 88.1 | 0.84 | 74 | 2.8 | 7.5 | 3.8 | 0.12 | 190 | 58 | 71 |
| **160L-6** | 11 | 22 | 17.5 | 975 | 89.5 | 0.81 | 108 | 3 | 7.6 | 3.9 | 0.12 | 190 | 58 | 71 |
| **180L-6** | 15 | 29 | 23.5 | 975 | 90.4 | 0.82 | 147 | 2.7 | 7.4 | 3.8 | 0.19 | 215 | 58 | 71 |
| **200L1-6** | 18.5 | 35.5 | 28.5 | 975 | 91 | 0.83 | 181 | 2.5 | 7 | 3.5 | 0.28 | 270 | 58 | 71 |
| **200L2-6** | 22 | 41.5 | 33 | 975 | 91.5 | 0.84 | 215 | 2.2 | 6.9 | 3.2 | 0.31 | 280 | 58 | 72 |
| **225M-6** | 30 | 57 | 45 | 985 | 92.3 | 0.83 | 291 | 3 | 6.9 | 2.7 | 0.69 | 404 | 58 | 72 |
| **250M-6** | 37 | 69 | 56 | 985 | 92.7 | 0.83 | 359 | 3 | 6.8 | 2.7 | 1.03 | 570 | 58 | 76 |
| **280S-6** | 45 | 85 | 68 | 985 | 93.5 | 0.82 | 436 | 2.8 | 6.6 | 2.4 | 1.35 | 720 | 62 | 77 |
| **280M-6** | 55 | 105 | 84 | 985 | 93.6 | 0.81 | 533 | 2.8 | 6.5 | 2.4 | 1.7 | 770 | 62 | 77 |
| **315S-6** | 75 | 131 | 105 | 990 | 94.1 | 0.88 | 723 | 3 | 7.2 | 2.7 | 4.3 | 995 | 65 | 79 |
| **315M-6** | 90 | 156 | 125 | 990 | 94.4 | 0.88 | 868 | 3.2 | 7.7 | 2.8 | 5 | 1050 | 65 | 79 |
| **315L1-6** | 110 | 191 | 152 | 990 | 94.7 | 0.88 | 1061 | 3.3 | 7.8 | 2.8 | 6 | 1145 | 69 | 84 |
| **315L2-6** | 132 | 230 | 182 | 990 | 95 | 0.88 | 1273 | 3.2 | 7.7 | 2.8 | 7.3 | 1265 | 69 | 84 |
| **315L3-6** | 160 | 275 | 220 | 990 | 95.2 | 0.88 | 1543 | 3.3 | 7.8 | 2.8 | 8.3 | 1440 | 69 | 84 |
| **355M-6** | 200 | 345 | 275 | 990 | 95.5 | 0.87 | 1929 | 1.8 | 6.7 | 2.7 | 11.3 | 1750 | 74 | 90 |
| **355L1-6** | 250 | 430[1] | 345 | 990 | 95.9 | 0.88 | 2411 | 1.8 | 6.7 | 2.7 | 13.8 | 1950 | 74 | 90 |
| **355L2-6** | 315 | 540[1] | 430[1] | 990 | 96 | 0.88 | 3039 | 1.7 | 6.9 | 2.6 | 17.6 | 2300 | 74 | 90 |
| **400M-6** | 355 | 595[1] | 475[1] | 994 | 96.6 | 0.89 | 3411 | 1.1 | 6.6 | 2.7 | 27 | 2850 | 78 | 94 |
| **400L-6** | 400 | 670[1] | 535[1] | 994 | 96.6 | 0.89 | 3843 | 1.1 | 6.8 | 2.6 | 31 | 3230 | 78 | 94 |
| **450M-6** | 450 | 755[1] | 605[1] | 995 | 96.6 | 0.89 | 4319 | 1.2 | 6.8 | 2.8 | 46 | 3500 | 78 | 94 |
| **450L-6** | 500 | 835[1] | 670[1] | 995 | 97 | 0.89 | 4799 | 1.1 | 6.8 | 2.7 | 51 | 3800 | 78 | 94 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment EAR

The values are also valid for series BD..

# Inverter operation 50 Hz



40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 100-1000 rpm | | 400-1000 rpm | | 200-1000 rpm | | 100-1000 rpm | | 1000-1740 rpm | | 100-1740 rpm | |
| Power/torque CD...Y2 | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **71M2-6** | 0.25 | 0.25 | 2.6 | 0.22 | 2.2 | 0.18 | 1.8 | 0.16 | 1.6 | 0.37 | 2 | - | - |
| **80M1-6** | 0.37 | 0.37 | 3.8 | 0.33 | 3.4 | 0.27 | 2.7 | 0.22 | 2.2 | 0.55 | 3 | - | - |
| **80M2-6** | 0.55 | 0.55 | 5.7 | 0.5 | 5.1 | 0.4 | 4 | 0.33 | 3.3 | 0.8 | 4.4 | - | - |
| **90S-6** | 0.75 | 0.75 | 7.9 | 0.65 | 6.7 | 0.55 | 5.5 | 0.42 | 4.2 | 1.1 | 6 | - | - |
| **90L-6** | 1.1 | 1.1 | 11.4 | 0.9 | 9.2 | 0.8 | 8 | 0.6 | 6 | 1.6 | 8.8 | - | - |
| **100L-6** | 1.5 | 1.5 | 15.2 | 1.4 | 14 | 1.1 | 11 | 0.9 | 9 | 2.2 | 12 | - | - |
| **112M-6** | 2.2 | 2.2 | 22.1 | 2 | 20 | 1.7 | 17 | 1.3 | 13 | 3.3 | 18 | - | - |
| **132S1-6** | 3 | 3 | 29.7 | 2.7 | 27 | 2.2 | 22 | 1.8 | 18 | 4.5 | 25 | 3 | 4.2 |
| **132M1-6** | 4 | 4 | 40 | 3.5 | 35 | 3 | 30 | 2.5 | 25 | 6 | 33 | 4 | 5.5 |
| **132M2-6** | 5.5 | 5.5 | 55 | 4.8 | 48 | 4 | 40 | 3.3 | 33 | 8 | 44 | 5.5 | 7.6 |
| **160M-6** | 7.5 | 7.5 | 75 | 7 | 69 | 6 | 59 | 5 | 49 | 11 | 60 | 7.5 | 10.5 |
| **160L-6** | 11 | 11 | 109 | 10 | 98 | 9 | 88 | 7.5 | 73 | 16 | 88 | 11 | 15 |
| **180L-6** | 15 | 15 | 148 | 13 | 128 | 12 | 118 | 10 | 98 | 21 | 115 | 15 | 20 |
| **200L1-6** | 18.5 | 17.5[2] | 171 | 16 | 157 | 14 | 137 | 12 | 118 | 26 | 143 | 17.5 | 24 |
| **200L2-6** | 22 | 20[2] | 196 | 19 | 186 | 17 | 167 | 15 | 147 | 30 | 165 | 20 | 28 |
| **225M-6** | 30 | 27[2] | 262 | 25 | 242 | 23 | 223 | 21 | 204 | 40 | 220 | 27 | 37 |
| **250M-6** | 37 | 33[2] | 320 | 31 | 301 | 29 | 281 | 26 | 252 | 49 | 269 | 33 | 45 |
| **280S-6** | 45 | 40[2] | 386 | 37 | 357 | 35 | 338 | 32 | 309 | 60 | 329 | 40 | 55 |
| **280M-6** | 55 | 47[2] | 453 | 45 | 434 | 43 | 415 | 41 | 396 | 70 | 384 | 47 | 65 |
| **315S-6** | 75 | 65[2] | 627 | 62 | 598 | 58 | 559 | 56 | 540 | 95 | 521 | 65 | 88 |
| **315M-6** | 90 | 78[2] | 752 | 73 | 704 | 70 | 675 | 68 | 656 | 110 | 604 | 78 | 105 |
| **315L1-6** | 110 | 95[2] | 916 | 90 | 868 | 88 | 849 | 85 | 820 | 140 | 768 | 95 | 130 |
| **315L2-6** | 132 | 115 | 1109 | 110 | 1061 | 105 | 1013 | 100 | 965 | 165 | 906 | 115 | 157 |
| **315L3-6** | 160 | 140 | 1351 | 135 | 1302 | 128 | 1235 | 120 | 1158 | 200 | 1098 | 140 | 190 |
| **355M-6** | 200 | 170 | 1640 | 165 | 1592 | 160 | 1543 | 150 | 1447 | 250 | 1372 | 170 | 240 |
| **355L1-6** | 250 | 215 | 2074 | 205 | 1978 | 200 | 1929 | 190 | 1833 | 310 | 1701 | 215 | 305 |
| **355L2-6** | 315 | 270 | 2605 | 260 | 2508 | 250 | 2412 | 235 | 2267 | 395 | 2168 | 270 | 385 |
| **400M-6** | 355 | 305 | 2942 | 295 | 2846 | 285 | 2749 | 265 | 2556 | 440 | 2115 | 305 | 425 |
| **400L-6** | 400 | 345 | 3328 | 335 | 3232 | 320 | 3087 | 300 | 2894 | 495 | 2717 | 345 | 480 |
| **450M-6** | 450 | 390 | 3762 | 375 | 3617 | 360 | 3473 | 340 | 3280 | 560 | 3074 | 390 | 540 |
| **450L-6** | 500 | 435 | 4196 | 415 | 4003 | 400 | 3859 | 375 | 3618 | 620 | 3404 | 435 | 600 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values) torque curves page 59

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE2
# Mains operation 50 Hz



Temperature class T4,
ns = 750 rpm, 2p = 8

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm2] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y2** | | | | | | **IE2 Efficiency according to IEC 60034-30** | | | | | | | | |
| **71M2-8** | 0.12 | 0.57 | 0.45 | 700 | 50 | 0.61 | 1.64 | 2.2 | 3.5 | 2.7 | 0.0025 | 25 | 41 | 53 |
| **80M1-8** | 0.18 | 0.66 | 0.52 | 705 | 58 | 0.58 | 2.43 | 1.9 | 3.2 | 2.7 | 0.0033 | 31 | 42 | 54 |
| **80M2-8** | 0.25 | 0.91 | 0.73 | 710 | 63 | 0.60 | 3.35 | 1.7 | 3.3 | 2.5 | 0.0046 | 35 | 42 | 54 |
| **90S-8** | 0.37 | 1.30 | 1.04 | 715 | 68 | 0.64 | 4.95 | 1.7 | 4.4 | 3 | 0.008 | 44 | 46 | 58 |
| **90L-8** | 0.55 | 1.85 | 1.48 | 715 | 71.5 | 0.64 | 7.3 | 1.8 | 4.5 | 3.1 | 0.0095 | 46 | 46 | 58 |
| **100L1-8** | 0.75 | 2.3 | 1.83 | 720 | 74 | 0.64 | 9.9 | 2.3 | 5 | 2.9 | 0.008 | 44 | 49 | 61 |
| **100L2-8** | 1.1 | 3.0 | 2.4 | 715 | 77.1 | 0.67 | 14.7 | 2.2 | 4.8 | 2.7 | 0.0095 | 46 | 49 | 61 |
| **112M-8** | 1.5 | 3.6 | 2.85 | 705 | 79.6 | 0.77 | 20.3 | 2 | 4.9 | 2.6 | 0.017 | 59 | 52 | 64 |
| **132S-8** | 2.2 | 5.4 | 4.3 | 710 | 81.6 | 0.72 | 29.6 | 2.8 | 6.3 | 3.2 | 0.029 | 97 | 53 | 66 |
| **132M-8** | 3 | 7.2 | 5.8 | 715 | 83.1 | 0.72 | 40 | 2.7 | 6.3 | 3.1 | 0.036 | 113 | 53 | 66 |
| **160M1-8** | 4 | 8.8 | 7 | 725 | 84.4 | 0.77 | 53 | 1.9 | 5.6 | 2.6 | 0.071 | 157 | 54 | 67 |
| **160M2-8** | 5.5 | 12 | 9.6 | 725 | 85.7 | 0.76 | 72 | 2.3 | 6 | 3.1 | 0.105 | 170 | 54 | 67 |
| **160L-8** | 7.5 | 16.8 | 13.5 | 725 | 86.6 | 0.74 | 99 | 2.4 | 6.5 | 3.2 | 0.136 | 190 | 54 | 67 |
| **180L-8** | 11 | 23 | 18.5 | 725 | 88.2 | 0.78 | 145 | 2.6 | 6.9 | 3.3 | 0.22 | 215 | 56 | 69 |
| **200L-8** | 15 | 32 | 25 | 730 | 89.1 | 0.77 | 196 | 2.4 | 7.1 | 3.3 | 0.4 | 280 | 56 | 70 |
| **225S-8** | 18.5 | 38 | 31 | 735 | 89.6 | 0.78 | 240 | 2.3 | 7.1 | 3.4 | 0.56 | 372 | 57 | 71 |
| **225M-8** | 22 | 45 | 36.0 | 735 | 90 | 0.78 | 286 | 2.4 | 7.2 | 3.5 | 0.69 | 404 | 57 | 71 |
| **250M-8** | 30 | 60 | 47.5 | 735 | 90.8 | 0.8 | 390 | 2.5 | 7.1 | 3.4 | 1.2 | 550 | 58 | 72 |
| **280S-8** | 37 | 71 | 57 | 735 | 91.2 | 0.82 | 481 | 2 | 6.5 | 2.9 | 1.9 | 740 | 61 | 75 |
| **280M-8** | 45 | 86 | 69 | 740 | 91.7 | 0.82 | 581 | 2.2 | 6.7 | 2.9 | 2.3 | 800 | 61 | 75 |
| **315S-8** | 55 | 104 | 83 | 740 | 92 | 0.83 | 710 | 2.7 | 6 | 2.5 | 4.3 | 995 | 68 | 83 |
| **315M-8** | 75 | 141 | 112 | 740 | 92.8 | 0.83 | 968 | 2.8 | 6.3 | 2.6 | 5 | 1050 | 68 | 83 |
| **315L1-8** | 90 | 168 | 135 | 740 | 93 | 0.83 | 1161 | 2.9 | 6.6 | 2.7 | 6 | 1145 | 68 | 83 |
| **315L2-8** | 110 | 210 | 166 | 740 | 93.2 | 0.82 | 1420 | 2.9 | 6.8 | 2.7 | 7.3 | 1265 | 68 | 83 |
| **315L3-8** | 132 | 250 | 199 | 740 | 93.4 | 0.82 | 1704 | 2.8 | 6.3 | 2.6 | 8.3 | 1440 | 68 | 83 |
| **355M-8** | 160 | 290 | 235 | 745 | 95.3 | 0.83 | 2051 | 1.7 | 6.4 | 2.6 | 11.4 | 1750 | 70 | 86 |
| **355L1-8** | 200 | 370 | 295 | 745 | 95.6 | 0.82 | 2564 | 1.6 | 6.6 | 2.6 | 13.9 | 1950 | 70 | 86 |
| **355L2-8** | 250 | 460[1)] | 370 | 745 | 95.6 | 0.82 | 3205 | 1.4 | 6.1 | 2.6 | 17.7 | 2300 | 70 | 86 |
| **400M-8** | 315 | 570[1)] | 455[1)] | 745 | 96.2 | 0.83 | 4038 | 1.2 | 6.2 | 2.7 | 30 | 3100 | 73 | 89 |
| **400L-8** | 355 | 640[1)] | 515[1)] | 745 | 96.3 | 0.83 | 4551 | 1 | 6.1 | 2.6 | 34 | 3440 | 73 | 89 |
| **450M-8** | 400 | 710[1)] | 570[1)] | 745 | 96.6 | 0.84 | 5128 | 1 | 6.1 | 2.8 | 51 | 3750 | 74 | 90 |
| **450L-8** | 450 | 800[1)] | 640[1)] | 745 | 96.7 | 0.84 | 5768 | 1 | 6.1 | 2.8 | 57 | 4050 | 74 | 90 |
| **500..** | by request | | | | | | | | | | | | | |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40°C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventilation | | Self-ventilation | | | | | | | | | | Forced ventilation | |
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | constant | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 50-87 Hz[1] | | 5-87 Hz[1] | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | | | | |
| Speed range | - | 100-1000 rpm | | 400-1000 rpm | | 200-1000 rpm | | 100-1000 rpm | | 1000-1740 rpm | | 100-1740 rpm | |
| Power/torque CD...Y2 | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 87 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $P_U$ [kW] 87 Hz |
| **71M2-8** | 0.12 | 0.12 | 1.7 | 0.11 | 1.5 | 0.1 | 1.4 | 0.08 | 1.1 | 0.18 | 1.3 | - | - |
| **80M1-8** | 0.18 | 0.18 | 2.5 | 0.16 | 2.2 | 0.13 | 1.7 | 0.11 | 1.5 | 0.25 | 1.8 | - | - |
| **80M2-8** | 0.25 | 0.25 | 3.5 | 0.22 | 3 | 0.18 | 2.4 | 0.16 | 2.2 | 0.37 | 2.7 | - | - |
| **90S-8** | 0.37 | 0.37 | 5.1 | 0.33 | 4.4 | 0.27 | 3.6 | 0.22 | 3 | 0.55 | 4 | - | - |
| **90L-8** | 0.55 | 0.55 | 7.6 | 0.5 | 6.7 | 0.4 | 5.4 | 0.33 | 4.4 | 0.8 | 5.9 | - | - |
| **100L1-8** | 0.75 | 0.75 | 10.1 | 0.65 | 8.7 | 0.55 | 7.4 | 0.42 | 5.6 | 1.1 | 8 | - | - |
| **100L2-8** | 1.1 | 1.1 | 15.1 | 0.9 | 12 | 0.8 | 11 | 0.6 | 8.1 | 1.6 | 12 | - | - |
| **112M-8** | 1.5 | 1.5 | 20.2 | 1.4 | 19 | 1.1 | 15 | 0.9 | 12 | 2.2 | 16 | - | - |
| **132S-8** | 2.2 | 2.2 | 30 | 2 | 27 | 1.7 | 23 | 1.3 | 17 | 3.3 | 24 | 2.2 | 3.1 |
| **132M-8** | 3 | 3 | 41 | 2.7 | 36 | 2.2 | 29 | 1.8 | 24 | 4.5 | 33 | 3 | 4.2 |
| **160M1-8** | 4 | 4 | 53 | 3.5 | 46 | 3 | 40 | 2.5 | 33 | 6 | 44 | 4 | 5.5 |
| **160M2-8** | 5.5 | 5.5 | 73 | 4.8 | 64 | 4 | 52 | 3.3 | 44 | 8 | 59 | 5.5 | 7.6 |
| **160L-8** | 7.5 | 7.5 | 99 | 7 | 92 | 5.5 | 72 | 4.5 | 59 | 11 | 80 | 7.5 | 10.5 |
| **180L-8** | 11 | 11 | 145 | 10 | 131 | 8 | 104 | 7 | 91 | 16 | 117 | 11 | 15 |
| **200L-8** | 15 | 15 | 196 | 13 | 170 | 11 | 143 | 10 | 130 | 21 | 154 | 15 | 20 |
| **225S-8** | 18.5 | 18.5 | 242 | 16 | 208 | 14 | 181 | 12 | 155 | 26 | 190 | 18.5 | 25 |
| **225M-8** | 22 | 22 | 288 | 19 | 245 | 17 | 219 | 15 | 194 | 30 | 220 | 22 | 29 |
| **250M-8** | 30 | 27[2] | 348 | 25 | 323 | 23 | 297 | 21 | 271 | 40 | 293 | 27 | 37 |
| **280S-8** | 37 | 33[2] | 426 | 31 | 400 | 29 | 374 | 26 | 336 | 49 | 359 | 33 | 45 |
| **280M-8** | 45 | 40[2] | 516 | 37 | 478 | 35 | 452 | 32 | 413 | 60 | 439 | 40 | 55 |
| **315S-8** | 55 | 48[2] | 619 | 45 | 581 | 43 | 555 | 41 | 529 | 70 | 512 | 48 | 65 |
| **315M-8** | 75 | 65[2] | 839 | 62 | 800 | 58 | 749 | 56 | 723 | 95 | 695 | 65 | 88 |
| **315L1-8** | 90 | 78[2] | 1007 | 73 | 942 | 70 | 903 | 68 | 878 | 110 | 805 | 78 | 105 |
| **315L2-8** | 110 | 95[2] | 1226 | 90 | 1161 | 88 | 1136 | 85 | 1097 | 140 | 1025 | 95 | 130 |
| **315L3-8** | 132 | 115 | 1484 | 110 | 1420 | 105 | 1309 | 100 | 1247 | 165 | 1027 | 115 | 157 |
| **355M-8** | 160 | 140 | 1807 | 135 | 1743 | 128 | 1596 | 120 | 1496 | 200 | 1464 | 140 | 190 |
| **355L1-8** | 200 | 170 | 2194 | 165 | 2129 | 160 | 1994 | 150 | 1870 | 250 | 1830 | 170 | 240 |
| **355L2-8** | 250 | 215 | 2775 | 205 | 2646 | 200 | 2493 | 190 | 2368 | 310 | 2269 | 215 | 305 |
| **400M-8** | 315 | 270 | 3484 | 260 | 3355 | 250 | 3116 | 235 | 2929 | 395 | 2891 | 270 | 385 |
| **400L-8** | 355 | 305 | 3935 | 295 | 3807 | 285 | 3553 | 265 | 3303 | 440 | 3220 | 305 | 425 |
| **450M-8** | 400 | 345 | 4452 | 335 | 4323 | 320 | 3989 | 300 | 3740 | 495 | 3622 | 345 | 480 |
| **450L-8** | 450 | 390 | 5033 | 375 | 4839 | 360 | 4488 | 340 | 4239 | 560 | 4098 | 390 | 540 |

**Notes**

[1] Higher frequencies by request.

[2] For inverter operation with output filter and practically sinusoidal output voltage. or clock frequency ≥ 4 kHz. output like $P_2$.

Output during operation at the inverter (guide values) torque curves page 59

Overload protection via temperature sensor

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE2
# Mains operation 60 Hz



Temperature class T4,
ns = 3600 rpm, 2p = 2

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $P_2$ [kW] | 460 V I [A] | 690 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | | | | | | | | | | | | |
| **63M1-2** | 0.18 | 0.39 | 0.26 | 3465 | 71.5 | 0.81 | 0.5 | 3.7 | 7 | 5.5 | 0.00028 | 16 | 53 | 65 | - | - |
| **63M2-2** | 0.25 | 0.52 | 0.35 | 3455 | 74.5 | 0.81 | 0.69 | 3.6 | 6.7 | 5.3 | 0.00028 | 16 | 53 | 65 | - | - |
| **71M1-2** | 0.37 | 0.73 | 0.49 | 3440 | 75.5 | 0.84 | 1.03 | 3 | 6.7 | 3.9 | 0.00058 | 24 | 56 | 68 | - | - |
| **71M2-2** | 0.55 | 1.03 | 0.67 | 3445 | 79.5 | 0.84 | 1.52 | 3.1 | 7.1 | 4.2 | 0.00080 | 25 | 56 | 68 | - | - |
| **80M1-2** | 0.75 | 1.4 | 0.94 | 3490 | 79.9 | 0.84 | 2.11 | 3.3 | 7.7 | 4.2 | 0.0013 | 31 | 60 | 72 | - | - |
| **80M2-2** | 1.1 | 1.96 | 1.31 | 3490 | 82.9 | 0.85 | 3.64 | 3.5 | 7.9 | 4.3 | 0.0018 | 35 | 60 | 72 | - | - |
| **90S-2** | 1.5 | 2.55 | 1.71 | 3505 | 84.3 | 0.87 | 4.1 | 3.4 | 8.5 | 3.8 | 0.0029 | 45 | 65 | 77 | - | - |
| **90L-2** | 2.2 | 3.65 | 2.45 | 3505 | 85.9 | 0.88 | 6 | 3.4 | 8.5 | 3.9 | 0.0039 | 48 | 65 | 77 | - | - |
| **100L-2** | 3 | 5 | 3.35 | 3520 | 85.8 | 0.87 | 8.1 | 2.9 | 8.2 | 3.4 | 0.0051 | 53 | 68 | 80 | - | - |
| **112M-2** | 4 | 6.6 | 4.4 | 3530 | 87.8 | 0.87 | 10.8 | 3.2 | 8.3 | 4 | 0.0089 | 95 | 68 | 80 | - | - |
| **132S1-2** | 5.5 | 8.8 | 5.9 | 3520 | 89.1 | 0.89 | 14.9 | 2.9 | 8.3 | 3.7 | 0.0125 | 103 | 68 | 81 | 60 | 73 |
| **132S2-2** | 7.5 | 11.8 | 7.9 | 3525 | 89.5 | 0.91 | 20.3 | 3.1 | 8.4 | 4 | 0.0177 | 115 | 68 | 81 | 60 | 73 |
| **160M1-2** | 11 | 18.2 | 12.1 | 3540 | 90.3 | 0.84 | 29.7 | 3.3 | 8.5 | 4 | 0.032 | 163 | 71 | 84 | 61 | 74 |
| **160M2-2** | 15 | 23.5 | 15.6 | 3545 | 90.4 | 0.89 | 40.5 | 3.6 | 8.5 | 4 | 0.043 | 173 | 71 | 84 | 61 | 74 |
| **160L-2** | 18.5 | 28 | 18.6 | 3545 | 91.3 | 0.91 | 49.8 | 3.3 | 8.4 | 3.9 | 0.052 | 188 | 71 | 84 | 61 | 74 |
| **180M-2** | 22 | 34.5 | 23 | 3560 | 91.5 | 0.88 | 59 | 3.2 | 8.6 | 3.8 | 0.075 | 196 | 75 | 88 | 64 | 77 |
| **200L1-2** | 30 | 45.5 | 30.5 | 3555 | 92 | 0.90 | 81 | 3.1 | 8.4 | 3.6 | 0.13 | 254 | 77 | 91 | 65 | 79 |
| **200L2-2** | 37 | 56 | 37 | 3560 | 92.6 | 0.90 | 99 | 3.3 | 8.6 | 3.8 | 0.16 | 278 | 77 | 91 | 65 | 79 |
| **225M-2** | 45 | 68 | 45 | 3555 | 93.5 | 0.89 | 121 | 3 | 8.4 | 3.3 | 0.24 | 400 | 78 | 92 | 66 | 80 |
| **250M-2** | 55 | 85 | 57 | 3575 | 93.7 | 0.87 | 147 | 3 | 8.5 | 3.3 | 0.4 | 545 | 81 | 95 | 70 | 84 |
| **280S-2** | 75 | 115 | 77 | 3570 | 93.9 | 0.87 | 201 | 2.7 | 8.2 | 3.1 | 0.65 | 700 | 82 | 96 | 72 | 86 |
| **280M-2** | 90 | 137 | 92 | 3570 | 94.6 | 0.87 | 241 | 2.9 | 8.4 | 3.4 | 0.78 | 762 | 82 | 96 | 72 | 86 |
| **315S-2** | 110 | 164 | 109 | 3575 | 94.8 | 0.89 | 294 | 2.7 | 8.2 | 3.1 | 1.4 | 960 | 82 | 96 | 73 | 88 |
| **315M-2** | 132 | 193 | 129 | 3575 | 95.2 | 0.90 | 353 | 2.9 | 8.5 | 3.2 | 1.6 | 1025 | 82 | 96 | 73 | 88 |
| **315L1-2** | 160 | 235 | 156 | 3580 | 95.4 | 0.90 | 427 | 2.8 | 8.6 | 3 | 1.9 | 1065 | 82 | 96 | 73 | 88 |
| **315L2-2** | 200 | 290 | 195 | 3580 | 95.5 | 0.90 | 533 | 2.6 | 8 | 3 | 2.2 | 1270 | 82 | 96 | 73 | 88 |
| **315L3-2** | 250 | 360 | 240 | 3580 | 95.6 | 0.91 | 667 | 2 | 8.4 | 3.1 | 2.8 | 1420 | 82 | 96 | 73 | 88 |
| **355L1-2** | 345 | 490[1] | 325 | 3575 | 96.1 | 0.92 | 922 | 1.6 | 7.1 | 3 | 4.5 | 1900 | 87 | 103 | 75 | 91 |
| **355L2-2** | 390 | 545[1] | 365 | 3580 | 96.3 | 0.93 | 1040 | 1.5 | 7.3 | 2.8 | 5 | 2050 | 87 | 103 | 75 | 91 |
| **355L3-2** | 440 | 615[1] | 410[1] | 3580 | 96.3 | 0.93 | 1174 | 1.4 | 7.4 | 2.8 | 5.5 | 2350 | 87 | 103 | 75 | 91 |
| **400L-2** | 495 | 685[1] | 455[1] | 3585 | 96.5 | 0.94 | 1319 | 1.15 | 7.6 | 3 | 8.5 | 2910 | 87 | 103 | 81 | 97 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

# IE2
# Mains operation 60 Hz

Temperature class T4,
ns = 1800 rpm, 2p = 4



| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | | Noise values with axial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 460 V | 690 V | | | | | | | | | | | | | |
| p | $P_2$ [kW] | I [A] | I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **CD...Y3** | | | | | **IE2** | **Efficiency according to IEC 60034-30** | | | | | | | | | | |
| **63M1-4** | 0.12 | 0.33 | 0.22 | 1745 | 69.5 | 0.66 | 0.66 | 3.9 | 6.1 | 4.3 | 0.00046 | 16 | 48 | 60 | - | - |
| **63M2-4** | 0.18 | 0.44 | 0.29 | 1735 | 74 | 0.69 | 0.99 | 3.3 | 6.1 | 3.9 | 0.00063 | 17 | 48 | 60 | - | - |
| **71M1-4** | 0.25 | 0.62 | 0.41 | 1755 | 74.5 | 0.68 | 1.36 | 3.6 | 6.6 | 4.3 | 0.00092 | 24 | 49 | 61 | - | - |
| **71M2-4** | 0.37 | 0.86 | 0.57 | 1755 | 78.5 | 0.69 | 2 | 4.2 | 7.3 | 4.5 | 0.00130 | 25 | 49 | 61 | - | - |
| **80M1-4** | 0.55 | 1.08 | 0.72 | 1755 | 82 | 0.78 | 3 | 3.4 | 7.9 | 4.1 | 0.00210 | 31 | 50 | 62 | - | - |
| **80M2-4** | 0.75 | 1.48 | 0.99 | 1750 | 82.5 | 0.77 | 4.1 | 3.7 | 7.8 | 4.8 | 0.0029 | 35 | 50 | 62 | - | - |
| **90S-4** | 1.1 | 2.05 | 1.37 | 1765 | 84.2 | 0.8 | 6 | 2.8 | 7.9 | 3.6 | 0.0046 | 44 | 53 | 65 | - | - |
| **90L-4** | 1.5 | 2.8 | 1.88 | 1760 | 84.5 | 0.79 | 8.1 | 3 | 8.3 | 3.8 | 0.0056 | 46 | 53 | 65 | - | - |
| **100L1-4** | 2.2 | 3.85 | 2.55 | 1760 | 87.6 | 0.82 | 11.9 | 3 | 8.5 | 3.8 | 0.011 | 59 | 57 | 69 | - | - |
| **100L2-4** | 3 | 5.4 | 3.6 | 1755 | 87.6 | 0.8 | 16.3 | 3.6 | 8.6 | 4.2 | 0.011 | 59 | 57 | 69 | - | - |
| **112M-4** | 4 | 7.1 | 4.8 | 1765 | 88.4 | 0.8 | 21.6 | 3.6 | 8.6 | 4.1 | 0.022 | 100 | 59 | 71 | - | - |
| **132S-4** | 5.5 | 9.5 | 6.3 | 1765 | 89.6 | 0.81 | 29.8 | 3.7 | 8.5 | 3.9 | 0.03 | 113 | 62 | 75 | 59 | 72 |
| **132M-4** | 7.5 | 12.4 | 8.3 | 1765 | 90.1 | 0.84 | 40.6 | 3.7 | 8.6 | 3.8 | 0.041 | 125 | 62 | 75 | 59 | 72 |
| **160M-4** | 11 | 17.8 | 11.9 | 1770 | 91.1 | 0.85 | 59 | 3.2 | 8.4 | 3.6 | 0.079 | 184 | 67 | 80 | 60 | 73 |
| **160L-4** | 15 | 24.5 | 16.3 | 1770 | 91.4 | 0.84 | 81 | 3.4 | 8.5 | 3.6 | 0.092 | 208 | 67 | 80 | 60 | 73 |
| **180M-4** | 18.5 | 32 | 21 | 1775 | 92.4 | 0.79 | 100 | 3.8 | 8.4 | 3.9 | 0.155 | 217 | 65 | 78 | 61 | 74 |
| **180L-4** | 22 | 35.5 | 23.5 | 1775 | 92.5 | 0.84 | 119 | 3.7 | 9 | 3.8 | 0.25 | 244 | 65 | 78 | 61 | 74 |
| **200L-4** | 30 | 50 | 33 | 1770 | 93.2 | 0.82 | 162 | 3.5 | 8.5 | 3.8 | 0.25 | 274 | 66 | 80 | 62 | 76 |
| **225S-4** | 37 | 59 | 39 | 1775 | 93.2 | 0.85 | 199 | 3.6 | 8 | 3.4 | 0.4 | 372 | 68 | 82 | 64 | 78 |
| **225M-4** | 45 | 70 | 47 | 1778 | 93.8 | 0.86 | 242 | 3.5 | 7.8 | 3.3 | 0.48 | 402 | 68 | 82 | 64 | 78 |
| **250M-4** | 55 | 84 | 56 | 1780 | 94.2 | 0.87 | 295 | 3.6 | 8.3 | 3.5 | 0.75 | 588 | 70 | 84 | 68 | 82 |
| **280S-4** | 75 | 120 | 80 | 1780 | 94.6 | 0.83 | 402 | 3.7 | 8.1 | 3.5 | 1.25 | 740 | 74 | 88 | 71 | 85 |
| **280M-4** | 90 | 140 | 93 | 1787 | 94.8 | 0.85 | 481 | 3.7 | 8.1 | 3.5 | 1.48 | 820 | 74 | 88 | 71 | 85 |
| **315S-4** | 110 | 173 | 115 | 1785 | 95.1 | 0.84 | 589 | 3 | 8 | 2.8 | 2.2 | 1040 | 76 | 91 | 72 | 87 |
| **315M-4** | 132 | 205 | 138 | 1786 | 95.2 | 0.84 | 706 | 3 | 8.1 | 2.8 | 2.7 | 1120 | 76 | 91 | 72 | 87 |
| **315L1-4** | 160 | 250 | 165 | 1786 | 95.4 | 0.85 | 856 | 3.4 | 8.2 | 3.2 | 3.1 | 1210 | 76 | 91 | 72 | 87 |
| **315L2-4** | 200 | 310 | 210 | 1788 | 96 | 0.84 | 1068 | 3.2 | 7.7 | 3 | 3.9 | 1430 | 76 | 91 | 72 | 87 |
| **315L3-4** | 250 | 370 | 250 | 1786 | 96 | 0.88 | 1337 | 2 | 8.5 | 3.1 | 4.6 | 1565 | 76 | 91 | 72 | 87 |
| **355L1-4** | 345 | 505[1] | 335 | 1790 | 96.3 | 0.89 | 1841 | 1.6 | 7.3 | 2.8 | 6.1 | 2050 | 78 | 94 | 74 | 90 |
| **355L2-4** | 390 | 570[1] | 380 | 1790 | 96.6 | 0.89 | 2081 | 1.7 | 7.3 | 3 | 6.7 | 2200 | 78 | 94 | 74 | 90 |
| **355L3-4** | 440 | 635[1] | 420[1] | 1790 | 97 | 0.90 | 2347 | 1.6 | 7.4 | 3 | 7.4 | 2430 | 78 | 94 | 74 | 90 |
| **400M-4** | 495 | 705[1] | 470[1] | 1794 | 97 | 0.91 | 2635 | 1.15 | 7.7 | 2.8 | 18 | 2850 | 84 | 100 | - | - |
| **400L-4** | 550 | 780[1] | 520[1] | 1794 | 97.1 | 0.91 | 2928 | 1.15 | 7.7 | 2.8 | 20 | 3230 | 84 | 100 | - | - |
| **450M-4** | 610 | 8651) | 575[1] | 1794 | 97.2 | 0.91 | 3247 | 1.05 | 7.2 | 2.8 | 26 | 3500 | 85 | 101 | - | - |
| **450L-4** | 690 | 975[1] | 650[1] | 1794 | 97.4 | 0.91 | 3673 | 1.05 | 7.2 | 2.8 | 31 | 3800 | 85 | 101 | - | - |
| **500..** | by request | | | | | | | | | | | | | | | |

**Note**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

| Size | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 |
| **63M1** | 50 | 63 | 68 | **70** | 53 | 65 | 67 | **68** | - | - | - | **-** |
| **63M2** | 53 | 66 | 71,5 | **73** | 60 | 68 | 72 | **72** | - | - | - | **-** |
| **71M1** | 55 | 67 | 73 | **74** | 63 | 71,5 | 74 | **73,8** | - | - | - | **-** |
| **71M2** | 58 | 71 | 77 | **78** | 63 | 76 | 78 | **77,5** | 47 | 62 | 68 | **69** |
| **80M1** | 68 | 79,2 | 82,3 | **82,8** | 67 | 79,7 | 80,5 | **81** | 47 | 62 | 70 | **72** |
| **80M2** | 70 | 80,2 | 83,4 | **83,7** | 64,7 | 77,8 | 81,7 | **82,6** | 51 | 71 | 77 | **77,4** |
| **90S** | 71,9 | 81,8 | 84,4 | **84,7** | 67,6 | 79,3 | 83,3 | **84,2** | 60,5 | 74,2 | 78,1 | **79,1** |
| **90L** | 76,4 | 84,5 | 86,4 | **86,4** | 70 | 81,9 | 85 | **85,5** | 63 | 76,3 | 80,5 | **81,4** |
| **100L1** | - | - | - | **-** | 75,5 | 84,7 | 86,9 | **87,1** | - | - | - | **-** |
| **100L/L2** | 81,8 | 87,6 | 88,6 | **88,1** | 77 | 85,1 | 87,6 | **87,8** | 66 | 77,7 | 83 | **83,5** |
| **112M** | 79 | 86,3 | 88,1 | **88,4** | 78,4 | 86,5 | 88,5 | **88,7** | 71,8 | 82,6 | 85,3 | **85,5** |
| **132S/S1** | 82,3 | 88,5 | 89,7 | **89,5** | 79,6 | 87,3 | 89,3 | **89,6** | 71,9 | 83,1 | 85,5 | **85,7** |
| **132S2** | 83,7 | 89,5 | 90,5 | **90,3** | - | - | - | **-** | - | - | - | **-** |
| **132M/M1** | - | - | - | **-** | 81,4 | 88,8 | 90,5 | **90,5** | 77,5 | 85,2 | 87,1 | **87** |
| **132M2** | - | - | - | **-** | - | - | - | **-** | 77 | 85,8 | 88,1 | **88,3** |
| **160M/M1** | 83,8 | 89,9 | 91,2 | **91,3** | 82,9 | 89,6 | 91,2 | **91,5** | 80,5 | 87,6 | 89,3 | **89,4** |
| **160M2** | 86,7 | 91,3 | 92,2 | **92** | - | - | - | **-** | - | - | - | **-** |
| **160L** | 88,6 | 92,2 | 92,8 | **92,5** | 84,1 | 90,3 | 91,9 | **92,1** | 81 | 89 | 90,5 | **90,5** |
| **180M** | 85,6 | 91,3 | 92,7 | **92,9** | 86,4 | 91,6 | 92,8 | **92,7** | - | - | - | **-** |
| **180L** | - | - | - | **-** | 87,4 | 92,3 | 93,3 | **93,2** | 83,9 | 90,1 | 91,5 | **91,5** |
| **200L/L1** | 87,7 | 92,5 | 93,5 | **93,5** | 87,8 | 92,9 | 93,9 | **93,8** | 87,3 | 91,9 | 92,4 | **92** |
| **200L2** | 88,7 | 92,9 | 93,9 | **93,8** | - | - | - | **-** | 87,5 | 92,1 | 92,8 | **92,4** |
| **225S** | - | - | - | **-** | 88,8 | 92,9 | 94 | **93,9** | - | - | - | **-** |
| **225M** | 88,6 | 93,1 | 94,1 | **94,2** | 89,8 | 93,7 | 94,5 | **94,3** | 87,7 | 92,4 | 93,1 | **93** |
| **250M** | 86,3 | 92,3 | 94,2 | **94,4** | 90,9 | 93,9 | 94,7 | **94,6** | 87,1 | 92,4 | 93,6 | **93,5** |
| **280S** | 88,5 | 93,1 | 94,3 | **94,8** | 89,8 | 94,1 | 95,1 | **95,2** | 88,6 | 93,1 | 93,9 | **93,9** |
| **280M** | 89 | 93,3 | 94,7 | **95,1** | 90,8 | 94,5 | 95,3 | **95,3** | 88,9 | 93,3 | 94,3 | **94,4** |
| **315S** | 92,7 | 95 | 95,5 | **95,4** | 91,6 | 94,9 | 95,6 | **95,6** | 91,2 | 94,5 | 95,1 | **94,9** |
| **315M** | 92,3 | 94,8 | 95,6 | **95,8** | 92,4 | 95,3 | 95,9 | **95,8** | 91,3 | 94,7 | 95,2 | **95,2** |
| **315L1** | 92,8 | 95 | 95,8 | **95,9** | 92,6 | 95,5 | 96,1 | **96** | 91,6 | 94,9 | 95,6 | **95,5** |
| **315L2** | 93 | 95 | 95,5 | **96** | 93,3 | 95,8 | 96,3 | **96,1** | 92,3 | 95,1 | 95,7 | **95,6** |
| **315L3** | 92 | 95,1 | 95,8 | **96** | 92,3 | 95,2 | 96,2 | **96,2** | 92,6 | 95,3 | 95,8 | **95,8** |
| **355M** | - | - | - | **-** | - | - | - | **-** | 93,2 | 95,7 | 96 | **95,9** |
| **355L1** | 93 | 96,5 | 96,8 | **96,6** | 93 | 96 | 96,5 | **96,3** | 93,2 | 95,7 | 96,1 | **95,9** |
| **355L2** | 93,3 | 95,7 | 96,8 | **96,8** | 93,2 | 96,2 | 96,6 | **96,6** | 93,3 | 95,8 | 96,1 | **96** |
| **355L3** | 93,2 | 95,7 | 96,9 | **96,8** | 93,6 | 96,5 | 97,1 | **97** | - | - | - | **-** |
| **400M** | - | - | - | **-** | 93,9 | 96,4 | 96,9 | **97** | 94,3 | 96,4 | 96,8 | **96,6** |
| **400L** | 93,7 | 96,2 | 97 | **97** | 94,4 | 96,6 | 97,1 | **97,1** | 94,1 | 96,3 | 96,8 | **96,6** |
| **450M** | - | - | - | **-** | 93,8 | 96,3 | 97,1 | **97,2** | 93,5 | 96,4 | 96,6 | **96,6** |
| **450L** | - | - | - | **-** | 95,1 | 97 | 97,4 | **97,4** | 94,8 | 96,8 | 97,1 | **97** |

| Size | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CD…Y2** | **0,25** | **0,5** | **0,75** | **1** | **0,25** | **0,5** | **0,75** | **1** | **0,25** | **0,5** | **0,75** | **1** |
| **63M1** | 0,48 | 0,64 | 0,77 | **0,83** | 0,34 | 0,48 | 0,6 | **0,69** | - | - | - | **-** |
| **63M2** | 0,48 | 0,65 | 0,78 | **0,83** | 0,37 | 0,52 | 0,63 | **0,71** | - | - | - | **-** |
| **71M1** | 0,52 | 0,73 | 0,83 | **0,87** | 0,33 | 0,52 | 0,65 | **0,72** | - | - | - | **-** |
| **71M2** | 0,51 | 0,72 | 0,82 | **0,85** | 0,33 | 0,5 | 0,63 | **0,71** | 0,33 | 0,49 | 0,62 | **0,70** |
| **80M1** | 0,52 | 0,73 | 0,83 | **0,87** | 0,38 | 0,58 | 0,71 | **0,79** | 0,32 | 0,48 | 0,61 | **0,71** |
| **80M2** | 0,56 | 0,75 | 0,83 | **0,87** | 0,38 | 0,59 | 0,71 | **0,78** | 0,33 | 0,52 | 0,65 | **0,73** |
| **90S** | 0,57 | 0,76 | 0,84 | **0,88** | 0,39 | 0,60 | 0,72 | **0,80** | 0,32 | 0,49 | 0,61 | **0,70** |
| **90L** | 0,57 | 0,77 | 0,85 | **0,88** | 0,39 | 0,61 | 0,73 | **0,81** | 0,32 | 0,51 | 0,64 | **0,72** |
| **100L1** | - | - | - | **-** | 0,46 | 0,68 | 0,79 | **0,84** | - | - | - | **-** |
| **100L/L2** | 0,60 | 0,79 | 0,85 | **0,88** | 0,45 | 0,66 | 0,78 | **0,84** | 0,30 | 0,48 | 0,63 | **0,71** |
| **112M** | 0,53 | 0,74 | 0,83 | **0,87** | 0,43 | 0,65 | 0,77 | **0,83** | 0,35 | 0,58 | 0,71 | **0,78** |
| **132S/S1** | 0,64 | 0,82 | 0,87 | **0,89** | 0,47 | 0,69 | 0,80 | **0,85** | 0,32 | 0,55 | 0,67 | **0,74** |
| **132S2** | 0,64 | 0,81 | 0,87 | **0,89** | - | - | - | **-** | - | - | - | **-** |
| **132M/M1** | - | - | - | **-** | 0,48 | 0,71 | 0,81 | **0,86** | 0,36 | 0,57 | 0,69 | **0,76** |
| **132M2** | - | - | - | **-** | - | - | - | **-** | 0,35 | 0,59 | 0,72 | **0,78** |
| **160M/M1** | 0,56 | 0,77 | 0,84 | **0,87** | 0,52 | 0,73 | 0,82 | **0,85** | 0,45 | 0,67 | 0,79 | **0,84** |
| **160M2** | 0,65 | 0,83 | 0,88 | **0,90** | - | - | - | **-** | - | - | - | **-** |
| **160L** | 0,66 | 0,83 | 0,89 | **0,91** | 0,45 | 0,67 | 0,78 | **0,83** | 0,32 | 0,60 | 0,74 | **0,81** |
| **180M** | 0,64 | 0,82 | 0,89 | **0,91** | 0,49 | 0,70 | 0,79 | **0,83** | - | - | - | **-** |
| **180L** | - | - | - | **-** | 0,43 | 0,65 | 0,76 | **0,81** | 0,43 | 0,65 | 0,76 | **0,82** |
| **200L/L1** | 0,65 | 0,82 | 0,88 | **0,90** | 0,50 | 0,72 | 0,81 | **0,85** | 0,45 | 0,67 | 0,77 | **0,83** |
| **200L2** | 0,68 | 0,85 | 0,89 | **0,90** | - | - | - | **-** | 0,47 | 0,69 | 0,79 | **0,84** |
| **225S** | - | - | - | **-** | 0,57 | 0,76 | 0,83 | **0,85** | - | - | - | **-** |
| **225M** | 0,67 | 0,84 | 0,89 | **0,90** | 0,56 | 0,76 | 0,83 | **0,86** | 0,50 | 0,72 | 0,8 | **0,83** |
| **250M** | 0,60 | 0,80 | 0,86 | **0,88** | 0,63 | 0,79 | 0,86 | **0,88** | 0,49 | 0,71 | 0,80 | **0,83** |
| **280S** | 0,67 | 0,82 | 0,86 | **0,88** | 0,55 | 0,76 | 0,82 | **0,85** | 0,51 | 0,72 | 0,79 | **0,82** |
| **280M** | 0,65 | 0,81 | 0,86 | **0,87** | 0,59 | 0,77 | 0,83 | **0,85** | 0,49 | 0,71 | 0,78 | **0,81** |
| **315S** | 0,74 | 0,87 | 0,89 | **0,89** | 0,61 | 0,79 | 0,83 | **0,84** | 0,62 | 0,8 | 0,87 | **0,88** |
| **315M** | 0,75 | 0,87 | 0,89 | **0,90** | 0,61 | 0,79 | 0,83 | **0,84** | 0,62 | 0,81 | 0,87 | **0,88** |
| **315L1** | 0,73 | 0,87 | 0,90 | **0,90** | 0,59 | 0,77 | 0,83 | **0,84** | 0,60 | 0,80 | 0,86 | **0,88** |
| **315L2** | 0,75 | 0,87 | 0,90 | **0,90** | 0,58 | 0,78 | 0,83 | **0,85** | 0,62 | 0,81 | 0,86 | **0,88** |
| **315L3** | 0,79 | 0,87 | 0,91 | **0,92** | 0,64 | 0,80 | 0,85 | **0,87** | 0,61 | 0,8 | 0,86 | **0,88** |
| **355M** | - | - | - | **-** | - | - | - | **-** | 0,60 | 0,80 | 0,86 | **0,88** |
| **355L1** | 0,83 | 0,91 | 0,92 | **0,92** | 0,67 | 0,84 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** |
| **355L2** | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** |
| **355L3** | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | - | - | - | **-** |
| **400M** | - | - | - | - | 0,65 | 0,83 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** |
| **400L** | 0,82 | 0,92 | 0,93 | **0,94** | 0,67 | 0,85 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** |
| **450M** | - | - | - | - | 0,68 | 0,84 | 0,89 | **0,91** | 0,65 | 0,83 | 0,88 | **0,89** |
| **450L** | - | - | - | - | 0,69 | 0,85 | 0,90 | **0,91** | 0,61 | 0,83 | 0,88 | **0,89** |

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE1
# Partial load data 50 Hz



Efficiency [%]

| Size | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | | 2p=8 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD... | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 |
| **63M1** | 38 | 53 | 62 | **66** | 40 | 55 | 63 | **67** | - | - | - | **-** | - | - | - | **-** |
| **63M2** | 46 | 61 | 67 | **70** | 50 | 63 | 68 | **70** | - | - | - | **-** | - | - | - | **-** |
| **71M1** | 53 | 65 | 71 | **71,5** | 56 | 67 | 69 | **68,5** | - | - | - | **-** | - | - | - | **-** |
| **71M2** | 54 | 67 | 71,5 | **72** | 60 | 70 | 72 | **71** | 38 | 53 | 60 | **62** | 25,5 | 39,5 | 46,5 | **49,5** |
| **80M1** | 58 | 69 | 74 | **74,5** | 62 | 71 | 73 | **72** | 44 | 60 | 65 | **67** | 30 | 45,5 | 51,5 | **54** |
| **80M2** | 63 | 74 | 78 | **78** | 64 | 75 | 76,5 | **75,5** | 49 | 64 | 68,5 | **69** | 34,5 | 49,5 | 55,5 | **58,5** |
| **90S** | 64 | 75 | 77 | **77,8** | 64 | 74 | 76,5 | **76** | 54 | 67 | 70 | **70,2** | 36 | 51 | 58 | **60** |
| **90L** | 68 | 78,5 | 81 | **82** | 67,5 | 77,5 | 79,5 | **79** | 55 | 68,5 | 72,7 | **73** | 43 | 58 | 62,5 | **63** |
| **100L1** | - | - | - | **-** | 65 | 77 | 79,5 | **80** | - | - | - | **-** | 43 | 58 | 64,5 | **67** |
| **100L/L2** | 69 | 79,5 | 81,5 | **82** | 68 | 78,5 | 81,5 | **81,7** | 61,5 | 73 | 76,8 | **77** | 53 | 65,5 | 69,3 | **69** |
| **112M** | 75 | 84 | 85,5 | **85** | 75 | 83 | 85,2 | **85** | 68 | 77,5 | 80,5 | **81** | 60 | 71,5 | 75 | **76** |
| **132S/S1** | 70 | 81 | 84,5 | **85,5** | 77 | 85 | 86,8 | **86,5** | 71,6 | 80,1 | 82,5 | **82,6** | 65,5 | 75,7 | 78 | **77** |
| **132S2** | 74 | 83,5 | 86 | **86,5** | - | - | - | **-** | - | - | - | **-** | - | - | - | **-** |
| **132M/M1** | - | - | - | **-** | 79,5 | 87 | 88,3 | **88** | 72,1 | 81 | 83,5 | **83,6** | 68,5 | 78,5 | 80,9 | **80,5** |
| **132M2** | - | - | - | **-** | - | - | - | **-** | 76,8 | 84 | 84,7 | **84,6** | - | - | - | **-** |
| **160M/M1** | 76 | 86 | 88,5 | **89** | 81,5 | 87,7 | 89,7 | **89,5** | 77,3 | 84,2 | 86,1 | **86,1** | 71,3 | 80,8 | 83,7 | **83,8** |
| **160M2** | 81 | 87,5 | 89 | **89** | - | - | - | **-** | - | - | - | **-** | 73,2 | 82,2 | 84,9 | **84,7** |
| **160L** | 83,5 | 89,5 | 90,7 | **90,5** | 83,7 | 89,3 | 90,3 | **90** | 81,5 | 87 | 88 | **87,5** | 76,7 | 83,5 | 85,2 | **85,2** |
| **180M** | 86,6 | 91 | 91,5 | **91,2** | 85,8 | 90,8 | 91,5 | **91** | - | - | - | **-** | - | - | - | **-** |
| **180L** | - | - | - | **-** | 88,2 | 91,3 | 91,8 | **91,5** | 82,6 | 88,8 | 89,3 | **89,1** | 80,1 | 86,4 | 87,6 | **87,1** |
| **200L/L1** | 85,6 | 90,7 | 92,1 | **92** | 88,2 | 92,3 | 92,5 | **92,2** | 86,2 | 89,7 | 90 | **89,7** | 84,5 | 88,5 | 89 | **88,5** |
| **200L2** | 86 | 91,8 | 92,5 | **92,5** | - | - | - | **-** | 85,5 | 89,6 | 90,4 | **90,4** | - | - | - | **-** |
| **225S** | - | - | - | **-** | 87,9 | 92 | 92,7 | **92,6** | - | - | - | **-** | 81,5 | 87,7 | 89 | **89** |
| **225M** | 86 | 91,5 | 92,7 | **92,8** | 88,1 | 92,2 | 92,9 | **92,8** | 86,5 | 90,7 | 91,3 | **90,9** | 82,8 | 88,3 | 89,7 | **89,5** |
| **250M** | 86,3 | 91,8 | 93,1 | **93,2** | 89,8 | 92,9 | 93,8 | **93,2** | 86,5 | 90,9 | 91,6 | **91,4** | 87,6 | 89,6 | 90,3 | **90,1** |
| **280S** | 87,6 | 92,3 | 93,4 | **93,6** | 90 | 93,3 | 94 | **93,8** | 87,4 | 91,8 | 92,5 | **92,4** | 86,3 | 90,3 | 90,8 | **91,1** |
| **280M** | 88 | 92,5 | 93,7 | **93,8** | 90,1 | 93,4 | 94,1 | **94** | 87,6 | 92 | 92,6 | **92,5** | 86,6 | 90,8 | 91,5 | **91,3** |
| **315S** | 91,6 | 93,9 | 94,3 | **94** | 90,9 | 93,5 | 94,3 | **94,2** | 90 | 92,8 | 93,4 | **93** | 87,3 | 91,3 | 92,2 | **91,8** |
| **315M** | 91,3 | 93,8 | 94,2 | **94,3** | 90,9 | 93,6 | 94,5 | **94,4** | 90,1 | 93 | 93,6 | **93,3** | 88,1 | 92,1 | 93 | **92,6** |
| **315L1** | 91,7 | 94 | 94,3 | **94,5** | 91,2 | 94,1 | 94,9 | **94,7** | 90,6 | 93,3 | 94 | **93,6** | 88,6 | 92,4 | 93,1 | **92,8** |
| **315L2** | 91,9 | 94,1 | 94,5 | **94,7** | 91,5 | 94,2 | 95 | **94,9** | 91,1 | 93,6 | 94,2 | **93,8** | 89,3 | 92,8 | 93,4 | **93** |
| **315L3** | 92 | 95,1 | 95,8 | **96** | 92,3 | 95,2 | 96,2 | **96,2** | 91,6 | 94,2 | 94,6 | **94,3** | 89,7 | 92,9 | 93,5 | **93,1** |
| **355M** | - | - | - | **-** | - | - | - | **-** | 92,3 | 94,8 | 95 | **94,8** | 91 | 94,5 | 95 | **95,1** |
| **355L1** | 93 | 96,5 | 96,8 | **96,6** | 93 | 96 | 96,5 | **96,3** | 93,2 | 95,7 | 96,1 | **95,9** | 91,5 | 94,8 | 95,5 | **95,8** |
| **355L2** | 93,3 | 95,7 | 96,8 | **96,8** | 93,2 | 96,2 | 96,6 | **96,6** | 93,3 | 95,8 | 96,1 | **96** | 91,6 | 94,9 | 95,5 | **95,6** |
| **355L3** | 93,2 | 95,7 | 96,9 | **96,8** | 93,6 | 96,5 | 97,1 | **97** | - | - | - | **-** | - | - | - | **-** |
| **400M** | - | - | - | **-** | 93,9 | 96,4 | 96,9 | **97** | 94,3 | 96,4 | 96,8 | **96,6** | 94 | 95,8 | 96,3 | **96,2** |
| **400L** | 93,7 | 96,2 | 97 | **97** | 94,4 | 96,6 | 97,1 | **97,1** | 94,1 | 96,3 | 96,8 | **96,6** | 93,5 | 95,7 | 96,3 | **96,3** |
| **450M** | - | - | - | **-** | 93,8 | 96,3 | 97,1 | **97,2** | 93,5 | 96,4 | 96,6 | **96,6** | 94,1 | 96,3 | 96,7 | **96,6** |
| **450L** | - | - | - | **-** | 95,1 | 97 | 97,4 | **97,4** | 94,8 | 96,8 | 97,1 | **97** | 94,5 | 96,4 | 96,8 | **96,7** |

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



| Size | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | | 2p=8 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD… | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 |
| 63M1 | 0,38 | 0,50 | 0,60 | **0,67** | 0,31 | 0,42 | 0,52 | **0,60** | - | - | - | - | - | - | - | - |
| 63M2 | 0,41 | 0,56 | 0,67 | **0,75** | 0,35 | 0,49 | 0,61 | **0,70** | - | - | - | - | - | - | - | - |
| 71M1 | 0,49 | 0,65 | 0,78 | **0,84** | 0,42 | 0,62 | 0,73 | **0,80** | - | - | - | - | - | - | - | - |
| 71M2 | 0,48 | 0,64 | 0,76 | **0,82** | 0,42 | 0,62 | 0,73 | **0,80** | 0,36 | 0,49 | 0,61 | **0,71** | 0,36 | 0,46 | 0,56 | **0,65** |
| 80M1 | 0,53 | 0,70 | 0,80 | **0,84** | 0,43 | 0,62 | 0,74 | **0,80** | 0,33 | 0,48 | 0,61 | **0,71** | 0,34 | 0,46 | 0,56 | **0,65** |
| 80M2 | 0,45 | 0,67 | 0,78 | **0,82** | 0,42 | 0,61 | 0,72 | **0,79** | 0,36 | 0,52 | 0,64 | **0,72** | 0,31 | 0,43 | 0,53 | **0,64** |
| 90S | 0,48 | 0,69 | 0,80 | **0,86** | 0,46 | 0,66 | 0,77 | **0,83** | 0,37 | 0,55 | 0,67 | **0,75** | 0,31 | 0,44 | 0,56 | **0,65** |
| 90L | 0,48 | 0,69 | 0,79 | **0,85** | 0,45 | 0,65 | 0,77 | **0,82** | 0,35 | 0,52 | 0,64 | **0,73** | 0,30 | 0,44 | 0,57 | **0,65** |
| 100L1 | - | - | - | - | 0,39 | 0,60 | 0,72 | **0,80** | - | - | - | - | 0,32 | 0,44 | 0,56 | **0,66** |
| 100L/L2 | 0,50 | 0,70 | 0,80 | **0,87** | 0,44 | 0,65 | 0,76 | **0,82** | 0,35 | 0,54 | 0,67 | **0,75** | 0,35 | 0,50 | 0,64 | **0,73** |
| 112M | 0,59 | 0,78 | 0,85 | **0,88** | 0,44 | 0,65 | 0,77 | **0,84** | 0,36 | 0,54 | 0,66 | **0,75** | 0,30 | 0,47 | 0,56 | **0,67** |
| 132S/S1 | 0,56 | 0,76 | 0,84 | **0,87** | 0,50 | 0,70 | 0,80 | **0,85** | 0,37 | 0,57 | 0,69 | **0,78** | 0,41 | 0,60 | 0,72 | **0,79** |
| 132S2 | 0,55 | 0,75 | 0,83 | **0,87** | - | - | - | - | - | - | - | - | - | - | - | - |
| 132M/M1 | - | - | - | - | 0,51 | 0,72 | 0,81 | **0,86** | 0,38 | 0,57 | 0,72 | **0,79** | 0,39 | 0,58 | 0,70 | **0,77** |
| 132M2 | - | - | - | - | - | - | - | - | 0,41 | 0,62 | 0,75 | **0,81** | - | - | - | - |
| 160M/M1 | 0,62 | 0,80 | 0,86 | **0,89** | 0,51 | 0,72 | 0,81 | **0,85** | 0,49 | 0,70 | 0,80 | **0,85** | 0,41 | 0,61 | 0,72 | **0,78** |
| 160M2 | 0,71 | 0,86 | 0,90 | **0,91** | - | - | - | - | - | - | - | - | 0,39 | 0,59 | 0,71 | **0,77** |
| 160L | 0,72 | 0,87 | 0,91 | **0,92** | 0,56 | 0,76 | 0,83 | **0,86** | 0,53 | 0,73 | 0,82 | **0,86** | 0,37 | 0,58 | 0,70 | **0,77** |
| 180M | 0,72 | 0,86 | 0,89 | **0,92** | 0,51 | 0,73 | 0,81 | **0,84** | - | - | - | - | - | - | - | - |
| 180L | - | - | - | - | 0,53 | 0,74 | 0,81 | **0,84** | 0,48 | 0,70 | 0,79 | **0,84** | 0,39 | 0,61 | 0,74 | **0,79** |
| 200L/L1 | 0,65 | 0,83 | 0,88 | **0,90** | 0,60 | 0,79 | 0,86 | **0,88** | 0,51 | 0,72 | 0,80 | **0,84** | 0,40 | 0,60 | 0,74 | **0,80** |
| 200L2 | 0,68 | 0,85 | 0,89 | **0,91** | - | - | - | - | 0,5 | 0,71 | 0,82 | **0,85** | - | - | - | - |
| 225S | - | - | - | - | 0,63 | 0,82 | 0,87 | **0,88** | - | - | - | - | 0,40 | 0,62 | 0,73 | **0,79** |
| 225M | 0,65 | 0,84 | 0,88 | **0,89** | 0,62 | 0,81 | 0,86 | **0,88** | 0,52 | 0,72 | 0,81 | **0,84** | 0,39 | 0,61 | 0,73 | **0,79** |
| 250M | 0,70 | 0,88 | 0,89 | **0,89** | 0,64 | 0,82 | 0,88 | **0,89** | 0,53 | 0,74 | 0,81 | **0,84** | 0,47 | 0,69 | 0,78 | **0,82** |
| 280S | 0,69 | 0,85 | 0,89 | **0,89** | 0,62 | 0,80 | 0,85 | **0,86** | 0,53 | 0,74 | 0,8 | **0,83** | 0,45 | 0,66 | 0,77 | **0,82** |
| 280M | 0,72 | 0,88 | 0,90 | **0,90** | 0,62 | 0,80 | 0,85 | **0,86** | 0,53 | 0,74 | 0,81 | **0,82** | 0,45 | 0,68 | 0,78 | **0,82** |
| 315S | 0,74 | 0,87 | 0,89 | **0,89** | 0,62 | 0,80 | 0,84 | **0,85** | 0,58 | 0,78 | 0,85 | **0,87** | 0,46 | 0,68 | 0,78 | **0,83** |
| 315M | 0,75 | 0,87 | 0,89 | **0,89** | 0,62 | 0,80 | 0,84 | **0,85** | 0,62 | 0,81 | 0,87 | **0,88** | 0,47 | 0,69 | 0,79 | **0,83** |
| 315L1 | 0,73 | 0,87 | 0,90 | **0,90** | 0,59 | 0,79 | 0,85 | **0,86** | 0,60 | 0,80 | 0,86 | **0,88** | 0,47 | 0,68 | 0,79 | **0,83** |
| 315L2 | 0,75 | 0,87 | 0,90 | **0,90** | 0,58 | 0,78 | 0,85 | **0,86** | 0,62 | 0,81 | 0,86 | **0,88** | 0,47 | 0,68 | 0,78 | **0,82** |
| 315L3 | 0,79 | 0,87 | 0,91 | **0,92** | 0,64 | 0,80 | 0,85 | **0,87** | 0,61 | 0,8 | 0,86 | **0,88** | 0,48 | 0,69 | 0,78 | **0,82** |
| 355M | - | - | - | - | - | - | - | - | 0,60 | 0,80 | 0,86 | **0,88** | 0,45 | 0,67 | 0,78 | **0,83** |
| 355L1 | 0,83 | 0,91 | 0,92 | **0,92** | 0,67 | 0,84 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** | 0,46 | 0,67 | 0,78 | **0,82** |
| 355L2 | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** | 0,48 | 0,69 | 0,79 | **0,82** |
| 355L3 | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | - | - | - | - | - | - | - | - |
| 400M | - | - | - | - | 0,65 | 0,83 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** | 0,50 | 0,71 | 0,80 | **0,83** |
| 400L | 0,82 | 0,92 | 0,93 | **0,94** | 0,67 | 0,85 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** | 0,49 | 0,71 | 0,80 | **0,83** |
| 450M | - | - | - | - | 0,68 | 0,84 | 0,89 | **0,91** | 0,65 | 0,83 | 0,88 | **0,89** | 0,53 | 0,74 | 0,81 | **0,84** |
| 450L | - | - | - | - | 0,69 | 0,85 | 0,90 | **0,91** | 0,61 | 0,83 | 0,88 | **0,89** | 0,54 | 0,75 | 0,82 | **0,84** |

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# IE2
# Partial load data 50 Hz



Efficiency [%]

| Baugröße | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y2 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 |
| **63M1** | 38 | 53 | 62 | **66** | 40 | 55 | 63 | **67** | - | - | - | **-** |
| **63M2** | 46 | 61 | 67 | **70** | 50 | 63 | 68 | **70** | - | - | - | **-** |
| **71M1** | 56,5 | 67,5 | 72,5 | **73** | 62 | 71 | 73 | **72,5** | - | - | - | **-** |
| **71M2** | 63 | 73 | 77 | **77** | 64 | 74 | 76 | **76,5** | 47,5 | 62,5 | 67 | **67,5** |
| **80M1** | 64 | 75,5 | 78,5 | **79** | 58,8 | 74,8 | 78,8 | **79,5** | 49,5 | 64,5 | 70,5 | **72,5** |
| **80M2** | 64,5 | 77,7 | 80,6 | **81,1** | 63,5 | 76,5 | 80 | **81** | 55 | 70 | 75,5 | **76** |
| **90S** | 70,2 | 79,9 | 82,4 | **82,7** | 66,5 | 78 | 82 | **82,7** | 57 | 71,5 | 76 | **77,4** |
| **90L** | 74,7 | 82,6 | 84,5 | **84,5** | 68,5 | 80,5 | 83,5 | **84** | 62,5 | 75 | 78,8 | **79,5** |
| **100L1** | - | - | - | **-** | 74 | 83 | 85,5 | **85,5** | - | - | - | **-** |
| **100L/L2** | 79,7 | 85,3 | 86,3 | **85,8** | 76 | 84 | 86,5 | **86,6** | 64 | 75,5 | 80,6 | **81,1** |
| **112M** | 77,7 | 84,8 | 86,6 | **86,9** | 77,4 | 85,4 | 87,4 | **87,6** | 70 | 80,2 | 82,8 | **83** |
| **132S/S1** | 81 | 87,1 | 88,2 | **88,1** | 78,7 | 86,3 | 88,3 | **88,6** | 71 | 81,8 | 84 | **84,4** |
| **132S2** | 82,6 | 88,3 | 89,3 | **89,1** | - | - | - | **-** | - | - | - | **-** |
| **132M/M1** | - | - | - | **-** | 80,4 | 87,8 | 89,5 | **89,5** | 76,3 | 84 | 85,8 | **85,7** |
| **132M2** | - | - | - | **-** | - | - | - | **-** | 75,8 | 84,5 | 86,8 | **87** |
| **160M/M1** | 82,9 | 88,9 | 90,2 | **90,3** | 82 | 88,7 | 90,4 | **90,6** | 79,3 | 86,3 | 88 | **88,1** |
| **160M2** | 85,9 | 90,4 | 91,3 | **91,1** | - | - | - | **-** | - | - | - | **-** |
| **160L** | 87,7 | 91,3 | 91,9 | **91,6** | 82,9 | 89,4 | 91,1 | **91,3** | 78,5 | 86,3 | 89,3 | **89,5** |
| **180M** | 84,7 | 90,4 | 91,8 | **92** | 85,7 | 90,8 | 92 | **91,9** | - | - | - | **-** |
| **180L** | - | - | - | **-** | 86,6 | 91,4 | 92,4 | **92,3** | 82,9 | 89 | 90,4 | **90,4** |
| **200L/L1** | 86 | 91,2 | 92,5 | **92,7** | 87 | 92 | 93 | **92,9** | 86 | 89,5 | 91,4 | **91** |
| **200L2** | 86 | 91,7 | 93 | **93,1** | - | - | - | **-** | 86,7 | 91,2 | 92 | **91,5** |
| **225S** | - | - | - | **-** | 88 | 92,4 | 93,5 | **93,3** | - | - | - | **-** |
| **225M** | 88,5 | 92,4 | 93,3 | **93,4** | 89,1 | 93 | 93,8 | **93,6** | 87,1 | 91,7 | 92,4 | **92,3** |
| **250M** | 86,5 | 91,8 | 93,5 | **93,8** | 90,3 | 93,4 | 94,1 | **94** | 86,3 | 91,6 | 92,8 | **92,7** |
| **280S** | 88,2 | 92,8 | 93,9 | **94,2** | 89,3 | 93,5 | 94,4 | **94,5** | 88,4 | 92,8 | 93,6 | **93,5** |
| **280M** | 88,7 | 93 | 94,2 | **94,5** | 90,3 | 93,9 | 94,7 | **94,7** | 88,7 | 92,9 | 93,6 | **93,6** |
| **315S** | 92,5 | 94,8 | 95 | **94,8** | 91 | 94,1 | 95 | **94,9** | 91 | 93,8 | 94,5 | **94,1** |
| **315M** | 92,4 | 94,7 | 95 | **95** | 91,5 | 94,3 | 95,1 | **95,1** | 91 | 94 | 94,6 | **94,4** |
| **315L1** | 92,5 | 94,8 | 95,1 | **95,2** | 91,7 | 94,7 | 95,3 | **95,3** | 91,5 | 94,2 | 94,9 | **94,7** |
| **315L2** | 92,7 | 94,9 | 95,2 | **95,4** | 92 | 94,8 | 95,6 | **95,5** | 92 | 94,5 | 95,2 | **95** |
| **315L3** | 92 | 95,1 | 95,8 | **96** | 92,3 | 95,2 | 96,2 | **96,2** | 92,3 | 94,9 | 95,5 | **95,2** |
| **355M** | - | - | - | **-** | - | - | - | **-** | 93 | 95,5 | 95,8 | **95,5** |
| **355L1** | 93 | 96,5 | 96,8 | **96,6** | 93 | 96 | 96,5 | **96,3** | 93,2 | 95,7 | 96,1 | **95,9** |
| **355L2** | 93,3 | 95,7 | 96,8 | **96,8** | 93,2 | 96,2 | 96,6 | **96,6** | 93,3 | 95,8 | 96,1 | **96** |
| **355L3** | 93,2 | 95,7 | 96,9 | **96,8** | 93,6 | 96,5 | 97,1 | **97** | - | - | - | **-** |
| **400M** | - | - | - | **-** | 93,9 | 96,4 | 96,9 | **97** | 94,3 | 96,4 | 96,8 | **96,6** |
| **400L** | 93,7 | 96,2 | 97 | **97** | 94,4 | 96,6 | 97,1 | **97,1** | 94,1 | 96,3 | 96,8 | **96,6** |
| **450M** | - | - | - | **-** | 93,8 | 96,3 | 97,1 | **97,2** | 93,5 | 96,4 | 96,6 | **96,6** |
| **450L** | - | - | - | **-** | 95,1 | 97 | 97,4 | **97,4** | 94,8 | 96,8 | 97,1 | **97** |

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



| Size | 2p=2 P/Pn | | | | 2p=4 P/Pn | | | | 2p=6 P/Pn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y2 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 | 0,25 | 0,5 | 0,75 | 1 |
| 63M1 | 0,48 | 0,64 | 0,77 | **0,83** | 0,34 | 0,48 | 0,6 | **0,69** | - | - | - | - |
| 63M2 | 0,48 | 0,65 | 0,78 | **0,83** | 0,37 | 0,52 | 0,63 | **0,71** | - | - | - | - |
| 71M1 | 0,52 | 0,73 | 0,83 | **0,87** | 0,33 | 0,52 | 0,65 | **0,72** | - | - | - | - |
| 71M2 | 0,51 | 0,72 | 0,82 | **0,85** | 0,33 | 0,5 | 0,63 | **0,71** | 0,33 | 0,49 | 0,62 | **0,70** |
| 80M1 | 0,52 | 0,73 | 0,83 | **0,87** | 0,38 | 0,58 | 0,71 | **0,79** | 0,32 | 0,48 | 0,61 | **0,71** |
| 80M2 | 0,56 | 0,75 | 0,83 | **0,87** | 0,38 | 0,59 | 0,71 | **0,78** | 0,33 | 0,52 | 0,65 | **0,73** |
| 90S | 0,57 | 0,76 | 0,84 | **0,88** | 0,39 | 0,60 | 0,72 | **0,80** | 0,32 | 0,49 | 0,61 | **0,70** |
| 90L | 0,57 | 0,77 | 0,85 | **0,88** | 0,39 | 0,61 | 0,73 | **0,81** | 0,32 | 0,51 | 0,64 | **0,72** |
| 100L1 | - | - | - | **-** | 0,46 | 0,68 | 0,79 | **0,84** | - | - | - | - |
| 100L/L2 | 0,60 | 0,79 | 0,85 | **0,88** | 0,45 | 0,66 | 0,78 | **0,84** | 0,30 | 0,48 | 0,63 | **0,71** |
| 112M | 0,53 | 0,74 | 0,83 | **0,87** | 0,43 | 0,65 | 0,77 | **0,83** | 0,35 | 0,58 | 0,71 | **0,78** |
| 132S/S1 | 0,64 | 0,82 | 0,87 | **0,89** | 0,47 | 0,69 | 0,80 | **0,85** | 0,32 | 0,55 | 0,67 | **0,74** |
| 132S2 | 0,64 | 0,81 | 0,87 | **0,89** | - | - | - | **-** | - | - | - | - |
| 132M/M1 | - | - | - | **-** | 0,48 | 0,71 | 0,81 | **0,86** | 0,36 | 0,57 | 0,69 | **0,76** |
| 132M2 | - | - | - | **-** | - | - | - | **-** | 0,35 | 0,59 | 0,72 | **0,78** |
| 160M/M1 | 0,56 | 0,77 | 0,84 | **0,87** | 0,52 | 0,73 | 0,82 | **0,85** | 0,45 | 0,67 | 0,79 | **0,84** |
| 160M2 | 0,65 | 0,83 | 0,88 | **0,90** | - | - | - | **-** | - | - | - | - |
| 160L | 0,66 | 0,83 | 0,89 | **0,91** | 0,45 | 0,67 | 0,78 | **0,83** | 0,32 | 0,60 | 0,74 | **0,81** |
| 180M | 0,64 | 0,82 | 0,89 | **0,91** | 0,49 | 0,70 | 0,79 | **0,83** | - | - | - | - |
| 180L | - | - | - | **-** | 0,43 | 0,65 | 0,76 | **0,81** | 0,43 | 0,65 | 0,76 | **0,82** |
| 200L/L1 | 0,65 | 0,82 | 0,88 | **0,90** | 0,50 | 0,72 | 0,81 | **0,85** | 0,45 | 0,67 | 0,77 | **0,83** |
| 200L2 | 0,68 | 0,85 | 0,89 | **0,90** | - | - | - | **-** | 0,47 | 0,69 | 0,79 | **0,84** |
| 225S | - | - | - | **-** | 0,57 | 0,76 | 0,83 | **0,85** | - | - | - | - |
| 225M | 0,67 | 0,84 | 0,89 | **0,90** | 0,56 | 0,76 | 0,83 | **0,86** | 0,50 | 0,72 | 0,8 | **0,83** |
| 250M | 0,60 | 0,80 | 0,86 | **0,88** | 0,63 | 0,79 | 0,86 | **0,88** | 0,49 | 0,71 | 0,80 | **0,83** |
| 280S | 0,67 | 0,82 | 0,86 | **0,88** | 0,55 | 0,76 | 0,82 | **0,85** | 0,51 | 0,72 | 0,79 | **0,82** |
| 280M | 0,65 | 0,81 | 0,86 | **0,87** | 0,59 | 0,77 | 0,83 | **0,85** | 0,49 | 0,71 | 0,78 | **0,81** |
| 315S | 0,74 | 0,87 | 0,89 | **0,89** | 0,61 | 0,79 | 0,83 | **0,84** | 0,62 | 0,8 | 0,87 | **0,88** |
| 315M | 0,75 | 0,87 | 0,89 | **0,90** | 0,61 | 0,79 | 0,83 | **0,84** | 0,62 | 0,81 | 0,87 | **0,88** |
| 315L1 | 0,73 | 0,87 | 0,90 | **0,90** | 0,59 | 0,77 | 0,83 | **0,84** | 0,60 | 0,80 | 0,86 | **0,88** |
| 315L2 | 0,75 | 0,87 | 0,90 | **0,90** | 0,58 | 0,78 | 0,83 | **0,85** | 0,62 | 0,81 | 0,86 | **0,88** |
| 315L3 | 0,79 | 0,87 | 0,91 | **0,92** | 0,64 | 0,80 | 0,85 | **0,87** | 0,61 | 0,8 | 0,86 | **0,88** |
| 355M | - | - | - | **-** | - | - | - | **-** | 0,60 | 0,80 | 0,86 | **0,88** |
| 355L1 | 0,83 | 0,91 | 0,92 | **0,92** | 0,67 | 0,84 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** |
| 355L2 | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | 0,61 | 0,81 | 0,85 | **0,88** |
| 355L3 | 0,83 | 0,91 | 0,92 | **0,93** | 0,70 | 0,85 | 0,89 | **0,90** | - | - | - | - |
| 400M | - | - | - | - | 0,65 | 0,83 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** |
| 400L | 0,82 | 0,92 | 0,93 | **0,94** | 0,67 | 0,85 | 0,89 | **0,91** | 0,68 | 0,84 | 0,88 | **0,89** |
| 450M | - | - | - | - | 0,68 | 0,84 | 0,89 | **0,91** | 0,65 | 0,83 | 0,88 | **0,89** |
| 450L | - | - | - | - | 0,69 | 0,85 | 0,90 | **0,91** | 0,61 | 0,83 | 0,88 | **0,89** |

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[1)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD...X | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | | |
| **63M1-2** | 0.25 | 0.69 | 0.55 | 2860 | 70 | 0.75 | 0.83 | 3.4 | 5.8 | 4.7 | 0.00028 | 16 | 49 | 61 |
| **63M2-2** | 0.37 | 0.89 | 0.71 | 2800 | 71.5 | 0.84 | 1.26 | 2.7 | 5.2 | 3.5 | 0.00028 | 16 | 49 | 61 |
| **71M1-2** | 0.46 | 1.43 | 1.15 | 2720 | 66 | 0.84 | 1.62 | 2.1 | 4.2 | 2.5 | 0.00028 | 16 | 57 | 69 |
| **71M2-2** | 0.75 | 1.91 | 1.53 | 2730 | 70 | 0.81 | 2.62 | 2.7 | 4.7 | 3.2 | 0.00039 | 17 | 57 | 69 |
| **80M1-2** | 1 | 2.65 | 2.1 | 2750 | 68 | 0.80 | 3.47 | 2.4 | 4.2 | 3 | 0.00058 | 24 | 59 | 71 |
| **80M2-2** | 1.4 | 3.3 | 2.65 | 2805 | 76.5 | 0.80 | 4.8 | 3.2 | 5.6 | 3.6 | 0.0008 | 25 | 59 | 71 |
| **90S-2** | 1.9 | 4.2 | 3.35 | 2830 | 78 | 0.84 | 6.4 | 2.2 | 5.8 | 3.1 | 0.0013 | 31 | 60 | 72 |
| **90L-2** | 2.7 | 6.2 | 4.95 | 2830 | 78 | 0.81 | 9.1 | 2.5 | 5.5 | 3.5 | 0.0018 | 35 | 60 | 72 |
| **100L-2** | 3.4 | 7.5 | 6 | 2845 | 80 | 0.82 | 11.4 | 2.8 | 5.8 | 3.5 | 0.0029 | 45 | 64 | 76 |
| **112M-2** | 5 | 9.9 | 7.9 | 2870 | 83.5 | 0.87 | 16.6 | 2.3 | 6.8 | 3 | 0.0051 | 53 | 66 | 78 |
| **132S1-2** | 6.6 | 14.3 | 11.4 | 2900 | 81.5 | 0.82 | 21.7 | 2.7 | 6.4 | 3.2 | 0.0089 | 95 | 69 | 82 |
| **132S2-2** | 9 | 18.7 | 15 | 2910 | 83.5 | 0.83 | 29.5 | 2.7 | 6.8 | 3.5 | 0.0125 | 100 | 69 | 82 |
| **160M1-2** | 13.5 | 27 | 21.5 | 2930 | 86 | 0.84 | 44 | 2.5 | 6.9 | 3.2 | 0.032 | 163 | 80 | 93 |
| **160M2-2** | 18.5 | 34.5 | 27.5 | 2910 | 87.5 | 0.89 | 61 | 2.5 | 6.5 | 3.2 | 0.043 | 173 | 80 | 93 |
| **160L-2** | 22 | 39.5 | 31.5 | 2915 | 89 | 0.90 | 72 | 2.8 | 6.9 | 3.4 | 0.052 | 188 | 80 | 93 |
| **180M-2** | 30 | 55 | 44 | 2915 | 89.5 | 0.88 | 98 | 2.7 | 6.9 | 3.1 | 0.075 | 196 | 83 | 96 |
| **200L1-2** | 37 | 66 | 53 | 2955 | 91.4 | 0.89 | 120 | 3 | 7.2 | 3.3 | 0.13 | 254 | 85 | 99 |
| **200L2-2** | 45 | 81 | 65 | 2955 | 92 | 0.87 | 145 | 2.8 | 7.2 | 3.3 | 0.16 | 278 | 85 | 99 |
| **225M-2** | 55 | 103 | 81 | 2965 | 92.6 | 0.84 | 177 | 2.9 | 7.1 | 3.7 | 0.24 | 400 | 87 | 101 |
| **250M-2** | 70 | 139 | 111 | 2970 | 91 | 0.80 | 225 | 2.9 | 7.2 | 3.5 | 0.4 | 545 | 87 | 101 |
| **280S-2** | 90 | 162 | 130 | 2970 | 92.2 | 0.87 | 289 | 2.2 | 6.6 | 2.5 | 0.65 | 700 | 89 | 103 |
| **280M-2** | 110 | 200 | 161 | 2975 | 93 | 0.85 | 353 | 2.4 | 7.3 | 2.6 | 0.78 | 762 | 89 | 103 |
| **315S-2** | 132 | 230 | 185 | 2975 | 93.6 | 0.88 | 424 | 1.9 | 6.5 | 2.3 | 1.4 | 960 | 90 | 105 |
| **315M-2** | 160 | 280 | 225 | 2975 | 93 | 0.89 | 514 | 1.8 | 6.7 | 2.4 | 1.6 | 1025 | 90 | 105 |
| **315L1-2** | 200 | 345 | 255 | 2975 | 93.5 | 0.89 | 594 | 2 | 6.9 | 2.6 | 1.9 | 1065 | 90 | 105 |
| **315L2-2** | 230 | 400 | 320 | 2975 | 93.5 | 0.89 | 738 | 2 | 6.9 | 2.6 | 2.2 | 1270 | 90 | 105 |

**Note:**
1) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD...X | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | | |
| **63M1-4** | 0.18 | 0.53 | 0.42 | 1415 | 70 | 0.70 | 1.2 | 2.7 | 4.7 | 2.7 | 0.00046 | 16 | 44 | 56 |
| **63M2-4** | 0.25 | 0.66 | 0.53 | 1370 | 68.5 | 0.80 | 1.74 | 2 | 3.9 | 2.5 | 0.00046 | 16 | 44 | 56 |
| **71M1-4** | 0.37 | 1.03 | 0.82 | 1350 | 65 | 0.80 | 2.62 | 1.7 | 3.6 | 2.3 | 0.00046 | 16 | 46 | 58 |
| **71M2-4** | 0.5 | 1.42 | 1.15 | 1335 | 67 | 0.79 | 3.58 | 2.1 | 3.6 | 2.7 | 0.00063 | 17 | 46 | 58 |
| **80M1-4** | 0.7 | 1.87 | 1.50 | 1370 | 70 | 0.77 | 4.9 | 2.2 | 3.5 | 2.4 | 0.00092 | 24 | 47 | 59 |
| **80M2-4** | 1 | 2.55 | 2.05 | 1380 | 74 | 0.77 | 6.9 | 2.3 | 4.1 | 2.5 | 0.0013 | 25 | 47 | 59 |
| **90S-4** | 1.4 | 3.25 | 2.6 | 1380 | 75.5 | 0.83 | 9.7 | 2 | 4.9 | 2.5 | 0.0021 | 31 | 49 | 61 |
| **90L-4** | 2 | 4.6 | 3.7 | 1360 | 75 | 0.83 | 14 | 2 | 4.2 | 2.2 | 0.0029 | 35 | 49 | 61 |
| **100L1-4** | 2.5 | 6.2 | 4.9 | 1415 | 76 | 0.77 | 16.9 | 2.3 | 5.7 | 2.7 | 0.0046 | 44 | 52 | 64 |
| **100L2-4** | 3.4 | 7.6 | 6.1 | 1400 | 78.8 | 0.82 | 23.2 | 2.1 | 5.5 | 2.8 | 0.0056 | 46 | 52 | 64 |
| **112M-4** | 5 | 11.1 | 8.9 | 1420 | 81 | 0.80 | 33.6 | 2.6 | 6.4 | 3 | 0.011 | 59 | 54 | 66 |
| **132S-4** | 6.6 | 13.4 | 10.7 | 1435 | 83.6 | 0.85 | 44 | 2.6 | 6.3 | 2.9 | 0.022 | 100 | 59 | 72 |
| **132M-4** | 9 | 18.3 | 14.6 | 1435 | 85.7 | 0.83 | 60 | 2.7 | 6.3 | 3 | 0.03 | 110 | 59 | 72 |
| **160M-4** | 13.5 | 27.5 | 22 | 1460 | 87.5 | 0.81 | 88 | 2.6 | 6.9 | 3 | 0.057 | 168 | 67 | 80 |
| **160L-4** | 17.5 | 34 | 27 | 1455 | 88.6 | 0.84 | 115 | 2.5 | 6.8 | 2.9 | 0.079 | 184 | 67 | 80 |
| **180M-4** | 22 | 43.5 | 35 | 1460 | 90 | 0.81 | 144 | 3.1 | 6.7 | 3.2 | 0.13 | 198 | 73 | 86 |
| **180L-4** | 27 | 52 | 42 | 1460 | 91 | 0.82 | 177 | 3 | 7.2 | 3.1 | 0.155 | 217 | 73 | 86 |
| **200L-4** | 37 | 68 | 55 | 1460 | 91 | 0.86 | 242 | 2.9 | 7.2 | 3 | 0.25 | 274 | 76 | 90 |
| **225S-4** | 45 | 81 | 65 | 1465 | 92 | 0.87 | 293 | 2.6 | 6.5 | 2.6 | 0.4 | 372 | 79 | 93 |
| **225M-4** | 55 | 100 | 80 | 1475 | 92.5 | 0.86 | 356 | 2.6 | 6.5 | 2.8 | 0.48 | 402 | 79 | 93 |
| **250M-4** | 70 | 127 | 102 | 1475 | 92.5 | 0.86 | 453 | 2.9 | 7.2 | 3.4 | 0.75 | 573 | 80 | 94 |
| **280S-4** | 90 | 168 | 134 | 1480 | 93.2 | 0.83 | 581 | 2.9 | 6.9 | 2.6 | 1.25 | 740 | 82 | 96 |
| **280M-4** | 110 | 200 | 161 | 1480 | 93.7 | 0.84 | 710 | 2.9 | 7 | 2.7 | 1.48 | 820 | 82 | 96 |
| **315S-4** | 132 | 245 | 194 | 1480 | 93.5 | 0.84 | 851 | 2.6 | 6.9 | 2.4 | 2.2 | 1040 | 84 | 99 |
| **315M-4** | 160 | 290 | 230 | 1480 | 94 | 0.85 | 1032 | 2.6 | 6.5 | 2.3 | 2.7 | 1120 | 84 | 99 |
| **315L1-4** | 200 | 360 | 290 | 1485 | 94.3 | 0.85 | 1190 | 2.7 | 6.9 | 2.5 | 3.3 | 1210 | 84 | 99 |
| **315L2-4** | 230 | 410[1] | 325 | 1485 | 94.7 | 0.86 | 1479 | 2.7 | 6.9 | 2.5 | 3.9 | 1430 | 84 | 99 |

**Note:**
1) Two parallel supply lines are required
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

# Increased performance
# Mains operation 60 Hz



Temperature class T4,
ns = 3600 rpm, 2p =2

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[1)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD...X | $P_2$ [kW] | 460 V I [A] | 690 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | | |
| **63M1-2** | 0.29 | 0.69 | 0.46 | 3430 | 70 | 0.75 | 0.81 | 3.4 | 5.8 | 4.7 | 0.00028 | 16 | 53 | 65 |
| **63M2-2** | 0.44 | 0.92 | 0.61 | 3360 | 71.5 | 0.84 | 1.25 | 2.7 | 5.2 | 3.5 | 0.00028 | 16 | 53 | 65 |
| **71M1-2** | 0.53 | 1.20 | 0.80 | 3265 | 66 | 0.84 | 1.62 | 2.1 | 4.2 | 2.5 | 0.00028 | 16 | 61 | 73 |
| **71M2-2** | 0.87 | 1.93 | 1.28 | 3275 | 70 | 0.81 | 2.54 | 2.7 | 4.7 | 3.2 | 0.00039 | 17 | 61 | 73 |
| **80M1-2** | 1.16 | 2.7 | 1.78 | 3300 | 68 | 0.80 | 3.46 | 2.4 | 4.2 | 3 | 0.00058 | 24 | 63 | 75 |
| **80M2-2** | 1.6 | 3.3 | 2.2 | 3365 | 76.5 | 0.80 | 4.5 | 3.2 | 5.6 | 3.6 | 0.0008 | 25 | 63 | 75 |
| **90S-2** | 2.2 | 4.2 | 2.8 | 3395 | 78 | 0.84 | 6.3 | 2.2 | 5.8 | 3.1 | 0.0013 | 31 | 64 | 76 |
| **90L-2** | 3.1 | 6.2 | 4.1 | 3395 | 78 | 0.81 | 8.7 | 2.5 | 5.5 | 3.5 | 0.0018 | 35 | 64 | 76 |
| **100L-2** | 3.9 | 7.5 | 4.95 | 3415 | 80 | 0.82 | 10.9 | 2.8 | 5.8 | 3.5 | 0.0029 | 45 | 68 | 80 |
| **112M-2** | 5.8 | 10 | 6.7 | 3445 | 83.5 | 0.87 | 16.1 | 2.3 | 6.8 | 3 | 0.0051 | 53 | 70 | 82 |
| **132S1-2** | 7.6 | 14.3 | 9.5 | 3495 | 81.5 | 0.82 | 21 | 2.7 | 6.4 | 3.2 | 0.0089 | 95 | 73 | 86 |
| **132S2-2** | 10.4 | 18.8 | 12.6 | 3495 | 83.5 | 0.83 | 28.4 | 2.7 | 6.8 | 3.5 | 0.0125 | 100 | 73 | 86 |
| **160M1-2** | 15.5 | 27 | 18 | 3505 | 86 | 0.84 | 42 | 2.5 | 6.9 | 3.2 | 0.032 | 163 | 85 | 98 |
| **160M2-2** | 22 | 35.5 | 23.5 | 3490 | 87.5 | 0.89 | 60 | 2.5 | 6.5 | 3.2 | 0.043 | 173 | 85 | 98 |
| **160L-2** | 26 | 40.5 | 27 | 3500 | 89 | 0.90 | 71 | 2.8 | 6.9 | 3.4 | 0.052 | 188 | 85 | 98 |
| **180M-2** | 35 | 56 | 37 | 3500 | 89.5 | 0.88 | 96 | 2.7 | 6.9 | 3.1 | 0.075 | 196 | 88 | 101 |
| **200L1-2** | 43 | 66 | 44 | 3545 | 91.4 | 0.89 | 116 | 3 | 7.2 | 3.3 | 0.13 | 254 | 90 | 104 |
| **200L2-2** | 52 | 82 | 54 | 3545 | 92 | 0.87 | 140 | 2.8 | 7.2 | 3.3 | 0.16 | 278 | 90 | 104 |
| **225M-2** | 64 | 104 | 69 | 3560 | 92 | 0.84 | 172 | 2.9 | 7.1 | 3.7 | 0.24 | 400 | 92 | 106 |
| **250M-2** | 81 | 140 | 93 | 3565 | 91 | 0.80 | 217 | 2.9 | 7.2 | 3.5 | 0.4 | 545 | 92 | 106 |
| **280S-2** | 105 | 165 | 110 | 3565 | 92 | 0.87 | 281 | 2.2 | 6.6 | 2.5 | 0.65 | 700 | 95 | 109 |
| **280M-2** | 121 | 193 | 128 | 3565 | 92.8 | 0.85 | 324 | 2.4 | 7.3 | 2.6 | 0.78 | 762 | 95 | 109 |
| **315S-2** | 145 | 220 | 147 | 3570 | 93.6 | 0.88 | 388 | 2 | 6.9 | 2.4 | 1.4 | 960 | 96 | 111 |
| **315M-2** | 176 | 265 | 178 | 3570 | 93 | 0.89 | 471 | 1.9 | 7.1 | 2.5 | 1.6 | 1025 | 96 | 111 |
| **315L1-2** | 220 | 330 | 220 | 3570 | 93.5 | 0.89 | 548 | 2.2 | 7.3 | 2.7 | 1.9 | 1065 | 96 | 111 |
| **315L2-2** | 255 | 385 | 265 | 3570 | 93.5 | 0.89 | 682 | 2.1 | 7.3 | 2.7 | 2.2 | 1270 | 96 | 111 |

**Note:**
1) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Break down torque | Mass moment of inertia | Weight[1] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD...X | $P_2$ | 460 V I | 690 V I | n | η | cos φ | M | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J | m | $L_P$ | $L_W$ |
| | [kW] | [A] | [A] | [rpm] | [%] | | [Nm] | | | | [kgm²] | [kg] | [dB(A)] | [dB(A)] |
| **Efficiency according to manufacturer's standard** | | | | | | | | | | | | | | |
| **63M1-4** | 0.21 | 0.54 | 0.36 | 1700 | 70 | 0.70 | 1.18 | 2.7 | 4.7 | 2.7 | 0.00046 | 16 | 48 | 60 |
| **63M2-4** | 0.3 | 0.69 | 0.46 | 1645 | 68.5 | 0.80 | 1.74 | 2 | 3.9 | 2.5 | 0.00046 | 16 | 48 | 60 |
| **71M1-4** | 0.43 | 1.04 | 0.69 | 1620 | 65 | 0.80 | 2.53 | 1.7 | 3.6 | 2.3 | 0.00046 | 16 | 49 | 61 |
| **71M2-4** | 0.58 | 1.38 | 0.92 | 1600 | 67 | 0.79 | 3.46 | 2.1 | 3.6 | 2.7 | 0.00063 | 17 | 49 | 61 |
| **80M1-4** | 0.81 | 1.89 | 1.26 | 1645 | 70 | 0.77 | 4.7 | 2.2 | 4.5 | 2.4 | 0.00092 | 24 | 50 | 62 |
| **80M2-4** | 1.16 | 2.55 | 1.70 | 1655 | 74 | 0.77 | 6.7 | 2.3 | 4.7 | 2.5 | 0.0013 | 25 | 50 | 62 |
| **90S-4** | 1.6 | 3.25 | 2.15 | 1680 | 75.5 | 0.83 | 9.1 | 2 | 4.9 | 2.5 | 0.0021 | 31 | 52 | 64 |
| **90L-4** | 2.3 | 4.6 | 3.05 | 1670 | 75.5 | 0.83 | 13.2 | 2 | 4.2 | 2.2 | 0.0029 | 35 | 52 | 64 |
| **100L1-4** | 2.9 | 6.2 | 4.15 | 1705 | 76 | 0.77 | 16.2 | 2.3 | 5.7 | 2.7 | 0.0046 | 44 | 55 | 67 |
| **100L2-4** | 3.9 | 7.6 | 5.1 | 1680 | 78.8 | 0.82 | 22.2 | 2.1 | 5.5 | 2.8 | 0.0056 | 46 | 55 | 67 |
| **112M-4** | 5.8 | 11.2 | 7.5 | 1705 | 81 | 0.80 | 32.5 | 2.6 | 6.4 | 3 | 0.011 | 59 | 57 | 69 |
| **132S-4** | 7.6 | 13.4 | 8.9 | 1720 | 83.6 | 0.85 | 42 | 2.6 | 6.3 | 2.9 | 0.022 | 100 | 63 | 76 |
| **132M-4** | 10.4 | 18.4 | 12.2 | 1720 | 85.7 | 0.83 | 58 | 2.7 | 6.3 | 3 | 0.03 | 110 | 63 | 76 |
| **160M-4** | 15.5 | 27.5 | 18.3 | 1750 | 87.5 | 0.81 | 85 | 2.6 | 6.9 | 3 | 0.057 | 168 | 71 | 84 |
| **160L-4** | 20 | 33.5 | 22.5 | 1745 | 88.6 | 0.84 | 109 | 2.5 | 6.8 | 2.9 | 0.079 | 184 | 71 | 84 |
| **180M-4** | 26 | 45 | 30 | 1750 | 90 | 0.81 | 142 | 3.1 | 6.7 | 3.2 | 0.13 | 198 | 76 | 89 |
| **180L-4** | 31 | 52 | 35 | 1750 | 91 | 0.82 | 169 | 3 | 7.2 | 3.1 | 0.155 | 217 | 76 | 89 |
| **200L-4** | 43 | 69 | 46 | 1750 | 91 | 0.86 | 235 | 2.9 | 7.2 | 3 | 0.25 | 274 | 81 | 95 |
| **225S-4** | 52 | 82 | 54 | 1760 | 92 | 0.87 | 282 | 2.6 | 6.1 | 2.6 | 0.4 | 372 | 84 | 98 |
| **225M-4** | 64 | 101 | 67 | 1770 | 92.5 | 0.86 | 345 | 2.6 | 6.5 | 2.8 | 0.48 | 402 | 84 | 98 |
| **250M-4** | 81 | 128 | 85 | 1770 | 92.5 | 0.86 | 437 | 2.9 | 7.2 | 3.4 | 0.75 | 573 | 85 | 99 |
| **280S-4** | 105 | 170 | 114 | 1775 | 93.2 | 0.83 | 565 | 2.9 | 6.9 | 2.6 | 1.25 | 740 | 87 | 101 |
| **280M-4** | 121 | 193 | 129 | 1775 | 93.7 | 0.84 | 651 | 3.1 | 7.4 | 2.8 | 1.48 | 820 | 87 | 101 |
| **315S-4** | 145 | 230 | 154 | 1775 | 93.5 | 0.84 | 780 | 2.7 | 7.4 | 2.5 | 2.2 | 1040 | 89 | 104 |
| **315M-4** | 176 | 275 | 184 | 1775 | 94 | 0.85 | 947 | 2.7 | 6.8 | 2.7 | 2.7 | 1120 | 89 | 104 |
| **315L1-4** | 220 | 345 | 230 | 1780 | 94.3 | 0.85 | 1100 | 2.8 | 7.3 | 2.6 | 3.3 | 1210 | 89 | 104 |
| **315L2-4** | 255 | 395 | 260 | 1780 | 94.7 | 0.86 | 1368 | 2.8 | 7.3 | 2.8 | 3.9 | 1430 | 89 | 104 |

**Note:**
1) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[2] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD.. | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **80M1-4/2** | 0.5 | 1.45 | 1.16 | 1400 | 66.5 | 0.75 | 3.4 | 1.9 | 3.9 | 2.5 | 0.00111 | 24 | 47 | 59 |
| | 0.65 | 1.69 | 1.35 | 2800 | 62.5 | 0.89 | 2.2 | 2.2 | 4.2 | 3 | | | 65 | 77 |
| **80M2-4/2** | 0.7 | 1.92 | 1.54 | 1400 | 70 | 0.75 | 4.8 | 2.1 | 4 | 2.7 | 0.00148 | 25 | 47 | 59 |
| | 0.85 | 2.15 | 1.71 | 2820 | 66 | 0.87 | 2.9 | 2.4 | 4.8 | 3.2 | | | 65 | 77 |
| **90S-4/2** | 1.1 | 2.7 | 2.15 | 1390 | 70 | 0.84 | 7.6 | 1.8 | 4.2 | 2.2 | 0.00238 | 31 | 52 | 64 |
| | 1.4 | 3.15 | 2.5 | 2810 | 70 | 0.92 | 4.8 | 1.9 | 4.9 | 3 | | | 69 | 81 |
| **90L-4/2** | 1.5 | 3.55 | 2.85 | 1400 | 74 | 0.82 | 10.2 | 2 | 4.7 | 2.3 | 0.00318 | 35 | 52 | 64 |
| | 1.9 | 4.1 | 3.25 | 2805 | 73 | 0.92 | 6.5 | 2.2 | 5.4 | 3.1 | | | 69 | 81 |
| **100L-4/2** | 2.6 | 5.9 | 4.7 | 1410 | 78 | 0.82 | 17.6 | 2.2 | 4.8 | 2.7 | 0.00608 | 46 | 55 | 67 |
| | 3.2 | 6.5 | 5.2 | 2870 | 78 | 0.91 | 10.6 | 2 | 5.8 | 2.8 | | | 75 | 87 |
| **112M-4/2** | 3.7 | 7.6 | 6.1 | 1430 | 82.5 | 0.85 | 24.7 | 2.1 | 6.1 | 3 | 0.0122 | 59 | 56 | 68 |
| | 4.4 | 8.9 | 7.1 | 2895 | 78.5 | 0.91 | 14.5 | 2.5 | 6.8 | 3.3 | | | 76 | 88 |
| **132S-4/2** | 5 | 10.1 | 8.1 | 1440 | 85 | 0.84 | 33.2 | 2 | 5.6 | 2.8 | 0.0238 | 100 | 62 | 75 |
| | 6 | 12.2 | 9.7 | 2905 | 79 | 0.90 | 19.7 | 2.5 | 6.6 | 3.3 | | | 80 | 93 |
| **132M-4/2** | 7 | 14.1 | 11.3 | 1445 | 86.5 | 0.83 | 46 | 2.6 | 6.5 | 2.9 | 0.0323 | 110 | 62 | 75 |
| | 9 | 17.5 | 14 | 2910 | 82.5 | 0.90 | 29.5 | 2.4 | 6.9 | 3.3 | | | 80 | 93 |
| **160M-4/2** | 9.5 | 18.7 | 14.9 | 1455 | 87.5 | 0.84 | 62 | 2.3 | 6 | 2.8 | 0.0625 | 168 | 57 | 70 |
| | 11 | 20 | 16 | 2930 | 87 | 0.91 | 36 | 2.6 | 6.9 | 3.2 | | | 68 | 81 |
| **160L-4/2** | 13 | 25 | 20 | 1455 | 88.5 | 0.84 | 85 | 2.3 | 6 | 2.8 | 0.085 | 184 | 57 | 70 |
| | 16 | 28.5 | 23 | 2930 | 87.5 | 0.92 | 52 | 2.6 | 6.9 | 3.2 | | | 68 | 81 |
| **180M-4/2** | 16.5 | 32 | 25.5 | 1460 | 89.5 | 0.83 | 108 | 2.8 | 6.5 | 2.7 | 0.13 | 198 | 58 | 71 |
| | 20 | 36.5 | 29.5 | 2930 | 87.5 | 0.90 | 65 | 2.8 | 7 | 3.1 | | | 69 | 82 |
| **180L-4/2** | 19 | 36.5 | 29.5 | 1465 | 90 | 0.83 | 124 | 3.1 | 6.6 | 2.9 | 0.155 | 217 | 58 | 71 |
| | 25 | 45.5 | 36.5 | 2940 | 88 | 0.90 | 81 | 2.9 | 7.1 | 3.2 | | | 69 | 82 |
| **200L-4/2** | 26 | 47 | 37.5 | 1470 | 91.5 | 0.87 | 169 | 2.8 | 6.8 | 3.1 | 0.25 | 274 | 60 | 74 |
| | 31 | 54 | 43 | 2955 | 90 | 0.92 | 100 | 2.7 | 7.2 | 3.5 | | | 73 | 87 |
| **225S-4/2** | 32 | 59 | 47 | 1470 | 91.5 | 0.86 | 208 | 2.6 | 6.5 | 2.5 | 0.4 | 372 | 61 | 75 |
| | 38 | 66 | 53 | 2950 | 90 | 0.92 | 123 | 2.6 | 7.2 | 3 | | | 74 | 88 |
| **225M-4/2** | 38 | 69 | 55 | 1470 | 92.5 | 0.86 | 247 | 2.8 | 6.5 | 2.7 | 0.48 | 402 | 61 | 75 |
| | 46 | 79 | 63 | 2955 | 91.5 | 0.92 | 149 | 2.8 | 7.2 | 3.2 | | | 74 | 88 |
| **250M-4/2** | 46 | 82 | 65 | 1470 | 92.5 | 0.88 | 299 | 2.7 | 6.5 | 2.8 | 0.75 | 573 | 63 | 77 |
| | 55 | 94 | 75 | 2955 | 91 | 0.93 | 178 | 2.9 | 7.1 | 3.3 | | | 76 | 90 |
| **280S-4/2** | 63 | 116 | 93 | 1480 | 93 | 0.84 | 407 | 2.8 | 6.5 | 3 | 1.25 | 740 | 65 | 79 |
| | 75 | 134 | 108 | 2970 | 91.5 | 0.88 | 241 | 2.6 | 7 | 3.1 | | | 78 | 92 |
| **280M-4/2** | 73 | 131 | 105 | 1480 | 93.5 | 0.86 | 471 | 2.8 | 6.5 | 3 | 1.48 | 820 | 65 | 79 |
| | 87 | 150 | 120 | 2970 | 92 | 0.91 | 280 | 2.4 | 7.1 | 3.2 | | | 78 | 92 |
| **315S-4/2** | 85 | 155 | 124 | 1485 | 94 | 0.84 | 547 | 2.5 | 6.5 | 2.4 | 2.2 | 1040 | 67 | 82 |
| | 100 | 174 | 139 | 2975 | 92.3 | 0.90 | 321 | 2.1 | 7 | 2.8 | | | 80 | 95 |
| **315M-4/2** | 100 | 180 | 144 | 1485 | 94.2 | 0.85 | 643 | 2.6 | 6.6 | 2.4 | 2.7 | 1120 | 67 | 82 |
| | 125 | 215 | 171 | 2975 | 92.5 | 0.91 | 401 | 2.3 | 7.1 | 3 | | | 80 | 95 |
| **315L1-4/2** | 120 | 215 | 172 | 1485 | 94.8 | 0.85 | 772 | 2.6 | 6.5 | 2.4 | 3.3 | 1210 | 67 | 82 |
| | 150 | 255 | 205 | 2975 | 93 | 0.91 | 482 | 2.3 | 7 | 2.9 | | | 80 | 95 |
| **315L2-4/2** | 145 | 260 | 210 | 1485 | 94.8 | 0.85 | 932 | 2.6 | 6.5 | 2.4 | 3.8 | 1430 | 67 | 82 |
| | 175 | 300 | 240 | 2975 | 93.2 | 0.91 | 562 | 2.3 | 7 | 2.9 | | | 80 | 95 |
| **355S-4/2** | 160 | 280 | 220 | 1485 | 95.5 | 0.87 | 1029 | 1.3 | 6.4 | 2.4 | 5.1 | 1800 | 70 | 86 |
| | 200 | 330 | 265 | 2980 | 94 | 0.93 | 641 | 1.4 | 6.9 | 2.7 | | | 82 | 98 |
| **355M1-4/2** | 180 | 315 | 250 | 1485 | 95.5 | 0.87 | 1158 | 1.3 | 6.6 | 2.3 | 5.6 | 1900 | 70 | 86 |
| | 220 | 365 | 290 | 2980 | 94 | 0.93 | 705 | 1.3 | 7.1 | 2.6 | | | 82 | 98 |
| **355M2-4/2** | 200 | 345 | 280 | 1485 | 95.5 | 0.87 | 1286 | 1.3 | 6.5 | 2.3 | 6 | 2050 | 70 | 86 |
| | 250 | 415[1] | 330 | 2985 | 94 | 0.93 | 800 | 1.3 | 7 | 2.6 | | | 82 | 98 |
| **355L-4/2** | 220 | 380 | 305 | 1485 | 96 | 0.87 | 1415 | 1.3 | 6.5 | 2.3 | 6.7 | 2200 | 70 | 86 |
| | 280 | 460[1] | 370 | 2985 | 94.5 | 0.93 | 896 | 1.3 | 7 | 2.6 | | | 82 | 98 |

**Note:**
1) Two parallel supply lines are required in each case
2) Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[1)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD.. | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **90S-6/4** | 0.45 | 1.5 | 1.2 | 940 | 62 | 0.70 | 4.6 | 1.8 | 3.5 | 2.3 | 0.0038 | 31 | 52 | 64 |
| | 0.65 | 1.77 | 1.42 | 1435 | 68 | 0.78 | 4.3 | 1.7 | 4.2 | 2.5 | | | 55 | 67 |
| **90L-6/4** | 0.6 | 1.91 | 1.53 | 940 | 63 | 0.72 | 6.1 | 1.8 | 3.6 | 2.3 | 0.0051 | 35 | 52 | 64 |
| | 0.9 | 2.3 | 1.86 | 1435 | 71 | 0.80 | 6 | 1.7 | 4.6 | 2.5 | | | 55 | 67 |
| **100L1-6/4** | 0.9 | 2.5 | 1.98 | 945 | 69 | 0.76 | 9.1 | 1.7 | 3.8 | 2.1 | 0.008 | 44 | 53 | 65 |
| | 1.3 | 3.05 | 2.45 | 1450 | 76.5 | 0.80 | 8.6 | 2 | 5.9 | 2.8 | | | 57 | 69 |
| **100L2-6/4** | 1.1 | 3.05 | 2.4 | 940 | 69 | 0.76 | 11.2 | 1.7 | 3.8 | 2.1 | 0.0105 | 46 | 53 | 65 |
| | 1.7 | 3.95 | 3.15 | 1445 | 77.5 | 0.8 | 11.2 | 1.9 | 5.5 | 2.6 | | | 57 | 69 |
| **112M-6/4** | 1.5 | 3.6 | 2.9 | 950 | 74 | 0.81 | 15.1 | 1.8 | 4.6 | 2.2 | 0.019 | 59 | 54 | 66 |
| | 2.4 | 5.1 | 4.05 | 1425 | 76.5 | 0.89 | 16.1 | 1.7 | 4.8 | 2.4 | | | 59 | 71 |
| **132S-6/4** | 2.2 | 5.2 | 4.2 | 960 | 75 | 0.81 | 21.9 | 1.6 | 4.6 | 2.6 | 0.033 | 104 | 59 | 72 |
| | 3.3 | 7.1 | 5.7 | 1450 | 78 | 0.86 | 21.7 | 1.7 | 5.9 | 2.6 | | | 62 | 75 |
| **132M-6/4** | 3 | 7 | 5.6 | 965 | 76.5 | 0.81 | 29.7 | 1.7 | 5.5 | 2.6 | 0.046 | 112 | 59 | 72 |
| | 4.5 | 9.2 | 7.4 | 1455 | 80 | 0.88 | 29.5 | 1.8 | 6.3 | 2.7 | | | 62 | 75 |
| **160M-6/4** | 4.5 | 10 | 8 | 970 | 80.5 | 0.81 | 44.3 | 2.1 | 6.4 | 2.9 | 0.095 | 170 | 64 | 77 |
| | 6.6 | 12.8 | 10.2 | 1445 | 82 | 0.91 | 43.6 | 1.8 | 6.3 | 2.7 | | | 70 | 83 |
| **160L-6/4** | 6.5 | 13.2 | 10.5 | 960 | 81 | 0.88 | 65 | 1.6 | 5.5 | 2.5 | 0.13 | 190 | 64 | 77 |
| | 9.5 | 18.1 | 14.5 | 1465 | 85 | 0.89 | 62 | 1.9 | 6.9 | 3 | | | 70 | 83 |
| **180L-6/4** | 11 | 23.5 | 18.9 | 975 | 85 | 0.79 | 108 | 2.4 | 6.9 | 3.2 | 0.155 | 215 | 56 | 69 |
| | 16 | 29.5 | 23.5 | 1465 | 87 | 0.90 | 104 | 1.8 | 6.6 | 2.8 | | | 63 | 76 |
| **200L-6/4** | 16 | 32.5 | 26 | 975 | 86.5 | 0.82 | 155 | 2 | 6.6 | 2.9 | 0.338 | 280 | 56 | 70 |
| | 24 | 43.5 | 35 | 1470 | 89 | 0.89 | 156 | 1.8 | 6.9 | 2.9 | | | 63 | 77 |
| **225S-6/4** | 21 | 40 | 32 | 975 | 89 | 0.85 | 206 | 2.8 | 6.5 | 2.8 | 0.4 | 372 | 60 | 74 |
| | 31 | 54 | 43 | 1470 | 90 | 0.92 | 201 | 2.2 | 6.7 | 2.9 | | | 67 | 81 |
| **225M-6/4** | 25 | 47 | 37.5 | 975 | 89.5 | 0.86 | 245 | 2.9 | 6.7 | 2.9 | 0.48 | 404 | 60 | 74 |
| | 37 | 64 | 51 | 1470 | 91 | 0.92 | 240 | 2.4 | 6.9 | 3 | | | 67 | 81 |
| **250M-6/4** | 32 | 59 | 47 | 975 | 90 | 0.87 | 313 | 2.9 | 6.9 | 2.8 | 0.75 | 570 | 61 | 75 |
| | 47 | 81 | 65 | 1475 | 91 | 0.92 | 304 | 2.4 | 7.1 | 2.9 | | | 68 | 82 |
| **280S-6/4** | 45 | 89 | 71 | 980 | 91 | 0.8 | 439 | 2.9 | 6.3 | 2.8 | 1.02 | 740 | 62 | 76 |
| | 66 | 118 | 86 | 1480 | 92.5 | 0.87 | 426 | 2.7 | 7.1 | 3.1 | | | 70 | 84 |
| **280M-6/4** | 54 | 107 | 86 | 980 | 91 | 0.80 | 526 | 3.2 | 6.7 | 3 | 1.27 | 820 | 62 | 76 |
| | 80 | 142 | 113 | 1475 | 92.5 | 0.88 | 518 | 2.6 | 7 | 3 | | | 70 | 84 |
| **315S-6/4** | 60 | 114 | 91 | 985 | 92.5 | 0.82 | 582 | 2.4 | 6.6 | 2.3 | 2.2 | 996 | 63 | 78 |
| | 85 | 147 | 118 | 1480 | 93.5 | 0.89 | 547 | 2.5 | 6.9 | 2.5 | | | 71 | 86 |
| **315M-6/4** | 70 | 134 | 107 | 985 | 93 | 0.81 | 679 | 2.5 | 6.7 | 2.4 | 2.7 | 1096 | 63 | 78 |
| | 100 | 173 | 138 | 1480 | 94 | 0.89 | 643 | 2.6 | 6.9 | 2.5 | | | 71 | 86 |
| **315L1-6/4** | 85 | 161 | 129 | 985 | 93 | 0.82 | 824 | 2.6 | 6.8 | 2.5 | 3.3 | 1221 | 63 | 78 |
| | 120 | 205 | 164 | 1480 | 94 | 0.90 | 772 | 2.7 | 7 | 2.6 | | | 71 | 86 |
| **315L2-6/4** | 100 | 182 | 145 | 985 | 93.5 | 0.85 | 970 | 2.6 | 6.8 | 2.5 | 3.9 | 1290 | 63 | 78 |
| | 140 | 235 | 189 | 1485 | 95 | 0.90 | 900 | 2.7 | 7 | 2.6 | | | 71 | 86 |
| **355S-6/4** | 110 | 192 | 154 | 985 | 94 | 0.88 | 1067 | 1.7 | 6.8 | 2.4 | 8.9 | 1750 | 83 | 83 |
| | 160 | 265 | 215 | 1485 | 95 | 0.91 | 1029 | 1.6 | 6.8 | 2.3 | | | 92 | 92 |
| **355M-6/4** | 130 | 225 | 181 | 985 | 94 | 0.88 | 1260 | 1.7 | 6.8 | 2.3 | 10.9 | 1950 | 83 | 83 |
| | 180 | 300 | 240 | 1485 | 95 | 0.91 | 1152 | 1.6 | 7 | 2.2 | | | 92 | 92 |
| **355L-6/4** | 150 | 260 | 210 | 990 | 94.5 | 0.88 | 1454 | 1.6 | 6.9 | 2.3 | 12.6 | 2200 | 83 | 83 |
| | 210 | 350 | 280 | 1485 | 95 | 0.91 | 1351 | 1.6 | 6.9 | 2.3 | | | 92 | 92 |

**Note:**

[1)] Type B3 with terminal compartment type EAR

The values are also valid for series BD..

## Temperature class T4,
## ns = 750/1500 rpm, 2p = 8/4

40 °C ambient temperature. winding heating within heat class F

| Size | Output | Rated current at | | Speed | Efficiency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[1)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD.. | $P_2$ [kW] | 400 V I [A] | 500 V I [A] | n [rpm | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **90S-8/4** | 0.4 | 1.62 | 1.3 | 695 | 57.5 | 0.62 | 5.5 | 1.6 | 2.9 | 2 | 0.0038 | 31 | 49 | 61 |
| | 0.6 | 1.46 | 1.17 | 1395 | 69 | 0.86 | 4.1 | 1.6 | 4.2 | 2.3 | | | 52 | 64 |
| **90L-8/4** | 0.55 | 2.1 | 1.68 | 700 | 60 | 0.63 | 7.5 | 1.6 | 3.3 | 2.2 | 0.0051 | 35 | 49 | 61 |
| | 0.8 | 1.84 | 1.47 | 1410 | 72 | 0.87 | 5.4 | 1.8 | 4.6 | 2.6 | | | 52 | 64 |
| **100L1-8/4** | 0.9 | 3.05 | 2.45 | 690 | 60 | 0.71 | 12.5 | 1.6 | 3.2 | 2.1 | 0.008 | 44 | 52 | 64 |
| | 1.3 | 3 | 2.45 | 1385 | 69.5 | 0.89 | 8.9 | 1.6 | 4.2 | 2.2 | | | 55 | 67 |
| **100L2-8/4** | 1 | 3.1 | 2.5 | 700 | 65 | 0.71 | 13.6 | 1.7 | 3.7 | 2.2 | 0.011 | 46 | 52 | 64 |
| | 1.6 | 3.6 | 2.9 | 1395 | 71 | 0.9 | 11 | 1.7 | 4.5 | 2.4 | | | 55 | 67 |
| **112M-8/4** | 1.5 | 4.6 | 3.7 | 710 | 72.5 | 0.65 | 20.2 | 2 | 4.4 | 2.2 | 0.019 | 59 | 52 | 64 |
| | 2.5 | 5.1 | 4.1 | 1410 | 78 | 0.90 | 16.9 | 1.9 | 5.2 | 2.3 | | | 56 | 68 |
| **132S-8/4** | 2.3 | 6.8 | 5.4 | 720 | 75 | 0.65 | 30.5 | 1.8 | 4.4 | 2.6 | 0.0325 | 97 | 53 | 66 |
| | 3.6 | 7.2 | 5.8 | 1440 | 81 | 0.89 | 23.8 | 1.8 | 5.8 | 2.5 | | | 62 | 75 |
| **132M-8/4** | 3 | 8.4 | 6.7 | 720 | 78 | 0.66 | 40 | 2 | 4.6 | 2.7 | 0.046 | 113 | 53 | 66 |
| | 5 | 9.7 | 7.8 | 1440 | 82.5 | 0.90 | 33 | 1.9 | 5.8 | 2.6 | | | 62 | 75 |
| **160M1-8/4** | 4.7 | 11.5 | 9.2 | 720 | 81 | 0.73 | 62 | 1.7 | 4.8 | 2.5 | 0.081 | 157 | 54 | 67 |
| | 5.5 | 12.2 | 9.8 | 1445 | 76.5 | 0.85 | 36.3 | 2.1 | 5.7 | 3 | | | 66 | 79 |
| **160M2-8/4** | 5.5 | 12.3 | 9.8 | 715 | 83 | 0.78 | 73 | 1.7 | 4.6 | 2.2 | 0.108 | 170 | 54 | 67 |
| | 7.5 | 14.8 | 11.9 | 1440 | 81 | 0.90 | 50 | 2 | 6.1 | 2.8 | | | 66 | 79 |
| **160L-8/4** | 7 | 16.3 | 13 | 720 | 84 | 0.74 | 93 | 2 | 5.5 | 2.7 | 0.145 | 190 | 54 | 67 |
| | 11 | 22 | 17.5 | 1445 | 81.5 | 0.89 | 73 | 2 | 6.6 | 3 | | | 66 | 79 |
| **180L-8/4** | 11 | 25 | 20 | 725 | 86.5 | 0.73 | 145 | 2 | 6 | 2.8 | 0.243 | 215 | 53 | 66 |
| | 18 | 32 | 25.5 | 1460 | 88.5 | 0.92 | 118 | 2 | 6.9 | 3.1 | | | 63 | 76 |
| **200L-8/4** | 17 | 41 | 33 | 730 | 88 | 0.68 | 222 | 2.2 | 6.4 | 3.5 | 0.438 | 280 | 53 | 67 |
| | 27 | 47 | 37.5 | 1470 | 91 | 0.91 | 175 | 2 | 7.3 | 3.6 | | | 63 | 77 |
| **225S-8/4** | 22 | 48.5 | 39 | 730 | 88.5 | 0.74 | 288 | 2.3 | 6.4 | 3.3 | 0.625 | 372 | 56 | 70 |
| | 32 | 56 | 45 | 1470 | 90.5 | 0.91 | 208 | 2.1 | 7.3 | 3.5 | | | 67 | 81 |
| **225M-8/4** | 26 | 53 | 43 | 730 | 90 | 0.78 | 340 | 2.4 | 6.5 | 3.4 | 0.75 | 404 | 56 | 70 |
| | 38 | 65 | 52 | 1470 | 91 | 0.91 | 247 | 22 | 7.3 | 3.6 | | | 67 | 81 |
| **250M-8/4** | 32 | 65 | 52 | 735 | 90.8 | 0.78 | 416 | 1.9 | 6.8 | 2.9 | 1.28 | 570 | 55 | 69 |
| | 47 | 80 | 64 | 1480 | 92 | 0.92 | 303 | 2 | 7.4 | 3.3 | | | 68 | 82 |
| **280S-8/4** | 42 | 85 | 68 | 735 | 91.5 | 0.78 | 546 | 2.1 | 6.4 | 2.5 | 2 | 740 | 58 | 72 |
| | 60 | 101 | 81 | 1475 | 92.5 | 0.93 | 388 | 2.1 | 7.2 | 3.1 | | | 70 | 84 |
| **280M-8/4** | 50 | 98 | 78 | 735 | 92 | 0.80 | 650 | 2.1 | 6.5 | 2.4 | 2.4 | 810 | 58 | 72 |
| | 72 | 120 | 96 | 1475 | 93 | 0.93 | 466 | 2 | 7.2 | 3 | | | 70 | 84 |
| **315S-8/4** | 60 | 114 | 91 | 740 | 92.5 | 0.82 | 774 | 2.6 | 6.5 | 2.5 | 4.4 | 996 | 67 | 82 |
| | 90 | 150 | 120 | 1480 | 93 | 0.93 | 581 | 2.5 | 7 | 2.6 | | | 79 | 94 |
| **315M-8/4** | 75 | 143 | 114 | 740 | 92.5 | 0.82 | 968 | 2.6 | 6.3 | 2.5 | 5.4 | 1096 | 67 | 82 |
| | 110 | 184 | 147 | 1480 | 93 | 0.93 | 710 | 2.5 | 7.1 | 2.7 | | | 79 | 94 |
| **315L1-8/4** | 90 | 170 | 136 | 740 | 93 | 0.82 | 1161 | 2.7 | 6.6 | 2.6 | 6.6 | 1221 | 67 | 82 |
| | 132 | 220 | 175 | 1480 | 93.5 | 0.93 | 852 | 2.5 | 7.1 | 2.9 | | | 79 | 94 |
| **315L2-8/4** | 115 | 215 | 173 | 740 | 92.5 | 0.83 | 1484 | 2.6 | 6.6 | 2.5 | 8 | 1320 | 67 | 82 |
| | 160 | 265 | 215 | 1480 | 93 | 0.93 | 1032 | 2.6 | 7.1 | 3 | | | 79 | 94 |
| **355M-8/4** | 120 | 230 | 185 | 745 | 94 | 0.8 | 1538 | 1.3 | 6.6 | 2.4 | 8.9 | 1750 | 69 | 85 |
| | 175 | 320 | 255 | 1485 | 94.5 | 0.93 | 1125 | 1.5 | 7.3 | 2.5 | | | 76 | 92 |
| **355L1-8/4** | 140 | 265 | 215 | 745 | 95 | 0.80 | 1795 | 1.4 | 6.9 | 2.5 | 10.9 | 1950 | 69 | 85 |
| | 215 | 345 | 275 | 1490 | 95.3 | 0.95 | 1378 | 1.6 | 7.6 | 2.3 | | | 76 | 92 |
| **355L2-8/4** | 165 | 315 | 250 | 745 | 95 | 0.80 | 2115 | 1.3 | 6.8 | 2.4 | 12.6 | 2200 | 69 | 85 |
| | 250 | 400 | 320 | 1490 | 95.5 | 0.94 | 1602 | 1.5 | 7.6 | 2.4 | | | 76 | 92 |

**Note:**

[1)] Type B3 with terminal compartment type EAR

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | 2p = 4/2 1500/3000 rpm Output | | Size | 2p = 6/4 1000/1500 rpm Output | | Size | 2p = 8/4 750/1500 rpm Output | |
|---|---|---|---|---|---|---|---|---|
| CD... | $P_2$ [kW] | | CD... | $P_2$ [kW] | | CD... | $P_2$ [kW] | |
| **80M1** | 0.17 | 0.65 | - | - | - | - | - | - |
| **80M2** | 0.25 | 0.85 | - | - | - | - | - | - |
| **90S** | 0.37 | 1.4 | 90S | 0.3 | 1 | 90S | 0.13 | 0.6 |
| **90L** | 0.5 | 1.9 | 90L | 0.4 | 1.3 | 90L | 0.18 | 0.8 |
| **100L** | 0.85 | 3.2 | 100L1 | 0.6 | 1.8 | 100L1 | 0.3 | 1.3 |
| **-** | - | - | 100L2 | 0.75 | 2.4 | 100L1 | 0.33 | 1.6 |
| **112M** | 1.2 | 4.4 | 112M | 0.9 | 3 | 112M | 0.5 | 2.5 |
| **132S** | 1.7 | 6 | 132S | 1.3 | 4.3 | 132S | 0.75 | 3.6 |
| **132M** | 2.3 | 9 | 132M | 1.8 | 5.5 | 132M | 1 | 5 |
| **160M** | 3.1 | 11 | 160M | 3 | 9 | 160M1 | 1.6 | 5.5 |
| **160L** | 4.3 | 16 | 160L | 3.5 | 12 | 160M2 | 1.8 | 7.5 |
| **-** | - | - | - | - | - | 160L | 2.3 | 11 |
| **180M** | 5.5 | 20 | - | - | - | - | - | - |
| **180L** | 6.3 | 25 | 180L | 6.5 | 19 | 180L | 3.7 | 18 |
| **200L** | 8.7 | 31 | 200L | 9.5 | 26 | 200L | 5.7 | 27 |
| **225S** | 11 | 38 | 225S | 12 | 34 | 225S | 7.3 | 32 |
| **225M** | 13 | 46 | 225M | 14.5 | 40 | 225M | 8.7 | 38 |
| **250M** | 15 | 55 | 250M | 18 | 52 | 250M | 11 | 47 |
| **280S** | 21 | 75 | 280S | 25 | 70 | 280S | 14 | 60 |
| **280M** | 24 | 87 | 280M | 30 | 82 | 280M | 17 | 72 |
| **315S** | 28 | 100 | 315S | 32 | 95 | 315S | 20 | 90 |
| **315M** | 33 | 125 | 315M | 37 | 115 | 315M | 25 | 110 |
| **315L1** | 40 | 150 | 315L1 | 47 | 135 | 315L1 | 30 | 132 |
| **315L2** | 48 | 175 | 315L2 | 55 | 160 | 315L2 | 38 | 160 |
| **355S** | 53 | 200 | 355S | 60 | 185 | - | - | - |
| **355M1** | 60 | 220 | 355M | 70 | 200 | 355M | 40 | 175 |
| **355M2** | 67 | 250 | 355L | 80 | 230 | 355L1 | 47 | 215 |
| **355L** | 73 | 280 | - | - | - | 355L2 | 55 | 250 |

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | 2p = 4/2 1800/3600 rpm Output | | Size | 2p = 6/4 1200/1800 rpm Output | | Size | 2p = 8/4 900/1800 rpm Output | |
|---|---|---|---|---|---|---|---|---|
| CD.. | $P_2$ [kW] | | CD... | $P_2$ [kW] | | CD... | $P_2$ [kW] | |
| **80M1** | 0.58 | 0.75 | - | - | - | - | - | - |
| **80M2** | 0.81 | 1 | - | - | - | - | - | - |
| **90S** | 1.3 | 1.6 | 90S | 0.52 | 0.75 | 90S | 0.46 | 0.7 |
| **90L** | 1.7 | 2.2 | 90L | 0.7 | 1.05 | 90L | 0.64 | 0.93 |
| **100L** | 3 | 3.7 | 100L1 | 1.05 | 1.5 | 100L1 | 1.05 | 1.5 |
| **-** | - | - | 100L2 | 1.3 | 2 | 100L1 | 1.15 | 1.9 |
| **112M** | 4.3 | 5 | 112M | 1.7 | 2.8 | 112M | 1.8 | 2.9 |
| **132S** | 5.8 | 7 | 132S | 2.5 | 3.8 | 132S | 2.7 | 4.2 |
| **132M** | 8 | 10.5 | 132M | 3.5 | 5.2 | 132M | 3.5 | 5.8 |
| **160M** | 11 | 12.7 | 160M | 5.2 | 8 | 160M1 | 5.4 | 6.4 |
| **160L** | 15 | 18.5 | 160L | 7.5 | 11 | 160M2 | 6.4 | 8.7 |
| **-** | - | - | - | - | - | 160L | 8.1 | 12.7 |
| **180M** | 19 | 23 | - | - | - | - | - | - |
| **180L** | 22 | 29 | 180L | 12.7 | 18.5 | 180L | 12.7 | 21 |
| **200L** | 30 | 36 | 200L | 18.5 | 28 | 200L | 20 | 31 |
| **225S** | 37 | 44 | 225S | 24 | 36 | 225S | 25 | 36 |
| **225M** | 44 | 53 | 225M | 29 | 43 | 225M | 30 | 44 |
| **250M** | 53 | 64 | 250M | 37 | 54 | 250M | 37 | 54 |
| **280S** | 73 | 87 | 280S | 52 | 76 | 280S | 49 | 69 |
| **280M** | 85 | 100 | 280M | 63 | 93 | 280M | 58 | 83 |
| **315S** | 94 | 110 | 315S | 70 | 98 | 315S | 69 | 104 |
| **315M** | 110 | 138 | 315M | 81 | 110 | 315M | 87 | 121 |
| **315L1** | 132 | 165 | 315L1 | 98 | 132 | 315L1 | 104 | 145 |
| **315L2** | 160 | 193 | 315L2 | 110 | 154 | 315L2 | 127 | 176 |
| **355S** | 176 | 220 | 355S | 121 | 176 | - | - | - |
| **355M1** | 198 | 240 | 355M | 143 | 198 | 355M | 123 | 193 |
| **355M2** | 220 | 275 | 355L | 165 | 230 | 355L1 | 154 | 235 |
| **355L** | 240 | 310 | - | - | - | 355L2 | 182 | 275 |

The values are also valid for series BD..

40 °C ambient temperature. winding heating within heat class F

| Size | 2p = 4/2 1800/3600 rpm Output | | Size | 2p = 6/4 1200/1800 rpm Output | | Size | 2p = 8/4 900/1800 rpm Output | |
|---|---|---|---|---|---|---|---|---|
| CD.. | $P_2$ [kW] | | CD… | $P_2$ [kW] | | CD… | $P_2$ [kW] | |
| **80M1** | 0.19 | 0.75 | - | - | - | - | - | - |
| **80M2** | 0.27 | 1 | - | - | - | - | - | - |
| **90S** | 0.43 | 1.6 | 90S | 0.35 | 1.15 | 90S | 0.15 | 0.7 |
| **90L** | 0.57 | 2.2 | 90L | 0.46 | 1.5 | 90L | 0.21 | 0.93 |
| **100L** | 1 | 3.7 | 100L1 | 0.7 | 2.1 | 100L1 | 0.35 | 1.5 |
| **-** | - | - | 100L2 | 0.87 | 2.8 | 100L1 | 0.38 | 1.9 |
| **112M** | 1.4 | 5 | 112M | 1.05 | 3.5 | 112M | 0.6 | 2.9 |
| **132S** | 1.9 | 7 | 132S | 1.5 | 5 | 132S | 0.9 | 4.2 |
| **132M** | 2.7 | 10.5 | 132M | 2.1 | 6.4 | 132M | 1.15 | 5.8 |
| **160M** | 3.7 | 12.7 | 160M | 3.5 | 10.5 | 160M1 | 1.8 | 6.4 |
| **160L** | 5 | 18.5 | 160L | 4.1 | 14 | 160M2 | 2.1 | 8.7 |
| **-** | - | - | - | - | - | 160L | 2.7 | 12.7 |
| **180M** | 6.3 | 23 | - | - | - | - | - | - |
| **180L** | 7.3 | 29 | 180L | 7.5 | 22 | 180L | 4.2 | 21 |
| **200L** | 10 | 36 | 200L | 11 | 30 | 200L | 6.7 | 31 |
| **225S** | 12 | 44 | 225S | 14 | 39 | 225S | 8.3 | 36 |
| **225M** | 15 | 53 | 225M | 17 | 46 | 225M | 10 | 44 |
| **250M** | 18 | 64 | 250M | 21 | 60 | 250M | 12 | 54 |
| **280S** | 24 | 87 | 280S | 29 | 81 | 280S | 16 | 69 |
| **280M** | 28 | 100 | 280M | 35 | 95 | 280M | 19 | 83 |
| **315S** | 31 | 110 | 315S | 37 | 110 | 315S | 23 | 104 |
| **315M** | 37 | 138 | 315M | 43 | 127 | 315M | 29 | 121 |
| **315L1** | 44 | 165 | 315L1 | 54 | 149 | 315L1 | 35 | 145 |
| **315L2** | 53 | 193 | 315L2 | 64 | 176 | 315L2 | 42 | 176 |
| **355S** | 59 | 220 | 355S | 69 | 205 | - | - | - |
| **355M1** | 66 | 240 | 355M | 81 | 220 | 355M | 44 | 193 |
| **355M2** | 73 | 275 | 355L | 93 | 255 | 355L1 | 51 | 235 |
| **355L** | 80 | 310 | - | - | - | 355L2 | 61 | 275 |

The values are also valid for series BD..

# Motors with built-in brake
# Mains operation 50 Hz



Temperature class T4,
2p = 2, 4, 6, 8

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Starting torque | Starting current | Motor torque | Brake-torque[1] | type | Mass moment of inertia | Weight[2] | Permissible switching operations per hour with operating mode S4 15. 20. 40 or 60% ED | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BD...B** | | 400V | 500V | | | | | | | | | | | | | | |
| | $P_2$ [kW] | I [A] | I [A] | n [rpm] | η [%] | cos φ | $M_A / M_N$ | $I_A / I_N$ | M [Nm] | $M_e$ [Nm] | | J [kgm²] | m [kg] | Fl = 1.5 [S/h] | Fl = 2 [S/h] | Fl = 3 [S/h] | Fl = 4 [S/h] |
| **$n_s$ = 3000 rpm 2p = 2** | | | | | | **Efficiency according to manufacturer's standard** | | | | | | | | | | | |
| **80M1-2** | 0.75 | 1.73 | 1.38 | 2790 | 74.5 | 0.84 | 2.7 | 4.8 | 2.57 | 20 | M16 | 0.0028 | 37 | 1110 | 935 | 710 | 570 |
| **80M2-2** | 1.1 | 2.5 | 1.99 | 2820 | 78 | 0.82 | 2.8 | 5.5 | 3.73 | 20 | M16 | 0.0031 | 41 | 580 | 495 | 435 | 320 |
| **90S-2** | 1.5 | 3.25 | 2.6 | 2840 | 77 | 0.86 | 2.9 | 5.9 | 5 | 46 | M32 | 0.0052 | 53 | 130 | 115 | 90 | 80 |
| **90L-2** | 2.2 | 4.55 | 3.65 | 2850 | 82 | 0.85 | 3 | 6.3 | 7.4 | 46 | M32 | 0.0059 | 56 | 184 | 165 | 135 | 115 |
| **100L-2** | 3 | 6.1 | 4.85 | 2850 | 82 | 0.87 | 2.7 | 6.8 | 10.1 | 46 | M32 | 0.0057 | 63 | 71 | 65 | 54 | 47 |
| **112M-2** | 4 | 7.7 | 6.2 | 2880 | 85 | 0.88 | 2.3 | 6.5 | 13.3 | 86 | M60 | 0.0112 | 105 | 140 | 120 | 95 | 75 |
| **132S1-2** | 5.5 | 10.7 | 8.5 | 2880 | 85.5 | 0.87 | 2.5 | 6.4 | 18.2 | 86 | M60 | 0.0151 | 120 | 53 | 46 | 37 | 30 |
| **132S2-2** | 7.5 | 14.4 | 11.5 | 2910 | 86.5 | 0.87 | 2.7 | 6.8 | 24.7 | 86 | M60 | 0.0197 | 132 | 70 | 60 | 45 | 40 |
| **$n_s$ = 1500 rpm 2p = 4** | | | | | | **Efficiency according to manufacturer's standard** | | | | | | | | | | | |
| **80M1-4** | 0.55 | 1.38 | 1.1 | 1380 | 72 | 0.8 | 2 | 3.8 | 3.8 | 20 | M16 | 0.0037 | 30 | 1340 | 1185 | 960 | 800 |
| **80M2-4** | 0.75 | 1.81 | 1.45 | 1400 | 75.5 | 0.79 | 2.1 | 4.5 | 5.1 | 20 | M16 | 0.0043 | 41 | 1340 | 1170 | 930 | 640 |
| **90S-4** | 1.1 | 2.55 | 2.05 | 1400 | 76 | 0.83 | 2.1 | 4.8 | 7.5 | 46 | M32 | 0.0068 | 52 | 230 | 205 | 170 | 145 |
| **90L-4** | 1.5 | 3.35 | 2.65 | 1405 | 79 | 0.82 | 2.3 | 5 | 10.2 | 46 | M32 | 0.0079 | 54 | 270 | 245 | 200 | 170 |
| **100L1-4** | 2.2 | 4.95 | 3.95 | 1420 | 80 | 0.8 | 2.4 | 5.4 | 14.8 | 46 | M32 | 0.0119 | 69 | 235 | 215 | 185 | 165 |
| **100L2-4** | 3 | 6.5 | 5.2 | 1415 | 81.7 | 0.82 | 2.3 | 5.5 | 20.2 | 46 | M32 | 0.0119 | 69 | 110 | 105 | 90 | 80 |
| **112M-4** | 4 | 8.1 | 6.5 | 1435 | 85 | 0.84 | 2.7 | 6.8 | 26.5 | 86 | M60 | 0.0233 | 110 | 220 | 210 | 180 | 160 |
| **132S-4** | 5.5 | 10.8 | 8.6 | 1440 | 86.5 | 0.85 | 2.5 | 6.4 | 36.5 | 86 | M60 | 0.0317 | 130 | 100 | 95 | 75 | 65 |
| **132M-4** | 7.5 | 14.3 | 11.4 | 1440 | 88 | 0.86 | 2.7 | 6.5 | 50 | 86 | M60 | 0.0417 | 142 | 100 | 90 | 75 | 65 |
| **$n_s$ = 1000 rpm 2p = 6** | | | | | | **Efficiency according to manufacturer's standard** | | | | | | | | | | | |
| **80M1-6** | 0.37 | 1.12 | 0.9 | 925 | 67 | 0.71 | 2.5 | 4.1 | 3.8 | 20 | M16 | 0.005 | 30 | 1120 | 950 | 725 | 590 |
| **80M2-6** | 0.55 | 1.6 | 1.28 | 925 | 69 | 0.72 | 2.4 | 4 | 5.7 | 20 | M16 | 0.006 | 31 | 1145 | 980 | 765 | 620 |
| **90S-6** | 0.75 | 2.15 | 1.72 | 910 | 70.2 | 0.75 | 1.8 | 3.4 | 7.9 | 46 | M32 | 0.0097 | 52 | 675 | 605 | 500 | 425 |
| **90L-6** | 1.1 | 3.05 | 2.45 | 920 | 73 | 0.73 | 2 | 3.7 | 11.4 | 46 | M32 | 0.0119 | 54 | 125 | 115 | 100 | 85 |
| **100L-6** | 1.5 | 3.75 | 3 | 945 | 77 | 0.75 | 2.5 | 4.9 | 15.2 | 46 | M32 | 0.0181 | 69 | 240 | 215 | 175 | 145 |
| **112M-6** | 2.2 | 5.2 | 4.2 | 950 | 81 | 0.75 | 2.7 | 5.6 | 22.1 | 86 | M60 | 0.0308 | 110 | 595 | 530 | 425 | 355 |
| **132S-6** | 3 | 6.6 | 5.3 | 965 | 84 | 0.78 | 2.7 | 6.3 | 29.7 | 86 | M60 | 0.0321 | 117 | 390 | 350 | 290 | 250 |
| **132M1-6** | 4 | 8.6 | 6.9 | 960 | 85 | 0.79 | 2.6 | 6 | 39.6 | 86 | M60 | 0.0376 | 121 | 215 | 195 | 160 | 140 |
| **132M2-6** | 5.5 | 11.4 | 9.1 | 960 | 86 | 0.81 | 2.6 | 6.4 | 55 | 86 | M60 | 0.0489 | 134 | 125 | 110 | 95 | 80 |
| **$n_s$ = 750 rpm 2p = 8** | | | | | | **Efficiency according to manufacturer's standard** | | | | | | | | | | | |
| **80M1-8** | 0.18 | 0.74 | 0.59 | 690 | 54 | 0.65 | 2.2 | 3.2 | 2.5 | 20 | M16 | 0.005 | 30 | 1125 | 940 | 710 | 580 |
| **80M2-8** | 0.25 | 0.96 | 0.77 | 690 | 58.5 | 0.64 | 2.2 | 3.2 | 3.5 | 20 | M16 | 0.006 | 31 | 1125 | 940 | 710 | 580 |
| **90S-8** | 0.37 | 1.36 | 1.10 | 690 | 60 | 0.65 | 1.8 | 3 | 5.1 | 46 | M32 | 0.0097 | 39 | 1285 | 1090 | 920 | 780 |
| **90L-8** | 0.55 | 1.94 | 1.55 | 690 | 63 | 0.65 | 1.8 | 3.1 | 7.6 | 46 | M32 | 0.0119 | 43 | 1160 | 980 | 830 | 690 |
| **100L1-8** | 0.75 | 2.45 | 1.96 | 710 | 67 | 0.66 | 2.4 | 4 | 10.1 | 46 | M32 | 0.0119 | 69 | 970 | 820 | 690 | 570 |
| **100L2-8** | 1.1 | 3.15 | 2.5 | 695 | 69 | 0.73 | 2 | 3.8 | 15.1 | 46 | M32 | 0.0181 | 69 | 880 | 750 | 630 | 520 |
| **112M-8** | 1.5 | 4.15 | 3.3 | 710 | 76 | 0.67 | 2.2 | 4.6 | 20.2 | 86 | M60 | 0.0293 | 107 | 680 | 560 | 480 | 406 |
| **132S-8** | 2.2 | 5.2 | 4.2 | 695 | 77 | 0.79 | 2 | 4.1 | 30 | 86 | M60 | 0.0306 | 114 | 650 | 550 | 460 | 380 |
| **132M-8** | 3 | 7 | 5.6 | 705 | 80.5 | 0.77 | 2.4 | 4.6 | 41 | 86 | M60 | 0.0399 | 130 | 630 | 520 | 450 | 360 |

**Note**

[1] Tolerance -20%/+40% at 1 m/s friction speed

[2] Type B3 with terminal compartment type EAR

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Starting torque | Starting current | Motor torque | Brake-torque[1] | type | Mass moment of inertia | Weight[2] | Permissible switching operations per hour with operating mode S4 15. 20. 40 or 60% ED | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BD...Y3B | $P_2$ [kW] | 400V I [A] | 500V I [A] | n [rpm] | η [%] | cos φ | $M_A / M_N$ | $I_A / I_N$ | M [Nm] | $M_e$ [Nm] | | J [kgm²] | m [kg] | Fl = 1.5 [S/h] | Fl = 2 [S/h] | Fl = 3 [S/h] | Fl = 4 [S/h] |
| **$n_s$ = 3000 rpm 2p = 2** | | | | | **IE3** | Efficiency according to IEC 60034-30 | | | | | | | | | | | |
| **80M1-2** | 0.75 | 1.5 | 1.20 | 2890 | 82.8 | 0.87 | 3 | 6.6 | 2.48 | | | by request | | 1110 | 935 | 710 | 570 |
| **80M2-2** | 1.1 | 2.2 | 1.74 | 2885 | 83.7 | 0.87 | 3.2 | 7.1 | 3.64 | | | by request | | 580 | 495 | 435 | 320 |
| **90S-2** | 1.5 | 2.9 | 2.3 | 2895 | 84.7 | 0.88 | 3 | 6.8 | 4.95 | | | by request | | 130 | 115 | 90 | 80 |
| **90L-2** | 2.2 | 4.2 | 3.35 | 2900 | 86.4 | 0.88 | 3 | 6.9 | 7.2 | | | by request | | 184 | 165 | 135 | 115 |
| **100L-2** | 3 | 5.6 | 4.45 | 2910 | 88.1 | 0.88 | 2.5 | 6.9 | 9.8 | | | by request | | 71 | 65 | 54 | 47 |
| **112M-2** | 4 | 7.5 | 6 | 2930 | 88.4 | 0.87 | 2.8 | 6.9 | 13 | | | by request | | 140 | 120 | 95 | 75 |
| **132S1-2** | 5.5 | 10 | 8 | 2925 | 89.5 | 0.89 | 2.5 | 7 | 18 | | | by request | | 53 | 46 | 37 | 30 |
| **132S1-2** | 7.5 | 13.5 | 10.78 | 2930 | 90.3 | 0.89 | 2.7 | 7.1 | 24.4 | | | by request | | 70 | 60 | 45 | 40 |
| **$n_s$ = 1500 rpm 2p = 4** | | | | | **IE3** | Efficiency according to IEC 60034-30 | | | | | | | | | | | |
| **80M1-4** | 0.55 | 1.24 | 0.99 | 1440 | 81 | 0.79 | 2.9 | 6.8 | 3.65 | | | by request | | 1340 | 1185 | 960 | 800 |
| **80M2-4** | 0.75 | 1.68 | 1.344 | 1445 | 82.6 | 0.78 | 3.2 | 6.8 | 5 | | | by request | | 1340 | 1170 | 930 | 640 |
| **90S-4** | 1.1 | 2.35 | 1.886 | 1455 | 84.2 | 0.8 | 2.4 | 6.8 | 7.2 | | | by request | | 230 | 205 | 170 | 145 |
| **90L-4** | 1.5 | 3.15 | 2.501 | 1450 | 85.5 | 0.81 | 2.5 | 6.9 | 9.9 | | | by request | | 270 | 245 | 200 | 170 |
| **100L1-4** | 2.2 | 4.35 | 3.45 | 1450 | 87.1 | 0.84 | 2.9 | 7.3 | 14.5 | | | by request | | 235 | 215 | 185 | 165 |
| **100L2-4** | 3 | 5.9 | 4.697 | 1450 | 87.8 | 0.84 | 3.1 | 7.4 | 18.8 | | | by request | | 110 | 105 | 90 | 80 |
| **112M-4** | 4 | 7.8 | 6.3 | 1460 | 88.7 | 0.83 | 3 | 7.2 | 26.2 | | | by request | | 220 | 210 | 180 | 160 |
| **132S-4** | 5.5 | 10.42 | 8.3 | 1460 | 89.6 | 0.85 | 3.2 | 7.1 | 36 | | | by request | | 100 | 95 | 75 | 65 |
| **132M-4** | 7.5 | 13.90 | 11.13 | 1460 | 90.5 | 0.86 | 3.1 | 7.4 | 49 | | | by request | | 100 | 90 | 75 | 65 |
| **$n_s$ = 1000 rpm 2p = 6** | | | | | **IE3** | Efficiency according to IEC 60034-30 | | | | | | | | | | | |
| **80M1-6** | 0.37 | 1.02 | 0.82 | 950 | 73.8 | 0.71 | 1.7 | 4.4 | 3.70 | | | by request | | 1120 | 950 | 725 | 590 |
| **80M2-6** | 0.55 | 1.41 | 1.12 | 945 | 77.4 | 0.73 | 1.8 | 4.5 | 5.3 | | | by request | | 1145 | 980 | 765 | 620 |
| **90S-6** | 0.75 | 1.955 | 1.56 | 955 | 79.1 | 0.70 | 2.7 | 5.5 | 7.5 | | | by request | | 675 | 605 | 500 | 425 |
| **90L-6** | 1.1 | 2.7 | 2.15 | 955 | 81.4 | 0.72 | 2.8 | 5.9 | 11 | | | by request | | 125 | 115 | 100 | 85 |
| **100L-6** | 1.5 | 3.652 | 2.9 | 965 | 83.5 | 0.71 | 3 | 6.8 | 14.8 | | | by request | | 240 | 215 | 175 | 145 |
| **112M-6** | 2.2 | 4.75 | 3.8 | 965 | 85.5 | 0.78 | 2.6 | 6.8 | 21.8 | | | by request | | 595 | 530 | 425 | 355 |
| **132S-6** | 3 | 6.8 | 5.5 | 970 | 85.7 | 0.74 | 3.2 | 7.1 | 29.5 | | | by request | | 390 | 350 | 290 | 250 |
| **132M1-6** | 4 | 8.7 | 7 | 965 | 87 | 0.76 | 2.9 | 6.9 | 39.6 | | | by request | | 215 | 195 | 160 | 140 |
| **132M2-6** | 5.5 | 11.53 | 9.2 | 965 | 88.3 | 0.78 | 2.9 | 7.2 | 54 | | | by request | | 125 | 110 | 95 | 80 |
| **$n_s$ = 750 rpm 2p = 8** | | | | | **IE3** | Efficiency according to IEC 60034-30 | | | | | | | | | | | |
| **80M1-8** | 0.18 | 0.71 | 0.57 | 705 | 63 | 0.58 | 1.9 | 3.2 | 2.43 | | | by request | | 1125 | 940 | 710 | 580 |
| **80M2-8** | 0.25 | 0.90 | 0.72 | 710 | 67 | 0.60 | 1.7 | 3.3 | 3.35 | | | by request | | 1125 | 940 | 710 | 580 |
| **90S-8** | 0.37 | 1.16 | 0.93 | 715 | 72 | 0.64 | 1.7 | 4.4 | 4.95 | | | by request | | 1285 | 1090 | 920 | 780 |
| **90L-8** | 0.55 | 1.68 | 1.34 | 715 | 74 | 0.64 | 1.8 | 4.5 | 7.3 | | | by request | | 1160 | 980 | 830 | 690 |
| **100L1-8** | 0.75 | 2.25 | 1.80 | 720 | 76 | 0.64 | 2.3 | 5 | 9.9 | | | by request | | 970 | 820 | 690 | 570 |
| **100L2-8** | 1.1 | 3.1 | 2.5 | 715 | 78 | 0.67 | 2.2 | 4.8 | 14.7 | | | by request | | 880 | 750 | 630 | 520 |
| **112M-8** | 1.5 | 3.5 | 2.8 | 705 | 80.6 | 0.77 | 2 | 4.9 | 20.3 | | | by request | | 680 | 560 | 480 | 406 |
| **132S-8** | 2.2 | 5.4 | 4.3 | 710 | 82 | 0.72 | 2.8 | 6.3 | 29.6 | | | by request | | 650 | 550 | 460 | 380 |
| **132M-8** | 3 | 7.2 | 5.8 | 715 | 83.5 | 0.72 | 2.7 | 6.3 | 40 | | | by request | | 630 | 520 | 450 | 360 |

**Note**
[1] Tolerance -20%/+40% at 1 m/s friction speed
[2] Type B3 with terminal compartment type EAR

| Size | Output | Rated current at | | Speed | Effi-ciency | Power factor | Starting torque | Starting current | Motor torque | Brake torque[1] | type | Mass-moment of inertia | Weight[2] | Permissible switching operations per hour with operating mode S4 15. 20. 40 or 60% ED | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BD…B | $P_2$ | 400V I | 500V I | n | η | cos φ | $M_A / M_N$ | $I_A / I_N$ | M | $M_e$ | | J | m | Fl = 1.5 | Fl = 2 | Fl = 3 | Fl = 4 |
| | [kW] | [A] | [A] | [rpm] | [%] | | | | [Nm] | [Nm] | | [kgm²] | [kg] | [S/h] | [S/h] | [S/h] | [S/h] |
| **$n_s$ = 750/1500 rpm 2p = 8/4** | | | | | | | | | | | | | | | | | |
| **90S-8/4** | 0.4 | 1.62 | 1.3 | 695 | 57.5 | 0.62 | 1.6 | 2.9 | 5.5 | 20 | M 16 | 0.0049 | 38 | by request | | | |
| | 0.6 | 1.46 | 1.17 | 1395 | 69 | 0.86 | 1.6 | 4.2 | 4.1 | | | | | | | | |
| **90L-8/4** | 0.55 | 2.1 | 1.68 | 700 | 60 | 0.63 | 1.6 | 3.3 | 7.5 | 20 | M 16 | 0.0069 | 42 | | | | |
| | 0.8 | 1.84 | 1.47 | 1410 | 72 | 0.87 | 1.8 | 4.6 | 5.4 | | | | | | | | |
| **100L1-8/4** | 0.9 | 3.05 | 2.45 | 690 | 60 | 0.71 | 1.6 | 3.2 | 12.5 | 46 | M 32 | 0.0098 | 51 | by request | | | |
| | 1.3 | 3 | 2.45 | 1385 | 69.5 | 0.89 | 1.5 | 4.2 | 9 | | | | | | | | |
| **100L2-8/4** | 1 | 3.1 | 2.5 | 700 | 65 | 0.71 | 1.7 | 3.7 | 13.6 | 46 | M 32 | 0.0138 | 54 | | | | |
| | 1.6 | 3.6 | 2.9 | 1395 | 71 | 0.9 | 1.6 | 4.5 | 11 | | | | | | | | |
| **112M-8/4** | 1.5 | 4.6 | 3.7 | 710 | 72.5 | 0.65 | 2 | 4.4 | 20.2 | 46 | M 32 | 0.0218 | 69 | by request | | | |
| | 2.5 | 5.1 | 4.1 | 1410 | 78 | 0.9 | 1.9 | 5.2 | 16.9 | | | | | | | | |
| **132S-8/4** | 2.3 | 6.8 | 5.4 | 720 | 75 | 0.65 | 1.8 | 4.4 | 30.5 | 86 | M 60 | 0.0353 | 127 | by request | | | |
| | 3.6 | 7.2 | 5.8 | 1440 | 81 | 0.89 | 1.8 | 5.8 | 23.8 | | | | | | | | |
| **132M-8/4** | 3 | 8.5 | 6.7 | 720 | 78 | 0.66 | 2 | 4.6 | 40 | 86 | M 60 | 0.0498 | 138 | | | | |
| | 5 | 9.7 | 7.8 | 1440 | 82.5 | 0.9 | 1.9 | 5.8 | 33 | | | | | | | | |
| **$n_s$ = 750/3000 rpm 2p = 8/2** | | | | | | | | | | | | | | | | | |
| **80M1-8/2** | 0.1 | 0.5 | 0.4 | 685 | 46.5 | 0.62 | 1.5 | 2.3 | 1.39 | 10 | M 8 | 0.0015 | 26 | by request | | | |
| | 0.4 | 1.07 | 0.86 | 2870 | 62.5 | 0.86 | 2.3 | 5.5 | 1.33 | | | | | | | | |
| **80M2-8/2** | 0.14 | 0.69 | 0.55 | 685 | 47 | 0.62 | 1.4 | 2.5 | 1.95 | 10 | M 8 | 0.0019 | 27 | | | | |
| | 0.56 | 1.51 | 1.21 | 2870 | 63 | 0.85 | 2 | 6 | 1.86 | | | | | | | | |
| **90S-8/2** | 0.2 | 0.95 | 0.76 | 710 | 49 | 0.62 | 1.9 | 2.3 | 2.7 | 20 | M 16 | 0.0035 | 38 | by request | | | |
| | 0.8 | 2 | 1.61 | 2885 | 63 | 0.91 | 2.3 | 5.5 | 2.65 | | | | | | | | |
| **90L-8/2** | 0.3 | 1.37 | 1.1 | 710 | 51 | 0.62 | 1.7 | 2.8 | 4 | 20 | M 16 | 0.0058 | 42 | | | | |
| | 1.1 | 2.55 | 2.05 | 2885 | 68 | 0.91 | 2.1 | 6.2 | 3.6 | | | | | | | | |
| **100L1-8/2** | 0.33 | 1.42 | 1.14 | 715 | 54 | 0.62 | 1.9 | 3 | 4.4 | 46 | M32 | 0.0069 | 51 | by request | | | |
| | 1.3 | 2.85 | 2.25 | 2885 | 72 | 0.92 | 1.8 | 6 | 4.3 | | | | | | | | |
| **100L2-8/2** | 0.4 | 1.68 | 1.34 | 715 | 55.5 | 0.62 | 1.9 | 3.3 | 5.3 | 46 | M 32 | 0.007 | 54 | | | | |
| | 1.5 | 3.2 | 2.55 | 2890 | 73.5 | 0.92 | 1.8 | 6.1 | 5 | | | | | | | | |
| **112M-8/2** | 0.55 | 2.15 | 1.72 | 715 | 59.5 | 0.62 | 1.6 | 3.2 | 7.3 | 46 | M 32 | 0.011 | 69 | by request | | | |
| | 2.2 | 4.4 | 3.5 | 2930 | 78.5 | 0.92 | 2.5 | 7.2 | 7.2 | | | | | | | | |
| **132S-8/2** | 0.8 | 2.95 | 2.35 | 720 | 60 | 0.65 | 1.7 | 3.2 | 10.6 | 86 | M 60 | 0.0286 | 127 | by request | | | |
| | 3.2 | 6.6 | 5.3 | 2925 | 76.5 | 0.92 | 2.5 | 7.2 | 10.4 | | | | | | | | |
| **132M-8/2** | 1.1 | 3.8 | 3.05 | 725 | 65 | 0.64 | 2.1 | 3.5 | 14.5 | 86 | M 60 | 0.037 | 138 | | | | |
| | 4.2 | 8.1 | 6.5 | 2935 | 80.5 | 0.93 | 2.6 | 7.2 | 13.7 | | | | | | | | |

**Note:**

[1] Tolerance -20%/+40% at 1 m/s friction speed

[2] Type B3 with terminal compartment type EAR

# Motors with mounted brake
# Mains operation 50 Hz



| Size<br><br>CD … SM<br>CD … SMN | Output<br><br>$P_2$<br>[kW] | Motor torque<br><br>M<br>[Nm] | Braking torque<br><br>$M_B$<br>[Nm] | Brake type CM/CM...N | Mass moment of inertia of brake<br><br>$J_B$<br>[kgm²] | Brake weight<br><br>m<br>[kg] | Total weight<br>CD…SM[1)]<br>m<br>[kg] | <br>CD…SMN[1)]<br>m<br>[kg] |
|---|---|---|---|---|---|---|---|---|
| **ns = 3000 rpm. 2p = 2** | | | | | | | | |
| 71M1-2 | 0.37 | 1.26 | 5 | 71 | - | - | - | - |
| 71M2-2 | 0.55 | 1.87 | 5 | 71 | - | - | - | - |
| 80M1-2 | 0.75 | 2.57 | 16 | 80 | 0.00033 | 31 | 55 | 57 |
| 80M2-2 | 1.1 | 3.73 | 16 | 80 | 0.00033 | 31 | 56 | 58 |
| 90S-2 | 1.5 | 5 | 20 | 90 | 0.00033 | 31 | 63 | 64 |
| 90L-2 | 2.2 | 7.4 | 20 | 90 | 0.00033 | 31 | 66 | 67 |
| 100L-2 | 3 | 10.1 | 50 | 112 | 0.00133 | 43 | 86 | 88 |
| 112M-2 | 4 | 13.3 | 50 | 112 | 0.00133 | 43 | 95 | 99 |
| 132S1-2 | 5.5 | 18.2 | 100 | 132 | 0.003 | 67 | 165 | 174 |
| 132S2-2 | 7.5 | 24.6 | 100 | 132 | 0.003 | 67 | 172 | 181 |
| 160M1-2 | 11 | 36 | 150 | 160 | 0.0057 | 100 | 270 | 278 |
| 160M2-2 | 15 | 49 | 150 | 160 | 0.0057 | 100 | 285 | 293 |
| 160L-2 | 18.5 | 60 | 150 | 160 | 0.0057 | 100 | 295 | 303 |
| **ns = 1500 rpm. 2p = 4** | | | | | | | | |
| 71M1-4 | 0.25 | 1.74 | 5 | 71 | - | - | - | - |
| 71M2-4 | 0.37 | 2.56 | 5 | 71 | - | - | - | - |
| 80M1-4 | 0.55 | 3.8 | 16 | 80 | 0.00033 | 31 | 54 | 56 |
| 80M2-4 | 0.75 | 5.1 | 16 | 80 | 0.00033 | 31 | 56 | 58 |
| 90S-4 | 1.1 | 7.5 | 20 | 90 | 0.00033 | 31 | 63 | 64 |
| 90L-4 | 1.5 | 10.2 | 20 | 90 | 0.00033 | 31 | 65 | 66 |
| 100L1-4 | 2.2 | 14.8 | 50 | 112 | 0.00133 | 43 | 86 | 88 |
| 100L2-4 | 3 | 20.2 | 50 | 112 | 0.00133 | 43 | 89 | 91 |
| 112M-4 | 4 | 26.6 | 50 | 112 | 0.00133 | 43 | 99 | 103 |
| 132S-4 | 5.5 | 36.5 | 100 | 132 | 0.003 | 67 | 172 | 181 |
| 132M-4 | 7.5 | 50 | 100 | 132 | 0.003 | 67 | 181 | 190 |
| 160M-4 | 11 | 72 | 150 | 160 | 0.0057 | 100 | 277 | 285 |
| 160L-4 | 15 | 98 | 150 | 160 | 0.0057 | 100 | 293 | 301 |

**Note:**
[1)] Type B3 with terminal compartment type EAR and brake

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



## Temperature class T4, Type CD...S, Type CD... SV and ...SVN

| Size | Output | Motor torque | Braking torque | Brake type | Mass moment of inertia of brake | Total weight[1)] |
|---|---|---|---|---|---|---|
| | $P_2$ [kW] | M [Nm] | $M_B$ [Nm] | | $J_B$ [kgm²] | m [kg] |
| **ns = 3000 rpm. 2p = 2** | | | | | | |
| **180 M-2** | 22 | 72 | 150 | 19 | 0.0125 | 310 |
| **200L1 -2** | 30 | 97 | 270 | 24 | 0.0125 | 360 |
| **200L2 -2** | 37 | 120 | 270 | 24 | 0.0125 | 385 |
| **ns = 1500 rpm 2p = 4** | | | | | | |
| **180M-4** | 18.5 | 121 | 150 | 19 | 0.0125 | 295 |
| **180L-4** | 22 | 144 | 270 | 24 | 0.0125 | 310 |
| **200L-4** | 30 | 196 | 270 | 24 | 0.0125 | 380 |

| Size | Output | Motor torque | Braking torque | Brake type | Total weight[1)] |
|---|---|---|---|---|---|
| **CD …SV** | $P_2$ [kW] | M [Nm] | $M_B$ [Nm] | | m [kg] |
| **ns = 3000 rpm 2p = 2** | | | | | |
| **180M-2*** | 22 | 72 | 250 | 180 | 331 |
| **200L1-2*** | 30 | 97 | 390 | 200 | 404 |
| **200L2-2*** | 37 | 120 | 390 | 200 | 428 |
| **ns = 1500 rpm 2p = 4** | | | | | |
| **180M-4** | 18.5 | 121 | 250 | 180 | 333 |
| **180L-4** | 22 | 144 | 250 | 180 | 352 |
| **200L-4** | 30 | 196 | 390 | 200 | 424 |
| **225S-4** | 37 | 241 | 390 | 225 | 547 |
| **225M-4** | 45 | 292 | 390 | 225 | 577 |
| **250M-4** | 55 | 357 | 900 | 250 | 838 |

| Size | Output | Motor torque | Braking torque | Brake type | Total weight[1)] |
|---|---|---|---|---|---|
| **CD…SVN** | $P_2$ [kW] | M [Nm] | $M_B$ [Nm] | | m [kg] |
| **ns = 1500 rpm 2p = 4** | | | | | |
| **180 M-2*** | 22 | 72 | 150 | 350 | 320 |
| **200L1-2*** | 30 | 97 | 270 | 350 | 370 |
| **200L2-2*** | 37 | 120 | 270 | 350 | 390 |
| **ns = 1500 rpm 2p = 4** | | | | | |
| **180M-4** | 18.5 | 121 | 180-350 | 350 | 305 |
| **180L-4** | 22 | 144 | 180-350 | 350 | 320 |
| **200L-4** | 30 | 196 | 180-350 | 350 | 390 |
| **225S-4** | 37 | 241 | 350-750 | 750 | 625 |
| **225M-4** | 45 | 292 | 350-750 | 750 | 655 |
| **250M-4** | 55 | 357 | 350-750 | 750 | 810 |
| **280S-4** | 75 | 484 | 350-750 | 750 | 1020 |
| **280M-4** | 90 | 579 | 350-750 | 750 | 1090 |

* only S3 40 %

**Note:**
[1)] Type B3 with terminal compartment type EAR and brake
Number of poles 6 and 8 by request.

**Built-in brakes type ...YB**

| Size Motor | Voltage U = [Nm] | Current I = [A] | Resistance $R_{min}$ [Ω] | Voltage U ~ [V] | Current I ~ [A] |
|---|---|---|---|---|---|
| **80** | 24 | 1.5 | 16 | - | - |
| | 103 | 0.36 | 290 | 230 | 0.57 |
| | 130 | 0.35 | 376 | 290 | 0.55 |
| | 176 | 0.26 | 684 | 400 | 0.41 |
| **90** | 24 | 1.85 | 13 | - | - |
| | 103 | 0.42 | 244 | 230 | 0.66 |
| | 130 | 0.35 | 376 | 290 | 0.55 |
| | 176 | 0.31 | 575 | 400 | 0.49 |
| **100 and 112** | 24 | 1.85 | 13 | - | - |
| | 103 | 0.42 | 244 | 230 | 0.66 |
| | 130 | 0.35 | 376 | 290 | 0.55 |
| | 176 | 0.31 | 575 | 400 | 0.49 |
| **132** | 24 | 2.93 | 8.58 | - | - |
| | 130 | 0.56 | 232 | 290 | 0.88 |
| | 176 | 0.49 | 360 | 400 | 0.77 |

**Mounting brakes type ...SM(N)**

| Size Motor | Voltage U = [Nm] | Current I = [A] | Output P = [W] | Voltage U ~ [V] | Current I ~ [A] | Resistance R [Ω] |
|---|---|---|---|---|---|---|
| **CM 71** | 24 | 0.92 | 22 | - | - | 26 |
| **CM 80** | 24 | 1.54 | 37 | - | - | 15 |
| | 104 | 0.43 | 44 | 230 | 0.16 | 293 |
| | 180 | 0.23 | 42 | 400 | 0.37 | 771 |
| | 207 | 0.19 | 40 | 460 | 0.09 | 1072 |
| **CM 90** | 24 | 1.54 | 37 | - | - | 15 |
| | 104 | 0.43 | 44 | 230 | 0.16 | 771 |
| | 180 | 0.23 | 42 | 400 | 0.37 | 293 |
| | 207 | 0.19 | 40 | 460 | 0.09 | 1072 |
| **CM100** | 24 | 2.42 | 58 | - | - | 10 |
| | 104 | 0.56 | 58 | 230 | 0.88 | 186 |
| | 180 | 0.33 | 59 | 400 | 0.52 | 550 |
| | 207 | 0.30 | 62 | 460 | 0.48 | 691 |
| **CM112 (M60)** | 24 | 2.42 | 58 | - | - | 10 |
| | 104 | 0.56 | 58 | 230 | 0.88 | 186 |
| | 180 | 0.33 | 59 | 400 | 0.52 | 550 |
| | 207 | 0.30 | 62 | 460 | 0.48 | 691 |
| **CM132 (M100)** | 24 | 3.42 | 82 | - | - | 7 |
| | 104 | 0.83 | 86 | 230 | 1.3 | 126 |
| | 180 | 0.46 | 82 | 400 | 0.72 | 395 |
| | 207 | 0.43 | 89 | 460 | 0.68 | 481 |
| **CM160 (M150)** | 24 | 3.96 | 95 | - | - | 6 |
| | 104 | 0.94 | 98 | 230 | 1.48 | 111 |
| | 180 | 0.53 | 94 | 400 | 0.82 | 345 |
| | 207 | 0.48 | 99 | 460 | 0.75 | 433 |

**Mounting brakes type ...S**

| Size Motor | Torque M [Nm] | Voltage U = [Nm] | Current I = [A] | Resistance $R_{min}$ [Ω] | Voltage U ~ [V] | Current I ~ [A] |
|---|---|---|---|---|---|---|
| **10/11** | 10 or 20 | 24 | 2.1 | 11.6 | - | - |
| | | 98 | 0.55 | 177 | 110 | 0.61 |
| | | 205 | 0.27 | 770 | 230 | 0.3 |
| | | 215 | 0.225 | 954 | 240 | 0.25 |
| | | 258 | 0.21 | 1197 | 270 | 0.23 |
| | | 356 | 0.14 | 2571 | 400 | 0.16 |
| **13/16** | 50 or 100 | 24 | 2.93 | 8.2 | - | - |
| | | 98 | 0.8 | 122.4 | 110 | 0.89 |
| | | 205 | 0.39 | 536 | 230 | 0.44 |
| | | 215 | 0.346 | 621 | 240 | 0.38 |
| | | 258 | 0.31 | 838 | 270 | 0.34 |
| | | 356 | 0.2 | 1685 | 400 | 0.24 |
| **19/24** | 150 or 270 | 24 | 3.08 | 7.8 | - | - |
| | | 98 | 0.85 | 116 | 110 | 0.94 |
| | | 205 | 0.4 | 516 | 230 | 0.45 |
| | | 215 | 0.4 | 538 | 240 | 0.44 |
| | | 356 | 0.25 | 1438 | 400 | 0.28 |

# IE3
# Three-phase asynchronous motors with integrated frequency inverter



Compact drive
Temperature class T4
2p = 2, 4

40 °C ambient temperature. winding heating within heat class F

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | decreasing | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 2-50 Hz | | 50-100 Hz | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | 1:25 | | | |
| Speed range | - | 300-3000 rpm | | 1200-3000 rpm | | 600-3000 rpm | | 300-3000 rpm | | 120-3000 rpm | | 3000-6000 rpm | |
| Power/torque | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 100 Hz | $M_U$ [Nm] |
| **80M1-2 I** | 0.75 | 0.75 | 2.6 | 0.7 | 2.4 | 0.6 | 2 | 0.5 | 1.7 | 0.47 | 1.6 | 0.75 | 1.3 |
| **80M2-2 I** | 1.1 | 1.1 | 3.7 | 1 | 3.4 | 0.9 | 3 | 0.75 | 2.5 | 0.7 | 2.35 | 1.1 | 1.9 |
| **90S-2 I** | 1.5 | 1.5 | 5 | 1.4 | 4.7 | 1.2 | 4 | 1 | 3.3 | 0.94 | 3.3 | 1.2 | 2 |
| **90L-2 I** | 2.2 | 2.2 | 7.4 | 2 | 6.7 | 1.7 | 5.7 | 1.4 | 4.7 | 1.3 | 4.4 | 2 | 3.4 |
| **100L-2 I** | 3 | 3 | 10 | 2.7 | 8.9 | 2.2 | 7.2 | 1.8 | 5.9 | 1.7 | 5.5 | 3 | 5 |
| **112M-2 I** | 4 | 4 | 13 | 3.7 | 12 | 3.2 | 11 | 2.5 | 8.2 | 2.35 | 7.7 | 3.5 | 5.8 |
| **132S1-2 I** | 5.5 | 5.5 | 18 | 5 | 16 | 4.5 | 15 | 3.7 | 12 | 3.3 | 10.8 | 4.8 | 7.9 |

| Operation on | Mains | Inverter | | | | | | | | | | Inverter | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Torque trend | - | square decreasing | | constant | | constant | | constant | | constant | | decreasing | |
| Frequency | 50 Hz | 5-50 Hz | | 20-50 Hz | | 10-50 Hz | | 5-50 Hz | | 2-50 Hz | | 50-100 Hz | |
| Control range | - | 1:10 | | 1:2.5 | | 1:5 | | 1:10 | | 1:25 | | | |
| Speed range | - | 150-1500 rpm | | 600-1500 rpm | | 300-1500 rpm | | 150-1500 rpm | | 60-1500 rpm | | 1500-3000 rpm | |
| Power/torque | $P_2$ [kW] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 50 Hz | $M_U$ [Nm] | $P_U$ [kW] 100 Hz | $M_U$ [Nm] |
| **80M1-4 I** | 0.55 | 0.55 | 3.8 | 0.52 | 3.5 | 0.45 | 3 | 0.33 | 2.2 | 0.31 | 2.05 | 0.4 | 1.4 |
| **80M2-4 I** | 0.75 | 0.75 | 5.2 | 0.7 | 4.8 | 0.6 | 4 | 0.5 | 3.3 | 0.47 | 3.1 | 0.6 | 2 |
| **90LS-4 I** | 1.1 | 1.1 | 7.5 | 1 | 6.7 | 0.9 | 6 | 0.75 | 5 | 0.7 | 4.7 | 0.9 | 2.9 |
| **90L-4 I** | 1.5 | 1.5 | 10 | 1.4 | 9.5 | 1.2 | 8 | 1 | 6.7 | 0.94 | 6.3 | 1.2 | 4 |
| **100L1-4 I** | 2.2 | 2.2 | 15 | 2 | 13 | 1.7 | 11 | 1.4 | 9.3 | 1.3 | 8.7 | 1.9 | 6.4 |
| **100L2-4 I** | 3 | 3 | 20 | 2.8 | 19 | 2.2 | 15 | 1.8 | 12 | 1.7 | 11.3 | 2.6 | 8.5 |
| **112M-4 I** | 4 | 4 | 27 | 3.6 | 24 | 3 | 20 | 2.5 | 16 | 2.35 | 15 | 3.5 | 11.6 |
| **132S-4 I** | 5.5 | 5.5 | 37 | 5 | 33 | 4.4 | 29 | 3.7 | 24 | 3.3 | 21.6 | 4.7 | 15.3 |

| Size | Output | Rated current at 400V | Speed | Efficiency | Power factor | Starting torque | Starting current | Weight[2] | Cooling water quantity | Noise values | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…W | $P_2$ [kW] | I [A] | n [rpm] | η [%] | cos φ | $M_A / M_N$ | $I_A / I_N$ | m [kg] | [l/min] 30°C | $L_P$ [dB (A)] | $L_W$ [dB (A)] |
| **$n_s$ = 3000 rpm 2p = 2** | | | | | **Efficiency according to manufacturer's standard** | | | | | | |
| **160M1-2** | 15 | 28.5 | 2915 | 87.5 | 0.87 | 2.5 | 6.5 | 125 | 6 | 51 | 64 |
| **160M2-2** | 18.5 | 33.5 | 2915 | 89 | 0.89 | 2.5 | 6.5 | 140 | 6 | 51 | 64 |
| **160L-2** | 22 | 39.5 | 2915 | 89.5 | 0.9 | 2.7 | 6.8 | 150 | 6 | 51 | 64 |
| **180M-2** | 30 | 54 | 2915 | 90 | 0.89 | 2.6 | 6.9 | 170 | 7 | 51 | 64 |
| **200L1-2** | 37 | 68 | 2950 | 92.5 | 0.85 | 3 | 7.2 | 270 | 9 | 52 | 66 |
| **200L2-2** | 45 | 81 | 2960 | 93 | 0.86 | 3.5 | 7.8 | 290 | 9 | 52 | 66 |
| **225M-2** | 55 | 100 | 2965 | 93 | 0.85 | 2.8 | 7.1 | 455 | 9 | 54 | 68 |
| **250M-2** | 75 | 139 | 2970 | 93 | 0.84 | 2.7 | 6.9 | 564 | 10 | 57 | 71 |
| **280S-2** | 90 | 154 | 2970 | 93.5 | 0.9 | 2 | 6.5 | 665 | 11 | 59 | 73 |
| **280M-2** | 110 | 191 | 2970 | 93.5 | 0.89 | 2.1 | 6.8 | 776 | 11 | 59 | 73 |
| **315S-2** | 132 | 225 | 2975 | 94.5 | 0.89 | 1.9 | 6.3 | 1010 | 12 | 60 | 75 |
| **315M-2** | 160 | 270 | 2975 | 95.5 | 0.89 | 1.8 | 6.7 | 1100 | 12 | 60 | 75 |
| **315L1-2** | 200 | 340 | 2975 | 95.5 | 0.89 | 2 | 6.9 | 1200 | 15 | 60 | 75 |
| **315L2-2** | 250 | 420[1] | 2980 | 96 | 0.9 | 1.7 | 6.9 | 1300 | 17 | 60 | 75 |
| **315L3-2** | 315 | 515[1] | 2980 | 96 | 0.92 | 1.5 | 6.8 | 1450 | 17 | 60 | 76 |
| **355L1-2** | 355 | 575[1] | 2985 | 96.5 | 0.92 | 1.5 | 6.8 | 2100 | 18 | 60 | 76 |
| **355L2-2** | 400 | 650[1] | 2985 | 96.8 | 0.92 | 1.5 | 6.8 | 2300 | 20 | 60 | 76 |
| **$n_s$ = 1500 rpm 2p = 4** | | | | | **Efficiency according to manufacturer's standard** | | | | | | |
| **160M-4** | 13.5 | 29 | 1450 | 86.5 | 0.78 | 2.6 | 6.1 | 130 | 6 | 51 | 64 |
| **160L-4** | 18.5 | 36 | 1450 | 89 | 0.84 | 2.5 | 6.2 | 150 | 6 | 51 | 64 |
| **180M-4** | 22 | 43.5 | 1460 | 90 | 0.81 | 3.1 | 6.7 | 170 | 7 | 51 | 64 |
| **180L-4** | 27 | 53 | 1455 | 90 | 0.81 | 3 | 6.5 | 190 | 7 | 51 | 64 |
| **200L-4** | 37 | 67 | 1460 | 91 | 0.87 | 2.7 | 6.8 | 295 | 9 | 51 | 65 |
| **225S-4** | 45 | 81 | 1465 | 92 | 0.87 | 2.9 | 6.5 | 441 | 9 | 52 | 66 |
| **225M-4** | 55 | 100 | 1470 | 92.5 | 0.86 | 3.2 | 6.6 | 480 | 9 | 52 | 66 |
| **250M-4** | 70 | 127 | 1475 | 92.5 | 0.86 | 2.9 | 7.1 | 590 | 10 | 56 | 70 |
| **280S-4** | 90 | 163 | 1480 | 93.5 | 0.85 | 2.7 | 6.7 | 745 | 11 | 58 | 72 |
| **280M-4** | 110 | 199 | 1480 | 94 | 0.85 | 2.9 | 6.9 | 850 | 11 | 58 | 72 |
| **315S-4** | 132 | 240 | 1485 | 95 | 0.84 | 2.2 | 6.6 | 1050 | 12 | 57 | 72 |
| **315M-4** | 160 | 290 | 1485 | 95.5 | 0.84 | 2.8 | 6.8 | 1115 | 12 | 57 | 72 |
| **315L1-4** | 200 | 350 | 1485 | 95.5 | 0.86 | 2.5 | 6.8 | 1200 | 15 | 57 | 72 |
| **315L2-4** | 250 | 435[1] | 1490 | 96 | 0.86 | 2 | 6.9 | 1300 | 17 | 57 | 72 |
| **315L3-4** | 315 | 545[1] | 1490 | 96 | 0.87 | 1.5 | 6.8 | 1600 | 17 | 58 | 74 |
| **355L1-4** | 355 | 590[1] | 1490 | 96.5 | 0.9 | 1.5 | 6.8 | 2250 | 18 | 58 | 74 |
| **355L2-4** | 400 | 665[1] | 1490 | 96.7 | 0.9 | 1.5 | 6.8 | 2450 | 20 | 58 | 74 |

**Note:**

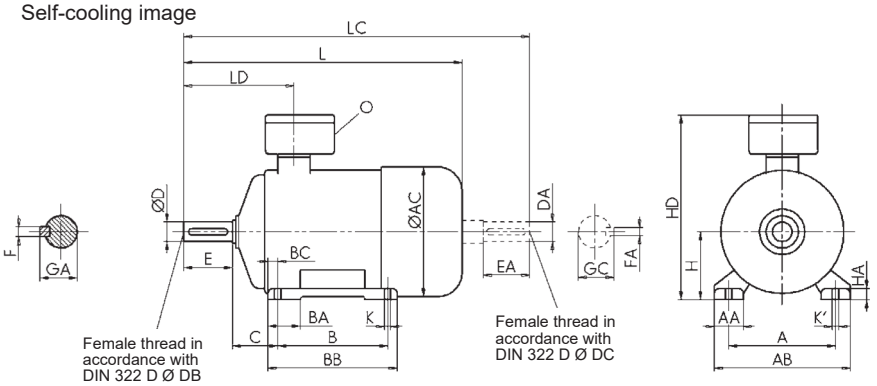
[1] Two parallel supply lines are required in each case

[2] Type B3 with terminal compartment type EAR

## Temperature class T4, 2p = 2, 4, 6, 8

| Size | Output | Rated current at 6000 V | Speed | Effi-ciency | Power factor | Torque | Starting torque | Starting current | Breakd own torque | Mass moment of inertia | Weight[2)] | Noise values with radial fan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD...H | $P_2$ [kW] | I [A] | n [rpm] | η [%] | cos φ | M [Nm] | $M_A / M_N$ | $I_A / I_N$ | $M_K / M_N$ | J [kgm²] | m [kg] | $L_P$ [dB(A)] | $L_W$ [dB(A)] |
| **$n_s$ = 3000 rpm 2p = 2** | | | | | | | | | | | | | |
| **355M-2** | 160 | 18.1 | 2981 | 94.5 | 0.9 | 513 | 1.1 | 6.5 | 2.5 | 2.6 | 1825 | 82 | 98 |
| **355L1-2** | 200 | 22.5 | 2981 | 94.8 | 0.9 | 641 | 1.1 | 6.6 | 2.5 | 3.1 | 2008 | 82 | 98 |
| **355L2-2** | 250 | 28 | 2982 | 95 | 0.91 | 801 | 1.1 | 6.6 | 2.6 | 3.4 | 2100 | 82 | 98 |
| **400M-2** | 280 | 31 | 2982 | 95.3 | 0.91 | 897 | 1 | 6.4 | 2.6 | 7.7 | 2389 | 82 | 98 |
| **400L-2** | 315 | 35 | 2982 | 95.5 | 0.91 | 1009 | 1 | 6.5 | 2.6 | 10.1 | 2800 | 82 | 98 |
| **450M1-2** | 355 | 39.5 | 2985 | 95.8 | 0.9 | 1136 | 0.9 | 6.6 | 2.7 | 9.4 | 3268 | 85 | 101 |
| **450M2-2** | 400 | 44.5 | 2987 | 96 | 0.9 | 1279 | 0.9 | 6.6 | 2.7 | 10.6 | 3437 | 85 | 101 |
| **450L1-2** | 450 | 49.5 | 2987 | 96.2 | 0.91 | 1439 | 0.9 | 6.5 | 2.6 | 12.6 | 3699 | 85 | 101 |
| **450L2-2** | 500 | 55 | 2988 | 96.4 | 0.91 | 1598 | 0.9 | 6.6 | 2.7 | 14.6 | 3962 | 85 | 101 |
| **450L3-2** | 560 | 61 | 2988 | 96.5 | 0.91 | 1790 | 0.9 | 6.5 | 2.6 | 16.8 | 4262 | 85 | 101 |
| **$n_s$ = 1500 rpm 2p = 4** | | | | | | | | | | | | | |
| **355M1-4** | 160 | 19.3 | 1488 | 94.8 | 0.84 | 1027 | 1.2 | 6.6 | 2.4 | 4.2 | 1800 | 73 | 89 |
| **355M2-4** | 220 | 26.5 | 1488 | 95.2 | 0.84 | 1412 | 1.2 | 6.6 | 2.4 | 5 | 1950 | 73 | 89 |
| **355L-4** | 280 | 33.5 | 1488 | 95.4 | 0.84 | 1797 | 1.2 | 6.6 | 2.4 | 5.9 | 2213 | 73 | 89 |
| **400M-4** | 315 | 37 | 1490 | 95.6 | 0.86 | 2019 | 1.1 | 6.6 | 2.5 | 12.9 | 3460 | 79 | 95 |
| **400L1-4** | 355 | 41.5 | 1490 | 95.8 | 0.86 | 2275 | 1.1 | 6.5 | 2.4 | 14.5 | 3665 | 79 | 95 |
| **400L2-4** | 400 | 46.5 | 1490 | 96 | 0.86 | 2564 | 1.1 | 6.6 | 2.5 | 16.4 | 3900 | 79 | 95 |
| **450M1-4** | 450 | 53 | 1491 | 96 | 0.85 | 2882 | 1 | 6.5 | 2.5 | 18.5 | 3887 | 80 | 96 |
| **450M2-4** | 500 | 59 | 1491 | 96.1 | 0.85 | 3203 | 1 | 6.6 | 2.5 | 20.7 | 4112 | 80 | 96 |
| **450L1-4** | 560 | 66 | 1492 | 96.2 | 0.85 | 3584 | 1 | 6.7 | 2.6 | 23.3 | 4375 | 80 | 96 |
| **450L2-4** | 630 | 73 | 1492 | 96.3 | 0.86 | 4033 | 0.9 | 6.5 | 2.4 | 26.2 | 4675 | 80 | 96 |
| **450L3-4** | 710 | 82 | 1492 | 96.5 | 0.86 | 4545 | 1 | 6.5 | 2.5 | 29.5 | 5012 | 80 | 96 |
| **$n_s$ = 1000 rpm 2p = 6** | | | | | | | | | | | | | |
| **355M-6** | 160 | 21 | 990 | 94.2 | 0.78 | 1543 | 1.2 | 6 | 2.2 | 5 | 1950 | 75 | 91 |
| **355L-6** | 200 | 26 | 990 | 94.3 | 0.79 | 1929 | 1.2 | 5.9 | 2.1 | 5.9 | 2179 | 75 | 91 |
| **400M-6** | 250 | 31 | 991 | 95.2 | 0.81 | 2409 | 1.2 | 6.4 | 2.3 | 12.9 | 3460 | 78 | 94 |
| **400L1-6** | 280 | 35 | 991 | 95.4 | 0.81 | 2698 | 1.2 | 6.5 | 2.3 | 14.5 | 3665 | 78 | 94 |
| **400L2-6** | 315 | 39 | 991 | 95.6 | 0.81 | 3036 | 1.2 | 6.5 | 2.3 | 16.4 | 3900 | 78 | 94 |
| **450M1-6** | 355 | 42.5 | 991 | 95.6 | 0.84 | 3421 | 1 | 6.3 | 2.4 | 29.1 | 4112 | 78 | 94 |
| **450M2-6** | 400 | 47.5 | 991 | 95.7 | 0.85 | 3855 | 1 | 6.3 | 2.4 | 32.7 | 4375 | 78 | 94 |
| **450L1-6** | 450 | 53 | 991 | 95.7 | 0.86 | 4337 | 1 | 6.3 | 2.4 | 36.8 | 4675 | 78 | 94 |
| **450L2-6** | 500 | 58 | 992 | 95.8 | 0.86 | 4814 | 1 | 6.4 | 2.4 | 41.5 | 5012 | 78 | 94 |
| **$n_s$ = 750 rpm 2p = 8** | | | | | | | | | | | | | |
| **400M-8** | 160 | 21.5 | 742 | 94.2 | 0.76 | 2059 | 1.1 | 5.3 | 2 | 12.9 | 3460 | 74 | 90 |
| **400L1-8** | 200 | 27 | 742 | 94.5 | 0.76 | 2574 | 1.1 | 5.5 | 2 | 14.5 | 3665 | 74 | 90 |
| **400L2-8** | 240 | 32 | 742 | 94.6 | 0.76 | 3089 | 1.1 | 5.5 | 2 | 16.4 | 3900 | 74 | 90 |
| **450M1-8** | 280 | 37 | 743 | 94.6 | 0.77 | 3599 | 1.1 | 5.8 | 2.3 | 29.1 | 4112 | 74 | 90 |
| **450M2-8** | 315 | 41 | 743 | 94.7 | 0.78 | 4049 | 1 | 5.7 | 2.3 | 32.7 | 4375 | 74 | 90 |
| **450L1-8** | 355 | 47 | 743 | 94.8 | 0.77 | 4563 | 1 | 5.9 | 2.4 | 36.8 | 4675 | 74 | 90 |
| **450L2-8** | 400 | 52 | 744 | 94.9 | 0.78 | 5134 | 1 | 6 | 2.4 | 41.5 | 5012 | 74 | 90 |

Self-cooling image




Lifting eyes from size 90.
Dimension AC, measured above bolt head. Dimension HD,
Ex e-related on terminal box.
Terminal box 4 x 90° rotatable.

Note:
Type IM V5 with protective roof; dimension LE see page 117.

| Type CD...Y3/Y/Y2 | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 | L Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 100 | 20 | 120 | 146 | 80 | 25 | 100 | 10 | 40 | 63 | 6 | 227 | Ø 7 | – | 270 | 270 | – | – |
| **71M** | 112 | 27 | 139 | 140 | 90 | 32 | 110 | 10 | 45 | 71 | 10 | 248 | Ø 8 | – | 301 | 301 | 301 | 301 |
| **80M** | 125 | 35 | 160 | 158 | 100 | 37 | 130 | 15 | 50 | 80 | 12 | 271 | Ø 10 | – | 343 | 343 | – | – |
| **90S** | 140 | 38 | 180 | 178 | 100 | 44 | 130 | 15 | 56 | 90 | 12 | 295 | Ø 10 | – | 398 | 398 | 398 | 398 |
| **90L** | 140 | 38 | 180 | 178 | 125 | 44 | 155 | 15 | 56 | 90 | 12 | 295 | Ø 10 | – | 398 | 398 | 398 | 398 |
| **100L** | 160 | 42 | 200 | 198 | 140 | 46 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø 12 | – | 419 | 419 | 419 | 419 |
| **112M** | 190 | 45 | 235 | 218 | 140 | 46 | 175 | 17,5 | 70 | 112 | 17 | 337 | Ø 12 | – | 517 | 517 | 517 | 517 |
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | – | 529 | 529 | 529 |
| **132S1** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | 529 | – | – | – |
| **132S2** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | 579 | – | – | – |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | – | 579 | – | 597 |
| **132M1** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | – | – | 529 | – |
| **132M2** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | – | – | 579 | – |
| **160M** | 254 | 65 | 310 | 318 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 713 | 676 | 676 | 676 |
| **160L Y2** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 713 | 676 | 676 | – |
| **160L Y3,Y** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 713 | 711 | 711 | 676 |
| **180M** | 279 | 75 | 350 | 353 | 241 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 | 726 | 726 | – | – |
| **180L Y2** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 | – | 726 | 726 | – |
| **180L Y3,Y** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 | – | 776 | 726 | 726 |
| **200L** | 318 | 80 | 390 | 393 | 305 | 90 | 365 | 30 | 133 | 200 | 30 | 581 | 20 | 26 | 789 | 789 | 789 | 789 |

| Type CD...Y3/Y/Y2 | A | AA | AB | AC | B | BA | BB | BC | C | H | HA | HD | K H17 | K' H17 | L Number of Poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **225S** | 356 | 85 | 450 | 455 | 286 | 90 | 370 | 29,5 | 149 | 225 -0,5 | 35 | 634 | 20 | 26 | – | 937 | – | 888 |
| **225M** | 356 | 85 | 450 | 455 | 311 | 90 | 370 | 29,5 | 149 | 225 -0,5 | 35 | 634 | 20 | 26 | 907 | 937 | 888 | 888 |
| **250M** | 406 | 105 | 510 | 493 | 349 | 110 | 420 | 35,5 | 168 | 250 -0,5 | 40 | 731 | 26 | 35 | 1000 | 1000 | 934 | 934 |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 | 1109 | 1109 | 1109 | 1109 |
| **280M** | 457 | 110 | 570 | 548 | 419 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 | 1109 | 1109 | 1109 | 1109 |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1218 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1218 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1298 |
| **315L2** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1418 | 1498 |
| **315L3** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1418 | 1498 |
| **355M** | 610 | 180 | 720 | 725 | 560 | 220 | 720 | 45 | 254 | 355 -1 | 50 | 1084 | 30 | 39 | – | – | – | 1697 |

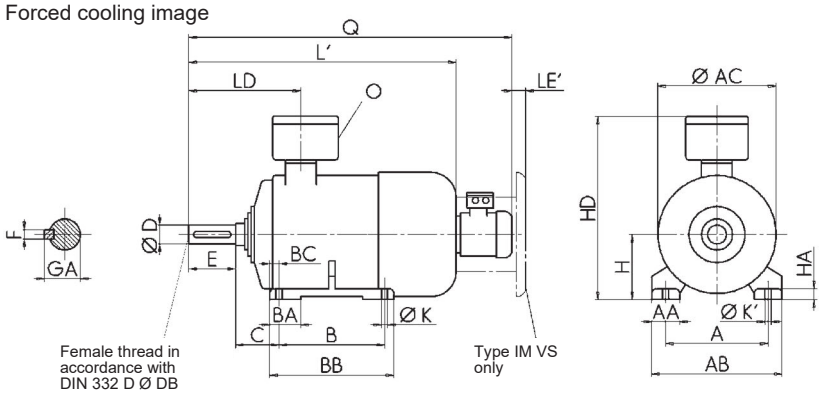
| Type CD...XY3/XY/XY3 **** | A | AA | AB | AC | B | BA | BB | BC | C | H | HA | HD | K H17 | K' H17 | L Number of Poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **250S** | 406 | 110 | 510 | 493 | 311 | 110 | 420 | 30 | 168 | 250 -0,5 | 45 | 731 | Ø 26,5 | – | 1000 | 1000 | 934 | 934 |
| **250M** | 406 | 110 | 510 | 548 | 349 | 110 | 420 | 30 | 168 | 250 -0,5 | 45 | 762 | Ø 26,5 | – | 1109 | 1109 | 1109 | 1109 |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 | 1109 | 1109 | 1109 | 1109 |
| **280M** | 457 | 110 | 570 | 635 | 419 | - | 570 | 40 | 190 | 280 -1 | 48 | 862 | Ø 26,5 | – | 1268 | 1298 | 1218 | 1218 |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1218 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1298 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1218 | 1298 |
| **315L2** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1418 | 1498 |

**** British version

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



Forced cooling image




Note:

2) The specifications of number of poles 2 apply for type 250 to 315- 4, 6, 8 dimension DA, EA, GC,

3) The 4-pole shaft end is always installed with pole-changing motors (4/2, 6/4 and 8/8). Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| Type | LC Number of poles | | | | LD | O | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC | Fan-motor | Type CD…Y2F/Y3F/YF L' | | | | Q | | | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3/Y/Y2 | 2 | 4 | 6 | 8 | | | | | | | | Type CD | 2 | 4 | 6 | 8 | 2 | 4 | 6 | 8 | |
| **63M** | by request | | – | — | 104 | M25x1,5 | 11 j6 | 23 | 12,5 | 4 | M4 | – | – | – | – | – | – | – | – | – | – |
| **71M** | 380 | 380 | 380 | 380 | 108,5 | M25x1,5 | 14 j6 | 30 | 16 | 5 | M5 | – | – | – | – | – | – | – | – | – | – |
| **80M** | 417 | 417 | – | – | 127 | M25x1,5 | 19 j6 | 40 | 21,5 | 6 | M6 | – | – | – | – | – | – | – | – | – | – |
| **90S** | 479 | 479 | 479 | – | 139 | M25x1,5 | 24 j6 | 50 | 27 | 8 | M8 | – | – | – | – | – | – | – | – | – | – |
| **90L** | 479 | 479 | 479 | – | 139 | M25x1,5 | 24 j6 | 50 | 27 | 8 | M8 | – | – | – | – | – | – | – | – | – | – |
| **100L** | 515 | 515 | 515 | 515 | 154 | M32x1,5 | 28 j6 | 60 | 31 | 8 | M10 | – | – | – | – | – | – | – | – | – | – |
| **112M** | 608 | 608 | 608 | 608 | 189 | M32x1,5 | 28 j6 | 60 | 31 | 8 | M10 | 63M1-4 | 588 | 588 | 588 | 588 | 803 | 803 | 803 | 803 | 30 |
| **132S** | – | 645 | 645 | 645 | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | 606 | 606 | 606 | – | 822 | 822 | 822 | 36 |
| **132S1** | 645 | – | – | – | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | 606 | – | – | – | 822 | – | – | – | 36 |
| **132S2** | 695 | – | – | – | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | 656 | – | – | – | 872 | – | – | – | 36 |
| **132M** | – | 695 | – | 645 | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | 656 | – | 606 | – | 872 | – | 822 | 36 |
| **132M1** | – | – | 645 | – | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | – | 606 | – | – | – | 822 | – | 36 |
| **132M2** | – | – | 695 | – | 226 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | – | 656 | – | – | – | 872 | – | 36 |
| **160M** | 864 | 864 | 864 | 864 | 261 | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 757 | 757 | 972 | 972 | 972 | 972 | 38 |
| **160L Y2** | 864 | 864 | 864 | – | 261 | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 757 | – | 972 | 972 | 972 | – | 38 |
| **160L Y3/Y** | 864 | 899 | 899 | 864 | 261 | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 792 | 792 | 757 | 972 | 1007 | 1007 | 972 | 38 |
| **180M** | 909 | 909 | – | – | 369 | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | 746 | 746 | – | – | 960 | 960 | – | – | 38 |
| **180L Y2** | – | 909 | 909 | – | 369 | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | – | 746 | 746 | 746 | – | 960 | 960 | 960 | 38 |
| **180L Y3/Y** | – | 959 | 909 | 909 | 369 | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | – | 796 | 746 | 746 | – | 1010 | 960 | 960 | 38 |
| **200L** | 983 | 983 | 983 | 983 | 390 | M50x1,5 | 55 m6 | 110 | 59 | 16 | M20 | 63M1-4 | 803 | 803 | 803 | 803 | 1018 | 1018 | 1018 | 1018 | 38 |

| Type | LC Number of poles | | | LD | | O | Shaft end D, DA m6 [2] | | E, EA [2] | | GA, GC [2] | | F, FA [2] | | DB, DC [2] | | Fan-motor | Type CD…Y2F/Y3F/YF L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3/Y/Y2 | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | Type CD | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| **225S** | – | 1175 | 1175 | - | 377 | M50x1,5 | – | 60 | – | 140 | – | 64 | – | 18 | – | M20 | 63M1-4 | – | 938 | – | 1153 | 38 |
| **225M** | 1145 | 1175 | 1175 | 347 | 377 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 | 63M1-4 | 908 | 938 | 1153 | 1153 | 38 |
| **250M** | 1250 | 1250 | 1250 | 482 | 482 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 | 63M1-4 | 1019 | 1019 | 1234 | 1234 | 38 |
| **280S** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **280M** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **315S** | 1543 | 1573 | 1573 | 526 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **315M** | 1543 | 1573 | 1573 | 526 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **315L1** | 1543 | 1573 | 1573 | 526 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **315L2** | 1743 | 1773 | 1773 | 526 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **315L3** | 1743 | 1773 | 1773 | 526 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | | | by request | | |
| **355M** | – | – | 1980 | - | 702 | M80x2 | – | 90 | – | 170 | – | 95 | – | 25 | – | M24 | – | – | – | – | – | – |

| Type | LC Number of poles | | | LD | | O | Shaft end D, DA m6 [2] | | E, EA [2] | | GA, GC [2] | | F, FA [2] | | DB, DC [2] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…XY3/ XY****/XY2 | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 |
| **250S** | 1250 | 1250 | 1184 | 482 | 482 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **250M** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **280S** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **280M** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **315S** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315M** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315L1** | 1743 | 1773 | 1773 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315L2** | 1743 | 1773 | 1773 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |

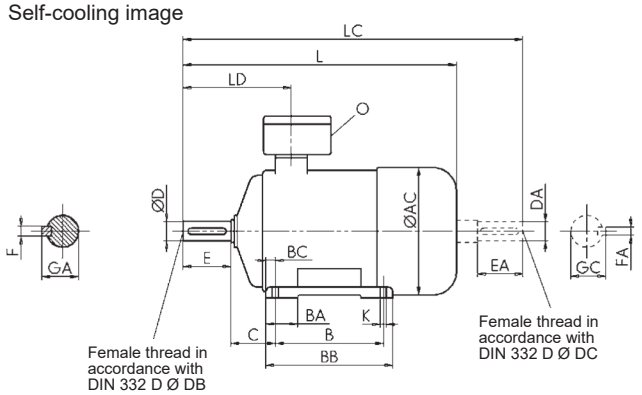
* Diameter 70 for British version by request - please note: Dimension GA becomes 74.5 and dimension F becomes 20

** Diameter 80 for British version by request - please note: Dimensions L, LC, LD and E become 30mm longer, dimension GA becomes 85 and dimension F becomes 22

*** Diameter 85 for British version by request - please note: Dimension GA becomes 90 and dimension F corresponds to the catalog

**** British version

Self-cooling image




Size 63 in T4, not ventilated.

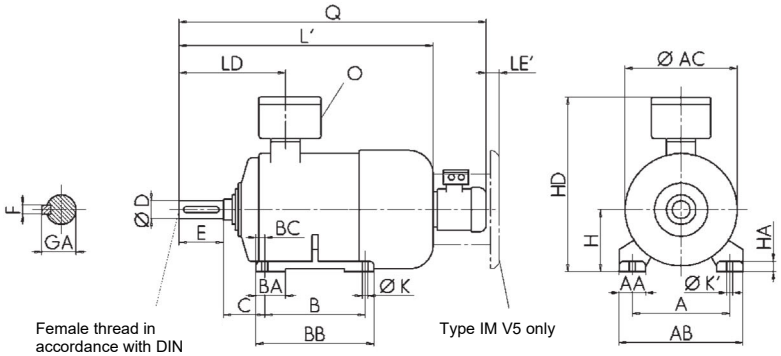
Lifting eyes from size 90.
Dimension AC, measured above bolt head.
Dimension HD in relation to Ex e box.
Terminal box can be rotated 4 x 90°. Also applies to BD series...

Note:
1) Type IM V5 with protective roof, see dimension LE page 117

| Type CD… | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 | L Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 100 | 20 | 120 | 134 | 80 | 25 | 100 | 10 | 40 | 63 | 6 | 227 | Ø 7 | – | 239 | 239 | 239 | 239 |
| **71M** | 112 | 30 | 139 | 145 | 90 | 25 | 110 | 10 | 45 | 71 | 10 | 235 | Ø 7 | – | 278 | 278 | 278 | 278 |
| **80M** | 125 | 35 | 160 | 163 | 100 | 35 | 130 | 15 | 50 | 80 | 12 | 260 | Ø 10 | – | 313 | 313 | 313 | 313 |
| **90S** | 140 | 40 | 180 | 183 | 100 | 40 | 130 | 15 | 56 | 90 | 12 | 275 | Ø 10 | – | 364 | 364 | 364 | 364 |
| **90L** | 140 | 40 | 180 | 183 | 125 | 40 | 155 | 15 | 56 | 90 | 12 | 275 | Ø 10 | – | 364 | 364 | 364 | 364 |
| **100L** | 160 | 45 | 200 | 201 | 140 | 45 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø 12 | – | 415 | 415 | 415 | 415 |
| **112M** | 190 | 50 | 235 | 225 | 140 | 50 | 175 | 17,5 | 70 | 112 | 17 | 317 | Ø 12 | – | 425 | 425 | 425 | 425 |
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | 529 | 529 | 529 | 529 |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – | - | 529 | 529 | 529 |
| **160M** | 254 | 65 | 310 | 318 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 713 | 676 | 676 | 676 |
| **160L** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 713 | 676 | 676 | 676 |
| **180M** | 279 | 75 | 350 | 353 | 241 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 | 726 | 726 | – | – |
| **180L** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 | - | 726 | 726 | 726 |
| **200L** | 318 | 80 | 390 | 393 | 305 | 90 | 365 | 30 | 133 | 200 | 30 | 581 | 20 | 26 | 789 | 789 | 789 | 789 |

| Type CD… | A | AA | AB | AC | B | BA | BB | BC | C | H | HA | HD | K H17 | K' H17 | L Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **225S** | 356 | 85 | 450 | 455 | 286 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 | - | 937 | - | 888 |
| **225M** | 356 | 85 | 450 | 455 | 311 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 | 907 | 937 | 888 | 888 |
| **250M** | 406 | 105 | 510 | 493 | 349 | 110 | 420 | 35,5 | 168 | 250-0,5 | 40 | 731 | 26 | 35 | 1000 | 1000 | 934 | 934 |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 | 1109 | 1109 | 1109 | 1109 |
| **280M** | 457 | 110 | 570 | 548 | 419 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 | 1109 | 1109 | 1109 | 1109 |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1218 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1218 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 | 1268 | 1298 | 1218 | 1298 |
| **315L2** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1418 | 1498 |
| **315L3** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 | 1468 | 1498 | 1418 | 1498 |
| **355M** | 610 | 180 | 720 | 725 | 560 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 | - | - | 1597 | 1597 |
| **355L1** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 | 1667 | 1697 | 1597 | 1597 |
| **355L2** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 | 1667 | 1667 | 1597 | 1597 |
| **355L3** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 | 1747 | 1777 | - | - |
| **400M** | 686 | 130 | 800 | 810 | 630 | 150 | 1264 | 152 | 280 | 400-1 | 34 | 1146 | Ø 35 | - | - | 1907 | 1907 | 1907 |
| **400L** | 686 | 130 | 800 | 810 | 710 | 150 | 1264 | 152 | 280 | 400-1 | 34 | 1146 | Ø 35 | - | 1837 | 1907 | 1907 | 1907 |
| **450M** | 760 | 150 | 900 | 910 | 710 | 180 | 1135 | 150 | 280 | 450-1 | 35 | 1264 | Ø 35 | - | - | 1903 | 1903 | 1903 |
| **450L** | 760 | 150 | 900 | 910 | 840 | 180 | 1135 | 150 | 280 | 450-1 | 35 | 1264 | Ø 35 | - | - | 1903 | 1903 | 1903 |

Forced cooling image

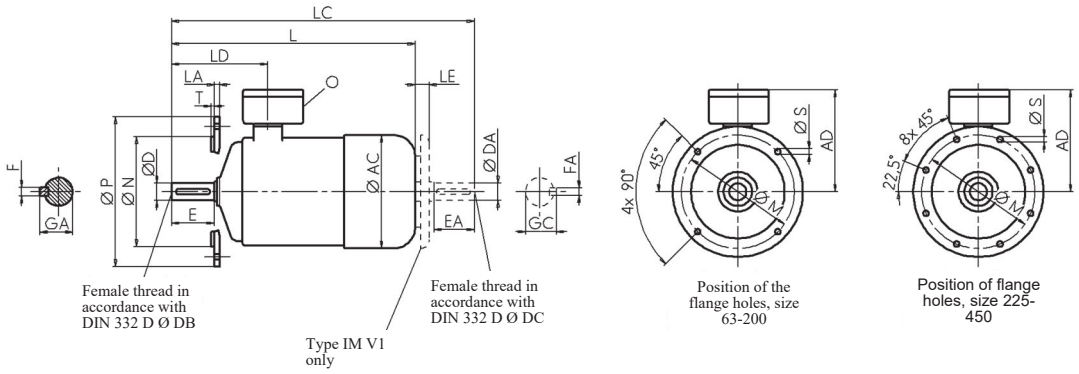



Note:
1) For type 250 to 400-4, 6, 8 dimension DA, EA, GC, FA, DC the specifications of number of poles 2 apply
For type 450 -6, 8 DA, EA, GC, FA, DC the specifications of number of poles 4 apply

| type | LC Number of poles | | | LD | O | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC | Fan motor | Type CD…F L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD… | 2 | 4 | 6, 8 | | | | | | | | Type CD | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| **63M** | 274 | 274 | 274 | 104 | M25x1,5 | 11j6 | 23 | 12,5 | 4 | M4 | – | – | – | – | – | – |
| **71M** | 334 | 334 | 334 | 111 | M25x1,5 | 14j6 | 30 | 16 | 5 | M5 | – | – | – | – | – | – |
| **80M** | 387 | 387 | 387 | 116 | M25x1,5 | 19j6 | 40 | 21,5 | 6 | M6 | – | – | – | – | – | – |
| **90S** | 445 | 445 | 445 | 137 | M25x1,5 | 24j6 | 50 | 27 | 8 | M8 | – | – | – | – | – | – |
| **90L** | 445 | 445 | 445 | 137 | M25x1,5 | 24j6 | 50 | 27 | 8 | M8 | – | – | – | – | – | – |
| **100L** | 510 | 510 | 510 | 149 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 | – | – | – | – | – | – |
| **112M** | 526 | 526 | 526 | 154 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 | 63M1-4 | 515 | 515 | 731 | 731 | 30 |
| **132S** | 645 | 645 | 645 | 226 | M32x1,5 | 38k6 | 80 | 41 | 10 | M12 | 63M1-4 | 606 | 606 | 822 | 822 | 36 |
| **132M** | – | 645 | 645 | 226 | M32x1,5 | 38k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | 606 | – | 822 | 36 |
| **160M** | 864 | 864 | 864 | 261 | M40x1,5 | 42k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 972 | 972 | 38 |
| **160L** | 864 | 864 | 864 | 261 | M40x1,5 | 42k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 972 | 972 | 38 |
| **180M** | 909 | 909 | – | 369 | M40x1,5 | 48k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | 746 | 746 | 960 | 960 | 38 |
| **180L** | – | 909 | 909 | 369 | M40x1,5 | 48k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | – | 746 | – | 960 | 38 |
| **200L** | 983 | 983 | 983 | 390 | M50x1,5 | 55m6 | 110 | 59 | 16 | M20 | 63M1-4 | 803 | 803 | 1018 | 1018 | 38 |

| Type | LC Number of poles | | | LD | | O | Shaft end $D_{m6}$, $DA_{m6}$ 1) | | | E, EA 1) | | GA, GC 1) | | | F, FA 1) | | DB, DC 1) | | Fan motor | Type CD…F L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD… | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | Type CD | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| **225S** | – | 1175 | 1175 | - | 377 | M50x1,5 | - | 60 | 60 | - | 140 | - | 64 | 64 | - | 18 | - | M20 | 63M1-4 | – | 938 | – | 1153 | 38 |
| **225M** | 1145 | 1175 | 1175 | 347 | 377 | M50x1,5 | 55 | 60 | 60 | 110 | 140 | 59 | 64 | 64 | 16 | 18 | M20 | M20 | 63M1-4 | 908 | 938 | 1153 | 1153 | 38 |
| **250M** | 1250 | 1250 | 1250 | 482 | 482 | M63x1,5 | 60 | 65 | 65 | 140 | 140 | 64 | 69 | 69 | 18 | 18 | M20 | M20 | 63M1-4 | 1019 | 1019 | 1234 | 1234 | 38 |
| **280S** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 65 | 75 | 75 | 140 | 140 | 69 | 79,5 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4Y3 | by request | | | | |
| **280M** | 1375 | 1375 | 1375 | 483 | 483 | M63x1,5 | 65 | 75 | 75 | 140 | 140 | 69 | 79,5 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **315S** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **315M** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **315L1** | 1543 | 1573 | 1573 | 496 | 526 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **315L2** | 1743 | 1773 | 1773 | 496 | 526 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **315L3** | 1743 | 1773 | 1773 | 496 | 526 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 Y3 | by request | | | | |
| **355M** | – | – | 1980 | - | 702 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79,5 | 95 | 95 | 20 | 25 | M20 | M24 | - | - | | | | |
| **355L1** | 1925 | 1980 | 1980 | 672 | 702 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79,5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 Y3 | by request | | | | |
| **355L2** | 1950 | 1980 | 1980 | 672 | 702 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79,5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 Y3 | by request | | | | |
| **355L3** | 2030 | 2060 | – | 672 | 702 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79,5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 Y3 | by request | | | | |
| **400M** | – | 2190 | 2190 | - | 788 | M95x2 | 75 | 100 | 100 | 140 | 210 | 79,5 | 106 | 106 | 20 | 28 | M20 | M24 | 80M2-4 Y3 | by request | | | | |
| **400L** | 2120 | 2190 | 2190 | 718 | 788 | M95x2 | 75 | 100 | 100 | 140 | 210 | 79,5 | 106 | 106 | 20 | 28 | M20 | M24 | 80M2-4 Y3 | by request | | | | |
| **450M** | – | 2280 | 2280 | - | 826 | M95x2 | 75 | 100 | 110 | 140 | 210 | 79,5 | 106 | 116 | 20 | 28 | M20 | M24 | 90S-4 Y3 | by request | | | | |
| **450L** | – | 2280 | 2280 | - | 826 | M95x2 | 75 | 100 | 110 | 140 | 210 | 79,5 | 106 | 116 | 20 | 28 | M20 | M24 | 90S-4 Y3 | by request | | | | |

Self-cooling image



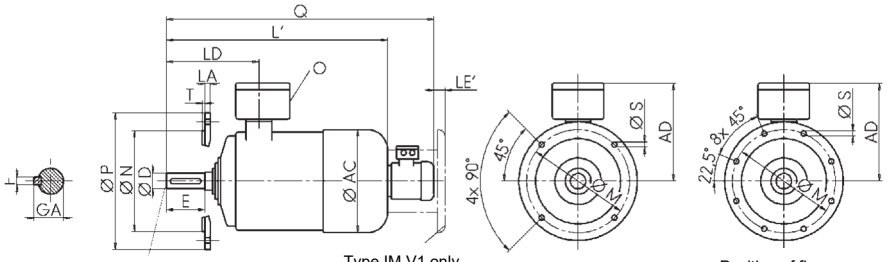

| Type | Mounting flange LA | M | N | P | S H17 | T | AC | AD | L Number of poles 2 | 4 | 6 | 8 | LC Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3/Y/Y2 | | | | | | | | | | | | | | | | |
| **63M** | 9 | 115 | 95 j6 | 140 | 10 | 3 | 146 | 164 | 270 | 270 | – | – | by request | | – | – |
| **71M** | 9 | 115 | 95 j6 | 140 | 10 | 3 | 140 | 177 | 301 | 301 | 301 | 301 | 380 | 380 | 380 | 380 |
| **80M** | 12 | 165 | 130 j6 | 200 | 12 | 3,5 | 158 | 185 | 343 | 343 | – | – | 417 | 417 | – | – |
| **90S+L** | 12 | 165 | 130 j6 | 200 | 12 | 3,5 | 178 | 198 | 398 | 398 | 398 | 398 | 479 | 479 | 479 | 479 |
| **100L** | 16 | 215 | 180 j6 | 250 | 14,5 | 4 | 198 | 205 | 419 | 419 | 419 | 419 | 515 | 515 | 515 | 515 |
| **112M** | 16 | 215 | 180 j6 | 250 | 14,5 | 4 | 218 | 225 | 517 | 517 | 517 | 517 | 608 | 608 | 608 | 608 |
| **132S** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | – | 529 | 529 | 529 | – | 645 | 645 | 645 |
| **132S1** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | 529 | – | – | – | 645 | – | – | – |
| **132S2** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | 579 | – | – | – | 695 | – | – | – |
| **132M** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | – | 579 | – | 529 | – | 695 | – | 645 |
| **132M1** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | – | – | 529 | – | – | – | 645 | – |
| **132M2** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 265 | 261 | – | – | 579 | – | – | – | 695 | – |
| **160M** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 318 | 299 | 713 | 676 | 676 | 676 | 864 | 864 | 864 | 864 |
| **160L Y2** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 318 | 299 | 713 | 676 | 676 | – | 864 | 864 | 864 | – |
| **160L Y3/Y** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 318 | 299 | 713 | 711 | 711 | 676 | 864 | 899 | 899 | 864 |
| **180M** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 353 | 365 | 726 | 726 | – | – | 909 | 909 | – | – |
| **180L Y2** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 353 | 365 | – | 726 | 726 | – | – | 909 | 909 | – |
| **180L Y3/Y** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 353 | 365 | – | 776 | 726 | 726 | – | 959 | 909 | 909 |
| **200L** | 20 | 350 | 300 h6 | 400 | 18,5 | 5 | 393 | 381 | 789 | 789 | 789 | 789 | 983 | 909 | 909 | 909 |
| **Type** | **Mounting flange LA** | **M** | **N** | **P** | **S H17** | **T** | **AC** | **AD** | **L Number of poles** | | | | **LC Number of poles** | | | |
| **CD…Y3/Y/Y2** | | | | | | | | | **2** | **4** | **6** | **8** | **2** | **4** | **6** | **8** |
| **225S** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | – | 937 | – | 888 | – | 1175 | 1175 | 1175 |
| **225M** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | 907 | 937 | 888 | 888 | 1145 | 1175 | 1175 | 1175 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 481 | 1000 | 1000 | 934 | 934 | 1250 | 1250 | 1184 | 1184 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315L** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1268 | 1298 | 1218 | 1298 | 1543 | 1573 | 1573 | 1573 |
| **315L2** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1468 | 1498 | 1418 | 1498 | 1743 | 1773 | 1773 | 1773 |
| **315L3** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1468 | 1498 | 1418 | 1498 | 1743 | 1773 | 1773 | 1773 |
| **355M** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | – | – | – | 1697 | – | – | – | 1980 |
| **Type** | **Mounting flange LA** | **M** | **N** | **P** | **S H17** | **T** | **AC** | **AD** | **L Number of poles** | | | | **LC Number of poles** | | | |
| **CD…XY2/XY3/XY** | | | | | | | | | **2** | **4** | **6** | **8** | **2** | **4** | **6** | **8** |
| **250S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 481 | 1000 | 1000 | 934 | 934 | 1250 | 1250 | 1184 | 1184 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 476 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 635 | 582 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1268 | 1298 | 1218 | 1298 | 1543 | 1573 | 1573 | 1573 |
| **315L1** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1468 | 1498 | 1218 | 1298 | 1743 | 1773 | 1773 | 1773 |
| **315L2** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1468 | 1498 | 1418 | 1498 | 1743 | 1773 | 1773 | 1773 |

**** British version

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.



Forcing cooled image




Female thread in accordance with DIN 332 D Ø DB

Type IM V1 only

Position of the flange holes, size 63-200

Position of flange holes, size 225-450

Mounting flange in accordance with EN 50347 form FF. Lifting eyes from size 90. Dimension AC, measured above bolt head. Dimension AD in relation to Ex e terminal compartment.
Terminal compartment 4 x 90° rotatable.

Note:
1) Protective roof required for type IM V1 , see, dimension LE; dimension LC includes LE.
2) For type 250 to 315-4,6,8 dimension DA, EA, GC, FA DC the specifications of number of poles 2 apply
3) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here.
The length dimension L corresponds to the 4-pole motors for all sizes.

| Type | LD | LE Number of poles | | | | O | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC | Fan-motor | Type CD…F L' | | | | Q | | | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3/Y/Y2 | | 2 | 4 | 6 | 8 | | | | | | | Type CD | 2 | 4 | 6 | 8 | 2 | 4 | 6 | 8 | |
| 63M | 104 | 25 | 25 | – | – | M25x1,5 | 11 j6 | 23 | 12,5 | 4 | M4 | – | – | – | – | – | – | – | – | – | – |
| 71M | 108,5 | 30 | 30 | 30 | 30 | M25x1,5 | 14 j6 | 30 | 16 | 5 | M5 | – | – | – | – | – | – | – | – | – | – |
| 80M | 127 | 25 | 25 | 25 | 25 | M25x1,5 | 19 j6 | 40 | 21,5 | 6 | M6 | – | – | – | – | – | – | – | – | – | – |
| 90S+L | 139 | 25 | 25 | 25 | 25 | M25x1,5 | 24 j6 | 50 | 27 | 8 | M8 | – | – | – | – | – | – | – | – | – | – |
| 100L | 154 | 30 | 30 | 30 | 30 | M32x1,5 | 28 j6 | 60 | 31 | 8 | M10 | – | – | – | – | – | – | – | – | – | – |
| 112M | 189 | 30 | 30 | 30 | 30 | M32x1,5 | 28 j6 | 60 | 31 | 8 | M10 | 63M1-4 | 588 | 588 | 588 | 588 | 803 | 803 | 803 | 803 | 30 |
| 132S | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | 606 | 606 | 606 | – | 822 | 822 | 822 | 36 |
| 32S1 | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | 606 | – | – | – | 822 | – | – | – | 36 |
| 132S2 | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | 656 | – | – | – | 872 | – | – | – | 36 |
| 132M | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | 656 | – | 606 | – | 872 | – | 822 | 36 |
| 132M1 | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | – | 606 | – | – | – | 822 | – | 36 |
| 132M2 | 226 | 30 | 30 | 30 | 30 | M32x1,5 | 38 k6 | 80 | 41 | 10 | M12 | 63M1-4 | – | – | 656 | – | – | – | 872 | – | 36 |
| 160M | 261 | 66 | 66 | 66 | 66 | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 757 | 757 | 972 | 972 | 972 | 972 | 38 |
| 160L Y2 | 261 | 66 | 66 | 66 | – | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 757 | – | 972 | 972 | 972 | – | 38 |
| 160L Y3/Y | 261 | 66 | 66 | 66 | 66 | M40x1,5 | 42 k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 792 | 792 | 757 | 972 | 1007 | 1007 | 972 | 38 |
| 180M | 369 | 66 | 66 | – | – | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | 746 | 746 | – | – | 960 | 960 | – | – | 38 |
| 180L Y2 | 369 | – | 66 | 66 | – | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | – | 746 | 746 | – | – | 960 | 960 | – | 38 |
| 180L Y3/Y | 369 | – | 66 | 66 | 66 | M40x1,5 | 48 k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | – | 796 | 746 | 746 | – | 1010 | 960 | 960 | 38 |
| 200L | 390 | 77 | 77 | 77 | 77 | M50x1,5 | 55 m6 | 110 | 59 | 16 | M20 | 63M1-4 | 803 | 803 | 803 | 803 | 1018 | 1018 | 1018 | 1018 | 38 |

| Type | LD Number of poles | | LE Number of poles | | | O | Shaft end D m6, DA m6 2) | | E, EA 2) | | GA, GC 2) | | F, FA 2) | | DB, DC 2) | | Fan-motor | Type CD…F L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3/Y/Y2 | 2 | 4, 6, 8 | 2 | 4 | 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | Type CD | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| 225S | – | 377 | – | 87 | 87 | M50x1,5 | – | 60 | – | 140 | – | 64 | – | 18 | – | M20 | 63M1-4 | – | 938 | – | 1153 | 38 |
| 225M | 347 | 377 | 87 | 87 | 87 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 | 63M1-4 | 908 | 938 | 1153 | 1153 | 38 |
| 250M | 482 | 482 | 94 | 94 | 94 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 | 63M1-4 | 1019 | 1019 | 1234 | 1234 | 38 |
| 280S | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 | 1140 | 1140 | 1387 | 1387 | 41 |
| 280M | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 | 1140 | 1140 | 1387 | 1387 | 41 |
| 315S | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| 315M | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| 315L1 | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| 315L2 | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1483 | 1513 | 1729 | 1759 | 42 |
| 315L3 | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1483 | 1513 | 1729 | 1759 | 42 |
| 355M | – | 702 | – | 130 | 130 | M80x2 | – | 90 | – | 170 | – | 95 | – | 25 | – | M24 | – | – | – | – | – | – |

| Type | LD Number of Poles | | LE Number of poles | | | O | Shaft end D m6, DA m6 2) | | E, EA 2) | | GA, GC 2) | | F, FA 2) | | DB, DC 2) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…XY2/XY3/XY **** | 2 | 4, 6, 8 | 2 | 4 | 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 |
| 250S | 482 | 482 | 94 | 94 | 94 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| 250M | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| 280S | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 65 | 75** | 140 | 140* | 69 | 79,5** | 18 | 20** | M20 | M20 |
| 280M | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 75** | 140 | 140* | 69 | 79,5** | 18 | 20** | M20 | M20 |
| 315S | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| 315M | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| 315L1 | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| 315L2 | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |

* Diameter 70 for British version by request - please note: Dimension GA becomes 74.5 and dimension F becomes 20

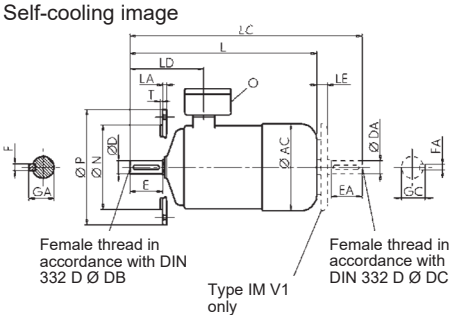
** Diameter 80 for British version by request - please note: Dimensions L, LC, LD and E become 30mm longer, dimension GA becomes 85 and dimension F becomes 22

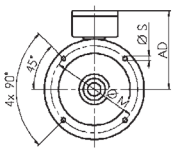
*** Diameter 85 for British version by request - please note: Dimension GA becomes 90 and dimension F corresponds to the catalog

**** British version

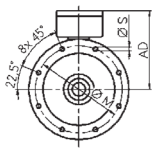
## Type IM B5, IM V1[1)], IM V3

Self-cooling image




Position of the flange holes
Size 63-200




Position of the flange holes
Size 225-450

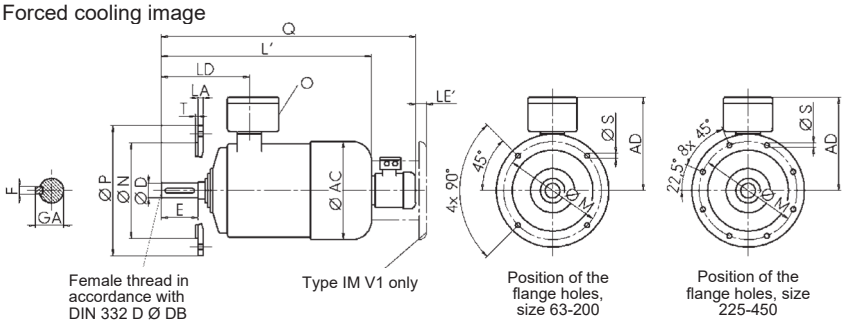
Size 63 in T4, not ventilated.
Mounting flange in accordance with EN 50347 form FF.
Lifting eyes from size 90.
Dimension AC measured above screw heads.
Dimension AD in relation to Ex e terminal compartment.
Terminal compartment, rotatable 4 x 90°.
Also applies to BD series...
Size 400-450 only available in type V1.
Note:

1) Protective roof required for type IM V1, see dimension LE page 117, dimension LC includes LE.

| Type | Mounting flange | | | | | | | | L | | | | LC | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LA | M | N | P | S H17 | T | AC | AD | Number of poles | | | | Number of poles | | | |
| CD… | | | | | | | | | 2 | 4 | 6 | 8 | 2 | 4 | 6 | 8 |
| **63M** | 9 | 115 | 95j6 | 140 | 10 | 3 | 134 | 164 | 239 | 239 | 239 | 239 | 274 | 274 | 274 | 274 |
| **71M** | 9 | 130 | 110j6 | 160 | 10 | 3,5 | 145 | 164 | 278 | 278 | 278 | 278 | 334 | 334 | 334 | 334 |
| **80M** | 12 | 165 | 130j6 | 200 | 12 | 3,5 | 163 | 180 | 313 | 313 | 313 | 313 | 387 | 387 | 387 | 387 |
| **90S** | 12 | 165 | 130j6 | 200 | 12 | 3,5 | 183 | 185 | 364 | 364 | 364 | 364 | 445 | 445 | 445 | 445 |
| **90L** | 12 | 165 | 130j6 | 200 | 12 | 3,5 | 183 | 185 | 364 | 364 | 364 | 364 | 445 | 445 | 445 | 445 |
| **100L** | 16 | 215 | 180j6 | 250 | 14,5 | 4 | 201 | 205 | 415 | 415 | 415 | 415 | 510 | 510 | 510 | 510 |
| **112M** | 16 | 215 | 180j6 | 250 | 14,5 | 4 | 225 | 205 | 425 | 425 | 425 | 425 | 526 | 526 | 526 | 526 |
| **132S+M** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | 529 | 529 | 529 | 529 | 645 | 645 | 645 | 645 |
| **160M+L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 713 | 676 | 676 | 676 | 864 | 864 | 864 | 864 |
| **180M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | 726 | 726 | - | - | 909 | 909 | - | - |
| **180L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | - | 726 | 726 | 726 | - | 909 | 909 | 909 |
| **200L** | 20 | 350 | 300h6 | 400 | 18,5 | 5 | 393 | 381 | 789 | 789 | 789 | 789 | 983 | 983 | 983 | 983 |

| Type | Mounting flange | | | | | | | | L | | | | LC | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LA | M | N | P | S H17 | T | AC | AD | Number of poles | | | | Number of poles | | | |
| CD… | | | | | | | | | 2 | 4 | 6 | 8 | 2 | 4 | 6 | 8 |
| **225S** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | - | 937 | - | 888 | - | 1175 | - | 1175 |
| **225M** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | 907 | 937 | 888 | 888 | 1145 | 1175 | 1175 | 1175 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 471 | 1000 | 1000 | 934 | 934 | 1250 | 1250 | 1250 | 1250 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 511 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 511 | 1109 | 1109 | 1109 | 1109 | 1375 | 1375 | 1375 | 1375 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 581 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 581 | 1268 | 1298 | 1218 | 1218 | 1543 | 1573 | 1573 | 1573 |
| **315L1** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 581 | 1268 | 1298 | 1218 | 1298 | 1543 | 1573 | 1573 | 1573 |
| **315L2** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 581 | 1468 | 1498 | 1418 | 1498 | 1743 | 1773 | 1773 | 1773 |
| **315L3** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 581 | 1468 | 1498 | 1418 | 1498 | 1743 | 1773 | 1773 | 1773 |
| **355M** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | - | - | 1597 | 1597 | - | - | 1980 | 1980 |
| **355L1** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1667 | 1697 | 1597 | 1597 | 1925 | 1980 | 1980 | 1980 |
| **355L2** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1667 | 1697 | 1597 | 1597 | 1950 | 1980 | 1980 | 1980 |
| **355L3** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1747 | 1777 | - | - | 2030 | 2060 | - | - |
| **400M** | 28 | 940 | 880 | 1000 | 28 | 6 | 810 | 746 | - | 1907 | 1907 | 1907 | - | 2190 | 2190 | 2190 |
| **400L** | 28 | 940 | 880 | 1000 | 28 | 6 | 810 | 746 | 1837 | 1907 | 1907 | 1907 | 2120 | 2190 | 2190 | 2190 |
| **450M** | 28 | 940 | 880 | 1000 | 28 | 6 | 910 | 814 | - | 1903 | 1903 | 1903 | - | 2280 | 2280 | 2280 |
| **450L** | 28 | 940 | 880 | 1000 | 28 | 6 | 910 | 814 | - | 1903 | 1903 | 1903 | - | 2280 | 2280 | 2280 |

Forced cooling image




Female thread in accordance with DIN 332 D Ø DB

Type IM V1 only

Position of the flange holes, size 63-200

Position of the flange holes, size 225-450

1) For type 250 to 400-4, 6, 8 dimension DA, EA, GC, FA, DC the specifications of number of poles 2 apply.
For type 450-6, 8 Dimension DA, EA, GC, FA, DC the specifications for number of poles 4 apply.

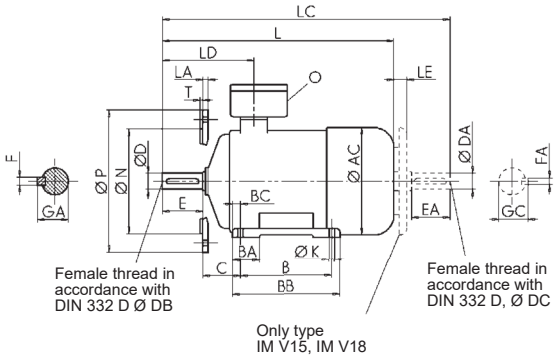
2) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

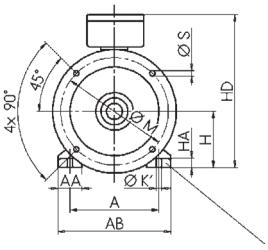
| Type CD… | LD | LE Number of Poles | | | O | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC | Fan motor Type CD | Type CD…F L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 4 | 6, 8 | | | | | | | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| **63M** | 104 | - | - | - | M25x1,5 | 11j6 | 23 | 12,5 | 4 | M4 | - | - | - | - | - | - |
| **71M** | 111 | 25 | 25 | 25 | M25x1,5 | 14j6 | 30 | 16 | 5 | M5 | - | - | - | - | - | - |
| **80M** | 116 | 25 | 25 | 25 | M25x1,5 | 19j6 | 40 | 21,5 | 6 | M6 | - | - | - | - | - | - |
| **90S** | 137 | 25 | 25 | 25 | M25x1,5 | 24j6 | 50 | 27 | 8 | M8 | - | - | - | - | - | - |
| **90L** | 137 | 25 | 25 | 25 | M25x1,5 | 24j6 | 50 | 27 | 8 | M8 | - | - | - | - | - | - |
| **100L** | 149 | 30 | 30 | 30 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 | - | - | - | - | - | - |
| **112M** | 154 | 30 | 30 | 30 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 | 63M1-4 | 515 | 515 | 731 | 731 | 30 |
| **132S+M** | 226 | 30 | 30 | 30 | M32x1,5 | 38k6 | 80 | 41 | 10 | M12 | 63M1-4 | 606 | 606 | 822 | 822 | 36 |
| **160M+L** | 261 | 66 | 66 | 66 | M40x1,5 | 42k6 | 110 | 45 | 12 | M16 | 63M1-4 | 757 | 757 | 972 | 972 | 38 |
| **180M** | 369 | 66 | 66 | - | M40x1,5 | 48k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | 746 | 746 | 960 | 960 | 38 |
| **180L** | 369 | - | 66 | 66 | M40x1,5 | 48k6 | 110 | 51,5 | 14 | M16 | 63M1-4 | - | 746 | - | 960 | 38 |
| **200L** | 390 | 77 | 77 | 77 | M50x1,5 | 55m6 | 110 | 59 | 16 | M20 | 63M1-4 | 803 | 803 | 1018 | 1018 | 38 |

| Type CD… | LD Poles | | LE Number of Poles | | | O | Shaft end $D_{m6}$, $DA_{m6}$ [1] | | | E, EA [1] | | GA, GC [1] | | | F, FA [1] | | DB, DC [1] | | Fan motor Type CD | Type CD…F L' | | Q | | LE' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4, 6, 8 | 2 | 4 | 6, 8 | | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | 2 | 4 | 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | |
| **225S** | - | 377 | - | 87 | 87 | M50x1,5 | - | 60 | 60 | - | 140 | - | 64 | 64 | - | 18 | - | M20 | 63M1-4 | - | 938 | - | 1153 | 38 |
| **225M** | 347 | 377 | 87 | 87 | 87 | M50x1,5 | 55 | 60 | 60 | 110 | 140 | 59 | 64 | 64 | 16 | 18 | M20 | M20 | 63M1-4 | 908 | 938 | 1153 | 1153 | 38 |
| **250M** | 482 | 482 | 94 | 94 | 94 | M63x1,5 | 60 | 65 | 65 | 140 | 140 | 64 | 69 | 69 | 18 | 18 | M20 | M20 | 63M1-4 | 1019 | 1019 | 1234 | 1234 | 38 |
| **280S** | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 65 | 75 | 75 | 140 | 140 | 69 | 79,5 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 | 1140 | 1140 | 1387 | 1387 | 41 |
| **280M** | 483 | 483 | 110 | 110 | 110 | M63x1,5 | 65 | 75 | 75 | 140 | 140 | 69 | 79,5 | 79,5 | 18 | 20 | M20 | M20 | 71M2-4 | 1140 | 1140 | 1387 | 1387 | 41 |
| **315S** | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| **315M** | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| **315L1** | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1283 | 1313 | 1529 | 1559 | 42 |
| **315L2** | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1483 | 1513 | 1729 | 1759 | 42 |
| **315L3** | 496 | 526 | 115 | 115 | 115 | M63x1,5 | 65 | 80 | 80 | 140 | 170 | 69 | 85 | 85 | 18 | 22 | M20 | M20 | 71M2-4 | 1483 | 1513 | 1729 | 1759 | 42 |
| **355M** | - | 702 | 130 | 130 | 130 | M80x2 | - | 90 | 90 | - | 170 | - | 95 | 95 | - | 25 | - | M24 | - | - | - | - | - | - |
| **355L1** | 672 | 702 | 130 | 130 | 130 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79.5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 | 1812 | 1842 | 2083 | 2113 | 40 |
| **355L2** | 672 | 702 | 130 | 130 | 130 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79.5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 | 1812 | 1842 | 2083 | 2113 | 40 |
| **355L3** | 672 | 702 | 130 | 130 | 130 | M80x2 | 75 | 90 | 90 | 140 | 170 | 79.5 | 95 | 95 | 20 | 25 | M20 | M24 | 80M1-4 | 1892 | 1922 | 2163 | 2193 | 40 |
| **400M** | - | 788 | 130 | 130 | 130 | M95x2 | - | 100 | 100 | - | 210 | - | 106 | 106 | - | 28 | - | M24 | 80M2-4 | 1837 | 1907 | 2108 | 2178 | 40 |
| **400L** | 718 | 788 | 130 | 130 | 130 | M95x2 | 75 | 100 | 100 | 140 | 210 | 79,5 | 106 | 106 | 20 | 28 | M20 | M24 | 80M2-4 | 1837 | 1907 | 2108 | 2178 | 40 |
| **450M** | 704 | 826 | 130 | 130 | 130 | M95x2 | 75 | 100 | 110 | 140 | 210 | 79,5 | 106 | 116 | 20 | 28 | M20 | M24 | 90S-4 | 1880 | 1950 | 2192 | 2262 | 40 |
| **450L** | 704 | 826 | 130 | 130 | 130 | M95x2 | 75 | 100 | 110 | 140 | 210 | 79,5 | 106 | 116 | 20 | 28 | M20 | M24 | 90S-4 | 1880 | 1950 | 2192 | 2262 | 40 |

## Type IM B14, IM B34, IM V17[1)], IM V18[1)], IM V19, IM V37

Self-cooling image




Type IM B14, IM V18, IM V19 without feet

Mounting flange in accordance with EN 50347 Form FT. Lifting eyes from size 90. Dimension AC, measured above bolt head. Dimension HD in relation to Ex e terminal compartment. Terminal compartment, rotatable 4 x 90°.

Note:

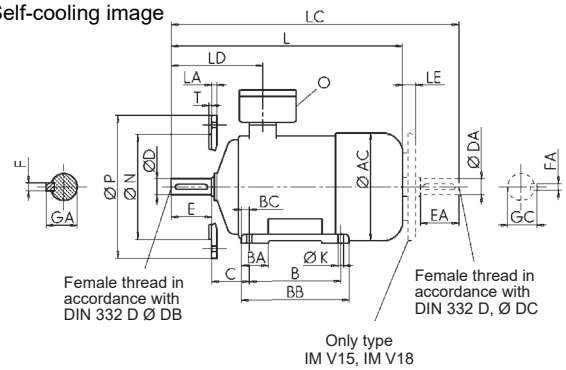
1) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors.

| type CD...Y3/Y/Y2 | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 100 | 20 | 120 | 146 | 80 | 25 | 100 | 10 | 40 | 63 | 6 | 227 | Ø 7 | – |
| **71M** | 112 | 27 | 139 | 140 | 90 | 32 | 110 | 10 | 45 | 71 | 10 | 248 | Ø 8 | – |
| **80M** | 125 | 35 | 160 | 158 | 100 | 37 | 130 | 15 | 50 | 80 | 12 | 265 | Ø 10 | – |
| **90S** | 140 | 38 | 180 | 178 | 100 | 44 | 130 | 15 | 56 | 90 | 12 | 288 | Ø 10 | – |
| **90L** | 140 | 38 | 180 | 178 | 125 | 44 | 155 | 15 | 56 | 90 | 12 | 288 | Ø 10 | – |
| **100L** | 160 | 42 | 200 | 198 | 140 | 46 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø 12 | – |
| **112M** | 190 | 45 | 235 | 218 | 140 | 46 | 175 | 17,5 | 70 | 112 | 17 | 337 | Ø 12 | – |
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132S1** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132S2** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M1** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M2** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |

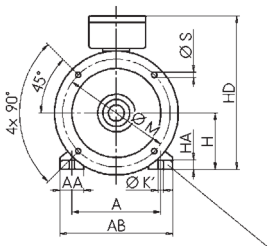
| type CD...Y3/Y/Y2 | L Number of poles 2 | 4 | 6 | 8 | LC Number of poles 2 | 4 | 6 | 8 | LE | LD | O |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 270 | 270 | – | – | by request | | – | – | 25 | 104 | M25x1,5 |
| **71M** | 301 | 301 | 301 | 301 | 380 | 380 | 380 | 380 | 30 | 108,5 | M25x1,5 |
| **80M** | 343 | 343 | – | – | 417 | 417 | – | – | 25 | 127 | M25x1,5 |
| **90S+L** | 398 | 398 | 398 | 398 | 479 | 479 | 479 | 479 | 25 | 139 | M25x1,5 |
| **100L** | 419 | 419 | 419 | 419 | 515 | 515 | 515 | 515 | 30 | 154 | M32x1,5 |
| **112M** | 517 | 517 | 517 | 517 | 608 | 608 | 608 | 608 | 30 | 189 | M32x1,5 |
| **132S** | – | 529 | 529 | 529 | – | 645 | 645 | 645 | 30 | 226 | M32x1,5 |
| **132S1** | 529 | – | – | – | 645 | – | – | – | 30 | 226 | M32x1,5 |
| **132S2** | 579 | – | – | – | 695 | – | – | – | 30 | 226 | M32x1,5 |
| **132M** | – | 579 | – | 529 | – | 695 | – | 645 | 30 | 226 | M32x1,5 |
| **132M1** | – | – | 529 | – | – | – | 645 | – | 30 | 226 | M32x1,5 |
| **132M2** | – | – | 579 | – | – | – | 695 | – | 30 | 226 | M32x1,5 |

| type CD...Y3/Y/Y2 | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC | Mounting flange LA | M | N j6 | P | S | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 11 j6 | 23 | 12,5 | 4 | M4 | 8 | 75 | 60 | 90 | M5 | 2,5 |
| **71M** | 14 j6 | 30 | 16 | 5 | M5 | 8 | 85 | 70 | 105 | M6 | 2,5 |
| **80M** | 19 j6 | 40 | 21,5 | 6 | M6 | 10 | 100 | 80 | 120 | M6 | 3 |
| **90S+L** | 24 j6 | 50 | 27 | 8 | M8 | 10 | 115 | 95 | 140 | M8 | 3 |
| **100L** | 28 j6 | 60 | 31 | 8 | M10 | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **112M** | 28 j6 | 60 | 31 | 8 | M10 | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **132S+M** | 38 k6 | 80 | 41 | 10 | M12 | 12 | 165 | 130 | 200 | M10 | 3,5 |

Self-cooling image




Only type IM V15, IM V18




Type IM B14, IM V18, IM V19 without feet

Size 63 in T4, not ventilated. Mounting flange in accordance with EN 50347 Form FT. Lifting eyes from size 90. Dimension AC measured above screw heads. Dimension HD in relation to Ex e terminal compartment. Terminal compartment, rotatable 4 x 90°. Also applies to BD series...

Note:
1) Protective roof required for types IM V17 and IM V18
2) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2.
The 2-pole shaft end is used here.
The length dimension L for all sizes corresponds to the 4-pole

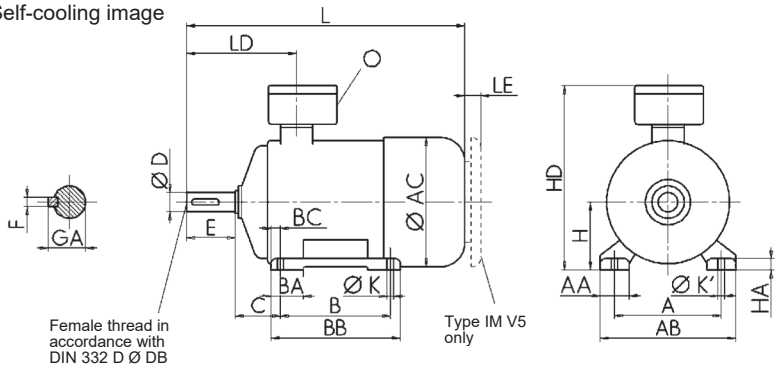
Only Type IM V15, IM V18

| Type CD… | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 100 | 20 | 120 | 134 | 80 | 25 | 100 | 10 | 40 | 63 | 6 | 227 | Ø 7 | – |
| **71M** | 112 | 30 | 139 | 145 | 90 | 25 | 110 | 10 | 45 | 71 | 10 | 235 | Ø 7 | – |
| **80M** | 125 | 35 | 160 | 163 | 100 | 35 | 130 | 15 | 50 | 80 | 12 | 260 | Ø 10 | – |
| **90S** | 140 | 40 | 180 | 183 | 100 | 40 | 130 | 15 | 56 | 90 | 12 | 275 | Ø 10 | – |
| **90L** | 140 | 40 | 180 | 183 | 125 | 40 | 155 | 15 | 56 | 90 | 12 | 275 | Ø 10 | – |
| **100L** | 160 | 45 | 200 | 201 | 140 | 45 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø 12 | – |
| **112M** | 190 | 50 | 235 | 225 | 140 | 50 | 175 | 17,5 | 70 | 112 | 17 | 317 | Ø 12 | – |
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |

| Type CD… | L | LC | LE | LD | O | Shaft end D, DA | E, EA | GA, GC | F, FA | DB, DC |
|---|---|---|---|---|---|---|---|---|---|---|
| **63M** | 239 | 274 | - | 104 | M25x1,5 | 11j6 | 23 | 12,5 | 4 | M4 |
| **71M** | 278 | 334 | 25 | 111 | M25x1,5 | 14j6 | 30 | 16 | 5 | M5 |
| **80M** | 313 | 387 | 25 | 116 | M25x1,5 | 19j6 | 40 | 21,5 | 6 | M6 |
| **90S+L** | 364 | 445 | 25 | 137 | M25x1,5 | 24j6 | 50 | 27 | 8 | M8 |
| **100L** | 415 | 510 | 30 | 149 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 |
| **112M** | 425 | 526 | 30 | 154 | M32x1,5 | 28j6 | 60 | 31 | 8 | M10 |
| **132S+M** | 529 | 645 | 30 | 226 | M32x1,5 | 38k6 | 80 | 41 | 10 | M12 |

| Type CD… | Mounting flange LA | M | N j6 | P | S | T |
|---|---|---|---|---|---|---|
| **63M** | 8 | 75 | 60 | 90 | M5 | 2,5 |
| **71M** | 8 | 85 | 70 | 105 | M6 | 2,5 |
| **80M** | 10 | 100 | 80 | 120 | M6 | 3 |
| **90S+L** | 10 | 115 | 95 | 140 | M8 | 3 |
| **100L** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **112M** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **132S+M** | 12 | 165 | 130 | 200 | M10 | 3,5 |

Self-cooling image




All motors with lifting eyes.
Dimension AC, measured above bolt head.
Dimension HD in relation to Ex e terminal compartment.
Terminal compartment, rotatable 4 x 90°.

Note:
1) Type IM V5 with protective roof;
Dimension LE see page 119.

| Type CD…Y3A/YA/Y2A CD…Y3AR/YAR/Y2AR | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132S1** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132S2** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **160M** | 254 | 65 | 310 | 318 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 |
| **160L Y2** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 |
| **160L Y3/Y** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 |
| **180M** | 279 | 75 | 350 | 353 | 241 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 |
| **180L Y2** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 |
| **180L Y3/Y** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 |
| **200L** | 318 | 80 | 390 | 393 | 305 | 90 | 365 | 30 | 133 | 200 | 30 | 581 | 20 | 26 |
| **type CD…Y3A/YA/Y2A CD…Y3AR/YAR/Y2AR** | **A** | **AA** | **AB** | **AC** | **B** | **BA** | **BB** | **BC** | **C** | **H** | **HA** | **HD** | **K H17** | **K' H17** |
| **225S** | 356 | 85 | 450 | 455 | 286 | 90 | 370 | 29,5 | 149 | 225 -0,5 | 35 | 634 | 20 | 26 |
| **225M** | 356 | 85 | 450 | 455 | 311 | 90 | 370 | 29,5 | 149 | 225 -0,5 | 35 | 634 | 20 | 26 |
| **250M** | 406 | 105 | 510 | 493 | 349 | 110 | 420 | 35,5 | 168 | 250 -0,5 | 40 | 731 | 26 | 35 |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 |
| **280M** | 457 | 110 | 570 | 548 | 419 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315L2** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315L3** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **type CD…XY2A/XY3A/XYA CD…XY2AR/XY3AR/XYAR ****** | **A** | **AA** | **AB** | **AC** | **B** | **BA** | **BB** | **BC** | **C** | **H** | **HA** | **HD** | **K H17** | **K' H17** |
| **250S** | 406 | 110 | 510 | 493 | 311 | 110 | 420 | 30 | 168 | 250 -0,5 | 45 | 731 | Ø 26,5 | – |
| **250M** | 406 | 110 | 510 | 548 | 349 | 110 | 420 | 30 | 168 | 250 -0,5 | 45 | 762 | Ø 26,5 | – |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280 -1 | 45 | 802 | 26 | 35 |
| **280M** | 457 | 110 | 570 | 635 | 419 | - | 570 | 40 | 190 | 280 -1 | 48 | 862 | Ø 26,5 | – |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315 -1 | 40 | 897 | 39 | 30 |

**** British version

Note:

2) For type 250 to 315-4 dimension DA, EA, GC, FA and DC the specifications of number of poles 2 apply.

3) With pole-changing motors (4/2, 6/4 nd 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| Type | L | | | | Shaft end | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3A/YA/Y2A | Number of poles | | LD | | O | D | | E | | GA | | F | | DB | |
| CD…Y3AR/YAR/Y2AR | 2 | 4 | | | | | | | | | | | | | |
| **132S** | – | 582 | 226 | | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132S1** | 582 | – | 226 | | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132S2** | 632 | – | 226 | | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M** | – | 632 | 226 | | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **160M** | 732 | 732 | 261 | | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L Y2** | 732 | 732 | 261 | | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L Y3/Y** | 732 | 767 | 261 | | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **180M** | 741 | 741 | 369 | | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L Y2** | – | 755 | 369 | | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L Y3/Y** | – | 805 | 369 | | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **200L** | 795 | 815 | 390 | | M50x1,5 | 55 m6 | | 110 | | 59 | | 16 | | M20 | |
| **Type** | **L** | | | | | **Shaft end** | | | | | | | | | |
| **CD…Y3A/YA/Y2A** | **Number of poles** | | **LD** | | **O** | **$D_{m6}$, $DA_{m6}$ 2)** | | **E, EA 2)** | | **GA, GC 2)** | | **F, FA 2)** | | **DB, DC 2)** | |
| **CD…Y3AR/YAR/Y2AR** | **2** | **4** | **2** | **4** | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| **225S** | – | 932 | – | 377 | M50x1,5 | – | 60 | – | 140 | – | 64 | – | 18 | – | M20 |
| **225M** | 902 | 932 | 347 | 377 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 |
| **250M** | 1014 | 1014 | 482 | 482 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 |
| **280S** | 1123 | 1123 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **280M** | 1123 | 1123 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **315S** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315M** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L1** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L2** | 1432 | 1494 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L3** | 1432 | 1494 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **Type** | **L** | | | | | **Shaft end** | | | | | | | | | |
| **CD…XY2A/XY3A/XYA** | **Number of poles** | | **LD** | | **O** | **$D_{m6}$, $DA_{m6}$ 2)** | | **E, EA 2)** | | **GA, GC 2)** | | **F, FA 2)** | | **DB, DC 2)** | |
| **CD…XY2AR/XY3AR/XYAR** **** | **2** | **4** | **2** | **4** | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| **250S** | 1014 | 1014 | 482 | 482 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **250M** | 1123 | 1123 | 483 | 483 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **280S** | 1123 | 1123 | 483 | 483 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **280M** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **315S** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315M** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315L1** | 1432 | 1494 | 496 | 526 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |

* Diameter 70 for British version by request - please note: Dimension GA becomes 74.5 and dimension F becomes 20

** Diameter 80 for British version by request - please note: Dimensions L, LC, LD and E become 30mm longer, dimension GA becomes 85 and dimension F becomes 22

*** Diameter 85 for British version by request - please note: Dimension GA becomes 90 and dimension F corresponds to the catalog

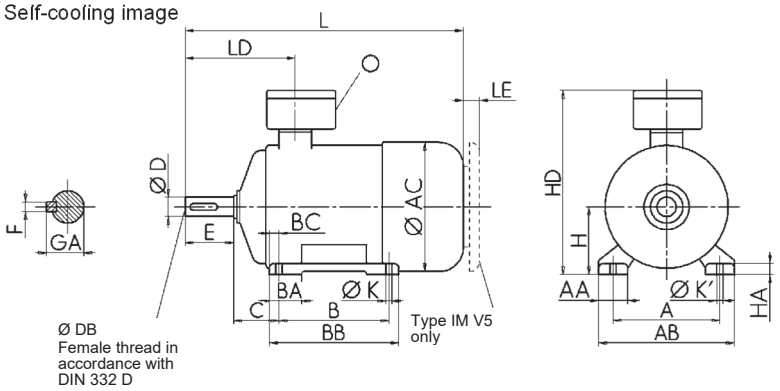
**** British version

# IE1
# Self-cooling with axial



## Noise class 2 and 3
## Type IM B3, IM B6, IM B7, IM B8, IM V5[1], IM V6

Self-cooling image




All motors with lifting eyes.
Dimension AC measured above screw heads.
Dimension HD in relation to Ex e terminal compartment. Terminal compartment, rotatable 4 x 90°.
Also applies to BD series...

Note:
1) Protective roof required for type IM V5, see dimension LE on page 117.
2) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole
3) Shaft end installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2.
The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD…A CD…AR | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | – |
| **160M** | 254 | 65 | 310 | 318 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 |
| **160L** | 254 | 65 | 310 | 318 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 |
| **180M** | 279 | 75 | 350 | 353 | 241 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 |
| **180L** | 279 | 75 | 350 | 353 | 279 | 100 | 340 | 30 | 121 | 180 | 25 | 545 | 15 | 20 |
| **200L** | 318 | 80 | 390 | 393 | 305 | 90 | 365 | 30 | 133 | 200 | 30 | 581 | 20 | 26 |
| **Type CD…A CD…AR** | **A** | **AA** | **AB** | **AC** | **B** | **BA** | **BB** | **BC** | **C** | **H** | **HA** | **HD** | **K H17** | **K' H17** |
| **225S** | 356 | 85 | 450 | 455 | 286 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 |
| **225M** | 356 | 85 | 450 | 455 | 311 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 |
| **250M** | 406 | 105 | 510 | 493 | 349 | 110 | 420 | 35,5 | 168 | 250-0,5 | 40 | 731 | 26 | 35 |
| **280S** | 457 | 110 | 570 | 548 | 368 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 |
| **280M** | 457 | 110 | 570 | 548 | 419 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 |
| **315S** | 508 | 150 | 630 | 635 | 406 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 |
| **315M** | 508 | 150 | 630 | 635 | 457 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 |
| **315L1** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 |
| **315L2** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 |
| **315L3** | 508 | 150 | 630 | 635 | 508 | 210 | 615 | 53 | 216 | 315-1 | 40 | 897 | 39 | 30 |
| **355L1** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 |
| **355L2** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 |
| **355L3** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355-1 | 50 | 1084 | 30 | 39 |

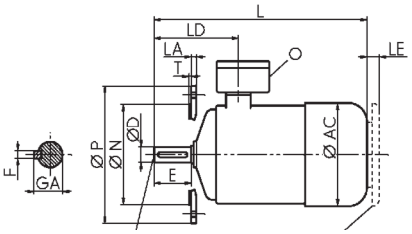
| type CD…A CD…AR | L Number of poles 2 | 4 | LD | | O | Shaft end D | | E | | GA | | F | | DB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **132S** | 582 | 582 | 226 | | M32x1,5 | 38k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M** | – | 582 | 226 | | M32x1,5 | 38k6 | | 80 | | 41 | | 10 | | M12 | |
| **160M** | 732 | 732 | 261 | | M40x1,5 | 42k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L** | 732 | 732 | 261 | | M40x1,5 | 42k6 | | 110 | | 45 | | 12 | | M16 | |
| **180M** | 741 | 754 | 369 | | M40x1,5 | 48k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L** | - | 754 | 369 | | M40x1,5 | 48k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **200L** | 795 | 815 | 390 | | M50x1,5 | 55m6 | | 110 | | 59 | | 16 | | M20 | |
| **type CD…A CD…AR** | **L Number of poles 2** | **4** | **LD 2** | **4** | **O** | **Shaft end D 2** | **4** | **E 2** | **4** | **GA 2** | **4** | **F 2** | **4** | **DB 2** | **4** |
| **225S** | - | 932 | - | 377 | M50x1,5 | - | 60 | - | 140 | - | 64 | - | 18 | - | M20 |
| **225M** | 902 | 932 | 347 | 377 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 |
| **250M** | 1014 | 1014 | 482 | 482 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 |
| **280S** | 1123 | 1123 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **280M** | 1123 | 1123 | 483 | 483 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **315S** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315M** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L1** | 1232 | 1294 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L2** | 1432 | 1494 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L3** | 1432 | 1494 | 496 | 526 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **355L1** | 1682 | 1682 | 672 | 702 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L2** | 1682 | 1682 | 672 | 702 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L3** | 1762 | 1762 | 672 | 702 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |

# IE3 / IE2
# Surface-cooled, low-voltage motors, self-cooling with axial fan



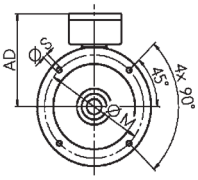
## Noise class 2 and 3
## Type IM B5, IM V1[1)], IM V3

Self-cooling image

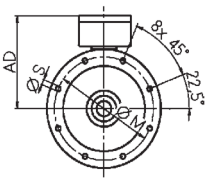



Female thread in accordance with DIN 332 D Ø DB

Type IM only V1




Position of flange holes Size 132-200




Position of flange holes Size 225-355

All motors with lifting eyes.
Dimension AC, measured above bolt head.
Dimension HD in relation to Ex e terminal compartment.
Terminal compartment, rotatable 4 x 90°.

Note:
1) Type IM V1 with protective roof; dimension LE see page 129.

| Type | Mounting flange | | | | | | | | L Number of poles | | LD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…Y3A/YA/Y2A<br>CD…Y3AR/YAR/Y2AR | LA | M | N | P | S H17 | T | AC | AD | 2 | 4 | 2 | 4 |
| **132S** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | - | 582 | - | 226 |
| **132S1** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | 582 | - | 226 | - |
| **132S2** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | 632 | - | 226 | - |
| **132M** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | - | 632 | - | 226 |
| **160M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 732 | 732 | 261 | 261 |
| **160L Y2** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 732 | 732 | 261 | 261 |
| **160L Y3/Y** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 732 | 767 | 261 | 261 |
| **180M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | 741 | 741 | 369 | 369 |
| **180L Y2** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | - | 755 | - | 369 |
| **180L Y3/Y** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | - | 805 | - | 369 |
| **200L** | 20 | 350 | 300h6 | 400 | 18,5 | 5 | 393 | 381 | 795 | 815 | 390 | 369 |
| **type** | **Mounting flange** | | | | | | | | **L Number of poles** | | **LD** | |
| **CD…Y3A/YA/Y2A<br>CD…Y3AR/YAR/Y2AR** | **LA** | **M** | **N h6** | **P** | **S H17** | **T** | **AC** | **AD** | **2** | **4** | **2** | **4** |
| **225S** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | - | 932 | - | 377 |
| **225M** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | 902 | 932 | 347 | 377 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 481 | 1015 | 1015 | 482 | 482 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1124 | 1124 | 483 | 483 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1124 | 1124 | 483 | 483 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1233 | 1295 | 496 | 526 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1233 | 1295 | 496 | 526 |
| **315L1** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1233 | 1295 | 496 | 526 |
| **315L2** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1433 | 1495 | 496 | 526 |
| **315L3** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1433 | 1495 | 496 | 526 |
| **type** | **Mounting flange** | | | | | | | | **L Number of poles** | | **LD** | |
| **CD…XY2A/XY3A/XYA<br>CD…XY2AR/XY3AR/XYAR<br>****** | **LA** | **M** | **N h6** | **P** | **S H17** | **T** | **AC** | **AD** | **2** | **4** | **2** | **4** |
| **250S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 481 | 1014 | 1014 | 482 | 482 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 476 | 1123 | 1123 | 483 | 483 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1123 | 1123 | 483 | 483 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315L1** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |

* Diameter 70 for British version by request - please note: Dimension GA becomes 74.5 and dimension F be
** Diameter 80 for British version by request - please note: Dimensions L, LC, LD and E become 30mm longer, dimension GA becomes 85 and dimension F becomes 22
***Diameter 85 for British version by request - please note: Dimension GA becomes 90 and dimension F corresponds to the catalog
****British version

Note:
2) For type 250 to 315-4 dimension DA, EA, GC, FA and DC the specifications of number of poles 2 apply.
3) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD…Y3A/YA/Y2A CD…Y3AR/YAR/Y2AR | LE | O | Shaft end D | | E | | GA | | F | | DB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **132S** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132S1** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132S2** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M1** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M2** | 30 | M32x1,5 | 38 k6 | | 80 | | 41 | | 10 | | M12 | |
| **160M** | 66 | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L Y2** | 66 | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L Y3/Y** | 66 | M40x1,5 | 42 k6 | | 110 | | 45 | | 12 | | M16 | |
| **180M** | 66 | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L Y2** | 66 | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L Y3/Y** | 66 | M40x1,5 | 48 k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **200L** | 77 | M50x1,5 | 55 m6 | | 110 | | 59 | | 16 | | M20 | |
| **Type CD…Y3A/YA/Y2A CD…Y3AR/YAR/Y2AR** | **LE** | **O** | **Shaft end $D_{m6}$ 2)** | | **E 2)** | | **GA 2)** | | **F 2)** | | **DB 2)** | |
| | | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| **225S** | 87 | M50x1,5 | - | 60 | - | 140 | - | 64 | - | 18 | - | M20 |
| **225M** | 87 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 |
| **250M** | 94 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 |
| **280S** | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **280M** | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **315S** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315M** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L1** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L2** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L3** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **Type CD…XY2A/XY3A/XYA CD…XY2AR/XY3AR/XYAR ****** | **LE** | **O** | **Shaft end $D_{m6}$ 2)** | | **E 2)** | | **GA 2)** | | **F 2)** | | **DB 2)** | |
| | | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| **250S** | 94 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **250M** | 110 | M63x1,5 | 60 | 65* | 140 | 140 | 64 | 69* | 18 | 18* | M20 | M20 |
| **280S** | 110 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **280M** | 115 | M63x1,5 | 65 | 75** | 140 | 140** | 69 | 79,5** | 18 | 20** | M20 | M20 |
| **315S** | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315M** | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |
| **315L1** | 115 | M63x1,5 | 65 | 80*** | 140 | 170 | 69 | 85*** | 18 | 22 | M20 | M20 |

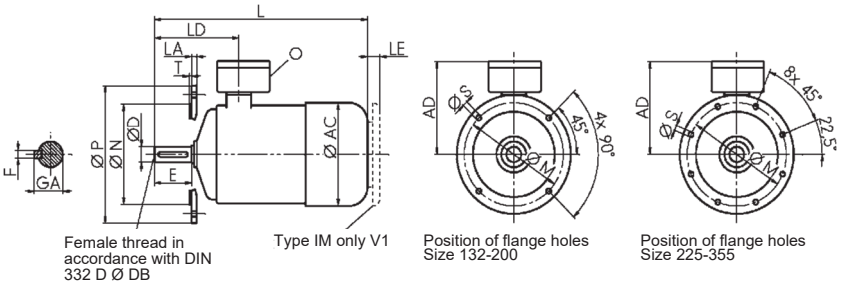
* Diameter 70 for British version by request - please note: Dimension GA becomes 74.5 and dimension F becomes 20
** Diameter 80 for British version by request - please note: Dimensions L, LC, LD and E become 30mm longer, dimension GA becomes 85 and dimension F becomes 22
***Diameter 85 for British version by request - please note: Dimension GA becomes 90 and dimension F corresponds to the catalog
**** British version

# IE1
# Surface-cooled low voltage motors
# Self-cooling with axial fan



## Noise class 2 and 3
## Type IM B5, IM V1[1]), IM V3

Self-cooling image




Mounting flange in accordance with EN 50347 Form FF. All motors with lifting eyes.
Dimension AC measured above screw heads.
Dimension AD in relation to Ex e terminal compartment.
Terminal compartment, rotatable 4 x 90°.
Also applies to BD series...

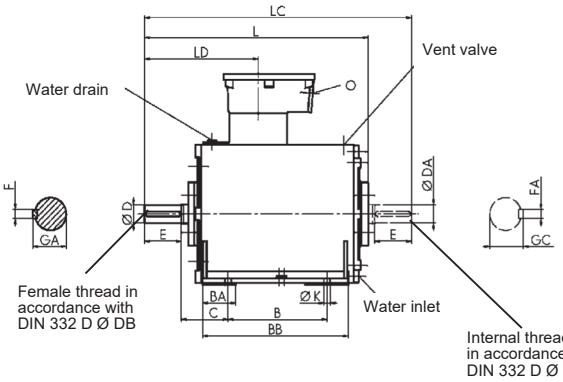
Note:
1) Protective roof required for type IM V1
2) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2.
The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

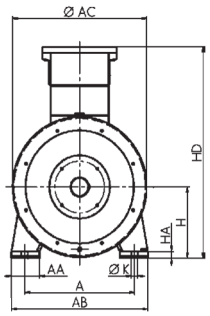
| Type | Mounting flange | | | | | | | | L Number of poles | | LD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…A CD…AR | LA | M | N | P | S H17 | T | AC | AD | 2 | 4 | | |
| **132S** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | 582 | 582 | 226 | |
| **132M** | 16 | 265 | 230j6 | 300 | 14,5 | 4 | 265 | 261 | – | 582 | 226 | |
| **160M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 732 | 732 | 261 | |
| **160L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 318 | 299 | 732 | 732 | 261 | |
| **180M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | 741 | 754 | 369 | |
| **180L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 353 | 365 | - | 754 | 369 | |
| **200L** | 20 | 350 | 300h6 | 400 | 18,5 | 5 | 393 | 381 | 795 | 815 | 390 | |
| **Type** | **Mounting flange** | | | | | | | | **L Number of poles** | | **LD Number of poles** | |
| **CD…A CD…AR** | **LA** | **M** | **N h6** | **P** | **S H17** | **T** | **AC** | **AD** | **2** | **4** | **2** | **4** |
| **225S** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | - | 932 | - | 377 |
| **225M** | 22 | 400 | 350 | 450 | 18,5 | 5 | 455 | 409 | 902 | 932 | 347 | 377 |
| **250M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 493 | 481 | 1014 | 1014 | 482 | 482 |
| **280S** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1123 | 1123 | 483 | 483 |
| **280M** | 18 | 500 | 450 | 550 | 18,5 | 5 | 548 | 522 | 1123 | 1123 | 483 | 483 |
| **315S** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315M** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315L1** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1232 | 1294 | 496 | 526 |
| **315L2** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1432 | 1494 | 496 | 526 |
| **315L3** | 22 | 600 | 550 | 660 | 24 | 6 | 635 | 582 | 1432 | 1494 | 496 | 526 |
| **355L1** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1682 | 1682 | 672 | 702 |
| **355L2** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1682 | 1682 | 672 | 702 |
| **355L3** | 25 | 740 | 680 | 800 | 24 | 6 | 725 | 729 | 1762 | 1762 | 672 | 702 |

p

| Type CD…A CD…AR | LE | O | Shaft end D | | E | | GA | | F | | DB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **132S** | 30 | M32x1,5 | 38k6 | | 80 | | 41 | | 10 | | M12 | |
| **132M** | 30 | M32x1,5 | 38k6 | | 80 | | 41 | | 10 | | M12 | |
| **160M** | 66 | M40x1,5 | 42k6 | | 110 | | 45 | | 12 | | M16 | |
| **160L** | 66 | M40x1,5 | 42k6 | | 110 | | 45 | | 12 | | M16 | |
| **180M** | 66 | M40x1,5 | 48k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **180L** | 66 | M40x1,5 | 48k6 | | 110 | | 51,5 | | 14 | | M16 | |
| **200L** | 77 | M50x1,5 | 55m6 | | 110 | | 59 | | 16 | | M20 | |
| **Type CD…A CD…AR** | **LE** | **O** | **Shaft end D** | | **E** | | **GA** | | **F** | | **DB** | |
| | | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| **225S** | 87 | M50x1,5 | - | 60 | - | 140 | - | 64 | - | 18 | - | M20 |
| **225M** | 87 | M50x1,5 | 55 | 60 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 |
| **250M** | 94 | M63x1,5 | 60 | 65 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 |
| **280S** | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **280M** | 110 | M63x1,5 | 65 | 75 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **315S** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315M** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L1** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L2** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L3** | 115 | M63x1,5 | 65 | 80 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **355L1** | 130 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L2** | 130 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L3** | 130 | M80x2 | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |

## Noise class 4
## Type IM B3, IM B6, IM B7, IM B8, IM V5, IM V6

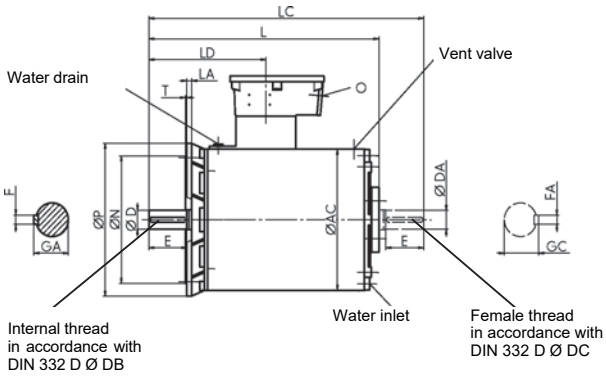


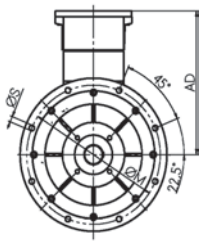




All motors with lifting eyes. Terminal compartment, rotatable 4 x 90°.
Dimension HD in relation to Ex e terminal compartment.

| Type CD...W | A | AA | AB | AC | B | BA | BB | BC | C | H | HA | HD | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **160M** | 254 | 65 | 310 | 317 | 210 | 100 | 300 | 21,5 | 108 | 160-0,5 | 15 | on request | 15 |
| **160L** | 254 | 65 | 310 | 317 | 254 | 100 | 300 | 21,5 | 108 | 160-0,5 | 15 | on request | 15 |
| **180M** | 279 | 75 | 350 | 454 | 241 | 100 | 340 | - | 121 | 180-0,5 | 15 | 545 | 15 |
| **180L** | 279 | 75 | 350 | 454 | 279 | 100 | 340 | - | 121 | 180-0,5 | 15 | 545 | 15 |
| **200L** | 318 | 80 | 390 | 385 | 305 | 90 | 365 | 30 | 133 | 200-0,5 | 20 | 581 | 20 |
| **225S** | 356 | 85 | 450 | 440 | 286 | 90 | 370 | 29,5 | 149 | 225-0,5 | 25 | 634 | 20 |
| **225M** | 356 | 85 | 450 | 440 | 311 | 90 | 370 | 29,5 | 149 | 225-0,5 | 25 | 634 | 20 |
| **250M** | 406 | 105 | 510 | 480 | 349 | 110 | 420 | - | 168 | 250-0,5 | 30 | 721 | 26 |
| **280S** | 457 | 110 | 570 | 536 | 368 | 120 | 500 | 80,5 | 190 | 280-1 | 35 | 791 | 26 |
| **280M** | 457 | 110 | 570 | 536 | 419 | 120 | 500 | 80,5 | 190 | 280-1 | 35 | 791 | 26 |
| **315S** | 508 | 150 | 630 | 619 | 406 | 210 | 615 | 106,5 | 216 | 315-1 | 35 | 896 | 30 |
| **315M** | 508 | 150 | 630 | 619 | 457 | 210 | 615 | 106,5 | 216 | 315-1 | 35 | 896 | 30 |
| **315L1** | 508 | 150 | 630 | 619 | 508 | 210 | 615 | 106,5 | 216 | 315-1 | 35 | 896 | 30 |
| **315L2** | 508 | 150 | 630 | 619 | 508 | 210 | 615 | 106,5 | 216 | 315-1 | 35 | 896 | 30 |
| **355M** | 610 | 130 | 720 | 702 | 560 | 220 | 720 | 151,5 | 254 | 355-1 | 35 | 1084 | 30 |
| **355L1** | 610 | 130 | 720 | 702 | 630 | 220 | 720 | 151,5 | 254 | 355-1 | 35 | 1084 | 30 |
| **355L2** | 610 | 130 | 720 | 702 | 630 | 220 | 720 | 151,5 | 254 | 355-1 | 35 | 1084 | 30 |

| type CD...W | L poles | | LC poles | | LD poles | | O | Shaft end D, DA | | E, EA | | GA, GC | | F, FA | | DB, DC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 |
| **160M** | 614 | 614 | 755 | 755 | 261 | 261 | M40x1,5 | 42k6 | 42k6 | 110 | 110 | 45 | 45 | 12 | 12 | M16 | M16 |
| **160L** | 614 | 614 | 755 | 755 | 261 | 261 | M40x1,5 | 42k6 | 42k6 | 110 | 110 | 45 | 45 | 12 | 12 | M16 | M16 |
| **180M** | 643 | 643 | 773 | 773 | 369 | 369 | M40x1,5 | 48k6 | 48k6 | 110 | 110 | 51,5 | 51,5 | 14 | 14 | M16 | M16 |
| **180L** | 643 | 643 | 773 | 773 | 369 | 369 | M40x1,5 | 48k6 | 48k6 | 110 | 110 | 51,5 | 51,5 | 14 | 14 | M16 | M16 |
| **200L** | 660 | 660 | 773 | 773 | 390 | 390 | M50x1,5 | 55m6 | 55m6 | 110 | 110 | 59 | 59 | 16 | 16 | M20 | M20 |
| **225S** | - | 771 | - | 931 | - | 377 | M50x1,5 | - | 60m6 | - | 140 | - | 64 | - | 18 | - | M20 |
| **225M** | 741 | 771 | 871 | 931 | 347 | 377 | M50x1,5 | 55m6 | 60m6 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M20 |
| **250M** | 880 | 880 | 1040 | 1040 | 482 | 482 | M63x1,5 | 60m6 | 65m6 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M20 |
| **280S** | 983 | 983 | 1143 | 1143 | 436 | 436 | M63x1,5 | 65m6 | 75m6 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **280M** | 983 | 983 | 1143 | 1143 | 436 | 436 | M63x1,5 | 65m6 | 75m6 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M20 |
| **315S** | 1093 | 1123 | 1248 | 1308 | 496 | 526 | M63x1,5 | 65m6 | 80m6 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315M** | 1093 | 1123 | 1248 | 1308 | 496 | 526 | M63x1,5 | 65m6 | 80m6 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L1** | 1093 | 1123 | 1248 | 1308 | 496 | 526 | M63x1,5 | 65m6 | 80m6 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **315L2** | 1293 | 1323 | 1448 | 1508 | 496 | 526 | M63x1,5 | 65m6 | 80m6 | 140 | 170 | 69 | 85 | 18 | 22 | M20 | M20 |
| **355M** | 1451 | 1481 | 1648 | 1978 | 672 | 702 | M80x2 | 75m6 | 90m6 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L1** | 1451 | 1481 | 1648 | 1978 | 672 | 702 | M80x2 | 75m6 | 90m6 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |
| **355L2** | 1451 | 1481 | 1648 | 1978 | 672 | 702 | M80x2 | 75m6 | 90m6 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 |



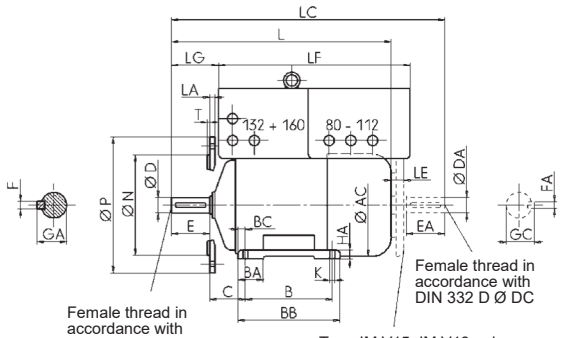




Mounting flange in accordance with EN 50347 Form FF. All motors with lifting eyes. Dimension AD in relation to Ex e terminal compartment. Terminal compartment, rotatable 4 x 90°.

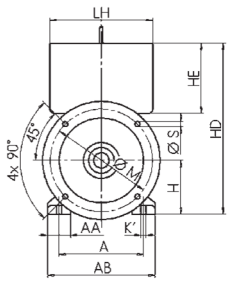
Note:

1) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| type | Mounting flange | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CD…W | LA | M | N | P | S H17 | T | AC | AD |
| **160M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 317 | by request |
| **160L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 317 | by request |
| **180M** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 454 | 365 |
| **180L** | 20 | 300 | 250j6 | 350 | 18,5 | 5 | 454 | 365 |
| **200L** | 20 | 350 | 300h6 | 400 | 18,5 | 5 | 385 | 381 |
| **225S** | 22 | 400 | 350h6 | 450 | 18,5 | 5 | 440 | 409 |
| **225M** | 22 | 400 | 350h6 | 450 | 18,5 | 5 | 440 | 409 |
| **250M** | 18 | 500 | 450h6 | 550 | 18,5 | 5 | 480 | 471 |
| **280S** | 18 | 500 | 450h6 | 550 | 18,5 | 5 | 536 | 511 |
| **280M** | 18 | 500 | 450h6 | 550 | 18,5 | 5 | 536 | 511 |
| **315S** | 22 | 600 | 550h6 | 660 | 24 | 6 | 619 | 581 |
| **315M** | 22 | 600 | 550h6 | 660 | 24 | 6 | 619 | 581 |
| **315L1** | 22 | 600 | 550h6 | 660 | 24 | 6 | 619 | 581 |
| **315L2** | 22 | 600 | 550h6 | 660 | 24 | 6 | 619 | 581 |
| **355M** | 25 | 740 | 680h6 | 800 | 24 | 6 | 702 | 729 |
| **355L1** | 25 | 740 | 680h6 | 800 | 24 | 6 | 702 | 729 |
| **355L2** | 25 | 740 | 680h6 | 800 | 24 | 6 | 702 | 729 |




Type IM V15, IM V18 only, IIM V5, IM V1, IM V17




Type IM B14, IM V18, IM V19, IM B5, IM V1, IM V3 without feet

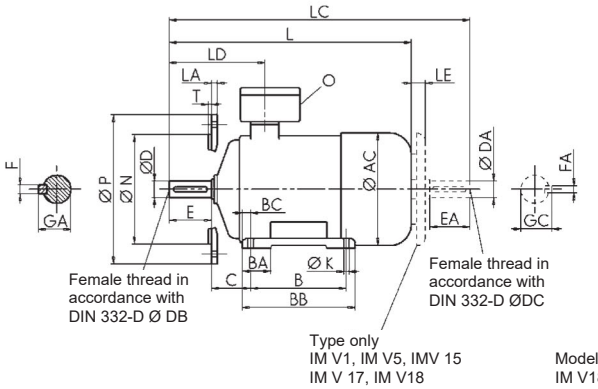
Mounting flange in accordance with EN 50347
All motors with lifting eyes.
Dimension AC measured above screw heads.

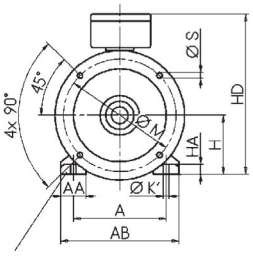
Note:
1) Models IM V1, IM V5, IM V15, IM V17 and IM V18 with protective roof
2) With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2.
The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD…YI | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | K' H17 | L | LC | LE | LF | LG | LH | HE | Gewicht ca. [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80M** | 125 | 35 | 160 | 158 | 100 | 37 | 130 | 15 | 50 | 80 | 12 | 365 | Ø 10 | – | 343 | 417 | 25 | 355 | 46 | 274 | 237 | 78 |
| **90S** | 140 | 40 | 180 | 178 | 100 | 44 | 130 | 15 | 56 | 90 | 12 | 378 | Ø 10 | – | 398 | 479 | 25 | 355 | 67 | 274 | 237 | 91 |
| **90L** | 140 | 40 | 180 | 178 | 125 | 44 | 155 | 15 | 56 | 90 | 12 | 378 | Ø 10 | – | 398 | 479 | 25 | 355 | 67 | 274 | 237 | 91 |
| **100L** | 160 | 45 | 200 | 198 | 140 | 46 | 175 | 17,5 | 63 | 100 | 15 | 410 | Ø 12 | – | 419 | 515 | 30 | 355 | 79 | 274 | 237 | 102 |
| **112M** | 190 | 50 | 235 | 218 | 140 | 46 | 175 | 17,5 | 70 | 112 | 17 | 420 | Ø 12 | – | 517 | 608 | 30 | 355 | 84 | 274 | 237 | 127 |
| **132S** | 216 | 59 | 264 | 258 | 140 | 56 | 187 | 23,5 | 89 | 132 | 20 | 459 | Ø 12 | – | 534 | 650 | 30 | 355 | 139 | 274 | 237 | 127 |

| type | Shaft end | | | | | Desings IM B35, IM B5, IM V1 [1], IM V3, IM V15 [1], IM V35 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…YI | D, DA | E, EA | GA, GC | F, FA | DB, DC | LA | M | N j6 | P | S H17 | T |
| **80M** | 19j6 | 40 | 21,5 | 6 | M6 | 12 | 165 | 130 | 200 | 12 | 3,5 |
| **90S+L** | 24j6 | 50 | 27 | 8 | M8 | 12 | 165 | 130 | 200 | 12 | 3,5 |
| **100L** | 28j6 | 60 | 31 | 8 | M10 | 16 | 215 | 180 | 250 | 14,5 | 4 |
| **112M** | 28j6 | 60 | 31 | 8 | M10 | 16 | 215 | 180 | 250 | 14,5 | 4 |
| **132S** | 38k6 | 80 | 41 | 10 | M12 | 16 | 265 | 230 | 300 | 14,5 | 4 |

| type | Desings IM B14, IM V18 [1], IM V19, IM B34, IM V17 [1], IM V37 | | | | | |
|---|---|---|---|---|---|---|
| CD…YI | LA | M | N j6 | P | S | T |
| **80M** | 10 | 100 | 80 | 120 | M6 | 3 |
| **90S+L** | 10 | 115 | 95 | 140 | M8 | 3 |
| **100L** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **112M** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **132S** | 12 | 165 | 130 | 200 | M10 | 3,5 |




Models IM B5, IM V1, IM V3, IM B14
IM V18, IM V19 without feet

Mounting flange in accordance with EN 50347 Form FF/FT.
All motors with lifting eyes.
Dimension AC measured above screw heads.
Dimension HD in relation to Ex e terminal compartment. Terminal compartment, rotatable 4 x 90°.

| Type BD…Y3B(R) | A | AA | AB | AC | B | BA | BB | BC | C | H -0,5 | HA | HD | K H17 | L | LC | LD | LE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80M** | 125 | 35 | 160 | 177 | 100 | 35 | 130 | 15 | 50 | 80 | 12 | 260 | Ø 10 | 411 | 480 | 127 | 25 |
| **90S** | 140 | 40 | 180 | 194 | 100 | 40 | 130 | 15 | 56 | 90 | 12 | 275 | Ø 10 | 472 | 553 | 139 | 25 |
| **90L** | 140 | 40 | 180 | 194 | 125 | 40 | 155 | 15 | 56 | 90 | 12 | 275 | Ø 10 | 472 | 553 | 139 | 25 |
| **100L** | 160 | 45 | 200 | 220 | 140 | 45 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø 12 | 502 | 598 | 154 | 30 |
| **112M** | 190 | 50 | 235 | 260 | 140 | 50 | 175 | 17,5 | 70 | 112 | 17 | 317 | Ø 12 | 600 | 692 | 189 | 30 |
| **132S** | 216 | 60 | 266 | 265 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | 621 | 720 | 226 | 30 |
| **132M** | 216 | 60 | 266 | 265 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø 12 | 621 | 720 | 226 | 30 |

| Type BD…Y3B(R) | O | Shaft end D | DA | E | EA | GA | GC | F | FA | DB | DC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **80M** | M25x1,5 | 19j6 | 19j6 | 40 | 40 | 21,5 | 21,5 | 6 | 6 | M6 | M6 |
| **90S+L** | M25x1,5 | 24j6 | 24j6 | 50 | 50 | 27 | 27 | 8 | 8 | M8 | M8 |
| **100L** | M32x1,5 | 28j6 | 28j6 | 60 | 60 | 31 | 31 | 8 | 8 | M10 | M10 |
| **112M** | M32x1,5 | 28j6 | 28j6 | 60 | 60 | 31 | 31 | 8 | 8 | M10 | M10 |
| **132S+M** | M32x1,5 | 38k6 | 28j6 | 80 | 60 | 41 | 31 | 10 | 8 | M12 | M10 |

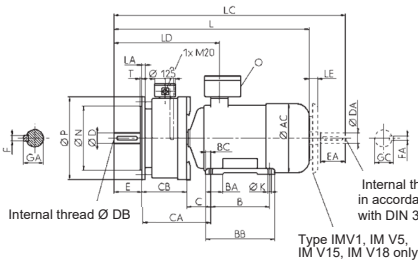
| Type BD…Y3B(R) | FF-flanges LA | M | N j6 | P | S H17 | T | LE |
|---|---|---|---|---|---|---|---|
| **80M** | 12 | 165 | 130 | 200 | 12 | 3,5 | 25 |
| **90S+L** | 12 | 165 | 130 | 200 | 12 | 3,5 | 25 |
| **100L** | 16 | 215 | 180 | 250 | 14,5 | 4 | 30 |
| **112M** | 16 | 215 | 180 | 250 | 14,5 | 4 | 30 |
| **132S+M** | 16 | 265 | 230 | 300 | 14,5 | 4 | 30 |

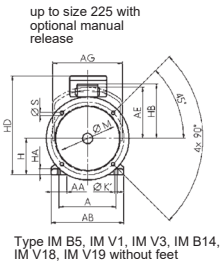
| Type BD…Y3B(R) | FT-flanges LA | M | N j6 | P | S H17 | T |
|---|---|---|---|---|---|---|
| **80M** | 10 | 100 | 80 | 120 | M6 | 3 |
| **90S+L** | 10 | 115 | 95 | 140 | M8 | 3 |
| **100L** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **112M** | 12 | 130 | 110 | 160 | M8 | 3,5 |
| **132S+M** | 12 | 165 | 130 | 200 | M10 | 3,5 |

ATTENTION: From 01.07.2021, motors with efficiency classes IE1 and IE2 may only be supplied to the EU area as replacement motors for identical ATB motors that are already in operation.

# Motors with mounted brake
# Type CD... SM(N)





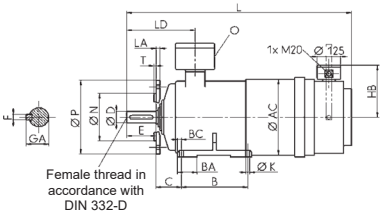



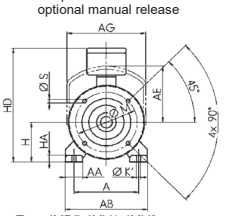

Note:
Mounting flange in accordance with EN 50347, form FF and FT. Form FF corresponds to type B5. Form FT corresponds to type B14.
With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end installed.
The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD...SM Y3, Y, Y2 | A | AA | AB | AC | AD | B | BA | BB | BC | C | H-0,5 | HA | HD | K H17 | K' H17 | L Number of poles 2 | 4 | 6 | 8 | LD | CA | CB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **71M Y3, Y, Y2** | 112 | 27 | 139 | 140 | 180 | 90 | 32 | 110 | 10 | 45 | 71 | 10 | 251 | Ø7 | - | 472 | 472 | 472 | 472 | 280 | 216 | 171 |
| **80M Y3, Y, Y2** | 125 | 35 | 160 | 158 | 185 | 100 | 37 | 130 | 15 | 50 | 80 | 12 | 271 | Ø10 | - | 540 | 540 | 540 | 540 | 320 | 243,5 | 193,5 |
| **90S Y3, Y, Y2** | 140 | 38 | 180 | 178 | 198 | 100 | 44 | 130 | 15 | 56 | 90 | 12 | 295 | Ø10 | - | 592 | 592 | 592 | 592 | 333 | 249,5 | 193,5 |
| **90L Y3, Y, Y2** | 140 | 38 | 180 | 178 | 198 | 125 | 44 | 155 | 15 | 56 | 90 | 12 | 295 | Ø10 | - | 592 | 592 | 592 | 592 | 333 | 249,5 | 193,5 |
| **100L Y3, Y, Y2** | 160 | 42 | 200 | 198 | 205 | 140 | 46 | 175 | 17,5 | 63 | 100 | 15 | 311 | Ø12 | - | 631 | 631 | 631 | 631 | 366 | 275 | 212 |
| **112M Y3, Y, Y2** | 190 | 45 | 235 | 218 | 225 | 140 | 46 | 175 | 17,5 | 70 | 112 | 17 | 337 | Ø12 | - | 729 | 729 | 729 | 729 | 400 | 282 | 212 |
| **132S Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | - | 774 | 774 | 774 | 471 | 334 | 245 |
| **132S1 Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | 774 | - | - | - | 471 | 334 | 245 |
| **132S2 Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | 824 | - | - | - | 471 | 334 | 245 |
| **132M Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | - | 824 | - | 774 | 471 | 334 | 245 |
| **132M1 Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | - | - | 774 | - | 471 | 334 | 245 |
| **132M2 Y3, Y, Y2** | 216 | 60 | 266 | 265 | 279 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | - | - | 824 | - | 471 | 334 | 245 |
| **160M Y3, Y, Y2** | 254 | 65 | 310 | 318 | 317 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 1012 | 975 | 975 | 975 | 560 | 451 | 299 |
| **160L Y2** | 254 | 65 | 310 | 318 | 317 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 1012 | 975 | 975 | - | 560 | 407 | 299 |
| **160L Y3,Y** | 254 | 65 | 310 | 318 | 317 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 1012 | 1010 | 1010 | 975 | 560 | 407 | 299 |

| Type CD...SM | A | AA | AB | AC | AD | B | BA | BB | BC | C | H-0,5 | HA | HD | K H17 | K' H17 | L Number of poles 2 | 4 | 6 | 8 | LD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **71M** | 112 | 30 | 139 | 145 | 164 | 90 | 25 | 110 | 10 | 45 | 71 | 10 | 235 | Ø7 | - | 449 | 449 | 449 | 449 | 282 |
| **80M** | 125 | 35 | 160 | 163 | 180 | 100 | 35 | 130 | 15 | 50 | 80 | 12 | 260 | Ø10 | - | 540 | 540 | 540 | 540 | 309 |
| **90S** | 140 | 40 | 180 | 183 | 185 | 100 | 40 | 130 | 15 | 56 | 90 | 12 | 275 | Ø10 | - | 560 | 560 | 560 | 560 | 330 |
| **90L** | 140 | 40 | 180 | 183 | 185 | 125 | 40 | 155 | 15 | 56 | 90 | 12 | 275 | Ø10 | - | 560 | 560 | 560 | 560 | 330 |
| **100L** | 160 | 45 | 200 | 201 | 205 | 140 | 45 | 175 | 17,5 | 63 | 100 | 15 | 305 | Ø12 | - | 627 | 627 | 627 | 627 | 361 |
| **112M** | 190 | 50 | 235 | 225 | 205 | 140 | 50 | 175 | 17,5 | 70 | 112 | 17 | 317 | Ø12 | - | 641 | 641 | 641 | 641 | 366 |
| **132S** | 216 | 60 | 266 | 265 | 279 | 140 | 60 | 187 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | 774 | 774 | 774 | 774 | 471 |
| **132M** | 216 | 60 | 266 | 265 | 279 | 178 | 60 | 225 | 23,5 | 89 | 132 | 20 | 393 | Ø12 | - | - | 774 | 774 | 774 | 471 |
| **160M** | 254 | 65 | 310 | 318 | 317 | 210 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 1012 | 975 | 975 | 975 | 560 |
| **160L** | 254 | 65 | 310 | 318 | 317 | 254 | 100 | 300 | 23 | 108 | 160 | 25 | 459 | 15 | 20 | 1012 | 975 | 975 | 975 | 560 |

| type CD...SM (Y3, Y, Y2) | FF-flange LA | M | N | P | S H17 | T | Shaft end D | E | GA | F | DB | O | FT-flange LA | M | N | P | S | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **71M (Y3, Y, Y2)** | 9 | 130 | 110 j6 | 160 | 10 | 3,5 | 14j5 | 30 | 16 | 5 | M5 | M25x1,5 | 8 | 85 | 70 j6 | 105 | M6 | 2,5 |
| **80M (Y3, Y, Y2)** | 12 | 165 | 130 j6 | 200 | 12 | 3,5 | 19j5 | 40 | 21,5 | 6 | M6 | M25x1,5 | 10 | 100 | 80 j6 | 120 | M6 | 3 |
| **90S (Y3, Y, Y2)** | 12 | 165 | 130 j6 | 200 | 12 | 3,5 | 24j5 | 50 | 27 | 8 | M8 | M25x1,5 | 10 | 115 | 95 j6 | 140 | M8 | 3 |
| **90L (Y3, Y, Y2)** | 12 | 165 | 130 j6 | 200 | 12 | 3,5 | 24j5 | 50 | 27 | 8 | M8 | M25x1,5 | 10 | 115 | 95 j6 | 140 | M8 | 3 |
| **100L (Y3, Y, Y2)** | 16 | 215 | 180 j6 | 250 | 14,5 | 4 | 28j5 | 60 | 31 | 8 | M10 | M32x1,5 | 12 | 130 | 110 j6 | 160 | M8 | 3,5 |
| **112M (Y3, Y, Y2)** | 16 | 215 | 180 j6 | 250 | 14,5 | 4 | 28j5 | 60 | 31 | 8 | M10 | M32x1,5 | 12 | 130 | 110 j6 | 160 | M8 | 3,5 |
| **132S (Y3, Y, Y2)** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 38j5 | 80 | 41 | 10 | M12 | M32x1,5 | 12 | 165 | 130 j6 | 200 | M10 | 3,5 |
| **132M (Y3, Y, Y2)** | 16 | 265 | 230 j6 | 300 | 14,5 | 4 | 38j5 | 90 | 41 | 10 | M12 | M32x1,5 | 12 | 165 | 130 j6 | 200 | M10 | 3,5 |
| **160M (Y3, Y, Y2)** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 42k5 | 110 | 45 | 12 | M16 | M40x1,5 | - | - | - | - | - | - |
| **160L (Y3, Y, Y2)** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 42k5 | 110 | 45 | 12 | M16 | M40x1,5 | - | - | - | - | - | - |




Note:
Mounting flange in accordance with EN 50347, form FF and FT. Form FF corresponds to type B5. Form FT corresponds to type B14.

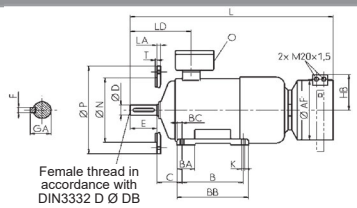
Dimensions that are not listed correspond to those of type CD...SM (Y3/Y/Y2).

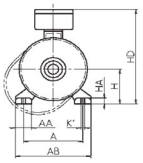
With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end installed.
The length dimension L corresponds to the 4-pole motors for all sizes.

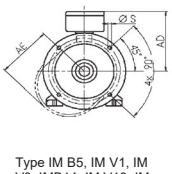
| Type CD...SMN Y3, Y, Y2 | L Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| **71M Y3, Y, Y2** | 483 | 483 | 483 | 483 |
| **80M Y3, Y, Y2** | 578 | 578 | - | - |
| **90S Y3, Y, Y2** | 650 | 650 | 650 | - |
| **90L Y3, Y, Y2** | 650 | 650 | 650 | - |
| **100L Y3, Y, Y2** | 705 | 705 | 705 | 705 |
| **112M Y3, Y, Y2** | 790 | 790 | 790 | 790 |
| **132S Y3, Y, Y2** | - | 818 | 818 | 818 |
| **132S1 Y3, Y, Y2** | 818 | - | - | - |
| **132S2 Y3, Y, Y2** | 868 | - | - | - |
| **132M Y3, Y, Y2** | - | 868 | - | 818 |
| **132M1 Y3, Y, Y2** | - | - | 818 | - |
| **132M2 Y3, Y, Y2** | - | - | 868 | - |
| **160M Y3, Y, Y2** | by request | 1000 | 1000 | 1000 |
| **160L Y2** | by request | 1000 | 1000 | 1000 |
| **160L Y3,Y** | by request | 1035 | 1035 | 1000 |

| type CD...SMN | L Number of poles 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| **71M** | 475 | 475 | 475 | 475 |
| **80M** | 535 | 535 | 535 | 535 |
| **90S+L** | 585 | 585 | 585 | 585 |
| **100L** | 680 | 680 | 680 | 680 |
| **112M** | 686 | 686 | 686 | 686 |
| **132S** | 818 | 818 | 818 | 818 |
| **132M** | - | 818 | 818 | 818 |
| **160M+L** | by request | 1000 | 1000 | 1000 |

| Valid for Type CD...SM Type CD...SMN | AE | AG | HB | Weight type | Brake [kg] |
|---|---|---|---|---|---|
| **71M (Y3, Y, Y2)** | - | - | - | CM 71 | by request |
| **80M (Y3, Y, Y2)** | 257 | 212 | 195 | CM 80 | 31 |
| **90S (Y3, Y, Y2)** | 257 | 212 | 195 | CM 90 | 31 |
| **90L (Y3, Y, Y2)** | 280 | 212 | 215 | CM 90 | 31 |
| **100L (Y3, Y, Y2)** | 280 | 256 | 215 | CM 112 | 43 |
| **112M (Y3, Y, Y2)** | 277 | 256 | 227 | CM 112 | 43 |
| **132S+M (Y3, Y, Y2)** | 277 | 287 | 227 | CM 132 | 67 |
| **160M+L (Y3, Y, Y2)** | 253 | 312 | 308 | CM 160 | 100 |



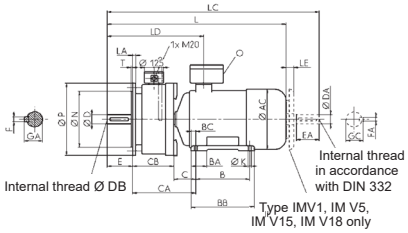

Mounting flange in accordance with EN 50347, form FF and FT. All motors with lifting eyes. Dimension AC measured above screw heads. Dimension AD in relation to

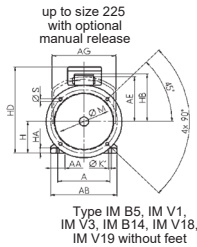
Ex e terminal compartment
Terminal compartment, rotatable 4 x 90°. Also applies to BD series...

| Type CD...S (Y3/Y/Y2) | A | AA | AB | AC | AD | B | BA | BB | BC | C | H | HA | HD | K H17 | K' H17 | L | LD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **180M (Y3/Y/Y2)** | 279 | 75 | 350 | 353 | 365 | 241 | 100 | 340 | 30 | 121 | 180-0,5 | 25 | 545 | 15 | 20 | 924 | 369 |
| **180L (L-6,8 Y3/ L-6,8 Y/L-2,4,6 Y2)** | 279 | 75 | 350 | 353 | 365 | 279 | 100 | 340 | 30 | 121 | 180-0,5 | 25 | 545 | 15 | 20 | 924 | 369 |
| **180L-4 Y3/Y** | 279 | 75 | 350 | 353 | 365 | 279 | 100 | 340 | 30 | 121 | 180-0,5 | 25 | 545 | 15 | 20 | by request | 369 |
| **200L (Y3/Y/Y2)** | 318 | 80 | 390 | 393 | 381 | 305 | 90 | 365 | 30 | 133 | 200-0,5 | 30 | 581 | 20 | 26 | 986 | 390 |
| **225S (Y3/Y/Y2)** | 356 | 85 | 450 | 455 | 409 | 286 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 | by | request |
| **225M (Y3/Y/Y2)** | 356 | 85 | 450 | 455 | 409 | 311 | 90 | 370 | 29,5 | 149 | 225-0,5 | 35 | 634 | 20 | 26 | by | request |
| **250M (Y3/Y/Y2)** | 406 | 105 | 510 | 493 | 471 | 349 | 110 | 420 | 35,5 | 168 | 250-0,5 | 40 | 731 | 26 | 35 | by | request |
| **280S (Y3/Y/Y2)** | 457 | 110 | 570 | 548 | 511 | 368 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 | by | request |
| **280M (Y3/Y/Y2)** | 457 | 110 | 570 | 548 | 511 | 419 | 120 | 500 | 40,5 | 190 | 280-1 | 45 | 802 | 26 | 35 | by | request |

| Type CD...S (Y3/Y/Y2) | FF-flange LA | M | N | P | S H17 | T | Shaft end D 2 | D 4, 6, 8 | E 2 | E 4, 6, 8 | GA 2 | GA 4, 6, 8 | F 2 | F 4, 6, 8 | DB | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **180M+L (Y3/Y/Y2)** | 20 | 300 | 250 j6 | 350 | 18,5 | 5 | 48 k6 | 48 k6 | 110 | 110 | 51,5 | 51,5 | 14 | 14 | M16 | M40x1,5 |
| **200L (Y3/Y/Y2)** | 20 | 350 | 300 h6 | 400 | 18,5 | 5 | 55 m6 | 55 m6 | 110 | 110 | 59 | 59 | 16 | 16 | M20 | M50x1,5 |
| **225S+M (Y3/Y/Y2)** | 22 | 400 | 350 h6 | 450 | 18,5 | 5 | 55 m6 | 60 m6 | 110 | 140 | 59 | 64 | 16 | 18 | M20 | M50x1,5 |
| **250M (Y3/Y/Y2)** | 18 | 500 | 450 h6 | 550 | 18,5 | 5 | 60 m6 | 65 m6 | 140 | 140 | 64 | 69 | 18 | 18 | M20 | M63x1,5 |
| **280S+M (Y3/Y/Y2)** | 18 | 500 | 450 h6 | 550 | 18,5 | 5 | 65 m6 | 75 m6 | 140 | 140 | 69 | 79,5 | 18 | 20 | M20 | M63x1,5 |

| Type CD...S (Y3/Y/Y2) | Brake AE | AF | HB | Größe | Brake weigth [kg] |
|---|---|---|---|---|---|
| **180M+L (Y3/Y/Y2)** | 215 | 330 | 205 | 19/24 | 57 |
| **200L (Y3/Y/Y2)** | 215 | 330 | 205 | 24 | 57 |

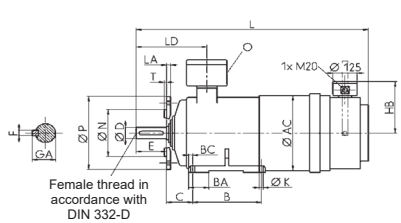


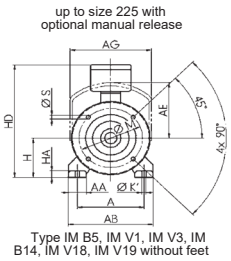




Note:
Mounting flange in accordance with EN 50347, form FF and FT. Form FF corresponds to type B5. Form FT corresponds to type B14.

Dimensions that are not listed correspond to the dimensions of type CD...S
With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed.
The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD...SV (Y3/Y/Y2) | L Number of poles 2 | 4 | 6, 8 | LC Number of poles 2 | 4 | 6, 8 | LD Number of poles 2 | 4, 6, 8 | CA 2 | CB 4, 6, 8 | LE 2 | FF-flange LA 4, 6, 8 | N h8 2 | P ±1 4, 6, 8 | S | DB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **180M (Y3/Y/Y2)** | 1026 | 1026 | 1026 | 1209 | 1209 | 1209 | 669 | 669 | 421 | 300 | 66 | 21 | 250 | 350 | 18 | M20x30 |
| **180L (L-6,8 Y3/ L-6,8 Y/L-2,4,6 Y2)** | --- | 1026 | 1026 | --- | 1209 | 1209 | 669 | 669 | 421 | 300 | 66 | 21 | 250 | 350 | 18 | M20x30 |
| **180L-4 Y3/Y** | --- | by request | 1026 | --- | by request | 1209 | 669 | 669 | 421 | 300 | 66 | 21 | 250 | 350 | 18 | M20x30 |
| **200L (Y3/Y/Y2)** | 1089 | 1089 | 1089 | 1283 | 1209 | 1209 | 690 | 690 | 433 | 300 | 77 | 21 | 300 | 400 | 18 | M20x30 |
| **225S+M (Y3/Y/Y2)** | 1237 | 1267 | 1218 | 1441 | 1505 | 1505 | 677 | 707 | 449 | 300 | 87 | 21 | 350 | 448 | 18 | M20x30 |
| **250M (Y3/Y/Y2)** | 1310 | 1310 | 1244 | 1561 | 1561 | 1495 | 792 | 792 | 478 | 310 | 94 | 26 | 450 | 550 | 18 | M20x30 |
| **280S+M (Y3/Y/Y2)** | 1419 | 1419 | 1419 | 1685 | 1685 | 1685 | 793 | 793 | 500 | 310 | 110 | 26 | 450 | 550 | 18 | M20x30 |



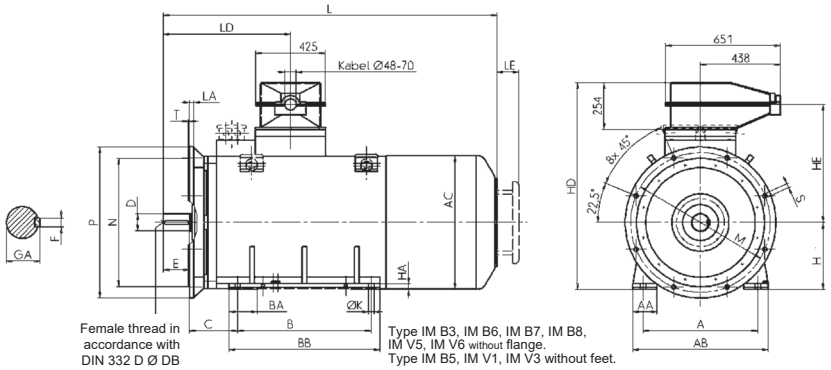

Note:
Mounting flange in accordance with EN 50347, form FF and FT. Form FF corresponds to type B5. Form FT corresponds to type B14.

Dimensions that are not listed correspond to those of type CD...S (Y3/Y/Y2).
With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end installed.
The length dimension L corresponds to the 4-pole motors for all sizes.

| Type CD...SVN (Y3/Y/Y2) | AC | L | LD | Valid for Type CD...SV (Y3/Y/Y2) Type CD...SVN (Y3/Y/Y2) | Brake AE | AG | HB | type | Brake weight [kg] |
|---|---|---|---|---|---|---|---|---|---|
| **180M (Y3/Y/Y2)** | by request | by request | by request | **180M+L (Y3/Y/Y2)** | 320 | 370 | 282 | 180 | 135 |
| **180L (L-6,8 Y3/ L-6,8 Y/L-2,4,6 Y2)** | by request | by request | by request | **200L (Y3/Y/Y2)** | 320 | 370 | 282 | 200 | 150 |
| **180L-4 Y3/Y** | by request | by request | by request | **225S+M (Y3/Y/Y2)** | 320 | 370 | 282 | 225 | 175 |
| **200L (Y3/Y/Y2)** | by request | by request | by request | **250M (Y3/Y/Y2)** | - | - | 328 | 250 | 175 |
| **225S+M (Y3/Y/Y2)** | by request | by request | by request | | | | | | |
| **250M (Y3/Y/Y2)** | by request | by request | by request | | | | | | |
| **280S+M (Y3/Y/Y2)** | by request | by request | by request | | | | | | |

# Surface-cooled, high-voltage motors
# Self-cooling with radial fan






Mounting flange in accordance with EN 50347 Form FF All motors with lifting eyes.
Dimension AC measured above screw heads. Dimension HD in relation to Ex e terminal compartment, type EAR 355 H6.

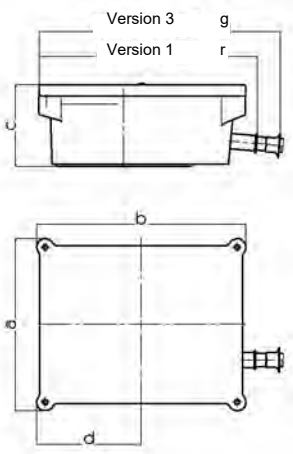
Note:
Sizes 400 and 450 available as flange type for V1 only.

With pole-changing motors (4/2, 6/4 and 8/4), the 4-pole shaft end is always installed. Exception: Size 355, 400 and 450 motors with pole reversal 4/2. The 2-pole shaft end is used here. The length dimension L corresponds to the 4-pole motors for all sizes

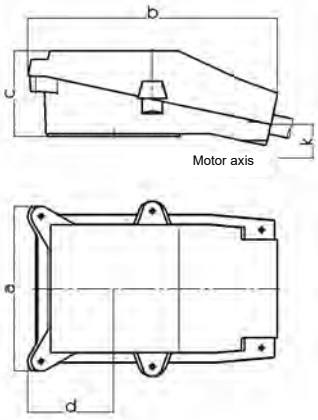
| Type | | | | | | | | | | | | | | | L | | | LD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…H | A | AA | AB | AC | B | BA | BB | BC | C | H -1 | HA | HD | HE | K | Number of poles | | | Number of poles | |
| | | | | | | | | | | | | | | | 2 | 4 | 6, 8 | 2 | 4, 6, 8 |
| **355M** | 610 | 180 | 720 | 725 | 560 | 220 | 720 | 45 | 254 | 355 | 50 | 1130 | 651 | 30 | 1667 | 1697 | 1597 | 672 | 702 |
| **355L** | 610 | 180 | 720 | 725 | 630 | 220 | 720 | 45 | 254 | 355 | 50 | 1130 | 651 | 30 | 1747 | 1777 | 1597 | 672 | 702 |
| **400M** | 686 | 130 | 800 | 810 | 630 | 150 | 1264 | 152 | 280 | 400 | 34 | 1192 | 668 | 35 | 1977 | 2047 | 2047 | 718 | 788 |
| **400L** | 686 | 130 | 800 | 810 | 710 | 150 | 1264 | 152 | 280 | 400 | 34 | 1192 | 668 | 35 | 1977 | 2047 | 2047 | 718 | 788 |
| **450M** | 760 | 150 | 900 | 910 | 710 | 180 | 1135 | 150 | 280 | 450 | 35 | 1310 | 736 | 35 | 1833 | 1903 | 1903 | 756 | 826 |
| **450L1** | 760 | 150 | 900 | 910 | 840 | 180 | 1280 | 150 | 280 | 450 | 35 | 1310 | 736 | 35 | 1983 | 2048 | 2048 | 756 | 826 |
| **450L2** | 760 | 150 | 900 | 910 | 840 | 180 | 1280 | 150 | 280 | 450 | 35 | 1310 | 736 | 35 | 1983 | 2228 | 2228 | 756 | 826 |
| **450L3** | 760 | 150 | 900 | 910 | 840 | 180 | 1280 | 150 | 280 | 450 | 35 | 1310 | 736 | 35 | 2163 | 2228 | 2228 | 756 | 826 |

| Type | D m6 | | E | | GA | | F | | DB | | Mounting flange | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD…H | Number of poles | | Number of poles | | Number of poles | | Number of poles | | Number of poles | | LA | M | N h6 | P | S H17 | T |
| | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | 2 | 4, 6, 8 | | | | | | |
| **355M** | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 | 25 | 740 | 680 | 800 | 24 | 6 |
| **355L** | 75 | 90 | 140 | 170 | 79,5 | 95 | 20 | 25 | M20 | M24 | 25 | 740 | 680 | 800 | 24 | 6 |
| **400M** | 75 | 100 | 140 | 210 | 79,5 | 106 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |
| **400L** | 75 | 100 | 140 | 210 | 79,5 | 106 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |
| **450M** | 75 | 100 | 140 | 210 | 79,5 | 116 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |
| **450L1** | 75 | 100 | 140 | 210 | 79,5 | 116 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |
| **450L2** | 75 | 100 | 140 | 210 | 79,5 | 116 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |
| **450L3** | 75 | 100 | 140 | 210 | 79,5 | 116 | 20 | 28 | M20 | M24 | 28 | 940 | 880 | 1000 | 28 | 6 |

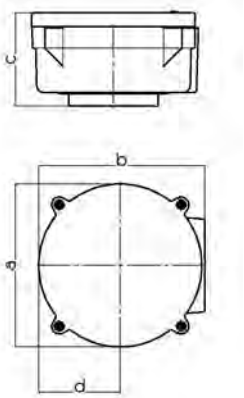
EAR - Ex e
Version 1 und 3




EAR - Ex e
Version 9 (VIK)




CAR - Ex d

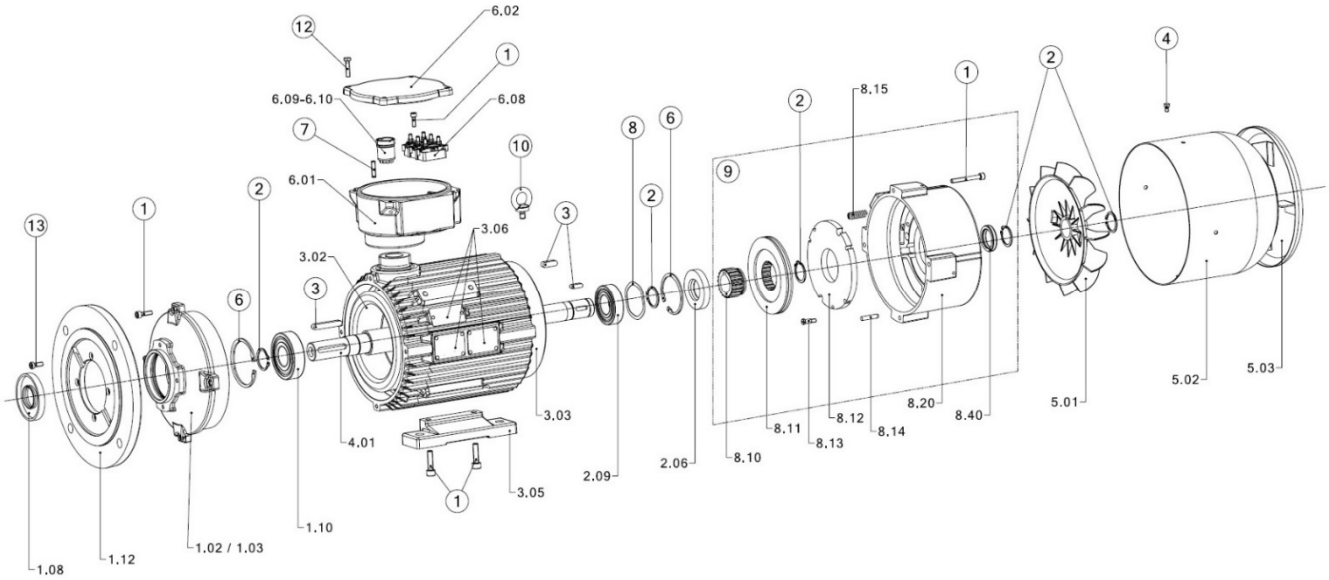



| Protection class Cable entry | | EAR - Ex e Version 1 und 3 | | | | | | CAR - Ex d without cable version | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Size** | **Terminal compartment** | **a** | **b** | **c** | **d** | **r** | **g** | **Size** | **Terminal compartment** | **a** | **b** | **c** | **d** |
| **63** | EAR 80 | 145 | 145 | 88 | 53 | 179 | 185 | **63** | CAR 80 | 145 | 145 | 92 | 53 |
| **71** | EAR 80 | 145 | 145 | 88 | 53 | 179 | 185 | **71** | CAR 80 | 145 | 145 | 92 | 53 |
| **80** | EAR 80 | 145 | 145 | 88 | 53 | 179 | 185 | **80** | CAR 80 | 145 | 145 | 92 | 53 |
| **90** | EAR 80 | 145 | 145 | 88 | 53 | 179 | 185 | **90** | CAR 80 | 145 | 145 | 92 | 53 |
| **100** | EAR 80 | 145 | 145 | 88 | 53 | 185 | 200 | **100** | CAR 80 | 145 | 145 | 92 | 53 |
| **112** | EAR 80 | 145 | 145 | 88 | 53 | 185 | 200 | **112** | CAR 80 | 145 | 145 | 92 | 53 |
| **132** | EAR 132 | 220 | 220 | 114 | 110 | 260 | 275 | **132** | CAR 132 | 220 | 220 | 120 | 110 |
| **160** | EAR 132 | 220 | 220 | 114 | 110 | 265 | 281 | **160** | CAR 132 | 220 | 220 | 120 | 110 |
| **180** | EAR 180 | 280 | 340 | 152 | 140 | 385 | 401 | **180** | CAR 180 | 265 | 270 | 162 | 133 |
| **200** | EAR 180 | 280 | 340 | 152 | 140 | 390 | 420 | **200** | CAR 180 | 265 | 270 | 162 | 133 |
| **225** | EAR 180 | 280 | 340 | 154 | 140 | 390 | 420 | **225** | CAR 225 | 380 | 380 | 202 | 190 |
| **250** | EAR 250 | 340 | 422 | 206 | 161 | 474 | 512 | **250** | CAR 225 | 380 | 380 | 202 | 190 |
| **280** | EAR 250 | 340 | 422 | 206 | 161 | 474 | 512 | **280** | CAR 225 | 380 | 380 | 202 | 190 |
| **315** | EAR 250 | 340 | 422 | 198 | 161 | 474 | 512 | **315** | CAR 315 | 380 | 380 | 208 | 190 |
| **355** | EAR 355 | 480 | 527 | 249 | 224 | - | 617 | **355** | CAR 355 | 484 | 734 | 335 | 242 |
| **400** | EAR 355 | 480 | 527 | 249 | 224 | - | 630 | **400** | CAR 355 | 484 | 734 | 335 | 242 |
| **450** | EAR 355 | 480 | 527 | 249 | 224 | - | 630 | **450** | CAR 355 | 484 | 734 | 335 | 242 |

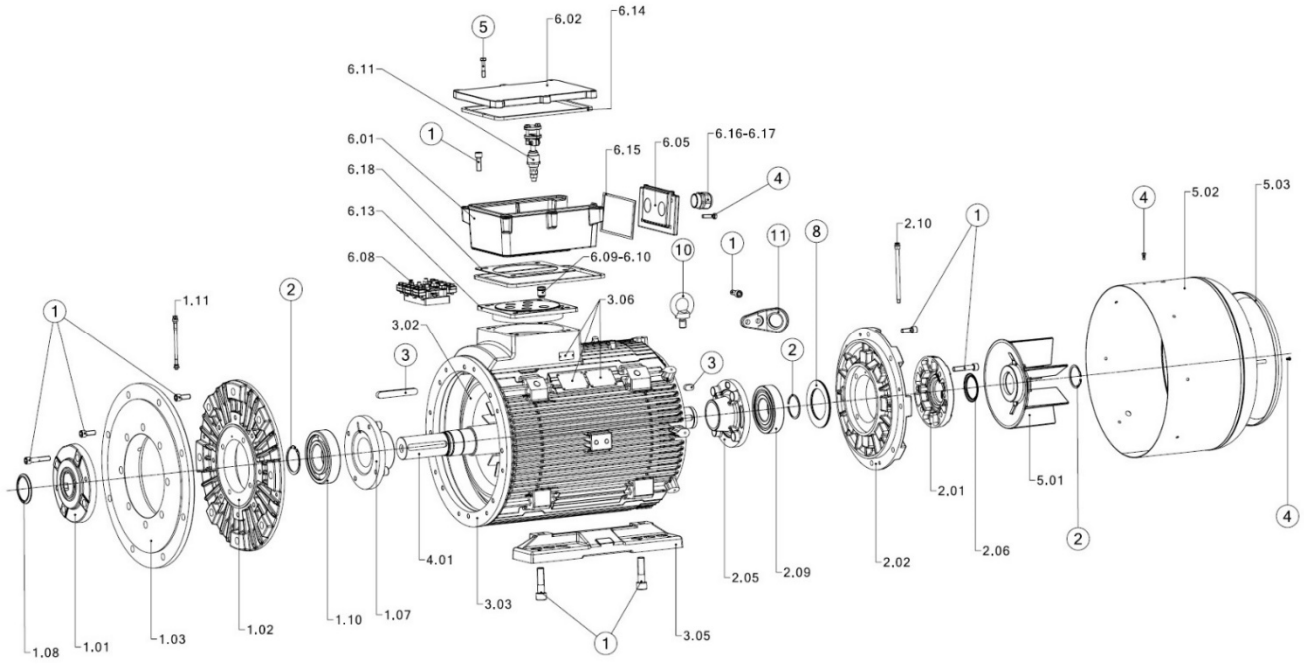
| Protection class Cable entry | | EAR - Ex e Version 9 (VIK) | | | | |
|---|---|---|---|---|---|---|
| **Size** | **Terminal compartment** | **a** | **b** | **c** | **d** | **k** |
| **250** | EAR 250 | 356 | 512 | 186 | 179 | 317 |
| **280** | EAR 250 | 356 | 512 | 186 | 179 | 357 |
| **315** | EAR 250 | 356 | 512 | 186 | 179 | 427 |
| **355** | EAR 355 | 425 | 650 | 254 | 213 | 541 |
| **400** | EAR 355 | 425 | 650 | 254 | 213 | 558 |
| **450** | EAR 355 | 425 | 650 | 254 | 213 | 626 |

| Protection class Cable entry Type CD…XY* | | EAR - Ex e Version 1 und 3 | | | | | | CAR - Ex d without cable version | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Size** | **Terminal compartment** | **a** | **b** | **c** | **d** | **r** | **g** | **Size** | **Terminal compartment** | **a** | **b** | **c** | **d** |
| **250S** | EAR 250 | 340 | 422 | 196 | 161 | 474 | 512 | **250S** | CAR 225 | 380 | 380 | 202 | 190 |
| **250M** | EAR 250 | 340 | 422 | 196 | 161 | 474 | 512 | **250M** | CAR 225 | 380 | 380 | 202 | 190 |
| **280S** | EAR 250 | 340 | 422 | 196 | 161 | 474 | 512 | **280S** | CAR 225 | 380 | 380 | 202 | 190 |
| **280M** | EAR 250 | 340 | 422 | 196 | 161 | 474 | 512 | **280M** | CAR 315 | 380 | 380 | 208 | 190 |
| **315** | EAR 250 | 340 | 422 | 196 | 161 | 474 | 512 | **315** | CAR 315 | 380 | 380 | 208 | 190 |

* British version




**Exploded view size 63 to 132**




**Exploded view size from 160**

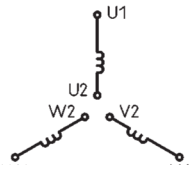
| | | | | | |
|---|---|---|---|---|---|
| ① | Screw according to DIN EN ISO 4762 | ⑥ | Circlip according to DIN 472 | ⑪ | Lifting eye |
| ② | Circlip according to DIN 471 | ⑦ | Grub screw according to DIN EN ISO 4027 | ⑫ | Screw according to DIN EN ISO 4017 |
| ③ | Feather key according to DIN 6885 | ⑧ | Belleville washer or shim | ⑬ | Screw according to DIN 6912 |
| ④ | Screw according to DIN EN ISO 4017 | ⑨ | only for brake motors | | |
| ⑤ | Screw according to DIN 6929 (recommendation) | ⑩ | Eyebolt according to DIN | | |

The spare parts that are listed are available from the factory. The design and combination depends on the motor that is supplied.

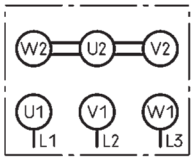
When requesting and ordering spare parts, the following information is required:
– Spare part number and designation
– Motor type and design
– Motor number

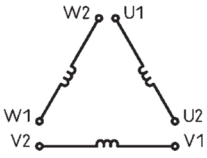
## Spare parts list

| Part no. | Designation |
|---|---|
| **1** | **DS bearing (drive side)** |
| 1.01 | Bearing cover DS external |
| 1.02 | End shield DS |
| 1.03 | Flange bearing shield DS |
| 1.07 | Bearing cover DS internal |
| 1.08 | Shaft seal DS |
| 1.10 | Roller bearing DS |
| 1.11 | Relubrication DS |
| 1.12 | Flange ring |
| 1.13 | Shim according to DIN 988 |
| 1.14 | Nilos Ring |
| **2** | **Bearing NS (non-drive side)** |
| 2.01 | Bearing cover NS external |
| 2.02 | End shield NS |
| 2.05 | Bearing cover NS internal |
| 2.06 | Shaft seal NS external |
| 2.09 | Roller bearing NS |
| 2.10 | Relubrication NS |
| **3** | **Housing** |
| 3.02 | Stator winding, complete |
| 3.03 | Housing |
| 3.05 | Housing feet (1 pair), machined |
| 3.06 | Signs |
| **4** | **Rotor** |
| 4.01 | Rotor complete |
| **5** | **Ventilation** |
| 5.01 | Fan |
| 5.02 | Fan guard |
| 5.03 | Canopy |
| **6** | **Terminal compartment** |
| 6.01 | Terminal box |
| 6.02 | Terminal box cover |
| 6.05 | Cable entry plate |
| 6.08 | Terminal board complete |
| 6.09 | Core grommet |
| 6.10 | Core grommet, PTC thermistor |
| 6.11 | Cable grommet |
| 6.13 | Feed-through plate |
| 6.14 | Junction box gasket |
| 6.15 | Gasket insertion plate |
| 6.16 | Cable entry |
| 6.17 | Cable entry, PTC thermistor |
| 6.18 | Lead-through plate gasket |
| **8** | **Brake** |
| 8.10 | Friction disc driver |
| 8.11 | Friction disc |
| 8.12 | Armature disk |
| 8.13 | Special screw |
| 8.14 | Special cylindrical pin |
| 8.15 | Position spring |
| 8.20 | Brake housing with coil, complete |
| 8.30 | Half-wave rectifier |
| 8.40 | Brake shaft seal |
| **9** | **Speed sensor (no illustration)** |
| 9.01 | Speed sensor |
| 9.10 | Torque support |
| 9.20 | Encoder housing |
| 9.40 | Oil seal |

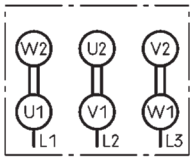


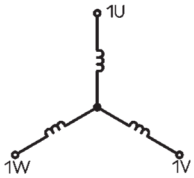

Y-circuit



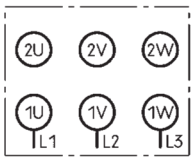




△-circuit

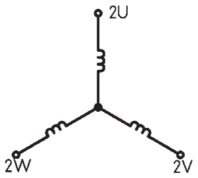


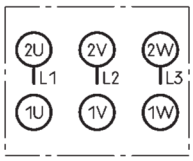

Slow speed

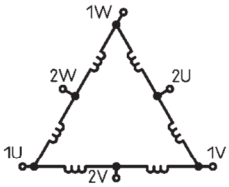



Pole-changing

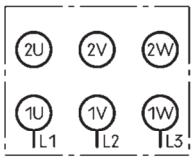



Fast speed

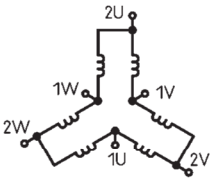


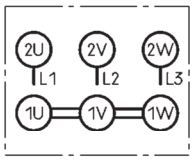

Slow speed

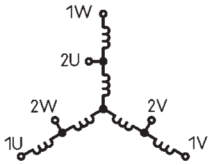



Dahlander circuit

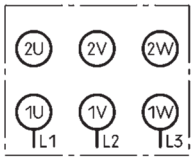



Fast speed

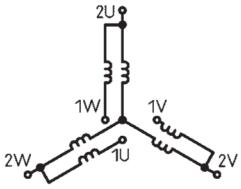


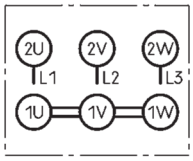

Slow speed




Dahlander circuit




Fast speed




| | | | | |
|---|---|---|---|---|
| 1 T P 1 - 1 T P 2 | PTC thermistor prewarning | U›2.5 V forbidden | Triggering device with marking II (2)G | Connection bolt |
| 2 T P 1 - 2 T P 2 | PTC thermistor disconnection[1)] | | | |
| 1 R 1 - R 2<br>4 R 1 - 5 R 2 | Resistance temperature sensor PT 100 / winding<br>1 R 1 2 R 1 3 R 1 R 2 | Resistance temperature sensor PT 100 / bearing<br>D-side: 4 R 1 4 R 2<br>N-side: 5 R 1 5 R 2 | | |
| 1 H E 1 - 1 H E 2 | Standstill heating to prevent condensation formation | | | |
| TB 1 - TB 2 | Microtherm T10 thermostat switch | | | |

| Thread size | Tightening torque (Nm) |
|---|---|
| M5 | 2 |
| M6 | 3 |
| M8 | 6 |
| M10 | 10 |
| M12 | 15.5 |
| M16 | 30 |

Note

[1)] Release unit with Ex marking required

# Conversion of technical units of measurement

in SI units of measure
(Systems Internationale d'Unitée)



## Output

1 kW = 1,36 PS = 102 kpm/s = 1000 Nm/s
1 PS = 0,736 kW = 75 kpm/s = 736 Nm/s

## Work

1 kWh = $3{,}6 \times 10^6$ J = $3{,}6 \times 10^6$ Nm
= $0{,}367 \times 10^6$ kpm
1 Ws = 1 J = 1 Nm = 0,102 kpm

## Force

1 N = 0,102 kp
1 kp = 9,81 N

## Torque

1 Nm = 0,102 kpm = 1 Ws
1 kpm = 9,81 Nm = 9,81 Ws

## Pressure

1 Pa = 1 N/m²
1 bar = 100 kPa
1 mm water column = 9,81 Pa

## Moment of inertia

1 kgm² = 1 Ws³ = 1 Nms² = 0,102 kpms²

## Power (three-phase motors)

$P_1 = U \times I \times \cos\varphi \times \sqrt{3} \times 10^{-3}$
$P_2 = P_1 \times \eta$
P1 = Power consumed [kW]
P2 = Power output [kW]
U = Voltage [V]
I = Current [A]
cos φ = Power factor
η = Efficiency

## Power requirements of some working machines

**Lifting movement**

$$P = \frac{F \times v}{\eta} \times 10^{-3} \text{ [kW]}$$

**Rotation**

$$P = \frac{M \times n}{9550 \times \eta} \text{ [kW]}$$

**Fan drive**

$$P = \frac{V \times p}{\eta} \times 10^{-3} \text{ [kW]}$$

**Pump drive**

$$P = \frac{V \times p}{\eta} \times 10^{-3} \text{ [kW]}$$

P = Power [kW]
F = Force [N]
v = Velocity [m/s]
η = Efficiency
M = Torque [Nm]
n = Speed [rpm]
V = Flow rate [m³/s]
p = Total counterpressure to be overcome [N/m²]

## Torques

**Torque from engine power**

$$M = 9550 \frac{P_2}{n} \text{ [Nm]}$$

$P_2$ = Motor power [kW]
n = Speed [rpm]

**Conversion of torques in case of gear reduction or transmission**

$$M_2 = \frac{M_1 \times n_1}{n_2}$$

$n_1$ = Motor speed [rpm]
$M_1$ = Motor torque [Nm]
$n_2$ = Operating speed rpm]
$M_2$ = Torque at n2 [Nm]

## Moment of inertia

**Relationship to momentum**

$$J = \frac{GD^2}{4}$$

J = Moment of inertia [kgm²]
$GD^2$ = Momentum [kgm²]

**Moment of inertia of masses moving in a straight line in relation to motor speed**

$$J = 91{,}2 \times m \left(\frac{v}{n}\right)^2 \text{ [kgm²]}$$

m = Mass [kg]
v = Velocity [m/s]
n = Motor speed [rpm]

**Conversion of moments of inertia to another speed with gear reduction or transmission**

$$J_2 = J_1 \left(\frac{n_1}{n_2}\right)^2$$

$n_1$ = Motor speed [rpm]
$J_1$ = Moment of inertia at $n_1$ [kgm²]
$n_2$ = Operating speed [rpm]
$J_2$ = Moment of inertia at $n_2$ [kgm²]

## Inertia factor

$$FI = \frac{J_{mot} + J_{zus}}{J_{mot}}$$

$J_{mot}$ = Moment of inertia of motor [kgm²]
$J_{zus}$ = Moment of inertia of driven machine [kgm²]

## Start-up time

$$ta = \frac{FI \times J_{mot} \times n}{9{,}55 \times M_b} \text{ [s]}$$

$M_b = M_{mot} - M_{geg}$ [Nm]
FI = Inertia factor
$J_{mot}$ = Moment of inertia of motor [kgm²]
n = Motor speed [rpm]
$M_b$ = Acceleration torque [Nm]
$M_{mot}$ = Motor torque during ramp-up averaged)
$M_{geg}$ = Counter-torque during ramp-up (averaged)

## Formulas from acoustics Sound pressure level

$$L_p = 20 \log \frac{p}{p_o} \text{ [dB]}$$

**Reference sound pressure**

$$p_o = 2 \times 10^{-5} \left[\frac{N}{m^2}\right]$$

**Sound power level**

$$L_W = 10 \log \frac{p}{P_o} \text{ [dB]}$$

**Reference sound power**

$P_o = 10^{-12}$ [W]

**Sound power**

$$P = \frac{p^2}{\alpha \times c} A \text{ [W]}$$

**Sound characteristic impedance**

$$\alpha \times c = 408 \left[\frac{Ns}{m^3}\right]$$

at 100 mbar and 20 °C

**Measuring surface dimension**

$$L_s = 10 \log \frac{A}{A_o}$$

$L_w = L_p + L_s$
$L_p$ = Sound pressure level [dB]
p = Sound pressure $\left[\frac{N}{m^2}\right]$
$p_o$ = Reference sound pressure
$L_w$ = Sound power level [dB]
P = Sound power [W]
$P_o$ = Reference sound power [W]
A = Radiating area [m²]
α x c = Sound characteristic impedance $\left[\frac{Ns}{m^3}\right]$
$A_o$ = Reference area = 1 m²
$L_s$ = measurement area [dB]

**Nordenham plant**

ATB NORDENHAM GmbH
Helgoländer Damm 75
D-26954 Nordenham
Tel.: +49 4731 365 - 0
Fax: +49 4731 365 - 159
info@atb-nordenham.de
www.atb-nordenham.de

For further contact addresses, service partners and local service workshops, please visit us on the Internet at www.atb-nordenham.de.

**Publisher**
ATB NORDENHAM GmbH
Helgoländer Damm 75
D-26954 Nordenham
Tel.: +49 4731 365 – 0
Fax: +49 4731 365 – 159
info@atb-nordenham.de
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EXMOT 20 Rev. 02 EN

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- SPECIAL MOTORS

ATB NORDENHAM GmbH

Helgoländer Damm 75
D-26954 Nordenham
Tel. +49 4731 365 - 0
Fax: +49 4731 365 - 159
info@atb-nordenham.de
www.atb-nordenham.de

You can also find information about the individual product groups on the Internet: www.atb-nordenham.de



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