

ELECTRIC MOTORS

ENGLISH



HISTORY

SACEMI WAS FOUNDED IN THE SIXTIES IN MILAN, BUT IT WAS IN 1995 IN VENETO, AND MORE PRECISELY IN NOVENTA DI PIAVE (VENICE), THAT IT CONSOLIDATED AND EXPANDED ITS PRESENCE ON THE MARKET OF ELECTRIC PUMPS FOR MACHINE TOOLS.

VISION & MISSION

IN CLOSE COOPERATION WITH THE MAIN MANUFACTURERS TO FULFILL THE REQUIREMENTS OF THE NEW MACHINE TOOLS AND TO DESIGN ELECTRIC PUMPS, ELECTRIC MOTORS AND THEIR COMPONENT PARTS, ACCORDING TO THE NEEDS AND WITH THE SAME CRITERIA AS THE MACHINES TO WHICH THEY BELONG.

THE GROUP

SACEMI-GAMAR SRL BELONGS TO THE MEZZALIRA INVESTMENT GROUP SPA, A DYNAMIC GROUP IN CONTINUOUS EXPANSION, WHICH INCLUDES OTHER COMPANIES REPRESENTING THE ITALIAN EXCELLENCE IN FURNITURE, MECHANICS AND PLASTIC. THE DIFFERENT INDUSTRIAL SCENARIOS OF THESE COMPANIES CREATE SYNERGIES FOR A GREATER VALORISATION OF EACH ONE, THUS ADDING VALUE TO EACH ONE OF THEM, AND STILL PRESERVING THE VALUE OF THE BRANDS, THE IDENTITY AND THE POSITIONING OF THE PRODUCTS.

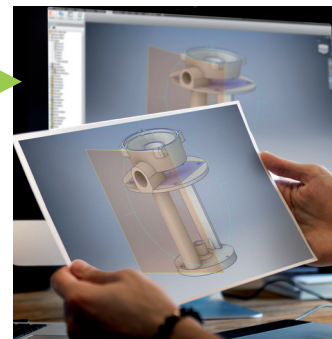
A HIGH LEVEL ORGANIZATION, WITH A QUALITY PRODUCTION STRUCTURE UP TO ANY CHALLENGE, COMPOSED OF A YOUNG TEAM WITH THE SAME DREAM: TO MAKE THE DIFFERENCE.

PRODUCTION

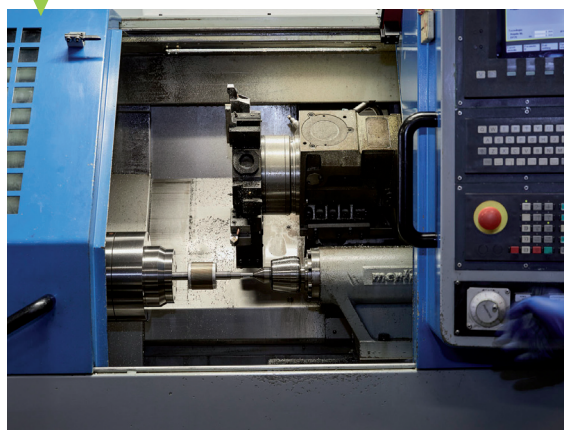
- THE PRODUCTION SITE OF SACEMI-GAMAR S.R.L., IN NOVENTA DI PIAVE (VE) EXTENDS OVER AN AREA OF 12,000 SQUARE METERS, 6,000 OF WHICH ARE COVERED.
- THE COMPANY FOCUSES ON TECHNOLOGY TO IMPROVE SPEED AND OPERATIONAL FLEXIBILITY AND ON DESIGN TO SATISFY THE MARKET DEMANDS IN REAL TIME.
- TECHNOLOGY, DESIGN AND MANUFACTURING OF MACHINE TOOLS AND EVERYTHING THAT ROTATES AROUND IT, SUCH AS ROBOTICS AND OTHER AUTOMATION SYSTEMS, ARE STRONGLY LINKED TO THE COMPONENTS, AND THE ELECTRIC PUMP AND THE ELECTRIC MOTOR ARE PART OF THEM.
- THE COMPANY IS IN CONTACT WITH VARIOUS REALITIES THAT CONSTANTLY REQUIRE NEW TECHNOLOGIES AND THEREFORE OFFERS ITSELF AS A COMPLEMENT FOR THE MANUFACTURERS OF MACHINES FOR MECHANICS, GLASS, AIR-CONDITIONING, BUILDING, AND LIQUIDS TREATMENT, CREATING AN INTEGRATION AMONG COMPONENTS, EQUIPMENT AND MACHINES.

CUSTOMIZATION DURING ALL PHASES OF THE PRODUCTION PROCESS

PROJECT DEPT.



PRODUCTION



TESTING DEPT.



LOGISTIC



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DECLARATION OF CONFORMITY



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DECLARES

under its full liability, that all Asynchronous Three-phase, Single-phase and Self-braking motors, with branded  **GAMAR**, belonging to the following groups:

- A) XSP, XSH, XS, XD, XDD, XDV, XDDV, X..., WPH, WSH, W...
- B) 10SH, 10D, 10DD, 10CO, 10CB, 10..., 20..., 30SH, 30D, 30DD, 30CO, 30CB, 30..., 33S, 33DD, 33..., ZCO, ZCB, ZSE, ZSET, ZIT, ZIV, Z...

are compliant with the international standard **IEC 60034**, and have all the features requested by the Low Voltage Directive (**LVD**) **2014/35/UE** del 19/05/2016.

Additional information:

1. The **CE** marking has been applied for the first time in 1997.

2. Electromagnetic Compatibility (EMC) Directive 2014/30/EC.

- Motors belonging to group "A" are conformed to Directive EMC 2014/30/UE dated 26/02/2014, according to standard EN 61000-6-3.

- Motors belonging to group "B" are conformed to Directive EMC 2014/30/UE dated 26/02/2014, according to standard EN 61000-6-4.

3. Community Directive (RoHS) 2011/65/EC.

- Motors belonging to group "A" and "B" are conformed to the Community Directive (RoHS) 2011/65/CE, dated 08/06/2011 which restricts the use of hazardous materials in the manufacture of various types of electronic and electrical equipment.

4. Directive setting ecological design (EcoDesign ErP) requirements 2009/125/EC.

- Motors marked IE2 on the nameplate comply with the 2014/4/UE regulation, dated 06/01/2014.

Efficiency class is defined according to the standard EN 60034-30-1; 2014.

5. Machine Directive (MD) 2006/42/EC.

- Motors belonging to group "A" and "B" are conformed to the Machine Directive MD 2006/42/EC, dated 17/05/2006, according to which motors, as components of a machine, must not be operated until they are declared to conform to the Machine Directive.

Note: In the use of motors is necessary to ensure compliance with Standard CEI EN 60204-1 and the safety instructions in the manual and the manufacturer's maintenance.

Sacemi-Gamar s.r.l.
The CEO

New international efficiency classes - Codes IE

The International Standard **IEC 60034-30-1; 2014** sets new efficiency classes (IE code) for the electric motors, providing a common basis for the design and the international classification of the same.

The method of measuring the efficiency of the engines has been revised with the **IEC 60034-2-1; 2014**, which provides test conditions and methods of measurement much more precise and accurate than previous EN 60034-2; 1996.

The efficiency classes under the new standard relates only to the three-phase motors, 50 or 60 Hz, at a single-speed, power range from 0,12 kW to 1000 kW, 2, 4, 6 or 8 pole, for continuous duty S1 or intermittent periodic S3 $\geq 80\%$ are identified as:

IE1 = Standard Efficiency

IE2 = High Efficiency

IE3 = Premium Efficiency

The IEC 60034-30-1 Norma though only defines the requirements for efficiency classes, creating shared measures at international level; It does not establish what are the engines to be supplied and their minimum levels of efficiency MEPS (Minimum Energy Performance Standards) that depend on individual local laws in real countries as shown by the table overleaf.

Note: For simplicity reasons we have limited the lists here below to the power of 22 kW as this is our production limit.

Efficiency values for 50 Hz according to IEC 60034-30-1; 2014

| Rated output kW | Standard Efficiency IE1 | | | | High Efficiency IE2 | | | | Premium Efficiency IE3 | | | |
|-----------------|----------------------------|--------|--------|--------|------------------------|--------|--------|--------|---------------------------|--------|--------|--------|
| | 2 pole | 4 pole | 6 pole | 8 pole | 2 pole | 4 pole | 6 pole | 8 pole | 2 pole | 4 pole | 6 pole | 8 pole |
| 0.12 | 45.0 | 50.0 | 38.3 | 31.0 | 53.6 | 59.1 | 50.6 | 39.8 | 60.8 | 64.8 | 57.7 | 50.7 |
| 0.18 | 52.8 | 57.0 | 45.5 | 38.0 | 60.4 | 64.7 | 56.6 | 45.9 | 65.9 | 69.9 | 63.9 | 58.7 |
| 0.20 | 54.6 | 58.5 | 47.6 | 39.7 | 61.9 | 65.9 | 58.2 | 47.4 | 67.2 | 71.1 | 65.4 | 60.6 |
| 0.25 | 58.2 | 61.5 | 52.1 | 43.4 | 64.8 | 68.5 | 61.6 | 50.6 | 69.7 | 73.5 | 68.6 | 64.1 |
| 0.37 | 63.9 | 66.0 | 59.7 | 49.7 | 69.5 | 72.7 | 67.6 | 56.1 | 73.8 | 77.3 | 73.5 | 69.3 |
| 0.40 | 64.9 | 66.8 | 61.1 | 50.9 | 70.4 | 73.5 | 68.8 | 57.2 | 74.6 | 78.0 | 74.4 | 70.1 |
| 0.55 | 69.0 | 70.0 | 65.8 | 56.1 | 74.1 | 77.1 | 73.1 | 61.7 | 77.8 | 80.8 | 77.2 | 73.0 |
| 0.75 | 72.1 | 72.1 | 70.0 | 61.2 | 77.4 | 79.6 | 75.9 | 66.2 | 80.7 | 82.5 | 78.9 | 75.0 |
| 1.1 | 75.0 | 75.0 | 72.9 | 66.5 | 79.6 | 81.4 | 78.1 | 70.8 | 82.7 | 84.1 | 81.0 | 77.7 |
| 1.5 | 77.2 | 77.2 | 75.2 | 70.2 | 81.3 | 82.8 | 79.8 | 74.1 | 84.2 | 85.3 | 82.5 | 79.7 |
| 2.2 | 79.7 | 79.7 | 77.7 | 74.2 | 83.2 | 84.3 | 81.8 | 77.6 | 85.9 | 86.7 | 84.3 | 81.9 |
| 3 | 81.5 | 81.5 | 79.7 | 77.0 | 84.6 | 85.5 | 83.3 | 80.0 | 87.1 | 87.7 | 85.6 | 83.5 |
| 4 | 83.1 | 83.1 | 81.4 | 79.2 | 85.8 | 86.6 | 84.6 | 81.9 | 88.1 | 88.6 | 86.8 | 84.8 |
| 5.5 | 84.7 | 84.7 | 83.1 | 81.4 | 87.0 | 87.7 | 86.0 | 83.8 | 89.2 | 89.6 | 88.0 | 86.2 |
| 7.5 | 86.0 | 86.0 | 84.7 | 83.1 | 88.1 | 88.7 | 87.2 | 85.3 | 90.1 | 90.4 | 89.1 | 87.3 |
| 11 | 87.6 | 87.6 | 86.4 | 85.0 | 89.4 | 89.8 | 88.7 | 86.9 | 91.2 | 91.4 | 90.3 | 88.6 |
| 15 | 88.7 | 88.7 | 87.7 | 86.2 | 90.3 | 90.6 | 89.7 | 88.0 | 91.9 | 92.1 | 91.2 | 89.6 |
| 18.5 | 89.3 | 89.3 | 88.6 | 86.9 | 90.9 | 91.2 | 90.4 | 88.6 | 92.4 | 92.6 | 91.7 | 90.1 |
| 22 | 89.9 | 89.9 | 89.2 | 87.4 | 91.3 | 91.6 | 90.9 | 89.1 | 92.7 | 93.0 | 92.2 | 90.6 |

Efficiency values for 50 Hz according to IEC 60034-30-1; 2014

| Rated output kW | Standard Efficiency IE1 | | | | High Efficiency IE2 | | | | Premium Efficiency IE3 | | | |
|-----------------|----------------------------|--------|--------|--------|------------------------|--------|--------|--------|---------------------------|--------|--------|--------|
| | 2 pole | 4 pole | 6 pole | 8 pole | 2 pole | 4 pole | 6 pole | 8 pole | 2 pole | 4 pole | 6 pole | 8 pole |
| 0.12 | 57.5 | 62.0 | 48.0 | 36.0 | 59.5 | 64.0 | 50.5 | 40.0 | 62.0 | 66.0 | 64.0 | 59.5 |
| 0.18 | 62.0 | 66.0 | 52.5 | 40.0 | 64.0 | 68.0 | 55.0 | 46.0 | 65.6 | 69.5 | 67.5 | 64.0 |
| 0.25 | 64.0 | 68.0 | 57.5 | 50.5 | 68.0 | 70.0 | 59.5 | 52.0 | 69.5 | 73.4 | 71.4 | 68.0 |
| 0.37 | 70.0 | 70.0 | 62.0 | 57.5 | 72.0 | 72.0 | 64.0 | 58.0 | 73.4 | 78.2 | 75.3 | 72.0 |
| 0.55 | 72.0 | 74.0 | 66.0 | 59.5 | 74.0 | 75.5 | 68.0 | 62.0 | 76.8 | 81.1 | 81.7 | 74.0 |
| 0.75 | 74.0 | 77.0 | 72.0 | 64.0 | 75.5 | 78.0 | 73.0 | 66.0 | 77.0 | 83.5 | 82.5 | 75.5 |
| 1.1 | 78.5 | 79.0 | 75.0 | 73.5 | 82.5 | 84.0 | 85.5 | 75.5 | 84.0 | 86.5 | 87.5 | 78.5 |
| 1.5 | 81.0 | 81.5 | 77.0 | 77.0 | 84.0 | 84.0 | 86.5 | 82.5 | 85.5 | 86.5 | 88.5 | 84.0 |
| 2.2 | 81.5 | 83.0 | 78.5 | 78.0 | 85.5 | 87.5 | 87.5 | 84.0 | 86.5 | 89.5 | 89.5 | 85.5 |
| 3.7 | 84.5 | 85.0 | 83.5 | 80.0 | 87.5 | 87.5 | 87.5 | 85.5 | 88.5 | 89.5 | 89.5 | 86.5 |
| 5.5 | 86.0 | 87.0 | 85.0 | 84.0 | 88.5 | 89.5 | 89.5 | 85.5 | 89.5 | 91.7 | 91.0 | 86.5 |
| 7.5 | 87.5 | 87.5 | 86.0 | 85.0 | 89.5 | 89.5 | 89.5 | 88.5 | 90.2 | 91.7 | 91.0 | 89.5 |
| 11 | 87.5 | 88.5 | 89.0 | 87.5 | 90.2 | 91.0 | 90.2 | 88.5 | 91.0 | 92.4 | 91.7 | 89.5 |
| 15 | 88.5 | 89.5 | 89.5 | 88.5 | 90.2 | 91.0 | 90.2 | 89.5 | 91.0 | 93.0 | 91.7 | 90.2 |
| 18.5 | 89.5 | 90.5 | 90.2 | 88.5 | 91.0 | 92.4 | 91.7 | 89.5 | 91.7 | 93.6 | 93.0 | 90.2 |
| 22 | 89.5 | 91.0 | 91.0 | 90.2 | 91.0 | 92.4 | 91.7 | 91.0 | 91.7 | 93.6 | 93.0 | 91.7 |

Minimum levels of efficiency in the world

| State | Product range | Law / Regulation | Minimum level of efficiency (MEPS)*** |
|-----------------------------|---|---|---|
| Europe | 400 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | EC 4/2014 IEC 60034-30-1:2014 | IE3 or IE2 for frequenci converter |
| Saudi Arabia | 380/400 V ± 5%; 60 Hz 0,75 ÷ 375 kW – 2/4/6 pole | SASO IEC 60034-30:2013 | IE3 |
| Australia / New Zealand | 415/690 V ± 10%; 50 Hz 0,75 ÷ 185 kW – 2/4/6/8 pole | AS/NZS 1359.5:2004 | IE2 |
| Brazil | 220/380/440/460/480 V ± 10%; 60 Hz 0,75 ÷ 185 kW – 2/4/6/8 pole | NBR 17094-1 Regulation 553 | IE2 |
| Canada | 460/575 V ± 10%; 60 Hz 0,75 ÷ 150 kW – 2/4/6 pole | CSA C390-10 | IE3 |
| Chile | 380/400/420/440/460/690 V ± 10%; 50 Hz 0,75 ÷ 7,5 kW – 2/4/6 pole | NCh 3086 | IE1 |
| China | 380 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | GB 18613-2012 | 01.09.2012 – IE2 (Grade 3) 0,75÷5,5 kW 01.09.2016 – IE3 (Grade 2) 7,5÷375 kW 01.09.2017 – IE3 (Grade 2) 0,75÷375 kW |
| Korea | Until 600 V ± 10%; 60 Hz 0,75 ÷ 200 kW – 2/4/6 pole | IEC 60034-30-1:2014 | IE3 |
| United Arab Emirates | 400 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | No regulation | No minimum efficiency requirement |
| Japan | 200/220/400/440 V ± 10%; 50/60 Hz 0,20 ÷ 375 kW – 2/4/6 pole | JIS C 4213-2014 | IE3 |
| Hong Kong | 380 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | Mandatory Buildings Energy Efficiency Bill | IE3 or IE2 for frequenci converter |
| India | 415/690 V ± 10%; 50 Hz 0,37 ÷ 315 kW – 2/4/6/8 pole | IS:12615-2011 | IE3 |
| Israel | 400 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | IEC 60034-30-1:2014 | 16.06.2011 – IE2 0,75÷5,5 kW 01.01.2015 – IE3 7,5÷375 kW |
| Mexico | 460 V ± 10%; 60 Hz 0,75 ÷ 375 kW – 2/4/6 pole | NOM-016-ENER 2010 | IE3 |
| Russia | Until 690 V ± 10%; 50 Hz 0,75 ÷ 375 kW – All pole | GOST R 51677-2000 | No minimum efficiency requirement |
| United States of America | 460 V ± 10%; 60 Hz 0,75 ÷ 375 kW – 2/4/6/8 pole | Nema EPAAct EISA 2007 | IE3 |
| South Africa | 400/525 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | No regulation | No minimum efficiency requirement |
| Switzerland | 400 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | EC 4/2014 IEC 6034-30-1:2014 | IE3 or IE2 for frequenci converter |
| Taiwan | < 600 V ± 10%; 60 Hz 0.75 ÷ 200 kW – 2/4/6/8 pole | CNS 14400 | IE2 |
| Turkey | 400 V ± 10%; 50 Hz 0,75 ÷ 375 kW – 2/4/6 pole | EC 4/2014 IEC 60034-30-1.2014 | IE3 or IE2 for frequenci converter |

*** Note: The minimum levels of efficiency (MEPS) are updated to 01.01.2017.

Standards and Specifications

Motors have been conformed to the standards and specifications according to the table below.

| Title | - | EU | I | GB | FR | D | E |
|---|------------|-------------|--------------------------|-------------------|----------------------------|-----------------|-----------------|
| | IEC | CENELEC | CEI-UNEL | BS | NFC | DIN-VDE | UNE |
| Electrical parts | | | | | | | |
| Electrical rotating machines: rated operation and characteristic data | 60034-1 | EN 60034-1 | CEI EN 60034-1 | 4999-1 4999-69 | 51 200 51 111 | DIN EN 60034-1 | UNE EN 60034-1 |
| Method for determining losses and efficiency of rotating electrical machines | 60034-2 | HD 53-2 | CEI EN 60034-2 | 4999-34 | 51 112 | DIN EN 60034-2 | UNE EN 60034-2 |
| Standard method for determining losses and efficiency from test | 60034-2-1 | | | | | | |
| Electrical rotating machine: designed of electric motors for converter supply | 60034-25 | | | | | | |
| Efficiency classes (IE code) for single speed motors | 60034-30-1 | | | | | | |
| Terminal marking and direction of rotation for electrical machines | 60034-8 | HD 53-8 S4 | CEI EN 60034-8 | 4999-3 | 51 118 | DIN VDE 0530-8 | 20113-8-96 |
| Start-up behaviour of squirrel-cage motors, single speed | 60034-12 | EN 60034-12 | CEI EN 60034-12 | 4999-112 | | DIN EN 60034-12 | UNE EN 60034-12 |
| Standard voltage | 60038 | HD 472 S1 | CEI 8-6 | | | DIN IEC 60038 | |
| Insulation materials | 60085 | | CEI EN 60085 | | 26206 | DIN IEC 60085 | |
| Mechanical parts | | | | | | | |
| Dimensions and outputs | 60072 | | UNEL 13113 | | | DIN EN 50347 | |
| Construction type and assembly of rotating electrical machines | 60034-7 | EN 60034-7 | CEI EN 60034-7 | 4999-22 | 51 117 | DIN EN 60034-7 | EN 60034-7 |
| Fixing dimensions and outputs for IM B3 | 60072 | HD 231 | UNEL 13113 | 4999-10 | 51 104 51 105 51 110 | DIN 42673-1 | UNE EN 50347 |
| Fixing dimensions and outputs for IM B5 | 60072 | HD 231 | UNEL 13117 | 4999-10 | 51 104 51 105 51 110 | DIN 42677-1 | |
| Fixing dimensions and outputs for IM B14 | 60072 | HD 231 | UNEL 13118 | 4999-10 | 51 104 51 105 51 110 | DIN 42677-1 | UNE EN 50347 |
| Flange tolerances | | | UNEL 13501 | | | DIN 42948 | |
| Cylindrical shaft ends For electrical machines | 60072 | HD 231 | UNEL 13502 | 4999-10 | 51 111 | DIN 748-3 | |
| Shaft ends tolerances | | | UNEL 13501 UNEL 13502 | | | DIN 42955 | |
| Vibrations severity of rotating electrical machines | 60034-14 | EN 60034-14 | CEI EN 60034-14 | 4999-50 | 51 111 | DIN EN 60034-14 | EN 60034-14 |
| Protection type | 60034-5 | EN 60034-5 | CEI EN 60034-5 | 4999-20 | EN 60034-5 | DIN EN 60034-5 | 20111-5 |
| Cooling method sods | 60034-6 | EN 60034-6 | CEI EN 60034-6 | 4999-21 | | DIN EN 60034-6 | EN 60034-6 |
| Noise emission, limits value | 60034-9 | EN 60034-9 | CEI EN 60034-9 | 4999-51 | 51 119 | DIN EN 60034-9 | EN 60034-9 |
| Balanced | ISO 8821 | | | | | DIN ISO 8821 | |
| Ambient conditions | 60721-2-1 | | CEI EN 60721-1 | | | DIN EN 60721-1 | |

Mechanical tolerances

On the table below mechanical tolerances of the coupling components have been reported according to the regulation IEC 60072-1.

| Detail | Designation | Dimension in mm | Tolerance |
|-----------------|-------------|--------------------------------|-----------|
| Shaft end*** | D – DA | from 11 to 28 from 38 to 48 | i6 k6 |
| Key width | F | - | h9 |
| Flange centring | N | up to 230 over 230 | i6 h6 |
| Shaft height | H | up to 250 | - 0.5 |

***Note: the shaft end of all motors is equipped with a threaded hole for the fitting of pulleys and couplings, according to DIN 332 part 2.

Electrical tolerances

The following table specifies the tolerances of the quantity requested, according to IEC 60034-1

| Quantity | Tolerance |
|--|--|
| Power factor ($\cos \varphi$) | - 1/6 of $(1 - \cos \varphi)$, minimum 0.02, maximum 0.07 |
| Efficiency (η) | - 1.5% $(1 - \eta)$ |
| Slip (s) | for $P_n < 1\text{ kW}$, $\pm 30\%$ for $P_n \geq 1\text{ kW}$, $\pm 20\%$ |
| Locked rotor current (I _s) | + 20% of the guaranteed value |
| Locked rotor torque (M _s) | - 1.5%, + 2.5% of the guaranteed value |
| Maximum torque (M _m) | - 10% of the guaranteed value (for $M_m \geq 1.5 \div 1.6 M_n$) |
| Sag down torque (M _i) | - 1.5% of the guaranteed value |
| Moment of inertia (J) | $\pm 10\%$ of the guaranteed value |
| Sound level | + 3 dB (A) |
| Vibration | + 10% of the guaranteed class |

General features

The motors of this catalogue have a high shaft range from 56 mm up to 160 mm.

The terminal box is usually located on the upper side of the motor; it may be requested to be supplied on the right or the left side. On motor with shaft of 56-63-71 mm the terminal box can be rotated of 180°, on all others with a release of 90°.

Concerning standard motors, **the cables glands** are not normally supplied.

The frame, made of aluminium casing for all sizes, on sizes 112-132-160 has a fitting eye and is designed for the mass inside the terminal box on the ground with connectivity outside.

The end shields and the flanges are aluminium casing made or, on specific request, cast iron made.

The shaft is usually made of steel C40E (UNI EN 10083-1 e EN 10277-5); on request it can be built with special types of steel. The squirrel cage of the rotor is made of aluminium pressure die-cast casing.

The rotor is dynamically balanced with a **half feather key** in order to be conformed to grade N (standard) of the regulation DIN-ISO 8821.

More accurate balancing processes, grade R (reduced) or S (special) may be obtained on specific request.

The noise level, dB(A) scale expressed, is taken through a measurement of acoustic pressure level according to A curve of the sound level meter, conformed to the regulation EN 60651.

The acoustic pressure level values L_{pA} and the sound waves pressure value L_{WA} are much below the maximum values indicated by the regulation EN 60034-9.

The stator winding is made with copper wire class H grade 2 insulated and insulation materials used belong to class F according to the regulation IEC 60034-1; it is protected by a deep impregnation obtained through immersion and following oven-drying. Stator windings insulated in upper classes (H) may be made on specific request.

Temperature rise, even if the motor is class F (105 K) insulated, is normally kept within class B (80 K) limit, on condition that motor alimentation is conformed to regulation IEC 60038.

Cooling, for standard motors, is IC 411 obtained with a radial flow fan allowing fully reversible rotation.

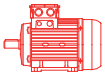


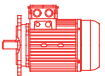


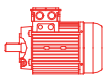





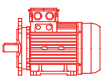


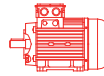


The nameplate, stainless steel made, is located on the frame.

Personalized nameplate may be supplied on request.

Screw and sheet-steel fan cover are always treated for corrosion prevention.

Standard painting is RAL 7011. Special painting may be supplied on request.

Mounting arrangements

| FOOT-MOUNTED MOTORS | | | FLANGE-MOUNTED MOTORS LARGE FLANGE CLEARANCE FIXIN HOLES | | | FLANGE-MOUNTED MOTORS SMALL FLANGE TAPPED FIXING HOLES | | |
|---|---|---|---|---|---|--|---|---|
| IM B3 IM 1001 | IM B6 IM 1051 | IM B7 IM 1061 | IM B5 IM 3001 | IM V1 IM 3011 | IM V3 IM 3031 | IM B14 IM 3601 | IM V18 IM 3611 | IM V19 IM 3631 |
|  |  |  |  |  |  |  |  |  |
| IM B8 IM 1071 | IM V5 IM 1011 | IM V6 IM 1031 | IM B35 IM 2001 | IM V15 IM 2011 | IM V36 IM 2031 | IM B34 IM 2101 | IM 2111 | IM 2131 |
|  |  |  |  |  |  |  |  |  |

Standard operating conditions

Motors are designed to operate at a voltage of 230/400 V \pm 10% and a frequency of 50 Hz, at an altitude not exceeding 1000 m above sea level (4000 for motors in IE2 and IE3) and a maximum ambient temperature of 40°C (60°C for motors in IE2 and IE3) with a relative humidity below 90%.

This design allows you to use 220/380 V \pm 5% and 240/415 V \pm 5% at 50 Hz frequency extension to 60 Hz and performances that vary according to the parameters of the table below.

If the operating conditions are more severe (e.g.: altitude and/or ambient temperature higher than those described above), there is a reduction of power output and it is recommended to call our Technical Department.

Note: The above said means regardless of the values of efficiency IE1 or IE2 or IE3 listed in the catalog tables or in the motor plates.

Transformation multiplier for 60 Hz operations

| Wound motor at Hz 50 | Connected at 60 Hz | Catalogue characteristics' variation coefficients | | | | | | |
|-------------------------|-----------------------|--|--------------|------------------|--------------------|---------------------|----------------|----------------------|
| | | Rated speed | Rated output | Full load torque | Rated load current | Locked rotor torque | Maximum torque | Locked rotor current |
| V \pm 10% | V | | | | | | | |
| 230 | 220 \pm 5% | 1.2 | 1.0 | 0.83 | 1.0 | 0.83 | 0.83 | 0.83 |
| 230 | 230 \pm 10% | 1.2 | 1.0 | 0.83 | 1.0 | 0.83 | 0.83 | 0.83 |
| 230 | 240 \pm 10% | 1.2 | 1.05 | 0.87 | 1.0 | 0.87 | 0.87 | 0.87 |
| 230 | 254 \pm 10% | 1.2 | 1.1 | 0.92 | 1.0 | 0.92 | 0.92 | 0.92 |
| 230 | 265 \pm 10% | 1.2 | 1.15 | 0.96 | 1.0 | 0.96 | 0.96 | 0.96 |
| 230 | 277 \pm 5% | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 400 | 380 \pm 5% | 1.2 | 1.0 | 0.83 | 1.0 | 0.83 | 0.83 | 0.83 |
| 400 | 400 \pm 10% | 1.2 | 1.0 | 0.83 | 1.0 | 0.83 | 0.83 | 0.83 |
| 400 | 415 \pm 10% | 1.2 | 1.05 | 0.87 | 1.0 | 0.87 | 0.87 | 0.87 |
| 400 | 440 \pm 10% | 1.2 | 1.1 | 0.92 | 1.0 | 0.92 | 0.92 | 0.92 |
| 400 | 460 \pm 10% | 1.2 | 1.15 | 0.96 | 1.0 | 0.96 | 0.96 | 0.96 |
| 400 | 480 \pm 5% | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

Bearings

Bearings are 2Z-C3 ball-kind (they are lubricated for life with deep groove).

The spring ring is located on the non drive end of the standard motors; on the self-braking motors the ring is fitted at drive end and the non drive end bearing is fitted in its place by a retaining ring.

Moreover, the bearing is protected by a sealing ring from water and dust penetration.

For specific uses, bigger or special bearing can be requested.

The chart below illustrates types of bearing assembled for each size of standard motor.

| Motor size | 56 | 63 | 71 | 80 | 90 | 100 | 112 | 132 | 160 |
|------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Bearing Type | 6201 2Z C3 | 6202 2Z C3 | 6203 2Z C3 | 6204 2Z C3 | 6205 2Z C3 | 6206 2Z C3 | 6206 2Z C3 | 6208 2Z C3 | 6309 2Z C3 |
| Dimensions dxDxB | 12x32x10 | 15x35x11 | 17x40x12 | 20x47x14 | 25x52x15 | 30x62x16 | 30x62x16 | 40x80x18 | 45x100x25 |

Radial and axial thrusts for ball bearings

In the table below the value of maximum radial load were calculated equal to a life of bearing 20000 hours for motor 2 pole 40000 hours and for those with a 4,6,8 pole frequency 50 Hz.

For the use of motors at 60 Hz these value are reduced by about 6%.

For multi-speed motors to consider the values corresponding to the higher speed.

Note: if the radial load applied to the shaft is less than the maximum table more you can apply axial loads (values on request).

| Motor | | Maximum radial load | | | Maximum additional axial load with maximum radial load applied in position 2 * | | | | | |
|------------|----------|----------------------------------|-------------------|-------------------|---|-----------|------------|-----------|---------------|-----------|
| Motor size | Polarity | Horizontal and vertical mounting | | | Horizontal shaft | | Shaft down | | Shaft upwards | |
| | | * Position 0 N | * Position 1 N | * Position 2 N | Push N | Pull N | Push N | Pull N | Push N | Pull N |
| 56 | 2 | 391 | 362 | 337 | 189 | 138 | 195 | 132 | 183 | 144 |
| | 4 | 390 | 362 | 337 | 189 | 138 | 192 | 131 | 182 | 145 |
| | 6 | 451 | 418 | 389 | 209 | 158 | 216 | 151 | 202 | 165 |
| | 8 | 505 | 468 | 436 | 221 | 170 | 228 | 163 | 214 | 177 |
| 63 | 2 | 444 | 410 | 383 | 233 | 156 | 243 | 146 | 223 | 166 |
| | 4 | 443 | 409 | 382 | 233 | 156 | 245 | 144 | 221 | 168 |
| | 6 | 512 | 473 | 441 | 255 | 178 | 267 | 166 | 243 | 190 |
| | 8 | 575 | 530 | 495 | 269 | 192 | 281 | 180 | 257 | 204 |
| 71 | 2 | 549 | 502 | 462 | 315 | 195 | 330 | 180 | 300 | 210 |
| | 4 | 545 | 498 | 459 | 316 | 196 | 338 | 174 | 294 | 218 |
| | 6 | 631 | 576 | 531 | 343 | 223 | 365 | 201 | 321 | 245 |
| | 8 | 708 | 647 | 596 | 361 | 241 | 383 | 219 | 339 | 263 |
| 80 | 2 | 725 | 652 | 591 | 442 | 262 | 460 | 244 | 424 | 280 |
| | 4 | 716 | 643 | 582 | 445 | 265 | 481 | 229 | 409 | 301 |
| | 6 | 829 | 744 | 675 | 481 | 301 | 517 | 265 | 445 | 337 |
| | 8 | 931 | 836 | 758 | 505 | 325 | 541 | 289 | 469 | 361 |
| 90S | 2 | 810 | 715 | 641 | 496 | 286 | 516 | 266 | 476 | 306 |
| | 4 | 800 | 706 | 631 | 500 | 290 | 539 | 251 | 461 | 329 |
| | 6 | 923 | 814 | 727 | 541 | 331 | 588 | 284 | 494 | 378 |
| | 8 | 1036 | 914 | 817 | 567 | 357 | 614 | 310 | 520 | 404 |
| 90L | 2 | 817 | 731 | 661 | 497 | 287 | 524 | 260 | 470 | 314 |
| | 4 | 804 | 719 | 649 | 502 | 292 | 554 | 240 | 450 | 344 |
| | 6 | 929 | 830 | 750 | 542 | 332 | 600 | 274 | 484 | 390 |
| | 8 | 1044 | 933 | 843 | 568 | 358 | 626 | 300 | 510 | 416 |
| 100L | 2 | 1125 | 999 | 898 | 689 | 399 | 721 | 367 | 657 | 431 |
| | 4 | 1104 | 977 | 876 | 697 | 407 | 772 | 332 | 622 | 482 |
| | 6 | 1275 | 1130 | 1013 | 753 | 463 | 836 | 380 | 670 | 546 |
| | 8 | 1428 | 1265 | 1134 | 792 | 502 | 886 | 408 | 698 | 596 |
| 112M | 2 | 1133 | 1012 | 914 | 690 | 400 | 730 | 360 | 650 | 440 |
| | 4 | 1103 | 982 | 884 | 701 | 411 | 801 | 311 | 601 | 511 |
| | 6 | 1276 | 1136 | 1022 | 758 | 468 | 868 | 358 | 648 | 578 |
| | 8 | 1430 | 1273 | 1146 | 796 | 506 | 916 | 386 | 676 | 626 |
| 132S | 2 | 1695 | 1486 | 1323 | 1070 | 600 | 1140 | 530 | 1000 | 670 |
| | 4 | 1655 | 1446 | 1283 | 1085 | 615 | 1235 | 465 | 935 | 765 |
| | 6 | 1921 | 1680 | 1491 | 1167 | 697 | 1317 | 547 | 1017 | 847 |
| | 8 | 2145 | 1876 | 1664 | 1227 | 757 | 1407 | 577 | 1047 | 937 |
| 132M | 2 | 1703 | 1514 | 1362 | 1073 | 603 | 1163 | 513 | 983 | 693 |
| | 4 | 1648 | 1459 | 1307 | 1093 | 623 | 1293 | 423 | 893 | 823 |
| | 6 | 1922 | 1704 | 1529 | 1172 | 702 | 1362 | 512 | 982 | 892 |
| | 8 | 2149 | 1905 | 1708 | 1233 | 763 | 1453 | 543 | 1013 | 983 |
| 160M | 2 | 3084 | 2696 | 2392 | 1789 | 1099 | 1949 | 939 | 1629 | 1259 |
| | 4 | 3024 | 2636 | 2332 | 1811 | 1121 | 2091 | 841 | 1531 | 1401 |
| | 6 | 3481 | 3033 | 2683 | 1971 | 1281 | 2311 | 941 | 1631 | 1621 |
| | 8 | 3919 | 3417 | 3025 | 2070 | 1380 | 2410 | 1040 | 1730 | 1720 |
| 160L | 2 | 3093 | 2736 | 2451 | 1795 | 1105 | 1995 | 905 | 1595 | 1301 |
| | 4 | 3018 | 2661 | 2376 | 1822 | 1132 | 2172 | 782 | 1472 | 1482 |
| | 6 | 3470 | 3057 | 2728 | 1985 | 1295 | 2415 | 865 | 1555 | 1725 |
| | 8 | 3911 | 3450 | 3081 | 2084 | 1394 | 2514 | 964 | 1654 | 1824 |

* Position 0 = In line with the flange surface (bar shaft-end)

Position 1 = Center shaft

Position 2 = Shaft end

Noise levels

The tables below show the sound power levels (Lw) of the motors of construction IM B3, for no-load and fed to the frequency of 50 Hz.

These values are determined according to EN 60651 and shown in dB (A).

According to EN 60034-9 are those set table with a maximum tolerance of +3 dB (A).

Note: These levels are also indicated in the acoustic pressure (Lp).

| Motor | 2 pole - 3000 min ⁻¹ | | | 4 pole - 1500 min ⁻¹ | | |
|-------|---------------------------------|---------|---------|---------------------------------|---------|---------|
| | EN 60034-9 | GAMAR ≤ | GAMAR ≤ | EN 60034-9 | GAMAR ≤ | GAMAR ≤ |
| Size | LwA | | LpA | LwA | | LpA |
| 56 | - | 57 | 48 | - | 52 | 43 |
| 63 | - | 60 | 51 | - | 52 | 43 |
| 71 | - | 65 | 56 | - | 53 | 44 |
| 80 | 81 | 70 | 61 | - | 58 | 49 |
| 90S | 81 | 73 | 64 | 71 | 59 | 50 |
| 90L | 86 | 74 | 65 | 71 | 60 | 51 |
| 100L | 86 | 76 | 67 | 76 | 62 | 52 |
| 112M | 86 | 77 | 68 | 76 | 65 | 56 |
| 132S | 91 | 81 | 71 | 81 | 71 | 61 |
| 132M | 91 | 81 | 71 | 81 | 71 | 61 |
| 160M | 91 | 82 | 72 | 88 | 73 | 63 |
| 160L | 94 | 82 | 72 | 88 | 73 | 63 |

| Motor | 6 pole - 1000 min ⁻¹ | | | 8 pole - 750 min ⁻¹ | | |
|-------|---------------------------------|---------|---------|--------------------------------|---------|---------|
| | EN 60034-9 | GAMAR ≤ | GAMAR ≤ | EN 60034-9 | GAMAR ≤ | GAMAR ≤ |
| Size | LwA | | LpA | LwA | | LpA |
| 56 | - | - | - | - | - | - |
| 63 | - | 52 | 43 | - | - | - |
| 71 | - | 53 | 44 | - | 48 | 39 |
| 80 | - | 53 | 44 | - | 50 | 41 |
| 90S | - | 55 | 46 | - | 53 | 44 |
| 90L | 71 | 56 | 47 | - | 53 | 44 |
| 100L | 71 | 61 | 52 | 71 | 55 | 46 |
| 112M | 76 | 64 | 55 | 71 | 60 | 51 |
| 132S | 76 | 69 | 59 | 71 | 64 | 54 |
| 132M | 80 | 69 | 59 | 76 | 64 | 54 |
| 160M | 80 | 71 | 61 | 76 | 72 | 62 |
| 160L | 84 | 71 | 61 | 80 | 72 | 62 |

Note: To add about 60 Hz → 6 dB - (2 pole) 4 dB - (4 pole) 3 dB - (6 pole) 2 dB - (8 pole)

Note: At load, for higher powers >1kW
add about → 2 dB - (2 pole) 5 dB - (4 pole) 7 dB - (6 pole) 8 dB - (8 pole)

Vibrations

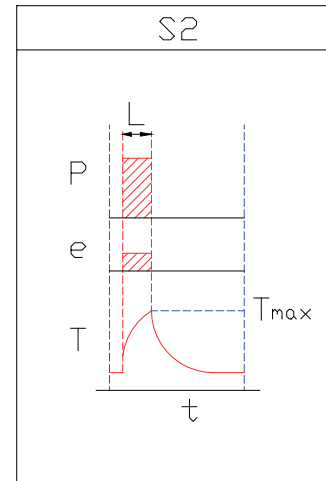
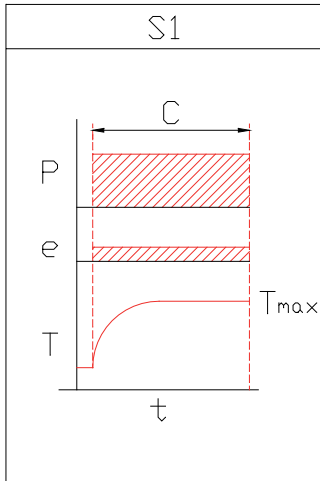
Vibrations levels permitted by EN 60034-14

| Capable of balancing | Speed min ⁻¹ | Maximum value of vibration velocity mm/s | |
|----------------------|-------------------------|--|----------------|
| | | Motor size 56÷132 | Motor size 160 |
| N (normal) | from 600 to 3600 | 1.8 | 2.8 |
| R (reduced) | from 600 to 1800 | 0.71 | 1.12 |
| | from 1800 to 3600 | 1.12 | 1.8 |
| S (special) | from 600 to 1800 | 0.45 | 0.71 |
| | from 1800 to 3600 | 0.71 | 1.12 |

Duty types

Symbols:

P = Power **e** = Losses **T** = Temperature **T_{max}** = Maximum temperature **t** = Time
n = Speed **C** = Cycle of load **A** = Starting **L** = Operation under load **R** = Resting
V = Operation on no load **F** = Electric braking **X** = Cyclic %

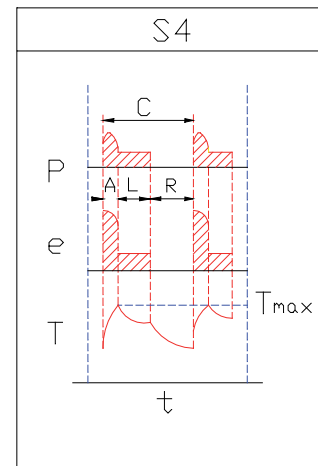
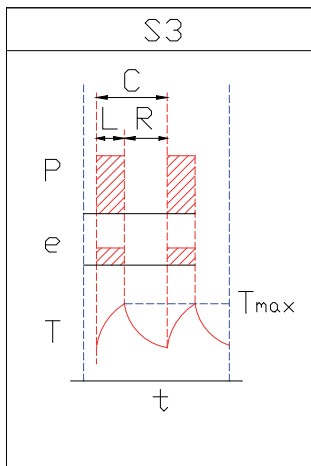


Duty-type S1: continuous operation.

Operation at constant load of sufficient duration to reach thermal equilibrium.

Duty-type S2: shorttime duty.

Operation at constant load for a time not sufficient to reach thermal equilibrium, followed by a rest period sufficient to restore equality between the motor and the thermal cooling fluid.



Duty-type S3: intermittent periodic duty.

A sequence of identical duty cycles, each cycle consisting of a constant load (without reaching thermal equilibrium) and a rest period. The start-up phase does not influence the temperature significantly.

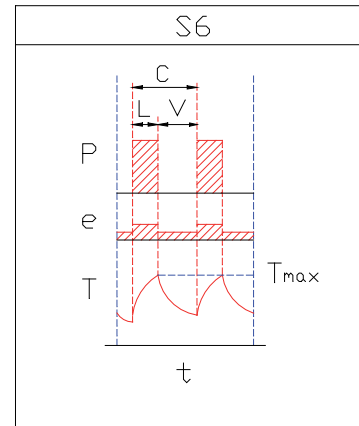
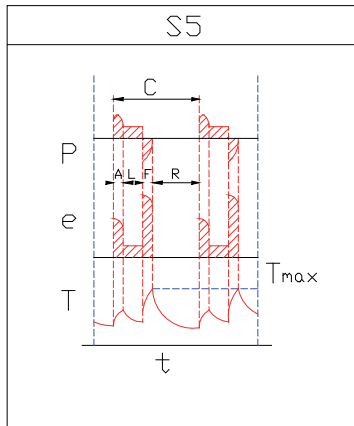
$$X = \frac{L}{L + R} \cdot 100$$

Duty-type S4: intermittent periodic duty with starting.

A sequence of identical duty cycles, each with a significant start-up, operation at constant load (without reaching thermal equilibrium) and a rest period.

$$X = \frac{A + L}{A + L + R} \cdot 100$$

Duty types

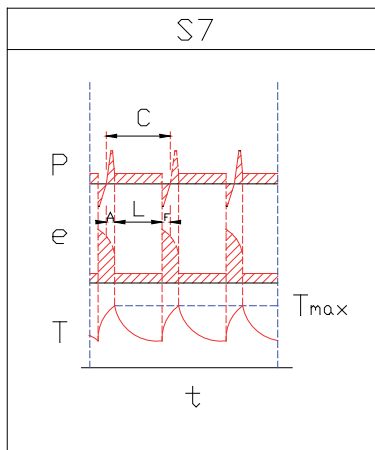


Duty-type S5: intermittent periodic duty with electric braking.
A sequence of identical duty cycles, each with a start-up, operation at constant load (without reaching thermal equilibrium), a rapid electric braking and a rest period.

$$X = \frac{A + L + F}{A + L + F + R} \cdot 100$$

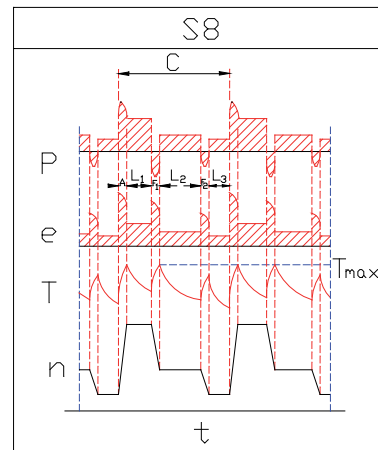
Duty-type S6: continuous operation with intermittent load.
A sequence of identical duty cycles, each including a period of load operation (without reaching thermal equilibrium) and a period of no load, without rest period.

$$X = \frac{L}{L + V} \cdot 100$$



Duty-type S7: continuous operation duty with starting and braking.
A sequence of identical duty cycles, each with a start-up, a period of constant load (without reaching thermal equilibrium) and an electric braking.

$$X = 100$$



Duty-type S8: continuous operation duty with related load/speed changes.
A sequence of identical duty cycles, each including a period of operation at constant load at a predetermined speed, followed by one or more periods of operation at other constant load at different speed.

$$X = \frac{A + L_1}{A + L_1 + F_1 + L_2 + F_2 + L_3} \cdot 100$$

Engineering formulae for motor drives

Power (three-phase motor)

Power input

$$P_1 = \sqrt{3} \cdot U \cdot I \cdot \cos\varphi \cdot 10^{-3} \text{ [kW]}$$

Potenza resa

$$P = P_1 \cdot \eta \text{ [kW]}$$

where: U = rated voltage (V)
I = rated load current (A)
cosφ = power factor
η = efficiency

Power requirements of some applications

Lifting.

$$P = \frac{m \cdot v}{\eta} \cdot 9,81 \cdot 10^{-3} \text{ [kW]}$$

Rotation:

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

Fan and pump drives:

$$P = \frac{H \cdot Q}{\eta} \cdot 10^{-3} \text{ [kW]}$$

where: P = power (kW)
m = mass (kg)
v = speed (m/s)
n = rotational speed (min⁻¹)
η = efficiency
M = torque (Nm)
Q = output (m³/s)
H = head (N/m²)

Torque for motor power

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

where: P = power (kW)
n = speed (min⁻¹)

Conversion of torque for step-up and step-down speed ratio:

$$M_1 = \frac{M \cdot n}{n_1} \text{ [Nm]}$$

where: n = motor speed (min⁻¹)
M = motor torque (Nm)
n₁ = speed of load (min⁻¹)
M₁ = torque of load at n₁ (Nm)

Moment of inertia

Moment of inertia a cylindrical flywheel:

$$J = \frac{m \cdot d^2}{8} \text{ [kg.m}^2\text{]}$$

where: m = mass (kg)
d = flywheel diameter (m)

Effective moment of inertia on the motor of a linearly moved load:

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

where: m = mass (kg)
v = velocity (m/s)
n = motor speed (min⁻¹)

Conversion of moment of inertia for step-up or step-down speed ratio:

$$J_1 = J \cdot \left(\frac{n}{n_1}\right)^2 \text{ [kg.m}^2\text{]}$$

where: n = motor speed (min⁻¹)
J = moment of inertia of motor (kg.m²)
n₁ = speed of load (min⁻¹)
J₁ = moment of inertia of load (kg.m²)

Factor of inertia

$$F_j = \frac{J + J_1}{J}$$

where: J = moment of inertia of motor
J₁ = moment of inertia of load

Starting time

$$t_a = \frac{F_j \cdot J \cdot n}{9,55 \cdot (M - M_1)} \text{ [s]}$$

dove: F_j = fattore di inerzia
J = momento d'inerzia del motore (kg.m²)
n = velocità del motore (min⁻¹)
M = coppia motrice media all'avviamento (Nm)
M₁ = coppia resistente media all'avviamento (Nm)

Speed

The no load speed is virtually the same as the synchronous speed is calculated as follow:

$$n_s = 120 \cdot \frac{f}{p} \text{ [min}^{-1}\text{]}$$

where: f = frequency (Hz) p = number of poles

The synchronous speed (n) is reduced by the slip (S) to the rated speed (n) according to the formulae:

$$n = n_s \cdot (1 - S) \text{ [min}^{-1}\text{]}$$

Driver motors by inverter

The optimization of production processes and energy saving invite us increasingly to use variable speed induction motors driven by inverters.

In general the drive using inverter, which converts the constants of the electrical network (V, Hz) in the variable values, involves not purely sinusoidal supply of engines and introduces harmonic components of voltage and current and requires a power margin of about on 15%.

It' must also take into account the following factors:

- Increase in losses as a function of frequency
- Mechanical resistance and balancing of the rotor
- Bearing life (lubrication, durability, heat)
- Ventilation, noise, vibration
- Performance of the motor (starting current, starting torque and speed)

The extent of decrease of motor efficiency varies depending on the type of inverter used.

The standard manufacturing motors can be powered by inverter variable speed and used subject to the general requirements set out in IEC 60034-1.

In compliance with this regulation does not produce stresses which cause the electrical insulation of the motor causing it.

In the case of particularly demanding applications, with the motor connected to a considerable distance from the inverter and/or multiple motors connected in parallel to it, it is recommended to control the waveform of the voltage across the motor and possibly use filters to attenuate the harmonic content.

If this is not possible to make a request through our Technical Office of the extra insulation windings act to support high voltage spikes in accordance with IEC 60034-17.

Applications to speed very low or very high may require the use of servo-ventilation, in order to improve in the first case the insufficient cooling and in the second case the noise of ventilation of the motor.

In driving the motors with inverters there are three areas of operation:

1) Area in voltage/frequency ratio constant.

For motors 230/400 V - 50 Hz is usually identified by the ratio 400 V/50 Hz, star connected motor and powered by three-phase inverter, or with a delta connected motor and powered by inverters.

This area identifies the operation of the constant-torque motor with the lower limit frequency (f_1) of approximately 25 Hz for standard motors and 18÷20 Hz for the servo-ventilated motors.

Lower frequency applications are possible but the rated torque of the motor is no longer guaranteed.

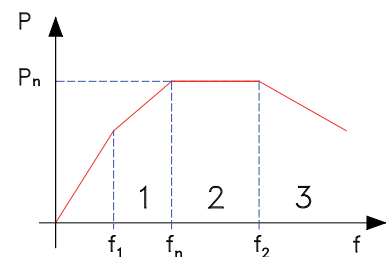
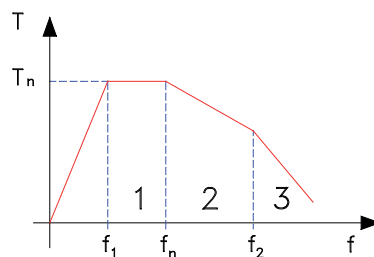
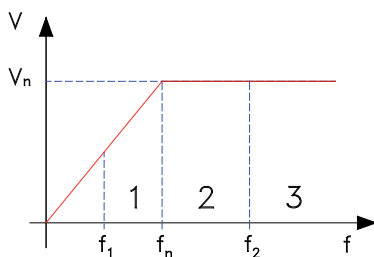
If the current required by the motor is that it does not overstress the drive, you can set the voltage/frequency ratio equal to 400/87, in these conditions, with a delta connected motor, the magnetic flux remains almost unchanged up to 87 Hz, so you can extend the zone up to the constant torque value of frequency without causing saturation phenomena and abnormally without stressing the insulation of the motor.

2) Zone at constant voltage (nominal value of the plate).

In this area remains constant motor power when you outflow with increasing frequency.

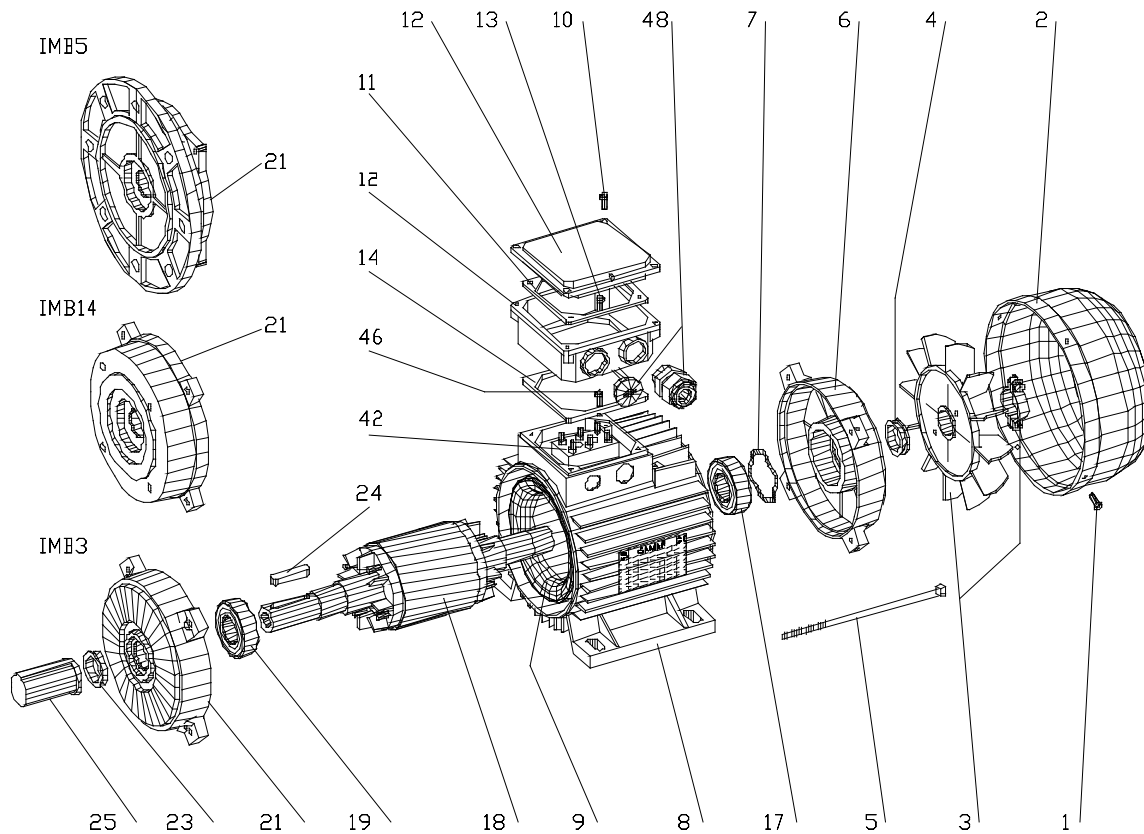
And 'to keep in mind that there is a physical limit in reducing the flow of the motor performance by keeping constant, this limit corresponds to a frequency (f_2) of 90÷100 Hz

3) Zone at constant voltage with decreasing torque and power.



Asynchronous three-phase motors

Three-phase motor - X... Type



Spare parts nomenclature

- | | |
|-----------------------------------|---------------------|
| 1. Screw for fan cover | 25. Shaft cap |
| 2. Fan cover | 42. Terminal board |
| 3. Fan | 46. Grounding screw |
| 4. Sealing ring | 48. Cable gland |
| 5. Rod | |
| 6. N-end shield | |
| 7. Spring ring | |
| 8. Frame | |
| 9. Stator package | |
| 10. Screw for terminal box cover | |
| 11. Gasket for terminal box cover | |
| 12. Terminal box | |
| 13. Screw for terminal box | |
| 14. Gasket for terminal box | |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |

Connection for motors XS.. Type

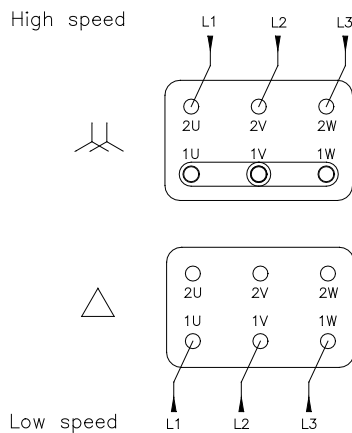
Three-phase **one-speed** motors



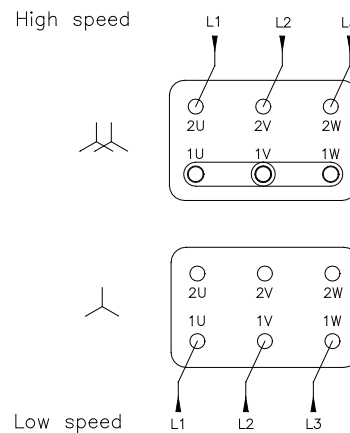
Connection for motors XD and XDV Type

Three-phase **two-speed** motors, **single winding**

XD Type

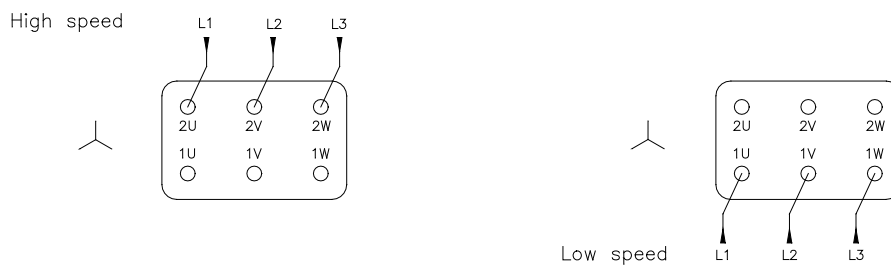


XDV Type



Connection for motors XDD and XDDV Type

Three-phase **two-speed** motors, **double winding**



One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSP Type 2 pole - 3000 min⁻¹ | | | | | | | | | | | | | | |
|--|------|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|
| Motor size | Type | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | | n min ⁻¹ | I _n A | IE3 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| 56 | a | 0.09 | 2720 | 0.32 | 48.6 | 55.9 | 56.7* | 0.77 | 0.33 | 2.3 | 3.2 | 2.2 | 0.073 | 2.7 |
| 56 | b | 0.12 | 2780 | 0.38 | 55.3 | 61.1 | 62.7 | 0.74 | 0.41 | 2.4 | 3.8 | 2.3 | 0.087 | 3.0 |
| 63 | a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 0.129 | 3.7 |
| 63 | b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 0.162 | 4.3 |
| 63 | c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 0.206 | 5.0 |
| 71 | a | 0.37 | 2805 | 0.97 | 70.7 | 74.6 | 74.8 | 0.76 | 1.30 | 3.4 | 5.2 | 3.4 | 0.342 | 5.8 |
| 71 | c | 0.55 | 2830 | 1.32 | 74.4 | 77.6 | 78.0 | 0.78 | 1.87 | 3.8 | 6.1 | 3.6 | 0.505 | 7.6 |
| 71 | d | 0.75 | 2820 | 1.84 | 74.9 | 78.1 | 80.7* | 0.75 | 2.53 | 4.0 | 6.1 | 3.9 | 0.505 | 7.6 |
| 80 | a | 0.75 | 2845 | 1.64 | 81.9 | 83.2 | 82.5 | 0.80 | 2.52 | 3.3 | 6.6 | 3.4 | 0.850 | 9.1 |
| 80 | b | 1.1 | 2865 | 2.36 | 83.9 | 85.3 | 84.8 | 0.80 | 3.68 | 3.7 | 7.4 | 3.6 | 1.129 | 11.1 |
| 80 | c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 84.2* | 0.79 | 5.07 | 3.3 | 6.4 | 3.4 | 1.129 | 11.1 |
| 90S | a | 1.5 | 2900 | 3.1 | 82.3 | 84.7 | 84.8 | 0.82 | 5.01 | 3.3 | 7.9 | 3.6 | 1.469 | 13.7 |
| 90S | b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 85.0* | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 1.469 | 13.8 |
| 90L | a | 2.2 | 2890 | 4.5 | 85.7 | 86.8 | 86.2 | 0.84 | 7.38 | 3.1 | 8.1 | 3.6 | 1.888 | 16.8 |
| 90L | b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 86.5* | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 1.888 | 16.8 |
| 100L | a | 3 | 2900 | 5.7 | 88.7 | 89.2 | 88.3 | 0.87 | 9.93 | 2.8 | 7.7 | 3.4 | 3.542 | 23.3 |
| 100L | b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 88.1* | 0.85 | 13.4 | 2.6 | 7.2 | 3.2 | 3.542 | 23.3 |
| 112M | a | 4 | 2920 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 5.191 | 28.5 |
| 112M | b | 4.7 | 2925 | 9.3 | 86.7 | 88.9 | 89.4 | 0.81 | 15.2 | 5.1 | 11.7 | 5.8 | 6.336 | 31.8 |
| 112M | c | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 89.2* | 0.84 | 18.1 | 4.3 | 9.9 | 6.3 | 6.336 | 31.8 |
| 132S | a | 5.5 | 2950 | 10.3 | 86.5 | 88.9 | 89.6 | 0.86 | 17.7 | 4.0 | 10.8 | 4.7 | 14.41 | 47.2 |
| 132S | b | 7.5 | 2945 | 14.1 | 88.6 | 90.3 | 90.5 | 0.85 | 24.3 | 3.6 | 10.2 | 4.6 | 17.06 | 52.8 |
| 132M | a | 9.2 | 2945 | 16.9 | 89.8 | 91.1 | 91.1 | 0.86 | 29.8 | 3.6 | 10.4 | 4.5 | 19.58 | 60.1 |
| 132M | b | 11 | 2940 | 21.1 | 89.0 | 90.6 | 91.2* | 0.83 | 35.7 | 4.2 | 10.1 | 4.6 | 19.58 | 60.6 |
| 160M | a | 11 | 2960 | 20.0 | 90.0 | 91.6 | 91.8 | 0.87 | 35.4 | 4.7 | 10.9 | 3.9 | 41.45 | 86.8 |
| 160M | b | 15 | 2960 | 27.2 | 90.4 | 91.8 | 92.1 | 0.87 | 48.4 | 4.7 | 11.5 | 4.0 | 53.42 | 104 |
| 160L | a | 18.5 | 2965 | 33.2 | 91.3 | 92.5 | 92.7 | 0.87 | 59.8 | 4.3 | 11.3 | 3.7 | 61.66 | 118 |
| 160L | b | 22 | 2950 | 38.9 | 91.9 | 92.5 | 92.7* | 0.89 | 71.4 | 4.1 | 9.9 | 3.0 | 61.66 | 117 |

| XSP Type 4 pole - 1500 min⁻¹ | | | | | | | | | | | | | | |
|--|------|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|
| Motor size | Type | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | | n min ⁻¹ | I _n A | IE3 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| 56 | a | 0.06 | 1320 | 0.26 | 39.8 | 44.6 | 53.6* | 0.69 | 0.45 | 1.9 | 2.3 | 2.0 | 0.117 | 2.7 |
| 56 | b | 0.09 | 1355 | 0.39 | 41.4 | 52.1 | 60.6* | 0.62 | 0.65 | 2.6 | 2.6 | 2.6 | 0.151 | 3.1 |
| 63 | b | 0.12 | 1370 | 0.41 | 55.6 | 61.8 | 64.8* | 0.67 | 0.85 | 2.1 | 3.0 | 2.3 | 0.263 | 4.3 |
| 63 | c | 0.18 | 1380 | 0.61 | 58.8 | 64.9 | 69.9* | 0.65 | 1.25 | 2.4 | 3.3 | 2.6 | 0.326 | 5.0 |
| 71 | b | 0.18 | 1400 | 0.50 | 65.9 | 70.3 | 70.6 | 0.73 | 1.24 | 2.3 | 4.2 | 2.5 | 0.800 | 6.4 |
| 71 | c | 0.25 | 1420 | 0.69 | 70.3 | 74.5 | 75.6 | 0.69 | 1.68 | 2.9 | 5.2 | 3.3 | 1.175 | 8.2 |
| 80 | a | 0.37 | 1430 | 0.88 | 74.5 | 78.2 | 78.5 | 0.77 | 2.47 | 2.8 | 5.9 | 3.3 | 2.157 | 9.6 |
| 80 | b | 0.55 | 1435 | 1.30 | 76.9 | 80.0 | 80.8 | 0.76 | 3.68 | 3.3 | 6.5 | 3.7 | 2.789 | 11.6 |
| 80 | c | 0.75 | 1425 | 1.70 | 78.6 | 81.2 | 82.5* | 0.79 | 5.02 | 3.0 | 6.4 | 3.5 | 2.789 | 11.6 |
| 90S | r | 0.75 | 1440 | 1.77 | 81.0 | 83.5 | 83.8 | 0.73 | 4.96 | 3.0 | 6.2 | 3.5 | 2.566 | 13.3 |
| 90S | a | 1.1 | 1425 | 2.6 | 80.8 | 82.8 | 84.1* | 0.75 | 7.37 | 2.4 | 5.2 | 2.9 | 2.566 | 13.3 |
| 90L | r | 1.1 | 1440 | 2.5 | 82.8 | 85.1 | 85.3 | 0.73 | 7.26 | 3.1 | 6.6 | 3.7 | 3.327 | 16.2 |
| 90L | a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 85.3* | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 3.327 | 16.2 |
| 100L | r | 1.5 | 1445 | 3.3 | 83.9 | 86.1 | 86.1 | 0.75 | 9.90 | 2.8 | 6.1 | 3.6 | 5.036 | 20.9 |
| 100L | s | 1.8 | 1455 | 4.1 | 83.1 | 85.9 | 86.5 | 0.70 | 11.6 | 3.3 | 7.4 | 4.3 | 6.446 | 24.8 |
| 100L | c | 2.2 | 1440 | 4.9 | 84.9 | 86.5 | 86.7* | 0.76 | 14.6 | 3.2 | 7.3 | 4.2 | 6.446 | 24.8 |
| 112M | s | 2.6 | 1460 | 5.6 | 85.6 | 88.0 | 88.5 | 0.76 | 16.9 | 3.2 | 8.0 | 4.1 | 11.08 | 31.4 |
| 112M | a | 3.7 | 1450 | 7.8 | 87.4 | 88.8 | 88.5 | 0.77 | 24.2 | 2.9 | 7.4 | 3.8 | 12.29 | 34.5 |
| 112M | b | 4 | 1440 | 8.0 | 87.3 | 88.1 | 88.6* | 0.82 | 26.3 | 2.4 | 6.5 | 3.1 | 11.08 | 31.4 |
| 132M | r | 5.5 | 1460 | 11.1 | 89.3 | 90.4 | 90.2 | 0.79 | 35.8 | 2.9 | 7.1 | 3.3 | 32.74 | 58.3 |
| 132M | b | 7.5 | 1450 | 14.8 | 90.0 | 90.1 | 90.4* | 0.82 | 49.4 | 2.4 | 6.1 | 2.7 | 32.74 | 58.1 |
| 160M | r | 7.5 | 1480 | 15.4 | 89.7 | 91.2 | 91.5 | 0.77 | 48.3 | 3.4 | 7.6 | 3.1 | 65.67 | 85.0 |
| 160M | s | 9.2 | 1470 | 18.1 | 90.6 | 91.5 | 91.2 | 0.80 | 59.6 | 2.9 | 6.2 | 2.5 | 65.67 | 85.0 |
| 160M | b | 11 | 1475 | 20.8 | 92.1 | 92.8 | 92.5 | 0.82 | 71.3 | 2.7 | 7.2 | 2.9 | 85.19 | 102 |
| 160L | a | 15 | 1475 | 29.6 | 91.8 | 92.6 | 92.4 | 0.79 | 97.1 | 3.1 | 7.3 | 2.9 | 98.50 | 113 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSP Type 6 pole - 1000 min⁻¹ | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE3 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 71 c | 0.12 | 900 | 0.44 | 54.3 | 60.2 | 61.4 | 0.65 | 1.27 | 1.9 | 2.9 | 2.4 | 1.175 | 8.0 | |
| 80 a | 0.18 | 935 | 0.56 | 59.7 | 66.1 | 67.5 | 0.69 | 1.83 | 2.2 | 3.7 | 2.5 | 1.499 | 7.7 | |
| 80 b | 0.25 | 935 | 0.77 | 64.0 | 68.9 | 70.4 | 0.66 | 2.54 | 2.6 | 4.1 | 2.8 | 2.043 | 9.0 | |
| 80 c | 0.37 | 940 | 1.10 | 64.1 | 70.0 | 73.5* | 0.68 | 3.78 | 2.8 | 4.4 | 3.0 | 2.517 | 10.8 | |
| 90S a | 0.37 | 955 | 1.09 | 70.0 | 75.7 | 77.5 | 0.64 | 3.72 | 3.1 | 5.2 | 3.6 | 4.148 | 13.0 | |
| 90L a | 0.55 | 950 | 1.45 | 74.1 | 77.7 | 78.6 | 0.69 | 5.53 | 2.5 | 5.1 | 3.3 | 5.421 | 15.9 | |
| 90L b | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 78.9* | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 5.421 | 15.9 | |
| 100L r | 0.75 | 950 | 2.0 | 75.0 | 78.5 | 79.2 | 0.67 | 7.54 | 2.9 | 5.3 | 3.5 | 8.032 | 18.9 | |
| 100L a | 1.1 | 950 | 2.8 | 78.8 | 82.0 | 82.0 | 0.70 | 11.1 | 2.7 | 5.7 | 3.5 | 10.59 | 22.8 | |
| 100L b | 1.5 | 940 | 3.7 | 78.5 | 80.6 | 82.5* | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 10.59 | 22.8 | |
| 112M a | 1.5 | 965 | 3.6 | 80.9 | 83.3 | 83.5 | 0.73 | 14.9 | 1.7 | 5.7 | 3.0 | 16.51 | 30.0 | |
| 112M b | 1.8 | 965 | 4.2 | 81.4 | 83.5 | 83.4 | 0.73 | 17.8 | 1.7 | 5.5 | 2.9 | 16.51 | 30.0 | |
| 112M c | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 84.3* | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 16.51 | 30.0 | |
| 132S a | 2.2 | 965 | 5.2 | 83.1 | 85.1 | 85.2 | 0.72 | 21.7 | 1.9 | 5.7 | 3.1 | 27.20 | 40.3 | |
| 132M a | 3 | 965 | 6.7 | 85.2 | 86.8 | 86.7 | 0.74 | 29.7 | 1.7 | 5.9 | 3.2 | 34.77 | 48.3 | |
| 132M b | 4 | 970 | 8.9 | 86.1 | 87.9 | 87.9 | 0.74 | 39.3 | 1.8 | 6.6 | 3.5 | 45.65 | 58.7 | |
| 132M c | 5.5 | 960 | 11.7 | 86.8 | 87.8 | 88.0* | 0.78 | 54.2 | 1.7 | 5.9 | 3.0 | 45.65 | 58.7 | |
| 160M b | 5.5 | 970 | 11.3 | 87.9 | 89.0 | 88.6 | 0.80 | 54.2 | 2.4 | 6.5 | 3.1 | 89.20 | 80.4 | |
| 160M c | 7.5 | 965 | 15.3 | 87.7 | 88.4 | 89.1* | 0.80 | 74.4 | 2.2 | 5.9 | 2.8 | 89.20 | 80.4 | |
| 160L b | 11 | 970 | 22.4 | 88.7 | 89.6 | 90.3* | 0.79 | 108.3 | 2.4 | 6.8 | 2.3 | 126.4 | 104 | |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply V 460 – 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSP Type 2 pole - 3600 min⁻¹ | | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 460 - Hz 60 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE3 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 56 | b | 0.12 | 3395 | 0.36 | 56.4 | 61.9 | 64.1 | 0.71 | 0.36 | 3.3 | 4.4 | 3.4 | 0.087 | 3.0 |
| 63 | a | 0.18 | 3390 | 0.47 | 62.3 | 68.2 | 70.0 | 0.71 | 0.52 | 4.0 | 4.8 | 4.2 | 0.129 | 3.7 |
| 63 | b | 0.25 | 3435 | 0.55 | 65.9 | 71.0 | 73.1 | 0.76 | 0.69 | 3.8 | 5.9 | 3.6 | 0.162 | 4.3 |
| 63 | c | 0.37 | 3455 | 0.84 | 67.1 | 73.2 | 75.0 | 0.74 | 1.03 | 3.8 | 6.6 | 4.1 | 0.206 | 5.0 |
| 71 | a | 0.37 | 3435 | 0.87 | 70.4 | 75.3 | 76.7 | 0.72 | 1.07 | 3.9 | 6.3 | 4.0 | 0.342 | 5.8 |
| 71 | c | 0.55 | 3450 | 1.18 | 73.4 | 77.5 | 79.0 | 0.75 | 1.52 | 4.6 | 7.3 | 4.4 | 0.505 | 7.6 |
| 71 | d | 0.75 | 3445 | 1.66 | 75.0 | 78.8 | 80.1 | 0.73 | 2.08 | 5.0 | 7.7 | 4.8 | 0.505 | 7.6 |
| 80 | a | 0.75 | 3470 | 1.46 | 81.3 | 83.6 | 83.9 | 0.78 | 2.09 | 3.6 | 7.6 | 3.9 | 0.850 | 9.1 |
| 80 | b | 1.1 | 3480 | 2.08 | 82.9 | 85.6 | 86.0 | 0.77 | 3.02 | 4.5 | 8.9 | 4.7 | 1.129 | 11.1 |
| 80 | c | 1.5 | 3465 | 2.9 | 84.0 | 86.0 | 85.5* | 0.76 | 4.17 | 4.2 | 7.9 | 4.2 | 1.129 | 11.1 |
| 90S | a | 1.5 | 3515 | 2.7 | 82.9 | 85.6 | 86.3 | 0.81 | 4.07 | 3.5 | 9.0 | 4.0 | 1.469 | 13.7 |
| 90S | b | 1.8 | 3490 | 3.1 | 84.7 | 86.2 | 85.5* | 0.85 | 4.95 | 3.1 | 8.1 | 3.5 | 1.469 | 13.8 |
| 90L | a | 2.2 | 3505 | 3.8 | 86.1 | 88.1 | 88.2 | 0.83 | 5.98 | 3.2 | 8.9 | 3.9 | 1.888 | 16.8 |
| 90L | b | 2.6 | 3485 | 4.4 | 87.2 | 88.1 | 86.5* | 0.85 | 7.12 | 3.3 | 7.7 | 3.8 | 1.888 | 16.8 |
| 100L | a | 3 | 3515 | 4.9 | 88.0 | 89.4 | 89.3 | 0.86 | 8.14 | 3.0 | 9.3 | 3.9 | 3.542 | 23.3 |
| 100L | b | 4 | 3495 | 6.7 | 88.5 | 89.3 | 88.5* | 0.84 | 11.1 | 2.8 | 8.3 | 3.5 | 3.542 | 23.3 |
| 112M | a | 4 | 3525 | 6.4 | 85.9 | 88.3 | 89.1 | 0.87 | 10.8 | 5.4 | 11.5 | 5.2 | 5.191 | 28.5 |
| 112M | b | 4.7 | 3535 | 8.1 | 86.1 | 88.9 | 89.9 | 0.81 | 12.7 | 6.2 | 13.8 | 6.7 | 6.336 | 31.8 |
| 112M | c | 5.5 | 3520 | 9.1 | 87.3 | 89.4 | 89.5* | 0.84 | 14.9 | 4.7 | 12.0 | 5.5 | 6.336 | 31.8 |
| 132S | a | 5.5 | 3555 | 9.1 | 85.1 | 88.2 | 89.5 | 0.85 | 14.7 | 5.5 | 12.3 | 5.2 | 14.41 | 47.2 |
| 132S | b | 7.5 | 3550 | 12.4 | 87.3 | 89.7 | 90.6 | 0.85 | 20.4 | 5.4 | 11.7 | 5.3 | 17.06 | 52.8 |
| 132M | a | 9.2 | 3555 | 14.7 | 88.9 | 90.9 | 91.5 | 0.86 | 24.8 | 5.4 | 12.0 | 5.4 | 19.58 | 60.1 |
| 132M | b | 11 | 3550 | 18.2 | 87.9 | 90.3 | 91.0* | 0.83 | 29.5 | 5.7 | 11.3 | 4.9 | 19.58 | 60.1 |
| 160M | a | 11 | 3565 | 17.5 | 88.4 | 90.6 | 91.4 | 0.87 | 29.4 | 5.3 | 12.4 | 4.2 | 41.45 | 86.8 |
| 160M | b | 15 | 3565 | 23.6 | 88.8 | 91.0 | 91.8 | 0.87 | 40.0 | 5.8 | 12.8 | 4.1 | 53.42 | 104 |
| 160L | a | 18.5 | 3565 | 28.8 | 90.2 | 92.0 | 92.5 | 0.87 | 49.6 | 6.1 | 13.2 | 4.0 | 61.66 | 118 |
| 160L | b | 22 | 3560 | 33.6 | 91.6 | 92.7 | 91.7* | 0.89 | 59.1 | 5.6 | 11.7 | 3.2 | 61.66 | 118 |
| XSP Type 4 pole - 1800 min⁻¹ | | | | | | | | | | | | | | |
| 63 | b | 0.12 | 1690 | 0.37 | 57.2 | 63.9 | 66.0* | 0.62 | 0.69 | 2.8 | 3.5 | 2.8 | 0.263 | 4.3 |
| 63 | c | 0.18 | 1700 | 0.56 | 60.4 | 66.9 | 69.5* | 0.59 | 1.04 | 3.0 | 3.9 | 3.2 | 0.326 | 5.0 |
| 71 | b | 0.18 | 1715 | 0.45 | 65.5 | 71.4 | 73.0 | 0.69 | 1.01 | 2.7 | 5.0 | 3.0 | 0.800 | 6.4 |
| 71 | c | 0.25 | 1730 | 0.63 | 70.7 | 75.4 | 77.3 | 0.65 | 1.39 | 3.4 | 6.1 | 4.2 | 1.175 | 8.2 |
| 80 | a | 0.37 | 1740 | 0.78 | 74.1 | 79.2 | 80.6 | 0.73 | 2.02 | 3.5 | 7.1 | 4.0 | 2.157 | 9.6 |
| 80 | b | 0.55 | 1740 | 1.18 | 77.2 | 80.9 | 82.3 | 0.72 | 3.04 | 3.8 | 7.7 | 4.5 | 2.789 | 11.6 |
| 80 | c | 0.75 | 1735 | 1.5 | 79.6 | 82.7 | 83.5* | 0.76 | 4.13 | 3.2 | 7.7 | 4.3 | 2.789 | 11.6 |
| 90S | r | 0.75 | 1750 | 1.6 | 81.0 | 84.2 | 85.4 | 0.69 | 4.08 | 3.3 | 7.0 | 4.1 | 2.566 | 13.3 |
| 90S | a | 1.1 | 1735 | 2.3 | 81.7 | 84.3 | 86.5* | 0.72 | 6.06 | 2.6 | 6.1 | 3.4 | 2.566 | 13.3 |
| 90L | r | 1.1 | 1750 | 2.3 | 82.6 | 85.7 | 86.6 | 0.70 | 5.99 | 3.4 | 7.4 | 4.3 | 3.327 | 16.2 |
| 90L | a | 1.5 | 1725 | 3.0 | 83.1 | 85.4 | 86.5* | 0.73 | 8.37 | 3.2 | 6.8 | 3.8 | 3.327 | 16.2 |
| 100L | r | 1.5 | 1750 | 3.0 | 83.5 | 86.4 | 87.2 | 0.72 | 8.15 | 3.2 | 7.0 | 4.1 | 5.036 | 20.9 |
| 100L | s | 1.8 | 1755 | 3.8 | 83.4 | 86.2 | 87.2 | 0.68 | 9.77 | 3.7 | 8.0 | 4.9 | 6.446 | 24.8 |
| 100L | c | 2.2 | 1750 | 4.3 | 85.1 | 87.6 | 89.5* | 0.73 | 12.0 | 2.2 | 2.2 | 2.2 | 6.446 | 24.8 |
| 112M | s | 2.6 | 1765 | 5.0 | 85.8 | 88.5 | 89.5 | 0.73 | 14.0 | 3.8 | 9.2 | 4.8 | 11.08 | 31.4 |
| 112M | a | 3.7 | 1760 | 6.9 | 87.7 | 89.6 | 89.9 | 0.74 | 20.1 | 3.4 | 8.4 | 4.5 | 12.29 | 34.5 |
| 112M | b | 4 | 1750 | 7.0 | 87.3 | 89.0 | 89.5* | 0.79 | 21.6 | 2.8 | 7.3 | 3.6 | 11.08 | 31.4 |
| 132M | r | 5.5 | 1770 | 9.8 | 89.4 | 91.0 | 91.7 | 0.77 | 29.8 | 3.4 | 8.0 | 3.8 | 32.74 | 58.3 |
| 132M | b | 7.5 | 1760 | 12.9 | 90.3 | 91.2 | 91.7* | 0.80 | 40.9 | 3.0 | 7.0 | 3.1 | 32.74 | 58.1 |
| 160M | r | 7.5 | 1780 | 13.7 | 88.9 | 91.0 | 91.7 | 0.75 | 40.2 | 4.3 | 8.8 | 3.4 | 65.67 | 85.0 |
| 160M | s | 9.2 | 1775 | 15.9 | 90.2 | 91.7 | 91.9 | 0.79 | 49.7 | 3.5 | 7.2 | 2.8 | 65.67 | 85.0 |
| 160M | b | 11 | 1775 | 18.2 | 91.6 | 92.9 | 93.0 | 0.81 | 59.1 | 3.3 | 8.3 | 3.0 | 85.19 | 102 |
| 160L | a | 15 | 1775 | 26.0 | 91.6 | 92.9 | 93.1 | 0.78 | 80.7 | 3.9 | 8.2 | 3.0 | 98.50 | 113 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply V 460 – 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

| Motor size | | Rated output P _n kW | n min ⁻¹ | I _n A | Technical data at rated output V 460 - Hz 60 | | | cos φ | M _n Nm | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
|------------|---|--------------------------------------|------------------------|---------------------|---|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------------|
| | | | | | IE3 η | | | | | M _s /M _n | I _s /I _n | M _m /M _n | | |
| | | | | | 50 % | 75 % | 100 % | | | | | | | |
| 71 | c | 0.12 | 1116 | 0.41 | 56.5 | 62.7 | 65.0 | 0.61 | 1.03 | 2.6 | 3.3 | 2.7 | 1.175 | 8.0 |
| 80 | a | 0.18 | 1145 | 0.51 | 60.5 | 67.5 | 69.9 | 0.64 | 1.52 | 2.5 | 4.4 | 3.0 | 2.157 | 7.7 |
| 80 | b | 0.25 | 1145 | 0.71 | 64.2 | 69.9 | 72.4 | 0.62 | 2.10 | 3.0 | 4.7 | 3.4 | 2.043 | 9.0 |
| 80 | c | 0.37 | 1145 | 1.00 | 64.2 | 71.1 | 75.3* | 0.64 | 3.09 | 3.3 | 5.1 | 3.6 | 2.517 | 10.8 |
| 90S | a | 0.37 | 1160 | 0.99 | 69.2 | 75.8 | 78.3 | 0.59 | 3.04 | 3.4 | 5.8 | 4.2 | 4.148 | 13.0 |
| 90L | a | 0.55 | 1155 | 1.31 | 74.2 | 78.6 | 81.7* | 0.65 | 4.53 | 2.9 | 5.9 | 3.9 | 5.421 | 15.9 |
| 90L | b | 0.75 | 1150 | 1.75 | 75.9 | 79.5 | 82.5* | 0.67 | 6.28 | 2.7 | 5.5 | 3.6 | 5.421 | 15.9 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSH Type 2 pole - 3000 min⁻¹ | | | | | | | | | | | | | | |
|--|---|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|--------------------------------|
| Motor size | | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | | | M _m /M _n |
| | | | | | 50 % | 75 % | 100 % | | | | | | | |
| 56 | a | 0.09 | 2720 | 0.32 | 48.6 | 55.9 | 56.5 | 0.77 | 0.33 | 2.3 | 3.2 | 2.2 | 0.073 | 2.7 |
| 56 | b | 0.12 | 2780 | 0.38 | 55.3 | 61.1 | 62.7 | 0.74 | 0.41 | 2.4 | 3.8 | 2.3 | 0.087 | 3.0 |
| 63 | a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 0.129 | 3.7 |
| 63 | b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 0.162 | 4.3 |
| 63 | c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 0.206 | 5.0 |
| 71 | a | 0.37 | 2820 | 0.95 | 68.6 | 73.6 | 74.4 | 0.75 | 1.24 | 3.3 | 5.5 | 3.4 | 0.342 | 5.8 |
| 71 | b | 0.55 | 2815 | 1.38 | 71.6 | 74.9 | 75.3 | 0.77 | 1.87 | 3.5 | 5.7 | 3.4 | 0.424 | 6.7 |
| 80 | a | 0.75 | 2840 | 1.7 | 78.9 | 80.7 | 80.2 | 0.81 | 2.54 | 3.3 | 6.6 | 3.4 | 0.850 | 9.1 |
| 80 | b | 1.1 | 2865 | 2.4 | 83.1 | 84.5 | 84.0 | 0.80 | 3.69 | 3.7 | 7.4 | 3.6 | 1.129 | 11.1 |
| 80 | c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 82.0 | 0.79 | 5.07 | 3.3 | 6.4 | 3.4 | 1.129 | 11.1 |
| 90S | a | 1.5 | 2900 | 3.2 | 82.6 | 84.9 | 84.8 | 0.82 | 4.94 | 3.3 | 7.9 | 3.6 | 1.469 | 13.8 |
| 90S | b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 83.6 | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 1.469 | 13.8 |
| 90L | a | 2.2 | 2890 | 4.4 | 84.1 | 85.9 | 85.7 | 0.84 | 7.26 | 3.1 | 8.1 | 3.6 | 1.888 | 16.8 |
| 90L | b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 84.8 | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 1.888 | 16.8 |
| 100L | a | 3 | 2900 | 5.9 | 88.0 | 88.5 | 87.7 | 0.84 | 9.89 | 2.6 | 7.3 | 3.3 | 3.147 | 21.2 |
| 100L | b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 86.8 | 0.85 | 13.4 | 2.6 | 7.2 | 3.2 | 3.542 | 23.3 |
| 112M | a | 4 | 2920 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 5.191 | 28.5 |
| 112M | b | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 88.8 | 0.84 | 18.1 | 4.3 | 9.9 | 6.3 | 6.336 | 31.8 |
| 132S | a | 5.5 | 2920 | 10.5 | 87.2 | 88.6 | 88.5 | 0.85 | 17.9 | 2.4 | 7.4 | 3.4 | 10.96 | 39.2 |
| 132S | b | 7.5 | 2940 | 14.2 | 88.0 | 89.6 | 89.7 | 0.84 | 24.3 | 3.6 | 8.8 | 4.0 | 14.41 | 47.2 |
| 132M | a | 9.2 | 2940 | 17.8 | 88.9 | 90.4 | 90.6 | 0.82 | 29.9 | 4.5 | 9.6 | 4.5 | 17.06 | 54.7 |
| 132M | b | 11 | 2940 | 21.1 | 89.0 | 90.6 | 90.7 | 0.83 | 35.7 | 4.2 | 10.1 | 4.6 | 19.58 | 60.6 |
| 160M | a | 11 | 2955 | 20.7 | 89.0 | 90.5 | 90.7 | 0.85 | 35.5 | 4.3 | 9.9 | 3.8 | 35.55 | 78.5 |
| 160M | b | 15 | 2960 | 28.2 | 90.1 | 91.4 | 91.5 | 0.84 | 48.4 | 4.1 | 10.1 | 4.2 | 45.51 | 93.1 |
| 160L | a | 18.5 | 2960 | 34.6 | 90.8 | 92.0 | 92.1 | 0.84 | 59.8 | 4.3 | 10.4 | 3.6 | 53.71 | 106 |
| 160L | b | 22 | 2950 | 38.9 | 91.9 | 92.5 | 92.1 | 0.89 | 71.4 | 4.1 | 9.9 | 3.0 | 61.66 | 117 |

| XSH Type 4 pole - 1500 min⁻¹ | | | | | | | | | | | | | | |
|--|---|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|--------------------------------|
| Motor size | | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | | | M _m /M _n |
| | | | | | 50 % | 75 % | 100 % | | | | | | | |
| 56 | a | 0.06 | 1320 | 0.26 | 39.8 | 44.6 | 49.0 | 0.69 | 0.45 | 1.9 | 2.3 | 2.0 | 0.117 | 2.7 |
| 56 | b | 0.09 | 1355 | 0.39 | 41.4 | 52.1 | 54.9 | 0.62 | 0.65 | 2.6 | 2.6 | 2.6 | 0.151 | 3.1 |
| 63 | b | 0.12 | 1370 | 0.41 | 55.6 | 61.8 | 63.1 | 0.67 | 0.85 | 2.1 | 3.0 | 2.3 | 0.263 | 4.3 |
| 63 | c | 0.18 | 1380 | 0.61 | 58.8 | 64.9 | 66.0 | 0.65 | 1.25 | 2.4 | 3.3 | 2.6 | 0.326 | 5.0 |
| 71 | b | 0.25 | 1380 | 0.68 | 66.5 | 69.5 | 68.7 | 0.76 | 1.73 | 2.1 | 3.8 | 2.3 | 0.800 | 6.4 |
| 71 | c | 0.37 | 1415 | 1.08 | 65.6 | 71.3 | 72.8 | 0.68 | 2.51 | 3.0 | 4.8 | 3.3 | 1.175 | 8.2 |
| 80 | a | 0.55 | 1415 | 1.26 | 76.3 | 78.6 | 78.3 | 0.79 | 3.67 | 2.4 | 5.4 | 2.8 | 2.157 | 9.7 |
| 80 | b | 0.75 | 1430 | 1.7 | 77.3 | 80.1 | 80.2 | 0.78 | 4.96 | 2.9 | 6.2 | 3.4 | 2.789 | 11.6 |
| 90S | a | 1.1 | 1425 | 2.5 | 80.9 | 82.7 | 82.1 | 0.76 | 7.37 | 2.4 | 5.3 | 2.9 | 2.566 | 13.3 |
| 90L | a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 83.8 | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 3.327 | 16.2 |
| 100L | a | 2.2 | 1430 | 5.0 | 83.7 | 85.3 | 84.7 | 0.75 | 14.7 | 2.6 | 5.7 | 3.2 | 5.036 | 20.9 |
| 100L | b | 3 | 1430 | 6.7 | 85.1 | 86.4 | 85.8 | 0.75 | 19.9 | 2.8 | 6.0 | 3.4 | 6.446 | 24.8 |
| 112M | a | 4 | 1440 | 8.0 | 87.3 | 88.1 | 87.2 | 0.82 | 26.3 | 2.4 | 6.5 | 3.1 | 11.08 | 31.4 |
| 132S | b | 5.5 | 1445 | 11.0 | 89.2 | 89.3 | 88.2 | 0.82 | 36.4 | 2.3 | 5.7 | 2.7 | 24.79 | 46.7 |
| 132M | b | 7.5 | 1450 | 14.8 | 90.0 | 90.1 | 89.1 | 0.82 | 49.4 | 2.4 | 6.1 | 2.7 | 32.74 | 58.1 |
| 160M | b | 11 | 1470 | 22.1 | 89.9 | 90.8 | 90.4 | 0.79 | 71.4 | 2.8 | 6.5 | 2.6 | 65.67 | 84.8 |
| 160L | a | 15 | 1470 | 29.0 | 91.1 | 91.6 | 91.1 | 0.82 | 97.3 | 2.6 | 6.5 | 2.8 | 85.48 | 104 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSH Type 6 pole - 1000 min⁻¹ | | | | | | | | | | | | | | |
|--|---|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|
| Motor size | | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| | | | | | 50 % | 75 % | 100 % | | | | | | | |
| 71 | b | 0.12 | 905 | 0.52 | 44.3 | 51.5 | 54.1 | 0.63 | 1.28 | 2.1 | 2.6 | 2.3 | 0.800 | 6.3 |
| 71 | c | 0.18 | 890 | 0.66 | 51.2 | 57.0 | 57.1 | 0.68 | 1.96 | 1.9 | 2.6 | 2.1 | 1.175 | 8.0 |
| 80 | b | 0.25 | 935 | 0.77 | 64.0 | 68.9 | 70.4 | 0.66 | 2.54 | 2.6 | 4.1 | 2.8 | 2.043 | 9.0 |
| 80 | c | 0.37 | 940 | 1.10 | 64.1 | 70.0 | 71.5 | 0.68 | 3.78 | 2.8 | 4.4 | 3.0 | 2.517 | 10.8 |
| 90S | a | 0.55 | 935 | 1.42 | 72.5 | 75.4 | 75.1 | 0.74 | 5.63 | 2.1 | 4.3 | 2.5 | 4.148 | 13.0 |
| 90L | a | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 77.9 | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 5.421 | 15.9 |
| 100L | r | 1.1 | 940 | 2.7 | 76.5 | 79.1 | 78.7 | 0.73 | 11.0 | 2.3 | 4.9 | 2.9 | 8.032 | 18.9 |
| 100L | a | 1.5 | 940 | 3.7 | 78.5 | 80.6 | 80.1 | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 10.59 | 22.8 |
| 112M | a | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 82.4 | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 16.51 | 30.0 |
| 132S | a | 3 | 955 | 6.8 | 83.6 | 84.7 | 83.9 | 0.76 | 30.0 | 1.6 | 5.0 | 2.6 | 27.20 | 40.3 |
| 132M | a | 4 | 960 | 8.9 | 84.8 | 86.0 | 85.3 | 0.76 | 39.7 | 1.6 | 5.4 | 2.9 | 34.77 | 48.3 |
| 132M | b | 5.5 | 960 | 11.7 | 86.8 | 87.8 | 87.1 | 0.78 | 54.2 | 1.7 | 5.9 | 3.0 | 45.65 | 58.7 |
| 160M | b | 7.5 | 965 | 15.3 | 87.7 | 88.4 | 87.7 | 0.80 | 74.4 | 2.2 | 5.9 | 2.8 | 89.20 | 80.4 |
| 160L | a | 11 | 970 | 22.4 | 88.7 | 89.6 | 89.0 | 0.79 | 108.3 | 2.4 | 6.8 | 2.3 | 126.4 | 104 |

| XSH Type 8 pole - 750 min⁻¹ | | | | | | | | | | | | | | |
|---|---|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|
| Motor size | | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| | | | | | 50 % | 75 % | 100 % | | | | | | | |
| 71 | b | 0.09 | 685 | 0.57 | 30.0 | 41.1 | 45.4 | 0.50 | 1.26 | 2.7 | 2.2 | 2.8 | 0.800 | 6.3 |
| 71 | c | 0.12 | 685 | 0.82 | 28.9 | 36.9 | 42.5 | 0.50 | 1.68 | 2.9 | 2.2 | 3.1 | 1.175 | 8.0 |
| 80 | b | 0.18 | 695 | 0.89 | 41.7 | 50.8 | 54.6 | 0.54 | 2.49 | 2.6 | 2.7 | 2.7 | 2.043 | 9.0 |
| 80 | c | 0.25 | 695 | 1.22 | 41.8 | 49.9 | 54.1 | 0.55 | 3.42 | 2.7 | 2.8 | 2.8 | 2.517 | 10.5 |
| 90S | a | 0.37 | 690 | 1.43 | 55.5 | 62.3 | 63.8 | 0.59 | 5.18 | 1.8 | 2.5 | 1.9 | 3.585 | 11.6 |
| 90L | a | 0.55 | 685 | 2.0 | 59.1 | 65.9 | 67.0 | 0.57 | 7.40 | 1.9 | 2.5 | 2.3 | 4.858 | 14.1 |
| 100L | r | 0.75 | 685 | 2.6 | 60.0 | 65.2 | 66.5 | 0.62 | 10.4 | 2.2 | 3.2 | 2.8 | 8.032 | 18.9 |
| 100L | a | 1.1 | 690 | 3.5 | 64.8 | 70.1 | 71.1 | 0.63 | 15.1 | 2.1 | 3.5 | 2.6 | 10.59 | 22.5 |
| 112M | a | 1.5 | 705 | 4.3 | 71.1 | 74.5 | 74.4 | 0.67 | 20.3 | 1.2 | 3.5 | 2.1 | 16.51 | 29.8 |
| 132S | b | 2.2 | 715 | 6.1 | 74.8 | 78.2 | 78.5 | 0.66 | 29.0 | 1.5 | 3.8 | 2.3 | 31.79 | 43.6 |
| 132M | b | 3 | 720 | 8.0 | 76.4 | 79.8 | 80.1 | 0.67 | 39.5 | 1.4 | 4.1 | 2.5 | 41.60 | 53.9 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply 460 V - 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSH Type 2 pole - 3600 min¹ | | | | | | | | | | | | | | |
|---|--------------------------------------|---|---------------------|-------|------|------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 460 - Hz 60 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 56 b | 0.12 | 3395 | 0.36 | 56.4 | 61.9 | 64.1 | 0.71 | 0.36 | 3.3 | 4.4 | 3.4 | 0.087 | 3.0 | |
| 63 a | 0.18 | 3390 | 0.47 | 62.3 | 68.2 | 70.0 | 0.71 | 0.52 | 4.0 | 4.8 | 4.2 | 0.129 | 3.7 | |
| 63 b | 0.25 | 3435 | 0.55 | 65.9 | 71.0 | 73.1 | 0.76 | 0.69 | 3.8 | 5.9 | 3.6 | 0.162 | 4.3 | |
| 63 c | 0.37 | 3455 | 0.84 | 67.1 | 73.2 | 75.0 | 0.74 | 1.03 | 3.8 | 6.6 | 4.1 | 0.206 | 5.0 | |
| 71 a | 0.37 | 3435 | 0.88 | 68.6 | 73.7 | 75.4 | 0.73 | 1.07 | 4.0 | 6.4 | 4.2 | 0.342 | 5.8 | |
| 71 b | 0.55 | 3440 | 1.24 | 71.0 | 75.5 | 77.3 | 0.74 | 1.55 | 4.4 | 6.8 | 4.2 | 0.424 | 6.7 | |
| 80 a | 0.75 | 3445 | 1.5 | 76.7 | 80.1 | 81.1 | 0.78 | 2.12 | 3.6 | 7.6 | 3.9 | 0.850 | 9.1 | |
| 80 b | 1.1 | 3465 | 2.1 | 80.6 | 83.7 | 84.3 | 0.77 | 3.07 | 4.5 | 8.9 | 4.7 | 1.129 | 11.1 | |
| 80 c | 1.5 | 3440 | 3.0 | 81.6 | 84.0 | 84.3 | 0.76 | 4.17 | 4.2 | 7.9 | 4.2 | 1.129 | 11.1 | |
| 90S a | 1.5 | 3490 | 2.8 | 81.8 | 84.9 | 86.0 | 0.81 | 4.19 | 3.5 | 9.0 | 4.0 | 1.469 | 13.8 | |
| 90S b | 1.8 | 3465 | 3.2 | 83.0 | 85.3 | 85.5 | 0.84 | 4.97 | 3.1 | 8.1 | 3.5 | 1.469 | 13.8 | |
| 90L a | 2.2 | 3480 | 3.9 | 84.9 | 87.1 | 87.6 | 0.82 | 6.10 | 3.2 | 8.9 | 3.9 | 1.888 | 16.8 | |
| 90L b | 2.6 | 3460 | 4.4 | 85.6 | 87.0 | 86.7 | 0.85 | 7.21 | 3.3 | 7.7 | 3.8 | 1.888 | 16.8 | |
| 100L a | 3 | 3505 | 5.1 | 85.5 | 87.5 | 87.9 | 0.84 | 8.20 | 2.8 | 8.3 | 3.6 | 3.147 | 21.2 | |
| 100L b | 4 | 3495 | 6.7 | 88.5 | 89.3 | 88.8 | 0.84 | 11.1 | 2.8 | 8.3 | 3.5 | 3.542 | 23.3 | |
| 112M a | 4 | 3525 | 6.4 | 85.9 | 88.3 | 89.1 | 0.87 | 10.8 | 5.4 | 11.5 | 5.2 | 5.191 | 28.5 | |
| 112M b | 5.5 | 3520 | 9.1 | 87.3 | 89.4 | 90.0 | 0.84 | 14.9 | 4.7 | 12.0 | 5.5 | 6.336 | 31.8 | |
| 132S a | 5.5 | 3535 | 9.1 | 85.1 | 87.8 | 88.6 | 0.85 | 14.9 | 4.6 | 8.7 | 3.8 | 10.96 | 39.2 | |
| 132S b | 7.5 | 3545 | 12.5 | 86.4 | 88.8 | 89.6 | 0.85 | 20.3 | 5.1 | 10.3 | 4.4 | 14.41 | 47.2 | |
| 132M a | 9.2 | 3550 | 15.4 | 88.2 | 90.4 | 90.9 | 0.83 | 24.9 | 5.4 | 11.1 | 5.0 | 17.06 | 54.9 | |
| 132M b | 11 | 3550 | 18.2 | 87.9 | 90.3 | 91.0 | 0.83 | 29.5 | 5.7 | 11.3 | 4.9 | 19.58 | 60.8 | |
| 160M a | 11 | 3560 | 18.0 | 87.0 | 89.5 | 90.3 | 0.85 | 29.4 | 5.1 | 10.6 | 3.7 | 35.55 | 78.5 | |
| 160M b | 15 | 3565 | 24.3 | 89.2 | 91.1 | 91.6 | 0.85 | 40.2 | 5.2 | 11.9 | 4.0 | 45.51 | 93.1 | |
| 160L a | 18.5 | 3565 | 29.7 | 90.1 | 91.8 | 92.3 | 0.85 | 49.7 | 5.8 | 12.7 | 3.9 | 53.71 | 106 | |
| 160L b | 22 | 3560 | 33.6 | 91.6 | 92.7 | 92.8 | 0.89 | 59.1 | 5.6 | 11.7 | 3.2 | 61.66 | 117 | |

| XSH Type 4 pole - 1800 min¹ | | | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|-----|-----|-----|-------|------|--|
| 63 b | 0.12 | 1690 | 0.37 | 57.2 | 63.9 | 66.4 | 0.62 | 0.69 | 2.8 | 3.5 | 2.8 | 0.263 | 4.3 | |
| 63 c | 0.18 | 1700 | 0.56 | 60.4 | 66.9 | 69.1 | 0.59 | 1.04 | 3.0 | 3.9 | 3.2 | 0.326 | 5.0 | |
| 71 b | 0.25 | 1705 | 0.61 | 67.5 | 71.8 | 72.9 | 0.71 | 1.41 | 2.5 | 4.7 | 2.8 | 0.800 | 6.4 | |
| 71 c | 0.37 | 1730 | 0.99 | 65.7 | 72.4 | 74.7 | 0.63 | 2.06 | 3.5 | 5.6 | 4.0 | 1.175 | 8.2 | |
| 80 a | 0.55 | 1730 | 1.13 | 76.7 | 80.0 | 80.8 | 0.76 | 3.06 | 2.9 | 6.5 | 3.5 | 2.157 | 9.7 | |
| 80 b | 0.75 | 1740 | 1.55 | 77.7 | 81.2 | 82.4 | 0.73 | 4.11 | 3.4 | 7.4 | 4.2 | 2.789 | 11.6 | |
| 90S a | 1.1 | 1725 | 2.3 | 81.6 | 84.1 | 84.6 | 0.73 | 6.20 | 2.8 | 6.1 | 3.5 | 2.566 | 13.3 | |
| 90L a | 1.5 | 1725 | 3.0 | 83.1 | 85.4 | 85.7 | 0.73 | 8.37 | 3.2 | 6.8 | 3.8 | 3.327 | 16.2 | |
| 100L a | 2.2 | 1745 | 4.4 | 85.4 | 87.4 | 87.6 | 0.72 | 12.0 | 3.0 | 6.6 | 3.9 | 5.036 | 20.9 | |
| 100L b | 3 | 1745 | 5.9 | 85.2 | 87.4 | 87.9 | 0.72 | 16.5 | 3.1 | 7.0 | 4.0 | 6.446 | 24.8 | |
| 112M a | 4 | 1750 | 7.0 | 87.3 | 89.0 | 89.0 | 0.79 | 21.6 | 2.8 | 7.3 | 3.6 | 11.08 | 31.4 | |
| 132S b | 5.5 | 1740 | 9.7 | 89.6 | 90.5 | 90.2 | 0.79 | 30.3 | 2.7 | 6.6 | 3.0 | 24.79 | 46.7 | |
| 132M b | 7.5 | 1760 | 12.9 | 90.3 | 91.2 | 90.9 | 0.80 | 40.9 | 3.0 | 7.0 | 3.1 | 32.74 | 58.1 | |
| 160M b | 11 | 1775 | 19.4 | 89.9 | 91.2 | 91.4 | 0.79 | 59.2 | 3.3 | 7.3 | 2.8 | 65.67 | 84.8 | |
| 160L a | 15 | 1775 | 25.2 | 91.2 | 92.3 | 92.3 | 0.81 | 80.8 | 3.5 | 7.3 | 2.7 | 85.48 | 104 | |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply 460 V - 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

| XSH Type 6 pole - 1200 min⁻¹ | | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|-------|------|------|-------|----------------------|--------------------------------|----------------------------------|--------------------------------|-------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 460 - Hz 60 | | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 b | 0.12 | 1130 | 0.48 | 45.4 | 53.1 | 57.2 | 0.56 | 1.02 | 2.6 | 2.8 | 3.0 | 0.800 | 6.3 | |
| 71 c | 0.18 | 1115 | 0.60 | 51.5 | 59.4 | 61.9 | 0.60 | 1.50 | 2.4 | 3.1 | 2.7 | 1.175 | 8.0 | |
| 80 b | 0.25 | 1145 | 0.71 | 64.2 | 69.9 | 72.4 | 0.62 | 2.10 | 3.0 | 4.7 | 3.4 | 2.043 | 9.0 | |
| 80 c | 0.37 | 1145 | 1.00 | 64.2 | 71.1 | 73.6 | 0.64 | 3.09 | 3.3 | 5.1 | 3.6 | 2.517 | 10.8 | |
| 90S a | 0.55 | 1145 | 1.27 | 73.2 | 77.0 | 77.9 | 0.69 | 4.58 | 2.4 | 4.9 | 2.9 | 4.148 | 13.0 | |
| 90L a | 0.75 | 1150 | 1.75 | 75.9 | 79.5 | 80.6 | 0.67 | 6.28 | 2.7 | 5.5 | 3.6 | 5.421 | 15.9 | |
| XSH Type 8 pole - 900 min⁻¹ | | | | | | | | | | | | | | |
| 71 c | 0.12 | 845 | 0.79 | 29.6 | 38.2 | 44.1 | 0.44 | 1.37 | 3.5 | 2.4 | 3.9 | 1.175 | 8.0 | |
| 80 b | 0.18 | 855 | 0.84 | 42.4 | 51.8 | 56.3 | 0.48 | 2.01 | 3.2 | 3.0 | 3.3 | 2.043 | 9.0 | |
| 80 c | 0.25 | 855 | 1.15 | 43.3 | 51.5 | 56.5 | 0.49 | 2.81 | 3.2 | 3.1 | 3.4 | 2.517 | 10.5 | |
| 90S a | 0.37 | 850 | 1.31 | 57.8 | 65.3 | 67.9 | 0.52 | 4.17 | 1.9 | 2.8 | 2.3 | 3.585 | 11.6 | |
| 90L a | 0.55 | 850 | 1.84 | 61.1 | 68.6 | 71.2 | 0.51 | 5.96 | 2.3 | 2.8 | 2.7 | 4.858 | 14.1 | |
| 100L r | 0.75 | 850 | 2.41 | 62.3 | 68.2 | 70.8 | 0.56 | 8.46 | 2.5 | 3.7 | 3.5 | 8.032 | 18.9 | |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

One-speed three-phase motors - Standard Efficiency (IE1) not affected by the IEC 60034-30; 2008

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| XS Type 2 poli - 3000 min¹ | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE1 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| 56 a | 0.09 | 2720 | 0.32 | 48.6 | 55.9 | 56.5 | 0.77 | 0.33 | 2.3 | 3.2 | 2.2 | 0.073 | 2.7 |
| 56 b | 0.12 | 2780 | 0.38 | 55.3 | 61.1 | 62.7 | 0.74 | 0.41 | 2.4 | 3.8 | 2.3 | 0.087 | 3.0 |
| 63 a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 0.129 | 3.7 |
| 63 b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 0.162 | 4.3 |
| 63 c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 0.206 | 5.0 |
| 71 a | 0.37 | 2820 | 0.95 | 68.6 | 73.6 | 74.4 | 0.75 | 1.24 | 3.3 | 5.5 | 3.4 | 0.342 | 5.8 |
| 71 b | 0.55 | 2815 | 1.38 | 71.6 | 74.9 | 75.3 | 0.77 | 1.87 | 3.5 | 5.7 | 3.4 | 0.424 | 6.7 |
| 71 c | 0.70 | 2825 | 1.79 | 70.3 | 74.2 | 74.9 | 0.75 | 2.36 | 3.6 | 5.6 | 3.3 | 0.505 | 7.6 |
| XS Type 4 poli - 1500 min¹ | | | | | | | | | | | | | |
| 56 a | 0.06 | 1320 | 0.26 | 39.8 | 44.6 | 49.0 | 0.69 | 0.45 | 1.9 | 2.3 | 2.0 | 0.117 | 2.7 |
| 56 b | 0.09 | 1355 | 0.39 | 41.4 | 52.1 | 54.9 | 0.62 | 0.65 | 2.6 | 2.6 | 2.6 | 0.151 | 3.1 |
| 63 a | 0.12 | 1370 | 0.46 | 50.8 | 57.3 | 59.6 | 0.65 | 0.87 | 2.2 | 2.9 | 2.3 | 0.206 | 3.7 |
| 63 b | 0.18 | 1360 | 0.62 | 55.9 | 61.8 | 62.2 | 0.69 | 1.28 | 2.1 | 3.0 | 2.2 | 0.263 | 4.3 |
| 63 c | 0.25 | 1365 | 0.83 | 59.0 | 63.8 | 64.4 | 0.67 | 1.76 | 2.3 | 3.2 | 2.3 | 0.326 | 5.0 |
| 71 a | 0.25 | 1390 | 0.73 | 63.1 | 67.6 | 68.2 | 0.73 | 1.73 | 2.4 | 4.0 | 2.5 | 0.687 | 5.8 |
| 71 b | 0.37 | 1380 | 1.00 | 67.3 | 70.9 | 70.1 | 0.76 | 2.59 | 2.2 | 4.1 | 2.3 | 0.800 | 6.4 |
| 71 c | 0.55 | 1395 | 1.55 | 67.3 | 71.3 | 71.9 | 0.71 | 3.77 | 2.8 | 4.4 | 2.8 | 1.175 | 8.2 |
| 80 a | 0.55 | 1400 | 1.4 | 67.2 | 71.2 | 71.1 | 0.80 | 3.74 | 2.0 | 4.4 | 2.3 | 1.499 | 7.7 |
| 80 r | 0.70 | 1415 | 1.7 | 70.9 | 74.7 | 75.1 | 0.80 | 4.70 | 2.7 | 5.4 | 2.9 | 2.043 | 9.1 |
| XS Type 6 poli - 1000 min¹ | | | | | | | | | | | | | |
| 63 c | 0.12 | 865 | 0.65 | 34.8 | 42.7 | 46.3 | 0.59 | 1.35 | 2.0 | 2.0 | 2.0 | 0.326 | 4.9 |
| 71 a | 0.12 | 890 | 0.49 | 44.8 | 51.0 | 52.2 | 0.68 | 1.31 | 1.9 | 2.5 | 2.1 | 0.687 | 5.7 |
| 71 b | 0.18 | 870 | 0.71 | 46.6 | 52.7 | 52.5 | 0.70 | 1.99 | 1.7 | 2.4 | 2.0 | 0.800 | 6.3 |
| 71 c | 0.25 | 895 | 1.01 | 46.7 | 52.9 | 54.9 | 0.65 | 2.67 | 2.1 | 2.7 | 2.3 | 1.175 | 8.0 |
| 80 b | 0.37 | 920 | 1.08 | 61.4 | 66.7 | 66.9 | 0.74 | 3.85 | 2.0 | 3.6 | 2.3 | 2.043 | 9.0 |
| 80 c | 0.55 | 920 | 1.57 | 66.1 | 70.0 | 70.4 | 0.72 | 5.73 | 2.6 | 4.0 | 2.6 | 2.517 | 10.8 |
| Serie XS 8 poli - 750 min¹ | | | | | | | | | | | | | |
| 71 b | 0.09 | 685 | 0.57 | 30.0 | 41.1 | 45.4 | 0.50 | 1.26 | 2.7 | 2.2 | 2.8 | 0.800 | 6.3 |
| 71 c | 0.12 | 685 | 0.82 | 28.9 | 36.9 | 42.5 | 0.50 | 1.68 | 2.9 | 2.2 | 3.1 | 1.175 | 8.0 |
| 80 b | 0.18 | 695 | 0.89 | 41.7 | 50.8 | 54.6 | 0.54 | 2.49 | 2.6 | 2.7 | 2.7 | 2.043 | 9.0 |
| 80 c | 0.25 | 695 | 1.22 | 41.8 | 49.9 | 54.1 | 0.55 | 3.42 | 2.7 | 2.8 | 2.8 | 2.517 | 10.5 |
| 90S a | 0.37 | 690 | 1.43 | 55.5 | 62.3 | 63.8 | 0.59 | 5.18 | 1.8 | 2.5 | 1.9 | 3.585 | 11.6 |
| 90L a | 0.55 | 685 | 2.02 | 59.1 | 65.9 | 67.0 | 0.57 | 7.40 | 1.9 | 2.5 | 2.3 | 4.858 | 14.1 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Two-speed three-phase motors - single winding - Dahlander connection (Star-Star/Delta) - for general use

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| XD Type 2/4 pole - 3000/1500 min¹ | | | | | | | | | |
|---|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| 63 a | 0.15/0.10 | 2780/1370 | 0.41/0.41 | 0.52/0.70 | 1.7/1.8 | 3.9/2.4 | 2.0/2.0 | 0.206 | 3.7 |
| 63 b | 0.22/0.15 | 2800/1380 | 0.58/0.58 | 0.75/1.04 | 1.8/1.9 | 4.1/2.6 | 2.2/2.1 | 0.263 | 4.3 |
| 63 c | 0.30/0.20 | 2800/1380 | 0.75/0.75 | 1.02/1.38 | 1.9/2.0 | 4.0/2.8 | 2.3/2.2 | 0.326 | 5.0 |
| 71 a | 0.30/0.20 | 2800/1380 | 0.78/0.78 | 1.02/1.38 | 1.9/2.0 | 3.8/3.2 | 2.1/2.1 | 0.687 | 5.8 |
| 71 b | 0.45/0.30 | 2810/1400 | 1.3/1.1 | 1.53/2.05 | 2.0/2.1 | 4.1/3.4 | 2.3/2.2 | 0.800 | 6.4 |
| 71 c | 0.60/0.45 | 2840/1400 | 1.6/1.4 | 2.02/3.07 | 2.1/2.3 | 4.5/3.6 | 2.6/2.5 | 1.175 | 8.2 |
| 80 a | 0.60/0.45 | 2780/1400 | 1.6/1.2 | 2.06/3.07 | 1.8/1.8 | 3.6/3.7 | 2.1/2.1 | 1.499 | 7.6 |
| 80 b | 0.85/0.65 | 2820/1400 | 2.4/1.7 | 2.88/4.43 | 1.8/2.0 | 3.8/3.6 | 2.4/2.3 | 2.043 | 9.1 |
| 80 c | 1.10/0.85 | 2830/1410 | 2.8/2.1 | 3.71/5.76 | 2.0/2.1 | 4.4/4.5 | 2.4/2.4 | 2.517 | 10.6 |
| 90S a | 1.50/1.10 | 2850/1410 | 3.3/2.7 | 5.03/7.45 | 2.2/2.0 | 4.8/4.3 | 2.9/2.4 | 2.210 | 11.8 |
| 90L a | 1.85/1.40 | 2850/1410 | 4.1/3.1 | 6.20/9.48 | 2.4/2.1 | 5.0/4.9 | 3.0//2.9 | 2.843 | 14.1 |
| 90L b | 2.20/1.70 | 2850/1410 | 5.0/3.9 | 7.37/11.5 | 2.5/2.3 | 5.6/5.1 | 3.2/3.0 | 3.327 | 16.0 |
| 100L a | 2.60/2.00 | 2850/1420 | 6.1/4.8 | 8.71/13.5 | 2.8/2.6 | 5.0/5.3 | 3.2/3.1 | 4.637 | 19.1 |
| 100L b | 3.50/2.70 | 2870/1420 | 8.0/6.4 | 11.6/18.2 | 2.7/2.7 | 5.7/4.9 | 3.2/2.9 | 6.034 | 22.9 |
| 112M a | 4.00/3.20 | 2880/1430 | 8.8/7.1 | 13.3/21.4 | 2.1/2.0 | 6.0/5.1 | 2.9/1.9 | 9.550 | 28.2 |
| 112M b | 4.80/3.70 | 2890/1430 | 9.8/8.2 | 15.9/24.7 | 2.0/2.0 | 6.2/5.0 | 2.7/1.8 | 11.08 | 31.2 |
| 132S b | 6.00/4.60 | 2890/1440 | 13.1/9.9 | 19.8/30.5 | 2.3/2.0 | 5.1/5.0 | 2.5/2.4 | 22.43 | 43.1 |
| 132M b | 8.20/6.60 | 2910/1440 | 17.5/13.5 | 26.9/43.8 | 2.5/2.2 | 6.1/5.3 | 2.8/1.8 | 29.61 | 53.5 |
| 132M c | 9.60/7.80 | 2920/1440 | 20.0/16.0 | 31.4/51.7 | 2.5/2.3 | 6.2/5.3 | 2.8/1.8 | 34.21 | 59.9 |
| 160M b | 11.0/9.20 | 2930/1450 | 25.4/19.2 | 35.9/60.6 | 2.4/2.0 | 6.0/5.2 | 2.6/2.4 | 59.13 | 78.3 |
| 160L a | 15.0/12.5 | 2930/1450 | 34.2/25.5 | 48.9/82.3 | 2.5/2.1 | 6.3/5.5 | 2.8/2.5 | 77.80 | 95.8 |

| XD Type 4/8 pole - 1500/750 min¹ | | | | | | | | | |
|--|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| 71 a | 0.10/0.05 | 1360/670 | 0.36/0.36 | 0.70/0.71 | 1.3/1.9 | 2.5/1.9 | 1.4/2.1 | 0.687 | 5.5 |
| 71 b | 0.14/0.07 | 1370/670 | 0.45/0.50 | 0.98/1.00 | 1.7/1.9 | 3.0/1.9 | 2.1/2.1 | 0.800 | 6.3 |
| 71 c | 0.20/0.10 | 1380/660 | 0.57/0.63 | 1.38/1.45 | 1.6/2.0 | 3.3/1.8 | 1.9/2.0 | 1.175 | 8.2 |
| 80 a | 0.25/0.13 | 1360/680 | 0.65/0.65 | 1.76/1.83 | 1.3/1.6 | 3.3/1.9 | 1.5/1.9 | 1.499 | 7.5 |
| 80 b | 0.37/0.20 | 1370/680 | 0.92/0.92 | 2.58/2.81 | 1.4/1.7 | 3.7/2.4 | 1.7/2.0 | 2.043 | 9.0 |
| 80 c | 0.50/0.26 | 1370/680 | 1.2/1.2 | 3.49/3.65 | 2.0/2.1 | 3.5/2.4 | 1.8/2.0 | 2.517 | 10.5 |
| 90S a | 0.70/0.36 | 1380/690 | 1.8/2.0 | 4.84/4.98 | 1.8/2.0 | 3.5/2.5 | 2.2/2.5 | 3.585 | 11.8 |
| 90L a | 1.00/0.52 | 1380/690 | 2.5/2.5 | 6.92/7.20 | 1.8/1.8 | 3.6/2.1 | 2.1/2.0 | 4.858 | 14.2 |
| 100L a | 1.10/0.60 | 1410/700 | 2.5/2.6 | 7.45/8.19 | 1.5/1.7 | 4.5/3.0 | 2.3/2.6 | 7.840 | 19.0 |
| 100L b | 1.50/0.80 | 1410/710 | 3.3/3.2 | 10.2/10.8 | 1.5/1.8 | 4.1/3.4 | 2.1/2.6 | 10.31 | 22.6 |
| 112M a | 2.20/1.20 | 1400/700 | 4.5/3.9 | 15.0/16.4 | 1.6/1.9 | 4.3/3.6 | 1.9/2.4 | 13.94 | 27.5 |
| 112M b | 2.60/1.40 | 1410/710 | 5.3/4.9 | 17.6/18.8 | 1.8/2.0 | 5.3/4.0 | 2.5/3.2 | 16.51 | 30.6 |
| 132S a | 3.00/1.70 | 1420/720 | 6.2/6.1 | 20.2/22.5 | 1.6/1.8 | 5.4/3.6 | 2.4/2.7 | 24.12 | 37.5 |
| 132S b | 4.00/2.20 | 1430/720 | 8.3/8.3 | 26.7/29.2 | 1.7/2.0 | 5.7/4.0 | 2.5/2.7 | 31.79 | 44.2 |
| 132M b | 5.50/3.00 | 1440/720 | 11.4/10.7 | 36.5/39.8 | 1.7/2.2 | 6.3/4.3 | 2.7/2.8 | 41.60 | 54.3 |
| 160M b | 7.50/4.30 | 1440/720 | 15.0/14.0 | 49.7/57.0 | 1.8/2.2 | 5.5/4.2 | 2.5/2.7 | 89.20 | 80.3 |
| 160L a | 11.0/6.30 | 1450/720 | 20.0/19.0 | 72.4/83.6 | 1.9/2.3 | 5.7/4.3 | 2.7/2.9 | 120.1 | 99.5 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Two-speed three-phase motors - double winding - Star/Star connection - for general use

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| XDD Type 2/6 pole - 3000/1000 min¹ | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 | c | 0.42/0.14 | 2810/885 | 0.95/0.64 | 1.43/1.51 | 1.6/1.7 | 4.1/2.2 | 2.0/1.8 | 1.175 | 8.2 |
| 80 | a | 0.42/0.14 | 2770/930 | 1.07/0.57 | 1.45/1.44 | 1.6/1.4 | 3.6/2.4 | 1.9/1.8 | 1.499 | 7.5 |
| 80 | b | 0.60/0.20 | 2820/930 | 1.40/0.89 | 2.03/2.05 | 1.6/1.5 | 4.0/2.4 | 1.9/1.9 | 2.043 | 9.0 |
| 80 | c | 0.90/0.30 | 2820/940 | 1.88/1.08 | 3.05/3.05 | 1.5/1.6 | 4.4/2.9 | 2.0/2.2 | 2.517 | 10.5 |
| 90S | a | 1.10/0.37 | 2750/930 | 2.6/1.3 | 3.82/3.80 | 1.8/1.7 | 3.5/2.7 | 2.2/2.0 | 2.210 | 11.7 |
| 90L | a | 1.50/0.50 | 2810/950 | 3.4/1.7 | 5.10/5.03 | 1.8/2.1 | 3.9/3.2 | 2.3/2.4 | 2.843 | 14.1 |
| 90L | b | 1.80/0.60 | 2840/930 | 4.1/2.1 | 6.05/6.16 | 1.8/1.9 | 4.4/2.9 | 2.4/2.2 | 3.327 | 15.7 |
| 100L | a | 2.20/0.75 | 2810/930 | 5.2/2.2 | 7.48/7.70 | 1.7/1.6 | 3.9/3.0 | 2.2/2.0 | 4.637 | 19.1 |
| 100L | b | 3.00/1.00 | 2820/910 | 6.4/3.1 | 10.2/10.5 | 1.8/1.5 | 4.4/2.6 | 2.4/1.7 | 6.034 | 22.9 |
| 112M | b | 4.00/1.35 | 2900/950 | 8.3/4.0 | 13.2/13.6 | 1.9/2.0 | 5.8/3.9 | 2.7/2.4 | 11.08 | 31.5 |
| 132S | b | 5.50/1.85 | 2905/965 | 11.1/5.2 | 18.1/18.3 | 2.3/1.7 | 6.2/3.7 | 2.7/2.2 | 31.79 | 41.7 |
| 132M | b | 7.50/2.50 | 2910/960 | 14.8/7.1 | 24.6/24.9 | 2.1/1.8 | 6.2/3.8 | 2.5/2.3 | 41.60 | 51.0 |

| XDD Type 2/8 pole - 3000/750 min¹ | | | | | | | | | | |
|---|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 | c | 0.33/0.08 | 2830/680 | 0.83/0.65 | 1.11/1.12 | 2.1/1.7 | 4.8/2.1 | 2.5/1.9 | 1.175 | 8.2 |
| 80 | a | 0.33/0.08 | 2830/690 | 0.83/0.44 | 1.11/1.11 | 1.5/1.6 | 3.2/1.9 | 2.0/1.8 | 1.499 | 7.5 |
| 80 | b | 0.44/0.11 | 2890/690 | 1.10/0.73 | 1.45/1.52 | 1.6/1.8 | 4.1/2.0 | 2.3/2.0 | 2.043 | 9.0 |
| 80 | c | 0.60/0.15 | 2890/690 | 1.50/0.75 | 1.98/2.08 | 1.6/1.6 | 4.4/2.1 | 2.5/1.9 | 2.517 | 10.5 |
| 90S | a | 0.75/0.18 | 2860/680 | 1.80/0.94 | 2.50/2.53 | 2.0/1.7 | 4.2/2.1 | 2.7/1.9 | 2.210 | 11.7 |
| 90L | a | 1.00/0.25 | 2880/690 | 2.3/1.3 | 3.32/3.46 | 2.0/1.7 | 4.6/2.2 | 2.4/2.1 | 2.843 | 14.1 |
| 90L | b | 1.20/0.30 | 2900/700 | 2.7/1.5 | 3.95/4.09 | 2.0/1.9 | 5.2/2.3 | 2.8/2.2 | 3.327 | 15.7 |
| 100L | a | 1.50/0.37 | 2890/700 | 3.3/1.7 | 4.96/5.05 | 1.6/1.8 | 4.6/2.4 | 2.4/2.1 | 4.637 | 19.1 |
| 100L | b | 2.00/0.50 | 2900/700 | 4.4/2.2 | 6.59/6.82 | 1.8/1.7 | 6.0/2.5 | 2.8/2.1 | 6.034 | 22.9 |
| 112M | a | 2.60/0.65 | 2810/710 | 5.9/2.3 | 8.84/8.74 | 1.9/1.5 | 5.8/3.4 | 2.0/1.9 | 13.94 | 26.2 |
| 112M | b | 3.20/0.80 | 2850/710 | 7.0/2.9 | 10.7/10.8 | 2.0/1.6 | 6.1/3.5 | 2.1/2.0 | 16.51 | 29.2 |
| 132S | b | 4.40/1.10 | 2900/720 | 9.2/3.8 | 14.5/14.6 | 2.0/1.5 | 6.3/3.5 | 2.3/2.1 | 31.79 | 41.7 |
| 132M | b | 6.00/1.50 | 2910/720 | 12.5/5.1 | 19.7/19.9 | 2.1/1.6 | 6.5/3.7 | 2.5/2.3 | 41.60 | 51.0 |

| XDD Type 4/6 pole - 1500/1000 min¹ | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 | c | 0.25/0.18 | 1390/890 | 0.98/0.87 | 1.72/1.93 | 1.6/1.5 | 2.7/2.0 | 2.1/1.7 | 1.175 | 8.1 |
| 80 | a | 0.25/0.18 | 1420/920 | 0.72/0.64 | 1.68/1.87 | 1.4/1.3 | 3.9/2.7 | 2.1/1.8 | 1.499 | 7.5 |
| 80 | b | 0.37/0.25 | 1440/930 | 1.00/0.87 | 2.45/2.57 | 1.5/1.4 | 4.1/2.9 | 2.4/2.0 | 2.043 | 9.0 |
| 80 | c | 0.55/0.37 | 1430/920 | 1.5/1.3 | 3.67/3.84 | 1.5/1.4 | 3.9/2.8 | 2.2/1.9 | 2.517 | 10.5 |
| 90S | a | 0.75/0.50 | 1420/920 | 2.0/1.7 | 5.04/5.19 | 1.6/1.5 | 3.5/2.6 | 2.2/1.8 | 2.210 | 11.8 |
| 90L | a | 0.90/0.60 | 1440/940 | 2.6/2.2 | 5.97/6.10 | 2.3/1.8 | 4.1/2.9 | 2.8/2.1 | 2.843 | 14.2 |
| 100L | a | 1.10/0.75 | 1430/910 | 2.7/2.3 | 7.35/7.87 | 2.1/1.5 | 4.3/2.5 | 2.6/1.7 | 4.637 | 19.3 |
| 100L | b | 1.50/1.00 | 1440/920 | 3.7/3.0 | 9.95/10.4 | 2.2/1.6 | 4.6/2.9 | 2.8/1.9 | 6.034 | 23.2 |
| 112M | a | 2.20/1.50 | 1450/950 | 4.6/3.9 | 14.5/15.1 | 1.6/1.6 | 4.4/4.0 | 2.3/2.3 | 13.94 | 27.5 |
| 112M | b | 2.60/1.80 | 1450/960 | 5.6/4.7 | 17.1/17.9 | 1.7/1.6 | 4.4/4.0 | 2.3/2.3 | 16.51 | 30.6 |
| 132S | a | 3.00/2.00 | 1450/960 | 6.8/5.1 | 19.8/19.9 | 1.7/1.5 | 5.6/4.0 | 2.7/2.1 | 24.12 | 37.5 |
| 132S | b | 4.00/2.70 | 1450/960 | 9.0/6.7 | 26.3/26.9 | 1.8/1.5 | 5.8/4.2 | 2.9/2.3 | 31.79 | 44.2 |
| 132M | b | 5.50/3.60 | 1450/960 | 12.0/9.2 | 36.2/35.8 | 1.8/1.6 | 5.7/4.1 | 2.9/2.4 | 41.60 | 54.3 |
| 160M | b | 7.50/4.90 | 1460/960 | 15.4/11.5 | 49.1/48.7 | 2.3/1.9 | 6.7/4.4 | 2.7/2.5 | 89.20 | 80.3 |
| 160L | a | 11.0/7.20 | 1460/960 | 23.3/17.8 | 72.0/71.6 | 2.5/2.1 | 7.0/4.6 | 2.8/2.6 | 120.1 | 99.5 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Two-speed three-phase motors - single winding - Dahlander connection (Star-Star/Star) - for centrifugal machines

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| XDV Type 2/4 pole - 3000/1500 min¹ | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|------------------------------------|--|-----------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m / M _n | | | |
| 63 | c | 0.37/0.07 | 2780/1400 | 0.88/0.28 | 1.27/0.48 | 1.7/2.5 | 4.0/3.0 | 2.1/2.6 | 0.326 | 5.0 |
| 71 | a | 0.37/0.07 | 2760/1380 | 1.14/0.44 | 1.28/0.48 | 1.8/2.4 | 3.4/2.3 | 2.1/2.6 | 0.342 | 5.7 |
| 71 | b | 0.55/0.11 | 2760/1380 | 1.70/0.65 | 1.90/0.76 | 1.8/2.2 | 3.5/2.3 | 2.1/2.5 | 0.424 | 6.6 |
| 71 | c | 0.75/0.17 | 2780/1380 | 2.10/0.80 | 2.58/1.18 | 1.9/2.2 | 3.6/2.4 | 2.0/2.3 | 0.505 | 7.6 |
| 80 | a | 0.75/0.17 | 2780/1400 | 1.95/0.65 | 2.58/1.16 | 1.9/2.0 | 4.2/3.3 | 2.1/2.2 | 0.704 | 7.9 |
| 80 | b | 1.10/0.25 | 2840/1410 | 2.50/0.85 | 3.69/1.69 | 2.1/2.5 | 4.4/4.3 | 2.9/3.2 | 0.923 | 9.4 |
| 90S | a | 1.50/0.35 | 2830/1420 | 3.5/0.9 | 5.06/2.35 | 2.3/2.2 | 4.1/4.0 | 2.6/2.5 | 2.210 | 11.6 |
| 90L | a | 1.85/0.45 | 2850/1430 | 4.2/1.1 | 6.20/3.01 | 2.4/2.3 | 4.6/4.3 | 2.7/2.6 | 2.843 | 14.1 |
| 90L | b | 2.20/0.55 | 2850/1430 | 5.0/1.3 | 7.37/3.67 | 2.5/2.3 | 5.0/4.5 | 2.8/2.6 | 3.327 | 16.0 |
| 100L | a | 3.00/0.75 | 2840/1410 | 6.9/1.7 | 10.1/5.08 | 2.3/2.0 | 4.9/4.8 | 2.7/2.5 | 4.637 | 19.1 |
| 100L | b | 4.00/1.00 | 2850/1420 | 8.2/2.1 | 13.4/6.73 | 2.4/2.1 | 5.2/4.9 | 2.7/2.7 | 6.034 | 22.9 |
| 112M | b | 4.80/1.20 | 2880/1430 | 10.0/2.6 | 15.9/8.01 | 2.6/2.1 | 5.8/6.4 | 2.8/2.5 | 11.08 | 31.2 |
| 132S | a | 5.50/1.50 | 2880/1440 | 11.6/3.4 | 18.2/9.95 | 2.0/1.9 | 4.8/4.5 | 2.4/2.4 | 10.03 | 36.2 |
| 132S | b | 7.50/2.00 | 2910/1450 | 15.0/4.5 | 24.6/13.2 | 2.1/2.1 | 5.8/5.1 | 2.7/2.6 | 12.71 | 42.2 |
| 132M | a | 9.20/2.50 | 2930/1450 | 18.4/5.5 | 30.0/16.5 | 2.9/2.4 | 7.7/4.9 | 3.2/2.5 | 15.40 | 49.8 |
| 132M | b | 11.0/3.00 | 2930/1460 | 22.2/6.6 | 35.9/19.6 | 2.6/2.3 | 7.3/5.5 | 2.9/2.6 | 18.10 | 56.0 |
| 160M | b | 12.5/3.40 | 2940/1450 | 25.0/8.0 | 40.6/22.4 | 2.7/2.8 | 8.8/6.4 | 2.7/2.8 | 42.67 | 85.5 |
| 160L | a | 15.0/4.00 | 2940/1450 | 30.0/9.4 | 48.7/26.3 | 2.7/2.8 | 8.9/6.5 | 2.8/2.8 | 50.15 | 97.6 |
| XDV Type 4/8 pole - 1500/750 min¹ | | | | | | | | | | |
| 71 | b | 0.37/0.06 | 1380/680 | 1.20/0.46 | 2.56/0.84 | 1.4/2.0 | 3.0/1.8 | 2.0/2.2 | 0.800 | 6.4 |
| 80 | a | 0.55/0.09 | 1390/690 | 1.50/0.57 | 3.78/1.25 | 1.4/2.1 | 3.6/2.3 | 2.1/2.6 | 1.499 | 7.6 |
| 80 | b | 0.75/0.12 | 1400/700 | 2.10/0.96 | 5.12/1.64 | 1.6/2.5 | 3.6/2.3 | 2.4/3.0 | 2.043 | 9.1 |
| 90S | a | 1.10/0.18 | 1390/700 | 2.8/1.1 | 7.56/2.46 | 1.8/2.1 | 3.3/2.1 | 2.0/2.3 | 2.210 | 13.4 |
| 90L | a | 1.50/0.25 | 1390/700 | 3.8/1.5 | 10.3/3.41 | 2.0/2.6 | 3.8/2.7 | 2.3/3.1 | 2.843 | 15.8 |
| 90L | b | 1.85/0.30 | 1400/700 | 4.7/1.8 | 12.6/4.09 | 2.1/2.7 | 3.9/2.8 | 2.5/3.1 | 3.327 | 17.5 |
| 100L | a | 2.20/0.40 | 1400/700 | 5.3/1.9 | 15.0/5.46 | 2.0/2.2 | 3.7/2.3 | 2.2/2.1 | 4.637 | 21.3 |
| 100L | b | 3.00/0.55 | 1410/710 | 6.5/2.4 | 20.3/7.40 | 2.2/2.3 | 4.1/2.5 | 2.4/2.2 | 6.034 | 25.0 |
| 112M | a | 4.00/0.75 | 1420/710 | 8.6/3.2 | 26.9/10.1 | 2.0/2.2 | 4.7/3.1 | 2.4/2.6 | 9.550 | 30.9 |
| 112M | b | 4.80/0.90 | 1420/710 | 9.8/3.8 | 32.3/12.1 | 2.1/2.3 | 4.8/3.1 | 2.5/2.6 | 11.08 | 33.3 |
| 132S | b | 5.50/1.10 | 1430/720 | 11.8/3.5 | 36.7/14.6 | 2.2/1.9 | 4.9/3.5 | 2.5/2.4 | 31.79 | 44.3 |
| 132M | b | 7.50/1.50 | 1440/720 | 15.0/4.5 | 49.7/19.9 | 2.3/2.1 | 5.2/3.7 | 2.7/2.5 | 41.60 | 54.5 |
| 160M | b | 9.20/1.85 | 1450/720 | 21.4/5.8 | 60.6/24.5 | 2.2/2.3 | 6.8/4.7 | 2.9/3.0 | 89.20 | 80.2 |
| 160L | a | 12.5/2.50 | 1460/720 | 25.5/7.6 | 81.8/33.2 | 2.3/2.3 | 6.9/4.9 | 3.1/3.2 | 120.1 | 99.5 |
| 160L | b | 15.0/3.00 | 1460/720 | 30.4/8.8 | 98.1/39.8 | 2.3/2.2 | 7.0/5.0 | 3.0/3.1 | 129.0 | 106 |
| XDV Type 6/12 pole - 1000/500 min¹ | | | | | | | | | | |
| 80 | b | 0.25/0.04 | 920/450 | 1.00/0.46 | 2.60/0.85 | 1.5/1.6 | 2.6/1.5 | 1.8/1.9 | 2.043 | 9.0 |
| 80 | c | 0.37/0.05 | 930/460 | 1.25/0.53 | 3.80/1.04 | 1.6/2.5 | 2.9/1.7 | 2.0/2.8 | 2.517 | 10.4 |
| 90S | a | 0.55/0.08 | 900/450 | 1.80/0.65 | 5.84/1.70 | 1.6/1.5 | 2.4/1.6 | 1.8/1.6 | 3.585 | 11.5 |
| 90L | a | 0.75/0.11 | 900/430 | 2.45/0.88 | 7.96/2.44 | 1.5/1.5 | 2.4/1.6 | 1.7/1.5 | 4.858 | 14.0 |
| 100L | a | 1.10/0.16 | 930/460 | 3.2/1.2 | 11.3/3.32 | 1.6/2.3 | 3.4/1.9 | 1.9/2.4 | 6.054 | 17.9 |
| 100L | b | 1.50/0.22 | 920/460 | 3.9/1.5 | 15.6/4.57 | 1.5/2.3 | 3.5/2.0 | 1.8/2.4 | 7.720 | 21.2 |
| 112M | a | 1.85/0.28 | 940/460 | 4.8/1.7 | 18.8/5.81 | 1.6/2.0 | 3.6/1.9 | 1.9/2.1 | 13.94 | 26.9 |
| 112M | b | 2.20/0.33 | 940/470 | 5.7/2.0 | 22.4/6.71 | 1.6/2.1 | 3.7/2.1 | 2.0/2.3 | 16.51 | 30.0 |
| 132S | a | 2.60/0.40 | 950/470 | 6.8/2.4 | 26.1/8.13 | 1.5/2.1 | 4.5/2.6 | 2.3/2.5 | 24.12 | 36.9 |
| 132S | b | 3.00/0.45 | 960/480 | 7.8/2.7 | 29.8/8.95 | 1.6/2.3 | 4.7/2.7 | 2.6/2.7 | 31.79 | 43.9 |
| 132M | b | 4.00/0.60 | 960/480 | 10.2/3.6 | 39.8/11.9 | 1.7/2.3 | 5.0/2.9 | 2.8/2.8 | 41.60 | 53.9 |
| 160M | b | 5.50/0.85 | 960/480 | 13.6/5.6 | 54.7/16.9 | 1.7/3.4 | 6.1/3.3 | 3.1/4.1 | 89.20 | 79.6 |
| 160L | a | 7.50/1.20 | 960/480 | 19.2/7.7 | 74.6/23.9 | 1.8/3.4 | 6.2/3.4 | 3.2/4.3 | 120.1 | 98.8 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Two-speed three-phase motors - double winding - (Star/Star) connection - for centrifugal machines

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| XDDV Type 4/6 pole - 1500/1000 min¹ | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 b | 0.25/0.08 | 1400/900 | 0.8/0.4 | 1.71/0.85 | 1.7/1.5 | 3.1/1.9 | 2.1/1.6 | 0.800 | 6.3 | |
| 71 c | 0.37/0.12 | 1400/900 | 1.2/0.6 | 2.52/1.27 | 1.8/1.5 | 3.3/2.1 | 2.2/1.8 | 1.175 | 8.1 | |
| 80 a | 0.37/0.12 | 1420/910 | 1.1/0.4 | 2.49/1.26 | 1.2/1.0 | 3.9//2.3 | 2.1//1.3 | 1.499 | 7.5 | |
| 80 b | 0.55/0.18 | 1440/930 | 1.5/0.6 | 3.65/1.85 | 1.3/1.0 | 4.4/2.5 | 2.5/1.6 | 2.043 | 9.0 | |
| 80 c | 0.75/0.24 | 1430/900 | 2.0/0.8 | 5.01/2.55 | 1.7/1.0 | 4.2/2.3 | 2.4/1.3 | 2.517 | 10.5 | |
| 90S a | 0.75/0.24 | 1430/930 | 1.9/0.9 | 5.01/2.46 | 1.7/1.0 | 3.8/2.2 | 2.1/1.4 | 2.210 | 13.6 | |
| 90L a | 1.10/0.35 | 1420/930 | 2.7/1.3 | 7.40/3.59 | 2.1/1.3 | 4.3/2.2 | 2.4/1.6 | 2.843 | 16.0 | |
| 90L b | 1.50/0.50 | 1410/920 | 3.6/1.6 | 10.2/5.19 | 2.1/1.3 | 4.7/2.2 | 2.7/1.4 | 3.327 | 17.7 | |
| 100L a | 1.85/0.60 | 1420/940 | 4.4/1.9 | 12.4/6.10 | 2.1/1.6 | 4.8/2.8 | 2.7/1.9 | 4.637 | 21.3 | |
| 100L b | 2.20/0.70 | 1420/940 | 5.0/2.2 | 14.8/7.11 | 2.1/1.7 | 4.9/2.9 | 2.3/1.8 | 6.034 | 25.1 | |
| 112M a | 3.00/0.96 | 1440/950 | 6.7/2.7 | 19.9/9.65 | 1.9/1.6 | 5.2/3.3 | 2.6/1.9 | 9.550 | 30.5 | |
| 132S a | 4.00/1.30 | 1420/960 | 8.6/3.5 | 26.9/12.9 | 1.6/1.1 | 5.2/3.4 | 2.3/1.9 | 24.12 | 37.5 | |
| 132S b | 5.50/1.80 | 1420/960 | 11.6/4.7 | 37.0/17.9 | 1.8/1.1 | 5.1/3.8 | 2.2/2.0 | 31.94 | 44.6 | |
| 132M b | 6.50/2.20 | 1440/970 | 13.8/5.8 | 43.1/21.7 | 1.9/1.1 | 5.6/4.0 | 2.4/2.1 | 41.60 | 55.1 | |
| 160M a | 7.50/2.50 | 1440/970 | 15.0/6.6 | 49.7/24.6 | 1.7/1.6 | 5.1/4.8 | 2.2/2.5 | 68.80 | 68.0 | |
| 160M b | 9.20/3.10 | 1440/970 | 18.8/8.5 | 61.0/30.5 | 1.8/1.6 | 6.0/5.2 | 2.5/2.6 | 89.20 | 80.3 | |
| 160L a | 12.5/4.20 | 1460/980 | 24.9/10.0 | 81.8/40.9 | 1.9/1.6 | 7.0/5.7 | 2.8/2.8 | 120.1 | 99.2 | |

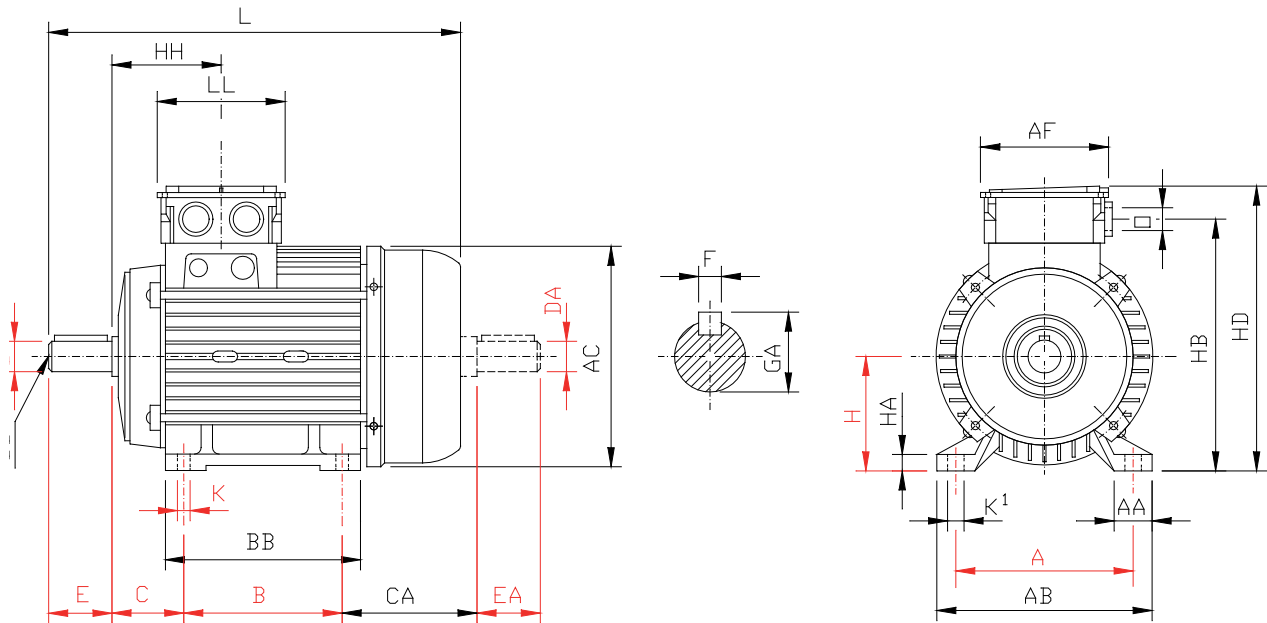
| XDDV Type 4/8 pole - 1500/750 min¹ | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 80 a | 0.37/0.05 | 1420/680 | 1.1/0.4 | 2.49/0.70 | 1.2/1.4 | 3.9/2.2 | 2.1/1.6 | 1.499 | 7.5 | |
| 80 b | 0.55/0.07 | 1440/700 | 1.5/0.6 | 3.65/0.96 | 1.3/1.5 | 4.4/2.3 | 2.5/1.7 | 2.043 | 9.0 | |
| 80 c | 0.75/0.10 | 1430/700 | 2.0/0.8 | 5.01/1.36 | 1.7/1.6 | 4.2/2.3 | 2.4/1.8 | 2.517 | 10.5 | |
| 90S a | 0.75/0.10 | 1430/700 | 1.9/0.8 | 5.01/1.36 | 1.7/1.7 | 3.8/1.8 | 2.1/1.8 | 2.210 | 11.7 | |
| 90L a | 1.10/0.15 | 1420/700 | 2.7/1.1 | 7.40/2.05 | 2.1/1.8 | 4.3/1.9 | 2.4/1.9 | 2.843 | 14.2 | |
| 90L b | 1.50/0.20 | 1410/700 | 3.6/1.5 | 10.2/2.73 | 2.1/1.8 | 4.7/1.9 | 2.7/1.9 | 3.327 | 16.0 | |
| 100L a | 1.85/0.25 | 1420/700 | 4.4/1.3 | 12.4/3.41 | 2.1/1.8 | 4.8/2.2 | 2.7/2.3 | 4.637 | 18.9 | |
| 100L b | 2.20/0.30 | 1420/700 | 5.0/1.6 | 14.8/4.09 | 2.1/1.9 | 4.9/2.3 | 2.3/2.5 | 6.034 | 22.7 | |
| 112M a | 3.00/0.40 | 1440/710 | 6.7/1.6 | 19.9/5.38 | 1.9/1.7 | 5.6/2.6 | 2.4/1.9 | 9.550 | 27.5 | |
| 132S a | 4.00/0.55 | 1420/720 | 8.6/1.9 | 26.9/7.30 | 1.6/1.4 | 5.2/2.7 | 2.3/1.9 | 24.12 | 37.1 | |
| 132S b | 5.50/0.75 | 1420/720 | 11.6/2.5 | 37.0/9.95 | 1.8/1.1 | 5.1/2.9 | 2.2/1.7 | 31.79 | 44.1 | |
| 132M b | 6.50/0.90 | 1440/720 | 13.8/3.0 | 43.1/11.9 | 1.9/1.5 | 5.6/3.0 | 2.4/2.2 | 41.60 | 55.0 | |
| 160M a | 7.50/1.10 | 1440/720 | 15.0/3.7 | 49.7/14.6 | 1.7/1.4 | 5.1/2.9 | 2.2/2.1 | 68.80 | 68.0 | |
| 160M b | 9.20/1.30 | 1440/720 | 18.8/4.3 | 61.0/17.2 | 1.8/1.5 | 6.0/3.1 | 2.5/2.4 | 89.20 | 80.3 | |
| 160L a | 12.5/1.80 | 1460/720 | 24.9/5.7 | 81.8/23.9 | 1.9/1.6 | 7.0/3.2 | 2.8/2.5 | 120.1 | 99.5 | |

| XDDV Type 6/8 pole - 1000/750 min¹ | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 80 b | 0.25/0.11 | 910/690 | 1.0/0.6 | 2.62/1.52 | 1.5/1.3 | 2.8/1.8 | 1.8/1.6 | 2.043 | 9.0 | |
| 80 c | 0.37/0.16 | 920/690 | 1.4/0.9 | 3.80/2.21 | 1.7/1.4 | 3.1/2.0 | 1.9/1.7 | 2.517 | 10.5 | |
| 90S a | 0.37/0.16 | 920/700 | 1.1/0.8 | 3.84/2.18 | 1.4/1.3 | 2.9/2.4 | 1.8/2.1 | 2.210 | 11.9 | |
| 90L a | 0.55/0.25 | 900/690 | 1.7/1.2 | 5.84/3.46 | 1.4/1.6 | 3.0/2.4 | 1.9/2.2 | 2.843 | 13.9 | |
| 90L b | 0.65/0.30 | 910/690 | 1.9/1.4 | 6.82/4.15 | 1.8/1.7 | 3.3/2.4 | 2.1/2.1 | 3.327 | 15.6 | |
| 100L a | 0.75/0.37 | 940/700 | 2.7/1.6 | 7.62/5.05 | 1.8/1.6 | 3.7/2.7 | 2.5/1.9 | 7.840 | 18.6 | |
| 100L b | 1.10/0.55 | 950/710 | 3.6/2.2 | 11.1/7.40 | 1.7/1.5 | 3.6/2.5 | 2.2/1.8 | 10.31 | 22.2 | |
| 112M a | 1.50/0.70 | 950/710 | 4.2/2.3 | 15.1/9.42 | 1.5/1.2 | 4.8/3.1 | 2.4/1.6 | 13.94 | 27.0 | |
| 112M b | 1.85/0.85 | 960/710 | 4.8/2.7 | 18.4/11.4 | 1.6/1.2 | 5.2/3.4 | 2.6/1.8 | 16.51 | 29.4 | |
| 132S b | 2.60/1.30 | 970/720 | 6.5/4.0 | 25.6/17.2 | 1.5/1.4 | 5.3/3.5 | 2.7/2.1 | 31.79 | 43.6 | |
| 132M b | 3.50/1.70 | 970/720 | 8.8/5.3 | 34.5/22.5 | 1.7/1.6 | 5.5/3.6 | 2.7/2.1 | 41.60 | 53.7 | |
| 160M a | 4.00/2.00 | 960/720 | 9.8/5.5 | 39.8/26.5 | 1.6/1.4 | 5.1/3.7 | 2.5/1.9 | 68.80 | 68.3 | |
| 160M b | 5.50/2.70 | 970/720 | 12.4/7.3 | 54.1/35.8 | 1.8/1.5 | 5.3/3.9 | 2.6/2.1 | 89.20 | 80.3 | |
| 160L a | 7.50/3.70 | 970/720 | 16.8/9.5 | 73.8/49.1 | 1.9/1.7 | 5.4/4.0 | 2.7/2.1 | 120.1 | 99.5 | |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Mounting arrangement IM B3

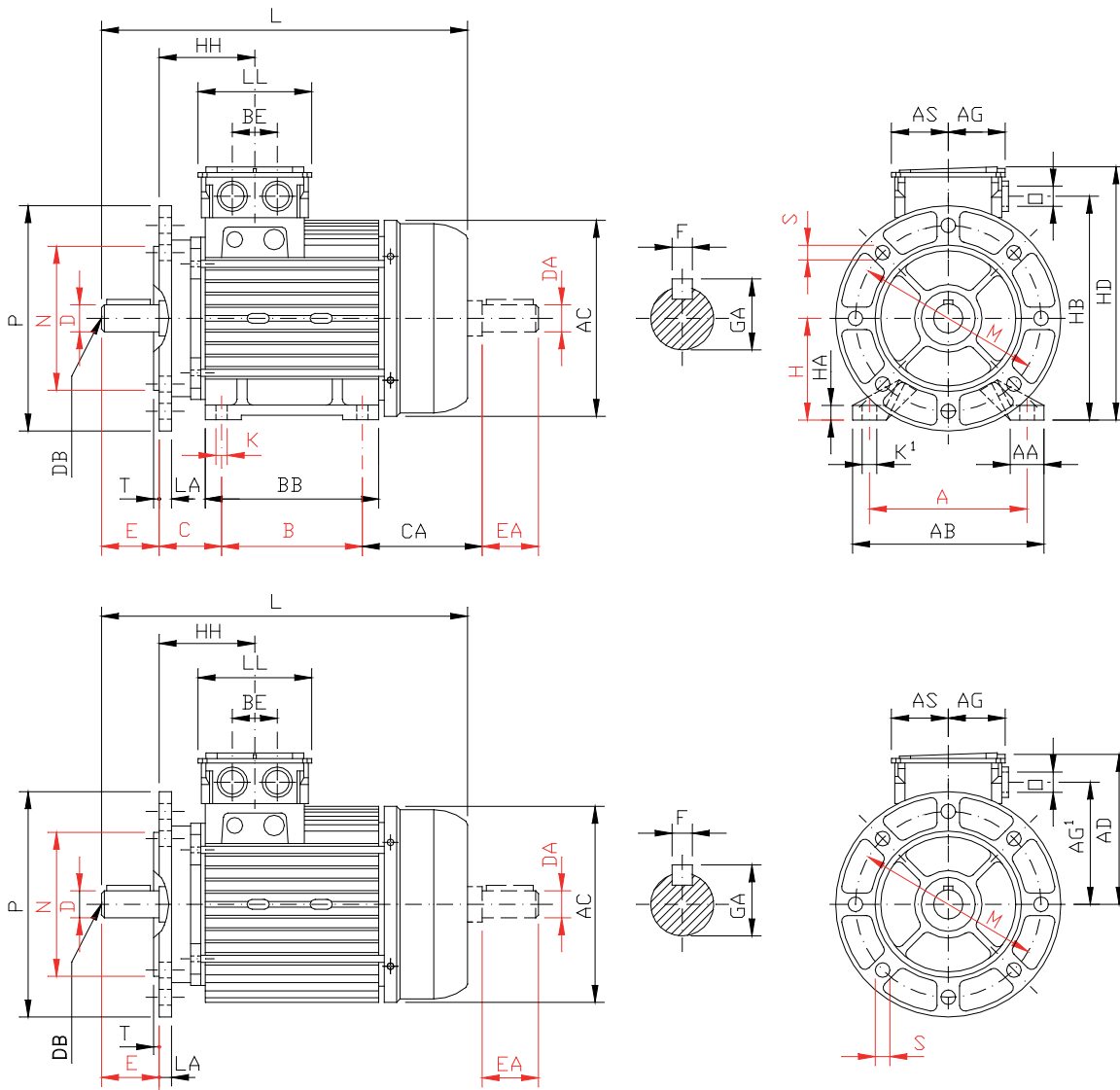
Three-phase motors - X... Type



| Motor size | Coupling | | | | | | | | | Overall | | | | | | | | Shaft end | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|---------|-----|-----|-----|-----|-----|-----|---------------|-----------|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | K | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 56 | 90 | 18 | 108 | 71 | 91 | 36 | 66 | 56 | 7 | 110 | 88 | 130 | 155 | 65 | 189 | 88 | M16+M20 x 1.5 | 9 | M3 | 20 | 3 | 10.2 |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 73 | 63 | 7 | 124 | 88 | 143 | 164 | 68 | 214 | 88 | M16+M20 x 1.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 7 | 141 | 88 | 161 | 183 | 73 | 247 | 88 | M16+M20 x 1.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 9 | 160 | 102 | 182 | 202 | 82 | 282 | 102 | M20+M25 x 1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 9 | 180 | 102 | 197 | 219 | 86 | 305 | 102 | M20+M25 x 1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 9 | 180 | 102 | 197 | 219 | 86 | 330 | 102 | M20+M25 x 1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 12 | 200 | 102 | 220 | 241 | 96 | 374 | 102 | M20+M25 x 1.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 130 | 112 | 12 | 224 | 134 | 255 | 280 | 106 | 395 | 134 | M32+M32 x 1.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 158 | 132 | 12 | 260 | 134 | 303 | 328 | 114 | 460 | 134 | M32+M32 x 1.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 158 | 132 | 12 | 260 | 134 | 303 | 328 | 114 | 498 | 134 | M32+M32 x 1.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 188 | 160 | 14 | 310 | 176 | 360 | 395 | 148 | 608 | 176 | M32+M32 x 1.5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 188 | 160 | 14 | 310 | 176 | 360 | 395 | 148 | 652 | 176 | M32+M32 x 1.5 | 42 | M16 | 110 | 12 | 45 |

Mounting arrangement IM B35 - IM B5

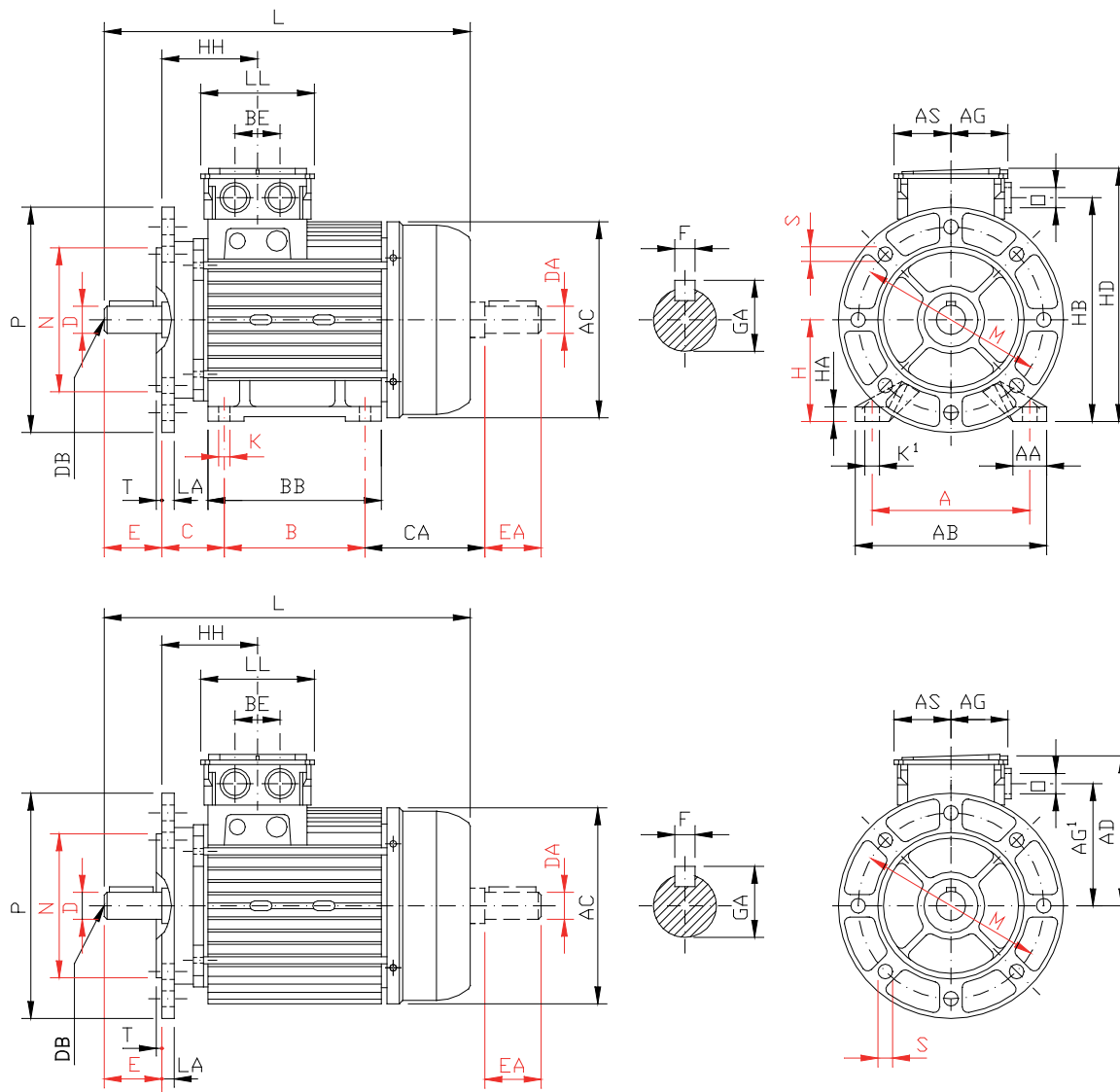
Three-phase motors - X... Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 56 | 110 | 99 | 44 | 74 | 44 | 34 | 130 | 155 | 65 | 189 | 88 | M16+M20 x 1.5 |
| 63 | 124 | 101 | 44 | 80 | 44 | 34 | 143 | 164 | 68 | 214 | 88 | M16+M20 x 1.5 |
| 71 | 141 | 112 | 44 | 90 | 44 | 34 | 161 | 183 | 73 | 247 | 88 | M16+M20 x 1.5 |
| 80 | 160 | 125 | 51 | 102 | 51 | 39 | 182 | 205 | 82 | 282 | 102 | M20+M25 x 1.5 |
| 90S | 180 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 86 | 305 | 102 | M20+M25 x 1.5 |
| 90L | 180 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 86 | 330 | 102 | M20+M25 x 1.5 |
| 100L | 200 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 96 | 374 | 102 | M20+M25 x 1.5 |
| 112M | 224 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 106 | 395 | 134 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 114 | 460 | 134 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 114 | 498 | 134 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 148 | 608 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 148 | 652 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B35 - IM B5

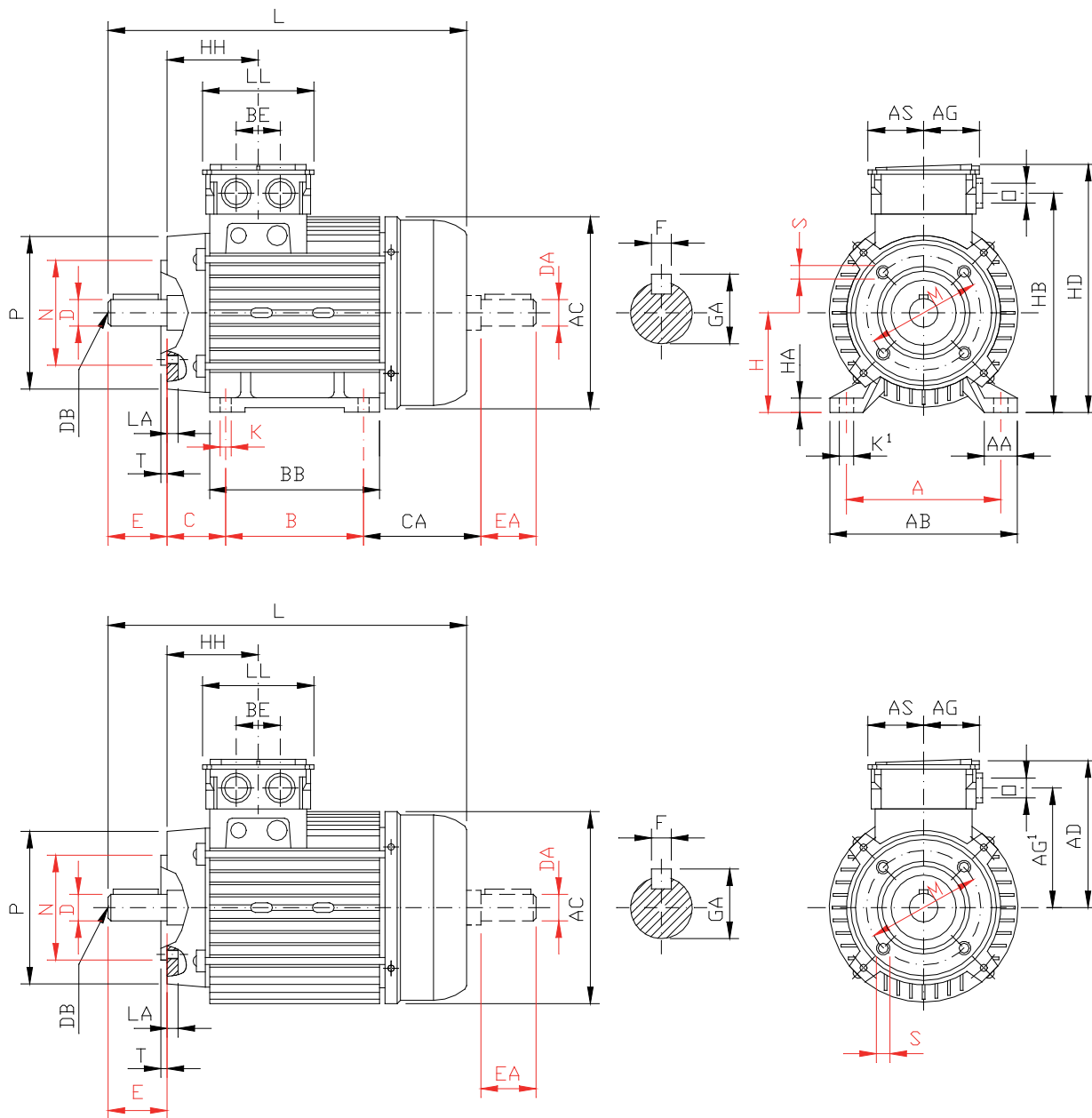
Three-phase motors - X... Type



| Motor size | Coupling | | | | | | | | | | | | Shaft end | | | | | | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|----|----------------|----|-----------|-----|-----|----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 56 | 90 | 18 | 108 | 71 | 91 | 36 | 66 | 56 | 7 | 7 | 9 | 8 | 100 | 80 | 120 | 7 | 2.5 | 9 | M3 | 20 | 3 | 10.2 |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 73 | 63 | 7 | 7 | 10 | 8 | 115 | 95 | 140 | 9 | 3 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 8 | 7 | 12 | 8 | 130 | 110 | 160 | 9 | 3.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 130 | 112 | 14 | 12 | 19 | 12 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 158 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 158 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 188 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 188 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 12.5 |

Mounting arrangement IM B34 - IM B14

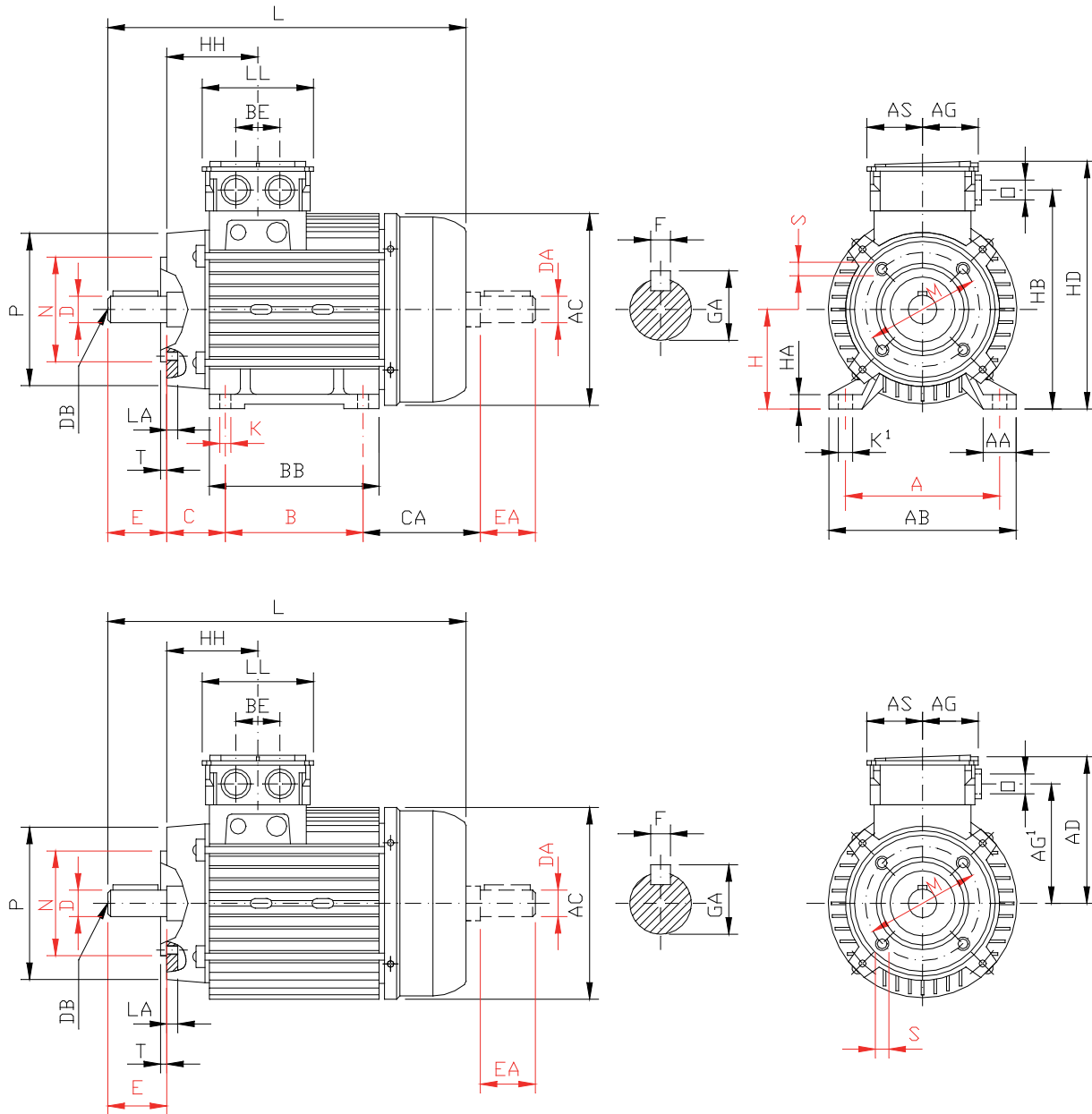
Three-phase motors - X... Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG' | AS | BE | HB | HD | HH | L | LL | O |
| 56 | 110 | 99 | 44 | 74 | 44 | 34 | 130 | 155 | 65 | 189 | 88 | M16+M20 x 1.5 |
| 63 | 124 | 101 | 44 | 80 | 44 | 34 | 143 | 164 | 68 | 214 | 88 | M16+M20 x 1.5 |
| 71 | 141 | 112 | 44 | 90 | 44 | 34 | 161 | 183 | 73 | 247 | 88 | M16+M20 x 1.5 |
| 80 | 160 | 125 | 51 | 102 | 51 | 39 | 182 | 205 | 82 | 282 | 102 | M20+M25 x 1.5 |
| 90S | 180 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 86 | 305 | 102 | M20+M25 x 1.5 |
| 90L | 180 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 86 | 330 | 102 | M20+M25 x 1.5 |
| 100L | 200 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 96 | 374 | 102 | M20+M25 x 1.5 |
| 112M | 224 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 106 | 395 | 134 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 114 | 460 | 134 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 114 | 498 | 134 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 148 | 608 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 148 | 652 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B34 - IM B14

Three-phase motors - X... Type

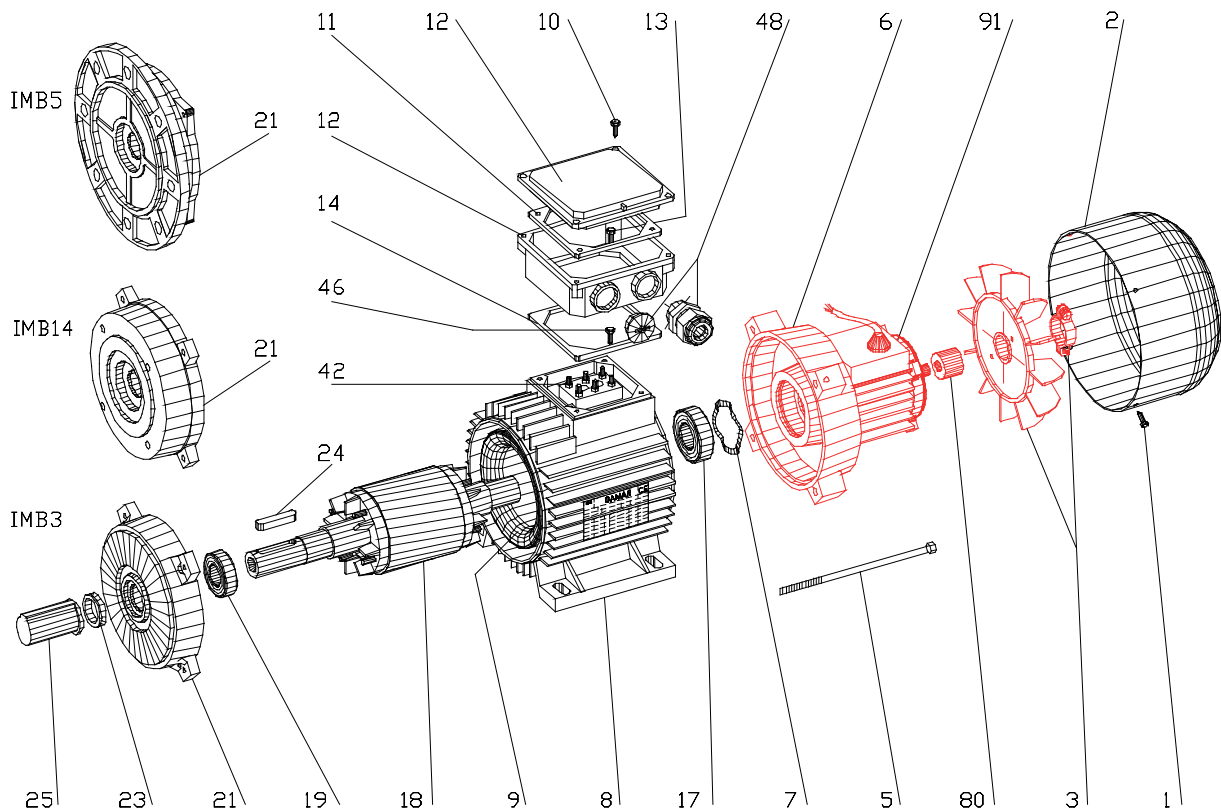


| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|----|----------------|-----------|-----|-----|-----|-----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | DA | DB | EA | F | GA |
| 56 | 90 | 18 | 108 | 71 | 91 | 36 | 66 | 56 | 7 | 7 | 9 | 7 | 65 | 50 | 80 | M5 | 2.5 | 9 | M3 | 20 | 3 | 10.2 |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 73 | 63 | 7 | 7 | 10 | 7 | 75 | 60 | 90 | M5 | 2.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 8 | 7 | 12 | 8 | 85 | 70 | 105 | M6 | 2.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 130 | 112 | 14 | 12 | 19 | 13 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 158 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 158 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 188 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 188 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 12.5 |

Asynchronous three-phase forced ventilated motors

Three-phase motor – WSH Type

With forced three-phase ventilation



Spare parts nomenclature

- | | |
|-----------------------------------|--|
| 1. Screw for fan cover | 46. Grounding screw |
| 2. Fan cover | 48. Cable gland |
| 3. Fan | 80. Fan adapter |
| 5. Rod | 91. Motor for axial forced ventilation |
| 6. N-end shield | |
| 7. Spring ring | |
| 8. Frame | |
| 9. Stator package | |
| 10. Screw for terminal box cover | |
| 11. Gasket for terminal box cover | |
| 12. Terminal box | |
| 14. Gasket for terminal box | |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |
| 42. Terminal board | |

Three-phase motors - High Efficiency (IE2) - with forced ventilation Papst

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection
IP 20 forced ventilation protection

Method of determining the efficiency: IEC 60034-2-1; 2014

| WPH Type | | 2 pole - 3000 min¹ | | | | | | | | | | | | |
|-----------------|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 63 | a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 0.129 | 4.3 |
| 63 | b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 0.162 | 4.9 |
| 63 | c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 0.206 | 5.6 |
| 71 | a | 0.37 | 2820 | 0.95 | 68.6 | 73.6 | 74.4 | 0.75 | 1.24 | 3.3 | 5.5 | 3.4 | 0.342 | 6.3 |
| 71 | b | 0.55 | 2815 | 1.38 | 71.6 | 74.9 | 75.3 | 0.77 | 1.87 | 3.5 | 5.7 | 3.4 | 0.424 | 7.2 |
| 80 | a | 0.75 | 2840 | 1.7 | 78.9 | 80.7 | 80.2 | 0.81 | 2.54 | 3.3 | 6.6 | 3.4 | 0.850 | 9.7 |
| 80 | b | 1.1 | 2865 | 2.4 | 83.1 | 84.5 | 84.0 | 0.80 | 3.69 | 3.7 | 7.4 | 3.6 | 1.129 | 11.7 |
| 80 | c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 82.0 | 0.79 | 5.07 | 3.3 | 6.4 | 3.4 | 1.129 | 11.7 |
| 90S | a | 1.5 | 2900 | 3.2 | 82.6 | 84.9 | 84.8 | 0.82 | 4.94 | 3.3 | 7.9 | 3.6 | 1.469 | 14.5 |
| 90S | b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 83.6 | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 1.469 | 14.5 |
| 90L | a | 2.2 | 2890 | 4.4 | 84.1 | 85.9 | 85.7 | 0.84 | 7.26 | 3.1 | 8.1 | 3.6 | 1.888 | 17.5 |
| 90L | b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 84.8 | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 1.888 | 17.5 |
| 100L | a | 3 | 2900 | 5.9 | 88.0 | 88.5 | 87.7 | 0.84 | 9.89 | 2.6 | 7.3 | 3.3 | 3.147 | 21.9 |
| 100L | b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 86.8 | 0.85 | 13.4 | 2.6 | 7.2 | 3.2 | 3.542 | 24.0 |
| 112M | a | 4 | 2920 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 5.191 | 29.6 |
| 112M | b | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 88.8 | 0.84 | 18.1 | 4.3 | 9.9 | 6.3 | 6.336 | 32.9 |
| WPH Type | | 4 pole - 1500 min¹ | | | | | | | | | | | | |
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 63 | b | 0.12 | 1370 | 0.41 | 55.6 | 61.8 | 63.1 | 0.67 | 0.85 | 2.1 | 3.0 | 2.3 | 0.263 | 4.8 |
| 63 | c | 0.18 | 1380 | 0.61 | 58.8 | 64.9 | 66.0 | 0.65 | 1.25 | 2.4 | 3.3 | 2.6 | 0.326 | 5.6 |
| 71 | b | 0.25 | 1380 | 0.68 | 66.5 | 69.5 | 68.7 | 0.76 | 1.73 | 2.1 | 3.8 | 2.3 | 0.800 | 6.9 |
| 71 | c | 0.37 | 1415 | 1.08 | 65.6 | 71.3 | 72.8 | 0.68 | 2.51 | 3.0 | 4.8 | 3.3 | 1.175 | 8.8 |
| 80 | a | 0.55 | 1415 | 1.26 | 76.3 | 78.6 | 78.3 | 0.79 | 3.67 | 2.4 | 5.4 | 2.8 | 2.157 | 10.3 |
| 80 | b | 0.75 | 1430 | 1.7 | 77.3 | 80.1 | 80.2 | 0.78 | 4.96 | 2.9 | 6.2 | 3.4 | 2.789 | 11.8 |
| 90S | a | 1.1 | 1425 | 2.5 | 80.9 | 82.7 | 82.1 | 0.76 | 7.37 | 2.4 | 5.3 | 2.9 | 2.566 | 14.0 |
| 90L | a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 83.8 | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 3.327 | 16.9 |
| 100L | a | 2.2 | 1430 | 5.0 | 83.7 | 85.3 | 84.7 | 0.75 | 14.7 | 2.6 | 5.7 | 3.2 | 5.036 | 21.6 |
| 100L | b | 3 | 1430 | 6.7 | 85.1 | 86.4 | 85.8 | 0.75 | 19.9 | 2.8 | 6.0 | 3.4 | 6.446 | 25.5 |
| 112M | a | 4 | 1440 | 8.0 | 87.3 | 88.1 | 87.2 | 0.82 | 26.3 | 2.4 | 6.5 | 3.1 | 11.08 | 32.5 |
| WPH Type | | 6 pole - 1000 min¹ | | | | | | | | | | | | |
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 71 | b | 0.12 | 905 | 0.52 | 44.3 | 51.5 | 54.1 | 0.63 | 1.28 | 2.1 | 2.6 | 2.3 | 0.800 | 6.3 |
| 71 | c | 0.18 | 890 | 0.66 | 51.2 | 57.0 | 57.1 | 0.68 | 1.96 | 1.9 | 2.6 | 2.1 | 1.175 | 8.0 |
| 80 | b | 0.25 | 935 | 0.77 | 64.0 | 68.9 | 70.4 | 0.66 | 2.54 | 2.6 | 4.1 | 2.8 | 2.043 | 9.0 |
| 80 | c | 0.37 | 940 | 1.10 | 64.1 | 70.0 | 71.5 | 0.68 | 3.78 | 2.8 | 4.4 | 3.0 | 2.517 | 10.8 |
| 90S | a | 0.55 | 935 | 1.42 | 72.5 | 75.4 | 75.1 | 0.74 | 5.63 | 2.1 | 4.3 | 2.5 | 4.148 | 13.0 |
| 90L | a | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 77.9 | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 5.421 | 16.6 |
| 100L | r | 1.1 | 940 | 2.7 | 76.5 | 79.1 | 78.7 | 0.73 | 11.0 | 2.3 | 4.9 | 2.9 | 8.032 | 19.6 |
| 100L | a | 1.5 | 940 | 3.7 | 78.5 | 80.6 | 80.1 | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 10.59 | 23.5 |
| 112M | a | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 82.4 | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 16.51 | 31.1 |

M_n = Full load torque

M_s = Locked rotor torque

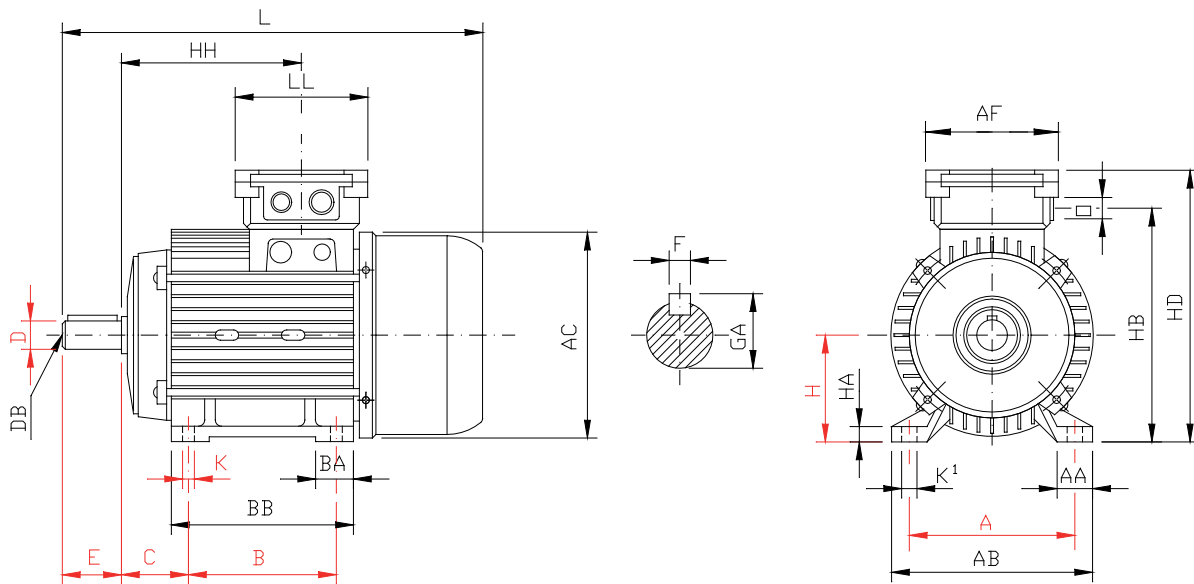
M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Mounting arrangement IM B3

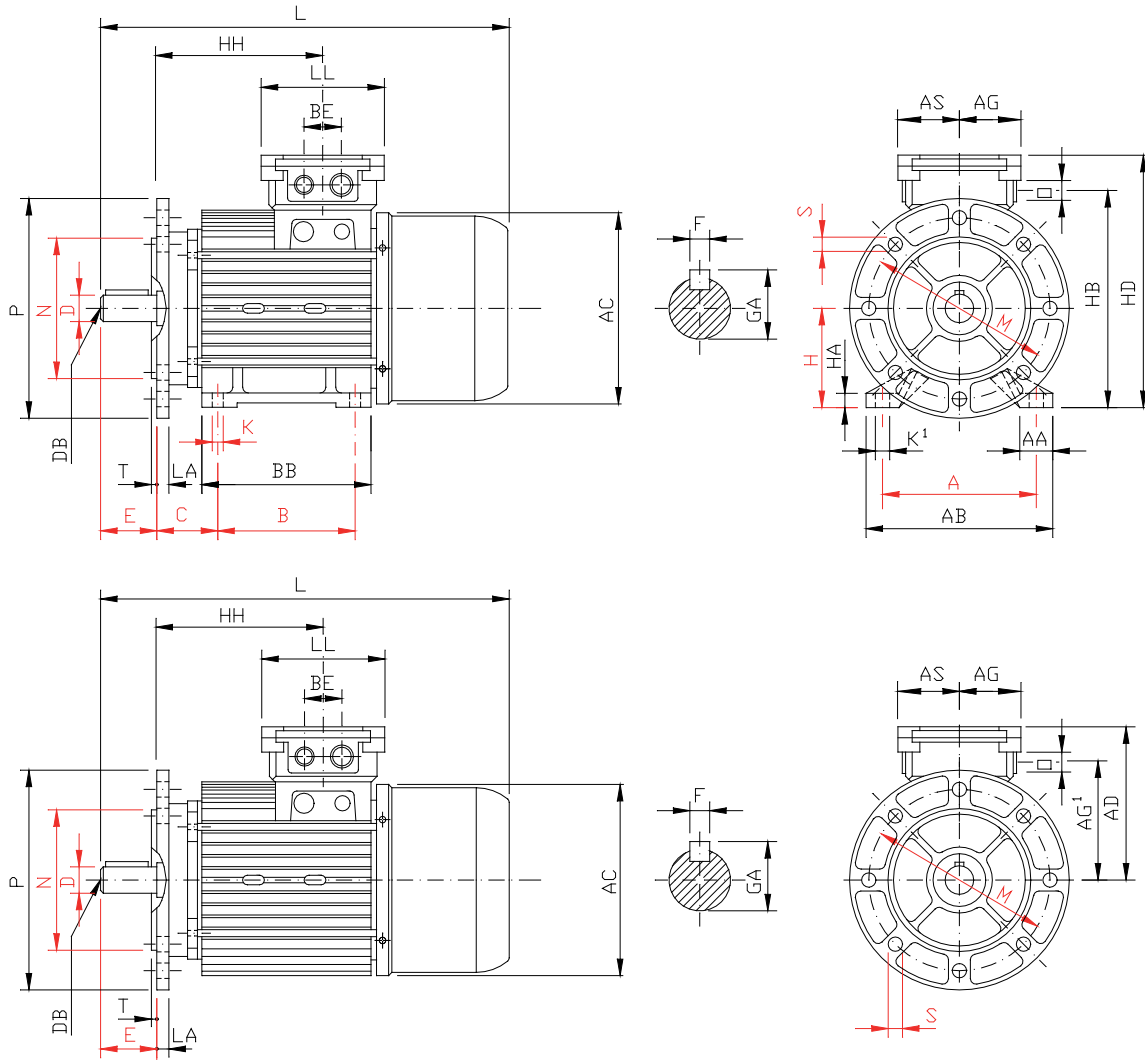
Three-phase motors WP.. Type – with forced ventilation Papst



| Motor size | Coupling | | | | | | | | | Overall | | | | | | | | Shaft end | | | | |
|------------|----------|----|-----|-----|----|-----|----|-----|----|---------|-----|-----|-----|-----|-----|-----|---------------|-----------|-----|----|---|------|
| | A | AA | AB | B | BA | BB | C | H | K | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 23 | 100 | 40 | 63 | 7 | 123 | 88 | 143 | 164 | 89 | 236 | 88 | M16+M20 x 1.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 25 | 112 | 45 | 71 | 7 | 138 | 88 | 161 | 183 | 103 | 263 | 88 | M16+M20 x 1.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 30 | 124 | 50 | 80 | 9 | 156 | 102 | 182 | 202 | 117 | 296 | 102 | M20+M25 x 1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 32 | 130 | 56 | 90 | 9 | 176 | 102 | 197 | 219 | 127 | 320 | 102 | M20+M25 x 1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 32 | 155 | 56 | 90 | 9 | 176 | 102 | 197 | 219 | 152 | 345 | 102 | M20+M25 x 1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 35 | 163 | 63 | 100 | 12 | 194 | 102 | 220 | 241 | 171 | 391 | 102 | M20+M25 x 1.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 40 | 183 | 70 | 112 | 12 | 220 | 134 | 255 | 280 | 175 | 405 | 134 | M32+M32 x 1.5 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B35 - IM B5

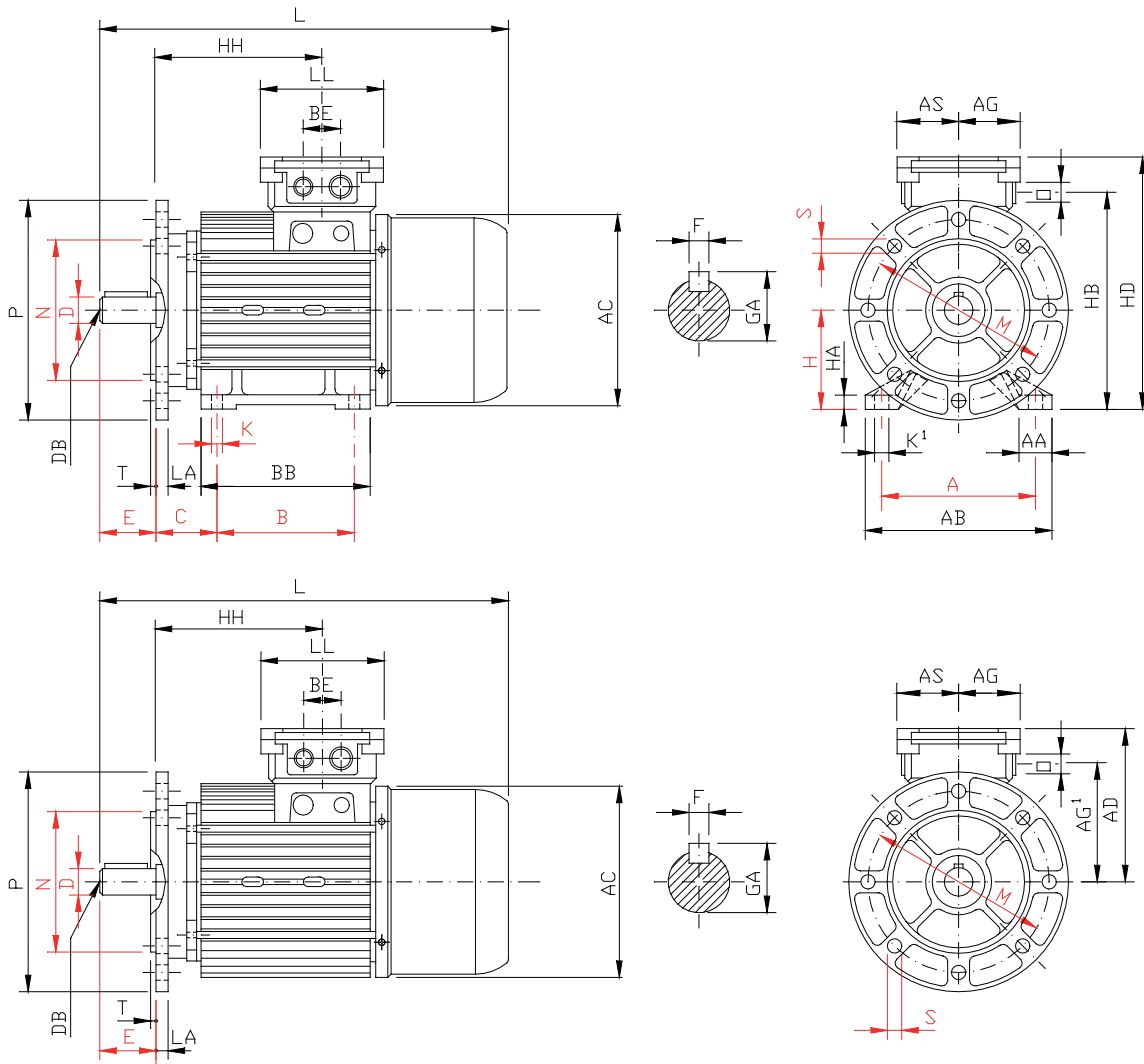
Three-phase motors WP.. Type – with forced ventilation Papst



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | Ø |
| 63 | 123 | 101 | 44 | 80 | 44 | 34 | 143 | 164 | 89 | 236 | 88 | M16+M20 x 1.5 |
| 71 | 138 | 112 | 44 | 90 | 44 | 34 | 161 | 183 | 103 | 263 | 88 | M16+M20 x 1.5 |
| 80 | 156 | 125 | 51 | 102 | 51 | 39 | 182 | 202 | 117 | 296 | 102 | M20+M25 x 1.6 |
| 90S | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 127 | 320 | 102 | M20+M25 x 1.5 |
| 90L | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 152 | 345 | 102 | M20+M25 x 1.5 |
| 100L | 194 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 171 | 391 | 102 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 175 | 405 | 134 | M32+M32 x 1.5 |

Mounting arrangement IM B35 - IM B5

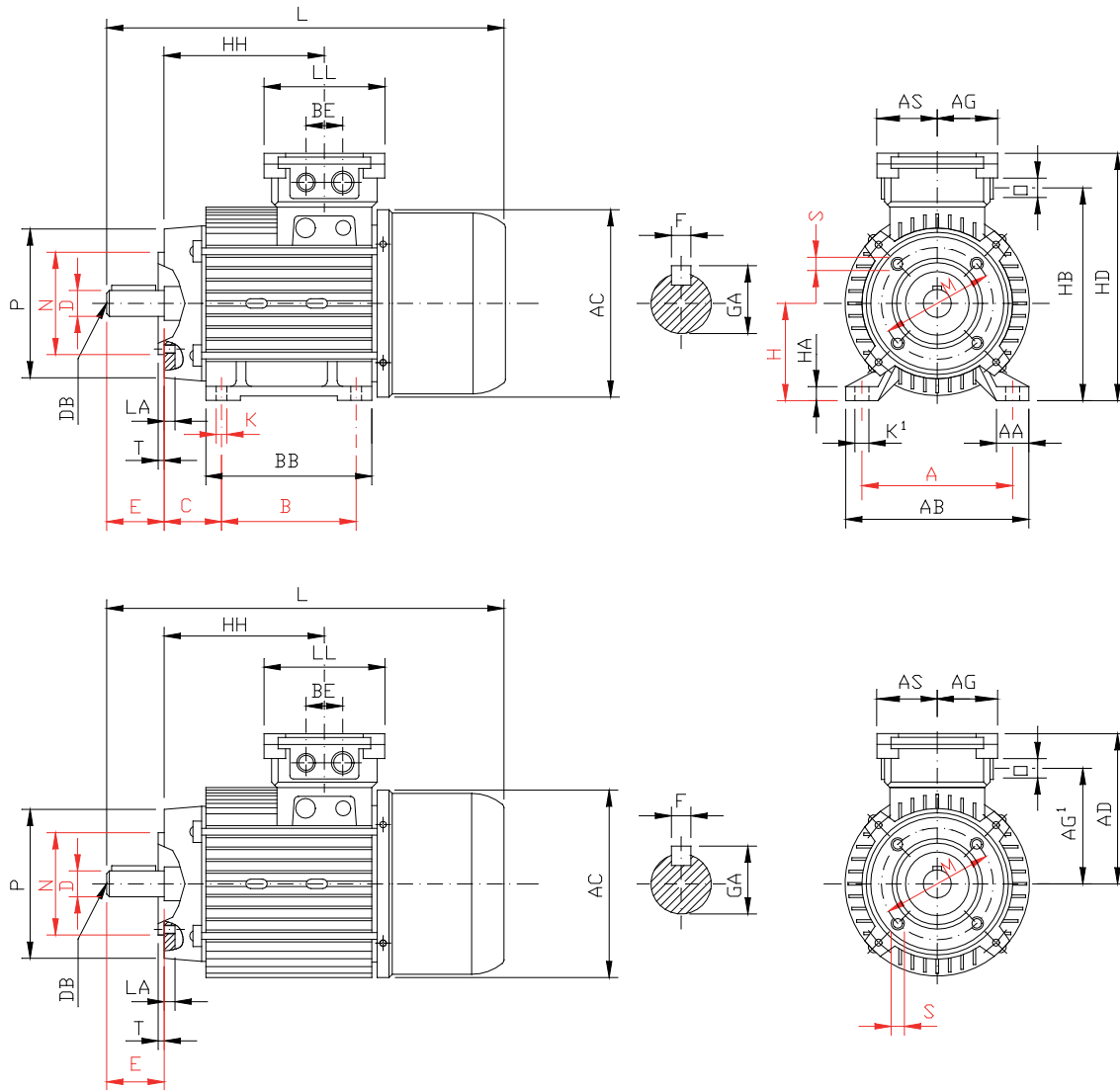
Three-phase motors WP.. Type – with forced ventilation Papst



| Motor size | Coupling | | | | | | | | | | Shaft end | | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|----|-----|-----|-----|----|-----|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 8 | 115 | 95 | 140 | 9 | 3 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 8 | 130 | 110 | 160 | 9 | 3.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 141 | 112 | 14 | 12 | 19 | 12 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B34 - IM B14

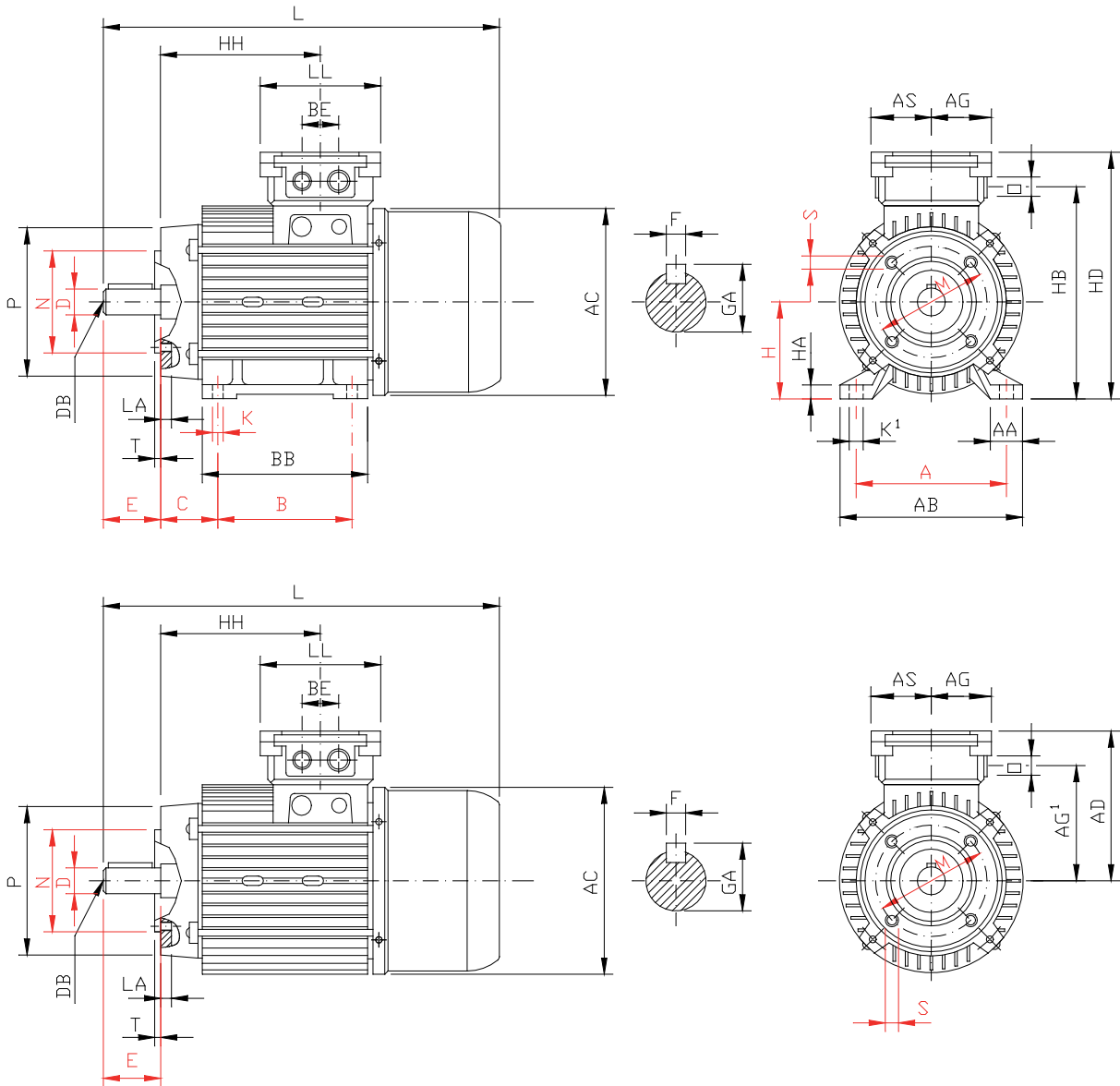
Three-phase motors WP.. Type – with forced ventilation Papst



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 63 | 123 | 101 | 44 | 80 | 44 | 34 | 143 | 164 | 89 | 236 | 88 | M16+M20 x 1.5 |
| 71 | 138 | 112 | 44 | 90 | 44 | 34 | 161 | 183 | 103 | 263 | 88 | M16+M20 x 1.5 |
| 80 | 156 | 125 | 51 | 102 | 51 | 39 | 182 | 202 | 117 | 296 | 102 | M20+M25 x 1.5 |
| 90S | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 127 | 320 | 102 | M20+M25 x 1.5 |
| 90L | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 152 | 345 | 102 | M20+M25 x 1.5 |
| 100L | 194 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 171 | 391 | 102 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 175 | 405 | 134 | M32+M32 x 1.5 |

Mounting arrangement IM B34 - IM B14

Three-phase motors WP.. Type – with forced ventilation Papst



| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----|-----------|-----|-----|-----|----|-----|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 7 | 75 | 60 | 90 | M5 | 2.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 8 | 85 | 70 | 105 | M6 | 2.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 141 | 112 | 14 | 12 | 19 | 13 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |

Three-phase motors - High Efficiency (IE2) - with forced ventilation three-phase motor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

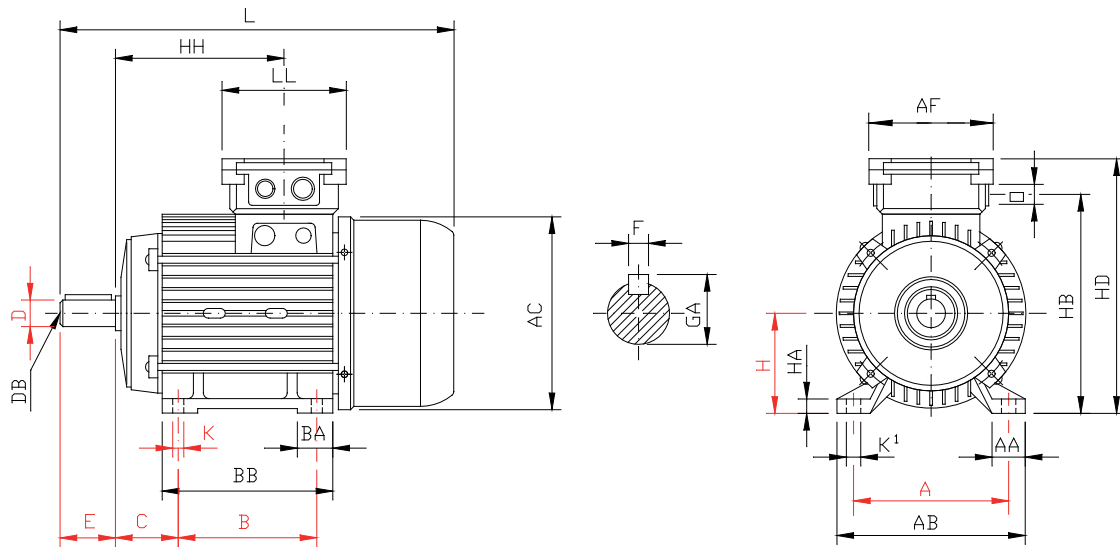
Method of determining the efficiency: IEC 60034-2-1; 2014

| WSH Type 2 pole - 3000 min⁻¹ | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | |
| 80 a | 0.75 | 2840 | 1.7 | 78.9 | 80.7 | 80.2 | 0.80 | 2.54 | 3.3 | 6.6 | 3.4 | 0.850 | 11.3 |
| 80 b | 1.1 | 2860 | 2.4 | 83.1 | 84.5 | 84.0 | 0.80 | 3.69 | 3.7 | 7.4 | 3.6 | 1.129 | 13.3 |
| 80 c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 82.0 | 0.80 | 5.07 | 3.3 | 6.4 | 3.4 | 1.129 | 13.3 |
| 90S a | 1.5 | 2900 | 3.2 | 82.6 | 84.9 | 84.8 | 0.82 | 4.94 | 3.3 | 7.9 | 3.6 | 1.469 | 16.0 |
| 90S b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 83.6 | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 1.469 | 16.0 |
| 90L a | 2.2 | 2890 | 4.4 | 84.1 | 85.9 | 85.7 | 0.84 | 7.26 | 3.1 | 8.1 | 3.6 | 1.888 | 19.0 |
| 90L b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 84.8 | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 1.888 | 19.0 |
| 100L a | 3 | 2900 | 5.9 | 88.0 | 88.5 | 87.7 | 0.84 | 9.89 | 2.6 | 7.3 | 3.3 | 3.147 | 23.3 |
| 100L b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 86.8 | 0.85 | 13.3 | 2.6 | 7.2 | 3.2 | 3.542 | 25.4 |
| 112M a | 4 | 2915 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 5.191 | 30.7 |
| 112M b | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 88.8 | 0.84 | 18.0 | 4.3 | 9.9 | 6.3 | 6.336 | 34.0 |
| 132S a | 5.5 | 2920 | 10.5 | 87.2 | 88.6 | 88.5 | 0.85 | 17.9 | 2.4 | 7.4 | 3.4 | 10.96 | 41.8 |
| 132S b | 7.5 | 2940 | 14.2 | 88.0 | 89.6 | 89.7 | 0.84 | 24.3 | 3.6 | 8.8 | 4.0 | 14.41 | 49.8 |
| 132M a | 9.2 | 2940 | 17.8 | 88.9 | 90.4 | 90.6 | 0.82 | 29.9 | 4.5 | 9.6 | 4.5 | 17.06 | 57.3 |
| 132M b | 11 | 2940 | 21.1 | 89.6 | 90.6 | 90.7 | 0.83 | 35.7 | 4.2 | 10.1 | 4.6 | 19.58 | 63.2 |
| 160M a | 11 | 2955 | 20.7 | 89.0 | 90.5 | 90.7 | 0.85 | 35.5 | 4.3 | 9.9 | 3.8 | 35.55 | 83.3 |
| 160M b | 15 | 2960 | 28.2 | 90.1 | 91.4 | 91.5 | 0.84 | 48.4 | 4.1 | 10.1 | 4.2 | 45.51 | 97.9 |
| 160L a | 18.5 | 2960 | 34.6 | 90.8 | 92.0 | 92.1 | 0.84 | 59.8 | 4.3 | 10.4 | 3.6 | 53.71 | 111 |
| 160L b | 22 | 2950 | 38.9 | 91.9 | 92.5 | 92.1 | 0.89 | 71.4 | 4.1 | 9.9 | 3.0 | 61.66 | 122 |
| WSH Type 4 pole - 1500 min⁻¹ | | | | | | | | | | | | | |
| 80 b | 0.75 | 1430 | 1.7 | 77.3 | 80.1 | 80.2 | 0.78 | 4.96 | 2.9 | 6.2 | 3.4 | 2.789 | 13.4 |
| 90S a | 1.1 | 1420 | 2.5 | 80.9 | 82.7 | 82.1 | 0.76 | 7.40 | 2.4 | 5.3 | 2.9 | 2.566 | 15.5 |
| 90L a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 83.8 | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 3.327 | 18.4 |
| 100L a | 2.2 | 1430 | 5.0 | 83.7 | 85.3 | 84.7 | 0.75 | 14.7 | 2.6 | 5.7 | 3.2 | 5.036 | 23.0 |
| 100L b | 3 | 1430 | 6.8 | 85.1 | 86.4 | 85.8 | 0.75 | 19.9 | 2.8 | 6.0 | 3.4 | 6.446 | 26.9 |
| 112M a | 4 | 1435 | 8.2 | 87.2 | 87.9 | 87.1 | 0.81 | 26.6 | 2.4 | 6.3 | 3.2 | 11.08 | 33.6 |
| 132S b | 5.5 | 1445 | 11.0 | 89.2 | 89.3 | 88.2 | 0.82 | 36.4 | 2.3 | 5.7 | 2.7 | 24.79 | 49.3 |
| 132M b | 7.5 | 1450 | 14.8 | 90.0 | 90.1 | 89.1 | 0.82 | 49.4 | 2.4 | 6.1 | 2.7 | 32.74 | 60.7 |
| 160M b | 11 | 1470 | 22.1 | 89.9 | 90.8 | 90.4 | 0.79 | 71.4 | 2.8 | 6.5 | 2.6 | 65.67 | 89.6 |
| 160L a | 15 | 1470 | 29.0 | 91.1 | 91.6 | 91.1 | 0.82 | 97.3 | 2.6 | 6.5 | 2.8 | 85.48 | 109 |
| WSH Type 6 pole - 1000 min⁻¹ | | | | | | | | | | | | | |
| 90L a | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 77.9 | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 5.421 | 18.1 |
| 100L r | 1.1 | 940 | 2.7 | 76.5 | 79.1 | 78.7 | 0.73 | 11.0 | 2.3 | 4.9 | 2.9 | 8.032 | 21.0 |
| 100L a | 1.5 | 940 | 3.7 | 78.4 | 80.5 | 80.1 | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 10.59 | 24.9 |
| 112M a | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 82.4 | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 16.51 | 32.2 |
| 132S a | 3 | 960 | 6.8 | 83.6 | 84.7 | 83.9 | 0.76 | 30.0 | 1.6 | 5.0 | 2.6 | 27.20 | 42.9 |
| 132M a | 4 | 960 | 8.9 | 84.8 | 86.0 | 85.3 | 0.76 | 39.7 | 1.6 | 5.4 | 2.9 | 34.77 | 50.9 |
| 132M b | 5.5 | 960 | 12.4 | 85.5 | 86.7 | 86.2 | 0.75 | 54.5 | 1.8 | 5.6 | 2.9 | 45.65 | 61.3 |
| 160M b | 7.5 | 965 | 15.3 | 87.7 | 88.4 | 87.7 | 0.80 | 74.4 | 2.2 | 5.9 | 2.8 | 89.20 | 85.2 |
| 160L a | 11 | 965 | 22.4 | 88.7 | 89.6 | 89.0 | 0.79 | 108.3 | 2.4 | 6.8 | 3.3 | 126.4 | 109 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Mounting arrangement IM B3

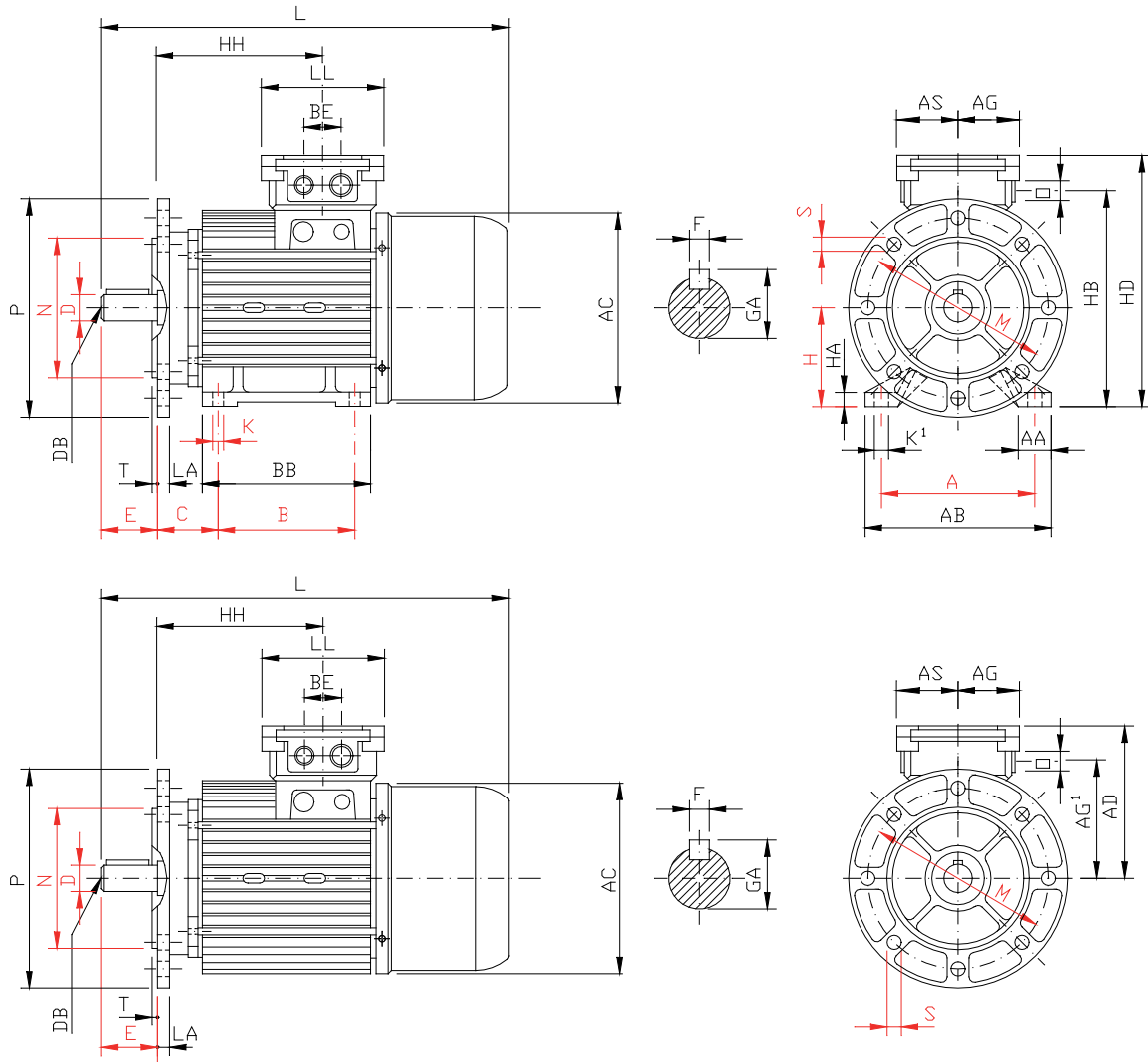
Three-phase motors WS.. Type – with forced ventilation three-phase motor



| Motor size | Coupling | | | | | | | | | Overall | | | | | | | | Shaft end | | | | |
|------------|----------|----|-----|-----|----|-----|-----|-----|----|---------|-----|-----|-----|-----|-----|-----|-------------|-----------|-----|-----|----|------|
| | A | AA | AB | B | BA | BB | C | H | K | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 80 | 125 | 28 | 152 | 100 | 30 | 124 | 50 | 80 | 9 | 156 | 102 | 182 | 202 | 117 | 376 | 102 | M20xM25x1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 32 | 130 | 56 | 90 | 9 | 176 | 102 | 197 | 219 | 127 | 395 | 102 | M20xM25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 32 | 155 | 56 | 90 | 9 | 176 | 102 | 197 | 219 | 152 | 420 | 102 | M20xM25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 35 | 163 | 63 | 100 | 12 | 194 | 102 | 220 | 241 | 171 | 461 | 102 | M20xM25x1.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 40 | 183 | 70 | 112 | 12 | 220 | 134 | 255 | 280 | 175 | 485 | 134 | M32xM32x1.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 40 | 180 | 89 | 132 | 12 | 260 | 134 | 303 | 328 | 206 | 560 | 134 | M32xM32x1.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 40 | 218 | 89 | 132 | 12 | 260 | 134 | 303 | 328 | 244 | 598 | 134 | M32xM32x1.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 57 | 261 | 108 | 160 | 14 | 310 | 176 | 360 | 395 | 234 | 738 | 176 | M32xM32x1.5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 57 | 305 | 108 | 160 | 14 | 310 | 176 | 360 | 395 | 278 | 782 | 176 | M32xM32x1.5 | 42 | M16 | 110 | 12 | 45 |

Mounting arrangement IM B35 - IM B5

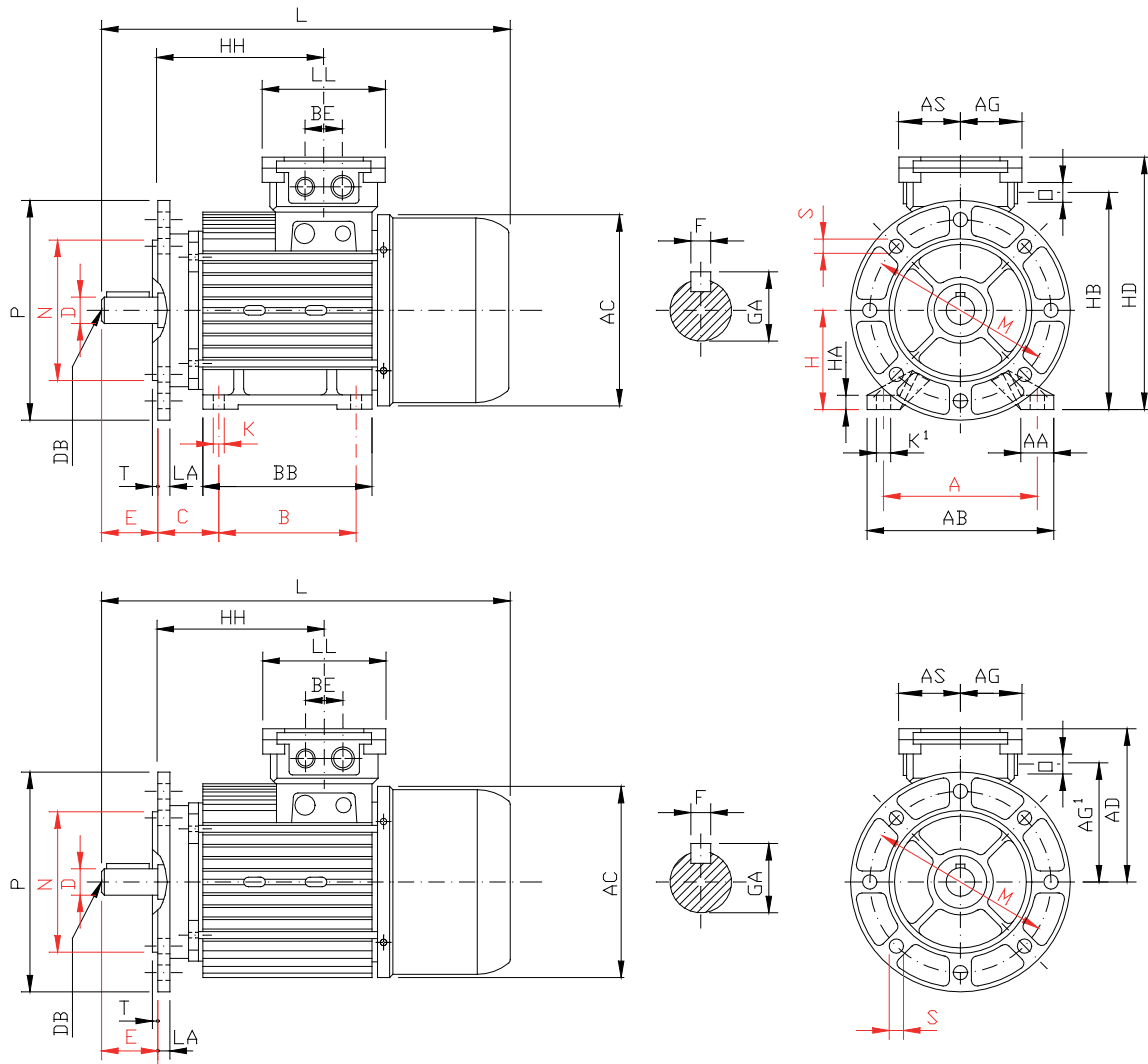
Three-phase motors WS.. Type – with forced ventilation three-phase motor



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 80 | 156 | 125 | 51 | 102 | 51 | 39 | 182 | 202 | 117 | 376 | 102 | M20+M25 x 1.5 |
| 90S | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 127 | 395 | 102 | M20+M25 x 1.5 |
| 90L | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 152 | 420 | 102 | M20+M25 x 1.5 |
| 100L | 194 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 171 | 461 | 102 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 175 | 485 | 134 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 206 | 560 | 134 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 67 | 171 | 67 | 45 | 303 | 328 | 244 | 598 | 134 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 234 | 738 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 278 | 782 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B35 - IM B5

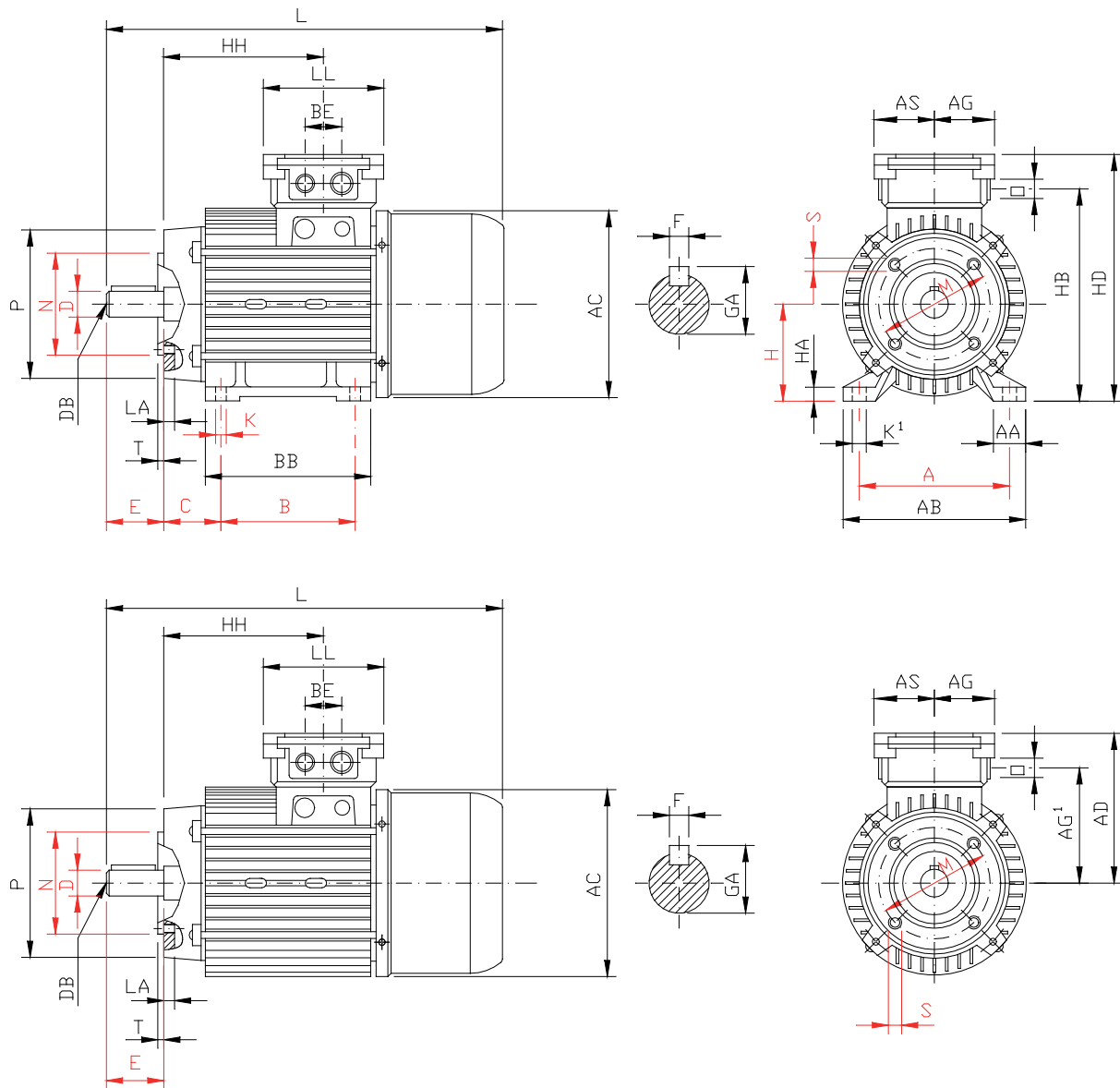
Three-phase motors WS.. Type – with forced ventilation three-phase motor



| Motor size | Accoppiamento | | | | | | | | | | | Albero | | | | | | | | | | |
|------------|---------------|----|-----|-----|-----|-----|-----|-----|----|----|----|--------|-----|-----|-----|----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | LA | M | N | P | S | T | D | DB | E | F | GA |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 221 | 112 | 14 | 12 | 19 | 12 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 258 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 258 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 318 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 318 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 12.5 |

Mounting arrangement IM B34 - IM B14

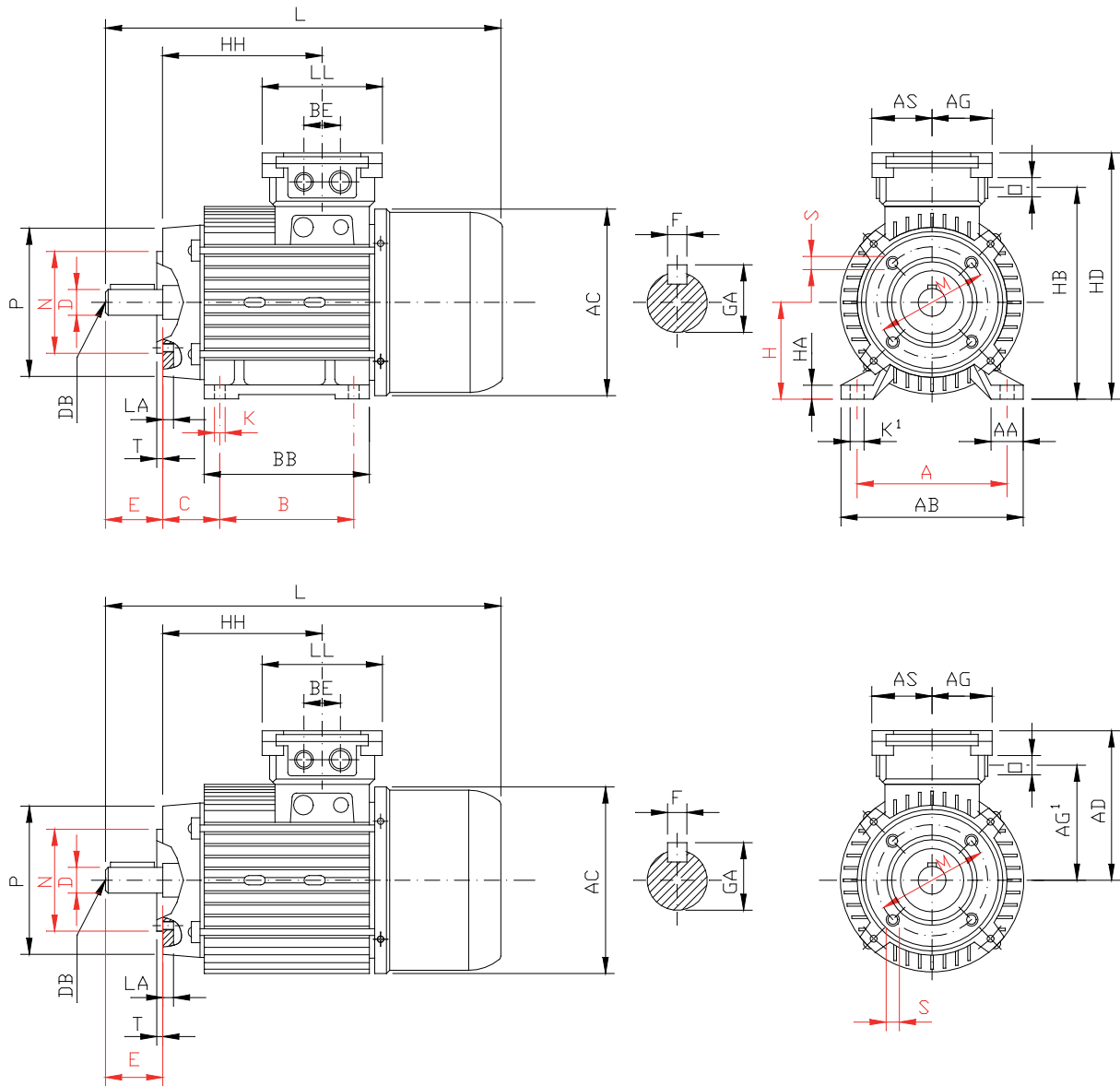
Three-phase motors WS.. Type – with forced ventilation three-phase motor



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 80 | 156 | 125 | 51 | 102 | 51 | 39 | 182 | 202 | 117 | 376 | 102 | M20+M25 x 1.5 |
| 90S | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 127 | 395 | 102 | M20+M25 x 1.5 |
| 90L | 176 | 129 | 51 | 107 | 51 | 39 | 197 | 219 | 152 | 420 | 102 | M20+M25 x 1.5 |
| 100L | 194 | 141 | 51 | 120 | 51 | 39 | 220 | 241 | 171 | 461 | 102 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 67 | 143 | 67 | 45 | 255 | 280 | 175 | 485 | 134 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 67 | 173 | 67 | 45 | 303 | 328 | 206 | 560 | 134 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 67 | 173 | 67 | 45 | 303 | 328 | 244 | 598 | 134 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 234 | 738 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 278 | 782 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B34 - IM B14

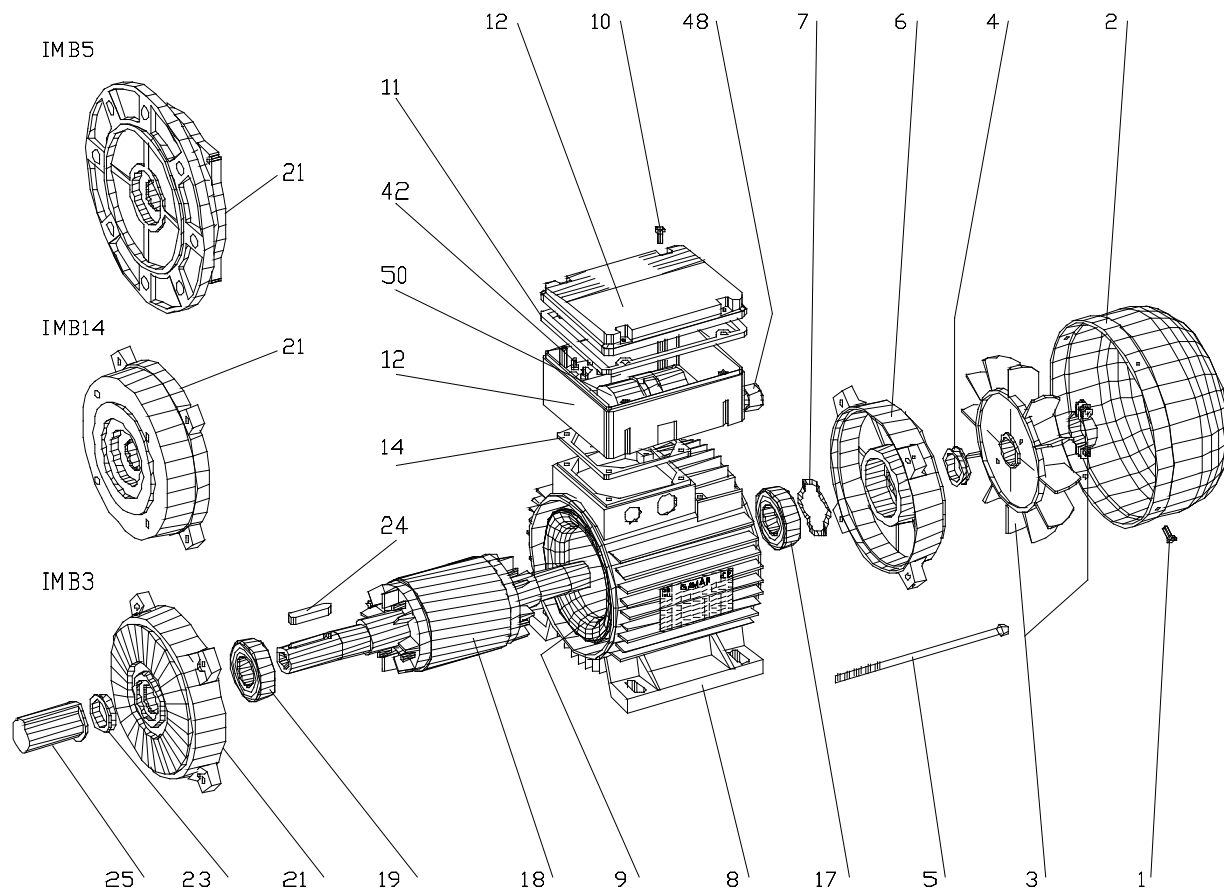
Three-phase motors WS.. Type – with forced ventilation three-phase motor



| Motor size | Accoppiamento | | | | | | | | | | | | Albero | | | | | | | | | |
|------------|---------------|----|-----|-----|-----|-----|-----|-----|----|----|----------------|----|--------|-----|-----|-----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 221 | 112 | 14 | 12 | 19 | 13 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 258 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 258 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 318 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 318 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 12.5 |

Asynchronous single-phase motors

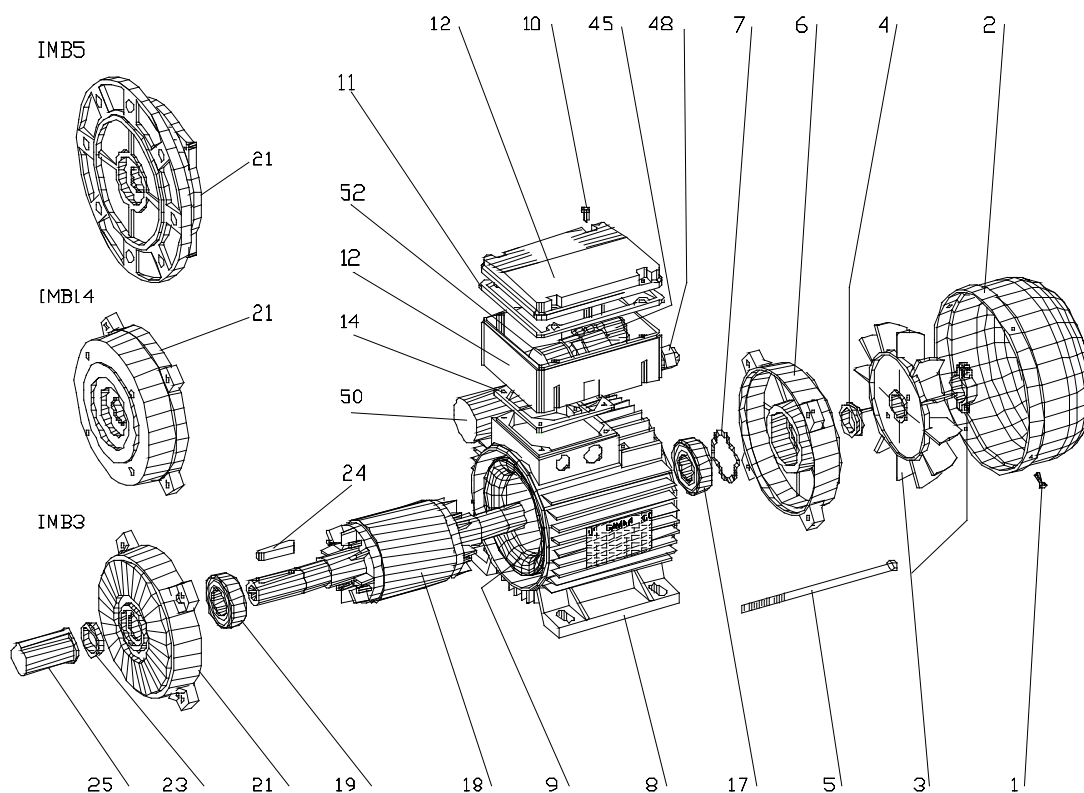
Single-phase motor - ZCO and ZCB Type



Spare parts nomenclature

- | | |
|------------------------------------|--------------------|
| 1. Screw for fan cover | 42. Terminal board |
| 2. Fan cover | 48. Cable gland |
| 3. Fan | 50. Run capacitor |
| 4. Sealing ring | |
| 5. Rod | |
| 6. N-end shield | |
| 7. Spring ring | |
| 8. Frame | |
| 9. Stator package | |
| 10. Screw for capacitor box cover | |
| 11. Gasket for capacitor box cover | |
| 12. Capacitor box | |
| 14. Gasket for capacitor box | |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |

Single-phase motor - ZIT and ZIV Type



Spare parts nomenclature

- | | |
|------------------------------------|---------------------|
| 1. Screw for fan cover | 45. Switch |
| 2. Fan cover | 48. Cable gland |
| 3. Fan | 50. Run capacitor |
| 4. Sealing ring | 52. Start capacitor |
| 5. Rod | |
| 6. N-end shield | |
| 7. Spring ring | |
| 8. Frame | |
| 9. Stator package | |
| 10. Screw for capacitor box cover | |
| 11. Gasket for capacitor box cover | |
| 12. Capacitor box | |
| 14. Gasket for capacitor box | |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |

Connection for motors ZCO Type

Single-phase motors with permanent capacitor



Connection for motors ZCB Type

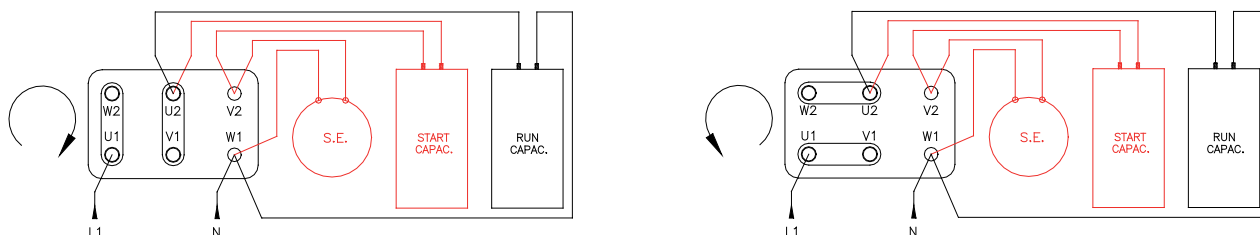
Single-phase motors with permanent capacitor - with balanced windings



Connection for motors ZSE Type

Single-phase motors with electromechanical relay for high starting torque

Suitable for insertions with at least 2 minute-interval



Connection for motors ZSE Type

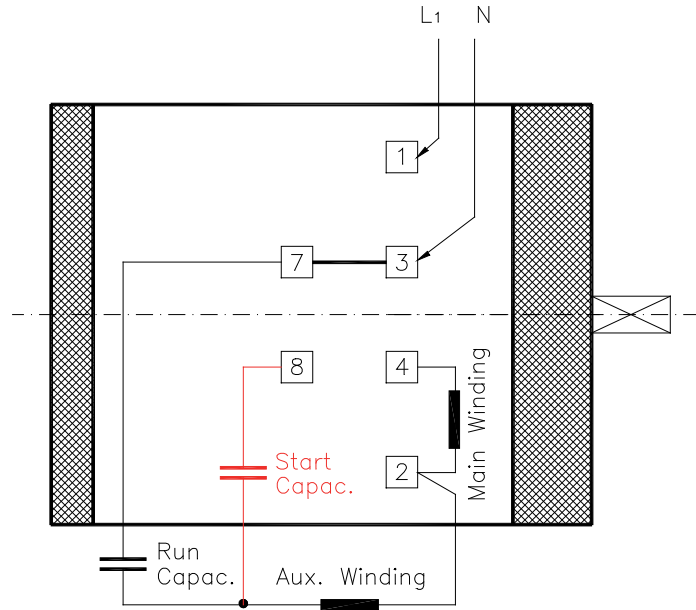
Single-phase motors with electronic starter for high starting torque

Suitable for insertions with about 6 second-interval



Connection for motors ZIT Type

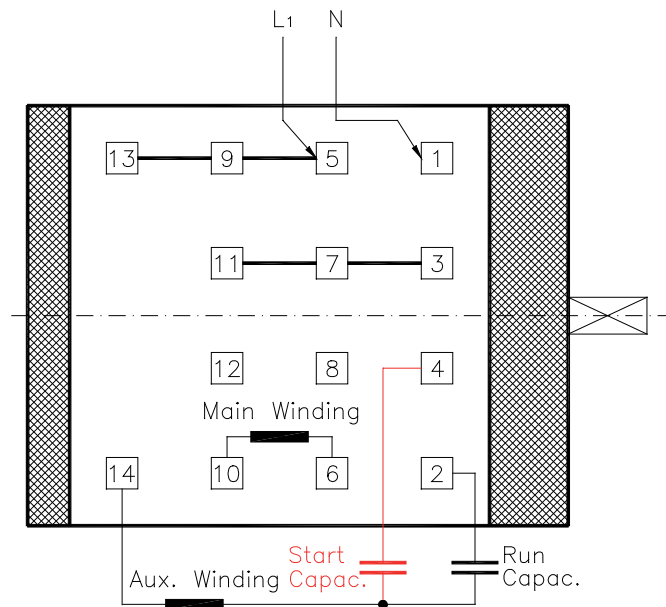
Single-phase motors with switch for high starting torque
 With run capacitor + start capacitor



To reverse rotation, interchange the wires of the main winding

Connection for motors ZIV Type

Single-phase motors with reversing switch for high starting torque
 With run capacitor + start capacitor



Single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| ZCO Type 2 pole - 3000 min¹ | | | | | | | | | | | | |
|---|--------------------------|---|---------|--------|-------|----------|----------------------------------|-------|-------|------------------------------|--|--------------------|
| Motor size | Rated output Pn kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor V 450 μF | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | In A | η % | cos φ | Mn Nm | Ms/Mn | Is/In | Mm/Mn | | | |
| 56 a | 0.09 | 2700 | 0.73 | 55.8 | 0.96 | 0.32 | 0.55 | 2.2 | 1.6 | 3.15 | 0.073 | 2.8 |
| 56 b | 0.12 | 2740 | 0.96 | 56.6 | 0.96 | 0.42 | 0.56 | 2.3 | 1.5 | 4 | 0.087 | 3.1 |
| 63 a | 0.18 | 2850 | 1.35 | 61.0 | 0.95 | 0.60 | 0.65 | 3.6 | 2.1 | 6.3 | 0.129 | 3.9 |
| 63 b | 0.25 | 2860 | 1.74 | 67.2 | 0.93 | 0.84 | 0.65 | 3.8 | 2.1 | 8 | 0.162 | 4.5 |
| 63 c | 0.37 | 2870 | 2.5 | 67.7 | 0.95 | 1.23 | 0.67 | 3.9 | 2.3 | 12.5 | 0.206 | 5.3 |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 0.56 | 3.1 | 1.9 | 12.5 | 0.342 | 5.9 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 0.54 | 3.1 | 1.8 | 16 | 0.424 | 6.9 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 0.50 | 3.8 | 1.8 | 20 | 0.505 | 7.8 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 0.64 | 3.5 | 1.9 | 20 | 0.704 | 7.9 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 0.65 | 3.7 | 1.9 | 25 | 0.923 | 9.4 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 0.65 | 3.7 | 2.0 | 31.5 | 1.153 | 11.0 |
| 90S a | 1.1 | 2830 | 7.4 | 71.8 | 0.90 | 3.71 | 0.61 | 3.8 | 2.2 | 35 | 1.266 | 12.4 |
| 90L a | 1.5 | 2840 | 10.0 | 72.5 | 0.90 | 5.05 | 0.62 | 4.1 | 2.3 | 40 | 1.619 | 14.9 |
| 90L b | 1.8 | 2840 | 11.2 | 77.2 | 0.93 | 6.05 | 0.62 | 4.2 | 2.4 | 50 | 1.888 | 16.8 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 0.61 | 3.4 | 2.2 | 50 | 2.666 | 18.9 |
| ZCO Type 4 pole - 1500 min¹ | | | | | | | | | | | | |
| 56 a | 0.06 | 1360 | 0.65 | 42.7 | 0.94 | 0.42 | 0.65 | 1.7 | 1.4 | 3.15 | 0.117 | 2.8 |
| 56 b | 0.09 | 1360 | 0.96 | 45.3 | 0.90 | 0.63 | 0.61 | 2.0 | 1.5 | 5 | 0.151 | 3.1 |
| 63 a | 0.09 | 1400 | 0.80 | 54.3 | 0.90 | 0.61 | 0.62 | 2.3 | 1.8 | 4 | 0.206 | 3.8 |
| 63 b | 0.12 | 1400 | 1.0 | 58.0 | 0.90 | 0.82 | 0.62 | 2.5 | 1.8 | 5 | 0.263 | 4.4 |
| 63 c | 0.18 | 1400 | 1.4 | 60.1 | 0.93 | 1.23 | 0.62 | 2.5 | 1.8 | 8 | 0.326 | 5.1 |
| 71 a | 0.18 | 1370 | 1.7 | 51.2 | 0.90 | 1.26 | 0.72 | 2.4 | 1.7 | 10 | 0.687 | 5.8 |
| 71 b | 0.25 | 1370 | 2.1 | 55.7 | 0.93 | 1.74 | 0.74 | 2.4 | 1.8 | 12.5 | 0.800 | 6.4 |
| 71 c | 0.37 | 1370 | 2.7 | 64.1 | 0.93 | 2.58 | 0.78 | 2.6 | 1.8 | 20 | 1.175 | 8.3 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 0.55 | 2.8 | 1.6 | 14 | 1.499 | 7.6 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 0.64 | 3.1 | 1.8 | 16 | 2.043 | 9.2 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 0.55 | 2.9 | 1.8 | 20 | 2.517 | 10.7 |
| 90L a | 1.1 | 1370 | 7.2 | 73.0 | 0.91 | 7.67 | 0.56 | 3.3 | 1.8 | 35 | 2.843 | 14.3 |
| 90L b | 1.5 | 1380 | 9.5 | 73.8 | 0.93 | 10.4 | 0.56 | 3.4 | 1.9 | 40 | 3.327 | 16.2 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 0.44 | 3.5 | 1.8 | 35 | 4.637 | 18.9 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 0.45 | 3.6 | 1.9 | 50 | 60.34 | 22.9 |
| ZCO Type 6 pole - 1000 min¹ | | | | | | | | | | | | |
| 63 b | 0.06 | 930 | 0.75 | 35.5 | 0.98 | 0.62 | 1.00 | 1.6 | 1.7 | 6.3 | 0.263 | 4.4 |
| 63 c | 0.09 | 930 | 0.98 | 42.0 | 0.95 | 0.92 | 0.80 | 1.8 | 1.7 | 8 | 0.326 | 5.1 |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 0.65 | 1.9 | 1.6 | 10 | 0.687 | 5.7 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 0.65 | 1.9 | 1.6 | 14 | 0.800 | 6.3 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 0.53 | 2.6 | 1.7 | 14 | 1.499 | 7.6 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 0.53 | 2.7 | 1.7 | 16 | 2.043 | 9.1 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 0.52 | 2.7 | 1.7 | 25 | 2.517 | 10.6 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 0.51 | 2.6 | 1.7 | 25 | 2.210 | 11.7 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 0.51 | 2.8 | 1.7 | 35 | 2.843 | 14.2 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 0.41 | 3.3 | 1.7 | 35 | 6.054 | 19.2 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 0.42 | 3.5 | 1.7 | 50 | 7.720 | 22.6 |

Mn = Full load torque

Ms = Locked rotor torque

Mm = Maximum torque

In = Rated load current

Is = Locked rotor current

Single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| ZCB Type | | 4 pole - 1500 min¹ | | | | | | | | | | |
|-----------------|--------------------------------|--|------------------|------|-------|-------------------|----------------------------------|---------------------|-----|--------------------------------|-----------------------|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor I _n A | Moment of inertia η % | Mass (IM B3) cos φ |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | P _n kW | n min ⁻¹ | η % | | | |
| 63 a | 0.09 | 1420 | 0.80 | 51.0 | 0.96 | 0.61 | 0.62 | 2.4 | 1.5 | 6.3 | 0.206 | 3.8 |
| 63 b | 0.12 | 1420 | 1.07 | 51.9 | 0.94 | 0.81 | 0.54 | 2.4 | 1.8 | 8 | 0.263 | 4.4 |
| 63 c | 0.18 | 1400 | 1.4 | 58.2 | 0.96 | 1.23 | 0.56 | 2.5 | 1.7 | 10 | 0.326 | 5.2 |
| 71 a | 0.18 | 1370 | 1.4 | 57.0 | 0.98 | 1.26 | 0.93 | 2.3 | 1.7 | 12.5 | 0.687 | 5.8 |
| 71 b | 0.25 | 1370 | 1.9 | 58.4 | 0.98 | 1.74 | 0.92 | 2.4 | 1.7 | 16 | 0.800 | 6.4 |
| 71 c | 0.37 | 1380 | 2.6 | 64.5 | 0.96 | 2.56 | 0.92 | 2.9 | 1.7 | 20 | 1.175 | 8.3 |
| 80 a | 0.37 | 1360 | 2.8 | 61.1 | 0.94 | 2.60 | 0.56 | 1.9 | 1.5 | 20 | 1.499 | 7.6 |
| 80 b | 0.55 | 1360 | 4.2 | 61.2 | 0.93 | 3.86 | 0.54 | 2.1 | 1.7 | 31.5 | 2.043 | 9.2 |
| 80 c | 0.75 | 1360 | 5.0 | 67.9 | 0.96 | 5.27 | 0.54 | 2.2 | 1.6 | 40 | 2.517 | 10.7 |
| 90S a | 0.75 | 1390 | 5.2 | 65.3 | 0.93 | 5.15 | 0.82 | 2.2 | 1.8 | 40 | 2.210 | 11.8 |
| 90L a | 1.1 | 1370 | 6.7 | 72.8 | 0.98 | 7.67 | 0.66 | 2.6 | 1.6 | 45 | 2.843 | 14.3 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Single-phase motors with electromechanical relay for high starting torque

Suitable for insertions at least 2 minute-interval.

With permanent capacitor + start capacitor.

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| ZSE Type 2 pole - 3000 min¹ | | | | | | | | | | | | | |
|---|--------------------------|---|---------|--------|-------|----------|----------------------------------|-------|-------|-----------------------------|-------------------------------|--|--------------------|
| Motor size | Rated output Pn kW | Technical data at rated output V 230 – Hz 50 | | | | | Direct insertion characteristics | | | Run capacit. V 450 µF | Start capacit. V 250 µF | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | In A | η % | cos φ | Mn Nm | Ms/Mn | Is/In | Mm/Mn | | | | |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 2.0 | 4.1 | 1.9 | 12.5 | 80-100 | 0.342 | 6.0 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 2.0 | 4.1 | 1.8 | 16 | 80-100 | 0.424 | 7.0 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 2.0 | 4.8 | 1.8 | 20 | 80-100 | 0.505 | 7.9 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 2.0 | 4.5 | 1.9 | 20 | 80-100 | 0.704 | 7.9 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 2.0 | 4.8 | 1.9 | 25 | 80-100 | 0.923 | 9.5 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 2.0 | 4.8 | 2.0 | 31.5 | 100-125 | 1.153 | 11.1 |
| 90S a | 1.5 | 2880 | 9.3 | 77.1 | 0.91 | 4.98 | 2.0 | 4.8 | 2.4 | 40 | 125-156 | 1.266 | 12.5 |
| 90L a | 1.8 | 2900 | 11.0 | 78.6 | 0.93 | 5.93 | 2.0 | 5.0 | 2.5 | 40 | 125-156 | 1.619 | 15.0 |
| 90L b | 2.2 | 2900 | 13.0 | 79.1 | 0.93 | 7.25 | 2.0 | 5.1 | 2.5 | 50 | 156-200 | 1.888 | 16.9 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 2.0 | 4.6 | 2.2 | 50 | 156-200 | 2.666 | 19.0 |
| ZSE Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
| 71 a | 0.25 | 1350 | 1.9 | 61.5 | 0.93 | 1.77 | 2.0 | 4.2 | 1.6 | 10 | 50-63 | 0.687 | 5.9 |
| 71 b | 0.37 | 1350 | 2.7 | 62.1 | 0.96 | 2.62 | 2.0 | 4.2 | 1.7 | 12.5 | 50-63 | 0.800 | 6.6 |
| 71 c | 0.55 | 1360 | 3.6 | 68.5 | 0.97 | 3.86 | 2.0 | 4.2 | 1.5 | 20 | 50-63 | 1.175 | 8.4 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 2.0 | 3.8 | 1.6 | 14 | 50-63 | 1.499 | 7.7 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 2.0 | 4.0 | 1.8 | 16 | 50-63 | 2.043 | 9.2 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 2.0 | 4.1 | 1.8 | 20 | 80-100 | 2.517 | 10.7 |
| 90S a | 1.1 | 1400 | 7.2 | 69.2 | 0.96 | 7.50 | 2.0 | 3.8 | 1.5 | 31.5 | 100-125 | 2.210 | 11.9 |
| 90L a | 1.5 | 1420 | 9.5 | 74.6 | 0.92 | 10.1 | 2.0 | 4.5 | 1.7 | 35 | 100-125 | 2.843 | 14.4 |
| 90L b | 1.8 | 1410 | 11.2 | 77.2 | 0.93 | 12.2 | 2.0 | 4.3 | 1.7 | 40 | 125-156 | 3.327 | 16.4 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 2.0 | 4.5 | 1.8 | 35 | 156-200 | 4.637 | 19.0 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 2.0 | 4.7 | 1.9 | 50 | 156-200 | 6.034 | 23.1 |
| ZSE Type 6 pole - 1000 min¹ | | | | | | | | | | | | | |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 2.0 | 2.4 | 1.6 | 10 | 50-63 | 0.687 | 5.9 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 2.0 | 2.4 | 1.6 | 14 | 50-63 | 0.800 | 6.5 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 2.0 | 3.3 | 1.7 | 14 | 50-63 | 1.499 | 7.7 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 2.0 | 3.5 | 1.7 | 16 | 50-63 | 2.043 | 9.2 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 2.0 | 3.5 | 1.7 | 25 | 50-63 | 2.517 | 10.7 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 2.0 | 3.4 | 1.7 | 25 | 50-63 | 2.210 | 11.8 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 2.0 | 3.6 | 1.7 | 35 | 80-100 | 2.843 | 14.3 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 2.0 | 4.2 | 1.7 | 35 | 125-156 | 6.054 | 19.3 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 2.0 | 4.5 | 1.7 | 50 | 156-200 | 7.720 | 22.7 |

Mn = Full load torque

Ms = Locked rotor torque

Mm = Maximum torque

In = Rated load current

Is = Locked rotor current

Single-phase motors with electronic starter for high starting torque

Suitable for insertions with about 6 second-interval.

With permanent capacitor + start capacitor.

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

| ZSET Type 2 pole - 3000 min¹ | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|--------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|-----------------------------|-------------------------------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 – Hz 50 | | | | | Direct insertion characteristics | | | Run capacit. V 450 μF | Start capacit. V 320 μF | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 2.0 | 4.1 | 1.9 | 12.5 | 50 | 0.342 | 6.3 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 2.0 | 4.1 | 1.8 | 16 | 50 | 0.424 | 7.3 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 2.0 | 4.8 | 1.8 | 20 | 50 | 0.505 | 8.2 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 2.0 | 4.5 | 1.9 | 20 | 50 | 0.704 | 8.3 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 2.0 | 4.8 | 1.9 | 25 | 50 | 0.923 | 9.8 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 2.0 | 4.8 | 2.0 | 31.5 | 50 | 1.153 | 11.4 |
| 90S a | 1.5 | 2880 | 9.3 | 77.1 | 0.91 | 4.98 | 2.0 | 4.8 | 2.4 | 40 | 80 | 1.266 | 12.8 |
| 90L a | 1.8 | 2900 | 11.0 | 78.6 | 0.93 | 5.93 | 2.0 | 5.0 | 2.5 | 40 | 80 | 1.619 | 15.3 |
| 90L b | 2.2 | 2900 | 13.0 | 79.1 | 0.93 | 7.25 | 2.0 | 5.1 | 2.5 | 50 | 80 | 1.888 | 17.2 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 2.0 | 4.6 | 2.2 | 50 | 80 | 2.666 | 19.3 |
| ZSET Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
| 71 a | 0.25 | 1350 | 1.9 | 61.5 | 0.93 | 1.77 | 2.0 | 4.2 | 1.6 | 10 | 50 | 0.687 | 6.3 |
| 71 b | 0.37 | 1350 | 2.7 | 62.1 | 0.96 | 2.62 | 2.0 | 4.2 | 1.7 | 12.5 | 50 | 0.800 | 6.9 |
| 71 c | 0.55 | 1360 | 3.6 | 68.5 | 0.97 | 3.86 | 2.0 | 4.2 | 1.5 | 20 | 50 | 1.175 | 8.8 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 2.0 | 3.8 | 1.6 | 14 | 50 | 1.499 | 8.0 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 2.0 | 4.0 | 1.8 | 16 | 50 | 2.043 | 9.6 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 2.0 | 4.1 | 1.8 | 20 | 50 | 2.517 | 11.0 |
| 90S a | 1.1 | 1400 | 7.2 | 69.2 | 0.96 | 7.50 | 2.0 | 3.8 | 1.5 | 31.5 | 80 | 2.210 | 12.2 |
| 90L a | 1.5 | 1420 | 9.5 | 74.6 | 0.92 | 10.1 | 2.0 | 4.5 | 1.7 | 35 | 80 | 2.843 | 14.7 |
| 90L b | 1.8 | 1410 | 11.2 | 77.2 | 0.93 | 12.2 | 2.0 | 4.3 | 1.7 | 40 | 80 | 3.327 | 16.6 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 2.0 | 4.5 | 1.8 | 35 | 80 | 4.637 | 19.3 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 2.0 | 4.7 | 1.9 | 50 | 80 | 6.034 | 23.3 |
| ZSET Type 6 pole - 1000 min¹ | | | | | | | | | | | | | |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 2.0 | 2.4 | 1.6 | 10 | 50 | 0.687 | 6.2 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 2.0 | 2.4 | 1.6 | 14 | 50 | 0.800 | 6.8 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 2.0 | 3.3 | 1.7 | 14 | 50 | 1.499 | 8.0 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 2.0 | 3.5 | 1.7 | 16 | 50 | 2.043 | 9.5 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 2.0 | 3.5 | 1.7 | 25 | 50 | 2.517 | 11.0 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 2.0 | 3.4 | 1.7 | 25 | 80 | 2.210 | 12.1 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 2.0 | 3.6 | 1.7 | 35 | 80 | 2.843 | 14.6 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 2.0 | 4.2 | 1.7 | 35 | 80 | 6.054 | 19.6 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 2.0 | 4.5 | 1.7 | 50 | 80 | 7.720 | 23.0 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Single-phase motors with switch for high starting torque

With permanent capacitor + start capacitor.

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Note:

On request we supply motors with reversing gear (**ZIV Type**).

The data of **ZIV Type** correspond of those of the under schedule.

| ZIT Type 2 pole - 3000 min¹ | | | | | | | | | | | | | |
|---|--------------------------------------|---|---------------------|--------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|-----------------------------|-------------------------------|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 – Hz 50 | | | | | Direct insertion characteristics | | | Run capacit. V 450 μF | Start capacit. V 250 μF | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 2.0 | 4.1 | 1.9 | 12.5 | 80-100 | 0.342 | 6.2 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 2.0 | 4.1 | 1.8 | 16 | 80-100 | 0.424 | 7.2 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 2.0 | 4.8 | 1.8 | 20 | 80-100 | 0.505 | 8.1 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 2.0 | 4.5 | 1.9 | 20 | 80-100 | 0.704 | 8.2 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 2.0 | 4.8 | 1.9 | 25 | 80-100 | 0.923 | 9.7 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 2.0 | 4.8 | 2.0 | 31.5 | 100-125 | 1.153 | 11.3 |
| 90S a | 1.5 | 2880 | 9.3 | 77.1 | 0.91 | 4.98 | 2.0 | 4.8 | 2.4 | 40 | 125-156 | 1.266 | 12.8 |
| 90L a | 1.8 | 2900 | 11.0 | 78.6 | 0.93 | 5.93 | 2.0 | 5.0 | 2.5 | 40 | 125-156 | 1.619 | 15.3 |
| 90L b | 2.2 | 2900 | 13.0 | 79.1 | 0.93 | 7.25 | 2.0 | 5.1 | 2.5 | 50 | 156-200 | 1.888 | 17.2 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 2.0 | 4.6 | 2.2 | 50 | 156-200 | 2.666 | 19.3 |
| ZIT Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
| 71 a | 0.25 | 1350 | 1.9 | 61.5 | 0.93 | 1.77 | 2.0 | 4.2 | 1.6 | 10 | 50-63 | 0.687 | 6.1 |
| 71 b | 0.37 | 1350 | 2.7 | 62.1 | 0.96 | 2.62 | 2.0 | 4.2 | 1.7 | 12.5 | 50-63 | 0.800 | 6.8 |
| 71 c | 0.55 | 1360 | 3.6 | 68.5 | 0.97 | 3.86 | 2.0 | 4.2 | 1.5 | 20 | 50-63 | 1.175 | 8.6 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 2.0 | 3.8 | 1.6 | 14 | 50-63 | 1.499 | 7.9 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 2.0 | 4.0 | 1.8 | 16 | 50-63 | 2.043 | 9.5 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 2.0 | 4.1 | 1.8 | 20 | 80-100 | 2.517 | 11.0 |
| 90S a | 1.1 | 1400 | 7.2 | 69.2 | 0.96 | 7.50 | 2.0 | 3.8 | 1.5 | 31.5 | 100-125 | 2.210 | 12.2 |
| 90L a | 1.5 | 1420 | 9.5 | 74.6 | 0.92 | 10.1 | 2.0 | 4.5 | 1.7 | 35 | 100-125 | 2.843 | 14.6 |
| 90L b | 1.8 | 1410 | 11.2 | 77.2 | 0.93 | 12.2 | 2.0 | 4.3 | 1.7 | 40 | 125-156 | 3.327 | 16.6 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 2.0 | 4.5 | 1.8 | 35 | 156-200 | 4.637 | 19.3 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 2.0 | 4.7 | 1.9 | 50 | 156-200 | 6.034 | 23.3 |
| ZIT Type 6 pole - 1000 min¹ | | | | | | | | | | | | | |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 2.0 | 2.4 | 1.6 | 10 | 50-63 | 0.687 | 6.1 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 2.0 | 2.4 | 1.6 | 14 | 50-63 | 0.800 | 6.7 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 2.0 | 3.3 | 1.7 | 14 | 50-63 | 1.499 | 7.9 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 2.0 | 3.5 | 1.7 | 16 | 50-63 | 2.043 | 9.4 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 2.0 | 3.5 | 1.7 | 25 | 50-63 | 2.517 | 11.0 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 2.0 | 3.4 | 1.7 | 25 | 50-63 | 2.210 | 12.1 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 2.0 | 3.6 | 1.7 | 35 | 80-100 | 2.843 | 14.6 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 2.0 | 4.2 | 1.7 | 35 | 125-156 | 6.054 | 19.5 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 2.0 | 4.5 | 1.7 | 50 | 156-200 | 7.720 | 23.0 |

M_n = Full load torque

M_s = Locked rotor torque

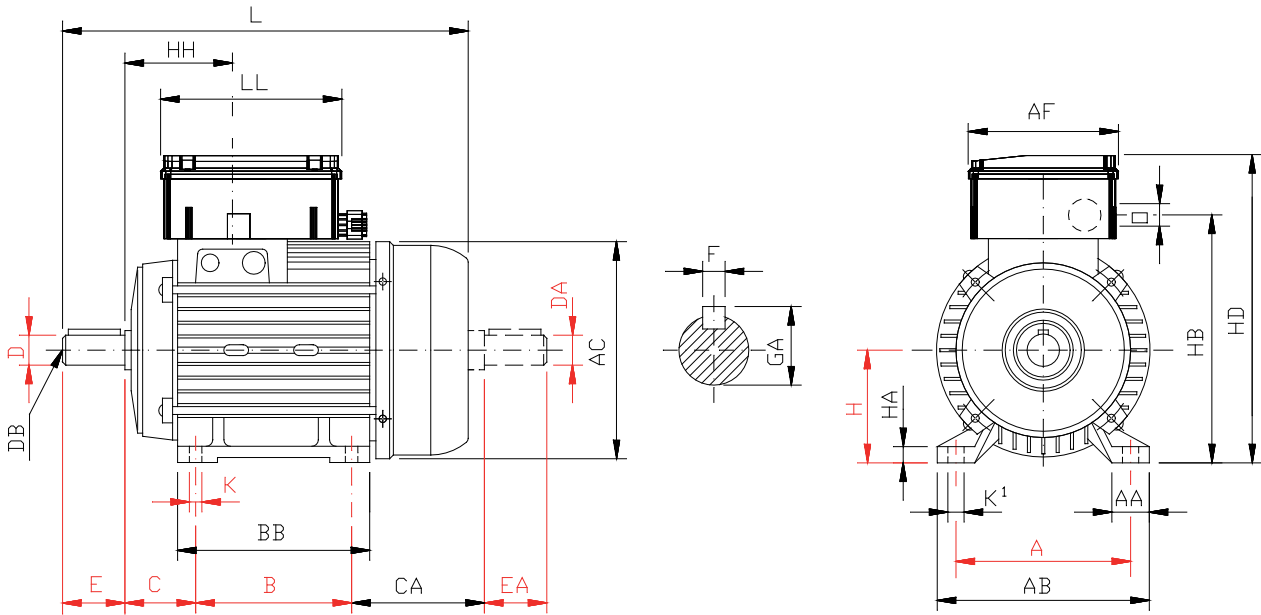
M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Mounting arrangement IM B3

Single-phase motors ZCO and ZCB Type

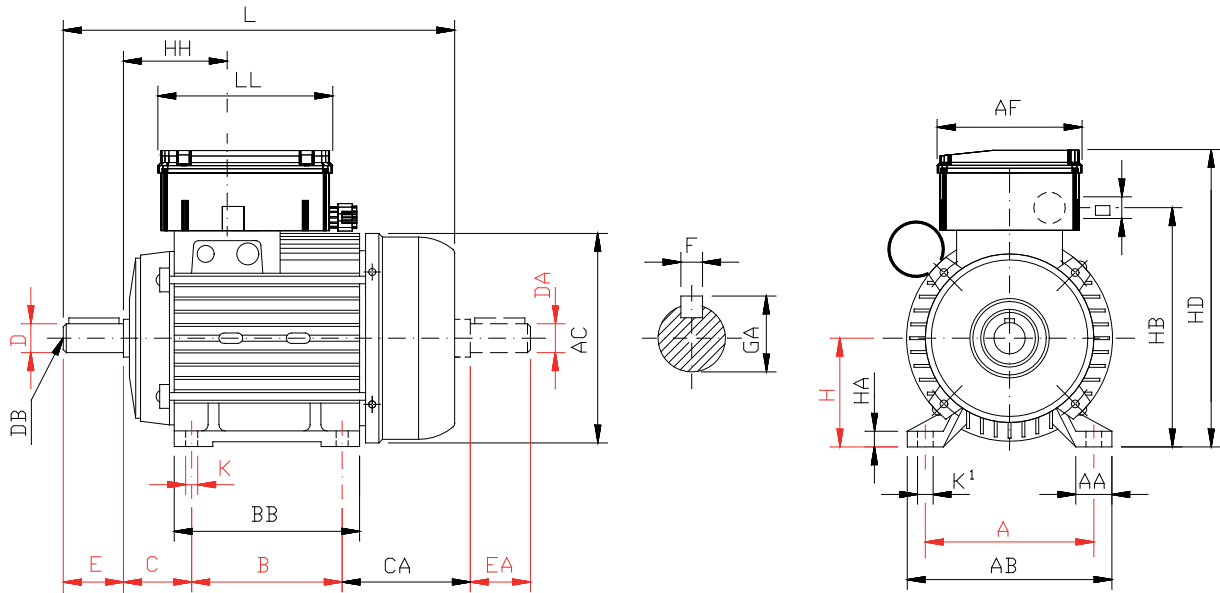


Measures for coupling, IM B5 mounting see page 31
 Measures for coupling, IM B14 mounting see page 33

| Motor size | Coupling | | | | | | | | | | Overall | | | | | | | Shaft end | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|-----|-----|-----|-----|----|-----|-----------|------|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 56 | 90 | 18 | 108 | 71 | 91 | 36 | 66 | 56 | 7 | 7 | 9 | 110 | 92 | 132 | 169 | 65 | 189 | 121 | PG11 | 9 | M3 | 20 | 3 | 10.2 |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 73 | 63 | 7 | 7 | 10 | 124 | 92 | 145 | 178 | 68 | 214 | 121 | PG11 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 8 | 7 | 12 | 141 | 92 | 163 | 197 | 73 | 247 | 121 | PG11 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 11 | 9 | 13 | 160 | 120 | 173 | 226 | 82 | 282 | 145 | PG16 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 305 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 330 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 14 | 12 | 17 | 200 | 120 | 211 | 262 | 96 | 374 | 145 | PG16 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B3

Single-phase motors ZSE and ZSET Type



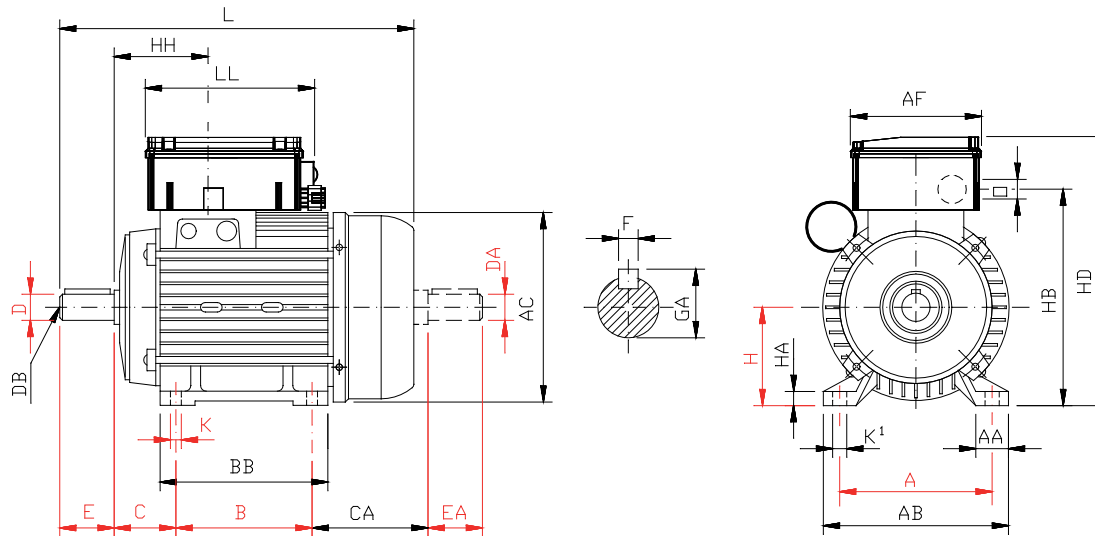
Measures for coupling, IM B5 mounting see page 31
 Measures for coupling, IM B14 mounting see page 33

Note: It is possible, in certain cases, the application of an external capacitor as from the figure.

| Motor size | Coupling | | | | | | | | | | | Overall | | | | | | | | Shaft end | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|---------|-----|-----|-----|----|-----|-----|------|-----------|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 8 | 7 | 12 | 141 | 120 | 155 | 211 | 73 | 247 | 145 | PG16 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 11 | 9 | 13 | 160 | 120 | 173 | 226 | 82 | 282 | 145 | PG16 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 305 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 330 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 14 | 12 | 17 | 200 | 120 | 211 | 262 | 96 | 374 | 145 | PG16 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B3

Single-phase motors ZIT and ZIV Type



Measures for coupling, IM B5 mounting see page 31
 Measures for coupling, IM B14 mounting see page 33

Note: It is possible, in certain cases, the application of an external capacitor as from the figure.

| Motor size | Coupling | | | | | | | | | | | Overall | | | | | | | | Shaft end | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|---------|-----|-----|-----|----|-----|-----|------|-----------|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 85 | 71 | 8 | 7 | 12 | 141 | 120 | 155 | 211 | 73 | 247 | 165 | PG16 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 95 | 80 | 11 | 9 | 13 | 160 | 120 | 173 | 226 | 82 | 282 | 165 | PG16 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 305 | 165 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 102 | 90 | 13 | 9 | 13 | 180 | 120 | 188 | 240 | 86 | 330 | 165 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 115 | 100 | 14 | 12 | 17 | 200 | 120 | 211 | 262 | 96 | 374 | 165 | PG16 | 28 | M10 | 60 | 8 | 31 |

Self-braking three-phase and single-phase motors

Notes and calculations

Calculation of the braking torque

The value of the braking torque M_b required for a particular application is obtained by the formula:

$$M_b = K \cdot \left(\frac{2\pi \cdot n}{60} \cdot \frac{J_t}{t_b} \pm M_l \right)$$

were:

K = Safety factor (~2)

n = Speed of rotation of the motor (min^{-1})

J_t = Total moment of inertia of the rotating shaft reduced ($\text{kg} \cdot \text{m}^2$)

t_b = Time allowed for braking (ms)

M_l = Moment of resistance in Nm load applied ***

*** Use "-" sign in the case of normal or braking loads uphill (who oppose the rotation of the motor).

Use "+" sign in the case of downward loads (which favour the rotation of the motor).

Verification of the heat dissipation

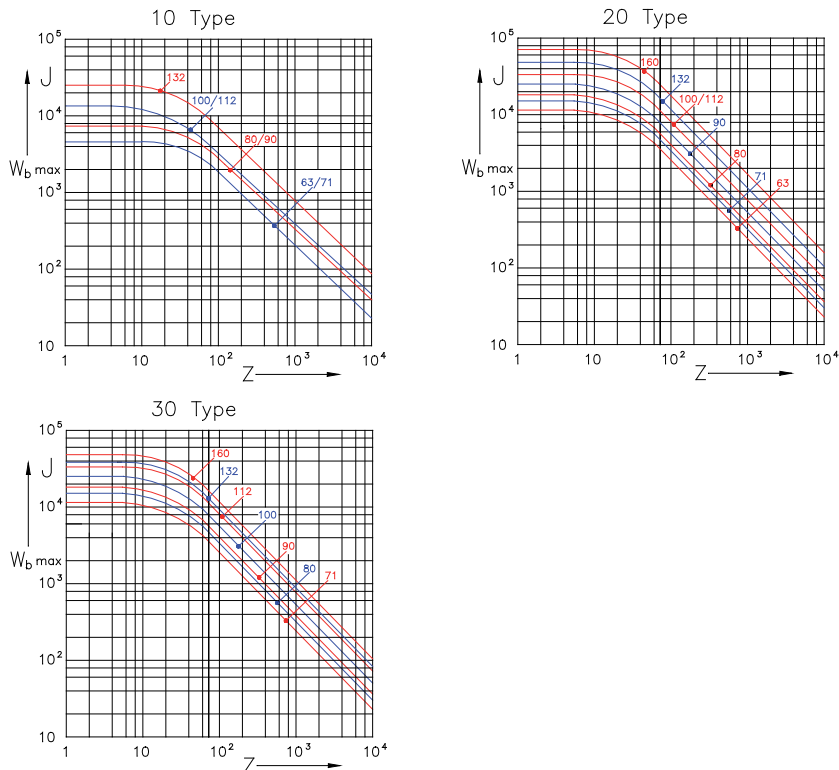
In each cycle, the energy possessed by the braked weight is transformed into heat by friction.

The braking work is calculated using the formula:

$$W_b = \frac{J_t}{2} \cdot \left(\frac{2\pi \cdot n}{60} \right)^2 \cdot \frac{M_b}{M_b \pm M_l}$$

Knowing the braking work W_b , the number of braking/time Z must be less than the planned number of cycles/hour max. eligible for the selected type of brake, detectable by the graphs below W_b max. and Z .

Conversely, the known number of cycles/hour Z , max. eligible W_b must be greater than that calculated.



Notes and calculations

Duration of the friction linings

The wear of the friction surfaces depends on many factors (number of interventions, brake torque, work done at each stop, environmental conditions, etc.).

The indicative number of permitted braking is achieved by the formula:

$$N_t = \frac{W_t}{W_b}$$

While the number allowed to be indicative of braking interval between two adjustments is:

$$N = \frac{W_1}{W_b}$$

The values of and are obtainable from the selected table to the brake.

Number of interventions

In general, the max. number of operations/hour, which can hold up to an motor load can be calculated as follows:

$$Z = K_J \cdot K_m \cdot Z_o$$

where:

K_J = Coefficient detected by the table function J_l/J

K_m = Coefficient detected by the table function M_s/M_l

J_l = Moment of inertia of the load

J = Moment of inertia of the motor

M_l = Moment resistance of the load

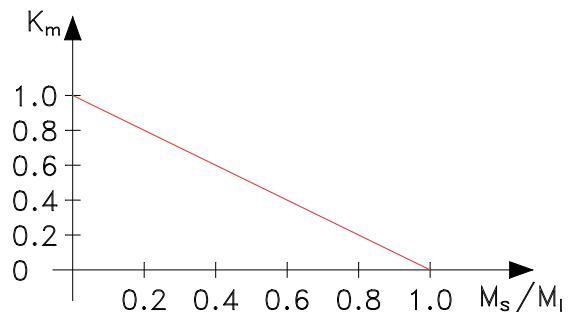
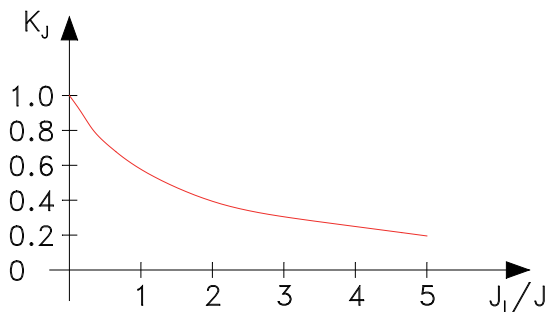
M_s = Starting torque of the motor

Z_o = Number of operation/hour sustainable by the motor without load (see table on page 68).

The number of starts thus calculated must be less than the number of operations/hour eligible by the brake.

If it does not mean that the brake is not able to dissipate the heat generated during braking and therefore reduces the frequency or goodwill, or you have to oversize the brake.

If the value of is close to it is recommended to control the temperature of the motor windings by using, for example, thermal protectors.



Starts per hour with no load

| Motor size | Starts per hour (Zo) - 10S Type | | | | Starts per hour (Zo) - 20S and 30S Type | | | |
|------------|---------------------------------|--------|--------|--------|---|--------|--------|--------|
| | 2 Pole | 4 Pole | 6 Pole | 8 Pole | 2 Pole | 4 Pole | 6 Pole | 8 Pole |
| 63 a | 4200 | 13000 | - | - | 6000 | 18000 | - | - |
| 63 b | 4000 | 12000 | 16000 | - | 5700 | 17000 | 23000 | - |
| 63 c | 3800 | 10500 | 15000 | - | 5500 | 15000 | 21000 | - |
| 71 a | 3800 | 11000 | 15500 | - | 5500 | 16000 | 22000 | - |
| 71 b | 3600 | 10700 | 15000 | 17000 | 5200 | 15500 | 21000 | 24000 |
| 71 c | 3500 | 9800 | 13500 | 16000 | 5000 | 14000 | 19000 | 23000 |
| 80 a | 3800 | 7000 | - | - | 5500 | 10000 | - | - |
| 80 b | 3600 | 6900 | 10500 | 14700 | 5200 | 9800 | 15000 | 21000 |
| 80 c | 3400 | 6600 | 9800 | 14000 | 4800 | 9500 | 14000 | 20000 |
| 90S a | 3000 | 7700 | 9000 | 10500 | 4200 | 11000 | 13000 | 15000 |
| 90S b | 2900 | - | - | - | 4100 | - | - | - |
| 90L a | 2800 | 7000 | 7700 | 9100 | 4000 | 10000 | 11000 | 13000 |
| 90L b | 2600 | 6000 | - | - | 3700 | 8500 | - | - |
| 100L a | 1900 | 5200 | 6300 | 7000 | 2700 | 7400 | 9000 | 10000 |
| 100L b | 1700 | 4800 | 5300 | 5600 | 2500 | 6800 | 7500 | 8000 |
| 112M a | 1100 | 2300 | 3500 | - | 1600 | 3300 | 5000 | - |
| 112M b | 1000 | 2100 | 2800 | 3800 | 1500 | 3000 | 4000 | 5500 |
| 132S a | 450 | - | 1400 | - | 600 | - | 2000 | - |
| 132S b | 390 | 900 | - | 1600 | 550 | 1300 | - | 2300 |
| 132M a | 350 | - | 1260 | - | 500 | - | 1800 | - |
| 132M b | 300 | 770 | 1050 | 1500 | 430 | 1100 | 1500 | 2100 |
| 132M c | - | 700 | - | - | - | 1000 | - | - |
| 160M a | - | - | - | - | - | - | - | 1800 |
| 160M b | - | - | - | - | - | 820 | 1100 | 1700 |
| 160L a | - | - | - | - | - | 750 | 1000 | 1600 |
| 160L b | - | - | - | - | - | - | - | - |

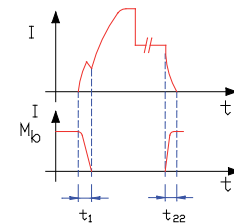
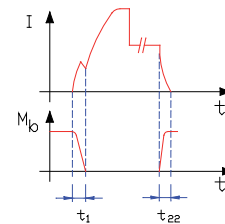
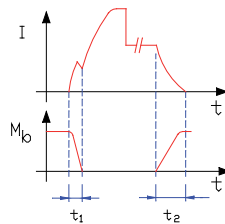
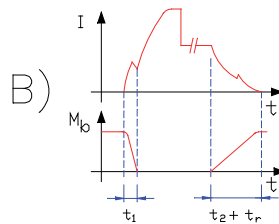
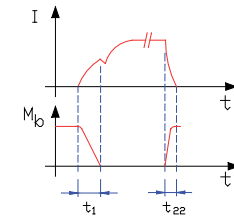
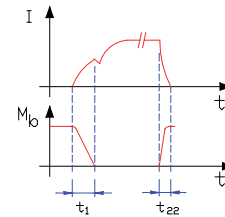
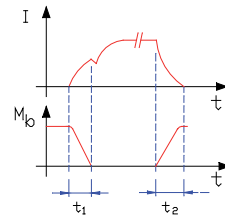
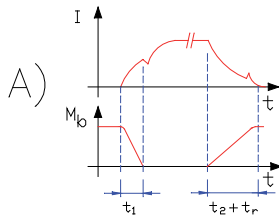
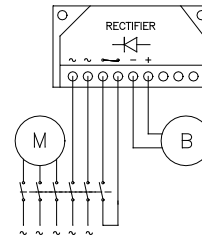
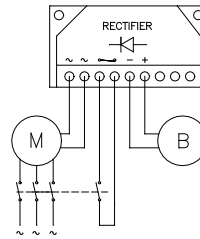
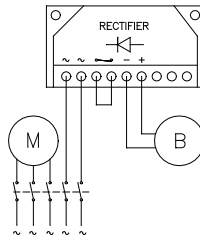
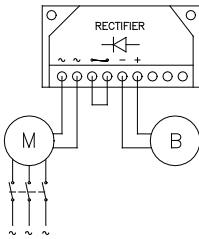
Diagrams of the times of the dc brake

Exemple 1

Exemple 2

Exemple 3

Exemple 4

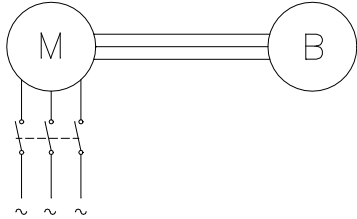


A) = Standard rectifier
B) = Increased rectifier

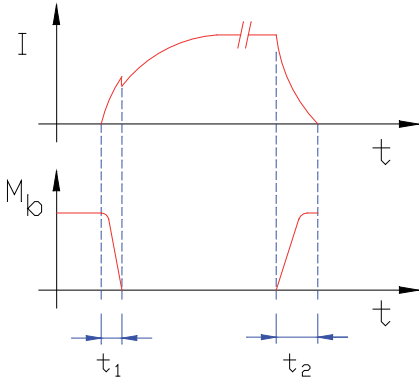
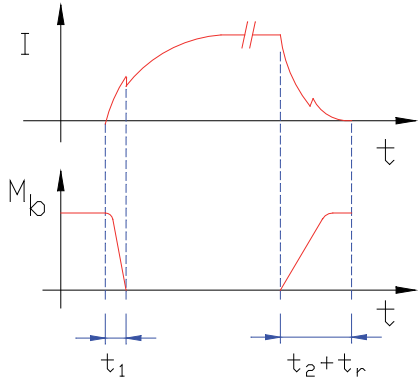
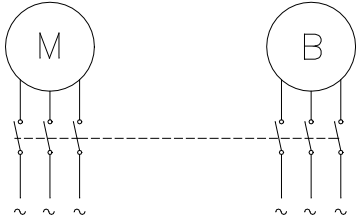
Note: The timing of intervention ($t_1 - t_2 - t_{11} - t_{22}$) are shown in the tables on pages following while the delay time (t_r), since it depends on the inertia of the load and the energy stored by the motor, can not be estimated because it varies from motor to motor.

Diagrams of the times of the ac brake

Exemple 1



Exemple 2



Note: The timing of intervention ($t_1 - t_2$) are shown in the tables on pages following while the delay time (t_r), since it depends on the inertia of the load and the energy stored by the motor, can not be estimated because it varies from motor to motor.

Self-braking three-phase motors Braking-torque fixed

Self-braking three-phase motors - 10.. Type

Typical applications:

- Machines for woodworking.
- Machines with long braking and high braking works.
- Machines that require arrests but not controlled precision.

Mechanical characteristics:

- Small brake.
- Rear brake mounting flange: aluminium.
- Fan cast iron brake.
- Seal friction asbestos-free and silent.
- Braking torques and other technical data: see table below.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power can be independent or derived from the motor, depending on motor type and the needs of employment.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Rated braking torque M_b Nm | Air-gap | | Maximum speed n_{max} min ⁻¹ | Brake life | | Brake release time | | Braking torque rise time *** | | Brake power input P_a W |
|------------|--|----------------------|------------------------|--|----------------------------------|----------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|--|
| | | s_n | s_{max} | | W_f 1) MJ | W₁ 2) | t₁ 3) ms | t₁₁ 4) | t₂ 5) ms | t₂₂ 6) | |
| 63 | 3 | 0.20 | 0.50 | 6000 | 250 | 30 | 30 | 15 | 80 | 8 | 21 |
| 71 | 4 | 0.20 | 0.60 | 6000 | 250 | 40 | 40 | 20 | 100 | 10 | 21 |
| 80 | 7 | 0.20 | 0.60 | 6000 | 375 | 60 | 60 | 30 | 150 | 15 | 34 |
| 90 | 7 | 0.20 | 0.60 | 3600 | 375 | 60 | 60 | 30 | 150 | 15 | 34 |
| 100 | 13 | 0.25 | 0.65 | 3600 | 500 | 80 | 100 | 45 | 250 | 15 | 38 |
| 112 | 13 | 0.25 | 0.65 | 3600 | 500 | 80 | - | 50 | 250 | 25 | 38 |
| 132 | 30 | 0.30 | 0.70 | 3600 | 1650 | 132 | - | 70 | 400 | 40 | 57 |

1) For wear of the friction linings up to a thickness of 1 mm

2) Between two wear adjustments from **s_n** to **s_{max}**

3) With standard rectifier

4) With increased rectifier

5) Opening on ac side

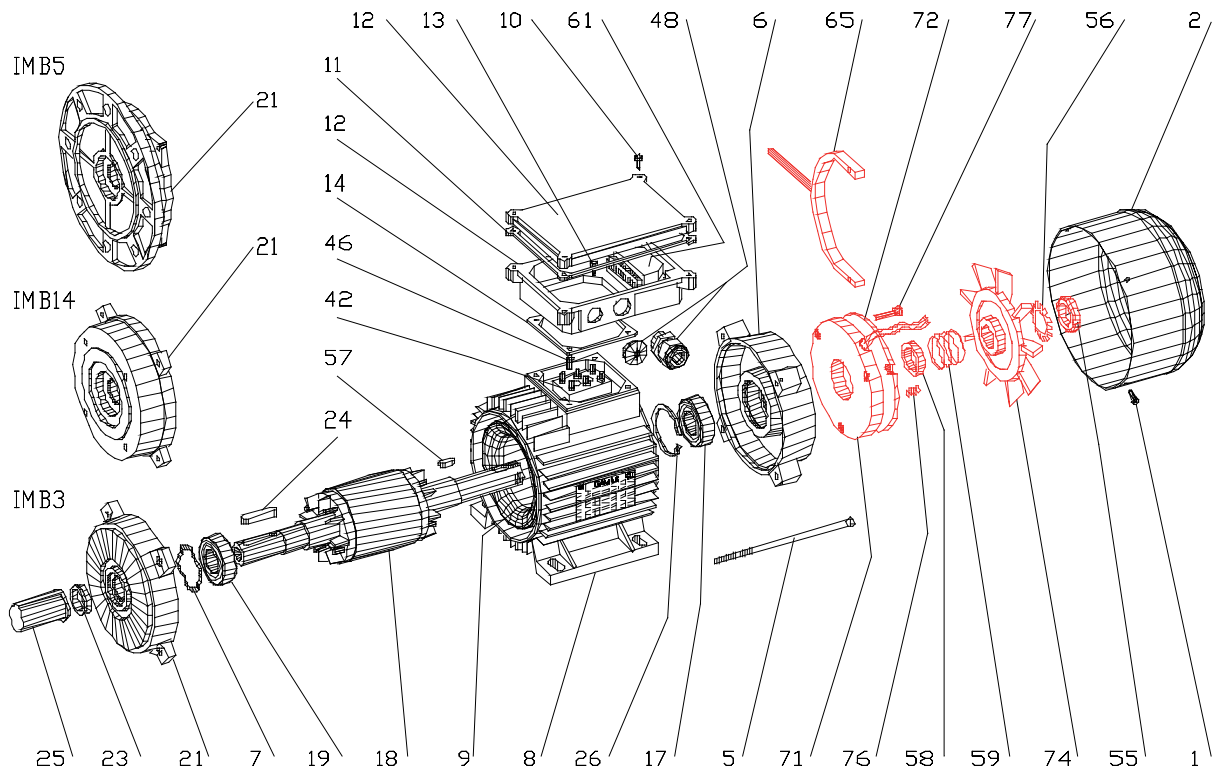
6) Opening on dc side or with rapid rectifier

*** - The time table is valid for a power independent of a brake motor.

If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening or using the dc-side rectifier fast, time is much improved.

For any further information you should contact our Technical Department.

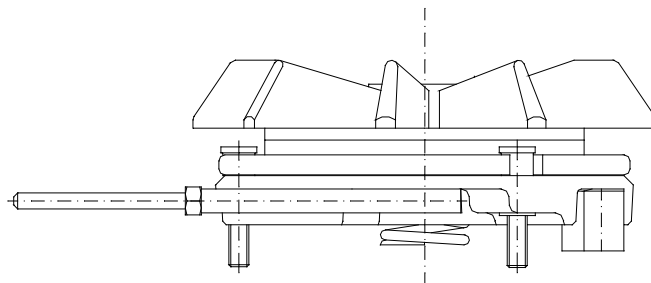
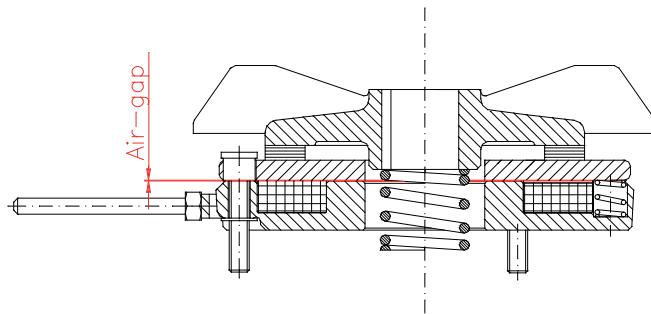
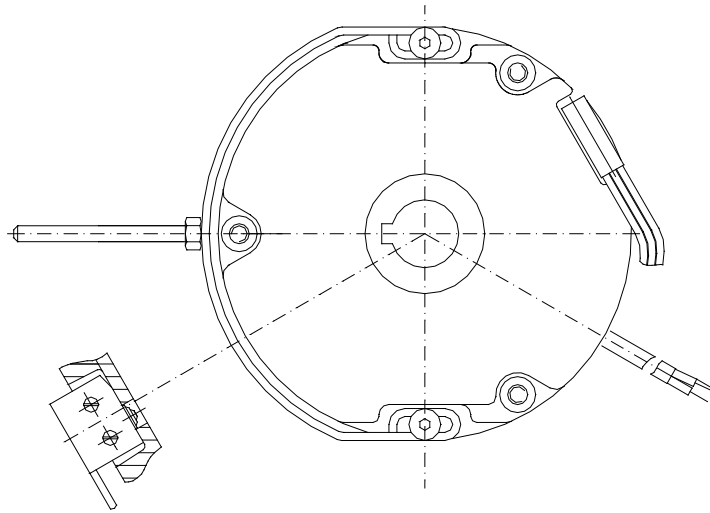
Self-braking three-phase motor - 10.. Type



Spare parts nomenclature

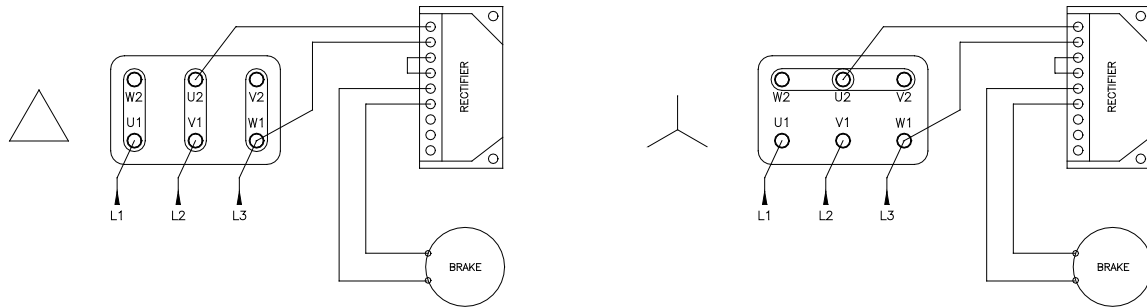
- | | |
|-----------------------------------|----------------------|
| 1. Screw for fan cover | 42. Terminal board |
| 2. Fan cover | 46. Grounding screw |
| 5. Rod | 48. Cable gland |
| 6. N-end shield | 55. Nut |
| 7. Spring ring | 56. Ring |
| 8. Frame | 57. Key |
| 9. Stator package | 58. Spacer |
| 10. Screw for terminal box cover | 59. Spring |
| 11. Gasket for terminal box cover | 61. Rectifier |
| 12. Terminal box | 65. Manual release |
| 13. Screw for terminal box | 71. Electromagnet |
| 14. Gasket for terminal box | 72. Movable armature |
| 17. Rear bearing | 74. Brake fan |
| 18. Rotor | 76. Spring |
| 19. Front bearing | 77. Screw for brake |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |
| 26. Retaining ring | |

Direct current brake - 10 Type



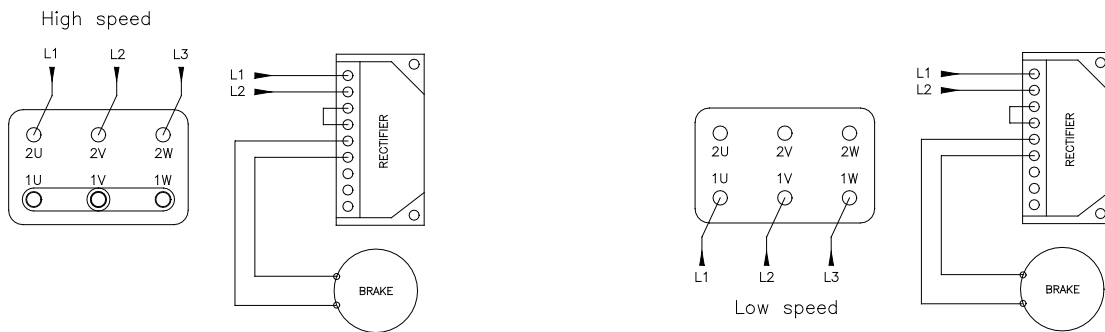
Connection for motors 10S Type

Self-braking three-phase **one-speed** motors - with dc brake



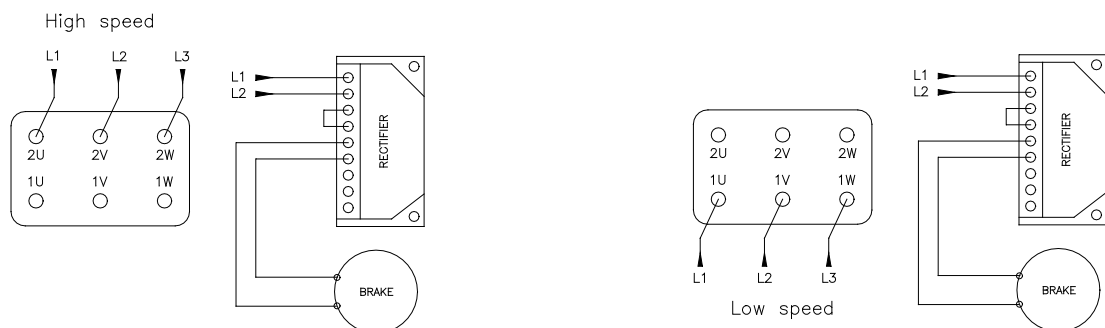
Connection for motors 10D Type

Self-braking three-phase **two-speed** motors - single winding - with dc brake



Connection for motors 10DD Type

Self-braking three-phase **two-speed** motors - double winding - with dc brake



One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

Method of determining the efficiency: IEC 60034-2-1; 2014

| 1OSH Type 2 pole - 3000 min¹ | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|-------------------|-------|----------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque Mb Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | Ms/Mn | Is/I _n | Mm/Mn | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 63 a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 3 | 0.429 | 5.4 |
| 63 b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 3 | 0.462 | 6.0 |
| 63 c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 3 | 0.506 | 6.7 |
| 71 a | 0.37 | 2820 | 0.95 | 68.6 | 73.6 | 74.4 | 0.75 | 1.24 | 3.3 | 5.5 | 3.4 | 4 | 0.842 | 7.8 |
| 71 b | 0.55 | 2815 | 1.38 | 71.6 | 74.9 | 75.3 | 0.77 | 1.87 | 3.5 | 5.7 | 3.4 | 4 | 0.924 | 8.7 |
| 80 a | 0.75 | 2840 | 1.7 | 78.9 | 80.7 | 80.2 | 0.81 | 2.54 | 3.3 | 6.6 | 3.4 | 7 | 1.850 | 12.2 |
| 80 b | 1.1 | 2865 | 2.4 | 83.1 | 84.5 | 84.0 | 0.80 | 3.69 | 3.7 | 7.4 | 3.6 | 7 | 2.129 | 14.2 |
| 80 c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 82.0 | 0.79 | 5.07 | 3.3 | 6.4 | 3.4 | 7 | 2.129 | 14.2 |
| 90S a | 1.5 | 2900 | 3.2 | 82.6 | 84.9 | 84.8 | 0.82 | 4.94 | 3.3 | 7.9 | 3.6 | 7 | 2.569 | 17.2 |
| 90S b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 83.6 | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 7 | 2.569 | 17.2 |
| 90L a | 2.2 | 2890 | 4.4 | 84.1 | 85.9 | 85.7 | 0.84 | 7.26 | 3.1 | 8.1 | 3.6 | 7 | 2.988 | 20.2 |
| 90L b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 84.8 | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 7 | 2.988 | 20.2 |
| 100L a | 3 | 2900 | 5.9 | 88.0 | 88.5 | 87.7 | 0.84 | 9.89 | 2.6 | 7.3 | 3.3 | 13 | 6.147 | 26.3 |
| 100L b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 86.8 | 0.85 | 13.4 | 2.6 | 7.2 | 3.2 | 13 | 6.542 | 28.4 |
| 112M a | 4 | 2920 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 13 | 8.591 | 33.8 |
| 112M b | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 88.8 | 0.84 | 18.1 | 4.3 | 9.9 | 6.3 | 13 | 9.736 | 37.1 |
| 132S a | 5.5 | 2920 | 10.5 | 87.2 | 88.6 | 88.5 | 0.85 | 17.9 | 2.4 | 7.4 | 3.4 | 30 | 15.96 | 48.0 |
| 132S b | 7.5 | 2940 | 14.2 | 88.0 | 89.6 | 89.7 | 0.84 | 24.3 | 3.6 | 8.8 | 4.0 | 30 | 19.41 | 55.9 |
| 132M a | 9.2 | 2940 | 17.8 | 88.9 | 90.4 | 90.6 | 0.82 | 29.9 | 4.5 | 9.6 | 4.5 | 30 | 22.06 | 63.3 |
| 132M b | 11 | 2940 | 21.1 | 89.0 | 90.6 | 90.7 | 0.83 | 35.7 | 4.2 | 10.1 | 4.6 | 30 | 24.58 | 69.2 |

| 1OSH Type 4 pole - 1500 min¹ | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|-------------------|-------|----------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque Mb Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | Ms/Mn | Is/I _n | Mm/Mn | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 63 b | 0.12 | 1370 | 0.41 | 55.6 | 61.8 | 63.1 | 0.67 | 0.85 | 2.1 | 3.0 | 2.3 | 3 | 0.563 | 5.9 |
| 63 c | 0.18 | 1380 | 0.61 | 58.8 | 64.9 | 66.0 | 0.65 | 1.25 | 2.4 | 3.3 | 2.6 | 3 | 0.626 | 6.7 |
| 71 b | 0.25 | 1380 | 0.68 | 66.5 | 69.5 | 68.7 | 0.76 | 1.73 | 2.1 | 3.8 | 2.3 | 4 | 1.300 | 8.4 |
| 71 c | 0.37 | 1415 | 1.08 | 65.6 | 71.3 | 72.8 | 0.68 | 2.51 | 3.0 | 4.8 | 3.3 | 4 | 1.675 | 10.2 |
| 80 a | 0.55 | 1415 | 1.26 | 76.3 | 78.6 | 78.3 | 0.79 | 3.67 | 2.4 | 5.4 | 2.8 | 7 | 3.157 | 12.8 |
| 80 b | 0.75 | 1430 | 1.7 | 77.3 | 80.1 | 80.2 | 0.78 | 4.96 | 2.9 | 6.2 | 3.4 | 7 | 3.789 | 14.7 |
| 90S a | 1.1 | 1425 | 2.5 | 80.9 | 82.7 | 82.1 | 0.76 | 7.37 | 2.4 | 5.3 | 2.9 | 7 | 3.666 | 16.7 |
| 90L a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 83.8 | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 7 | 4.427 | 19.6 |
| 100L a | 2.2 | 1430 | 5.0 | 83.7 | 85.3 | 84.7 | 0.75 | 14.7 | 2.6 | 5.7 | 3.2 | 13 | 8.036 | 25.9 |
| 100L b | 3 | 1430 | 6.7 | 85.1 | 86.4 | 85.8 | 0.75 | 19.9 | 2.8 | 6.0 | 3.4 | 13 | 9.450 | 29.8 |
| 112M a | 4 | 1440 | 8.0 | 87.3 | 88.1 | 87.2 | 0.82 | 26.3 | 2.4 | 6.5 | 3.1 | 13 | 14.48 | 36.6 |
| 132S b | 5.5 | 1445 | 11.0 | 89.2 | 89.3 | 88.2 | 0.82 | 36.4 | 2.3 | 5.7 | 2.7 | 30 | 29.79 | 55.5 |
| 132M b | 7.5 | 1450 | 14.8 | 90.0 | 90.1 | 89.1 | 0.82 | 49.4 | 2.4 | 6.1 | 2.7 | 30 | 37.74 | 66.9 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

Method of determining the efficiency: IEC 60034-2-1; 2014

| 1OSH Type 6 pole - 1000 min¹ | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|----------------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque M _b Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 b | 0.12 | 905 | 0.52 | 44.3 | 51.5 | 54.1 | 0.63 | 1.28 | 2.1 | 2.6 | 2.3 | 4 | 1.300 | 8.3 |
| 71 c | 0.18 | 890 | 0.66 | 51.2 | 57.0 | 57.1 | 0.68 | 1.96 | 1.9 | 2.6 | 2.1 | 4 | 1.675 | 10.0 |
| 80 b | 0.25 | 935 | 0.77 | 64.0 | 68.9 | 70.4 | 0.66 | 2.54 | 2.6 | 4.1 | 2.8 | 7 | 3.043 | 12.3 |
| 80 c | 0.37 | 940 | 1.10 | 64.1 | 70.0 | 71.5 | 0.68 | 3.78 | 2.8 | 4.4 | 3.0 | 7 | 3.517 | 13.6 |
| 90S a | 0.55 | 935 | 1.42 | 72.5 | 75.4 | 75.1 | 0.74 | 5.63 | 2.1 | 4.3 | 2.5 | 7 | 5.248 | 16.4 |
| 90L a | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 77.9 | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 7 | 6.521 | 19.3 |
| 100L r | 1.1 | 940 | 2.7 | 76.5 | 79.1 | 78.7 | 0.73 | 11.0 | 2.3 | 4.9 | 2.9 | 13 | 11.03 | 23.9 |
| 100L a | 1.5 | 940 | 3.7 | 78.5 | 80.6 | 80.1 | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 13 | 13.59 | 27.9 |
| 112M a | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 82.4 | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 13 | 19.91 | 35.4 |
| 132S a | 3 | 955 | 6.8 | 83.6 | 84.7 | 83.9 | 0.76 | 30.0 | 1.6 | 5.0 | 2.6 | 30 | 32.20 | 48.9 |
| 132M a | 4 | 960 | 8.9 | 84.8 | 86.0 | 85.3 | 0.76 | 39.7 | 1.6 | 5.4 | 2.9 | 30 | 39.77 | 58.9 |
| 132M b | 5.5 | 960 | 11.7 | 86.8 | 87.8 | 87.1 | 0.78 | 54.2 | 1.7 | 5.9 | 3.0 | 30 | 50.65 | 72.1 |

| 1OSH Type 8 pole - 750 min¹ | | | | | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------|------|------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|----------------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque M _b Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 b | 0.09 | 685 | 0.57 | 30.0 | 41.1 | 45.4 | 0.50 | 1.26 | 2.7 | 2.2 | 2.8 | 4 | 1.300 | 8.3 |
| 71 c | 0.12 | 685 | 0.82 | 28.9 | 36.9 | 42.5 | 0.50 | 1.68 | 2.9 | 2.2 | 3.1 | 4 | 1.675 | 10.1 |
| 80 b | 0.18 | 695 | 0.89 | 41.7 | 50.8 | 54.6 | 0.54 | 2.49 | 2.6 | 2.7 | 2.7 | 7 | 3.043 | 12.1 |
| 80 c | 0.25 | 695 | 1.22 | 41.8 | 49.9 | 54.1 | 0.55 | 3.42 | 2.7 | 2.8 | 2.8 | 7 | 3.517 | 13.6 |
| 90S a | 0.37 | 690 | 1.43 | 55.5 | 62.3 | 63.8 | 0.59 | 5.18 | 1.8 | 2.5 | 1.9 | 7 | 4.685 | 15.0 |
| 90L a | 0.55 | 685 | 2.0 | 59.1 | 65.9 | 67.0 | 0.57 | 7.40 | 1.9 | 2.5 | 2.3 | 7 | 5.958 | 17.5 |
| 100L r | 0.75 | 685 | 2.6 | 60.0 | 65.2 | 66.5 | 0.62 | 10.4 | 2.2 | 3.2 | 2.8 | 13 | 10.84 | 24.0 |
| 100L a | 1.1 | 690 | 3.5 | 64.8 | 70.1 | 71.1 | 0.63 | 15.1 | 2.1 | 3.5 | 2.6 | 13 | 13.31 | 27.6 |
| 112M a | 1.5 | 705 | 4.3 | 71.1 | 74.5 | 74.4 | 0.67 | 20.3 | 1.2 | 3.5 | 2.1 | 13 | 19.91 | 35.1 |
| 132S b | 2.2 | 715 | 6.1 | 74.8 | 78.2 | 78.5 | 0.66 | 29.0 | 1.5 | 3.8 | 2.3 | 30 | 36.79 | 52.2 |
| 132M b | 3 | 720 | 8.0 | 76.4 | 79.8 | 80.1 | 0.67 | 39.5 | 1.4 | 4.1 | 2.5 | 30 | 46.60 | 62.5 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Two-speed self-braking three-phase motors - single winding - Dahlander connection (Star-Star/Delta)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

| 10D Type 2/4 pole - 3000/1500 min⁻¹ | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|----------------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Braking torque M _b Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 63 a | 0.15/0.10 | 2780/1370 | 0.41/0.41 | 0.52/0.70 | 1.7/1.8 | 3.9/2.4 | 2.0/2.0 | 3 | 0.506 | 5.4 |
| 63 b | 0.22/0.15 | 2800/1380 | 0.58/0.58 | 0.75/1.04 | 1.8/1.9 | 4.1/2.6 | 2.2/2.1 | 3 | 0.563 | 6.0 |
| 63 c | 0.30/0.20 | 2800/1380 | 0.75/0.75 | 1.02/1.38 | 1.9/2.0 | 4.0/2.8 | 2.3/2.2 | 3 | 0.626 | 6.7 |
| 71 a | 0.30/0.20 | 2800/1380 | 0.78/0.78 | 1.02/1.38 | 1.9/2.0 | 3.8/3.2 | 2.1/2.1 | 4 | 1.187 | 7.8 |
| 71 b | 0.45/0.30 | 2810/1400 | 1.3/1.1 | 1.53/2.05 | 2.0/2.1 | 4.1/3.4 | 2.3/2.2 | 4 | 1.300 | 8.4 |
| 71 c | 0.60/0.45 | 2840/1400 | 1.6/1.4 | 2.02/3.07 | 2.1/2.3 | 4.5/3.6 | 2.6/2.5 | 4 | 1.675 | 10.3 |
| 80 a | 0.60/0.45 | 2780/1400 | 1.6/1.2 | 2.06/3.07 | 1.8/1.8 | 3.6/3.7 | 2.1/2.1 | 7 | 2.499 | 10.7 |
| 80 b | 0.85/0.65 | 2820/1400 | 2.4/1.7 | 2.88/4.43 | 1.8/2.0 | 3.8/3.6 | 2.4/2.3 | 7 | 3.043 | 12.2 |
| 80 c | 1.10/0.85 | 2830/1410 | 2.8/2.1 | 3.71/5.76 | 2.0/2.1 | 4.4/4.5 | 2.4/2.4 | 7 | 3.517 | 13.6 |
| 90S a | 1.50/1.10 | 2850/1410 | 3.3/2.7 | 5.03/7.45 | 2.2/2.0 | 4.8/4.3 | 2.9/2.4 | 7 | 3.310 | 15.2 |
| 90L a | 1.85/1.40 | 2850/1410 | 4.1/3.1 | 6.20/9.48 | 2.4/2.1 | 5.0/4.9 | 3.0/2.9 | 7 | 3.943 | 17.4 |
| 90L b | 2.20/1.70 | 2850/1410 | 5.0/3.9 | 7.37/11.5 | 2.5/2.3 | 5.6/5.1 | 3.2/3.0 | 7 | 4.427 | 19.3 |
| 100L a | 2.60/2.00 | 2850/1420 | 6.1/4.8 | 8.71/13.5 | 2.8/2.6 | 5.0/5.3 | 3.2/3.1 | 13 | 7.637 | 24.2 |
| 100L b | 3.50/2.70 | 2870/1420 | 8.0/6.4 | 11.6/18.2 | 2.7/2.7 | 5.7/4.9 | 3.2/2.9 | 13 | 9.030 | 27.9 |
| 112M a | 4.00/3.20 | 2880/1430 | 8.8/7.1 | 13.3/21.4 | 2.1/2.0 | 6.0/5.1 | 2.9/1.9 | 13 | 12.95 | 33.4 |
| 112M b | 4.80/3.70 | 2890/1430 | 9.8/8.2 | 15.9/24.7 | 2.0/2.0 | 6.2/5.0 | 2.7/1.8 | 13 | 14.48 | 36.4 |
| 132S b | 6.00/4.60 | 2890/1440 | 13.1/9.9 | 19.8/30.5 | 2.3/2.0 | 5.1/5.0 | 2.5/2.4 | 30 | 27.43 | 51.7 |
| 132M b | 8.20/6.60 | 2910/1440 | 17.5/13.5 | 26.9/43.8 | 2.5/2.2 | 6.1/5.3 | 2.8/1.8 | 30 | 34.61 | 62.1 |
| 132M c | 9.60/7.80 | 2920/1440 | 20.0/16.0 | 31.4/51.7 | 2.5/2.3 | 6.2/5.3 | 2.8/1.8 | 30 | 39.21 | 68.5 |

| 10D Type 4/8 pole - 1500/750 min⁻¹ | | | | | | | | | | |
|--|------------------|----------|-----------|-----------|---------|---------|---------|----|-------|------|
| 71 a | 0.10/0.05 | 1360/670 | 0.36/0.36 | 0.70/0.71 | 1.3/1.9 | 2.5/1.9 | 1.4/2.1 | 4 | 1.187 | 7.6 |
| 71 b | 0.14/0.07 | 1370/670 | 0.45/0.50 | 0.98/1.00 | 1.7/1.9 | 3.0/1.9 | 2.1/2.1 | 4 | 1.300 | 8.3 |
| 71 c | 0.20/0.10 | 1380/660 | 0.57/0.63 | 1.38/1.45 | 1.6/2.0 | 3.3/1.8 | 1.9/2.0 | 4 | 1.675 | 10.2 |
| 80 a | 0.25/0.13 | 1360/680 | 0.65/0.65 | 1.76/1.83 | 1.3/1.6 | 3.3/1.9 | 1.5/1.9 | 7 | 2.499 | 10.6 |
| 80 b | 0.37/0.20 | 1370/680 | 0.92/0.92 | 2.58/2.81 | 1.4/1.7 | 3.7/2.4 | 1.7/2.0 | 7 | 3.043 | 12.1 |
| 80 c | 0.50/0.26 | 1370/680 | 1.2/1.2 | 3.49/3.65 | 2.0/2.1 | 3.5/2.4 | 1.8/2.0 | 7 | 3.517 | 13.5 |
| 90S a | 0.70/0.36 | 1380/690 | 1.8/2.0 | 4.84/4.98 | 1.8/2.0 | 3.5/2.5 | 2.2/2.5 | 7 | 4.685 | 15.2 |
| 90L a | 1.00/0.52 | 1380/690 | 2.5/2.5 | 6.92/7.20 | 1.8/1.8 | 3.6/2.1 | 2.1/2.0 | 7 | 5.958 | 17.6 |
| 100L a | 1.10/0.60 | 1410/700 | 2.5/2.6 | 7.45/8.19 | 1.5/1.7 | 4.5/3.0 | 2.3/2.6 | 13 | 10.84 | 24.1 |
| 100L b | 1.50/0.80 | 1410/710 | 3.3/3.2 | 10.2/10.8 | 1.5/1.8 | 4.1/3.4 | 2.1/2.6 | 13 | 13.31 | 27.7 |
| 112M a | 2.20/1.20 | 1400/700 | 4.5/3.9 | 15.0/16.4 | 1.6/1.9 | 4.3/3.6 | 1.9/2.4 | 13 | 17.34 | 32.8 |
| 112M b | 2.60/1.40 | 1410/710 | 5.3/4.9 | 17.6/18.8 | 1.8/2.0 | 5.3/4.0 | 2.5/3.2 | 13 | 19.91 | 35.8 |
| 132S a | 3.00/1.70 | 1420/720 | 6.2/6.1 | 20.2/22.5 | 1.6/1.8 | 5.4/3.6 | 2.4/2.7 | 30 | 29.12 | 46.0 |
| 132S b | 4.00/2.20 | 1430/720 | 8.3/8.3 | 26.7/29.2 | 1.7/2.0 | 5.7/4.0 | 2.5/2.7 | 30 | 36.79 | 52.8 |
| 132M b | 5.50/3.00 | 1440/720 | 11.4/10.7 | 36.5/39.8 | 1.7/2.2 | 6.3/4.3 | 2.7/2.8 | 30 | 46.60 | 62.9 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Two-speed self-braking three-phase motors - double winding - Star/Star connection

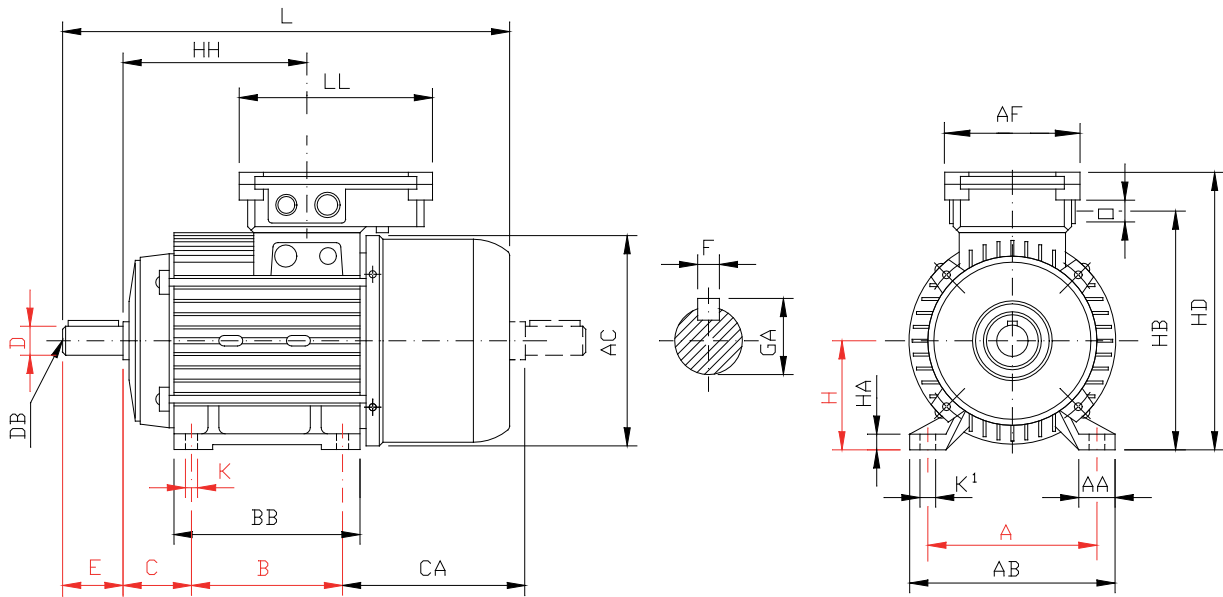
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

| 10DD Type 2/6 pole - 3000/1000 min¹ | | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|----------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Braking torque Mb Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 71 c | 0.42/0.14 | 2810/885 | 0.95/0.64 | 1.43/1.51 | 1.6/1.7 | 4.1/2.2 | 2.0/1.8 | 4 | 1.675 | 10.3 | |
| 80 a | 0.42/0.14 | 2770/930 | 1.07/0.57 | 1.45/1.44 | 1.6/1.4 | 3.6/2.4 | 1.9/1.8 | 7 | 2.499 | 10.6 | |
| 80 b | 0.60/0.20 | 2820/930 | 1.40/0.89 | 2.03/2.05 | 1.6/1.5 | 4.0/2.4 | 1.9/1.9 | 7 | 3.043 | 12.1 | |
| 80 c | 0.90/0.30 | 2820/940 | 1.88/1.08 | 3.05/3.05 | 1.5/1.6 | 4.4/2.9 | 2.0/2.2 | 7 | 3.517 | 13.5 | |
| 90S a | 1.10/0.37 | 2750/930 | 2.6/1.3 | 3.82/3.80 | 1.8/1.7 | 3.5/2.7 | 2.2/2.0 | 7 | 3.310 | 15.1 | |
| 90L a | 1.50/0.50 | 2810/950 | 3.4/1.7 | 5.10/5.03 | 1.8/2.1 | 3.9/3.2 | 2.3/2.4 | 7 | 3.943 | 17.4 | |
| 90L b | 1.80/0.60 | 2840/930 | 4.1/2.1 | 6.05/6.16 | 1.8/1.9 | 4.4/2.9 | 2.4/2.2 | 7 | 4.427 | 19.1 | |
| 100L a | 2.20/0.75 | 2810/930 | 5.2/2.2 | 7.48/7.70 | 1.7/1.6 | 3.9/3.0 | 2.2/2.0 | 13 | 7.637 | 24.2 | |
| 100L b | 3.00/1.00 | 2820/910 | 6.4/3.1 | 10.2/10.5 | 1.8/1.5 | 4.4/2.6 | 2.4/1.7 | 13 | 9.034 | 27.9 | |
| 112M b | 4.00/1.35 | 2900/950 | 8.3/4.0 | 13.2/13.6 | 1.9/2.0 | 5.8/3.9 | 2.7/2.4 | 13 | 14.48 | 36.7 | |
| 132S b | 5.50/1.85 | 2905/965 | 11.1/5.2 | 18.1/18.3 | 2.3/1.7 | 6.2/3.7 | 2.7/2.2 | 30 | 36.79 | 50.3 | |
| 132M b | 7.50/2.50 | 2910/960 | 14.8/7.1 | 24.6/24.9 | 2.1/1.8 | 6.2/3.8 | 2.5/2.3 | 30 | 46.60 | 59.5 | |
| 10DD Type 2/8 pole - 3000/750 min¹ | | | | | | | | | | | |
| 71 c | 0.33/0.08 | 2830/680 | 0.83/0.65 | 1.11/1.12 | 2.1/1.7 | 4.8/2.1 | 2.5/1.9 | 4 | 1.675 | 10.3 | |
| 80 a | 0.33/0.08 | 2830/690 | 0.83/0.44 | 1.11/1.11 | 1.5/1.6 | 3.2/1.9 | 2.0/1.8 | 7 | 2.499 | 10.6 | |
| 80 b | 0.44/0.11 | 2890/690 | 1.10/0.73 | 1.45/1.52 | 1.6/1.8 | 4.1/2.0 | 2.3/2.0 | 7 | 3.043 | 12.1 | |
| 80 c | 0.60/0.15 | 2890/690 | 1.50/0.75 | 1.98/2.08 | 1.6/1.6 | 4.4/2.1 | 2.5/1.9 | 7 | 3.517 | 13.5 | |
| 90S a | 0.75/0.18 | 2860/680 | 1.80/0.94 | 2.50/2.53 | 2.0/1.7 | 4.2/2.1 | 2.7/1.9 | 7 | 3.310 | 15.1 | |
| 90L a | 1.00/0.25 | 2880/690 | 2.3/1.3 | 3.32/3.46 | 2.0/1.7 | 4.6/2.2 | 2.4/2.1 | 7 | 3.943 | 17.4 | |
| 90L b | 1.20/0.30 | 2900/700 | 2.7/1.5 | 3.95/4.09 | 2.0/1.9 | 5.2/2.3 | 2.8/2.2 | 7 | 4.427 | 19.1 | |
| 100L a | 1.50/0.37 | 2890/700 | 3.3/1.7 | 4.96/5.05 | 1.6/1.8 | 4.6/2.4 | 2.4/2.1 | 13 | 7.637 | 24.2 | |
| 100L b | 2.00/0.50 | 2900/700 | 4.4/2.2 | 6.59/6.82 | 1.8/1.7 | 6.0/2.5 | 2.8/2.1 | 13 | 9.034 | 27.9 | |
| 112M a | 2.60/0.65 | 2810/710 | 5.9/2.3 | 8.84/8.74 | 1.9/1.5 | 5.8/3.4 | 2.0/1.9 | 13 | 17.34 | 31.4 | |
| 112M b | 3.20/0.80 | 2850/710 | 7.0/2.9 | 10.7/10.8 | 2.0/1.6 | 6.1/3.5 | 2.1/2.0 | 13 | 19.91 | 34.4 | |
| 132S b | 4.40/1.10 | 2900/720 | 9.2/3.8 | 14.5/14.6 | 2.0/1.5 | 6.3/3.5 | 2.3/2.1 | 30 | 36.79 | 50.3 | |
| 132M b | 6.00/1.50 | 2910/720 | 12.5/5.1 | 19.7/19.9 | 2.1/1.6 | 6.5/3.7 | 2.5/2.3 | 30 | 46.60 | 59.5 | |
| 10DD Type 4/6 pole - 1500/1000 min¹ | | | | | | | | | | | |
| 71 c | 0.25/0.18 | 1390/890 | 0.98/0.87 | 1.72/1.93 | 1.6/1.5 | 2.7/2.0 | 2.1/1.7 | 4 | 1.675 | 10.2 | |
| 80 a | 0.25/0.18 | 1420/920 | 0.72/0.64 | 1.68/1.87 | 1.4/1.3 | 3.9/2.7 | 2.1/1.8 | 7 | 2.499 | 10.6 | |
| 80 b | 0.37/0.25 | 1440/930 | 1.00/0.87 | 2.45/2.57 | 1.5/1.4 | 4.1/2.9 | 2.4/2.0 | 7 | 3.043 | 12.1 | |
| 80 c | 0.55/0.37 | 1430/920 | 1.5/1.3 | 3.67/3.84 | 1.5/1.4 | 3.9/2.8 | 2.2/1.9 | 7 | 3.517 | 13.5 | |
| 90S a | 0.75/0.50 | 1420/920 | 2.0/1.7 | 5.04/5.19 | 1.6/1.5 | 3.5/2.6 | 2.2/1.8 | 7 | 3.310 | 15.2 | |
| 90L a | 0.90/0.60 | 1440/940 | 2.6/2.2 | 5.97/6.10 | 2.3/1.8 | 4.1/2.9 | 2.8/2.1 | 7 | 3.943 | 17.6 | |
| 100L a | 1.10/0.75 | 1430/910 | 2.7/2.3 | 7.35/7.87 | 2.1/1.5 | 4.3/2.5 | 2.6/1.7 | 13 | 7.637 | 24.4 | |
| 100L b | 1.50/1.00 | 1440/920 | 3.7/3.0 | 9.95/10.4 | 2.2/1.6 | 4.6/2.9 | 2.8/1.9 | 13 | 9.030 | 28.2 | |
| 112M a | 2.20/1.50 | 1450/950 | 4.6/3.9 | 14.5/15.1 | 1.6/1.6 | 4.4/4.0 | 2.3/2.3 | 13 | 17.34 | 32.8 | |
| 112M b | 2.60/1.80 | 1450/960 | 5.6/4.7 | 17.1/17.9 | 1.7/1.6 | 4.4/4.0 | 2.3/2.3 | 13 | 19.91 | 35.8 | |
| 132S a | 3.00/2.00 | 1450/960 | 6.8/5.1 | 19.8/19.9 | 1.7/1.5 | 5.6/4.0 | 2.7/2.1 | 30 | 29.12 | 46.0 | |
| 132S b | 4.00/2.70 | 1450/960 | 9.0/6.7 | 26.3/26.9 | 1.8/1.5 | 5.8/4.2 | 2.9/2.3 | 30 | 36.79 | 52.8 | |
| 132M b | 5.50/3.60 | 1450/960 | 12.0/9.2 | 36.2/35.8 | 1.8/1.6 | 5.7/4.1 | 2.9/2.4 | 30 | 46.60 | 62.9 | |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Mounting arrangement IM B3

Self-braking three-phase motors - 10.. Type

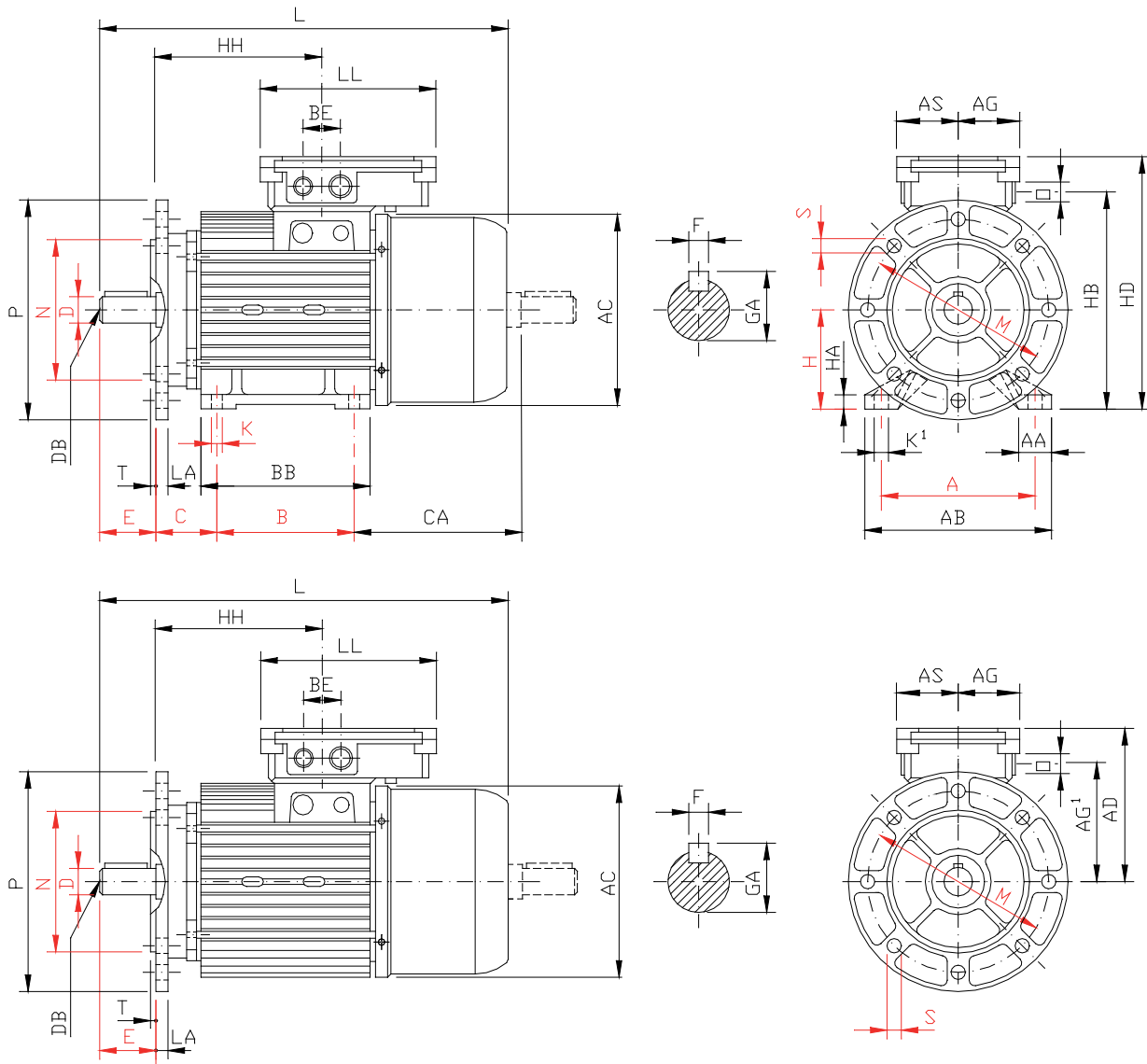


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Overall | | | | | | | Shaft end | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|---------|-----|-----|-----|-----|-----|-----|-------------|----|-----|----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 123 | 104 | 149 | 174 | 89 | 236 | 148 | M16+M20x1.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 138 | 104 | 167 | 193 | 103 | 263 | 148 | M16+M20x1.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 156 | 114 | 185 | 210 | 117 | 296 | 158 | M20+M25x1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 176 | 114 | 200 | 224 | 127 | 320 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 176 | 114 | 200 | 224 | 152 | 345 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 194 | 114 | 223 | 246 | 171 | 391 | 158 | M20+M25x1.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 141 | 112 | 14 | 12 | 19 | 220 | 138 | 257 | 280 | 175 | 405 | 202 | M32+M32x1.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 183 | 132 | 16 | 12 | 22 | 260 | 138 | 305 | 328 | 206 | 485 | 202 | M32+M32x1.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 183 | 132 | 16 | 12 | 22 | 260 | 138 | 305 | 328 | 244 | 523 | 202 | M32+M32x1.5 | 38 | M12 | 80 | 10 | 41 |

Mounting arrangement IM B35 - IM B5

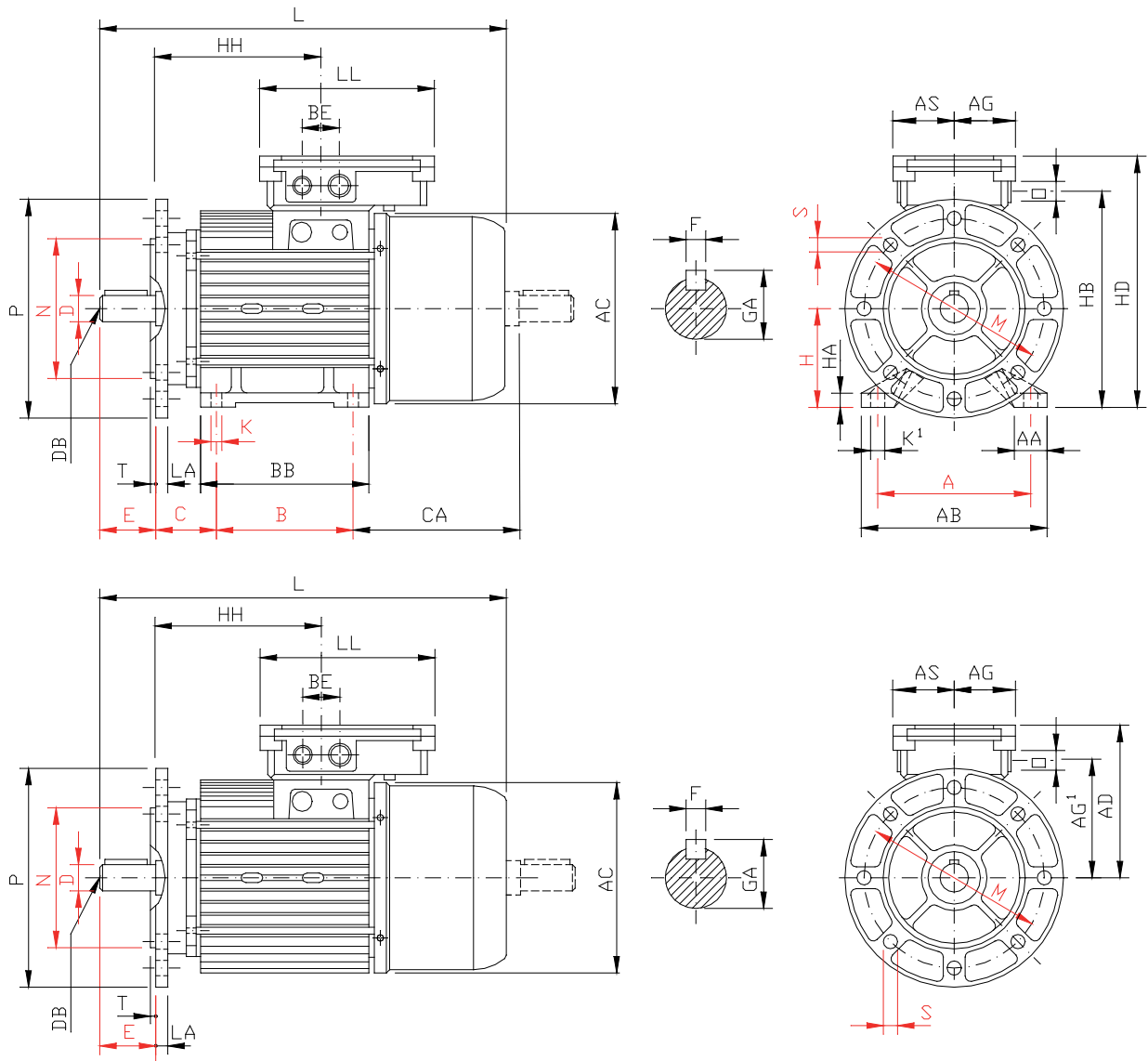
Self-braking three-phase motors - 10.. Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 63 | 123 | 111 | 52 | 86 | 52 | 35 | 149 | 174 | 89 | 236 | 148 | M16+M20 x 1.5 |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 263 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 296 | 158 | M20+M25 x 1.6 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 320 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 345 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 171 | 391 | 158 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 57 | 145 | 69 | 45 | 257 | 280 | 175 | 405 | 202 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 206 | 485 | 202 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 244 | 523 | 202 | M32+M32 x 1.5 |

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motors - 10.. Type

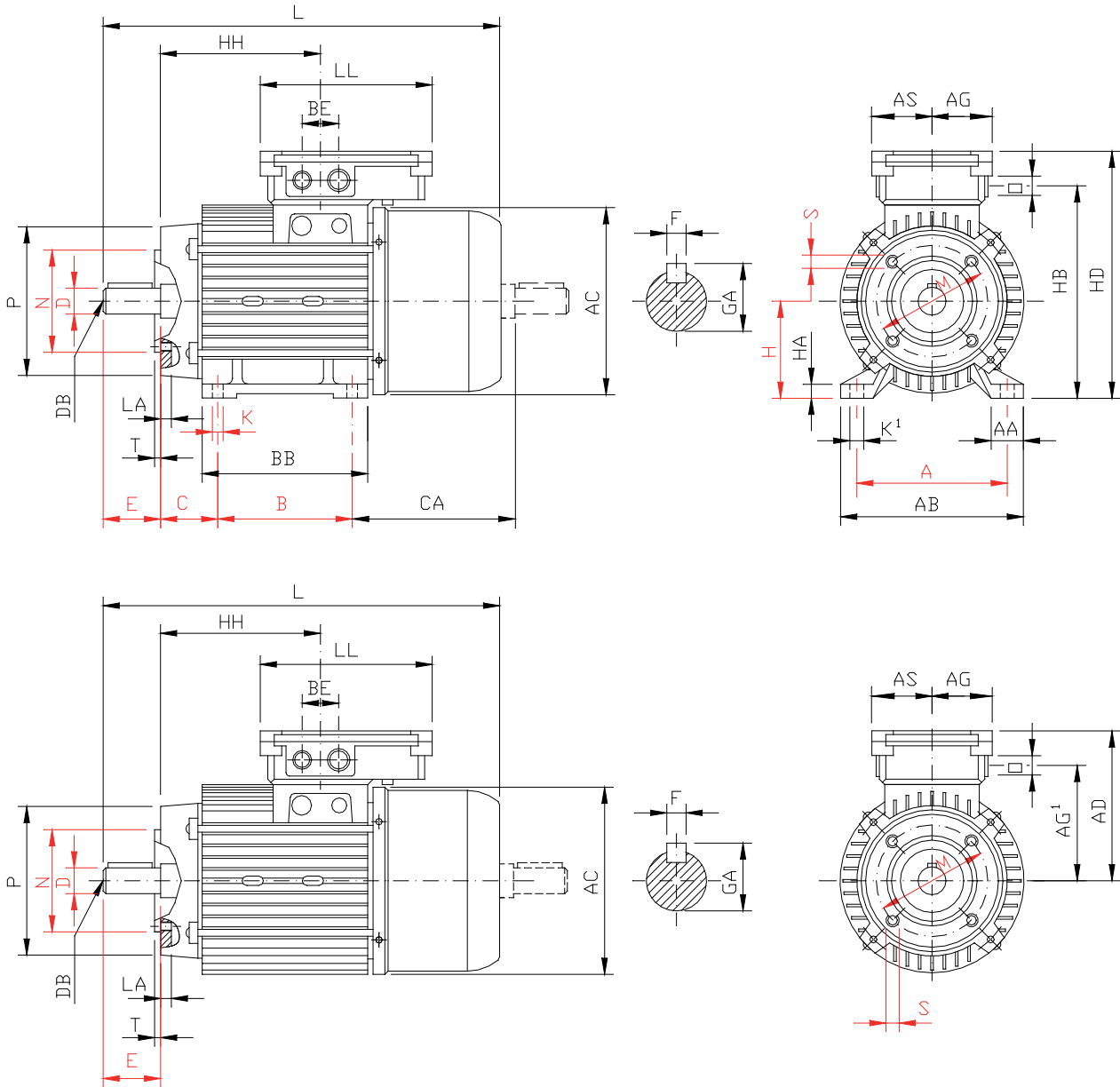


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|-----------|-----|-----|-----|----|-----|----|-----|----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 8 | 115 | 95 | 140 | 9 | 3 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 8 | 130 | 110 | 160 | 9 | 3.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 141 | 112 | 14 | 12 | 19 | 12 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 183 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 183 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |

Mounting arrangement IM B34 - IM B14

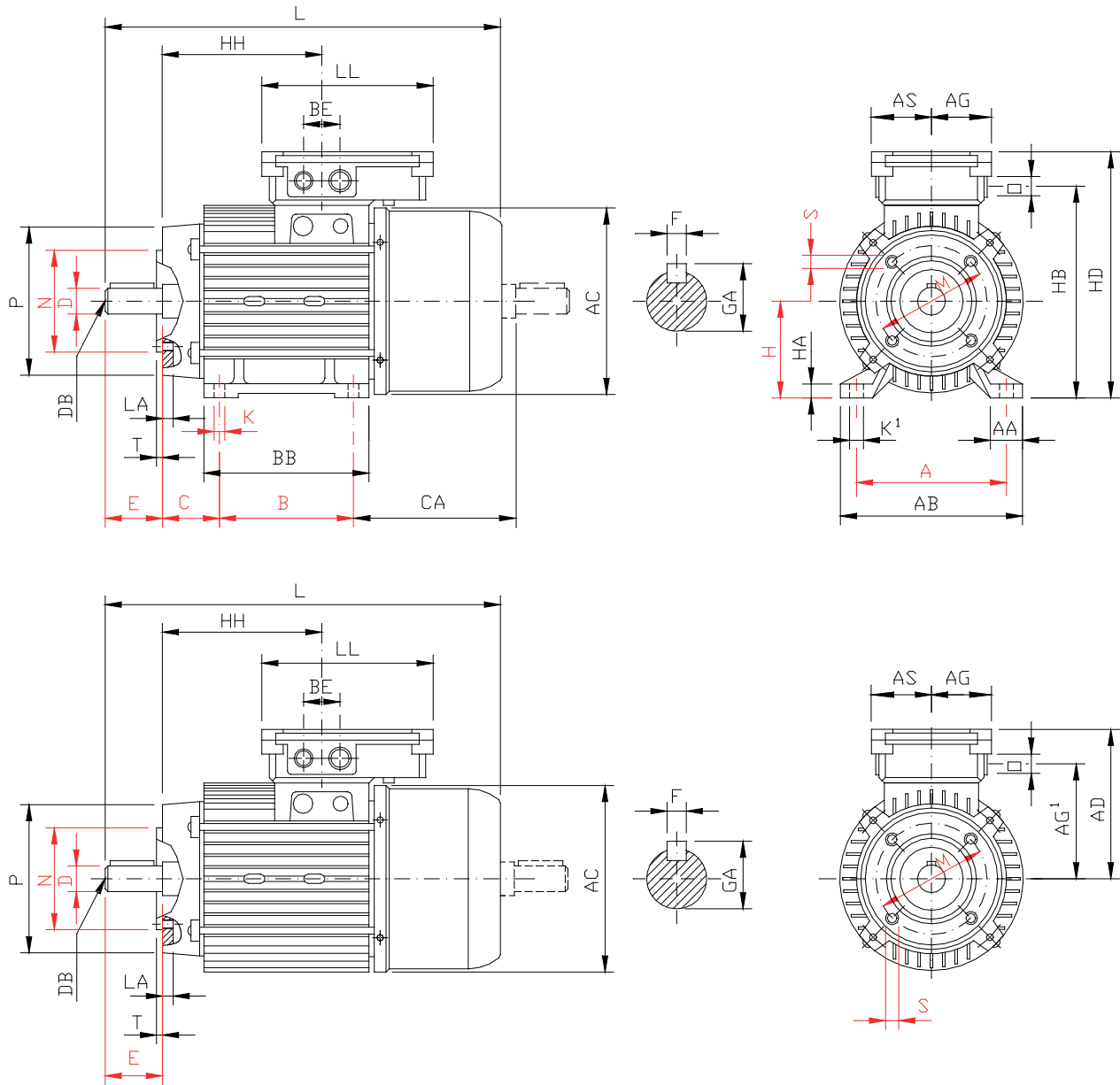
Self-braking three-phase motors - 10.. Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 63 | 123 | 111 | 52 | 86 | 52 | 35 | 149 | 174 | 89 | 236 | 148 | M16+M20 x 1.5 |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 263 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 296 | 158 | M20+M25 x 1.5 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 320 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 345 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 151 | 391 | 158 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 69 | 145 | 69 | 45 | 257 | 280 | 175 | 405 | 202 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 206 | 485 | 202 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 244 | 523 | 202 | M32+M32 x 1.5 |

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motors - 10.. Type



Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----|-----------|-----|-----|-----|-----|-----|----|-----|----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 7 | 75 | 60 | 90 | M5 | 2.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 8 | 85 | 70 | 105 | M6 | 2.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 141 | 112 | 14 | 12 | 19 | 13 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 183 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 183 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |

Self-braking single-phase motors Braking-torque fixed

Self-braking single-phase motors - 10.. Type

Typical applications:

- Machines for woodworking.
- Machines with long braking and high braking works.
- Machines that require arrests but not controlled precision.

Mechanical characteristics:

- Small brake.
- Rear brake mounting flange: aluminium.
- Fan cast iron brake.
- Seal friction asbestos-free and silent.
- Braking torques and other technical data: see table below.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power can be independent or derived from the motor, depending on motor type and the needs of employment.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Rated braking torque M_b Nm | Air-gap | | Maximum speed n_{max} min ⁻¹ | Brake life | | Brake release time | | Braking torque rise time *** | | Brake power input P_a W |
|------------|--|----------------------|------------------------|--|----------------------------------|----------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|--|
| | | s_n | s_{max} | | W_i 1) MJ | W₁ 2) | t₁ 3) ms | t₁₁ 4) | t₂ 5) ms | t₂₂ 6) | |
| 63 | 3 | 0.20 | 0.50 | 6000 | 250 | 30 | 30 | 15 | 80 | 8 | 21 |
| 71 | 4 | 0.20 | 0.60 | 6000 | 250 | 40 | 40 | 20 | 100 | 10 | 21 |
| 80 | 7 | 0.20 | 0.60 | 6000 | 375 | 60 | 60 | 30 | 150 | 15 | 34 |
| 90 | 7 | 0.20 | 0.60 | 3600 | 375 | 60 | 60 | 30 | 150 | 15 | 34 |
| 100 | 13 | 0.25 | 0.65 | 3600 | 500 | 80 | 100 | 45 | 250 | 15 | 38 |

1) For wear of the friction linings up to a thickness of 1 mm

3) With standard rectifier

5) Opening on ac side

2) Between two wear adjustments from **s_n** to **s_{max}**

4) With increased rectifier

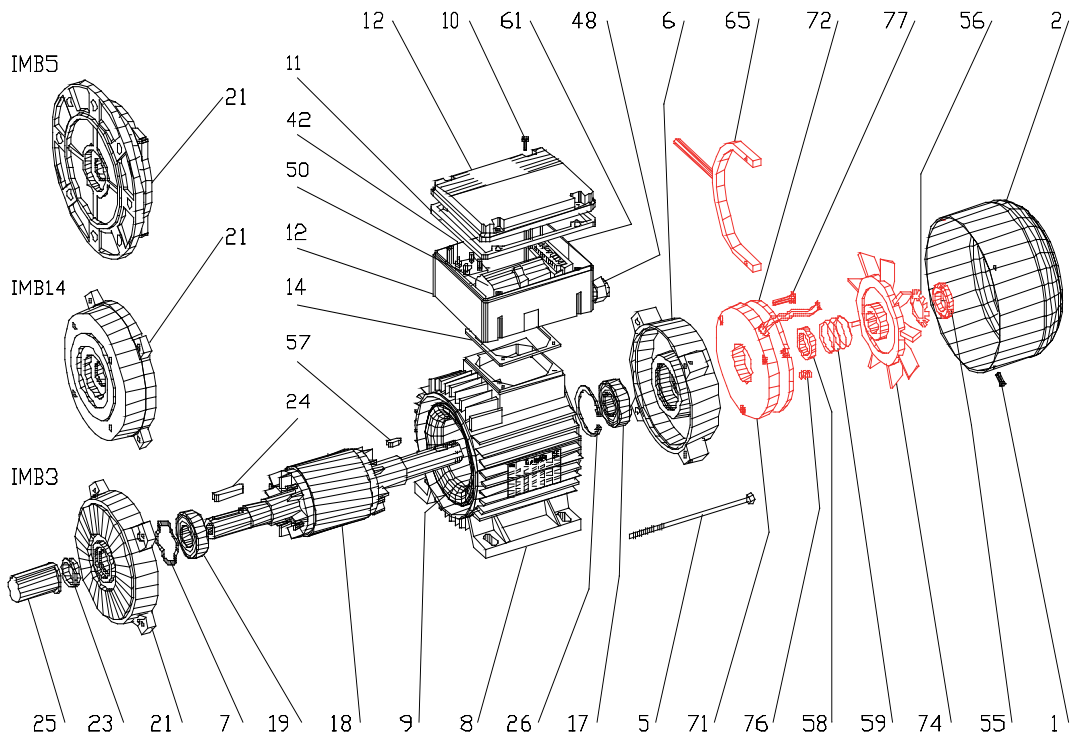
6) Opening on dc side or with rapid rectifier

*** - The time table is valid for a power independent of a brake motor.

If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening or using the dc-side rectifier fast, time is much improved.

For any further information you should contact our Technical Department.

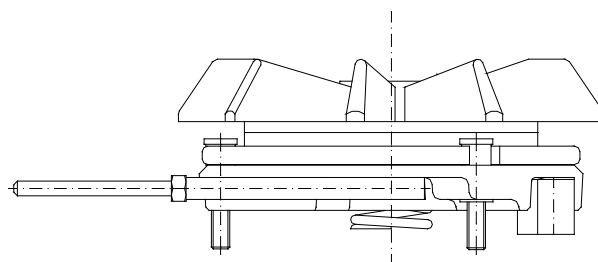
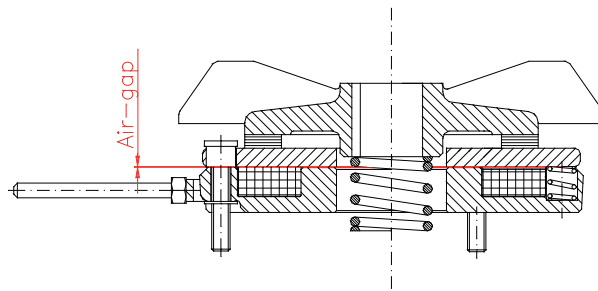
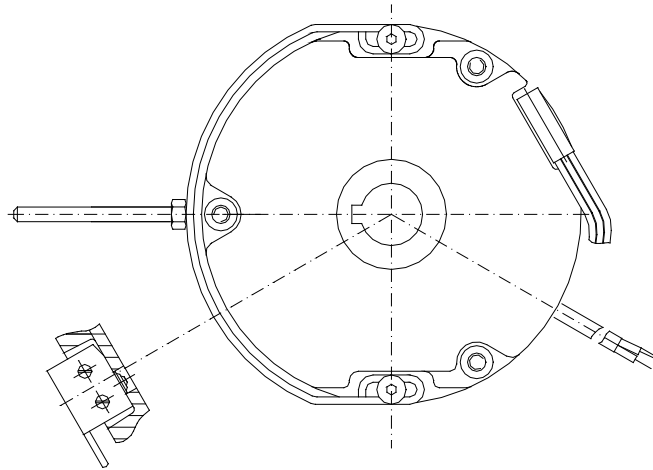
Self-braking single-phase motor - 10.. Type



Spare parts nomenclature

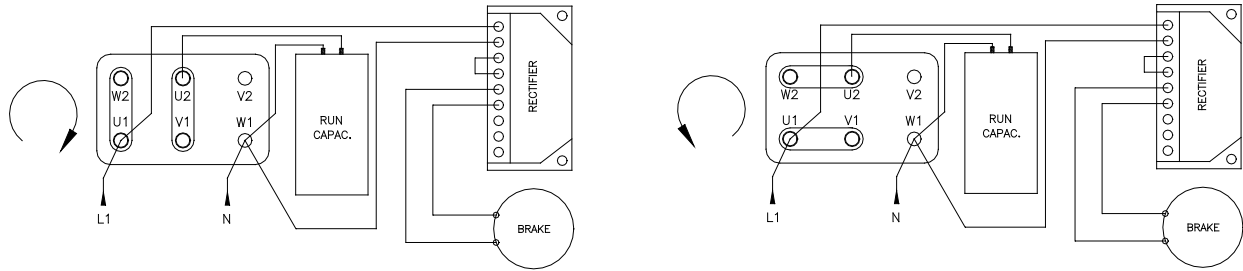
- | | |
|------------------------------------|----------------------|
| 1. Screw for fan cover | 48. Cable gland |
| 2. Fan cover | 50. Run capacitor |
| 5. Rod | 55. Nut |
| 6. N-end shield | 56. Ring |
| 7. Spring ring | 57. Key |
| 8. Frame | 58. Spacer |
| 9. Stator package | 59. Spring |
| 10. Screw for capacitor box cover | 61. Rectifier |
| 11. Gasket for capacitor box cover | 65. Manual release |
| 12. Capacitor box | 71. Electromagnet |
| 14. Gasket for capacitor box | 72. Movable armature |
| 17. Rear bearing | 74. Fan brake |
| 18. Rotor | 76. Spring |
| 19. Front bearing | 77. Screw for brake |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |
| 26. Retaining ring | |
| 42. Terminal board | |

Direct current brake - 10 Type



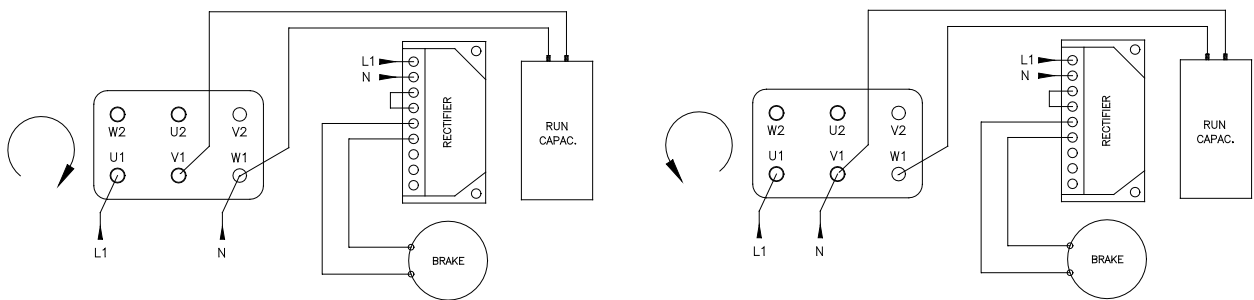
Connection for motors 10CO Type

Self-braking single-phase motors - with dc brake



Connection for motors 10CB Type

Self-braking single-phase motors - with **balanced winding** - with dc brake



Self-braking single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

| 10CO Type 2 pole - 3000 min¹ | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|------------------------|----------------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor V 450 μF | Braking torque M _b Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 63 a | 0.18 | 2850 | 1.35 | 61.0 | 0.95 | 0.60 | 0.65 | 3.6 | 2.1 | 6.3 | 3 | 0.429 | 5.4 |
| 63 b | 0.25 | 2860 | 1.74 | 67.2 | 0.93 | 0.84 | 0.65 | 3.8 | 2.1 | 8 | 3 | 0.462 | 6.0 |
| 63 c | 0.37 | 2870 | 2.5 | 67.7 | 0.95 | 1.23 | 0.67 | 3.9 | 2.3 | 12.5 | 3 | 0.506 | 6.8 |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 0.56 | 3.1 | 1.9 | 12.5 | 4 | 0.842 | 7.7 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 0.54 | 3.1 | 1.8 | 16 | 4 | 0.924 | 8.7 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 0.50 | 3.8 | 1.8 | 20 | 4 | 1.005 | 9.6 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 0.64 | 3.5 | 1.9 | 20 | 7 | 1.704 | 10.6 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 0.65 | 3.7 | 1.9 | 25 | 7 | 1.923 | 12.1 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 0.65 | 3.7 | 2.0 | 31.5 | 7 | 2.153 | 13.7 |
| 90S a | 1.1 | 2830 | 7.4 | 71.8 | 0.90 | 3.71 | 0.61 | 3.8 | 2.2 | 35 | 7 | 2.366 | 15.4 |
| 90L a | 1.5 | 2840 | 10.0 | 72.5 | 0.90 | 5.05 | 0.62 | 4.1 | 2.3 | 40 | 7 | 2.719 | 17.9 |
| 90L b | 1.8 | 2840 | 11.2 | 77.2 | 0.93 | 6.05 | 0.62 | 4.2 | 2.4 | 50 | 7 | 2.988 | 19.8 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 0.61 | 3.4 | 2.2 | 50 | 13 | 5.666 | 23.5 |
| 10CO Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
| 63 a | 0.09 | 1400 | 0.80 | 54.3 | 0.90 | 0.61 | 0.62 | 2.3 | 1.8 | 4 | 3 | 0.506 | 5.3 |
| 63 b | 0.12 | 1400 | 1.0 | 58.0 | 0.90 | 0.82 | 0.62 | 2.5 | 1.8 | 5 | 3 | 0.563 | 5.9 |
| 63 c | 0.18 | 1400 | 1.4 | 60.1 | 0.93 | 1.23 | 0.62 | 2.5 | 1.8 | 8 | 3 | 0.626 | 6.7 |
| 71 a | 0.18 | 1370 | 1.7 | 51.2 | 0.90 | 1.26 | 0.72 | 2.4 | 1.7 | 10 | 4 | 1.187 | 7.6 |
| 71 b | 0.25 | 1370 | 2.1 | 55.7 | 0.93 | 1.74 | 0.74 | 2.4 | 1.8 | 12.5 | 4 | 1.300 | 8.3 |
| 71 c | 0.37 | 1370 | 2.7 | 64.1 | 0.93 | 2.58 | 0.78 | 2.6 | 1.8 | 20 | 4 | 1.675 | 10.1 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 0.55 | 2.8 | 1.6 | 14 | 7 | 2.499 | 10.3 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 0.64 | 3.1 | 1.8 | 16 | 7 | 3.043 | 11.9 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 0.55 | 2.9 | 1.8 | 20 | 7 | 3.517 | 13.4 |
| 90L a | 1.1 | 1370 | 7.2 | 73.0 | 0.91 | 7.67 | 0.56 | 3.3 | 1.8 | 35 | 7 | 3.943 | 17.3 |
| 90L b | 1.5 | 1380 | 9.5 | 73.8 | 0.93 | 10.4 | 0.56 | 3.4 | 1.9 | 40 | 7 | 4.427 | 19.3 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 0.44 | 3.5 | 1.8 | 35 | 13 | 7.637 | 23.5 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 0.45 | 3.6 | 1.9 | 50 | 13 | 9.030 | 27.6 |
| 10CO Type 6 pole - 1000 min¹ | | | | | | | | | | | | | |
| 63 b | 0.06 | 930 | 0.75 | 35.5 | 0.98 | 0.62 | 1.00 | 1.6 | 1.7 | 6.3 | 3 | 0.563 | 5.9 |
| 63 c | 0.09 | 930 | 0.98 | 42.0 | 0.95 | 0.92 | 0.80 | 1.8 | 1.7 | 8 | 3 | 0.626 | 6.6 |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 0.65 | 1.9 | 1.6 | 10 | 4 | 1.187 | 7.6 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 0.65 | 1.9 | 1.6 | 14 | 4 | 1.300 | 8.2 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 0.53 | 2.6 | 1.7 | 14 | 7 | 2.499 | 10.3 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 0.53 | 2.7 | 1.7 | 16 | 7 | 3.043 | 11.8 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 0.52 | 2.7 | 1.7 | 25 | 7 | 3.517 | 13.3 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 0.51 | 2.6 | 1.7 | 25 | 7 | 3.310 | 14.7 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 0.51 | 2.8 | 1.7 | 35 | 7 | 3.943 | 17.2 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 0.41 | 3.3 | 1.7 | 35 | 13 | 9.050 | 23.8 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 0.42 | 3.5 | 1.7 | 50 | 13 | 10.72 | 27.3 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Self-braking single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

| 10CB Type 4 pole - 1500 min⁻¹ | | | | | | | | | | | | | |
|---|--------------------------------------|---|---------------------|--------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|------------------------------|--|--|-----------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor V 450 μF | Braking torque M _b Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 63 a | 0.09 | 1420 | 0.80 | 51.0 | 0.96 | 0.61 | 0.62 | 2.4 | 1.5 | 6.3 | 3 | 0.506 | 5.3 |
| 63 b | 0.12 | 1420 | 1.07 | 51.9 | 0.94 | 0.81 | 0.54 | 2.4 | 1.8 | 8 | 3 | 0.563 | 5.9 |
| 63 c | 0.18 | 1400 | 1.4 | 58.2 | 0.96 | 1.23 | 0.56 | 2.5 | 1.7 | 10 | 3 | 0.626 | 6.7 |
| 71 a | 0.18 | 1370 | 1.4 | 57.0 | 0.98 | 1.26 | 0.93 | 2.3 | 1.7 | 12.5 | 4 | 1.187 | 7.6 |
| 71 b | 0.25 | 1370 | 1.9 | 58.4 | 0.98 | 1.74 | 0.92 | 2.4 | 1.7 | 16 | 4 | 1.300 | 8.3 |
| 71 c | 0.37 | 1380 | 2.6 | 64.5 | 0.96 | 2.56 | 0.92 | 2.9 | 1.7 | 20 | 4 | 1.675 | 10.1 |
| 80 a | 0.37 | 1360 | 2.8 | 61.1 | 0.94 | 2.60 | 0.56 | 1.9 | 1.5 | 20 | 7 | 2.499 | 10.3 |
| 80 b | 0.55 | 1360 | 4.2 | 61.2 | 0.93 | 3.86 | 0.54 | 2.1 | 1.7 | 31.5 | 7 | 3.043 | 11.9 |
| 80 c | 0.75 | 1360 | 5.0 | 67.9 | 0.96 | 5.27 | 0.54 | 2.2 | 1.6 | 40 | 7 | 3.517 | 13.4 |
| 90S a | 0.75 | 1390 | 5.2 | 65.3 | 0.93 | 5.15 | 0.82 | 2.2 | 1.8 | 40 | 7 | 3.310 | 14.9 |
| 90L a | 1.1 | 1370 | 6.7 | 72.8 | 0.98 | 7.67 | 0.66 | 2.6 | 1.6 | 45 | 7 | 3.943 | 17.3 |

M_n = Full load torque

M_s = Locked rotor torque

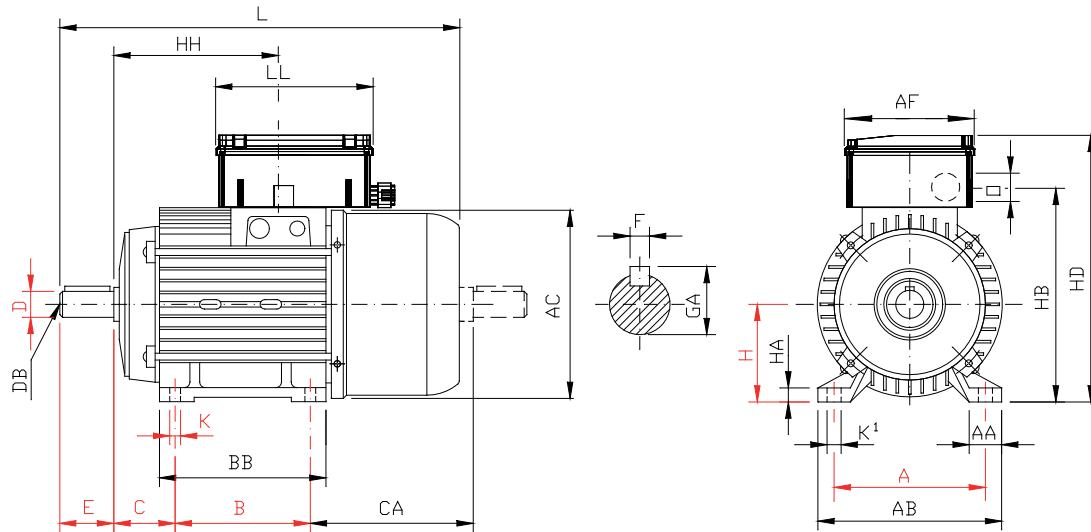
M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Mounting arrangement IM B3

Self-braking single-phase motors - 10 Type



Measures for coupling, IM B5 mounting see page 83
 Measures for coupling, IM B14 mounting see page 85

Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | Overall | | | | | | | | Shaft end | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|---------|-----|-----|-----|-----|-----|-----|-----|-----------|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 97 | 63 | 7 | 7 | 10 | 123 | 120 | 137 | 192 | 89 | 236 | 145 | PG16 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 102 | 71 | 8 | 7 | 12 | 138 | 120 | 155 | 211 | 103 | 263 | 145 | PG16 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 110 | 80 | 11 | 9 | 13 | 156 | 120 | 173 | 226 | 117 | 296 | 145 | PG16 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 119 | 90 | 13 | 9 | 13 | 176 | 120 | 188 | 240 | 127 | 320 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 119 | 90 | 13 | 9 | 13 | 176 | 120 | 188 | 240 | 152 | 345 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 133 | 100 | 14 | 12 | 17 | 194 | 120 | 211 | 262 | 171 | 391 | 145 | PG16 | 28 | M10 | 60 | 8 | 31 |

Self-braking three-phase motors Braking-torque adjustable

Self-braking three-phase motors - 30.. Type

For normal use

Typical applications:

- Application with a high number of interventions (ac brake).
- Lifting and transportation.
- Machines for packaging.
- Gear motors.

Mechanical characteristics:

- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.

Unscrewing the screws will not decrease the braking torque under the safe value of 35%.

The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.

- Braking torque lower standard may be provided on request.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:

- Standard brake ac; alternatively can be supplied in dc.
- Both the brake for the ac dc, the power can be independent or derived from the motor, depending on motor type and the needs of employment.
- **In the case of dc brake**, power is obtained with a rectifier already built into the terminal box.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Maximum braking torque Mb max. Nm | Air-gap | | Maximum speed nmax min ⁻¹ | Brake life | | Brake release time | | | Braking torque rise time *** | | | Brake power input | |
|------------|--|-----------|-------------|---|-----------------------|-----------------|--------------------|-----------------|------------------|------------------------------|-----------------|-----------------|-------------------|-----------------|
| | | Sn | Smax | | Wt 1) MJ | W1 2) | ac | | dc | | ac | | dc | |
| | | | | | | | t1 ms | t1 ms | t11 ms | t1 ms | t2 ms | t2 ms | t22 ms | Pa VA |
| 63 | 5 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 4 | 30 | 15 | 20 | 100 | 10 | 60 | 16 |
| 71 | 5 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 4 | 30 | 15 | 20 | 100 | 10 | 60 | 16 |
| 80 | 10 | 0.20 | 0.50 | 3600 | 370 | 22.4 | 4 | 60 | 25 | 40 | 120 | 10 | 80 | 20 |
| 90 | 20 | 0.30 | 0.60 | 3600 | 500 | 30 | 6 | 100 | 40 | 60 | 150 | 10 | 110 | 30 |
| 100 | 40 | 0.30 | 0.60 | 3600 | 750 | 45 | 8 | 120 | 50 | 90 | 220 | 15 | 250 | 40 |
| 112 | 70 | 0.35 | 0.70 | 3600 | 1000 | 70 | 16 | - | 80 | 120 | 300 | 30 | 470 | 50 |
| 132 | 100 | 0.35 | 0.70 | 3000 | 1100 | 77 | 16 | - | 80 | 140 | 200 | 20 | 550 | 65 |
| 160 | 150 | 0.40 | 0.80 | 3000 | 1650 | 132 | 16 | - | 100 | 180 | 200 | 20 | 600 | 65 |

1) For wear of the friction linings up to a thickness of 1 mm

3) With standard rectifier

5) Opening on ac side

2) Between two wear adjustments from **sn** to **smax**

4) With increased rectifier

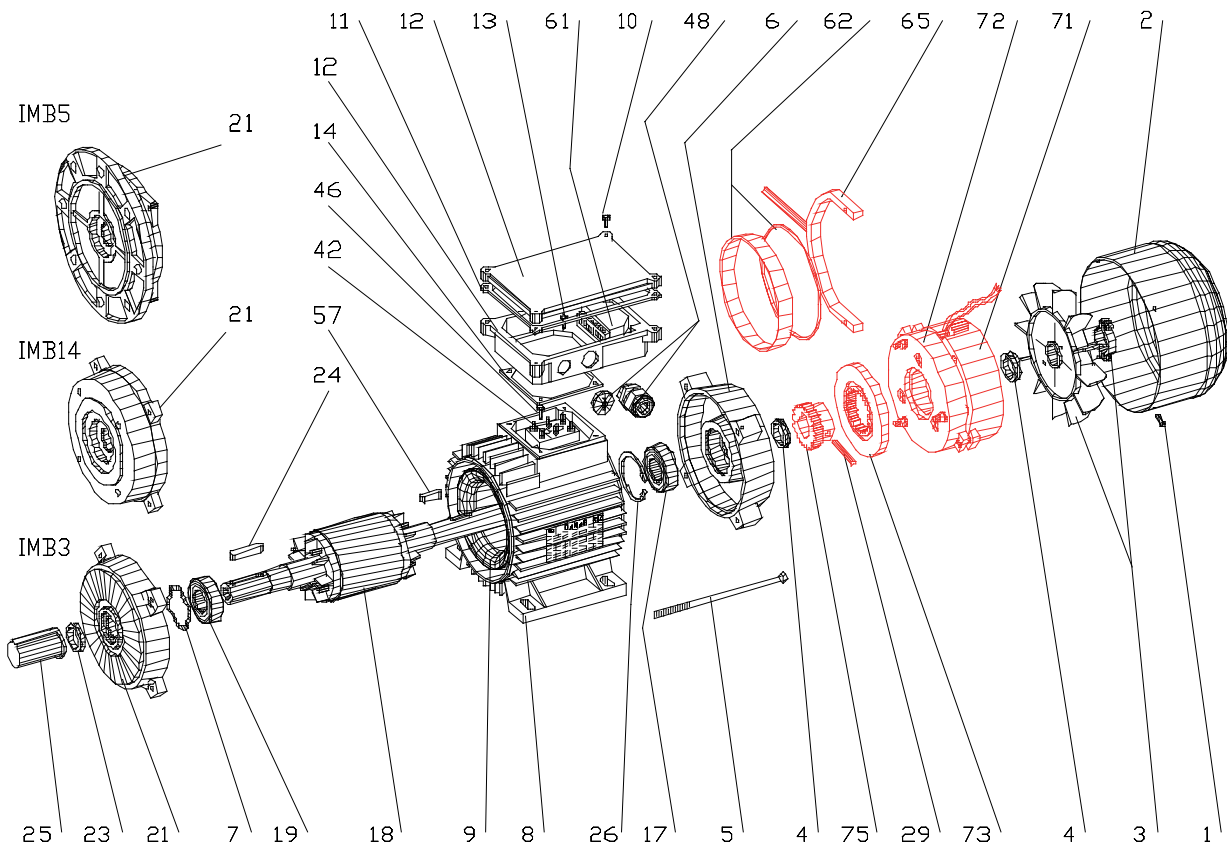
6) Opening on dc side or with rapid rectifier

*** - The time table is valid for a power independent of a brake motor.

If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, if the brake is in dc, the times are much improved with the opening of the circuit or by using the dc-side rectifier fast.

For any further information you should contact our Technical Department.

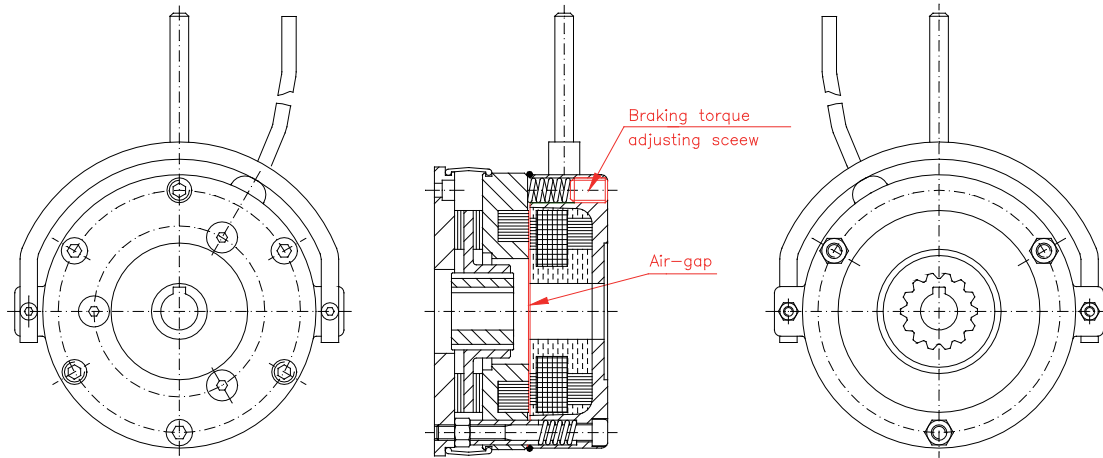
Self-braking three-phase motor - 30.. Type



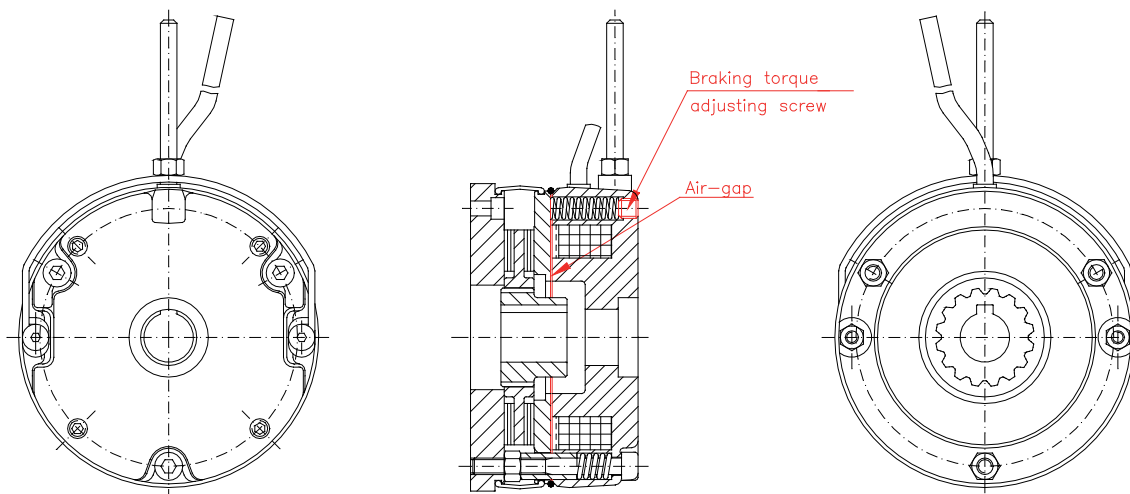
Spare parts nomenclature

- | | |
|-----------------------------------|----------------------|
| 1. Screw for fan cover | 25. Shaft cap |
| 2. Fan cover | 26. Retaining ring |
| 3. Fan | 29. Gear pin |
| 4. Sealing ring | 42. Terminal board |
| 5. Rod | 46. Grounding screw |
| 6. N-end shield | 48. Cable gland |
| 7. Spring ring | 57. Key |
| 8. Frame | 61. Rectifier |
| 9. Stator package | 62. O-ring for brake |
| 10. Screw for terminal box cover | 65. Manual release |
| 11. Gasket for terminal box cover | 71. Electromagnet |
| 12. Terminal box | 72. Movable armature |
| 13. Screw for terminal box | 73. Brake disc |
| 14. Gasket for terminal box | 75. Cogged hub |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |

Alternating current brake – 30 Type

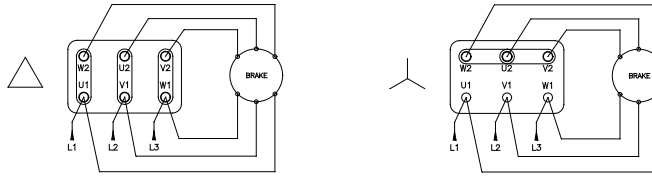


Direct current brake – 30 Type

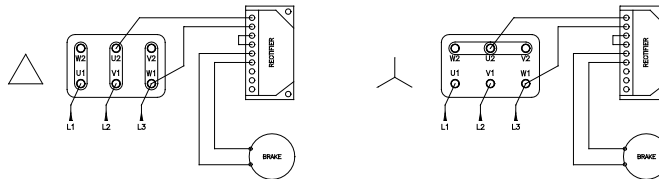


Connection for motors 30S Type

Self-braking three-phase **one-speed** motors - with **ac** brake

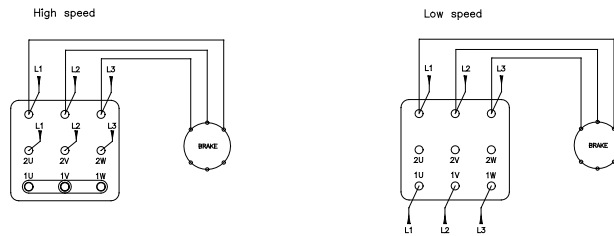


Self-braking three-phase **one-speed** motors - with **dc** brake

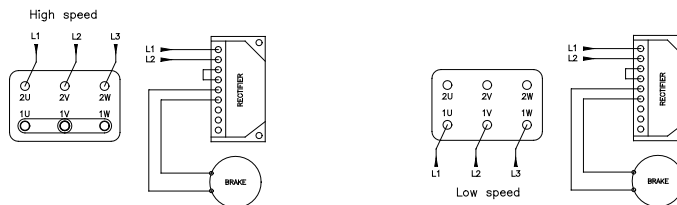


Connection for motors 30D Type

Self-braking three-phase **two-speed** motors - **single winding** - with **ac** brake

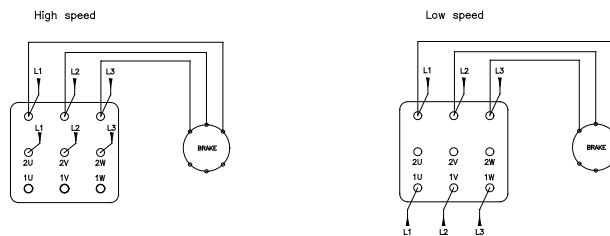


Self-braking three-phase **two-speed** motors - **single winding** - with **dc** brake

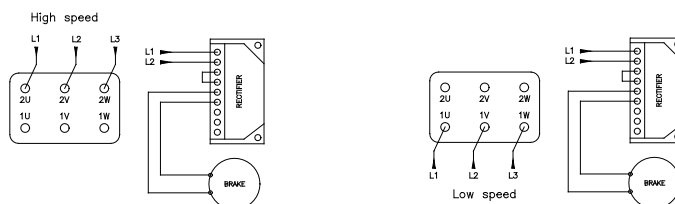


Connection for motors 30DD Type

Self-braking three-phase **two-speed** motors - **double winding** - with **ac** brake



Self-braking three-phase **two-speed** motors - **double winding** - with **dc** brake



One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
 Brake power with alternating current (direct current on request).

Method of determining the efficiency: IEC 60034-2-1; 2014

| 30SH Type 2 pole - 3000 min¹ | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------------|-------|------|-------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|---------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque Mb max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 63 a | 0.18 | 2815 | 0.49 | 64.2 | 69.5 | 70.5 | 0.76 | 0.62 | 2.9 | 4.7 | 2.9 | 5 | 0.189 | 6.2 |
| 63 b | 0.25 | 2800 | 0.64 | 68.1 | 71.6 | 71.7 | 0.81 | 0.89 | 2.9 | 5.0 | 3.1 | 5 | 0.222 | 6.8 |
| 63 c | 0.37 | 2825 | 0.91 | 69.7 | 73.9 | 74.2 | 0.80 | 1.26 | 3.4 | 5.6 | 3.2 | 5 | 0.266 | 7.5 |
| 71 a | 0.37 | 2820 | 0.95 | 68.6 | 73.6 | 74.4 | 0.75 | 1.24 | 3.3 | 5.5 | 3.4 | 5 | 0.402 | 8.5 |
| 71 b | 0.55 | 2815 | 1.38 | 71.6 | 74.9 | 75.3 | 0.77 | 1.87 | 3.5 | 5.7 | 3.4 | 5 | 0.484 | 9.4 |
| 80 a | 0.75 | 2840 | 1.7 | 78.9 | 80.7 | 80.2 | 0.81 | 2.54 | 3.3 | 6.6 | 3.4 | 10 | 0.960 | 13.2 |
| 80 b | 1.1 | 2865 | 2.4 | 83.1 | 84.5 | 84.0 | 0.80 | 3.69 | 3.7 | 7.4 | 3.6 | 10 | 1.239 | 15.2 |
| 80 c | 1.5 | 2830 | 3.4 | 81.7 | 82.9 | 82.0 | 0.79 | 5.07 | 3.3 | 6.4 | 3.4 | 10 | 1.239 | 15.2 |
| 90S a | 1.5 | 2900 | 3.2 | 82.6 | 84.9 | 84.8 | 0.82 | 4.94 | 3.3 | 7.9 | 3.6 | 20 | 1.629 | 20.0 |
| 90S b | 1.8 | 2870 | 3.7 | 83.7 | 84.6 | 83.6 | 0.85 | 5.99 | 2.6 | 6.6 | 2.8 | 20 | 1.629 | 20.0 |
| 90L a | 2.2 | 2890 | 4.4 | 84.1 | 85.9 | 85.7 | 0.84 | 7.26 | 3.1 | 8.1 | 3.6 | 20 | 2.048 | 22.8 |
| 90L b | 2.6 | 2850 | 5.2 | 86.4 | 86.4 | 84.8 | 0.87 | 8.80 | 2.8 | 6.6 | 3.0 | 20 | 2.048 | 22.8 |
| 100L a | 3 | 2900 | 5.9 | 88.0 | 88.5 | 87.7 | 0.84 | 9.89 | 2.6 | 7.3 | 3.3 | 40 | 3.497 | 30.1 |
| 100L b | 4 | 2875 | 7.9 | 88.1 | 88.1 | 86.8 | 0.85 | 13.4 | 2.6 | 7.2 | 3.2 | 40 | 3.892 | 32.3 |
| 112M a | 4 | 2920 | 7.3 | 86.6 | 88.4 | 88.6 | 0.88 | 12.9 | 3.9 | 9.9 | 5.5 | 70 | 6.071 | 42.0 |
| 112M b | 5.5 | 2910 | 10.5 | 87.6 | 88.9 | 88.8 | 0.84 | 18.1 | 4.3 | 9.9 | 6.3 | 70 | 7.216 | 45.1 |
| 132S a | 5.5 | 2920 | 10.5 | 87.2 | 88.6 | 88.5 | 0.85 | 17.9 | 2.4 | 7.4 | 3.4 | 100 | 11.99 | 56.0 |
| 132S b | 7.5 | 2940 | 14.2 | 88.0 | 89.6 | 89.7 | 0.84 | 24.3 | 3.6 | 8.8 | 4.0 | 100 | 15.44 | 63.9 |
| 132M a | 9.2 | 2940 | 17.8 | 88.9 | 90.4 | 90.6 | 0.82 | 29.9 | 4.5 | 9.6 | 4.5 | 100 | 18.09 | 71.2 |
| 132M b | 11 | 2940 | 21.1 | 89.0 | 90.6 | 90.7 | 0.83 | 35.7 | 4.2 | 10.1 | 4.6 | 100 | 20.61 | 77.1 |
| 30SH Type 4 pole - 1500 min¹ | | | | | | | | | | | | | | |
| 63 b | 0.12 | 1370 | 0.41 | 55.6 | 61.8 | 63.1 | 0.67 | 0.85 | 2.1 | 3.0 | 2.3 | 5 | 0.323 | 6.8 |
| 63 c | 0.18 | 1380 | 0.61 | 58.8 | 64.9 | 66.0 | 0.65 | 1.25 | 2.4 | 3.3 | 2.6 | 5 | 0.686 | 7.5 |
| 71 b | 0.25 | 1380 | 0.68 | 66.5 | 69.5 | 68.7 | 0.76 | 1.73 | 2.1 | 3.8 | 2.3 | 5 | 0.747 | 9.1 |
| 71 c | 0.37 | 1415 | 1.08 | 65.6 | 71.3 | 72.8 | 0.68 | 2.51 | 3.0 | 4.8 | 3.3 | 5 | 0.860 | 10.9 |
| 80 a | 0.55 | 1415 | 1.26 | 76.3 | 78.6 | 78.3 | 0.79 | 3.67 | 2.4 | 5.4 | 2.8 | 10 | 2.267 | 13.7 |
| 80 b | 0.75 | 1430 | 1.7 | 77.3 | 80.1 | 80.2 | 0.78 | 4.96 | 2.9 | 6.2 | 3.4 | 10 | 2.899 | 15.6 |
| 90S a | 1.1 | 1425 | 2.5 | 80.9 | 82.7 | 82.1 | 0.76 | 7.37 | 2.4 | 5.3 | 2.9 | 20 | 2.726 | 19.3 |
| 90L a | 1.5 | 1425 | 3.4 | 82.8 | 84.4 | 83.8 | 0.76 | 10.1 | 2.7 | 5.8 | 3.2 | 20 | 3.487 | 22.9 |
| 100L a | 2.2 | 1430 | 5.0 | 83.7 | 85.3 | 84.7 | 0.75 | 14.7 | 2.6 | 5.7 | 3.2 | 40 | 5.386 | 29.8 |
| 100L b | 3 | 1430 | 6.7 | 85.1 | 86.4 | 85.8 | 0.75 | 19.9 | 2.8 | 6.0 | 3.4 | 40 | 6.796 | 33.7 |
| 112M a | 4 | 1440 | 8.0 | 87.3 | 88.1 | 87.2 | 0.82 | 26.3 | 2.4 | 6.5 | 3.1 | 70 | 11.96 | 44.6 |
| 132S b | 5.5 | 1445 | 11.0 | 89.2 | 89.3 | 88.2 | 0.82 | 36.4 | 2.3 | 5.7 | 2.7 | 100 | 25.82 | 63.4 |
| 132M b | 7.5 | 1450 | 14.8 | 90.0 | 90.1 | 89.1 | 0.82 | 49.4 | 2.4 | 6.1 | 2.7 | 100 | 33.77 | 74.8 |
| 160M b | 11 | 1470 | 22.1 | 89.9 | 90.8 | 90.4 | 0.79 | 71.4 | 2.8 | 6.5 | 2.6 | 150 | 67.92 | 119 |
| 160L a | 15 | 1470 | 29.0 | 91.1 | 91.6 | 91.1 | 0.82 | 97.3 | 2.6 | 6.5 | 2.8 | 150 | 87.70 | 138 |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
 Brake power with alternating current (direct current on request).

Method of determining the efficiency: IEC 60034-2-1; 2014

| 30SH Type 6 pole - 1000 min¹ | | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|-------|------|-------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|---|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | | | Direct insertion characteristics | | | Braking torque M _b max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | IE2 η | | | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| | | | | 50 % | 75 % | 100 % | | | | | | | | |
| 71 b | 0.12 | 905 | 0.52 | 44.3 | 51.5 | 54.1 | 0.63 | 1.28 | 2.1 | 2.6 | 2.3 | 5 | 0.860 | 9.0 |
| 71 c | 0.18 | 890 | 0.66 | 51.2 | 57.0 | 57.1 | 0.68 | 1.96 | 1.9 | 2.6 | 2.1 | 5 | 1.235 | 10.7 |
| 80 b | 0.25 | 935 | 0.77 | 64.0 | 68.9 | 70.4 | 0.66 | 2.54 | 2.6 | 4.1 | 2.8 | 10 | 2.153 | 13.3 |
| 80 c | 0.37 | 940 | 1.10 | 64.1 | 70.0 | 71.5 | 0.68 | 3.78 | 2.8 | 4.4 | 3.0 | 10 | 2.627 | 14.5 |
| 90S a | 0.55 | 935 | 1.42 | 72.5 | 75.4 | 75.1 | 0.74 | 5.63 | 2.1 | 4.3 | 2.5 | 20 | 4.308 | 19.0 |
| 90L a | 0.75 | 935 | 2.0 | 75.4 | 78.2 | 77.9 | 0.72 | 7.83 | 2.3 | 4.7 | 2.9 | 20 | 5.581 | 21.9 |
| 100L r | 1.1 | 940 | 2.7 | 76.5 | 79.1 | 78.7 | 0.73 | 11.0 | 2.3 | 4.9 | 2.9 | 40 | 8.382 | 27.8 |
| 100L a | 1.5 | 940 | 3.7 | 78.5 | 80.6 | 80.1 | 0.74 | 15.3 | 2.3 | 5.1 | 3.0 | 40 | 10.94 | 31.7 |
| 112M a | 2.2 | 960 | 5.3 | 80.2 | 82.5 | 82.4 | 0.73 | 21.8 | 1.6 | 5.4 | 2.8 | 70 | 17.39 | 43.4 |
| 132S a | 3 | 955 | 6.8 | 83.6 | 84.7 | 83.9 | 0.76 | 30.0 | 1.6 | 5.0 | 2.6 | 100 | 28.23 | 57.0 |
| 132M a | 4 | 960 | 8.9 | 84.8 | 86.0 | 85.3 | 0.76 | 39.7 | 1.6 | 5.4 | 2.9 | 100 | 35.80 | 67.8 |
| 132M b | 5.5 | 960 | 11.7 | 86.8 | 87.8 | 87.1 | 0.78 | 54.2 | 1.7 | 5.9 | 3.0 | 100 | 46.68 | 78.0 |
| 160M b | 7.5 | 965 | 15.3 | 87.7 | 88.4 | 87.7 | 0.80 | 74.4 | 2.2 | 5.9 | 2.8 | 150 | 91.40 | 114 |
| 160L a | 11 | 970 | 22.4 | 88.7 | 89.6 | 89.0 | 0.79 | 108 | 2.4 | 6.8 | 2.3 | 150 | 128.6 | 138 |
| 30SH Type 8 pole - 750 min¹ | | | | | | | | | | | | | | |
| 71 b | 0.09 | 685 | 0.57 | 30.0 | 41.1 | 45.4 | 0.50 | 1.26 | 2.7 | 2.2 | 2.8 | 5 | 0.860 | 9.0 |
| 71 c | 0.12 | 685 | 0.82 | 28.9 | 36.9 | 42.5 | 0.50 | 1.68 | 2.9 | 2.2 | 3.1 | 5 | 1.235 | 10.8 |
| 80 b | 0.18 | 695 | 0.89 | 41.7 | 50.8 | 54.6 | 0.54 | 2.49 | 2.6 | 2.7 | 2.7 | 10 | 2.153 | 13.0 |
| 80 c | 0.25 | 695 | 1.22 | 41.8 | 49.9 | 54.1 | 0.55 | 3.42 | 2.7 | 2.8 | 2.8 | 10 | 2.627 | 14.5 |
| 90S a | 0.37 | 690 | 1.43 | 55.5 | 62.3 | 63.8 | 0.59 | 5.18 | 1.8 | 2.5 | 1.9 | 20 | 4.308 | 18.1 |
| 90L a | 0.55 | 685 | 2.0 | 59.1 | 65.9 | 67.0 | 0.57 | 7.40 | 1.9 | 2.5 | 2.3 | 20 | 5.581 | 20.7 |
| 100L r | 0.75 | 685 | 2.6 | 60.0 | 65.2 | 66.5 | 0.62 | 10.4 | 2.2 | 3.2 | 2.8 | 40 | 8.382 | 27.8 |
| 100L a | 1.1 | 690 | 3.5 | 64.8 | 70.1 | 71.1 | 0.63 | 15.1 | 2.1 | 3.5 | 2.6 | 40 | 10.94 | 31.4 |
| 112M a | 1.5 | 705 | 4.3 | 71.1 | 74.5 | 74.4 | 0.67 | 20.3 | 1.2 | 3.5 | 2.1 | 70 | 17.39 | 43.1 |
| 132S b | 2.2 | 715 | 6.1 | 74.8 | 78.2 | 78.5 | 0.66 | 29.0 | 1.5 | 3.8 | 2.3 | 100 | 32.82 | 60.1 |
| 132M b | 3 | 720 | 8.0 | 76.4 | 79.8 | 80.1 | 0.67 | 39.5 | 1.4 | 4.1 | 2.5 | 100 | 42.63 | 70.4 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Two-speed self-braking three-phase motors - single winding - Dahlander connection (Star-Star/Delta)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Brake power with alternating current (direct current on request).

| 30D Type 2/4 pole - 3000/1500 min⁻¹ | | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|---------------------------|--|-----------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Braking torque Mb max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 63 a | 0.15/0.10 | 2780/1370 | 0.41/0.41 | 0.52/0.70 | 1.7/1.8 | 3.9/2.4 | 2.0/2.0 | 5 | 0.226 | 6.2 | |
| 63 b | 0.22/0.15 | 2800/1380 | 0.58/0.58 | 0.75/1.04 | 1.8/1.9 | 4.1/2.6 | 2.2/2.1 | 5 | 0.283 | 6.8 | |
| 63 c | 0.30/0.20 | 2800/1380 | 0.75/0.75 | 1.02/1.38 | 1.9/2.0 | 4.0/2.8 | 2.3/2.2 | 5 | 0.386 | 7.5 | |
| 71 a | 0.30/0.20 | 2800/1380 | 0.78/0.78 | 1.02/1.38 | 1.9/2.0 | 3.8/3.2 | 2.1/2.1 | 5 | 0.747 | 8.5 | |
| 71 b | 0.45/0.30 | 2810/1400 | 1.3/1.1 | 1.53/2.05 | 2.0/2.1 | 4.1/3.4 | 2.3/2.2 | 5 | 0.860 | 9.1 | |
| 71 c | 0.60/0.45 | 2840/1400 | 1.6/1.4 | 2.02/3.07 | 2.1/2.3 | 4.5/3.6 | 2.6/2.5 | 5 | 1.235 | 10.9 | |
| 80 a | 0.60/0.45 | 2780/1400 | 1.6/1.2 | 2.06/3.07 | 1.8/1.8 | 3.6/3.7 | 2.1/2.1 | 10 | 1.609 | 11.7 | |
| 80 b | 0.85/0.65 | 2820/1400 | 2.4/1.7 | 2.88/4.43 | 1.8/2.0 | 3.8/3.6 | 2.4/2.3 | 10 | 2.153 | 13.2 | |
| 80 c | 1.10/0.85 | 2830/1410 | 2.8/2.1 | 3.71/5.76 | 2.0/2.1 | 4.4/4.5 | 2.4/2.4 | 10 | 2.627 | 14.6 | |
| 90S a | 1.50/1.10 | 2850/1410 | 3.3/2.7 | 5.03/7.45 | 2.2/2.0 | 4.8/4.3 | 2.9/2.4 | 20 | 2.370 | 17.8 | |
| 90L a | 1.85/1.40 | 2850/1410 | 4.1/3.1 | 6.20/9.48 | 2.4/2.1 | 5.0/4.9 | 3.0/2.9 | 20 | 3.003 | 20.1 | |
| 90L b | 2.20/1.70 | 2850/1410 | 5.0/3.9 | 7.37/11.5 | 2.5/2.3 | 5.6/5.1 | 3.2/3.0 | 20 | 3.487 | 22.0 | |
| 100L a | 2.60/2.00 | 2850/1420 | 6.1/4.8 | 8.71/13.5 | 2.8/2.6 | 5.0/5.3 | 3.2/3.1 | 40 | 4.987 | 28.1 | |
| 100L b | 3.50/2.70 | 2870/1420 | 8.0/6.4 | 11.6/18.2 | 2.7/2.7 | 5.7/4.9 | 3.2/2.9 | 40 | 6.384 | 31.8 | |
| 112M a | 4.00/3.20 | 2880/1430 | 8.8/7.1 | 13.3/21.4 | 2.1/2.0 | 6.0/5.1 | 2.9/1.9 | 70 | 10.43 | 41.4 | |
| 112M b | 4.80/3.70 | 2890/1430 | 9.8/8.2 | 15.9/24.7 | 2.0/2.0 | 6.2/5.0 | 2.7/1.8 | 70 | 11.96 | 44.4 | |
| 132S a | 6.00/4.60 | 2890/1440 | 13.1/9.9 | 19.8/30.5 | 2.3/2.0 | 5.1/5.0 | 2.5/2.4 | 100 | 23.46 | 59.6 | |
| 132M b | 8.20/6.60 | 2910/1440 | 17.5/13.5 | 26.9/43.8 | 2.5/2.2 | 6.1/5.3 | 2.8/1.8 | 100 | 30.64 | 70.0 | |
| 132M c | 9.60/7.80 | 2920/1440 | 20.0/16.0 | 31.4/51.7 | 2.5/2.3 | 6.2/5.3 | 2.8/1.8 | 100 | 35.24 | 76.4 | |
| 30D Type 4/8 pole - 1500/750 min⁻¹ | | | | | | | | | | | |
| 71 a | 0.10/0.05 | 1360/670 | 0.36/0.36 | 0.70/0.71 | 1.3/1.9 | 2.5/1.9 | 1.4/2.1 | 5 | 0.747 | 8.3 | |
| 71 b | 0.14/0.07 | 1370/670 | 0.45/0.50 | 0.98/1.00 | 1.7/1.9 | 3.0/1.9 | 2.1/2.1 | 5 | 0.860 | 9.0 | |
| 71 c | 0.20/0.10 | 1380/660 | 0.57/0.63 | 1.38/1.45 | 1.6/2.0 | 3.3/1.8 | 1.9/2.0 | 5 | 1.235 | 10.9 | |
| 80 a | 0.25/0.13 | 1360/680 | 0.65/0.65 | 1.76/1.83 | 1.3/1.6 | 3.3/1.9 | 1.5/1.9 | 10 | 1.609 | 11.6 | |
| 80 b | 0.37/0.20 | 1370/680 | 0.92/0.92 | 2.58/2.81 | 1.4/1.7 | 3.7/2.4 | 1.7/2.0 | 10 | 2.153 | 13.1 | |
| 80 c | 0.50/0.26 | 1370/680 | 1.2/1.2 | 3.49/3.65 | 2.0/2.1 | 3.5/2.4 | 1.8/2.0 | 10 | 2.627 | 14.5 | |
| 90S a | 0.70/0.36 | 1380/690 | 1.8/2.0 | 4.84/4.98 | 1.8/2.0 | 3.5/2.5 | 2.2/2.5 | 20 | 3.745 | 17.8 | |
| 90L a | 1.00/0.52 | 1380/690 | 2.5/2.5 | 6.92/7.20 | 1.8/1.8 | 3.6/2.1 | 2.1/2.0 | 20 | 5.018 | 20.3 | |
| 100L a | 1.10/0.60 | 1410/700 | 2.5/2.6 | 7.45/8.19 | 1.5/1.7 | 4.5/3.0 | 2.3/2.6 | 40 | 8.190 | 27.9 | |
| 100L b | 1.50/0.80 | 1410/710 | 3.3/3.2 | 10.2/10.8 | 1.5/1.8 | 4.1/3.4 | 2.1/2.6 | 40 | 10.66 | 31.6 | |
| 112M a | 2.20/1.20 | 1400/700 | 4.5/3.9 | 15.0/16.4 | 1.6/1.9 | 4.3/3.6 | 1.9/2.4 | 70 | 14.82 | 40.8 | |
| 112M b | 2.60/1.40 | 1410/710 | 5.3/4.9 | 17.6/18.8 | 1.8/2.0 | 5.3/4.0 | 2.5/3.2 | 70 | 17.39 | 43.9 | |
| 132S a | 3.00/1.70 | 1420/720 | 6.2/6.1 | 20.2/22.5 | 1.6/1.8 | 5.4/3.6 | 2.4/2.7 | 100 | 25.15 | 54.0 | |
| 132S b | 4.00/2.20 | 1430/720 | 8.3/8.3 | 26.7/29.2 | 1.7/2.0 | 5.7/4.0 | 2.5/2.7 | 100 | 32.82 | 60.7 | |
| 132M b | 5.50/3.00 | 1440/720 | 11.4/10.7 | 36.5/39.8 | 1.7/2.2 | 6.3/4.3 | 2.7/2.8 | 100 | 42.63 | 70.8 | |
| 160M b | 7.50/4.30 | 1440/720 | 15.0/14.0 | 49.7/57.0 | 1.8/2.2 | 5.5/4.2 | 2.5/2.7 | 150 | 91.40 | 114 | |
| 160L a | 11.0/6.30 | 1450/720 | 20.0/19.0 | 72.4/83.6 | 1.9/2.3 | 5.7/4.3 | 2.7/2.9 | 150 | 122.3 | 133 | |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Two-speed self-braking three-phase motors - double winding - Star/Star connection

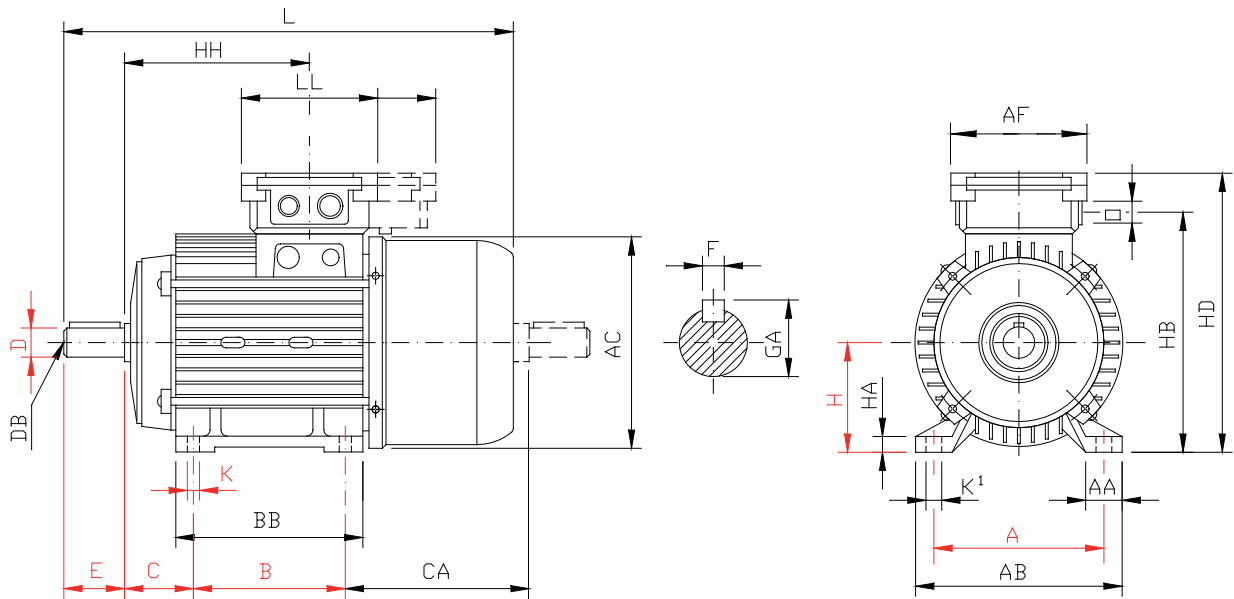
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
 Brake power with alternating current (direct current on request).

| 30DD Type 2/6 pole - 3000/1000 min¹ | | | | | | | | | | | |
|---|--------------------------------------|---|---------------------|----------------------|----------------------------------|--------------------------------|--------------------------------|---|--|--------------------|--|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Braking torque M _b max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg | |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 71 c | 0.42/0.14 | 2810/885 | 0.95/0.64 | 1.43/1.51 | 1.6/1.7 | 4.1/2.2 | 2.0/1.8 | 5 | 1.235 | 11.0 | |
| 80 a | 0.42/0.14 | 2770/930 | 1.07/0.57 | 1.45/1.44 | 1.6/1.4 | 3.6/2.4 | 1.9/1.8 | 10 | 1.609 | 11.6 | |
| 80 b | 0.60/0.20 | 2820/930 | 1.40/0.89 | 2.03/2.05 | 1.6/1.5 | 4.0/2.4 | 1.9/1.9 | 10 | 2.153 | 13.1 | |
| 80 c | 0.90/0.30 | 2820/940 | 1.88/1.08 | 3.05/3.05 | 1.5/1.6 | 4.4/2.9 | 2.0/2.2 | 10 | 2.627 | 14.5 | |
| 90S a | 1.10/0.37 | 2750/930 | 2.6/1.3 | 3.82/3.80 | 1.8/1.7 | 3.5/2.7 | 2.2/2.0 | 20 | 2.370 | 17.8 | |
| 90L a | 1.50/0.50 | 2810/950 | 3.4/1.7 | 5.10/5.03 | 1.8/2.1 | 3.9/3.2 | 2.3/2.4 | 20 | 3.003 | 20.1 | |
| 90L b | 1.80/0.60 | 2840/930 | 4.1/2.1 | 6.05/6.16 | 1.8/1.9 | 4.4/2.9 | 2.4/2.2 | 20 | 3.487 | 21.8 | |
| 100L a | 2.20/0.75 | 2810/930 | 5.2/2.2 | 7.48/7.70 | 1.7/1.6 | 3.9/3.0 | 2.2/2.0 | 40 | 4.987 | 28.1 | |
| 100L b | 3.00/1.00 | 2820/910 | 6.4/3.1 | 10.2/10.5 | 1.8/1.5 | 4.4/2.6 | 2.4/1.7 | 40 | 6.384 | 31.8 | |
| 112M b | 4.00/1.35 | 2900/950 | 8.3/4.0 | 13.2/13.6 | 1.9/2.0 | 5.8/3.9 | 2.7/2.4 | 70 | 11.96 | 44.8 | |
| 132S b | 5.50/1.85 | 2905/965 | 11.1/5.2 | 18.1/18.3 | 2.3/1.7 | 6.2/3.7 | 2.7/2.2 | 100 | 32.82 | 58.2 | |
| 132M b | 7.50/2.50 | 2910/960 | 14.8/7.1 | 24.6/24.9 | 2.1/1.8 | 6.2/3.8 | 2.5/2.3 | 100 | 42.63 | 67.4 | |
| 30DD Type 2/8 pole - 3000/750 min¹ | | | | | | | | | | | |
| 71 c | 0.33/0.08 | 2830/680 | 0.83/0.65 | 1.11/1.12 | 2.1/1.7 | 4.8/2.1 | 2.5/1.9 | 5 | 1.235 | 11.0 | |
| 80 a | 0.33/0.08 | 2830/690 | 0.83/0.44 | 1.11/1.11 | 1.5/1.6 | 3.2/1.9 | 2.0/1.8 | 10 | 1.609 | 11.6 | |
| 80 b | 0.44/0.11 | 2890/690 | 1.10/0.73 | 1.45/1.52 | 1.6/1.8 | 4.1/2.0 | 2.3/2.0 | 10 | 2.153 | 13.1 | |
| 80 c | 0.60/0.15 | 2890/690 | 1.50/0.75 | 1.98/2.08 | 1.6/1.6 | 4.4/2.1 | 2.5/1.9 | 10 | 2.627 | 14.5 | |
| 90S a | 0.75/0.18 | 2860/680 | 1.80/0.94 | 2.50/2.53 | 2.0/1.7 | 4.2/2.1 | 2.7/1.9 | 20 | 2.370 | 17.8 | |
| 90L a | 1.00/0.25 | 2880/690 | 2.3/1.3 | 3.32/3.46 | 2.0/1.7 | 4.6/2.2 | 2.4/2.1 | 20 | 3.003 | 20.1 | |
| 90L b | 1.20/0.30 | 2900/700 | 2.7/1.5 | 3.95/4.09 | 2.0/1.9 | 5.2/2.3 | 2.8/2.2 | 20 | 3.487 | 21.8 | |
| 100L a | 1.50/0.37 | 2890/700 | 3.3/1.7 | 4.96/5.05 | 1.6/1.8 | 4.6/2.4 | 2.4/2.1 | 40 | 4.987 | 28.1 | |
| 100L b | 2.00/0.50 | 2900/700 | 4.4/2.2 | 6.59/6.82 | 1.8/1.7 | 6.0/2.5 | 2.8/2.1 | 40 | 6.384 | 31.8 | |
| 112M a | 2.60/0.65 | 2810/710 | 5.9/2.3 | 8.84/8.74 | 1.9/1.5 | 5.8/3.4 | 2.0/1.9 | 70 | 14.82 | 39.5 | |
| 112M b | 3.20/0.80 | 2850/710 | 7.0/2.9 | 10.7/10.8 | 2.0/1.6 | 6.1/3.5 | 2.1/2.0 | 70 | 17.39 | 42.5 | |
| 132S b | 4.40/1.10 | 2900/720 | 9.2/3.8 | 14.5/14.6 | 2.0/1.5 | 6.3/3.5 | 2.3/2.1 | 100 | 32.82 | 58.2 | |
| 132M b | 6.00/1.50 | 2910/720 | 12.5/5.1 | 19.7/19.9 | 2.1/1.6 | 6.5/3.7 | 2.5/2.3 | 100 | 42.63 | 67.4 | |
| 30DD Type 4/6 pole - 1500/1000 min¹ | | | | | | | | | | | |
| 71 c | 0.25/0.18 | 1390/890 | 0.98/0.87 | 1.72/1.93 | 1.6/1.5 | 2.7/2.0 | 2.1/1.7 | 5 | 1.235 | 10.9 | |
| 80 a | 0.25/0.18 | 1420/920 | 0.72/0.64 | 1.68/1.87 | 1.4/1.3 | 3.9/2.7 | 2.1/1.8 | 10 | 1.609 | 11.6 | |
| 80 b | 0.37/0.25 | 1440/930 | 1.00/0.87 | 2.45/2.57 | 1.5/1.4 | 4.1/2.9 | 2.4/2.0 | 10 | 2.153 | 13.1 | |
| 80 c | 0.55/0.37 | 1430/920 | 1.5/1.3 | 3.67/3.84 | 1.5/1.4 | 3.9/2.8 | 2.2/1.9 | 10 | 2.627 | 14.5 | |
| 90S a | 0.75/0.50 | 1420/920 | 2.0/1.7 | 5.04/5.19 | 1.6/1.5 | 3.5/2.6 | 2.2/1.8 | 20 | 2.370 | 17.8 | |
| 90L a | 0.90/0.60 | 1440/940 | 2.6/2.2 | 5.97/6.10 | 2.3/1.8 | 4.1/2.9 | 2.8/2.1 | 20 | 3.003 | 20.2 | |
| 100L a | 1.10/0.75 | 1430/910 | 2.7/2.3 | 7.35/7.87 | 2.1/1.5 | 4.3/2.5 | 2.6/1.7 | 40 | 4.987 | 28.3 | |
| 100L b | 1.50/1.00 | 1440/920 | 3.7/3.0 | 9.95/10.4 | 2.2/1.6 | 4.6/2.9 | 2.8/1.9 | 40 | 6.384 | 32.1 | |
| 112M a | 2.20/1.50 | 1450/950 | 4.6/3.9 | 14.5/15.1 | 1.6/1.6 | 4.4/4.0 | 2.3/2.3 | 70 | 14.82 | 40.8 | |
| 112M b | 2.60/1.80 | 1450/960 | 5.6/4.7 | 17.1/17.9 | 1.7/1.6 | 4.4/4.0 | 2.3/2.3 | 70 | 17.39 | 43.9 | |
| 132S a | 3.00/2.00 | 1450/960 | 6.8/5.1 | 19.8/19.9 | 1.7/1.5 | 5.6/4.0 | 2.7/2.1 | 100 | 25.15 | 54.0 | |
| 132S b | 4.00/2.70 | 1450/960 | 9.0/6.7 | 26.3/26.9 | 1.8/1.5 | 5.8/4.2 | 2.9/2.3 | 100 | 32.82 | 60.7 | |
| 132M b | 5.50/3.60 | 1450/960 | 12.0/9.2 | 36.2/35.8 | 1.8/1.6 | 5.7/4.1 | 2.9/2.4 | 100 | 42.63 | 70.8 | |
| 160M b | 7.50/4.90 | 1460/960 | 15.4/11.5 | 49.1/48.7 | 2.3/1.9 | 6.7/4.4 | 2.7/2.5 | 150 | 91.40 | 114 | |
| 160L a | 11.0/7.20 | 1460/960 | 23.3/17.8 | 72.0/71.6 | 2.5/2.1 | 7.0/4.6 | 2.8/2.6 | 150 | 122.3 | 133 | |

M_n = Full load torque M_s = Locked rotor torque M_m = Maximum torque I_n = Rated load current I_s = Locked rotor current

Mounting arrangement IM B3

Self-braking three-phase motors - 30 Type

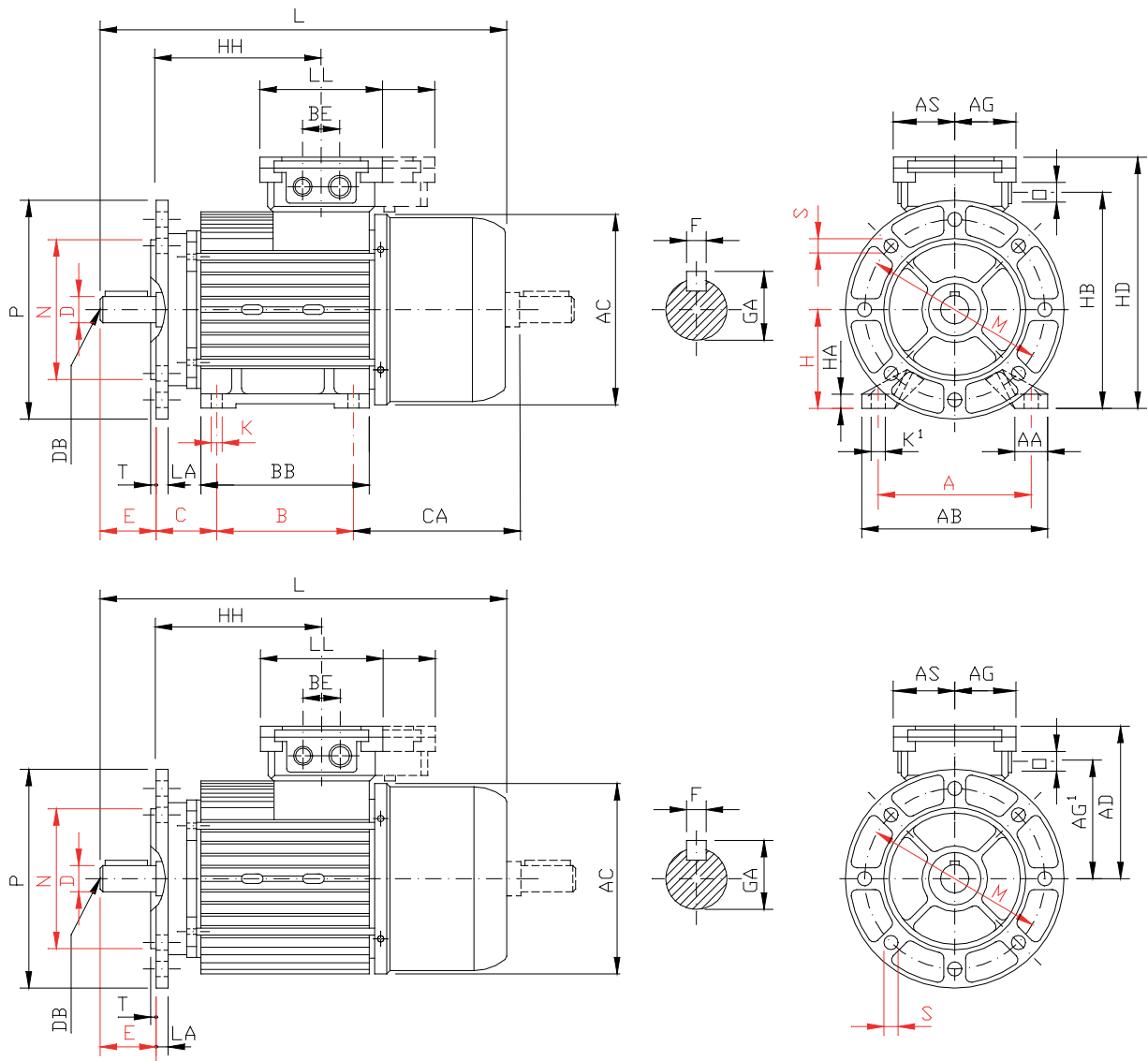


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | Overall | | | | | | | Shaft end | | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|----|---------|-----|-----|-----|-----|-----|-----|-------------|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 127 | 63 | 7 | 7 | 123 | 104 | 149 | 174 | 89 | 266 | 148 | M16+M20x1.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 138 | 104 | 167 | 193 | 103 | 308 | 148 | M16+M20x1.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 156 | 114 | 185 | 210 | 117 | 351 | 158 | M20+M25x1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 176 | 114 | 200 | 224 | 127 | 385 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 176 | 114 | 200 | 224 | 152 | 410 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 194 | 114 | 223 | 246 | 171 | 461 | 158 | M20+M25x1.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 221 | 112 | 14 | 12 | 220 | 138 | 257 | 280 | 175 | 485 | 202 | M32+M32x1.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 258 | 132 | 16 | 12 | 260 | 138 | 305 | 328 | 206 | 560 | 202 | M32+M32x1.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 258 | 132 | 16 | 12 | 260 | 138 | 305 | 328 | 244 | 598 | 202 | M32+M32x1.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 318 | 160 | 20 | 14 | 310 | 176 | 360 | 395 | 234 | 738 | 176 | M32+M32x1.5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 318 | 160 | 20 | 14 | 310 | 176 | 360 | 395 | 278 | 782 | 176 | M32+M32x1.5 | 42 | M16 | 110 | 12 | 45 |

Mounting arrangement IM B35 - IM B5

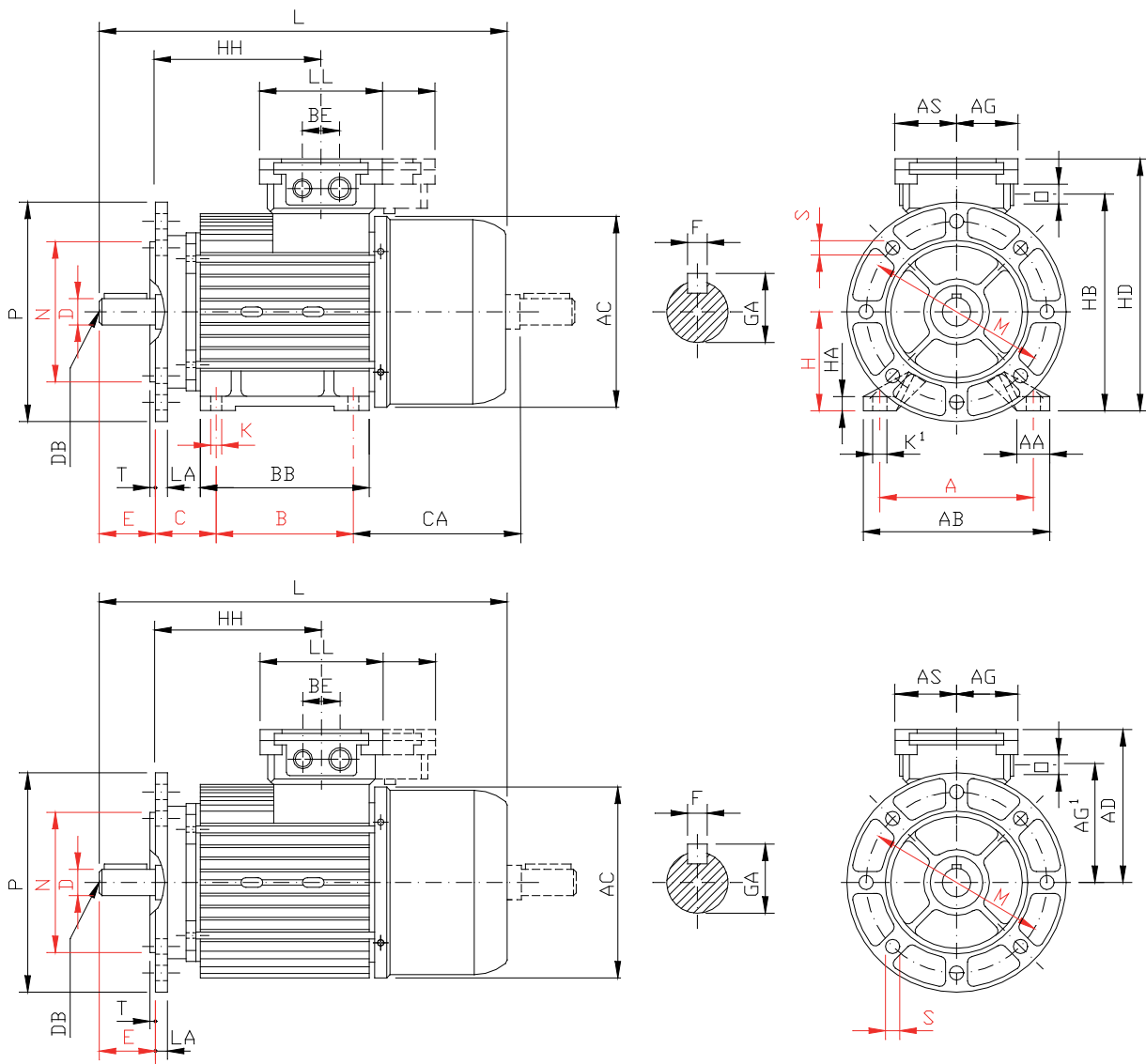
Self-braking three-phase motors - 30 Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 63 | 123 | 111 | 52 | 86 | 52 | 35 | 149 | 174 | 89 | 266 | 148 | M16+M20 x 1.5 |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 308 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 351 | 158 | M20+M25 x 1.5 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 385 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 410 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 171 | 461 | 158 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 69 | 145 | 69 | 45 | 257 | 280 | 175 | 485 | 202 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 206 | 560 | 202 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 244 | 598 | 202 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 234 | 738 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 278 | 782 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motors - 30 Type

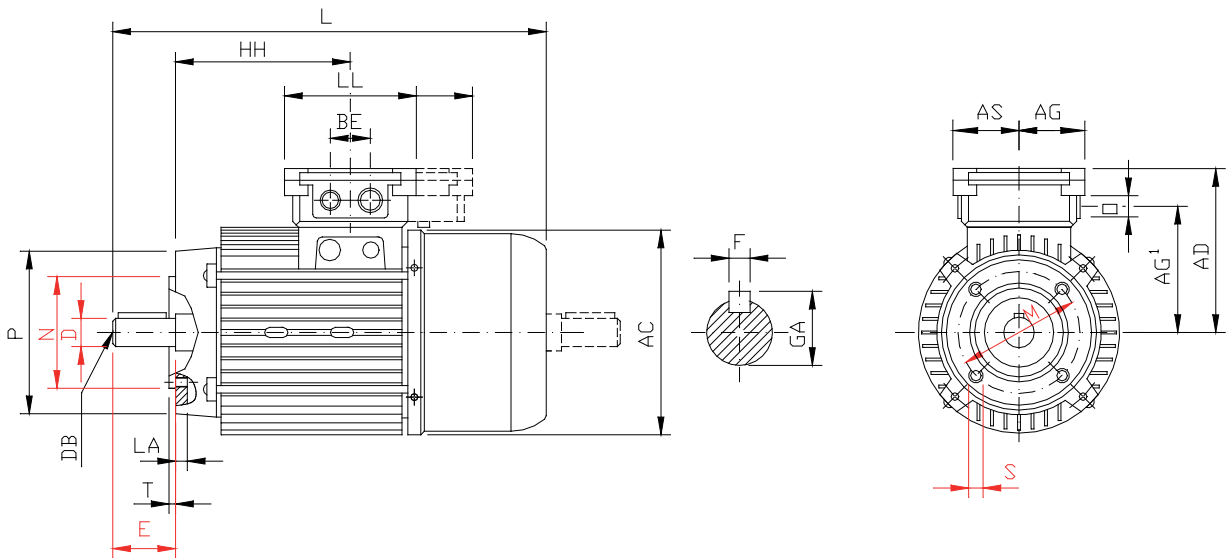
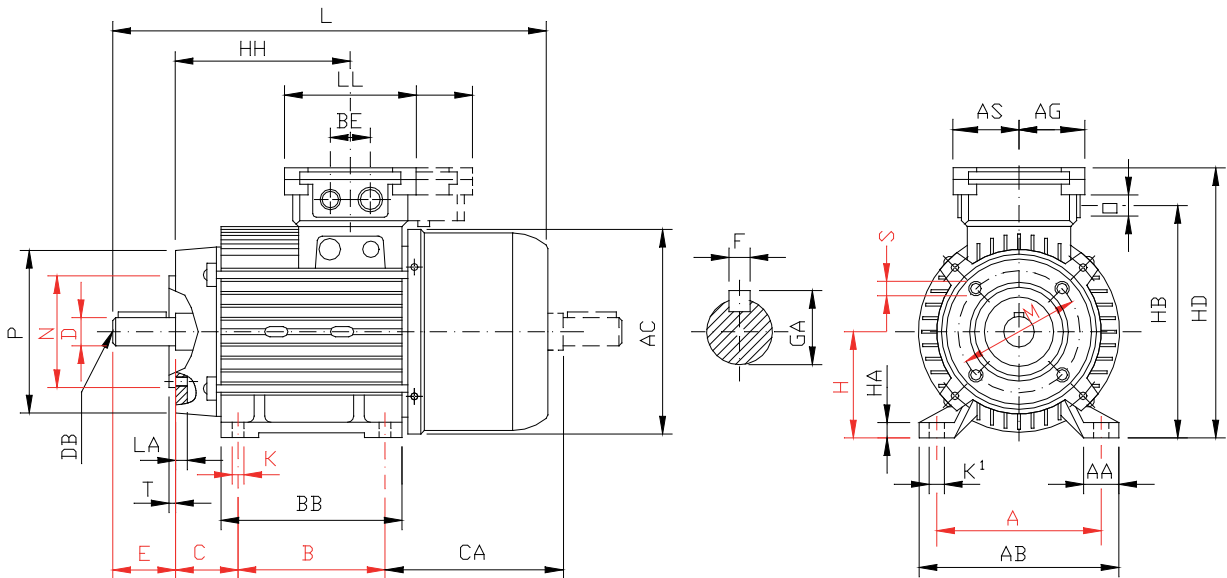


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|----|----------------|-----------|-----|-----|-----|----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 127 | 63 | 7 | 7 | 10 | 8 | 115 | 95 | 140 | 9 | 3 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 12 | 8 | 130 | 110 | 160 | 9 | 3.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 221 | 112 | 14 | 12 | 19 | 12 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 258 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 258 | 132 | 16 | 12 | 22 | 18 | 265 | 230 | 300 | 14 | 4 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 318 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 318 | 160 | 20 | 14 | 24 | 14 | 300 | 250 | 350 | 18 | 5 | 42 | M16 | 110 | 12 | 45 |

Mounting arrangement IM B34 - IM B14

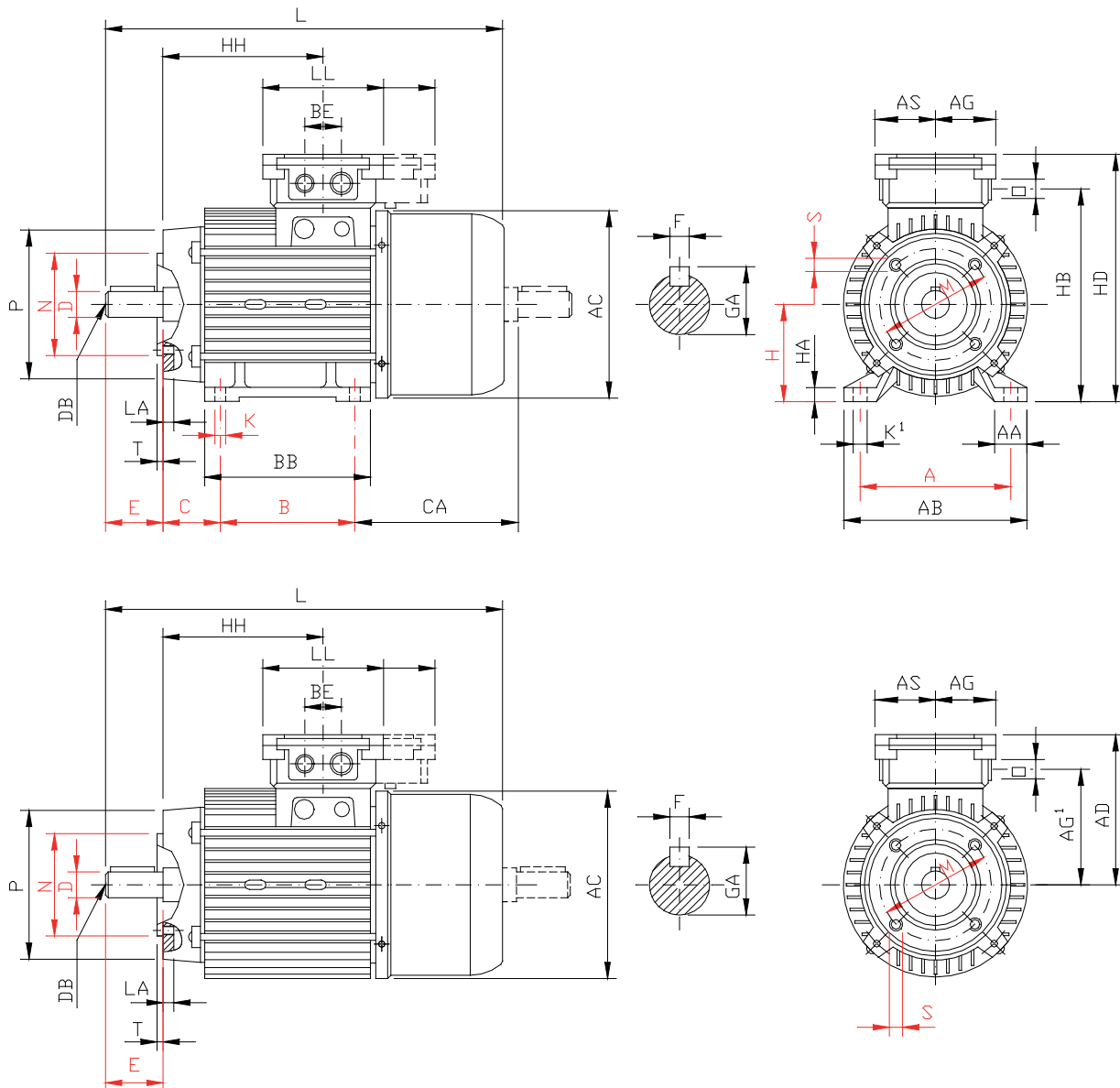
Self-braking three-phase motors - 30 Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG' | AS | BE | HB | HD | HH | L | LL | Ø |
| 63 | 123 | 111 | 52 | 86 | 52 | 35 | 149 | 174 | 89 | 266 | 148 | M16+M20 x 1.5 |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 308 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 351 | 158 | M20+M25 x 1.5 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 385 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 410 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 151 | 461 | 158 | M20+M25 x 1.5 |
| 112M | 220 | 168 | 69 | 145 | 69 | 45 | 257 | 280 | 175 | 485 | 202 | M32+M32 x 1.5 |
| 132S | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 206 | 560 | 202 | M32+M32 x 1.5 |
| 132M | 260 | 196 | 69 | 173 | 69 | 45 | 305 | 328 | 244 | 598 | 202 | M32+M32 x 1.5 |
| 160M | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 234 | 738 | 176 | M32+M32 x 1.5 |
| 160L | 310 | 235 | 88 | 200 | 88 | 55 | 360 | 395 | 278 | 782 | 176 | M32+M32 x 1.5 |

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motors - 30 Type



Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|-----|-----|-----|----|----|----|-----------|-----|-----|-----|-----|-----|----|-----|-----|----|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | LA | M | N | P | S | T | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 127 | 63 | 7 | 7 | 10 | 7 | 75 | 60 | 90 | M5 | 2.5 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 12 | 8 | 85 | 70 | 105 | M6 | 2.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 112M | 190 | 40 | 220 | 140 | 183 | 70 | 221 | 112 | 14 | 12 | 19 | 13 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |
| 132S | 216 | 44 | 260 | 140 | 180 | 89 | 258 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 132M | 216 | 44 | 260 | 178 | 218 | 89 | 258 | 132 | 16 | 12 | 22 | 15 | 165 | 130 | 200 | M10 | 3.5 | 38 | M12 | 80 | 10 | 41 |
| 160M | 254 | 65 | 319 | 210 | 261 | 108 | 318 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 45 |
| 160L | 254 | 65 | 319 | 254 | 305 | 108 | 318 | 160 | 20 | 14 | 24 | 18 | 215 | 180 | 250 | M12 | 4 | 42 | M16 | 110 | 12 | 12.5 |

Self-braking single-phase motors Braking-torque adjustable

Self-braking single-phase motors - 30.. Type

For normal use

Typical applications:

- Lifting and transportation.
- Machines for packaging.
- Gear motors.

Mechanical characteristics:

- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.

Unscrewing the screws will not decrease the braking torque under the safe value of 35%.

The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.

- Braking torque lower standard may be provided on request.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The brake power is derived directly from the motor factory.
- **On request it is possible to have a separate power brake.**
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Maximum braking torque Mb max. Nm | Air-gap | | Maximum speed nmax min ⁻¹ | Brake life | | Brake release time | | Braking torque rise time *** | | Brake power input Pa W |
|------------|--|-----------|-------------|---|-----------------------|-----------------|-----------------------|------------------|------------------------------|------------------|-------------------------------------|
| | | sn | smax | | Wf 1) MJ | W1 2) | t1 3) ms | t11 4) | t2 5) ms | t22 6) | |
| 63 | 5 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 30 | 15 | 100 | 10 | 16 |
| 71 | 5 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 30 | 15 | 100 | 10 | 16 |
| 80 | 10 | 0.20 | 0.50 | 3600 | 370 | 22.4 | 60 | 25 | 120 | 10 | 20 |
| 90 | 20 | 0.30 | 0.60 | 3600 | 500 | 30 | 100 | 40 | 150 | 10 | 30 |
| 100 | 40 | 0.30 | 0.60 | 3600 | 750 | 45 | 120 | 50 | 220 | 15 | 40 |

1) For wear of the friction linings up to a thickness of 1 mm

3) With standard rectifier

5) Opening on ac side

2) Between two wear adjustments from **sn** to **smax**

4) With increased rectifier

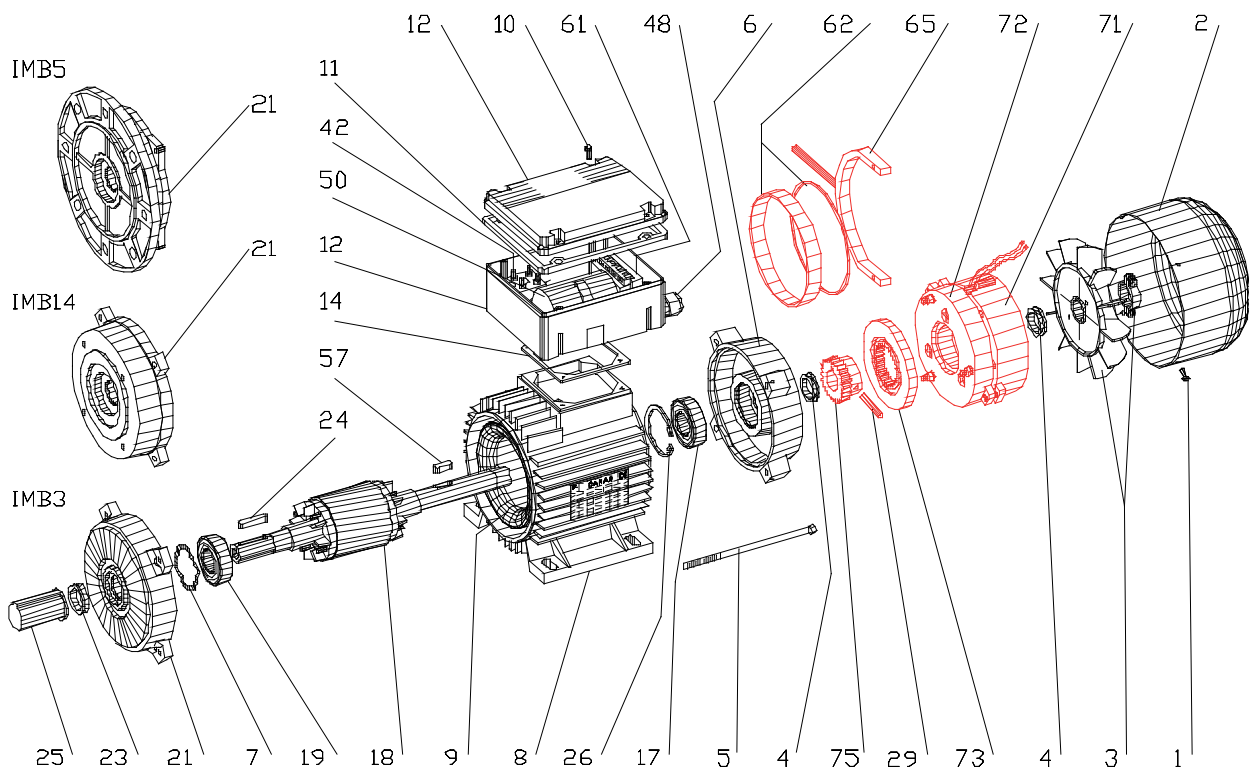
6) Opening on dc side or with rapid rectifier

*** - The time table is valid for a power independent of a brake motor.

If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening of the circuit or by using the dc-side rectifier fast, time are much improved.

For any further information you should contact our Technical Department.

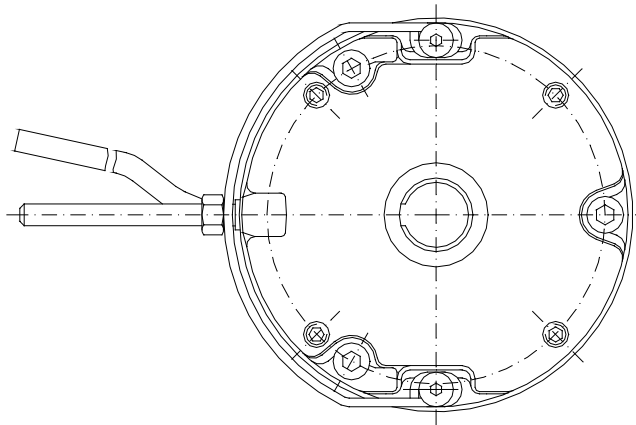
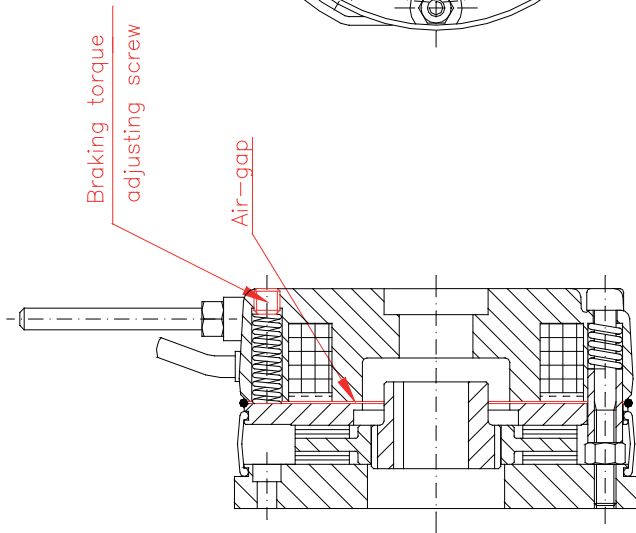
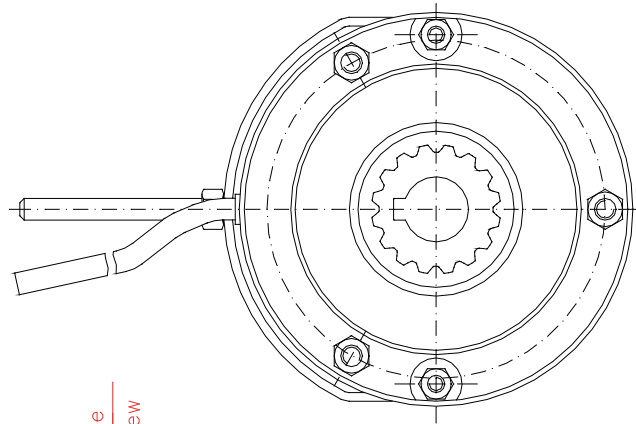
Self-braking single-phase motor - 30.. Type



Spare parts nomenclature

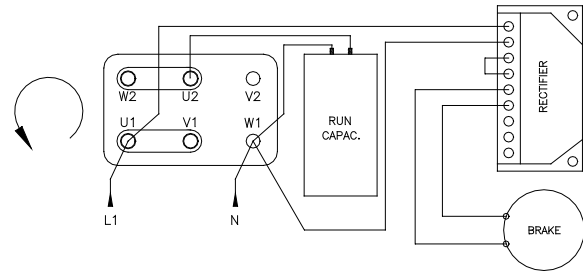
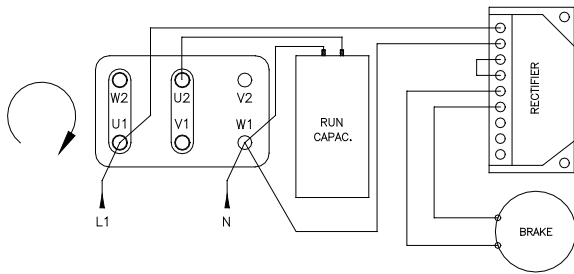
- | | |
|------------------------------------|----------------------|
| 1. Screw for fan cover | 26. Retaining ring |
| 2. Fan cover | 29. Gear pin |
| 3. Fan | 42. Terminal board |
| 4. Sealing ring | 48. Cable gland |
| 5. Rod | 50. Run capacitor |
| 6. N-end shield | 57. Key |
| 7. Spring ring | 61. Rectifier |
| 8. Frame | 62. O-ring for brake |
| 9. Stator package | 65. Manual release |
| 10. Screw for capacitor box cover | 71. Electromagnet |
| 11. Gasket for capacitor box cover | 72. Movable armature |
| 12. Capacitor box | 73. Brake disc |
| 14. Gasket for capacitor box | 74. Cogged hub |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |
| 25. Shaft cap | |

Direct current brake – 30 Type



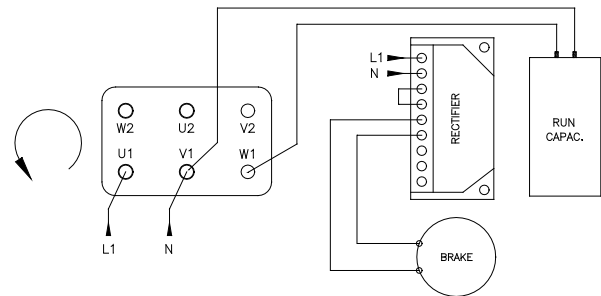
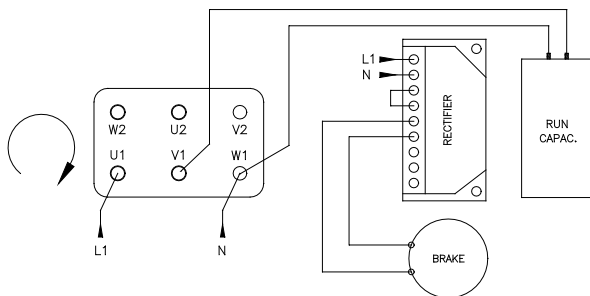
Connection for motors 30CO Type

Self-braking single-phase motors - with dc brake



Connection for motors 30CB Type

Self-braking single-phase motors - with **balanced windings** - with dc brake



Self-braking single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current power supply

| 30CO Type 2 pole - 3000 min¹ | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|--------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|------------------------------|---------------------------------|--|-----------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor V 450 μF | Braking torque Mb max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 63 a | 0.18 | 2850 | 1.35 | 61.0 | 0.95 | 0.60 | 0.65 | 3.6 | 2.1 | 6.3 | 5 | 0.189 | 6.4 |
| 63 b | 0.25 | 2860 | 1.74 | 67.2 | 0.93 | 0.84 | 0.65 | 3.8 | 2.1 | 8 | 5 | 0.222 | 6.9 |
| 63 c | 0.37 | 2870 | 2.5 | 67.7 | 0.95 | 1.23 | 0.67 | 3.9 | 2.3 | 12.5 | 5 | 0.266 | 7.7 |
| 71 a | 0.37 | 2780 | 2.7 | 63.4 | 0.94 | 1.27 | 0.56 | 3.1 | 1.9 | 12.5 | 5 | 0.402 | 8.5 |
| 71 b | 0.55 | 2810 | 3.7 | 71.8 | 0.90 | 1.87 | 0.54 | 3.1 | 1.8 | 16 | 5 | 0.484 | 9.5 |
| 71 c | 0.75 | 2840 | 4.6 | 75.4 | 0.94 | 2.52 | 0.50 | 3.8 | 1.8 | 20 | 5 | 0.565 | 10.5 |
| 80 a | 0.55 | 2830 | 3.5 | 72.0 | 0.95 | 1.86 | 0.64 | 3.5 | 1.9 | 20 | 10 | 0.814 | 11.8 |
| 80 b | 0.75 | 2870 | 4.5 | 76.3 | 0.95 | 2.50 | 0.65 | 3.7 | 1.9 | 25 | 10 | 1.033 | 13.4 |
| 80 c | 1.1 | 2850 | 6.3 | 79.9 | 0.95 | 3.69 | 0.65 | 3.7 | 2.0 | 31.5 | 10 | 1.263 | 14.9 |
| 90S a | 1.1 | 2830 | 7.4 | 71.8 | 0.90 | 3.71 | 0.61 | 3.8 | 2.2 | 35 | 20 | 1.426 | 18.2 |
| 90L a | 1.5 | 2840 | 10.0 | 72.5 | 0.90 | 5.05 | 0.62 | 4.1 | 2.3 | 40 | 20 | 1.779 | 20.7 |
| 90L b | 1.8 | 2840 | 11.2 | 77.2 | 0.93 | 6.05 | 0.62 | 4.2 | 2.4 | 50 | 20 | 2.048 | 22.6 |
| 100L a | 2.2 | 2850 | 12.2 | 80.0 | 0.98 | 7.38 | 0.61 | 3.4 | 2.2 | 50 | 40 | 3.016 | 27.5 |
| 30CO Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
| 63 a | 0.09 | 1400 | 0.80 | 54.3 | 0.90 | 0.61 | 0.62 | 2.3 | 1.8 | 4 | 5 | 0.266 | 6.2 |
| 63 b | 0.12 | 1400 | 1.0 | 58.0 | 0.90 | 0.82 | 0.62 | 2.5 | 1.8 | 5 | 5 | 0.323 | 6.8 |
| 63 c | 0.18 | 1400 | 1.4 | 60.1 | 0.93 | 1.23 | 0.62 | 2.5 | 1.8 | 8 | 5 | 0.386 | 7.6 |
| 71 A | 0.18 | 1370 | 1.7 | 51.2 | 0.90 | 1.26 | 0.72 | 2.4 | 1.7 | 10 | 5 | 0.747 | 8.5 |
| 71 b | 0.25 | 1370 | 2.1 | 55.7 | 0.93 | 1.74 | 0.74 | 2.4 | 1.8 | 12.5 | 5 | 0.860 | 9.1 |
| 71 c | 0.37 | 1370 | 2.7 | 64.1 | 0.93 | 2.58 | 0.78 | 2.6 | 1.8 | 20 | 5 | 1.235 | 11.0 |
| 80 a | 0.37 | 1370 | 2.9 | 61.0 | 0.91 | 2.58 | 0.55 | 2.8 | 1.6 | 14 | 10 | 1.609 | 11.5 |
| 80 b | 0.55 | 1380 | 3.8 | 65.5 | 0.96 | 3.81 | 0.64 | 3.1 | 1.8 | 16 | 10 | 2.153 | 13.1 |
| 80 c | 0.75 | 1360 | 5.3 | 64.8 | 0.95 | 5.27 | 0.55 | 2.9 | 1.8 | 20 | 10 | 2.627 | 14.6 |
| 90L a | 1.1 | 1370 | 7.2 | 73.0 | 0.91 | 7.67 | 0.56 | 3.3 | 1.8 | 35 | 20 | 3.003 | 20.0 |
| 90L b | 1.5 | 1380 | 9.5 | 73.8 | 0.93 | 10.4 | 0.56 | 3.4 | 1.9 | 40 | 20 | 3.487 | 22.0 |
| 100L a | 1.8 | 1380 | 11.4 | 76.7 | 0.92 | 12.4 | 0.44 | 3.5 | 1.8 | 35 | 40 | 4.987 | 27.5 |
| 100L b | 2.2 | 1410 | 14.0 | 75.1 | 0.91 | 14.9 | 0.45 | 3.6 | 1.9 | 50 | 40 | 6.384 | 31.6 |
| 30CO Type 6 pole - 1000 min¹ | | | | | | | | | | | | | |
| 63 b | 0.06 | 930 | 0.75 | 35.5 | 0.98 | 0.62 | 1.00 | 1.6 | 1.7 | 6.3 | 5 | 0.323 | 6.9 |
| 63 c | 0.09 | 930 | 0.98 | 42.0 | 0.95 | 0.92 | 0.80 | 1.8 | 1.7 | 8 | 5 | 0.386 | 7.6 |
| 71 a | 0.12 | 920 | 1.15 | 50.4 | 0.90 | 1.25 | 0.65 | 1.9 | 1.6 | 10 | 5 | 0.747 | 8.4 |
| 71 b | 0.18 | 920 | 1.7 | 50.6 | 0.91 | 1.87 | 0.65 | 1.9 | 1.6 | 14 | 5 | 0.860 | 9.0 |
| 80 a | 0.25 | 930 | 2.1 | 55.7 | 0.93 | 2.60 | 0.53 | 2.6 | 1.7 | 14 | 10 | 1.609 | 11.6 |
| 80 b | 0.37 | 920 | 3.1 | 57.0 | 0.91 | 3.84 | 0.53 | 2.7 | 1.7 | 16 | 10 | 2.153 | 13.0 |
| 80 c | 0.55 | 920 | 4.1 | 63.4 | 0.92 | 5.71 | 0.52 | 2.7 | 1.7 | 25 | 10 | 2.627 | 14.6 |
| 90S a | 0.55 | 920 | 3.9 | 65.9 | 0.93 | 5.71 | 0.51 | 2.6 | 1.7 | 25 | 20 | 2.370 | 17.5 |
| 90L a | 0.75 | 920 | 5.1 | 67.3 | 0.95 | 7.79 | 0.51 | 2.8 | 1.7 | 35 | 20 | 3.003 | 20.0 |
| 100L a | 1.1 | 930 | 7.3 | 71.2 | 0.92 | 11.3 | 0.41 | 3.3 | 1.7 | 35 | 40 | 6.404 | 27.8 |
| 100L b | 1.5 | 930 | 9.8 | 72.3 | 0.92 | 15.4 | 0.42 | 3.5 | 1.7 | 50 | 40 | 8.070 | 31.2 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Self-braking single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current power supply

| 30CB Type 4 pole - 1500 min¹ | | | | | | | | | | | | | |
|--|--------------------------------------|---|---------------------|--------|-------|----------------------|----------------------------------|--------------------------------|--------------------------------|------------------------------|---|--|--------------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 230 - Hz 50 | | | | | Direct insertion characteristics | | | Run capacitor V 450 μF | Braking torque M _b max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B3) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | | |
| 63 a | 0.09 | 1420 | 0.80 | 51.0 | 0.96 | 0.61 | 0.62 | 2.4 | 1.5 | 6.3 | 5 | 0.266 | 6.3 |
| 63 b | 0.12 | 1420 | 1.07 | 51.9 | 0.94 | 0.81 | 0.54 | 2.4 | 1.8 | 8 | 5 | 0.323 | 6.8 |
| 63 c | 0.18 | 1400 | 1.4 | 58.2 | 0.96 | 1.23 | 0.56 | 2.5 | 1.7 | 10 | 5 | 0.386 | 7.6 |
| 71 a | 0.18 | 1370 | 1.4 | 57.0 | 0.98 | 1.26 | 0.93 | 2.3 | 1.7 | 12.5 | 5 | 0.747 | 8.5 |
| 71 b | 0.25 | 1370 | 1.9 | 58.4 | 0.98 | 1.74 | 0.92 | 2.4 | 1.7 | 16 | 5 | 0.860 | 9.1 |
| 71 c | 0.37 | 1380 | 2.6 | 64.5 | 0.96 | 2.56 | 0.92 | 2.9 | 1.7 | 20 | 5 | 1.235 | 11.0 |
| 80 a | 0.37 | 1360 | 2.8 | 61.1 | 0.94 | 2.60 | 0.56 | 1.9 | 1.5 | 20 | 10 | 1.609 | 11.6 |
| 80 b | 0.55 | 1360 | 4.2 | 61.2 | 0.93 | 3.86 | 0.54 | 2.1 | 1.7 | 31.5 | 10 | 2.153 | 13.2 |
| 80 c | 0.75 | 1360 | 5.0 | 67.9 | 0.96 | 5.27 | 0.54 | 2.2 | 1.6 | 40 | 10 | 2.627 | 14.7 |
| 90S a | 0.75 | 1390 | 5.2 | 65.3 | 0.93 | 5.15 | 0.82 | 2.2 | 1.8 | 40 | 20 | 2.370 | 17.6 |
| 90L a | 1.1 | 1370 | 6.7 | 72.8 | 0.98 | 7.67 | 0.66 | 2.6 | 1.6 | 45 | 20 | 3.003 | 20.1 |

M_n = Full load torque

M_s = Locked rotor torque

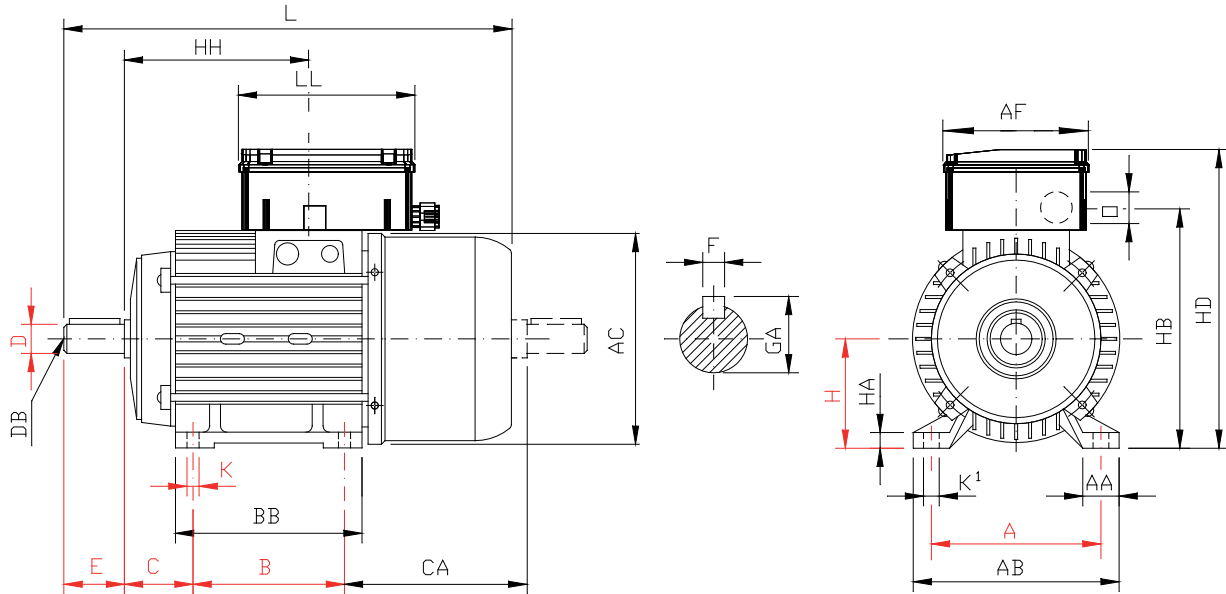
M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Mounting arrangement IM B3

Self-braking single-phase motors – 30.. Type



Measures for coupling, IM B5 mounting see page 107
 Measures for coupling, IM B14 mounting see page 109

Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Overall | | | | | | | Shaft end | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----|---------|-----|-----|-----|-----|-----|-----|-----------|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 63 | 100 | 22 | 120 | 80 | 100 | 40 | 127 | 63 | 7 | 7 | 10 | 123 | 120 | 137 | 192 | 89 | 266 | 145 | PG16 | 11 | M4 | 23 | 4 | 12.5 |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 12 | 138 | 120 | 155 | 211 | 103 | 308 | 145 | PG16 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 156 | 120 | 173 | 226 | 117 | 351 | 145 | PG16 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 176 | 120 | 180 | 240 | 127 | 385 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 176 | 120 | 180 | 240 | 152 | 410 | 145 | PG16 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 194 | 120 | 211 | 262 | 171 | 461 | 145 | PG16 | 28 | M10 | 60 | 8 | 31 |

Self-braking three-phase motors Starting and progressive braking

One-speed self-braking three-phase motors - 33S Type - starting and progressive braking - (special rotor)

Note: translation movements pose the problem of smooth starts and progressive braking to avoid the oscillation of the suspended load and sliding on the guide rails.

This engine series meets these particular problems due to a rotor and a brake appropriately designed.

It is natural that when selecting the motor should be noted that the use of insufficient power can cause excessive heating, while exuberant power can reduce the progression.

The adoption of special rotor which reduces starting currents can request the engine starts quickly, provided they are not excessively long time.

For more information you should contact our Technical Department.

Typical applications:

- Translations of cranes and overhead cranes.

Mechanical characteristics:

- Aluminium front flange, (cast iron on request).
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.

Unscrewing the screws will not decrease the braking torque under the safe value of 35%.

The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.

- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power is independent of motor.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Maximum braking torque M_b max. Nm | Air-gap | | Maximum speed n_{max} min ⁻¹ | Brake life | | Brake release time t₁ ms | Braking torque rise time | | Brake power input P_a W |
|------------|---|----------------------------|------------------------------|--|----------------------------------|----------------------------|--|----------------------------------|-----------------------------|--|
| | | s_n mm | s_{max} mm | | W_t 1) MJ | W₁ 2) | | t₂ 5) ms | t₂₂ 6) | |
| 71 | 5 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 30 | 100 | 10 | 16 |
| 80 | 10 | 0.20 | 0.50 | 3600 | 370 | 22.4 | 60 | 120 | 10 | 20 |
| 90 | 20 | 0.30 | 0.60 | 3600 | 500 | 30 | 100 | 150 | 10 | 30 |
| 100 | 40 | 0.30 | 0.60 | 3600 | 750 | 45 | 120 | 220 | 15 | 40 |

1) For wear of the friction linings up to a thickness of 1 mm

2) Between two wear adjustments from **s_n** to **s_{max}**

3) With standard rectifier

4) -

5) Opening on ac side

6) Opening on dc side or with rapid rectifier

For any further information you should contact our Technical Department.

Two-speed self-braking three-phase motors - 33DD Type - double winding - Star/Star connection - starting and progressive braking - (special rotor)

Note: translation movements pose the problem of smooth starts and progressive braking to avoid the oscillation of the suspended load and sliding on the guide rails.

This engine series meets these particular problems due to a rotor and a brake appropriately designed.

It is natural that when selecting the motor should be noted that the use of insufficient power can cause excessive heating, while exuberant power can reduce the progression.

The adoption of special rotor which reduces starting currents can request the engine starts quickly, provided they are not excessively long time.

For more information you should contact our Technical Department.

Typical applications:

- Translations of cranes and overhead cranes.

Mechanical characteristics:

- Aluminium front flange, (cast iron on request).
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.

Unscrewing the screws will not decrease the braking torque under the safe value of 35%.

The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.

- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power is independent of motor.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

| Motor size | Maximum brake torque M_b max. Nm | Air-gap | | Maximum speed n_{max} min ⁻¹ | Brake life | | Brake release time t₁ ms | Braking torque rise time | | Brake power input P_a W |
|------------|---|----------------------------|------------------------------|--|----------------------------------|----------------------------------|--|----------------------------------|-----------------------------------|--|
| | | s_n mm | s_{max} mm | | W_t 1) MJ | W₁ 2) MJ | | t₂ 5) ms | t₂₂ 6) ms | |
| 71 | 2 | 0.20 | 0.50 | 3600 | 260 | 15.6 | 30 | 100 | 10 | 16 |
| 80 | 4 | 0.20 | 0.50 | 3600 | 370 | 22.4 | 60 | 120 | 10 | 20 |
| 90 | 8 | 0.30 | 0.60 | 3600 | 500 | 30 | 100 | 150 | 10 | 30 |
| 100 | 17 | 0.30 | 0.60 | 3600 | 750 | 45 | 120 | 220 | 15 | 40 |

1) For wear of the friction linings up to a thickness of 1 mm

2) Between two wear adjustments from **s_n** to **s_{max}**

3) With standard rectifier

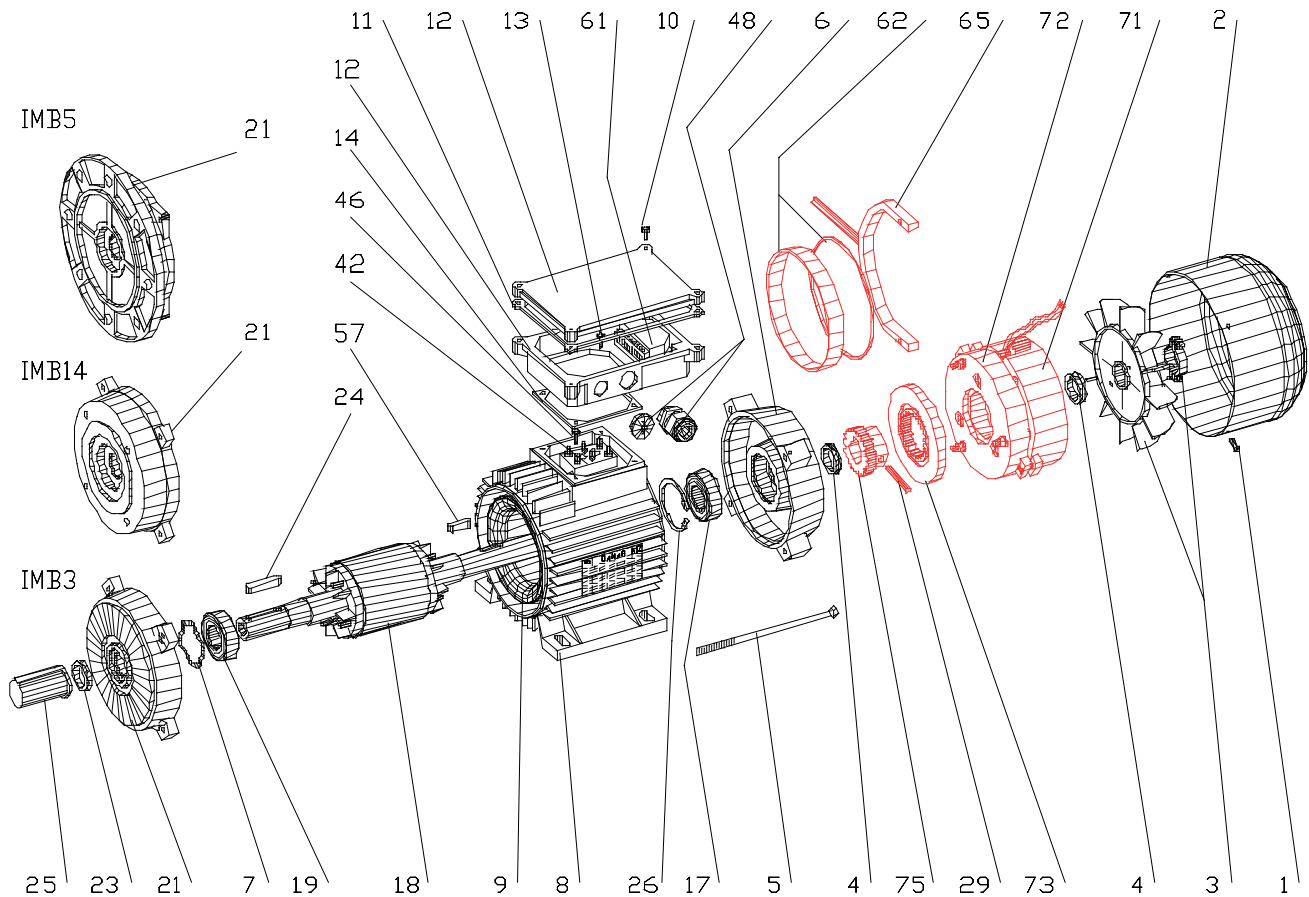
4) -

5) Opening on ac side

6) Opening on dc side or with rapid rectifier

For any further information you should contact our Technical Department.

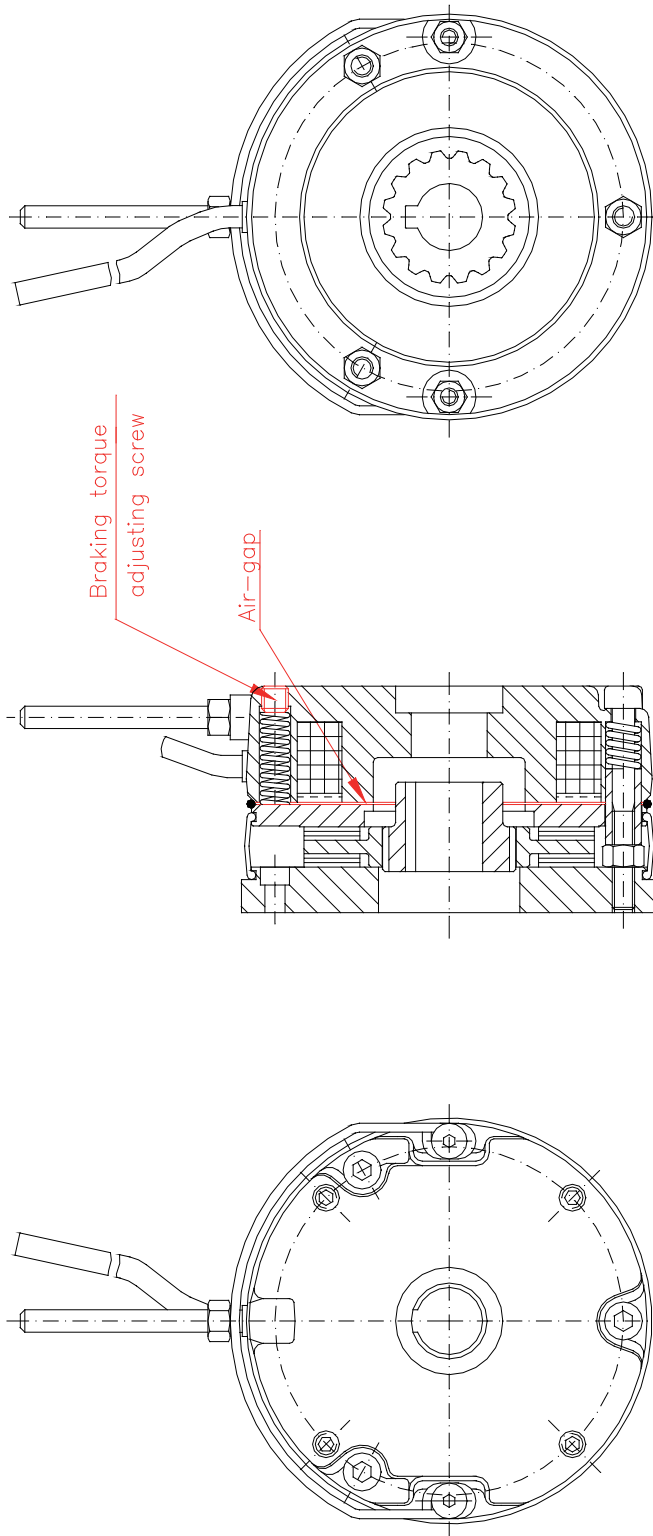
Self-braking three-phase motor - 33.. Type



Spare parts nomenclature

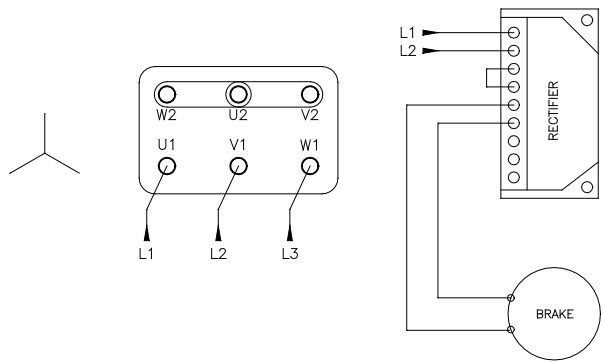
- | | |
|-----------------------------------|----------------------|
| 1. Screw for fan cover | 25. Shaft cap |
| 2. Fan cover | 26. Retaining ring |
| 3. Fan | 29. Gear pin |
| 4. Sealing ring | 42. Terminal board |
| 5. Rod | 46. Grounding screw |
| 6. N-end shield | 48. Cable gland |
| 7. Spring ring | 57. Key |
| 8. Frame | 61. Rectifier |
| 9. Stator package | 62. O-ring for brake |
| 10. Screw for terminal box cover | 65. Manual release |
| 11. Gasket for terminal box cover | 71. Electromagnet |
| 12. Terminal box | 72. Movable armature |
| 13. Screw for terminal box | 73. Brake disc |
| 14. Gasket for terminal box | 75. Cogged hub |
| 17. Rear bearing | |
| 18. Rotor | |
| 19. Front bearing | |
| 21. D-end shield/flange | |
| 23. Sealing ring | |
| 24. Key | |

Direct current brake - 33 Type



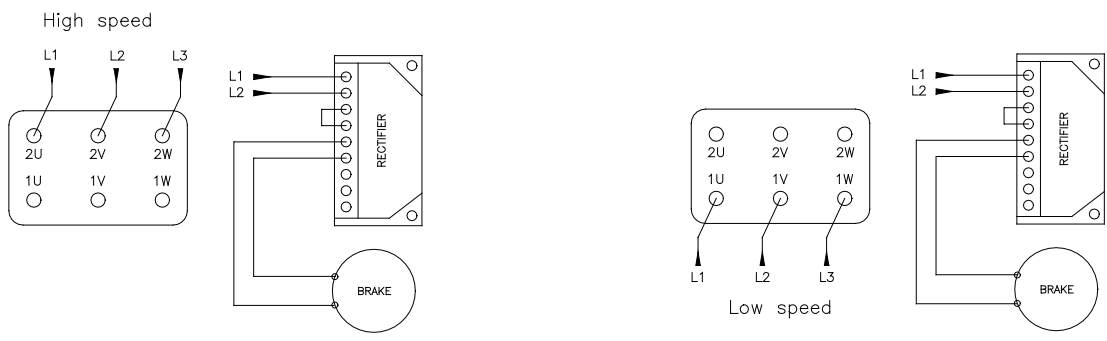
Connection for motors 33S Type

Self-braking three-phase **one-speed** motors - with **dc brake**



Connection for motors 33DD Type

Self-braking three-phase **two-speed** motors - **double winding** - with **ac brake**



One-speed self braking three-phase motors - starting and progressive braking - (special rotor)

TEFC construction – Squirrel cage rotor – Duty S3-40% – Insulation class F – IP 54 protection

Direct current power supply

| 33S Type 4 pole - 1500 min ¹ | | | | | | | | | | | | |
|---|--------------------------------|--|------------------|------|-------|-------------------|----------------------------------|--------------------------------|--------------------------------|---------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | | | Direct insertion characteristics | | | Braking torque Mb max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B5) kg |
| | | n min ⁻¹ | I _n A | η % | cos φ | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 a | 0.25 | 1250 | 0.81 | 62.0 | 0.72 | 1.91 | 2.2 | 2.4 | 2.2 | 5 | 0.747 | 8.8 |
| 71 b | 0.33 | 1250 | 1.08 | 60.5 | 0.73 | 2.52 | 2.3 | 2.5 | 2.3 | 5 | 0.860 | 9.4 |
| 71 c | 0.55 | 1270 | 1.7 | 62.4 | 0.75 | 4.14 | 2.7 | 2.9 | 2.7 | 5 | 1.235 | 11.3 |
| 80 a | 0.55 | 1270 | 1.5 | 66.2 | 0.80 | 4.14 | 2.5 | 2.9 | 2.5 | 10 | 1.609 | 12.3 |
| 80 b | 0.75 | 1300 | 2.0 | 67.7 | 0.80 | 5.51 | 2.5 | 3.2 | 2.5 | 10 | 2.153 | 13.7 |
| 80 c | 1.1 | 1310 | 2.9 | 68.5 | 0.80 | 8.02 | 2.4 | 3.4 | 2.4 | 10 | 2.627 | 15.2 |
| 90S a | 1.1 | 1320 | 3.0 | 68.8 | 0.77 | 7.96 | 2.6 | 3.4 | 2.6 | 20 | 2.370 | 18.2 |
| 90L a | 1.5 | 1320 | 3.9 | 71.3 | 0.78 | 10.9 | 2.7 | 3.4 | 2.7 | 20 | 3.003 | 20.6 |
| 90L b | 1.85 | 1330 | 4.5 | 74.3 | 0.80 | 13.3 | 2.7 | 3.6 | 2.7 | 20 | 3.487 | 22.3 |
| 100L a | 2.2 | 1350 | 5.6 | 73.7 | 0.77 | 15.6 | 2.8 | 3.8 | 2.8 | 40 | 4.987 | 28.7 |
| 100L b | 3 | 1360 | 7.1 | 79.3 | 0.77 | 21.1 | 2.8 | 4.2 | 2.8 | 40 | 6.384 | 32.4 |

M_n = Full load torque

M_s = Locked rotor torque

M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Two-speed self-braking three-phase motors - double winding – Star/Star connection - starting and progressive braking – (special rotor)

TEFC construction – Squirrel cage rotor – Duty S3-40% – Insulation class F – IP 54 protection

Direct current power supply

| 33DD Type 2/6 pole - 3000/1000 min¹ | | | | | | | | | | |
|---|--------------------------------|--|------------------|-------------------|----------------------------------|--------------------------------|--------------------------------|---------------------------|--|-----------------|
| Motor size | Rated output P _n kW | Technical data at rated output V 400 - Hz 50 | | | Direct insertion characteristics | | | Braking torque Mb max. Nm | Moment of inertia J 10 ⁻³ kg.m ² | Mass (IM B5) kg |
| | | n min ⁻¹ | I _n A | M _n Nm | M _s /M _n | I _s /I _n | M _m /M _n | | | |
| 71 c | 0.30/0.10 | 2780/860 | 0.7/0.6 | 1.03/1.11 | 2.9/2.7 | 4.7/1.8 | 3.0/2.7 | 2 | 1.235 | 11.3 |
| 80 a | 0.30/0.10 | 2800/920 | 0.9/0.5 | 1.02/1.04 | 2.5/2.5 | 3.6/2.4 | 2.6/2.5 | 4 | 1.609 | 12.1 |
| 80 b | 0.42/0.14 | 2800/920 | 1.1/0.7 | 1.43/1.45 | 2.7/2.7 | 4.3/2.5 | 2.8/2.8 | 4 | 2.153 | 13.7 |
| 80 c | 0.60/0.20 | 2800/920 | 1.5/1.0 | 2.05/2.08 | 2.8/3.0 | 4.5/2.4 | 2.9/3.1 | 4 | 2.627 | 15.1 |
| 90S a | 0.80/0.27 | 2800/920 | 2.0/1.2 | 2.73/2.80 | 2.9/2.9 | 4.1/2.8 | 3.0/2.9 | 8 | 2.370 | 18.0 |
| 90L a | 1.10/0.37 | 2800/920 | 2.7/1.6 | 3.75/3.84 | 3.2/3.2 | 4.3/2.9 | 3.3/3.2 | 8 | 3.003 | 20.4 |
| 90L b | 1.30/0.45 | 2800/920 | 3.1/1.8 | 4.43/4.67 | 3.6/3.0 | 5.4/3.1 | 3.8/3.1 | 8 | 3.487 | 22.1 |
| 100L a | 1.50/0.50 | 2840/920 | 3.7/1.9 | 5.04/5.19 | 3.1/2.6 | 5.1/3.1 | 3.3/2.7 | 17 | 4.987 | 28.6 |
| 100L b | 2.20/0.75 | 2840/920 | 5.0/2.6 | 7.40/7.79 | 3.1/2.6 | 5.6/3.2 | 3.5/2.7 | 17 | 6.384 | 32.4 |
| 33DD Type 2/8 pole - 3000/750 min¹ | | | | | | | | | | |
| 71 c | 0.25/0.06 | 2800/660 | 0.7/0.7 | 0.85/0.87 | 2.8/2.9 | 4.0/1.6 | 2.8/2.9 | 2 | 1.235 | 11.3 |
| 80 a | 0.25/0.06 | 2800/660 | 0.8/0.4 | 0.85/0.87 | 2.5/2.3 | 3.5/1.9 | 2.5/2.3 | 4 | 1.609 | 12.1 |
| 80 b | 0.37/0.09 | 2800/660 | 1.0/0.6 | 1.26/1.30 | 2.7/2.6 | 4.2/2.0 | 2.7/2.6 | 4 | 2.153 | 13.7 |
| 80 c | 0.55/0.14 | 2800/660 | 1.4/0.7 | 1.88/2.03 | 2.4/2.2 | 4.2/2.0 | 2.4/2.2 | 4 | 2.627 | 15.1 |
| 90S a | 0.75/0.19 | 2800/660 | 1.8/0.9 | 2.56/2.75 | 2.7/2.1 | 3.8/2.1 | 2.7/2.1 | 8 | 2.370 | 18.0 |
| 90L a | 0.90/0.23 | 2800/660 | 2.1/1.1 | 3.07/3.33 | 2.9/2.4 | 4.4/2.3 | 2.9/2.4 | 8 | 3.003 | 20.4 |
| 90L b | 1.10/0.28 | 2800/660 | 2.6/1.4 | 3.75/4.05 | 3.2/2.3 | 5.0/2.3 | 3.2/2.3 | 8 | 3.487 | 22.0 |
| 100L a | 1.50/0.38 | 2820/660 | 3.7/1.7 | 5.08/5.50 | 2.2/1.8 | 3.8/2.1 | 2.2/1.8 | 17 | 4.987 | 28.6 |
| 100L b | 2.20/0.55 | 2820/660 | 4.8/2.4 | 7.45/7.96 | 2.3/2.0 | 4.6/2.2 | 2.3/2.0 | 17 | 6.384 | 32.4 |
| 33DD Type 4/8 pole - 1500/750 min¹ | | | | | | | | | | |
| 71 c | 0.12/0.06 | 1420/660 | 0.6/0.7 | 0.81/0.87 | 3.0/2.9 | 3.5/1.6 | 3.0/2.9 | 2 | 1.235 | 11.3 |
| 80 a | 0.12/0.06 | 1420/660 | 0.5/0.4 | 0.81/0.87 | 3.0/2.3 | 3.3/1.9 | 3.0/2.3 | 4 | 1.609 | 11.9 |
| 80 b | 0.18/0.09 | 1420/660 | 0.7/0.6 | 1.21/1.30 | 3.0/2.6 | 3.5/2.0 | 3.0/2.6 | 4 | 2.153 | 13.5 |
| 80 c | 0.28/0.14 | 1420/660 | 0.9/0.7 | 1.88/2.03 | 2.8/2.2 | 3.7/2.0 | 2.8/2.2 | 4 | 2.627 | 14.9 |
| 90S a | 0.37/0.19 | 1420/660 | 1.1/0.9 | 2.49/2.75 | 3.0/2.1 | 3.9/2.1 | 3.0/2.1 | 8 | 2.370 | 17.8 |
| 90L a | 0.46/0.23 | 1420/660 | 1.5/1.1 | 3.09/3.33 | 3.9/2.4 | 4.6/2.3 | 3.9/2.4 | 8 | 3.003 | 20.2 |
| 90L b | 0.55/0.28 | 1420/660 | 1.7/1.4 | 3.70/4.05 | 3.6/2.3 | 4.7/2.3 | 3.6/2.3 | 8 | 3.487 | 21.9 |
| 100L a | 0.75/0.38 | 1430/660 | 2.1/1.7 | 5.01/5.50 | 3.1/1.8 | 4.7/2.1 | 3.1/1.8 | 17 | 4.987 | 28.3 |
| 100L b | 1.10/0.55 | 1430/660 | 3.0/2.4 | 7.35/7.96 | 3.3/2.0 | 4.8/2.2 | 3.3/2.0 | 17 | 6.384 | 32.4 |

M_n = Full load torque

M_s = Locked rotor torque

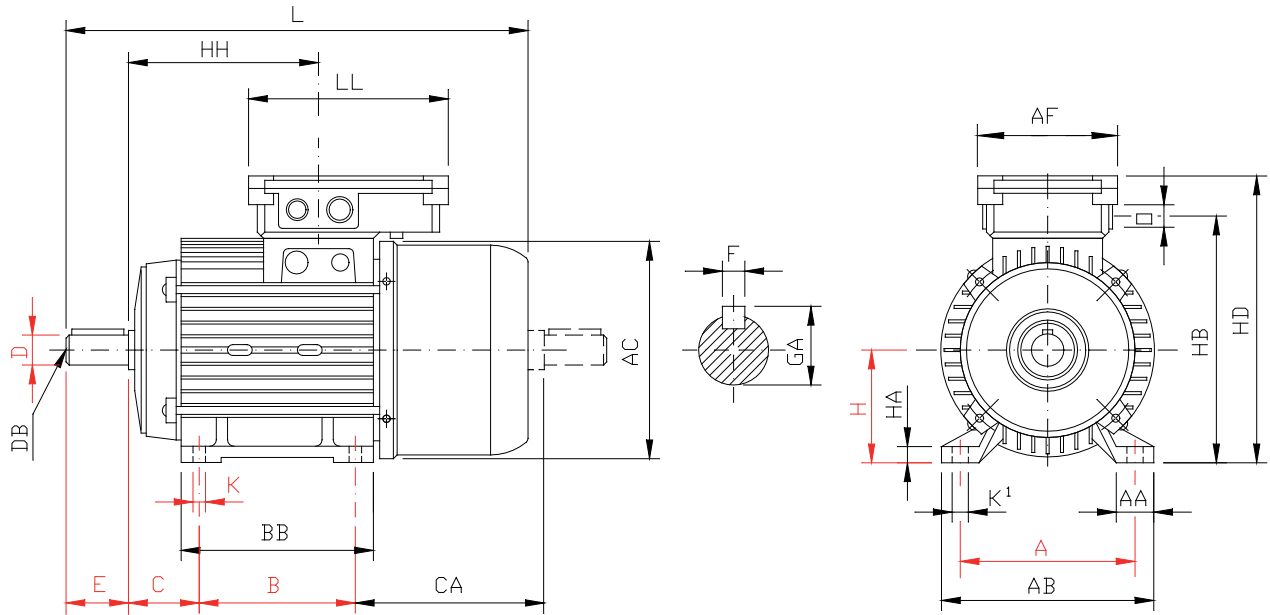
M_m = Maximum torque

I_n = Rated load current

I_s = Locked rotor current

Mounting arrangements IM B3

Self-braking three-phase motors - 33 Type

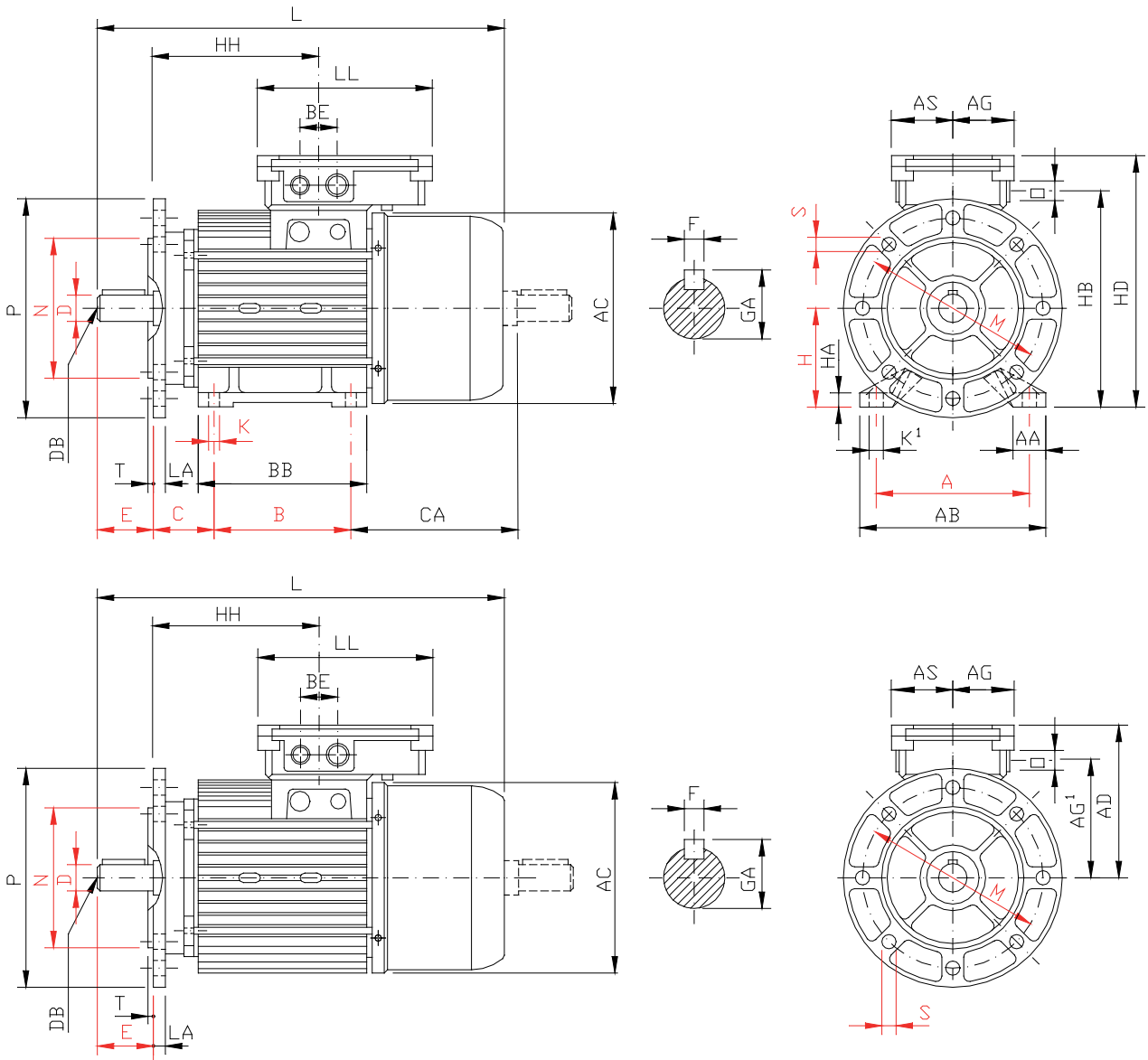


Note: Ledge of the second shaft is reduced to a size.

| Motor size | Coupling | | | | | | | | | | Overall | | | | | | | Shaft end | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|---------|-----|-----|-----|-----|-----|-----|-------------|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | AC | AF | HB | HD | HH | L | LL | O | D | DB | E | F | GA |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 138 | 104 | 167 | 193 | 103 | 308 | 148 | M16+M20x1.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 156 | 114 | 185 | 210 | 117 | 351 | 158 | M20+M25x1.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 176 | 114 | 200 | 224 | 127 | 385 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 176 | 114 | 200 | 224 | 152 | 410 | 158 | M20+M25x1.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 194 | 114 | 223 | 246 | 171 | 461 | 158 | M20+M25x1.5 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B35 - IM B5

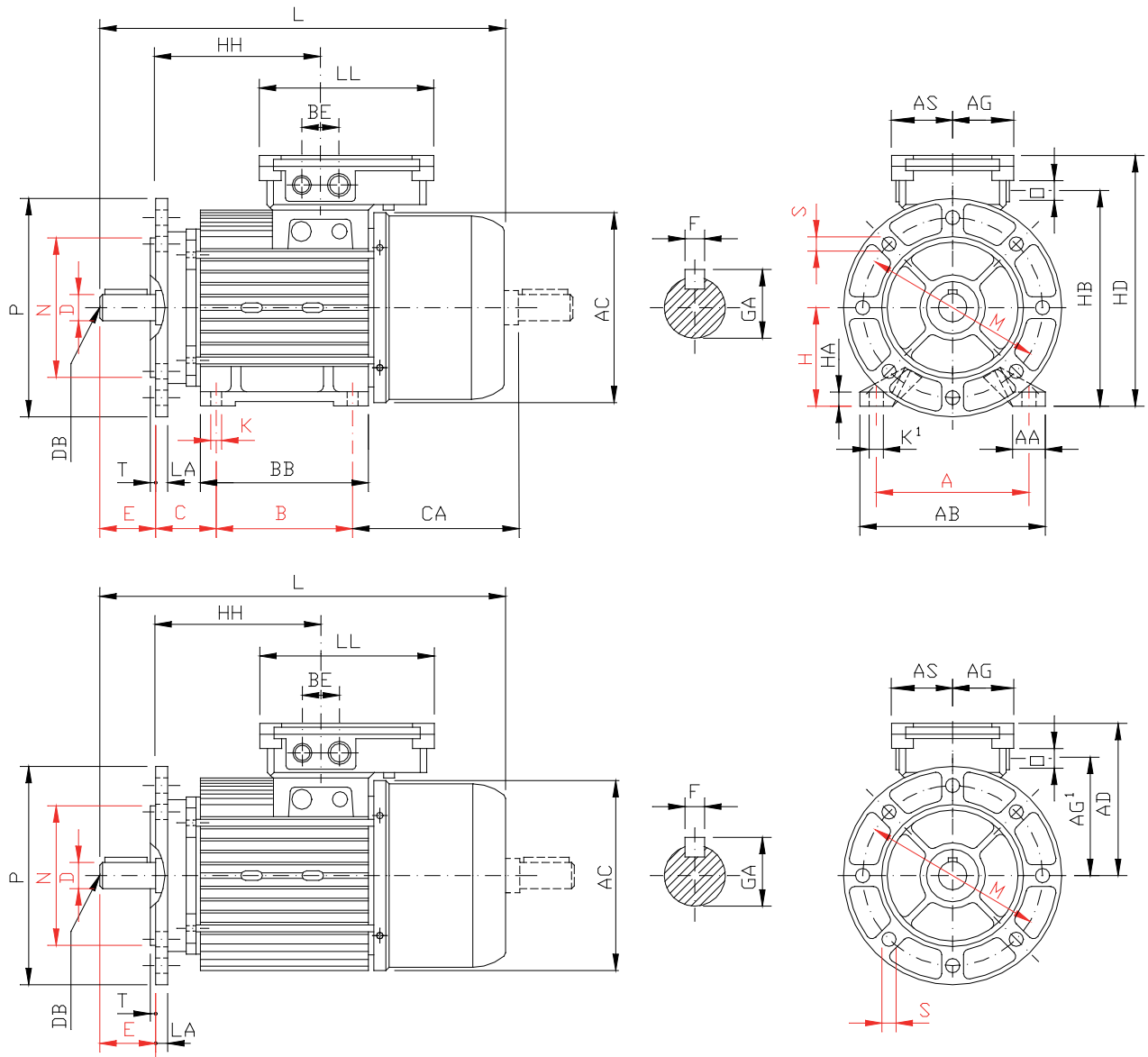
Self-braking three-phase motor – 33.. Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|-------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 308 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 351 | 158 | M20+M25 x 1.5 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 385 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 410 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 171 | 461 | 158 | M20+M25 x 1.5 |

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motor – 33.. Type

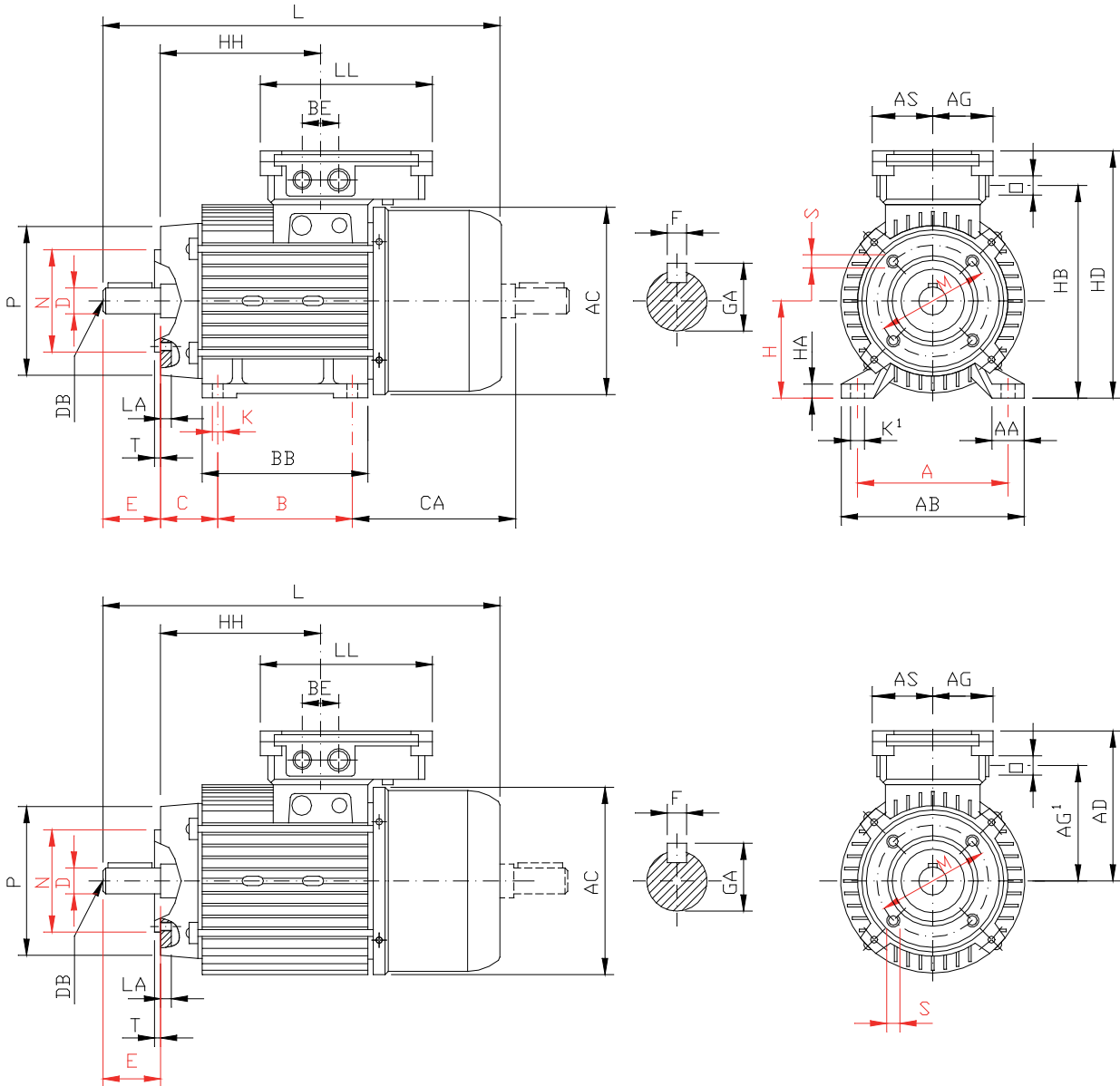


Note: Ledge of the second shaft is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----------------|-----------|-----|-----|-----|----|-----|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K ¹ | LA | M | N | P | S | T | D | DB | E | F | GA |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 12 | 8 | 130 | 110 | 160 | 9 | 3.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 9 | 165 | 130 | 200 | 11 | 3.5 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 165 | 130 | 200 | 11 | 3.5 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 11 | 215 | 180 | 250 | 14 | 4 | 28 | M10 | 60 | 8 | 31 |

Mounting arrangement IM B34 - IM B14

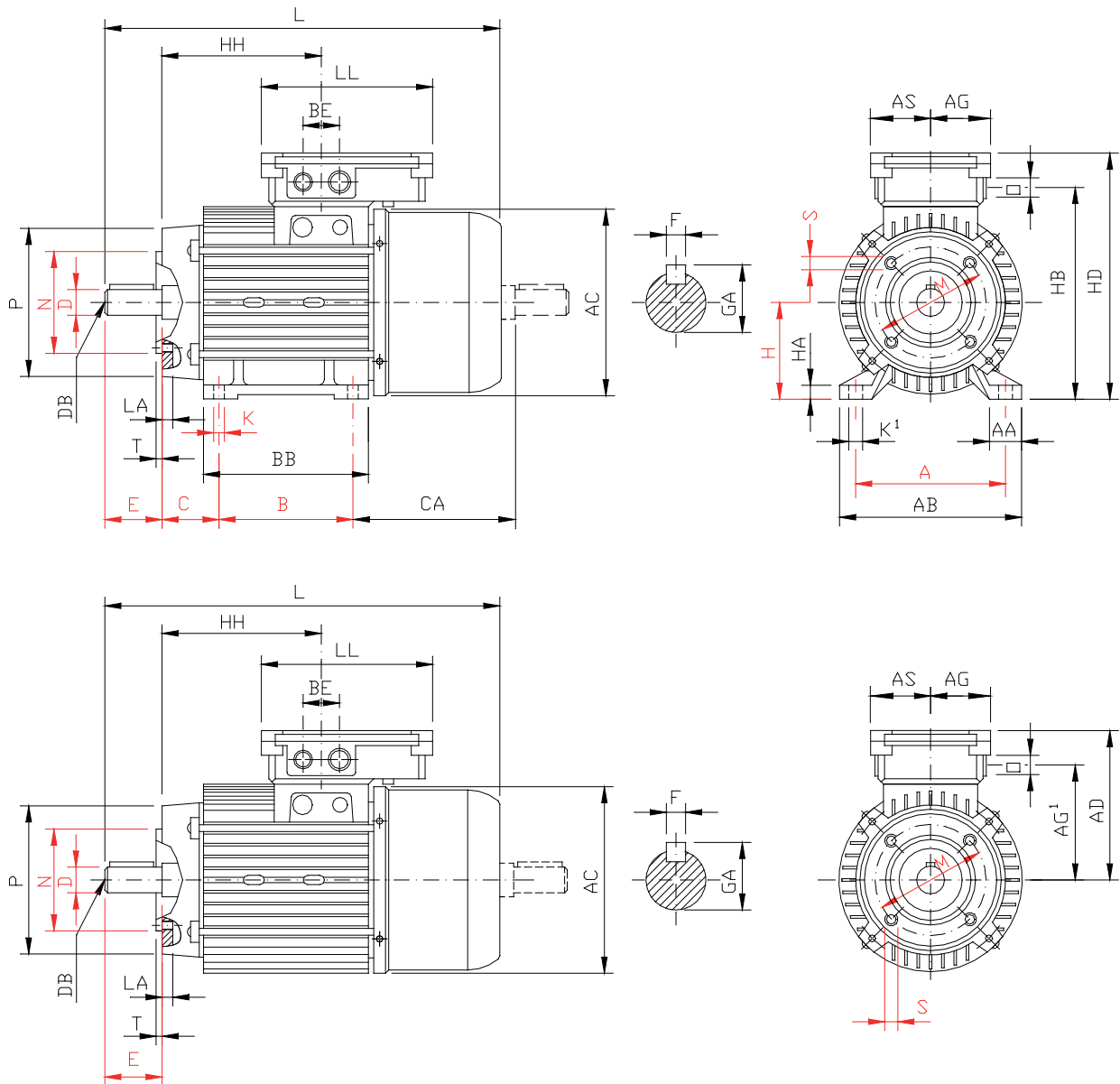
Self-braking three-phase motor – 33.. Type



| Motor size | Overall dimensions | | | | | | | | | | | |
|------------|--------------------|-----|----|-----------------|----|----|-----|-----|-----|-----|-----|---------------|
| | AC | AD | AG | AG ¹ | AS | BE | HB | HD | HH | L | LL | O |
| 71 | 138 | 122 | 52 | 96 | 52 | 35 | 167 | 193 | 103 | 308 | 148 | M16+M20 x 1.5 |
| 80 | 156 | 130 | 57 | 105 | 57 | 35 | 185 | 210 | 117 | 351 | 158 | M20+M25 x 1.5 |
| 90S | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 127 | 385 | 158 | M20+M25 x 1.5 |
| 90L | 176 | 134 | 57 | 110 | 57 | 35 | 200 | 224 | 152 | 410 | 158 | M20+M25 x 1.5 |
| 100L | 194 | 146 | 57 | 123 | 57 | 35 | 223 | 246 | 151 | 461 | 158 | M20+M25 x 1.5 |

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motor – 33.. Type



Note: Ledge of the second shaft is reduced to a size.

| Motor size | Coupling | | | | | | | | | | | Shaft end | | | | | | | | | | |
|------------|----------|----|-----|-----|-----|----|-----|-----|----|----|----|-----------|-----|-----|-----|----|-----|----|-----|----|---|------|
| | A | AA | AB | B | BB | C | CA | H | HA | K | K' | LA | M | N | P | S | T | D | DB | E | F | GA |
| 71 | 112 | 26 | 135 | 90 | 112 | 45 | 147 | 71 | 8 | 7 | 12 | 8 | 85 | 70 | 105 | M6 | 2.5 | 14 | M5 | 30 | 5 | 16 |
| 80 | 125 | 28 | 152 | 100 | 124 | 50 | 165 | 80 | 11 | 9 | 13 | 17 | 100 | 80 | 120 | M6 | 3 | 19 | M6 | 40 | 6 | 21.5 |
| 90S | 140 | 30 | 170 | 100 | 130 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 90L | 140 | 30 | 170 | 125 | 155 | 56 | 184 | 90 | 13 | 9 | 13 | 10 | 115 | 95 | 140 | M8 | 3 | 24 | M8 | 50 | 8 | 27 |
| 100L | 160 | 35 | 192 | 140 | 163 | 63 | 203 | 100 | 14 | 12 | 17 | 10 | 130 | 110 | 160 | M8 | 3.5 | 28 | M10 | 60 | 8 | 31 |

Use and maintenance

Three-phase and single-phase motors

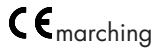
General information

This instruction and maintenance handbook forms an integral part of the motor and must be thoroughly read before operating the motor.

This document must be kept for future consultation.

SACEMI-GAMAR S.r.l. cannot be held responsible for any breakage, accidents or inconveniences resulting from inappropriate usage of the motor as described in his handbook.

You are strongly recommended to contact **SACEMI-GAMAR S.r.l.** Technical Department if the motors are to be connected to electronic or other equipment and for any other particular uses.



With the **CE** trademark the manufacturer declares that the product conforms to Community Directives LVD 2006/95/EC, EMC 2004/108/EC, MD 2006/42/EC and to RoHS 2002/95/EC, and complies with all legal obligations applied by EC countries.

Range of products and construction features

This handbook refers to serial three-phase motors, from size 56 to 160, to three-phase servo-ventilated motors from size 63 to 160 and to single-phase motors from size 56 to 100.

With regards to the self-braking models, these refer to three-phase motors from size 63 to 160, equipped with a three-phase or single-phase brake in direct current and to single-phase motors, from size 63 to 100, with a single-phase brake in direct current.

The motor unit is serially built with protection IP 55 (IEC 60034-5).

It has been designed for continuous operation S1 according to its power rating.

The dynamic balance of the rotor is by half key (ISO 8821).

-Serial three-phase and servo-ventilated motors

These motors belong to family "A".

The servo-ventilator, is firmly attached to the fan cover on the motor.

-Self-braking three-phase and single-phase motors

These motors belong to family "B".

Construction-wise, the self-braking model is formed by a motor unit and a brake set.

The brake-unit is firmly welded to an appropriate flange at the back of the motor and is part of the motor itself.

-The electro-magnet is designed for continual use S1 at a room temperature between -5 and +40°C.

-The set of brakes in motors rated for S1 service, is designed for emergency stalls and has static braking couples stated in the catalogue for every type and size of motor.

A particular use of the brake (i.e. frequent intermittent operation or duty affecting the variation of thermal load) must be agreed with **SACEMI-GAMAR S.r.l.** Technical Department.

Electromagnetic compatibility

If the brake-unit is built with a three-phase electromagnet, according to laboratory tests in accordance with EN 50081-1 and EN 50081-2 standards concerning emissivity, self-braking models of this kind do not present operating anomaly, even in the presence of surrounding electromagnetic interference.

In the case of serial self-braking models with the brake in direct current, feeding of the brake is provided by an electronic type of feeder appropriately constructed and geared for standard EMC 2004/108/EC.

A different solution could be adopted by **SACEMI-GAMAR S.r.l.** for whatever reason and it is therefore recommendable to check electrical connection systems inside the motor terminal-box.

The above self-braking motors, with a three-phase motor, can be indifferently used both in residential and industrial environments.

A restriction is made for single-phase motors which in certain cases can only be used in industrial environments. Further details must be requested to **SACEMI-GAMAR S.r.l.** Technical Department.

Check on receipt of goods and handling

Make sure that the motor has not been damaged during transportation. Check rating.
If the motor is self-braking and has a manual release turn the shaft manually to check easy rotation.
The motor must be handled with care, a sudden impact could damage the framework, bearings or other parts.
The appropriate eyebolt, if provided, must be used for lifting and the axis must be maintained horizontal.
The motor should never, under any circumstances, be lifted by the shaft.


Storage

The motor must be stored in a clean, dry and closed environment, free from vibration, gas or corrosive atmospheres. The room temperature should never be less than -15°C.
It is advisable that unvarnished metal parts (shafts, flanges, etc.) are treated with a protective lubricant.
In case of long-term storage it is advisable to periodically rotate the shaft manually.

Installation and assembly

Before operating the motor, measure the insulation resistance of all winding and towards earth with the appropriate instrument in direct current (500 V). Dry if inferior to 10 Mega ohm.
Installation must be carried out by personnel, qualified (definition according IEC 364) for handling mechanical and electrical equipment and who are also well adjourned on local safety regulations.
To avoid accidental starting, during installation phase the motors must be literally disconnected from feeder cables or an electric security system, which complies with current rules and regulations, must be activated.
Even if the motor is equipped with this electrical security device, it is advisable to check the absolute absence of power on the motor terminal, using the appropriate instruments.
After the mechanical functionality of the motor has been visibly and manually (where possible) checked, assembly must be carried out on adequately sized bases or flanges which have been previously checked for planning and orthogonality.
Connection of transmission gears must be carried out with caution. Avoid striking with a hammer or similar item when inserting the pulley axle or joints.
When using the latter, make sure that the alignment is correct and in certain cases check their state of dynamic balancing.
Tension of the belt must not be superior to data indicated in the catalogue.
Anti-condensation holes must be aligned correctly.

Electrical connection

Connection of the motor to the mains must be carried out by qualified personnel only. Before connecting, check that the line is correctly rated and that power and frequency available at the ends coincide with those on the rating-plate.
The supply leads must be inserted in the terminal box through the appropriate cable presses, with a metric threading, and the earth terminal connected to the suitable terminal  inside the terminal box.

- Three-phase and single-phase motors

In three-phase motors, rotation is hourly respecting the sequence of phases L1⇒U1, L2⇒V1, L3⇒W1.
Direction of rotation can be reversed by changing the 2 phases. In serial motors, the terminal boxes should be arranged for star connection (horizontal lines) or delta connection (vertical lines) respecting the enclosed diagram and the voltage as indicated on the rating-plate.

Three-phase servo-ventilated motors are equipped with two terminal boxes (to feed the motor and servo ventilator separately) it is therefore essential to follow the wiring diagram accurately. In serial single-phase motors, the rotation direction set in the factory is hourly and can be changed by following the diagram inside the terminal box.

- Self-braking single-phase and three-phase motors

Serial self-braking motors (one speed) are fitted with electrical wiring of the brake in parallel to the motor inside the terminal box. Except for particular cases, it is necessary only to connect the line to the terminal box in accordance with the diagram supplied with the motor.

Bearing the above in mind for serial motors other considerations must be made.

The choice of connection, star or delta, automatically modifies feeding of the three-phase brake.

In the case of self-braking motors in the standard model where the brake is in direct current, the variation of star or delta connection involves a change in wiring the brake feeder.

In this case the enclosed wiring diagram must be scrupulously followed.

In the case of delta or star connection starting, the gear voltage is delta: therefore the enclosed diagram for feeding the brake must be respected.

In self-braking single-phase motors, normally a dc brake is supplied and wired to the terminal box in parallel to the motor. In this case it is sufficient to connect the terminals following the diagram enclosed in the motor.

Operation

During operation and for several minutes after shutdown of motor, the exterior frame of the motor will reach a temperature of over 60°C. Bearing this in mind, great precaution must be adopted in handling the motor and suitable protective garments should be worn (gloves, arm and leg guards).

Maintenance

Before carrying out any maintenance or cleaning operation make sure that the motor is switched off and that it can in no way be accidentally re-started.

Any physical contact during maintenance must always be carried out with caution considering the high temperature reached during operation. In any case when the temperature of the motor frame has dropped sufficiently, disconnect feeding from the mains and check inside the terminal box, using the appropriate instruments, that there are no live phases.

In the case of single-phase motors, wait a few minutes before checking with the appropriate instruments for residue tension on the capacitors.

The self-braking motor requires a more severe maintenance schedule than required for an electric motor without a brake.

All personnel employed in the maintenance of the motors, must have specific competency in dealing with electrical equipment, a good background in mechanics and knowledge of the environment and the machine onto which the motor is fitted. It must be recalled that a brake which maintains a mechanism in suspension or locked, could cause very serious accidents, should it become released.

A periodical check-up, according to the kind of use, should particularly investigate the following parts:

- width of the friction packing, which should never be less than 1 mm;
- clearance between the brake-disk and the gear;
- clearance between the key and its seating on the hub;
- clearance between the gear and the motor axis;
- the air gap, which if necessary should be adjusted to nominal values, according to the type of brake; this is explained in detail in the following pages. If necessary replace used parts.

Motor frames, protective casing of the brakes and the brakes themselves must be freed from stagnant dust or other agents preventing a normal thermal exchange and adequate ventilation.

The wear of the bearings depends on the type of service the motor is exposed to. These components too are subject to a periodical check-up. For normal service S1, they should wear for more than 20.000 working hours.

Pulleys or pinions should be extracted from the axis using appropriate pullers.

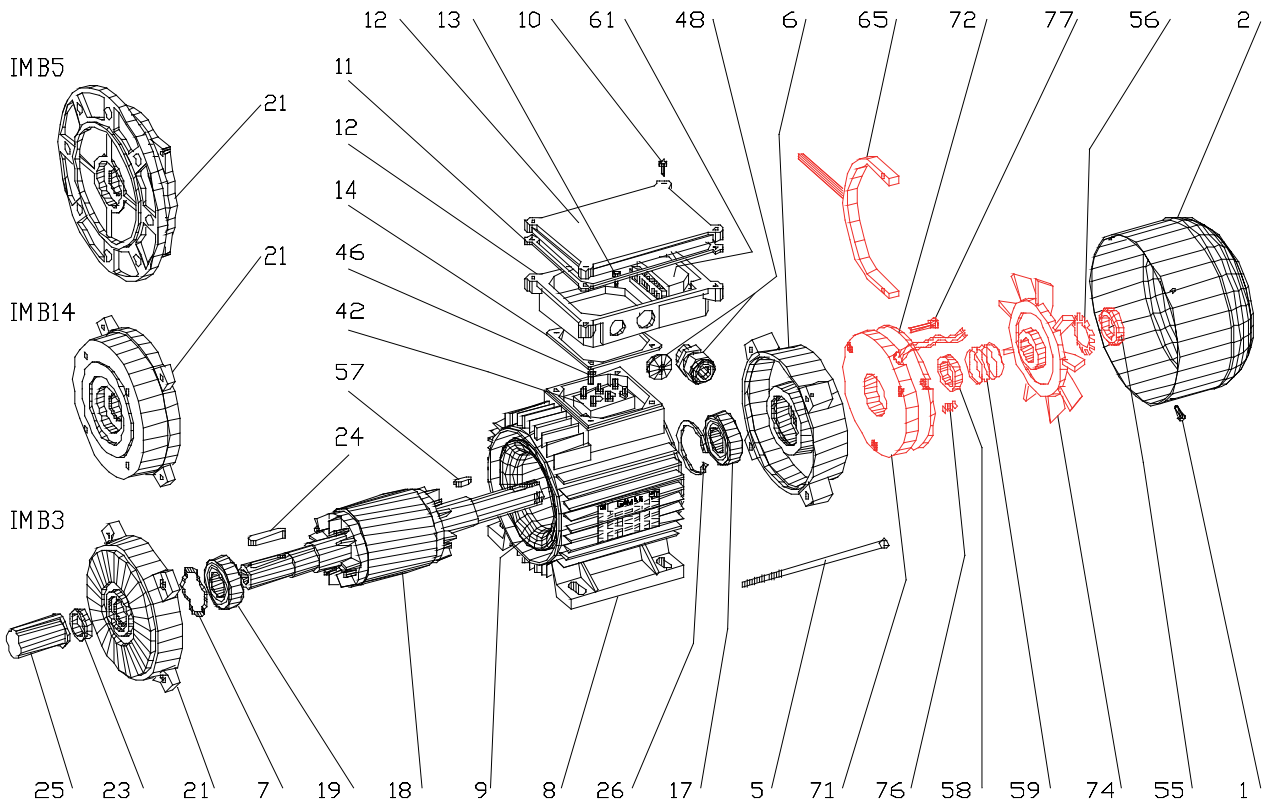
Disassembly and re-assembly of motors should be carried out according to the detailed diagram, according to the type of motor or brake concerned.

Further instructions, details and features for each type of brake are to be found in the following pages

SACEMI-GAMAR S.r.l. Technical Department is at your disposal for more specific details in order to improve safety measures concerning the machines and work environments.

Self-braking motors - 10.. Type

Braking torque fixed



Adjustment of the braking torque

The braking torque depends on the type of spring fit to the brake and cannot be modified.

⚠ ⚡ Re-adjustment of air-gap

Series 10 brakes are emergency brakes and reduce the braking couple until extinction, according to their wear. Therefore it is important to check and re-adjust the air-gap more frequently than with other types of brakes.

Once the motor fan-cover has been removed (2), using a suitable tool, lift the key of the safety-ring, (56) which secures the lock nut (55) of the brake fan (74) or the flywheel (67).

Insert the brake-lining laminate between the movable armature (72) and the electromagnet (71).

Adjust the air-gap in accordance with below table by turning the nut.

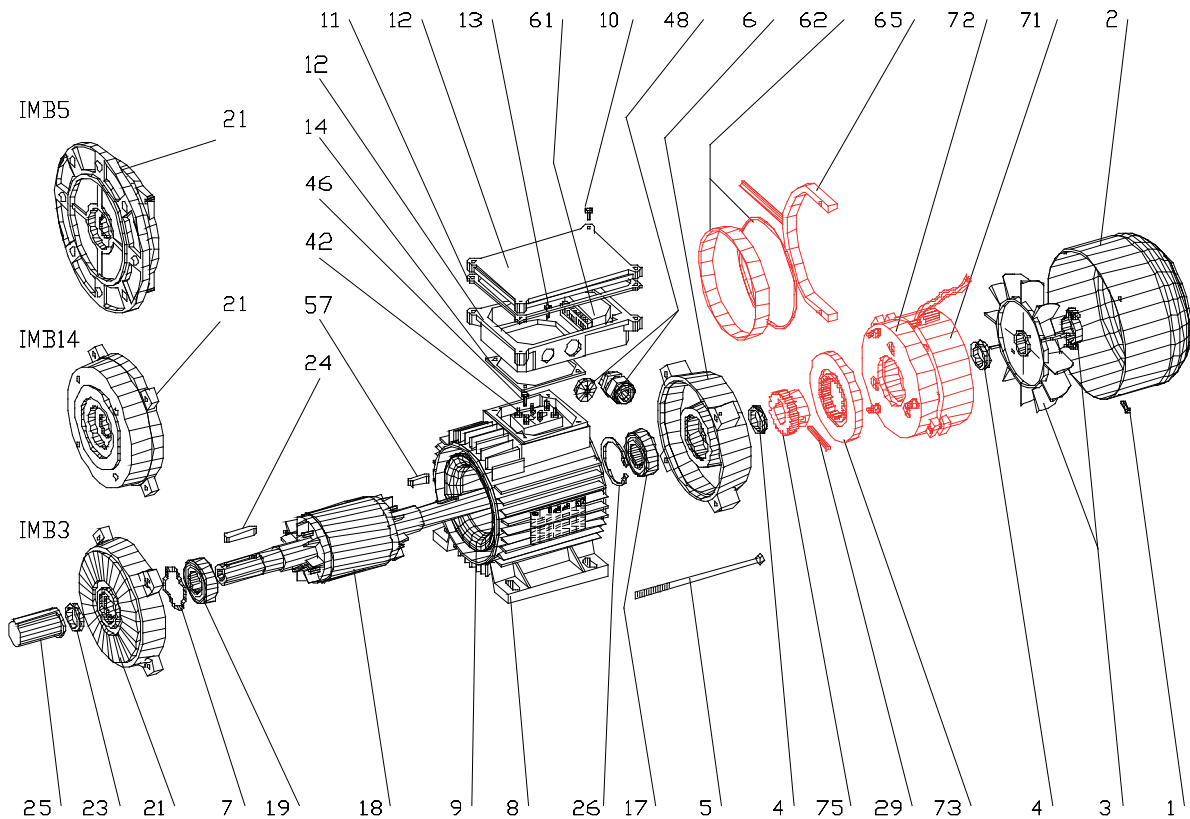
Bend the safety ring key at the nearest slit of the nut and to finish insert the fan cover.

Measure table for air-gap in series 10 brakes

| | Motor-size | | | | | | | |
|----------------------------|------------|------|------|------|------|------|------|-----|
| | 63 | 71 | 80 | 90 | 100 | 112 | 132 | 160 |
| Air-gap 10 Type | 0.20 | 0.20 | 0.20 | 0.20 | 0.25 | 0.25 | 0.30 | - |

Self-braking motors – 20.., 30.. and 33.. Type

Braking torque adjustable



⚠ ⚡ Adjustment of the braking torque

The braking torque is normally regulated in the factory at a medium level. Slight alterations can be made to the embedded hexagonal headed grooves to be found on the rear of the electromagnet (71).

⚠ ⚡ Re-adjustment of air-gap

Unmount motor fan cover (2), take off cooling fan (3) then lift (where they are provided) O-rings for brakes (62) and loosen screws of brake-unit (recognised by the cylindrical head with embedded hexagonal grooves) and at the same time unengaged lock nuts on the cast iron flange.

Insert the brake-lining laminate between electromagnet (71) and movable armature (72), tighten locking screws to required air-gap.

Fix lock nuts on brake supporting flange (6) to conclude operation.

Re-assemble O-rings, cooling fan and fan cover and check intermittent operation of the brake and motor.

Table for air-gap sizes in series 20, 30 and 33 brakes

| | Motor-size | | | | | | | |
|----------------------------|------------|------|------|------|------|------|------|------|
| | 63 | 71 | 80 | 90 | 100 | 112 | 132 | 160 |
| Air-gap 20 Type | 0.20 | 0.20 | 0.30 | 0.30 | 0.35 | 0.35 | 0.40 | 0.50 |
| Air-gap 30 Type | 0.20 | 0.20 | 0.20 | 0.30 | 0.30 | 0.35 | 0.35 | 0.40 |
| Air-gap 33 Type | - | 0.20 | 0.20 | 0.30 | 0.30 | - | - | - |

SACEMI-GAMAR S.r.l. Technical Department is at your disposal for more specific details in order to improve safety measures concerning the machines and work environments.

The data shown here are indicative and not binding. **SACEMI-GAMAR S.r.l.** reserves at any time, without notice to change the signs, according to the technical development of manufacturing.
This catalogue supersedes all previous versions.

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