LAFERTSERVO

TECHNICAL CATALOGUE 2008

LAFERTGROUP

CONTENTS

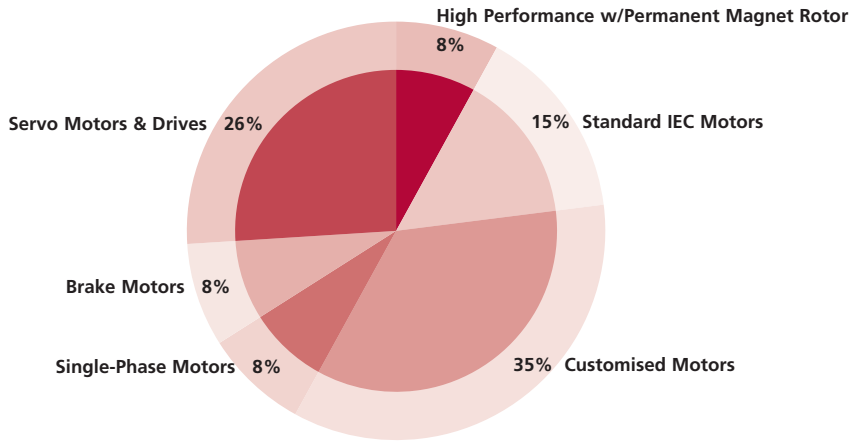
GENERAL INFORMATION

Lafert Group product policy

In the next few pages we offer a detailed overview of our manufacturing programme of AC induction motors.

The main scope of our core business is the development of dedicated solutions that improves our Customer's product design, thereby giving our customers a competitive advantage. The core business of our Company stands on the ability to adapt and engineer our standard Product design to any specific market demand.

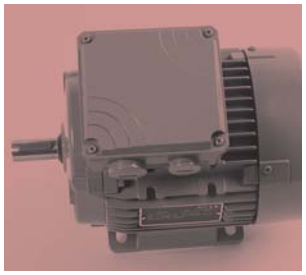
The chart below gives manufacture by product type.



Standard IEC motors

The standard design includes the following basic features to give a high level of flexibility:

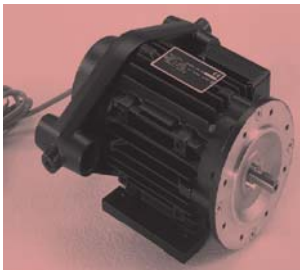
- Multi Mount Construction for an easy change of terminal box position
- Terminal box rotates by 90° to allow cable entry from any direction
- Easy-to-change flanges with over-sized and smaller-sized dimensions
- Provision for oil seal at Drive End



Dedicated and customised executions

Lafert specialises in customised solutions for non-standard motor applications. We are considered as a market leader in this field and have built a reputation for excellence for this core activity over the past 45 years.

The range of specials includes both electrical and mechanical variants:
- Extended stainless steel motor shafts for the fan industry
- Motors for pumping applications
- Complete Tailor made designs
- Customised flange and shaft for gear motors
- Electrical design to meet specific duty requests
- Specific wound motors for worldwide electrical supply
- Motor design to meet special environmental requests (Smoke and heat exhaust ventilation, Dust Ignition for Zone 22, Non Sparking Exn)



Energy efficient motors

Motors conforming to the higher efficiency standards for Europe, North America and Australia.

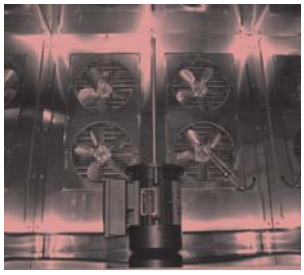
For Europe, Lafert offers its EFF1 rated 'AMHE' range of AC induction motors, whose efficiency values are conforming to CEMEP's Voluntary Agreement.

Lafert's motor for the North American market comprise the 'AMH' range. These machines meet the higher efficiency demands of the USA's Department of Energy's Energy Policy Act (EPAct): it is illegal to import Motors into the USA and Canada that do not comply with this standard.

In addition to EPAct requirements, these motors are a recognised component verified by Underwriters Laboratories and carry the UL approved logo.

Single Phase motors

The range available is especially designed for superior performance and low vibration and noise. The AMM range is ideal for low-inertia applications and the fan industry; while the AMME range meets high starting torque requirements such as mixing machines and other machinery.



Brake motors

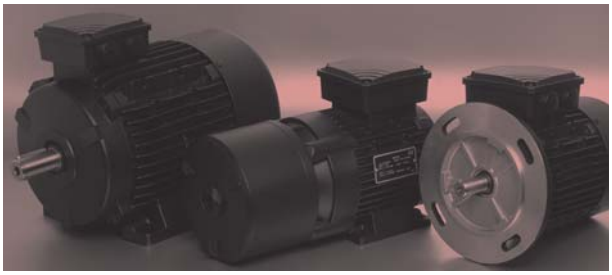
Lafert's brake motors (3 and single phase) are engineered to give safety, versatility and long service life. The motor's mechanical design is specific for brake motors in order to avoid any risk of failure.

The three brake options available can fit any application and are available both with AC or DC brake coil.

The AMF and AMBY ranges have a very strong design and may meet any heavy duty application. The AMBY range is also available with low noise brake, specific for theatres.

The compact AMS range is the ideal solution for woodworking equipment manufacturers, packaging machines manufacturers, as well as small crane manufacturers.

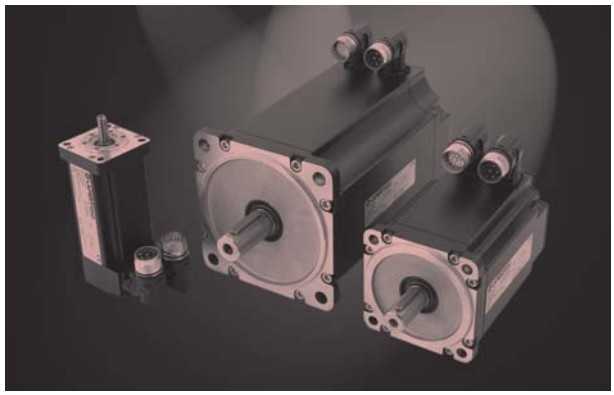
As well as meeting industry specific safety requirements, the motors are also failsafe machines: a combination that ensures maximum machine safety.



Brushless Servo Motors and Drives

Among the few independent manufacturers of Servo Motors in the market, Lafert can supply a wide range of standard and tailor made products for Industrial Automation.
The whole manufacturing process is integrated within Lafert manufacturing facilities, giving an excellent flexibility to specific market demands, as well as a high level of cost-efficiency.

- Brushless Standard Motors
- Direct Drive Motors
- Low Inertia Motors
- Compact Motors

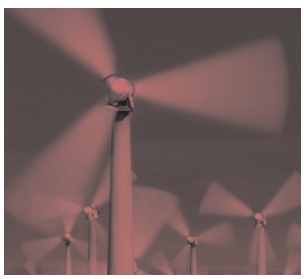


High performance motors with permanent magnet rotor

A differentiator with Sensorless Permanent Magnet Motors is the absolute high efficiency level and the compact design. The efficiency level normally stands over 90% all along the motor's speed range.

This Product must be driven by a frequency converter, that can also be on-board as an integral drive.

Major applications are the Pump and Fan Industry, Textile Machinery Manufacturers, Gearbox Manufacturers, Traction Systems for microcars and scooters; this Product can be produced as a Generator for Wind Energy.

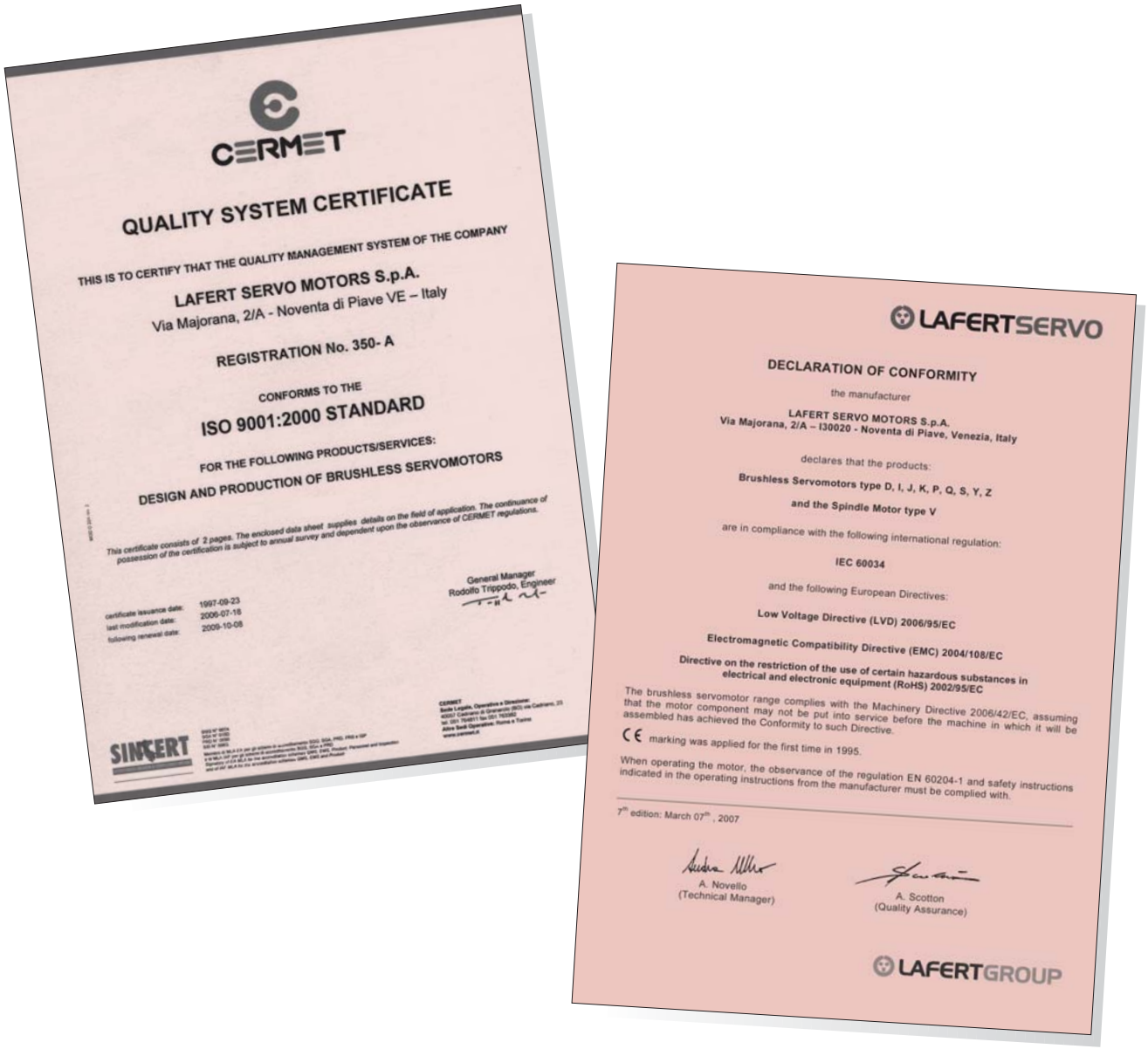


Our Strengths: Customer Designs
Exact Engineering

…In Partnership with the Customer

STANDARDS AND REGULATIONS

The strictness of our quality control assures the flawless operation and reliability of our products. Our quality system is certified to ISO 9001 by CERMET, the certifying body of SINCERT.



CERMET

QUALITY SYSTEM CERTIFICATE

THIS IS TO CERTIFY THAT THE QUALITY MANAGEMENT SYSTEM OF THE COMPANY

LAFERT SERVO MOTORS S.p.A.
Via Majorana, 2/A - Noventa di Piave VE – Italy

REGISTRATION No. 350- A

CONFORMS TO THE

ISO 9001:2000 STANDARD

FOR THE FOLLOWING PRODUCTS/SERVICES:

DESIGN AND PRODUCTION OF BRUSHLESS SERVOMOTORS

This certificate consists of 2 pages. The enclosed data sheet supplies details on the field of application. The continuance of possession of the certification is subject to annual survey and dependent upon the observance of CERMET regulations.

General Manager
Rodolfo Trippodo, Engineer

certificate issuance date: 1997-09-23
last modification date: 2006-07-18
following renewal date: 2009-10-08

SINCERT

LAFERTSERVO

DECLARATION OF CONFORMITY

the manufacturer

LAFERT SERVO MOTORS S.p.A.
Via Majorana, 2/A – I30020 - Noventa di Piave, Venezia, Italy

declares that the products:

Brushless Servomotors type D, I, J, K, P, Q, S, Y, Z

and the Spindle Motor type V

are in compliance with the following international regulation:

IEC 60034

and the following European Directives:

Low Voltage Directive (LVD) 2006/95/EC

Electromagnetic Compatibility Directive (EMC) 2004/108/EC

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) 2002/95/EC

The brushless servomotor range complies with the Machinery Directive 2006/42/EC, assuming that the motor component may not be put into service before the machine in which it will be assembled has achieved the Conformity to such Directive.

CE marking was applied for the first time in 1995.

When operating the motor, the observance of the regulation EN 60204-1 and safety instructions indicated in the operating instructions from the manufacturer must be complied with.

7th edition: March 07th , 2007

A. Novello
(Technical Manager)

A. Scotton
(Quality Assurance)

LAFERTGROUP

Furthermore all servomotors are manufacturable according to the following standard:

UL 1004 - Electric Motors
and **CSA C22.2 No 100 - Motors and Generators**

So the mark c UL us applies to the whole series.

Certificate of Compliance

Certificate Number 290104 - E235396
Report Reference E235396, December 15th, 2003
Issue Date 2004 January 29

Page 1 of 1

Underwriters Laboratories Inc.®

Issued to: LAFERT SERVO MOTORS S P A
VIA MAJORANA 2/A
I-30020 NOVENTA DI PIAVE VENEZIA ITALY

This is to certify that representative samples of Motor constructions for Permanent magnet
synchronous series B f/b 28, 29, 36, 38, 56, 63, 71, 10, 13, 16 f/b two or three digit f/b I, Z, P, J, K, W, X, S f/b one or two number or letter f/b H, M, W, X f/b letters and or numbers.

Have been investigated by Underwriters Laboratories Inc.® in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1004 - Electric Motors
CSA C22.2 No. 100 - Motors and Generators

Additional Information: ELECTRICAL RATING:

Voltage Max (V) ac	Phase (N°)	RPM Max	Ampere (A)	Torque (Nm)
600	3	10000	0.1 to 200	0.1 to 270

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.
The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: RU may be used in conjuction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceeding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada: RU and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Look for the UL Recognized Component Mark on the product

Issued by: Gianmarco Serrao - Engineering Associate
UL International Italia Srl

Reviewed by: Guido Bonardi - CAS Manager
UL International Italia Srl

Pursuant to the Corporate Services Agreement between UL International Italia Srl and Underwriters Laboratories Inc. ("UL"), UL hereby accepts and issues this Certificate of Compliance. For questions in Italy, you may call +39 079 2636600.

Motors comply with the relevant standards and regulations as indicated in the table below:

Title	IEC	EU CENELEC	D DIN/VDE	I CEI/UNEL	GB BS	F NFC	E UNE
Electrical components							
General stipulations for electrical machines	60034-1	EN 60034-1	DIN EN 60034-1	CEI 2-3	4999-1	51-200 4999-69	UNE EN 60034-1 51-111
Terminal markings and and direction of rotation of rotating electrical machines	60034-8	HD 53 8 S4	DIN VDE 0530-8	CEI 2-8	4999-3	51-118	20113-8-96
Thermal evaluation and classification of electrical insulation - Insulating materials	60085		DIN IEC 60085	CEI 15-26			
Mechanical components							
Dimensions and output series for rotating electrical machines IM B3 shape	60072-1	HD 231	DIN 42673-1	UNEL 13113	4999-10 51-110	51-105 51-104	20106-1/26 1980
Dimensions and output series for rotating electrical machines IM B5 shape	60072	HD 231	DIN 42677-1	UNEL 13117		20106-2-74	
Cylindrical shaft ends for electric motors	60072	HD 231	DIN 784-3	UNEL 13502	4999-10	51-111	
Classification of protection degree (IP code)	60034-5	EN 60034-5	DIN IEC60034-5	CEI 2-16	4999-20	EN60034-5	20111-5
Methods of cooling	60034-6	EN 60034-6	DIN EN 60034-6	CEI 2-7	4999-21		EN 60034-6
Mounting arrangements - IM code	60034-7	EN 60034-7	DIN EN 60034-7	CEI 2-14	4999-22	51-117	EN 60034-7
Mechanical vibration - measurements. evaluations and limits of vibrations	60034-14	EN60034-14	DIN EN 60034-14	CEI 2-23	4999-50	51-111	EN 60034-14
Tolerances			DIN 42948	UNEL 13501			
Tolerances of mounting and shaft extensions			DIN 42955	UNEL 13501/ 13502			
Classifications of environmental conditions	600721-2-1		DIN IEC 60721-2-1		CEI 75-1		
Mechanical vibration and shock (Balancing)	ISO 8821		DIN ISO 8821				

Mechanical Tolerances

Mechanical dimensions of electric motors are indicated in the regulation IEC 72-1 that also sets out admissible tolerances, see the table below:

Values for	By dimension	Tolerance compared to rated values
Diameter of the shaft end	from 11 up to 28 mm from 32 up to 48 mm from 55 up to 100 mm	j6 k6 m6
Feather key width	/	h9
Flange pilot	/	j6

Note: The threaded holes at the shaft ends conform to the regulation DIN 332-D

Electrical Tolerances

Values for	Tolerance compared to rated values
Stall current (measurement in S1 duty cycle at rated speed with $\vartheta_{amb} \leq 40$ °C and altitude ≤1000 m above sea level).	Io +/- 5%
Rated current with rated torque and revolutions (measurement in S1 duty cycle at rated speed with $\vartheta_{amb} \leq 40$ °C and altitude ≤1000 m above sea level).	In +/- 5%
Back electromotive force: Bemf	Bemf +/- 5%

ϑ_{amb} = Ambient temperature

Derating Tables

The following derating tables with cumulative coefficients are provided for guidance.
Ktot = Ktemp*Khigh*Kduty, according to different operating conditions, ambient temperature higher than 40 °C, altitude higher than 1000 m above sea level or duty cycles with overload.

Derating according to altitude

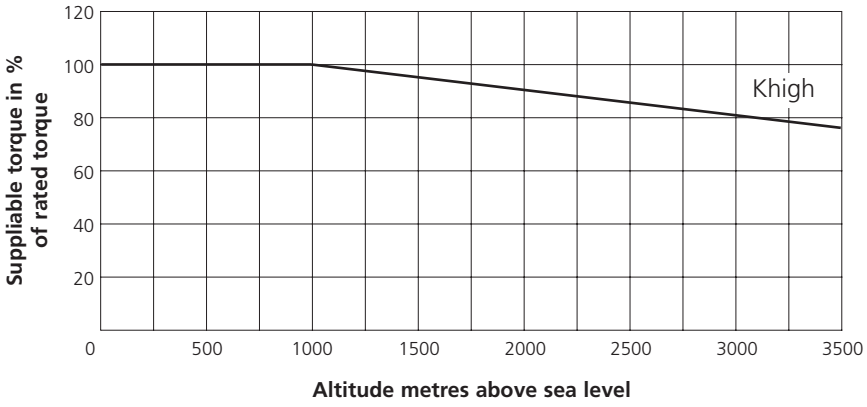


Fig. 1

Derating according to ambient temperature

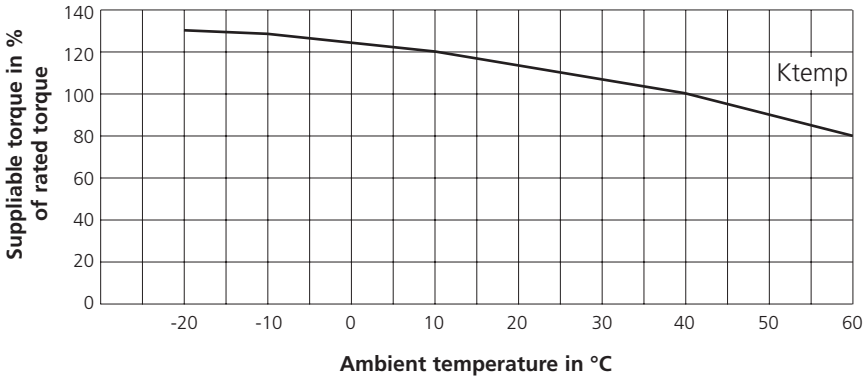


Fig. 2

Suppliable torque according to a duty cycle

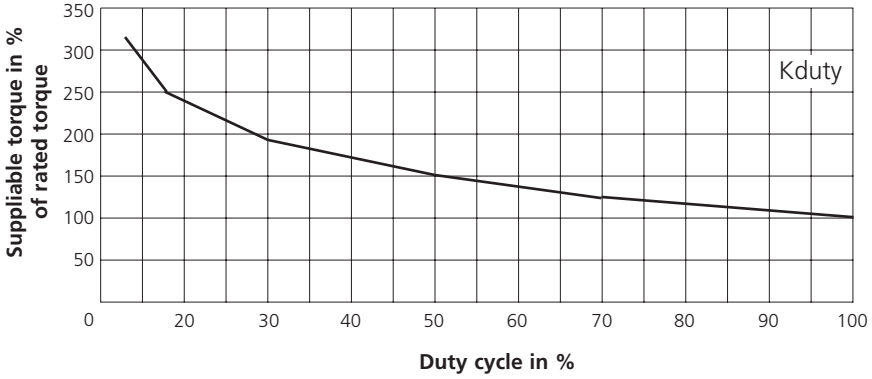


Fig. 3

The permanent magnet synchronous servomotor along with the relative electronic drive, represents a servo system suitable for driving a shaft at high performance, particularly when dynamic control during transients or steady state stability is required. In general, they assure higher bandwidths than other motor types due to their compact design giving a high ratio of torque/inertia. They need no brushes, as their name suggests, unlike a DC motor. This gives high performance for limited dimensions, excellent reliability and reduced maintenance procedures.

Brushless servomotors are used in a wide range of operating fields, chosen for their ability to operate with an almost constant torque and withstanding overloads several times higher than rated current.

Servomotor performance is linked to the electronic drive that supplies them controlling stator phase switching thus substituting the commutator of the old DC machines. In the brushless servomotor currents are distributed to windings through power static switches (for example, IGBT, MOSFET) according to the position detected by means of an angular position transducer, such as resolver, encoder or Hall sensor. The power bridge along with the feedback element replaces the commutator of the old DC machines. The feature maintained in common with a DC motor is constant torque up to rated speed.

Three-phase synchronous permanent magnet servomotors are made up of the following main components:

• Stator, with low-loss Fe-Si core lamination stack and three-phase star connection winding; insulation class F (for temperature rise of ΔT=105°K and ambient temperature of +40°C). Optionally available cURus compliant insulation system.
• Rotor, characterized by low-loss Fe-Si core lamination stack and peripheral surface with rare earth permanent magnets; the shaft is made of Ni-Cr steel; bearing have permanent lubrification.
• Frame components, such as die-cast flange, endshield and cover, and extruded aluminium case.
• Rotor position detector, whose adjustment respondes to specific rules.
is available in different types:
– Phase control and monitoring of motor revolution speed with a Resolver, (2-pole standard version, available with 4 and 6 poles) combinable with other feedback options.
– Monitoring of angular position and motor rotation speed with an Encoder combinable with other feedback options.
Note: it is also available with a sinusoidal encoder and a RS485 interface.
– AC (standard) brushless tacho-generator for monitoring motor rotation speed, equipped with three-phase winding (table "Tachometric transducer") combinable with other feedback options.
– Hall-effect sensors with high thermal stability and high magnetic sensitivity: They allow monitoring of the rotor position for the correct piloting of the power bridge combinable with other feedback options.
• Thermal sensor placed into stator winding in order to protect motor temperature. Different sensors type is also available on request.
• Connections with the drive for both power and signals with connectors in all series.
• Terminal board as an alternative option, instead of the power connector with brass-plated bolts. Easy access to connections and high operating safety (except for B28, B36 available only with connectors).
• Failsafe holding brake (optional) to be fitted in the flanged endshield, equipped with permanent magnets and electromagnetic release.

Brief Description

The following features of our standard motors may vary depending on series and type:

- Admissible environmental temperature: from -15 °C up to +40 °C, with altitudes 1000 m above sea level
- Mounting: IM B5 (V1 and V3 available)
- Flange concentricity degree "N"; balancing: vibration "N"; dynamic balancing with half key
- Shaft designed according to the standard version with key (also available without key)
- Available stall toque: from 0.15 Nm up to 75 Nm.
- Available speeds: 1200, 2000, 3000, 4000, 6000 rpm
- Drive operating voltage: 230 or 400 Vac
- Pole number according to the series: 4, 6, 8 poles
- Insulation class: "F"; cooling through radiation and natural convection
- IP65 degree of protection for the whole range (IP67 optional); B28 is designed with IP65 protection as well except for the flange end
- On-Off PTO switch for thermal protection tripping at 140 °C (NTC and PTC are available)
- Optional feedback by choice: resolver, encoder, tacho and Hall sensors (several combinations may be added to this list)
- High acceleration and deceleration: up to 90.000 rad/sec2
- Reduced dimensions
- Rare earth permanent magnets
- Excellent distribution of the rotor magnetic field, in order to eliminate torque fluctuations at low speed.

Applications

- Numerical control shaft drive
- Intermittent motion controls
- Controls according to complex motion laws
- Machine tools for metals, wood and other material manufacturing (in general, chip forming machining)
- Textile machines
- Graphic and serigraphic machines
- Machines for ceramics industry
- Machines for packing industry
- Plastic moulding machines
- Winding and unwinding machines
- Vehicles supplied by batteries for material transport and movement
- Press supply
- Robotics and manipulation
- Transfer lines
- Paper factories

Definitions - Timing and Motor Identification

Definitions

• **Stall torque (Mo):** Torque available on the shaft continuously (service S1) with speed close to zero (lower than 200 rpm) and with a winding current equivalent to the stall current (see Figure 4).
• **Rated torque (Mn):** Torque available on the shaft continuously (service S1) with rated speed. and with a winding current equivalent to the rated current (see Figure 4).
• **Peak torque (Mpk):** Torque available on the shaft discontinuously, with a winding current equivalent to the peak current (see Figure 4).
• **Stall current (Io):** Current supplied to the motor continuously at a speed closed to zero, required to develop stall torque.
• **Rated current (In):** Current supplied to the motor continuously at a rated speed, required to develop rated torque.
• **Peak current (Ipk):** Current supplied to the motor discontinuously within a wide range of speed, required to develop peak torque (not to be exceeded to avoid magnet demagnetization).
• **Voltage constant (Ke):** Ratio between voltage induced by the rotor rotation (RMS value for sinusoidal motor, peak value for trapezoidal motor) at a certain number of revolutions and angular speed ($\omega=2 \times \pi \times n/60$ where n is the speed expressed in rpm) measured in rad/sec.
• **Torque constant (Kt):** Ratio between torque on the shaft and the current RMS value for sinusoidal motors, peak value for trapezoidal motors (equivalent to the voltage constant of a trapezoidal motor and to that of a sinusoidal motor multiplied by $\sqrt{3}$).
• **Back electromotive force (B.E.M.F):** Voltage induced by the rotor rotation (RMS value for sinusoidal motor, peak value for trapezoidal motor) at a certain number of revolutions.
• **Phasing procedure:** Synchronization procedure of those signals generated by the transducer with the back electromotive force induced by the rotating rotor and measured between two phase terminals of the motor winding.
• **Saturation (saturation curve):** It is made up of the peak torque curve combined with that representing the physical limit of the current, which may be expressed at some speed according to supply voltage (see Figure 4).
• **Duty cycle:** In case of an intermittent duty cycle it is possible to overload the motor in proportion to the ratio between operating time and total cycle time: the figure shows two overload curves at 20% and 50% (S3 duty).

Torque to speed performance curve: continuous and intermittent duties.

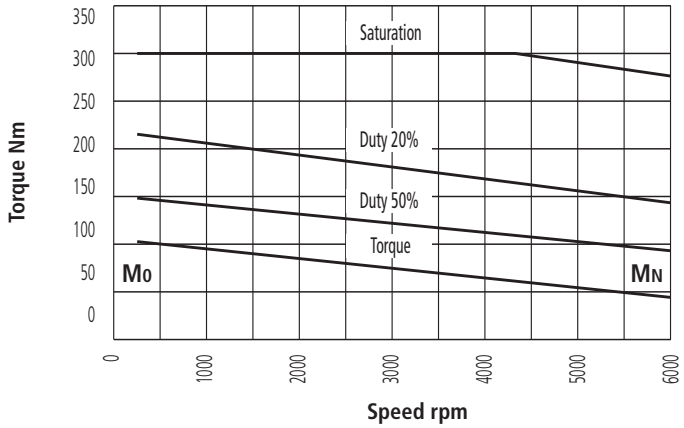


Fig. 4

• Continuous duty area: It includes all points of the torque/speed figure where the load torque value is lower than or equivalent to the torque curve that joints Mo and Mn: therefore, this is a continuous operation duty. The continuous duty area is defined as the area below the torque curve in the motor speed range available (see Figure 4).
• Intermittent duty area: It includes all points of the torque/speed figure where the load torque value is higher than the torque curve that joints Mo and Mn: therefore, this is non-continuous operation duty. The Intermittent duty area is defined as the area between the torque curve and the saturation curve (see Figure 4).

Phasing Procedure

• Autotuning
In the event that the motor is equipped with a new generation digital drive you only need to carry out phasing procedures explained in the reference handbook, thus matching data indicated in the motor nameplate with related parameters.

• Example of mechanical manual phasing procedure of a 2-pole resolver mounted on a 6-pole sinusoidal brushless servomotor.
Disconnect terminals U, V, W from the DRIVE.
Inject a direct current applying voltage with positive polarity in the phase V (blue) and negative polarity in the phase W (red): in this way the rotor of the motor results locked in a certain position. A current is required to hold the rotor in a fixed position, therefore without the presence of position clearance. The resolver must be excited with an operating generator at 7VRMS - 10KHz or through a drive, keeping, for instance, only electric supply R1, R3 connected to the drive and leaving the other wires (S1, S2, S3, S4) free. Display the signal S1 (red) and S2 (yellow) using a two-channel oscilloscope by connecting each probe screen to the equipotential connections Mo, including wires S3, S4 and R3 (see Resolver at page 18). Loosen the cramp screws of the NDE-shield and turn the stator of the resolver (always keeping the motor shaft still) until the signal S1-Mo is null (=100mV) and the signal S2-Mo reaches the maximum value. Check that, slightly turning the motor shaft clockwise (looking at the flange end and disconnecting S2 probe in order to connect the power supply voltage signal R1), the signal S1-Mo results in phase with the signal R1-Mo. In the event that it is in phase opposition (180°), turn the resolver again and search for the following position that minimizes the signal S1-Mo, and then repeat the phase test. As soon as a reciprocal phase is obtained, let the shaft free to reach the angular position (V-W phases are still executed by the direct current). In this position fix the stator of the resolver with the screws that must be sealed using varnish.

Motor Identification

In order to properly choose the motor, kinematic mechanism must be assessed, thus defining rated and stall torque, accelerations required through a speed torque graph compared with time, inertia of the machine (when a gearbox is coupled to the motor), and installation environment.
In order to make the choice of the motor easier, please refer to the Chapter "Order Data".

Degrees of protection

Degrees of protection for mechanical machines are designated in accordance with IEC 60034-5 by the letters **IP** and two characteristic numerals.

First numeral: Protection against contact and ingress of foreign bodies

IP	Description
0	No special protection
1	Protection against solid foreign bodies larger than 50 mm (Example: inadvertent contact with the hand)
2	Protection against solid foreign bodies larger than 12 mm (Example: inadvertent contact with the fingers)
3	Protection against solid foreign bodies larger than 2.5 mm (Example: Wires, tools)
4	Protection against solid foreign bodies larger than 1 mm (Example: Wires, bands)
5	Protection against dust (harmful deposits of dust)
6	**Complete protection against dust. Is not described for electrical machines to IEC 34-5**

Second numeral: Protection against ingress of water

IP	Description
0	No special protection
1	Protection against vertically falling water drops (condensation)
2	Protection against dropping water when inclined by up to 15°
3	Protection against waterspray at up to 60° from vertical
4	Protection against water splashed from any direction
5	**Protection against water projected by a nozzle from any direction**
6	Protection against heavy seas or water projected in powerful jets
7	Protection when submerged between 0.15 and 1 m.
8	Protection when continuously submerged in water at conditions agreed between the manufacturer and the user

Series B28 are manufactured with degree of protection IP65 except for flange end. while series B36, B56, B63, B71, B100 are fully designed in accordance with degree of protection IP65. In addition, IP67 motors can be designed on request.

Mechanical Components

Bearings
Specification of bearings (standard design).

Ball bearings in compliance with the regulation DIN 625

Type	Drive end	No drive end
B28	6000 2ZC3WT	6000 2ZC3WT
B36	6202 2ZC3WT	6002 2ZC3WT
B56	6202 2ZC3WT	6202 2ZC3WT
B63I	6204 2ZC3WT	6203 2ZC3WT
B63J	6204 2ZC3WT	6204 2ZC3WT
B71	6205 2ZC3WT	6203 2ZC3WT
B100	6208 2ZC3WT	6206 2ZC3WT
B132	6309 2ZC3WT	6208 2ZC3WT

Tab. 1

Bearing Mounting

Type	DE-shield bearings	NDE-shield bearings	Preloading bearing
All type	Locating bearings	Non-locating bearings	Non-drive end

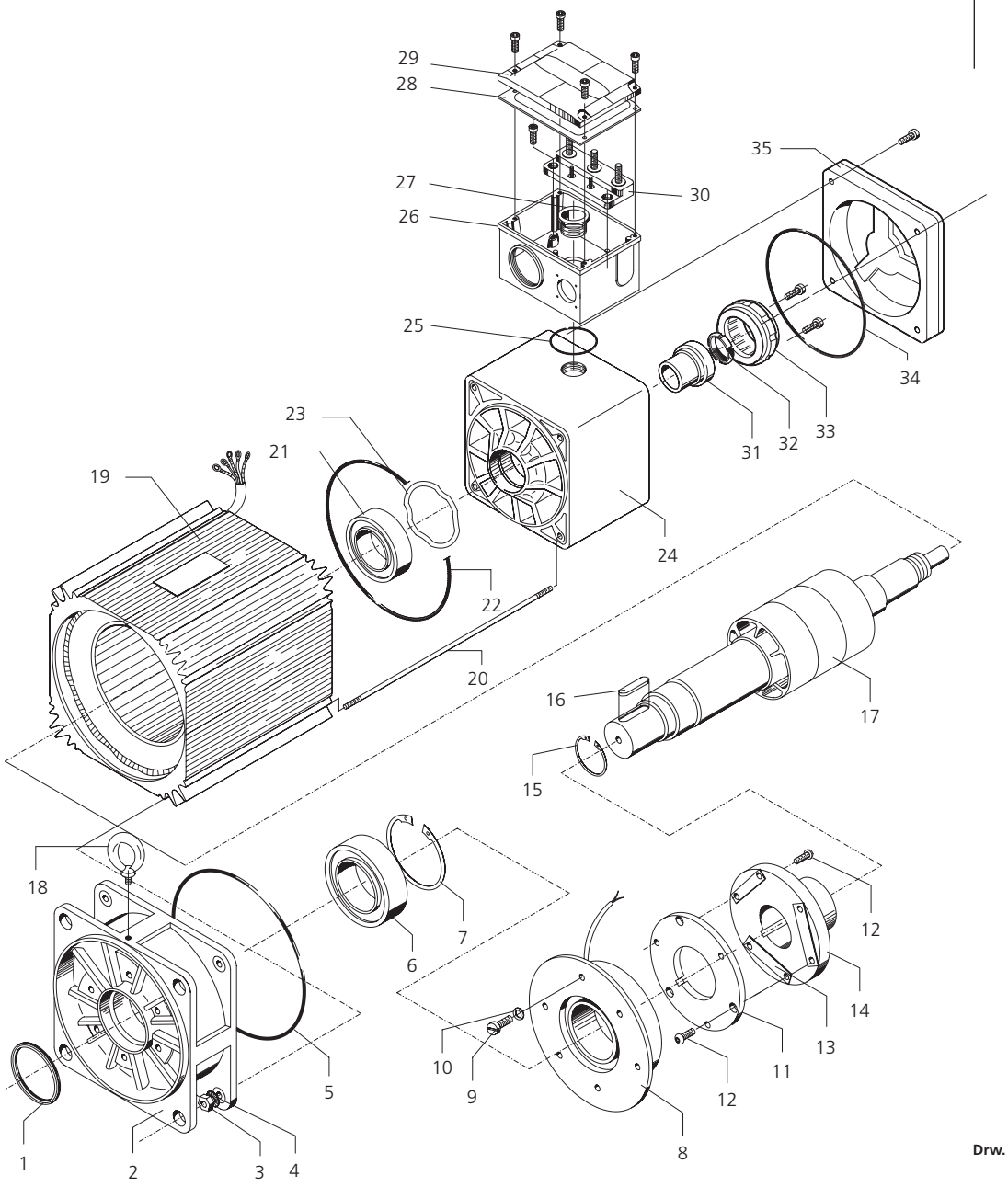
Tab. 2

Bearing lubrication and maintenance

All motors have bearings type 2ZC3 with grease suitable for high and low temperature and permanent lubrication.
Grease type WT (asonic GHY 72) or LHT 23 (multemp) or ENS: suitable for low and high temperature (-40; 140 °C)

Paint Finish
Motors are marketed with two different paint finishes:

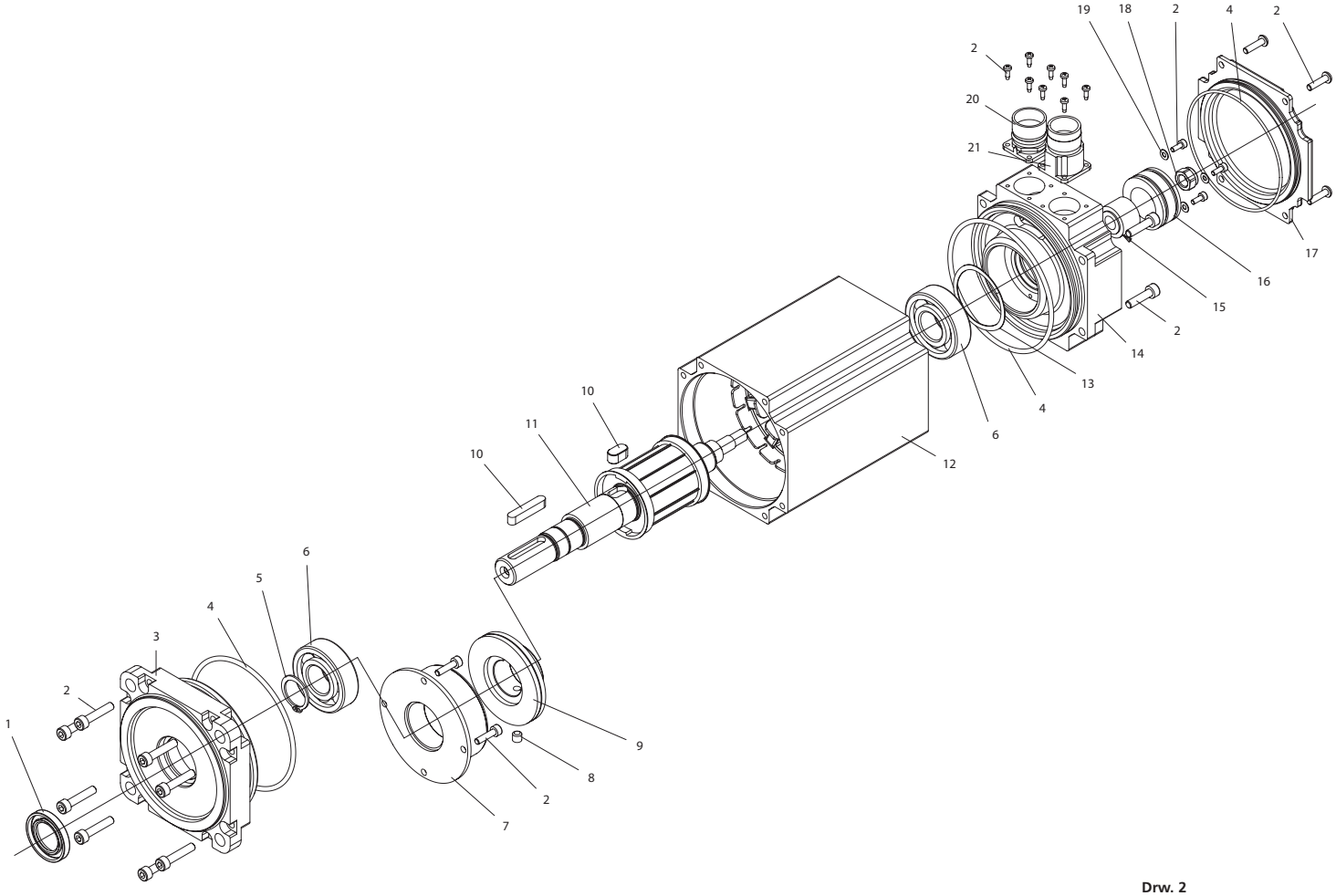
- *Normal finish*: Black finish with mono-component water-soluble enamel, suitable for applications in environments not exposed to climatic agents.
- *Special finish*: Dull black finish with bi-component polyurethane, suitable even for environments partially exposed to climatic agents.



Drw. 1

Component description terminal box construction

1 Oil seal
2 DE shield
3 Nut
4 Caching washer
5 O-ring seal
6 DE bearing
7 Snap ring
8 Brake magnet
9 Screw
10 Washer
11 Armature disk
12 Screw
13 Flat spring
14 Brake hub
15 Snap ring
16 Shaft key
17 Rotor
18 Eyebolt
19 Stator housing with winding
20 Tie rod
21 NDE bearing
22 O-ring seal
23 Spring ring
24 NDE shield
25 O-ring seal
26 Terminal box
27 Threaded ring
28 Gasket
29 Cover
30 Terminal board
31 Tachogenerator rotor
32 Thereaded ring
33 Tachogenerator stator
34 O-ring seal
35 Back cover



Drw. 2

Component description connector construction

1 Oil seal
2 Screw
3 DE shield
4 O-ring seal
5 Snap ring
6 Bearing
7 Brake magnet
8 Srew nut
9 Brake hub
10 Shaft key
11 Rotor
12 Stator house with winding
13 Spring ring
14 NDE shield
15 Feedback rotor
16 Feedback stator
17 Back cover
18 Nut
19 Caching washer
20 Signal conector

Features of feedback detectors

As previously indicated, motors may be equipped with various transducer types in order to meet the different requirements for precision, cost and other parameters. The standard motor includes the use of resolvers. Encoders, tachos and Hall sensors are also available.

Example for the definition of the option required:

B 71 12 I 3 H 1 A 01 0 000

Trasducer

00 =	No transducer	01 =	Tacho*
X5 =	Resolver	X9 =	Hall sensors + Encoder**
RS =	Encoder Stegmann SRS	RM =	Encoder Stegmann SRM
EX =	Encoder Heidenhain	RK =	Encoder Stegmann SKS

* Tacho consists of tacho plus phase commutation signal with hall sensors
** As regards encoder types available. please refer to "Encoder + Hall sensors"

Tab. 3

Resolver

Rated features	Assembled on the whole series	Units of measurement
Supply voltage	7 (±5%) 10 kHz	Vrms
Maximum speed	10000	rpm
Input current	50	mA
Pole number	2	/
Transformation ratio	0.5 ±5%	/
Electric error	±8'	°(Elect)

Tab. 4

Incremental Encoder + Hall sensors

Rated features	Assembled on the whole series	Units of measurement
Supply voltage	5 (±5%)	Vcc
Impulse number per revolution	1024 [1)]	ppr
Pole number	6 [2)]	/
Maximum frequency	100	KHz
Permitted maximum current	150	mA
Maximum speed	6000	rpm
Encoder electronics	Line driver [3)]	/
Hall electronics	NPN open collector [3)]	/

[1)] Available 250 (opt. A9), 256 (opt. B9), 500 (opt. C9), 512 (opt. D9), 1000 (opt. E9), 1024 (opt. 09), 2000 (opt. L9), 2048 (opt. F9), 4000 (opt. G9), 4096 (opt. H9) sinusoidal encoder with RS485 interface: single-turn (opt. RS), multi-turn (opt. RM) M9 = Magnetic encoder 64 pulses.
[2)] 4, 8 and 10 poles available
[3)] Further types of electronics available

Tab. 5

Tacho-generator

Rated features	Assembled on motor size 28-56	Assembled on motor sizes 63, 71, 100	Units of measurements
Loadless voltage at 1000 rpm (±5%)	3.33	13.0*	V
Voltage constant (KE)	0.0318	0.124	Vs
Reference voltage precision	1.2	1.2	%
Admissible maximum current	0.1	0.1	A
Pole number	4	6	
Maximum speed	6000	3000	rpm
Insulation class	F	F	
Excitation	Permanent Magnet		

* 6.5V for motors with maximum speed equal to 4000 and 6000 rpm.

Tab. 6

Signals

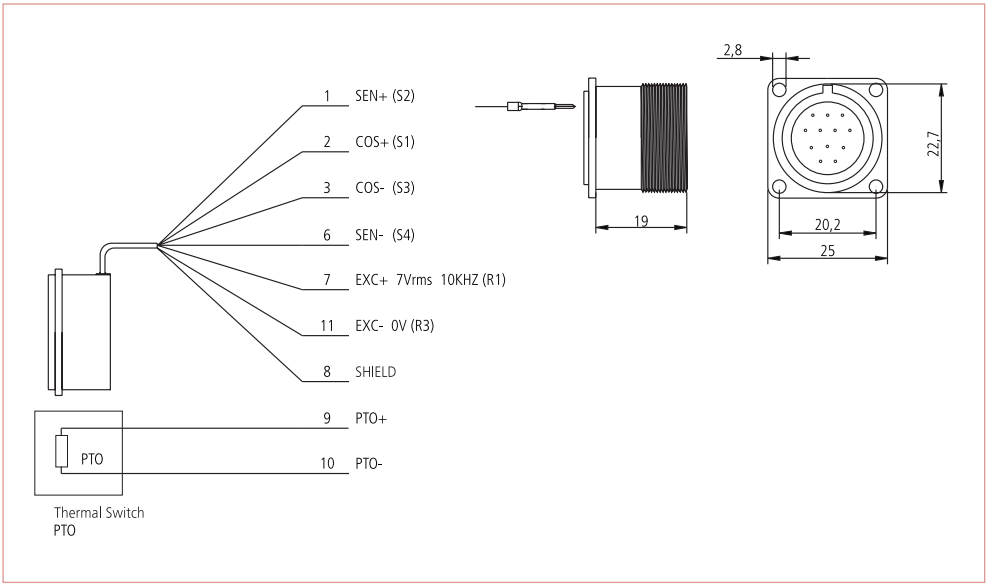
The standard signal connections described below refer to motors equipped with resolver. encoder. tacho and Hall sensors. The options listed may coexist in the event that different configurations are used - such as resolver together with encoder - and may be customised according to the specific requirements of the customer.

Connector	Pin Nr.	Male connector	Female connector
Resolver	12	XCNS0001C00B	XCNS0002C00B
Encoder	19	XCNS0001CM1B	XCNS0002CM2B
Tacho	12	XCNS0001C00B	XCNS0002C00B

Tab. 7

Resolver

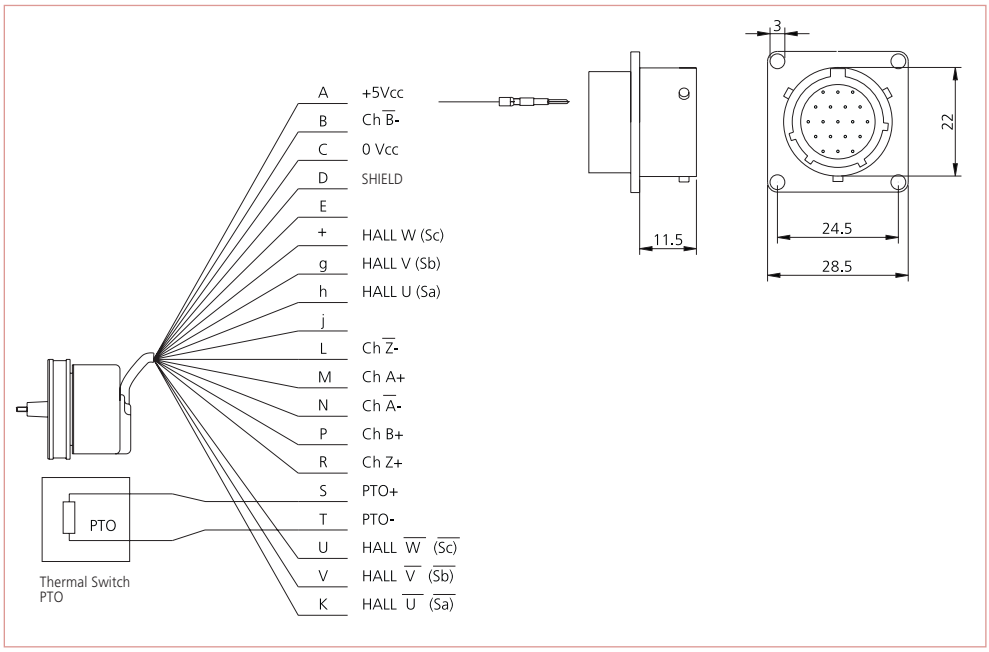
Signal connector. Code XCNS0001C00B



Drw. 3

Encoder

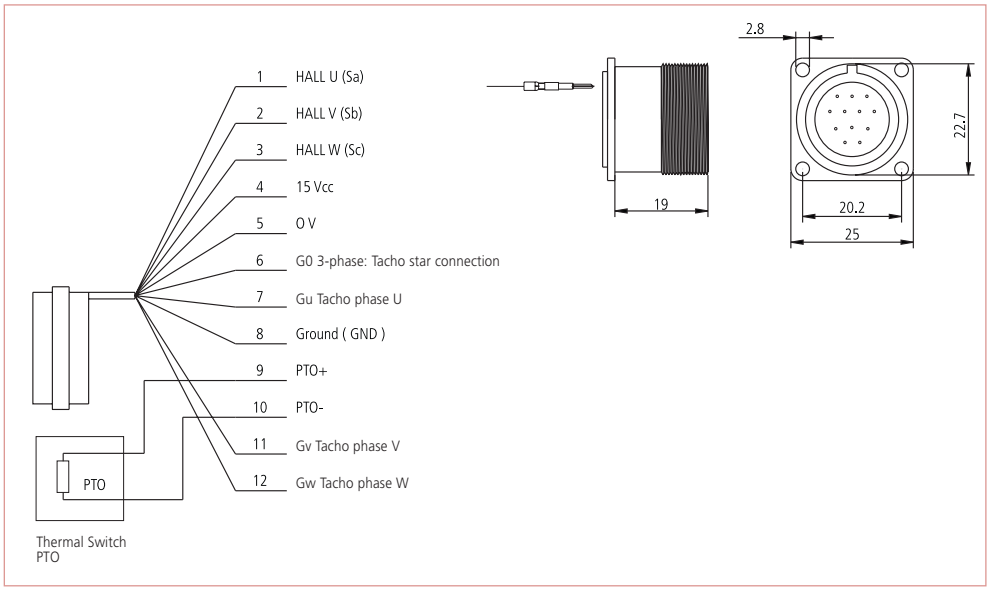
Signal connector. Code XCNS0001CM1B



Drw. 4

Tacho + Hall

Signal connector. Code XCNS0001C00B



Drw. 5

Electrical Components

Thermal Protection

All our motors are equipped with a single PTO switch. a thermal on-off detector that activates itself at a temperature of 140 °C (standard tolerance 5 °C).
However a NTC or a PTC may be used as an alternative.

Parking Brake

Motors with option "B" (in the alphanumeric code it is the 10th position as from the left: "A" and "D" no brake, "B"and "E" brake), are equipped with a parking brake with features depending on the series. See specific table for each motor type.

Forced Ventilation

All standard motors are not ventilated; they are therefore cooled by conduction and convection through the surface (system IC410 or IC416).

In the series from B63 through to B100, forced ventilation motors are also available. In this way it is possible to increase torque and current rated values by 25%. Length dimensions increase as well to accommodate the cooling fan (reference data is indicated in the table below).
All fan have a degree of protection equal to IP20 (max IP54).

Fan caracteristics are depending on motor sized according the table below:

Type	Voltage Volt	Watt	Frequency Hz	Poles	Dimensions ⍁xH*
B56	2~230	12	50/60	2	120x120x85
B63	2~230	47	50/60	2	140x140x70
B71	2~230	47	50/60	2	165x165x91
B100	2~230	53	50/60	2	210x210x180

Nb: The series B63 and B71 may be equipped with 24 Volt DC servoventilation.

* H: quote to add to the length of the series motors

Tab. 8

Motor Series:
- B28 / B36 / B56 / B63 / B71 / B100

-Pin 1 = phase "U"
-Pin 2 = PE
-Pin 3 = phase "V"
-Pin 4 = phase "W"
-Pin A= N.C.
-Pin B = N.C.
-Pin C= +24 Vdc Brake
-Pin D= 0 Vdc Brake

Motor Series:
- B56 / B63

-Pin A= phase "U"
-Pin B = phase "V"
-Pin C= phase "W"
-Pin D= PE
-Pin E = +24 Vdc Brake
-Pin F = 0 Vdc Brake

Motor Series:
- B71

-Pin A= phase "U"
-Pin B = phase "V"
-Pin C= phase "W"
-Pin D= PE
-Pin E = +24 Vdc Brake
-Pin F = 0 Vdc Brake

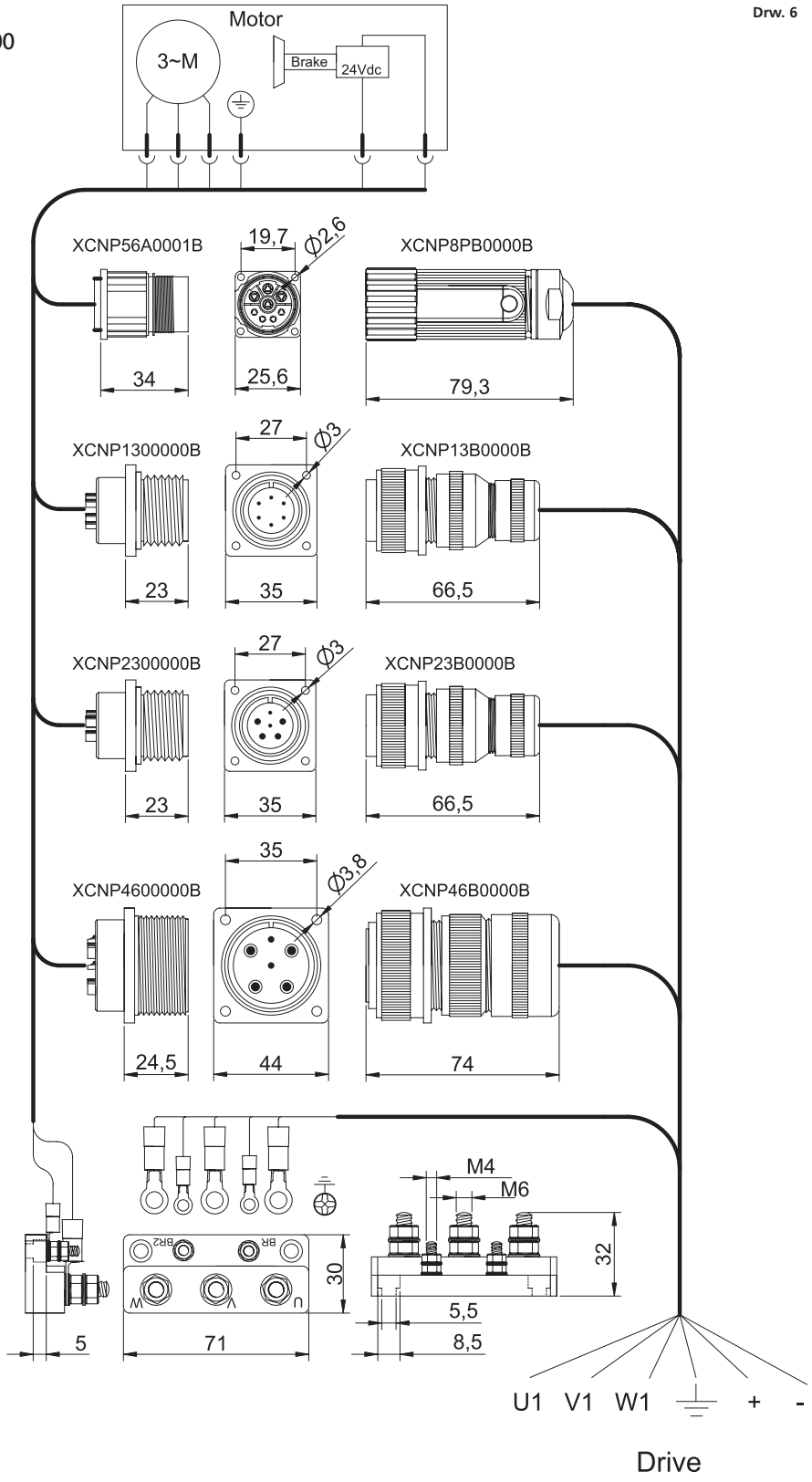
Motor Series:
- B100

-Pin A= phase "U"
-Pin B = phase "V"
-Pin C= phase "W"
-Pin D= PE
-Pin E = +24 Vdc Brake
-Pin F = 0 Vdc Brake

Motor Series:
- B56 / B63
- B71 / B100

-U = phase "U"
-V = phase "V"
-W = phase "W"
- = PE
-BR = +24 Vdc Brake
-BR2 = 0 Vdc Brake

Drw. 6



Power

The following power connectors are available for the standard motor version.

POWER CONNECTORS

STANDARD

Type	N° Pin	Male connector code	Female connector code	Continous current: max I_{rms} phase / I_{cc} Brake	Connector shape
B28, B36	8	XCNP56A0001B	XCNP8PB0000B	11 / 1.5	straight
B56, B63	6	XCNP1300000B	XCNP13B0000B	13 / 1.5	straight
B71	6	XCNP2300000B	XCNP23B0000B	23 / 1.5	straight
B100	6	XCNP4600000B	XCNP46B0000B	46 / 1.5	straight
B132	8	XCNP8PC0000B	XCNP8PCB000B	46 / 1.5	straight
Other solutions					
B28, B36, B56	8	XCNP8PA9000B	XCNP8PB0000B	30 / 10	90°
B63, B71, B100	8	XCNP8PA90R0B	XCNP8PB0000B	30 / 10	90° swiveling
B132	8	XCNP8PC9000B	XCNP8PCB000B	46 / 1.5	90°
B132	8	XCNP8PC90R0B	XCNP8PCB000B	46 / 1.5	90° swiveling

Tab. 9

TERMINAL BOX

STANDARD

Type	N° Pin	Terminal board code	Continous current: max I_{rms} phase / I_{cc} Brake
B56 (B63)	5	XMR004050000	70 / 1.5
B63, B71, B100	5	XMR004010000	100 / 1.5
Other solutions			
all type	4	XMR00154G000	- / 1.5
B56, B63	4	XMR00G054000	30 / 1.5
B71, B100	4	XMR00G104000	85 / 1.5

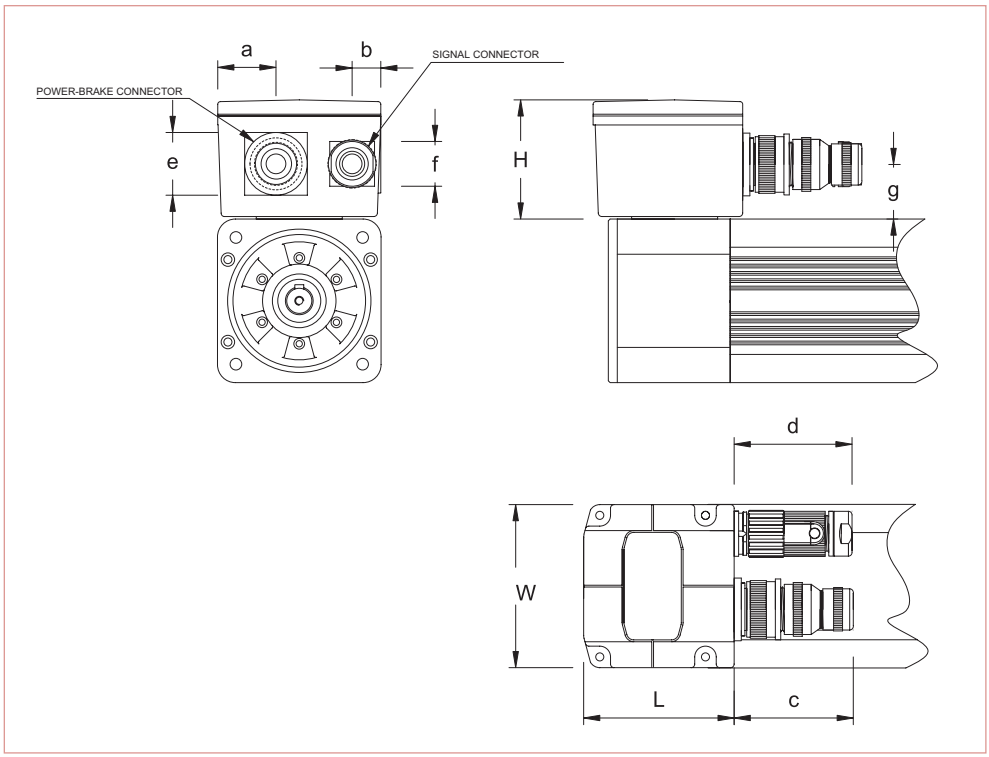
Tab. 10

Connection 1

Swivel box with power-brake and signal connectors. Connections available for: B56, B63, B71 and B100.

Type	Connector							Terminal box
	Code	(dimension in mm)						dimension in mm³
		a	b	c	d	e	f	W x L x H
	Signal:							
ALL	XCNS-resolver	-	16	-	67	-	26	84.5x53x80
ALL	XCNS-encoder	-	16	-	62	-	26	84.5x53x91
	Power:							
B56 - B63	XCNP-13	32.5	-	70	-	34	-	84.5x67x91
B71	XCNP-23	32.5	-	70	-	34	-	84.5x67x91
B100	XCNP-46	32.5	-	70	-	43	-	84.5x67x91

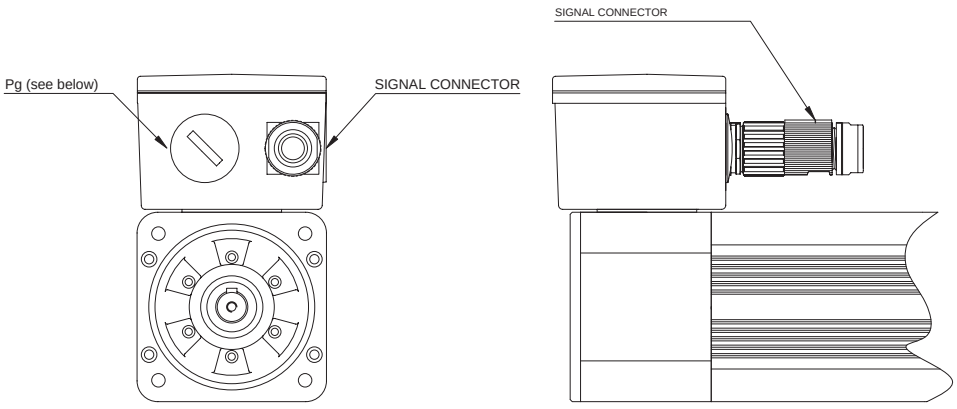
Tab. 11



Drw. 7

Connections 2 and 3

Swivel box with power-brake terminal board and signal connector: thermal detectors in the terminal board for the Connection 2, on the signal connector for the Connection 3. Suitable for series B56, B63, B71, B100.



FRAME SIZE	Pg
28	-
36	-
56	21
63	29
71	29
100	29

Drw. 8

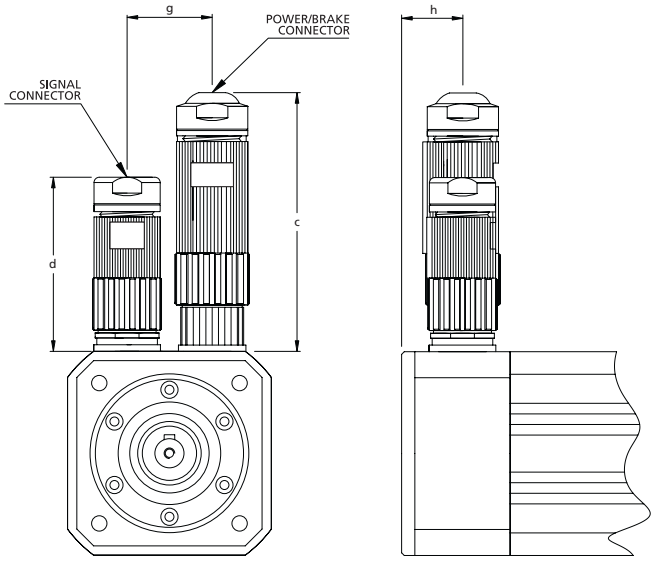
Connection 4

Fixed connectors for power-brake and signals. Suitable for all motor series.

Type	Connector				
	Code	(dimensions in mm)			
		c	d	g	h
	Power-brake connectors:				
B28, B36, B56	XCNP-56	100	67	32	-
B63	XCNP-56	100	67	39	41
B71	XCNP-56	100	67	35	45
B100	XCNP-56	100	67	52.5	57
B132	XCNP8PC	140	67	55	36

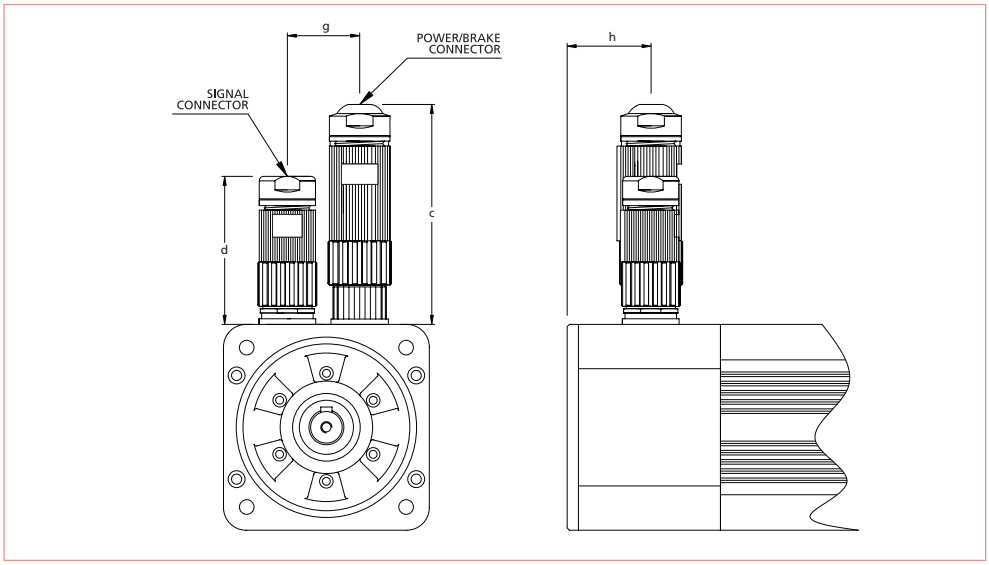
Tab. 12

Type B28 - B36



Drw. 9

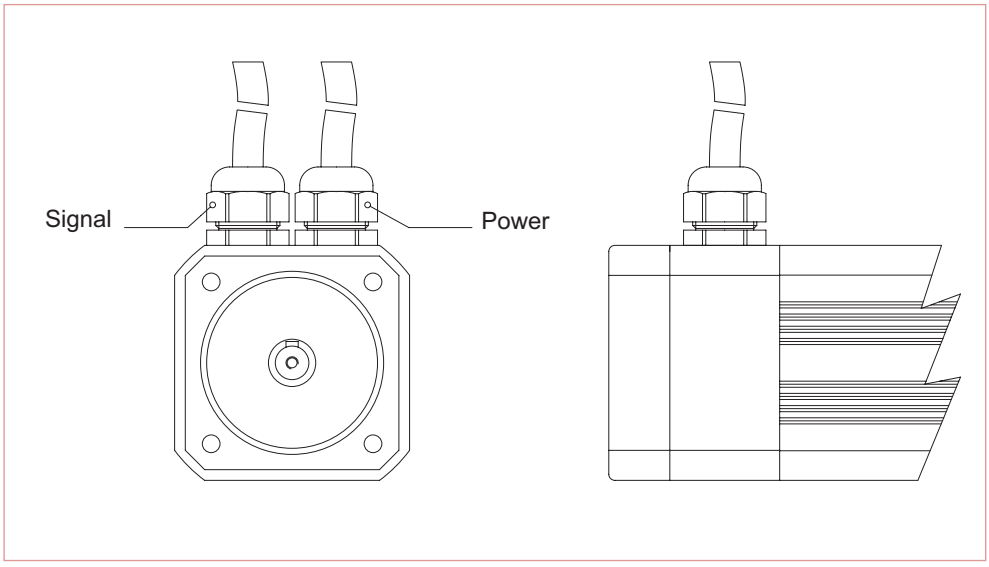
Type B56 - B63 - B71 - B100 - B132



Drw. 10

Connection 5

Outgoing cables plus strain relief variable according motor size.



Suitable for type B28, B36, B56 and higher

Drw. 11

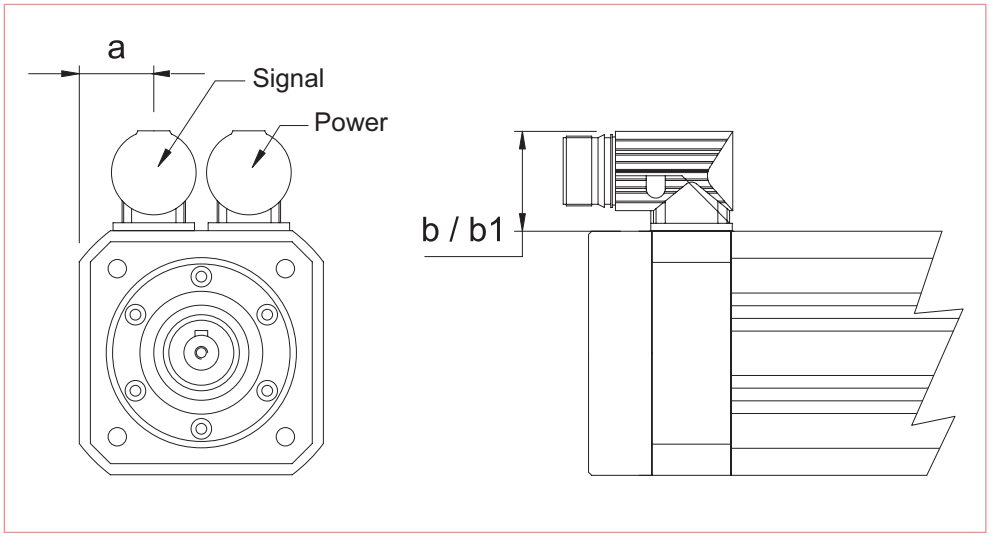
Connections 6 and 7

Power and signal connectors 90° angled FIXED and ROTATABLE, anchored to the alluminium frame.
Suitable for all series.
The connector direction can be defined throught motor type (see page 30).

Type Distances referred to the connector in (mm)	B28S	B36I	B56	B63	B71	B100	B132
a	14	24	32	39	53	73	78
b	37	32	32	32	32	32	56
b_1	45	40	40	40	40	40	62

b_1: Rotatable connector height referred to connection 7.

Tab. 13

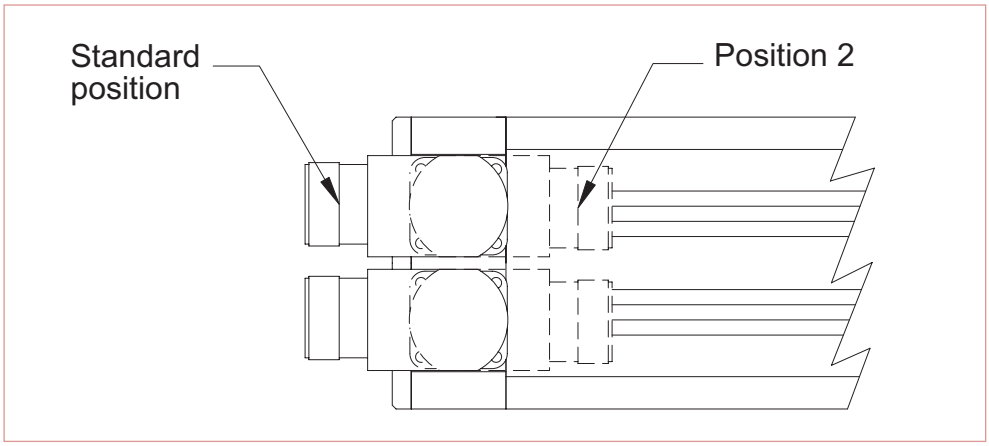


Drw. 12

Direction of

CONNECTORS

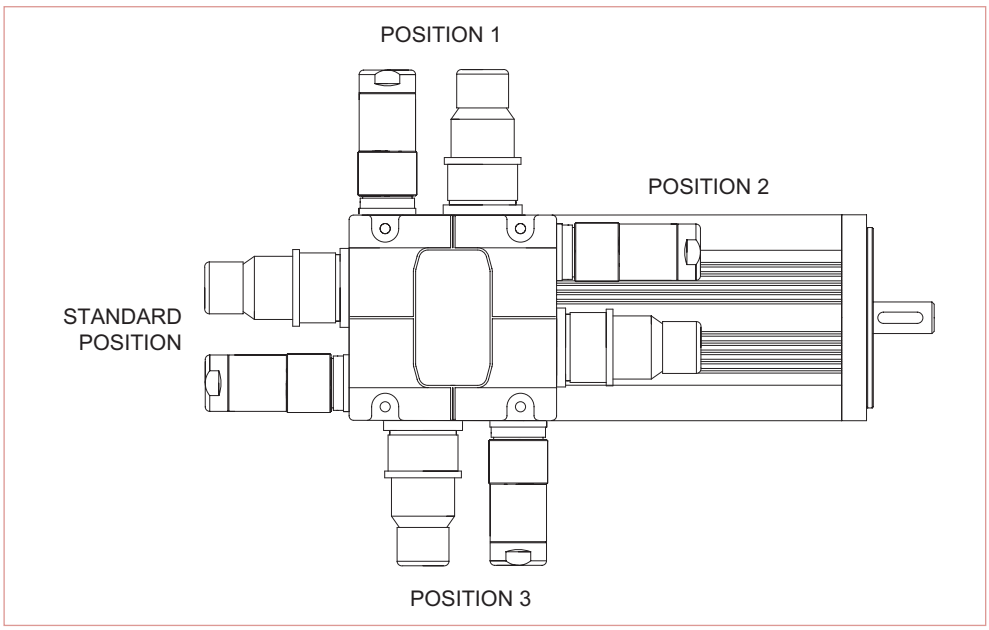
Referable to connection 6 and 7: generally directions “standard” and “2” applies to all motor series manufactured with 90° angled connectors.



Drw. 13

TERMINAL BOX

Four different mounting positions are available relating to the location of the terminal box and connectors when looking at drive end. "0" is the standard position, "1". "2" and "3" according to the figure below (please also refer to motor coding).



Drw. 14

Motors for continuous duty S1

Quotation	No. and date
Quantity	Unit
Name	Type
Stall torque	Nm
Rated speed	min-1
Rated voltage	Volt
Mounting arrangement	Ex - 600034-7
Degree of protection	Ex - 600034-5
Feedback element	Resolver. Encoder. Tacho or Hall sensors
Thermal detectors	PTO (otherwise PTC or NTC)
Parking brake	"Yes" or "No"
Connection from	1 to 7
Possible terminal box	from 0 to 3

Additional information

Paint finish	Cold-water or two component paint
Vibration level	Indicate class: “N”, “R” or “S” ex – IEC60034-1-14

The lead time is strongly related to the motor configuration, please contact us about this subject.

Additional information for special duties

S 2: ... min (short-time duty)

S 3: ... % - ... min (intermittent duty)

S 4: ... % - JM ... kgm2 - Jext ... kgm2 (intermittent duty with starting)

S 5: ... % - JM ... kgm2 - Jext ... kgm2 (intermittent duty with electric braking)

S 6: ... % - min (continuous-operation periodic duty with intermittent load)

S 7: .JM ... kgm2 - Jext ... kgm2 (continuous-operation periodic duty with electric braking)

S 8: .JM ... kgm2 - Jext ... kgm2 (continuous-operation periodic duty with speed changes)

S 9: ... kW equ (continuous duty with non-periodic load and speed variations)
For this duty type suitable full load values should be taken as the overload concept

S10: p/.t .... r .... TL (Duty with discrete constant loads)
Starting conditions (no-load or loaded starting)

Load torque curve during the cycle (graph: min-1/Nm compared to time)

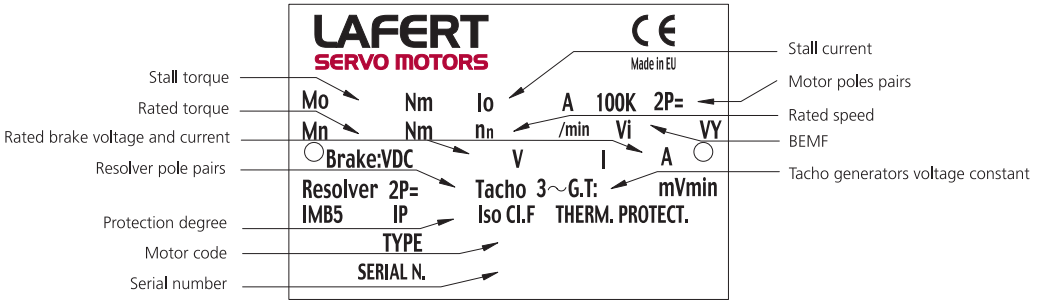
Moment of inertia of the machine (kgm2)

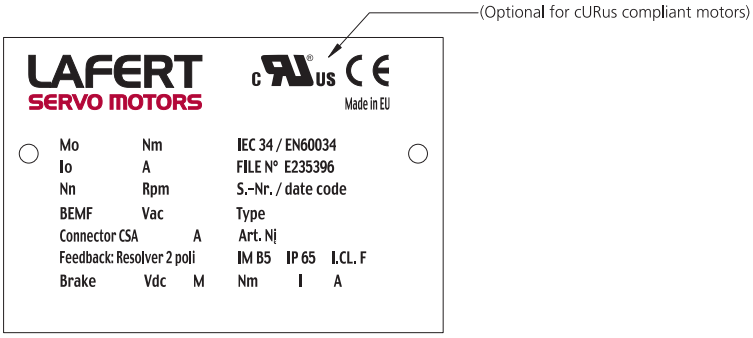
Description of drive (Gearbox, belt, screw, wheel ratio I=…)

Radial force (N) and/or axial force (N) draw the shaft indicating both application and direction point of the force

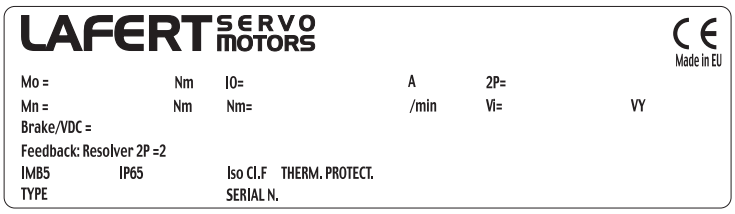
Ambient conditions (humidity, temperature, altitude, dust accumulation, internal or external installation).

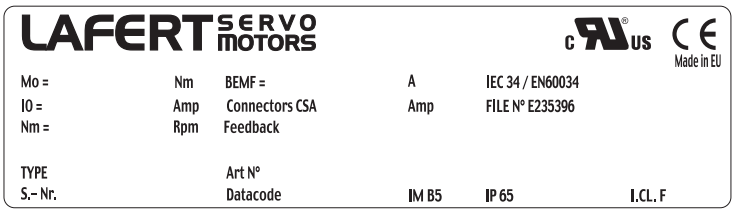
Aluminium nameplates





Sticker nameplates





ORDER DATA

Motor type codes used

DIGIT — DESCRIPTION

x — PRODUCT TYPE

B	Complete Brushless Servomotor
F	Brushless Servomotor components

aa — MOTOR SIZE

B28	☐ Flange 58
B36	☐ Flange 70
B56	☐ Flange 92
B63	☐ Flange 115
B71	☐ Flange 142
B100	☐ Flange 190
B132	☐ Flange 240

DIRECT DRIVE

B10	☐ Flange typical 225
B16	☐ Flange typical 275
B18	☐ Flange typical 386
F13	☐ Flange typical 290

bb — STALL TORQUE CODE

Integer: digit + digit		Fractional: letter + digit (x)		Over hundred: letter + digit or letter		Over Threehundred: digit + digir + digit	
02	2 Nm	Dx	0.x Nm	C0	100 Nm	300	300 Nm
12	12 Nm	Ex	1.x Nm	CA	105 Nm	375	375 Nm
25	25 Nm	Fx	2.x Nm	C1	110 Nm	460	460 Nm
…	etc...	Gx	3.x Nm	CB	115 Nm	…	etc..
		Hx	4.x Nm	…	etc..		
		Ix	5.x Nm	B0	200 Nm		
		Lx	6.x Nm	BA	205 Nm		
		Mx	7.x Nm	B1	210 Nm		
		Nx	8.x Nm	BB	215 Nm		
		Ox	9.x Nm	…	etc..		

c — BRUSHLESS MOTOR TYPE

Frame Size	Series	Description	Size	Series	Description
28	S	Sinusoidal 4 poles Short version	71	I	Sinusoidal 6 poles Standard inertia
				Q	Sinusoidal 8 poles Low inertia
36	I	Sinusoidal 4 poles	100	I	Sinusoidal 6 poles Standard inertia
56	P	Sinusoidal 8 poles			
	J	Sinusoidal 4 poles Low Inertia	132	I	Sinusoidal 6 poles Standard inertia
63	I	Sinusoidal 6 poles Standard inertia			
	J	Sinusoidal 10 poles Low inertia			

DIRECT DRIVE TYPE

Size	Series	Description	Size	Series	Description
B10	P	Sinusoidal 12 poles	B18	P	Sinusoidal 30 poles
B16	P	Sinusoidal 24 poles	F13	L	Sinusoidal 24 poles

d — SPEED

1	1200 rpm	A	1500 rpm
2	2000 rpm	B	2500 rpm
3	3000 rpm	C	3500 rpm
4	4000 rpm	D	4500 rpm
6	6000 rpm		

	x	aa	bb	c	d	e	f	g	hh	i	l	mm
Eg.:	*B*	*63*	*08*	*I*	*3*	*H*	*6*	*A*	*05*	*0*	*0*	*00*

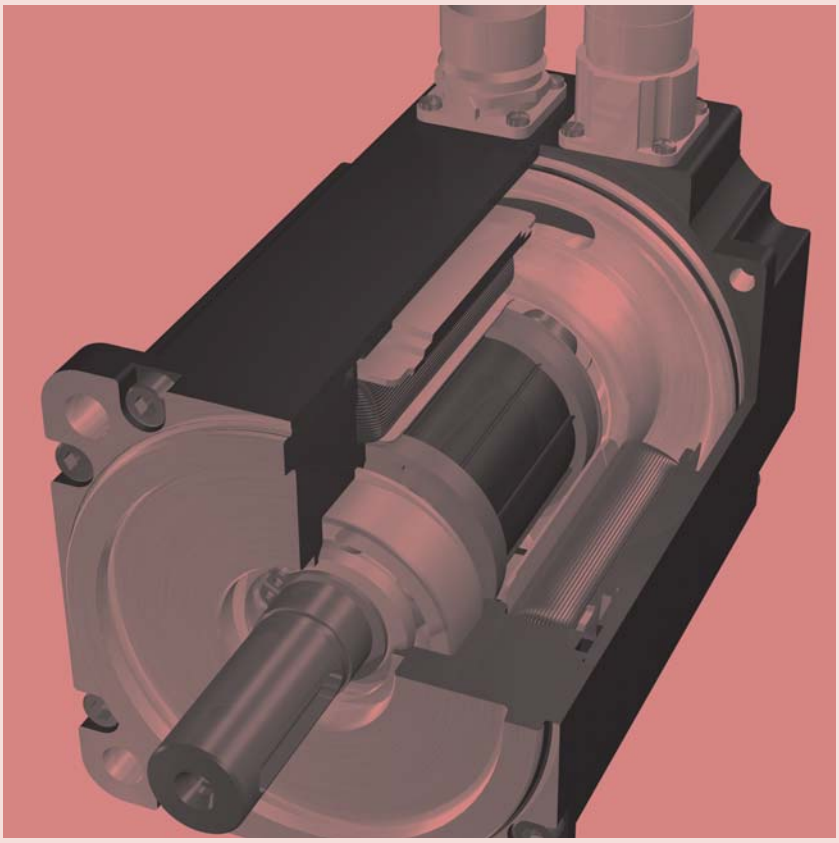
Motor type codes used

DIGIT	DESCRIPTION
	VOLTAGE
e	M 220/230V H 380/400V
	CONNECTION TYPE
f	1 Terminal box with signal connector + power connector 2 Terminal box with power + thermal sensor on terminal board & signal connector 3 Terminal box with Pg hole for power & signal connector + thermal sensor 4 Straight connectors on endshield 5 Cables signal & power exit (Std length = 0.6m) 6 90° angled connectors 7 Swiveling 90° angled connectors
	BRAKE AND SHAFT EXTENSION
g	A Without brake, keyed shaft B With brake, keyed shaft C With reinforced brake, keyed shaft (if available) D Without brake, smooth shaft E With brake, smooth shaft F With reinforced brake, smooth shaft (if available)
	FEEDBACK*
hh	00 Without feedback 01 Tacho with Hall sensors X5 Resolver* X9 Encoder with Hall sensors* RS Single-turn encoder Stegmann SRS50 RM Multi-turn encoder Stegmann SRM50 RK Single-turn encoder Stegmann SKS36 EX Encoder Heidenhain*
	ENCODER COUNT OPTION*
	E9 1000 i/g 09 1024 i/g I9 1500 i/g L9 2000 i/g F9 2048 i/g G9 4000 i/g H9 4096 i/g
	ENCODER HEIDENHAIN OPTION*
	E0 Encoder Heidenhain ECN 1313 E1 Encoder Heidenhain EQN 1325 E2 Encoder Heidenhain ECI 1317 E3 Encoder Heidenhain EQI 1329 E4 Encoder Heidenhain ECN 1113 E5 Encoder Heidenhain EQN 1125
	RESOLVER OPTION*
	05 Resolver 2 poles A5 Resolver 4 poles B5 Resolver 6 poles C5 Resolver 8 poles
	* The availability of each feedback system as to be evaluated on the motor size
	CONNECTION DIRECTION
i	0 Standard 1 Position 1 2 Position 2 3 Position 3
	COOLING
l	0 Natural convection V Forced Ventilation 230Vac from NDE to DE U Forced Ventilation 230Vac from DE to NDE X Forced Ventilation 24Vdc from NDE to DE
mm	**CUSTOMER OPTION**

See description pag. 33

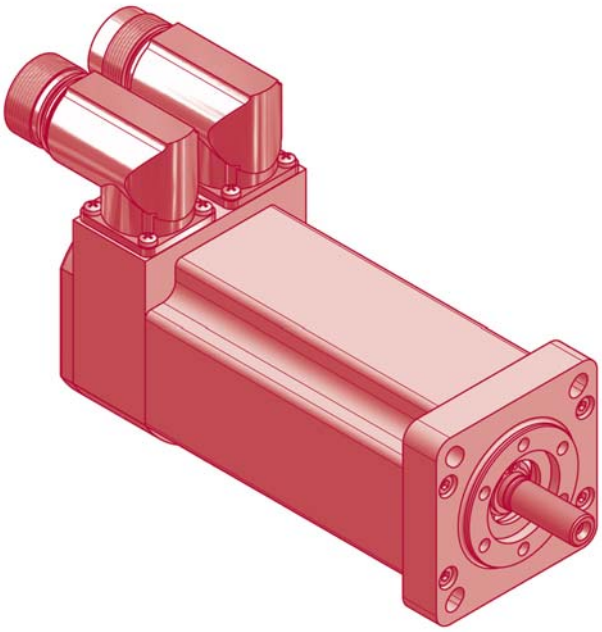
	x	aa	bb	c	d	e	f	g	hh	i	l	mm
Eg.:	*B*	*63*	*08*	*I*	*3*	*H*	*6*	*A*	*05*	*0*	*0*	*00*

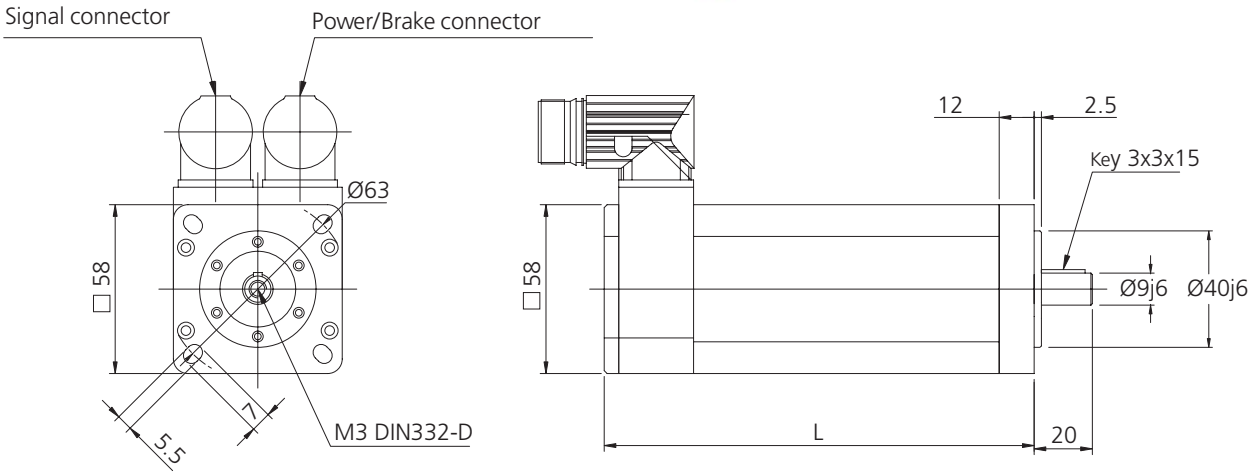
BRUSHLESS SERVO MOTORS



TYPE B28S

sinusoidal 4 Poles voltage H (400 Volt)





Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B28.D2S	0.20	106	130	126	150
B28.D4S	0.40	121	145	141	165
B28.D6S	0.60	136	160	156	180
B28.D8S	0.80	151	175	171	195

Brake Data

Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	2.1	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	70.6	Ohm
Electrical Power	Pbr	8.2	W
Current	Ibr	0.34	Adc
Additional* Rotor Inertia	Jbr	0.12	$kgcm^2$
Opening (release) time	to max	30	ms
Closing (fall in) time	tc max	15	ms
Additional* Motor weight	mbr	0.25	kg

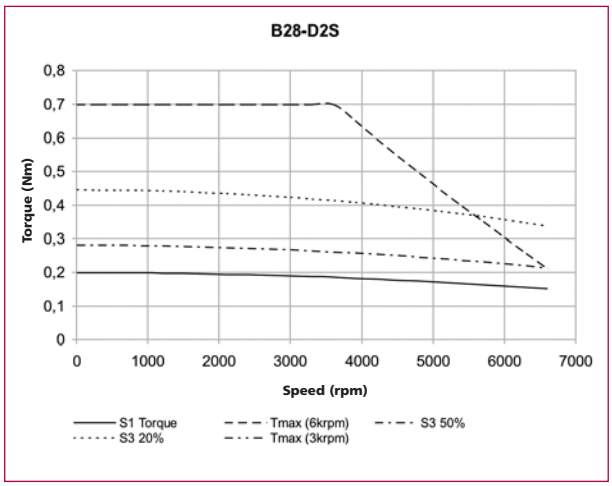
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

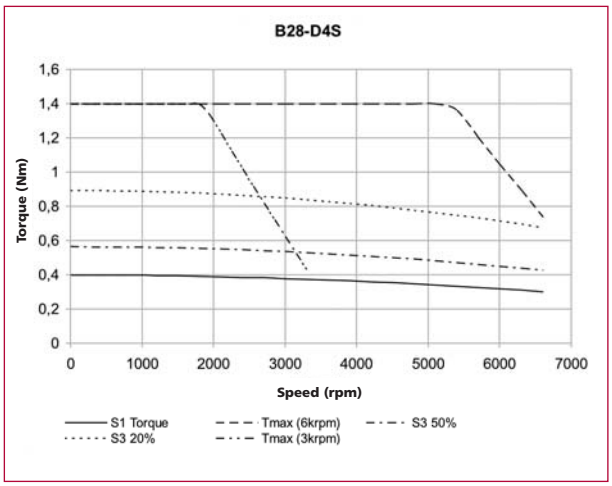
TYPE B28S
sinusoidal 4 Poles voltage H (400 Volt)

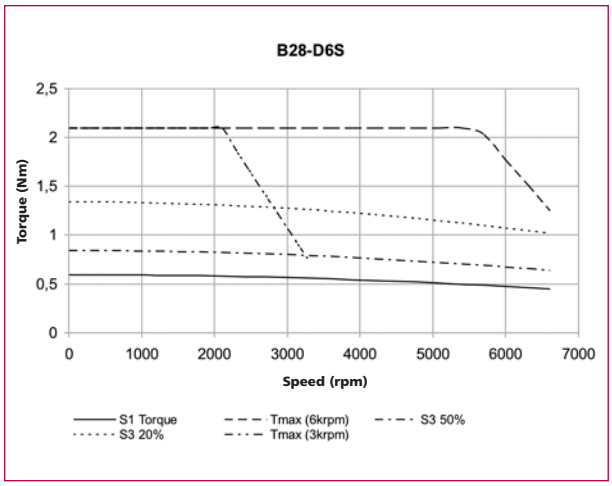
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n W	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_w Ω	Inductance phase to phase L_w mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B28.D4S	0.40	3000	119	0.38	1.4	12000	0.13	111111	35	140	0.84	1.45	229	289	264	0.28	0.26
B28.D6S	0.60	3000	179	0.57	2.1	12000	0.18	118644	38	140	0.84	1.45	114	173	264	0.41	0.39
B28.D8S	0.80	3000	239	0.76	2.8	12000	0.23	122271	40	140	0.84	1.45	75.0	130	264	0.55	0.52
6000 min^{-1} - Connection Y																	
B28.D2S	0.20	6000	101	0.16	0.7	12000	0.07	94595	32	140	0.42	0.73	203	172	264	0.28	0.22
B28.D4S	0.40	6000	201	0.32	1.4	12000	0.13	111111	35	140	0.42	0.73	51.0	71.8	264	0.55	0.44
B28.D6S	0.60	6000	302	0.48	2.1	12000	0.18	118644	38	140	0.42	0.73	29.6	43.9	264	0.83	0.66
B28.D8S	0.80	6000	402	0.64	2.8	12000	0.23	122271	40	140	0.42	0.73	18.8	32.4	264	1.10	0.88

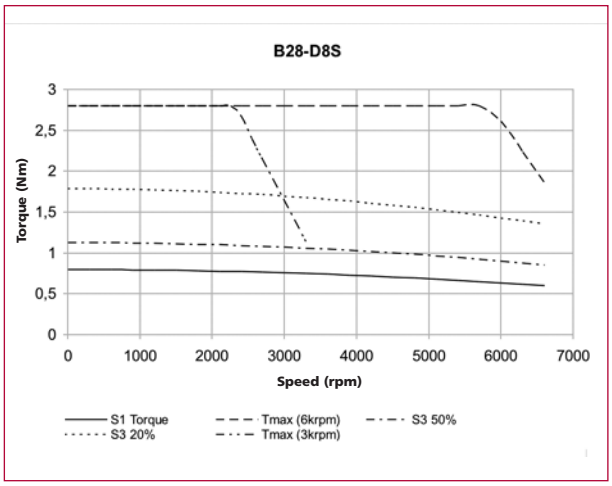
TYPE B28S

sinusoidal 4 Poles voltage H (400 Volt)

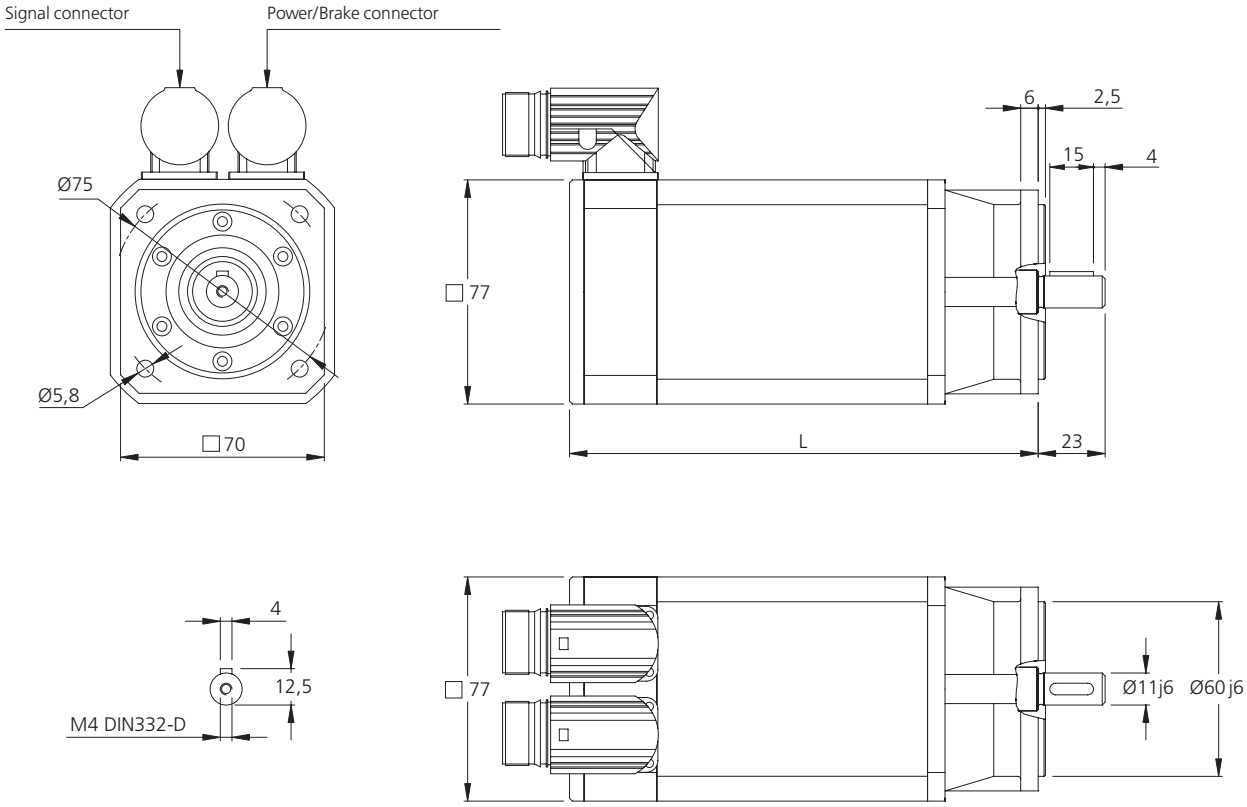








TYPE B36I
sinusoidal 4 Poles voltage H (400 Volt)



Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B36.D6I	0.60	126	173	152	199
B36.E2I	1.20	151	198	177	224
B36.E8I	1.80	176	223	202	249
B36.F5I	2.50	201	248	227	274
B36.03I	3.00	226	273	252	299

Brake Data

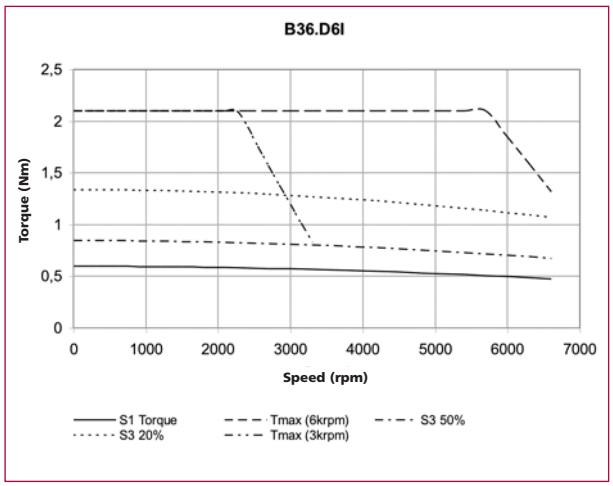
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	3.2	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	53.2	Ohm
Electrical Power	Pbr	10.8	W
Current	Ibr	0.45	Adc
Additional* Rotor Inertia	Jbr	0.38	$kgcm^2$
Opening (release) time	to max	60	ms
Closing (fall in) time	tc max	10	ms
Additional* Motor weight	mbr	0.3	kg

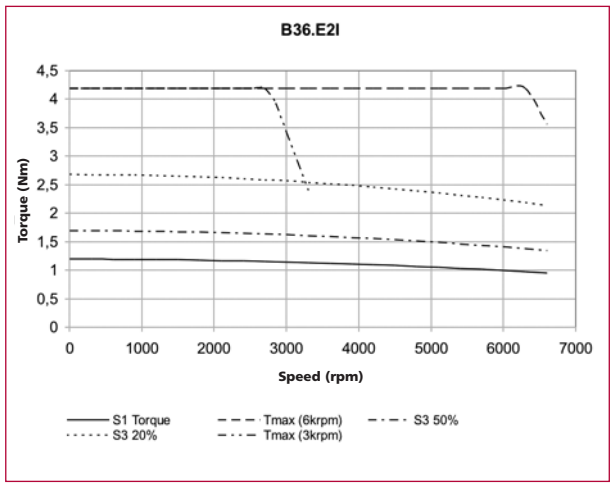
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

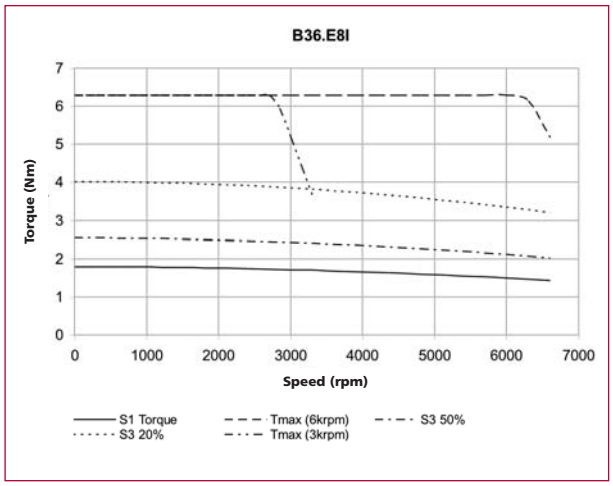
TYPE B36I
sinusoidal 4 Poles voltage H (400 Volt)

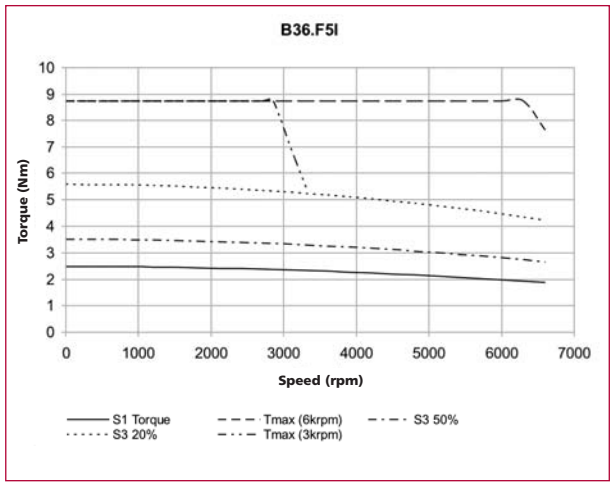
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n W	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B36.D6I	0.60	3000	173	0.55	2.10	9000	0.42	50000	32	140	0.84	1.45	97.5	195	264	0.41	0.38
B36.E2I	1.20	3000	346	1.10	4.20	9000	0.77	54545	35	140	0.84	1.45	32.2	82.3	264	0.82	0.76
B36.E8I	1.80	3000	518	1.65	6.30	9000	1.10	57273	38	140	0.84	1.45	17.6	53.7	264	1.24	1.13
B36.F5I	2.50	3000	691	2.20	8.75	9000	1.42	61620	40	140	0.84	1.45	13.6	42.8	264	1.72	1.51
B36.03I	3.00	3000	864	2.75	10.50	9000	1.74	60345	43	140	0.84	1.45	8.80	28.1	264	2.1	1.89
6000 min^{-1} - Connection Y																	
B36.D6I	0.60	6000	314	0.50	2.10	9000	0.42	50000	32	140	0.42	0.73	25.1	48.6	264	0.82	0.69
B36.E2I	1.20	6000	628	1.00	4.20	9000	0.77	54545	35	140	0.42	0.73	8.10	20.6	264	1.65	1.37
B36.E8I	1.80	6000	942	1.50	6.30	9000	1.10	57273	38	140	0.42	0.73	5.00	15.2	264	2.5	2.1
B36.F5I	2.50	6000	1257	2.00	8.75	9000	1.42	61620	40	140	0.42	0.73	3.30	10.5	264	3.4	2.7
B36.03I	3.00	6000	1571	2.50	10.50	9000	1.74	60345	43	140	0.42	0.73	2.20	7.00	264	4.1	3.4

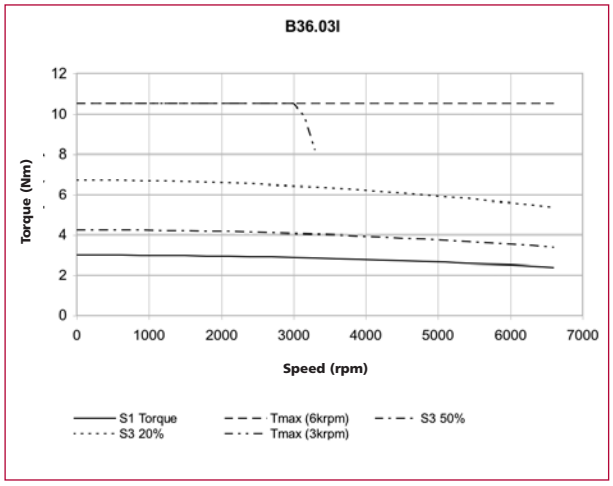
TYPE B36I
sinusoidal 4 Poles voltage H (400 Volt)





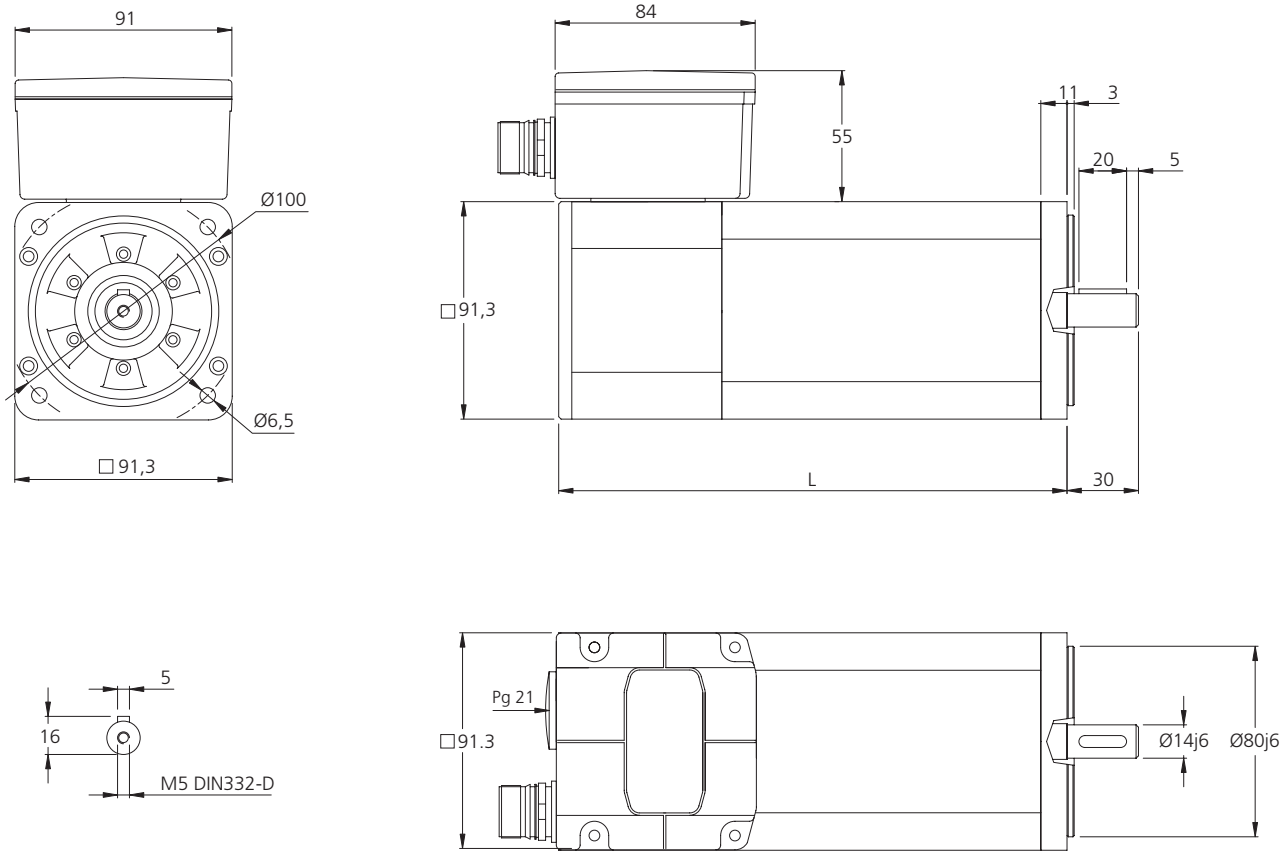






TYPE B56P

sinusoidal 8 Poles voltage H (400 Volt)



Mechanical Data

Type	Torque	Length with RESOLVER (L)		Length with ENCODER (L)	
	Nm	Without brake	With brake	Without brake	With brake
B56.01P	1.00	186	213	224	251
B56.02P	2.00	211	238	249	276
B56.03P	3.20	236	263	274	301
B56.04P	4.20	261	288	299	326

Brake Data

Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	3.2	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	53.2	Ohm
Electrical Power	Pbr	10.8	W
Current	Ibr	0.45	Adc
Additional* Rotor Inertia	Jbr	0.38	$kgcm^2$
Opening (release) time	to max	60	ms
Closing (fall in) time	tc max	10	ms
Additional* Motor weight	mbr	0.3	kg

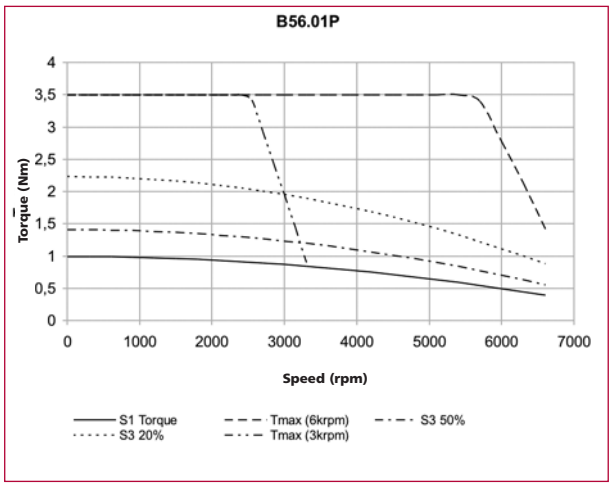
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

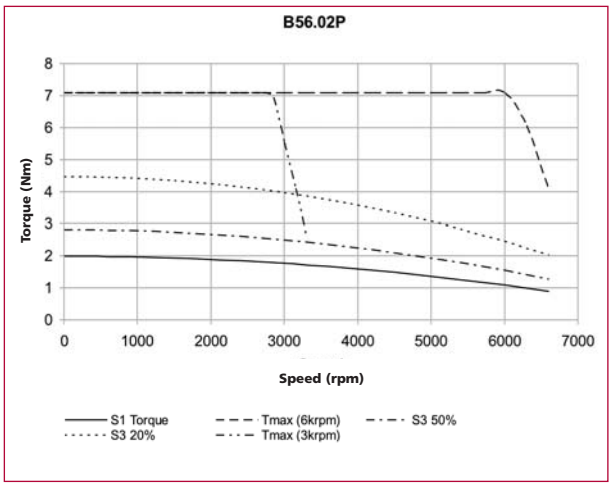
TYPE B56P
sinusoidal 8 Poles voltage H (400 Volt)

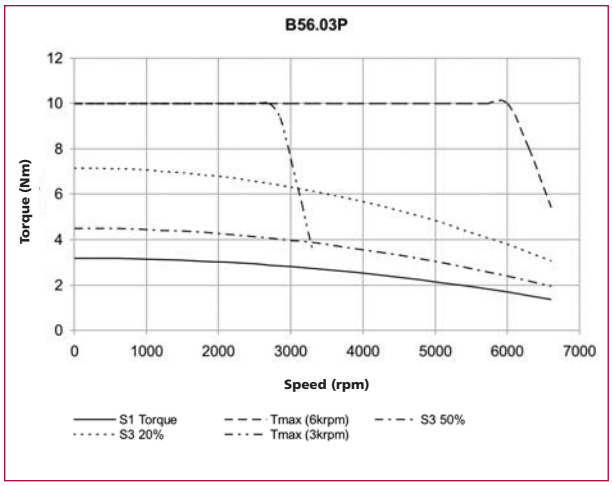
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n W	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B56.01P	1.00	3000	251	0.80	3.50	6000	0.73	47945	32	140	0.94	1.63	38.1	64.5	296	0.61	0.49
B56.02P	2.00	3000	503	1.60	7.10	6000	1.40	50714	35	140	0.94	1.63	13.5	22.8	296	1.23	0.98
B56.03P	3.20	3000	817	2.60	10.00	6000	1.84	54348	38	140	0.94	1.63	9.70	18.3	296	1.97	1.60
B56.04P	4.20	3000	1068	3.40	14.00	6000	2.28	61404	40	140	0.94	1.63	6.70	13.1	296	2.6	2.1
6000 min^{-1} - Connection Y																	
B56.01P	1.00	6000	314	0.50	3.50	6000	0.73	47945	32	140	0.47	0.81	9.70	16.5	296	1.23	0.61
B56.02P	2.00	6000	691	1.10	7.10	6000	1.40	50714	35	140	0.47	0.81	3.40	5.80	296	2.5	1.35
B56.03P	3.20	6000	1068	1.70	10.00	6000	1.84	54348	38	140	0.47	0.81	2.40	4.60	296	3.9	2.1
B56.04P	4.20	6000	1445	2.30	14.00	6000	2.28	61404	40	140	0.47	0.81	1.60	3.30	296	5.2	2.8

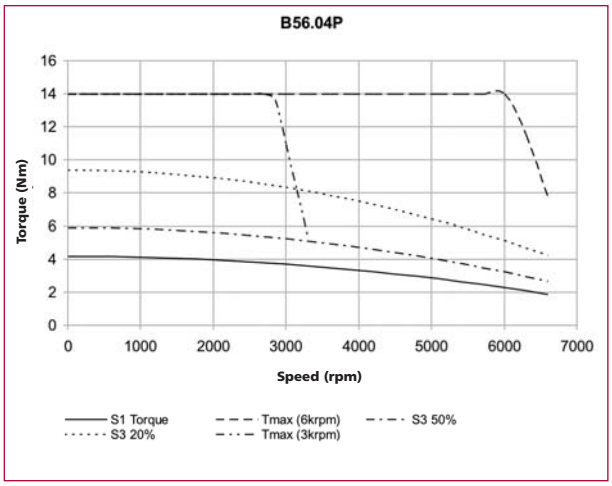
TYPE B56P

sinusoidal 8 Poles voltage H (400 Volt)

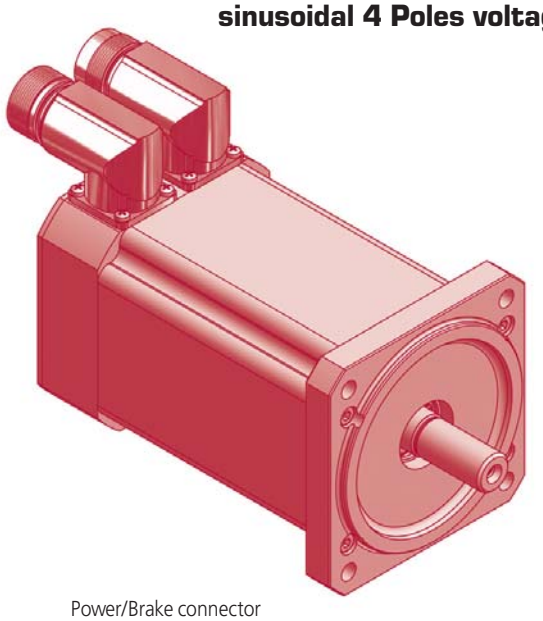


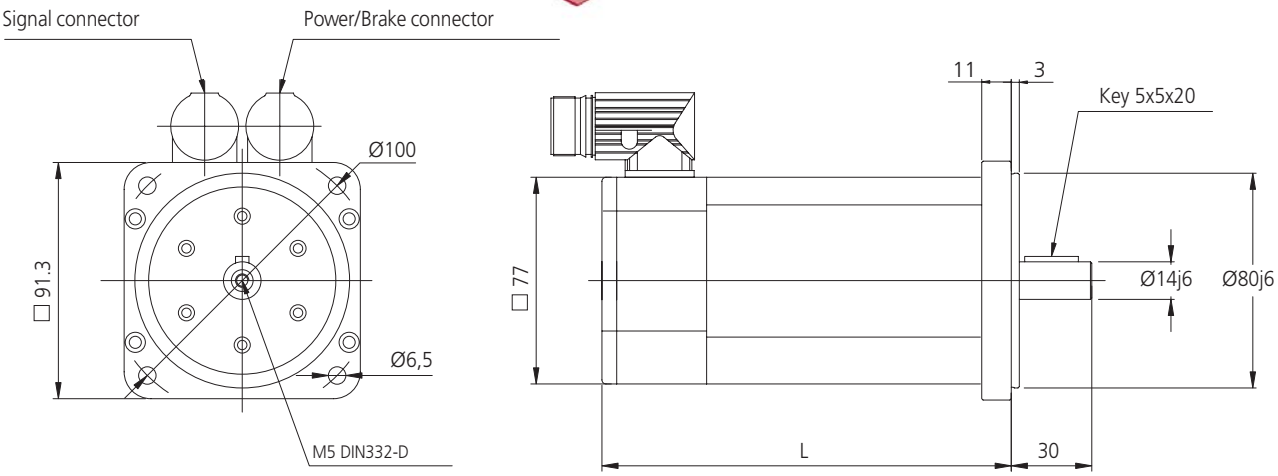






TYPE B56J
sinusoidal 4 Poles voltage H (400 Volt)





Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B56.D7J	0.7	115	160	145	190
B56.E4J	1.4	140	185	170	215
B56.F2J	2.2	165	210	195	240
B56.F8J	2.8	190	235	220	265
B56.G4J	3.4	215	260	245	290

Brake Data

Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	3.2	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	53.2	Ohm
Electrical Power	Pbr	10.8	W
Current	Ibr	0.45	Adc
Additional* Rotor Inertia	Jbr	0.38	$kgcm^2$
Opening (release) time	to max	60	ms
Closing (fall in) time	tc max	10	ms
Additional* Motor weight	mbr	0.3	kg

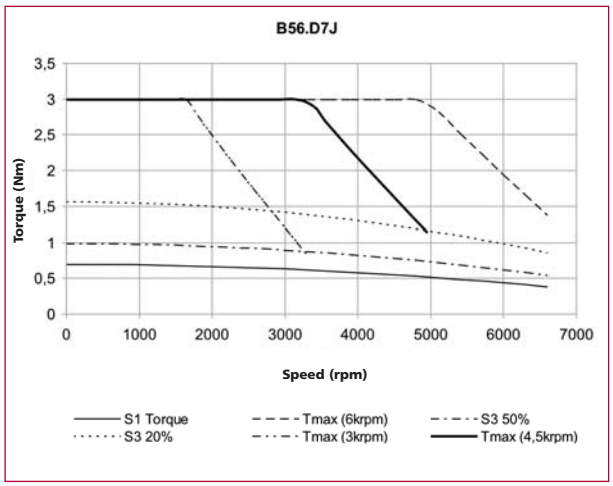
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

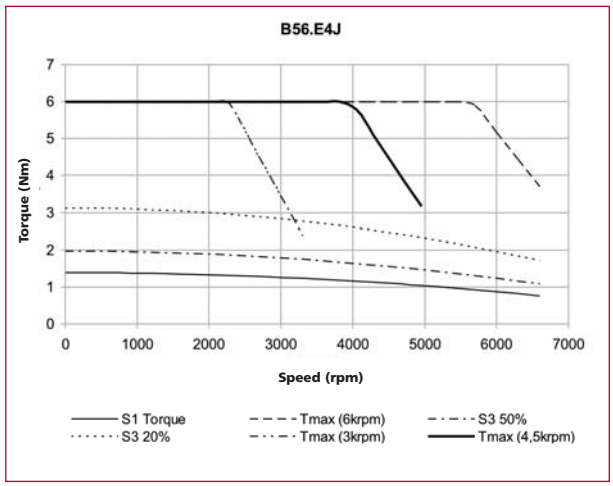
TYPE B56J

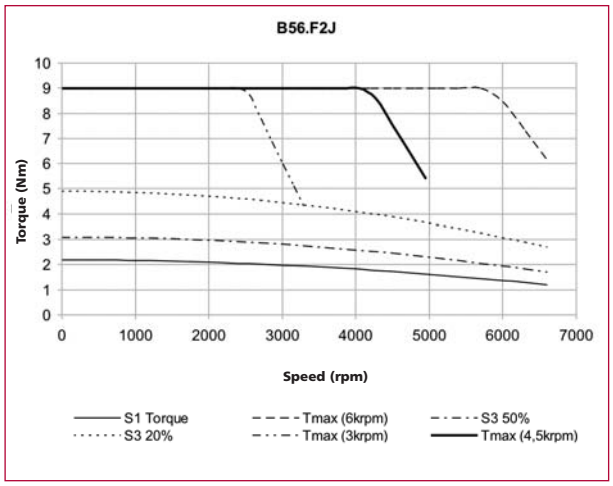
sinusoidal 4 Poles voltage H (400 Volt)

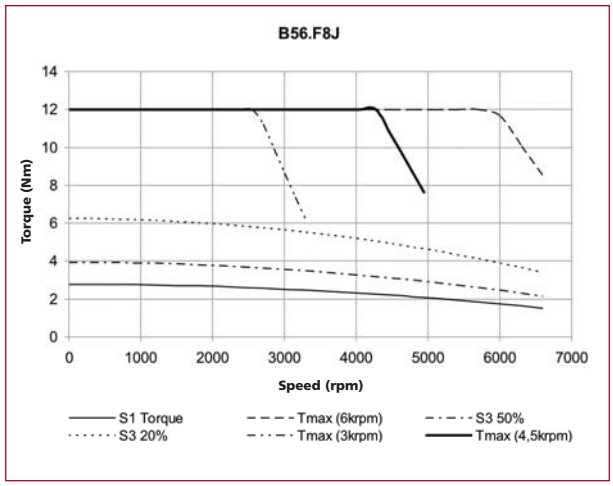
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n W	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B56.D7J	0.7	3000	201	0.64	3.0	12000	0.35	85714	20	140	0.84	1.45	100	170	264	0.5	0.4
B56.E4J	1.4	3000	399	1.27	6.0	12000	0.64	93750	22	140	0.84	1.45	34.0	73.1	264	1.0	0.9
B56.F2J	2.2	3000	628	2.00	9.0	12000	0.93	96774	24	140	0.84	1.45	19.0	49.2	264	1.5	1.4
B56.F8J	2.8	3000	801	2.55	12.0	12000	1.22	98361	26	140	0.84	1.45	11.5	36.5	264	1.9	1.8
B56.G4J	3.4	3000	971	3.09	15.0	12000	1.60	93750	28	140	0.84	1.45	9.70	31.5	264	2.3	2.1
4500 min^{-1} - Connection Y																	
B56.D7J	0.7	4500	254	0.54	3.0	12000	0.35	85714	20	140	0.56	0.97	45.0	75.0	264	0.7	0.6
B56.E4J	1.4	4500	509	1.08	6.0	12000	0.64	93750	22	140	0.56	0.97	15.6	32.8	264	1.4	1.1
B56.F2J	2.2	4500	796	1.69	9.0	12000	0.93	96774	24	140	0.56	0.97	8.10	21.7	264	2.3	1.7
B56.F8J	2.8	4500	1013	2.15	12.0	12000	1.22	98361	26	140	0.56	0.97	5.20	16.6	264	2.9	2.2
B56.G4J	3.4	4500	1235	2.62	15.0	12000	1.60	93750	28	140	0.56	0.97	4.20	13.9	264	3.5	2.7
6000 min^{-1} - Connection Y																	
B56.D7J	0.7	6000	276	0.44	3.0	12000	0.35	85714	20	140	0.42	0.73	26.0	42.0	264	1.0	0.6
B56.E4J	1.4	6000	553	0.88	6.0	12000	0.64	93750	22	140	0.42	0.73	8.50	18.3	264	1.9	1.2
B56.F2J	2.2	6000	867	1.38	9.0	12000	0.93	96774	24	140	0.42	0.73	4.50	12.3	264	3.0	1.9
B56.F8J	2.8	6000	1100	1.75	12.0	12000	1.22	98361	26	140	0.42	0.73	2.90	9.50	264	3.8	2.4
B56.G4J	3.4	6000	1338	2.13	15.0	12000	1.60	93750	28	140	0.42	0.73	2.40	7.90	264	4.7	2.9

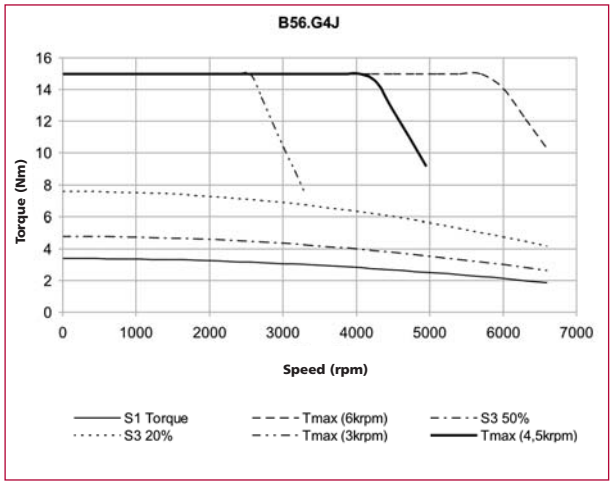
TYPE B56J
sinusoidal 4 Poles voltage H (400 Volt)





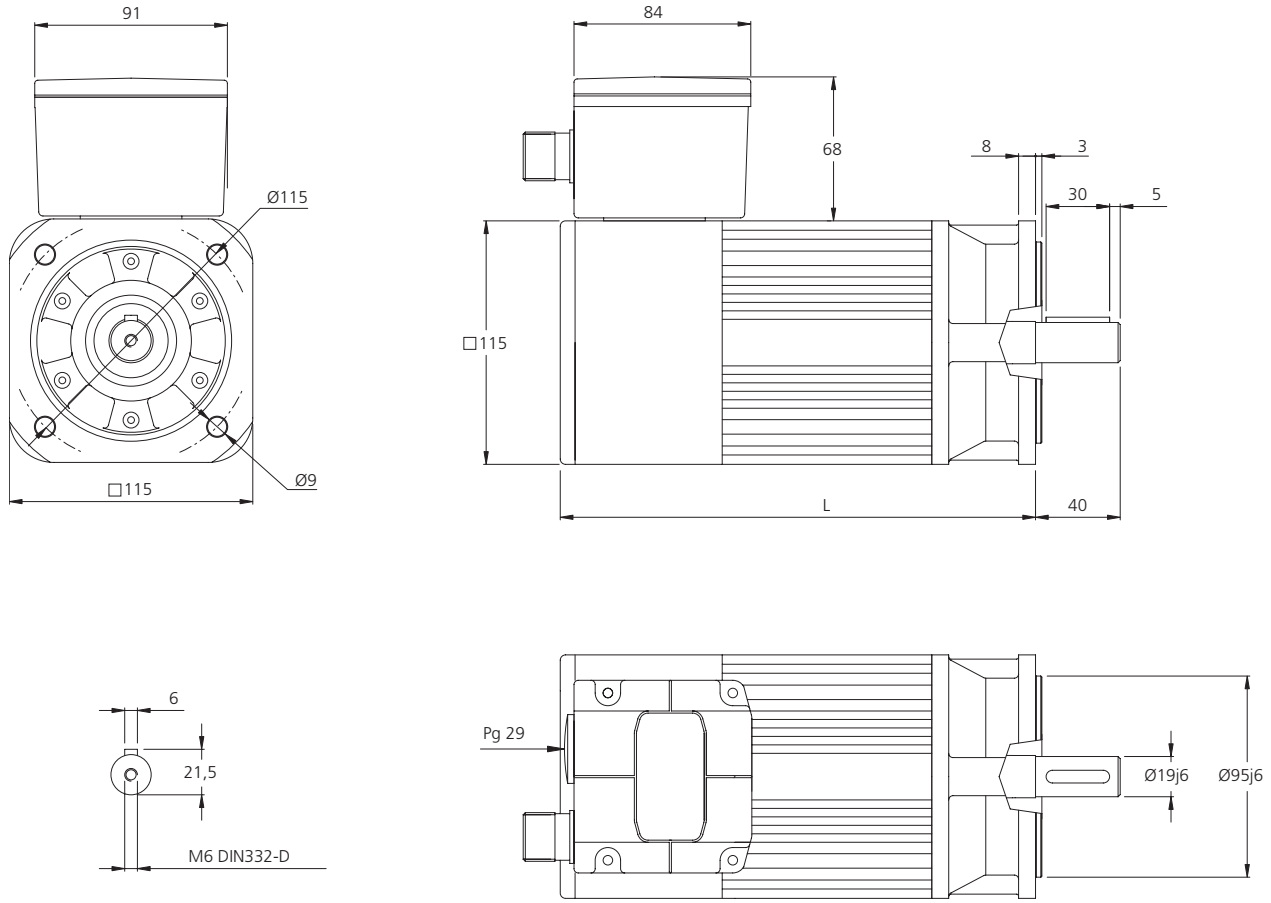






TYPE B63I

sinusoidal 6 Poles voltage H (400 Volt)



Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B63.04I	4.0	224	255	256	287
B63.06I	6.0	249	280	281	312
B63.08I	8.0	274	305	306	337
B63.10I	10.0	299	330	331	362

Brake Data

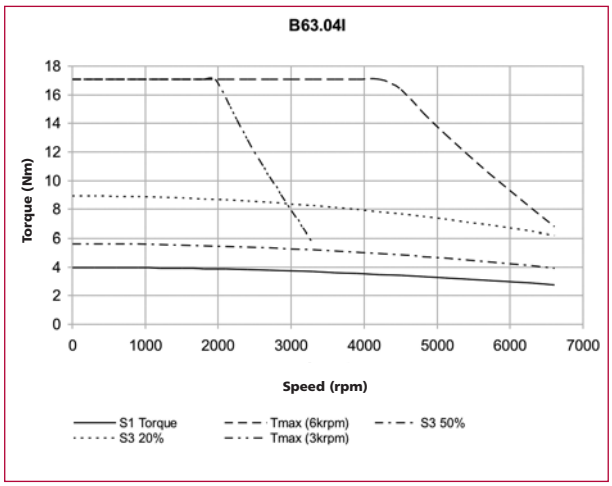
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	9.5	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	30.0	Ohm
Electrical Power	Pbr	19.2	W
Current	Ibr	0.8	Adc
Additional* Rotor Inertia	Jbr	3.6	$kgcm^2$
Opening (release) time	to max	80	ms
Closing (fall in) time	tc max	35	ms
Additional* Motor weight	mbr	1.0	kg

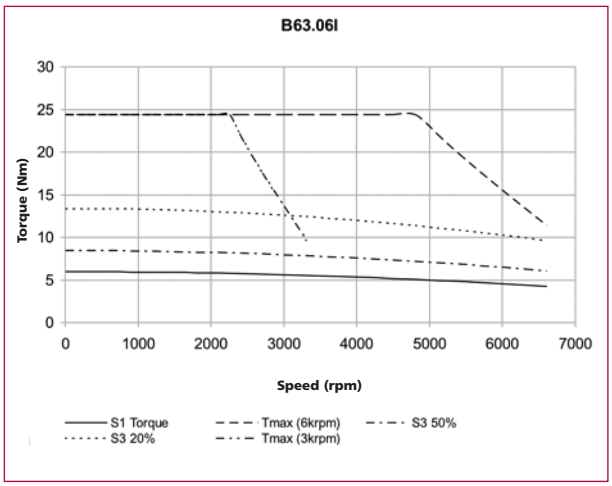
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

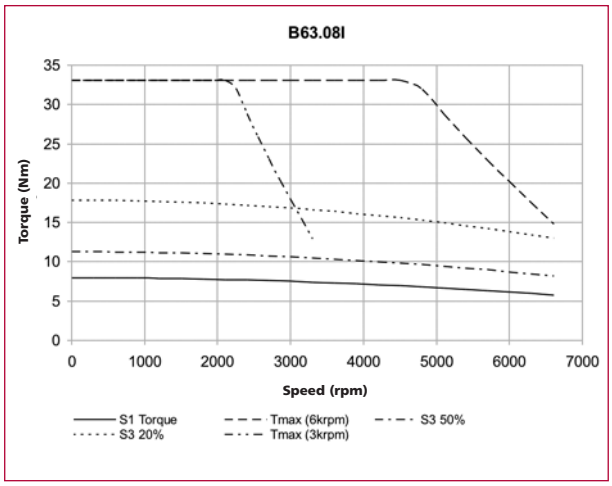
TYPE B63I
sinusoidal 6 Poles voltage H (400 Volt)

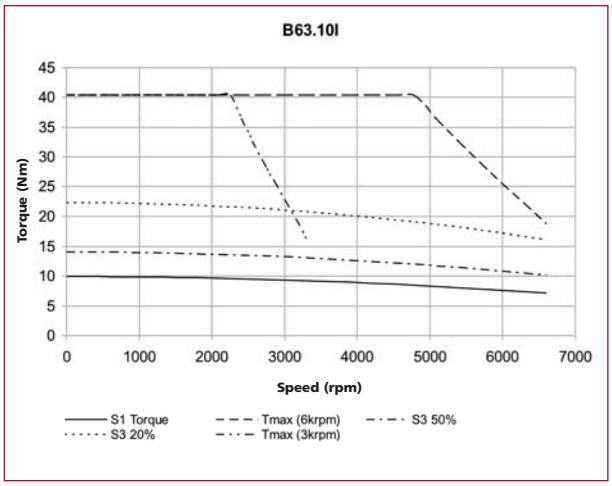
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B63.04I	4.0	3000	1.1	3.5	17.1	7200	5.81	29432	25	140	0.94	1.63	11.1	48.7	296	2.5	2.1
B63.06I	6.0	3000	1.7	5.3	24.4	7200	8.55	28538	30	140	0.94	1.63	5.50	28.5	296	3.7	3.3
B63.08I	8.0	3000	2.2	7.1	33.1	7200	11.20	29554	30	140	0.94	1.63	3.70	22.5	296	4.9	4.4
B63.10I	10.0	3000	2.8	8.8	40.5	7200	13.65	29670	35	140	0.94	1.63	2.70	16.9	296	6.1	5.4
6000 min^{-1} - Connection Y																	
B63.04I	4.0	6000	1.9	3.0	17.1	7200	5.81	29432	25	140	0.47	0.82	2.50	11.1	296	4.9	3.7
B63.06I	6.0	6000	2.9	4.6	24.4	7200	8.55	28538	30	140	0.47	0.82	1.28	6.80	296	7.4	5.6
B63.08I	8.0	6000	3.9	6.2	33.1	7200	11.20	29554	30	140	0.47	0.82	0.90	5.30	296	9.8	7.6
B63.10I	10.0	6000	4.8	7.7	40.5	7200	13.65	29670	35	140	0.47	0.82	0.68	4.23	296	12.3	9.4

TYPE B63I
sinusoidal 6 Poles voltage H (400 Volt)

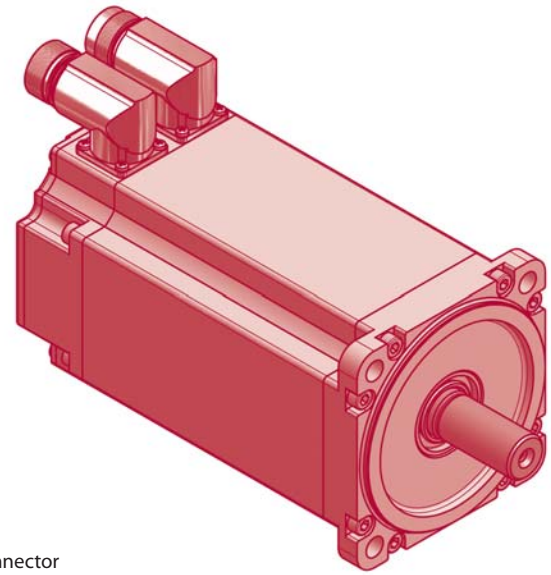


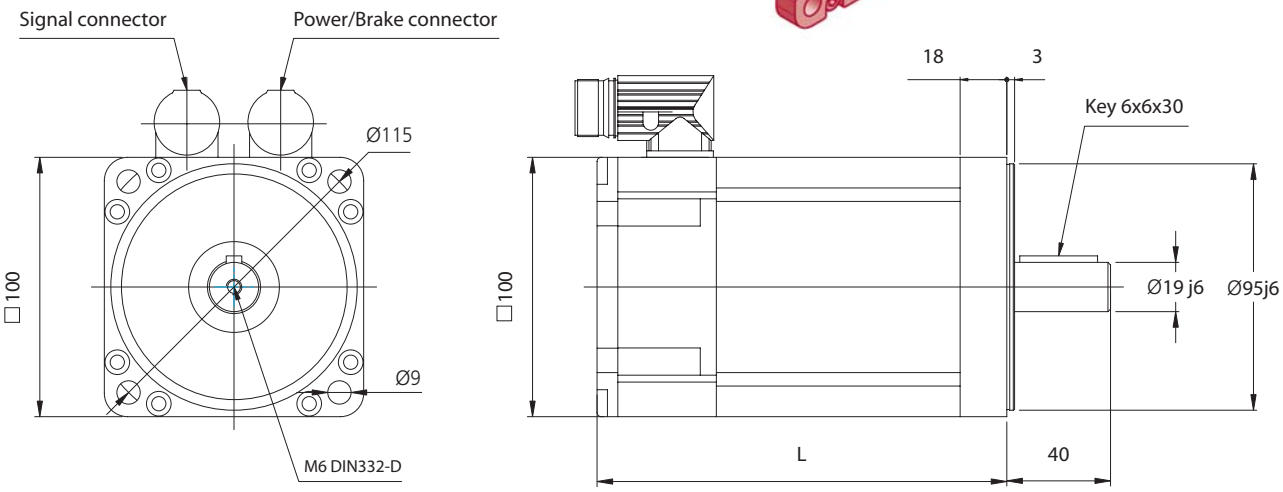






TYPE B63J
sinusoidal 10 Poles voltage H (400 Volt)





Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B63.04J	4.0	160	192	195	227
B63.06J	6.0	180	212	215	247
B63.08J	8.0	204	236	239	271
B63.10J	10.0	224	256	259	291

Brake Data

Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	5.0	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	37.0	Ohm
Electrical Power	Pbr	15.6	W
Current	Ibr	0.65	Adc
Additional* Rotor Inertia	Jbr	1.07	$kgcm^2$
Opening (release) time	to max	40	ms
Closing (fall in) time	tc max	20	ms
Additional* Motor weight	mbr	0.7	kg

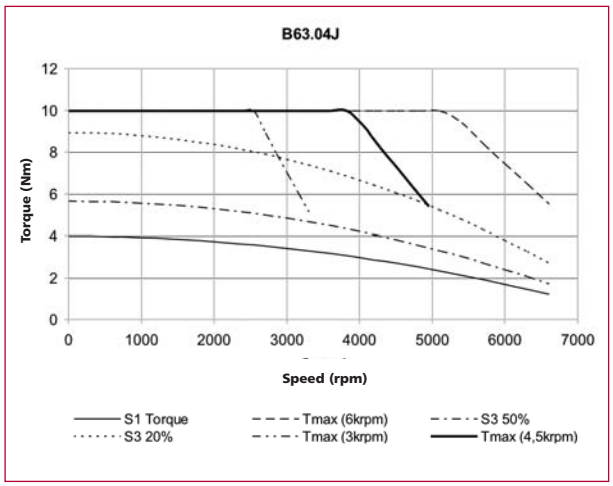
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

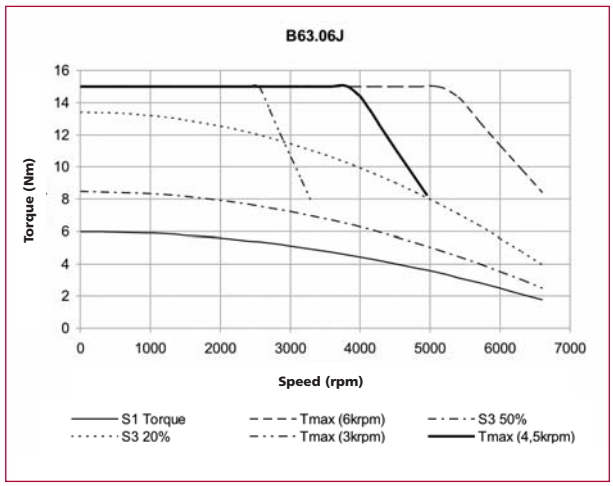
TYPE B63J

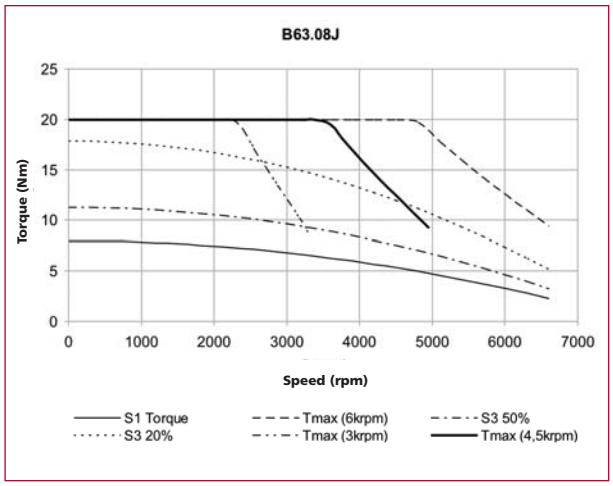
sinusoidal 10 Poles voltage H (400 Volt)

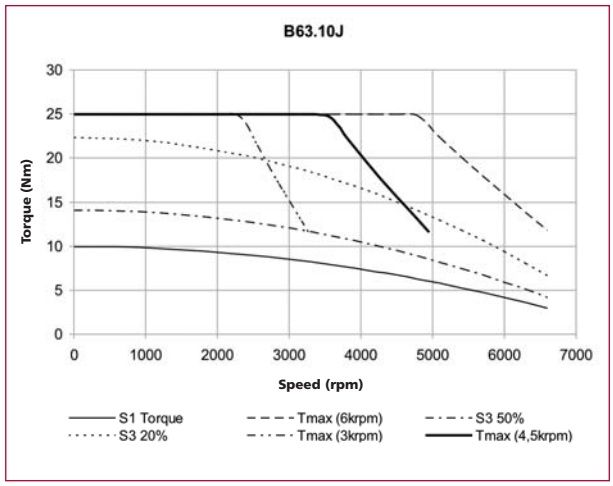
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
3000 min^{-1} - Connection Y																	
B63.04J	4.0	3000	0.94	3.0	10	9000	1.75	57143	25	140	0.94	1.63	5.40	36.5	296	2.5	1.8
B63.06J	6.0	3000	1.41	4.5	15	9000	2.51	59761	30	140	0.94	1.63	3.50	24.0	296	3.7	2.8
B63.08J	8.0	3000	1.88	6.0	20	9000	3.29	60790	30	140	0.94	1.63	2.50	21.8	296	4.9	3.7
B63.10J	10.0	3000	2.36	7.5	25	9000	4.07	61425	35	140	0.94	1.63	1.90	17.4	296	6.1	4.6
4500 min^{-1} - Connection Y																	
B63.04J	4.0	4500	1.13	2.4	10	9000	1.75	57143	25	140	0.63	1.09	2.40	16.5	296	3.7	2.2
B63.06J	6.0	4500	1.70	3.6	15	9000	2.51	59761	30	140	0.63	1.09	1.50	10.8	296	5.5	3.3
B63.08J	8.0	4500	2.26	4.8	20	9000	3.29	60790	30	140	0.63	1.09	1.10	9.70	296	7.4	4.4
B63.10J	10.0	4500	2.83	6.0	25	9000	4.07	61425	35	140	0.63	1.09	0.90	7.80	296	9.2	5.5
6000 min^{-1} - Connection Y																	
B63.04J	4.0	6000	1.07	1.7	10	9000	1.75	57143	25	140	0.47	0.81	1.35	9.13	296	4.9	2.1
B63.06J	6.0	6000	1.57	2.5	15	9000	2.51	59761	30	140	0.47	0.81	0.88	6.00	296	7.4	3.1
B63.08J	8.0	6000	2.07	3.3	20	9000	3.29	60790	30	140	0.47	0.81	0.63	5.45	296	9.8	4.1
B63.10J	10.0	6000	2.64	4.2	25	9000	4.07	61425	35	140	0.47	0.81	0.48	4.35	296	12.3	5.2

TYPE B63J
sinusoidal 10 Poles voltage H (400 Volt)



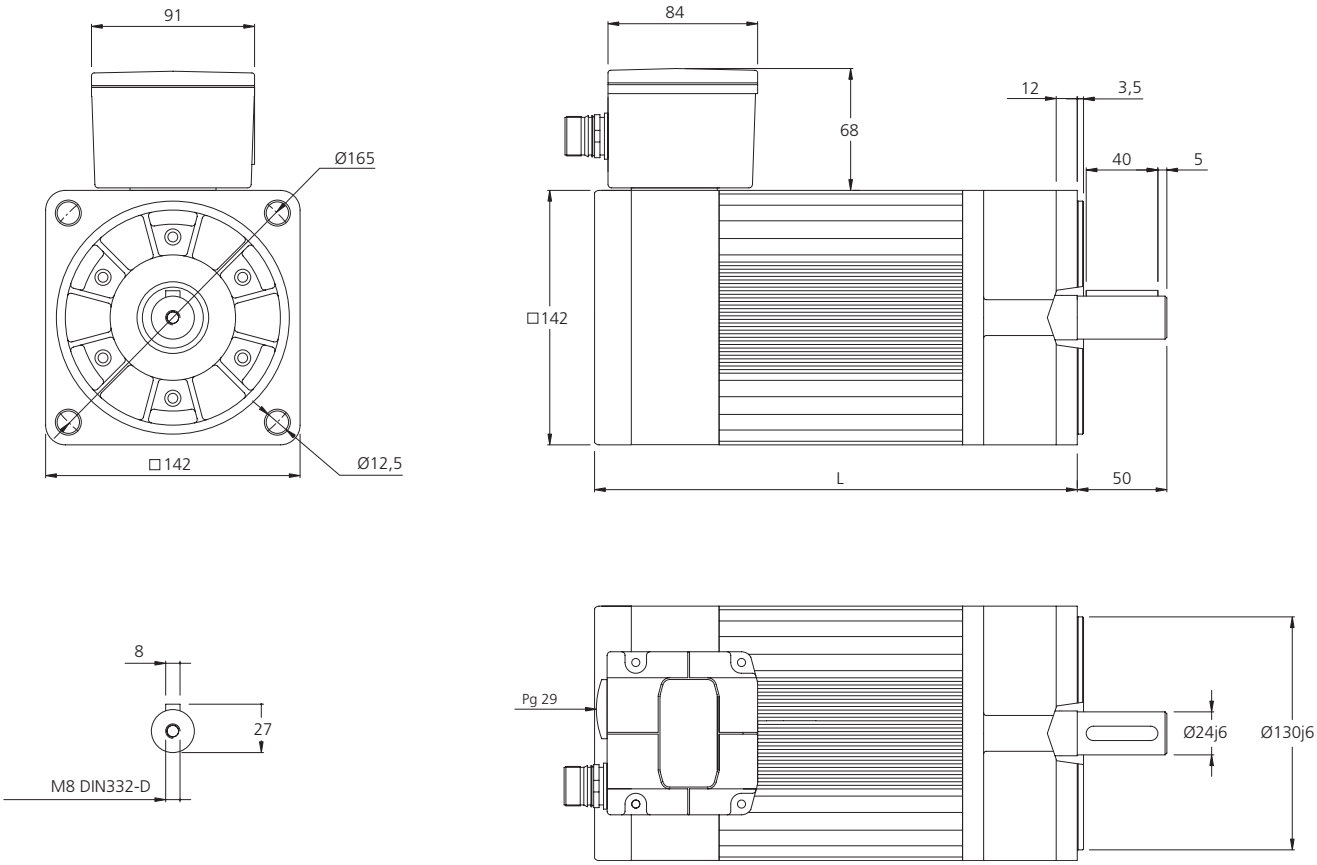






TYPE B71I

sinusoidal 6 Poles voltage H (400 Volt)



Mechanical Data

Type	Torque Nm	Length with RESOLVER (L)		Length with ENCODER (L)	
		Without brake	With brake	Without brake	With brake
B71.08I	7.8	234	264	256	287
B71.12I	11.7	259	289	281	312
B71.16I	15.6	284	314	306	337
B71.20I	19.5	309	339	331	362
B71.24I	23.4	334	364	356	387
B71.28I	27.3	359	389	381	412

Brake Data

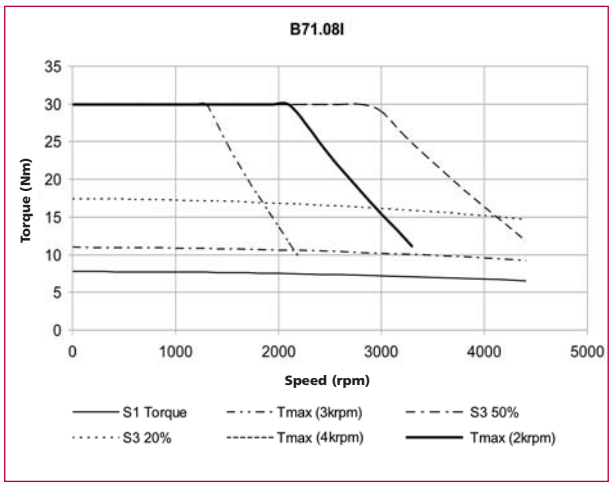
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	27	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	23.4	Ohm
Electrical Power	Pbr	24.6	W
Current	Ibr	1.03	Adc
Additional* Rotor Inertia	Jbr	9.5	$kgcm^2$
Opening (release) time	to max	110	ms
Closing (fall in) time	tc max	50	ms
Additional* Motor weight	mbr	2.5	kg

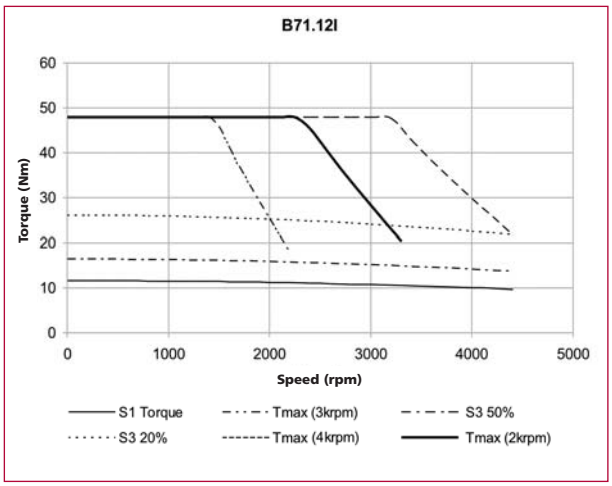
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

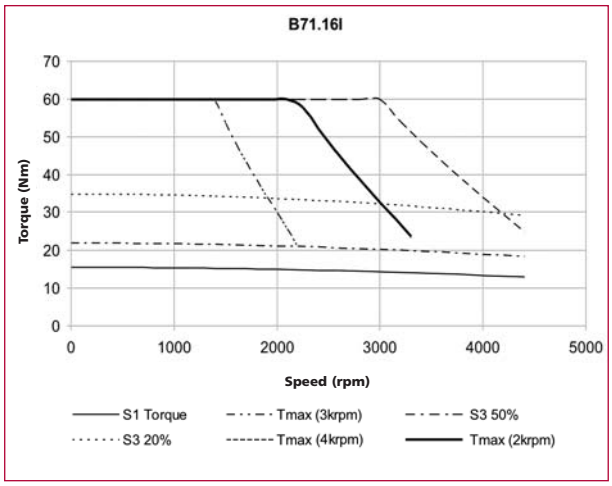
TYPE B71I
sinusoidal 6 Poles voltage H (400 Volt)

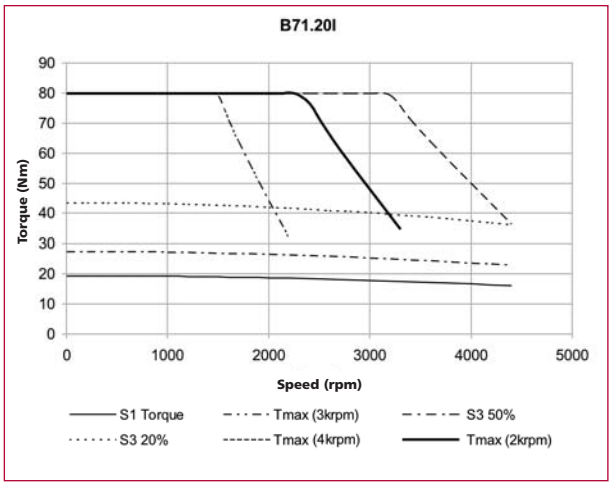
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
2000 min^{-1} - Connection Y																	
B71.08I	7.8	2000	1.5	7.4	30	7200	15.75	19048	40	140	1.41	2.45	9.50	57.4	296	3.2	3.0
B71.12I	11.7	2000	2.3	11.0	48	7200	23.60	20339	45	140	1.41	2.45	5.20	34.0	296	4.8	4.5
B71.16I	15.6	2000	3.1	14.7	60	7200	31.53	19029	45	140	1.41	2.45	3.40	27.0	296	6.4	6.0
B71.20I	19.5	2000	3.9	18.4	80	7200	38.44	20812	50	140	1.41	2.45	2.40	20.7	296	8.0	7.5
B71.24I	23.4	2000	4.6	22.0	92	7200	45.35	20287	55	140	1.41	2.45	1.60	13.3	296	9.6	9.0
B71.28I	27.3	2000	5.3	25.5	108	7200	52.26	20666	60	140	1.41	2.45	1.10	9.20	296	11.2	10.4
3000 min^{-1} - Connection Y																	
B71.08I	7.8	3000	2.2	7.0	30	7200	15.75	19048	40	140	0.94	1.63	4.23	25.1	296	4.8	4.3
B71.12I	11.7	3000	3.3	10.5	48	7200	23.60	20339	45	140	0.94	1.63	2.30	15.1	296	7.2	6.4
B71.16I	15.6	3000	4.4	14.1	60	7200	31.53	19029	45	140	0.94	1.63	1.61	13.0	296	9.6	8.6
B71.20I	19.5	3000	5.5	17.6	80	7200	38.44	20812	50	140	0.94	1.63	1.10	9.60	296	12.0	10.8
B71.24I	23.4	3000	6.6	21.1	92	7200	45.35	20287	55	140	0.94	1.63	0.64	5.40	296	14.3	12.9
B71.28I	27.3	3000	7.7	24.6	108	7200	52.26	20666	60	140	0.94	1.63	0.49	4.10	296	16.7	15.1
4000 min^{-1} - Connection Y																	
B71.08I	7.8	4000	2.8	6.8	30	7200	15.75	19048	40	140	0.71	1.22	2.33	13.9	296	6.4	5.6
B71.12I	11.7	4000	4.2	10.1	48	7200	23.60	20339	45	140	0.71	1.22	1.20	7.70	296	9.6	8.3
B71.16I	15.6	4000	5.7	13.5	60	7200	31.53	19029	45	140	0.71	1.22	0.86	7.00	296	12.7	11.0
B71.20I	19.5	4000	7.0	16.8	80	7200	38.44	20812	50	140	0.71	1.22	0.56	4.80	296	15.9	13.7
B71.24I	23.4	4000	8.4	20.1	92	7200	45.35	20287	55	140	0.71	1.22	0.35	2.90	296	19.1	16.4

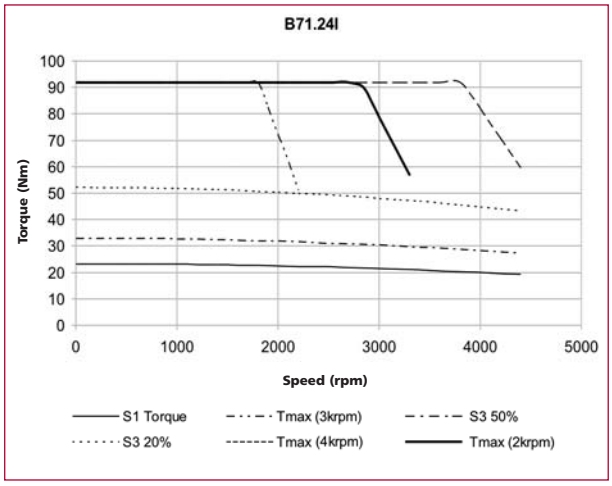
TYPE B71I
sinusoidal 6 Poles voltage H (400 Volt)

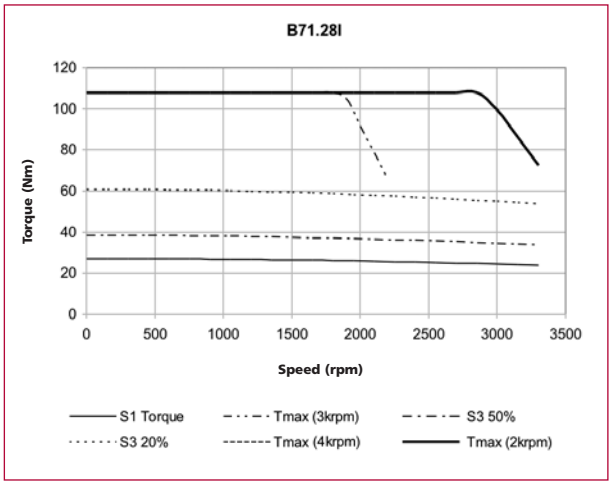




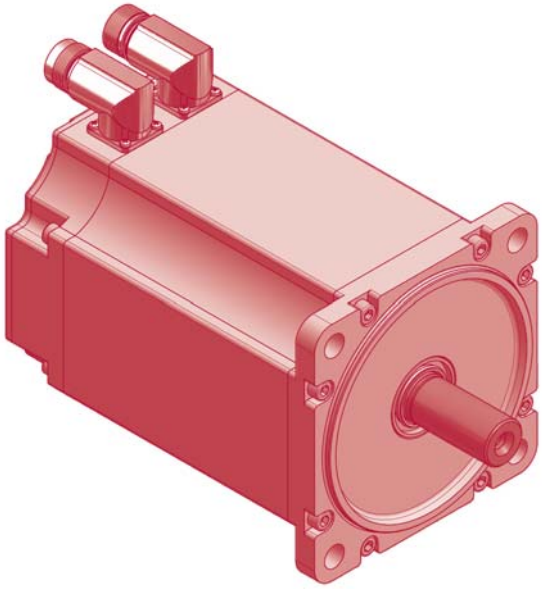


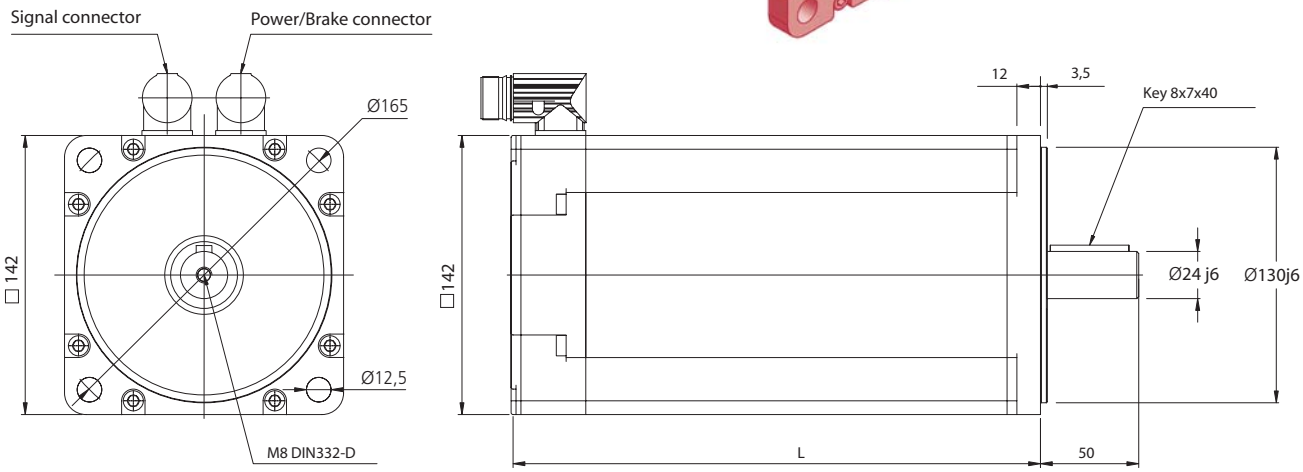






TYPE B71Q
sinusoidal 8 Poles voltage H (400 Volt)





Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B71.04Q	4.5	137	167	167	197
B71.06Q	9.0	165	195	195	225
B71.12Q	12.5	182	212	212	242
B71.16Q	16.0	205	235	235	265
B71.20Q	20.0	227	257	257	287

Brake Data

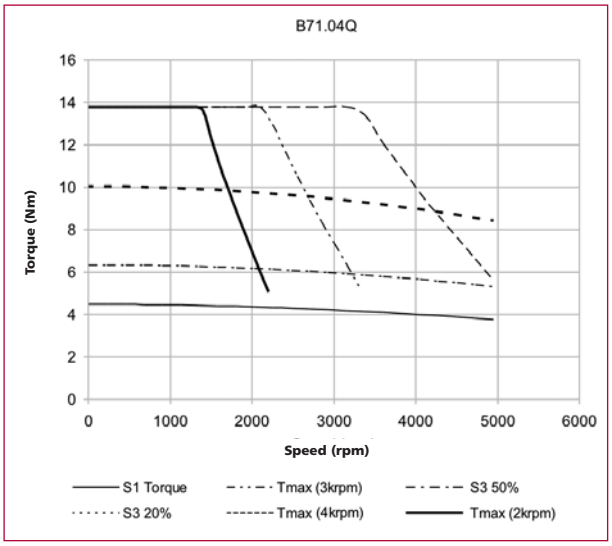
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	15	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	24	Ohm
Electrical Power	Pbr	24	W
Current	Ibr	1.0	Adc
Additional* Rotor Inertia	Jbr	1.66	$kgcm^2$
Opening (release) time	to max	50	ms
Closing (fall in) time	tc max	30	ms
Additional* Motor weight	mbr	1.5	kg

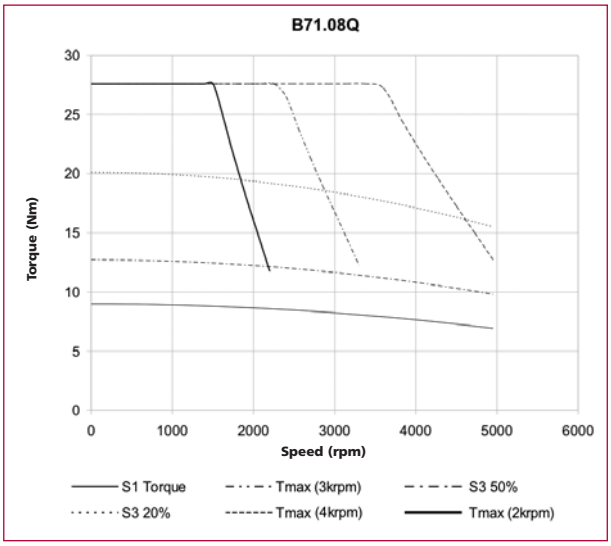
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

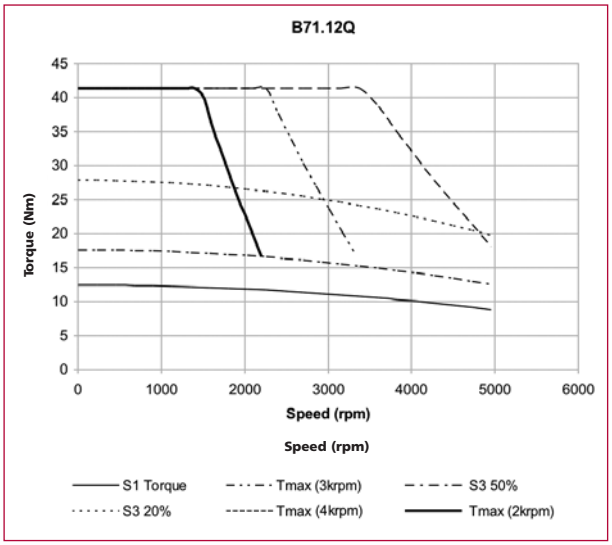
TYPE B71Q
sinusoidal 8 Poles voltage H (400 Volt)

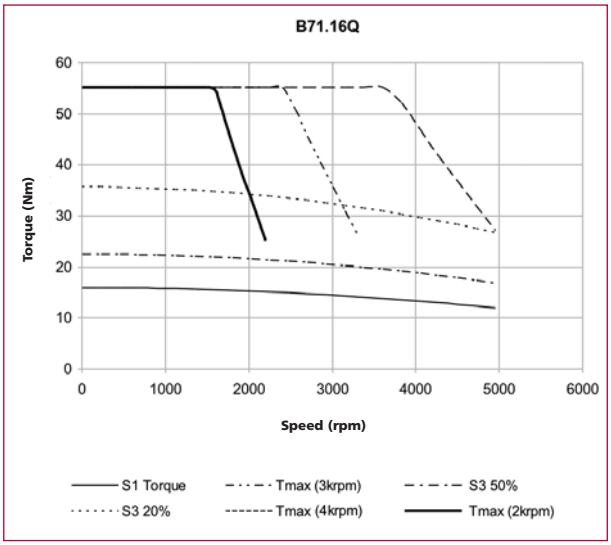
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_w Ω	Inductance phase to phase L_w mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
2000 min^{-1} - Connection Y																	
B71.04Q	4.5	2000	0.9	4.2	13.8	9000	3.62	38122	32	140	1.41	2.44	11.3	99.0	296	1.8	1.7
B71.18Q	9.0	2000	1.7	8.1	27.6	9000	6.04	45695	35	140	1.41	2.44	4.03	44.4	296	3.7	3.3
B71.12Q	12.5	2000	2.5	11.8	41.4	9000	8.20	50488	38	140	1.41	2.44	2.88	31.0	296	5.1	4.8
B71.16Q	16.0	2000	3.2	15.1	55.2	9000	10.70	51589	40	140	1.41	2.44	1.73	20.9	296	6.5	6.2
B71.20Q	20.0	2000	3.9	18.5	69.0	9000	13.10	52672	40	140	1.41	2.44	1.34	17.4	296	8.2	7.6
3000 min^{-1} - Connection Y																	
B71.04Q	4.5	3000	1.3	4.0	13.8	9000	3.62	38122	32	140	0.94	1.63	5.59	47.4	296	2.8	2.5
B71.08Q	9.0	3000	2.4	7.7	27.6	9000	6.04	45695	35	140	0.94	1.63	2.03	21.5	296	5.5	4.7
B71.12Q	12.5	3000	3.6	11.6	41.4	9000	8.20	50488	38	140	0.94	1.63	1.13	12.5	296	7.7	7.1
B71.16Q	16.0	3000	4.4	13.9	55.2	9000	10.70	51589	40	140	0.94	1.63	0.87	10.1	296	9.8	8.5
B71.20Q	20.0	3000	5.5	17.5	69.0	9000	13.10	52672	40	140	0.94	1.63	0.64	7.9	296	12.3	10.7
4500 min^{-1} - Connection Y																	
B71.04Q	4.5	4500	1.8	3.9	13.8	9000	3.62	38122	32	140	0.63	1.09	2.22	19.3	296	4.1	3.6
B71.08Q	9.0	4500	3.4	7.3	27.6	9000	6.04	45695	35	140	0.63	1.09	0.79	8.7	296	8.3	6.7
B71.12Q	12.5	4500	4.5	9.5	41.4	9000	8.20	50488	38	140	0.63	1.09	0.57	6.1	296	11.5	8.7
B71.16Q	16.0	4500	6.0	12.7	55.2	9000	10.70	51589	40	140	0.63	1.09	0.34	4.1	296	14.7	11.7
B71.20Q	20.0	4500	7.1	15.0	69.0	9000	13.10	52672	40	140	0.63	1.09	0.26	3.2	296	18.4	13.8

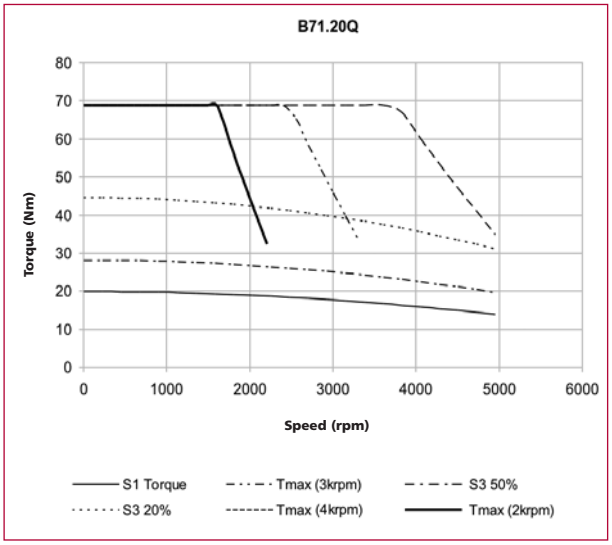
TYPE B71Q
sinusoidal 8 Poles voltage H (400 Volt)





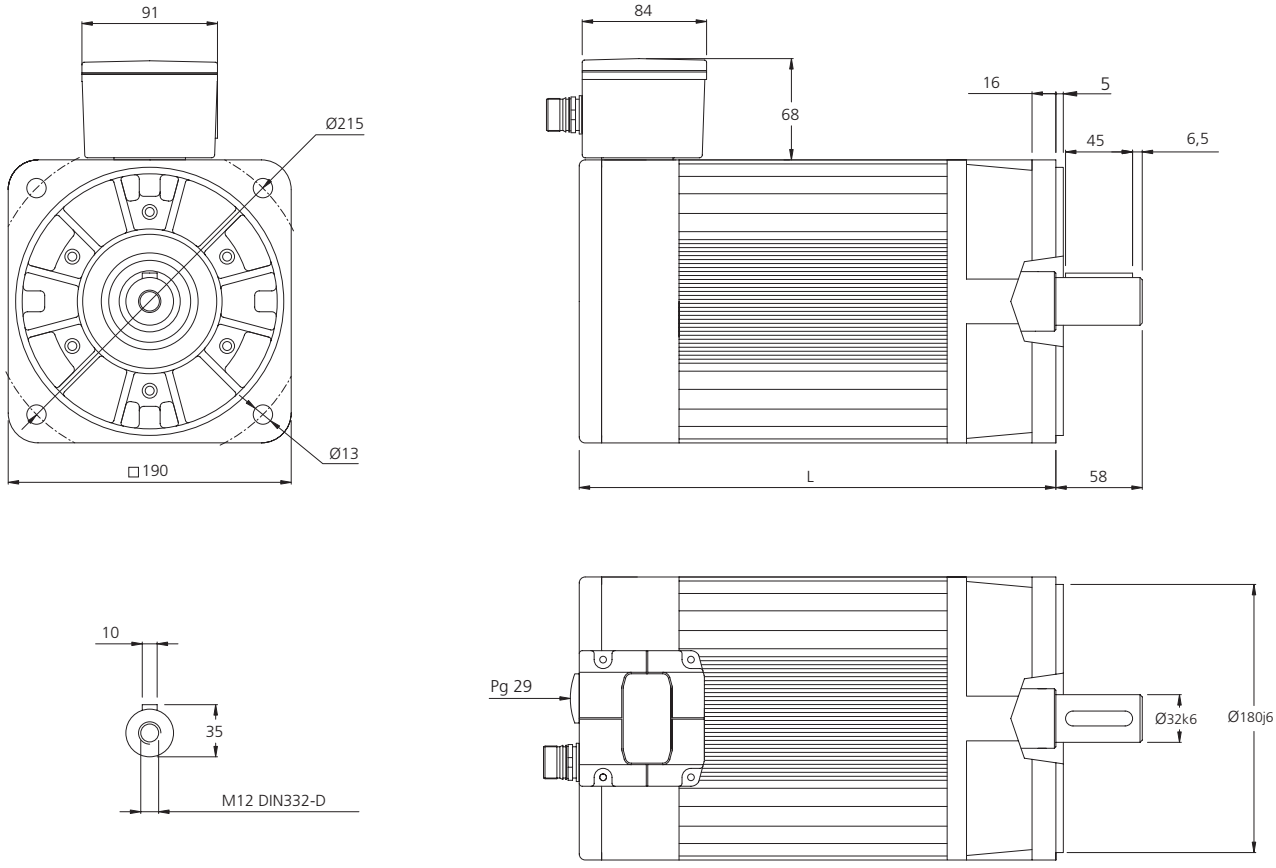






TYPE B100I

sinusoidal 6 Poles voltage H (400 Volt)



Mechanical Data

Type	Torque Nm	Length with RESOLVER (L)		Length with ENCODER (L)	
		Without brake	With brake	Without brake	With brake
B10.12I	12.0	276	340	303	367
B10.24I	24.0	301	365	328	392
B10.30I	30.0	326	390	353	417
B10.43I	43.0	376	440	403	467
B10.54I	54.0	426	490	453	517
B10.66I	66.0	476	540	503	567

Brake Data

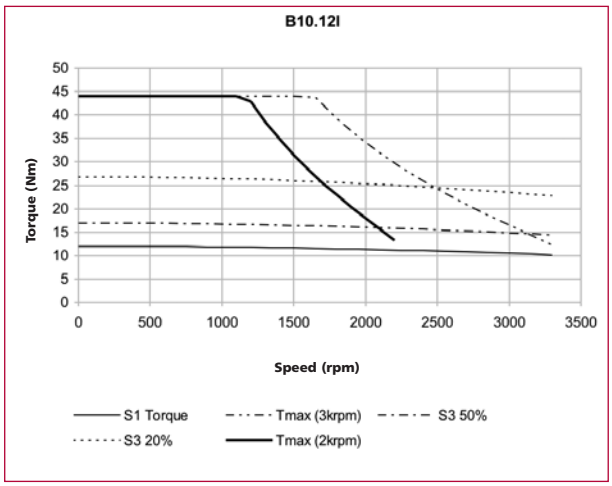
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	48	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	25.4	Ohm
Electrical Power	Pbr	22.7	W
Current	Ibr	0.94	Adc
Additional* Rotor Inertia	Jbr	31.8	$kgcm^2$
Opening (release) time	to max	250	ms
Closing (fall in) time	tc max	90	ms
Additional* Motor weight	mbr	4.0	kg

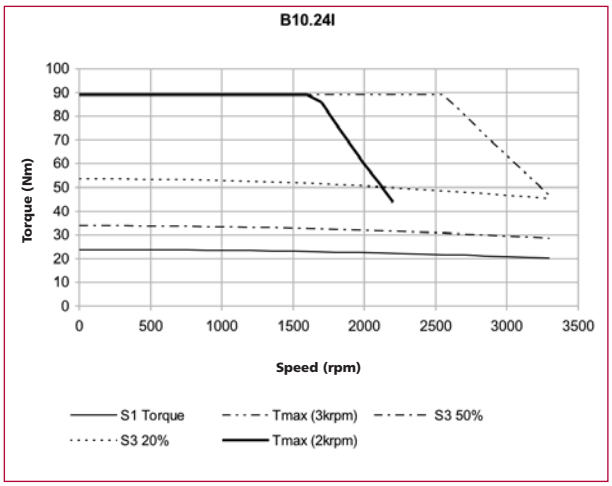
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

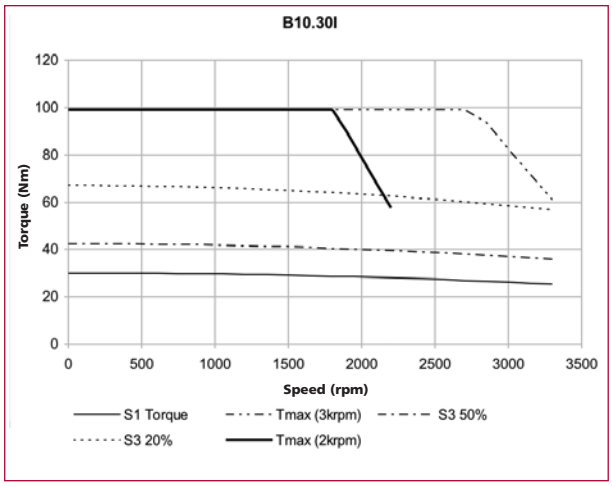
TYPE B100I
sinusoidal 6 Poles voltage H (400 Volt)

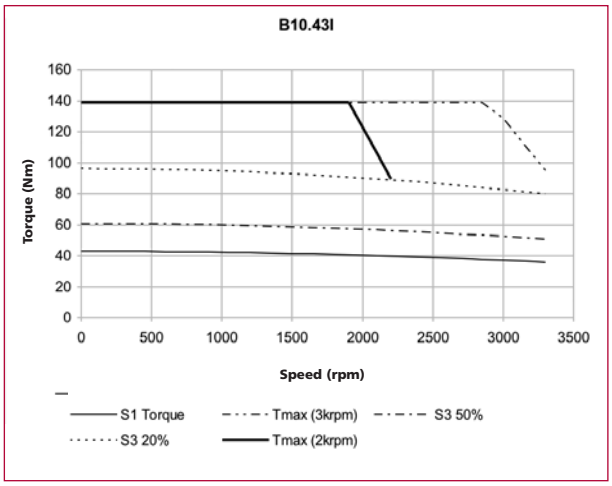
Type	Stall torque (Δt=105°C)	Rated speed	Output rated speed	Rated torque (Δt=105°C)	Peak torque	Maximum speed	Moment of inertia	Peak torque acceleration	Thermal time constant	Thermal protection threshold	Voltage constant	Torque constant	Resistance phase to phase (20°C)	Inductance phase to phase	B.E.M.F. at rated speed	Stall current	Rated current
	M_o Nm	n 1/min	P_n kW	M_n Nm	M_{pk} Nm	n_{max} rpm	J 10^{-4} Kgm²	a_{pk} rad/sec²	T_{th} min	ϑ_{max} °C	k_e Vs	k_t Nm/A	R_W Ω	L_W mH	E_n Vrms	I_o Arms	I_n Arms
2000 min^{-1} - Connection Y																	
B10.12I	12.0	2000	2.3	10.9	44	4000	68.0	6471	45	140	1.41	2.45	2.70	27.2	296	4.9	4.45
B10.24I	24.0	2000	4.6	21.8	89	4000	136.0	6544	55	140	1.41	2.45	1.10	13.60	296	9.8	8.90
B10.30I	30.0	2000	5.7	27.3	99	4000	170.0	5824	60	140	1.41	2.45	0.89	11.20	296	12.2	11.1
B10.43I	43.0	2000	8.2	39.1	139	4000	238.0	5840	65	140	1.41	2.45	0.55	7.60	296	17.6	16.0
B10.54I	54.0	2000	10.3	49.1	163	4000	300.0	5433	70	140	1.41	2.45	0.39	5.90	296	22.0	20.0
B10.66I	66.0	2000	12.6	60.1	199	4000	370.0	5378	70	140	1.41	2.45	0.31	4.70	296	26.9	24.5
3000 min^{-1} - Connection Y																	
B10.12I	12.0	3000	3.3	10.5	44	4000	68.0	6471	45	140	0.94	1.63	1.35	13.6	296	7.36	6.44
B10.24I	24.0	3000	6.6	20.9	89	4000	136.0	6544	55	140	0.94	1.63	0.55	6.80	296	14.7	12.8
B10.30I	30.0	3000	8.2	26.2	99	4000	170.0	5824	60	140	0.94	1.63	0.37	5.30	296	18.4	16.0
B10.43I	43.0	3000	11.6	37.0	139	4000	238.0	5840	65	140	0.94	1.63	0.24	3.40	296	26.3	22.7
B10.54I	54.0	3000	14.8	47.0	163	4000	300.0	5433	70	140	0.94	1.63	0.18	2.60	296	33.1	28.8

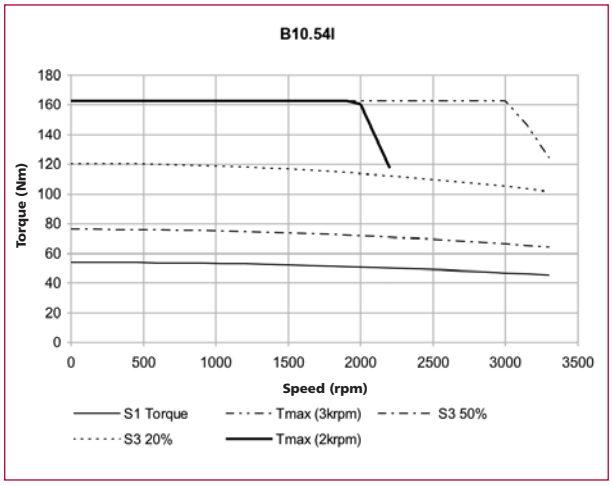
TYPE B100I
sinusoidal 6 Poles voltage H (400 Volt)

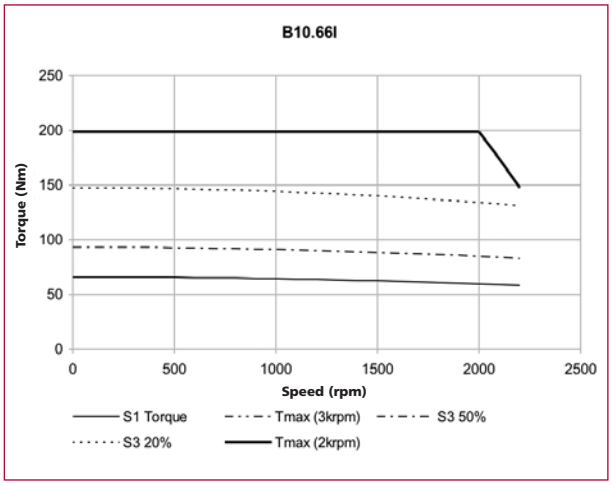




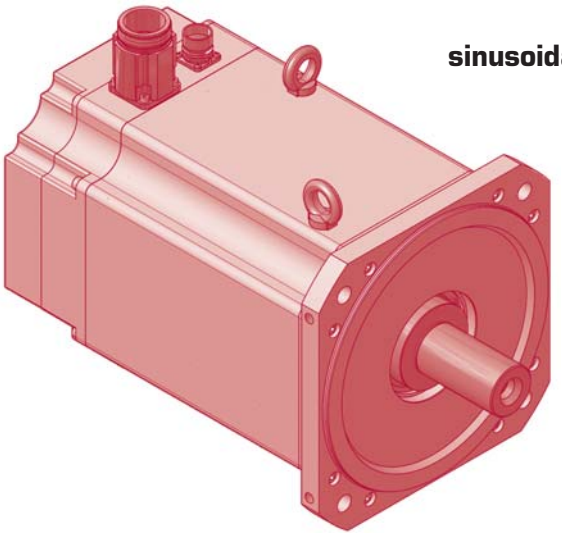






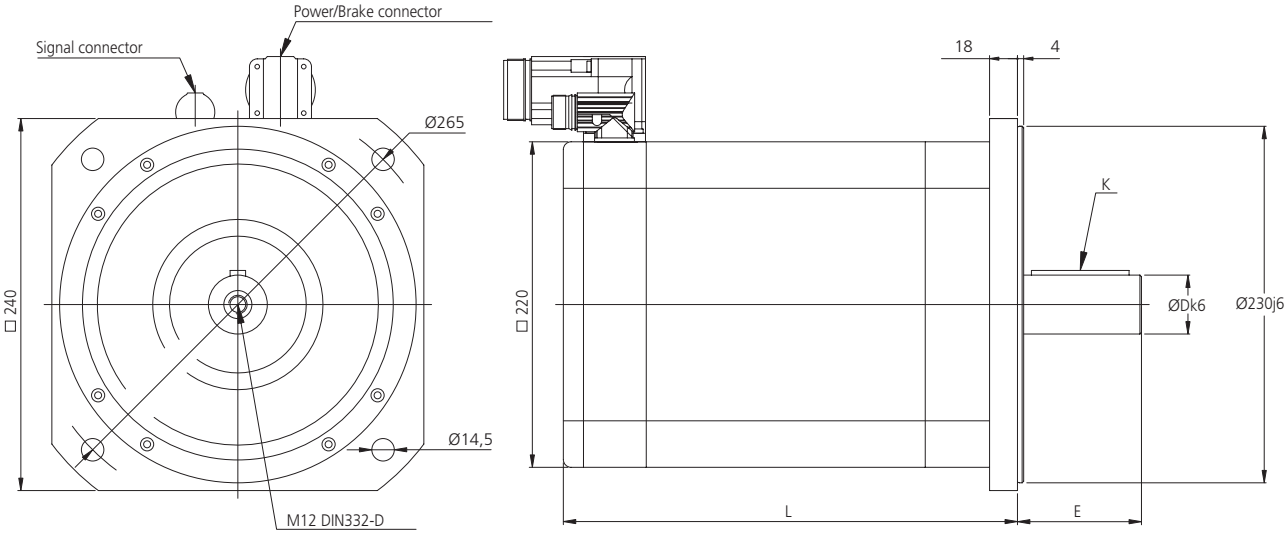


TYPE B132I
sinusoidal 6 Poles voltage H (400 Volt)



TYPE	D	E	K
B13.40	Ø38k6	80	10x8x63
B13.69	Ø38k6	80	10x8x63

TYPE	D	E	K
B13.94	Ø42k6	110	12x8x63
B13.CB	Ø42k6	110	12x8x63



Mechanical Data

Type	Torque Nm	Length with RESOLVER (L) Without brake	Length with RESOLVER (L) With brake	Length with ENCODER (L) Without brake	Length with ENCODER (L) With brake
B13.40I	40.0	293	343	321	371
B13.69I	69.0	373	423	401	451
B13.94I	94.0	433	483	461	511
B13.CBI	115.0	493	543	521	571

Brake Data

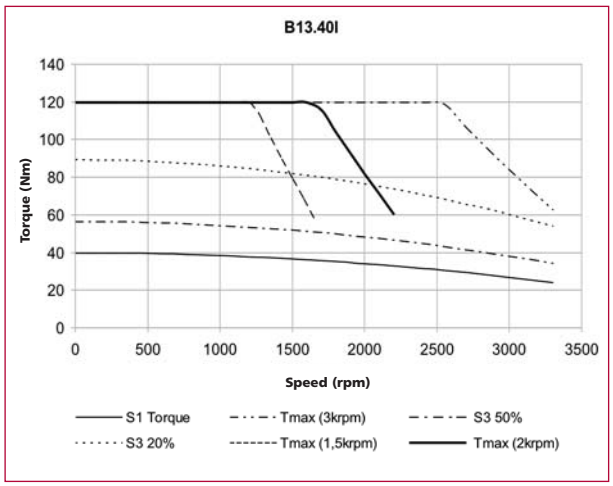
Brake data	Symbol	Data	Unit
Holding torque 20°C	Mbr	145	Nm
Voltage	Ubr	24	Vdc +/- 10%
Resistance	Rbr	12.3	Ohm
Electrical Power	Pbr	50	W
Current	Ibr	2.08	Adc
Additional* Rotor Inertia	Jbr	52.87	$kgcm^2$
Opening (release) time	to max	190	ms
Closing (fall in) time	tc max	12	ms
Additional* Motor weight	mbr	5.35	kg

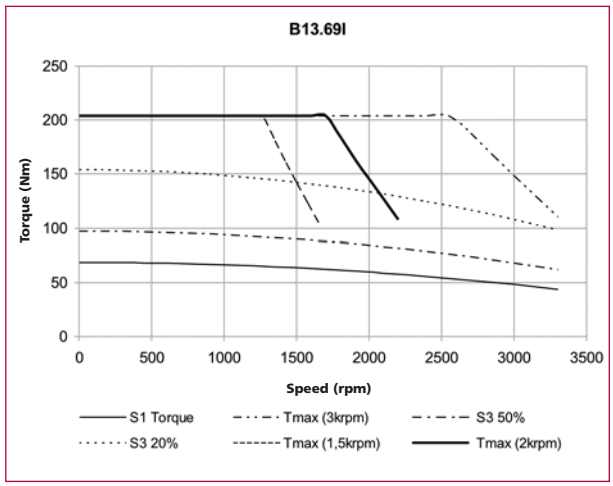
* Additional values are related to the motor data when the brake is mounted on the motor of the respective size, these values differ from the brake data in unmounted condition!

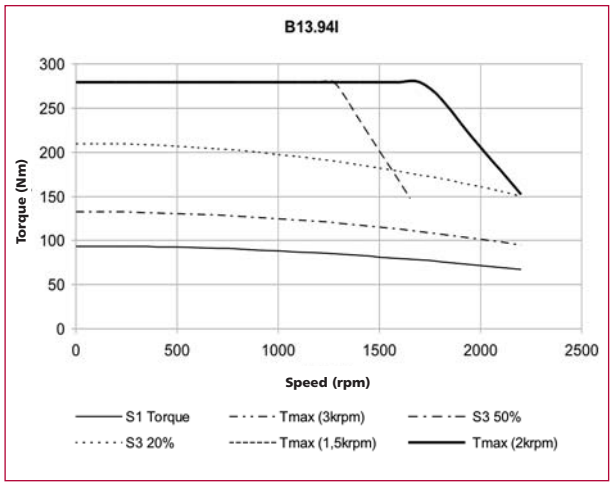
TYPE B132I
sinusoidal 6 Poles voltage H (400 Volt)

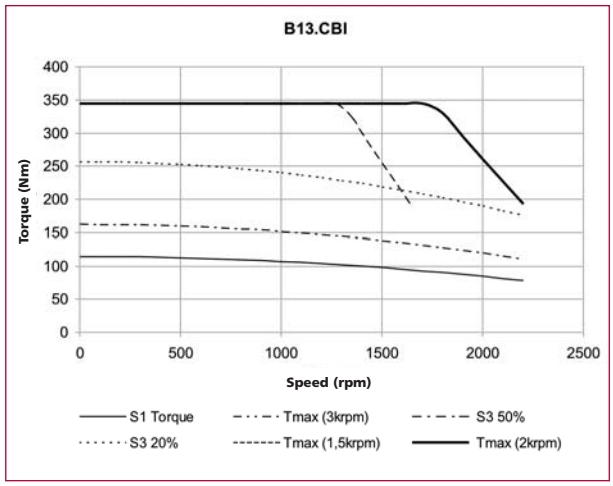
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
1500 min^{-1} - Connection Y																	
B13.40I	40.0	1500	5.50	35.5	120	3600	65	18462	50	140	1.88	3.26	0.90	16.9	296	12.3	10.9
B13.69I	69.0	1500	9.11	58.5	204	3600	114	17895	65	140	1.88	3.26	0.45	12.5	296	21.2	17.9
B13.94I	94.0	1500	12.10	77.5	280	3600	150	18667	80	140	2.00	3.46	0.33	9.4	314	27.1	22.4
B13.CBI	115.0	1500	14.77	94.5	345	3600	192	17969	90	140	1.80	3.13	0.20	6.1	284	36.8	30.2
2000 min^{-1} - Connection Y																	
B13.40I	40.0	2000	6.70	32.5	120	3600	65	18462	50	140	1.41	2.44	0.53	12.7	296	16.4	13.3
B13.69I	69.0	2000	11.10	53.5	204	3600	114	17895	65	140	1.41	2.44	0.24	7.3	296	28.2	21.9
B13.94I	94.0	2000	15.08	72.5	280	3600	150	18667	80	140	1.41	2.44	0.17	4.9	296	38.5	29.7
B13.CBI	115.0	2000	17.80	85.5	345	3600	192	17969	90	140	1.41	2.44	0.12	3.9	296	47.1	35.0
3000 min^{-1} - Connection Y																	
B13.40I	40.0	3000	8.48	27.5	120	3600	65	18462	50	140	0.94	1.63	0.23	5.4	296	24.5	16.9
B13.69I	69.0	3000	15.21	48.9	204	3600	114	17895	65	140	0.94	1.63	0.10	3.1	296	42.3	30.0

TYPE B132I
sinusoidal 6 Poles voltage H (400 Volt)

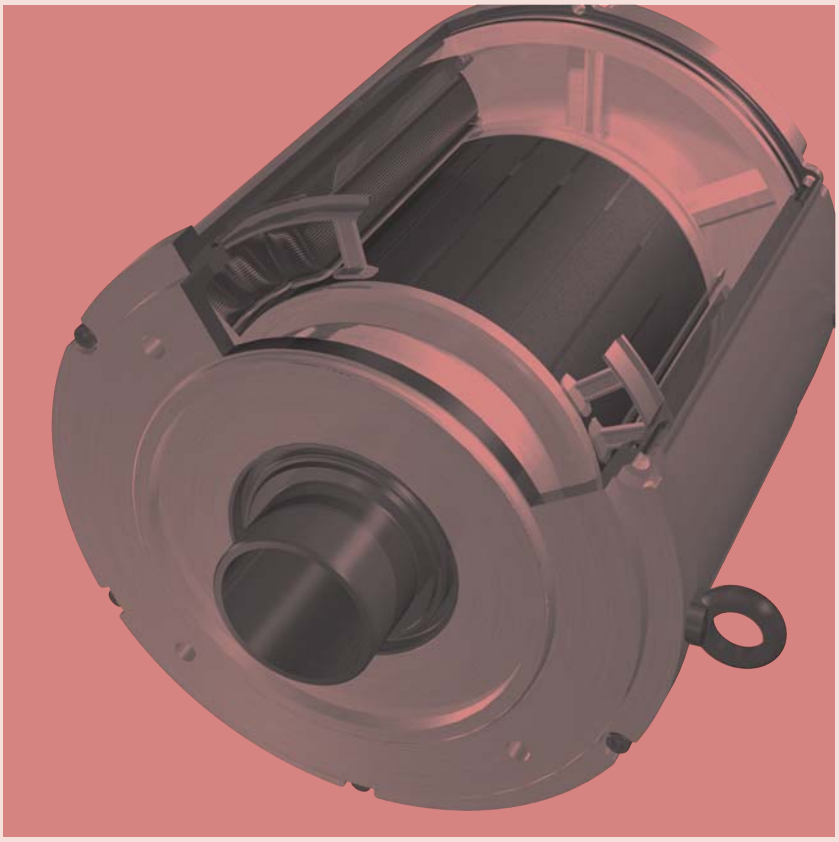




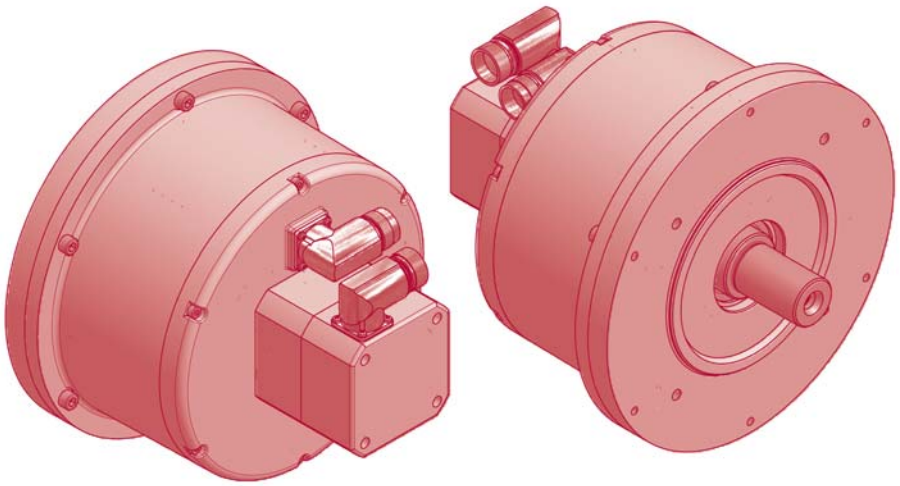


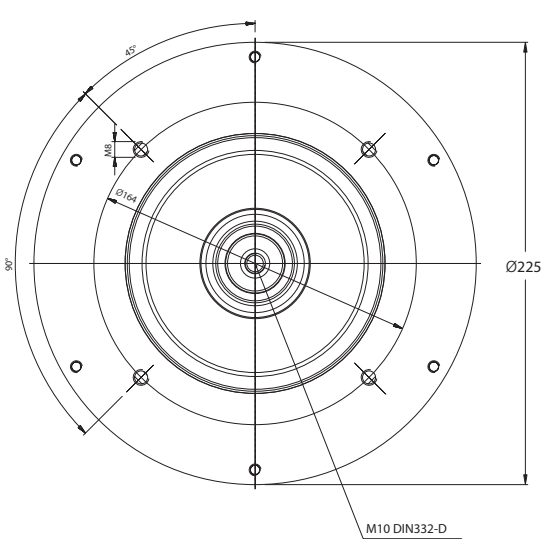


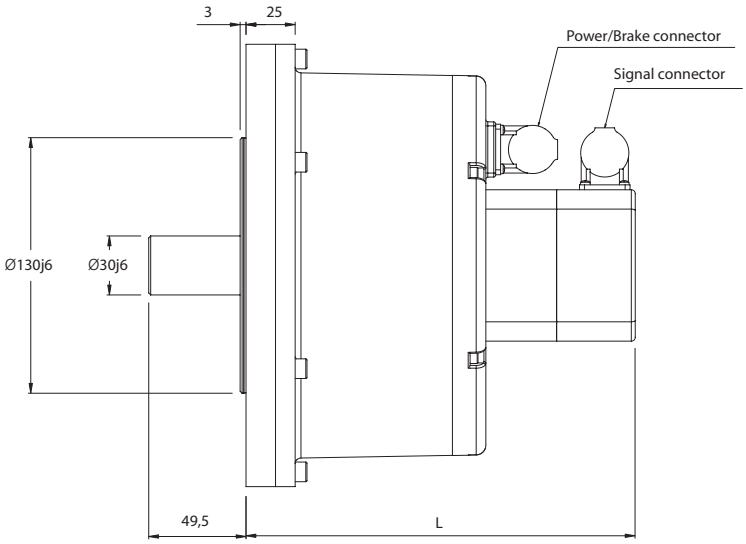
DIRECT DRIVE MOTORS



TYPE B10P
sinusoidal 12 Poles voltage H (400 Volt)







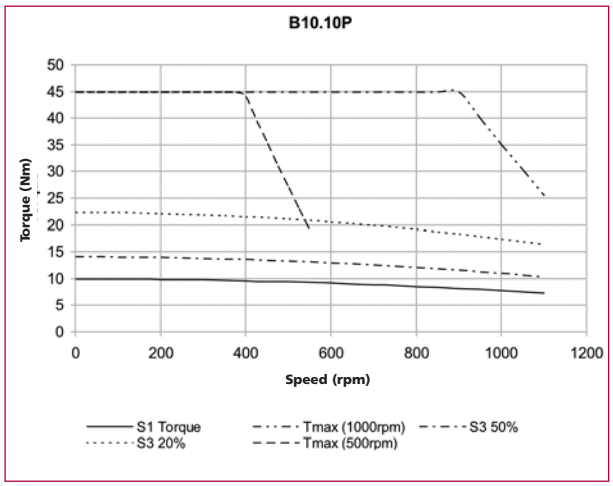
Mechanical Data

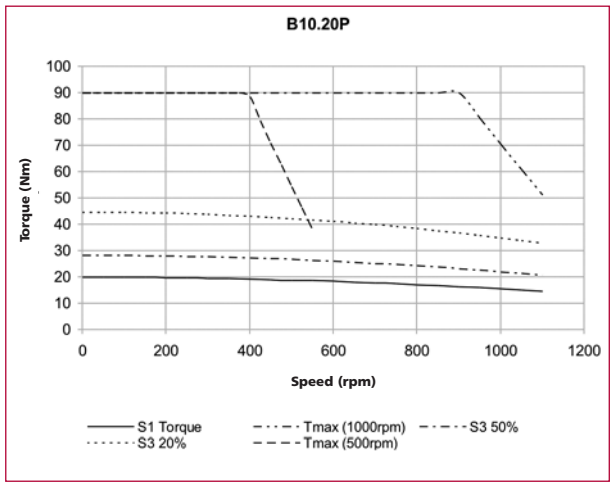
Type	Torque Nm	Lenght (L) mm
B10.10P	10.0	198.0
B10.20P	20.0	

TYPE B10P
sinusoidal 12 Poles voltage H (400 Volt)

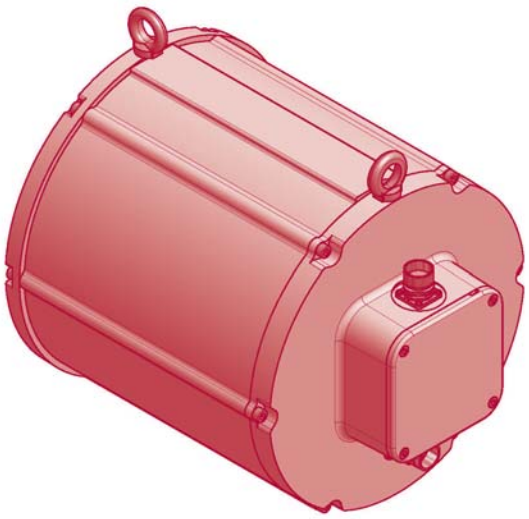
Type	Stall torque (Δt=105°C)	Rated speed	Output rated speed	Rated torque (Δt=105°C)	Peak torque	Maximum speed	Moment of inertia	Peak torque acceleration	Thermal time constant	Thermal protection threshold	Voltage constant	Torque constant	Resistance phase to phase (20°C)	Inductance phase to phase	B.E.M.F. at rated speed	Stall current	Rated current
	M_o Nm	n 1/min	P_n kW	M_n Nm	M_{pk} Nm	n_{max} rpm	J 10^{-4} Kgm²	a_{pk} rad/sec²	T_{th} min	ϑ_{max} °C	k_e Vs	k_t Nm/A	R_w Ω	L_w mH	E_n Vrms	I_o Arms	I_n Arms
500 min⁻¹ - Connection Y																	
B10.10P	10.0	500	0.49	9.6	45	1500	30	15000	40	140	5.60	9.67	24.6	190.0	293	1.03	0.99
B10.20P	20.0	500	0.98	19.0	90	1500	60	15000	40	140	5.60	9.67	12.0	95.0	293	2.06	1.96
1000 min⁻¹ - Connection Y																	
B10.10P	10.0	1000	0.82	8.0	45	1500	30	15000	40	140	2.80	4.85	6.15	47.5	293	2.06	1.65
B10.20P	20.0	1000	1.63	15.8	90	1500	60	15000	40	140	2.80	4.85	3.05	23.7	293	4.12	3.26

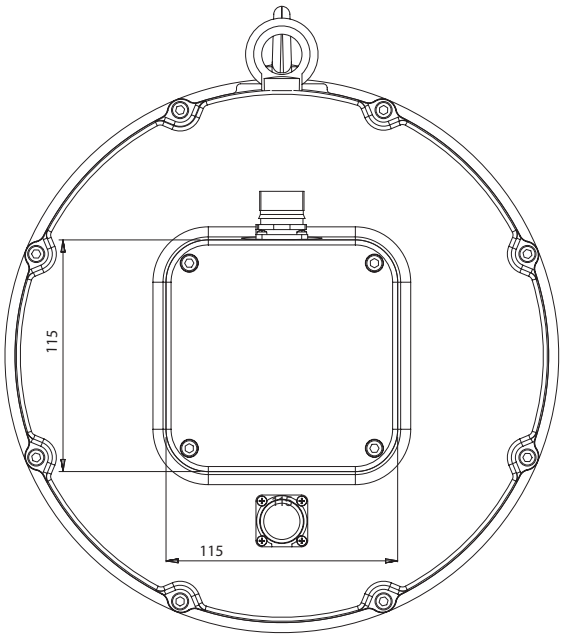
* The value of inertia is approximate, because it is deeply depending on the type of coupling choosen by the customer.
** The value of stall and nominal torque are approximate and depending on the type of coupling system choosen for the application.

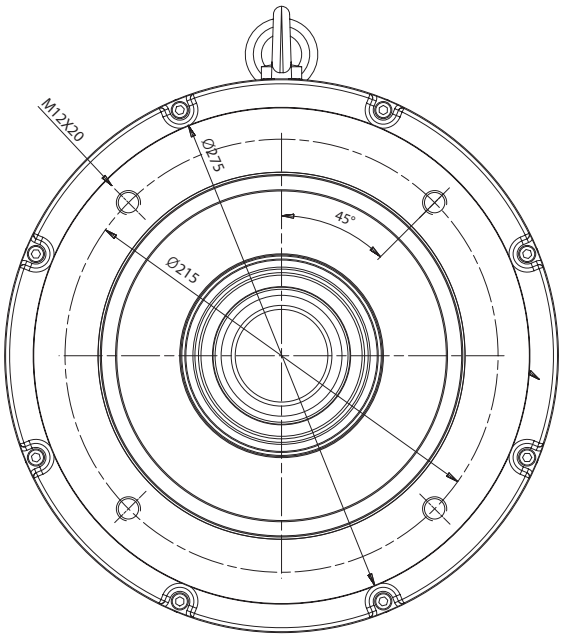




TYPE B16P
sinusoidal 24 Poles voltage H (400 Volt)







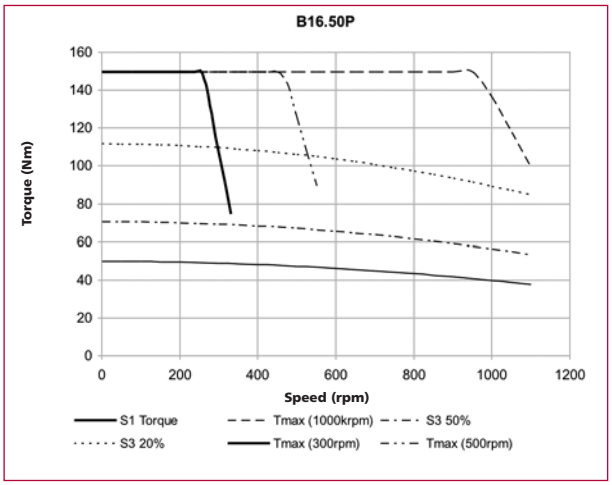
Mechanical Data

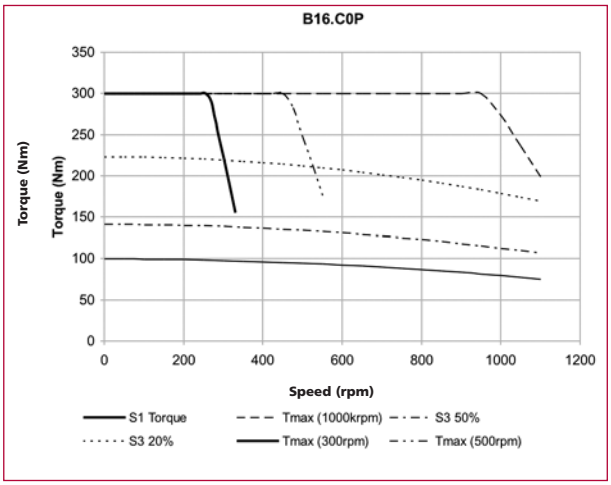
Type	Torque Nm	Lenght (L) mm
B16.50P	50.0	230.0
B16.C0P	100.0	280.0
B16.C5P	150.0	330.0
B16.B0P	200.0	380.0

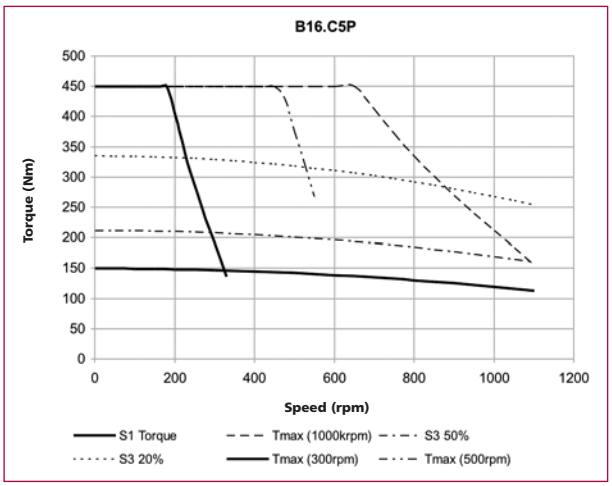
TYPE B16P
sinusoidal 24 Poles voltage H (400 Volt)

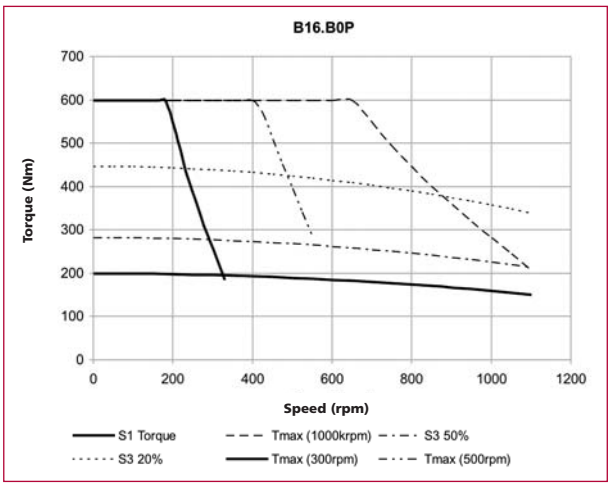
Type	Stall torque (Δt=105°C) M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
300 min^{-1} - Connection Y																	
B16.50P	50	300	1.5	48	150	2000	370	4054	50	140	9.50	16.45	7.6	79.8	298	3.0	2.9
B16.C0P	100	300	3.0	96	300	2000	730	4110	70	140	9.50	16.45	3.6	39.4	298	6.1	5.8
B16.C5P	150	300	4.5	143	450	2000	1050	4286	90	140	9.50	16.45	2.5	26.6	298	9.1	8.7
B16.B0P	200	300	5.9	189	600	2000	1400	4286	110	140	9.50	16.45	1.8	19.9	298	12.2	11.5
500 min^{-1} - Connection Y																	
B16.50P	50	500	2.4	46	150	2000	370	4054	50	140	5.70	9.87	2.6	28.2	298	5.1	4.7
B16.C0P	100	500	4.7	91	300	2000	730	4110	70	140	5.70	9.87	1.4	14.3	298	10.1	9.2
B16.C5P	150	500	7.1	136	450	2000	1050	4286	90	140	5.70	9.87	0.87	9.4	298	15.2	13.8
B16.B0P	200	500	9.5	181	600	2000	1400	4286	110	140	5.70	9.87	0.68	7.1	298	20.3	18.3
1000 min^{-1} - Connection Y																	
B16.50P	50	1000	4.2	41	150	2000	370	4054	50	140	2.85	4.94	0.68	7.1	298	10.1	8.3
B16.C0P	100	1000	8.4	81	300	2000	730	4110	70	140	2.85	4.94	0.34	3.6	298	20.3	16.4
B16.C5P	150	1000	12.6	121	450	2000	1050	4286	90	140	2.85	4.94	0.22	2.4	298	30.4	24.5
B16.B0P	200	1000	16.8	161	600	2000	1400	4286	110	140	2.85	4.94	0.16	1.8	298	40.5	32.6

* The value of inertia is approximate, because it is deeply depending on the type of coupling choosen by the customer.
** The value of stall and nominal torque are approximate and depending on the type of coupling system choosen for the application.

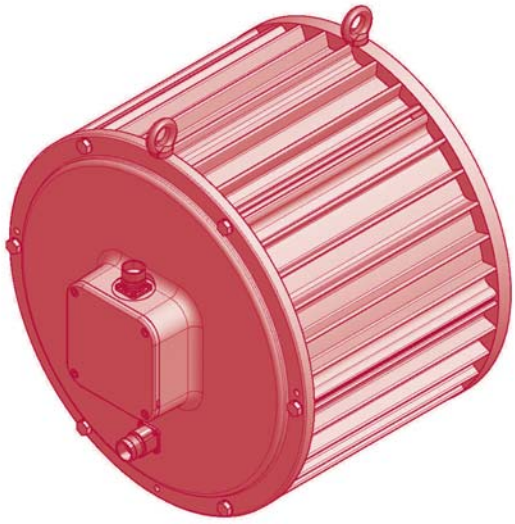


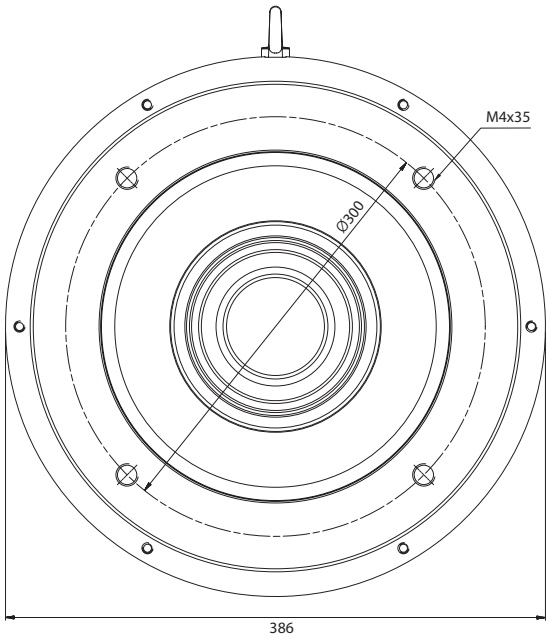


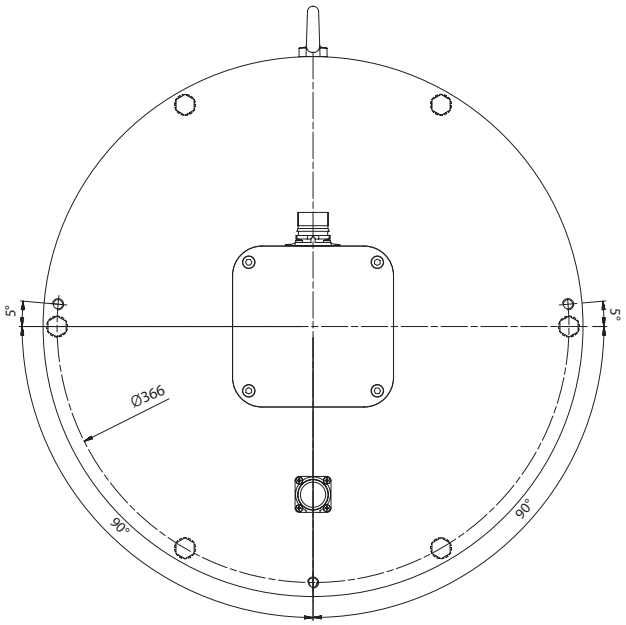




TYPE B18P
sinusoidal 30 Poles voltage H (400 Volt)







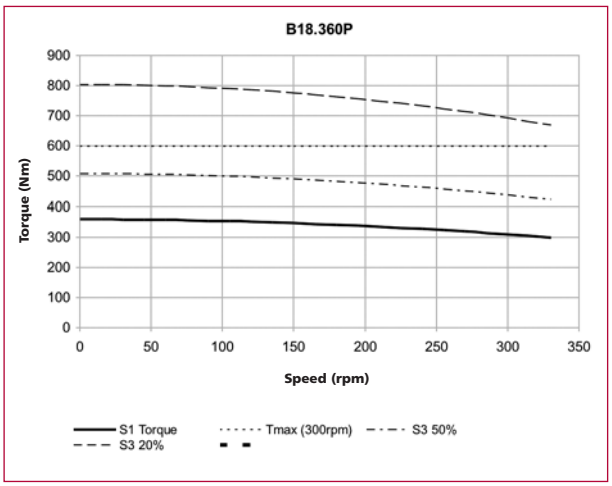
Mechanical Data

Type	Torque Nm	Lenght (L) mm
B18.360P	360.0	239.0

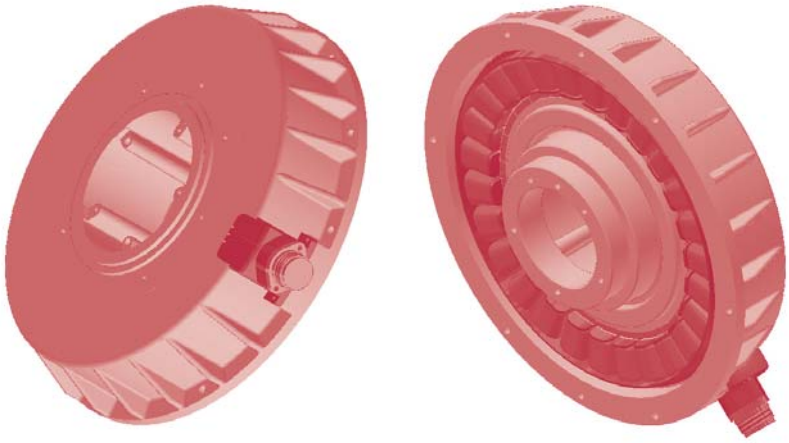
TYPE B18P
sinusoidal 30 Poles voltage H (400 Volt)

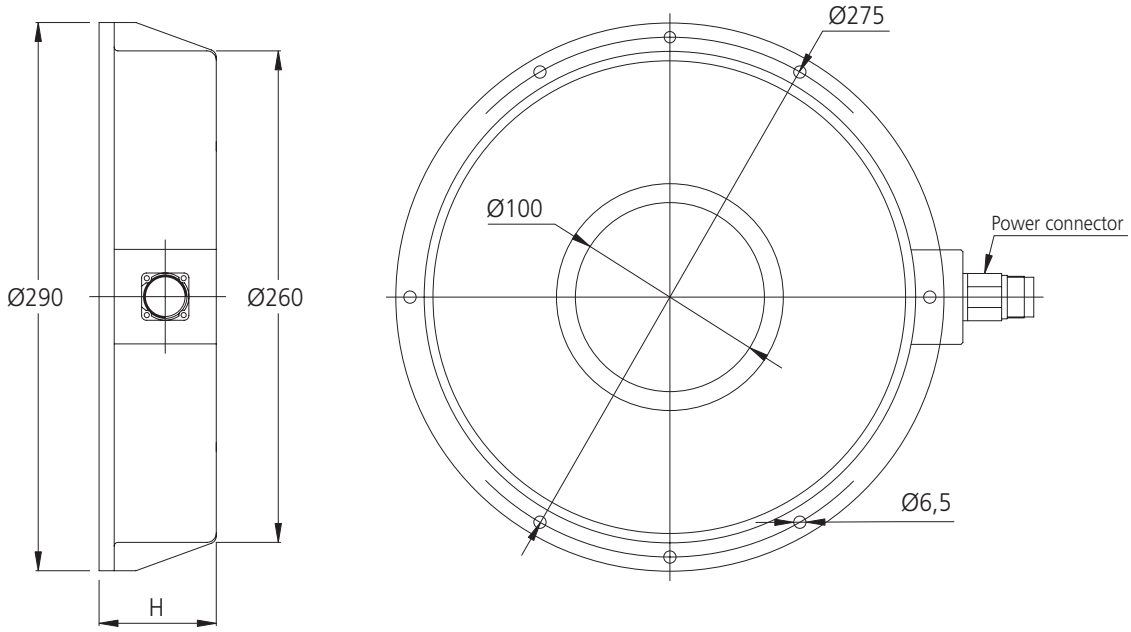
Type	Stall torque (Δt=105°C)	Rated speed	Output rated speed	Rated torque (Δt=105°C)	Peak torque	Maximum speed	Moment of inertia	Peak torque acceleration	Thermal time constant	Thermal protection threshold	Voltage constant	Torque constant	Resistance phase to phase (20°C)	Inductance phase to phase	B.E.M.F. at rated speed	Stall current	Rated current
	M_o Nm	n 1/min	P_n kW	M_n Nm	M_{pk} Nm	n_{max} rpm	J 10^{-4} Kgm²	a_{pk} rad/sec²	T_{th} min	ϑ_{max} °C	k_e Vs	k_t Nm/A	R_w Ω	L_w mH	E_n Vrms	I_o Arms	I_n Arms
300 min^{-1} - Connection Y																	
B18.360P	360	300	9.8	312	900	600	5200	1731	200	140	9.41	16.30	0.63	11.6	296	22.1	19.1

* The value of inertia is approximate, because it is deeply depending on the type of coupling choosen by the customer.
** The value of stall and nominal torque are approximate and depending on the type of coupling system choosen for the application.



TYPE F13L
sinusoidal 24 Poles voltage H (400 Volt)





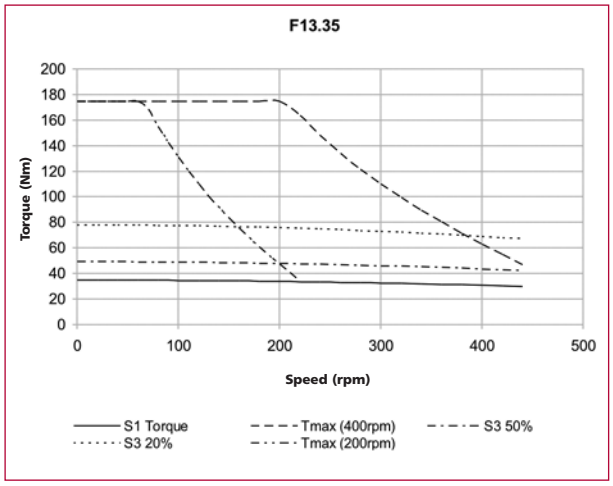
Mechanical Data

Type	Torque Nm	Height (H) mm
F13.35L	35.0	65.0

TYPE F13L
sinusoidal 24 Poles voltage H (400 Volt)

Type	Stall torque (Δt=105°C)** M_o Nm	Rated speed n 1/min	Output rated speed P_n kW	Rated torque (Δt=105°C) M_n Nm	Peak torque M_{pk} Nm	Maximum speed n_{max} rpm	Moment of inertia* J 10^{-4} Kgm²	Peak torque acceleration a_{pk} rad/sec²	Thermal time constant T_{th} min	Thermal protection threshold ϑ_{max} °C	Voltage constant k_e Vs	Torque constant k_t Nm/A	Resistance phase to phase (20°C) R_W Ω	Inductance phase to phase L_W mH	B.E.M.F. at rated speed E_n Vrms	Stall current I_o Arms	Rated current I_n Arms
200 min^{-1} - Connection Y																	
F13.35L	35.0	200	0.69	33.0	175	500	161	10897	35	140	15.60	27.00	50.00	145.0	327	1.3	1.2
400 min^{-1} - Connection Y																	
F13.35L	35.0	400	1.30	31.0	175	500	161	10897	35	140	7.80	13.50	12.50	103.8	327	2.6	2.3

* The value of inertia is approximate, because it is deeply depending on the type of coupling choosen by the customer.
** The value of stall and nominal torque are approximate and depending on the type of coupling system choosen for the application.



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