



en-GB

Synchronous motors with IE5+ energy efficiency

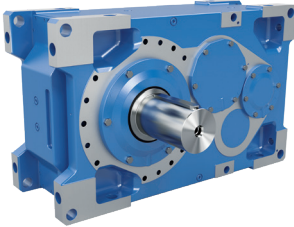
M5000



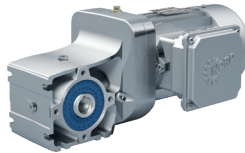
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NORD DRIVESYSTEMS Group



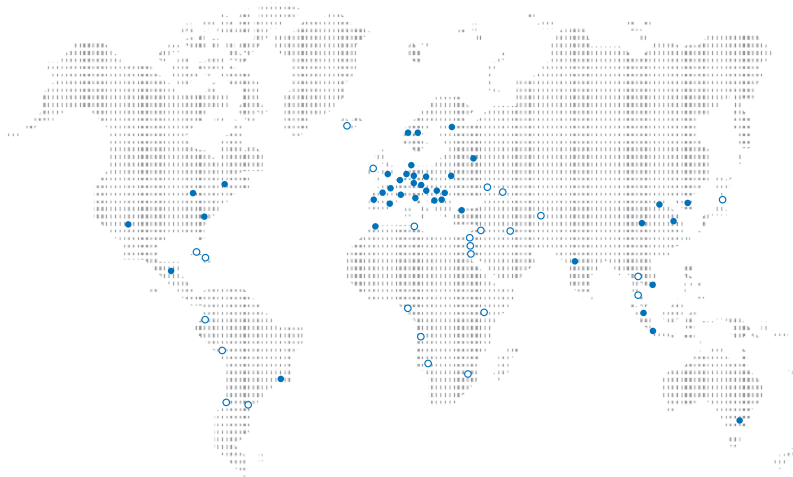
Industrial gear units



Geared motors



Frequency inverters and motor starters



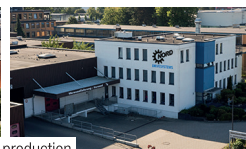
- ▶ Headquarters and technology centre in Bargteheide near Hamburg.
- ▶ Innovative drive solutions for more than 100 branches of industry.
- ▶ 7 production locations with cutting edge technology produce gear units, motors and drive electronics for complete drive systems from a single source.
- ▶ NORD has 48 subsidiaries in 36 countries and further sales partners in more than 50 countries, providing local stocks, assembly centres, technical support and customer service.
- ▶ More than 4,900 employees throughout the world create customised solutions.



Headquarters in Bargteheide



Gear unit production



Inverter production



Inverter production



Motor production



Production and assembly



Motor mounting

Synchronous motors with IE5+ energy efficiency

Highlights



NORD supplies IE5+ synchronous motors with outputs between 0,35 and 11 kW.

The motor achieves its high efficiency, over a wide torque range and is therefore ideally suited for economical operation in the partial load range.

The compact IE5+ motor offers a high power density with less installation space:

- ▶ Lower operating costs
 - thanks to highly efficiency synchronous motors with permanent magnet technology
- ▶ Simple and highly flexible combination
 - through full compatibility with the NORD modular system
- ▶ Simplified control of applications
 - thanks to almost constant motor speed

NXD tupH™

NORD eXtreme Duty surface protection systems, the housing parts individually receive a full surface conversion. For NXD BASIC a gear motor is built of converted parts and then a single layer of paint is applied. For NXD tupH the individual housing parts are further applied with a high-performance sealer and the gear unit is then built out of these parts. Available for smooth body aluminium gear units and motors. NXD tupH also available on smooth body decentral inverter NORDAC ON PURE.

NXD tupH™ is exceptionally chemical, corrosion and abrasion resistant. The converted surface becomes very scratchresistant as it becomes 6-7 times harder than the original aluminum alloy because of this process.

The new IE5+ motor generation for reducing operating costs:

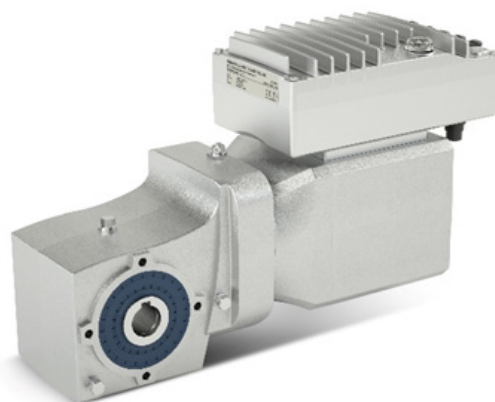
- ▶ Highest operational efficiency
- ▶ Reduced total cost of ownership (TCO) and fast return on investment (ROI)
- ▶ Variant reduction possible due to constant torque over a wide speed range
- ▶ TENV motor variants particularly easy to clean due to smooth and fanless motor design with high corrosion resistance in combination with NORD surface solutions
- ▶ Ideally coordinated system solution in the NORD modular system with frequency inverter, gearbox and motor
- ▶ Compact and hygienic design of the TENV motor variant for ultimate application versatility

Features:

- ▶ Permanent magnet synchronous motor (PMSM) of the latest generation
- ▶ Power range from 0,35 to 11 kW
- ▶ IEC B14 flange mounting, IEC B5 flange mounting, NEMA C-face flange attachment, direct attachment to all NORD gearboxes
- ▶ Speed range from 0 to 2.400 r/min
- ▶ Surface finish NXD tupH™ and protection class IP69K optional
- ▶ Encoder and mechanical brake optional



NORD IE5+ Synchronous motor



Bevel gear unit SK 93072.1
NORD IE5+ Synchronous motor

Further information can be found in:

Flyer S9012



Motor catalog
Asynchronous motors M7000



Catalog
Geared motors G5000



Application Guide - PMSM
Drive Optimization AG0101



Motor information

Norms and Standards

The NORD motors comply with the IEC 60034 series of standards and meet the other standards:

Norm	Synchronous Motors	Asynchronous Motors
IEC 60034-1, EN 60034-1	X	X
IEC 60034-2-1, EN 60034-2-1		X
IEC 60034-2-3, EN 60034-2-3	X	X
IEC 60034-5, EN 60034-5	X	X
IEC 60034-7, EN 60034-7	X	X
IEC 60034-8, EN 60034-8	X	X
IEC 60034-9, EN 60034-9	X	X
IEC 60034-11, EN 60034-11	X	X
IEC 60034-12, EN 60034-12		X
IEC 60034-14, EN 60034-14	X	X
IEC 60034-18-41, EN 60034-18-41	X	X
IEC 60034-30-1, EN 60034-30-1		X
IEC 60034-30-2, EN 60034-30-2	X	X
IEC 60072		X
EN 50347		X
NEMA MG1	X	X
UL 1004-1	X	X
UL 1004-6	X	
ABNT NBR 17094-1		X
CSA-C22.2 No. 100	X	X

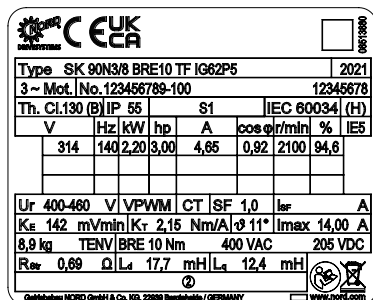
All motors run by frequency inverters are tested acc. to IEC 60034-25.

Type designation

Frame size: 71, 90, 112				
N = non ventilated (TENV)		F = fan cooled (TEFC)		
Package length 1..4		Code depends on length		
Number of poles		Options		
71	N/	1	/8	...

Nameplate

The following figure shows an exemplary type plate of the motor.



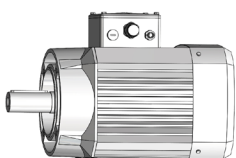
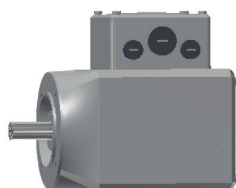
The nameplate shows efficiency class IE5, although the motor overachieves the defined IE5 efficiency values as per IEC 60034-30-2 as no higher efficiency class is yet defined in IEC 60034-30-2.

Designs accordings to DIN EN 60034-7

The same dimensions apply to the following designs:

- ▶ IM B5 = IM V1, IM V3
- ▶ IM THE B14 = IM THE V18, IM THE V19

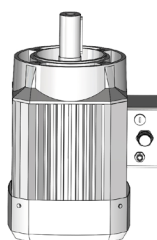
IM B5 / IM B14



IM V1 / IM V18



IM V3 / IM V19



The motors can be ordered in the basic design and operated according to the above installation (universal design).

- ▶ In the case of a condensation drainage hole (KB), the installation position must be specified.
- ▶ For design IM V1, IM V18 we recommend a drip proof fan cover (RD).
- ▶ For the options condensation drainage hole (KB) and drip proof fan cover (RD) please contact NORD.
- ▶ In the case of geared motors, the stamped installation position of the gearbox must be observed.



Universal design
Installation position
condensation drainage hole
with drip proof fan cover (RD)

Dimensions according to DIN EN 50347

Fits

D, DA	≤ 30	j6	▶ Keyways + keys according to DIN 6885/1
	> 30	k6	▶ Threaded holes DB + DC according to DIN 332/2
N	≤ 250	j6	▶ Assignment of power, shaft ends and flanges
	> 250	h6	▶ Parallelism shaft / foot surface; Concentricity of the shaft
H		-0,5	▶ Flat flange / shaft according to DIN EN 50347

Motor information

Terminal Box

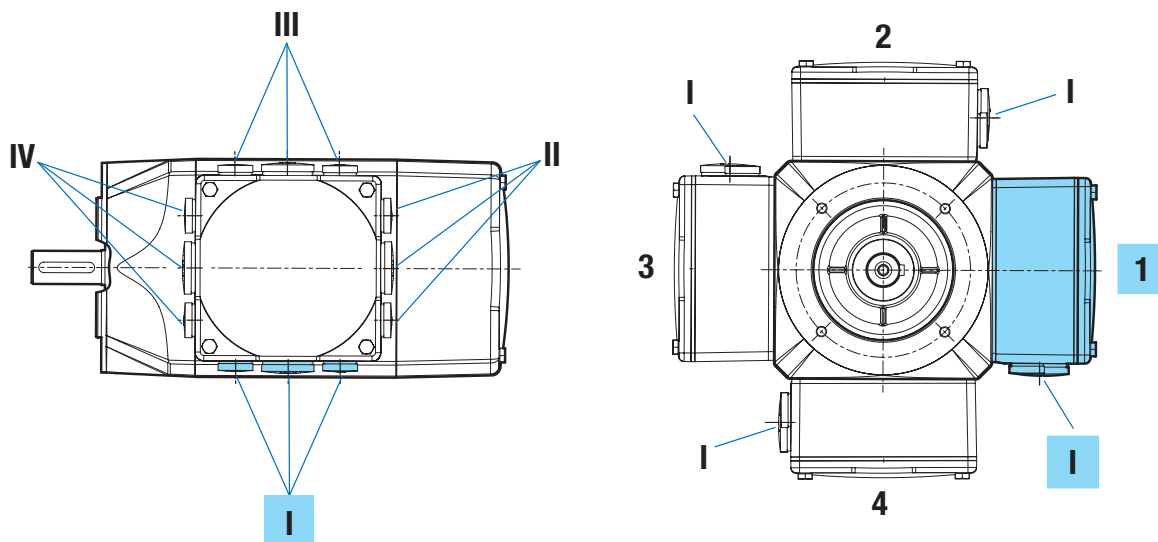
The motors are equipped with a square terminal box.

The position of the terminal box, as well as the position of the cable entry and motor connector, can be freely selected.

The position of the terminal box is indicated by Arabic numerals (1, 2, 3, 4) as viewed onto the motor shaft and the position of the cable entry and motor connector is indicated by Roman numerals (I, II, III, IV).

The standard configuration of the terminal box is

- ▶ terminal box position on 1
- ▶ cable entry location on I



Cable Plug

The terminal boxes are equipped with three metric threads.

The threads are plugged at delivery.

Motor type	Cable Entry
71N, 71F	1 x M25 x 1,5 2 x M16 x 1,5
90N, 90F	1 x M25 x 1,5 2 x M16 x 1,5
112F	1 x M32 x 1,5 2 x M16 x 1,5

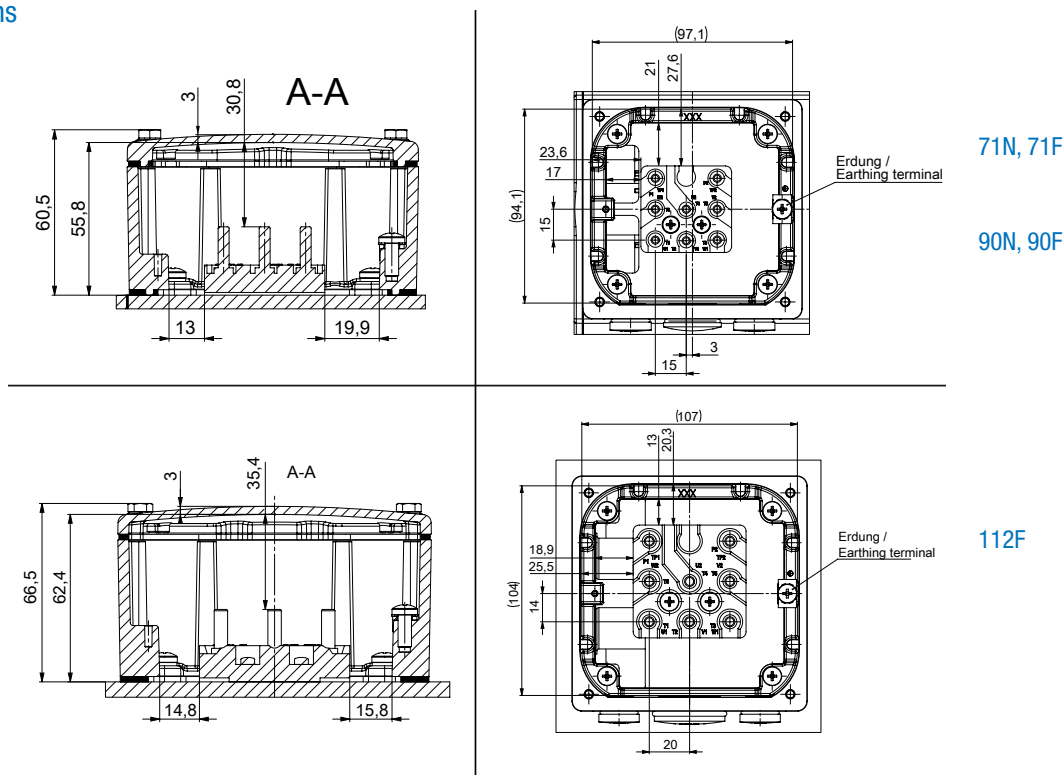
Terminal Board

The terminal board features 8 terminals for the connection of power and thermal protection.

Terminal sizes are:

Motor type	Terminal size
71N, 71F	M4
90N, 90F	M4
112F	M5

Dimensions



Operation modes

Compared to asynchronous motors, the operation of synchronous motors has the following relevant differences:

- ▶ **No mains operation**
NORD synchronous motors can only be operated on the frequency inverter.
- ▶ **Field weakening area**
NORD synchronous motors cannot be operated or can only be operated to a very limited extent in the field weakening range.
The permanent magnets in the rotor induce a voltage in the stator during rotation. The induced voltage is proportional to the motor speed and reduces the current-driving clamping voltage. This reduces the available motor torque. In addition, there is a risk, e.B. in the event of falling loads of a hoist, that high induced voltages will damage the frequency inverter due to high motor speeds.
- ▶ **Frequency inverter functions**
Certain frequency inverter functions such as DC braking are not available.

Operation on NORD frequency inverter

NORD IE5 motors can be operated with all frequency inverters of the following series.

- ▶ NORDAC ON+
- ▶ NORDAC FLEX
- ▶ NORDAC LINK
- ▶ NORDAC PRO

Some restrictions or boundary conditions must be observed. More information can be found in the E3000.

Sizing

The power of the frequency inverter may not exceed one power level greater than the nominal motor power.

Motor information

Control Types

Closed-loop operation

Closed-loop operation is possible with NORD frequency inverter series NORDAC PRO, NORDAC LINK, NORDAC ON and NORDAC FLEX. When configuring/assigning, observe the correct choice of encoder and the appropriate frequency inverter encoder interface.

Open-loop operation

Open-loop operation is possible with all NORD frequency inverters from the following firmware versions.

NORDAC	Devices	Open Loop Firmware
NORDAC	<i>ON+</i>	1.2R5
NORDAC	<i>FLEX</i>	2.3R0
NORDAC	<i>LINK</i>	1.4R0
NORDAC	<i>PRO</i>	
	SK5xxE	3.3R0
	SK54xE	2.5R0
	SK5xxP	1.3R3

Furthermore, the following boundary conditions apply to open-loop operation:

- ▶ the used motor torque shall not exceed the nominal torque of the motor at any time
- ▶ a ramp time of 0.6 seconds must not be undercut during acceleration or deceleration operations

Open-loop Injection operation

Open-loop Injection operation is a performance version for faster acceleration possible with some NORD frequency inverters from the following firmware versions.

NORDAC	Devices	Open Loop Firmware
NORDAC	<i>ON+</i>	1.3
NORDAC	<i>PRO</i>	
	SK5xxE	1.4

Furthermore, the following boundary conditions apply to open-loop injection operation:

- ▶ In the range 0-20% of the speed, the used motor torque shall not exceed 150% of the nominal torque of the motor. Subsequently, the used motor torque shall not exceed 200% of the nominal torque of the motor.
- ▶ A ramp time of 0.2 seconds must not be undercut during acceleration or deceleration operations
- valid for motors after identification of rotor position

Cooling Types

Overview of cooling types EN 60034-6

Designation	English short form	NORD motors types
IC410 without fan	TENV	71 Nx/8, 90 Nx/8
IC411 self-ventilated	TEFC	71 Fx/8, 90 Fx/8, 112 Fx/8

NORD IE5+ synchronous motors of sizes 71 and 90 are available in IC410 and IC411.

NORD IE5+ synchronous motors of size 112 is available in IC411 only.

Vibration

NORD synchronous motors are designed according to vibration level A according to DIN EN 60034-14.

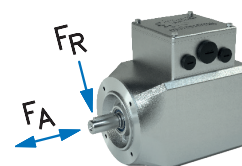
Radial- and Axial Forces

Permissible Radial and Axial Forces for IEC / NEMA Motors

The listed values are valid for a calculated bearing life of $L_h = 20.000h$ in 140 Hz operation with an 8-pole motor.

- ▶ F_R = permissible shear force at $F_A = 0$
- ▶ F_A = permissible axial force at $F_R = 0$

Motor type	F_R [N]	F_A [N]
71N, 71F	780	680
90N, 90F	1.100	1.000
112 F	1.800	1.800



Bearing and Shaft sealing

NORD motors have lifetime lubricated rolling bearings. The NDE bearing is designed as a fixed bearing.

- ▶ On the A and B sides, shaft seals without spring are used.
- ▶ For direct attachment to the gearboxes, oil-tight motors with different flanges are available.

⇒  Operating and Maintenance Instructions B5000.

Protection classes according to DIN EN 60034-5

Protection against touching moving and live parts as well as against the ingress of solid foreign bodies, dust and water.

The degree of protection is indicated by the letters IP (International Protection) and two codes. (e.g. IP55).

Reference number 1	Abstract	Explanation
5	Protection against contact, foreign objects, dust	Complete contact protection, dust can not penetrate in harmful amount.
6	Protection against contact, foreign objects, dust	Complete contact protection. Dust cannot penetrate.
Reference number 2	Abstract	Explanation
5	Protection against water	Protection against water jets from all directions. Water cannot penetrate in harmful quantities.
6	Protection against water	Protection against heavy seas and strong water jets from all directions. Water cannot penetrate in harmful quantities.
9K	Protection against water	Protected against water ingress from any direction, even under significantly increased pressure against the housing from 80–100 bar steam jet high-pressure cleaners.

Motor information

Noise Emission

L_{PA} Sound pressure level

L_s Meas. surface dimension

L_{WA} Sound power level

The sound pressure level L_{PA} is measured according to DIN EN ISO 3745/44 in the anechoic space at idle of the test object. The measuring surface dimension L_s [dB] is calculated from the geometric dimensions of the test object.

By adding the measuring surface dimension to the sound pressure level, the sound power level L_{WA} is determined.

Motor	L_{PA} [dba]	Motor	L_{PA} [dba]
71 N1/8	52	71 F1/8	55
71 N2/8	52	71 F2/8	55
71 N3/8	52	71 F3/8	55
		71 F4/8	55
90 N1/8	56	90 F1/8	57
90 N2/8	56	90 F2/8	57
90 N3/8	56	90 F3/8	57
		90 F4/8	57
		112 F1/8	64
		112 F2/8	63
		112 F3/8	66
		112 F4/8	66

Winding and Surface Temperature

The winding and surface temperatures in persistence are shown in the following table.

In the event of deviating operating conditions (e.g., load behavior, ambient conditions), the temperature behavior of the motors may differ.

Motor	Winding ΔT [K]	Surface ΔT [K]	Motor	Winding ΔT [K]	Surface ΔT [K]
71 N1/8	39	28	71 F1/8	27	12
71 N2/8	46	37	71 F2/8	28	15
71 N3/8	59	47	71 F3/8	31	16
			71 F4/8	42	20
90 N1/8	44	29	90 F1/8	25	10
90 N2/8	53	37	90 F2/8	26	10
90 N3/8	58	45	90 F3/8	33	13
			90 F4/8	37	18
			112 F1/8	55	33
			112 F2/8	57	34
			112 F3/8	58	36
			112 F4/8	60	38

Special environmental conditions

The windings of the NORD IE5 motors are designed with insulation class 130 (B). With cooling air temperatures of up to 40°C and installation altitudes of up to 1000 m, the maximum permissible temperature increase is 90 K.

The highest permissible winding temperature is 130° C. The integrated temperature protection is dimensioned accordingly.

At cooling temperatures of < -20°C or > 40°C, technical modifications to the motor may be necessary. The type of modification is chosen according to the application.

Heat class 130 (B)

Ambient temperature
< -20°C or > 40°C

Certifications and Approvals

- ▶ NORD motors may be used in every country globally.
- ▶ Local laws, regulations and individual requirements for market access may be considered.
- ▶ NORD provides an overview of the global regulations on: <https://info.nord.com/efficiency-regulations-motors>

NORD IE5+ synchronous motors comply with or are certified:

Europe (EU), Switzerland, Turkey	CE	
United Kingdom	UKCA	
Ukraine	UA TR	
Morocco	CMIM	
USA	UL	
Canada	CSA	
China	CCC & CEL	

Motor options

Motor Options

Abbreviation	Description	TEFC	TENV
TF	Temperature sensors, PTCs	X	X
IP66	Protection class IP66	X	X
IP69K	Protection class IP69K		X
ICP	Internal Corrosion Protection	X	X
BRE	Holding brake	X	X
BRE HL	Holding brake with hand release lever	X	
BRE FHL	Holding brake with hand release lever lockable	X	
MS	Motor connector MS31, MS32, MS21, MSR, MS41, MS42	X	X
NXD tupH™	NXD tupH™ sealed surface conversion system		X
IGxxP	Incremental encoder with plug 5- or 8-pin IG6P5, IG61P8, IG62P5, IG62P8	X	X
FKM	Shaft seal in FKM design	X	X
MGZ	Magnetic encoder with zero track	X	
AG	Absolute encoder AG8, AG9	X	

Thermal Motor Protection (TF)

A sensible motor selection protects the motor from overheating due to the application or the ambient conditions. Factors that can lead to overheating of the motor are e.g..

- ▶ Overload
- ▶ high ambient temperatures
- ▶ a limited cooling air supply
- ▶ low motor speed because of inverter operation

NORD IE5+ motors are equipped with thermal motor protection.

TF = PTC thermistor

Response temperature

These are used for the direct monitoring of the winding temperatures when the motor power is fully utilized.

3 TF temperature sensors (one per strand) connected in series are located at the warmest points of the windings. Their connections are guided to 2 terminals in the terminal box.

When the nominal response temperature (NAT) is reached, the temperature sensor increases its resistance value by leaps and bounds to almost 10 times.

- ▶ Response temperature: 135°C voltage max. 30 V terminals TP1 + TP2



The PTC temperature sensor fulfils its protective function only connected to a tripping device! A tripping device evaluates the increase in resistance and switches off the drive.

Encoders

Incremental Encoders IG / MG

Modern drive applications often require speed feedback. For this purpose, incremental encoders are usually used, which convert the rotational movement into electrical signals as measured value transducers.

These signals are read and processed by frequency inverter or other control devices. The incremental encoder of the IE5+ motor works according to a magnetic principle. The encoder consists of two components, the magnetic wheel, which sits on the motor shaft and the sensor board.

The integrated electronics convert the measurement signals into a digitized rectangular signal according to TTL or HTL logic.

In combination with NORD frequency inverters, the following requirements can be met:

- ▶ Speed control with large adjustment range
- ▶ High speed accuracy, load-independent
- ▶ Synchronization controls
- ▶ Positioning controls
- ▶ Standstill torques
- ▶ High overload reserves

Type	Version	Supply voltage	Resolution	Connection
IG6P5	RS485	10... 30 V DC	Digital output of position and speed	M12 5-pin
IG61P5	TTL	10... 30 V DC	2048 ppr	M12 5-pin
IG61P8	TTL	10... 30 V DC	2048 ppr	M12 8-pin
IG62P5	HTL	10... 30 V DC	2048 ppr	M12 5-pin
IG62P8	HTL	10... 30 V DC	2048 ppr	M12 8-pin
MGZ	HTL	8... 35 V DC	1024 ppr	Cable
MGZN	HTL	8... 35 V DC	1024 ppr	M12 / 5-pin

Motor options

Attachment of Incremental Encoders IG

The incremental encoder is fully integrated into the motor housing and is possible with all variants of the IE5+ motor. The motor-integrated installation completely protects the encoder system from external influences.

The electrical connection is made via a flange plug in the terminal box of the motor. Depending on the encoder variant, plugs with 5 connections or 8 connections are available. The appropriate signal cable can be supplied on request.

In case of a motor mounted frequency inverter the incremental encoder is not equipped with a plug but are connected directly to the frequency inverter.

Connection IG

Signal	IG6P5		IG62P5		IG61P8, IG62P8	
	Pin	Color strands	Pin	Color strands	Pin	Color strands
0V	3	blue	3	blue	1	white
+V	1	brown	1	brown	2	brown
A+			4	black	3	green
A\					4	yellow
B+			2	white	5	grey
B\					6	pink
N+			5	grey	7	blue
N\					8	red
RS485A	2	white				
RS485B	4	black				

Attachment of Magnetic incremental encoder with zero setting MGZ

The magnetic screw is located under the cover of the motor, while the sensor is screwed against it from the outside.

The magnetic encoder is available in two versions.

- Option MGZ is equipped with a 1 m connection cable with open leads.
- Option MGZN is equipped with a M12 plug connector.

Connection MGZ

Signal	MGZN Pin	MGZ Color strands
GND	3	black
U_b	1	red
Channel A	4	brown
Channel B	2	orange
Channel Z	5	green

Absolute Encoders AG

Absolute encoders are encoders for rotational movements, which output absolute position information in the range of a revolution of the motor (360°, Singleturn) or additionally, the number of rotations with reference to a zero point (Multiturn). Typical values are 8192 (13Bit) steps per rotation and with Multiturn, additionally 4096 (12Bit) distinguishable rotations.

Singleturn encoders are mounted on the output side of the system (typically: turntables) whereas Multiturn encoders are mounted on the output side of the gear unit or directly on the motor.

With absolute encoders the rotations are measured either entirely electromagnetically or mechanically by means of small gear stages which reduce the speed of additional bar code discs.

The position information is always up to date, even in case of changes of position when no voltage is present, and in the case of lost or impaired pulses.

Absolute encoders cannot be used for speed control (with NORDAC inverters). However, combined encoders with absolute and additional incremental encoder signals are available. Absolute encoders with various data protocols, e.g. DDI, CANopen or Profibus, are available. The selection depends on the evaluation electronics.

The following absolute value encoders are available serially for NORD IE5+ motors.

	AG8 Absolute Encoder with TTL	AG9 Absolute Encoder with HTL
Frequency Inverter	SK 53xE, SK 54xE, SK 530P, SK 550P	SK 2xxE, SK 5xxP
Singleturn resolution	8192 (13 Bit)	8192 (13 Bit)
Multiturn resolution	65536 (16 Bit)	65536 (16 Bit)
Interface	CANopen Profile DS406 V3.2	CANopen Profile DS406 V3.2
CAN address	33	33
Baud rate	250k	250k
Bus cover	-	-
Incremental encoder output	TTL / RS422	HTL
Pulses [ppr]	2048	2048
Power supply	10 – 30 VDC	10 – 30 VDC
Max. speed [r/min]	6000	6000
Referencing	CANopen	CANopen
Scanning method	optical	Optical
Shaft design	12 mm hollow shaft, through	12 mm hollow shaft, through
Electrical connection	Cable 1,5 m	Cable 1,5 m
Temperature range	-40°C to +80°C	-40°C to +80°C
IP class	IP 66	IP 66
Max. current [mA]	100	100
IP class	IP 66	IP 66
Max. current [mA]	100	100

Attachment of Absolute Encoders AG

The absolute encoder is located underneath the fan cover. It is assembled behind the fan. The connection cable is leg out of the fan cover.

Connection AG

Signal	Color strands	Signal	Color strands
0V (GND)	white-green	Address1	white
+ V	brown-green	Address2	yellow
CAN_L	black	Address3	blue
CAN_H	Red	Term.	violett
A	brown		
A-	green		
B	grey		
B-	pink		

Motor options

Motor connectors MS

The IE5+ motors can also be supplied with motor connectors on request. The following motor connectors are available as standard:

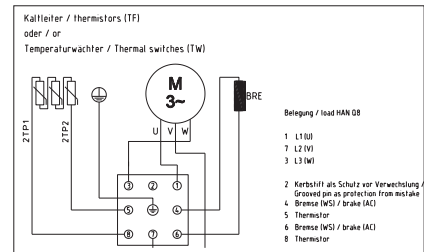
- ▶ Motor plug MS21 (HAN Q8)
- ▶ Motor plug MS31 / MS32 (HAN 10E)
- ▶ Motor plug MS41 / MS42 (HAN C modular)
- ▶ Motor plug MSR / MSR VA

The motor connectors are delivered without a mating plug and protected against dirt with a protective cap. The matching mating plugs are also available on request.

Motor connector MS21



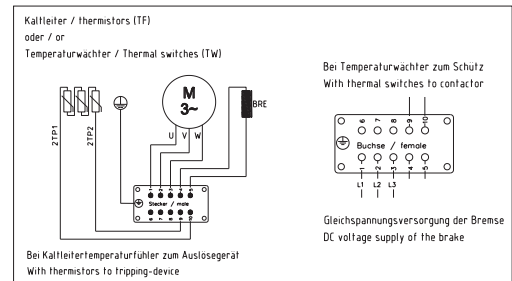
Plug: HAN Q8
 Number of contacts: 8-pin
 Current: 16 A max.
 Voltage: 500 V max. (600 V max. according to UL/CSA)
 Cage tension spring connection



Motor connector MS31 / 32 / 31E / 32E



Plug: HAN 10 ES/HAN ESS
 Number of contacts: 10-pin
 Current: 16 A max.
 Voltage: 500 V max. (600 V max. according to UL/CSA)
 Cage tension spring connection



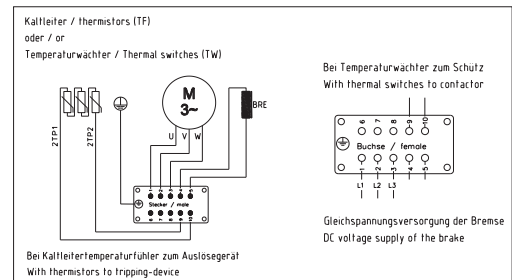
with EMC-protection

The MS31E and MS32E motor connectors are each suitable for applications with increased electromagnetic compatibility (EMC protection).

Motor connector MS41 / 42



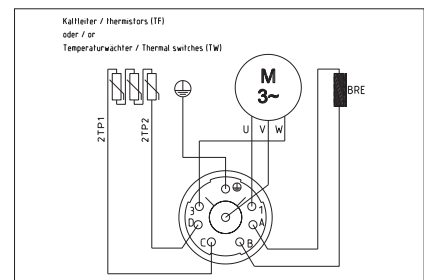
Plug: HAN C-Modular
 Number of contacts: 9-pin
 Current: 22 A max.
 Voltage: 690 V max. (600 V max. according to UL/CSA)
 Cage tension spring connection



Motor connector MSR / MSR VA



Plug: M20 x 1,5 motor screw-in thread with M25 x 1,5 connection thread
 Number of contacts: 8-pin (4 + 3+ PE)
 Current: 28 A max.
 Voltage: 600 V max.
 Cage tension spring connection



VA-version

Optionally available in stainless steel (VA) version.

Motor connector Assignment

Motor	MS21	MS31 / MS32	MS41 / MS42	MSR
71N1/8	X	X		x
71N2/8	X	X		X
71N3/8	X	X		X
90N1/8	X	X		X
90N2/8	X	X		X
90N3/8	X	X		X
71F1/8	X	X		X
71F2/8	X	X		X
71F3/8	X	X		X
71F4/8	X	X		X
90F1/8	X	X		X
90F2/8	X	X		X
90F3/8	X	X		X
90F4/8	X	X		X
112 F1/8	X	X	X	X
112 F2/8	X	X	X	X
112 F3/8	X	X	X	X
112 F4/8			X	X

Motor options

Brake (BRE)

Brake Assignment

Motor	BRE 2,5 [Nm]	BRE 5 [Nm]	BRE 7.5 [Nm]	BRE 10 [Nm]	BRE 20 [Nm]		BRE 25 [Nm]	BRE 35 [Nm]	BRE 50 [Nm]
71N1/8	X	*							
71N2/8		X							
71N3/8		X							
90N1/8				X	*				
90N2/8				X	*				
90N3/8				X	*				
71F1/8	X	*	*						
71F2/8		X	*						
71F3/8			X						
71F4/8									
90F1/8				X	*				
90F2/8				X	*				
90F3/8					X				
90F4/8					X				
112 F1/8						X	*	*	
112 F2/8							X	*	
112 F3/8								X	
112 F4/8									X
Weight [kg]	2	2	2	3,5	3,5	3,8	3,8	3,8	5,6
J [10 ⁻³ kgm ²]	0,015	0,015	0,015	0,045	0,045	0,173	0,173	0,173	0,173

* alternative

Characteristics of the Brake

Property	Value	Remark
Maximum speed	6000 r/min	
Friction work per emergency stop	3000 J	then regeneration by simple braking
Switching frequency at 1500 J	100 circuits/ h	then maximum friction is reduced
Protection class	IP20 IP66	TENV version (brake is enclosed) TEFC version
Control via PWM	possible	
Connection voltage	24 VDC, 180 VDC, 205 VDC	
Hand Release	HL	TEFC Version only

Brake Control

To control the brakes, a frequency inverter with a corresponding rectifier is required.

A rectifier integrated in the terminal box of the motor is not available on the IE5+ motors. Alternatively, a rectifier can be used in the control cabinet. With the SK EBGR-1, NORD offers a rectifier.

Further technical information on the rectifier can be found on the NORD homepage.

Brake selection

The selection of a standard combination motor brake according to the above overview must be ensured by careful project planning! The braking torque must be determined according to the requirements of the application.

The design of the drives is based, among other things, on the torque requirement of the application as well as on the motor side torque. If necessary, the braking torque must be significantly reduced so that the gearbox is not overloaded when braking large moving masses.



**Braking torque
determine**

Holding brake • Working brake • Emergency stop brake

A distinction between „holding brake“, „working brake“ and „emergency stop brake“ arises from the type of application.

A holding brake has the task of preventing a drive train from moving at a standstill or in an almost stationary state.

As soon as a brake must do significant friction work, it is considered a working brake. The respective friction as well as the switching frequency must be determined and taken into account when selecting the brake.

For the emergency stop function of a brake, very large masses must be braked once, and the brake is loaded with correspondingly large energies.

In this case, the brake must be selected according to the maximum permissible friction per braking.

Holding brake

Working brake

Emergency stop brake

Application-related examples of holding brakes and working brakes

The acceleration and deceleration of the application is controlled by a frequency inverter and only when the application comes to a standstill does the mechanical spring brake fall in.

The brake is therefore only used to „hold“ the application (parking position) and does not perform any friction work, consequently no conditioning of the friction surfaces. Friction work is only implemented in the event of an emergency stop or power failure.

The gear motor is controlled by a frequency inverter. To delay the application, the mechanical spring-loaded brake must apply a braking torque and thus performs friction work.

The continuous friction work ensures conditioning of the friction pairings. Care must be taken to ensure that the resulting frictional heat is dissipated efficiently. The mechanical brake is also used to „hold“ the application (parking position).

Holding brake

- Parking position

Working brake

- Parkposition

Motor data IE5+

Motor data 400V

Motor size	M _N	P _N	P _N	n _N	I 400V	I _{max} 400V	η	J	m	M _{max}	k _T	k _E
	[Nm]	[kW]	[hp]	[r/min]	[A]	[A]	[%]	[kgm ²]	[kg]	[Nm]	[Nm/A]	[mV/r/min]
71 N1/8	1,6	0,35	0,46	2.100	0,76	1,52	89,1	0,00019	4,90	3,20	2,11	143
71 N2/8	3,2	0,70	0,95	2.100	1,45	2,90	92,5	0,00038	6,00	6,40	2,21	144
71 N3/8	4,8	1,05	1,40	2.100	2,14	4,28	93,6	0,00057	7,00	9,60	2,24	144
90 N1/8	5,0	1,10	1,50	2.100	2,10	4,20	94,0	0,00090	10,00	10,00	2,38	145
90 N2/8	6,8	1,50	2,00	2.100	3,01	6,02	94,0	0,00110	10,80	13,64	2,27	145
90 N3/8	10,0	2,20	3,00	2.100	4,35	8,70	94,6	0,00176	13,20	20,00	2,30	142
71 F1/8	2,0	0,50	0,67	2.400	1,12	2,23	89,1	0,00019	7,00	4,00	1,79	125
71 F2/8	4,0	1,00	1,35	2.400	2,11	4,22	92,5	0,00038	7,50	8,00	1,90	129
71 F3/8	6,0	1,50	2,00	2.400	3,07	6,15	93,2	0,00057	8,00	12,00	1,95	127
71 F4/8	8,8	2,20	3,00	2.400	4,67	9,34	94,4	0,00081	9,50	17,60	1,88	127
90 F1/8	6,0	1,50	2,00	2.400	2,95	5,90	94,0	0,00090	10,00	12,00	2,03	130
90 F2/8	8,8	2,20	3,00	2.400	4,29	8,59	94,2	0,00132	10,80	17,60	2,05	129
90 F3/8	11,9	3,00	4,00	2.400	5,72	11,44	95,2	0,00176	13,80	23,80	2,08	127
90 F4/8	14,7	3,70	5,00	2.400	7,26	14,52	95,3	0,00220	15,60	29,40	2,02	136
112 F1/8	15,9	4,00	5,40	2.400	7,77	15,60	93,4	0,00412	26,12	31,80	2,05	129
112 F2/8	21,9	5,50	7,50	2.400	10,30	20,70	95,0	0,00578	32,44	43,80	2,12	131
112 F3/8	29,8	7,50	10,00	2.400	14,10	28,20	94,8	0,00796	37,83	59,70	2,12	133
112 F4/8	43,8	11,00	15,00	2.400	20,30	40,60	95,8	0,01118	46,73	87,50	2,16	135

Motor data 230V

Motor size	M_N	P_N	P_N	n_N	I 230V	I_{max} 230V	η	J	m	M_{max}	k_T	k_E
	[Nm]	[kW]	[hp]	[r/min]	[A]	[A]	[%]	[kgm ²]	[kg]	[Nm]	[Nm/A]	[mV/r/min]
71 N1/8	1,6	0,35	0,46	2.100	1,45	2,90	89,90	0,00019	4,90	3,20	1,10	89
71 N2/8	3,2	0,70	0,95	2.100	2,70	5,41	92,90	0,00038	6,00	6,40	1,18	86
71 N3/8	4,8	1,05	1,40	2.100	4,03	8,07	93,50	0,00057	7,00	9,60	1,19	87
90 N1/8	5,0	1,10	1,50	2.100	4,12	8,24	94,00	0,00090	10,00	10,00	1,21	87
90 N2/8	6,8	1,50	2,00	2.100	5,20	10,40	94,00	0,00110	10,80	13,60	1,31	88
90 N3/8	10,0	2,20	3,00	2.100	7,54	15,10	93,10	0,00176	13,20	20,00	1,33	86
71 F1/8	2,0	0,50	0,67	2.400	1,88	3,75	88,50	0,00019	7,00	4,00	1,07	76
71 F2/8	4,0	1,00	1,35	2.400	3,54	7,09	92,10	0,00038	7,50	8,00	1,13	77
71 F3/8	6,0	1,50	2,00	2.400	5,15	10,31	92,80	0,00057	8,00	12,00	1,16	76
71 F4/8	8,8	2,20	3,00	2.400	7,78	15,57	93,90	0,00081	9,50	17,60	1,13	77
90 F1/8	6,0	1,50	2,00	2.400	4,87	9,74	92,50	0,00090	10,00	12,00	1,23	76
90 F2/8	8,8	2,20	3,00	2.400	7,24	14,48	92,80	0,00132	10,80	17,60	1,22	77
90 F3/8	11,9	3,00	4,00	2.400	9,42	18,85	93,60	0,00176	13,80	23,80	1,26	77
90 F4/8	14,7	3,70	5,00	2.400	12,38	24,77	94,20	0,00220	15,60	29,40	1,19	78

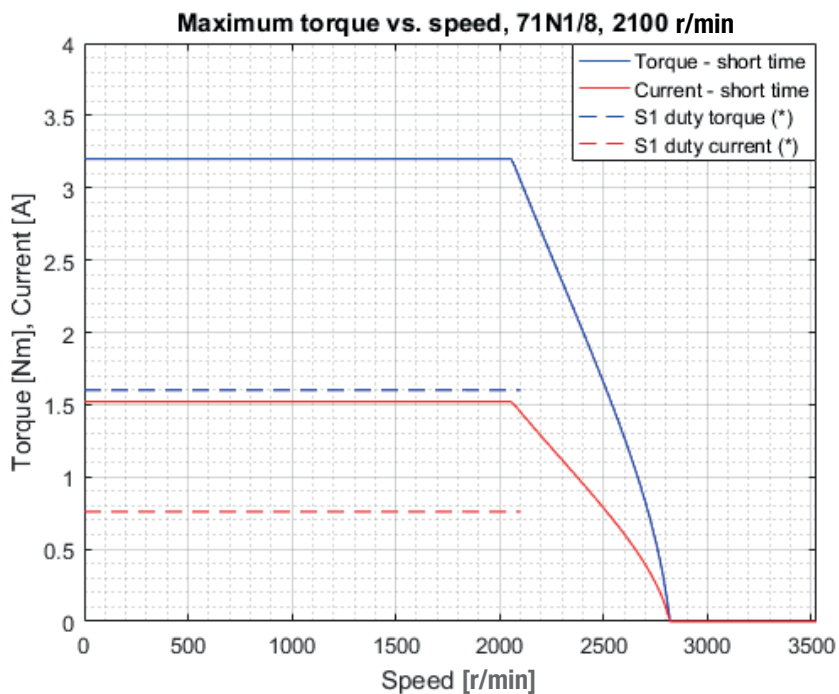
Holding torque

Motor	M_0/M_N
71 N1/8	0,90
71 Fx/8	0,65
90 Nx/8	0,85
90 Fx/8	0,60
112 Fx/8	0,65

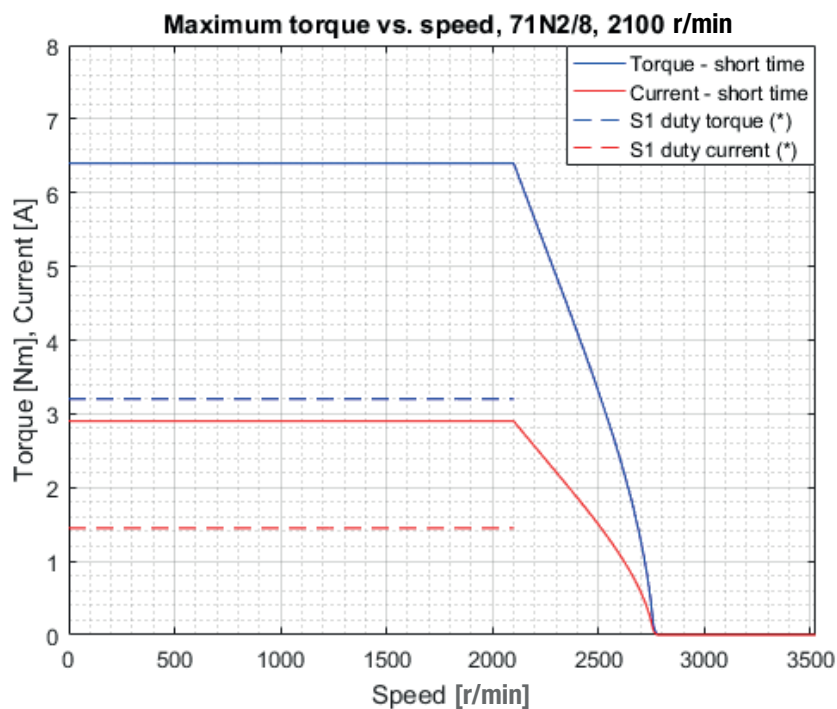
The holding torque is permanently available.

Motor characteristics

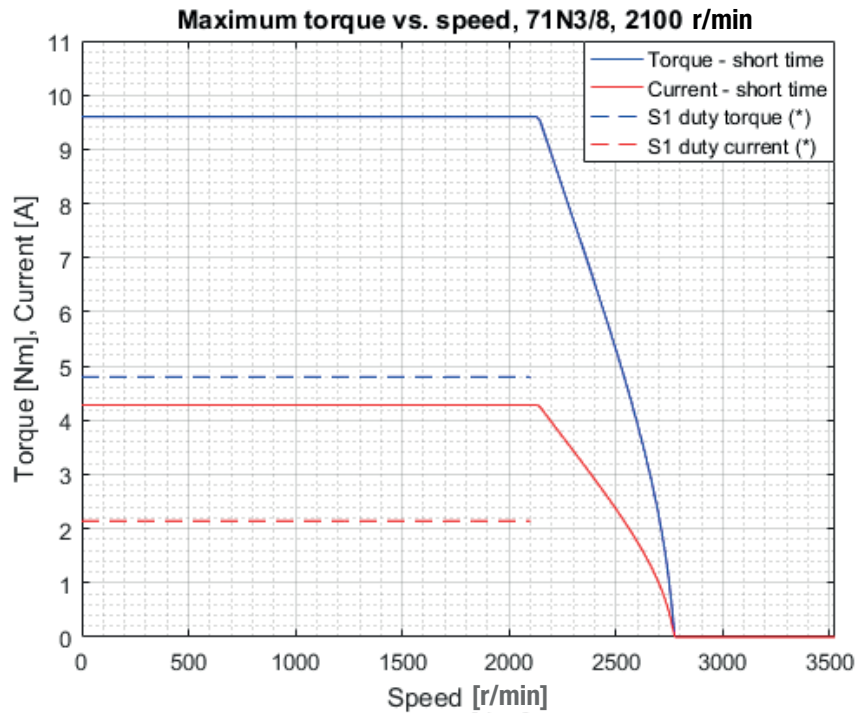
71 N1/8 400V



71 N2/8 400V

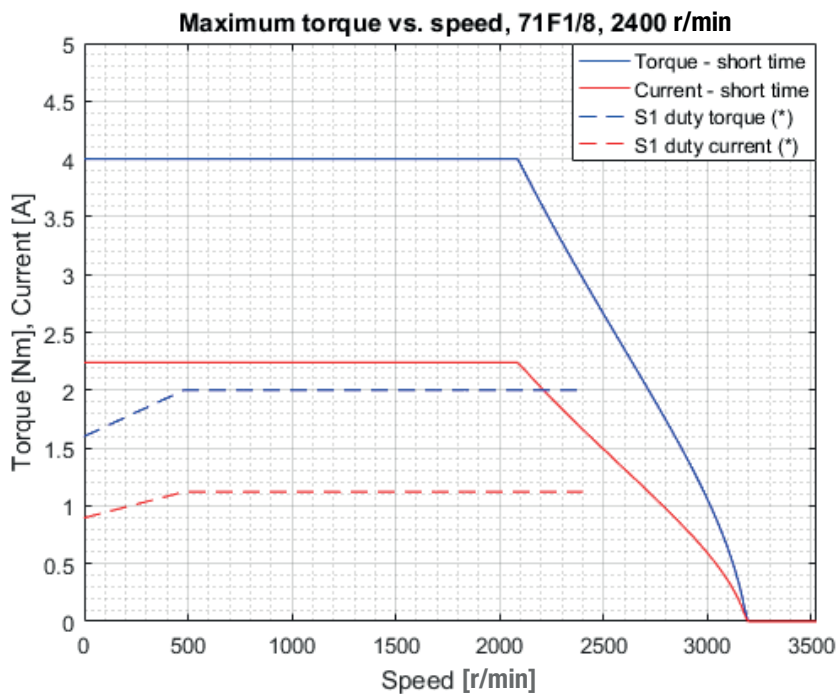


71 N3/8 400V

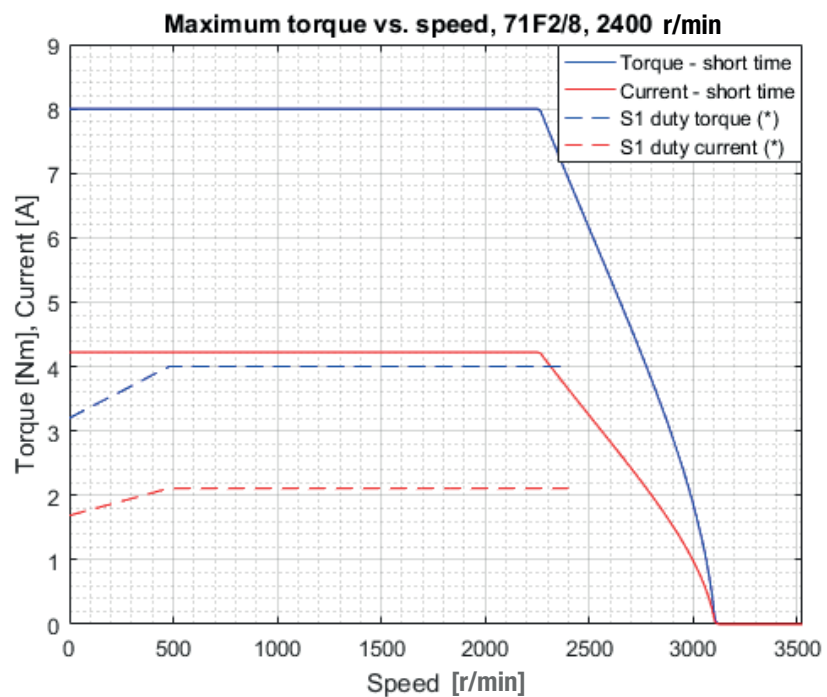


Motor characteristics

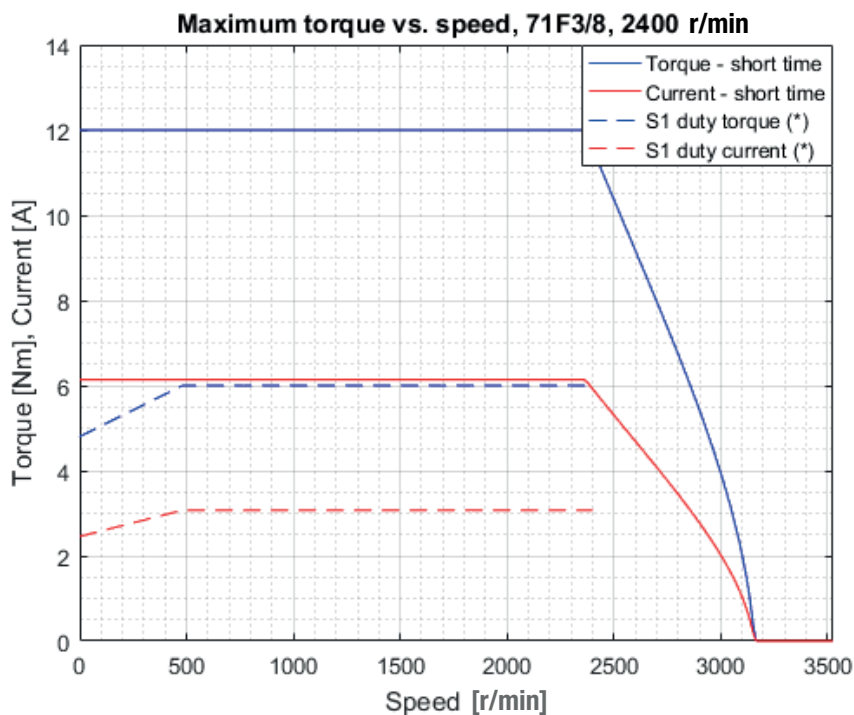
71 F1/8 400V



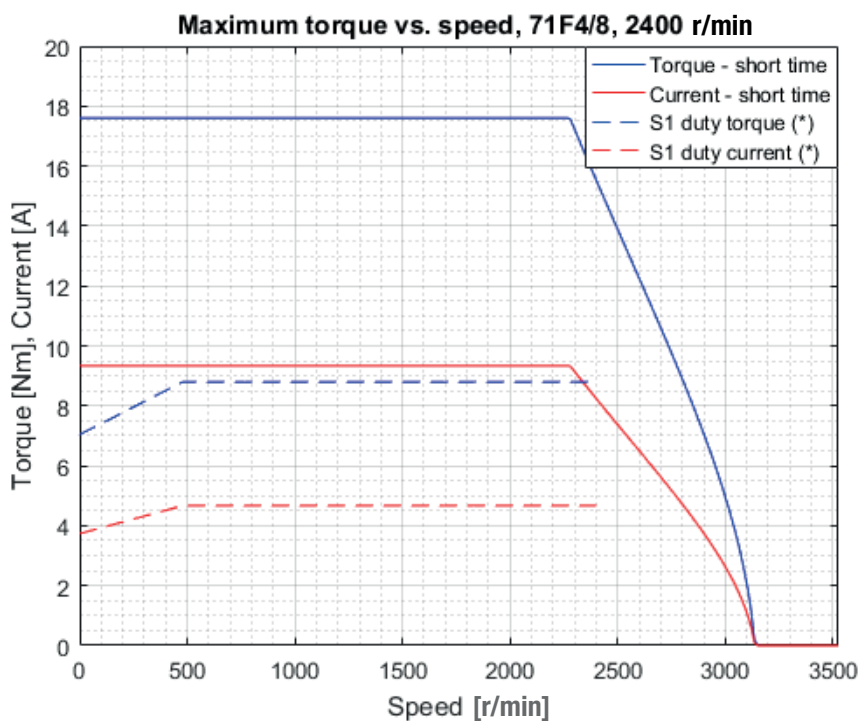
71 F2/8 400V



71 F3/8 400V

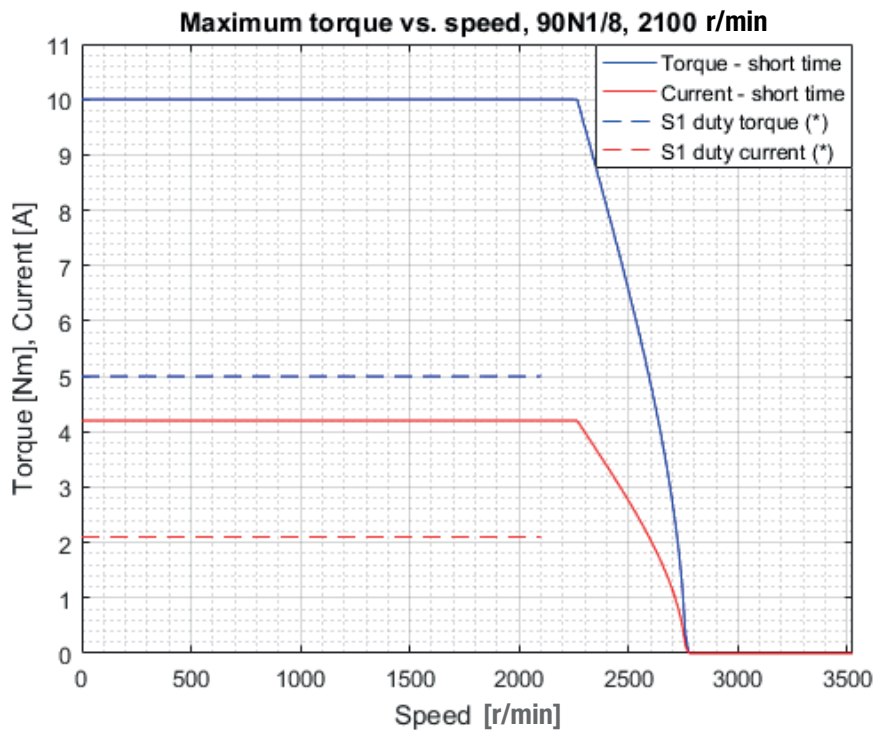


71 F4/8 400V

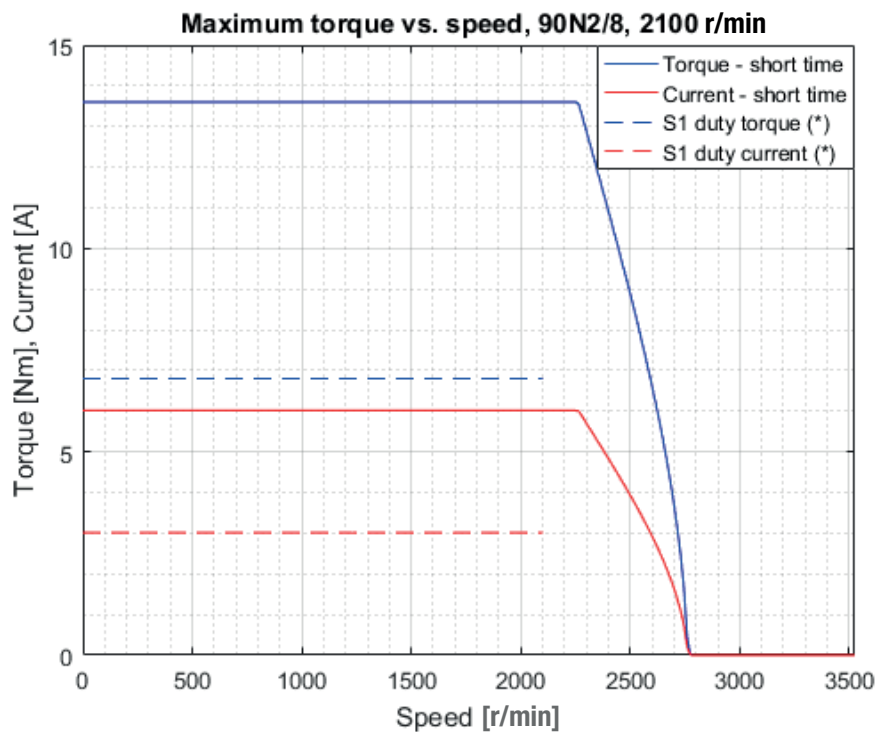


Motor characteristics

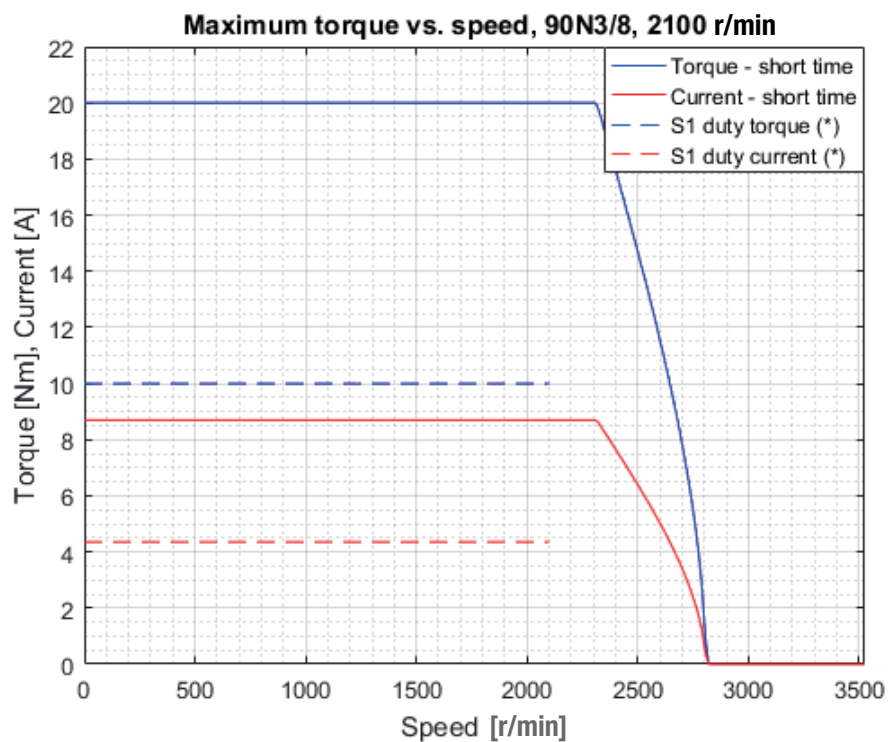
90 N1/8 400V



90 N2/8 400V

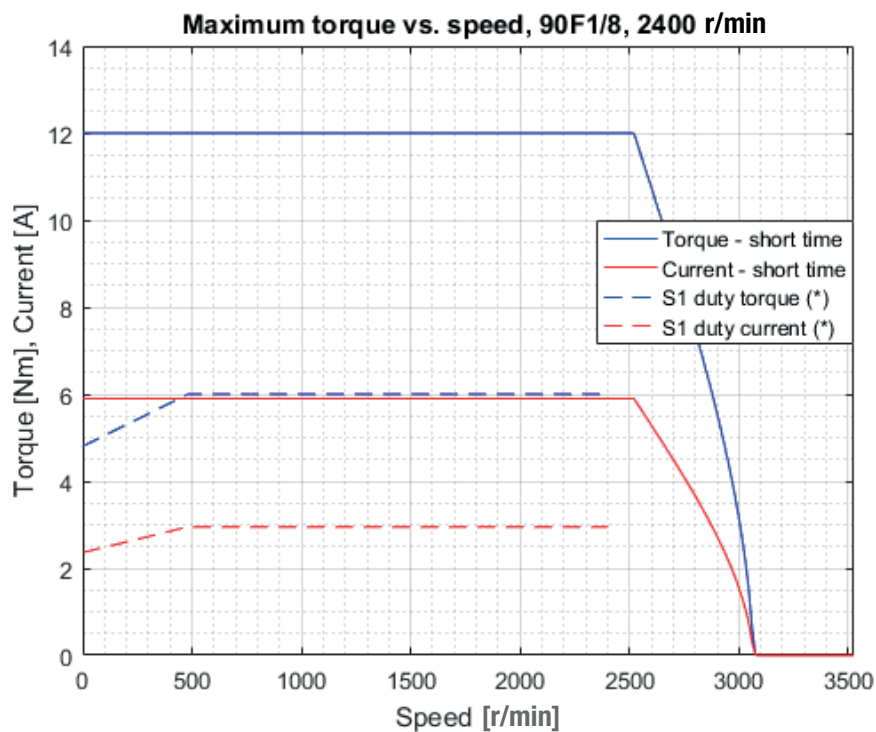


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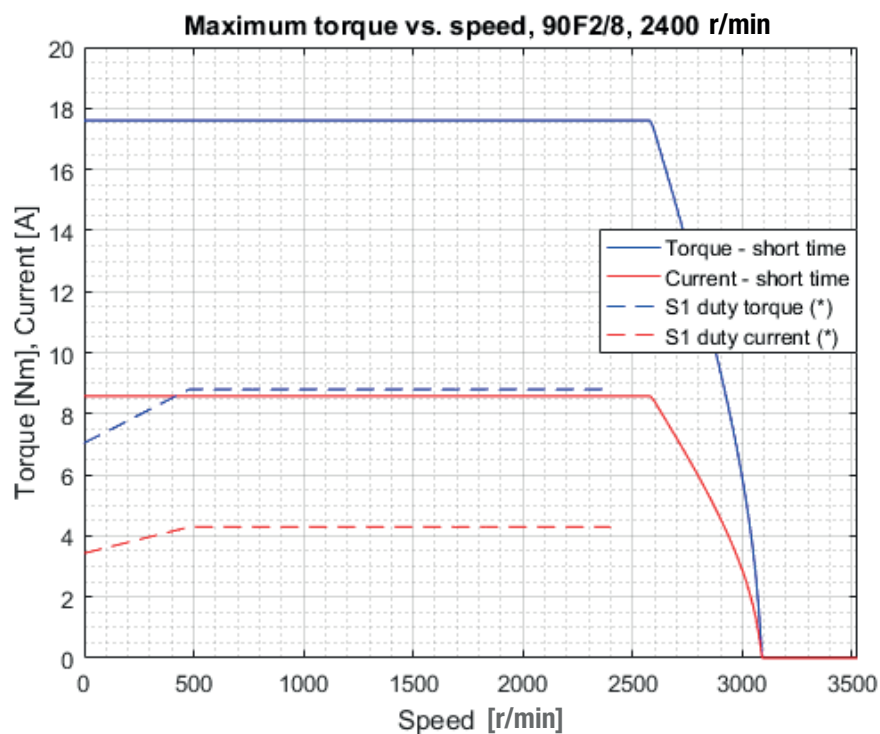


Motor characteristics

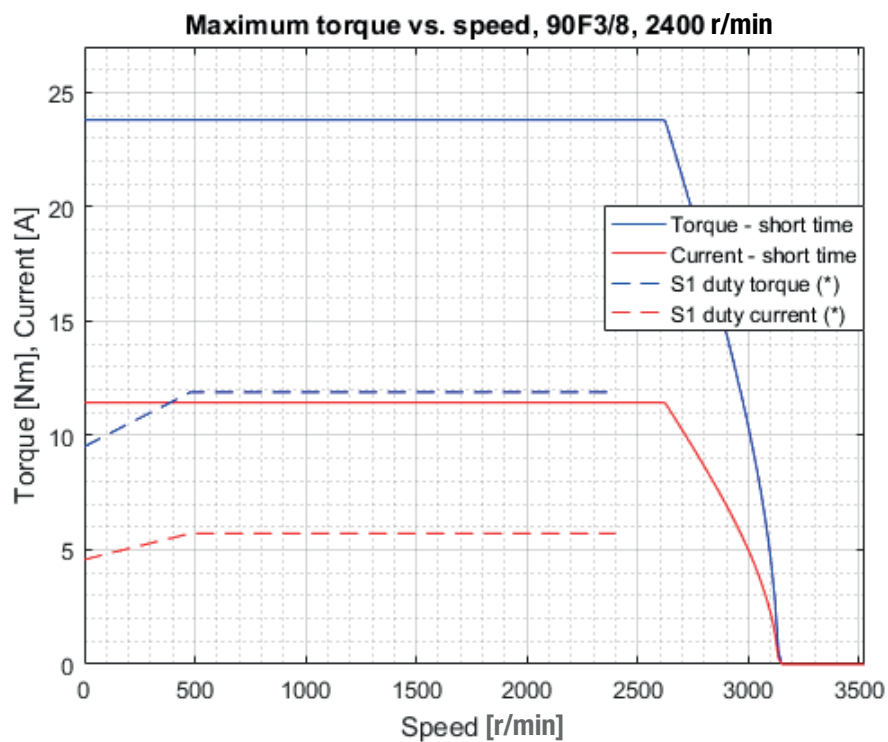
90 F1/8 400V



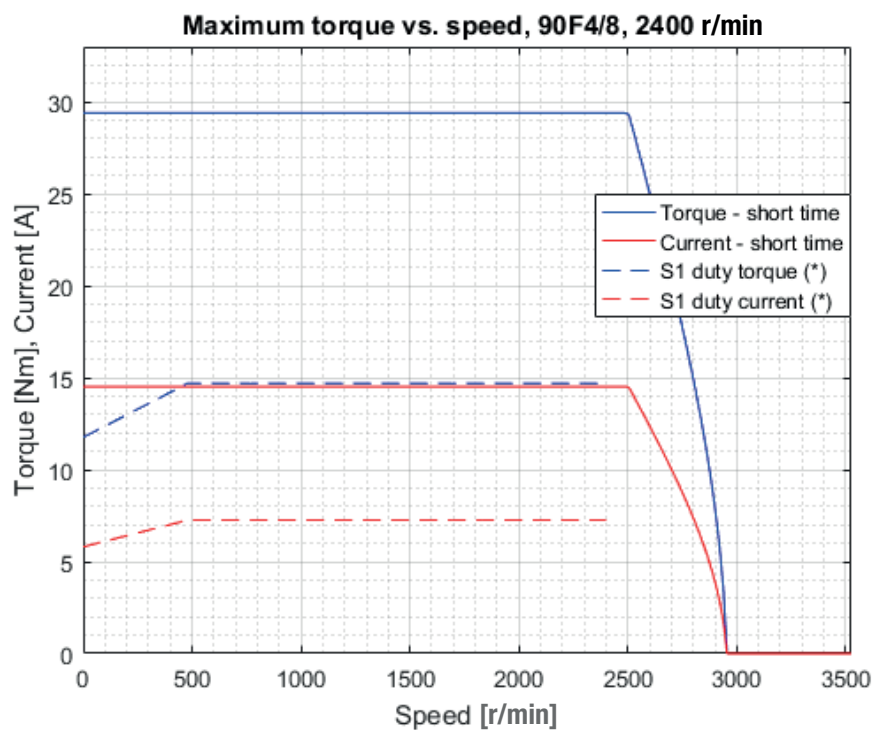
90 F2/8 400V



90 F3/8 400V

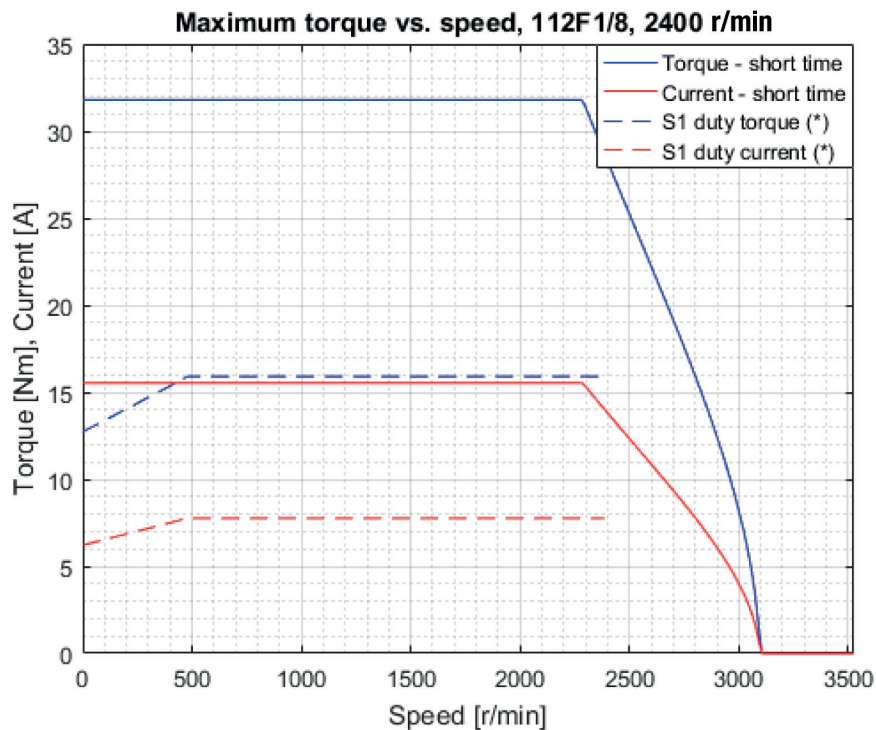


90 F4/8 400V

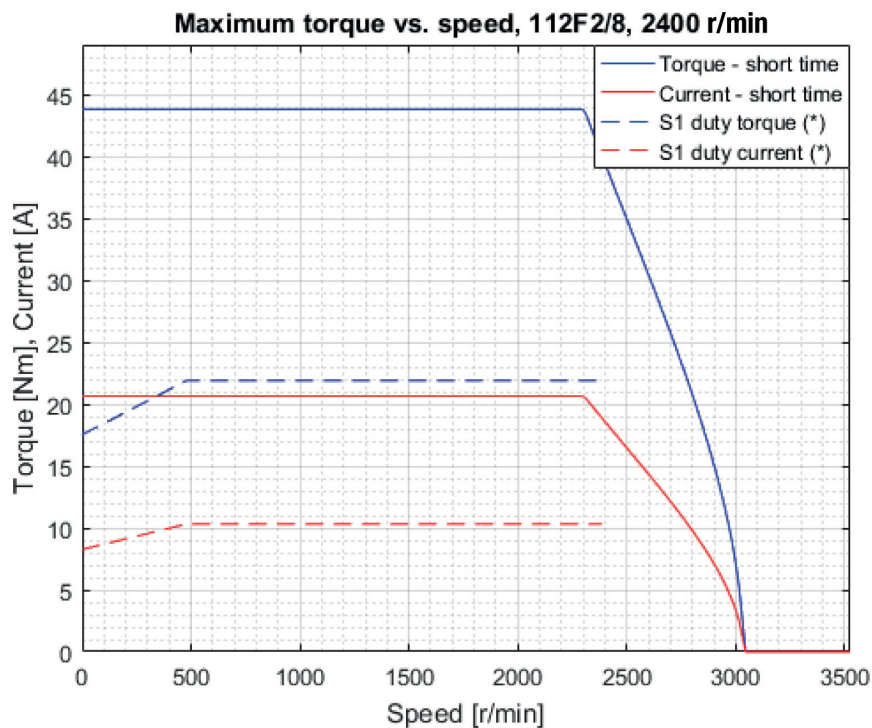


Motor characteristics

112 F1/8 400V

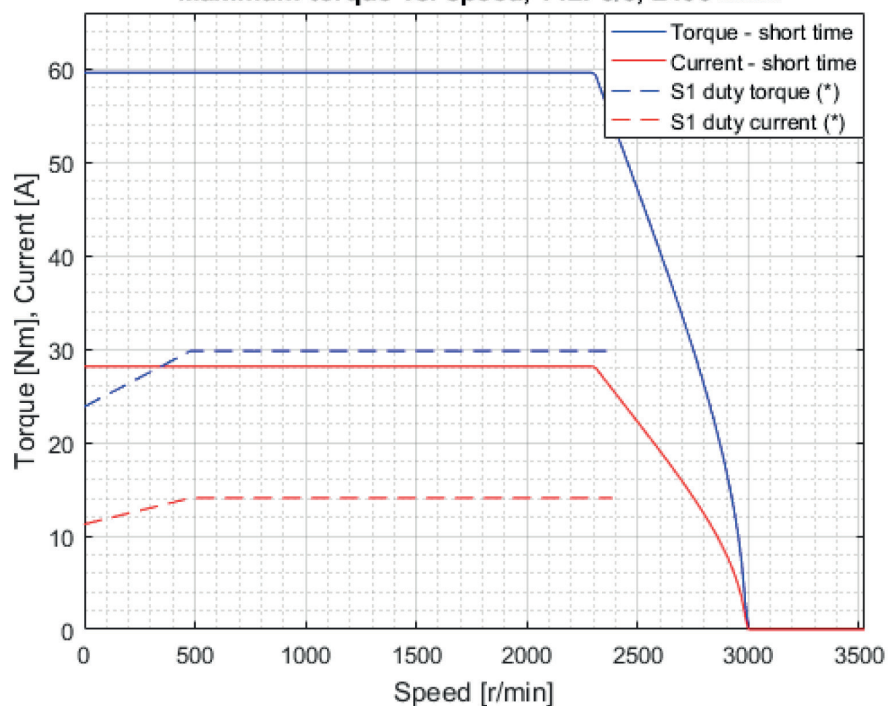


112 F2/8 400V



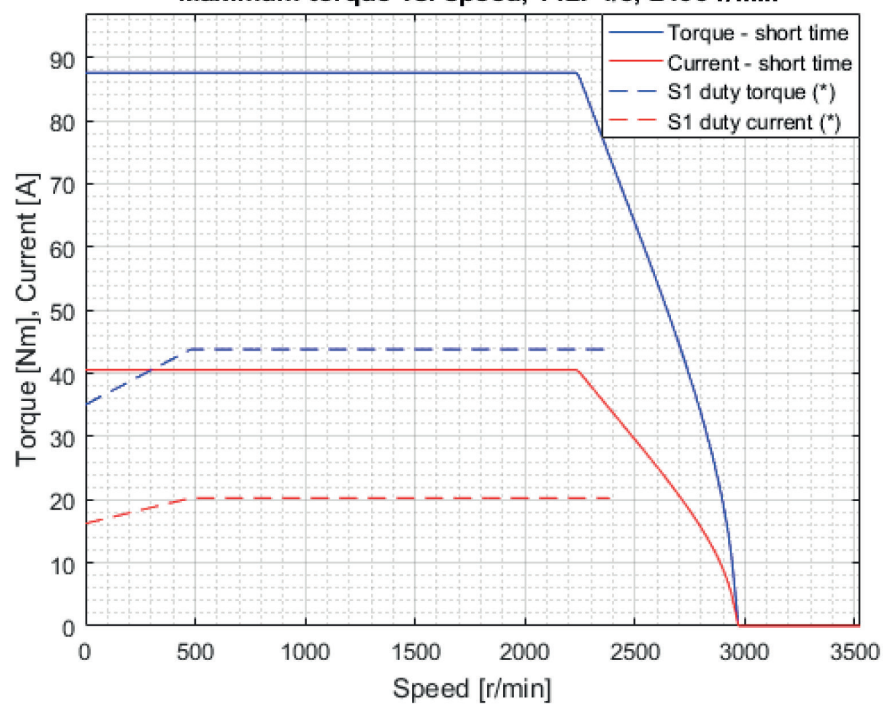
112 F3/8 400V

Maximum torque vs. speed, 112F3/8, 2400 r/min



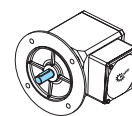
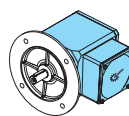
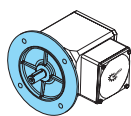
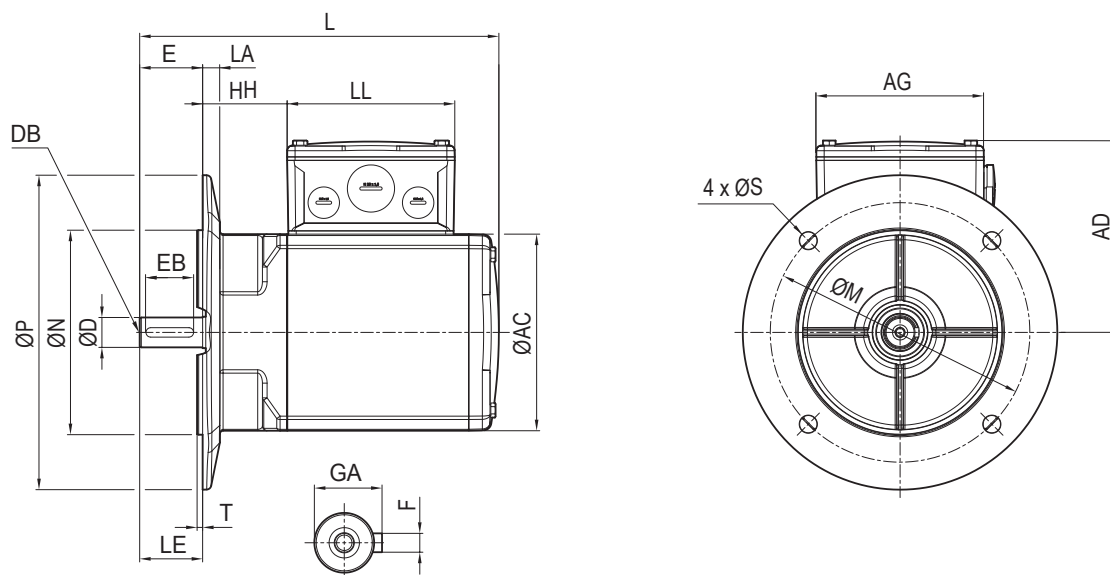
112 F4/8 400V

Maximum torque vs. speed, 112F4/8, 2400 r/min



Dimension drawings

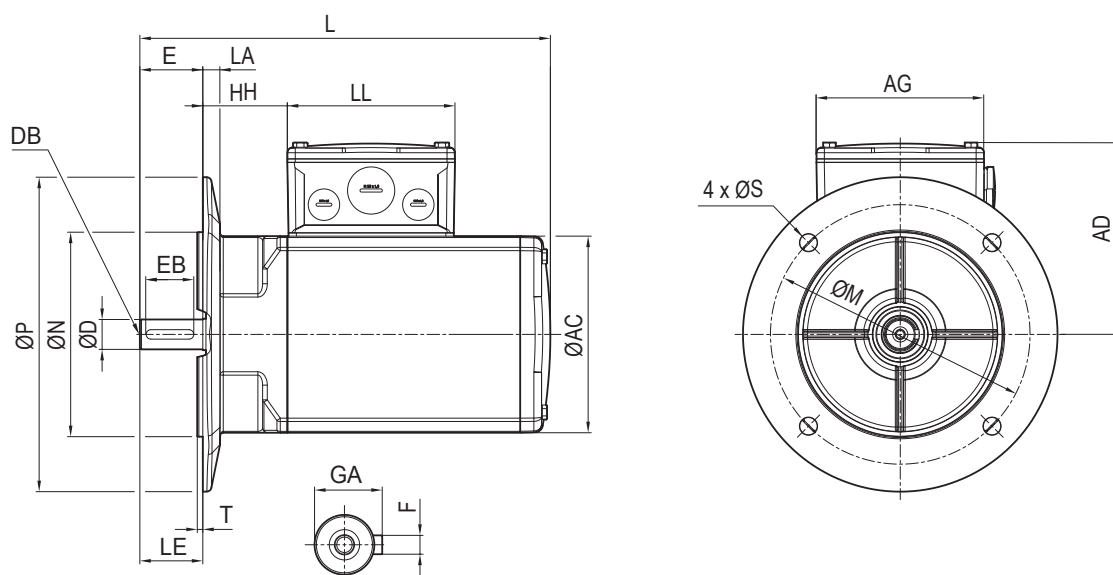
71 Nx/8 B5



Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
71N1/8	11	165	130	200	11	4,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5	
71N2/8	11	165	130	200	11	4,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5	
71N2/8	11	165	130	200	11	4,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5	

All specifications in mm unless otherwise indicated.

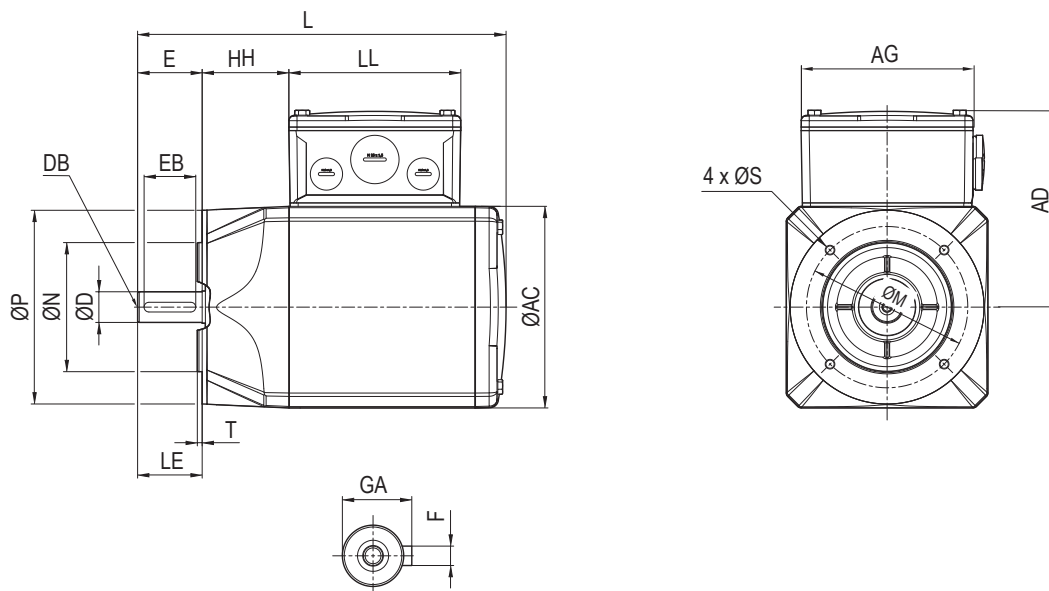
71 Nx/8 B5 BRE

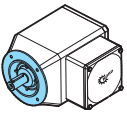
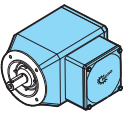
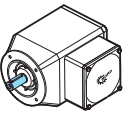


Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
71N1/8	11	165	130	200	11	4,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	2,5
71N2/8	11	165	130	200	11	4,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	5
71N3/8	11	165	130	200	11	4,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	5

Dimension drawings

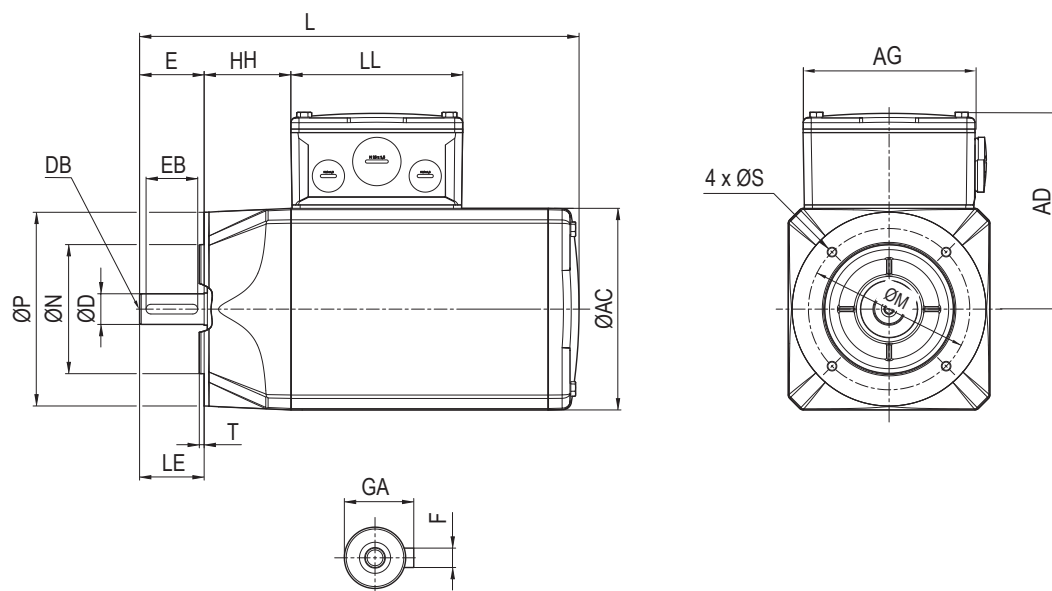
71 Nx/8 B14

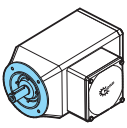
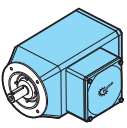
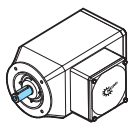


Typ																		
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA
71N1/8	100	80	120	M6x15	3,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5
71N2/8	100	80	120	M6x15	3,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5
71N3/8	100	80	120	M6x15	3,0	125	121	105	55	228	40	105	19	M6	40	32	6	21,5

All specifications in mm unless otherwise indicated.

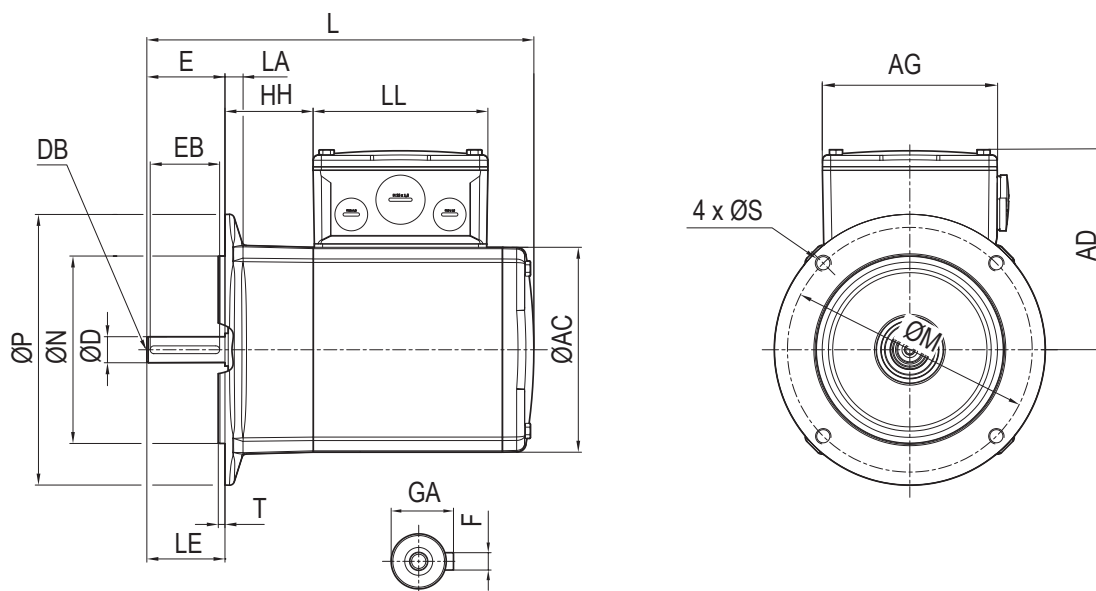
71 Nx/8 B14 BRE

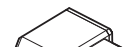
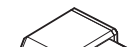


Typ																			BRE
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
71N1/8	100	80	120	M6x15	3,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	2,5
71N2/8	100	80	120	M6x15	3,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	5
71N3/8	100	80	120	M6x15	3,0	125	121	105	55	274	40	105	19	M6	40	32	6	21,5	5

Dimension drawings

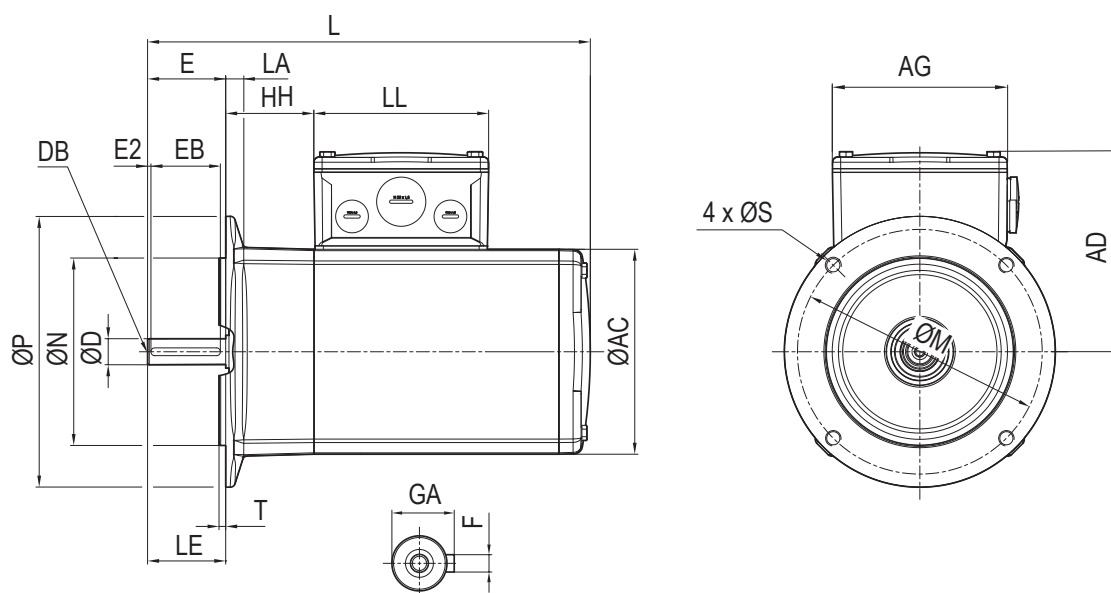
71 Nx/8 NEMA C-face

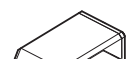
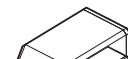


																				
Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	E2	EB	F	GA
71N1/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	236	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9
71N2/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	236	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9
71N3/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	236	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9

All specifications in mm unless otherwise indicated.

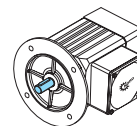
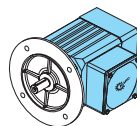
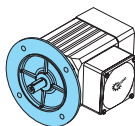
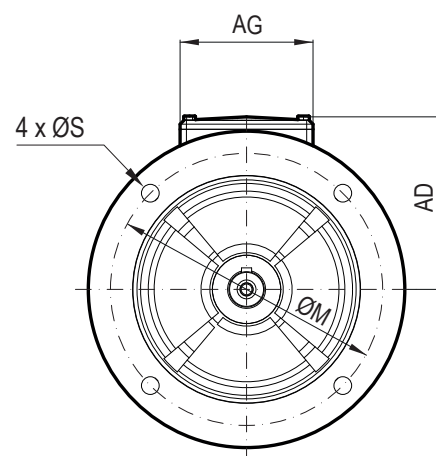
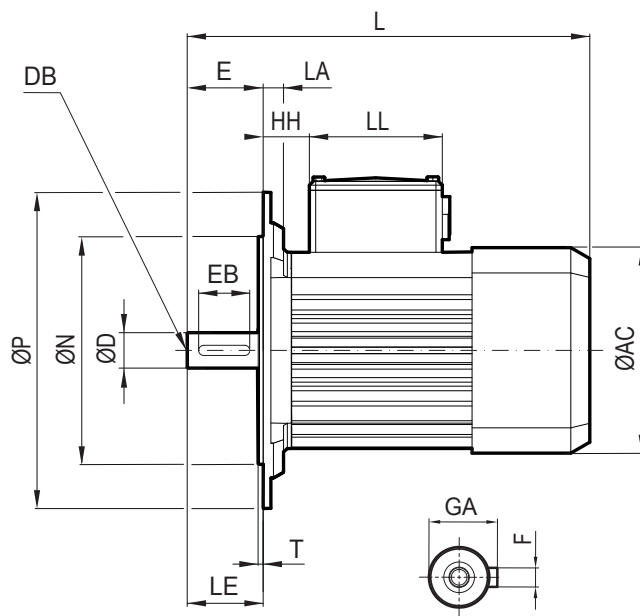
71 Nx/8 NEMA C-face BRE



Typ																					
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	E2	EB	F	GA	BRE
71N1/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	281	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9	2,5
71N2/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	281	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9	5
71N3/8	11	149,2	114,3	165	M6x15	4,0	125	121	105	55	281	47,6	105	15,87	M6	47,6	1,5	42,9	4,76	17,9	5

Dimension drawings

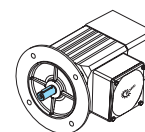
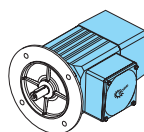
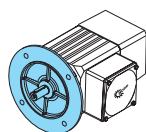
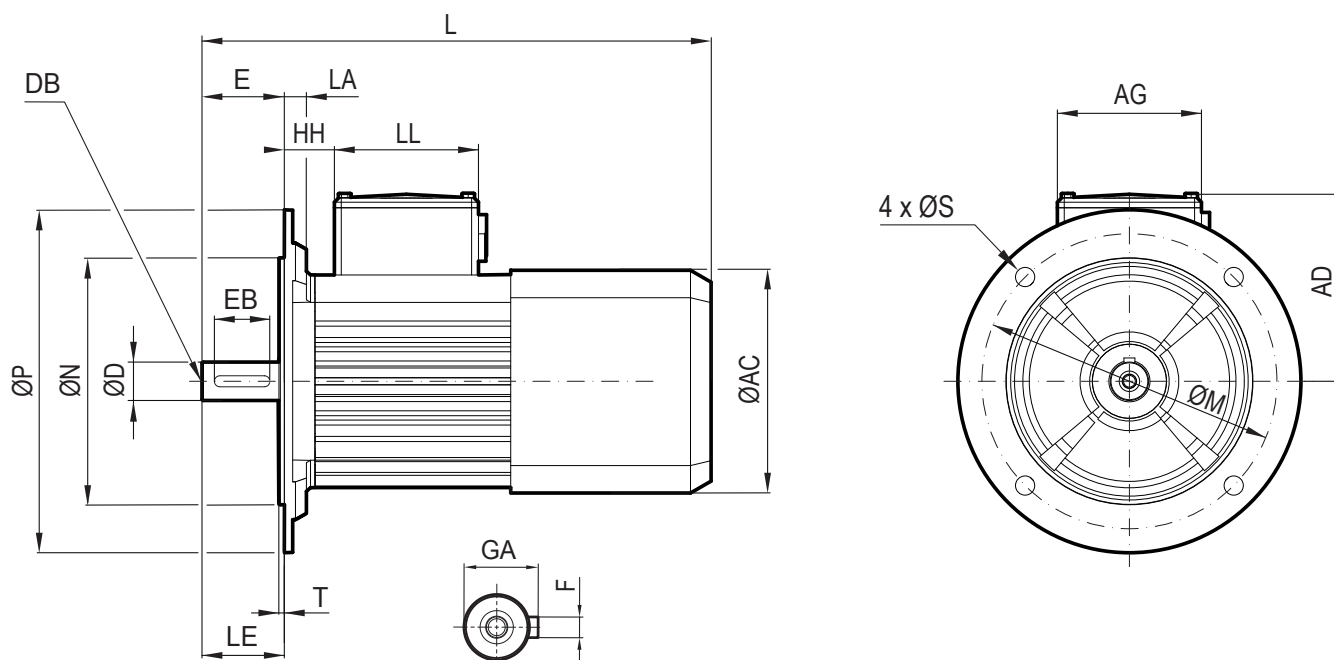
71 Fx/8 B5



Typ																					
	LA	M	N	P	S	T		AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
71F1/8	11	165	130	200	11	4,0		132	121	105	54	285	40	105	19	M6	40	32	6	21,5	
71F2/8	11	165	130	200	11	4,0		132	121	105	54	285	40	105	19	M6	40	32	6	21,5	
71F3/8	11	165	130	200	11	4,0		132	121	105	54	285	40	105	19	M6	40	32	6	21,5	
71F4/8	11	165	130	200	14	4,0		132	121	105	36	312	40	105	19	M6	40	32	6	21,5	

All specifications in mm unless otherwise indicated.

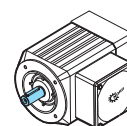
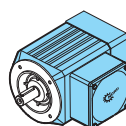
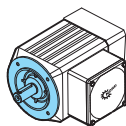
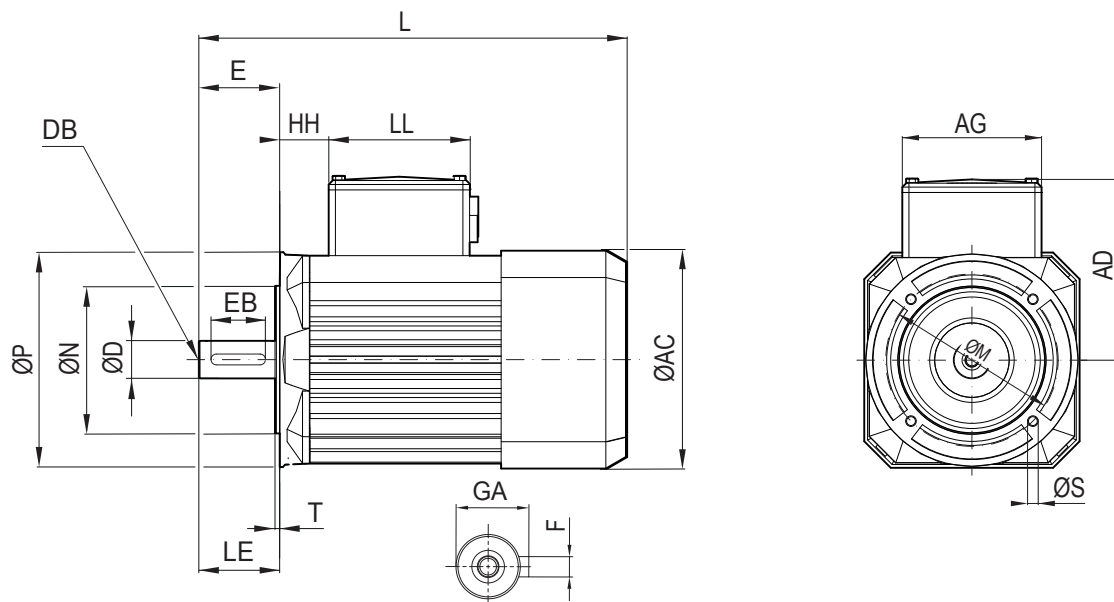
71 Fx/8 B5 BRE



Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
71F1/8	11	165	130	200	11	4,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	2,5
71F2/8	11	165	130	200	11	4,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	5
71F3/8	11	165	130	200	11	4,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	7,5

Dimension drawings

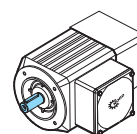
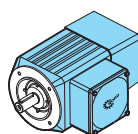
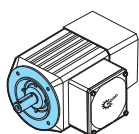
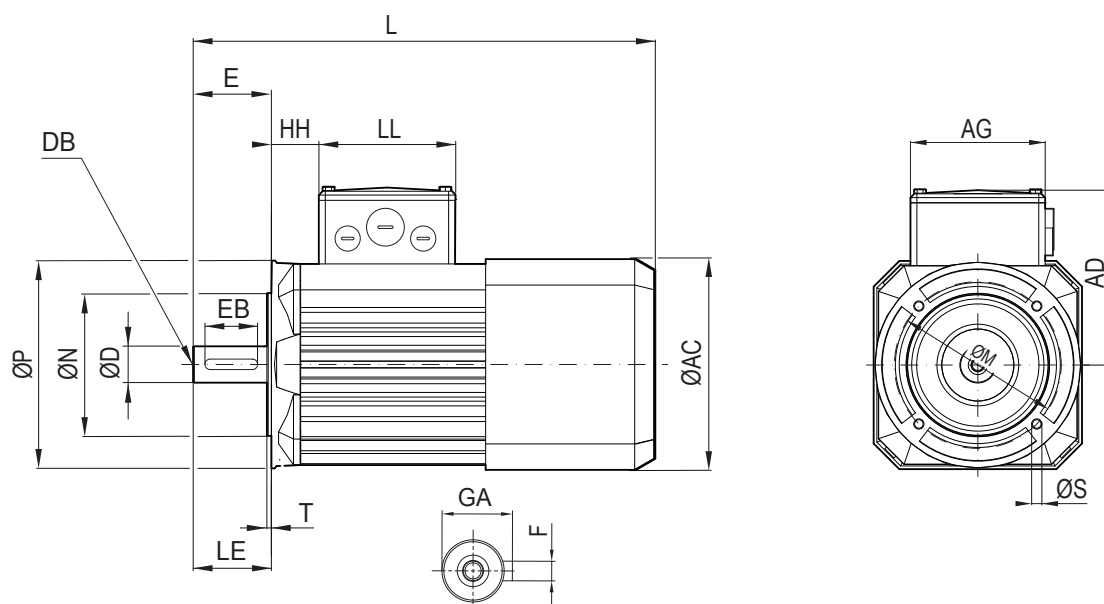
71 Fx/8 B14



Typ																				
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA		
71F1/8	100	80	120	M6x15	3,0	132	121	105	54	285	40	105	19	M6	40	32	6	21,5		
71F2/8	100	80	120	M6x15	3,0	132	121	105	54	285	40	105	19	M6	40	32	6	21,5		
71F3/8	100	80	120	M6x15	3,0	132	121	105	54	285	40	105	19	M6	40	32	6	21,5		
71F4/8	100	89	120	M6x15	3,0	132	121	105	36	312	40	105	19	M6	40	32	6	21,5		

All specifications in mm unless otherwise indicated.

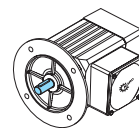
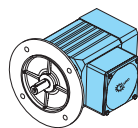
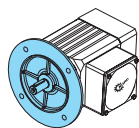
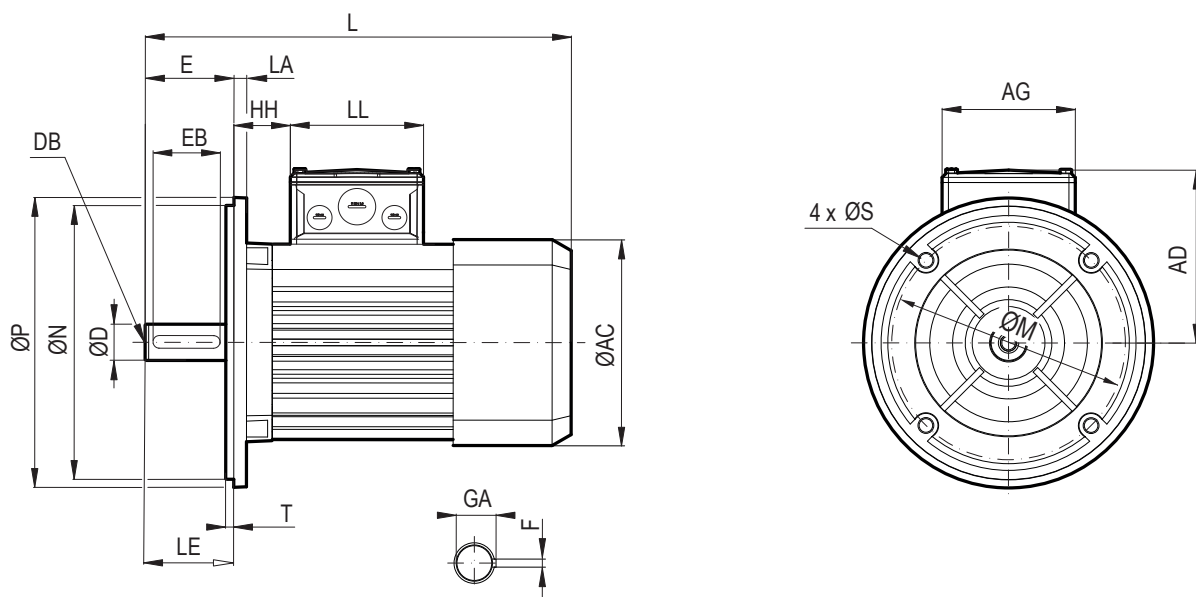
71 Fx/8 B14 BRE



Typ																			
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
71F1/8	100	80	120	M6x15	3,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	2,5
71F2/8	100	80	120	M6x15	3,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	5
71F3/8	100	80	120	M6x15	3,0	132	121	105	54	322	40	105	19	M6	40	32	6	21,5	7,5

Dimension drawings

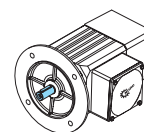
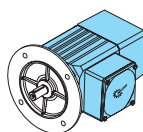
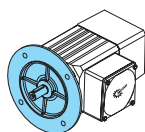
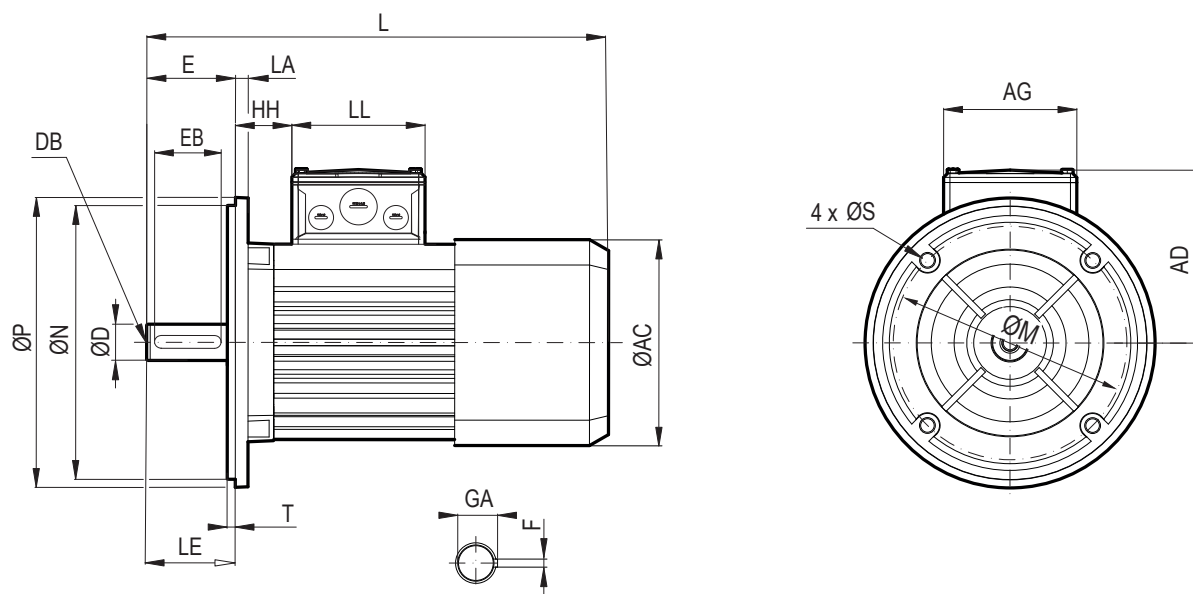
71 Fx/8 NEMA C-face



Typ																					
	LA	M	N	P	S	T		AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
71F1/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	293	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	
71F2/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	293	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	
71F3/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	293	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	
71F4/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	320	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	

All specifications in mm unless otherwise indicated.

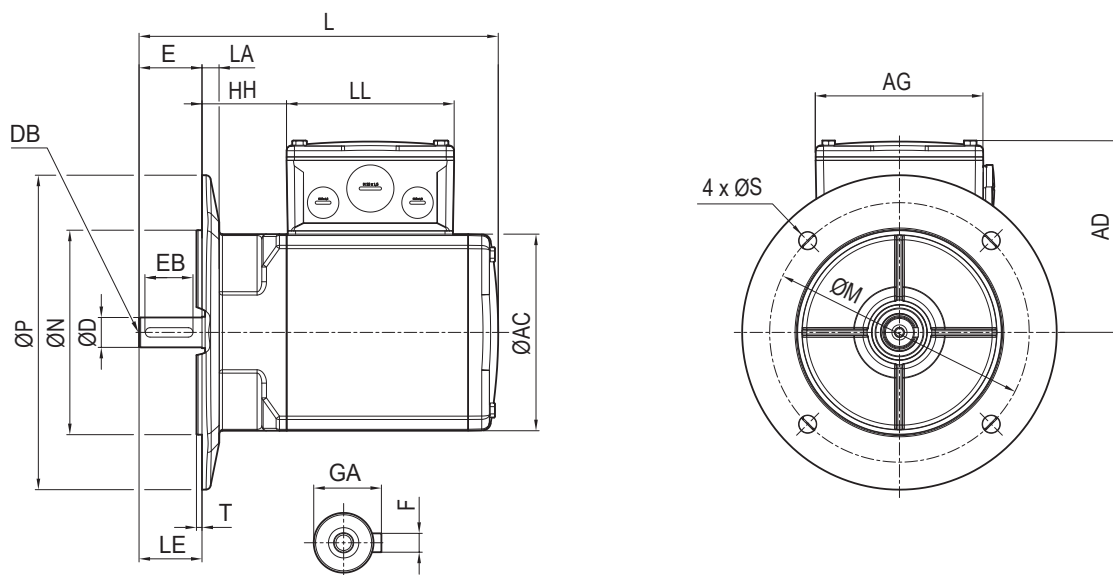
71 Fx/8 NEMA C-face BRE

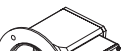


Typ																					
	LA	M	N	P	S	T		AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
71F1/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	330	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	2,5
71F2/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	330	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	5
71F3/8	11	149,2	114,3	165,1	3/8-16	4,1		132	121	105	54	330	47,6	105	15,875	M6	47,6	42,9	4,76	17,9	7,5

Dimension drawings

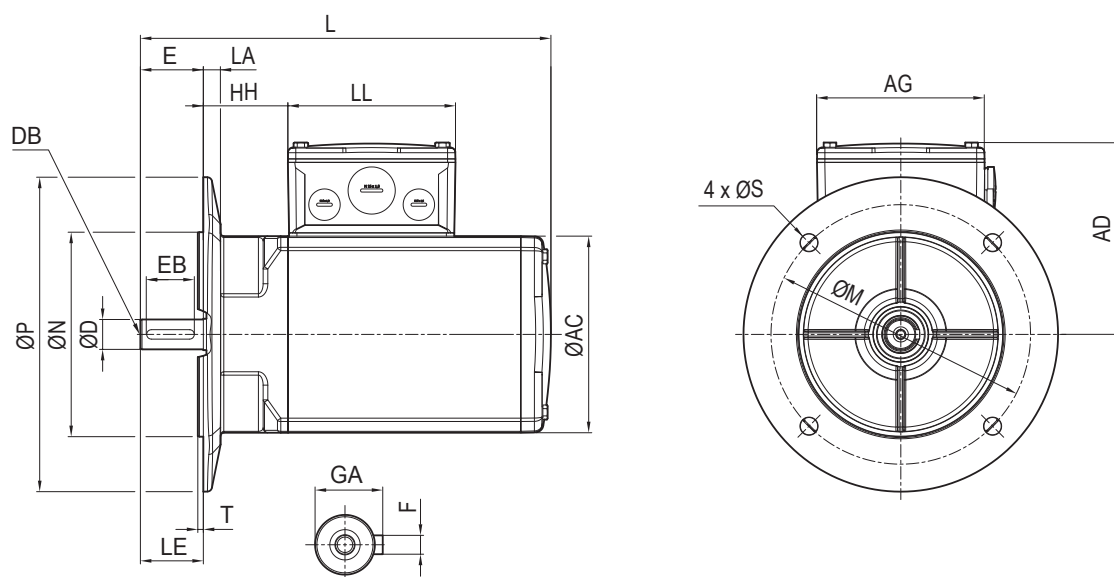
90 Nx/8 B5

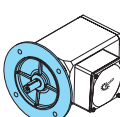
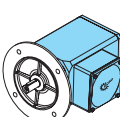
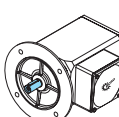


																				
Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
90N1/8	16	215	180	250	14	4,0	155	136	105	36	282	60	105	28	M10	60	50	8	31	
90N2/8	16	215	180	250	14	4,0	155	136	105	36	282	60	105	28	M10	60	50	8	31	
90N3/8	16	215	180	250	14	4,0	155	136	105	36	282	60	105	28	M10	60	50	8	31	

All specifications in mm unless otherwise indicated.

90 Nx/8 B5 BRE

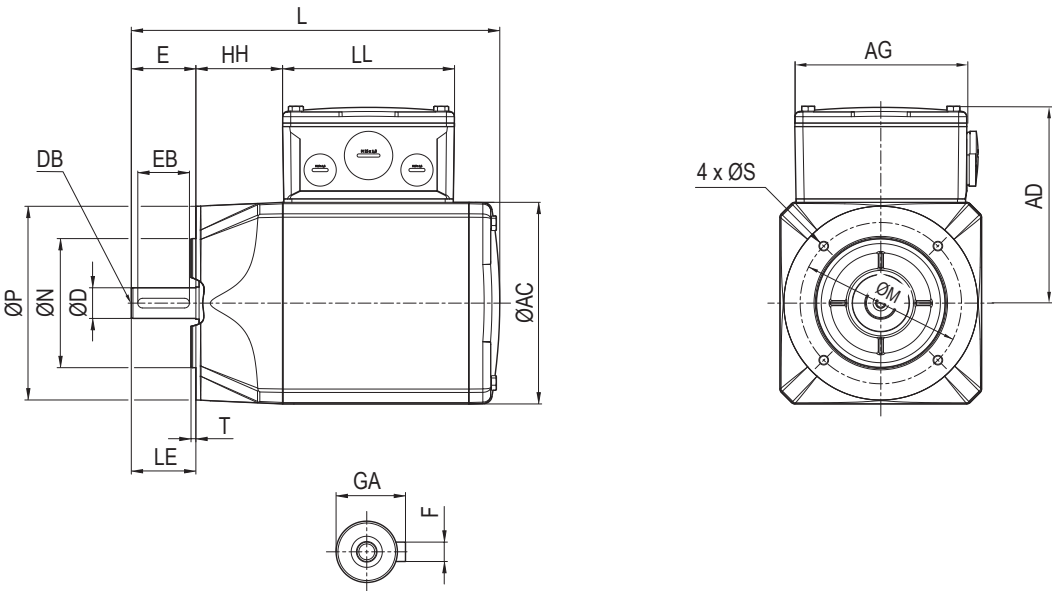


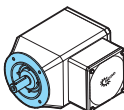
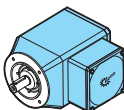
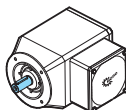
																				
Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
90N1/8	16	215	180	250	14	4,0	155	136	105	36	337	60	105	28	M10	60	50	8	31	10
90N2/8	16	215	180	250	14	4,0	155	136	105	36	337	60	105	28	M10	60	50	8	31	10
90N3/8	16	215	180	250	14	4,0	155	136	105	36	337	60	105	28	M10	60	50	8	31	10

NORD DRIVESYSTEMS

Dimension drawings

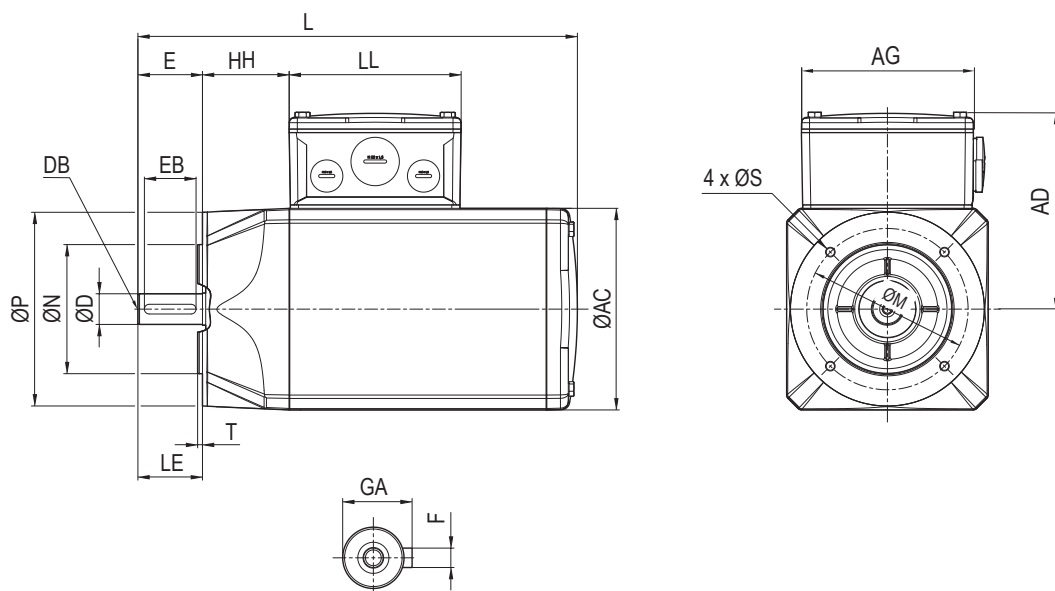
90 Nx/8 B14

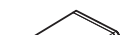


Typ																			
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
90Nx/8	130	110	160	M8x15	4,0	155	136	105	36	283	60	105	28	M10	60	50	8	31	

All specifications in mm unless otherwise indicated.

90 Nx/8 B14 BRE

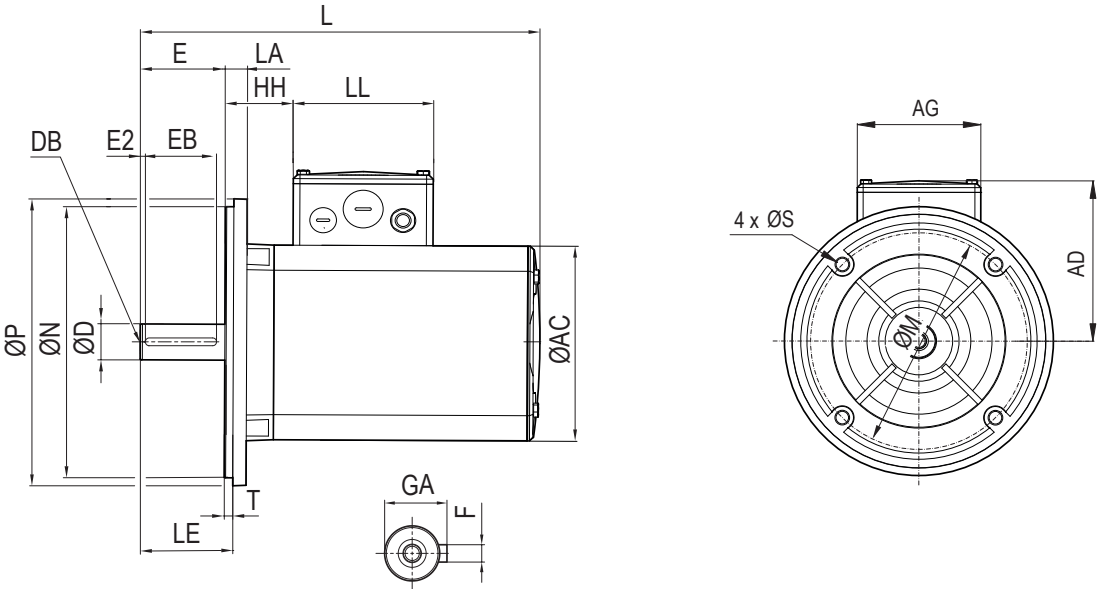


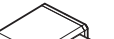
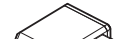
Typ																			
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
90Nx/8	130	110	160	M8x15	4,0	155	136	105	36	336	60	105	28	M10	60	50	8	31	10

NORD DRIVESYSTEMS

Dimension drawings

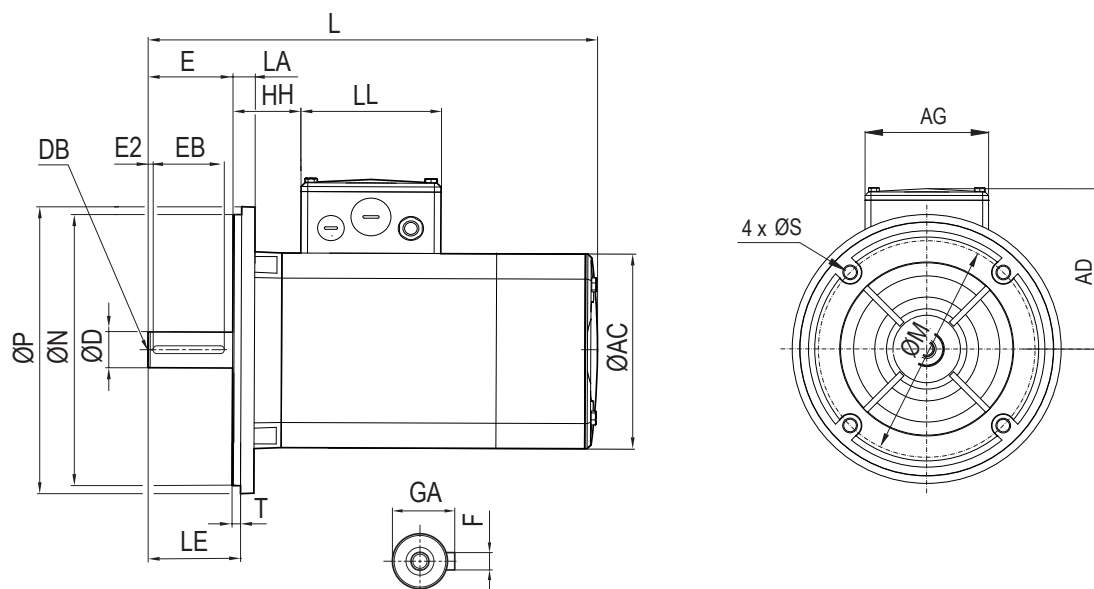
90 Nx/8 NEMA C-face



Typ																			
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA
90Nx/8	10	184,1	216	228,6	3/8-16	6,3	155	136	105	44	300	70	105	28,575	M10	69,9	57,1	6,35	31,4

All specifications in mm unless otherwise indicated.

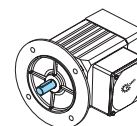
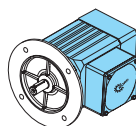
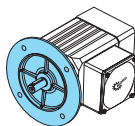
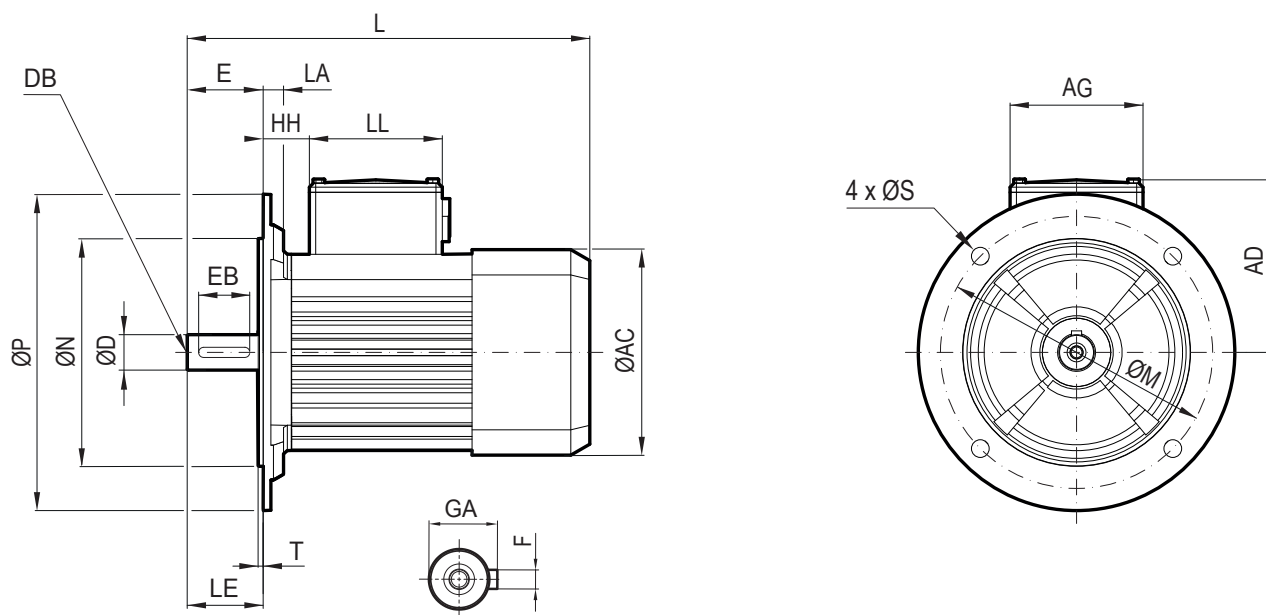
90 Nx/8 NEMA C-face BRE



Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
90Nx/8	10	184,1	216	228,6	3/8-16	6,3	155	136	105	44	355	69,8	105	28,575	M10	69,9	57,1	6,35	31,4	10

Dimension drawings

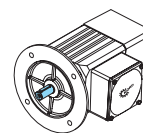
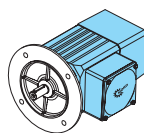
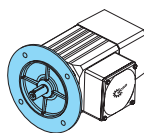
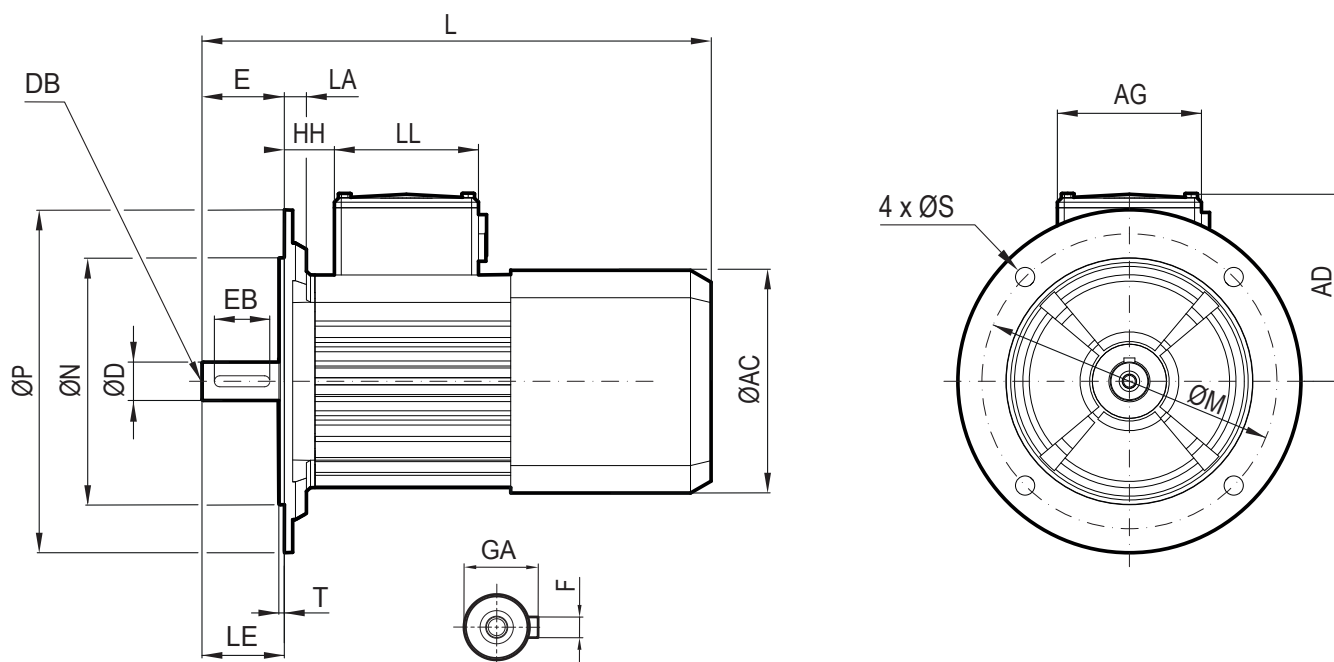
90 Fx/8 B5



Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
90F1/8	16	215	180	250	14	4,0	162	136	105	36	318	60	105	28	M10	60	50	8	31	
90F2/8	16	215	180	250	14	4,0	162	136	105	36	318	60	105	28	M10	60	50	8	31	
90F3/8	16	215	180	250	14	4,0	162	136	105	36	358	60	105	28	M10	60	50	8	31	
90F4/8	16	215	180	250	14	4,0	162	136	105	36	358	60	105	28	M10	60	50	8	31	

All specifications in mm unless otherwise indicated.

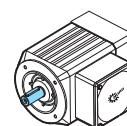
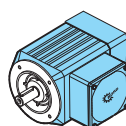
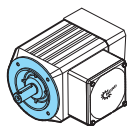
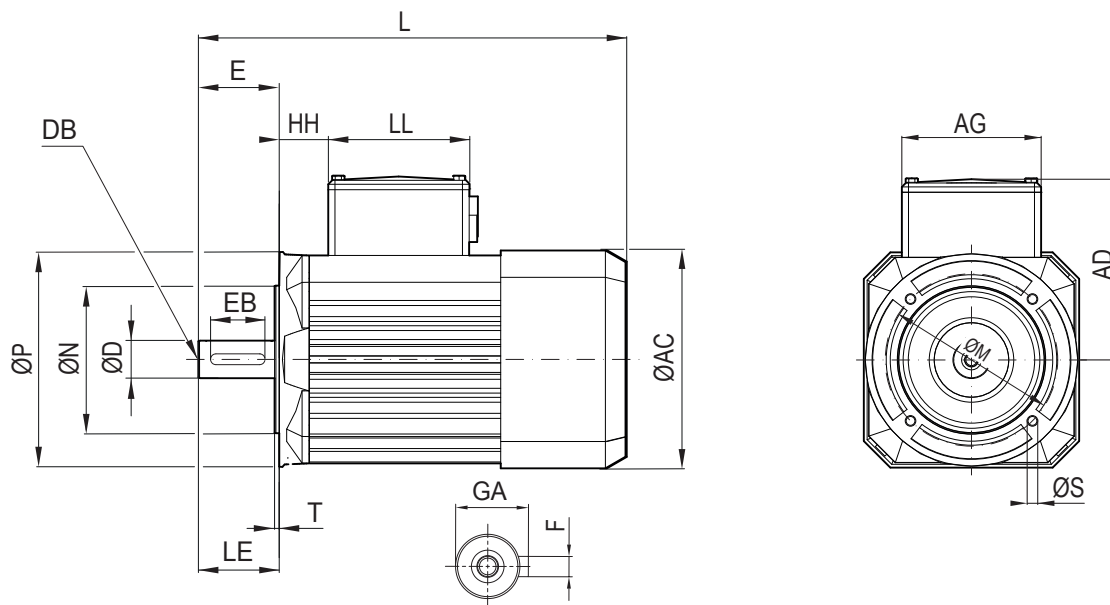
90 Fx/8 B5 BRE



Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
90F1/8	16	215	180	250	14	4,0	162	136	105	36	371	60	105	28	M10	60	50	8	31	10
90F2/8	16	215	180	250	14	4,0	162	136	105	36	371	60	105	28	M10	60	50	8	31	10
90F3/8	16	215	180	250	14	4,0	162	136	105	36	411	60	105	28	M10	60	50	8	31	20
90F4/8	16	215	180	250	14	4,0	162	136	105	36	411	60	105	28	M10	60	50	8	31	20

Dimension drawings

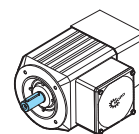
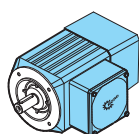
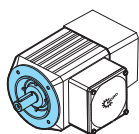
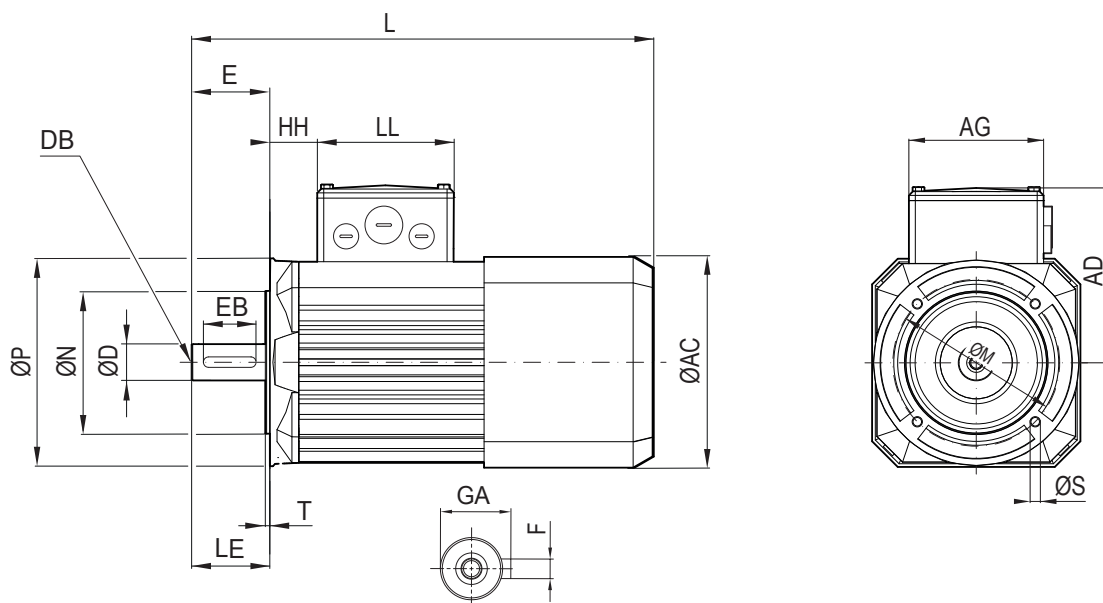
90 Fx/8 B14



Typ																				
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA		
90F1/8	130	110	160	M8x15	4,0	162	136	105	36	318	60	105	28	M10	60	50	8	31		
90F2/8	130	110	160	M8x15	4,0	162	136	105	36	318	60	105	28	M10	60	50	8	31		
90F3/8	130	110	160	M8x15	4,0	162	136	105	36	358	60	105	28	M10	60	50	8	31		
90F4/8	130	110	160	M8x15	4,0	162	136	105	36	358	60	105	28	M10	60	50	8	31		

All specifications in mm unless otherwise indicated.

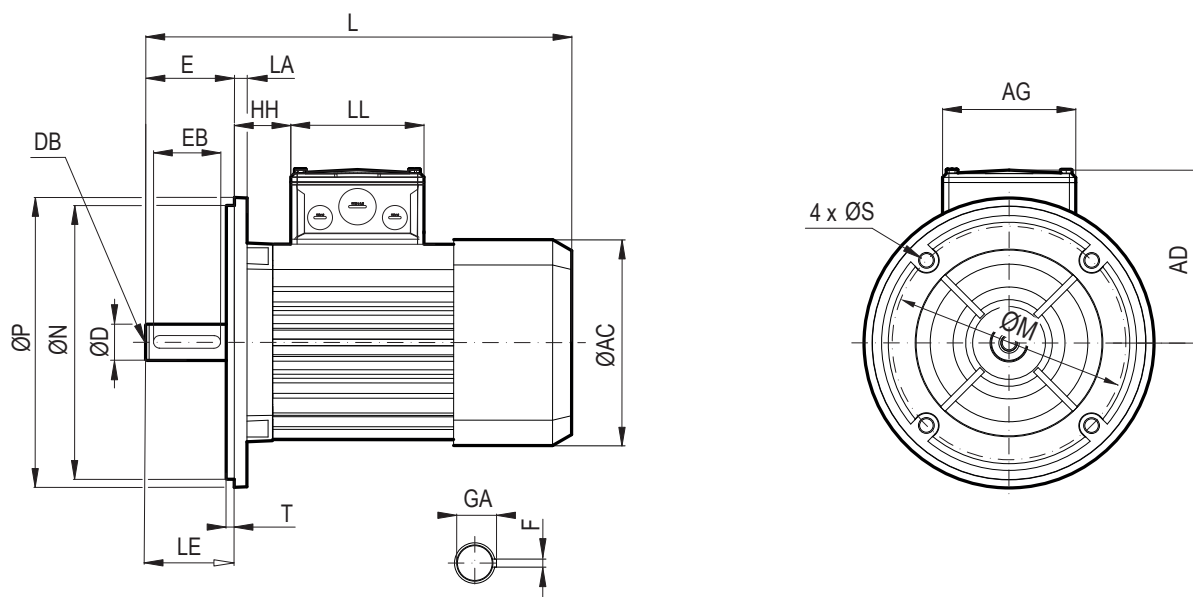
90 Fx/8 B14 BRE

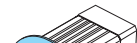
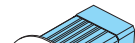
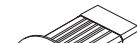


Typ																				
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE	
90F1/8	130	110	160	M8x15	4,0	162	136	105	36	371	60	105	28	M10	60	50	8	31	10	
90F2/8	130	110	160	M8x15	4,0	162	136	105	36	371	60	105	28	M10	60	50	8	31	10	
90F3/8	130	110	160	M8x15	4,0	162	136	105	36	411	60	105	28	M10	60	50	8	31	20	
90F4/8	130	110	160	M8x15	4,0	162	136	105	36	411	60	105	28	M10	60	50	8	31	20	

Dimension drawings

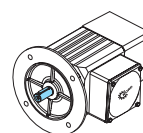
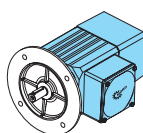
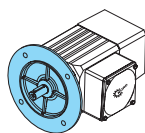
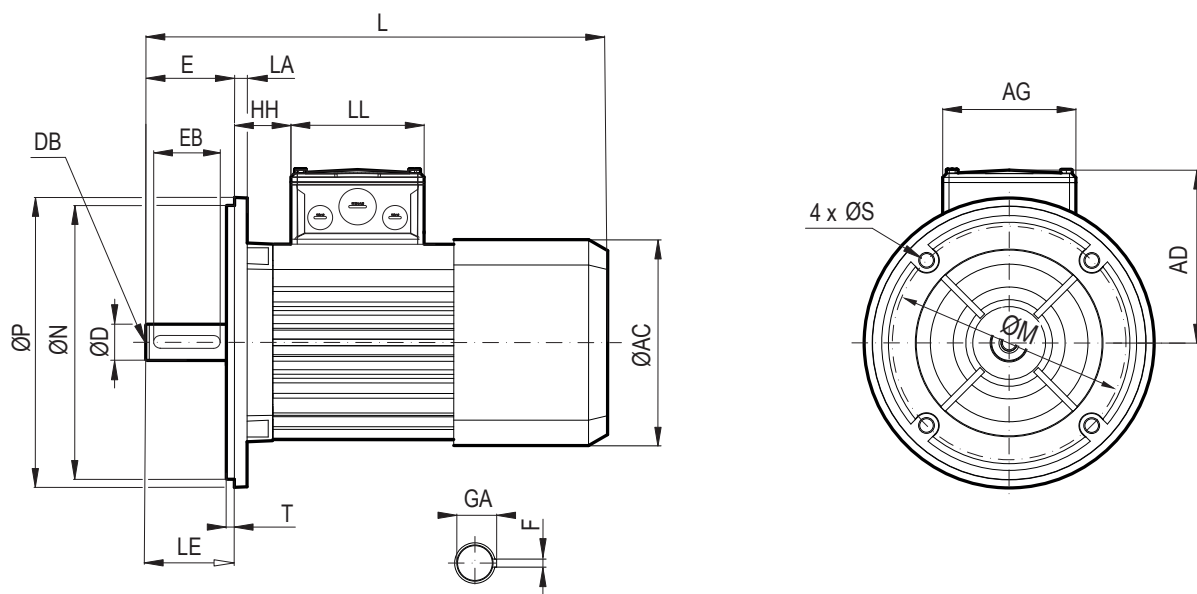
90 Fx/8 NEMA C-face



																				
Typ																				
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	
90F1/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	336	70	105	28,57	M10	70	57,2	6,35	31,4	
90F2/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	336	70	105	28,57	M10	70	57,2	6,35	31,4	
90F3/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	376	70	105	28,57	M10	70	57,2	6,35	31,4	
90F4/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	376	70	105	28,57	M10	70	57,2	6,35	31,4	

All specifications in mm unless otherwise indicated.

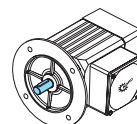
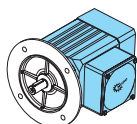
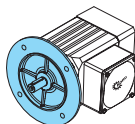
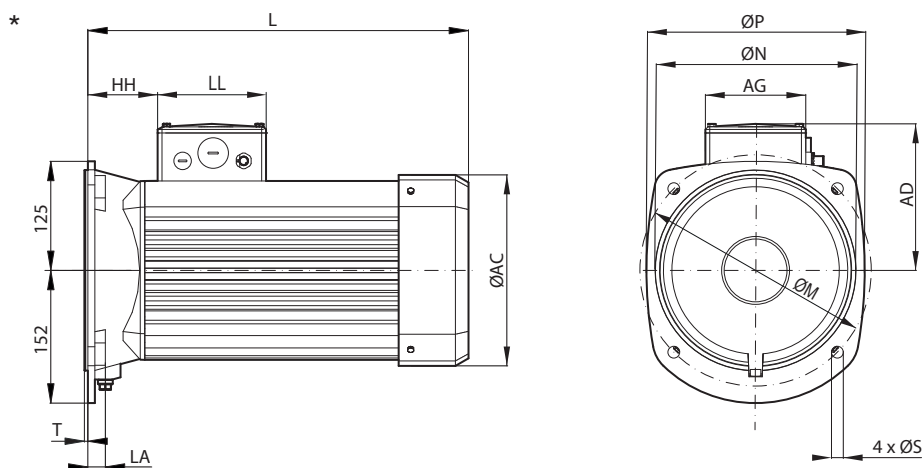
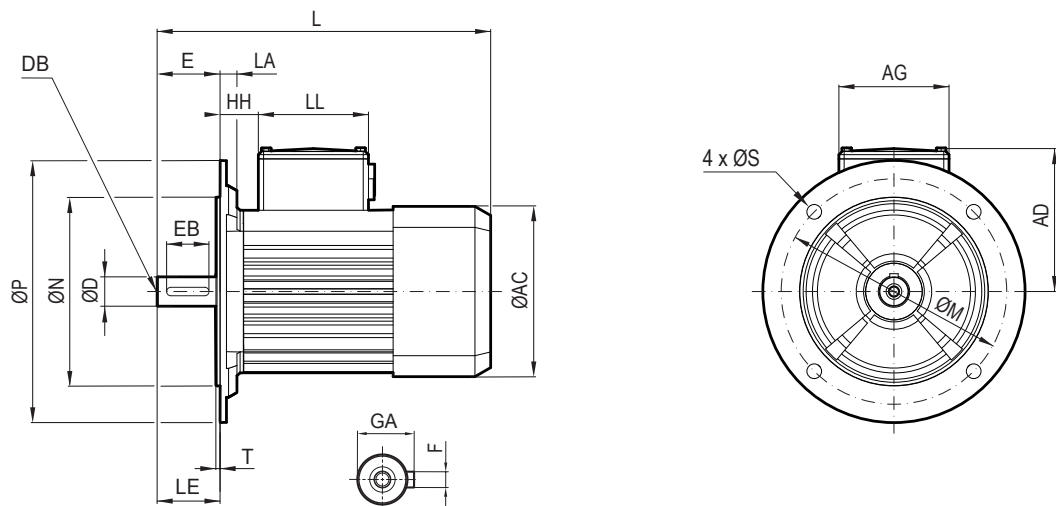
90 Fx/8 NEMA C-face BRE



Typ																							
	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE			
90F1/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	389	70	105	28,57	M10	70	57,2	6,35	31,4	10			
90F2/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	389	70	105	28,57	M10	70	57,2	6,35	31,4	10			
90F3/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	429	70	105	28,57	M10	70	57,2	6,35	31,4	20			
90F4/8	10	184,2	215,9	228,6	3/8-16	6,4	162	121	105	44	429	70	105	28,57	M10	70	57,2	6,35	31,4	20			

Dimension drawings

112 Fx/8 B5

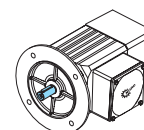
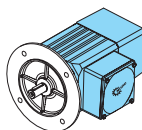
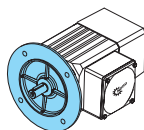
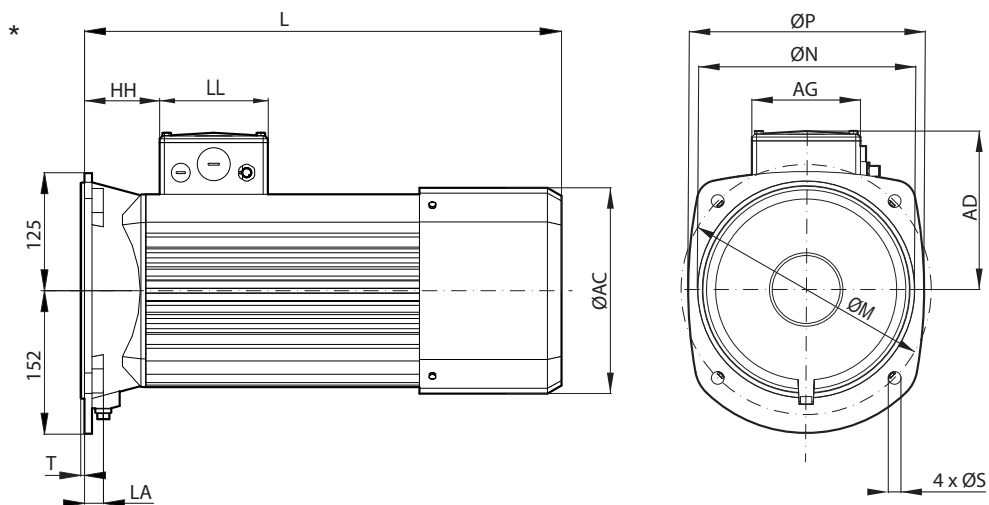
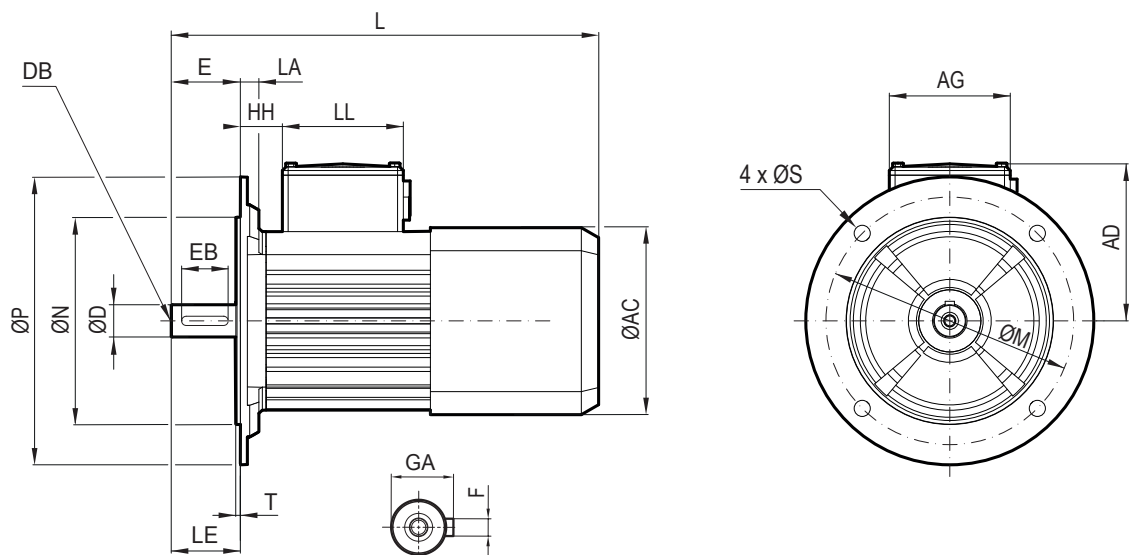


Typ	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA
112F1/8	19	265	230	300	14,5	4,0	219	168	115	84	410	80	115	38	M10	80	70	10	41
112F2/8	19	265	230	300	14,5	4,0	219	168	115	84	470	80	115	38	M10	80	70	10	41
112F3/8	19	265	230	300	14,5	4,0	219	168	115	84	470	80	115	38	M10	80	70	10	41
112F4/8*	14	215	180	200	13,5	4,0	219	168	115	100	456	-	115	-	-	-	-	-	-

* does not comply with IEC standard dimensions

All specifications in mm unless otherwise indicated.

112 Fx/8 B5 BRE

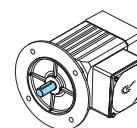
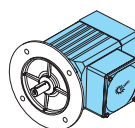
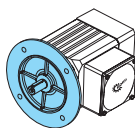
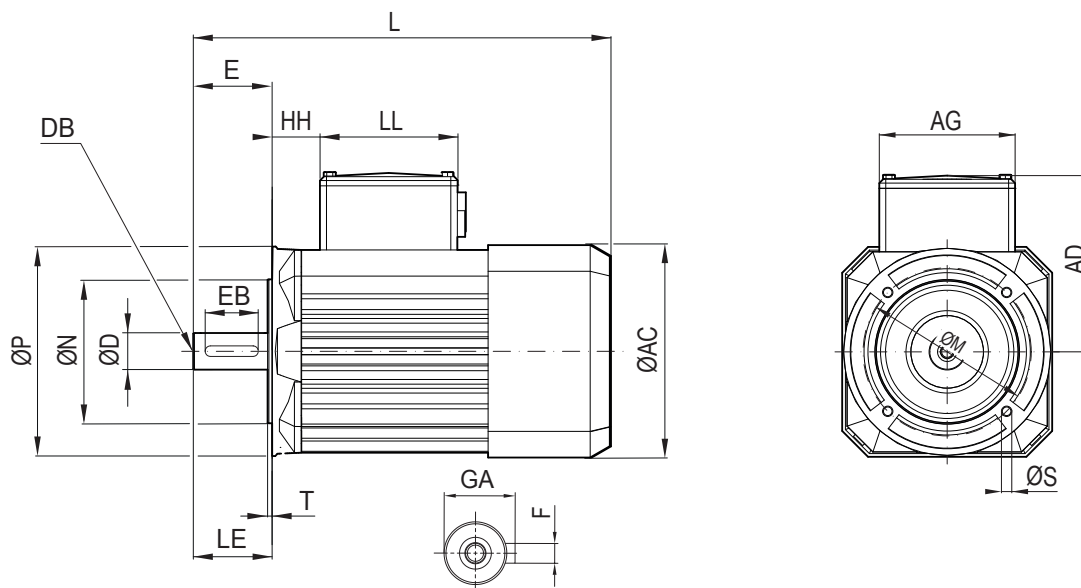


Typ	LA	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
112F1/8	19	265	230	300	14,5	4,0	219	168	115	84	481	80	115	38	M10	80	70	10	41	20
112F2/8	19	265	230	300	14,5	4,0	219	168	115	84	541	80	115	38	M10	80	70	10	41	25
112F3/8	19	265	230	300	14,5	4,0	219	168	115	84	541	80	115	38	M10	80	70	10	41	35
112F4/8*	14	215	180	200	13,5	4,0	219	168	115	100	527	-	115	-	-	-	-	-	-	50

* does not comply with IEC standard dimensions

Dimension drawings

112 Fx/8 B14

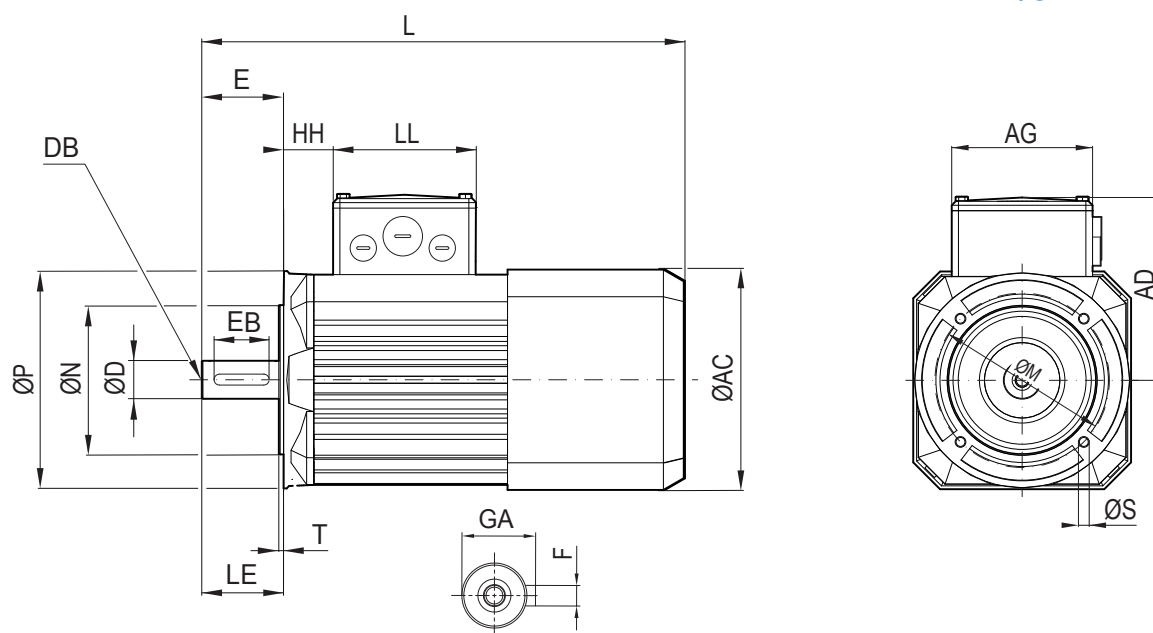


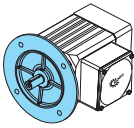
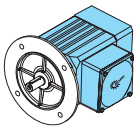
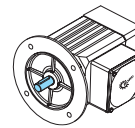
Typ																				
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA		
112F1/8	165	130	200	M10x16	3,5	219	168	115	84	410	80	115	38	M10	80	70	10	41		
112F2/8	165	130	200	M10x16	3,5	219	168	115	84	470	80	115	38	M10	80	70	10	41		
112F3/8	165	130	200	M10x16	3,5	219	168	115	84	470	80	115	38	M10	80	70	10	41		
112F4/8*	see 112F4/8 B5																			

* does not comply with IEC standard dimensions

All specifications in mm unless otherwise indicated.

112 Fx/8 B14 BRE

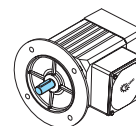
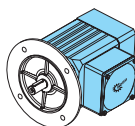
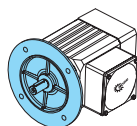
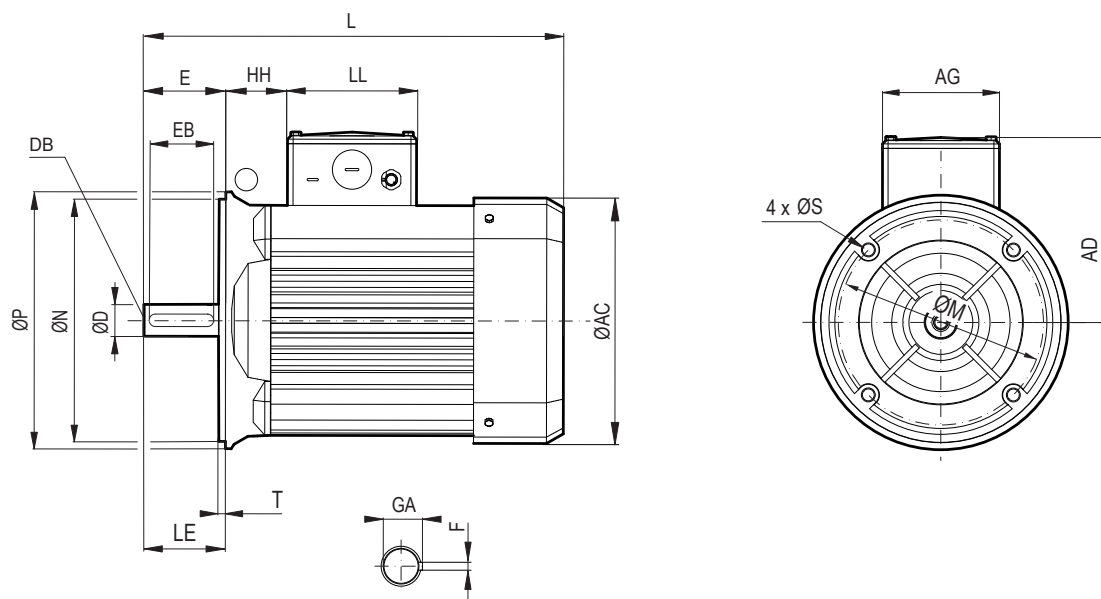


Typ																			
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE
112F1/8	165	130	200	M10x16	3,5	219	168	115	84	481	80	115	38	M10	80	70	10	41	20
112F2/8	165	130	200	M10x16	3,5	219	168	115	84	541	80	115	38	M10	80	70	10	41	25
112F3/8	165	130	200	M10x16	3,5	219	168	115	84	541	80	115	38	M10	80	70	10	41	35
112F4/8 *	see 112F4/8 B5																		

* does not comply with IEC standard dimensions

Dimension drawings

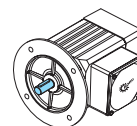
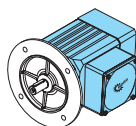
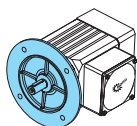
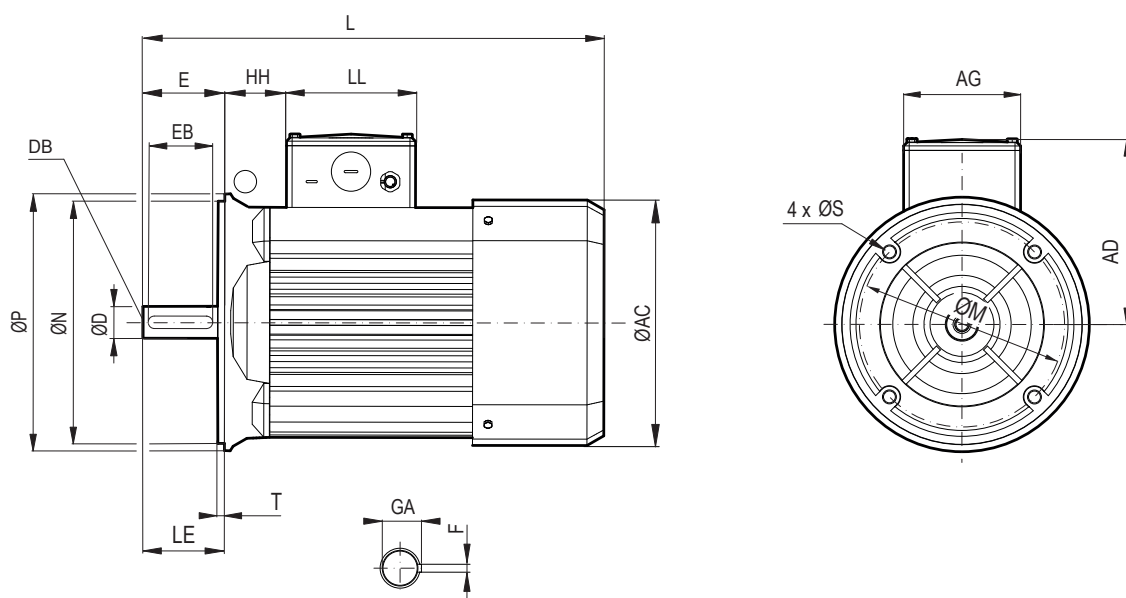
112 Fx/8 NEMA C-face



Typ	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA
112F1/8	184,2	215,9	228,6	1/2-13	6,4	219	168	115	58	374	72,9	115	28,575	M10	69,9	57,1	6,35	31,4
112F2/8	184,2	215,9	228,6	1/2-13	6,3	219	168	115	55	447	85,5	115	34,925	M10	85,7	77,8	7,94	38,4
112F3/8	184,2	215,9	228,6	1/2-13	6,3	219	168	115	55	447	85,5	115	34,925	M10	85,7	77,9	7,94	38,4
112F4/8	184,2	215,9	228,6	1/2-13	6,4	219	168	115	55	513	101,7	115	41,275	M10	101,6	79,4	9,53	45,5

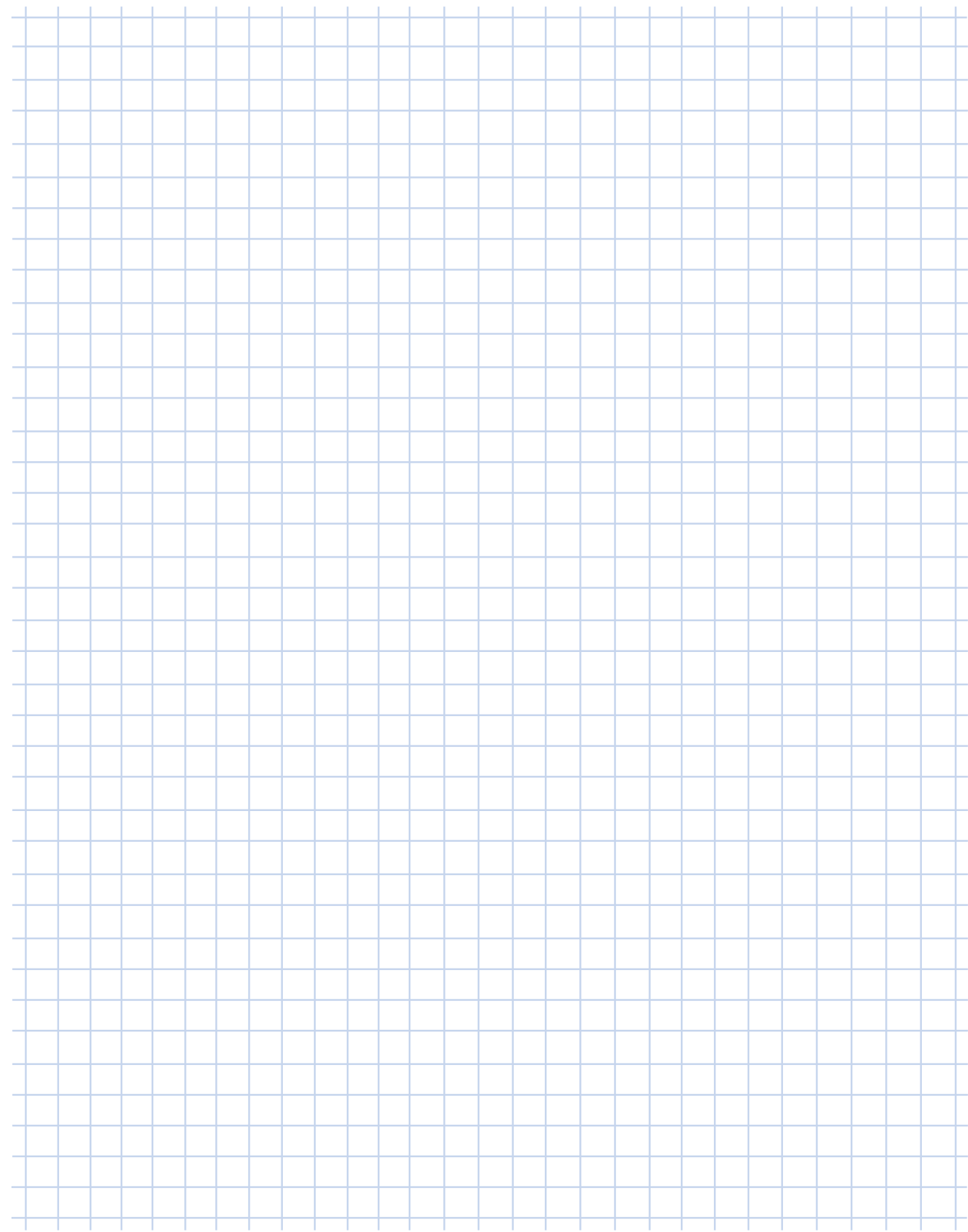
All specifications in mm unless otherwise indicated.

112 Fx/8 NEMA C-face BRE



Typ																						
	M	N	P	S	T	AC	AD	AG	HH	L	LE	LL	D	DB	E	EB	F	GA	BRE			
112F1/8	184,2	215,9	228,6	1/2-13	6,4	219	168	115	58	445	72,9	115	28,575	M10	69,9	57,1	6,35	31,4	20			
112F2/8	184,2	215,9	228,6	1/2-13	6,3	219	168	115	55	518	85,5	115	34,925	M10	85,7	77,8	7,94	38,4	25			
112F3/8	184,2	215,9	228,6	1/2-13	6,3	219	168	115	55	518	85,5	115	34,925	M10	85,7	77,9	7,94	38,4	35			
112F4/8	184,2	215,9	228,6	1/2-13	6,4	219	168	115	55	584	101,7	115	41,275	M10	101,6	79,4	9,53	45,5	50			

Notes



Selections from the NORD® range

G1000 Constant Speed Drive 50 / 60 Hz

- ▶ NORDBLOC.1 Helical Inline Gear Motor
- ▶ UNICASE Helical Inline Gear Motor
- ▶ UNICASE Parallel Shaft Gear Motor
- ▶ NORDBLOC.1 Helical Bevel Gear Motor
- ▶ UNICASE Helical Bevel Gear Motor
- ▶ UNICASE Helical Worm Gear Motor
- ▶ UNIVERSAL SI and SMI Worm Gear Motor



G5000 Geared motors with IE5

- ▶ NORDBLOC.1 Helical Inline Gear Motor
- ▶ UNICASE Helical Inline Gear Motor
- ▶ UNICASE Parallel Shaft Gear Motor
- ▶ NORDBLOC.1 Helical Bevel Gear Motor
- ▶ UNICASE Helical Bevel Gear Motor
- ▶ UNICASE Helical Worm Gear Motor



G1050 MAXXDRIVE® industrial gear units UNICASE housing 50 / 60 Hz

- ▶ Helical gear units
- ▶ Helical bevel gear units



E3000 NORDAC Electronic drive technology



EN

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