Designs

Motor types F2
Options F2
Abbreviation F3

Standards and regulations

Standards and regulations F3
Voltage and frequency F4
Permitted voltage and frequency deviations F4
Voltage tolerances F4
Rated voltage F4

Technical explanations

Acoustic pressure level and acoustic power level F4
Insulation class F5
Thermal motor protection F5
Thermostat F5
Temperature sensor F5
Enclosure F6
Operating modes F6

Motor options F7

Frequency inverter operation F9

Auxiliary fan F10
Incremental encoder, absolute encoder, sensor bearing F11

High efficiency motorsingle-phase motors EAR1, EHB1, EST, ECR F12

Motor data

Cable glands F12
4 pole, 50Hz F13
4 pole, 50/60Hz F14
6 pole F15
4-2 pole, 50Hz F15
8-2 pole F16
4 pole high efficiency F16
Single-phase motors EAR1, EHB1, EST, ECR F17

Motor dimensions

Additional lengths of motors with optional features . . . F19

Three-phase AC-motors

Size: 63 - 315
Power: 0,12 - 200 kW
Number of poles: 4 + 6 pole
(other versions upon request)

100 L A / 4 ....

- **Options**
- **Versions**
- **Number of poles**
- **Performance enhanced motor**
- **Power index**
- **Size**

Versions

Motor types

2G	Explosion protected motors with ignition protection type “e” (zone 1)
2GXD	Explosion protected motors with ignition protection type “de” (zone 1)
3G	Explosion protected motors with ignition protection type “n” (zone 2)
2D	Dust explosion protected motors zone 21
3D	Dust explosion protected motors zone 22
EAR1/ECR	Single-phase motor with operational and start-up capacitator
EHB1	Single-phase motor with operational capacitator
EST	Single-phase motor with operational capacitator and Steinmetz circuit
HE	Motors according to EPACT - high efficiency or motors according to CEMEP efficiency class EFF1
CUS	CUS approved motors

Options

Abbreviation	Meaning
BRE	Brake / braking torque
RG	Corrosion protected version
SR	Dust and corrosion protected version
HL	Manual hand release
FHL	Lockable manual release
MIK	Micro switch
IR	Current sensing relay
DBR	Double brake
BRB	Anti-condensation heater / Brake
ERD	External earth terminal
TF	Thermistor, PTC resistor
TW	Thermostat, bimetallic switch
SH	Anti-condensation heater
WU	Silumin rotor
Z	Heavy fan, cast-iron fan
WE	2nd shaft end
HR	Handwheel
RD	Canopy
RDD	Double fan-cowl

Abbreviation	Meaning
OL	Without fan
OL/H	Without fan, without cover
KB	Condensation drainage hole
EKK	One-piece terminal box
MS	Motor plug connector
KKV	Terminal box, moulded
FEU	Increased moisture protection
TRO	Tropics-proof
MOL	Dairy version
VIK	Regulation “Vereinigung Industrieller Kraftwirtschaft” [Association of the Industrial Power Industry]
F	Auxiliary fan for single and three-phase operation
RLS	Back stop
IG1 (IG11, IG21)	Incremental encoder 1024
IG2 (IG12, IG22)	Incremental encoder 2048
IG4 (IG41, IG42)	Incremental encoder 4096
IG.K	Encoder with terminal box
AG	Absolute encoder
SL	Sensor bearing
RE	Resolver

Abbreviation	Description	Unit
ED	Relative cyclic duration factor	**[%]**
P_N	Nominal power	**[kW]**
n_N	Nominal rotation speed	**[min^{-1}]**
I_A	Starting current	**[A]**
I_N	Nominal current	**[A]**
I_A / I_N	Starting current / nominal current	**[–]**
cos φ	Power factor	**[–]**
η	Efficiency	**[%]**
M_A	Starting torque	**[Nm]**
M_N	Nominal torque	**[Nm]**
M_A / M_N	Starting torque / nominal torque	**[–]**
M_K	Breakdown torque	**[Nm]**
M_K / M_N	Breakdown torque / nominal torque	**[–]**
M_B	Braking torque	**[Nm]**
J	Mass moment of inertia	**[kgm^2]**
U	Voltage	**[V]**
L_{PA}	Acoustic pressure leve	**[dB(A)]**
L_{WA}	Acoustic power level	**[dB(A)]**
t_E	Heating time in blocked status (EExe - motors)	**[s]**
Z_O	No-Load starting frequency	**[1/h]**
*	The power of these motors is outside thespecified range of the CEMEPagreements (see page F12)	

Standards and regulations

China **C**ompulsory **C**ertification

NEMA — Regulation of **N**ational **E**lectrical **M**anufacturers **A**ssociation

CE-labelling of products that comply with EU regulations

UL listed motors
63S - 132M File-Nr.: 191510
160M - 315 File-Nr.: E93429

EFF 1 EFF 2 — Efficiency classes as agreement of the CEMEP members

CSA and CUS accepted
Motors 63S - 132M
File-Nr.: 1293961 (LR112560)
Motors 160M - 315
File-Nr.: LR38727

VIK — Motors as per recommendation of the **V**erband der **I**ndustriellen Energie- und **K**raftwirtschaft e.V. [Association of the Industrial Energy and Power Industry, registered society]

CSA accepted
high efficiency motors

Standards and regulations

NORD motors are closed, self-ventilated squirrel-cage induction motors in three-phase or single-phase design.

The standard design complies with the following standards:

DIN EN 60 034-1
- **General specifications**

DIN EN 60 034-5
- **Types of enclosure**

DIN EN 60 034-6
- **Cooling types**

DIN EN 60 034-8
- **Terminal designations and direction of rotation**

DIN EN 60 034-9
- **Noise limits**

DIN EN 60 034-11
- **Built-in thermal protection**

DIN EN 60 034-14
- **Mechanical vibrations**

The following standards apply especially to **explosion protected motors**.

DIN EN 50 014
- **Ex motors, general provisions**

DIN EN 50 018
- **Exd motors, pressure resistant enclosure “d”**

DIN EN 50 019
- **Exe motors, increased safety “e”**

DIN EN 50 281-1-1
Electrical equipment for use in areas with combustible dust
(2D and 3D motors, zone 21 and zone 22)

NEMA compliant motors, CSA accepted (cCSAus) and UL listed(.) motors are also available.

Voltage and frequency

Constant-speed NORD standard motors can be used up to 2.2kW for 230/400V Δ/Y 50Hz and from 3kW for 400/690V Δ/Y 50Hz. NORD motors for other voltages and other frequencies are available with special windings.

Permitted voltage and frequency deviation according to DIN EN 60034-1

AC machines must work reliable in accordance with this standard at their rated voltage or within their rated voltage range ± 5 % and their rated frequency ± 2 %. Their heating may hereby exceed the heating limit of their thermal class (F) by approx. 10K. The voltages or rather voltage ranges stamped on the motor rating plates are the rated voltages or rather rated voltage ranges that the voltage tolerance refers to.

Permitted voltage deviations according to NEMA, CSA

The permitted voltage deviation according to NEMA and CSA is ± 10 % of the stamped rated voltage or rather the stamped rated voltage range.

Voltage tolerance according to DIN IEC60038

It is intended to unify the rated voltages of European public power supply to 230V, 400V and 690V as per DIN IEC 60038.

Previous mains voltages of 220V, 380V and 660V will be switched to 230V, 400V and 690V +6/-10 % until 2008 and previous mains voltages of 240V and 415V will be switched to 230V and 400V +10/-6 % until 2008. DIN IEC 60038 recommends, that voltages at the connection points may not be allowed to deviate by more than ± 10 % from the new standard values.

Rated voltage of NORD motors

NORD standard motors, 4 pole - 50Hz, are rated for the voltages ranges of 220-240/380-420V and 380-420/ 660-725V. They work reliably in continuous operation as per DIN EN 60 034 within ± 5 % of these voltage ranges. Reliable operation in the recommended range of the IEC standard voltages 230V, 400V and 690V +/-10 % is thus guaranteed.
NORD motors according to NEMA, CSA (cCSAus), UL are rated only with the rated voltage and not with a rated voltage range. Their permissible voltage deviation is thus ± 10 % of the stamped rated voltage.

Acoustic pressure level and acoustic power level

Noise is measured according to DIN21680-1 in an anechoic chamber at rated power. Noise is specified as acoustic pressure level in [db(A)] and acoustic power level in [db(A)].
As a rule, the noise value of the acoustic pressure level is used.

Insulation class

The windings of NORD motors are designed for insulation class 155°C (F). The highest permissible temperature increase at an ambient temperature of 40°C and an elevation of 1000 m is 105 K. The highest permissible winding temperature is 155° C

Permissible motor power at increased cooling air temperature and/or increased site altitude

	40°C	45°C	50°C	55°C	60°C
1000 m	100%	96%	92%	87%	82%
1500 m	97%	93%	89%	84%	80%
2000 m	94%	90%	86%	82%	77%
2500 m	90%	86%	83%	78%	74%
3000 m	86%	83%	79%	75%	71%
3500 m	83%	80%	76%	72%	68%
4000 m	80%	77%	74%	70%	66%

The values for motors in environments with explosion hazard differ.

Operation of 50 Hz motors on 60 Hz mains conversion factors for list values

50 Hz	60 Hz	n_N	P_N	M_N	I_N	M_A/M_N M_K/M_N	I_A/I_N
230V	230V	1,2	1,0	0,83	1,0	0,83	0,83
400V	400V	1,2	1,0	0,83	1,0	0,83	0,83
400V	460V	1,2	1,0	0,83	0,9	1,10	1,06
400V	460V	1,2	1,15	0,96	1,0	0,96	0,96
500V	500V	1,2	1,0	0,83	1,0	0,83	0,83
500V	575V	1,2	1,0	0,83	0,9	1,10	1,06
500V	575V	1,2	1,15	0,96	1,0	0,96	0,9

Thermal motor protection

Getriebebau NORD offers 2 thermal protection components (TW = bimetallic temperature monitor and TF = PTC resistor temperature sensor) at a surcharge. These monitor the winding temperatures at full motor power.

Three (one per phase) TWs or TFs in series each are located at the hotest spot of the windings. They are connected at 2 terminals in the terminal box. TW or TF motor protection is urgently recommended for frequency converter operation, heavy start-ups, switching operation, increased ambient temperature, impaired cooling, etc.

Thermostat (TW)

(Other common designations: Thermal opening contact, Clixon, bimetallic opening contact)
The thermostat is an encapsulated miniature bimetallic switch, usually working as an opening contact.

It must be wired in a way that once switching temperature is reached, it will interrupt the seal-in circuit of the motor contactor. The contactor will be deactivated and disconnect the motor.
The bimetallic switch will not close its contacts until the temperature has considerably decreased.

Response temperature: 155° C
Nominal current: 1.6 A at 250 V
Switch version: Breaker (terminals TB1 + TB2)

Temperature sensor (TF)

(Other common designations: PTC resistor, PTC temperature sensor, PTC thermistor)
As soon as the nominal minimum operating temperature (NAT) is reached, the resistance value of the temperature sensor will increase suddenly to almost ten times the normal value.

The PTC temperature sensor executes its protection function it only connected to a tripping device!

The tripping device will evaluate the resistance increase and disconnects the system.

Response temperature: 155° C
Max. voltage 30 V
Terminals TP1 + TP2
Also available as 2TF for warning and switching off!
2TF e.g.: 130° C = **Warning**, 155° C = **Switching off**

Enclosure according to DIN EN60034-5

Enclosure against contact with movable parts, as well as penetration of solid foreign bodies or dust and water. The protection level is indicated with the letters IP and two indexes. (e.g. IP55)

1. Index	Protection against	Explanation
5	Contact, foreign bodies, dust	Complete protection against contact. Dust cannot penetrate in hazardous quantities
6	Contact, foreign bodies, dust	Complete protection against contact.Dust cannot penetrate.
2. Index	**Protection against**	**Explanation**
5	Water	Protection against water jets from all directions. Water cannot penetrate in harmful amounts.
6	Water	Protection against heavy water jets from all directions. Water cannot penetrate in harmful amounts.

Motor for indoor operation

NORD recommends the following options for indoor operation:

	Indoor operation, dry	Indoor operation, humid
Motor version	IP 55 (Standard)	IP 55 (Standard)
Fluctuation in temperature and/or high humidity	—	KB, SH, FEU
Vertical design	RD	RDD

Motor for external operation

NORD recommends the following options for external operation:

	External operation	Extreme ambient conditions
Motor version	IP 55 (Standard)	IP 66
Fluctuation in temperature and/or high humidity	KB, SH, TR or FEU	
Vertical design	RD	RDD

Option KKV is available upon customer request.
Painting see 📖A43

Operating modes

The data of NORD motors in the catalogue apply to continuous operation (S1). In practice, motors must often work only short-term or with frequent interruptions.

Power increase in short-term and intermittent operation

Electromotor may be subjected to higher loads with short-term (S2) and intermittent operation (S3, S6) than with continuous operation (S1). The factors of the permissible power increase versus rated power (PN) with continuous operation are included in the following table. Generally, the output may only be increased to the point that the relative breakdown torque (M_K/M_N) divided by the output increase factor results in the value ≥1.6. In individual cases higher factors than listed in the table my result. These will be told upon request.

S2	Perm. power	S3	Perm. power	S6	Perm. power
10min	1,4 x P_N	25%	1,33 x P_N	25%	1,45 x P_N
30min	1,15 x P_N	40%	1,18 x P_N	40%	1,35 x P_N
		60%	1,08 x P_N	60%	1,15 x P_N

Definition of the most important operating modes

S1
Continuous operation with constant load
S2
Short-term operation with constant load. Thermal equilibrium is not attained. The motor will not be restarted until it has cooled down to a value of max. 2K above cooling air temperature. Example: S2-10 min. Recommended values for the determination: 10, 30 min
S3
Intermittent operation, consisting of identical load cycles with periods of constant load and subsequent breaks. Neither the frequency of starting nor starting against heavy load must have a noticeable effect on the temperature. Unless otherwise agreed, a cycle duration of 10 min. is assumed. The relative cyclic duration factor indicates the portion of the operating time in relation to complete cycle duration. Example: S3-40 % ED: 4 min load - 6 min break Recommended values for the determination: 25, 40, 60 %
S6
Continuous operation, consisting of identical load cycles with periods of constant load and subsequent idling. Cycle duration and relative cyclic duration factor as with S3. Example: S6 - 40 % ED Recommended values for the determination: 25, 40, 60 %

For applications with a high starting frequency or heavy-duty starting characteristics, motor rating and operation classification should be checked with Getriebebau NORD.

Following data must be provided:
- Relative cyclic duration factor
- Starting frequency
- External mass moment of inertia
- Load torque behaviour at the speed
- Braking type

External earth terminal (ERD)

A corrosion-resistant earth terminal in the form of a flat terminal or terminal strap is attached to the motor housing.
E.g. 112 M/4 **ERD**

Thermal motor protection (⇨🕮 F5)

Getriebebau NORD offers 2 thermal protection components at a surcharge.
- **TW** = bimetallic temperature monitor
- **TF** = PTC resistor temperature sensor

Canopy (RD)

For protection against the ingress of foreign bodies, when the motor is in the vertical position with the shaft facing downwards, NORD recommend that a canopy should be used. A protective roof is mandatory for ex-motors in vertical design with a downward facing shaft according to DIN EN 50014. E.g. 112 M/4 **RD**

Double fan-cowl (RDD)

Increased protection against rain and snow as well as the ingress of foreign bodies in the vertical position with the shaft facing downward. E.g. 132 S/4 **RDD**

Condensation drainage holes (KB)

Depending on installation position, condensation drainage holes are drilled at the lowest position of the A or B bearing plate. These are closed with oval-head screws. E.g. 71 S/4 **KB**

⚠ The design must be specified!

Condensation drainage holes must be opened regularly and condensed water drained prior to commissioning and during operation.

Anti-condensation heater (SH)

An anti-condensation heater is to be used with strong temperature variations or extreme climate conditions. It prevents accumulation of moisture inside the motor.
The anti-condensation heater must not be switched on with running motors!
A brake terminal box is used for designs with TF or TW.
⚠ Dimensions

Available version: 110 V; **230 V**; 500 V

⚠ Please indicate the required supply voltage!
E.g. 100 L/4 **SH 230V**

Without fan (OL)
Without fan without ventilation cover (OL/H)

With this version the motor is delivered without fan (OL) or rather without fan and without ventilation cover. Advantage: No ventilation noise, reduced installation length with OL/H. E.g. 63 S/4 **OL/H**

⚠ Power reduction or rather only for operating mode S3 - 40 %

Moisture protection insulation (FEU)

For the use of motors in humid environments we recommend the version with moisture protection insulation. E.g. 71 L/4 **FEU**

Tropicalised insulation (TRO)

For the use of motors in extreme climatic condition (tropics) we recommend the version with tropicalised insulation. E.g. 71 L/4-2 **TR**

Dairy version (MOL)

Motor with cooling ribs
Measures:
- open condensation drainage holes
- terminal box, moulded
- knurled-head screws for ventilation cover attachment
- rating plate from V2A

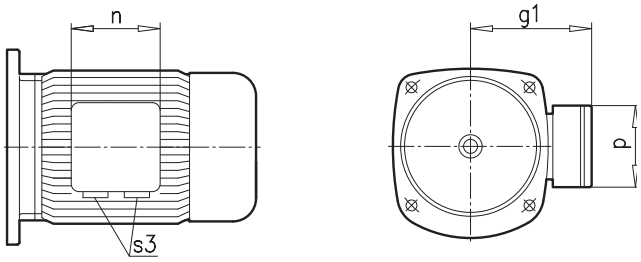
E.g. 80 S/4 **MOL** ⚠ The design must be specified!

VIK version (VIK)

Motors as per technical requirements of the “Verbandes der Industriellen Energie- und Kraftwirtschaft [Association of Industrial Energy and Power Industry]”. Please inquire!
E. g. 100 L/4 **VIK**

One-piece terminal box (EKK)

Version with small, one-piece terminal box. Please observe cable glands. Not available for brake motors. E.g. 63 L/6 **EKK**



EKK	g1	n	p	S3 (EKK)
63 S/L	100	75	75	2x M16 x 1,5
71 S/L	109	75	75	2x M16 x 1,5
80 S/L	124	92	92	2x M20 x 1,5
90 S/L	129	92	92	2x M20 x 1,5
100 L	140	92	92	2x M20 x 1,5
112 M	150	92	92	2x M20 x 1,5
132 S/M	174	105	105	2x M25 x 1,5

2nd shaft end (WE)

Motors with 2. shaft end, on the B-side. For motors with or without brake. This option cannot be combined with the auxiliary fan (F) option. For combination with one or more of the following options we ask for prior request: encoder attachment (IG), protective roof (RD), double ventilation cover (RDD). The transferable power as well as permissible radial forces for the 2nd shaft end upon request. E.g. 112 MH/4 **WE**

Handwheel (HR)

Motors with installed handwheel on the 2. shaft end. E.g. 132 M/40 **HR**

Silumin rotor (WU)

For drives in the materials-handling technology without converter supply. E.g. 90 S/8-2 **WU**

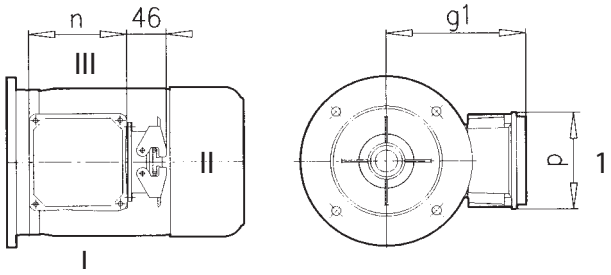
Cast-ir0n fan / flywheel (Z)

Motor with cast-iron fan. Mass moment of inertia J_Z (kgm^2)

Size	J_Z (kgm^2)
63	0,00093
71	0,0020
80	0,0048
90	0,0100
100	0,0113
112	0,0238
132	0,0238

Motor length as with brake motors e.g. 90 S/8-2 WU **Z**

Motor plug connector (MS)



Sandard version

Terminal box (KK) at 1, plug at II (to ventilation cover), plug at I + III possible

	BG 63	BG 71	BG 80	BG 90	BG 100	BG 112	BG 132
g1 / g1 Bre	140	149	158	163	174	184	204 / 219
n	114	114	114	114	114	114	122
p	114	114	114	114	114	114	122

Three-phase (brake) motors of the sizes 63 to 132 can also be delivered with motor plug connector upon request. (Type affix: **MS**)
The plug connector is attached laterally to the terminal box. Standard version facing the ventilation cover with II. Plug for I or rather III available. Housings with 2 bracket transverse locking are used.

On the motor-side with BG 63 - 112 there is a HAN 10 ES/HAN 10 ESS pin version. The customer must supply a HAN 10ES plug connecter insert as socket version. (Manufacture: Harting)
With BG 132 there is a HAN C-modular pin version on the motor-side.

The specified contact assignment is present in constant-speed and pole-changeable (separate winding and Dahlander pole changing) motors. The contacts for the PTC resistor temperature sensor or temperature monitor as well as the brake supply voltage are specified as well.

The motor plug connector is delivered without female connector and protected against soiling with a protective cap.

BG 63 - 112 technical data:

Plug:	Han 10 ES/Han 10 ESS
Number of contacts:	10
Power:	16 A max.
Voltage:	500 V max.
Cage clamp	

BG 132 technical data:

Plug:	Han 10 C-modular
Number of contacts:	9
Power:	40 A max.
Voltage:	690 V max.
Crimp connection	

Please inquire for detailed information.

Backstop (RLS)

Backstops are used to prevent backdriving of the gearbox by external loads when the motor is switched off. A drive with backstop can rotate in one direction only. The desired rotation direction of the drive must be specified with the order. Left or right rotation at the drive shaft.

⚠ Please be careful with motors with increased number of poles (>4) and with inverter operation: Always observe the speed threshold for return stop release! A backstop works without wear only above the lift-off speed.

Please also refer to page A31 of the Technical Explanations chapter for more information.

Motor-Size	RLS [Nm]	Lift-off speed n [min^{-1}]	Motor-extension x_{RLS} [mm]
80 S/L	130	860	64
90 S/L	130	860	75
100 L	130	860	91
112 M	370	750	93
132 S/M	370	750	107
160 M/L	890	670	167
180 MX/LX	890	670	171
200 L	1030	630	167
225 S/M	1030	630	167
250 M	2500	400	250
280 S/M	5800	320	280

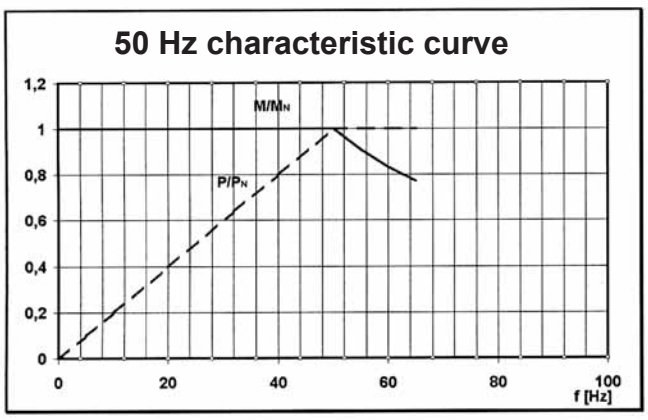
Frequency inverter operation

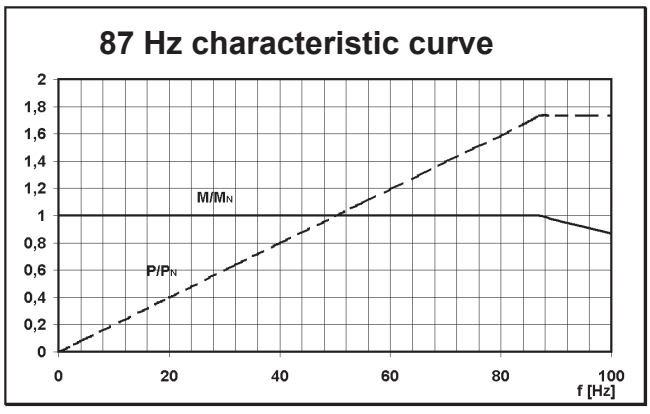
NORD motors are suited for operation with standard frequency inverters (pulse inverters). The windings are protected against high voltage rises with double coated wires and phase insulation.
The use of du/dt filters or sinus filters is recommended for motors with inverter operation above 500 V.

⚠ Thermal motor protection (TW, TF) is recommended urgently (see page F5).

87 Hz characteristic curve

Motors for 230/400V, 50Hz can be supplied with 400V, 87Hz for inverter operation, if they are switched in a Delta connection. Speed and power are increased to 173% thus, the torque remains constant.
The inverter must be selected according to the increased power. Consultation is required with regard to the gearing.





Auxiliary fan (F)

For cases in which the motor is thermally loaded strongly, an auxiliary fan is available at a surcharge.
Typical cases are **frequency inverter** controlled drives, which have a full drive torque load for extended periods of time at low motor speed or drives in cyclic operation with high switching frequency (operating mode S4). The auxiliary fan is integrated in the ventilation cover of the three-phase motor. Please refer to the table on page F19/F20 for the extension.

Please observe that the auxiliary fan is connected separately from the three-phase current motor. In addition, the motor should be protected with thermal sensors (TF) against auxiliary fan failure.

Type affix **F =** protection class IP66 third party fans with separate terminal box

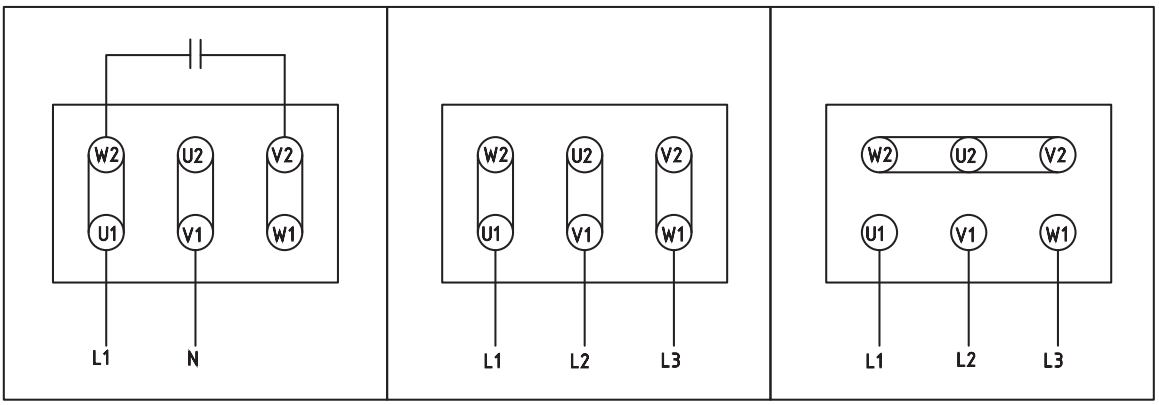
- **For single-phase operation**
  Steinmetz connection (220 (230)V - 277V) 50 + 60 Hz

- **For three-phase operation**
  Star connection (380V - 500V) 50 Hz
  Delta connection (220V - 290V) 50 Hz
  Star connection (380V - 575V) 60 Hz
  Delta connection (220V - 332V) 60 Hz

The auxiliary fan for sizes 63 - 90 is by default switched for single-phase operation, for sizes 100 and > in three-phase operation.

F	1~, 50 Hz				3~, 50 Hz △ / ⅄					
	U_N [V]	I_N [mA]	P_N [W]	n_N [min^{-1}]	U_N△[V]	I_N△[mA]	U_N ⅄[V]	I_N ⅄[mA]	P_N [W]	n_N [min^{-1}]
63 S/L	230 - 277	78 - 94	18,5 - 27	2960 - 2900	220 - 290	59 - 92	380 - 500	24 - 45	16,5 - 27	2830 - 2910
71 S/L	230 - 277	84 - 99	20 - 28	2780 - 2860	220 - 290	60 - 95	380 - 500	27 - 46	17,5 - 30	2780 - 2860
80 S/L	230 - 277	92 - 104	22 - 29	2530 - 2740	220 - 290	62 - 90	380 - 500	57 - 45	18 - 28,5	2640 - 2790
90 S/L	220 - 277	215 - 295	47 - 82	2870 - 2915	220 - 290	215 - 335	380 - 500	120 - 185	46 - 97	2875 - 2925
100 L/LA	220 - 277	240 - 310	53 - 86	2820 - 2885	220 - 290	225 - 345	380 - 500	125 - 190	48 - 100	2835 - 2900
112 M	220 - 277	265 - 305	59 - 85	2700 - 2830	220 - 290	225 - 330	380 - 500	130 - 180	48 - 95	2760 - 2860
132 S/M/MA	230 - 277	216 - 283	53 - 82	1440 - 1460	220 - 290	219 - 320	380 - 500	124 - 179	52 - 95	1430 - 1460
160 M/L	230 - 277	342 - 446	85 - 128	1420 - 1450	220 - 290	361 - 523	380 - 500	207 - 291	74 - 155	1420 - 1450
180 MX/LX	230 - 277	342 - 446	85 - 128	1420 - 1450	220 - 290	361 - 523	380 - 500	207 - 291	74 - 155	1420 - 1450
200 L	230 - 277	342 - 446	85 - 128	1420 - 1450	220 - 290	361 - 523	380 - 500	207 - 291	74 - 155	1420 - 1450
225 S/M	230 - 277	342 - 446	85 - 128	1420 - 1450	220 - 290	361 - 523	380 - 500	207 - 291	74 - 155	1420 - 1450

Connection circuit diagrams of auxiliary fan



Single-phase operation
Steinmetz connection
220 (230)V - 277V (50 + 60Hz)

Three-phase operation
Delta connection △
220V - 290V (50Hz)
220V - 332V (60Hz)

Three-phase operation
Star connection ⅄
380V - 500V (50Hz)
380V - 575V (60Hz)

Incremental encoder (IG1, IG2 and IG4)

Modern drive applications require often a speed feedback. As a rule, incremental encoders are used for this. Incremental encoders are electronic encoders, which are available with industry standard interfaces and different resolutions.

The combination with NORDAC frequency inverters offers solutions for varied requirements:

- Speed control with a large adjustment range
- High speed precision
- Simultaneous control
- Positioning control
- Standstill torque
- Peak load allowance

Encoder mounting

The mounting of encoders is possible for motors of the sizes 63 to 225. (BG250-315 upon request) The motors are available as self-ventilated or auxiliary ventilated, with or without brake. Getriebebau NORD hollow shaft attachment encoders are protected under the ventilation cover and attached directly to the B-side shaft end of the motor. This ensures safe, torsion-free encoder connection. The electrical connection is done with a pre-fabricated 1.5 m cable.
Connection is possible in a separate terminal box. Option: **IG1K, IG2K** or **IG4K** (surcharge)

		Type / increment number		
		IG1 / 1024 IG2 / 2048 IG4 / 4096	**IG11 / 1024 IG21 / 2048 IG41 / 4096**	**IG12 / 1024 IG22 / 2048 IG42 / 4096**
Interface		**TTL / RS 442**	**TTL / RS 422**	**HTL push-pull**
Operational voltage	**[V]**	4...6	10...30	10...30
Max. output frequency	**[kHz]**	300		
Max. operational speed	**[min^{-1}]**	12000		
Ambient temperature	**[°C]**	-40...+70		
Protection class		IP65		
Max. power consumption	**[mA]**	150		

NORD motors are also available with the following encoder systems:

Absolute encoder (AG)

The following absolute encoder is available fitted to NORD motors.

Type: CH 58 Multiturn
- Resolution programmable, max. 8192 steps per revolution, 4096 revolutions
- Interfaces: SSI, SSI with incremental track, profibus
- Connection technology with cable outlet, radial field bus connection with 3x cable clamping
- Supply: 24V

The absolute encoder is attached under the ventilation cover starting with version BG 80, with field bus connection outside the ventilation cover. (BG 250 - 315 upon request)
The attachment of absolute encoders of alternative manufacturer are available upon request.

Sensor bearing (SL)

A version with sensor bearing (SL) is available for NORD motors BG **63** to **132** upon request. The sensor output signal consists of two square waves, which are phase-delayed by 90° and allow rotation direction determination. The number of pulses depends on the stock size, it is 32, 48, 64 or 80 pulses!

Resolver (RE)

The attachment of resolvers to NORD motors is possible, please enquire!

CEMEP agreement

NORD high efficiency motors

CEMEP agreement, efficiency classes EFF1 to EFF3 (applies to three-phase squirrel-cage induction motors, 2 pole and 4 pole, closed, self-cooled, with IEC standard power from 1.1 kW to 90 kW, S1 operation, 230/400V and 400/690V at 50Hz)

NORD standard motors are designed for efficiency class EFF2.
NORD three-phase current motors for efficiency class EFF1 are available as well.

⚠ For size 112 MH/4 the dimensions indicated in the catalogue are extended by 25 mm (📖F16).

EPACT/CSA

High efficiency motors for the American market (USA, Canada) are available as well.

NORD single-phase motors

EAR1, EHB1 (50Hz only)

The EAR1, EHB1 series replaces the proven series EAR, EHB. This series is characterised by increased breakdown torques, a wide voltage range of 220-240V (and additionally according to EN60034 +/-5 %) and thus increased operational safety.

ECR (60Hz)

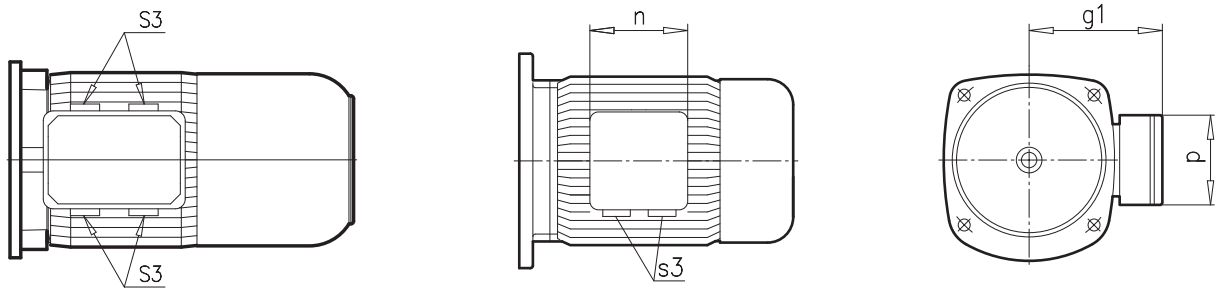
The ECR series is intended for demanding operation at 60Hz mains with 115V or 230V. The permissible voltage range is 115/230V +/-10 % without additional tolerance. These motors may be overloaded continuously with 15 % with voltage tolerance utilisation. (SF 1.15).

EST

A reasonable solution with steinmetz circuit for basic requirements.

Cable glands

63 - 132 BRE



	S3	S3 (BRE)	S3 (EKK)
63 S/L	2x M20 x 1,5	4x M20 x 1,5	2x M16 x 1,5
71 S/L	2x M20 x 1,5	4x M20 x 1,5	2x M16 x 1,5
80 S/L	2x M25 x 1,5	4x M25 x 1,5	2x M20 x 1,5
90 S/L	2x M25 x 1,5	4x M25 x 1,5	2x M20 x 1,5
100 L	2x M32 x 1,5	4x M25 x 1,5	2x M20 x 1,5
112 M	2x M32 x 1,5	4x M25 x 1,5	2x M20 x 1,5
132 S/M	2x M32 x 1,5	4x M25 x 1,5	2x M25 x 1,5
160 M/L	2x M40 x 1,5	2x M40 x 1,5	--
180 MX/LX	2x M40 x 1,5	2x M40 x 1,5	--
200 L	2x M50 x 1,5	2x M50 x 1,5	--
225 S/M	2x M50 x 1,5	2x M50 x 1,5	--
250 M	2x M63 x 1,5	2x M63 x 1,5	--
280 S/M	2x M63 x 1,5	2x M63 x 1,5	--
315 S/M/L	2x M63 x 1,5	--	

1500 min^{-1} 50 Hz				230/400V & 400/690V - S1											EFF2
	P_N [kW]	n_N [min^{-1}]	I_N (230/400V) [A]	I_N (400/690V) [A]	cos φ	η(4/4xP_N) [%]	η(3/4xP_N) [%]		M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	L_{PA} dB(A)	L_{WA} dB(A)	J [kgm^2]
63S/4	0,12	1335	0,95 / 0,55		0,64	49,9	*	*	0,86	2,7	2,7	2,9	44	52	0,00021
63L/4	0,18	1360	1,18 / 0,68		0,64	56,2	*	*	1,26	2,5	2,6	3,3	44	52	0,00028
71S/4	0,25	1380	1,32 / 0,76		0,77	61,6	*	*	1,73	2,2	2,1	3,3	49	57	0,00072
71L/4	0,37	1380	1,89 / 1,09		0,71	64,4	*	*	2,56	2,3	2,5	4,2	49	57	0,00086
80S/4	0,55	1375	2,63 / 1,52		0,73	71,5	*	*	3,82	1,9	2,0	3,3	51	59	0,00109
80L/4	0,75	1375	3,64 / 2,10		0,74	69,6	*	*	5,21	2,0	2,1	3,5	51	59	0,00145
90S/4	1,10	1395	4,87 / 2,81		0,74	76,2	75,9	**EFF2**	7,53	2,3	2,6	4,4	53	61	0,00235
90L/4	1,50	1395	6,15 / 3,55		0,78	78,5	78,2	**EFF2**	10,3	2,3	2,6	4,8	53	61	0,00313
100L/4	2,20	1440	9,04 / 5,22		0,74	81,1	81,1	**EFF2**	14,6	2,3	3,0	5,1	56	64	0,0045
100LA/4	3,00	1415		6,54 / 3,78	0,80	82,6	82,4	**EFF2**	20,2	2,5	2,9	5,4	56	64	0,006
112M/4	4,00	1445		8,30 / 4,79	0,80	86,0	84,0	**EFF2**	26,4	2,3	2,8	5,3	58,	66	0,011
132S/4	5,50	1445		11,4 / 6,56	0,81	85,8	85,4	**EFF2**	36,5	2,1	2,7	5,5	64	72	0,024
132M/4	7,50	1445		14,8 / 8,55	0,84	87,0	86,0	**EFF2**	49,6	2,5	2,8	5,5	64	72	0,032
132MA/4	9,20	1450		18,8 / 10,9	0,80	87,4	*	*	60,6	2,6	3,1	6,0	64	72	0,035
160M/4	11,0	1460		22,0 / 12,7	0,81	89,0	89,0	**EFF2**	72,0	2,3	2,7	6,5	67	75	0,061
160L/4	15,0	1460		28,8 / 16,6	0,84	89,9	90,0	**EFF2**	98,1	2,7	3,1	6,7	67	75	0,082
180MX/4	18,5	1460		35,7 / 20,6	0,82	90,7	90,7	**EFF2**	121	3,1	3,1	7,1	67	75	0,095
180LX/4	22,0	1460		43,4 / 25,0	0,82	90,9	90,7	**EFF2**	144	3,1	3,1	6,9	67	75	0,115
200L/4	30,0	1465		55,0 / 32,0	0,86	91,8	91,8	**EFF2**	196	2,6	3,2	7,0	65	78	0,240
225S/4	37,0	1470		66,0 / 38,0	0,87	92,9	92,9	**EFF2**	240	2,8	3,2	7,0	65	78	0,320
225M/4	45,0	1470		80,0 / 46,0	0,87	93,4	93,4	**EFF2**	292	2,8	3,3	7,7	65	78	0,360
250M/4	55,0	1480		100 / 58,0	0,85	93,5	93,8	**EFF2**	355	2,4	2,8	6,1	67	80	0,690
280S/4	75,0	1485		136 / 79,0	0,85	94,2	94,1	**EFF2**	482	2,5	3,0	7,1	70	83	1,20
280M/4	90,0	1485		160 / 92,0	0,86	94,6	94,6	**EFF2**	579	2,5	3,0	7,4	70	83	1,40
315S/4	110	1488		198 / 114	0,85	94,6	*	*	706	2,5	2,8	6,4	70	83	1,90
315M/4	132	1488		235 / 136	0,85	95,2	*	*	847	2,7	2,9	6,8	70	83	2,30
315MA/4	160	1486		280 / 162	0,86	95,7	*	*	1028	2,7	2,8	6,8	70	83	2,90
315L/4	200	1486		340 / 196	0,88	95,9	*	*	1285	2,6	2,8	6,5	70	83	3,50

1500 / 1800 min^{-1} S1
50 / 60 Hz

	50 Hz						60 Hz				
	P_N [kW]	n_N [min^{-1}]	230/400V I_N [A]	400/690V I_N [A]	380V I_N [A]	420V I_N [A]	P_N [kW]	n_N [min^{-1}]	440V I_N [A]	460V I_N [A]	480V I_N [A]
63S/4	0,12	1335	0,95 / 0,55	0,55 / 0,32	0,53	0,63	0,14	1635	0,50	0,54	0,57
63L/4	0,18	1360	1,18 / 0,68	0,68 / 0,39	0,65	0,75	0,21	1660	0,63	0,65	0,71
71S/4	0,25	1380	1,32 / 0,76	0,76 / 0,44	0,76	0,76	0,29	1655	0,76	0,76	0,76
71L/4	0,37	1380	1,89 / 1,09	1,09 / 0,63	1,07	1,12	0,43	1680	1,05	1,05	1,08
80S/4	0,55	1375	2,63 / 1,52	1,52 / 0,88	1,52	1,54	0,63	1650	1,50	1,50	1,52
80L/4	0,75	1375	3,64 / 2,10	2,10 / 1,22	1,95	2,2	0,86	1650	2,00	2,10	2,20
90S/4	1,10	1395	4,87 / 2,81	2,81 / 1,63	2,80	2,90	1,27	1675	2,85	2,78	2,81
90L/4	1,50	1395	6,15 / 3,55	3,55 / 2,05	3,50	3,50	1,73	1675	3,65	3,55	3,50
100L/4	2,20	1440	9,04 / 5,22	5,22 / 3,00	5,20	5,60	2,55	1725	5,20	5,20	5,35
100LA/4	3,00	1415	11,3 / 6,54	6,54 / 3,78	6,35	6,82	3,45	1700	6,73	6,35	6,54
112M/4	4,00	1445	14,4 / 8,3	8,30 / 4,79	8,60	7,75	4,60	1735	8,70	8,60	8,30
132S/4	5,50	1445	19,7 / 11,4	11,4 / 6,56	11,8	11,9	6,30	1730	11,8	10,9	11,7
132M/4	7,50	1445	25,6 / 14,8	14,8 / 8,55	15,3	14,2	8,60	1735	15,3	14,6	14,8
132MA/4	9,20	1450	32,6 / 18,8	18,8 / 10,9	19,1	18,9	10,6	1745	18,7	18,1	18,1
160M/4	11,0	1460	38,0 / 22,0	22,0 / 12,7	22,8	22,2	12,6	1760	22,3	22,0	21,6
160L/4	15,0	1460	49,9 / 28,8	28,8 / 16,6	29,8	28,3	17,3	1760	29,8	28,8	28,3
180MX/4	18,5	1460	61,8 / 35,7	35,7 / 20,6	36,6	35,7	21,3	1760	35,8	35,1	34,4
180LX/4	22,0	1460	75,0 / 43,4	43,4 / 25,0	44,1	43,1	25,3	1760	42,8	41,2	41,5
200L/4	30,0	1465	95 / 55	55 / 32	57	54	34,5	1760	57	55	54
225S/4	37,0	1470	114 / 66	66 / 38	69	64	42,5	1770	69	66	64
225M/4	45,0	1470	139 / 80	80 / 46	84	78	52	1770	83	80	78
250M/4	55,0	1480	173 / 100	100 / 58	104	98	63	1780	104	99	97
280S/4	75,0	1485	236 / 136	136 / 79	144	132	86	1785	136	132	130
280M/4	90,0	1485	277 / 160	160 / 92	168	156	104	1785	166	158	154
315S/4	110	1488	—	198 / 114	205	194	127	1786	205	198	194
315M/4	132	1488	—	235 / 136	245	230	152	1788	245	235	230
315MA/4	160	1486	—	280 / 162	295	275	184	1786	295	275	270
315L/4	200	1486	—	340 / 196	360	330	230	1786	360	340	330

1000 min^{-1} 50 HZ — 230/400V & 400/690V - S1

	P_N [kW]	n_N [min^{-1}]	I_N 230/400V I_N [A]	I_N 400/690V I_N [A]	cos φ	η [%]	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	J [kgm^2]
63S/6	0,09	850	0,85/0,49		0,67	39,6	1,01	2,00	2,00	1,8	0,00028
63L/6	0,12	865	1,13/0,65		0,62	42,8	1,32	2,10	2,10	1,9	0,00035
71S/6	0,18	910	1,23/0,71		0,67	54,0	1,89	2,20	2,30	2,8	0,00091
71L/6	0,25	920	1,59/0,92		0,67	58,5	2,60	2,50	2,60	3,2	0,0012
80S/6	0,37	930	2,11/1,22		0,70	62,5	3,80	2,40	2,60	3,7	0,0022
80L/6	0,55	920	2,67/1,54		0,74	69,7	5,71	1,85	2,05	3,3	0,0028
90S/6	0,75	915	3,85/2,22		0,73	66,8	7,83	2,20	2,40	3,8	0,0037
90L/6	1,10	910	5,14/2,97		0,77	69,4	11,5	1,90	2,20	3,6	0,005
100L/6	1,50	940	6,63/3,83		0,74	76,4	15,2	2,40	2,66	4,6	0,010
112M/6	2,20	950	9,30/5,40		0,73	80,5	22,1	1,60	2,40	4,6	0,018
132S/6	3,00	965		7,30/4,22	0,72	82,4	29,7	1,55	1,90	3,2	0,031
132M/6	4,00	960		9,10/5,30	0,76	93,6	39,8	1,45	1,90	3,2	0,038
132MA/6	5,50	945		12,4/7,16	0,76	84,3	55,6	1,45	1,90	3,7	0,045

1500 / 3000 min^{-1} 50 Hz — 400V Δ / YY - S1

	P_N [kW]	n_N [min^{-1}]	I_N (400V) [A]	cos φ	η [%]	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	J [kgm^2]
71S/4-2	0,21 0,28	1410 2780	0,66 0,80	0,73 0,86	63,2 58,6	1,42 0,96	2,14 2,46	2,32 2,70	2,32 2,70	0,00072
71L/4-2	0,30 0,45	1385 2715	0,98 1,30	0,75 0,88	59,2 56,7	2,07 1,58	2,08 1,57	2,13 1,86	2,13 1,86	0,00086
80S/4-2	0,48 0,60	1390 2785	1,30 1,66	0,77 0,82	68,9 63,9	3,30 2,06	1,70 1,81	1,82 2,04	1,82 2,04	0,00109
80L/4-2	0,70 0,85	1355 2770	1,84 2,34	0,79 0,80	69,9 65,5	4,93 2,93	1,64 2,02	1,74 2,05	1,74 2,05	0,00145
90S/4-2	1,10 1,40	1400 2780	2,68 3,50	0,84 0,88	70,8 66,0	7,50 4,81	1,55 1,62	2,08 2,08	2,08 2,08	0,00235
90L/4-2	1,50 1,90	1380 2775	3,50 4,70	0,81 0,82	76,0 70,8	10,38 6,54	2,01 2,32	2,14 2,29	2,14 2,29	0,00313
100L/4-2	2,00 2,40	1400 2380	4,60 5,50	0,75 0,85	83,7 74,1	13,64 8,10	1,74 2,04	2,04 2,17	2,04 2,17	0,0045
100LA/4-2	2,60 3,10	1380 2825	5,62 6,71	0,87 0,88	76,4 76,0	17,99 10,48	1,77 2,10	2,06 2,24	2,06 2,24	0,0060
112M/4-2	3,70 4,40	1435 2905	7,90 9,60	0,84 0,83	80,2 80,0	24,62 14,46	1,95 2,42	2,60 3,04	2,60 3,04	0,0110
132S/4-2	4,70 5,90	1465 2905	9,30 12,0	0,84 0,88	87,4 80,3	30,64 19,39	1,93 2,30	2,48 2,68	2,48 2,68	0,0233
132M/4-2	6,50 8,00	1450 2915	13,0 18,0	0,83 0,79	87,0 81,2	42,81 26,21	2,20 2,56	2,62 2,90	2,62 2,90	0,0317
160M/4-2	9,30 11,5	1455 2930	18,3 23,4	0,85 0,89	87,0 80,0	61,04 37,48	2,00 1,80	2,60 2,40	2,60 2,40	0,0430
160L/4-2	13,0 17,0	1455 2930	25,6 32	0,84 0,88	88,0 87,0	85,33 55,41	2,50 2,80	3,00 3,00	3,00 3,00	0,06
180M/4-2	15,0 18,0	1470 2950	29,0 37,5	0,83 0,80	90,0 87,0	97,45 58,27	2,10 2,20	2,70 3,20	2,70 3,20	0,13
180L/4-2	18,0 21,5	1465 2950	34,5 42,0	0,84 0,85	90,0 87,0	117,34 69,60	2,00 2,20	2,60 3,10	2,60 3,10	0,15
200L/4-2	26,0 31,0	1465 2940	48,5 61,0	0,86 0,85	90,0 87,0	169,50 100,70	2,60 2,60	2,80 3,30	2,80 3,30	0,24

750 / 3000 min^{-1} 50 Hz — 400V Y / Y - S3-40% WU

	P_N [kW]	n_N [min^{-1}]	I_N (400V) [A]	cos φ	η [%]	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	J [kgm^2]
71S/8-2WU	0,045 0,220	645 2150	0,47 0,84	0,60 0,95	23,0 39,8	0,67 0,98	2,60 1,50	2,60 1,60	1,50 1,90	0,00072
71L/8-2WU	0,06 0,30	660 2290	0,57 0,92	0,61 0,96	24,9 49,0	0,87 1,25	2,76 1,30	3,00 1,76	1,58 2,39	0,00086
80S/8-2WU	0,10 0,45	660 2715	0,73 1,37	0,57 0,77	34,7 61,6	1,45 1,58	2,00 2,02	2,28 2,78	1,64 3,07	0,00109
80L/8-2WU	0,13 0,55	585 2620	0,74 1,47	0,70 0,90	36,2 60,0	2,12 2,00	1,41 2,10	1,46 2,05	1,62 3,33	0,00145
90S/8-2WU	0,20 0,80	660 2800	1,31 2,50	0,59 0,87	37,4 53,0	2,89 2,73	2,04 2,90	2,25 3,08	1,83 3,92	0,00235
90L/8-2WU	0,30 1,20	650 2825	1,66 3,17	0,59 0,79	44,2 69,2	4,41 4,06	1,66 2,27	1,88 2,81	1,87 4,16	0,00313
100L/8-2WU	0,40 1,60	670 2745	1,77 4,00	0,61 0,87	53,5 66,4	5,70 5,57	2,09 2,21	2,19 2,55	2,37 3,93	0,0045
100LA/8-2WU	0,55 2,20	630 2735	2,43 5,35	0,62 0,85	52,7 69,8	8,34 7,68	1,50 2,00	2,30 2,60	2,10 4,40	0,0060
112M/8-2WU	0,75 3,00	680 2865	3,15 6,94	0,56 0,83	61,4 75,2	10,5 10,0	2,20 2,69	2,33 3,45	2,51 5,95	0,0110
132S/8-2WU	1,00 4,00	685 2810	4,02 8,80	0,63 0,91	57,0 72,1	13,9 13,6	1,78 2,35	1,95 2,31	2,49 4,77	0,0240
132M/8-2WU	1,40 5,50	700 2830	5,26 10,7	0,61 0,93	63,0 79,8	19,1 18,6	1,90 2,28	2,31 2,49	2,83 5,31	0,0317
160M/8-2WU	1,90 7,50	705 2865	6,20 15,8	0,63 0,89	70,0 77,0	25,7 25,0	2,00 2,10	2,20 2,30	3,50 5,50	0,040
160L/8-2WU	2,50 10,0	710 2880	8,20 20,0	0,62 0,90	71,0 80,0	33,6 33,2	2,00 2,30	2,30 2,50	3,60 6,40	0,054

1500 min-1 50 Hz — 230/400V & 400/690V - S1 — EFF1

	P_N [kW]	n_N [min^{-1}]	I_N (230/400V) [A]	I_N (400/690V) [A]	cos φ	η(4/4xP_N) [%]	η(3/4xP_N) [%]	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	L_{PA} dB(A)	L_{WA} dB(A)	J [kgm^2]
90SH/4	1,1	1430	4,35 / 2,51		0,75	84,0	85,1	7,35	2,8	3,1	5,2	53,2	61,2	0,00344
90LH/4	1,5	1435	6,22 / 3,59		0,71	85,0	85,3	9,98	3,6	3,7	5,6	53,2	61,2	0,00391
100LH/4	2,2	1465	8,45 / 4,88		0,74	87,5	87,9	14,34	3,3	4,0	6,9	55,7	63,8	0,0075
112SH/4	3,0	1460		6,70 / 3,87	0,72	87,4	90,0	19,62	3,3	4,2	7,2	58,2	66,2	0,0119
112MH/4*	4,0	1455		8,90 / 5,10	0,74	88,3	90,2	26,25	3,3	4,0	6,9	58,2	66,2	0,0128
132SH/4	5,5	1450		10,6 / 6,14	0,87	89,2	89,7	36,20	2,1	2,8	6,2	64,3	72,5	0,0317
132MH/4	7,5	1470		15,5 / 8,95	0,77	90,8	91,0	48,72	2,9	3,5	6,6	64,3	72,5	0,0354
160MH/4	11,0	1475		20,5 / 11,9	0,82	91,9	92,5	71,20	3,7	3,8	8,6	66,6	74,9	0,0953
160LH/4	15,0	1475		28,8 / 16,6	0,81	92,4	92,9	97,10	3,8	3,8	6,9	66,6	74,9	0,115
180MH/4	18,5	1465		34,5 / 19,9	0,84	92,5	93,0	121	2,5	3,2	7,0	63	76	0,15
180LH/4	22,0	1465		40,5 / 23,4	0,84	93,0	93,4	143	2,6	3,4	7,3	63	76	0,19
200LH/4	30,0	1465		53,0 / 30,6	0,87	93,5	94,0	196	2,6	3,2	7,0	65	78	0,32
225SH/4	37,0	1480		67 / 39	0,85	94,0	94,4	239	2,7	3,0	6,8	60	73	0,40
225MH/4	45,0	1480		81 / 47	0,85	94,5	94,7	290	2,8	3,0	6,9	60	73	0,49
250MH/4	55,0	1485		96 / 55	0,87	95,1	95,3	354	2,6	3,0	7,5	65	78	0,86
280SH/4	75,0	1485		130 / 75	0,87	95,1	95,2	482	2,5	2,9	6,8	67	80	1,4
280MH/4	90,0	1486		158 / 91	0,86	95,4	95,5	578	2,7	3,1	7,5	67	80	1,7

* ⇨🕮 F12

EAR1

1500 min^{-1} 50 Hz — **1 ~ 230 V - S1**

	P_N [kW]	n_N [min^{-1}]	I_N [A]	cos φ	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N
63 L/4 EAR1	0,12	1405	1,22	0,95	0,81	2,30	2,32	3,20
63 LA/4 EAR1	0,18	1405	1,71	0,91	1,23	2,44	2,14	3,30
71 L/4 EAR1	0,25	1430	1,96	0,95	1,66	2,10	2,19	4,10
71 LA/4 EAR1	0,37	1425	2,90	0,90	2,49	2,12	2,19	4,57
80 L/4 EAR1	0,55	1440	3,87	0,90	3,67	2,07	2,16	4,27
80 LA/4 EAR1	0,75	1435	5,10	0,90	4,97	2,20	1,93	4,29
90 L/4 EAR1	1,10	1445	7,54	0,87	7,27	2,20	2,03	4,83
90 LB/4 EAR1	1,50	1425	9,02	0,94	9,99	2,20	1,90	5,25

EHB1

1500 min^{-1} 50 Hz — **1 ~ 230 V - S1**

	P_N [kW]	n_N [min^{-1}]	I_N [A]	cos φ	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	J [kgm^2]
63 L/4 EHB1	0,12	1405	1,22	0,96	0,81	0,90	2,32	2,46	0,00028
63 LA/4 EHB1	0,18	1405	1,71	0,91	1,23	0,98	2,14	2,60	0,00035
71 L/4 EHB1	0,25	1430	1,96	0,95	1,66	0,60	2,19	3,36	0,00086
71 LA/4 EHB1	0,37	1425	2,90	0,90	2,49	0,68	2,19	3,48	0,00115
80 L/4 EHB1	0,55	1440	3,87	0,90	3,67	0,33	2,16	3,86	0,00145
80 LA/4 EHB1	0,75	1435	5,10	0,90	4,97	0,38	1,93	3,52	0,00195
90 L/4 EHB1	1,10	1445	7,54	0,87	7,27	0,21	2,03	4,22	0,00313
90 LB/4 EHB1	1,50	1425	9,02	0,94	9,99	0,32	1,90	4,04	0,00391

EST

1500 min^{-1} 50 Hz — **1 ~ 230 V - S1**

	P_N [kW]	n_N [min^{-1}]	I_N [A]	cos φ	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N
63 S/4 EST	0,09	1390	0,97	0,98	0,62	0,81	1,94	1,6
63 L/4 EST	0,12	1405	1,19	0,98	0,82	0,74	2,20	1,9
71 S/4 EST	0,18	1425	1,54	0,98	1,21	0,66	1,98	2,5
71 L/4 EST	0,25	1420	1,94	0,98	1,68	0,54	1,85	2,7
80 S/4 EST	0,37	1425	2,62	0,96	2,48	0,44	1,50	2,6
80 L/4 EST	0,55	1420	3,60	0,96	3,70	0,46	1,30	2,6
90 S/4 EST	0,75	1435	4,60	0,96	4,99	0,40	1,64	3,6
90 L/4 EST	1,10	1435	6,46	0,96	7,32	0,27	1,55	3,4

EST

1800 min^{-1} 60 Hz — **1 ~ 230 V - S1**

	P_N [kW]	n_N [min^{-1}]	I_N [A]	cos φ	M_N [Nm]	M_A/M_N	M_K/M_N	I_A/I_N	J [kgm^2]
63 S/4 EST	0,09	1665	0,96	0,98	0,52	0,85	1,88	1,8	0,0002
63 L/4 EST	0,12	1695	1,20	0,98	0,62	0,81	1,96	1,9	0,0003
71 S/4 EST	0,18	1710	1,63	0,98	1,00	0,60	2,10	2,1	0,0007
71 L/4 EST	0,25	1700	2,09	0,98	1,40	0,57	1,79	2,3	0,0009
80 S/4 EST	0,37	1720	2,38	0,98	2,05	0,20	1,30	2,4	0,0011
80 L/4 EST	0,55	1700	3,49	0,98	3,09	0,26	1,30	2,2	0,0001
90 S/4 EST	0,75	1730	4,62	0,98	4,14	0,38	1,50	3,1	0,0024
90 L/4 EST	1,10	1725	6,31	0,98	6,09	0,13	1,40	3,2	0,0031

ECR

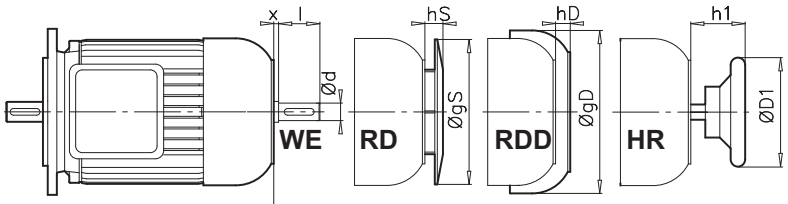
1800 min^{-1} 60 Hz — 1 ~ 115 / 230 V - S1

	P_N		SF	n_N		I_N		cos φ	
	[kW]	[HP]		(115V)	(230V)	(115V)	(230V)	(115V)	(230V)
63LA/4 ECR	0,12	0,16	1,35	1740	1740	3,30	1,57	0,66	0,70
71L/4 ECR	0,18	0,25	1,35	1760	1750	3,46	1,89	0,89	0,92
71LA/4 ECR	0,25	0,33	1,35	1750	1750	5,40	2,65	0,69	0,71
80L/4 ECR	0,37	0,50	1,35	1765	1765	6,55	3,40	0,80	0,79
80LA/4 ECR	0,55	0,75	1,35	1760	1760	9,40	4,70	0,71	0,72
90L/4 ECR	0,75	1,00	1,35	1770	1770	11,85	5,94	0,79	0,78
90LB/4 ECR	1,10	1,50	1,35	1765	1760	15,25	7,62	0,85	0,84
90LX/4 ECR	1,50	2,00	1,35	1745	1735	20,30	10,40	0,86	0,83

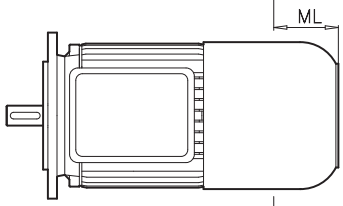
1800 min^{-1} 60 Hz — 1 ~ 115 / 230 V - S1

	M_N		M_A/M_N		M_K/M_N		I_A/I_N		J
	(115V)	(230V)	(115V)	(230V)	(115V)	(230V)	(115V)	(230V)	kgm^2
63 LA/4 ECR	0,66	0,66	2,50	2,50	3,48	3,64	3,40	3,60	0,00035
71L/4 ECR	1,00	1,02	2,10	2,40	3,30	3,27	4,50	5,20	0,00086
71LA/4 ECR	1,40	1,40	2,10	2,20	3,00	2,90	4,50	4,70	0,00115
80L/4 ECR	2,01	2,01	2,40	2,19	3,38	3,28	5,57	5,68	0,00145
80LA/4 ECR	3,00	3,00	2,55	2,70	2,90	2,83	5,13	5,17	0,00195
90L/4 ECR	4,10	4,10	2,30	2,27	2,90	3,10	6,30	6,80	0,00313
90LB/4 ECR	6,00	6,00	2,00	2,08	2,76	2,87	5,73	6,50	0,00391
90LX/4 ECR	8,20	8,20	1,70	1,45	2,30	2,30	5,40	5,20	0,00391

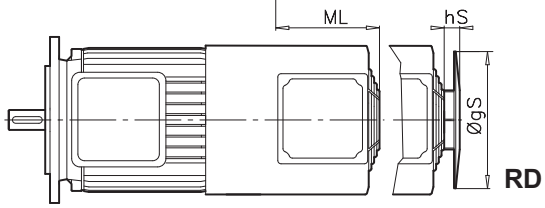
Standard Motor



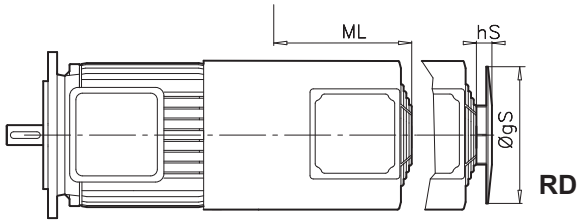
Option **IG**



Option **F**



Option **IG F**



Standard Motor	WE			RD		RDD		HR		IG	F	IG F	F RD / IG F RD	
	d	l	x	gS	hS	gD	hD	D1	h1	ML	ML	ML	gS	hS
63 S/L	11	23	0	123	12	153	27	100	39	56	88	158	133	37
71 S/L	11	23	1	138	12	169	24	100	40	56	89	144	150	37
80 S/L	14	30	3	156	16	183	31	100	49	61	90	140	170	40
90 S/L	19	40	7	176	16	201	31	160	67	72	104	149	188	30
100 L	24	50	6	194	16	225	28	160	75	69	95	155	210	28
112 M	24	50	4	218	16	265	38	160	74	68	99	149	249	33
132 S/M	32	80	18	257	18	318	41	200	116	63	115	155	300	25
160 M/L	38	80	23	250	53	367	45	250	120	75	165	176	338	32
180 MX/LX	*			340	80	403	70	*		105	149	199	338	32
200 L	55	110	17	340	80	450	82	–	–	207	156	207	338	32
225 S	55	110	17	340	80	450	82	–	–	207	156	207	338	32
225 M	55	110	17	340	80	450	82	–	–	207	156	207	338	32
250 M	60	140	5	470	100	570	82	–	–	*	135	*	*	*
280 S	65	140	5	525	110	625	82	–	–	*	160	*	*	*
280 M	65	140	5	525	110	625	82	–	–	*	160	*	*	*
315 S	70	140	5	590	110	700	82	–	–	*	160	*	*	*
315 M	70	140	5	590	110	700	82	–	–	*	160	*	*	*
315 L	70	140	5	590	110	700	82	–	–	*	160	*	*	*

*** auf Anfrage / on request / sur demande**