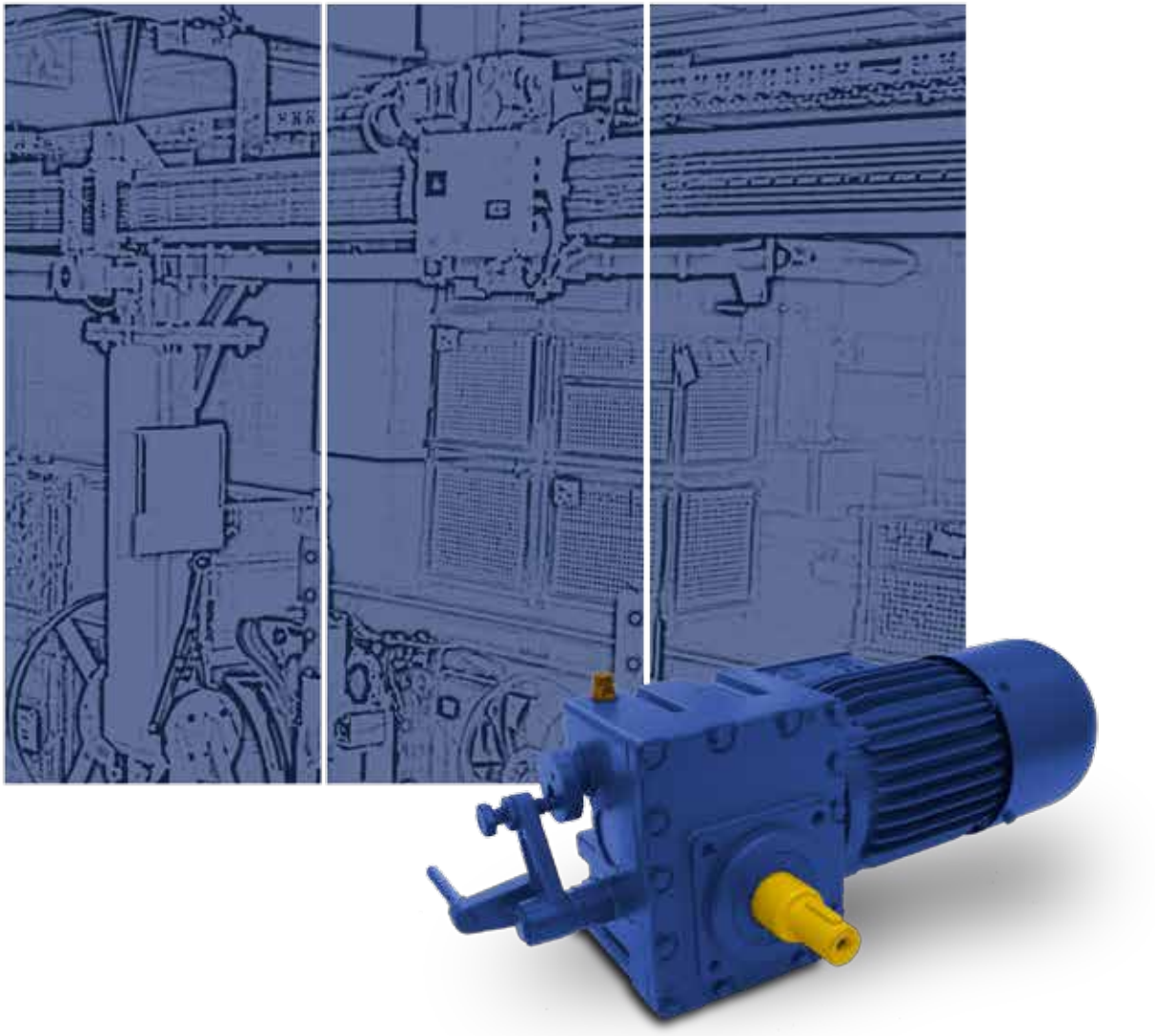
ALTRA INDUSTRIAL MOTION

Geared Motors for Monorail Systems

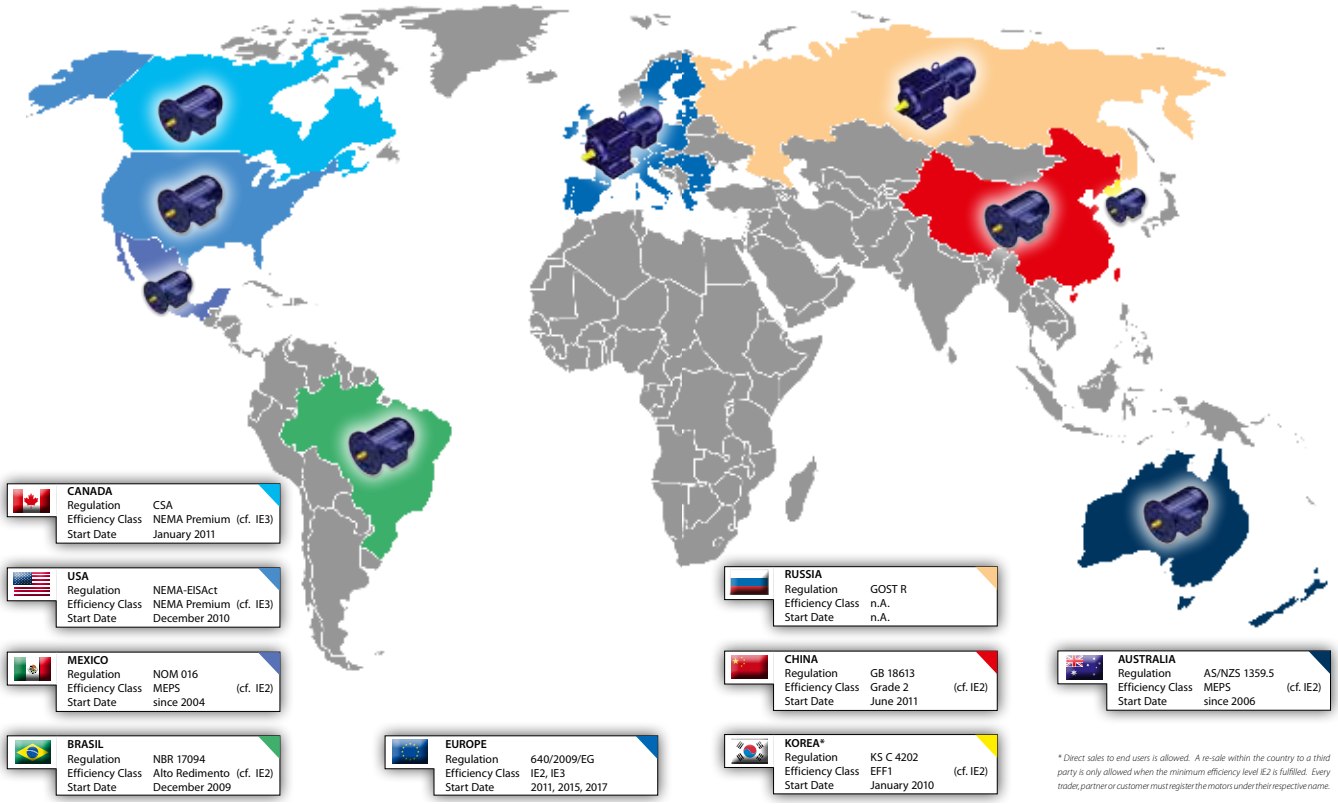
Catalogue Edition 03/2014 EN



Bauer® Gear Motor

An Altra Industrial Motion Company

Worldwide Efficiency Regulations



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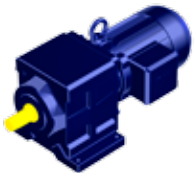


Efficiency requirements are valid for geared motors and solo motors

Efficiency requirements are valid only for solo motors

Exceptions to regulation (EC) no. 640/2009/EC of 22 July 2009:

Operating conditions

- Motors designed to operate fully submerged in a liquid (IP68)

Construction

- motors that are completely integrated in a product (such as a transmission, pump, fan or compressor) whose energy efficiency cannot be determined independently of this product

Ambient conditions

- at heights above 1,000 metres above sea level
- at ambient temperatures above 40° C
- at maximum operating temperatures above 400 °C
- at ambient temperatures below -15° C (all motors) or ambient temperatures below 0° C (air cooled motors)
- with coolant temperatures at product intake below 5 °C or above 25 °C

from 27. July 2014

- at heights above 4,000 metres above sea level
- at ambient temperatures above 60° C
- at ambient temperatures below -30° C (all motors) or ambient temperatures below 0° C (air cooled motors)

Ambient conditions

- in areas with a potentially explosive atmosphere as mentioned in Directive 94/9/EC of the European Parliament and Council

Other

- Brake motors
- Pole changing motors
- 8,10,12 pole motors
- Single phase motors
- DC motors
- Duty cycles other than S1
- Motors exclusively designed for inverter duty

Type Designations

BM 10 - 7 1 V / D.. 09L A 4 - TF - ST - G - SL - K / ES 010 A 9 HN / C2

B M 10 Z X - 7 1 V

- V = Flange A or C at front
- H = Flange A or C at rear
- UO = Foot bottom and top

1 = Solid Shaft, front
2 = Solid Shaft, rear
3 = Solid Shaft, front and rear
7 = Solid Shaft front, flush with Standard-Flange only BM30-40

0 = Gear Housing, no surface machining
6 = Gear Housing, Foot-threaded bores
7 = Gear Housing, C - Flange

- = seperates gear type from gear design

X = reinforced bearings for higher wheel loading

Z = Gearbox with pre-stage

•• = Gear Size (09, 10, 20, 30, 40)

B M = Gear type (BM)

D .. 09 L A 4 - TF - S

S = rectifier

TF = Motor monitoring

4 = No. of pole for motor

LA = Motor core length and design

09 = Motor size

.. = SE Three-Phase Motor with increased efficiency acc. to IE1
.. = HE Three-Phase Motor with increased efficiency acc. to IE2
.. = PE Three-Phase Motor with increased efficiency acc. to IE3

D = Three-Phase Motor

S = Permanent Magnet Synchronous Motor

ES 010 A 9 HN

HA = Hand Release (lockable)
HN = Hand Release (none lockable)

9 = Code for setting torque

A = Design

010 = Brake size

ES = Single disk brakes - HOLDING BRAKE
ZS = Double disk brakes - HOLDING BRAKE
ESX = Single disk brakes - WORKING BRAKE
ZSX = Double disk brakes - WORKING BRAKE

B M .. - 0 7 V / .. / S ..

01 = Flange A and solid shaft extended on gearbox side V (BM30;BM40)
02 = Flange A and solid shaft „greatly“ extended on gearbox side V (BM30;BM40)

V = Flange A

7 = Solid Shaft front, flush with Standard-Flange only BM30-40

0 = Gear Housing, no surface machining

- = seperates gear type from gear design

•• = Gear Size (09, 10, 20, 30, 40)

B M = Gear type (BM)

EU-Directive 640/2009/EC

What does the EU directive mean?
EN 60034-30 is an international standard for energy-efficient motors and will in future years be used worldwide in this area.
Electric motors account for approximately 1.07 billion kWh of the total energy demand of the EU. Using energy efficient motors would achieve energy savings of 20 to 30 per cent, thereby reducing the total cost of ownership (TCO) and reducing global warming.

As things stand today
New IE (International Energy Efficiency) efficiency classes were introduced at the beginning of 2009:

IE1 = Standard Efficiency (~ EFF2)

IE2 = High Efficiency (~ EFF1)

IE3 = Premium Efficiency (10–15 % higher efficiency than IE2)

IE4 = Super Premium Efficiency

The IE classes cover the following:

Rated voltage
up to 1,000 V
Power
0.75 kW to 375 kW
Number of poles
2, 4 or 6 (50 and 60 Hz)
Operation
Mains Duty
Operating modes
S1
Remarks
Geared motors are considered

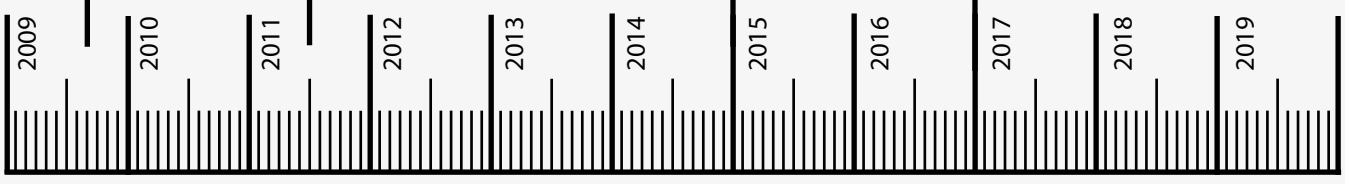
What happens when?

August 2009
EN 60034-30 standard introduced.

Starting 16 June 2011
IE2 efficiency class is mandatory.
(640/2009/EG)

From 1 January 2015
Efficiency class IE3 is a legal requirement for motors rated at 7.5 kW or more. Alternatively, IE2 motors may be used in combination with a frequency converter.
(640/2009/EG)

2017 onward
Efficiency class IE3 is also mandatory for motors rated less than 7.5 kW.
(640/2009/EG)



Geared motors for electric overhead conveyors series BM

Flexible and robust for large and small loads

We are one of the leading manufacturers of intelligent drive technology for more than 85 years. Innovative products, modern processes and responsible employees realise this with the target of conserving resources and the environment together with efficient energy use over our whole field of activity. The success of our efforts assumes that we know and master our customers applications and the requirements on drive technology. We do this perfectly - from engineering, design and calculation through procurement, production and logistic to special application knowledge in the most important branch sectors.
Modelled on the basis of Bauer's 2000 Geared Motor Range, the success of the electric monorail drives is just one example of Bauer's years of expertise and industry knowledge in the field of dedicated geared motor solutions.

CD Rom:

Literatur:

For further information on all of our products, please see:
www.bauergears.com

The most recent version of the Terms and Conditions can be found under „www.bauergears.com".

Geared motors for electric overhead conveyors series BM

General Product Overview

Helical-Geared Motor Series BG

Compact and economical inline helical geared motors for long lifetime under arduous conditions.

- Motor power from 0.03 kW to 75 kW
- 13 gearbox sizes for torques from 20 Nm to 18500 Nm
- New attachment possibilities with low design height
- High efficiency through 2 stage base design
- Enclosure IP 65 as standard

Shaft-Mounted Geared Motor Series BF

Shaft-mounted geared motors with integrated torque arm are easily integrated and economically applied.

- Motor power from 0.03 kW to 75 kW
- 10 gearbox sizes for torques from 90 Nm to 18500 Nm
- Gearbox housing with integral torque arm
- High efficiency through 2 stage base design
- Enclosure IP 65 as standard

Bevel-Geared Motor Series BK

Power-dense, right-angle, bevel-geared motors ensure the highest efficiency especially when used with frequency inverters.

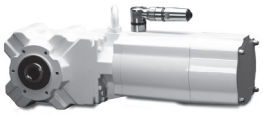
- Motor power from 0.03 kW to 75 kW
- 10 gearbox sizes for torques from 80 Nm to 18500 Nm
- The right angle gearbox with universal attachement possibilities
- High efficiency through 2 stage base design
- Enclosure IP 65 as standard

Small Industry Geared Motors KIG

Gearbox and motor build a compact unit. Small industrial gear motors are spacesaving and versatile and can be supplied for any mounting position.

- Available for three-phase and single-phase
- Lightweight, compact drives help to reduce the weight of the machine
- Saves space and reduces costs, especially for conveyor systems
- Motor connection via CAGE CLAMP® is vibration-proof and saves you money
- Motor parts for many installation situations and supply voltages
- In self- or non-ventilated design

AsepticDrive™



Geared motors for the food & beverage industry as well as for all applications with high cleaning intensity or ambient conditions such as dust, fluff etc.

- Motor without fan and cooling fins
- Motor power
  DA08 0.25 kW - 0.55 kW
  DA09 0.37 kW - 1.5 kW
  DA11 1.1 kW - 2.2 kW
- Available with helical, parallel shaft, bevel and worm gears
- Motor winding in Iso Class F with thermistors as standard
- Enclosure IP 67 and IP 69K with acid and alkali resistant coating as standard
- Motor connection through standard stainless steel plug connector

CleanDrive™

Geared motors for the Food & Beverage industry in enclosure IP 66 with acid and alkali resistant coating as standard.

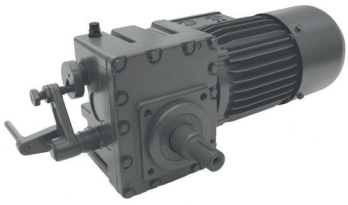
- Motor without fan and cooling fins
- Motor power 0.12 kW
- Motor winding in Iso Class F with thermistors as standard
- Motor connection through standard terminal box or stainless steel cable gland

Worm-Geared Motor Series BS

Economical, right-angle, worm-geared motors install easily in the tightest applications.

- Motor power from 0.03 kW to 5.5 kW
- 8 gearbox sizes for torques from 25 Nm to 1000 Nm
- Hollow shaft version already available from 25 Nm
- High loadable worm gearing for long lifetime
- Enclosure IP 65 as standard

Overhead Monorail Geared Motor Series BM



A completely new range of monorail drives for light and heavy load monorail applications.

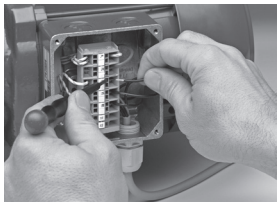
- Torques from 30 Nm up to 680 Nm
- Radial force up to 25.000 N
- Flexible mounting on the running gear
- Enclosure IP 65 as standard
- Improved efficiency – lower energy consumption – ideal as travelling drives
- Reverse motion of the gearbox is possible

Frequency Converter Geared Motor Series Eta-K

Eta-K solutions are combinations of geared motors and frequency converters. They provide compact drive solutions with infinite speed control.

- Saving space and costs
- No shielded motor cables required
- Mechatronic adaption of VLT drive and geared motor
- Motor power range 0.12 kW up to 7.5 kW
- Supply voltage 3 x 380 V - 480 V
- Compliance to all EMC standards
- Standard RS485-Interface, optional Profibus-Interface
- Ⓔx Zone 2 and 22 possible
- UL approved

CAGE CLAMP®



The use of Bauer geared motors up to 30 kW with CAGE CLAMP® connection technology reduce costs both during installation and in service cases.

- Cost reduction during connection
- Simple handling
- Cable core diameters up to 25 mm² without wire-end sleeves
- Cost saving in material and tooling
- Vibration and shock resistant
- Ⓔx approved

Explosion-proof BAUER Geared Motors

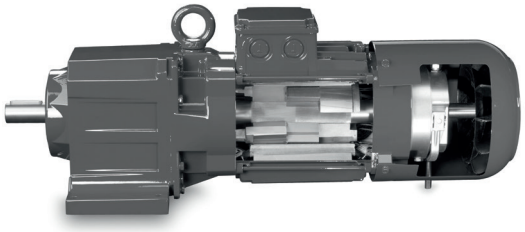
Geared motors suitable for use in explosive areas:

GAS	Zones 1, 2		
DUST	Zones 21, 22		
DXD	Zone 1,	II 2 G Ex d(e) IIC T3…T4 Gb	0,12… 75 kW
DXE	Zone 1,	II 2 G Ex e IIC T1…T4 Gb	0,12… 11 kW
SXE	Zone 1,	II 2 G Ex e IIC T1…T4 Gb	0,55 … 15 kW
DXN	Zone 2,	II 3 G Ex nA IIC T3 Gc	0,03… 30 kW
DXC	Zone 21,	II 2 D Ex tb IIIC T160°C IP66 Db	0,03… 30 kW
DXC	Zone 21,	II 2 D Ex tb IIIC T120°C IP66 Db	0,03… 22 kW
SXC	Zone 21,	II 2 D Ex tb IIIC T120°C…160°C IP66 Db	
DXS	Zone 22,	II 3 D Ex tc IIIC T120°C…160°C IP65 Dc	0,03… 30 kW
DXD	Zone 1/21,	II 2 G Ex d(e) IIC T3…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP65 Db	0,12… 75 kW
DXE	Zone 1/21,	II 2 G Ex e IIC T1…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP66 Db	0,12… 11 kW
SXE	Zone 1/21,	II 2 G Ex e IIC T1…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP66 Db	0,55… 15 kW
DXS	Zone 2/22,	II 3 G Ex nA IIC T1…T3 Gc	
		II 3 D Ex tc IIIC T120°C…160°C IP65 Dc	0,03… 30 kW

Getriebemotoren für Elektro-Hängebahnen Reihe BM

General Product Overview

Energy Saving Geared Motors



η	Advantages	Your benefits
Without	• Motor design according to duty • Small installation volume and minimum weight • Higher motor powers	• Economical • Small installation space • Efficient motor utilisation • Tailored to customer application • Smaller motor frame size
IE1	• Standard efficiency in continuous operation • Small installation volume and minimum weight	• Economical • Small installation space • For general-purpose use inside or outside Europe
IE2	• Higher efficiency in continuous operation • Higher start-up torque	• Economical • Small installation space • Up to 34% more energy savings compared to IE1 • Lower rated motor power than IE1 for dynamic load applications • Short amortisation period
IE3	• Premium efficiency in continuous operation • Higher start-up torque	• Up to 18% more energy savings compared to IE2 • Already meets minimum efficiency requirements for 2015/2017
IE4	• Super Premium efficiency • Speed control with highest possible efficiency • Small installation volume and minimum weight • Considerably better efficiency than IE2 motors, even under partial load conditions • High torque and power density • High overload capacity	• Up to 39% more energy savings compared to IE2 • Short amortisation period • Small installation space • Compact drive unit • More torque with same size motor frame • Requires smaller installation space with same power • Reduced number of variants thanks to higher efficiency over the entire torque range • Design security thanks to spare drive unit capacity • Technology leader • Already meets the efficiency requirements of future standards

Energy Saving Geared Motors Series S in IE4 for explosion hazardous areas

WORLD FIRST

Permanent magnet synchronous motors (PMSM) Series S as variable-speed motors in efficiency class IE4 for use in explosion hazardous areas.

- Design torque M_N: 5 Nm – 48 Nm
- Rated power P_N: 0,75 kW – 15 kW
- Protection type: Increased Safety
  Zone 1

  Ex II 2 G Ex e IIC T1 - T3 Gb

S.XE.08MA4
S.XE.08LA4
S.XE.09SA4
S.XE.09XA4
S.XE.11SA6
S.XE.11MA6
S.XE.11LA6

- Dust explosion protection
  Zone 21

Ex II 2 D Ex tb IIIC T 160°C ... 120° Db

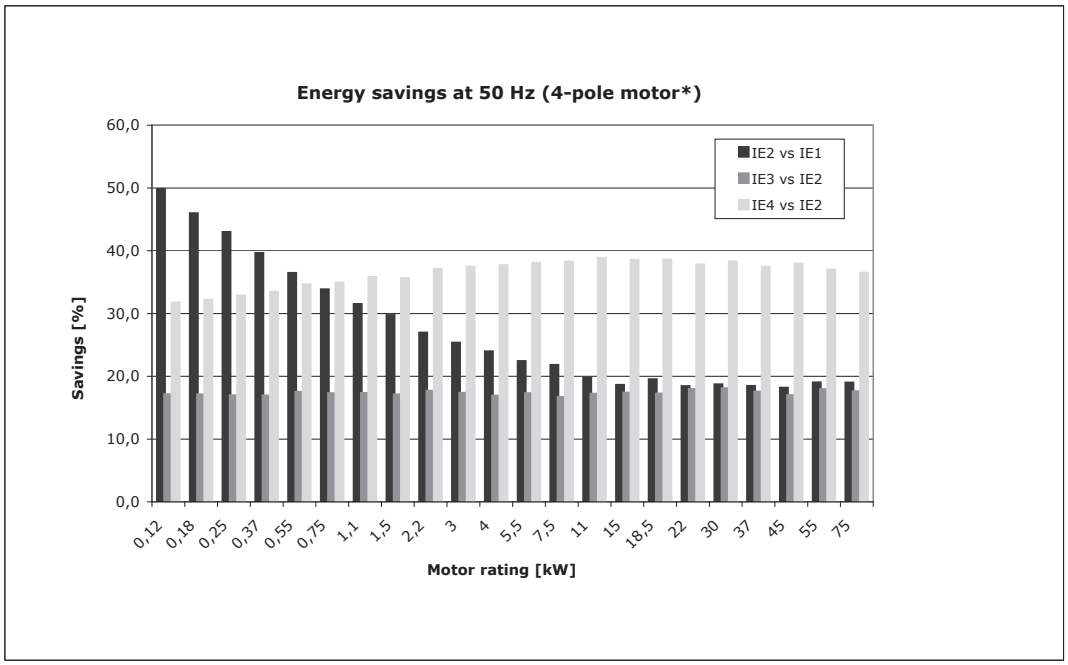
S.XC.08MA4
S.XC.08LA4
S.XC.09SA4
S.XC.09XA4
S.XC.11SA6
S.XC.11MA6
S.XC.11LA6

The highest energy efficiency that can be achieved with the current state of motor technology.

Investment security for the future

Electrically driven machinery accounts for around 70% of overall energy demand for industrial consumption. If existing drives which have already been in service for decades were to be replaced by modern drive systems, energy savings of 135 billion kilowatt-hours per year would be possible within Europe. The Bauer Gear Motor range of motors offers trend-setting technologies for energy-efficient drives and for motor designs tailored to specific applications. The latter option enables highly efficient drive solutions without requiring additional space.

Potential for energy savings in drive technology



P_N [kW]	IE1*	IE2*	IE3*	IE3*	IE4*
0,55	DSE08MA4	DHE08LA4			SU08MA4
0,75	DSE08LA4	DHE08XA4	DPE09LA4		S08MA4
1,1	DSE09SA4	DHE09LA4	DPE09XA4		S08LA4
1,5	DSE09LA4	DHE09XA4	DPE09XA4C	S08LA4	S09SA4
2,2	DSE09XA4	DHE09XA4C	DPE11MA4	S09SA4	S09XA4
3	DSE11SA4	DHE11MA4	DPE11LA4	S09XA4	S11SA6
4	DSE11MA4	DHE11LA4	DPE11LA4C	S11SA6	S11MA6
5,5	DSE11LA4	DHE11LA4C	DPE13LA4	S11MA6	S11LA6

*at 1,500 rpm

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Advantages

Bauer-electric overhead conveyors systems

What we offer...	Your benefit...
Tried and tested technology with several thousand drives in the field	Reliability
Flexible assembly possibility	Simple engineering
Coupling lever always on the front side	Simple engineering, easy to reach
Gearboxes designed for efficiency	Energy saving
Industry standard shaft connection	Flexible choice of wheel
Long service intervals	High productivity
Finely graduated brake torques	High availability
Asynchronous and permanent magnet technology	High flexibility in engineering reduces stocking costs and increases the working capital
Permanent magnet synchronous motors	Energy saving, high power density, weight reduction
Customer specific modifications	Flexibility
Drives can be reversed without disengaging the clutch	Reduced downtime

Bauer Gearboxes

Easy access to the fixation points reduces assembly times and installation costs

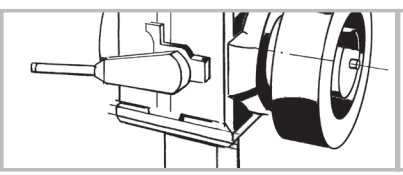
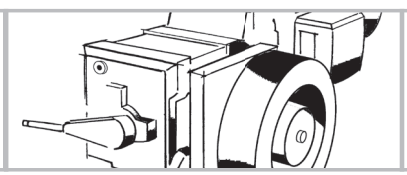
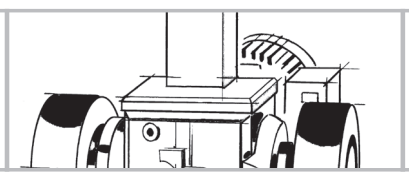
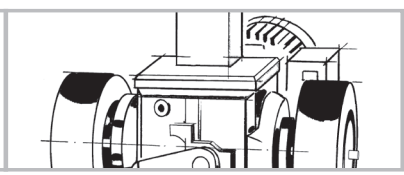
- Low servicing costs as the lubrication change results in normal duty with a lubrication temperature of approx. 80°C first after 15.000 operating hours when using CLP oils or 25.000 operating hours when using PGLP oils
- 2-stage gearbox concept reduces the spare part stocking
- A variety of attachment possibilities (Foot, Flange, Solid and Hollow shafts, Torque arms)
- Sealed housing design reduces the risk of oil leakage and increases the oil lifetime
- The large housing volume allows usage in very harsh environments

Bauer Motors

- Low operating costs due to high motor efficiencies (IE2, IE3 and IE4 as Standard)
- Low installation costs through CAGE CLAMP® instead of the classical terminal block connection
- A variety of additional designs (connectors, brakes, backstops, rain covers, forced cooling, encoders etc.)
- Cost reduction of connection cabling and avoidance of additional protective elements (chokes, filters etc.), through built-on inverters (ETA-K)
- Ideal for frequency inverter

Bauer Brakes

- Low servicing costs through long lifetime of the brake discs
- Brake-Motor correlation tailor made to the application by virtue of on average three brake sizes per motor size
- A variety of designs (lockable and non-lockable hand release, microswitch, heaters)
- Robust design for heavy duty applications
- Enclosure IP65 as standard
- Very high wear resistance.

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Bauer Gear Motor
An Altra Industrial Motion Company

Partnership at Eye Level

LJU
A Member of
GRENZEBACH

References

Pioneers

Flexibility

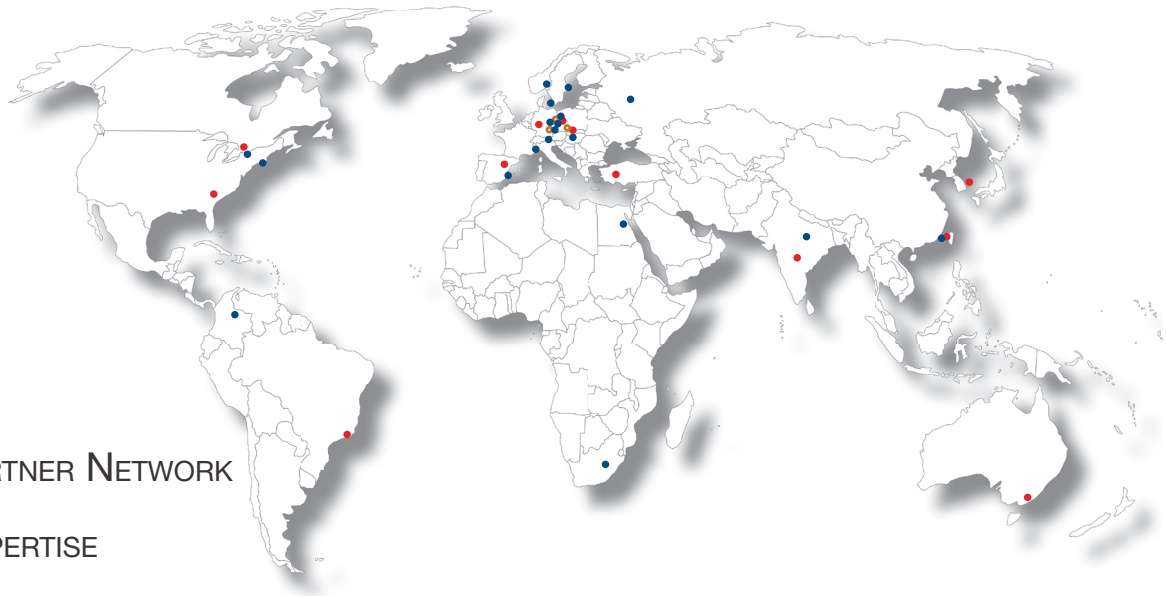
Open System

Tradition

Plug&Drive

Worldwide Partner Network

Application Expertise



Nordand South America
- Bauer MLD - Sladeview - CA
- Bauer Gear Motor LLC. - Somerset, USA

Europe
- Eegholm a/s - Sønderborg - DK
- Elektrotechnik & Automation Ulrich Brodbeck - Aichtal - DE
- Klebs & Hartmann GmbH & Co. KG - Ludwigshafen - DE
- Scheib Elektrotechnik GmbH - Düsseldorf - DE
- Steinlen Elektromaschinenbau GmbH - Burgwedel - DE
- Bauer Gearmotor AS - Skedsmokorset - N
- ESKO Elektromaschinenbau GmbH - Fohnsdorf - AT
- Bauer Gearmotor Sverige AB - Gustavsfors - S
- Meier & Co AG - Niedergösgen - CH
- TEM - Igualada - ES

MEA
- International Combustion India Ltd. - Aurangabad - IND
- BAUER a Division of Hudaco - Germiston - ZA

Russia
- Altra Industrial Motion OOO - Moskau - RU

China
- Altra Industrial Motion (Shenzhen) Co., Ltd - Beijing - CN

Production
- Bauer Gear Motor GmbH - Esslingen - DE
- Bauer Gear Motor Slovakia s.r.o. - Zlaté Moravce - SK

Nord and South America
- Grenzebach North America - Newnan - USA
- North America Service Rho Industries Inc. - Dundas, CA
- Grenzebach do Brasil Ltda.- Sáo José dos Campos - BR

Europe
- LJU Service - Potsdam - DE
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- Sical Automation S.L. - Madrid - ES
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- LJU-PROTEK - Yenisehir/Izmir - TR

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- Shinkang Intech Co. Ltd. - Kyungki-Do - KR

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Production
- LJU Automatisierungstechnik GmbH - Potsdam - DE

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Page

Five unit sizes to handle every load

The BM (Bauer Monorail) series offers five gear unit sizes which differ in their permissible torques (from 50 to 680 Nm). The gear units are also offered in heavy duty versions for increased permissible radial loads.

Gear unit		F_{RN} in N	d_{AW} in mm	Shaft height in mm	Shaft collar in mm
1	BM09	4400	20	61	30
	BM09X	6500	25	61	30
2	BM10	8000	25	62,5 (60)	34,5
	BM10X	10000	25	62,5 (60)	34,5
3	BM20	10000	30	70,5 (68)	35
	BM20X	12000	30	70,5 (68)	35
4	BM30(Z)	12000	35	94 (90)	45
	BM30(Z)X	15000	35	94 (90)	45
5	BM40(Z)	20000	55	125 (120)	60
	BM40(Z)X	25000	55	125 (120)	60

Type	Allowable torque [Nm]	Allowable wheel load at power application *ML [N]	Gear ratios	Speed (based on wheel [m/min]	Wheel diameter [mm]	Output shaft [mm]
BM09	30 - 100	4400	11,34 - 53,85	10 - 100	125	20 x 35
BM09X		6500		12,8 - 128	160	25 x 35
BM10	140 - 160	8000	11,68 - 58,18	12 - 128	160	25 x 35
BM10X		10000		16 - 160	200	25 x 35
BM20	182 - 220	10000	7,66 - 74,76	9 - 69	160	30 x 35
BM20X		12000		12 - 87	200	30 x 35
BM30	260 - 350	12000	7,91 - 71,09	13 - 186	200	35 x 49
BM30X		15000		16 - 233	250	35 x 49
BM40	600 - 680	20000	11,17 - 104	11 - 162	250	55 x 110
BM40X		25000		13 - 194	300	55 x 110

***ML: The position of the power application point „centre of wheel" can be seen on the applicable dimensional drawings. Significantly higher gear ratios are optional.**

The BM09 and BM10 gear units can run on "C1 profiles". Compliance with the VDI Code of practice 3643 (C1-Standard) and the need to reduce the cost of overhead conveyor drives of this size resulted in a thoroughly tested design which uses a worm-gear set in the first stage and a spur gear set in the second stage. The worm-gear stage with its very small reduction ratios offers particularly high levels of efficiency (greater than 85 %) thanks to the high speeds. The mechanical claw clutch engages the first stage on the BM09 and the final stage on the BM10.

BM20, BM30 and BM40 are heavy-load overhead conveyor drives and have a helical-gear set in the first stage and a bevel-gear set in the final stage. The clutch is mounted in the final stage on these gear units also.

The BM10, BM20, BM30 and BM40 offer additional mounting options. The flange can be located outside on the front of the gear unit, or on the back ("H" side). A version with sturdy securing threads on the underside ("U") and on top ("O") of the gear unit can also be supplied. This enables new and easy - to - maintain carriage designs. The use of BM gear units as drive units for floor conveyors is simplified by the version with an output shaft on both sides. Hollow shaft design available on request.

Installed positions of geared motors

Bauer geared motors can be supplied for any type of fitting position. Vertical installation positions (motor-down) place a particularly severe strain on the shaft seal. It is advisable to avoid this arrangement especially at high motor speeds (e.g. above 1800 r/min) and continuous operation.

Notes on safety

See the notes on safety regarding installation in Operationg Indstructions.

Guards for rotating parts

The shrink disk (SSV) guards required under the German law relating to technical materials (Law Concerning Industrial Equipment - Equipment safety law GPSG) or by the Accident Prevention Regulations (UVV) are not included in the standard scope of supply because they are fitted by the customer in most cases, or the risk of accident can be eliminated by suitable installation.

See the Operating Instruction.

Protection against accidental contact

The D04LA and D05LA small motors have smooth motor housings. In the textile, pharmaceutical and foodstuffs industries in particular and in plant engineering, this IP54 version has a number of advantages over ribbed housings. In some instances, protection against accidental contact may have to be installed by the customer because for technical reasons, the surface temperatures of motors with smooth housings can be high, especially in continuous operation.

Operating noise

The typical operating noise levels of BAUER geared motors are within the limits stipulated by VDI directive 2159 for gears and EN 60034-9, Table 2 for motors.

For physical reasons, low-ratio, high-speed gears produce more noise than medium- and high-ratio gears operating at low speeds.

Paint finish and corrosion protection

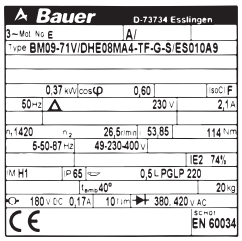
BAUER geared motors are spray-painted in RAL 7031 to DIN 1843 as standard. Other RAL colours are available at extra cost.

The output shafts are shipped in protective sleeves or with a protective coating to prevent corrosion.

If high requirements for corrosion resistance are required, the drives are available with enhanced corrosion protection: CORO 1, CORO 2, or CORO 3 (see chapter 11 “Special corrosion protection”).

Paint finishes up to 200 µm in thickness are available on request at extra cost. Thicker paint finishes for geared motors are impractical, because the paint tends to flake at the ribs and when the terminal box is opened.

3



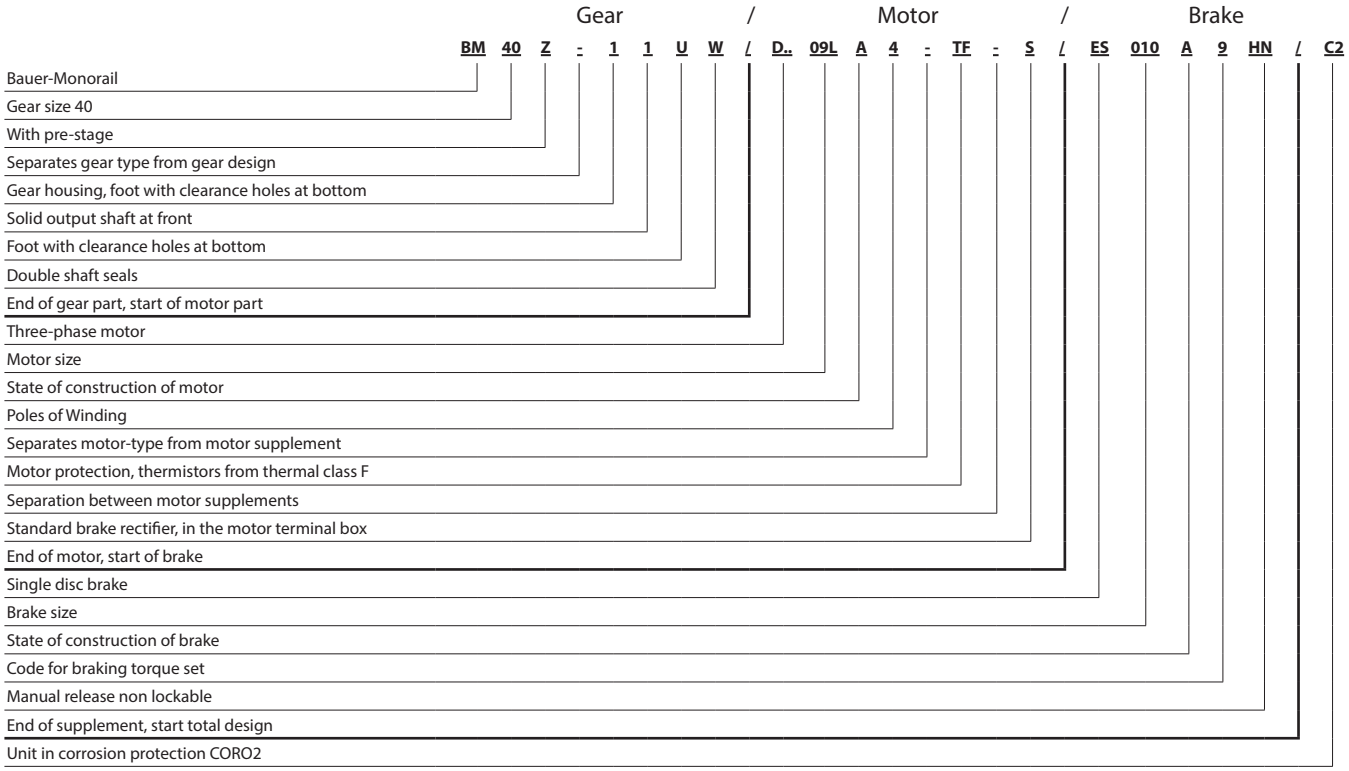
Monorail geared motor with brake and series options

Example: monorail geared motor with brake and series options

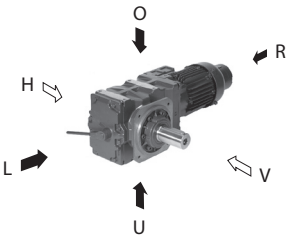
Significance of type designation

The type designation of a BAUER geared motor is a code designating all the features in the drive configuration.

The type designation of a BAUER geared motor is a code designating of all the features in the drive configuration. The build-up of the type designation is explained with the help of the following example of a monorail geared motor with brake and series options.



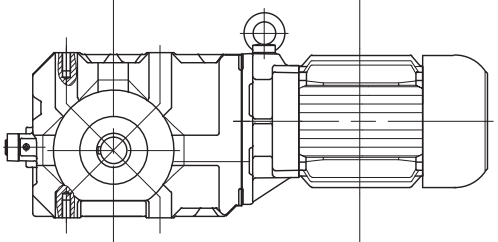
Geared motors for electric overhead conveyors series BM
Type Designations



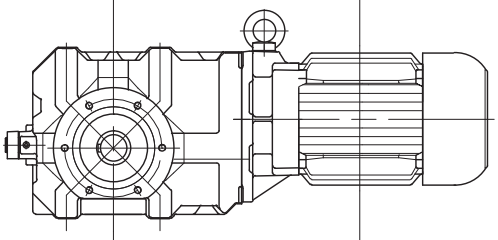
gear type
gear size
pre-stage
re-inforced bearing (≥BK20)
code for gear design
code for shaft design
Three-phase motor
motor size
core length
design edition
number of poles

BM30 Z X-61U / D..09 LA4

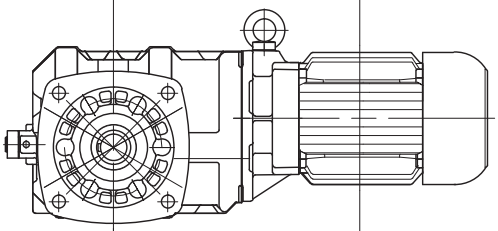
6 . O — foot with threaded holes, top
6 . U — foot with threaded holes, bottom
6 . UO — foot with threaded holes, bottom and top



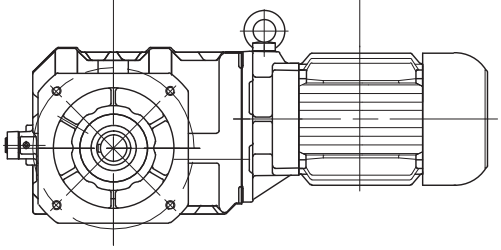
7 . V — C-flange with threaded holes, front
7 . H — C-flange with threaded holes, rear



8 . — completely machined
07 . V /.../ S02 — far drawed flange at front



07 . V /.../ S01 — drawed flange at front



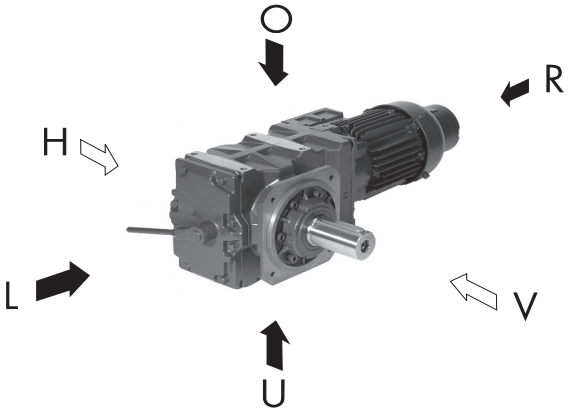
. 1 solid shaft on gear side V
. 2 solid shaft on gear side H
. 3 solid shaft on gear side V and H

Gear unit designs:

Gear unit	1st stage	2nd stage	Flange on rear	"U"and "O" foot threads	Output shaft on both sides	Output shaft on rear	Preferred flange
BM09(X)	Worm-gear	Helical-gear	-	-	-	-	-
BM10(X)	Worm-gear	Helical-gear	Option	Option	Option	-	-
BM20(X)	Helical-gear	Bevel-gear	Option	Option	Option	-	-
BM30Z(X)	Helical-gear	Bevel-gear	Option	Option	Option	-	Option
BM40Z(X)	Helical-gear	Bevel-gear	Option	Option	Option	Option	Option

Type designation and components of the BM-series geared motors

BM..-	Bauer Monorail geared motor Gear unit size (BM09,10, 20, 30, 40)
BM..Z-..	Gear unit with additional primary stage for very high reduction ratios
BM..G-..	Gear unit with double gearing for very high reduction ratios
BM..X-..	Reinforced gear unit for high wheel loads
BM..-7.V	C-flange with threaded holes on the "V" side of the gear unit
BM..-7.H	C-flange with threaded holes on the "H" side of the gear unit (available on request)
BM..-6.UO/	Foot thread on the "U" and "O" sides of the gear unit (not with BM09)
BM..-.1/	Solid shaft on the "V" side of the gear unit
BM..-.2/	Solid shaft on the "H" side of the gear unit (available on request)
BM..-.3/	Solid shaft on the "V" and "H" sides of the motor (available on request)
BM..-07V/../S01	A-flange and solid shaft extended on the V side of the gear unit (BM30; BM40)
BM..-07V/../S02	A-flange and solid shaft "greatly" extended on the V side of the gear unit (BM30; BM40)



V = Front
The side of the gear unit facing toward the viewer looking toward the type H1 unit

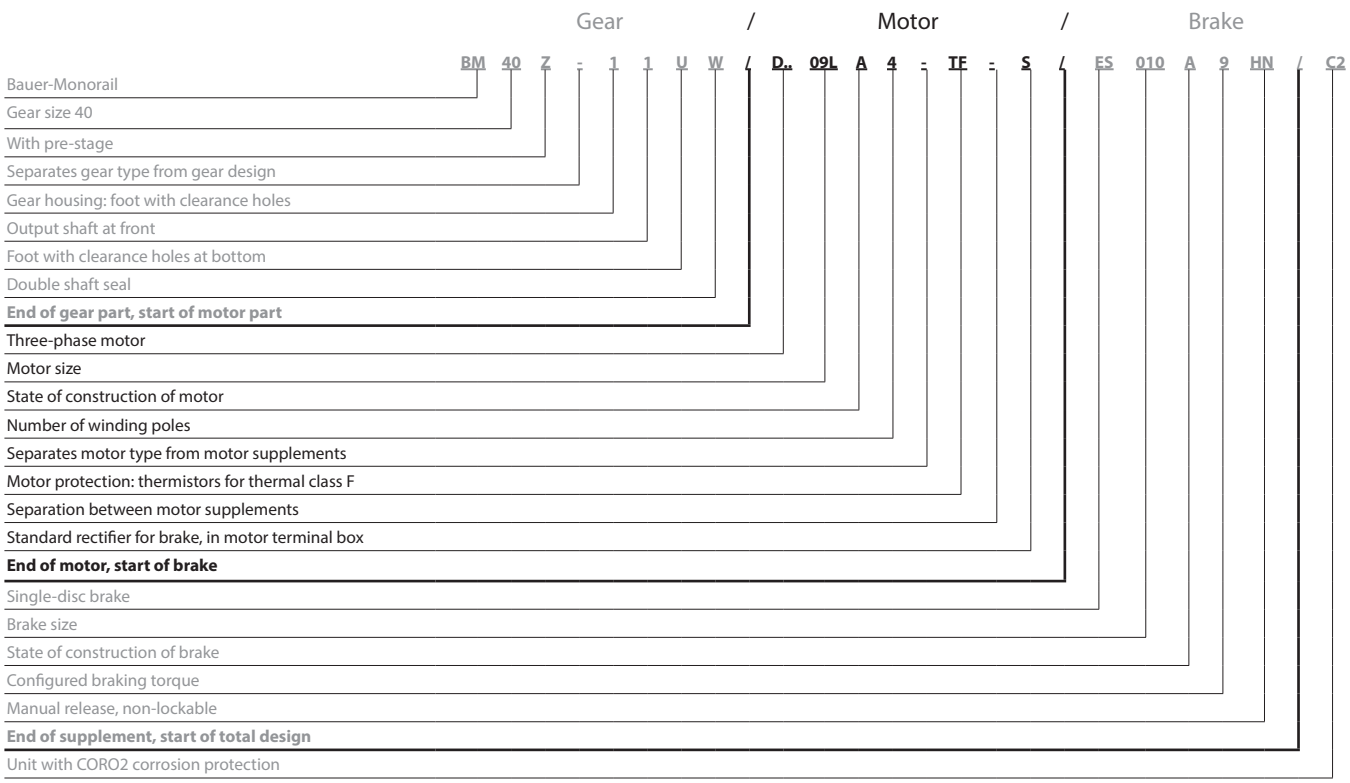
H = Rear
The side of the gear unit facing away from the viewer looking toward the type H1 unit

L = Links
The left side of the gear unit as viewed from the output shaft side of type H1,
or the torque brace oriented to the left

O = Top
The top side of the gear unit as viewed from the output shaft side of type H1,
or the torque brace oriented upwards

U = Bottom
The bottom side of the gear unit as viewed from the output shaft side of type H1,
or the torque brace oriented downwards

Geared motors for electric overhead conveyors series BM
Type Designations



3

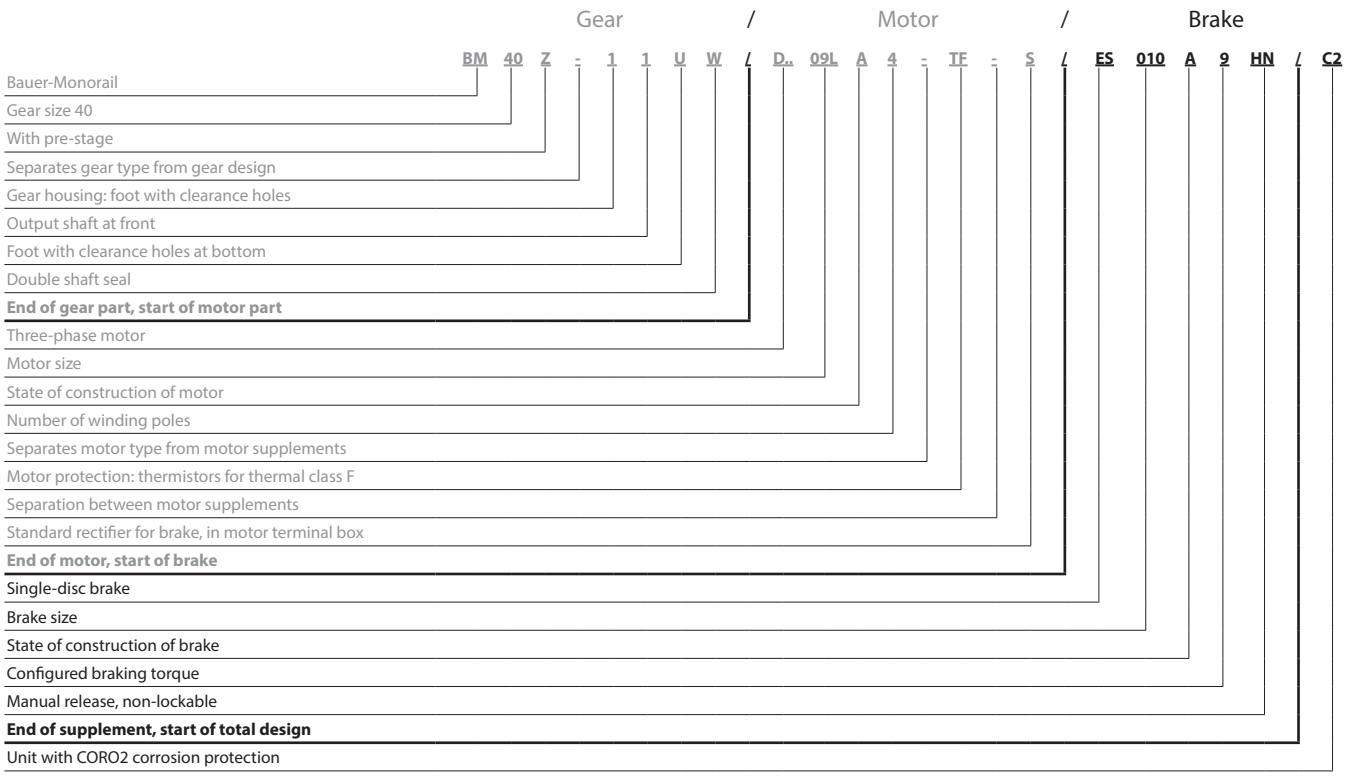
Three-phase motor	D	=	Three-phase motor
	E	=	Single-phase motor (Steinmetz circuit)
	S	=	PM-Synchronous motor
	. A	=	Aseptic motor (germ-free drive)
	. SE	=	Three-phase motor with enhanced efficiency compliant with IE1
	. HE	=	Three-phase motor with enhanced efficiency compliant with IE2
	. PE	=	Three-phase motor with enhanced efficiency compliant with IE3
	. N	=	Motor without gear unit; foot-mount version
	. NF	=	Motor without gear unit; flange-mount version
	. R	=	Roller table motor
	. XE	=	Explosion-proof motor with increased safety
	. XD	=	Explosion-proof motors
	. W	=	Torque motor
	. L	=	Special rotor for traction and slewing gear motors
	. C	=	With main and auxiliary windings; only with single-phase motors (EC....)
	. V	=	Multiple voltage ranges (wide voltage range)
	. U	=	Unventilated (no forced ventilation)

Motor protection	TB	=	Thermistor 140°
	TF	=	Thermistor 160°
	TH	=	Thermistor 180°
	TEB	=	Thermistor warning/shutdown 120°/140°
	TBF	=	Thermistor warning/shutdown 140°/160°
	TFH	=	Thermistor warning/shutdown 160°/180°
	TOB	=	Thermostatic switch, NC 140°
	TOF	=	Thermostatic switch, NC 160°
	TOH	=	Thermostatic switch, NC 180°
	TSB	=	Thermostatic switch, NO 125°
	TSF	=	Thermostatic switch, NO 160°
	TSH	=	Thermostatic switch, NO 180°
	TX	=	Other

Brake rectifier in motor terminal box	S	=	Standard rectifier	SG
	E	=	Special rectifier	ESG
	M	=	Special rectifier	MSG

Plug connector	ST	=	Harting (other)
Heavy-duty fan	SL		
Protective cover	D		

Geared motors for electric overhead conveyors series BM
Type Designations



Brake

E		= Single-disc brake
ES		= Single-disc holding brake
EH		= Single-disc holding brake in heavy duty
ZS		= Two-disc holding brake
ESX		= Single-disc service brake
EHX		= Single-disc service brake in heavy duty version
ZSX		= Two-disc service brake
… 010		= Brake size
… …	A	= Construction state
… …	. 9	= Code for configured braking torque
… …	. . HN	= Manual release (not lockable)
… …	. . HA	= Manual release (lockable)

Reverse rotation block

RR	= Blocking direction clockwise
RL	= Blocking direction counterclockwise

Encoders

G

Second shaft end

ZW	= With parallel key
ZV	= With square shaft

Forced ventilation

FV

Overall design

AV	= USA/Canada version with shaft dimensions in inches
AM	= USA/Canada version with metric shaft dimensions
UL	= US version
CS	= Canadian version
C1	= Coro1 corrosion protection
C2	= Coro2 corrosion protection
C3	= Coro3 corrosion protection
SP	= Non-catalogue version

4

Bauer Gear Motor

Bauer has an experienced team of experts available for the dimensioning of EHB carriage drives.

If you give a precise description of the conditions of operation, using our questionnaire (see 14.2), a quote for the best drive for you can be processed as quickly as possible.

For frequently used applications where the drives are supplied from a frequency inverter, however, the selection tables below can be used for rough drive dimensioning.

Procedure for selecting BM-series geared motors

1) Establish the wheel load and running wheel diameter

$F_A = m_A \cdot g$

F_A	[N]	(Wheel load on running wheel)
m_A	[kg]	(Mass acting on the drive wheel)
g	[9,81 m/s²]	Acceleration due to gravity
F_{RN}	[N]	(Maximum permissible radial force at the centre, of the wheel, see table 14.3.1 and 14.4.1)

Selection is baded on the following: $\mathbf{F_A}<F_{RN}$

Running wheel diameter d is determined by the plant engineer (preferred diameters: 125 mm, 160 mm, 200 mm, 300 mm). Criteria are wheel load and carriage design, for example.

2) The travelling speed is a further important criterion in the selection tables.
Two setting ranges are available for selection: 1:10 and 1:20. The full range of rated torques up to these frequencies are available. At higher frequencies, the torque decreases as a result of the speed range under field control. As a rule, geared motors with the 1:10 setting range are somewhat quieter in operation and those with the 1:20 setting range have smaller, less expensive motor components. The 1:20 setting range facilitates lower positioning speeds.

$$n_2 = \frac{v}{d \cdot \pi}$$

v	[m/min]	(Travelling speed)
n_2	[1/min]	(Speed at the output shaft)
d	[m]	(Running wheel diameter)

3) Geared motor selection in accordance with the required acceleration torque M_{acc2} (specification: M_{acc2} > Mtot) and the permissible long-term rated torque M_{N2} (specification: $M_{N2}>M_r+M_h$).
The values for M_{acc2} and M_{N2} are contained in the selection tables. If acceleration torque M_{acc2} is not sufficient, the table usually provides higher values for torques M_{acc2} and M_{N2} at a higher permissible radial force F_{RN}.

Torque from rolling friction [Nm]:

$$M_w = F_w \cdot \frac{d}{2} = m \cdot f_w \cdot \frac{d}{2}$$

Lift on gradient: [Nm]:

$$M_h = m \cdot g \cdot \sin\alpha \cdot \frac{d}{2}$$

Acceleration torque [Nm]:

$$M_a = m \cdot a \cdot \frac{d}{2} = m \cdot \frac{v}{t_a} \cdot \frac{d}{2}$$

Total torque required during acceleration [Nm]:

$\mathbf{M_{tot} = M_W + M_h + M_a}$

M_{acc2} = Torque [Nm] available at the output shaft during acceleration

M_{N2} = Torque [Nm] available at the output shaft during continuous operation.

d	[m]	(Running wheel diameter)
m	[kg]	(Moving mass)
f_W	[N/kg]	(Rolling resistance form rolling friction per 1000 kg , guide value approcimately ca. 200 N / 1000 kg = 0.2 N/kg)
F_W	[N]	(Rolling resistance from rolling friction)
v	[m/s]	(Maximum travelling speed)
t_a	[s]	(Run-up time)
a	[m/s²]	(Acceleration, standard values approximately 0,3 m/s²...1 m/s²)
α	(Angle of inclination)	

4) Establishing the brake size in the brake selection table.

Choose a brake which can be fitted externally and then select the required braking torque. Guide value for braking torque on the forizontal $M_{br1} = 0{,}9 \cdot M_{N1}$.

Total load and rotor at the moment of inertia at the rotor shaft [kgm²]

$\mathbf{J_{tot1} = J_{Last1} + J_{rot}\ (+J_{SL})}$ **(J_{SL}, with heavy cast-iron fan impeller)**

Load at the moment of inertia at the rotor shaft [kgm²]

$$J_{Last1} = m \cdot \frac{\left(\frac{d}{2}\right)^2}{i^2} \text{ oder } J_{Last1} = 91{,}2 \cdot m \cdot \frac{v^2}{n_1^2}$$

Braking time [s]:

$$t_{br} = \frac{J_{tot1} \cdot n_1}{9{,}55 \cdot M_{br}}$$

n1	[1/min]	Rotor shaft speed
M_{br}	[Nm]	Brake torque of the mechanical brake

$$a_{br} = \frac{v}{t_{br}}$$

Rate of deceleration [m/s²]:

v	[m/s]	Travelling speed
a_{br}	[m/s²]	Rate of deceleration

The calculated rate of deceleration abr is a guide value which is exceeded somewhat in practice since the rolling resistance and level of efficiency are not taken into account.

d	[m]	(Running wheel diameter))
m	[kg]	(Moving mass)
i		Gear reduction ratio
v	[m/s]	Travelling speed
n_1	[1/min]	Rotor shaft speed
J_{rot}	[kgm²]	Moment of inertia of the rotor at the rotor shaft from the motor table
J_{SL}	[kgm²]	Moment of inertia of the heavy cast-iron fan from the motor table

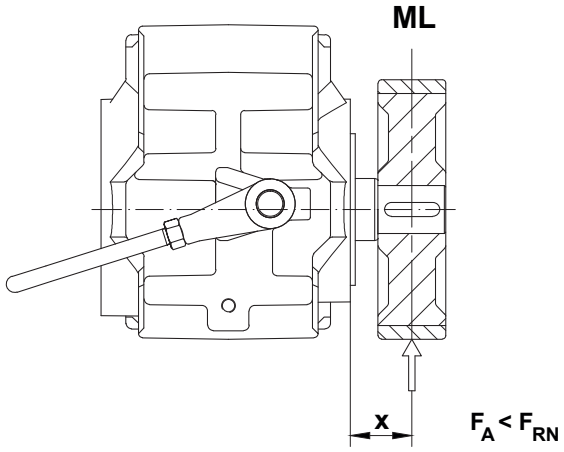
5) Compare the dimensional drawing of the geared motor with the carriage design, and determine the position of the terminal box.

6) Compare the electrical data of the motor (I_N und I_{acc}) with the data of the inverter supplied.

Permissible radial forces

d_{Wheel}	F_{RN}	Gear unit type	D_{Shaft}
in mm	in N		in mm
125	4400	BM09	20
125	6500	BM09X	25
125	8000	BM10	25
160	6500	BM09X	25
160	8000	BM10	25
200	8000	BM10	25
200	10000	BM10X	25
200	10000	BM20	30
200	12000	BM20X	30
200	12000	BM30(Z)	35
200	15000	BM30(Z)X	35
250	15000	BM30(Z)	35
250	20000	BM40(Z)	55
300	20000	BM40(Z)	55
300	25000	BM40(Z)X	55

Definition des Kraftangriffes der Radlast



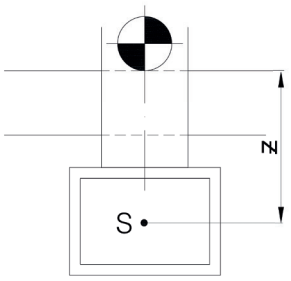
Maß x, siehe entsprechendes Maßbild

Abbreviations in the selection tables:

v	Travelling speed of the wheel diameter at a synchronous speed
i	Gear reduction ratio
M_{acc2}	Acceleration torque at the output shaft
M_{N2}	Permissible permanent load torque at the output shaft between 30 and 50 or 30 and 87 Hz in inverter duty
I_{acc}	Acceleration current (must be produced by the inverter)
I_L	Required current in inverter duty with $M_L = M_{N2}$
P	Rated output
n_2	Rated speed of the output shaft on a 50 Hz system
F_{RN}	Permissible radial force at the centre of the wheel (see dimension diagram)
d_{Wheel}	Running wheel diameter
d_{AW}	Output shaft diameter

Carriage design

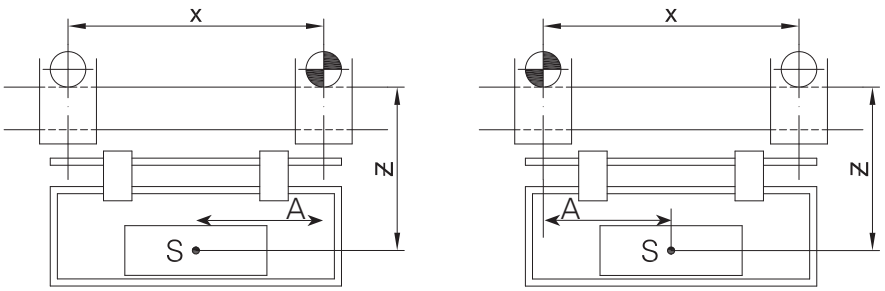
Prinzip „X/X“ = „/“ (Please enter principle used)
Prinzip „1/1“: One running wheel / one driven wheel



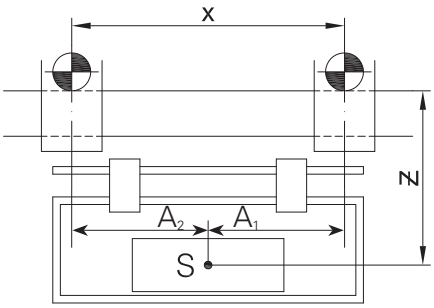
Legend:

S	Load centre of gravity
Z	Distance from rail to load centre of gravity
X	Distance between running wheels
Y	Distance between pivot joints
A, A1, A2	Distance from middle of running wheel to centre of gravity
	Driven wheel
	Non-driven wheel

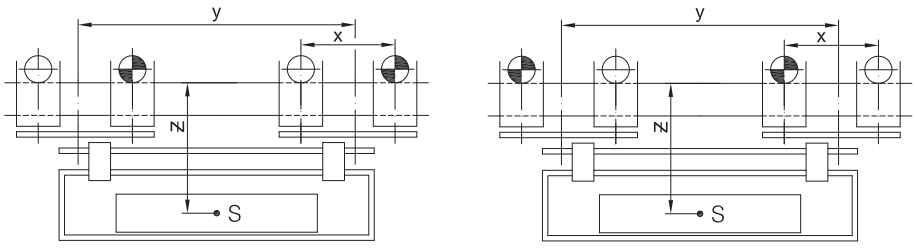
Prinzip „1/2“: Two running wheels / one driven wheel



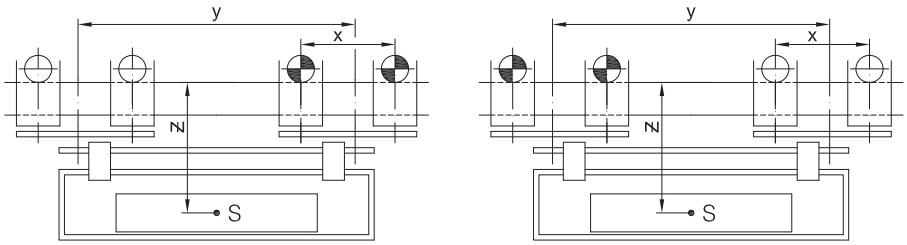
Prinzip „2/2“: Two running wheels / two driven wheels



Prinzip „1/4“: four running wheels/with one driven wheel per trolley



Prinzip „2/4“: four running wheels/two driven wheels per trolley



Note, „Principle 2/2“ and „Principle 2/4“ both involve carriages with two drives. Particular attention must be paid to cornering in such cases since different speeds will be present on the two drives when entering and exiting the corner; in practice this is resolved by the different motor slip on the two drives. This can cause considerable additional loading on the gear unit and motor, particularly where curves are tight and there are large distances between the drives wheels.

Please provide a sketch of your own principle here:

Geared motors for electric overhead conveyors series BM

Questionnaire on drive designs

Address

Company: .....
Street address: .....
Postcode: .....
Town: .....
Contact person .....
Telephone: .....
Fax: .....
Email: .....
Requesting ☐return call ☐project planning ☐controls

BAUER contact details

Please submit your completed questionnaire to:
Fax: +49 711 3518 429 or
Email: monorail@bauergears.com

4

Trolley construction

Trolley construction		☐1/2 ☐2/2 ☐1/4 ☐2/4 ☐other	
Dimensions	X	.....	[mm]
	Y	.....	[mm]
	Z	.....	[mm]
	A	.....	[mm]
	A1	.....	[mm]
	A2	.....	[mm]

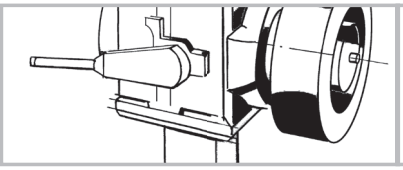
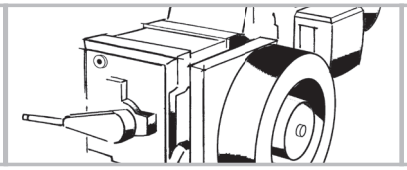
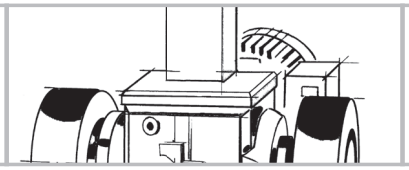
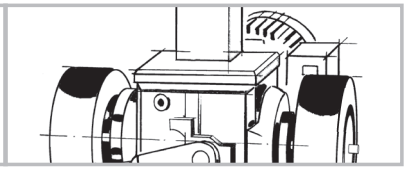
Operating Conditions

Installation height (above sea level)		.....	[m]
Ambient temperature	min.	.....	[°C]
	max.	.....	[°C]
Mains voltage		.....	[V]
Mains frequency		.....	[Hz]
Regulations		.....	
Further information		.....	
		.....	

Technical data - drive

Trolley mass		.....	[kg]
Suspension gear mass		.....	[kg]
Gear motor mass		.....	[kg]
Transport load mass		.....	[kg]
Wheel load of the driving wheel		.....	[N]
Radial force on the main shaft		.....	[N]
Distance from shaft collar of...		.....	[mm]
Axial force on the main shaft		.....	[N]
Bogie wheel diameter	d	.....	[mm]
Bogie wheel material		.....	[--]
Minimum curve radius		.....	[m]
Angle of the sharpest curve		.....	[°]
Total track length		.....	[m]
Horizontal travel			
Travel velocity	max.	.....	[m/min]
Duty cycle		.....	[%]
Number of start-ups per hour		.....	[--}
Travel velocity	min.	.....	[m/min]
Duty cycle		.....	[%]
Number of start-ups per hour		.....	[--}
Travel through curves			
Travel velocity	max.	.....	[m/min]
Duty cycle		.....	[%]
Number of start-ups per hour		.....	[--}
Travel velocity (curve)	min.	.....	[m/min]
Duty cycle		.....	[%]
Number of start-ups per hour		.....	[--}
Desired acceleration		.....	[m/s^2]
Desired deceleration		.....	[m/s^2]
Permissible braking distance during operation		.....	[mm]
Requisite stopping accuracy		.....	[mm]
Permissible braking distance for emergency stop ..... [mm]			
Number of start-ups per hour		.....	[--}
Coupling	☐ manual coupling	☐ mechanical coupling	
Coupling and uncoupling possible while loaded	☐ YES	☐ NO	

Technical data - ascent	Ascent	.....	[°]
	Length of inclined track	.....	[m]
	Travel velocity	.....	[m/min]
	Duty cycle	.....	[%]
	Number of start-ups per hour	.....	[--}
	Desired acceleration	.....	[m/s²]
	Desired deceleration	.....	[m/s²]
	Permissible braking distance during operation	.....	[mm]
	Requisite stopping accuracy	.....	[mm]
	Permissible braking distance for emergency stop [mm]	.....	
	Number of start-ups per hour	.....	[--}
	Ascent assistance available	☐ YES ☐ NO	
	Surface pressure	.....	[N]
Technical data - descent	Descent	.....	[°]
	Length of declined track	.....	[m]
	Travel velocity	.....	[m/min]
	Duty cycle	.....	[%]
	Number of start-ups per hour	.....	[--}
	Desired acceleration	.....	[m/s²]
	Desired deceleration	.....	[m/s²]
	Permissible braking distance during operation	.....	[mm]
	Requisite stopping accuracy	.....	[mm]
	Permissible braking distance during emergency stop [mm]	.....	
	Number of start-ups per hour	.....	[--}
	Ascent assistance available	☐ YES ☐ NO	
	Surface pressure	.....	[N]
Further drive versions	Mechanical brakes	☐ YES ☐ NO	
	Manual release	☐ YES ☐ NO	
	Brake supply voltage	.....	[V]
	Brake rectifier	☐ on trolley control panel ☐ in terminal box	
	Brake switching	☐ AC ☐ DC	
	Motor protection	☐ PTC ☐ thermostat	
	Motor connection	☐ terminal box ☐ connector	
	Main shaft		
	Dimensions	dxl	[mm]
	Model	☐ with keyway ☐ without keyway	
	Construction	.....	[--]
	Terminal box position	.....	[--]
	RAL tone paint (BAUER-Standard RAL 7031)	.....	[--]

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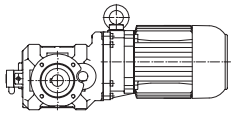

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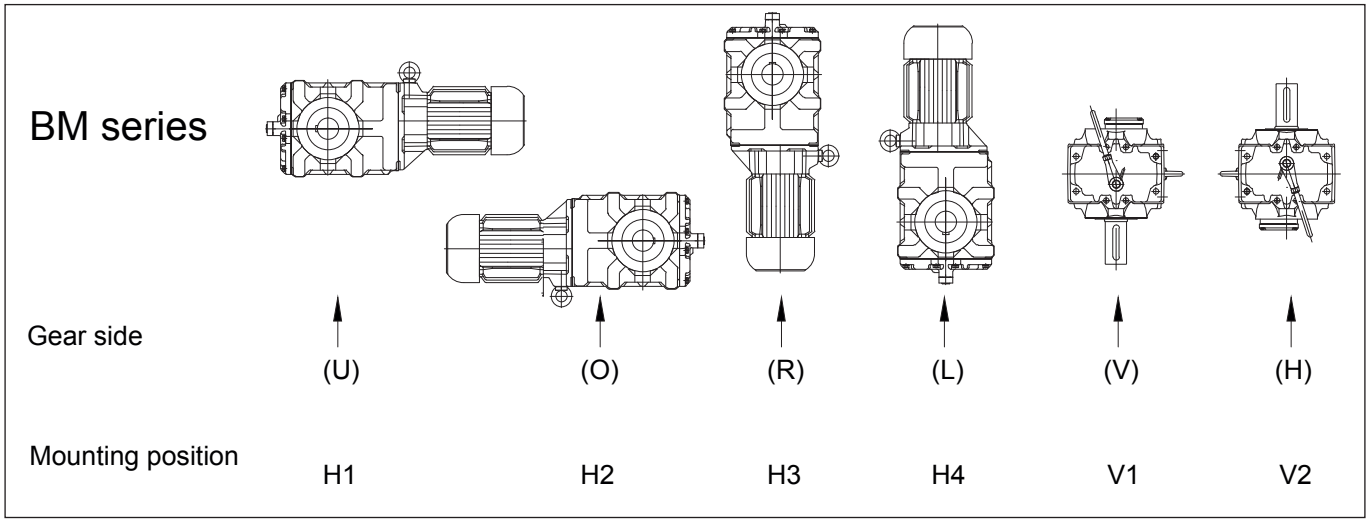
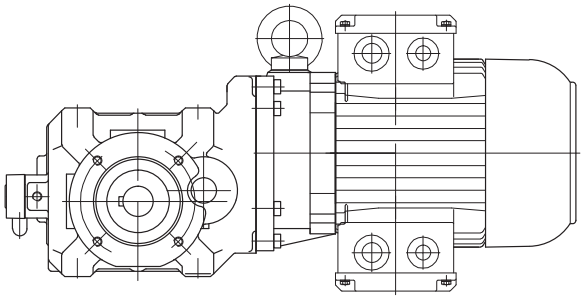


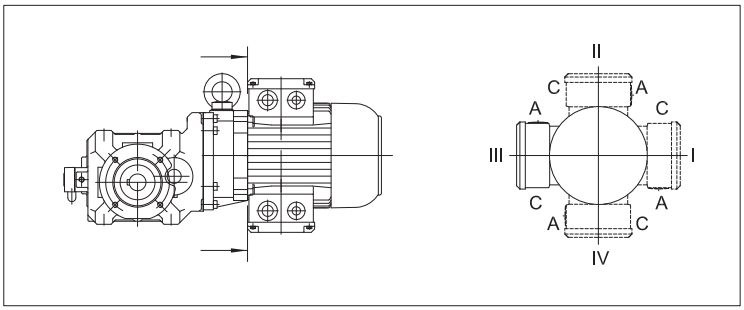
Standard fitting position of BM geared motors

Geared motor carriages for overhead conveyors are almost always installed horizontally in installation type H1. The lubricant quantity is adapted to suit the resulting inclined positions of the gear unit where ascents and descents have to be negotated. Please therefore specifiy the rise angle with your enquiries or orderes. BM-series geared motors can also **be used as** point operationg gears. Please indicate the mounting orientation. This usually difffers from the fitting position of the carriage drives.



Position of the terminal box and the cable glands

The standard position of the terminal box for BM geared motors is position III, opposite the output shaft pointing towards the "H" side of the gear unit. This position is preferred for most overhead conveyor applications. The terminal box can be supplied rotated by 90 degrees about the motor axis upon request. The standard cable entry is from side A or C. Cable entry towards the fan cowl (B) available on request.



Lubricants

The drives are shipped ready-filled with gear lubricant. Lubricated in this way, the gear units are suitable for ambient temperatures in the range -20°C to + 40°C. The quantity of lubricant is optimised for the desired installed position as is stated on the nameplate. The type of lubricant is stated in the Operating Instructions. Lubricants for other temperature ranges or special applications available on request.

Wear-protective EP gear oils as indicated in the following table have proven particularly effective:

	Lubricant type
	Synthetic Oil
	ISO VG 460
Disposal No.	**ASN 13 02 06**
Lubricant Manufacturer	Standard oil for gearboxes in the series **BM20-BM40** High temperature oil for gearboxes in the series **BM20-BM40**
AGIP	
ARAL	**DEGOL GS460**
BECHEM RHUS	
BP	**ENERSYN SG-XP 460**
CASTROL	**ALPHASYN PG 460 TRIBOL 800/460 ALPHASYN 460**
ESSO	
FUCHS	**RENOLIN PG 460**
KLÜBER	**KLÜBERSYNTH GH6-460**
MOBIL	**GLYGOYLE 460**
OEST	
OPTIMOL	**OPTIFLEX A 460**
SHELL	**OMALA S4 WE 460**
TEXACO	
TOTAL	
WINTERSHALL	

Important:
Synthetic gear oils of a Polyglykol base (e.g. PGLP…) must be disposed of separately to mineral oil as **Special Waste** .

So long as the ambient temperature does not fall below – 20 °C the international definition of the viscosity class at 40 °C according to ISO 3448 and DIN 51519 ISO the viscosity class VG220 (SAE90) is recommended according, in North America AGMA 5EP.

For lower temperatures it is recommended to use oils of a lower nominal viscosity with a corresponding better starting characteristic, for instance a PGLP with a nominal viscosity VG68 (SAE80) or AGMA 2EP respectively. These types of oil can already be necessary at a temperature around the freezing point, if the break away torque of a drive is reduced by some smooth starting device or if the motor has a relatively low power.

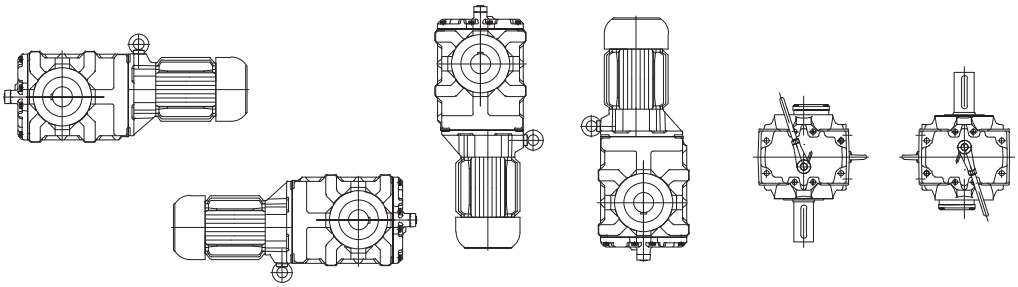
Lubricant quantities

The preferred quantity of lubricant for the planned type of installation is stated on the motor's rating plate (symbol "oil can"). When topping up care should be taken to ensure that, depending on the fitting position, gearwheels and rolling contact bearings positioned at the top are also properly oiled. In special versions the oil level mark should be noted. Information about the quantity of lubricant required for other types of installation can be obtained from the factory.

Lubricants

Lubricant quantities, BM-series gears

Lubrication quantity in l



Gearbox type	H1	H2	H3	H4	V1	V2
BM09	0.5	on request				
BM10	0.65					
BM20	0.7					
BM30	1.2 1.8*					
BM30/S1	1.2 1.8*					
BM30/S2	1.3 1.9*					
BM40	2.5 3.2*					
BM40/S1	2.5 3.2*					
BM40/S2	2.6 3.3*					

*: Lubrication quantity für BM30Z/BM40Z
Caution: if * is shown the lubrication quantity of the pre-stage is filled into the main gear.

Lubricant quantity the primary stage (Z) for installation type H1

Gear unit	Litres in the primary stage (Z)
BM09(X)	-
BM10(X)	-
BM20(X)	0,15
BM30(X)	-
BM40(X)	-
BM30Z(X)	0,2
BM40Z(X)	0,32

Lubricant quantities for other types of installation available on request.

Gear ventilation

BM gear units are shipped ready-equipped with a vent plug. Low operating temperatures are achieved thanks to the high levels of efficiency of BM gear units and the fact that their surfaces have been designed for optimum heat dissipation. This results in oil change intervals of 2500.

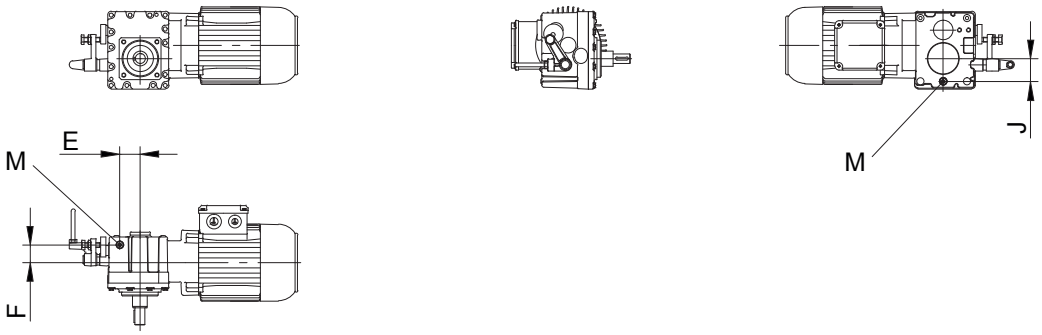
Geared motors for electric overhead conveyors series BM

Threaded plugs

Position of threaded plugs, BM

Size

BM09



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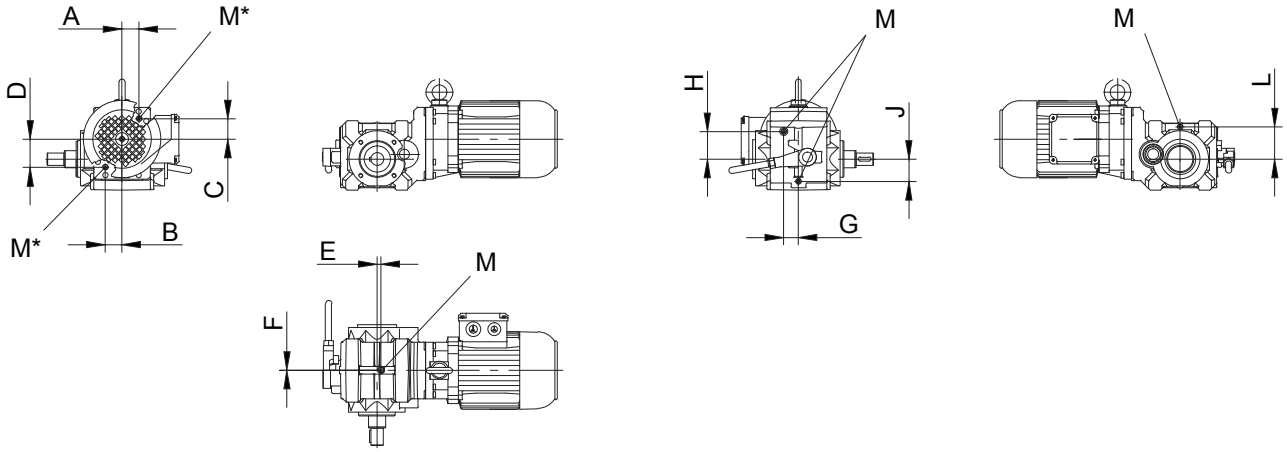
Size

BM10 - BM40

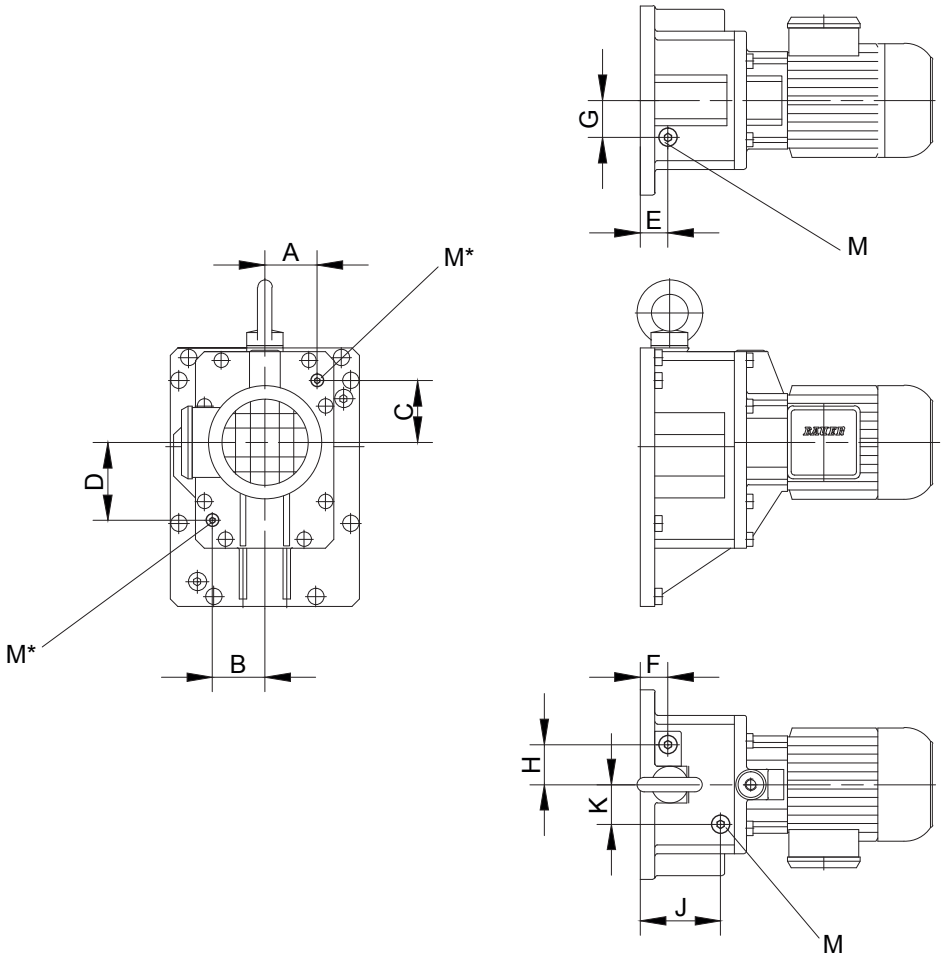


M = Plug according to DIN 908

Typ	A	B	C	D	E	F	G	H	J	L	M
BM09	-				41	36	-	-	46.5	-	M10x1
BM10	* Tab.I-Tab.III size B10				8	0	30	55	45	-	M10x1
BM20	* Tab.I-Tab.III size B10				0	49	-	-	45	62	M10x1
BM30	* Tab.I-Tab.III size B10				-	-	0	70	-	-	M10x1
BM40	* Tab.I-Tab.III size B10				-	-	0	-	-	-	-

* see Position of the oil drain and filler plugs on the system cover

Position of threaded plugs, pre-stage gears (Z)



M = Plug according to DIN 908

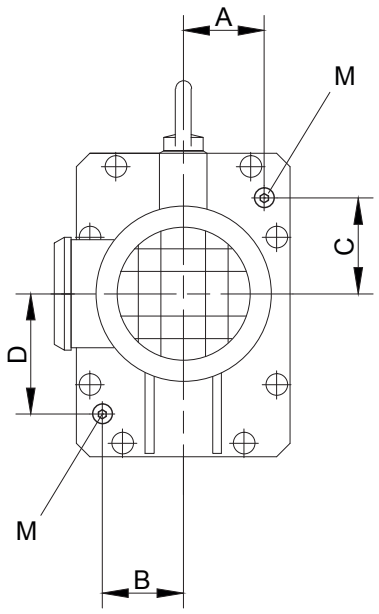
Gear	A	B	C	D	E	F	G	H	J	K	M
BM20(Z)	-	-	-	-	49	-	28.5	-	23.5	28	M10x1
BM30(Z)	* Tab.I u. II size B.10				-	24	-	30	-	-	M10x1
BM40(Z)	* Tab.I u. II size B.20				-	27.5	-	36.5	-	-	M14x1.5

* see position of the oil drain and filler plugs on the system cover

M* =Factor and position of the drain plug see page 44.

Threaded plugs

Position of the drain plugs in the System Cover
Design with Standard Geared Motor



M = Plug according to DIN 908

Table I: Design with standard geared motor

Gear	Size	A	B	C	D	M
BM10(X)	D05-D..09	36	34	43.5	59	M10x1
BM20(Z)	D05-D..09	44	44	58	72.5	M10x1
BM30(Z)	D05-D..09	56.5	40	58.2	75	M10x1
BM40(Z)	D..08-D..11	66	71	71	94	M14x1.5

M* =Factor and position of the drain plug see page 44.

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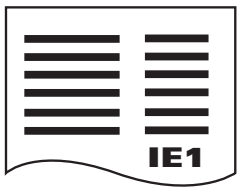
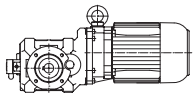


P = 0.03 kW



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
11.5	**23.5**	**9.4**	117.9	**BM20Z-../D04LA4**	21	12000	12000	14	19.4	11
9.5	**28.5**	**7.7**	142.8	"	"	12000	12000	11.5	23.5	9.4
7.6	**35.5**	**5.9**	178.9	"	"	12000	12000	9.1	29.5	7.1
6.6	**41**	**4.7**	205.3	"	"	12000	12000	7.9	34	5.7

P = 0.04 kW

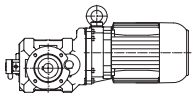
50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
16	**22.5**	**9.8**	85.45	**BM20Z-../D04LA4**	21	12000	12000	19	19.1	12
14	**25.5**	**8.6**	99.47	"	"	12000	12000	16.5	21.5	10
11.5	**31.5**	**7.0**	117.9	"	"	12000	12000	14	25.5	8.6
9.5	**38**	**5.8**	142.8	"	"	12000	12000	11.5	31.5	7.0
7.6	**47.5**	**4.4**	178.9	"	"	12000	12000	9.1	39.5	5.3
6.6	**54**	**3.6**	205.3	"	"	12000	12000	7.9	45.5	4.2

P = 0.06 kW

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**4.2**	**7.1**	11.34	**BM09-../D05LA4**	13	4400	6500	143	3.5	8.6
103	**4.85**	**6.6**	13.23	"	"	4400	6500	123	4.05	7.9
77	**6.5**	**7.2**	17.73	"	"	4400	6500	92	5.4	8.7
64	**7.8**	**7.2**	21.20	"	"	4400	6500	77	6.5	8.6
55	**9.1**	**6.5**	24.74	"	"	4400	6500	66	7.6	7.8
52	**9.6**	**7.2**	25.98	"	"	4400	6500	63	8.0	8.6
45	**11.2**	**6.4**	30.31	"	"	4400	6500	54	9.3	7.7
41	**12.2**	**7.1**	32.97	"	"	4400	6500	49.5	10.1	8.6
35.5	**14.2**	**6.5**	38.46	"	"	4400	6500	42.5	11.8	7.8
32	**15.5**	**5.5**	42.44	"	"	4400	6500	38.5	12.9	6.6
25.5	**19.5**	**5.5**	53.85	"	"	4400	6500	30.5	16.3	6.6
7.6	**71**	**2.9**	178.9	**BM20Z-../D06LA4**	24	12000	12000	9.1	59	3.5
6.6	**82**	**2.4**	205.3	"	"	12000	12000	7.9	68	2.8

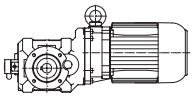
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE1



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**6.3**	**4.8**	11.34	**BM09-../D05LA4**	13	4400	6500	143	5.2	5.8
103	**7.3**	**4.4**	13.23	"	"	4400	6500	123	6.1	5.2
77	**9.8**	**4.8**	17.73	"	"	4400	6500	92	8.2	5.7
64	**11.8**	**4.7**	21.20	"	"	4400	6500	77	9.8	5.7
55	**13.7**	**4.3**	24.74	"	"	4400	6500	66	11.4	5.2
52	**14.5**	**4.8**	25.98	"	"	4400	6500	63	12	5.8
45	**16.8**	**4.3**	30.31	"	"	4400	6500	54	14	5.1
41	**18.4**	**4.7**	32.97	"	"	4400	6500	49.5	15.2	5.7
35.5	**21**	**4.4**	38.46	"	"	4400	6500	42.5	17.7	5.2
32	**23**	**3.7**	42.44	"	"	4400	6500	38.5	19.4	4.4
25.5	**29**	**3.7**	53.85	"	"	4400	6500	30.5	24.5	4.4
11.5	**71**	**3.1**	117.9	**BM20Z-../D06LA4**	24	12000	12000	14	58	3.8
9.5	**85**	**2.6**	142.8	"	"	12000	12000	11.5	71	3.1
7.6	**107**	**1.95**	178.9	"	"	12000	12000	9.1	89	2.3
6.6	**123**	**1.55**	205.3	"	"	12000	12000	7.9	103	1.85
3.9	**178**	**2.8**	348.7	**BM40Z-../D06LA4**	64	20000	25000	4.7	148	3.4
3.2	**210**	**2.4**	430.0	"	"	20000	25000	3.8	180	2.8

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**8.4**	**3.6**	11.34	**BM09-../D05LA4**	13	4400	6500	143	7.0	4.3
103	**9.7**	**3.3**	13.23	"	"	4400	6500	123	8.1	4.0
77	**13**	**3.6**	17.73	"	"	4400	6500	92	10.9	4.3
64	**15.7**	**3.6**	21.20	"	"	4400	6500	77	13	4.3
55	**18.3**	**3.2**	24.74	"	"	4400	6500	66	15.2	3.9
52	**19.3**	**3.6**	25.98	"	"	4400	6500	63	16	4.3
45	**22**	**3.3**	30.31	"	"	4400	6500	54	18.6	3.9
41	**24.5**	**3.6**	32.97	"	"	4400	6500	49.5	20	4.4
35.5	**28**	**3.3**	38.46	"	"	4400	6500	42.5	23.5	3.9
32	**31**	**2.7**	42.44	"	"	4400	6500	38.5	25.5	3.3
25.5	**39**	**2.8**	53.85	"	"	4400	6500	30.5	32.5	3.3
18.5	**58**	**3.1**	74.76	**BM20-../D06LA4**	23	12000	12000	22	49	3.7
16	**68**	**3.2**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	57	3.9
14	**77**	**2.9**	99.47	"	"	12000	12000	16.5	65	3.4
11.5	**94**	**2.3**	117.9	"	"	12000	12000	14	77	2.9
9.5	**114**	**1.95**	142.8	"	"	12000	12000	11.5	94	2.3
7.6	**143**	**1.45**	178.9	"	"	12000	12000	9.1	119	1.75
6.6	**164**	**1.2**	205.3	"	"	12000	12000	7.9	137	1.4
9.0	**108**	**3.2**	150.3	**BM30Z-../D06LA4**	41	12000	15000	11	88	4.0
7.7	**126**	**2.8**	177.2	"	"	12000	15000	9.2	105	3.3
4.7	**197**	**3.0**	289.8	**BM40Z-../D06LA4**	64	20000	25000	5.6	165	3.6
3.9	**235**	**2.2**	348.7	"	"	20000	25000	4.7	197	2.6
3.2	**285**	**1.75**	430.0	"	"	20000	25000	3.8	240	2.1

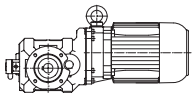


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**12.6**	**2.4**	11.34	**BM09-../D05LA4**	13	4400	6500	143	10.5	2.9
103	**14.6**	**2.2**	13.23	"	"	4400	6500	123	12.2	2.6
77	**19.6**	**2.4**	17.73	"	"	4400	6500	92	16.4	2.9
64	**23.5**	**2.4**	21.20	"	"	4400	6500	77	19.6	2.9
55	**27.5**	**2.1**	24.74	"	"	4400	6500	66	22.5	2.6
52	**29**	**2.4**	25.98	"	"	4400	6500	63	24	2.9
45	**33.5**	**2.1**	30.31	"	"	4400	6500	54	28	2.6
41	**36.5**	**2.4**	32.97	"	"	4400	6500	49.5	30.5	2.9
35.5	**42.5**	**2.2**	38.46	"	"	4400	6500	42.5	35.5	2.6
32	**46.5**	**1.85**	42.44	"	"	4400	6500	38.5	38.5	2.2
25.5	**58**	**1.85**	53.85	"	"	4400	6500	30.5	49	2.2
30	**48**	**3.3**	45.00	**BM10-../D06LA4**	21	8000	10000	36	40	4.0
26	**54**	**2.8**	52.44	"	"	8000	10000	31	45	3.3
23.5	**59**	**2.7**	58.18	"	"	8000	10000	28	50	3.2
22.5	**72**	**2.7**	60.64	**BM20-../D06LA4**	23	12000	12000	27	60	3.2
18.5	**88**	**2.1**	74.76	"	"	12000	12000	22	74	2.5
16	**102**	**2.2**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	85	2.6
14	**116**	**1.9**	99.47	"	"	12000	12000	16.5	98	2.2
11.5	**142**	**1.55**	117.9	"	"	12000	12000	14	116	1.9
9.5	**171**	**1.3**	142.8	"	"	12000	12000	11.5	142	1.55
7.6	**210**	**1.0**	178.9	"	"	12000	12000	9.1	179	1.15
19	**79**	**3.3**	71.09	**BM30-../D06LA4**	39	12000	15000	23	65	4.0
13.5	**109**	**3.2**	100.7	**BM30Z-../D06LA4**	41	12000	15000	16.5	89	3.9
11	**134**	**2.6**	128.2	"	"	12000	15000	13	113	3.1
9.0	**162**	**2.2**	150.3	"	"	12000	15000	11	132	2.7
7.7	**189**	**1.85**	177.2	"	"	12000	15000	9.2	158	2.2
6.4	**220**	**3.1**	211.5	**BM40Z-../D06LA4**	64	20000	25000	7.7	183	3.7
5.5	**250**	**2.7**	246.6	"	"	20000	25000	6.6	210	3.2
4.7	**295**	**2.0**	289.8	"	"	20000	25000	5.6	245	2.4
3.9	**355**	**1.45**	348.7	"	"	20000	25000	4.7	295	1.7
3.2	**425**	**1.2**	430.0	"	"	20000	25000	3.8	360	1.4

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**17.5**	**1.7**	11.34	**BM09-../D05LA4**	13	4400	6500	143	14.6	2.1
103	**20**	**1.6**	13.23	"	"	4400	6500	123	17	1.9
77	**27**	**1.75**	17.73	"	"	4400	6500	92	22.5	2.1
64	**32.5**	**1.7**	21.20	"	"	4400	6500	77	27	2.1
55	**38**	**1.55**	24.74	"	"	4400	6500	66	31.5	1.85
52	**40**	**1.75**	25.98	"	"	4400	6500	63	33	2.1
45	**46.5**	**1.55**	30.31	"	"	4400	6500	54	38.5	1.85
41	**51**	**1.7**	32.97	"	"	4400	6500	49.5	42	2.1
35.5	**59**	**1.55**	38.46	"	"	4400	6500	42.5	49	1.9
32	**64**	**1.35**	42.44	"	"	4400	6500	38.5	53	1.6
25.5	**81**	**1.35**	53.85	"	"	4400	6500	30.5	68	1.6
41	**50**	**3.0**	33.19	**BM10-../D06LA4**	21	8000	10000	49	41.5	3.6
37	**55**	**2.9**	36.82	"	"	8000	10000	44	46.5	3.4
33.5	**59**	**2.5**	40.56	"	"	8000	10000	40	50	3.0
30	**66**	**2.4**	45.00	"	"	8000	10000	36	55	2.9
26	**75**	**2.0**	52.44	"	"	8000	10000	31	63	2.4
23.5	**83**	**1.95**	58.18	"	"	8000	10000	28	69	2.3

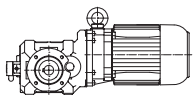
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE1



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
32.5	**69**	**3.2**	42.18	**BM20-../D06LA4**	23	12000	12000	38.5	58	3.8
26	**87**	**2.4**	52.84	"	"	12000	12000	31	73	2.9
22.5	**100**	**1.95**	60.64	"	"	12000	12000	27	84	2.3
18.5	**122**	**1.5**	74.76	"	"	12000	12000	22	103	1.75
16	**141**	**1.55**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	119	1.85
14	**162**	**1.35**	99.47	"	"	12000	12000	16.5	137	1.6
11.5	**197**	**1.1**	117.9	"	"	12000	12000	14	162	1.35
9.5	**235**	**0.94**	142.8	"	"	12000	12000	11.5	197	1.1
22.5	**93**	**2.9**	61.33	**BM30-../D06LA4**	39	12000	15000	26.5	79	3.4
19	**110**	**2.3**	71.09	"	"	12000	15000	23	91	2.8
16	**129**	**2.7**	85.96	**BM30Z-../D06LA4**	41	12000	15000	19	109	3.2
13.5	**152**	**2.3**	100.7	"	"	12000	15000	16.5	124	2.8
11	**186**	**1.9**	128.2	"	"	12000	15000	13	157	2.2
9.0	**225**	**1.55**	150.3	"	"	12000	15000	11	184	1.9
7.7	**260**	**1.35**	177.2	"	"	12000	15000	9.2	220	1.6
9.5	**210**	**3.2**	143.0	**BM40Z-../D06LA4**	64	20000	25000	11.5	174	3.9
8.0	**245**	**2.8**	169.0	"	"	20000	25000	9.6	205	3.3
6.4	**305**	**2.2**	211.5	"	"	20000	25000	7.7	250	2.7
5.5	**350**	**1.95**	246.6	"	"	20000	25000	6.6	290	2.3
4.7	**410**	**1.45**	289.8	"	"	20000	25000	5.6	345	1.75
3.9	**495**	**1.0**	348.7	"	"	20000	25000	4.7	410	1.25
3.2	**590**	**0.85**	430.0	"	"	20000	25000	3.8	500	1.0

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**21**	**1.45**	11.34	**BM09-../D07LA4**	17	4400	6500	143	17.6	1.7
103	**24**	**1.35**	13.23	"	"	4400	6500	123	20	1.6
77	**32.5**	**1.45**	17.73	"	"	4400	6500	92	27	1.75
64	**39**	**1.45**	21.20	"	"	4400	6500	77	32.5	1.7
55	**45.5**	**1.3**	24.74	"	"	4400	6500	66	38	1.55
52	**48**	**1.45**	25.98	"	"	4400	6500	63	40	1.75
45	**56**	**1.3**	30.31	"	"	4400	6500	54	46.5	1.55
41	**61**	**1.45**	32.97	"	"	4400	6500	49.5	50	1.75
35.5	**71**	**1.3**	38.46	"	"	4400	6500	42.5	59	1.55
32	**77**	**1.1**	42.44	"	"	4400	6500	38.5	64	1.35
25.5	**97**	**1.1**	53.85	"	"	4400	6500	30.5	81	1.35
51	**49**	**3.1**	26.55	**BM10-../D07LA4**	23	8000	10000	62	40.5	3.7
46	**54**	**3.0**	29.45	"	"	8000	10000	56	45	3.6
41	**60**	**2.5**	33.19	"	"	8000	10000	49	50	3.0
37	**66**	**2.4**	36.82	"	"	8000	10000	44	55	2.9
33.5	**71**	**2.1**	40.56	"	"	8000	10000	40	60	2.5
30	**80**	**2.0**	45.00	"	"	8000	10000	36	66	2.4
26	**90**	**1.65**	52.44	"	"	8000	10000	31	75	2.0
23.5	**99**	**1.6**	58.18	"	"	8000	10000	28	83	1.95
38.5	**70**	**3.1**	35.25	**BM20-../D07LA4**	26	12000	12000	46	59	3.7
32.5	**83**	**2.7**	42.18	"	"	12000	12000	38.5	70	3.1
26	**104**	**2.0**	52.84	"	"	12000	12000	31	87	2.4
22.5	**120**	**1.6**	60.64	"	"	12000	12000	27	100	1.95
18.5	**147**	**1.25**	74.76	"	"	12000	12000	22	123	1.5
16	**170**	**1.3**	85.45	**BM20Z-../D07LA4**	27	12000	12000	19	143	1.55
14	**194**	**1.15**	99.47	"	"	12000	12000	16.5	164	1.35
11.5	**235**	**0.94**	117.9	"	"	12000	12000	14	194	1.15

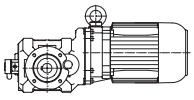


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
22.5	**112**	**2.4**	61.33	**BM30-../D07LA4**	41	12000	15000	26.5	95	2.8
19	**132**	**1.95**	71.09	"	"	12000	15000	23	109	2.4
16	**155**	**2.3**	85.96	**BM30Z-../D07LA4**	44	12000	15000	19	131	2.7
13.5	**182**	**1.9**	100.7	"	"	12000	15000	16.5	149	2.3
11	**220**	**1.6**	128.2	"	"	12000	15000	13	189	1.85
9.0	**270**	**1.3**	150.3	"	"	12000	15000	11	220	1.6
7.7	**315**	**1.1**	177.2	"	"	12000	15000	9.2	260	1.35
11.5	**210**	**3.2**	118.2	**BM40Z-../D07LA4**	66	20000	25000	14	173	3.9
9.5	**250**	**2.7**	143.0	"	"	20000	25000	11.5	205	3.3
8.0	**295**	**2.3**	169.0	"	"	20000	25000	9.6	245	2.8
6.4	**365**	**1.85**	211.5	"	"	20000	25000	7.7	305	2.2
5.5	**420**	**1.6**	246.6	"	"	20000	25000	6.6	350	1.95
4.7	**490**	**1.2**	289.8	"	"	20000	25000	5.6	410	1.45
3.9	**590**	**0.86**	348.7	"	"	20000	25000	4.7	490	1.05

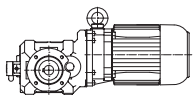
50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**25.5**	**1.2**	11.34	**BM09-../D07LA4**	**17**	4400	6500	143	21.5	1.4
103	**30**	**1.05**	13.23	"	"	4400	6500	123	25	1.3
77	**40**	**1.2**	17.73	"	"	4400	6500	92	33.5	1.4
64	**48.5**	**1.15**	21.20	"	"	4400	6500	77	40	1.4
55	**56**	**1.05**	24.74	"	"	4400	6500	66	47	1.25
52	**59**	**1.15**	25.98	"	"	4400	6500	63	49	1.4
45	**69**	**1.05**	30.31	"	"	4400	6500	54	57	1.25
41	**75**	**1.15**	32.97	"	"	4400	6500	49.5	62	1.4
35.5	**87**	**1.05**	38.46	"	"	4400	6500	42.5	73	1.25
32	**96**	**0.89**	42.44	"	"	4400	6500	38.5	79	1.1
25.5	**120**	**0.9**	53.85	"	"	4400	6500	30.5	100	1.1
60	**51**	**2.9**	22.62	**BM10-../D07LA4**	**23**	8000	10000	72	43	3.5
54	**57**	**2.8**	25.09	"	"	8000	10000	65	47.5	3.4
51	**60**	**2.5**	26.55	"	"	8000	10000	62	50	3.0
46	**67**	**2.4**	29.45	"	"	8000	10000	56	55	2.9
41	**74**	**2.0**	33.19	"	"	8000	10000	49	62	2.4
37	**82**	**1.95**	36.82	"	"	8000	10000	44	69	2.3
33.5	**88**	**1.7**	40.56	"	"	8000	10000	40	74	2.0
30	**98**	**1.65**	45.00	"	"	8000	10000	36	82	1.95
26	**111**	**1.35**	52.44	"	"	8000	10000	31	93	1.6
23.5	**123**	**1.3**	58.18	"	"	8000	10000	28	103	1.55
46	**72**	**3.1**	29.39	**BM20-../D07LA4**	**26**	12000	12000	56	59	3.7
38.5	**87**	**2.5**	35.25	"	"	12000	12000	46	72	3.1
32.5	**103**	**2.1**	42.18	"	"	12000	12000	38.5	87	2.5
26	**129**	**1.6**	52.84	"	"	12000	12000	31	108	1.95
22.5	**149**	**1.3**	60.64	"	"	12000	12000	27	124	1.55
18.5	**181**	**1.0**	74.76	"	"	12000	12000	22	152	1.2
16	**205**	**1.05**	85.45	**BM20Z-../D07LA4**	**27**	12000	12000	19	176	1.25
14	**235**	**0.94**	99.47	"	"	12000	12000	16.5	200	1.1
27.5	**114**	**2.8**	49.66	**BM30-../D07LA4**	**41**	12000	15000	33	95	3.3
22.5	**138**	**1.95**	61.33	"	"	12000	15000	26.5	117	2.3
19	**163**	**1.6**	71.09	"	"	12000	15000	23	135	1.9

Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE1



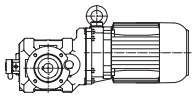
50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2 1/min	M_2 Nm	f_B			kg	N	N	n_2 1/min	M_2 Nm	f_B
16	**192**	**1.8**	85.96	**BM30Z-../D07LA4**	**44**	12000	15000	19	161	2.2
13.5	**225**	**1.55**	100.7	"	"	12000	15000	16.5	184	1.9
11	**275**	**1.25**	128.2	"	"	12000	15000	13	230	1.5
9.0	**330**	**1.05**	150.3	"	"	12000	15000	11	270	1.3
7.7	**390**	**0.9**	177.2	"	"	12000	15000	9.2	325	1.1
11.5	**260**	**2.6**	118.2	**BM40Z-../D07LA4**	**66**	20000	25000	14	210	3.2
9.5	**310**	**2.2**	143.0	"	"	20000	25000	11.5	255	2.7
8.0	**365**	**1.85**	169.0	"	"	20000	25000	9.6	305	2.2
6.4	**450**	**1.5**	211.5	"	"	20000	25000	7.7	375	1.8
5.5	**520**	**1.3**	246.6	"	"	20000	25000	6.6	430	1.6
4.7	**600**	**1.0**	289.8	"	"	20000	25000	5.6	510	1.15



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**54**	**2.6**	11.68	**BM10-../DSE08LA4**	26	8000	10000	144	45	3.1
109	**59**	**2.5**	12.95	"	"	8000	10000	130	50	3.0
86	**74**	**1.95**	16.39	"	"	8000	10000	103	61	2.4
78	**81**	**1.9**	18.18	"	"	8000	10000	93	68	2.3
62	**101**	**1.5**	22.62	"	"	8000	10000	75	84	1.8
56	**112**	**1.45**	25.09	"	"	8000	10000	67	94	1.7
53	**118**	**1.25**	26.55	"	"	8000	10000	64	98	1.55
48	**131**	**1.2**	29.45	"	"	8000	10000	58	108	1.5
42.5	**144**	**1.05**	33.19	"	"	8000	10000	51	120	1.25
38.5	**159**	**1.0**	36.82	"	"	8000	10000	46	133	1.2
35	**171**	**0.88**	40.56	"	"	8000	10000	41.5	144	1.05
31.5	**191**	**0.84**	45.00	"	"	8000	10000	37.5	160	1.0
84	**81**	**2.7**	16.72	**BM20-../DSE08LA4**	28	12000	12000	101	67	3.3
71	**95**	**2.3**	19.72	"	"	12000	12000	86	79	2.8
56	**121**	**1.8**	25.25	"	"	12000	12000	67	101	2.2
48	**141**	**1.55**	29.39	"	"	12000	12000	58	117	1.9
40	**170**	**1.3**	35.25	"	"	12000	12000	48	141	1.55
33.5	**200**	**1.1**	42.18	"	"	12000	12000	40	170	1.3
26.5	**255**	**0.82**	52.84	"	"	12000	12000	32	210	1.0
25	**270**	**0.81**	56.58	**BM20Z-../DSE08LA4**	30	12000	12000	30	225	0.98
60	**108**	**3.2**	23.38	**BM30-../DSE08LA4**	44	12000	15000	72	90	3.9
47.5	**137**	**2.6**	29.76	"	"	12000	15000	57	114	3.1
40.5	**160**	**2.2**	34.88	"	"	12000	15000	48.5	134	2.6
34.5	**186**	**1.9**	41.13	"	"	12000	15000	41	157	2.2
28.5	**220**	**1.45**	49.66	"	"	12000	15000	34	187	1.7
23	**270**	**1.0**	61.33	"	"	12000	15000	27.5	225	1.2
20	**315**	**0.82**	71.09	"	"	12000	15000	24	260	0.99
16.5	**375**	**0.93**	85.96	**BM30Z-../DSE08LA4**	46	12000	15000	20	310	1.15
14	**435**	**0.8**	100.7	"	"	12000	15000	17	360	0.97
27.5	**225**	**3.0**	51.18	**BM40-../DSE08LA4**	64	20000	25000	33	191	3.6
23.5	**265**	**2.6**	59.66	"	"	20000	25000	28.5	220	3.1
20	**310**	**2.2**	70.11	"	"	20000	25000	24	255	2.7
17	**365**	**1.65**	84.36	"	"	20000	25000	20	310	1.95
13.5	**450**	**1.35**	104.0	"	"	20000	25000	16.5	365	1.65
12	**500**	**1.35**	118.2	**BM40Z-../DSE08LA4**	69	20000	25000	14.5	415	1.65
9.8	**610**	**1.1**	143.0	"	"	20000	25000	12	500	1.35
8.3	**710**	**0.96**	169.0	"	"	20000	25000	10	590	1.15

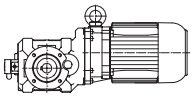
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE1



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**79**	**1.75**	11.68	**BM10-../DSE08XA4**	27	8000	10000	144	66	2.1
109	**87**	**1.7**	12.95	"	"	8000	10000	130	73	2.1
86	**108**	**1.35**	16.39	"	"	8000	10000	103	90	1.6
78	**119**	**1.3**	18.18	"	"	8000	10000	93	100	1.55
62	**149**	**1.0**	22.62	"	"	8000	10000	75	123	1.2
56	**165**	**0.97**	25.09	"	"	8000	10000	67	137	1.15
53	**174**	**0.86**	26.55	"	"	8000	10000	64	144	1.05
48	**192**	**0.83**	29.45	"	"	8000	10000	58	159	1.0
138	**72**	**3.1**	10.15	**BM20-../DSE08XA4**	29	12000	12000	166	60	3.7
105	**95**	**2.3**	13.34	"	"	12000	12000	126	79	2.8
84	**118**	**1.85**	16.72	"	"	12000	12000	101	98	2.2
71	**140**	**1.55**	19.72	"	"	12000	12000	86	116	1.9
56	**178**	**1.25**	25.25	"	"	12000	12000	67	148	1.5
48	**205**	**1.05**	29.39	"	"	12000	12000	58	172	1.3
40	**245**	**0.9**	35.25	"	"	12000	12000	48	205	1.05
87	**111**	**3.2**	16.10	**BM30-../DSE08XA4**	45	12000	15000	105	92	3.8
71	**136**	**2.6**	19.96	"	"	12000	15000	85	113	3.1
60	**159**	**2.2**	23.38	"	"	12000	15000	72	132	2.7
47.5	**200**	**1.75**	29.76	"	"	12000	15000	57	167	2.1
40.5	**235**	**1.5**	34.88	"	"	12000	15000	48.5	197	1.8
34.5	**270**	**1.3**	41.13	"	"	12000	15000	41	230	1.5
28.5	**325**	**0.97**	49.66	"	"	12000	15000	34	270	1.15
40.5	**230**	**3.0**	34.61	**BM40-../DSE08XA4**	65	20000	25000	49	192	3.5
34.5	**270**	**2.5**	40.88	"	"	20000	25000	41.5	225	3.0
27.5	**335**	**2.0**	51.18	"	"	20000	25000	33	280	2.4
23.5	**390**	**1.75**	59.66	"	"	20000	25000	28.5	320	2.1
20	**455**	**1.5**	70.11	"	"	20000	25000	24	380	1.8
17	**530**	**1.15**	84.36	"	"	20000	25000	20	455	1.3
13.5	**660**	**0.91**	104.0	"	"	20000	25000	16.5	540	1.1
12	**740**	**0.92**	118.2	**BM40Z-../DSE08XA4**	70	20000	25000	14.5	610	1.1

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
122	**106**	**1.3**	11.68	**BM10-../DSE09LA4**	34	8000	10000	147	88	1.6
110	**118**	**1.25**	12.95	"	"	8000	10000	133	98	1.55
87	**146**	**0.99**	16.39	"	"	8000	10000	105	121	1.2
79	**161**	**0.96**	18.18	"	"	8000	10000	95	134	1.15
186	**73**	**2.7**	7.66	**BM20-../DSE09LA4**	36	9100	10900	225	60	3.3
140	**97**	**2.3**	10.15	"	"	12000	12000	169	80	2.8
107	**127**	**1.75**	13.34	"	"	12000	12000	129	105	2.1
85	**160**	**1.4**	16.72	"	"	12000	12000	103	132	1.65
73	**186**	**1.2**	19.72	"	"	12000	12000	87	156	1.4
57	**235**	**0.94**	25.25	"	"	12000	12000	68	200	1.1
114	**115**	**3.0**	12.46	**BM30-../DSE09LA4**	52	12000	15000	138	95	3.7
89	**148**	**2.4**	16.10	"	"	12000	15000	107	123	2.8
72	**183**	**1.9**	19.96	"	"	12000	15000	86	153	2.3
61	**210**	**1.65**	23.38	"	"	12000	15000	74	176	2.0
48	**270**	**1.3**	29.76	"	"	12000	15000	58	220	1.6
41	**315**	**1.1**	34.88	"	"	12000	15000	49.5	260	1.35
35	**365**	**0.96**	41.13	"	"	12000	15000	42	305	1.15



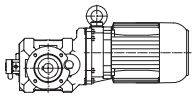
50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
50	**255**	**2.7**	28.59	**BM40-../DSE09LA4**	72	20000	25000	60	210	3.2
41.5	**310**	**2.2**	34.61	"	"	20000	25000	49.5	260	2.6
35	**365**	**1.85**	40.88	"	"	20000	25000	42	305	2.2
28	**450**	**1.5**	51.18	"	"	20000	25000	33.5	375	1.8
24	**520**	**1.3**	59.66	"	"	20000	25000	29	430	1.6
20.5	**600**	**1.15**	70.11	"	"	20000	25000	24.5	500	1.35
17	**730**	**0.82**	84.36	"	"	20000	25000	20.5	600	1.0

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
122	**156**	**0.9**	11.68	**BM10-../DSE09XA4**	38	8000	10000	147	130	1.1
110	**173**	**0.87**	12.95	"	"	8000	10000	133	143	1.05
186	**107**	**1.85**	7.66	**BM20-../DSE09XA4**	40	9100	10900	225	88	2.3
140	**142**	**1.55**	10.15	"	"	12000	12000	169	118	1.85
107	**186**	**1.2**	13.34	"	"	12000	12000	129	154	1.45
85	**230**	**0.96**	16.72	"	"	12000	12000	103	193	1.15
73	**270**	**0.81**	19.72	"	"	12000	12000	87	225	0.98
180	**107**	**3.0**	7.91	**BM30-../DSE09XA4**	56	11000	13800	220	87	3.7
142	**136**	**2.6**	10.06	"	"	12000	15000	170	113	3.1
114	**169**	**2.1**	12.46	"	"	12000	15000	138	140	2.5
89	**215**	**1.65**	16.10	"	"	12000	15000	107	180	1.95
72	**265**	**1.3**	19.96	"	"	12000	15000	86	220	1.6
61	**310**	**1.15**	23.38	"	"	12000	15000	74	255	1.35
48	**395**	**0.89**	29.76	"	"	12000	15000	58	325	1.1
79	**235**	**2.9**	18.05	**BM40-../DSE09XA4**	76	20000	25000	95	199	3.4
64	**295**	**2.3**	22.44	"	"	20000	25000	77	245	2.8
50	**375**	**1.8**	28.59	"	"	20000	25000	60	315	2.2
41.5	**455**	**1.5**	34.61	"	"	20000	25000	49.5	380	1.8
35	**540**	**1.25**	40.88	"	"	20000	25000	42	450	1.5
28	**660**	**1.05**	51.18	"	"	20000	25000	33.5	550	1.25
24	**770**	**0.88**	59.66	"	"	20000	25000	29	630	1.1

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
128	**200**	**3.1**	11.17	**BM40-../DSE11SA4**	84	18300	22900	154	167	3.7
98	**260**	**2.6**	14.50	"	"	20000	25000	118	215	3.2
79	**325**	**2.1**	18.05	"	"	20000	25000	95	270	2.5
64	**400**	**1.7**	22.44	"	"	20000	25000	77	330	2.1
50	**510**	**1.35**	28.59	"	"	20000	25000	60	425	1.6
41.5	**620**	**1.1**	34.61	"	"	20000	25000	49.5	520	1.3
35	**730**	**0.93**	40.88	"	"	20000	25000	42	610	1.1

Geared motors for electric overhead conveyors series BM

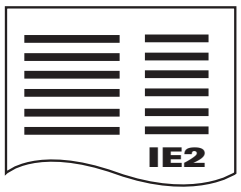
Selection table asynchronous motors ASM IE1

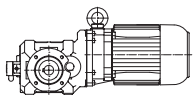


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
128	**265**	**2.4**	11.17	**BM40-../DSE11MA4**	90	18300	22900	154	220	2.8
98	**350**	**1.95**	14.50	**"**	"	20000	25000	118	290	2.3
79	**435**	**1.55**	18.05	**"**	"	20000	25000	95	360	1.9
64	**530**	**1.3**	22.44	**"**	"	20000	25000	77	445	1.55
50	**680**	**1.0**	28.59	**"**	"	20000	25000	60	570	1.2
41.5	**820**	**0.83**	34.61	**"**	"	20000	25000	49.5	690	0.99

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
128	**365**	**1.7**	11.17	**BM40-../DSE11LA4**	102	18300	22900	154	305	2.0
98	**480**	**1.4**	14.50	**"**	"	20000	25000	118	400	1.7
79	**590**	**1.15**	18.05	**"**	"	20000	25000	95	495	1.35
64	**730**	**0.93**	22.44	**"**	"	20000	25000	77	610	1.1

7





50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
11.5	**23.5**	**9.4**	117.9	**BM20Z-../D04LA4**	21	12000	12000	14	19.4	11
9.5	**28.5**	**7.7**	142.8	"	"	12000	12000	11.5	23.5	9.4
7.6	**35.5**	**5.9**	178.9	"	"	12000	12000	9.1	29.5	7.1
6.6	**41**	**4.7**	205.3	"	"	12000	12000	7.9	34	5.7

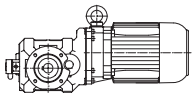
50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
16	**22.5**	**9.8**	85.45	**BM20Z-../D04LA4**	21	12000	12000	19	19.1	12
14	**25.5**	**8.6**	99.47	"	"	12000	12000	16.5	21.5	10
11.5	**31.5**	**7.0**	117.9	"	"	12000	12000	14	25.5	8.6
9.5	**38**	**5.8**	142.8	"	"	12000	12000	11.5	31.5	7.0
7.6	**47.5**	**4.4**	178.9	"	"	12000	12000	9.1	39.5	5.3
6.6	**54**	**3.6**	205.3	"	"	12000	12000	7.9	45.5	4.2

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**4.2**	**7.1**	11.34	**BM09-../D05LA4**	13	4400	6500	143	3.5	8.6
103	**4.85**	**6.6**	13.23	"	"	4400	6500	123	4.05	7.9
77	**6.5**	**7.2**	17.73	"	"	4400	6500	92	5.4	8.7
64	**7.8**	**7.2**	21.20	"	"	4400	6500	77	6.5	8.6
55	**9.1**	**6.5**	24.74	"	"	4400	6500	66	7.6	7.8
52	**9.6**	**7.2**	25.98	"	"	4400	6500	63	8.0	8.6
45	**11.2**	**6.4**	30.31	"	"	4400	6500	54	9.3	7.7
41	**12.2**	**7.1**	32.97	"	"	4400	6500	49.5	10.1	8.6
35.5	**14.2**	**6.5**	38.46	"	"	4400	6500	42.5	11.8	7.8
32	**15.5**	**5.5**	42.44	"	"	4400	6500	38.5	12.9	6.6
25.5	**19.5**	**5.5**	53.85	"	"	4400	6500	30.5	16.3	6.6
7.6	**71**	**2.9**	178.9	**BM20Z-../D06LA4**	24	12000	12000	9.1	59	3.5
6.6	**82**	**2.4**	205.3	"	"	12000	12000	7.9	68	2.8

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**6.3**	**4.8**	11.34	**BM09-../D05LA4**	13	4400	6500	143	5.2	5.8
103	**7.3**	**4.4**	13.23	"	"	4400	6500	123	6.1	5.2
77	**9.8**	**4.8**	17.73	"	"	4400	6500	92	8.2	5.7
64	**11.8**	**4.7**	21.20	"	"	4400	6500	77	9.8	5.7
55	**13.7**	**4.3**	24.74	"	"	4400	6500	66	11.4	5.2
52	**14.5**	**4.8**	25.98	"	"	4400	6500	63	12	5.8
45	**16.8**	**4.3**	30.31	"	"	4400	6500	54	14	5.1
41	**18.4**	**4.7**	32.97	"	"	4400	6500	49.5	15.2	5.7
35.5	**21**	**4.4**	38.46	"	"	4400	6500	42.5	17.7	5.2
32	**23**	**3.7**	42.44	"	"	4400	6500	38.5	19.4	4.4
25.5	**29**	**3.7**	53.85	"	"	4400	6500	30.5	24.5	4.4
11.5	**71**	**3.1**	117.9	**BM20Z-../D06LA4**	24	12000	12000	14	58	3.8
9.5	**85**	**2.6**	142.8	"	"	12000	12000	11.5	71	3.1
7.6	**107**	**1.95**	178.9	"	"	12000	12000	9.1	89	2.3
6.6	**123**	**1.55**	205.3	"	"	12000	12000	7.9	103	1.85
3.9	**178**	**2.8**	348.7	**BM40Z-../D06LA4**	64	20000	25000	4.7	148	3.4
3.2	**210**	**2.4**	430.0	"	"	20000	25000	3.8	180	2.8

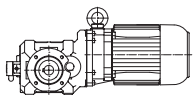
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE2



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**8.4**	**3.6**	11.34	**BM09-../D05LA4**	13	4400	6500	143	7.0	4.3
103	**9.7**	**3.3**	13.23	"	"	4400	6500	123	8.1	4.0
77	**13**	**3.6**	17.73	"	"	4400	6500	92	10.9	4.3
64	**15.7**	**3.6**	21.20	"	"	4400	6500	77	13	4.3
55	**18.3**	**3.2**	24.74	"	"	4400	6500	66	15.2	3.9
52	**19.3**	**3.6**	25.98	"	"	4400	6500	63	16	4.3
45	**22**	**3.3**	30.31	"	"	4400	6500	54	18.6	3.9
41	**24.5**	**3.6**	32.97	"	"	4400	6500	49.5	20	4.4
35.5	**28**	**3.3**	38.46	"	"	4400	6500	42.5	23.5	3.9
32	**31**	**2.7**	42.44	"	"	4400	6500	38.5	25.5	3.3
25.5	**39**	**2.8**	53.85	"	"	4400	6500	30.5	32.5	3.3
18.5	**58**	**3.1**	74.76	**BM20-../D06LA4**	23	12000	12000	22	49	3.7
16	**68**	**3.2**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	57	3.9
14	**77**	**2.9**	99.47	"	"	12000	12000	16.5	65	3.4
11.5	**94**	**2.3**	117.9	"	"	12000	12000	14	77	2.9
9.5	**114**	**1.95**	142.8	"	"	12000	12000	11.5	94	2.3
7.6	**143**	**1.45**	178.9	"	"	12000	12000	9.1	119	1.75
6.6	**164**	**1.2**	205.3	"	"	12000	12000	7.9	137	1.4
9.0	**108**	**3.2**	150.3	**BM30Z-../D06LA4**	41	12000	15000	11	88	4.0
7.7	**126**	**2.8**	177.2	"	"	12000	15000	9.2	105	3.3
4.7	**197**	**3.0**	289.8	**BM40Z-../D06LA4**	64	20000	25000	5.6	165	3.6
3.9	**235**	**2.2**	348.7	"	"	20000	25000	4.7	197	2.6
3.2	**285**	**1.75**	430.0	"	"	20000	25000	3.8	240	2.1

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**12.6**	**2.4**	11.34	**BM09-../D05LA4**	13	4400	6500	143	10.5	2.9
103	**14.6**	**2.2**	13.23	"	"	4400	6500	123	12.2	2.6
77	**19.6**	**2.4**	17.73	"	"	4400	6500	92	16.4	2.9
64	**23.5**	**2.4**	21.20	"	"	4400	6500	77	19.6	2.9
55	**27.5**	**2.1**	24.74	"	"	4400	6500	66	22.5	2.6
52	**29**	**2.4**	25.98	"	"	4400	6500	63	24	2.9
45	**33.5**	**2.1**	30.31	"	"	4400	6500	54	28	2.6
41	**36.5**	**2.4**	32.97	"	"	4400	6500	49.5	30.5	2.9
35.5	**42.5**	**2.2**	38.46	"	"	4400	6500	42.5	35.5	2.6
32	**46.5**	**1.85**	42.44	"	"	4400	6500	38.5	38.5	2.2
25.5	**58**	**1.85**	53.85	"	"	4400	6500	30.5	49	2.2
30	**48**	**3.3**	45.00	**BM10-../D06LA4**	21	8000	10000	36	40	4.0
26	**54**	**2.8**	52.44	"	"	8000	10000	31	45	3.3
23.5	**59**	**2.7**	58.18	"	"	8000	10000	28	50	3.2
22.5	**72**	**2.7**	60.64	**BM20-../D06LA4**	23	12000	12000	27	60	3.2
18.5	**88**	**2.1**	74.76	"	"	12000	12000	22	74	2.5
16	**102**	**2.2**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	85	2.6
14	**116**	**1.9**	99.47	"	"	12000	12000	16.5	98	2.2
11.5	**142**	**1.55**	117.9	"	"	12000	12000	14	116	1.9
9.5	**171**	**1.3**	142.8	"	"	12000	12000	11.5	142	1.55
7.6	**210**	**1.0**	178.9	"	"	12000	12000	9.1	179	1.15
19	**79**	**3.3**	71.09	**BM30-../D06LA4**	39	12000	15000	23	65	4.0
13.5	**109**	**3.2**	100.7	**BM30Z-../D06LA4**	41	12000	15000	16.5	89	3.9
11	**134**	**2.6**	128.2	"	"	12000	15000	13	113	3.1
9.0	**162**	**2.2**	150.3	"	"	12000	15000	11	132	2.7
7.7	**189**	**1.85**	177.2	"	"	12000	15000	9.2	158	2.2

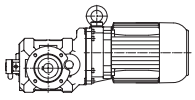


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
6.4	**220**	**3.1**	211.5	**BM40Z-../D06LA4**	64	20000	25000	7.7	183	3.7
5.5	**250**	**2.7**	246.6	"	"	20000	25000	6.6	210	3.2
4.7	**295**	**2.0**	289.8	"	"	20000	25000	5.6	245	2.4
3.9	**355**	**1.45**	348.7	"	"	20000	25000	4.7	295	1.7
3.2	**425**	**1.2**	430.0	"	"	20000	25000	3.8	360	1.4

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**17.5**	**1.7**	11.34	**BM09-../D05LA4**	13	4400	6500	143	14.6	2.1
103	**20**	**1.6**	13.23	"	"	4400	6500	123	17	1.9
77	**27**	**1.75**	17.73	"	"	4400	6500	92	22.5	2.1
64	**32.5**	**1.7**	21.20	"	"	4400	6500	77	27	2.1
55	**38**	**1.55**	24.74	"	"	4400	6500	66	31.5	1.85
52	**40**	**1.75**	25.98	"	"	4400	6500	63	33	2.1
45	**46.5**	**1.55**	30.31	"	"	4400	6500	54	38.5	1.85
41	**51**	**1.7**	32.97	"	"	4400	6500	49.5	42	2.1
35.5	**59**	**1.55**	38.46	"	"	4400	6500	42.5	49	1.9
32	**64**	**1.35**	42.44	"	"	4400	6500	38.5	53	1.6
25.5	**81**	**1.35**	53.85	"	"	4400	6500	30.5	68	1.6
41	**50**	**3.0**	33.19	**BM10-../D06LA4**	21	8000	10000	49	41.5	3.6
37	**55**	**2.9**	36.82	"	"	8000	10000	44	46.5	3.4
33.5	**59**	**2.5**	40.56	"	"	8000	10000	40	50	3.0
30	**66**	**2.4**	45.00	"	"	8000	10000	36	55	2.9
26	**75**	**2.0**	52.44	"	"	8000	10000	31	63	2.4
23.5	**83**	**1.95**	58.18	"	"	8000	10000	28	69	2.3
32.5	**69**	**3.2**	42.18	**BM20-../D06LA4**	23	12000	12000	38.5	58	3.8
26	**87**	**2.4**	52.84	"	"	12000	12000	31	73	2.9
22.5	**100**	**1.95**	60.64	"	"	12000	12000	27	84	2.3
18.5	**122**	**1.5**	74.76	"	"	12000	12000	22	103	1.75
16	**141**	**1.55**	85.45	**BM20Z-../D06LA4**	24	12000	12000	19	119	1.85
14	**162**	**1.35**	99.47	"	"	12000	12000	16.5	137	1.6
11.5	**197**	**1.1**	117.9	"	"	12000	12000	14	162	1.35
9.5	**235**	**0.94**	142.8	"	"	12000	12000	11.5	197	1.1
22.5	**93**	**2.9**	61.33	**BM30-../D06LA4**	39	12000	15000	26.5	79	3.4
19	**110**	**2.3**	71.09	"	"	12000	15000	23	91	2.8
16	**129**	**2.7**	85.96	**BM30Z-../D06LA4**	41	12000	15000	19	109	3.2
13.5	**152**	**2.3**	100.7	"	"	12000	15000	16.5	124	2.8
11	**186**	**1.9**	128.2	"	"	12000	15000	13	157	2.2
9.0	**225**	**1.55**	150.3	"	"	12000	15000	11	184	1.9
7.7	**260**	**1.35**	177.2	"	"	12000	15000	9.2	220	1.6
9.5	**210**	**3.2**	143.0	**BM40Z-../D06LA4**	64	20000	25000	11.5	174	3.9
8.0	**245**	**2.8**	169.0	"	"	20000	25000	9.6	205	3.3
6.4	**305**	**2.2**	211.5	"	"	20000	25000	7.7	250	2.7
5.5	**350**	**1.95**	246.6	"	"	20000	25000	6.6	290	2.3
4.7	**410**	**1.45**	289.8	"	"	20000	25000	5.6	345	1.75
3.9	**495**	**1.0**	348.7	"	"	20000	25000	4.7	410	1.25
3.2	**590**	**0.85**	430.0	"	"	20000	25000	3.8	500	1.0

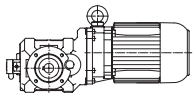
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE2



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**21**	**1.45**	11.34	**BM09-../D07LA4**	17	4400	6500	143	17.6	1.7
103	**24**	**1.35**	13.23	"	"	4400	6500	123	20	1.6
77	**32.5**	**1.45**	17.73	"	"	4400	6500	92	27	1.75
64	**39**	**1.45**	21.20	"	"	4400	6500	77	32.5	1.7
55	**45.5**	**1.3**	24.74	"	"	4400	6500	66	38	1.55
52	**48**	**1.45**	25.98	"	"	4400	6500	63	40	1.75
45	**56**	**1.3**	30.31	"	"	4400	6500	54	46.5	1.55
41	**61**	**1.45**	32.97	"	"	4400	6500	49.5	50	1.75
35.5	**71**	**1.3**	38.46	"	"	4400	6500	42.5	59	1.55
32	**77**	**1.1**	42.44	"	"	4400	6500	38.5	64	1.35
25.5	**97**	**1.1**	53.85	"	"	4400	6500	30.5	81	1.35
51	**49**	**3.1**	26.55	**BM10-../D07LA4**	23	8000	10000	62	40.5	3.7
46	**54**	**3.0**	29.45	"	"	8000	10000	56	45	3.6
41	**60**	**2.5**	33.19	"	"	8000	10000	49	50	3.0
37	**66**	**2.4**	36.82	"	"	8000	10000	44	55	2.9
33.5	**71**	**2.1**	40.56	"	"	8000	10000	40	60	2.5
30	**80**	**2.0**	45.00	"	"	8000	10000	36	66	2.4
26	**90**	**1.65**	52.44	"	"	8000	10000	31	75	2.0
23.5	**99**	**1.6**	58.18	"	"	8000	10000	28	83	1.95
38.5	**70**	**3.1**	35.25	**BM20-../D07LA4**	26	12000	12000	46	59	3.7
32.5	**83**	**2.7**	42.18	"	"	12000	12000	38.5	70	3.1
26	**104**	**2.0**	52.84	"	"	12000	12000	31	87	2.4
22.5	**120**	**1.6**	60.64	"	"	12000	12000	27	100	1.95
18.5	**147**	**1.25**	74.76	"	"	12000	12000	22	123	1.5
16	**170**	**1.3**	85.45	**BM20Z-../D07LA4**	27	12000	12000	19	143	1.55
14	**194**	**1.15**	99.47	"	"	12000	12000	16.5	164	1.35
11.5	**235**	**0.94**	117.9	"	"	12000	12000	14	194	1.15
22.5	**112**	**2.4**	61.33	**BM30-../D07LA4**	41	12000	15000	26.5	95	2.8
19	**132**	**1.95**	71.09	"	"	12000	15000	23	109	2.4
16	**155**	**2.3**	85.96	**BM30Z-../D07LA4**	44	12000	15000	19	131	2.7
13.5	**182**	**1.9**	100.7	"	"	12000	15000	16.5	149	2.3
11	**220**	**1.6**	128.2	"	"	12000	15000	13	189	1.85
9.0	**270**	**1.3**	150.3	"	"	12000	15000	11	220	1.6
7.7	**315**	**1.1**	177.2	"	"	12000	15000	9.2	260	1.35
11.5	**210**	**3.2**	118.2	**BM40Z-../D07LA4**	66	20000	25000	14	173	3.9
9.5	**250**	**2.7**	143.0	"	"	20000	25000	11.5	205	3.3
8.0	**295**	**2.3**	169.0	"	"	20000	25000	9.6	245	2.8
6.4	**365**	**1.85**	211.5	"	"	20000	25000	7.7	305	2.2
5.5	**420**	**1.6**	246.6	"	"	20000	25000	6.6	350	1.95
4.7	**490**	**1.2**	289.8	"	"	20000	25000	5.6	410	1.45
3.9	**590**	**0.86**	348.7	"	"	20000	25000	4.7	490	1.05

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
120	**25.5**	**1.2**	11.34	**BM09-../D07LA4**	17	4400	6500	143	21.5	1.4
103	**30**	**1.05**	13.23	"	"	4400	6500	123	25	1.3
77	**40**	**1.2**	17.73	"	"	4400	6500	92	33.5	1.4
64	**48.5**	**1.15**	21.20	"	"	4400	6500	77	40	1.4
55	**56**	**1.05**	24.74	"	"	4400	6500	66	47	1.25
52	**59**	**1.15**	25.98	"	"	4400	6500	63	49	1.4
45	**69**	**1.05**	30.31	"	"	4400	6500	54	57	1.25
41	**75**	**1.15**	32.97	"	"	4400	6500	49.5	62	1.4
35.5	**87**	**1.05**	38.46	"	"	4400	6500	42.5	73	1.25
32	**96**	**0.89**	42.44	"	"	4400	6500	38.5	79	1.1
25.5	**120**	**0.9**	53.85	"	"	4400	6500	30.5	100	1.1

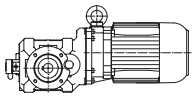


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2 1/min	M_2 Nm	f_B			kg	N	N	n_2 1/min	M_2 Nm	f_B
60	**51**	**2.9**	22.62	**BM10-../D07LA4**	23	8000	10000	72	43	3.5
54	**57**	**2.8**	25.09	"	"	8000	10000	65	47.5	3.4
51	**60**	**2.5**	26.55	"	"	8000	10000	62	50	3.0
46	**67**	**2.4**	29.45	"	"	8000	10000	56	55	2.9
41	**74**	**2.0**	33.19	"	"	8000	10000	49	62	2.4
37	**82**	**1.95**	36.82	"	"	8000	10000	44	69	2.3
33.5	**88**	**1.7**	40.56	"	"	8000	10000	40	74	2.0
30	**98**	**1.65**	45.00	"	"	8000	10000	36	82	1.95
26	**111**	**1.35**	52.44	"	"	8000	10000	31	93	1.6
23.5	**123**	**1.3**	58.18	"	"	8000	10000	28	103	1.55
46	**72**	**3.1**	29.39	**BM20-../D07LA4**	26	12000	12000	56	59	3.7
38.5	**87**	**2.5**	35.25	"	"	12000	12000	46	72	3.1
32.5	**103**	**2.1**	42.18	"	"	12000	12000	38.5	87	2.5
26	**129**	**1.6**	52.84	"	"	12000	12000	31	108	1.95
22.5	**149**	**1.3**	60.64	"	"	12000	12000	27	124	1.55
18.5	**181**	**1.0**	74.76	"	"	12000	12000	22	152	1.2
16	**205**	**1.05**	85.45	**BM20Z-../D07LA4**	27	12000	12000	19	176	1.25
14	**235**	**0.94**	99.47	"	"	12000	12000	16.5	200	1.1
27.5	**114**	**2.8**	49.66	**BM30-../D07LA4**	41	12000	15000	33	95	3.3
22.5	**138**	**1.95**	61.33	"	"	12000	15000	26.5	117	2.3
19	**163**	**1.6**	71.09	"	"	12000	15000	23	135	1.9
16	**192**	**1.8**	85.96	**BM30Z-../D07LA4**	44	12000	15000	19	161	2.2
13.5	**225**	**1.55**	100.7	"	"	12000	15000	16.5	184	1.9
11	**275**	**1.25**	128.2	"	"	12000	15000	13	230	1.5
9.0	**330**	**1.05**	150.3	"	"	12000	15000	11	270	1.3
7.7	**390**	**0.9**	177.2	"	"	12000	15000	9.2	325	1.1
11.5	**260**	**2.6**	118.2	**BM40Z-../D07LA4**	66	20000	25000	14	210	3.2
9.5	**310**	**2.2**	143.0	"	"	20000	25000	11.5	255	2.7
8.0	**365**	**1.85**	169.0	"	"	20000	25000	9.6	305	2.2
6.4	**450**	**1.5**	211.5	"	"	20000	25000	7.7	375	1.8
5.5	**520**	**1.3**	246.6	"	"	20000	25000	6.6	430	1.6
4.7	**600**	**1.0**	289.8	"	"	20000	25000	5.6	510	1.15

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2 1/min	M_2 Nm	f_B			kg	N	N	n_2 1/min	M_2 Nm	f_B
124	**37**	**0.81**	11.34	**BM09-../D08MA4**	18	4400	6500	149	31	0.97
79	**58**	**0.81**	17.73	"	"	4400	6500	95	48.5	0.97
67	**68**	**0.82**	21.20	"	"	4400	6500	80	57	0.98
54	**85**	**0.81**	25.98	"	"	4400	6500	65	71	0.97
42.5	**108**	**0.81**	32.97	"	"	4400	6500	51	90	0.97
86	**54**	**2.7**	16.39	**BM10-../D08MA4**	24	8000	10000	103	45	3.2
78	**59**	**2.6**	18.18	"	"	8000	10000	93	50	3.1
62	**74**	**2.0**	22.62	"	"	8000	10000	75	61	2.5
56	**82**	**1.95**	25.09	"	"	8000	10000	67	68	2.4
53	**87**	**1.7**	26.55	"	"	8000	10000	64	72	2.1
48	**96**	**1.65**	29.45	"	"	8000	10000	58	79	2.0
42.5	**106**	**1.4**	33.19	"	"	8000	10000	51	88	1.7
38.5	**117**	**1.35**	36.82	"	"	8000	10000	46	98	1.65
35	**126**	**1.2**	40.56	"	"	8000	10000	41.5	106	1.4
31.5	**140**	**1.15**	45.00	"	"	8000	10000	37.5	117	1.35
27	**159**	**0.94**	52.44	"	"	8000	10000	32.5	132	1.15
24.5	**175**	**0.91**	58.18	"	"	8000	10000	29	148	1.1

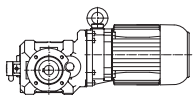
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE2



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
71	**70**	**3.1**	19.72	**BM20-../D08MA4**	26	12000	12000	86	58	3.8
56	**89**	**2.5**	25.25	"	"	12000	12000	67	74	3.0
48	**103**	**2.1**	29.39	"	"	12000	12000	58	86	2.6
40	**124**	**1.75**	35.25	"	"	12000	12000	48	103	2.1
33.5	**148**	**1.5**	42.18	"	"	12000	12000	40	124	1.75
26.5	**188**	**1.1**	52.84	"	"	12000	12000	32	155	1.35
23.5	**210**	**0.92**	60.64	"	"	12000	12000	28	178	1.1
21	**235**	**0.94**	66.74	**BM20Z-../D08MA4**	28	12000	12000	25.5	195	1.15
40.5	**118**	**3.0**	34.88	**BM30-../D08MA4**	42	12000	15000	48.5	98	3.6
34.5	**137**	**2.6**	41.13	"	"	12000	15000	41	115	3.0
28.5	**164**	**1.95**	49.66	"	"	12000	15000	34	137	2.3
23	**200**	**1.35**	61.33	"	"	12000	15000	27.5	168	1.6
20	**230**	**1.1**	71.09	"	"	12000	15000	24	192	1.35
16.5	**275**	**1.25**	85.96	**BM30Z-../D08MA4**	45	12000	15000	20	225	1.55
14	**320**	**1.1**	100.7	"	"	12000	15000	17	265	1.3
11	**410**	**0.85**	128.2	"	"	12000	15000	13.5	330	1.05
20	**225**	**3.0**	70.11	**BM40-../D08MA4**	63	20000	25000	24	190	3.6
17	**265**	**2.3**	84.36	"	"	20000	25000	20	225	2.7
13.5	**330**	**1.8**	104.0	"	"	20000	25000	16.5	270	2.2
12	**370**	**1.85**	118.2	**BM40Z-../D08MA4**	67	20000	25000	14.5	305	2.2
9.8	**450**	**1.5**	143.0	"	"	20000	25000	12	365	1.85
8.3	**520**	**1.3**	169.0	"	"	20000	25000	10	435	1.55
6.7	**640**	**1.05**	211.5	"	"	20000	25000	8.0	530	1.3
5.7	**740**	**0.92**	246.6	"	"	20000	25000	6.9	610	1.1

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
122	**53**	**2.6**	11.68	**BM10-../DHE08XA4**	27	8000	10000	147	44	3.2
110	**59**	**2.5**	12.95	"	"	8000	10000	133	49	3.1
87	**73**	**2.0**	16.39	"	"	8000	10000	105	60	2.4
79	**80**	**1.95**	18.18	"	"	8000	10000	95	67	2.3
63	**100**	**1.5**	22.62	"	"	8000	10000	76	82	1.85
57	**110**	**1.45**	25.09	"	"	8000	10000	69	91	1.75
54	**116**	**1.3**	26.55	"	"	8000	10000	65	96	1.55
48.5	**129**	**1.25**	29.45	"	"	8000	10000	59	106	1.5
43	**143**	**1.05**	33.19	"	"	8000	10000	52	118	1.25
39	**157**	**1.0**	36.82	"	"	8000	10000	46.5	132	1.2
35.5	**169**	**0.89**	40.56	"	"	8000	10000	42.5	141	1.05
32	**188**	**0.85**	45.00	"	"	8000	10000	38	158	1.0
85	**80**	**2.8**	16.72	**BM20-../DHE08XA4**	29	12000	12000	103	66	3.3
73	**93**	**2.4**	19.72	"	"	12000	12000	87	78	2.8
57	**119**	**1.85**	25.25	"	"	12000	12000	68	100	2.2
48.5	**140**	**1.55**	29.39	"	"	12000	12000	59	115	1.9
40.5	**168**	**1.3**	35.25	"	"	12000	12000	49	138	1.6
34	**200**	**1.1**	42.18	"	"	12000	12000	41	165	1.35
27	**250**	**0.84**	52.84	"	"	12000	12000	32.5	205	1.0
25.5	**265**	**0.83**	56.58	**BM20Z-../DHE08XA4**	31	12000	12000	30.5	220	1.0
61	**106**	**3.3**	23.38	**BM30-../DHE08XA4**	45	12000	15000	74	88	4.0
48	**135**	**2.6**	29.76	"	"	12000	15000	58	112	3.1
41	**158**	**2.2**	34.88	"	"	12000	15000	49.5	131	2.7
35	**184**	**1.9**	41.13	"	"	12000	15000	42	153	2.3
29	**215**	**1.45**	49.66	"	"	12000	15000	34.5	184	1.7
23.5	**265**	**1.0**	61.33	"	"	12000	15000	28	225	1.2
20	**315**	**0.82**	71.09	"	"	12000	15000	24.5	255	1.0

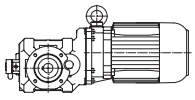


50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
17	**365**	**0.96**	85.96	**BM30Z-../DHE08XA4**	48	12000	15000	20	310	1.15
14.5	**420**	**0.83**	100.7	**"**	"	12000	15000	17	360	0.97
28	**225**	**3.0**	51.18	**BM40-../DHE08XA4**	65	20000	25000	33.5	188	3.6
24	**260**	**2.6**	59.66	**"**	"	20000	25000	29	215	3.2
20.5	**300**	**2.3**	70.11	**"**	"	20000	25000	24.5	250	2.7
17	**365**	**1.65**	84.36	**"**	"	20000	25000	20.5	300	2.0
14	**430**	**1.4**	104.0	**"**	"	20000	25000	16.5	365	1.65
12.5	**485**	**1.4**	118.2	**BM40Z-../DHE08XA4**	70	20000	25000	14.5	415	1.65
10	**600**	**1.15**	143.0	**"**	"	20000	25000	12	500	1.35
8.5	**690**	**0.99**	169.0	**"**	"	20000	25000	10.5	560	1.2

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
124	**77**	**1.8**	11.68	**BM10-../DHE09LA4**	34	8000	10000	149	64	2.2
112	**85**	**1.75**	12.95	**"**	"	8000	10000	135	70	2.1
88	**106**	**1.35**	16.39	**"**	"	8000	10000	107	87	1.65
80	**116**	**1.35**	18.18	**"**	"	8000	10000	96	97	1.6
64	**144**	**1.05**	22.62	**"**	"	8000	10000	77	120	1.25
58	**159**	**1.0**	25.09	**"**	"	8000	10000	70	132	1.2
55	**168**	**0.89**	26.55	**"**	"	8000	10000	66	140	1.05
49	**188**	**0.85**	29.45	**"**	"	8000	10000	60	154	1.05
142	**70**	**3.1**	10.15	**BM20-../DHE09LA4**	36	12000	12000	172	58	3.8
108	**92**	**2.4**	13.34	**"**	"	12000	12000	131	76	2.9
87	**114**	**1.95**	16.72	**"**	"	12000	12000	105	95	2.3
74	**134**	**1.65**	19.72	**"**	"	12000	12000	89	112	1.95
58	**172**	**1.3**	25.25	**"**	"	12000	12000	69	144	1.55
49	**200**	**1.1**	29.39	**"**	"	12000	12000	60	166	1.35
41	**240**	**0.92**	35.25	**"**	"	12000	12000	49.5	200	1.1
90	**107**	**3.3**	16.10	**BM30-../DHE09LA4**	52	12000	15000	109	88	4.0
73	**132**	**2.7**	19.96	**"**	"	12000	15000	88	109	3.2
62	**154**	**2.3**	23.38	**"**	"	12000	15000	75	127	2.8
48.5	**197**	**1.8**	29.76	**"**	"	12000	15000	59	162	2.2
41.5	**230**	**1.5**	34.88	**"**	"	12000	15000	50	191	1.85
35.5	**265**	**1.3**	41.13	**"**	"	12000	15000	42.5	220	1.6
29	**320**	**0.99**	49.66	**"**	"	12000	15000	35.5	260	1.2
27	**335**	**0.84**	53.67	**BM30Z-../DHE09LA4**	54	12000	15000	32.5	280	1.0
21	**435**	**0.8**	69.35	**"**	"	12000	15000	25.5	355	0.99
42	**225**	**3.0**	34.61	**BM40-../DHE09LA4**	72	20000	25000	51	185	3.7
35.5	**265**	**2.6**	40.88	**"**	"	20000	25000	43	215	3.2
28.5	**320**	**2.1**	51.18	**"**	"	20000	25000	34	270	2.5
24.5	**375**	**1.8**	59.66	**"**	"	20000	25000	29.5	310	2.2
21	**435**	**1.55**	70.11	**"**	"	20000	25000	25	365	1.85
17.5	**520**	**1.15**	84.36	**"**	"	20000	25000	21	435	1.4
14	**630**	**0.95**	104.0	**"**	"	20000	25000	17	520	1.15
12.5	**710**	**0.96**	118.2	**BM40Z-../DHE09LA4**	76	20000	25000	15	590	1.15
10.5	**840**	**0.81**	143.0	**"**	"	20000	25000	12.5	700	0.97

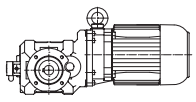
Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors ASM IE2



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2 1/min	M_2 Nm	f_B			kg	N	N	n_2 1/min	M_2 Nm	f_B
124	**105**	**1.35**	11.68	**BM10-../DHE09XA4**	38	8000	10000	149	87	1.6
112	**116**	**1.3**	12.95	"	"	8000	10000	135	96	1.55
88	**144**	**1.0**	16.39	"	"	8000	10000	107	119	1.2
80	**159**	**0.97**	18.18	"	"	8000	10000	96	132	1.15
188	**72**	**2.8**	7.66	**BM20-../DHE09XA4**	40	9100	10900	230	59	3.4
142	**95**	**2.3**	10.15	"	"	12000	12000	172	79	2.8
108	**126**	**1.75**	13.34	"	"	12000	12000	131	103	2.1
87	**156**	**1.4**	16.72	"	"	12000	12000	105	129	1.7
74	**183**	**1.2**	19.72	"	"	12000	12000	89	152	1.45
58	**230**	**0.96**	25.25	"	"	12000	12000	69	197	1.1
49	**275**	**0.8**	29.39	"	"	12000	12000	60	225	0.98
116	**113**	**3.1**	12.46	**BM30-../DHE09XA4**	56	12000	15000	140	94	3.7
90	**146**	**2.4**	16.10	"	"	12000	15000	109	120	2.9
73	**180**	**1.95**	19.96	"	"	12000	15000	88	149	2.3
62	**210**	**1.65**	23.38	"	"	12000	15000	75	173	2.0
48.5	**265**	**1.3**	29.76	"	"	12000	15000	59	220	1.6
41.5	**310**	**1.15**	34.88	"	"	12000	15000	50	260	1.35
35.5	**360**	**0.97**	41.13	"	"	12000	15000	42.5	300	1.15
51	**250**	**2.7**	28.59	**BM40-../DHE09XA4**	76	20000	25000	61	210	3.2
42	**305**	**2.2**	34.61	"	"	20000	25000	51	250	2.7
35.5	**360**	**1.9**	40.88	"	"	20000	25000	43	295	2.3
28.5	**440**	**1.55**	51.18	"	"	20000	25000	34	370	1.85
24.5	**510**	**1.35**	59.66	"	"	20000	25000	29.5	425	1.6
21	**590**	**1.15**	70.11	"	"	20000	25000	25	495	1.35
17.5	**710**	**0.85**	84.36	"	"	20000	25000	21	590	1.0

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2 1/min	M_2 Nm	f_B			kg	N	N	n_2 1/min	M_2 Nm	f_B
124	**154**	**0.91**	11.68	**BM10-../DHE09XA4C**	40	8000	10000	149	128	1.1
112	**170**	**0.88**	12.95	"	"	8000	10000	135	141	1.05
188	**106**	**1.9**	7.66	**BM20-../DHE09XA4C**	42	9100	10900	230	86	2.3
142	**140**	**1.55**	10.15	"	"	12000	12000	172	116	1.9
108	**184**	**1.2**	13.34	"	"	12000	12000	131	152	1.45
87	**225**	**0.98**	16.72	"	"	12000	12000	105	190	1.15
74	**265**	**0.83**	19.72	"	"	12000	12000	89	220	1.0
183	**105**	**3.1**	7.91	**BM30-../DHE09XA4C**	58	11000	13800	220	87	3.7
144	**134**	**2.6**	10.06	"	"	12000	15000	173	111	3.2
116	**166**	**2.1**	12.46	"	"	12000	15000	140	138	2.5
90	**210**	**1.65**	16.10	"	"	12000	15000	109	177	2.0
73	**260**	**1.35**	19.96	"	"	12000	15000	88	215	1.65
62	**305**	**1.15**	23.38	"	"	12000	15000	75	250	1.4
48.5	**390**	**0.9**	29.76	"	"	12000	15000	59	320	1.1
80	**235**	**2.9**	18.05	**BM40-../DHE09XA4C**	79	20000	25000	97	194	3.5
65	**290**	**2.3**	22.44	"	"	20000	25000	78	240	2.8
51	**370**	**1.85**	28.59	"	"	20000	25000	61	305	2.2
42	**450**	**1.5**	34.61	"	"	20000	25000	51	370	1.85
35.5	**530**	**1.3**	40.88	"	"	20000	25000	43	435	1.55
28.5	**640**	**1.05**	51.18	"	"	20000	25000	34	540	1.25
24.5	**750**	**0.91**	59.66	"	"	20000	25000	29.5	620	1.1



50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
129	**199**	**3.1**	11.17	**BM40-../DHE11MA4**	90	18300	22900	156	165	3.8
100	**255**	**2.7**	14.50	"	"	20000	25000	120	210	3.2
80	**320**	**2.1**	18.05	"	"	20000	25000	97	265	2.6
65	**395**	**1.7**	22.44	"	"	20000	25000	78	330	2.1
51	**500**	**1.35**	28.59	"	"	20000	25000	61	420	1.6
42	**610**	**1.1**	34.61	"	"	20000	25000	51	500	1.35
35.5	**720**	**0.94**	40.88	"	"	20000	25000	43	590	1.15

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
129	**265**	**2.4**	11.17	**BM40-../DHE11LA4**	102	18300	22900	156	220	2.8
100	**340**	**2.0**	14.50	"	"	20000	25000	120	285	2.4
80	**425**	**1.6**	18.05	"	"	20000	25000	97	350	1.95
65	**520**	**1.3**	22.44	"	"	20000	25000	78	440	1.55
51	**670**	**1.0**	28.59	"	"	20000	25000	61	560	1.2
42	**810**	**0.84**	34.61	"	"	20000	25000	51	670	1.0

50 Hz			i	Type	m	F_{RN}	F_{RV}	60 Hz		
n_2	M_2	f_B						n_2	M_2	f_B
1/min	Nm				kg	N	N	1/min	Nm	
131	**360**	**1.75**	11.17	**BM40-../DHE11LA4C**	106	18300	22900	158	295	2.1
101	**465**	**1.45**	14.50	"	"	20000	25000	122	385	1.75
81	**580**	**1.15**	18.05	"	"	20000	25000	98	480	1.4
66	**710**	**0.96**	22.44	"	"	20000	25000	79	590	1.15

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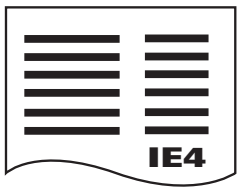
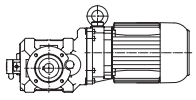


Geared motors for electric overhead conveyors series BM

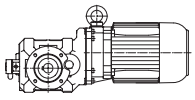
Selection table asynchronous motors PMSM - IE4 1500 $^{1}/_{min}$



n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
128	**69**	**BM10-../S08MA4**	12,5	42,5	85	128	154	53	59	69	69	69	**2,0**	11,68	24	8000	10000.0
115	**76**		11,5	38,5	77	115	138	58	65	76	76	76	**2,0**	12,95	24	8000	10000.0
91	**94**		9,1	30,5	61	91	109	72	81	94	94	94	**1,5**	16,39	24	8000	10000.0
82	**105**		8,2	27,5	55	82	99	80	90	105	105	105	**1,5**	18,18	24	8000	10000.0
66	**129**		6,6	22	44	66	79	99	111	129	129	129	**1,2**	22,62	24	8000	10000.0
59	**143**		5,9	19,5	39,5	59	71	110	123	143	143	143	**1,1**	25,09	24	8000	10000.0
56	**151**		5,6	18,5	37,5	56	67	116	130	151	151	151	**0,99**	26,55	24	8000	10000.0
50	**168**		5,0	16,5	33,5	50	61	129	145	168	168	168	**0,95**	29,45	24	8000	10000.0
45	**185**		4,5	15	30	45	54	142	159	185	185	185	**0,81**	33,19	24	8000	10000.0
112	**82**	**BM20-../S08MA4**	11	37	74	112	134	63	70	82	82	82	**2,7**	13,34	26	12000	12000.0
89	**103**		8,9	29,5	59	89	107	79	88	103	103	103	**2,1**	16,72	26	12000	12000.0
76	**121**		7,6	25	50	76	91	93	104	121	121	121	**1,8**	19,72	26	12000	12000.0
59	**155**		5,9	19,5	39,5	59	71	119	134	155	155	155	**1,4**	25,25	26	12000	12000.0
51	**181**		5,1	17	34	51	61	139	156	181	181	181	**1,2**	29,39	26	12000	12000.0
42,5	**215**		4,2	14	28	42,5	51	167	187	215	215	215	**1,0**	35,25	26	12000	12000.0
35,5	**260**		3,5	11,5	23,5	35,5	42,5	200	220	260	260	260	**0,84**	42,18	26	12000	12000.0
75	**119**	**BM30-../S08MA4**	7,5	25	50	75	90	91	102	119	119	119	**2,9**	19,96	42	12000	15000.0
64	**138**		6,4	21	42,5	64	76	106	119	138	138	138	**2,5**	23,38	42	12000	15000.0
50	**176**		5,0	16,5	33,5	50	60	135	151	176	176	176	**2,0**	29,76	42	12000	15000.0
43	**205**		4,3	14	28,5	43	51	158	177	205	205	205	**1,7**	34,88	42	12000	15000.0
36	**240**		3,6	12	24	36	43,5	185	205	240	240	240	**1,5**	41,13	42	12000	15000.0
30	**285**		3,0	10	20	30	36	220	245	285	285	285	**1,1**	49,66	42	12000	15000.0
27,5	**300**	**BM30Z-../S08MA4**	2,7	9,3	18,5	27,5	33,5	230	260	300	300	300	**0,92**	53,67	45	12000	15000.0
21,5	**390**		2,1	7,2	14	21,5	25,5	300	335	390	390	390	**0,89**	69,35	45	12000	15000.0
36,5	**235**	**BM40-../S08MA4**	3,6	12	24	36,5	44	183	205	235	235	235	**2,8**	40,88	63	20000	25000.0
29	**290**		2,9	9,7	19,5	29	35	225	250	290	290	290	**2,3**	51,18	63	20000	25000.0
25	**340**		2,5	8,3	16,5	25	30	260	290	340	340	340	**2,0**	59,66	63	20000	25000.0
21	**395**		2,1	7,1	14	21	25,5	300	340	395	395	395	**1,7**	70,11	63	20000	25000.0
17,5	**475**		1,7	5,9	11,5	17,5	21	365	410	475	475	475	**1,3**	84,36	63	20000	25000.0
14	**570**		1,4	4,8	9,6	14	17	440	495	570	570	570	**1,0**	104	63	20000	25000.0
12,5	**650**	**BM40Z-../S08MA4**	1,2	4,2	8,4	12,5	15	500	560	650	650	650	**1,0**	118,2	67	20000	25000.0
10	**780**		1,0	3,4	6,9	10	12,5	600	670	780	780	780	**0,87**	143	67	20000	25000.0

Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors PMSM - IE4 1500 $^{1}/_{min}$



n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
128	**101**	**BM10-../S08LA4**	12,5	42,5	85	128	154	69	85	101	101	101	**1,4**	11,68	26	8000	10000.0
115	**112**		11,5	38,5	77	115	138	76	94	112	112	112	**1,3**	12,95	26	8000	10000.0
91	**139**		9,1	30,5	61	91	109	94	116	139	139	139	**1,0**	16,39	26	8000	10000.0
82	**154**		8,2	27,5	55	82	99	105	129	154	154	154	**1,0**	18,18	26	8000	10000.0
195	**69**	**BM20-../S08LA4**	19,5	65	130	195	230	47	58	69	69	69	**2,9**	7,66	28	9100	10900.0
147	**92**		14,5	49	98	147	177	62	77	92	92	92	**2,4**	10,15	28	12000	12000.0
112	**121**		11	37	74	112	134	82	101	121	121	121	**1,8**	13,34	28	12000	12000.0
89	**151**		8,9	29,5	59	89	107	103	127	151	151	151	**1,5**	16,72	28	12000	12000.0
76	**178**		7,6	25	50	76	91	121	149	178	178	178	**1,2**	19,72	28	12000	12000.0
59	**225**		5,9	19,5	39,5	59	71	155	191	225	225	225	**0,96**	25,25	28	12000	12000.0
51	**265**		5,1	17	34	51	61	181	220	265	265	265	**0,83**	29,39	28	12000	12000.0
93	**141**	**BM30-../S08LA4**	9,3	31	62	93	111	96	118	141	141	141	**2,5**	16,1	44	12000	15000.0
75	**175**		7,5	25	50	75	90	119	146	175	175	175	**2,0**	19,96	44	12000	15000.0
64	**200**		6,4	21	42,5	64	76	138	170	200	200	200	**1,7**	23,38	44	12000	15000.0
50	**255**		5,0	16,5	33,5	50	60	176	215	255	255	255	**1,4**	29,76	44	12000	15000.0
43	**300**		4,3	14	28,5	43	51	205	250	300	300	300	**1,2**	34,88	44	12000	15000.0
36	**350**		3,6	12	24	36	43,5	240	295	350	350	350	**0,99**	41,13	44	12000	15000.0
52	**245**	**BM40-../S08LA4**	5,2	17	34,5	52	62	167	205	245	245	245	**2,8**	28,59	64	20000	25000.0
43	**295**		4,3	14	28,5	43	52	200	245	295	295	295	**2,3**	34,61	64	20000	25000.0
36,5	**350**		3,6	12	24	36,5	44	235	290	350	350	350	**1,9**	40,88	64	20000	25000.0
29	**430**		2,9	9,7	19,5	29	35	290	360	430	430	430	**1,6**	51,18	64	20000	25000.0
25	**500**		2,5	8,3	16,5	25	30	340	420	500	500	500	**1,4**	59,66	64	20000	25000.0
21	**580**		2,1	7,1	14	21	25,5	395	485	580	580	580	**1,2**	70,11	64	20000	25000.0
17,5	**700**		1,7	5,9	11,5	17,5	21	475	580	700	700	700	**0,86**	84,36	64	20000	25000.0

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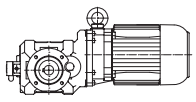
n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
128	**138**	**BM10-../S09SA4**	12,5	42,5	85	128	154	85	106	138	138	122	**1,0**	11,68	30	8000	10000
115	**153**		11,5	38,5	77	115	138	94	117	153	153	135	**0,98**	12,95	30	8000	10000
195	**94**	**BM20-../S09SA4**	19,5	65	130	195	230	58	72	94	94	83	**2,1**	7,66	32	9100	10900
147	**125**		14,5	49	98	147	177	77	96	125	125	110	**1,8**	10,15	32	12000	12000
112	**164**		11	37	74	112	134	101	126	164	164	145	**1,3**	13,34	32	12000	12000
89	**205**		8,9	29,5	59	89	107	127	158	205	205	182	**1,1**	16,72	32	12000	12000
76	**240**		7,6	25	50	76	91	149	187	240	240	215	**0,9**	19,72	32	12000	12000
149	**120**	**BM30-../S09SA4**	14,5	49,5	99	149	178	74	92	120	120	106	**2,9**	10,06	48	12000	15000
120	**149**		12	40	80	120	144	91	114	149	149	131	**2,3**	12,46	48	12000	15000
93	**192**		9,3	31	62	93	111	118	148	192	192	170	**1,8**	16,1	48	12000	15000
75	**235**		7,5	25	50	75	90	146	183	235	235	210	**1,5**	19,96	48	12000	15000
64	**275**		6,4	21	42,5	64	76	170	210	275	275	240	**1,3**	23,38	48	12000	15000
50	**350**		5,0	16,5	33,5	50	60	215	270	350	350	310	**0,99**	29,76	48	12000	15000
43	**410**		4,3	14	28,5	43	51	250	315	410	410	365	**0,85**	34,88	48	12000	15000
66	**260**	**BM40-../S09SA4**	6,6	22	44,5	66	80	161	200	260	260	230	**2,6**	22,44	68	20000	25000
52	**330**		5,2	17	34,5	52	62	205	255	330	330	295	**2,0**	28,59	68	20000	25000
43	**400**		4,3	14	28,5	43	52	245	310	400	400	355	**1,7**	34,61	68	20000	25000
36,5	**475**		3,6	12	24	36,5	44	290	365	475	475	420	**1,4**	40,88	68	20000	25000
29	**580**		2,9	9,7	19,5	29	35	360	450	580	580	510	**1,2**	51,18	68	20000	25000
25	**680**		2,5	8,3	16,5	25	30	420	520	680	680	600	**1,0**	59,66	68	20000	25000
21	**790**		2,1	7,1	14	21	25,5	485	600	790	790	700	**0,86**	70,11	68	20000	25000



n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
195	**145**	**BM20-../S09XA4**	19,5	65	130	195	230	90	116	145	145	138	**1,4**	7,66	40	9100	10900
147	**192**		14,5	49	98	147	177	120	154	192	192	183	**1,1**	10,15	40	12000	12000
112	**250**		11	37	74	112	134	158	200	250	250	240	**0,87**	13,34	40	12000	12000
189	**145**	**BM30-../S09XA4**	18,5	63	126	189	225	90	116	145	145	138	**2,2**	7,91	56	11000	13800
149	**185**		14,5	49,5	99	149	178	115	148	185	185	175	**1,9**	10,06	56	12000	15000
120	**225**		12	40	80	120	144	143	183	225	225	215	**1,5**	12,46	56	12000	15000
93	**295**		9,3	31	62	93	111	185	235	295	295	280	**1,2**	16,1	56	12000	15000
75	**365**		7,5	25	50	75	90	225	290	365	365	345	**0,95**	19,96	56	12000	15000
64	**425**		6,4	21	42,5	64	76	265	340	425	425	400	**0,82**	23,38	56	12000	15000
103	**260**	**BM40-../S09XA4**	10	34	68	103	124	163	205	260	260	245	**2,6**	14,5	76	20000	25000
83	**320**		8,3	27,5	55	83	99	200	255	320	320	305	**2,1**	18,05	76	20000	25000
66	**400**		6,6	22	44,5	66	80	250	320	400	400	380	**1,7**	22,44	76	20000	25000
52	**510**		5,2	17	34,5	52	62	320	410	510	510	485	**1,3**	28,59	76	20000	25000
43	**620**		4,3	14	28,5	43	52	385	495	620	620	590	**1,1**	34,61	76	20000	25000
36,5	**730**		3,6	12	24	36,5	44	455	580	730	730	690	**0,92**	40,88	76	20000	25000

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
134	**225**	**BM40-../S11SA6**	13	44,5	89	134	161	180	200	225	225	225	**2,8**	11,17	84	18300	22900.0
103	**290**		10	34	68	103	124	230	260	290	290	290	**2,3**	14,5	84	20000	25000.0
83	**365**		8,3	27,5	55	83	99	290	320	365	365	365	**1,9**	18,05	84	20000	25000.0
66	**450**		6,6	22	44,5	66	80	360	400	450	450	450	**1,5**	22,44	84	20000	25000.0
52	**570**		5,2	17	34,5	52	62	460	510	570	570	570	**1,2**	28,59	84	20000	25000.0
43	**700**		4,3	14	28,5	43	52	560	620	700	700	700	**0,97**	34,61	84	20000	25000.0
36,5	**820**		3,6	12	24	36,5	44	660	730	820	820	820	**0,82**	40,88	84	20000	25000.0

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
134	**350**	**BM40-../S11MA6**	13	44,5	89	134	161	265	300	350	350	350	**1,8**	11,17	90	18300	22900.0
103	**455**		10	34	68	103	124	345	390	455	455	455	**1,5**	14,5	90	20000	25000.0
83	**560**		8,3	27,5	55	83	99	430	485	560	560	560	**1,2**	18,05	90	20000	25000.0
66	**700**		6,6	22	44,5	66	80	530	600	700	700	700	**0,96**	22,44	90	20000	25000.0

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	1500	1800	150	500	1000	1500	1800			kg	N	N
134	**480**	**BM40-../S11LA6**	13	44,5	89	134	161	325	395	480	480	475	**1,3**	11,17	102	18300	22900.0
103	**620**		10	34	68	103	124	420	510	620	620	610	**1,1**	14,5	102	20000	25000.0
83	**770**		8,3	27,5	55	83	99	520	640	770	770	770	**0,87**	18,05	102	20000	25000.0

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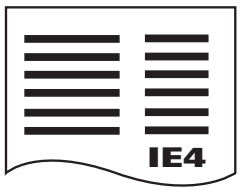
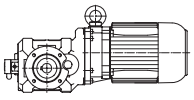


Geared motors for electric overhead conveyors series BM

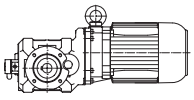
Selection table asynchronous motors PMSM - IE4 3000 $^{1}/_{min}$



n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
255	**69**	**BM10-../S08MA4**	12,5	42,5	85	255	305	53	59	69	69	69	**2,0**	11,68	24	8000	10000.0
230	**76**		11,5	38,5	77	230	275	58	65	76	76	76	**2,0**	12,95	24	8000	10000.0
183	**94**		9,1	30,5	61	183	215	72	81	94	94	94	**1,5**	16,39	24	8000	10000.0
165	**105**		8,2	27,5	55	165	198	80	90	105	105	105	**1,5**	18,18	24	8000	10000.0
132	**129**		6,6	22	44	132	159	99	111	129	129	129	**1,2**	22,62	24	8000	10000.0
119	**143**		5,9	19,5	39,5	119	143	110	123	143	143	143	**1,1**	25,09	24	8000	10000.0
112	**151**		5,6	18,5	37,5	112	135	116	130	151	151	151	**0,99**	26,55	24	8000	10000.0
101	**168**		5,0	16,5	33,5	101	122	129	145	168	168	168	**0,95**	29,45	24	8000	10000.0
90	**185**		4,5	15	30	90	108	142	159	185	185	185	**0,81**	33,19	24	8000	10000.0
220	**82**	**BM20-../S08MA4**	11	37	74	220	265	63	70	82	82	82	**2,7**	13,34	26	12000	12000.0
179	**103**		8,9	29,5	59	179	215	79	88	103	103	103	**2,1**	16,72	26	12000	12000.0
152	**121**		7,6	25	50	152	182	93	104	121	121	121	**1,8**	19,72	26	12000	12000.0
118	**155**		5,9	19,5	39,5	118	142	119	134	155	155	155	**1,4**	25,25	26	12000	12000.0
102	**181**		5,1	17	34	102	122	139	156	181	181	181	**1,2**	29,39	26	12000	12000.0
85	**215**		4,2	14	28	85	102	167	187	215	215	215	**1,0**	35,25	26	12000	12000.0
71	**260**		3,5	11,5	23,5	71	85	200	220	260	260	260	**0,84**	42,18	26	12000	12000.0
150	**119**	**BM30-../S08MA4**	7,5	25	50	150	180	91	102	119	119	119	**2,9**	19,96	42	12000	15000.0
128	**138**		6,4	21	42,5	128	153	106	119	138	138	138	**2,5**	23,38	42	12000	15000.0
100	**176**		5,0	16,5	33,5	100	120	135	151	176	176	176	**2,0**	29,76	42	12000	15000.0
86	**205**		4,3	14	28,5	86	103	158	177	205	205	205	**1,7**	34,88	42	12000	15000.0
72	**240**		3,6	12	24	72	87	185	205	240	240	240	**1,5**	41,13	42	12000	15000.0
60	**285**		3,0	10	20	60	72	220	245	285	285	285	**1,1**	49,66	42	12000	15000.0
55	**300**	**BM30Z-../S08MA4**	2,7	9,3	18,5	55	67	230	260	300	300	300	**0,92**	53,67	45	12000	15000.0
43	**390**		2,1	7,2	14	43	51	300	335	390	390	390	**0,89**	69,35	45	12000	15000.0
73	**235**	**BM40-../S08MA4**	3,6	12	24	73	88	183	205	235	235	235	**2,8**	40,88	63	20000	25000.0
58	**290**		2,9	9,7	19,5	58	70	225	250	290	290	290	**2,3**	51,18	63	20000	25000.0
50	**340**		2,5	8,3	16,5	50	60	260	290	340	340	340	**2,0**	59,66	63	20000	25000.0
42,5	**395**		2,1	7,1	14	42,5	51	300	340	395	395	395	**1,7**	70,11	63	20000	25000.0
35,5	**475**		1,7	5,9	11,5	35,5	42,5	365	410	475	475	475	**1,3**	84,36	63	20000	25000.0
28,5	**570**		1,4	4,8	9,6	28,5	34,5	440	495	570	570	570	**1,0**	104	63	20000	25000.0
25	**650**	**BM40Z-../S08MA4**	1,2	4,2	8,4	25	30	500	560	650	650	650	**1,0**	118,2	67	20000	25000.0
20,5	**780**		1,0	3,4	6,9	20,5	25	600	670	780	780	780	**0,87**	143	67	20000	25000.0

Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors PMSM - IE4 3000 $^{1}/_{min}$



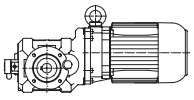
n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
255	**101**	**BM10-../S08LA4**	12,5	42,5	85	255	305	69	85	101	101	101	**1,4**	11,68	26	8000	10000.0
230	**112**		11,5	38,5	77	230	275	76	94	112	112	112	**1,3**	12,95	26	8000	10000.0
183	**139**		9,1	30,5	61	183	215	94	116	139	139	139	**1,0**	16,39	26	8000	10000.0
165	**154**		8,2	27,5	55	165	198	105	129	154	154	154	**1,0**	18,18	26	8000	10000.0
390	**69**	**BM20-../S08LA4**	19,5	65	130	390	465	47	58	69	69	69	**2,9**	7,66	28	9100	10900.0
295	**92**		14,5	49	98	295	350	62	77	92	92	92	**2,4**	10,15	28	12000	12000.0
220	**121**		11	37	74	220	265	82	101	121	121	121	**1,8**	13,34	28	12000	12000.0
179	**151**		8,9	29,5	59	179	215	103	127	151	151	151	**1,5**	16,72	28	12000	12000.0
152	**178**		7,6	25	50	152	182	121	149	178	178	178	**1,2**	19,72	28	12000	12000.0
118	**225**		5,9	19,5	39,5	118	142	155	191	225	225	225	**0,96**	25,25	28	12000	12000.0
102	**265**		5,1	17	34	102	122	181	220	265	265	265	**0,83**	29,39	28	12000	12000.0
186	**141**	**BM30-../S08LA4**	9,3	31	62	186	220	96	118	141	141	141	**2,5**	16,1	44	12000	15000.0
150	**175**		7,5	25	50	150	180	119	146	175	175	175	**2,0**	19,96	44	12000	15000.0
128	**200**		6,4	21	42,5	128	153	138	170	200	200	200	**1,7**	23,38	44	12000	15000.0
100	**255**		5,0	16,5	33,5	100	120	176	215	255	255	255	**1,4**	29,76	44	12000	15000.0
86	**300**		4,3	14	28,5	86	103	205	250	300	300	300	**1,2**	34,88	44	12000	15000.0
72	**350**		3,6	12	24	72	87	240	295	350	350	350	**0,99**	41,13	44	12000	15000.0
104	**245**	**BM40-../S08LA4**	5,2	17	34,5	104	125	167	205	245	245	245	**2,8**	28,59	64	20000	25000.0
86	**295**		4,3	14	28,5	86	104	200	245	295	295	295	**2,3**	34,61	64	20000	25000.0
73	**350**		3,6	12	24	73	88	235	290	350	350	350	**1,9**	40,88	64	20000	25000.0
58	**430**		2,9	9,7	19,5	58	70	290	360	430	430	430	**1,6**	51,18	64	20000	25000.0
50	**500**		2,5	8,3	16,5	50	60	340	420	500	500	500	**1,4**	59,66	64	20000	25000.0
42,5	**580**		2,1	7,1	14	42,5	51	395	485	580	580	580	**1,2**	70,11	64	20000	25000.0
35,5	**700**		1,7	5,9	11,5	35,5	42,5	475	580	700	700	700	**0,86**	84,36	64	20000	25000.0

9

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
255	**138**	**BM10-../S09SA4**	12,5	42,5	85	255	305	85	106	138	138	116	**1,0**	11,68	30	8000	10000
230	**153**		11,5	38,5	77	230	275	94	117	153	153	129	**0,98**	12,95	30	8000	10000
390	**94**	**BM20-../S09SA4**	19,5	65	130	390	465	58	72	94	94	80	**2,1**	7,66	32	9100	10900
295	**125**		14,5	49	98	295	350	77	96	125	125	106	**1,8**	10,15	32	12000	12000
220	**164**		11	37	74	220	265	101	126	164	164	139	**1,3**	13,34	32	12000	12000
179	**205**		8,9	29,5	59	179	215	127	158	205	205	174	**1,1**	16,72	32	12000	12000
152	**240**		7,6	25	50	152	182	149	187	240	240	205	**0,9**	19,72	32	12000	12000
295	**120**	**BM30-../S09SA4**	14,5	49,5	99	295	355	74	92	120	120	101	**2,9**	10,06	48	12000	15000
240	**149**		12	40	80	240	285	91	114	149	149	126	**2,3**	12,46	48	12000	15000
186	**192**		9,3	31	62	186	220	118	148	192	192	162	**1,8**	16,1	48	12000	15000
150	**235**		7,5	25	50	150	180	146	183	235	235	200	**1,5**	19,96	48	12000	15000
128	**275**		6,4	21	42,5	128	153	170	210	275	275	230	**1,3**	23,38	48	12000	15000
100	**350**		5,0	16,5	33,5	100	120	215	270	350	350	295	**0,99**	29,76	48	12000	15000
86	**410**		4,3	14	28,5	86	103	250	315	410	410	345	**0,85**	34,88	48	12000	15000
133	**260**	**BM40-../S09SA4**	6,6	22	44,5	133	160	161	200	260	260	220	**2,6**	22,44	68	20000	25000
104	**330**		5,2	17	34,5	104	125	205	255	330	330	280	**2,0**	28,59	68	20000	25000
86	**400**		4,3	14	28,5	86	104	245	310	400	400	340	**1,7**	34,61	68	20000	25000
73	**475**		3,6	12	24	73	88	290	365	475	475	400	**1,4**	40,88	68	20000	25000
58	**580**		2,9	9,7	19,5	58	70	360	450	580	580	495	**1,2**	51,18	68	20000	25000
50	**680**		2,5	8,3	16,5	50	60	420	520	680	680	570	**1,0**	59,66	68	20000	25000
42,5	**790**		2,1	7,1	14	42,5	51	485	600	790	790	670	**0,86**	70,11	68	20000	25000

Geared motors for electric overhead conveyors series BM

Selection table asynchronous motors PMSM - IE4 3000 $^{1}/_{min}$



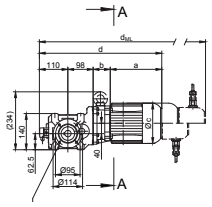
n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
390	**145**	**BM20-../S09XA4**	19,5	65	130	390	465	90	116	145	145	105	**1,4**	7,66	40	9100	10900
295	**192**		14,5	49	98	295	350	120	154	192	192	139	**1,1**	10,15	40	12000	12000
220	**250**		11	37	74	220	265	158	200	250	250	183	**0,87**	13,34	40	12000	12000
375	**145**	**BM30-../S09XA4**	18,5	63	126	375	455	90	116	145	145	105	**2,2**	7,91	56	11000	13800
295	**185**		14,5	49,5	99	295	355	115	148	185	185	134	**1,9**	10,06	56	12000	15000
240	**225**		12	40	80	240	285	143	183	225	225	166	**1,5**	12,46	56	12000	15000
186	**295**		9,3	31	62	186	220	185	235	295	295	210	**1,2**	16,1	56	12000	15000
150	**365**		7,5	25	50	150	180	225	290	365	365	265	**0,95**	19,96	56	12000	15000
128	**425**		6,4	21	42,5	128	153	265	340	425	425	305	**0,82**	23,38	56	12000	15000
205	**260**	**BM40-../S09XA4**	10	34	68	205	245	163	205	260	260	189	**2,6**	14,5	76	20000	25000
166	**320**		8,3	27,5	55	166	199	200	255	320	320	235	**2,1**	18,05	76	20000	25000
133	**400**		6,6	22	44,5	133	160	250	320	400	400	290	**1,7**	22,44	76	20000	25000
104	**510**		5,2	17	34,5	104	125	320	410	510	510	370	**1,3**	28,59	76	20000	25000
86	**620**		4,3	14	28,5	86	104	385	495	620	620	450	**1,1**	34,61	76	20000	25000
73	**730**		3,6	12	24	73	88	455	580	730	730	530	**0,92**	40,88	76	20000	25000

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
265	**225**	**BM40-../S11SA6**	13	44,5	89	265	320	180	200	225	225	225	**2,8**	11,17	84	18300	22900.0
205	**290**		10	34	68	205	245	230	260	290	290	290	**2,3**	14,5	84	20000	25000.0
166	**365**		8,3	27,5	55	166	199	290	320	365	365	365	**1,9**	18,05	84	20000	25000.0
133	**450**		6,6	22	44,5	133	160	360	400	450	450	450	**1,5**	22,44	84	20000	25000.0
104	**570**		5,2	17	34,5	104	125	460	510	570	570	570	**1,2**	28,59	84	20000	25000.0
86	**700**		4,3	14	28,5	86	104	560	620	700	700	700	**0,97**	34,61	84	20000	25000.0
73	**820**		3,6	12	24	73	88	660	730	820	820	820	**0,82**	40,88	84	20000	25000.0

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
265	**350**	**BM40-../S11MA6**	13	44,5	89	265	320	265	280	350	350	340	**1,8**	11,17	90	18300	22900.0
205	**455**		10	34	68	205	245	345	365	455	455	445	**1,5**	14,5	90	20000	25000.0
166	**560**		8,3	27,5	55	166	199	430	450	560	560	550	**1,2**	18,05	90	20000	25000.0
133	**700**		6,6	22	44,5	133	160	530	560	700	700	690	**0,96**	22,44	90	20000	25000.0

n2	M2	Type	Speed range n2 [1/min] at engine speed n1 [1/min]					Torque range M2 [Nm] at engine speed n1 [1/min]					fB	i_{ges}	m	F_{RN}	F_{RV}
1/min	Nm		150	500	1000	3000	3600	150	500	1000	3000	3600			kg	N	N
265	**480**	**BM40-../S11LA6**	13	44,5	89	265	320	325	395	480	480	400	**1,3**	11,17	102	18300	22900.0
205	**620**		10	34	68	205	245	420	510	620	620	520	**1,1**	14,5	102	20000	25000.0
166	**770**		8,3	27,5	55	166	199	520	640	770	770	640	**0,87**	18,05	102	20000	25000.0

10

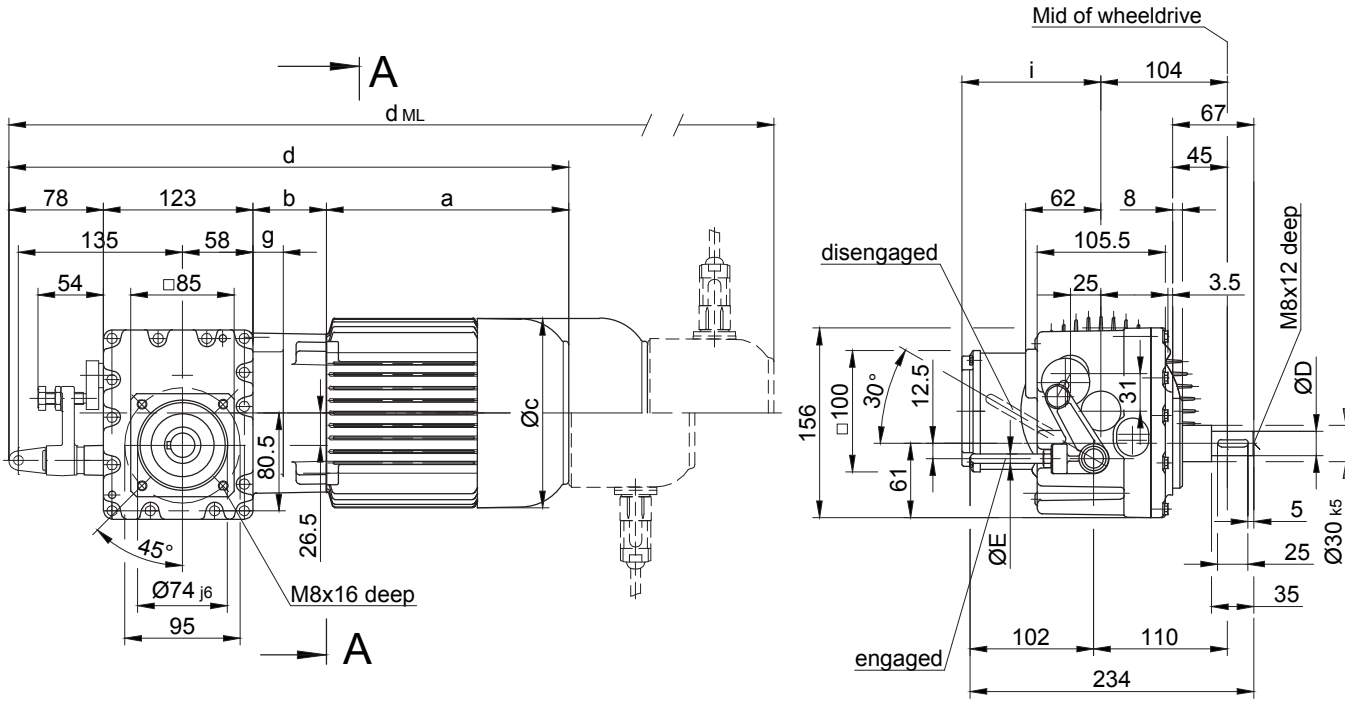


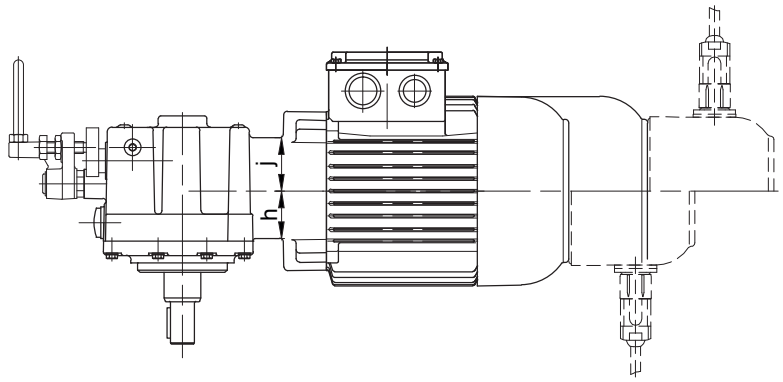
Page

BM09

Flange with tapped holes at front. Follow-up type of SZ2-V3209

Code -7.V/





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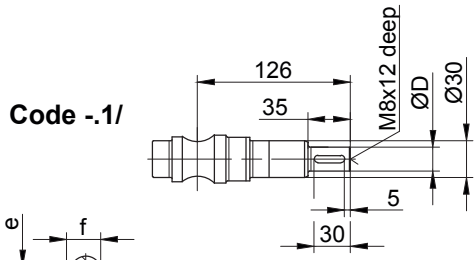
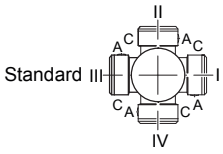




Type/ Shaft Ø D/ Clutch lever Ø E

Type	Ø D	e	f	Clutch lever Ø	Ø E	
BM09-../ D...	20_{k6}	6	22.5		8mm	Standard
BM09X-../ D...	25_{k6}	8	28		10mm	Reinforced Version

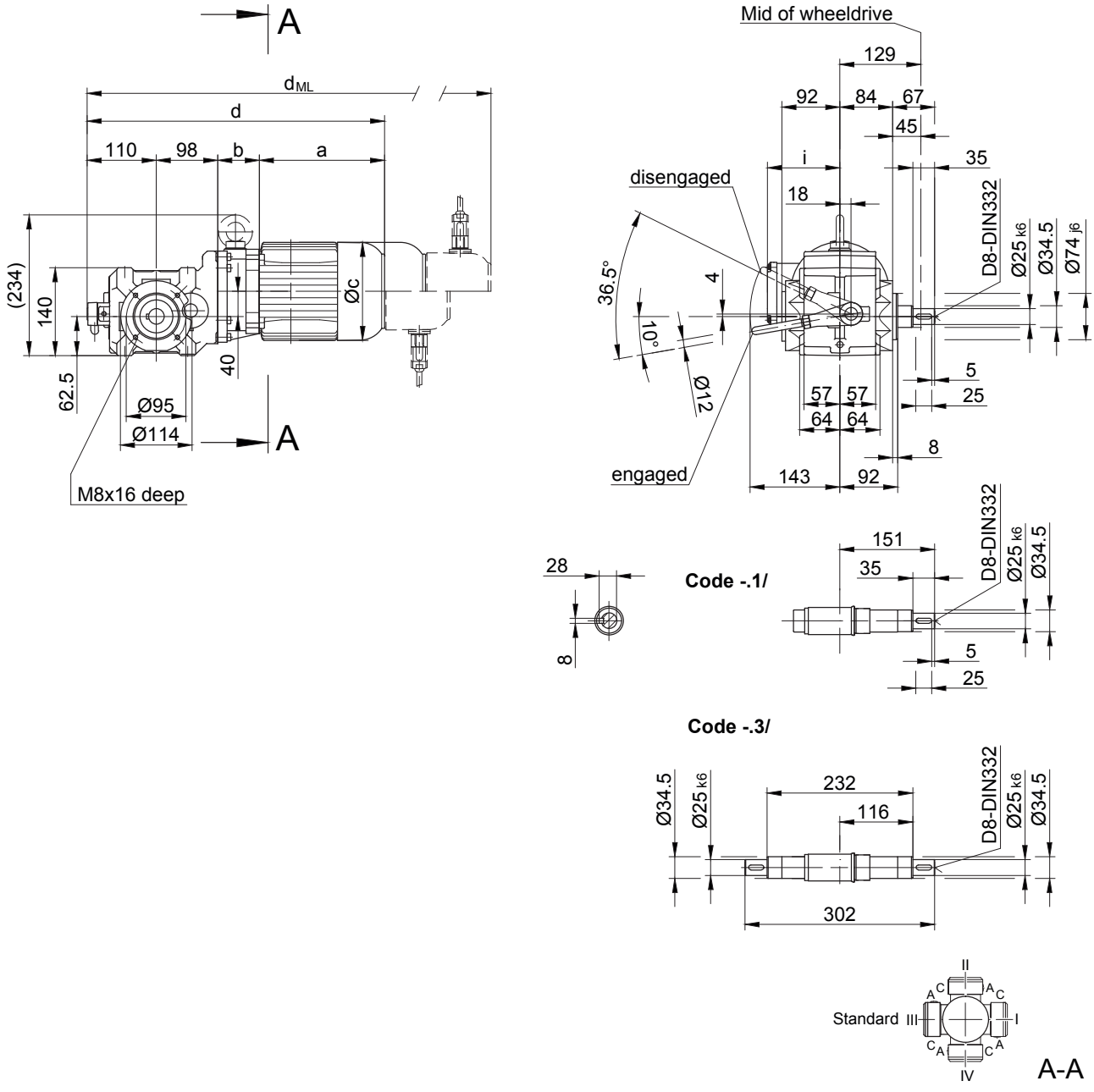
Type											Design with motor extensions			
Gear	ASM	PMSM	a	b	c	d	g	h	i	j	ES../ZS.. d_{ML}	G d_{ML}	ES../ZS..-G d_{ML}	RR/RL d_{ML}
BM09(X)-../	D05..	S05..	170	14	123	386	-	-	100	-	427	489	530	-
BM09(X)-../	D06..	-	170	14	123	386	-	-	100	-	427	489	530	-
BM09(X)-../	D07..	-	190	14	123	406	-	-	100	-	447	509	550	-
BM09(X)-../	D..08..	S..08..	200	60.5	156	461	25	39	115	44	527	568	634	527

The actual gearbox design can vary from the geometry shown.

BM10

Flange with tapped holes at front

Code -7.V/



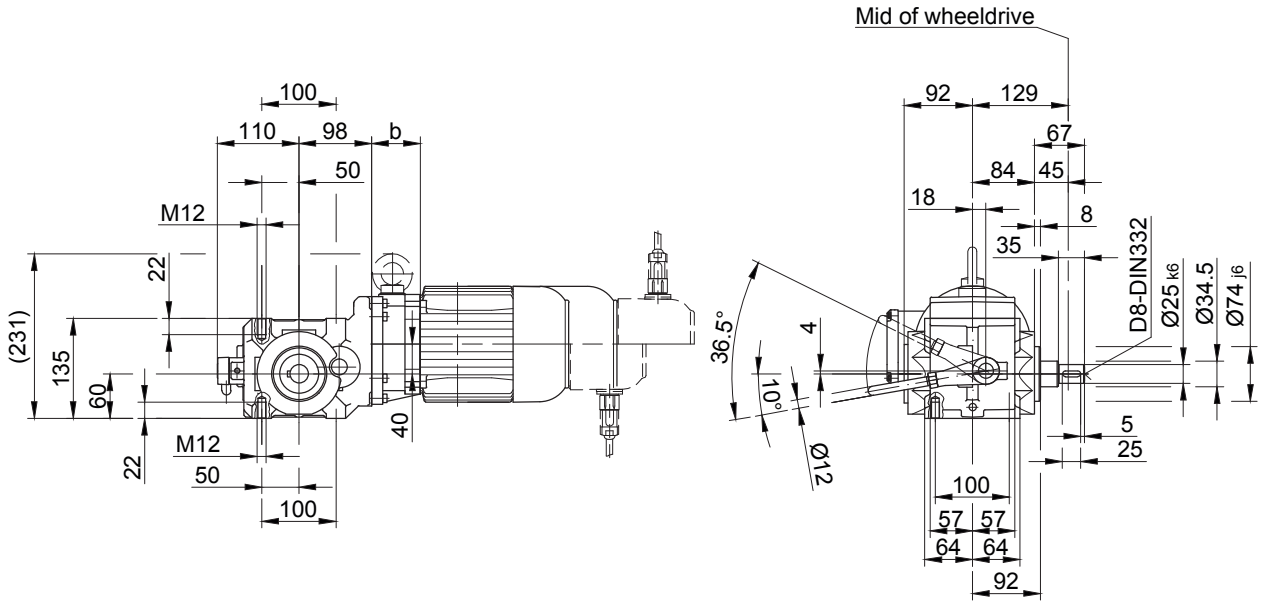
Type								Design with motor extensions			
Gear	ASM	PMSM	a	b	c	d	i	ES../ZS..	G	ES../ZS..-G	RR/RL
								d_{ML}	d_{ML}	d_{ML}	d_{ML}
BM10(X)-../	D05..	S05..	170	62	123	441	100	482	544	585	-
BM10(X)-../	D06..	-	170	62	123	441	100	482	544	585	-
BM10(X)-../	D07..	-	190	62	123	461	100	502	564	605	-
BM10(X)-../	D..08..	S..08..	200	66	156	474	115	540	581	647	540
BM10(X)-../	D..09..	S..09..	251	80.5	181	539	124	626	646	733	626

The actual gearbox design can vary from the geometry shown.

BM10

Foot with tapped holes at bottom and top

Code -6.UO/



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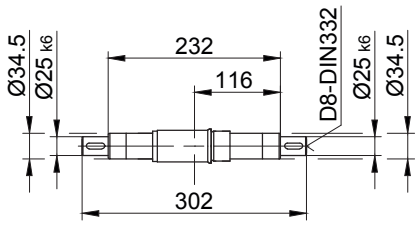
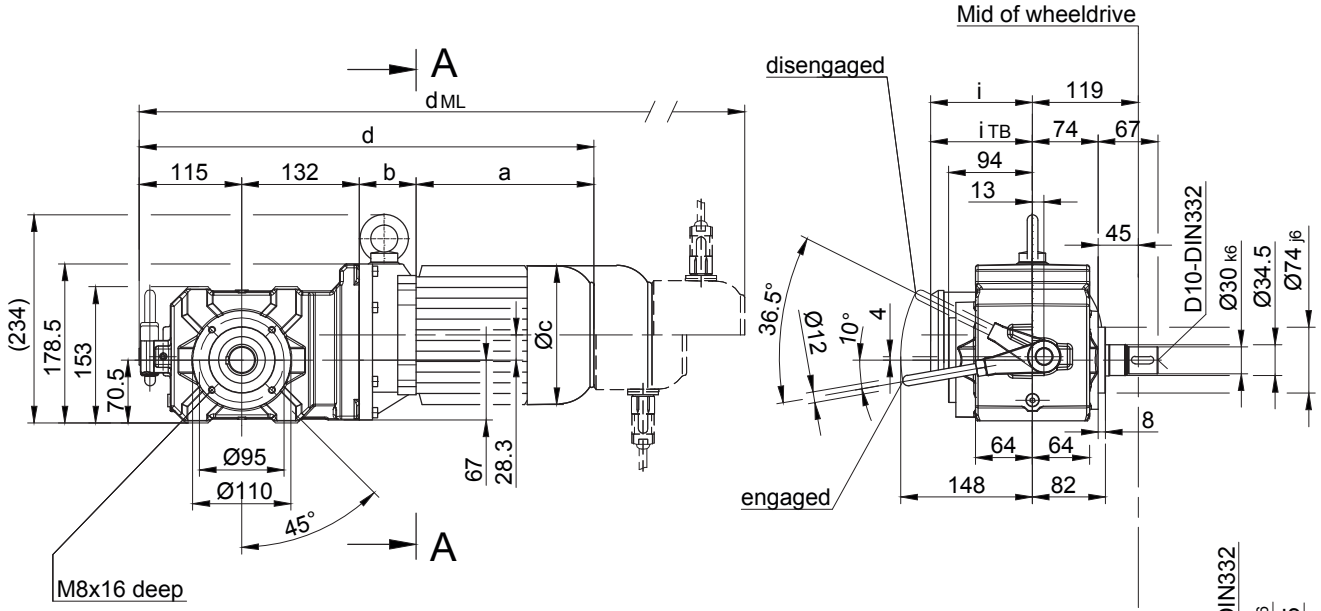


The actual gearbox design can vary from the geometry shown.

BM20-BM20Z

Flange with tapped holes at front

Code -7.V/



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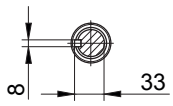
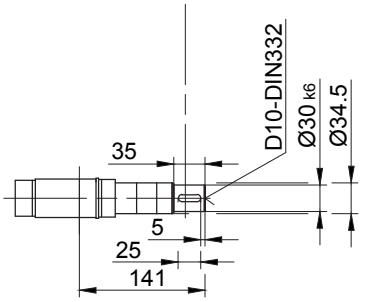
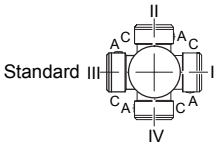






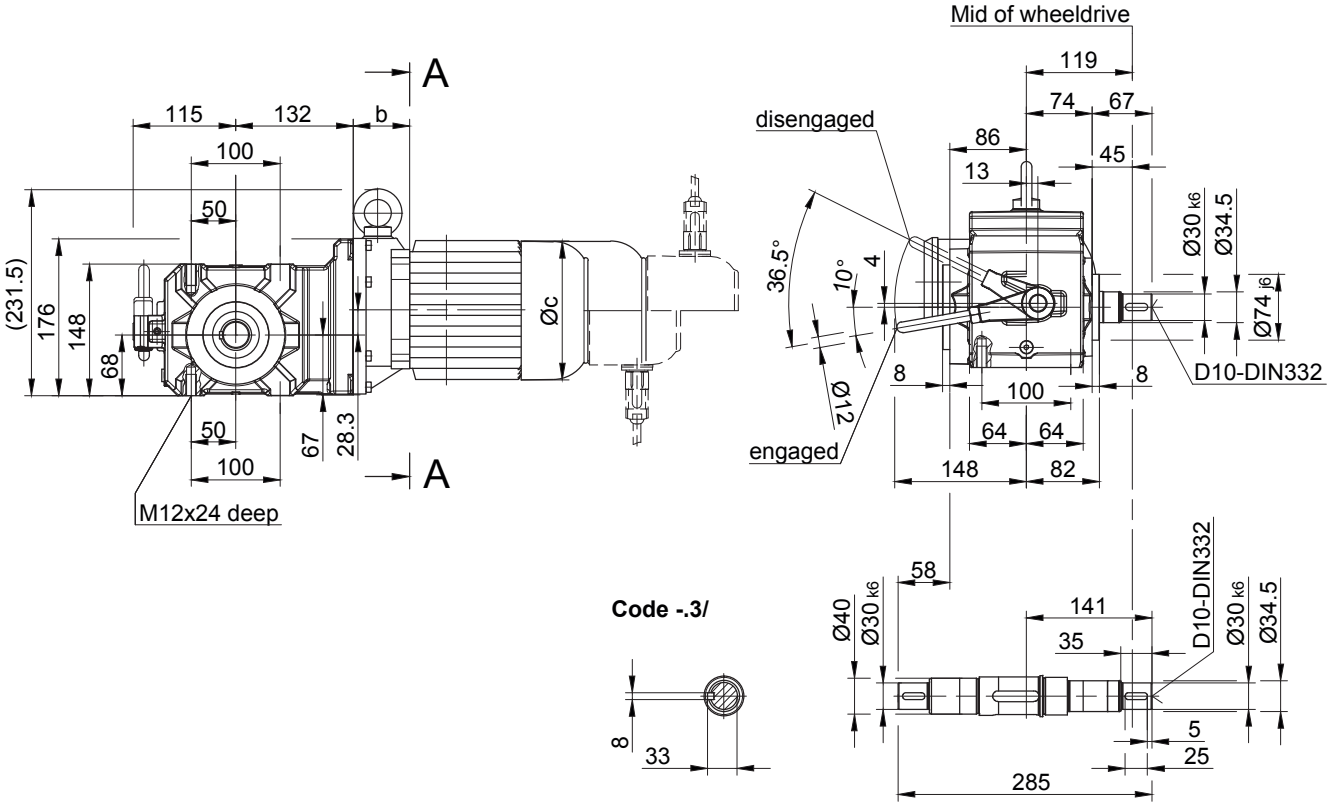
Type								Design with motor extensions				
Gear	ASM	PMSM	a	b	c	d	i	i_{TB}	ES../ZS.. d_{ML}	G d_{ML}	ES../ZS..-G d_{ML}	RR/RL d_{ML}
BM20Z-.1/	D04..	-	143	100	111	490	90	112	535.5	552.5	598	-
BM20-.1/	D05..	S05..	170	60	123	478	100	117	519	581	622	-
BM20Z-.1/	D05..	S05..	170	102	123	520	100	117	561	623	664	-
BM20-.1/	D06..	-	170	60	123	478	100	119	519	581	622	-
BM20Z-.1/	D06..	-	170	102	123	520	100	119	561	623	664	-
BM20-.1/	D07..	-	190	60	123	498	100	119	539	601	642	-
BM20Z-.1/	D07..	-	190	102	123	540	100	119	581	643	684	-
BM20-.1/	D..08..	S..08..	200	64	156	512	115	136.5	578	619	685	578
BM20Z-.1/	D..08..	S..08..	200	146	156	594	115	136.5	660	701	767	660
BM20-.1/	D..09..	S..09..	251	78.5	181	577.5	124	158	664.5	684.5	771.5	664.5

The actual gearbox design can vary from the geometry shown.

BM20-BM20Z

Foot with tapped holes at bottom and top

Code -6.UO/

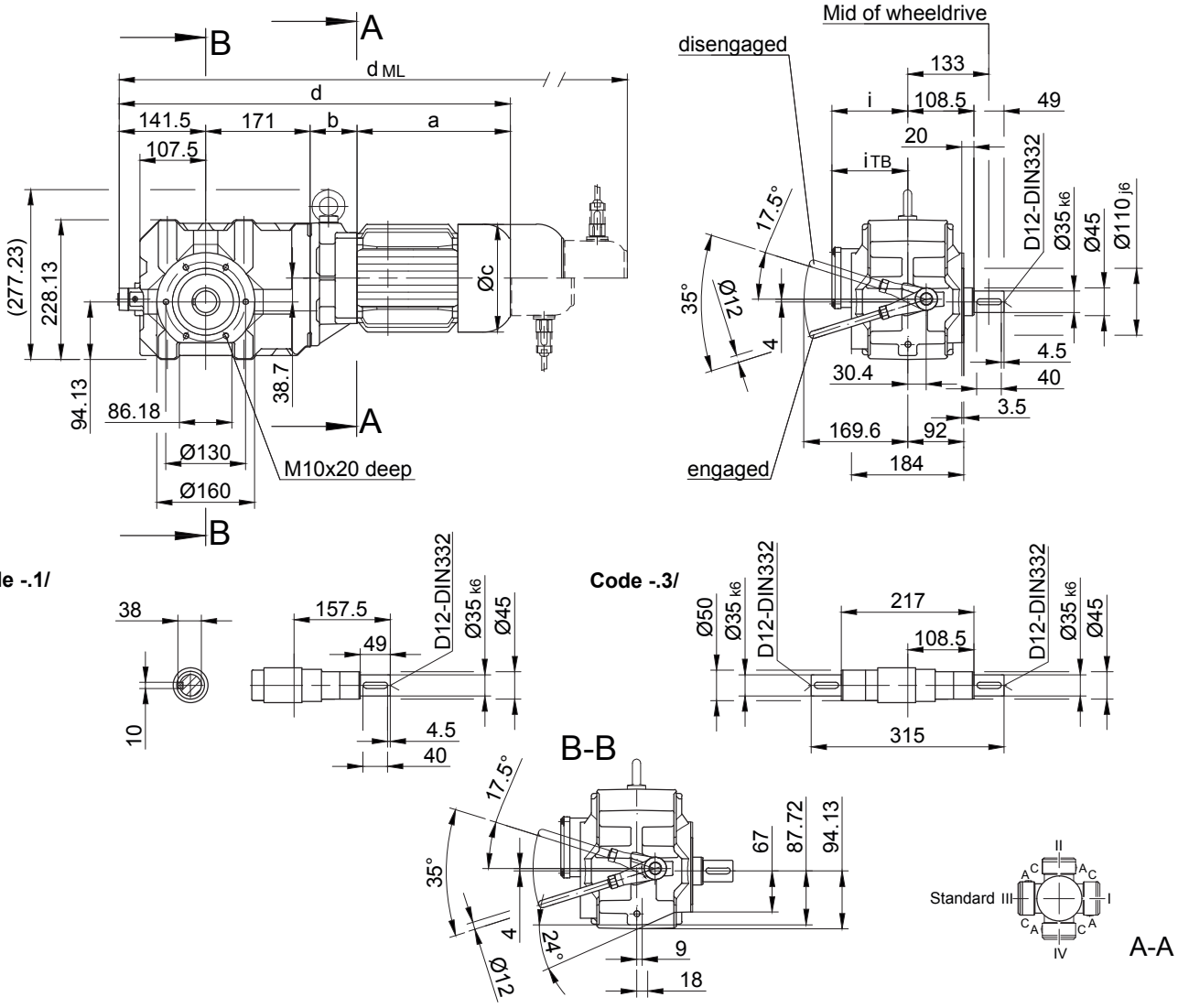


The actual gearbox design can vary from the geometry shown.

BM30 - BM30Z

Flange with tapped holes at front

Code -7.V/



Code -.1/

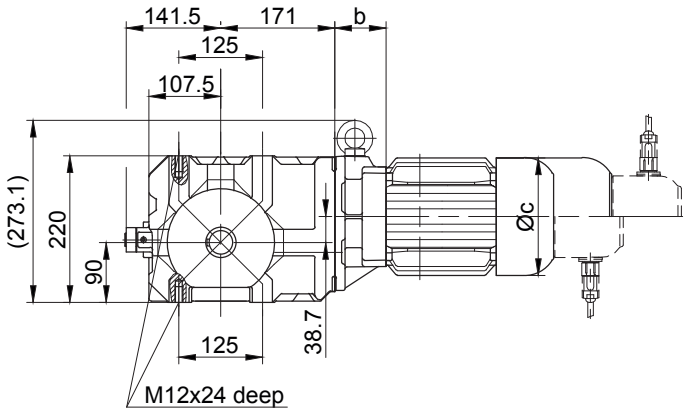
Code -.3/

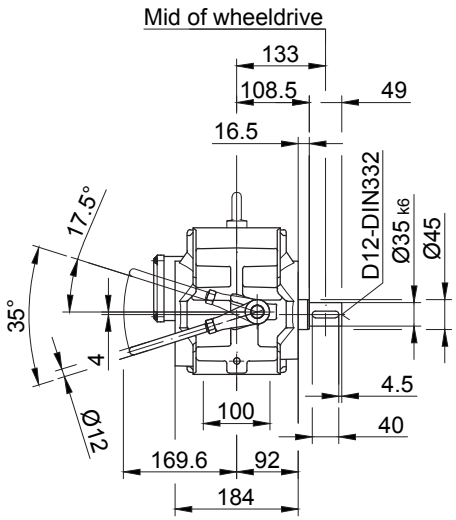
Type								Design with motor extensions				
Gear	ASM	PMSM	a	b	c	d	i	i_{TB}	ES../ZS..	G	ES../ZS..-G	RR/RL
									d_{ML}	d_{ML}	d_{ML}	d_{ML}
BM30-../	D05..	S05..	170	58	123	541	100	100	582	644	685	-
BM30Z-../	D05..	S05..	170	133.5	123	617	100	117	658	720	761	-
BM30-../	D06..	-	170	58	123	541	100	119	582	644	685	-
BM30Z-../	D06..	-	170	133.5	123	617	100	119	658	720	761	-
BM30-../	D07..	-	190	58	123	561	100	119	602	664	705	-
BM30Z-../	D07..	-	190	133.5	123	637	100	119	678	737	681	-
BM30-../	D..08..	S..08..	200	62	156	574	115	136.5	640	681	747	640
BM30Z-../	D..08..	S..08..	200	137.5	156	650	115	136.5	716	757	823	716
BM30-../	D..09..	S..09..	251	76.5	181	640	124	158	727	747	834	727
BM30Z-../	D..09..	S..09..	251	152	181	715.5	124	158	802.5	822.5	909.5	802.5
BM30-../	D..11..	S..11..	319	83	228	714.5	181	181	810.5	821.5	821.5	810.5

The actual gearbox design can vary from the geometry shown.

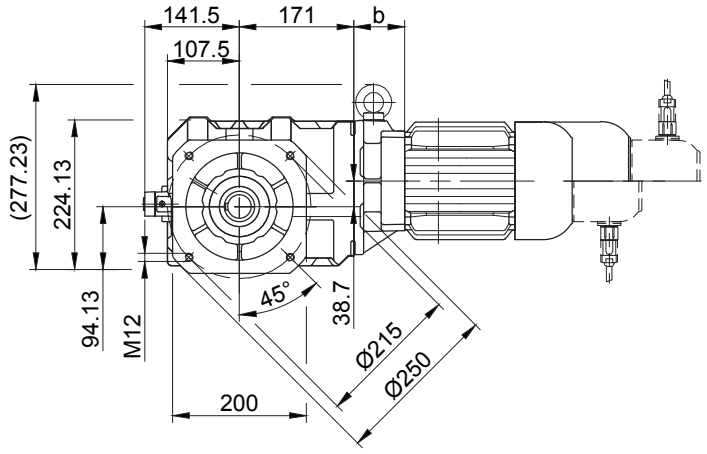
BM30 - BM30Z

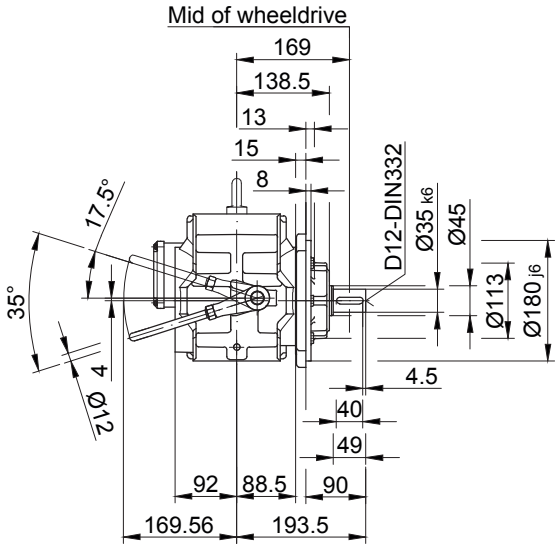
Foot with tapped holes at bottom and top
Code -6.UO/



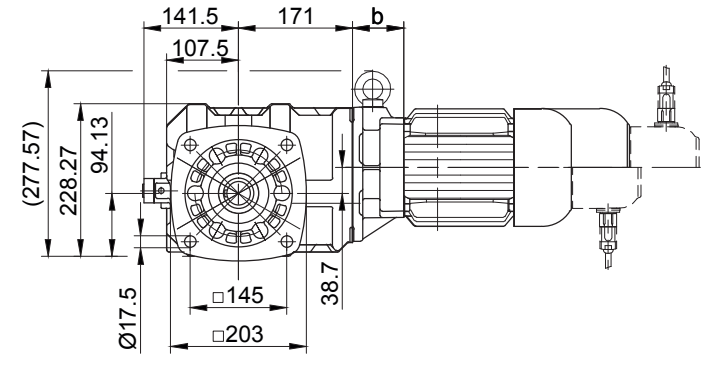


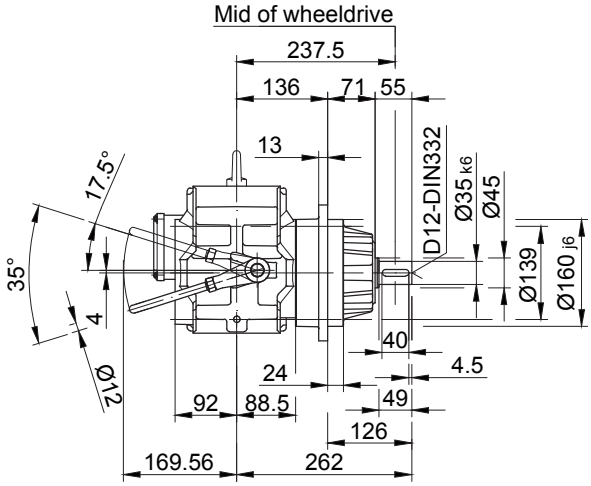
drawed flange at front
Code -07V/.../S01





far drawed flange at front
Code -07V/.../S02



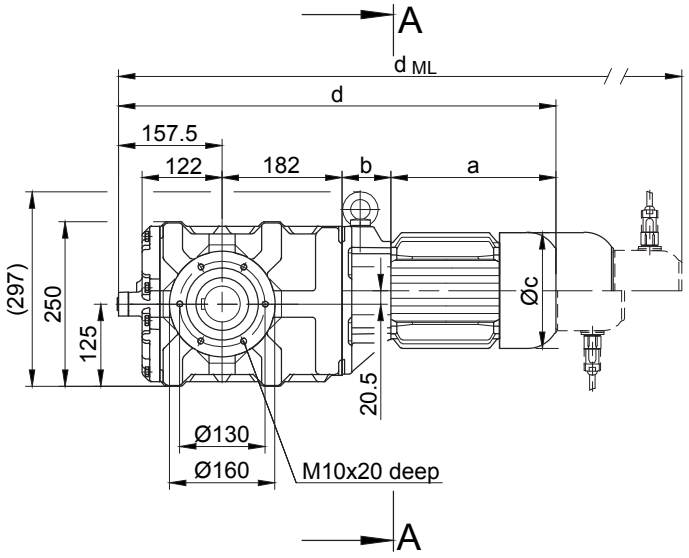


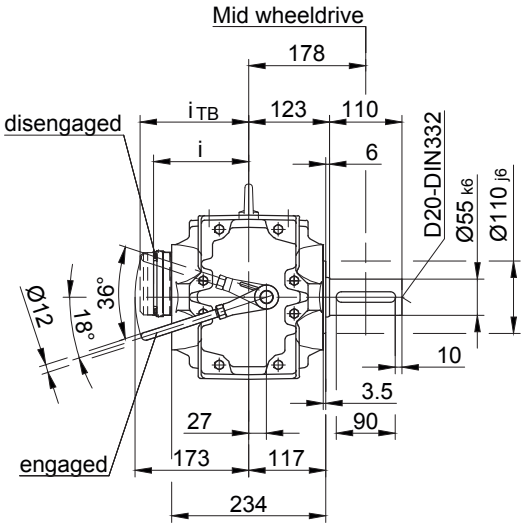
The actual gearbox design can vary from the geometry shown.

Dimensional drawings

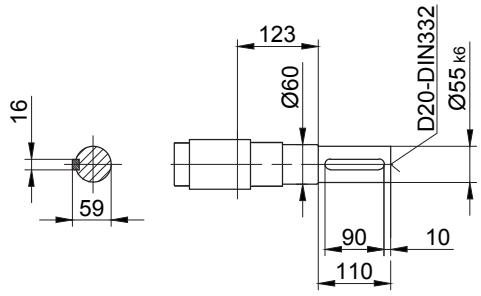
BM40 - BM40Z

Flange with tapped holes at front
Code -7.V/

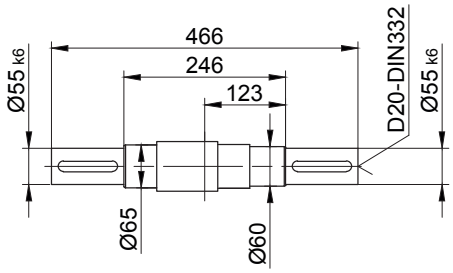


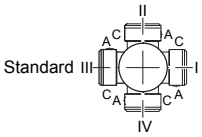


Code -.1/



Code -.3/





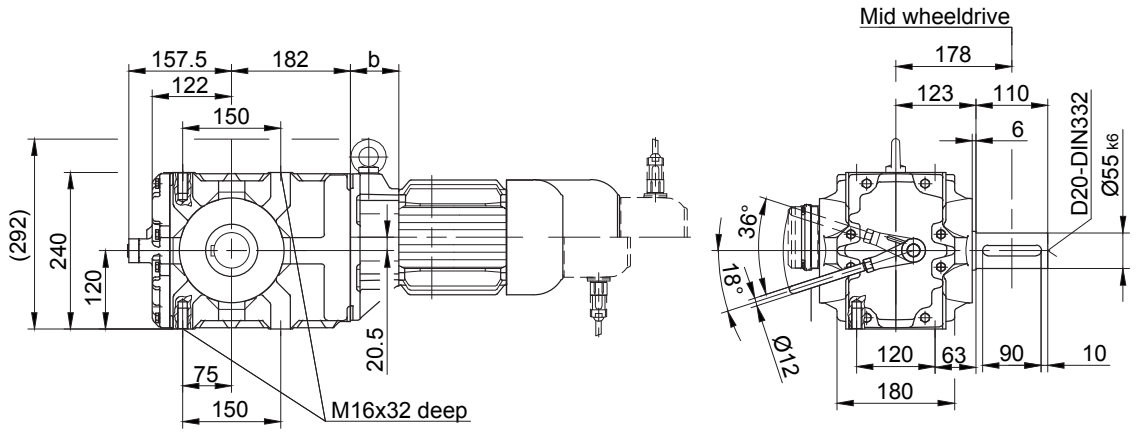
A-A

Type								Design with motor extensions				
Gear	ASM	PMSM	a	b	c	d	i	i_{TB}	ES../ZS..	G	ES../ZS..-G	RR/RL
									d_{ML}	d_{ML}	d_{ML}	d_{ML}
BM40Z-../	D05..	S05..	170	138.5	123	649	100	117	690	752	793	-
BM40Z-../	D06..	-	170	138.5	123	649	100	119	690	752	793	-
BM40Z-../	D07..	-	190	138.5	123	669	100	119	710	772	813	-
BM40-../	D..08..	S..08..	200	60	156	599	115	136.5	665	706	772	665
BM40Z-../	D..08..	S..08..	200	142.5	156	682	115	136.5	748	789	855	748
BM40-../	D..09..	S..09..	251	74.5	181	665	124	158	752	772	859	758
BM40Z-../	D..09..	S..09..	251	157	181	747	124	158	834	852	941	834
BM40-../	D..11..	S..11..	319	81	228	740	181	181	836	847	943	836

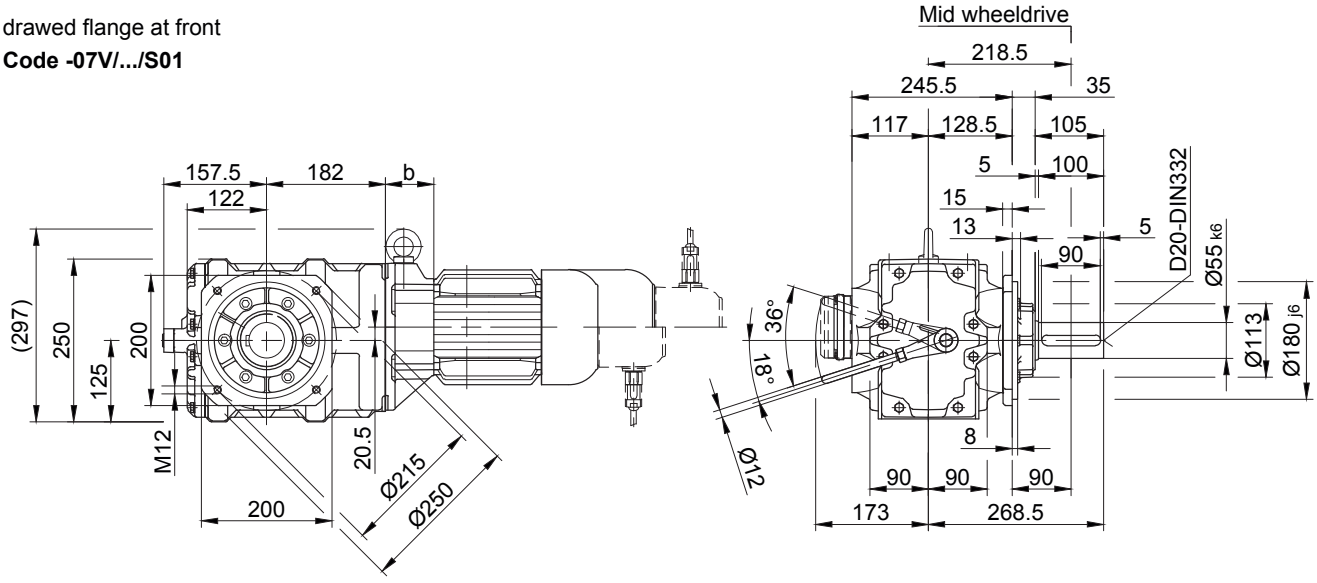
The actual gearbox design can vary from the geometry shown.

BM40 - BM40Z

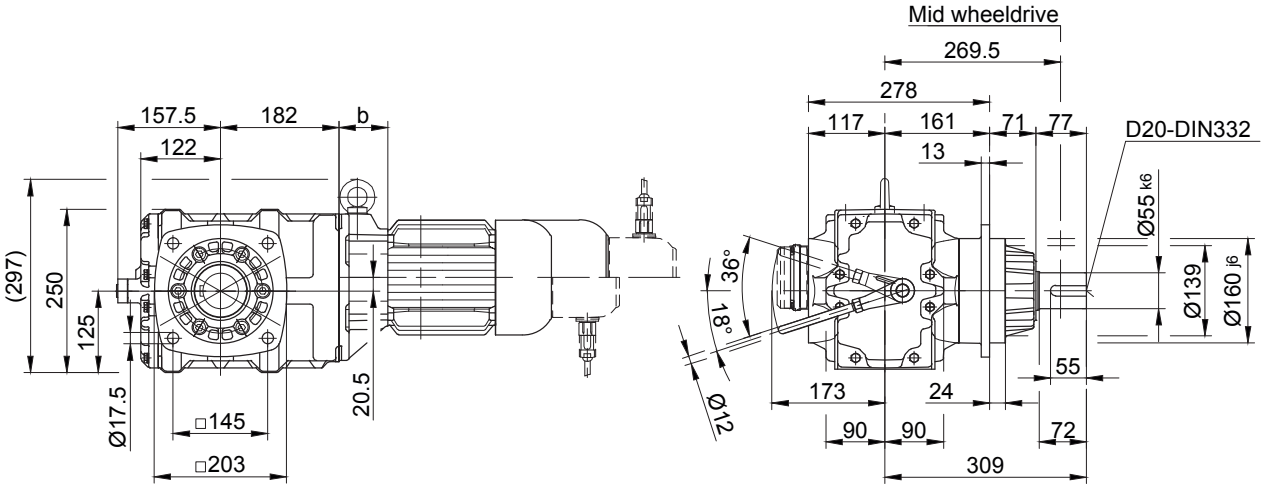
Foot with tapped holes at bottom and top
Code -6.UO/



drawed flange at front
Code -07V/.../S01

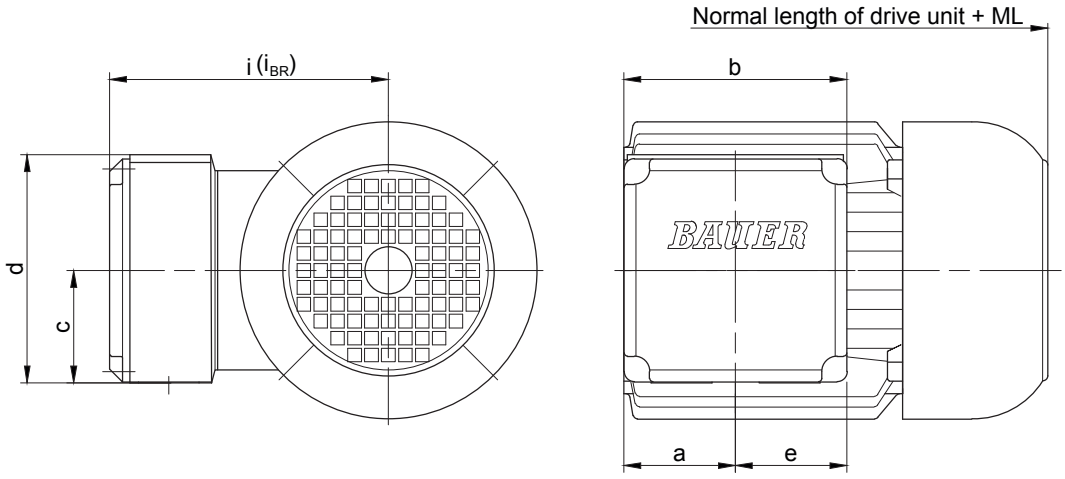


far drawed flange at front
Code -07V/.../S02



The actual gearbox design can vary from the geometry shown.

Standard terminal box

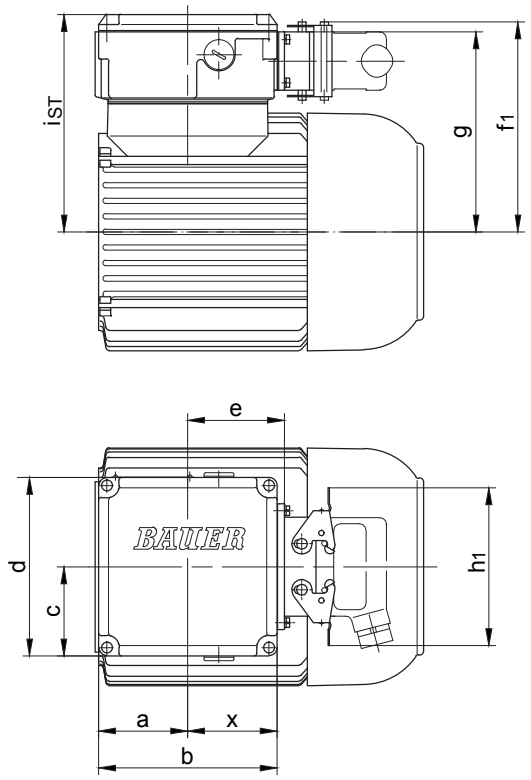


Motor/ Motor with Brake		Dimensions (mm)						Code	Cable entry Major (M) Minor (N)	max. wrench size for cable entry gland
ASM	PMSM	a	b	c	d	e	i / i_{BR}			
D04	-	42.5	88	44	88	44	90	KAG1	M=2xM20x1.5	24 mm
D05	S05	50	100	50	100	50	100	KAG2	M=2xM25x1.5	29 mm
D06	-	50	100	50	100	50	100	KAG2	M=2xM25x1.5	29 mm
D07..	-	50	100	50	100	50	100	KAG2	M=2xM25x1.5	29 mm
D..08	S..08	50	100	50	100	50	115	KAG2	M=2xM25x1.5	29 mm
D..09	S..09	50	100	50	100	50	124	KAG2	M=2xM25x1.5	29 mm
D..11	S..11	62	132	66.5	135	66	181	TB222	M=2xM32x1.5; N=2xM25x1.5	-
D..13	-	78	156	78.5	158	78	217	TB322	M=2xM40x1.5; N=2xM25x1.5	-
D..16	-	74	156	78.5	158	78	243	TB322	M=2xM40x1.5; N=2xM25x1.5	-
D..18	-	94	200	100.5	201	100	288	TB422	M=2xM50x1.5; N=2xM25x1.5	-

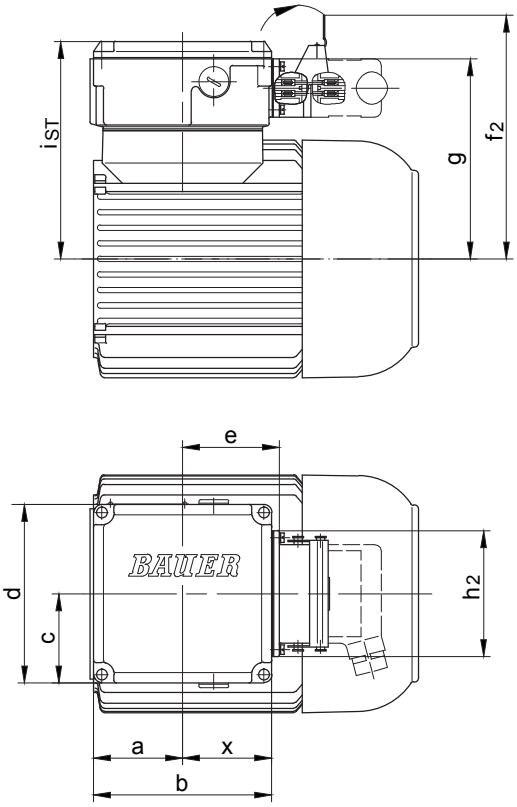
The actual gearbox design can vary from the geometry shown.

Plug-connector terminal box

Standard design (two brackets)



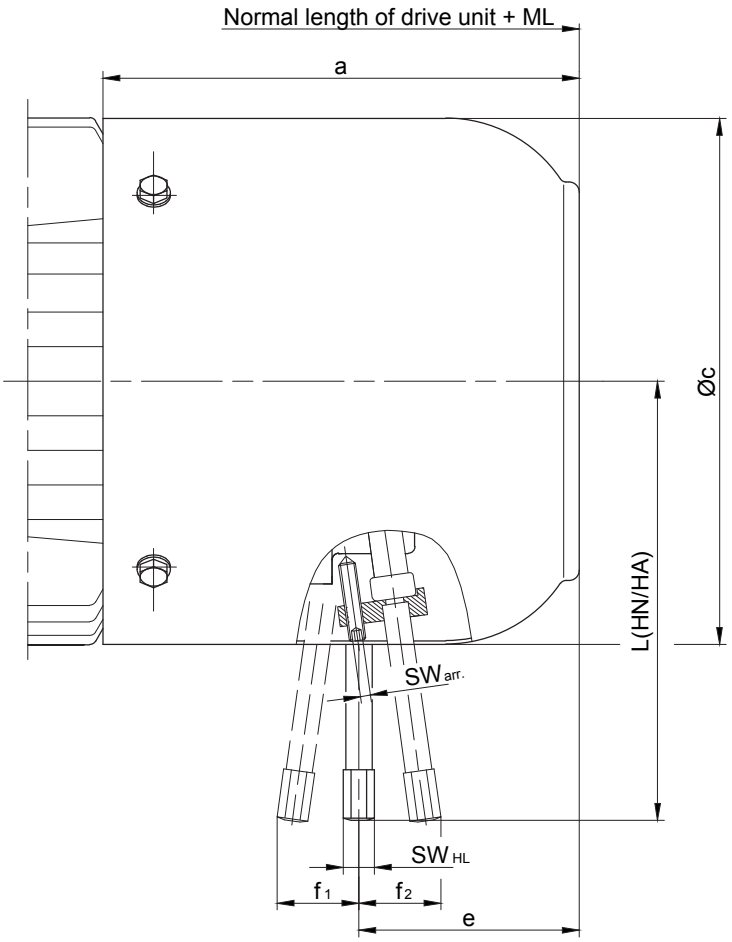
Optional for DESINA (one bracket)



Motor ASM	Motor PMSM	Size of terminal box	a	b	c	d	e	f_1	f_2	g	h_1	h_2	i_{ST}	x
D04	-	TBS1	30	90	52.5	106	49	118.5	147	111	117	93	124.5	46
D05	S05	TBS1	57	90	52.5	106	49	123.5	152	116	117	93	129.5	46
D06	-	TBS1	45	90	52.5	106	49	125.5	154	118	117	93	131.5	46
D07	-	TBS1	45	90	52.5	106	49	125.5	154	118	117	93	131.5	46
D..08	S..08	TBS1	45	90	52.5	106	49	143.5	172	136	117	93	149.5	46
D..09	S..09	TBS2	62	132	66	135	71.5	158.5	187	158	117	93	164	68.5
D..11	S..11	TBS2	62	132	66	135	71.5	175.5	191	166	117	93	181	68.5
D..13	-	TBS3	78	156	78	158	83.5	199	227.5	191.5	117	93	216	79.5
D..16	-	TBS3	74	156	78	158	83.5	225	253.5	225	117	93	242	79.5
D..18	-	TBS4	94	200	100	201	105.5	257	299	257	117	93	287	100.5

The actual gearbox design can vary from the geometry shown.

Standard brakes

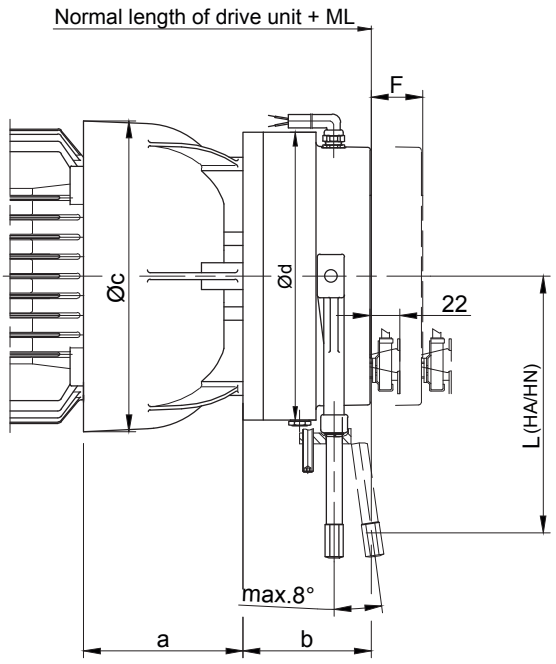


Motor Type ASM	Motor Type PMSM	Brake Type	ML(mm) Additional length with brake	Dimensions (mm) a	Øc	e	f_1	f_2	L(HN/HA)	SW_{HL}	$SW_{arr.}$	Add. weight kg
D04	-	E003	43.5	97	110.5	58.5	20.5	24	96/102	11	11	1.0
D05	S05		42	102	123	60						
D06	-					58.5						
D07	-	E003 / E004										
D..08	S..08	ES(X)010	66	141	156	68	-	29	132	8	2.5	2.6
D..09	S..09	ES(X)010	93	173	176	99	-	29	132	8	2.5	2.7
		ES(X)027				91	-	35.5	162			4.2
D..11	S..11	ES(X)027	98	195	218	103	-	35.5	162	8	2.5	4.5
		ES(X)040				100	-	37	172			6.3
		ES(X)070				96	-	34.5	190	12	4	8.5
D..13	-	ES(X)040	111	225	258	125	-	41	202	12	4	6.5
		ES(X)070				121	-	38	225			8.5
		ES(X)125				116	-	45	223			12.5
D..16	-	ES(X)125	144	280	310	148	-	48.5	244	12	4	13.5
		ES(X)200				141	-	50	256			19
		ZS(X)300				112	-					22
D..18	-	ES(X)250	149	304	348	153	-	58.5	286	12	4	28
		ZS(X)500				123	-			19	5	30

HN = Manual release non-locking HA = Manual release locking

The actual gearbox design can vary from the geometry shown.

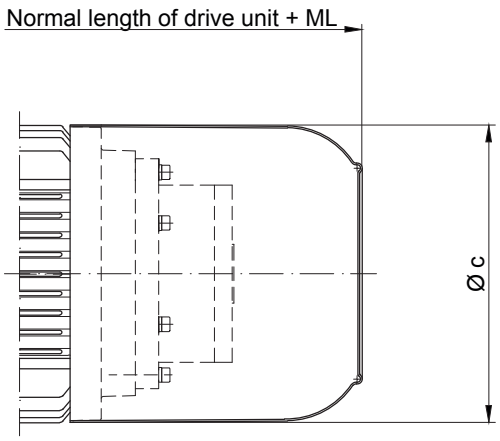
"Heavy-Duty"- brake



Motor		Brake	ML(mm) Additional length with brake		Dimensions (mm)					Add. weight
ASM	PMSM		Standard	Micro s.	a	b	c	Ød	L (HA/HN)	kg
D..08	S..08	EH(X)027	79	101	83.5	66.5	166	145	162	5.5
D..09	S..09	EH(X)040	90	112	102	73	191	168	172	8.3
D..11	S..11	EH(X)125	114	136	120	95	231	213	208.5	19.5
D..13	-	EH(X)200	128	150	140	106	274.5	245	221	29.3
D..16	-	EH(X)400	141	163	155	124	326	324	313	55.8
D..18	-		152	174	183		366			61

The actual gearbox design can vary from the geometry shown.

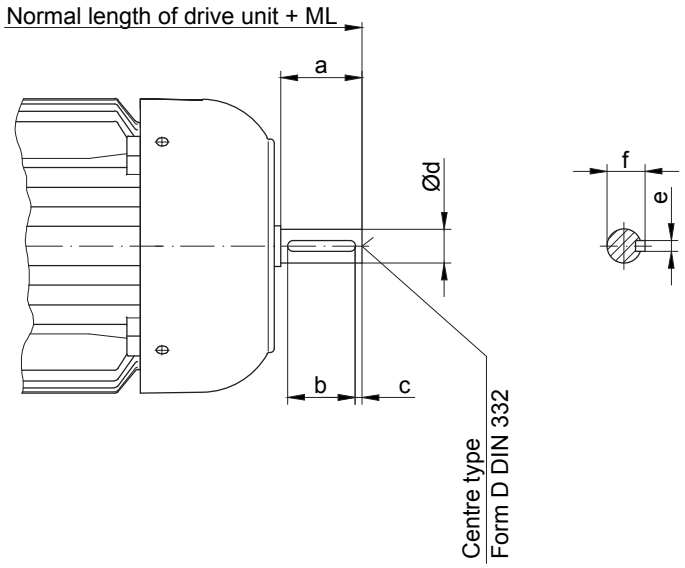
Motors with back stop



Motor		ML (mm) Add. length with backstop	Dimensions (mm)	Add. weight
ASM	PMSM		c	kg
D..08	S..08	66	156	6.5
D..09	S..09	93	181	6.5
D..11	S..11	98	228	8
D..13	-	111	258	13.5
D..16	-	144	322	16
D..18	-	149	368	17

The actual gearbox design can vary from the geometry shown.

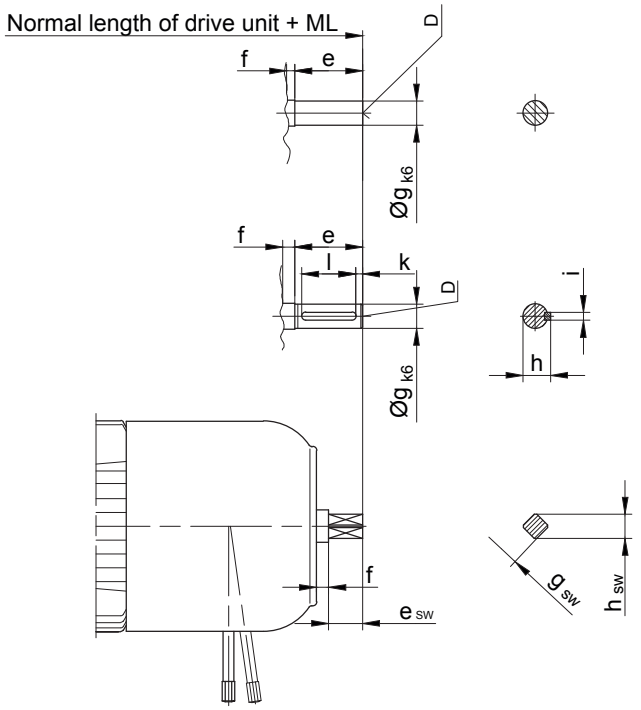
Motors with second shaft end



Motor		ML(mm) Add. length with second shaft extension	Dimensions (mm)						Centre
ASM	PMSM		a	b	c	d	e	f	DIN 332
D04	-	20	15	-	-	8 g6	-	-	-
D05	S05	25	20	-	-	10 k6	-	-	-
D06	-	25	20	-	-	10 k6	-	-	-
D07	-	25.5	20	-	-	10 k6	-	-	-
D..08	S..08	45	40	30	5	16 k6	5	18	D 5
D..09	S..09	55	50	40	5	20 k6	6	22.5	D 5
D..11	S..11	65	60	50	5	25 k6	8	28	D 8
D..13	-	85	80	60	10	35 k6	10	38	D 12
D..16	-	115	110	90	10	40 k6	12	43	D 16
D..18	-	115	110	90	10	45 k6	14	48.5	D 16

The actual gearbox design can vary from the geometry shown.

Motors with brake and second shaft end



10

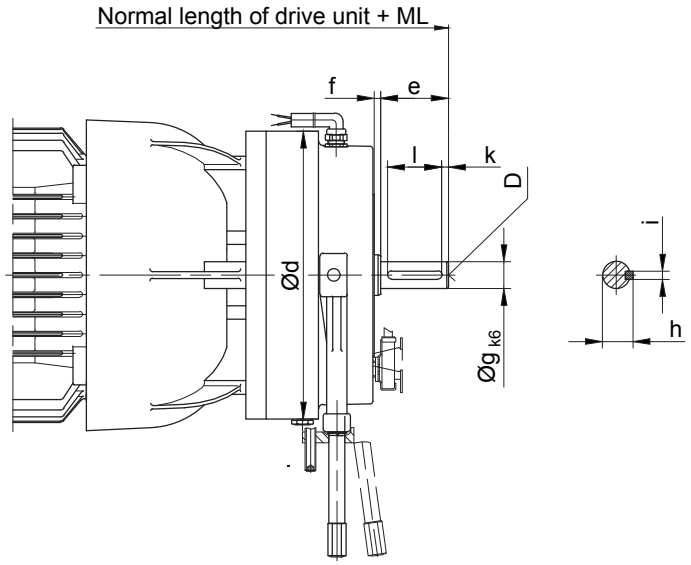
Motor		Brake	Additional length		Dimensions (mm)										Center D DIN332	
ASM	PMSM		ML	ML_{SW}	e	e_{SW}	f	g	g_{SW}	h	h_{SW}	i	k	l		SW
D04	-	E003	63	-	15	-	5	8	-	-	-	-	-	-	-	-
D05	S05				20			10								
D06	-															
D07	-	E003 / E004														
D..08	S..08	ES(X)..	121	96 *	50	25 *	5	18	SW14 *	20.5	18 *	6	5	40	D6	D4 *
D..09	S..09		98	123 *												
D..11	S..11		153.5 *	128	50 *	25		20 *	SW14	22.5 *	18	6 *	5 *	40 *	D6 *	D4
D..13	-		176 *	156	60 *	40	4.5	28 *	SW22	31 *	28	8 *		50 *	D10 *	D10
D..16	-	ES(X).. / ZS(X)..	208.5 *	188.5												
D..18	-		359 *	194.5			5									

* Special design

** with manual release

The actual gearbox design can vary from the geometry shown.

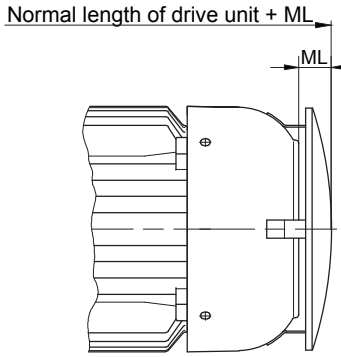
Motors with “heavy duty“ brake and second shaft end

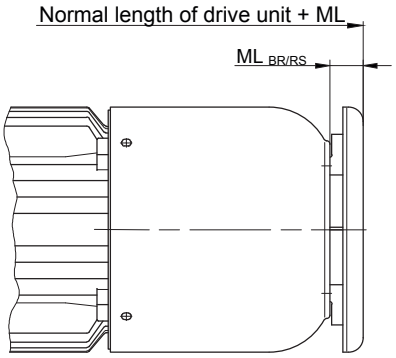


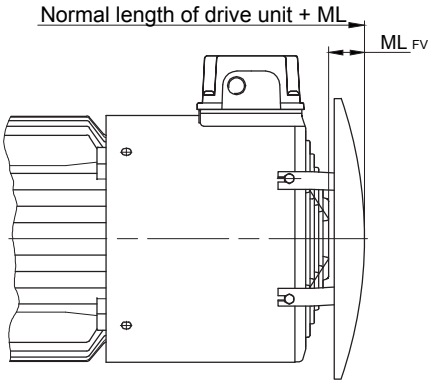
Motor		Brake	ML(mm) Additional length with brake and encoder	Dimensions (mm)								Centring D 332	Add. weight
ASM	PMSM			Ød	e	f	g	h	i	k	k		kg
D..08	S..08	EH(X)027	132	145	50	4	18	20.5	6	5	6	D06	6
D..09	S..09	EH(X)040	144	168		5							9
D..11	S..11	EH(X)125	169	213			20	22.5					20
D..13	-	EH(X)200	192	245	60		28	31	8		8	D10	29.5
D..16	-	EH(X)400	205.5	324									56
D..18	-		216.5				30	33					61

The actual gearbox design can vary from the geometry shown.

Motors with protective hood



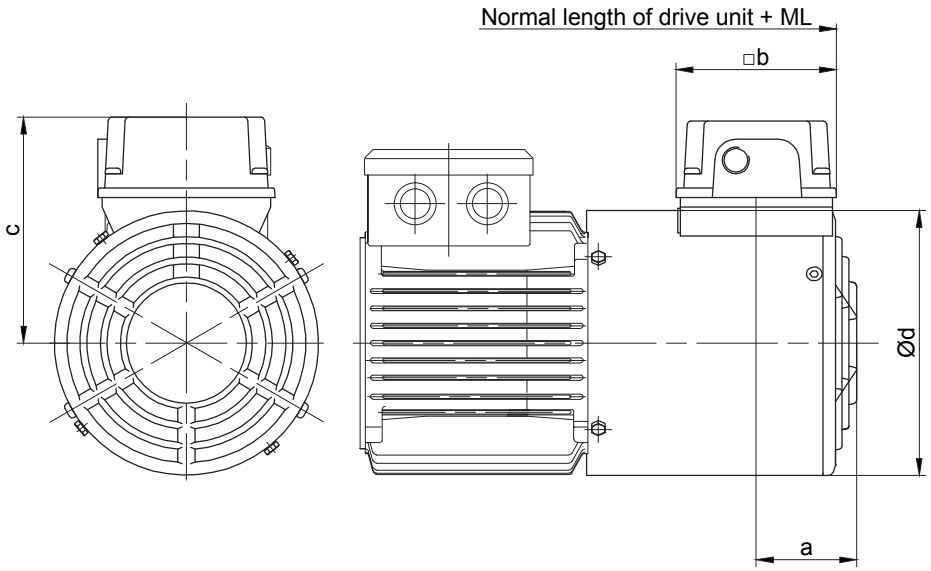




Motor		ML(mm) Add. length with attached protective cover				Add. weight
ASM	PMSM	ML	ML_{BR}	ML_{RS}	ML_{FV}	kg
D06	-	18	-	-	-	0.15
D07	-	18	-	-	-	0.15
D..08	S..08	14.5	24.5	24.5	40	0.20
D..09	S..09	22	24.5	24.5	30	0.30
D..11	S..11	29	29.5	29.5	33	0.40
D..13	-	30	29.5	29.5	25	0.6
D..16	-	47	34.5	34.5	32	1.8
D..18	-	54	34.5	34.5	32	5.5

The actual gearbox design can vary from the geometry shown.

Motors with independent fan

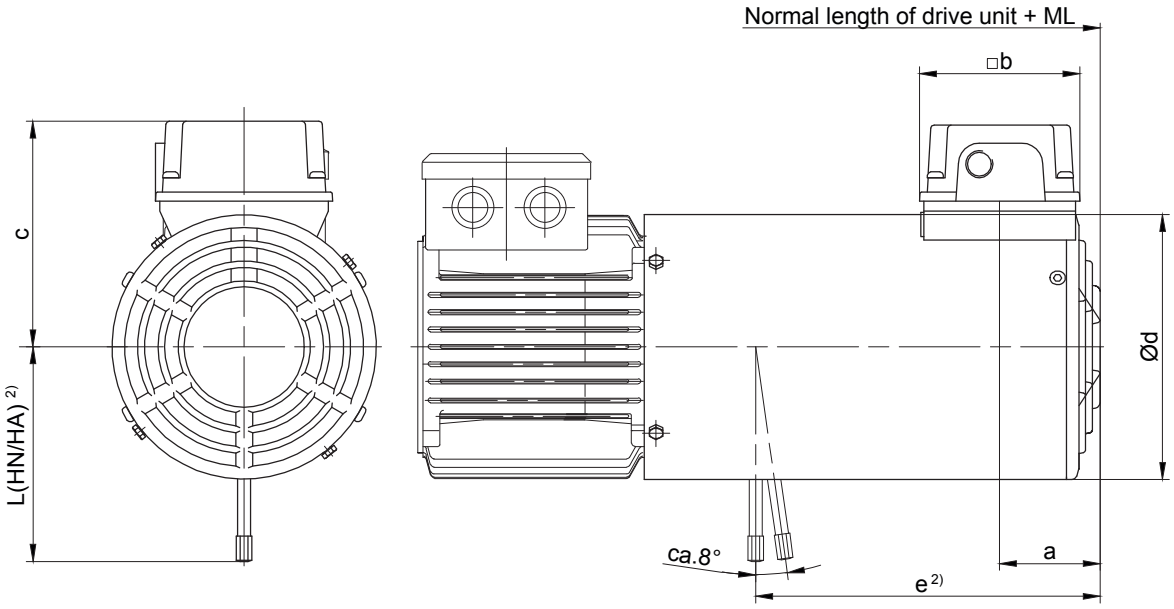


Drive Motor Type ASM	Drive Motor Type PMSM	Fan Motor Type	kW	r/min	400 V A	ML (mm) Additional length forced vent.	Dimensions (mm) a	b	c	d	Add. weight ~ kg
D..08	S..08	FV D08	0.019	2670	0.029	92	69.5	95	131.5	157	2.2
D..09	S..09	FV D09	0.046	2820	0.106	97	69.5	95	141.5	176	2.7
D..11	S..11	FV D11	0.051	2660	0.110	97	79.5	95	162.5	219	3.2
D..13	-	FV D13	0.073	2820	0.169	119	78.8	95	182	258	4.6
D..16✳	-	FV D16	0.154	2760	0.347	144	78.8	95	208.5	311	6.4
D..18✳	-	FV D18	0.154	2760	0.347	303	78.8	95	208.5	348	8.4

✳ bayonet joint

The actual gearbox design can vary from the geometry shown.

Motors with brake and independent fan



Motor ASM	Motor PMSM	Brake	ML (mm) 1) Additional length with attached brake and forced ventilation	Dimensions (mm) a	b	c	Ød	e 2)	L(HN/HA) 2)	Add. weight ~kg
D..08	S..08	ES(X)010	202	59	95	131.5	157	204	132	5.0
D..09	S..09	ES(X)010	214	69.5	95	141.5	176	220	132	5.5
		ES(X)027						212	162	7.5
D..11✳	S..11✳	ES(X)027	221	69.5	95	162.5	219	226	162	8.0
		ES(X)040						223	172	10
		ES(X)070						218	184	12
D..13✳	-	ES(X)040	237	79.5	95	182	258	254	202	11.5
		ES(X)070						250	225	13.5
		ES(X)125						245	223	17.5
D..16✳	-	ES(X)125	294	78.8	95	208.5	311	298	244	19.5
		ES(X)200						291	256	25
		ZS(X)300						262		27
D..18✳	-	ES(X)250	303	78.8	95	208.5	348	307	286	37
		ZS(X)500						277		38.5

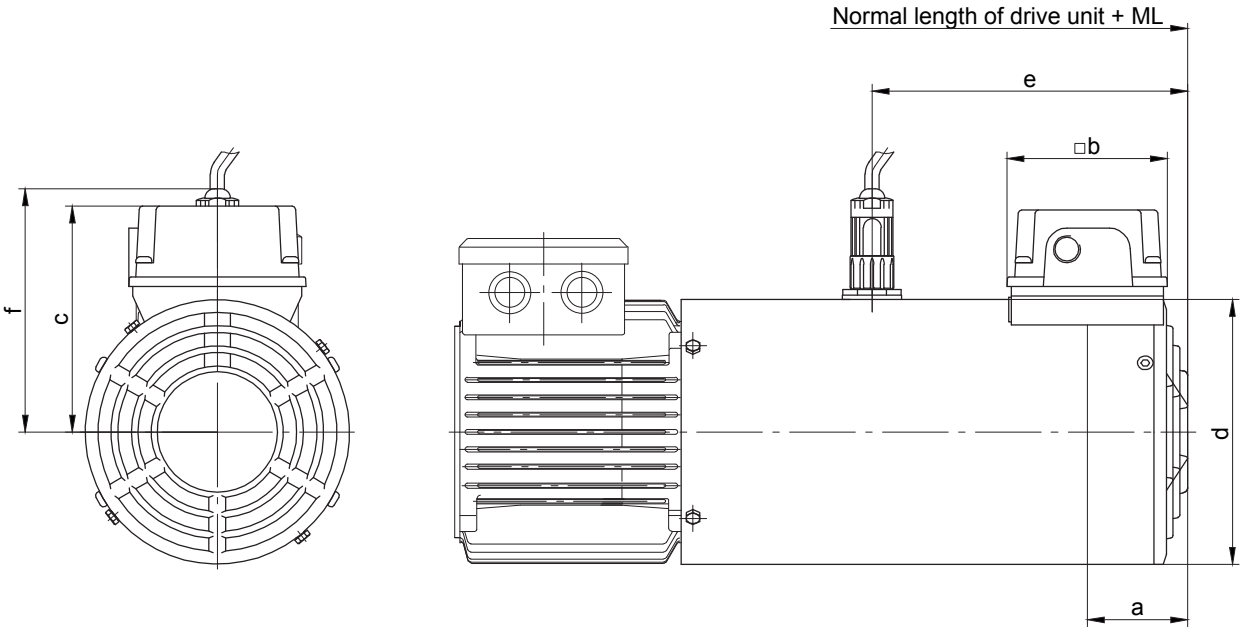
✳ bayonet joint

1) The additional length is for normal motor unit without brake.
Other dimensions see the appropriate normal dimensioned sketch

2) Brake release on request

The actual gearbox design can vary from the geometry shown.

Motors with encoder and built-on independent fan



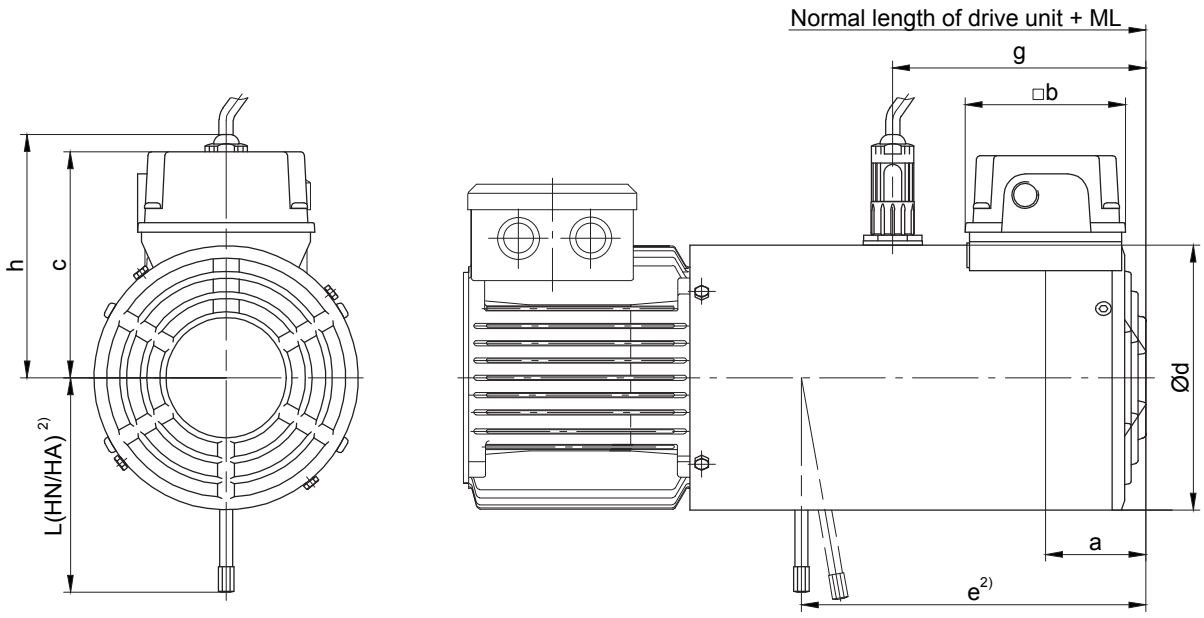
Motor		ML(mm)[1] Additional length with attached encoder and forced ventilation	Dimensions (mm)						Add. weight
ASM	PMSM		a	b	c	d	e	f	~ kg
D..08	S..08	202	59	95	131.5	157	187	144	2.6
D..09	S..09	214	69.5	95	141.5	176	192	153.5	3.3
D..11✳	S..11✳	221	69.5	95	162.5	218	192	-	4.0
D..13✳	-	240	79.5	95	182	258	217	-	5.7
D..16✳	-	294	78.8	95	208.5	311	252	-	7.9
D..18✳	-	303	78.8	95	208.5	348	267	-	10.9

✳ with bayonet joint

1) The additional length is for normal motor unit without brake.
Other dimensions see the appropriate normal dimensioned sketch

The actual gearbox design can vary from the geometry shown.

Motors with brake and encoder with built-on independent fan



Motor ASM	Motor PMSM	Brake	ML (mm) 1) Additional length with attached brake, encoder and forced ventilation	Dimensions (mm) a	b	c	Ød	e 2)	g	h	L(HN/HA) 2)	Add. weight ~ kg
D..08	S..08	ES(X)010	202	59	95	131.5	157	204	150	150	132	6.0
D..09	S..09	ES(X)010	214	69.5	95	141.5	176	220	160	160	132	6.5
		ES(X)027						212	160		162	8.5
D..11✳	S..11✳	ES(X)027	221	69.5	95	162.5	219	226	155	155	162	9.0
		ES(X)040						223	155		172	11.5
		ES(X)070						218	155		184	13.5
D..13✳	-	ES(X)040	240	79.5	95	182	258	254	175	175	202	13
		ES(X)070						250	175		225	15
		ES(X)125						245	175		223	19
D..16✳	-	ES(X)125	294	78.8	95	208.5	311	298	195	195	244	21
		ES(X)200						291	195		256	27
		ZS(X)300						262	195			29
D..18✳	-	ES(X)250	303	78.8	95	208.5	348	207	212	212	286	39
		ZS(X)500						277	212			40.5

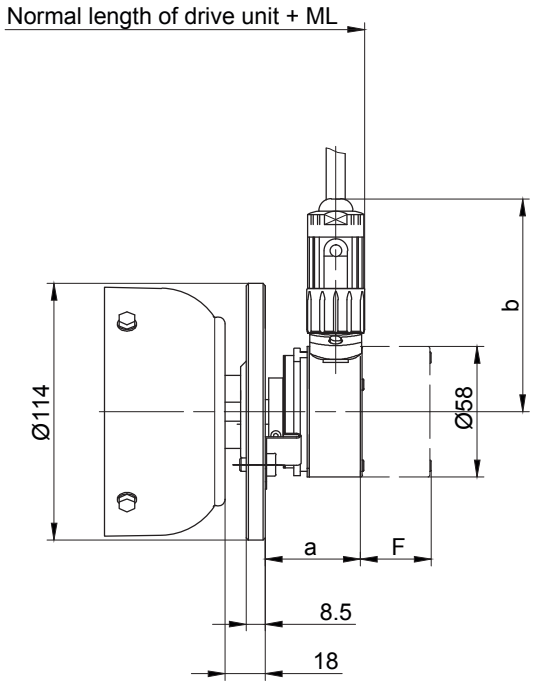
bayonet joint

1) The additional length is for normal motor unit without brake.
Other dimensions see the appropriate normal dimensioned sketch

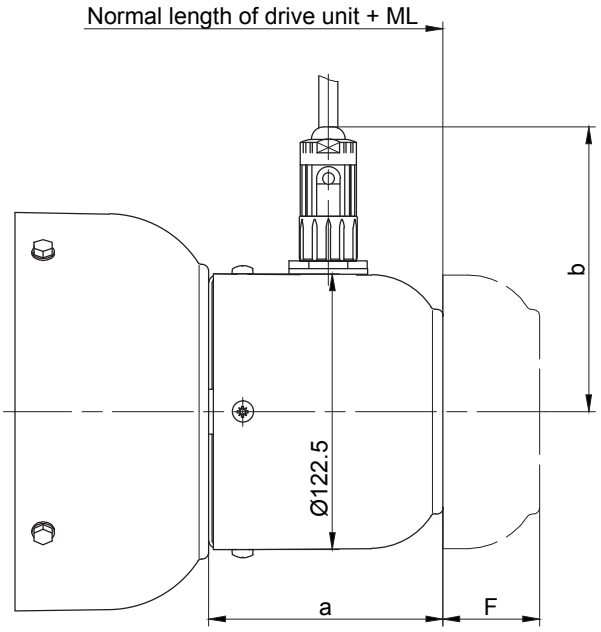
2) Brake release on request

The actual gearbox design can vary from the geometry shown.

Motors with standard encoder



D04

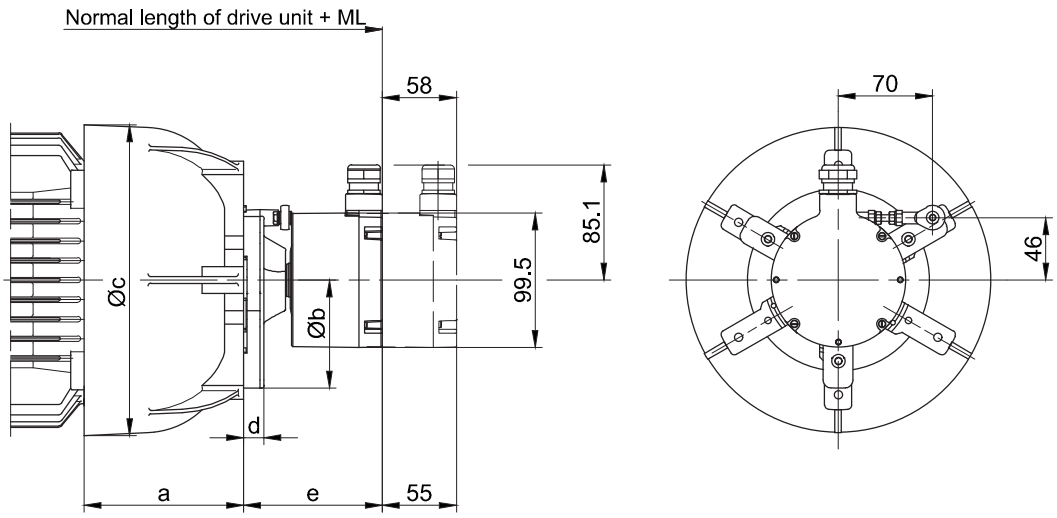


D05-D..18
S05, S..08-S..11

Motor		ML(mm) Additional length with encoder	Dimensions (mm)				Add. weight	Free space for removing encoder "F"	
			incremental encoder Fa. Kübler Typ 5820		absolute encoder Fa. TR Typ CS58-M			incremental encoder Fa. Kübler Typ 5820	absolute encoder Fa. TR Typ CS58-M
ASM	PMSM		a	b	a	b	kg		
D04	-	62.5	43.5	95	69.5	109.5	0.7	30	55
D05	S05	103	98.5	127	98.5	127	0.9	63	88
D06	-								
D07	-								
D..08	S..08	107	107.5		107.5			41	66
D..09	S..09		104		104		0.8	43	68
D..11	S..11								
D..13	-								
D..16	-	108							
D..18	-								

The actual gearbox design can vary from the geometry shown.

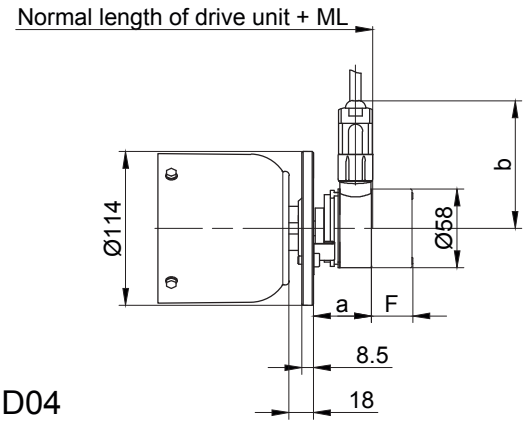
Motors with “heavy duty“ encoder



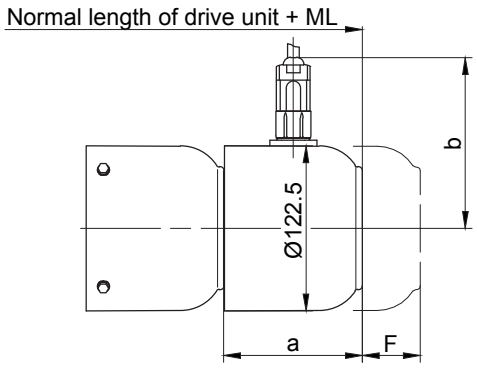
Motor		ML(mm) Additional length with encoder	Dimensions (mm)					Add. weight
ASM	PMSM		a	b	c	d	e	kg
D..08	S..08	114	83.5	160	166	15	102.5	2
D..09	S..09	118.5	102		191			
D..11	S..11	121.5	120		231			5.4
D..13	-	115.5	140	185	274.5	17	94.5	8.6
D..16	-	113.5	155		326			9.6
D..18	-	122.5	183		366			11.5

The actual gearbox design can vary from the geometry shown.

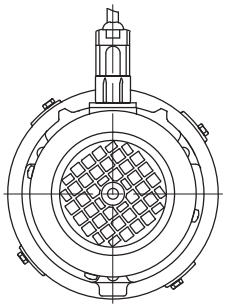
Motors with brake and encoder

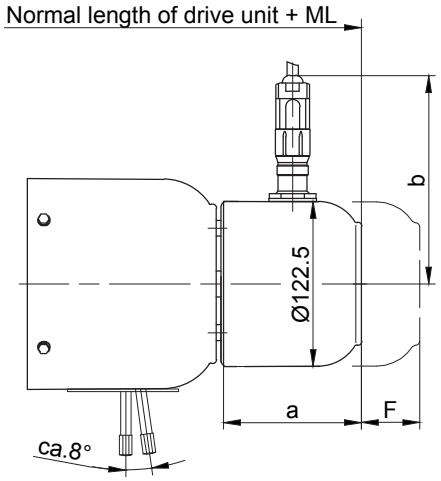


D04



D05-D07
S05



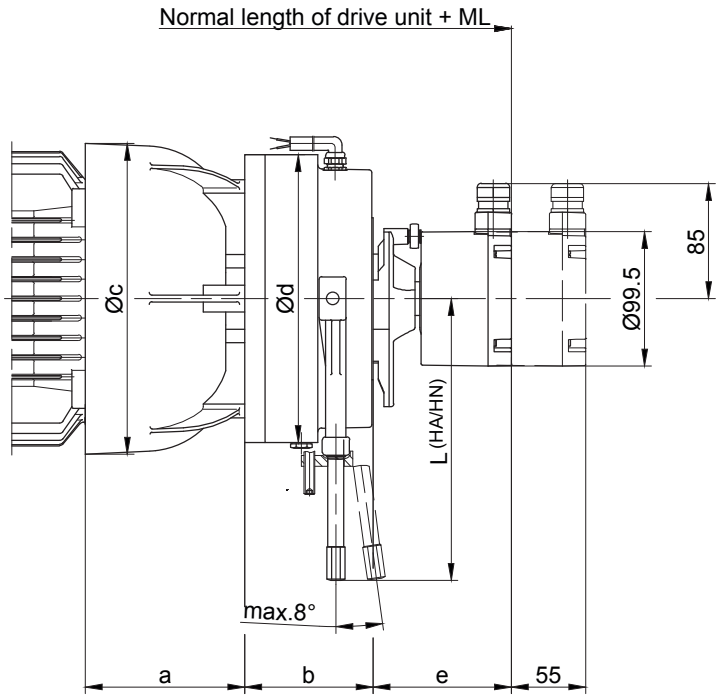


D..08-D..18
S..08-S..11

Motor ASM	Motor PMSM	Brake	ML(mm) Additional length with brake and encoder	Dimensions (mm) incremental encoder Fa. Kübler Typ 5820 a	Dimensions (mm) incremental encoder Fa. Kübler Typ 5820 b	Dimensions (mm) absolute encoder Fa. TR Typ CS58-M a	Dimensions (mm) absolute encoder Fa. TR Typ CS58-M b	Add. weight kg	Free space for removing encoder "F" incremental encoder Fa. Kübler Typ 5820	Free space for removing encoder "F" absolute encoder Fa. TR Typ CS58-M
D04	-	E003	105.5	43.5	95	69.5	109.5	0.7	30	55
D05	S05	E003	145	102	127	102	127	0.9	63	88
D06	-	E003	145	102	127	102	127	0.9	63	88
D07	-	E003 / E004	145	102	127	102	127	0.9	63	88
D..08	S..08	ES(X)..	173.5	102	127	102	127	0.8	49	74
D..09	S..09	ES(X)..	197	102	127	102	127	0.8	49	74
D..11	S..11	ES(X)..	200	102	127	102	127	0.8	49	74
D..13	-	ES(X)..	212	102	127	102	127	0.8	49	74
D..16	-	ES(X).. / ZS(X)..	248	102	127	102	127	0.8	49	74
D..18	-	ES(X).. / ZS(X)..	253	102	127	102	127	0.8	49	74

The actual gearbox design can vary from the geometry shown.

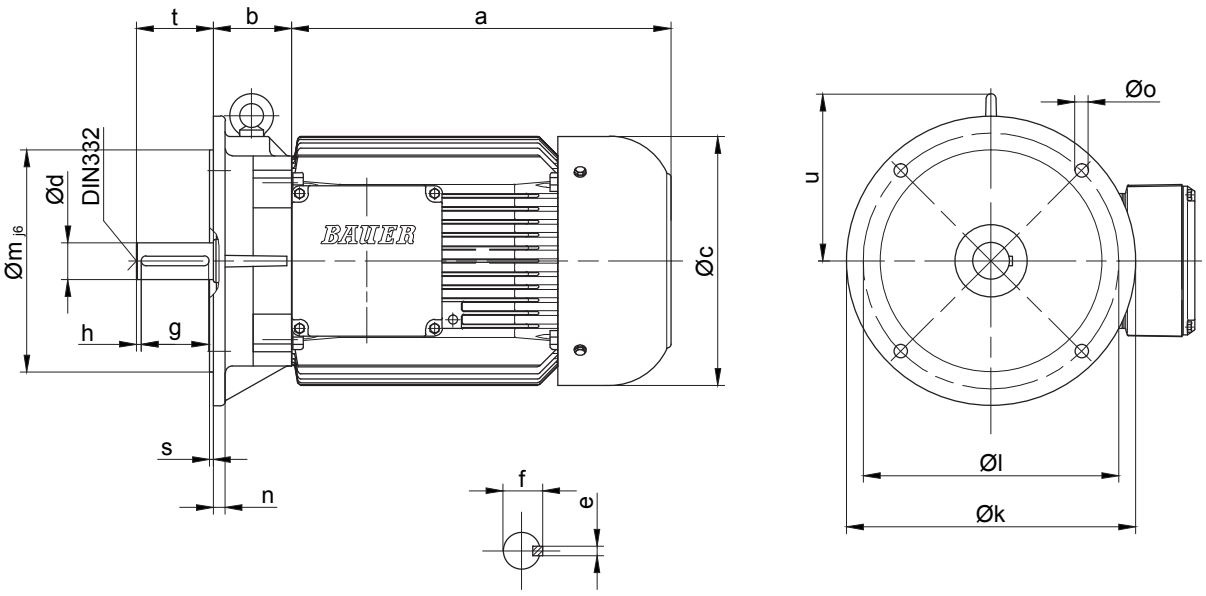
Motors with “heavy duty“ brake and encoder



Motor		Brake	ML(mm) Additional length with brake and encoder	Dimensions (mm)						Add. weight
ASM	PMSM			a	b	c	Ød	e	L (HA/HN)	kg
D..08	S..08	EH(X)027	180.5	83.5	66.5	166	145	102.5	162	7.1
D..09	S..09	EH(X)040	191.5	102	73	191	168		172	10
D..11	S..11	EH(X)125	216.5	120	95	231	213		208.5	21.4
D..13	-	EH(X)200	259	140	106	274.5	245	94.5	221	32
D..16	-	EH(X)400	243	155	124	326	324		313	58
D..18	-		254	183		366				61

The actual gearbox design can vary from the geometry shown.

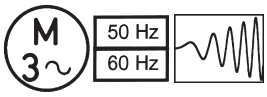
Motors in IEC design



Motor		Dimensions (mm)																Center
ASM	PMSM	a	b	c	d	e	f	g	h	k	l	m	n	o	s	t	u	DIN 332
D06	-	170	45	123	11_{j6}	4	12.5	18	2.5	140	115	95	9	10	2.75	23	-	D4
D07	-	190	45	123	11_{j6}	4	12.5	18	2.5	140	115	95	9	10	2.75	23	-	D4
D..08	S..08	200	49	156	19_{j6}	6	21.5	35	2.5	200	165	130	10	12	3.5	40	-	D4
D..09	S..09	251	66	176	24_{j6}	8	27	40	5	200	165	130	10	12	3.5	50	128.5	D6
D..11	S..11	319	75	218	28_{j6}	8	31	50	5	250	215	180	11	14.5	4	60	145.5	D8
D..13	-	393	81	266	38_{k6}	10	41	70	5	300	265	230	12	14	4	80	173	D12
D..16	-	429	98.5	310	42_{k6}	12	45	90	10	350	300	250	13	18.5	5	110	215.5	D16

The actual gearbox design can vary from the geometry shown.

11



General

ErP Directive 2009/125/EC

Directive 2009/125/EC of the European Parliament and the Council, issued in 2009, specifies requirements for the environmentally responsible design of energy-related products (ErPs). In November 2009 it superseded Directive 2005/32/EC, which formed the framework for requirements for the environmentally responsible design of energy-using products (EuPs). This change has no effect on already proclaimed implementation measures.

From 16 June 2011 onward, new motors or geared motors marketed in the EU must comply with the requirements of **energy efficiency class IE2**. **From 1 January 2015 onward, motors with rated outputs from 7.5 to 375 kW** destined for the European market must comply with **energy efficiency class IE3**, and **from 1 January 2017 onward this requirement also applies to smaller motors rated at 0.75 kW** or more.

Objectives
The ErP Directive has several objectives:

1. **Mitigating the environmental impact of energy-using products**
   This objective is intended to be achieved by the documentation and labelling of products, by regulations for inspection, and by the formulation of individual requirements in implementation measures. As the entire product life cycle is taken into consideration, action must be taken as early as the design phase.

2. **Climate protection**
   Achievement of the EU climate protection objectives is to be supported. This can be implemented by reducing energy consumption and the emission of global warming gasses in the production, operation and disposal of energy-using products.

3. **Harmonised legislation**
   The directive creates a framework for the European regulation of environmental design requirements. This avoids trade impediments resulting from differences in national regulations. This can be achieved by means of the proclamation of legally binding implementation measures for the entire Community and protection of free trade in goods against further-reaching regulations of the Member States.

IEC 60034-30-1

Rotating electrical machines. Efficiency classes of line operated AC motors (IE-Code)

The new edition IEC 60034-30-1 addresses now all types of single speed electrical motors which are rated for a sinusoidal power supply and for mains and constant duty according to IEC 60034-1 or IEC 60079-0. This includes, without any differentiation of the motor technology, single and three phase low voltage motors independent of their rated voltage or frequency together with Line Start permanent magnet motors.

General

Efficiency class designation		Comparison with CEMEP classification	
Efficiency	**Code**	**Efficiency**	**Logo**
Super Premium	**IE4**	**-**	**-**
Premium	**IE3**	**-**	**-**
High	**IE2**	**High**	EFF 1
Standard	**IE1**	**Improved**	EFF 2
Lower than Standard	**No designation**	**Standard**	EFF 3

640/2009/EG

Motors subject to the ErP Directive as specified by the Electric Motors Regulation 640/2009/EC

- → Single-speed, three-phase, 50 Hz and 50/60 Hz
- → 2-, 4- or 6-pole motors
- → Rated output from 0.75 to 375 kW
- → Rated voltage up to 1000 V
- → Duty type S1 (continuous running)
- → For operation directly from the mains (50 Hz or 60 Hz)
- → For Design N motors complying with IEC 60034-12
- → Motors with two switchable rated voltages, under the condition that the magnetic flux is the same with both voltages
- → Geared motors
  The new Electric Motors Regulation has a broader scope than the standard previously used in Europe.

Motors excluded from the regulation

- → Motors exclusively manufactured for converter operation in accordance with IEC 60034-25
- → Pole-changing motors
- → Motors fully integrated into a machine (such as pumps, fans and compressors) that cannot be tested separately from the machine
- → At altitudes exceeding 4000 meters above sea-level
- → Where ambient air temperarures exceed 60°C
- → Where ambient air temperarures are less than -30 °C
- → From 16 June 2011 onward: IE1 motors for none S1 duty destined for the European market
- → Explosion-proof motors (explosion protection has higher priority)
- → Brake motors
- → as from 2015/2017, IE2-Motors for use with variable speed drives (Additional name plate)

Example :

Method for determining motor efficiency according to IE 60034-2-1

Individual loss method
Additional losses using the residual loss method
Low measurement uncertainty

General

Bauer geared motors for connection to three-phase supply are supplied with specially designed induction motors. This design ensures maximum operating safety with high breakaway torque and minimum starting current.

The torque/speed characteristic is largely free of torque dips. Torque is optimised to suit requirements and application parameters. See "www.bauergears.com" for more information.

Torques

The torques as stated in the selection tables are fully available at the output shaft. These figures apply for continuous operation (S1-100%) at a maximum ambient temperature of 40° C and at site elevations up to 1000 m above sea level. Drives for higher ambient temperatures and site elevations are available on request. Gear efficiencies, which are lower than the usual values for spur gears, are taken into account in the torques listed in the selection tables.

Line voltages

BAUER motors are available as standard for the following three-phase line voltages:

Motor size	Standard voltages:
D04LA4 - D09XA4	220 V Δ / 380 V Y 50 Hz
0,06 - 2,2 kW	230 V Δ /**400 V Y 50 Hz* (anm-iec38)**
	240 V Δ / 415 V Y 50 Hz**
	440 V Y / 60 Hz
	460 V Y / 60 Hz
from D11SA4	220 V Δ / 380 V Y 50 Hz
from 3,0 kW	230 V Δ / 400 V Y 50 Hz
	240 V Δ / 415 V Y 50 Hz**
	440 V Y / 60 Hz
	460 V Y / 60 Hz
	380 V Δ / 660 V Y 50 Hz
	400 V Δ / 690 V Y**50 Hz***
	415 V Δ / 50 Hz**
	440 V Δ / 60 Hz
	460 V Δ / 60 Hz

*Voltage recommended world-wide by IEC 38 and in Europe by CENELEC.
**= Insulation Class F is necessary.

Designs for other voltages available on request and at extra cost.

Unless otherwise specified, motors for operation in conjunction with frequency converters with a 50 or 60 Hz frequency have a Y-circuit to optimise operating noise and winding load.

Unless otherwise stated, the tolerance for the rated voltage is +/- 5 %, in accordance with IEC 60034-1.

The D04 to D18 motors in 4 pole design can be operated within a tolerance of +/- 10 % of the rated voltage (400 V 50 Hz).

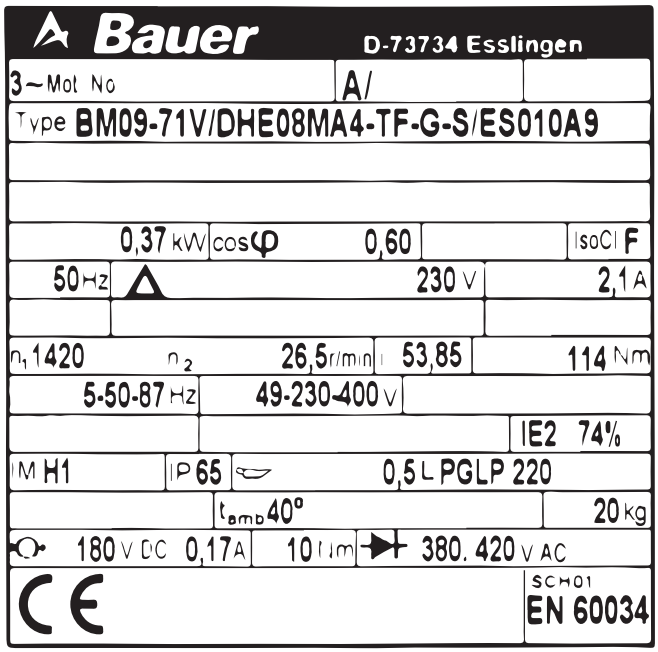
General

Line frequencies

All motors are available with the same power ratings for either 50 or 60 Hz . Increased power models are available on request.

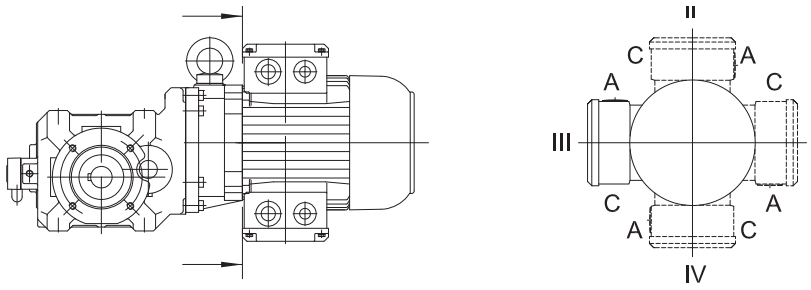
Rating plate

Bauer geared motors are supplied with a corrosion-proof rating plate as standard. The standard rating plate is made of special plastic tried and tested in many years of practical use and approved for hazardous areas by the Physikalisch-Technische-Bundesanstalt (PTB).



Terminal box

The cables of motors with and without brakes can be introduced into the motor terminal box from side A or side C.



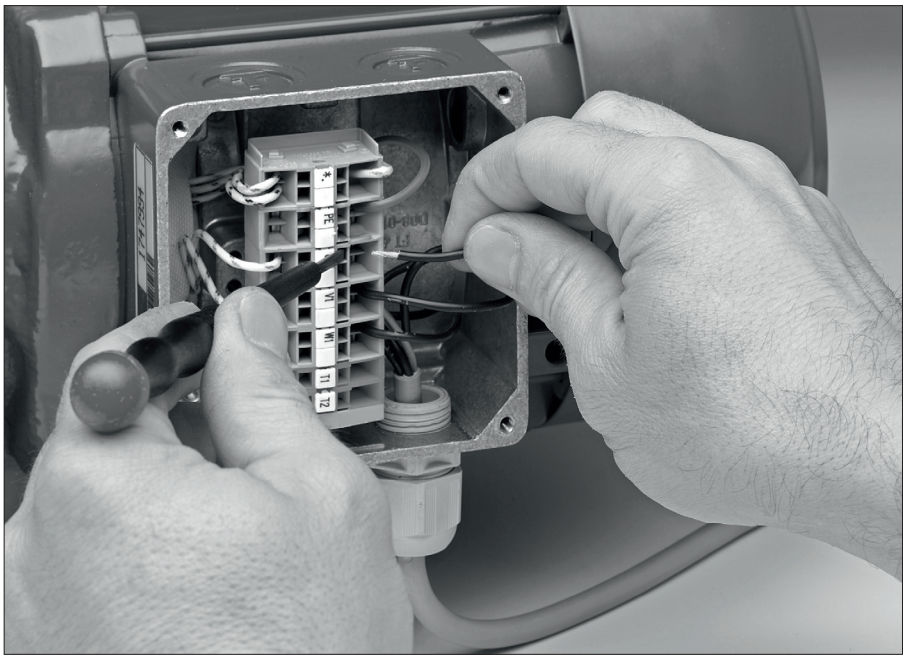
The standard position for the motor terminal box is shown in the dimensional drawings for the geared motors (see chapter 10,11,12 and 13). The terminal box can be installed at any of 3 other positions on request, if on-site space is restricted. The 4 possible positions are 90° offsets around the axis of the motor (dimensional drawing and designation for standard terminal box, see chapter 17 “Dimensional drawing standard terminal box”).

Cast-on terminal boxes (KAG) are supplied with knock out entries with metric nut for cable gland. Screw- on terminal boxes (TBI...4 are supplied with a metric screw thread as standard.

General

Motor connections

The electrical connection of gear motors is time consuming and creates costs, which cannot be neglected both during initial installation and in service cases. These costs are reduced considerably by the use of BAUER Gear Motors, have CAGE CLAMP® connection technology instead of the conventional terminal block – and that without extra charge.



What are the advantages for you ?

Cost reduction during connection
Public timing test have confirmed, that the electrical connection of a cable by means of CAGE CLAMP® technology saves up to 75% working time compared with the classic screw connection.

Simple Handling
Cable connection from the top, very easily accessible: The CAGE CLAMP® spring is pressed, and the cable inserted from the front, i.e. in the field of vision of the installation engineer.

Which cable core diameters ?
Suitable for all copper wires from 0,5 mm^2 to 25 mm^2.

Cost saving in material and tooling
- multicore cable ends, cable eyes or cable ring eyes are no longer needed
- Tools such as crimping pliers are no longer needed
- Inadvertently over tightening or breaking of the terminal bolts and the procurement of a new terminal block belong in the past.
- Searching and procurement of nuts and washers for the terminal blocks, which have fallen down, also belongs in the past.

Vibration and shock resistant
Vibration and shock result neither in conductor damage nor in a measurable contact interruption. The connection is service free.

Type of conductors
The CAGE CLAMP®-connector can clamp fine stranded, stranded and solid cores wires.

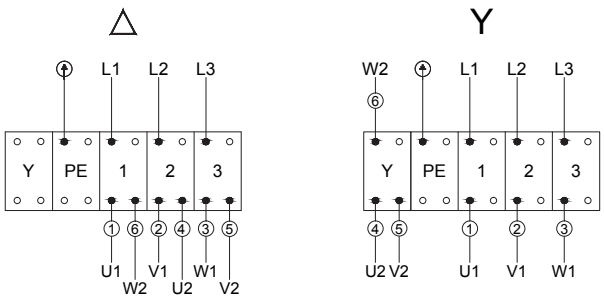
General

Terminal connections for single speed motors without motor protection

Standard connection of three phase motors without motor protection via CAGE CLAMP®.

D04 ... D..09

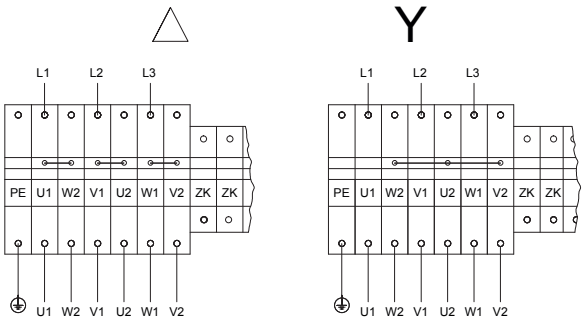
Three Phase motor means of CAGE CLAMP ®



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	U1 V1 W1 U2 V2 W2	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
△	Connections for the low rated voltage (e.g.: 230 V)		
Y	Connections for the high rated voltage (e.g.: 400 V)		

D..11 ... D..18

Connection of three phase motor via CAGE CLAMP



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	U1 V1 W1 U2 V2 W2	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
△	Connections for the low rated voltage (e.g.: 230 V)		
Y	Connections for the high rated voltage (e.g.: 400 V)		
ZK	Optional additional connection		

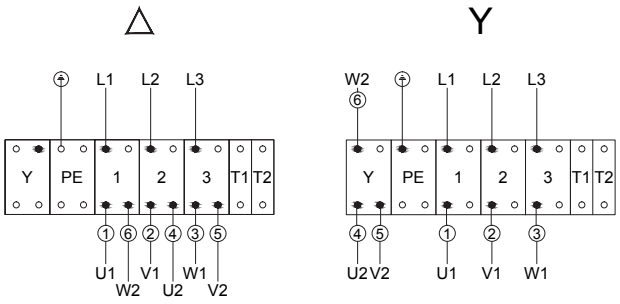
General

Terminal connections for single speed motors with motor protection

Standard connection of three phase motors with motor protection via CAGE CLAMP®.

D04 ... DO..09

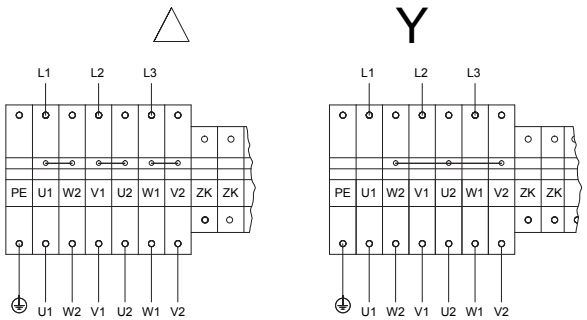
Three Phase motor and thermal protection connection by means of CAGE CLAMP®



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	U1 V1 W1 U2 V2 W2	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
△	Connections for the low rated voltage (e.g.: 230 V)		
Y	Connections for the high rated voltage (e.g.: 400 V)		
T1 T2	Thermal motor protection		

D..11 ... D..18

Connection of three phase motor via CAGE CLAMP



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	U1 V1 W1 U2 V2 W2	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
△	Connections for the low rated voltage (e.g.: 230 V)		
Y	Connections for the high rated voltage (e.g.: 400 V)		
ZK	Optional additional connection		

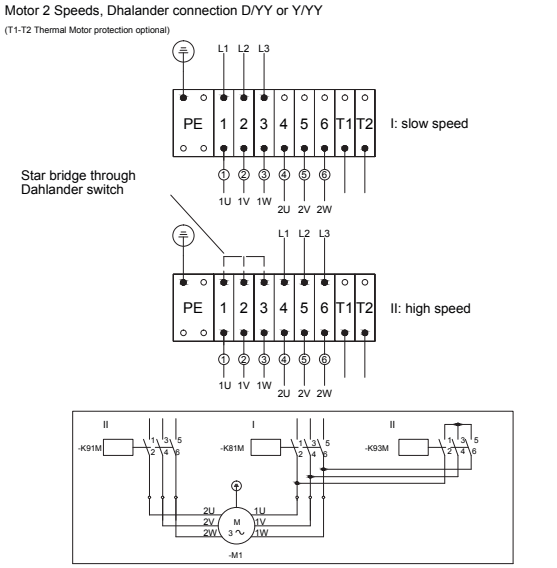
11

General

Terminal connections for pole changing motors in Dahlander connection (Δ/YY or Y/YY)

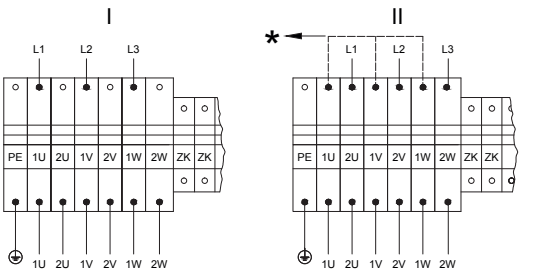
Standard connection of three phase motors without motor protection via CAGE CLAMP®.

D04 ... D..09, S04...S09



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	1U 1V 1W 2U 2V 2W	T1 T2 T3 T5 T6 T4	black blue brown yellow red violet
I	Low speed		
II	High speed		

D..11, S11



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	1U 1V 1W 2U 2V 2W	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
I	Low speed		
II	High speed		
ZK	Optional additional connection		
*	Star point over Dahlander Relay		

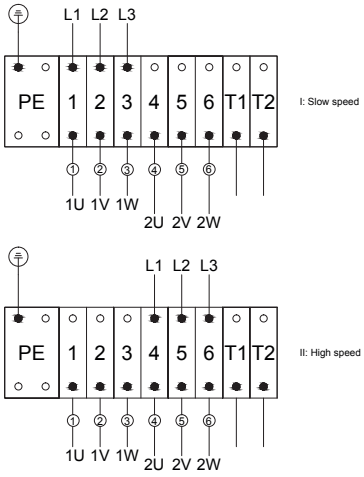
General

Terminal connections for pole changing motors with two separate windings (Y/Y or Δ/Δ)

Standard connection of three phase motors with motor protection via CAGE CLAMP®.

D04 ... D..09, S04...S09

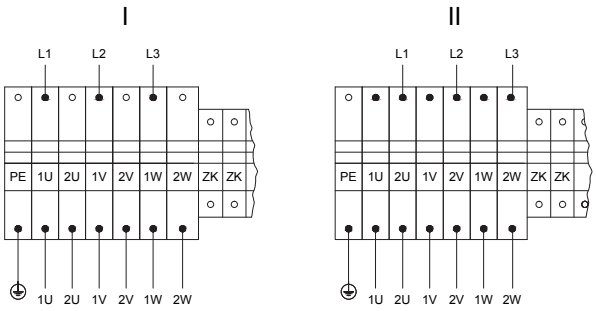
Pole change motor
2 Speeds, 2 windings Y/Y or D/D
(T1-T2 Thermal Motor protection optional)



	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	1U 1V 1W 2U 2V 2W	T1 T2 T3 T11 T12 T13	black blue brown yellow red violet
I	Low speed		
II	High speed		
T1 T2	Thermal motor protection		

D..11, S11

Connection of three phase motor via CAGE CLAMP
Pole changing for 2 speeds; separate windings Y/Y or Δ/Δ



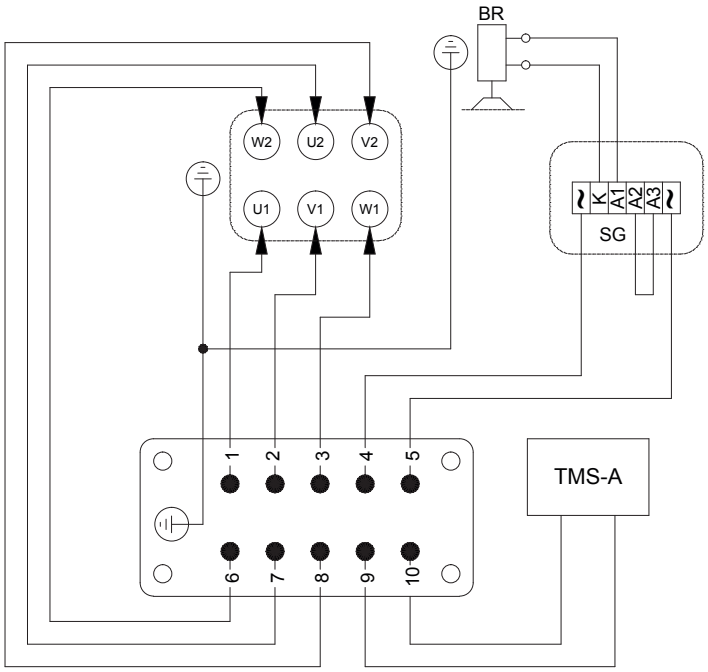
	IEC / EN 60034-8	NEMA MG 1	Colour
Supply lines	L1 L2 L3	L1 L2 L3	
Motor winding	1U 1V 1W 2U 2V 2W	T1 T2 T3 T4 T5 T6	black blue brown yellow red violet
I	Low speed		
II	High speed		
ZK	Optional additional connection		

General

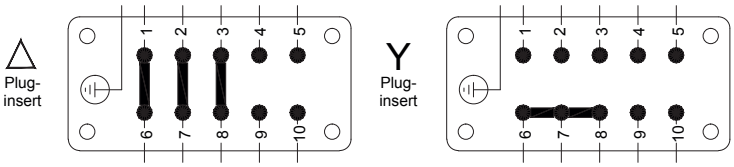
Plug-and-socket connection

D06 to D..16 Bauer motors are available with plug-in motor connection. The socket housing is mounted on the fan-cowl side of the terminal box as standard. This layout minimises the protrusion caused by the plug.
The standard plug-and-socket type connection incorporates the attachment housing, pin insert and cover. Grommet-type housings and jack inserts are available on request at extra cost. Pin assignments on request (dimensional drawing, see chapter 17 "Dimensional drawing, plug-connector terminal box").

A design with single clamp lever according to the DESINA regulation of the „Verbandes Deutscher Werkzeugmaschinenhersteller" (VDW) is also available.



△- or Y-Connection in the plughousing or installation cabinet is performed by the machine manufacturer.



Han 10ESS

Caution !

Motor shaft rotates clockwise for this connection (A-side).
The rotation of the gear shaft is depent on the gear design.

The motors are also available with a low-cost round plug connector as an alternative. This is fitted at the factory in the standard terminal box and is also suitable for brake connection, thermistors and thermostats. Additional information on request.

Bauer motors from D08 with motor-mounted brake are also available with plug-in brake connection. This means that if it requires attention, the brake can be replaced on site with no loss of time.

General

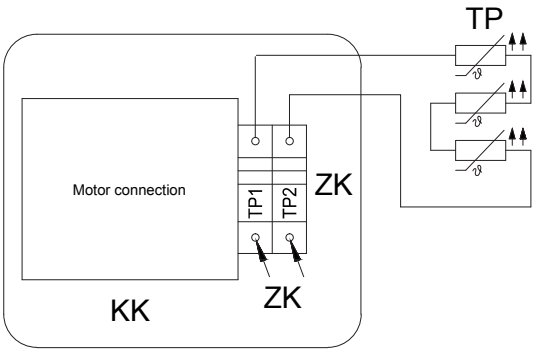
Motor protection

Each geared motor requires a current-dependent motor protection switch or an overcurrent relay with thermal delay in the switchgear to protect the motor windings. The rated motor currents required for settings are stated in the order acknowledgment. Thermal protection for the winding is recommended as an additional safety measure for special operating conditions (short-time or intermittent periodic duty, high switching frequency, severe voltage fluctuations or restricted cooling) and for operation in conjunction with a frequency converter.

Thermistors (PTC)

Thermistors are temperature-dependent resistors which are fitted in each phase winding. In conjunction with a motor protection switch, they ensure optimum protection for the winding in the event of rapid temperature rise. Characteristic to DIN 44081 and "Mark A" to IEC 34-11-2. Thermistors are available for all motors at extra cost. The requisite monitoring device is not included in the scope of supply.

Thermal motor protection with PTC-thermistors



KK	Terminal box
ZK	Additional terminals
TP	PTC-thermistors DIN 44081/IEC 34-11-2 Mark A
TCU	Connection of thermistor control unit EN 60947 Max. permissible testing voltage 2,5 VDC / thermistor in case of with auth. certificate:

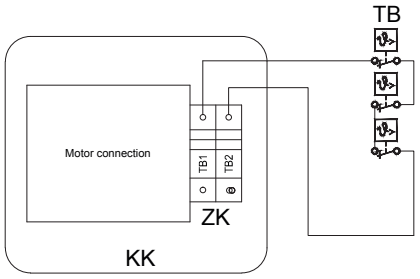
The location of the additional terminals in the drawing is not necessarily identical with the actual arrangement.

General

Thermostatic protection

Bimetal switches are used for slow-acting, independent temperature monitoring and are embedded in each winding section of the motor.
The bimetal disc is sized such that when the temperature rises above a specific, previously set value, the disc suddenly snaps from a convex state to a concave state and the contact moves vertically away from the contact plate. In this state the switch is either open (normally closed switch) or closed (normally open switch). A significant temperature change is necessary to allow the bimetal disc to independently snap back to its initial position. When it does, the switch is again closed (normally closed switch) or open (normally open switch). Thermal protection switches are available for all motors at additional cost. For technical reasons, this option is not recommended for large motors (D11 to D18).

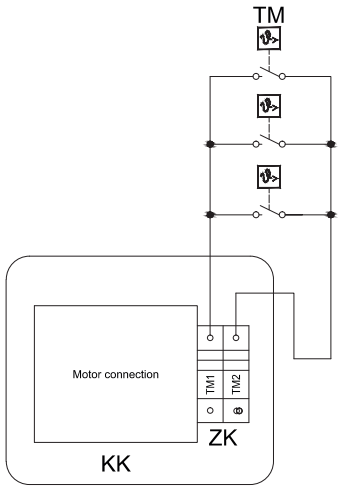
Thermal motor protection with thermostats
(with normally closed contacts)



KK	Terminal box
ZK	Additional terminals
TB	Thermostats with normally closed contacts max. 250VAC 1,6A

The location of the additional terminals in the drawing is not necessarily identical with the actual arrangement.

Thermal motor protection with thermostats
(with normally opened contacts)



KK	Terminal box
ZK	Additional terminals
TB	Thermostats with normally closed contacts max. 250VAC 1,6A

The location of the additional terminals in the drawing is not necessarily identical with the actual arrangement.

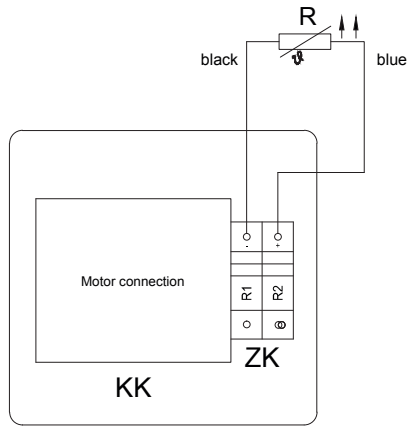
General

KTY sensors

KTY sensors with heat-shrink insulation can be used to measure and monitor critical surface temperatures and internal temperatures of motors and machines. These sensors are suitable for use in harsh industrial environments in all places where accurate measurements with a single sensor are required. KTY sensors are available for all types of motors at additional cost.

Working principle: KTY sensors are temperature-dependent components. The resistance of the KTY sensor increases when its temperature rises. The characteristic curve is nearly linear in the sensor's measuring range; the reference resistance (at 100 °C) is 970 to 1030 ohms.

Resistance temperature sensor KTY84-130SH



KK	Terminal box
ZK	Additional terminals
R	Resistance temperature sensor

The location of the additional terminals in the drawing is not necessarily identical with the actual arrangement.

General

PT100 sensors

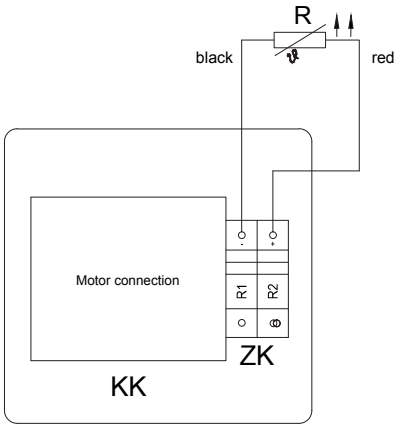
Precise monitoring of motor temperatures is necessary in many fields of industry. Pt100 sensors feature high accuracy, short response time and long-term stability, and they are suitable for use over a wide range of temperatures. Pt100 sensors are available for all motor types at additional cost.

Specifications

Nominal resistance: 100 Ω at 0 °C

The resistance characteristics are specified in EN 60751.

Resistance temperature sensor PT 100



KK	Terminal box
ZK	Additional terminals
R	Resistance temperature sensor

11

The location of the additional terminals in the drawing is not necessarily identical with the actual arrangement.

General

Insulation

The gearmotors described in the selection tables of this catalogue with the motor sizes D04, D05, D06, D08, D..09S and D..09L are executed in insulation class B. Temperature class F is available on request at extra cost.
4-pole motors D07 and D..09XA4 (2.2 kW) to D..18XA4 (30 kW) and all multi-speed motors are rated in Temperature Class F as standard.
Insulation Class F bestows the winding a multiple protection against high humidity, acidic gases and heavy tropical influences while making the same shock resistant and more resistant to heat. Protection against insects (termites) is guaranteed through the complete enclosure (IP65) as long as the mains cables are encased in metal.

Degree of protection

Bauer motors from motor size D06 are manufactured to IP65 degree of protection as standard. Motor sizes D04 and D05 have smooth housings, degree of protection IP 54, on request in IP65 at extra cost. The motor terminal box is always IP 65.

Special corrosion protection

If high requirements for corrosion resistance are required, the geared motors are available with three levels of enhanced corrosion protection:

CORO1: Finished with two-component paint to protect against chemically aggressive gases and vapours.

CORO2: External paint as CORO1. In addition, sheet steel fan cowl with coating. The screws for the terminal-box cover are non-rusting steel.

CORO3 with IP 66: Available from motor size D06. Corrosion protection as CORO2. All motors manufactured within Temperature Class F. Terminal box compartment separated from motor interior by cast resin. Threaded cable entries and mating faces have special seals. See Bauer special imprint SD1 for more information.

Speed of output shaft

The rated speeds in the selection tables are guidelines for load at rated power. Speed can vary depending on degree of load and temperature (particularly in the case of relatively small motors). Combination gear units for lower speeds are available on request.

Notes on design

Use the torque required at the lowest operating speed to select motors for applications which require constant torque over the entire speed range, as is the case, for example, with lifting gear and conveyors. Bear in mind, too, the possibility of torque being lower in the field-weakening range.

Use only the torque required at the highest operating speed to select motors for applications which require square-law torque over the speed range, as is the case, for example, with pumps and fans. Field weakening is not permissible.

The motor's power is frequency-dependent. It can be approximated in kW from torque M in Nm, the 50 Hz or 60 Hz speed n and the frequency f in Hz by means of the equation

$P = M \times n / 9550 \times f/50$
or
$P = M \times n / 9550 \times f/60$

If a frequency inverter is used in conjunction with a pulse generator, the full 50 Hz or 60 Hz rated torque is available as holding torque at motor standstill (independent fan required for prolonged periods at standstill). In many instances, however, a mechanical brake is necessary for holding a position exactly or for safety reasons.

General

The use of thermistors for the thermal protection of the motor winding for frequency inverter duty are strictly recommended (available at extra cost for all motor sizes).

Increased torque with reduced duty factor

A reduction in duty factor increases the torque available at the low end of the frequency range (up to the transition frequency for field weakening) in accordance with the factors in the table below:

Duty factor	Motor torque with reduced duty factor	Increase in current requiremen-tapproximate
100 %	-	-
60 %	1,15 x S1 torque	1,15 x S1 current
40 %	1,30 x S1 torque	1,30 x S1 current
25 %	1,45 x S1 torque	1,45 x S1 current
15 %	1,60 x S1 torque	1,60 x S1 current

This, in turn, means that short-term overload by a factor of 1.6 is permissible for starting from a low speed, for example. An increase in torque in the field-weakening range due to a reduction in duty factor is possible only under certain conditions; the 1.6x S1 torque generally cannot be achieved

Increased torque with external fan

If an independent fan is used, the S1- torque in the lower frequency range (below 30 Hz) need not be reduced, i.e., when it has an independent fan the motor can provide the 50 Hz or 60 Hz rated torque throughout the entire frequency range to the cut-off frequency of the field weakening.

With a high quality frequency inverter of 160%, when independent ventilation is combined with a reduced duty factor the 50 Hz or 60 Hz torque is available from rest through to the transition frequency of the field weakening range.

External ventilation is available for motor types D08 and larger (see chapter 16 "Motor-independent fan (FV)). In many instances, a more economical alternative is to select a larger motor without external ventilation.

Energy-saving function

High quality frequency inverters reduce voltage in part-load operation to lower the motor current and thus improve efficiency. This converter function emulates the method of operation of commercially available "energy-saving devices".

Regeneration

By decreasing the voltage, the high grade frequency converter reduces the motor current, thereby enhancing efficiency. Inverter functions such as these are fundamental to the operation of the 'energy-saving devices' currently found on the market. As with motor torque, an increase in regenerative torque with reduced duty factor is permissible.

Notes on operation with other-make frequency inverters

The precondition is that the motor current generated by the frequency converter is largely free of harmonics. The harmonics generated in the motor by some old-style frequency inverters result in additional losses and cut available torque by some 10% across the entire frequency range. There is also a risk of oscillation causing damage to the gear unit.

At frequencies below approximately 5 Hz, operation without pulse generators is possible only using a frequency inverter with state-of- the-art control. If frequency inverters are used that do not feature load-dependent frequency and current adjustment, the increase in the motor's current consumption means that, particularly in the case of small motors (D04-D..09), torque has to be reduced at frequencies below approximately 10 Hz even if an external fan is used or the duty factor is reduced. Regenerative operation is possible only under certain circumstances.

General

Explosion protection

The **gearboxes** described in this catalogue are suitable for use in explosive areas of Zones 1, 2, 21 and 22. An **EC-Declaration of Conformity** can be supplied on request; it is based on a "ignition hazards assessment report" which has been registered with a notified body (PTB). The explosion class of the associated **motors** are designated according to the Zone in which they should be used and according to the Method of use (e.g. use on inverter). The motor parts are partly larger or – for explosion proof – differently designed compared with the standard design shown in this catalogue. The modular system shown in section 3 allows, in most cases, the gear sizes and the connection dimensions to be maintained.

ATEX

The term ATEX is derived from Atmosphères explosibles. The designation 95 and 137 are based on a new numbering of the articles of the first contract of the foundation of the EU. **ATEX 95:** Directive 94/9/EC on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres; binding for **placing on the market** since 01.07.2003
ATEX 137: Directive 1999/92/EG on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres; binding for use in new installations since 01.07.2003 and binding for existing installations to comply with the requirements from 01.07.2006.
For Safety Instructions for the use of explosion protection geared motors, see the operating instructions BA170… .

Scope of supply

Geared motors suitable for use in explosive areas:

GAS	Zones 1, 2		
DUST	Zones 21, 22		
DXD	Zone 1,	II 2 G Ex d(e) IIC T3…T4 Gb	0,12… 75 kW
DXE	Zone 1,	II 2 G Ex e IIC T1…T4 Gb	0,12… 11 kW
SXE	Zone 1,	II 2 G Ex e IIC T1…T4 Gb	0,55 … 15 kW
DXN	Zone 2,	II 3 G Ex nA IIC T3 Gc	0,03… 30 kW
DXC	Zone 21,	II 2 D Ex tb IIIC T160°C IP66 Db	0,03… 30 kW
DXC	Zone 21,	II 2 D Ex tb IIIC T120°C IP66 Db	0,03… 22 kW
SXC	Zone 21,	II 2 D Ex tb IIIC T120°C…160°C IP66 Db	
DXS	Zone 22,	II 3 D Ex tc IIIC T120°C…160°C IP65 Dc	0,03… 30 kW
DXD	Zone 1/21,	II 2 G Ex d(e) IIC T3…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP65 Db	0,12… 75 kW
DXE	Zone 1/21,	II 2 G Ex e IIC T1…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP66 Db	0,12… 11 kW
SXE	Zone 1/21,	II 2 G Ex e IIC T1…T4 Gb	
		II 2 D Ex tb IIIC T120°C…160°C IP66 Db	0,55… 15 kW
DXS	Zone 2/22,	II 3 G Ex nA IIC T1…T3 Gc	
		II 3 D Ex tc IIIC T120°C…160°C IP65 Dc	0,03… 30 kW

Frequency converters

Frequency converters used must comply with the requirements set out in the EC Type Examination Certificate.
For the corresponding motor type, the EC Type Examination Certificate contains the maximum possible torques depending on the frequency, the corresponding rated current, converter settings and other requirements for the converter.
The pulse voltage at the motor terminals must be limited to a maximum permissible pulse voltage of 1,556 V (2 x √2 x 550 V) by selecting a suitable frequency converter and/or using filters.
The maximum permissible frequency converter input voltage is 500 V

Protective device

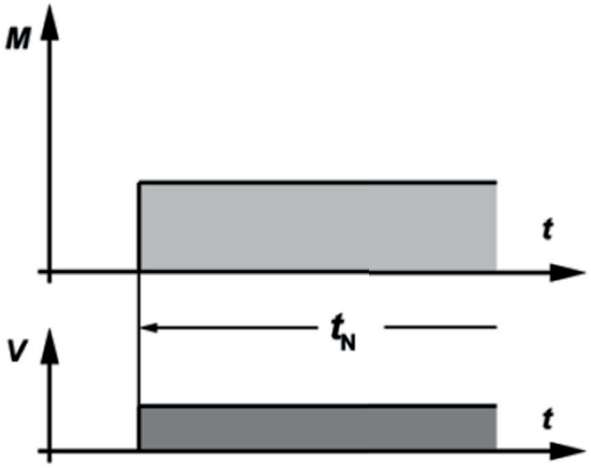
The motor is protected against unacceptable heating by the defined frequency converter setting, as well as by the integrated thermistor sensor in accordance with DIN 44081 / 44082 Response temperature **140°C**. Analysis of the built-in thermal winding protection must be done by using a trip unit with Ex-mark II (2) G or II (2) D that fulfils the requirements of Directive 94/9/EC.

Duty types as defined by EN 60034

General

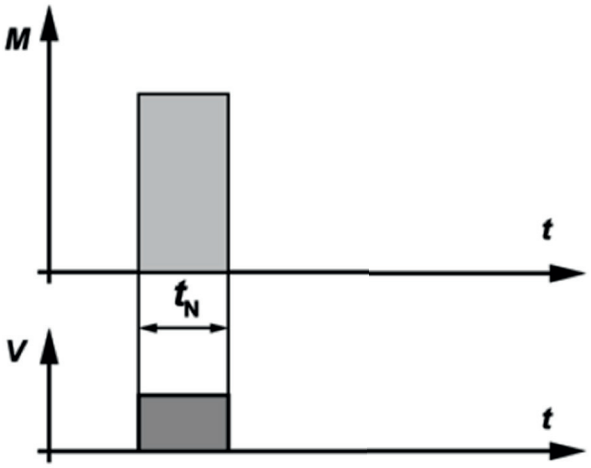
#Aside from special drives (such as lifting equipment), standard motors are always designed for continuous running duty. If the drive is operated with frequent on/off cycles, it may be necessary to select a larger motor with a special design. On the other hand, with pronounced short-time duty it is often possible to select a smaller model. **For this reason, it is technically necessary or economically advantageous to inform the motor manufacturer of any duty type that differs from continuous running.**

Continuous running duty (S1)



Operation under rated load for sufficient time to allow temperature equilibrium to be attained, such that the temperature does not increase any more with continued operation. The equipment can operate continuously under the rated load without exceeding the allowable temperature.

Short-time duty (S2)

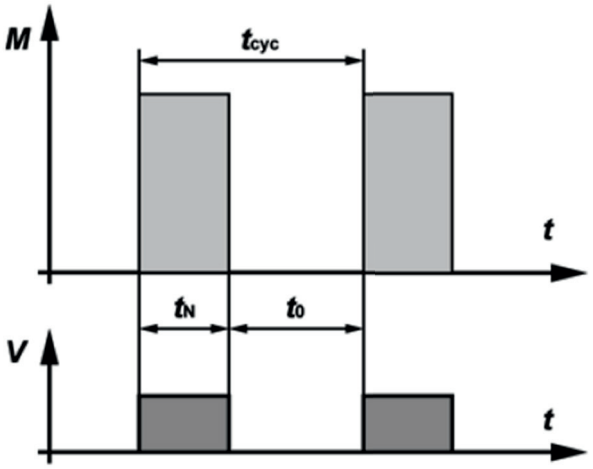


The operating time under rated load is short compared with the subsequent rest period. The standard operating times are 10, 30, 60 and 90 minutes. The equipment can operate for this period under the rated load without exceeding the allowable temperature.

Example: S2 – 60 min

Duty types as defined by EN 60034

Intermittent periodic duty (S3)



S3 duty consists of a sequence of identical cycles, each composed of an operating time with constant load and a rest time with the windings de-energised. The cycle is such that the starting current does not significantly affect the temperature rise. The operating time under rated load and the subsequent pause are both short. The equipment can operate under load only during the period indicated by the duty cycle as a percentage of the total cycle time (cycle duration).
The standardised duty cycles are 15, 25, 40 and 60%. The cycle duration is 10 minutes unless otherwise specified.

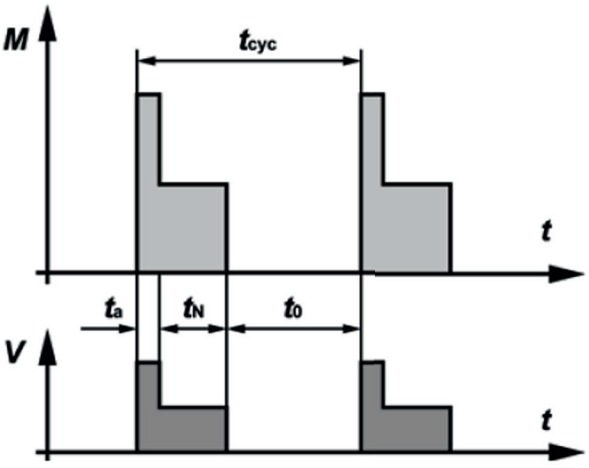
Intermittent periodic duty means that a state of thermal equilibrium is not reached during the load interval.

The duty cycle can be determined as follows:

$$ED = \frac{t_N}{t_{cyc}} \times 100\% = \frac{t_N}{t_N + t_0} \times 100\%$$

Example: S3 – 25%

Intermittent periodic duty with starting (S4)



Duty types as defined by EN 60034

S4 duty consists of a sequence of identical cycles, each of which is composed of a distinct starting time, a time of operation under constant load, and a rest period with the windings de-energised.

The operating time under rated load and the subsequent pause are both short. The equipment can operate under load only during the period indicated by the duty cycle as a percentage of the total cycle time (cycle duration).

The standardised duty cycles are 15, 20, 40 and 60%. The cycle duration is 10 minutes unless otherwise specified.

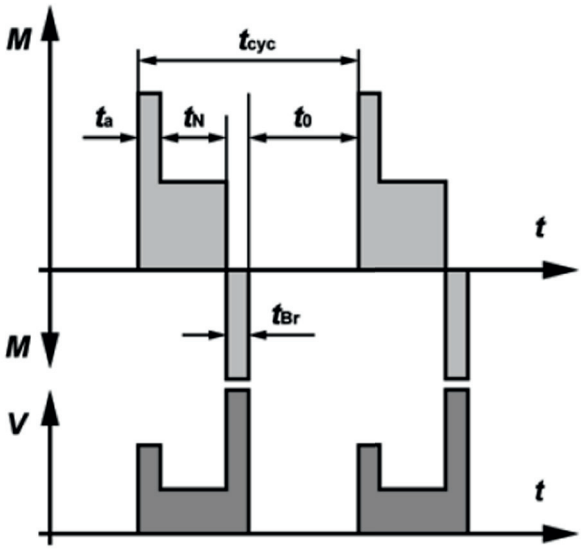
The load cycle corresponds to mode S3, but with additional heating during the starting time that must be taken into account.

The duty cycle can be determined as follows:

$$ED = \frac{(t_a + t_N)}{t_{cyc}} \times 100\% = \frac{t_a + t_N}{t_a + t_N + t_0} \times 100\%$$

Example: S4 – 25%, $J_M = 0.15$ kgm²

Intermittent periodic duty with electric braking (S5)



S5 duty consists of a sequence of identical cycles, each of which is composed of a starting time, a time of operation under constant load, a time of fast electric braking, and a rest period with the windings de-energised.
The operating time under rated load and the subsequent pause are both short. The equipment can operate under load only during the period indicated by the duty cycle as a percentage of the total cycle time (cycle duration).
The standardised duty cycles are 15, 20, 40 and 60%. The cycle duration is 10 minutes unless otherwise specified.

The load cycle corresponds to S3 duty, but with additional warming during the starting time t_a and the braking time t_{Br} taken into account.

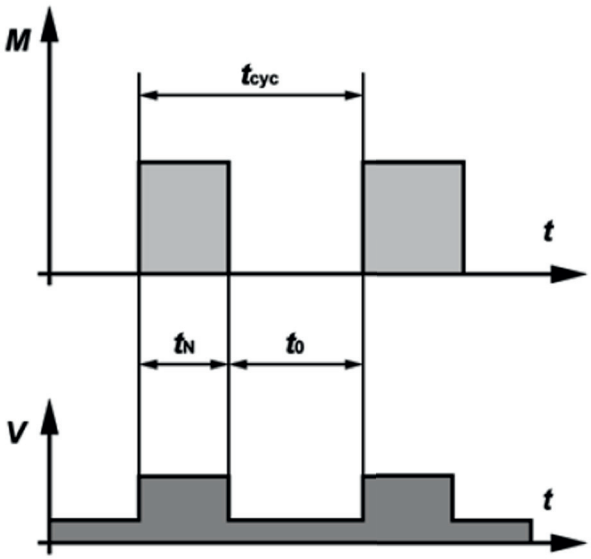
The duty cycle can be determined as follows:

$$ED = \frac{(t_a + t_N + t_{Br})}{t_{cyc}} \times 100\% = \frac{t_a + t_N + t_{Br}}{t_a + t_N + t_{Br} + t_0} \times 100\%$$

Example: S5 – 25%; $J_M = 0.15$ kgm², $J_{ext} = 0.7$ kgm²

Duty types as defined by EN 60034

Continuous-operation periodic duty (S6)



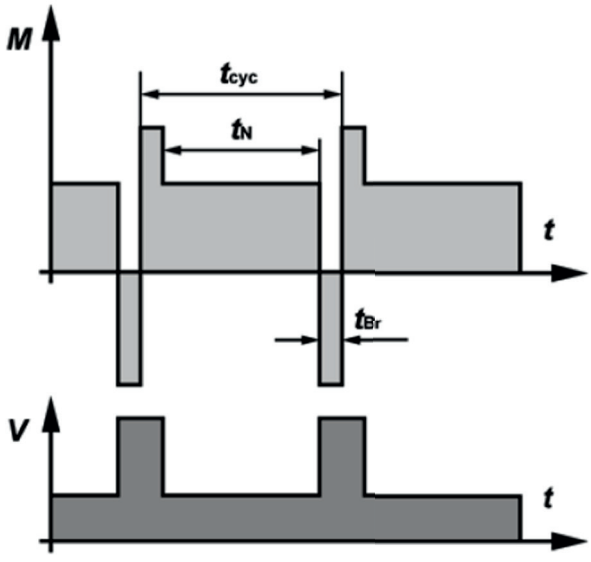
This type of duty corresponds to S3, with the exception that the equipment remains energised during the rest periods. In other words, it operates with no load during these periods. The duty cycle and cycle duration are specified the same way as for S3 duty.

The duty cycle can be determined as follows:

$$ED = \frac{t_N}{t_{cyc}} \times 100\% = \frac{t_N}{t_N + t_0} \times 100\%$$

Example: S6 – 40%

Continuous-operation periodic duty with electric braking (S7)

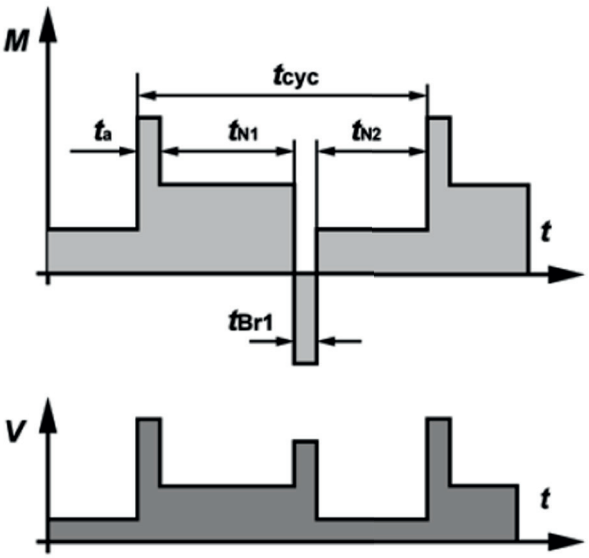


The machine starts up, operates under load, and then is braked electrically, for example by feeding it from a DC power source. Following this, it starts up again immediately. The machine can operate continuously in this manner if the specified moments of inertia of the motor J_M and of the load J_{Ext} as well as the specified duty cycle are not exceeded. If the cycle duration is not specified, it is assumed to be 10 minutes.

The duty cycle can be determined as follows: DC = 1
Example: S7 – J_M = 0.4 kgm², J_{ext} = 7.5 kgm²

Duty types as defined by EN 60034

Continuous-operation periodic duty with relative load/speed changes (S8)



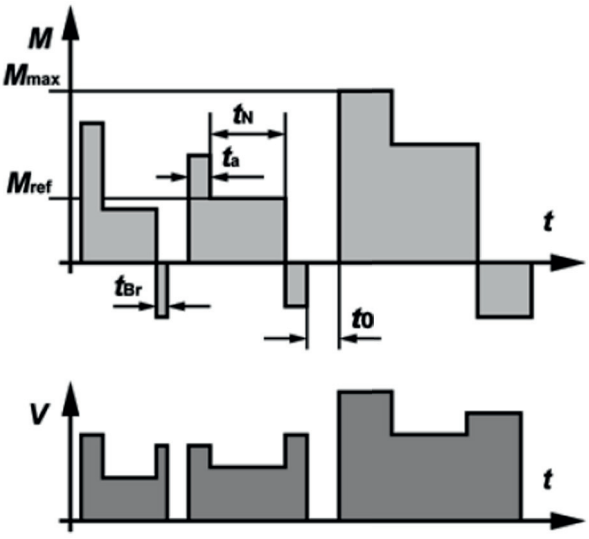
The machine runs continuously under variable load with frequent speed variations. The machine can operate continuously in this manner if at each speed the specified values are not exceeded (moments of inertia J_M and J_{Ext} cycle duration (if other than 10 minutes), rated output and duty cycle. With a moment of inertia of 1 kg m², the acceleration characteristics are the same as with a mass of 1 kg at a distance of 1 m from the axis of rotation).

The duty cycle can be determined as follows:

$$ED = \frac{t_a + t_{N1}}{t_{cyc}} \times 100\% = \frac{t_{Br} + t_{N2}}{t_{cyc}} \times 100\%$$

Example: S8 – $J_M = 0.5$ kgm², $J_{ext} = 6$ kgm²

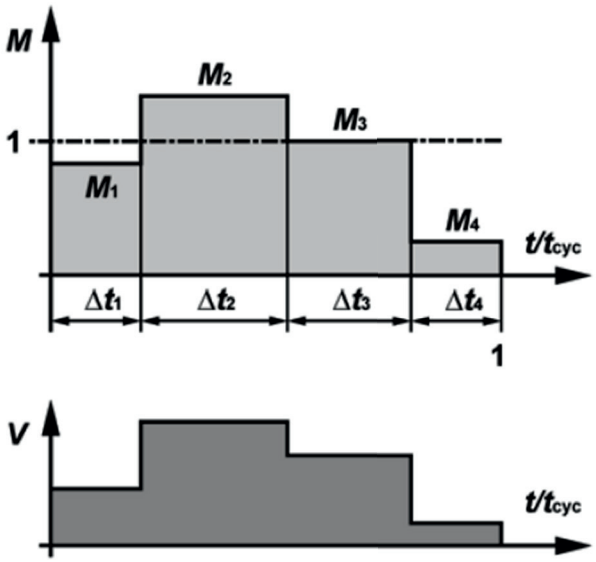
Duty with non-periodic load and speed variations (S9)



In S9 duty the load and the speed vary non-periodically within the permissible operating range. This includes frequently applied overloads, which must never exceed the reference load.
For this duty type, a constant load appropriately selected and based on duty type S1 shall be taken as the reference value M_{ref} for the overload.

Duty types as defined by EN 60034

Duty with discreet constant loads and speeds (S10)



S10 duty comprises operation with at most four different load levels, each of which is maintained long enough to allow the machine to reach thermal equilibrium.
The minimum load within a duty cycle may have a value of zero (no-load operation or at rest with the windings de-energised).
The appropriate abbreviation is S10 followed by the per unit quantities $p/\Delta t$ for the respective load and its duration and the per unit quantity *TL* for the relative thermal life expectancy of the insulation system. The reference value for the thermal life expectancy is the thermal life expectancy at rating for continuous running duty and permissible limits of temperature rise based on duty type S1. For a time de-energized and at rest, the load shall be indicated by the letter *r*.

Example: S10 $p/\Delta t$ = 1.1/0.4, 1/0.3, 0.9/0.2, *r*/0.1; *TL* = 0.6

Technical data 4-pole IE1 motors

4-pole IE1 motors for continuous operation S1, line frequency 50 Hz
For use after 16 June 2011 only in non-EU countries, except for brake motors

P_N kW	Type	n_N 1/min	M_N Nm	I_N 400 V A	Connection	cosφ	η (100% - Last) %	η (75% - Last) %	η (50% - Last) %	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²	Brake
0,03	D04LA4	1350	0,21	0,20	Y	0,60	-	-	-	2,2	2,6	2,6	3,0	0,000175	
0,04	D04LA4	1350	0,28	0,20	Y	0,60	-	-	-	2,2	2,0	2,0	2,3	0,000175	
0,06	D04LA4	1350	0,42	0,30	Y	0,60	-	-	-	2,3	2,1	2,1	2,4	0,000175	E003
0,09	D04LA4	1350	0,63	0,45	Y	0,69	-	-	-	2,5	2,2	2,2	2,6	0,000175	
0,12	D04LA4	1350	0,84	0,46	Y	0,73	-	-	-	2,3	1,7	1,7	1,9	0,000175	
0,06	D05LA4	1350	0,42	0,35	Y	0,72	-	-	-	3,7	3,7	3,5	3,7	0,000295	
0,09	D05LA4	1350	0,63	0,38	Y	0,70	-	-	-	3,9	3,0	2,8	3,0	0,000295	
0,12	D05LA4	1350	0,85	0,42	Y	0,73	-	-	-	3,4	2,2	2,1	2,2	0,000295	E003
0,18	D05LA4	1350	1,28	0,63	Y	0,70	-	-	-	3,4	2,3	2,2	2,4	0,000295	
0,25	D05LA4	1350	1,75	0,88	Y	0,69	-	-	-	3,3	2,3	2,2	2,3	0,000295	
0,06	D06LA4	1350	0,42	0,35	Y	0,72	-	-	-	3,7	3,7	3,5	3,7	0,000295	
0,09	D06LA4	1350	0,63	0,38	Y	0,70	-	-	-	3,9	3,0	2,8	3,0	0,000295	
0,12	D06LA4	1350	0,85	0,42	Y	0,73	-	-	-	3,4	2,2	2,1	2,2	0,000295	E003
0,18	D06LA4	1350	1,28	0,63	Y	0,70	-	-	-	3,4	2,3	2,2	2,4	0,000295	
0,25	D06LA4	1350	1,76	0,89	Y	0,69	-	-	-	3,2	2,3	2,2	2,3	0,000295	
0,3	D07LA4	1350	2,1	1,30	Y	0,60	-	-	-	2,7	2,7	2,7	2,8	0,000385	E003
0,37	D07LA4	1350	2,6	1,35	Y	0,66	-	-	-	2,6	2,2	2,2	2,2	0,000385	E004
0,55	DSE08MA4	1400	3,75	1,45	Y	0,72	75,4	75,2	72,0	4,2	2,1	2,0	2,4	0,00115	ES(X)010
0,75	DSE08LA4	1400	5,1	1,95	Y	0,76	75,6	76,2	72,7	4,6	2,0	2,0	2,4	0,00150	EH(X)027
1,1	DSE08XA4	1400	7,5	2,8	Y	0,75	75,5	76,8	73,5	3,7	2,0	1,8	2,2	0,00170	
1,1	DSE09SA4	1420	7,5	2,6	Y	0,76	80,0	80	77,5	4,9	2,5	2,2	2,8	0,00245	ES(X)010
1,5	DSE09LA4	1420	10,1	3,5	Y	0,76	80,7	80,9	79,5	5,0	2,5	2,3	2,9	0,00320	ES(X)027
2,2	DSE09XA4	1420	15	4,9	Y	0,81	80,5	81,1	80,4	4,5	2,3	2,2	2,6	0,00380	EH(X)040
3	DSE11SA4	1420	20	6,4	D	0,80	84,4	85,0	83,8	5,9	2,7	2,5	3,2	0,00810	ES(X)027
4	DSE11MA4	1420	27	8,4	D	0,83	84,0	84,9	84,2	5,5	2,8	2,4	3,0	0,01050	ES(X)040
5,5	DSE11LA4	1420	37	11,3	D	0,83	85,8	86,2	85,4	6,3	2,8	2,6	3,2	0,01400	ES(X)070 EH(X)125

P	Rated output at 50 HZ mains frequency
n	Typical rated rotor shaft speed with 50 Hz mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 400 V (for other special voltages, multiply by the inverse voltage ratio to convert the current at 400 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia
η	Efficiency with different loads
Brake	See Section 16 for brake configuration.

The standard motor winding configuration is for 400 V / 50 Hz.

All motors designed for thermal class F are suitable for operation over the voltage range 380–420 V or 400 V +/- 10%.
Note: the current, power factor and torque vary depending on the deviation from 400 V.

See "www.bauergears.com" for more information.

50 Hz

Technical data 4-pole IE2 motors

4-pole motors for continuous operation S1, line frequency 50 Hz

P_N kW	Type	n_N 1/min	M_N Nm	I_N (400 V) A	Connection	cosφ	η (100% - Last) %	η (75% - Last) %	η (50% - Last) %	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²	Brake
0,03	D04LA4	1350	0,21	0,20	Y	0,60	-	-	-	2,2	2,6	2,6	3,0	0,000175	
0,04	D04LA4	1350	0,28	0,20	Y	0,60	-	-	-	2,2	2,0	2,0	2,3	0,000175	
0,06	D04LA4	1350	0,42	0,30	Y	0,60	-	-	-	2,3	2,1	2,1	2,4	0,000175	E003
0,09	D04LA4	1350	0,63	0,45	Y	0,69	-	-	-	2,5	2,2	2,2	2,6	0,000175	
0,12	D04LA4	1350	0,84	0,46	Y	0,73	-	-	-	2,3	1,7	1,7	1,9	0,000175	
0,06	D05LA4	1350	0,42	0,35	Y	0,72	-	-	-	3,7	3,7	3,5	3,7	0,000295	
0,09	D05LA4	1350	0,63	0,38	Y	0,70	-	-	-	3,9	3,0	2,8	3,0	0,000295	
0,12	D05LA4	1350	0,85	0,42	Y	0,73	-	-	-	3,4	2,2	2,1	2,2	0,000295	E003
0,18	D05LA4	1350	1,28	0,63	Y	0,70	-	-	-	3,4	2,3	2,2	2,4	0,000295	
0,25	D05LA4	1350	1,75	0,88	Y	0,69	-	-	-	3,3	2,3	2,2	2,3	0,000295	
0,06	D06LA4	1350	0,42	0,35	Y	0,72	-	-	-	3,7	3,7	3,5	3,7	0,000295	
0,09	D06LA4	1350	0,63	0,38	Y	0,70	-	-	-	3,9	3,0	2,8	3,0	0,000295	
0,12	D06LA4	1350	0,85	0,42	Y	0,73	-	-	-	3,4	2,2	2,1	2,2	0,000295	E003
0,18	D06LA4	1350	1,28	0,63	Y	0,70	-	-	-	3,4	2,3	2,2	2,4	0,000295	
0,25	D06LA4	1350	1,76	0,89	Y	0,69	-	-	-	3,2	2,3	2,2	2,3	0,000295	
0,3	D07LA4	1350	2,1	1,30	Y	0,60	-	-	-	2,7	2,7	2,7	2,8	0,000385	E003
0,37	D07LA4	1350	2,6	1,35	Y	0,66	-	-	-	2,6	2,2	2,2	2,2	0,000385	E004
0,37	DHE08MA4	1420	2,45	1,20	Y	0,60	76,2	76,0	74,2	5,4	3,2	3,0	3,6	0,00115	ES(X)010
0,55	DHE08LA4	1420	3,7	1,36	Y	0,74	78,4	78,8	76,0	6,8	2,1	2,0	2,4	0,0015	EH(X)027
0,75	DHE08XA4	1420	5,0	1,88	Y	0,72	79,7	80,0	77,4	4,7	2,3	2,2	2,7	0,00170	
0,75	DHE09SA4	1440	5,0	1,8	Y	0,73	81,6	81,0	77,4	5,9	3,1	2,7	3,5	0,00245	
1,1	DHE09LA4	1440	7,3	2,5	Y	0,75	82,7	82,3	79,8	5,9	2,9	2,7	3,4	0,0032	ES(X)010
1,5	DHE09XA4	1440	10,0	3,3	Y	0,78	83,2	82,8	79,5	5,6	3,0	2,9	3,3	0,0038	ES(X)027
2,2	DHE09XA4C	1440	14,5	4,75	Y	0,79	84,5	85,0	83,5	5,2	1,8	1,7	2,7	0,0053	EH(X)040
2,2	DHE11SA4	1440	14,5	4,6	Y	0,80	86,2	86,0	84,7	7,0	3,1	2,8	3,6	0,0081	ES(X)027
3	DHE11MA4	1440	20	6,3	D	0,80	86,5	86,5	84,7	6,7	3,4	2,8	3,7	0,0105	ES(X)040
4	DHE11LA4	1440	26,5	8,4	D	0,79	87,5	87,0	85,3	7,6	3,6	3,3	4,2	0,0140	ES(X)070
5,5	DHE11LA4C	1460	36	11,0	D	0,82	87,8	88,2	86,5	6,7	2,1	1,6	3,4	0,0162	EH(X)125

P	Rated power at 50 Hz line frequency
n	Guideline value for rated speed at the rotor shaft at 50 Hz line frequency
M_N	Rated torque at the rotor shaft
I_N	Rated current at 400 V (the current can be converted as inverse ratios of voltages from 400 V to the desired special voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative breakaway torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Mass moment of inertia of the rotor
Brake	recommended standard brake for normal requirements (see chapter 16)

Winding configuration for standard motors for 400 V / 50 Hz.

All motors are suitable for the voltage range 380…420V or 400V +/- 10% if executed in insulation class F.

Important: Current, power factor and torque change as voltage deviates from 400 V.

See "www.bauergears.com" for more information.

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Technical data 4-pole IE3 motors

4-pole motors for intermittent periodic duty S3/S6, line frequency 50 Hz

P_N	Type	n_N	M_N	I_N	Connec-tion	cosφ	η	η	η	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot}
				400 V			(100% - Last)	(75% - Last)	(50% - Last)					
kW		1/min	Nm	A			%	%	%					kgm^2
0,75	**DPE09LA4**	1440	4,9	1,68	Y	0,76	84,0	83,2	79,9	6,6	3,3	2,7	3,7	0,0032
1,1	**DPE09XA4**	1440	7,25	2,45	Y	0,76	85,0	84,1	81,2	7,1	3,6	3,2	4,0	0,0038
1,5	**DPE09XA4C**	1460	9,8	3,25	Y	0,78	85,3	85,5	83,0	6	2,1	2	3,1	0,0053
1,5	**DPE11SA4**	1460	9,8	3,20	Y	0,79	86,8	86,0	83,0	8,2	3,5	3,0	4,3	0,0081
2,2	**DPE11MA4**	1450	14,5	4,50	Y	0,81	87,0	86,5	84,6	7,8	3,7	3,0	4,0	0,0105
3,0	**DPE11LA4**	1450	19,7	6,05	D	0,81	88,2	88,1	86,2	8,3	3,6	3	4,2	0,0140
4,0	**DPE11LA4C**	1470	26	8,3	D	0,78	88,8	88,5	86,5	7,5	2,2	2	4	0,0162

P	Rated power at 50 Hz line frequency, duty type S3/S6
n	Guideline value for rated speed at the rotor shaft at 50 Hz line frequency
M_N	Rated torque at the rotor shaft
I_N	Rated current at 400 V (the current can be converted as inverse ratios of voltages from 400 V to the desired special voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative breakaway torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Mass moment of inertia of the rotor
Brake	recommended standard brake for normal requirements (see chapter 16)

Winding configuration for standard motors for 400 V / 50 Hz.

See "www.bauergears.com" for more information.

Technical data 4-pole S3/S6

4 pole motors for periodic duty S3/S6-75%, Mains Frequency 50 Hz

P_N	Type	n_N	M_N	I_N	Connec-tion	cos φ	IA/IN	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot}	Brake
kW		1/min	Nm	400V A							kgm^2	
0,03	**D04LA4**	1350	0,21	0,20	Y	0,60	2,2	2,6	2,6	3,0	0,000175	
0,04	**D04LA4**	1350	0,28	0,20	Y	0,60	2,2	2,0	2,0	2,3	0,000175	
0,06	**D04LA4**	1350	0,42	0,30	Y	0,60	2,3	2,1	2,1	2,4	0,000175	E003
0,09	**D04LA4**	1350	0,63	0,45	Y	0,69	2,5	2,2	2,2	2,6	0,000175	
0,12	**D04LA4**	1350	0,84	0,46	Y	0,73	2,3	1,7	1,7	1,9	0,000175	
0,06	**D05LA4**	1350	0,42	0,35	Y	0,72	3,7	3,7	3,5	3,7	0,000295	
0,09	**D05LA4**	1350	0,63	0,38	Y	0,70	3,9	3,0	2,8	3,0	0,000295	
0,12	**D05LA4**	1350	0,85	0,42	Y	0,73	3,4	2,2	2,1	2,2	0,000295	E003
0,18	**D05LA4**	1350	1,28	0,63	Y	0,70	3,4	2,3	2,2	2,4	0,000295	
0,25	**D05LA4**	1350	1,75	0,88	Y	0,69	3,3	2,3	2,2	2,3	0,000295	
0,06	**D06LA4**	1350	0,42	0,35	Y	0,72	3,7	3,7	3,5	3,7	0,000295	
0,09	**D06LA4**	1350	0,63	0,38	Y	0,70	3,9	3,0	2,8	3,0	0,000295	E003
0,12	**D06LA4**	1350	0,85	0,42	Y	0,73	3,4	2,2	2,1	2,2	0,000295	
0,18	**D06LA4**	1350	1,28	0,63	Y	0,70	3,4	2,3	2,2	2,4	0,000295	
0,25	**D06LA4**	1350	1,76	0,89	Y	0,69	3,2	2,3	2,2	2,3	0,000295	
0,3	**D07LA4**	1350	2,1	1,30	Y	0,60	2,7	2,7	2,7	2,8	0,000385	E003
0,37	**D07LA4**	1350	2,6	1,35	Y	0,66	2,6	2,2	2,2	2,2	0,000385	E004
0,55	**DSE08MA4**	1400	3,75	1,45	Y	0,72	4,2	2,1	2,0	2,4	0,00115	ES(X)010
0,75	**DSE08LA4**	1400	5,1	1,95	Y	0,76	4,6	2,0	2,0	2,4	0,00150	EH(X)027
1,1	**DSE08XA4**	1400	7,5	2,8	Y	0,75	3,7	2,0	1,8	2,2	0,00170	
1,1	**DSE09SA4**	1420	7,5	2,6	Y	0,76	4,9	2,5	2,2	2,8	0,00245	ES(X)010
1,5	**DSE09LA4**	1420	10,1	3,5	Y	0,76	5,0	2,5	2,3	2,9	0,00320	ES(X)027
2,2	**DSE09XA4**	1420	15	4,9	Y	0,81	4,5	2,3	2,2	2,6	0,00380	EH(X)040
3	**DSE11SA4**	1420	20	6,4	D	0,80	5,9	2,7	2,5	3,2	0,00810	ES(X)027
4	**DSE11MA4**	1420	27	8,4	D	0,83	5,5	2,8	2,4	3,0	0,01050	ES(X)040
5,5	**DSE11LA4**	1420	37	11,3	D	0,83	6,3	2,8	2,6	3,2	0,01400	ES(X)070 EH(X)125

P	Rated outputs at 50 Hz line frequency
n	Guideline values for rated speeds at the rotor shaft at 50 Hz line frequency
M_N	Rated torques at the rotor shaft
I_N	Rated currents 400 V Δ/YY (currents can be converted as inverse ratios of voltages from 400 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_S/M_N	Relative pull-up torques
M_K/M_N	Relative breakdown torques
J_{rot}	Mass moment of inertia of the rotor
Brake	Delection of the brake, see chapter 16

Standard motor winding design for 400V / 50 Hz

Technical data 4-pole S3/S6

4-pole motors for intermittent periodic duty (S3/S6) and 50 Hz mains frequency

P kW	ED	Type	n 1/min	M_N Nm	IN (400 V) A	Connec-tion	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,15	15%	**D04LA4**	1350	1,05	0,60	Y	0,77	2,0	1,6	1,5	1,6	0,000175
0,3	15%	**D05LA4**	1350	2,1	0,98	Y	0,75	2,6	1,9	1,8	1,9	0,000295
0,3	60%	**D06LA4**	1350	2,1	0,98	Y	0,75	2,6	1,9	1,8	1,9	0,000295
0,55	60%	**D07LA4**	1350	3,9	1,95	Y	0,86	3,4	1,6	1,5	1,6	0,000385
0,75	60%	**D08MA4**	1400	5,1	2,0	Y	0,81	3,4	1,6	1,4	1,7	0,00115
1,1	60%	**D08LA4**	1400	7,5	2,8	Y	0,82	3,3	1,5	1,4	1,7	0,0015
1,5	60%	**D09SA4**	1400	10,2	3,6	Y	0,84	3,9	1,7	1,5	2,0	0,00245
2,2	60%	**D09LA4**	1400	15	5,0	Y	0,86	3,9	1,6	1,5	1,9	0,0032
3,0	60%	**D09XA4**	1400	20	6,8	Y	0,86	3,4	1,7	1,6	1,9	0,0038
4,0	60%	**D11SA4**	1420	26,5	8,9	Δ	0,85	4,0	1,6	1,4	2,0	0,0081
5,5	60%	**D11MA4**	1420	37	11,7	Δ	0,87	4,3	1,5	1,5	2,0	0,0105
7,5	60%	**D11LA4**	1420	50	16	Δ	0,87	4,3	1,8	1,7	2,1	0,014

P	Rated output at 50 Hz mains frequency, S3/S6 duty
DC	Permissible duty cycle
n	Typical rated rotor shaft speed at 50 Hz Mains frequency
M_N	Rated shaft torque
I_N	Rated current at 400 V (for other special voltages, multiply by the inverse voltage ratio to convert the current at 400 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia

The standard motor winding configuration is for 400 V / 50 Hz.

See "www.bauergears.com" for more information.

50 Hz

Technical data 4/2-pole S1

4/2-pole Δ/YY motors for continuous running duty (S1) and 50 Hz mains frequency

P kW	**Type**	n 1/min	M_N Nm	I_N (400 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,03 / 0,06	**D04LA42**	1350 / 2700	0,210 / 0,210	0,230 / 0,250	0,56 / 0,67	2,2 / 3,1	3,4 / 3,1	3,4 / 3,1	3,6 / 3,3	0,000175
0,04 / 0,08	**D04LA42**	1350 / 2700	0,280 / 0,280	0,250 / 0,280	0,60 / 0,75	2,0 / 2,8	3,0 / 2,1	3,0 / 2,1	3,3 / 2,2	0,000175
0,06 / 0,12	**D05LA42**	1350 / 2700	0,420 / 0,420	0,450 / 0,450	0,50 / 0,75	2,8 / 3,3	3,1 / 2,0	3,0 / 1,9	3,8 / 2,6	0,000295
0,08 / 0,16	**D05LA42**	1350 / 2700	0,56 / 0,56	0,50 / 0,50	0,55 / 0,75	2,8 / 3,3	3,1 / 1,8	2,7 / 1,7	3,4 / 2,3	0,000295
0,06 / 0,12	**D06LA42**	1350 / 2700	0,420 / 0,420	0,450 / 0,450	0,50 / 0,75	2,8 / 3,3	3,1 / 2,0	3,0 / 1,9	3,8 / 2,6	0,000295
0,08 / 0,16	**D06LA42**	1350 / 2700	0,56 / 0,56	0,50 / 0,50	0,55 / 0,75	2,8 / 3,3	2,8 / 1,8	2,7 / 1,7	3,4 / 2,3	0,000295
0,11 / 0,22	**D06LA42**	1350 / 2700	0,77 / 0,77	0,68 / 0,68	0,55 / 0,75	2,8 / 3,3	2,8 / 1,8	2,7 / 1,7	3,4 / 2,3	0,000295
0,16 / 0,32	**D06LA42**	1350 / 2700	1,13 / 1,13	0,90 / 0,90	0,57 / 0,80	2,8 / 3,3	2,6 / 1,7	2,5 / 1,6	3,1 / 2,1	0,000295
0,2 / 0,4	**D07LA42**	1400 / 2800	1,35 / 1,37	1,10 / 1,15	0,58 / 0,81	2,9 / 3,6	2,8 / 1,6	2,7 / 1,4	3,0 / 2,0	0,000385
0,28 / 0,56	**D08MA42**	1400 / 2800	1,90 / 1,90	1,20 / 1,75	0,61 / 0,81	3,4 / 2,9	2,3 / 1,5	2,3 / 1,4	3,0 / 1,9	0,00115
0,4 / 0,8	**D08LA42**	1400 / 2800	2,7 / 2,7	1,53 / 1,91	0,62 / 0,90	4,7 / 5,1	2,7 / 1,8	2,4 / 1,7	3,1 / 2,1	0,0015
0,5 / 1,0	**D09SA42**	1400 / 2800	3,4 / 3,4	1,65 / 2,4	0,71 / 0,91	5,1 / 4,5	2,9 / 1,9	2,9 / 1,9	3,6 / 2,4	0,00245
0,7 / 1,4	**D09SA42**	1400 / 2800	4,8 / 4,8	2,1 / 3,3	0,71 / 0,93	4,7 / 4,1	2,5 / 1,6	2,5 / 1,6	3,1 / 2,0	0,00245
1,0 / 2,0	**D09LA42**	1400 / 2800	6,8 / 6,8	2,9 / 4,7	0,72 / 0,94	4,7 / 4,1	2,5 / 1,6	2,5 / 1,6	3,1 / 2,0	0,0032
1,2 / 2,4	**D09XA42**	1400 / 2800	8,2 / 8,1	3,8 / 5,7	0,65 / 0,87	6,2 / 3,0	2,5 / 1,8	2,5 / 1,8	3,1 / 2,3	0,0038
1,4 / 2,8	**D11SA42**	1420 / 2840	9,4 / 9,4	3,6 / 6,2	0,74 / 0,90	6,4 / 4,5	3,0 / 1,7	2,6 / 1,5	4,1 / 2,8	0,0081
2,0 / 4,0	**D11MA42**	1420 / 2840	13,5 / 13,4	5,5 / 9,1	0,70 / 0,90	6,7 / 5,4	3,1 / 2,1	2,7 / 1,6	3,7 / 2,5	0,0105
2,5 / 5,0	**D11LA42**	1420 / 2840	16,8 / 16,8	5,5 / 10	0,79 / 0,92	5,6 / 4,6	2,8 / 1,8	2,7 / 1,7	3,7 / 2,6	0,014

P	Rated output at 50 Hz mains frequency
n	Typical rated rotor shaft speed at 50 Hz Mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 400 V Δ/YY (for other special voltages, multiply by the inverse voltage ratio to convert the current at 400 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia

Technical data 8/4-pole S1

8/4-pole Δ/YY motors for continuous running duty (S1) and 50 Hz mains frequency

P kW	**Type**	**n** 1/min	**M_N** Nm	**I_N (400 V)** A	**cos φ**	**I_A/I_N**	**M_A/M_N**	**M_S/M_N**	**M_K/M_N**	**J_{rot}** kgm²
0,03 / 0,06	**D05LA84**	680 / 1350	0,410 / 0,420	0,300 / 0,280	0,52 / 0,71	1,6 / 2,6	2,7 / 1,9	1,6 / 1,7	1,6 / 1,7	0,000295
0,03 / 0,06	**D06LA84**	680 / 1350	0,410 / 0,420	0,300 / 0,280	0,52 / 0,71	1,6 / 2,6	2,7 / 1,9	1,6 / 1,7	1,6 / 1,7	0,000295
0,04 / 0,08	**D06LA84**	680 / 1350	0,54 / 0,56	0,480 / 0,400	0,52 / 0,66	1,4 / 2,2	2,6 / 2,1	1,6 / 1,7	1,6 / 1,7	0,000295
0,06 / 0,12	**D07LA84**	680 / 1350	0,84 / 0,85	0,70 / 0,60	0,52 / 0,66	1,7 / 2,8	3,2 / 1,7	3,2 / 1,5	3,3 / 2,1	0,000385
0,06 / 0,12	**D08LA84**	700 / 1400	0,81 / 0,81	0,50 / 0,50	0,61 / 0,83	2,8 / 3,7	3,1 / 2,3	3,1 / 2,3	3,7 / 3,1	0,0025
0,08 / 0,16	**D08LA84**	700 / 1400	1,08 / 1,09	0,62 / 0,62	0,61 / 0,83	2,8 / 3,7	3,0 / 2,2	3,0 / 2,2	3,5 / 3,0	0,0025
0,11 / 0,22	**D08LA84**	700 / 1400	1,49 / 1,5	0,80 / 0,80	0,61 / 0,83	2,8 / 3,7	2,8 / 2,1	2,8 / 2,1	3,3 / 2,8	0,0025
0,14 / 0,28	**D08LA84**	700 / 1400	1,90 / 1,91	1,00 / 1,00	0,61 / 0,83	2,8 / 3,7	2,8 / 2,1	2,8 / 2,1	3,3 / 2,8	0,0025
0,2 / 0,4	**D08LA84**	700 / 1400	2,7 / 2,7	1,10 / 1,30	0,55 / 0,77	2,8 / 3,7	2,3 / 1,7	2,3 / 1,7	2,7 / 2,3	0,0025
0,25 / 0,5	**D09XC84**	700 / 1400	3,3 / 3,3	1,40 / 1,40	0,48 / 0,77	2,9 / 5,0	2,7 / 2,0	2,7 / 2,1	3,1 / 2,7	0,006
0,28 / 0,56	**D09XC84**	700 / 1400	3,8 / 3,8	1,40 / 1,50	0,57 / 0,80	2,9 / 4,9	2,4 / 1,8	2,4 / 1,9	2,8 / 2,4	0,006
0,4 / 0,8	**D09XC84**	700 / 1400	5,4 / 5,4	1,95 / 2,4	0,55 / 0,79	2,8 / 4,2	2,3 / 1,7	2,3 / 1,8	2,7 / 2,3	0,006
0,5 / 1,0	**D09XC84**	700 / 1400	6,8 / 6,8	2,4 / 2,6	0,55 / 0,81	2,6 / 4,0	2,2 / 1,6	2,2 / 1,6	2,5 / 2,2	0,006
0,8 / 1,6	**D11LC84**	710 / 1420	10,7 / 10,7	3,0 / 4,2	0,63 / 0,88	3,5 / 4,3	2,2 / 1,9	2,2 / 1,7	2,8 / 2,7	0,0215
1,1 / 2,2	**D11LC84**	710 / 1420	14,7 / 14,7	4,0 / 5,0	0,58 / 0,85	3,9 / 5,7	2,3 / 2,1	2,3 / 1,7	2,7 / 2,5	0,0215
1,6 / 3,2	**D11LC84**	710 / 1420	21,5 / 21,5	6,0 / 7,6	0,59 / 0,84	3,7 / 5,1	2,2 / 1,8	2,1 / 1,5	2,6 / 2,3	0,0215

P	Rated output at 50 Hz mains frequency
n	Typical rated rotor shaft speed at 50 Hz Mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 400 V Δ/YY (for other special voltages, multiply by the inverse voltage ratio to convert the current at 400 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_A/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia

50 Hz

Technical data 8/2-pole S3

8/2-pole Y/Y motors for intermittent periodic duty S3 25/75% and 50 Hz mains frequency

P kW	ED	**Type**	n 1/min	M_N Nm	I_N (400 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm^2
0,04 / 0,16	25/75%	**D05LA82**	680 / 2700	0,56 / 0,56	0,400 / 0,80	0,63 / 0,75	1,6 / 3,2	1,9 / 2,2	1,9 / 2,1	2,0 / 2,3	0,000295
0,05 / 0,20	25/75%	**D06LA82**	680 / 2700	0,70 / 0,70	0,51 / 1,02	0,63 / 0,75	1,4 / 2,8	1,7 / 2,0	1,7 / 1,9	1,8 / 2,1	0,000295
0,063 / 0,25	25/75%	**D07LA82**	650 / 2840	0,87 / 0,87	0,60 / 1,20	0,69 / 0,62	1,4 / 2,6	1,6 / 1,4	1,6 / 1,4	1,8 / 2,7	0,000385
0,071 / 0,28	25/75%	**D07LA82**	650 / 2840	0,99 / 0,98	0,65 / 1,40	0,69 / 0,68	1,4 / 2,6	1,5 / 1,3	1,5 / 1,3	1,7 / 2,6	0,000385
0,063 / 0,25	25/75%	**D08LA82**	700 / 2800	0,85 / 0,85	0,55 / 0,70	0,55 / 0,87	2,8 / 4,0	2,4 / 2,6	2,4 / 2,5	2,8 / 3,0	0,0015
0,09 / 0,36	25/75%	**D08LA82**	700 / 2800	1,22 / 1,22	0,70 / 1,05	0,60 / 0,92	2,9 / 4,5	2,0 / 2,6	2,0 / 2,5	2,4 / 2,9	0,0015
0,12 / 0,5	25/75%	**D08LA82**	700 / 2800	1,70 / 1,70	0,95 / 1,43	0,60 / 0,92	2,9 / 4,5	2,0 / 2,6	2,0 / 2,5	2,4 / 2,9	0,0015
0,16 / 0,63	25/75%	**D08LA82**	700 / 2800	2,1 / 2,1	1,20 / 1,45	0,63 / 0,90	2,0 / 4,6	1,8 / 2,1	1,8 / 2,0	2,2 / 2,4	0,0015
0,25 / 1,0	25/75%	**D09XA82**	700 / 2800	3,4 / 3,4	1,30 / 2,3	0,62 / 0,90	2,2 / 5,2	1,9 / 2,3	1,9 / 2,3	2,0 / 2,6	0,0038
0,36 / 1,4	25/75%	**D09XA82**	700 / 2800	4,9 / 4,8	2,1 / 3,3	0,57 / 0,87	2,0 / 4,5	1,9 / 2,1	1,9 / 2,1	2,0 / 2,4	0,0038
0,45 / 1,8	25/75%	**D09XA82**	700 / 2800	6,1 / 6,1	2,4 / 4,3	0,65 / 0,89	2,0 / 4,3	1,7 / 2,0	1,7 / 2,0	2,0 / 2,5	0,0038
0,56 / 2,2	25/75%	**D11LA82**	710 / 2840	7,5 / 7,3	2,3 / 4,7	0,60 / 0,94	3,2 / 4,9	1,9 / 2,9	1,9 / 2,4	2,2 / 2,9	0,014
0,71 / 2,8	25/75%	**D11LA82**	710 / 2840	9,5 / 9,4	2,8 / 5,6	0,58 / 0,94	2,5 / 4,7	1,9 / 2,3	1,9 / 2,0	2,1 / 2,4	0,014
0,90 / 3,6	25/75%	**D11LA82**	710 / 2840	12,1 / 12,1	3,5 / 7,9	0,58 / 0,94	2,5 / 4,5	1,8 / 2,0	1,8 / 1,8	2,0 / 2,1	0,014

P	Rated output at 50 Hz mains frequency and S3 25/75% duty
n	Typical rated rotor shaft speed at 50 Hz Mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 400 V Y/Y (for other special voltages, multiply by the inverse voltage ratio to convert the current at 460 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia

Technical data 12/2-pole S3

12/2 pole motors Y/Y for periodic duty S3-25/75%, Mains Frequency 50 Hz

P kW	ED	Type	n 1/min	M_N Nm	I_N (400 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm^2
0,045 / 0,28	25/75%	**D08LA122**	470 / 2800	0,92 / 0,95	0,55 / 0,86	0,70 / 0,90	1,4 / 4,5	1,9 / 2,4	1,9 / 2,4	1,9 / 2,7	0,0015
0,063 / 0,4	25/75%	**D08LA122**	470 / 2800	1,29 / 1,36	0,66 / 1,10	0,70 / 0,90	1,4 / 4,5	1,7 / 2,2	1,7 / 2,2	1,7 / 2,4	0,0015
0,09 / 0,56	25/75%	**D08LA122**	470 / 2800	1,85 / 1,91	1,00 / 1,45	0,63 / 0,89	1,4 / 4,1	1,7 / 2,1	1,7 / 2,3	1,8 / 2,4	0,0015
0,11 / 0,71	25/75%	**D09XA122**	470 / 2800	2,3 / 2,4	1,05 / 1,60	0,59 / 0,88	1,5 / 5,5	1,7 / 2,7	1,7 / 2,6	1,8 / 3,3	0,0038
0,16 / 1,0	25/75%	**D09XA122**	470 / 2800	3,2 / 3,4	1,70 / 2,4	0,62 / 0,89	1,5 / 5,5	1,8 / 2,6	1,8 / 2,5	1,8 / 3,3	0,0038
0,20 / 1,25	25/75%	**D09XA122**	470 / 2800	4,1 / 4,2	2,0 / 3,0	0,62 / 0,89	1,5 / 5,0	1,7 / 2,4	1,7 / 2,3	1,7 / 3,1	0,0038
0,25 / 1,6	25/75%	**D11LA122**	470 / 2840	5,1 / 5,3	2,3 / 3,4	0,53 / 0,95	1,6 / 4,9	1,7 / 2,6	1,7 / 2,4	2,0 / 2,8	0,014
0,32 / 2,0	25/75%	**D11LA122**	470 / 2840	6,5 / 6,7	2,9 / 4,0	0,53 / 0,94	1,6 / 4,7	1,7 / 2,5	1,7 / 2,2	2,0 / 2,7	0,014
0,45 / 2,8	25/75%	**D11LA122**	470 / 2840	9,2 / 9,4	4,5 / 5,6	0,52 / 0,94	1,6 / 4,7	1,5 / 2,3	1,5 / 2,0	1,8 / 2,4	0,014

P	Nominal Powers for 50 Hz mains frequency, Duty S3-25/75%
n	Guideline values for rated speeds at the rotor shaft at 50 Hz line frequency
M_N	Rated torques at the rotor shaft
I_N	Rated currents 400 V Δ/YY (currents can be converted as inverse ratios of voltages from 400 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_A/M_N	Relative pull-up torques
M_K/M_N	Relative beakdown torques
J_{rot}	Mass moment of inertia of the rotor

Technical data 4-pole IE1 motors

4-pole IE1 motors for continuous running duty S1 and 60 Hz mains frequency
For use after 16 June 2011 only in non-EU countries, except for brake motors

P_N	Type	n_N	M_N	I_N	Connec-tion	cosφ	η	η	η	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot}	Brake
kW		1/min	Nm	460 V A			(100% - Last) %	(75% - Last) %	(50% - Last) %					kgm²	
0,03	D04LA4	1620	0,17	0,18	Y	0,60	-	-	-	2,4	2,9	2,9	3,3	0,000175	
0,04	D04LA4	1620	0,23	0,18	Y	0,60	-	-	-	2,4	2,2	2,2	2,5	0,000175	
0,06	D04LA4	1620	0,35	0,28	Y	0,60	-	-	-	2,5	2,3	2,3	2,7	0,000175	E003
0,09	D04LA4	1620	0,52	0,40	Y	0,69	-	-	-	2,7	2,4	2,4	2,9	0,000175	
0,12	D04LA4	1620	0,7	0,42	Y	0,73	-	-	-	2,5	1,9	1,9	2,1	0,000175	
0,06	D05LA4	1620	0,35	0,32	Y	0,72	-	-	-	4,1	4,1	3,8	4,1	0,000295	
0,09	D05LA4	1620	0,52	0,35	Y	0,70	-	-	-	4,3	3,3	3,1	3,3	0,000295	
0,12	D05LA4	1620	0,7	0,38	Y	0,73	-	-	-	3,7	2,4	2,3	2,4	0,000295	E003
0,18	D05LA4	1620	1,06	0,58	Y	0,70	-	-	-	3,7	2,5	2,4	2,6	0,000295	
0,25	D05LA4	1620	1,45	0,80	Y	0,69	-	-	-	3,6	2,5	2,4	2,5	0,000295	
0,06	D06LA4	1620	0,35	0,32	Y	0,72	-	-	-	4,1	4,1	3,8	4,1	0,000295	
0,09	D06LA4	1620	0,52	0,35	Y	0,70	-	-	-	4,3	3,3	3,1	3,3	0,000295	
0,12	D06LA4	1620	0,7	0,38	Y	0,73	-	-	-	3,7	2,4	2,3	2,4	0,000295	E003
0,18	D06LA4	1620	1,06	0,58	Y	0,70	-	-	-	3,7	2,5	2,4	2,6	0,000295	
0,25	D06LA4	1620	1,45	0,80	Y	0,69	-	-	-	3,6	2,5	2,4	2,5	0,000295	
0,3	D07LA4	1620	1,76	1,20	Y	0,60	-	-	-	3,0	3,0	3,0	3,1	0,000385	E003
0,37	D07LA4	1620	2,1	1,26	Y	0,66	-	-	-	2,8	2,4	2,4	2,4	0,000385	E004
0,55	DSE08MA4	1720	3,1	1,28	Y	0,72	75,4	75,2	73,0	4,6	2,3	2,2	2,7	0,00115	ES(X)010
0,75	DSE08LA4	1720	4,15	1,75	Y	0,69	78,2	77,0	72,7	4,8	2,5	2,4	2,9	0,00150	EH(X)027
1,1	DSE08XA4	1720	6,2	2,4	Y	0,71	79,0	77,0	73,0	4,1	2,2	2,0	2,4	0,00170	
1,1	DSE09SA4	1740	6,05	2,3	Y	0,72	83,6	82,6	79,2	6,5	3,6	3,3	4,0	0,00245	ES(X)010
1,5	DSE09LA4	1740	8,25	3,1	Y	0,72	84,2	83,5	80,4	6,5	3,4	3,1	4,0	0,00320	ES(X)027
2,2	DSE09XA4	1720	12,2	4,3	Y	0,76	84,9	85,0	83,0	6,2	3,3	3,0	3,6	0,00380	EH(X)040
3	DSE11SA4	1740	16,4	5,5	D	0,78	86,7	86,6	84,4	6,9	3,0	2,7	3,8	0,00810	ES(X)027
4	DSE11MA4	1740	21,9	7,2	D	0,81	86,2	86,4	84,9	6,9	3,3	2,7	3,7	0,01050	ES(X)040
5,5	DSE11LA4	1740	30,2	9,7	D	0,81	87,7	87,8	86	7,6	3,3	2,9	4,0	0,01400	ES(X)070 EH(X)125

P	Rated torque at 60 Hz mains frequency
n	Typical rated rotor shaft speed at 60 Hz Mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 460 V (for other special voltages, multiply by the inverse voltage ratio to convert the current at 460 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia
η	Efficiency with different loads
Brake	Brake configuration (see Section 16)

The standard motor winding configuration is for 460 V / 60 Hz.

All motors designed for thermal class F are suitable for operation over the voltage range 440–480 V or 460 V +/- 10%.
Note: the current, power factor and torque vary depending on the deviation from 460 V.

See "www.bauergears.com" for more information.

Technical data 4-pole IE2 motors

4-pole motors for continuous operation S1, line frequency 60 Hz

P_N kW	Type	n_N 1/min	M_N Nm	I_N 460 V A	Connec-tion	cosφ	η (100% - Last) %	η (75% - Last) %	η (50% - Last) %	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²	Brake
0,03	D04LA4	1620	0,17	0,18	Y	0,60	-	-	-	2,4	2,9	2,9	3,3	0,000175	
0,04	D04LA4	1620	0,23	0,18	Y	0,60	-	-	-	2,4	2,2	2,2	2,5	0,000175	
0,06	D04LA4	1620	0,35	0,28	Y	0,60	-	-	-	2,5	2,3	2,3	2,7	0,000175	E003
0,09	D04LA4	1620	0,52	0,40	Y	0,69	-	-	-	2,7	2,4	2,4	2,9	0,000175	
0,12	D04LA4	1620	0,7	0,42	Y	0,73	-	-	-	2,5	1,9	1,9	2,1	0,000175	
0,06	D05LA4	1620	0,35	0,32	Y	0,72	-	-	-	4,1	4,1	3,8	4,1	0,000295	
0,09	D05LA4	1620	0,52	0,35	Y	0,70	-	-	-	4,3	3,3	3,1	3,3	0,000295	
0,12	D05LA4	1620	0,7	0,38	Y	0,73	-	-	-	3,7	2,4	2,3	2,4	0,000295	E003
0,18	D05LA4	1620	1,06	0,58	Y	0,70	-	-	-	3,7	2,5	2,4	2,6	0,000295	
0,25	D05LA4	1620	1,45	0,80	Y	0,69	-	-	-	3,6	2,5	2,4	2,5	0,000295	
0,06	D06LA4	1620	0,35	0,32	Y	0,72	-	-	-	4,1	4,1	3,8	4,1	0,000295	
0,09	D06LA4	1620	0,52	0,35	Y	0,70	-	-	-	4,3	3,3	3,1	3,3	0,000295	
0,12	D06LA4	1620	0,7	0,38	Y	0,73	-	-	-	3,7	2,4	2,3	2,4	0,000295	E003
0,18	D06LA4	1620	1,06	0,58	Y	0,70	-	-	-	3,7	2,5	2,4	2,6	0,000295	
0,25	D06LA4	1620	1,45	0,80	Y	0,69	-	-	-	3,6	2,5	2,4	2,5	0,000295	
0,3	D07LA4	1620	1,76	1,20	Y	0,60	-	-	-	3,0	3,0	3,0	3,1	0,000385	E003
0,37	D07LA4	1620	2,1	1,26	Y	0,66	-	-	-	2,8	2,4	2,4	2,4	0,000385	E004
0,75	DHE08XA4	1720	4,1	1,60	Y	0,72	82,5	81,0	78,0	5,1	2,5	2,4	3,0	0,0017	ES(X)010 EH(X)027
0,75	DHE09SA4	1740	4,1	1,60	Y	0,70	83,7	82,4	78,3	7,3	3,4	3,0	4,0	0,00245	ES(X)010 ES(X)027 EH(X)040
1,1	DHE09LA4	1740	6,0	2,25	Y	0,73	84,8	83,8	80,4	7,3	3,6	3,3	4,3	0,0032	
1,5	DHE09XA4	1740	8,2	2,95	Y	0,74	85,8	85,2	82,5	7,2	3,7	3,5	4,3	0,0038	
2,2	DHE09XA4C	1760	12	4,0	Y	0,79	87,5	87,5	86,0	6,0	2,1	2,0	3,1	0,0053	
2,2	DHE11SA4	1760	12	4,0	Y	0,78	87,7	87,2	84,1	8,3	3,5	3,1	4,3	0,0081	ES(X)027
3	DHE11MA4	1760	16,5	5,5	D	0,78	87,6	87,2	83,9	7,9	3,9	3,1	4,4	0,0105	ES(X)040
4	DHE11LA4	1760	21,5	7,3	D	0,77	88,3	87,5	84,6	9,3	4,1	3,6	4,9	0,0140	ES(X)070
5,5	DHE11LA4C	1760	30	9,5	D	0,81	89,6	89,2	88,3	8,2	2,4	1,8	4,1	0,0162	EH(X)125

P	Rated output at 60 Hz line frequency
n	Guideline value for rated speed at the rotor shaft at 60 Hz line frequency
M_N	Rated torque at the rotor shaft
I_N	Rated current at 460 V (the current can be converted as inverse ratios of voltages from 460 V to the desired special voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative breakaway torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Mass moment of inertia of the rotor
Brake	recommended standard brake for normal requirements (see chapter 16)

Winding configuration for standard motors for 460 V / 60 Hz.

All motors are suitable for the voltage range 440…480V or 460V +/- 10% if executed in insulation class F.

Important: Current, power factor and torque change as voltage deviates from 460 V.

See "www.bauergears.com" for more information.

60 Hz

Technical data 4-pole S3/S6

4-pole motors for intermittent periodic duty (S3/S6 75%) and 60 Hz mains frequency

P_N	Type	n_N	M_N	I_N	Connec-tion	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot}	Brake
kW		1/min	Nm	460V A							kgm^2	
0,03	**D04LA4**	1620	0,17	0,18	Y	0,60	2,4	2,9	2,9	3,3	0,000175	
0,04	**D04LA4**	1620	0,23	0,18	Y	0,60	2,4	2,2	2,2	2,5	0,000175	
0,06	**D04LA4**	1620	0,35	0,28	Y	0,60	2,5	2,3	2,3	2,7	0,000175	E003
0,09	**D04LA4**	1620	0,52	0,40	Y	0,69	2,7	2,4	2,4	2,9	0,000175	
0,12	**D04LA4**	1620	0,7	0,42	Y	0,73	2,5	1,9	1,9	2,1	0,000175	
0,06	**D05LA4**	1620	0,35	0,32	Y	0,72	4,1	4,1	3,8	4,1	0,000295	
0,09	**D05LA4**	1620	0,52	0,35	Y	0,70	4,3	3,3	3,1	3,3	0,000295	
0,12	**D05LA4**	1620	0,7	0,38	Y	0,73	3,7	2,4	2,3	2,4	0,000295	E003
0,18	**D05LA4**	1620	1,06	0,58	Y	0,70	3,7	2,5	2,4	2,6	0,000295	
0,25	**D05LA4**	1620	1,45	0,80	Y	0,69	3,6	2,5	2,4	2,5	0,000295	
0,06	**D06LA4**	1620	0,35	0,32	Y	0,72	4,1	4,1	3,8	4,1	0,000295	
0,09	**D06LA4**	1620	0,52	0,35	Y	0,70	4,3	3,3	3,1	3,3	0,000295	
0,12	**D06LA4**	1620	0,7	0,38	Y	0,73	3,7	2,4	2,3	2,4	0,000295	E003
0,18	**D06LA4**	1620	1,06	0,58	Y	0,70	3,7	2,5	2,4	2,6	0,000295	
0,25	**D06LA4**	1620	1,45	0,80	Y	0,69	3,6	2,5	2,4	2,5	0,000295	
0,3	**D07LA4**	1620	1,76	1,20	Y	0,60	3,0	3,0	3,0	3,1	0,000385	E003
0,37	**D07LA4**	1620	2,1	1,26	Y	0,66	2,8	2,4	2,4	2,4	0,000385	E004
0,55	**DSE08MA4**	1720	3,1	1,28	Y	0,72	4,6	2,3	2,2	2,7	0,00115	ES(X)010
0,75	**DSE08LA4**	1720	4,15	1,75	Y	0,69	4,8	2,5	2,4	2,9	0,00150	EH(X)027
1,1	**DSE08XA4**	1720	6,2	2,4	Y	0,71	4,1	2,2	2,0	2,4	0,00170	
1,1	**DSE09SA4**	1740	6,05	2,3	Y	0,72	6,5	3,6	3,3	4,0	0,00245	ES(X)010
1,5	**DSE09LA4**	1740	8,25	3,1	Y	0,72	6,5	3,4	3,1	4,0	0,00320	ES(X)027
2,2	**DSE09XA4**	1720	12,2	4,3	Y	0,76	6,2	3,3	3,0	3,6	0,00380	EH(X)40
3	**DSE11SA4**	1740	16,4	5,5	D	0,78	6,9	3,0	2,7	3,8	0,00810	ES(X)027
4	**DSE11MA4**	1740	21,9	7,2	D	0,81	6,9	3,3	2,7	3,7	0,01050	ES(X)040
5,5	**DSE11LA4**	1740	30,2	9,7	D	0,81	7,6	3,3	2,9	4,0	0,01400	ES(X)070 EH(X)125

P	Rated torque at 60 Hz mains frequency
n	Typical rated rotor shaft speed at 60 Hz Mains frequency
M_N	Rated torque at rotor shaft
I_N	Rated current at 460 V (for other special voltages, multiply by the inverse voltage ratio to convert the current at 460 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia
Brake	Brake configuration (see Section 16)

The standard motor winding configuration is for 460 V / 60 Hz.

Technical data 4-pole S3/S6

4-pole motors for intermittent periodic duty (S3/S6) and 60 Hz mains frequency

P kW	ED	Type	n 1/min	M_N Nm	I_N (460 V) A	Connection	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,15	15%	**D04LA4**	1620	0,87	0,56	Y	0,77	2,2	1,8	1,7	1,8	0,000175
0,3	15%	**D05LA4**	1620	1,75	0,9	Y	0,75	2,8	2,1	2,0	2,1	0,000295
0,3	60%	**D06LA4**	1620	1,75	0,9	Y	0,75	2,8	2,1	2,0	2,1	0,000295
0,55	60%	**D07LA4**	1620	3,2	1,78	Y	0,86	3,7	1,8	1,6	1,8	0,000385
0,75	60%	**D08MA4**	1680	4,2	1,84	Y	0,81	3,7	1,8	1,5	1,9	0,00115
1,1	60%	**D08LA4**	1680	6,2	2,5	Y	0,82	3,6	1,6	1,5	1,9	0,0015
1,5	60%	**D09SA4**	1680	8,5	3,3	Y	0,84	4,3	1,9	1,6	2,2	0,00245
2,2	60%	**D09LA4**	1680	12,5	4,5	Y	0,86	4,3	1,8	1,6	2,1	0,0032
3,0	60%	**D09XA4**	1680	16,6	6,2	Y	0,86	3,7	1,9	1,8	2,1	0,0038
4,0	60%	**D11SA4**	1710	22	8,1	Δ	0,85	4,4	1,8	1,5	2,2	0,0081
5,5	60%	**D11MA4**	1710	30,5	10,7	Δ	0,87	4,7	1,6	1,6	2,2	0,0105
7,5	60%	**D11LA4**	1710	41,5	14,6	Δ	0,87	5,0	2,0	1,9	2,3	0,014

P	Rated output at 60 Hz mains frequency, S3/S6 duty
DC	Permissible duty cycle
n	Typical rated rotor shaft speed at 60 Hz
	Mains frequency
M_N	Rated shaft torque
I_N	Rated current at 460 V (for other special voltages, multiply by the inverse voltage ratio to convert the current at 460 V to the current at the desired voltage)
cos φ	Power factor
I_A/I_N	Relative starting current
M_A/M_N	Relative starting torque
M_S/M_N	Relative pull-up torque
M_K/M_N	Relative breakdown torque
J_{rot}	Rotor moment of inertia

The standard motor winding configuration is for 460 V / 60 Hz.

See "www.bauergears.com" for additional information.

60 Hz

Technical data 4-pole S1

4/2-pole motors Δ/YY for continuous operation S1, line frequency 60 Hz

P kW	**Type**	n 1/min	M_N Nm	I_N (460 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,03 / 0,06	**D04LA42**	1620 / 3240	0,160 / 0,170	0,200 / 0,230	0,56 / 0,67	2,4 / 3,4	3,8 / 3,4	3,8 / 3,4	4,0 / 3,7	0,000175
0,04 / 0,08	**D04LA42**	1620 / 3240	0,230 / 0,230	0,230 / 0,260	0,60 / 0,75	2,2 / 3,1	3,3 / 2,3	3,3 / 2,3	3,7 / 2,4	0,000175
0,06 / 0,12	**D05LA42**	1620 / 3240	0,350 / 0,350	0,420 / 0,420	0,50 / 0,75	3,1 / 3,6	3,4 / 2,2	3,3 / 2,1	4,2 / 2,9	0,000295
0,08 / 0,16	**D05LA42**	1620 / 3240	0,470 / 0,470	0,460 / 0,460	0,55 / 0,75	3,1 / 3,6	3,1 / 2,0	3,0 / 1,9	3,8 / 2,5	0,000295
0,06 / 0,12	**D06LA42**	1620 / 3240	0,350 / 0,350	0,420 / 0,420	0,50 / 0,75	3,1 / 3,6	3,4 / 2,2	3,3 / 2,1	4,2 / 2,9	0,000295
0,08 / 0,16	**D06LA42**	1620 / 3240	0,470 / 0,470	0,460 / 0,460	0,55 / 0,75	3,1 / 3,6	3,1 / 2,0	3,0 / 1,9	3,8 / 2,5	0,000295
0,11 / 0,22	**D06LA42**	1620 / 3240	0,64 / 0,64	0,63 / 0,63	0,55 / 0,75	3,1 / 3,6	3,1 / 2,0	3,0 / 1,9	3,8 / 2,5	0,000295
0,16 / 0,32	**D06LA42**	1620 / 3240	0,94 / 0,94	0,82 / 0,82	0,57 / 0,80	3,1 / 3,6	2,8 / 1,9	2,7 / 1,8	3,4 / 2,3	0,000295
0,2 / 0,4	**D07LA42**	1680 / 3360	1,12 / 1,14	1,04 / 1,08	0,58 / 0,81	3,2 / 3,9	3,1 / 1,8	3,0 / 1,5	3,3 / 2,2	0,000385
0,28 / 0,56	**D08MA42**	1680 / 3360	1,58 / 1,58	1,10 / 1,60	0,61 / 0,81	3,7 / 3,2	2,5 / 1,7	2,5 / 1,5	3,3 / 2,1	0,00115
0,4 / 0,8	**D08LA42**	1680 / 3360	2,2 / 2,2	1,40 / 1,74	0,62 / 0,90	5,1 / 5,6	3,0 / 2,0	2,6 / 1,9	3,4 / 2,3	0,0015
0,5 / 1,0	**D09SA42**	1680 / 3360	2,8 / 2,8	1,60 / 2,6	0,71 / 0,91	5,5 / 4,6	3,4 / 2,2	3,4 / 2,2	4,2 / 2,6	0,00245
0,7 / 1,4	**D09SA42**	1680 / 3360	3,9 / 3,9	1,93 / 3,1	0,71 / 0,93	5,1 / 4,5	2,8 / 1,8	2,8 / 1,8	3,4 / 2,2	0,00245
1,0 / 2,0	**D09LA42**	1680 / 3360	5,6 / 5,6	2,8 / 4,3	0,72 / 0,94	5,1 / 4,5	2,8 / 1,8	2,8 / 1,8	3,4 / 2,2	0,0032
1,2 / 2,4	**D09XA42**	1680 / 3360	6,8 / 6,7	3,4 / 5,2	0,65 / 0,87	6,8 / 3,3	2,7 / 2,0	2,7 / 2,0	3,4 / 2,5	0,0038
1,4 / 2,8	**D11SA42**	1710 / 3420	7,8 / 7,8	3,3 / 5,7	0,74 / 0,90	7,0 / 4,9	3,3 / 1,9	2,8 / 1,6	4,5 / 3,1	0,0081
2,0 / 4,0	**D11MA42**	1710 / 3420	11,2 / 11,1	5,1 / 8,4	0,70 / 0,90	7,3 / 5,9	3,4 / 2,3	3,0 / 1,8	4,1 / 2,8	0,0105
2,5 / 5,0	**D11LA42**	1710 / 3420	14 / 14	5,0 / 9,1	0,79 / 0,92	6,1 / 5,0	3,1 / 2,0	3,0 / 1,9	4,1 / 2,8	0,014

P	Rated outputs at 60 Hz line frequency
n	Guideline values for rated speeds at the rotor shaft at 60 Hz line frequency
M_N	Rated torques at the rotor shaft
I_N	Rated currents 460 V Δ/YY (currents can be converted as inverse ratios of voltages from 460 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_S/M_N	Relative pull-up torques
M_K/M_N	Relative breakdown torques
J_{rot}	Mass moment of inertia of the rotor

Technical data 8/4-pole S1

8/4-pole motors Δ/YY for continuous operation S1, line frequency 60 Hz

P kW	**Type**	n 1/min	M_N Nm	I_N (460 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,03 / 0,06	**D05LA84**	810 / 1620	0,340 / 0,350	0,280 / 0,260	0,52 / 0,71	1,8 / 2,8	3,0 / 2,1	1,8 / 1,9	1,8 / 1,9	0,000295
0,03 / 0,06	**D06LA84**	810 / 1620	0,340 / 0,350	0,280 / 0,260	0,52 / 0,71	1,8 / 2,8	3,0 / 2,1	1,8 / 1,9	1,8 / 1,9	0,000295
0,04 / 0,08	**D06LA84**	810 / 1620	0,450 / 0,460	0,440 / 0,370	0,52 / 0,66	1,5 / 2,4	2,9 / 2,3	1,8 / 1,9	1,8 / 1,9	0,000295
0,06 / 0,12	**D07LA84**	810 / 1620	0,70 / 0,70	0,65 / 0,55	0,52 / 0,66	1,9 / 3,1	3,5 / 1,9	3,5 / 1,7	3,6 / 2,3	0,000385
0,06 / 0,12	**D08LA84**	840 / 1680	0,67 / 0,67	0,460 / 0,460	0,61 / 0,83	3,1 / 4,1	3,4 / 2,5	3,4 / 2,5	3,9 / 3,2	0,0025
0,08 / 0,16	**D08LA84**	840 / 1680	0,90 / 0,90	0,57 / 0,57	0,61 / 0,83	3,1 / 4,1	3,3 / 2,4	3,3 / 2,4	3,9 / 3,3	0,0025
0,11 / 0,22	**D08LA84**	840 / 1680	1,24 / 1,25	0,74 / 0,74	0,61 / 0,83	3,1 / 4,1	3,1 / 2,3	3,1 / 2,3	3,7 / 3,1	0,0025
0,14 / 0,28	**D08LA84**	840 / 1680	1,58 / 1,59	0,92 / 0,92	0,61 / 0,83	3,1 / 4,1	3,1 / 2,3	3,1 / 2,3	3,7 / 3,1	0,0025
0,2 / 0,4	**D08LA84**	840 / 1680	2,2 / 2,2	1,05 / 1,20	0,55 / 0,77	3,1 / 4,1	2,5 / 1,9	2,5 / 1,9	3,0 / 2,5	0,0025
0,25 / 0,5	**D09XC84**	840 / 1680	2,8 / 2,8	1,28 / 1,28	0,48 / 0,77	3,2 / 5,5	3,0 / 2,2	3,0 / 2,3	3,4 / 3,0	0,006
0,28 / 0,56	**D09XC84**	840 / 1680	3,1 / 3,1	1,29 / 1,38	0,57 / 0,80	3,2 / 5,4	2,7 / 2,0	2,7 / 2,1	3,1 / 2,7	0,006
0,4 / 0,8	**D09XC84**	840 / 1680	4,5 / 4,5	1,80 / 2,2	0,55 / 0,79	3,1 / 4,6	2,5 / 1,9	2,5 / 2,0	3,0 / 2,5	0,006
0,5 / 1,0	**D09XC84**	840 / 1680	5,6 / 5,6	2,2 / 2,4	0,55 / 0,81	2,9 / 4,4	2,4 / 1,8	2,4 / 1,8	2,8 / 2,4	0,006
0,8 / 1,6	**D11LC84**	850 / 1710	8,9 / 8,9	2,8 / 3,8	0,63 / 0,88	3,8 / 4,7	2,4 / 2,1	2,4 / 1,9	3,1 / 3,0	0,0215
1,1 / 2,2	**D11LC84**	850 / 1710	12,2 / 12,2	3,7 / 4,5	0,58 / 0,85	4,3 / 6,2	2,5 / 2,3	2,5 / 1,9	3,0 / 2,7	0,0215
1,6 / 3,2	**D11LC84**	850 / 1710	17,9 / 17,9	5,5 / 7,0	0,59 / 0,84	4,1 / 5,6	2,4 / 2,0	2,3 / 1,6	2,8 / 2,5	0,0215

P	Rated outputs at 60 Hz line frequency
n	Guideline values for rated speeds at the rotor shaft at 60 Hz line frequency
M_N	ated torques at the rotor shaft
I_N	Rated currents 460 V Δ/YY (currents can be converted as inverse ratios of voltages from 460 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_S/M_N	Relative pull-up torques
M_K/M_N	Relative breakdown torques
J_{rot}	Mass moment of inertia of the rotor

60 Hz

Technical data 8/2-pole S3/S6

8/2-pole motors Y/Y for for periodic intermittent

P kW	ED	**Type**	n 1/min	M_N Nm	I_N (460 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm²
0,04 / 0,16	25/75%	**D05LA82**	810 / 3240	0,460 / 0,470	0,370 / 0,74	0,63 / 0,75	1,8 / 3,5	2,1 / 2,4	2,1 / 2,3	2,2 / 2,5	0,000295
0,05 / 0,20	25/75%	**D06LA82**	810 / 3240	0,58 / 0,59	0,470 / 0,94	0,63 / 0,75	1,5 / 3,1	1,9 / 2,2	1,9 / 2,1	2,0 / 2,3	0,000295
0,063 / 0,25	25/75%	**D07LA82**	800 / 3420	0,75 / 0,75	0,55 / 1,10	0,69 / 0,62	1,5 / 2,8	1,8 / 1,5	1,8 / 1,5	2,0 / 3,0	0,000385
0,071 / 0,28	25/75%	**D07LA82**	800 / 3420	0,82 / 0,81	0,60 / 1,30	0,69 / 0,68	1,5 / 2,8	1,7 / 1,4	1,7 / 1,4	1,9 / 2,9	0,000385
0,063 / 0,25	25/75%	**D08LA82**	840 / 3360	0,70 / 0,71	0,51 / 0,65	0,55 / 0,87	3,1 / 4,4	2,6 / 2,9	2,6 / 2,8	3,1 / 3,3	0,0015
0,09 / 0,36	25/75%	**D08LA82**	840 / 3360	1,01 / 1,01	0,65 / 0,98	0,60 / 0,92	3,2 / 4,9	2,2 / 2,9	2,2 / 2,8	2,7 / 3,2	0,0015
0,12 / 0,50	25/75%	**D08LA82**	840 / 3360	1,41 / 1,41	0,90 / 1,33	0,60 / 0,92	3,2 / 4,9	2,2 / 2,9	2,2 / 2,8	2,7 / 3,2	0,0015
0,16 / 0,63	25/75%	**D08LA82**	840 / 3360	1,79 / 1,75	1,12 / 1,35	0,63 / 0,90	2,2 / 5,0	2,0 / 2,3	2,0 / 2,2	2,5 / 2,7	0,0015
0,25 / 1,0	25/75%	**D09XA82**	840 / 3360	2,8 / 2,8	1,19 / 2,1	0,62 / 0,90	2,4 / 5,7	2,1 / 2,5	2,1 / 2,5	2,2 / 2,8	0,0038
0,36 / 1,4	25/75%	**D09XA82**	840 / 3360	4,0 / 3,9	1,91 / 3,0	0,57 / 0,87	2,2 / 4,9	2,1 / 2,3	2,1 / 2,3	2,2 / 2,6	0,0038
0,45 / 1,8	25/75%	**D09XA82**	840 / 3360	5,1 / 5,0	2,2 / 3,9	0,65 / 0,89	2,2 / 4,7	1,9 / 2,2	1,9 / 2,2	2,2 / 2,7	0,0038
0,56 / 2,2	25/75%	**D11LA82**	850 / 3420	6,2 / 6,0	2,1 / 4,3	0,60 / 0,94	3,5 / 5,4	2,1 / 3,2	2,1 / 2,6	2,4 / 3,2	0,014
0,71 / 2,8	25/75%	**D11LA82**	850 / 3420	7,9 / 7,8	2,5 / 5,1	0,58 / 0,94	2,7 / 5,1	2,1 / 2,5	2,1 / 2,2	2,3 / 2,6	0,014
0,90 / 3,6	25/75%	**D11LA82**	850 / 3420	10 / 10	3,2 / 7,2	0,58 / 0,94	2,7 / 4,9	2,0 / 2,2	2,0 / 2,0	2,2 / 2,3	0,014

P	Rated outputs at 60 Hz line frequency, duty type S3-25/75%
n	Guideline values for rated speeds at the rotor shaft at 60 Hz line frequency
M_N	Rated torques at the rotor shaft
I_N	Rated currents 460 V Y/Y (currents can be converted as inverse ratios of voltages from 460 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_S/M_N	Relative pull-up torques
M_K/M_N	Relative breakdown torques
J_{rot}	Mass moment of inertia of the rotor

Technical data 12/2-pole S3

12/2-pole motors Y/Y for intermittent periodic duty S3-25/75%, line frequency 60 Hz

P kW	ED	**Type**	n 1/min	M_N Nm	I_N (460 V) A	cos φ	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J_{rot} kgm^2
0,045 / 0,28	25/75%	**D08LA122**	560 / 3360	0,76 / 0,79	0,51 / 0,79	0,70 / 0,90	1,5 / 4,9	2,1 / 2,7	2,1 / 2,7	2,1 / 3,0	0,0015
0,063 / 0,40	25/75%	**D08LA122**	560 / 3360	1,07 / 1,13	0,61 / 1,02	0,70 / 0,90	1,5 / 4,9	1,9 / 2,4	1,9 / 2,4	1,9 / 2,7	0,0015
0,09 / 0,56	25/75%	**D08LA122**	560 / 3360	1,54 / 1,59	0,95 / 1,35	0,63 / 0,89	1,5 / 4,5	1,9 / 2,3	1,9 / 2,5	2,0 / 2,6	0,0015
0,11 / 0,71	25/75%	**D09XA122**	560 / 3360	1,88 / 2,0	1,00 / 1,50	0,59 / 0,88	1,6 / 6,0	1,9 / 3,0	1,9 / 2,9	2,0 / 3,6	0,0038
0,16 / 1,0	25/75%	**D09XA122**	560 / 3360	2,7 / 2,8	1,56 / 2,2	0,62 / 0,89	1,6 / 6,0	2,0 / 2,9	2,0 / 2,7	2,0 / 3,6	0,0038
0,2 / 1,25	25/75%	**D09XA122**	560 / 3360	3,4 / 3,5	1,85 / 2,8	0,62 / 0,89	1,6 / 5,5	1,9 / 2,6	1,9 / 2,5	1,9 / 3,4	0,0038
0,25 / 1,6	25/75%	**D11LA122**	560 / 3420	4,2 / 4,4	2,1 / 3,1	0,53 / 0,95	1,8 / 5,4	1,9 / 2,8	1,9 / 2,6	2,2 / 3,1	0,014
0,32 / 2,0	25/75%	**D11LA122**	560 / 3420	5,4 / 5,5	2,7 / 3,6	0,53 / 0,94	1,8 / 5,1	1,9 / 2,7	1,9 / 2,4	2,2 / 3,0	0,014
0,45 / 2,8	25/75%	**D11LA122**	560 / 3420	7,6 / 7,8	3,8 / 5,1	0,52 / 0,94	1,8 / 5,1	1,6 / 2,5	1,6 / 2,2	2,0 / 2,6	0,014

P	Rated outputs at 60 Hz line frequency, duty type S3-25/75%
n	Guideline values for rated speeds at the rotor shaft at 60 Hz line frequency
M_N	Rated torques at the rotor shaft
I_N	Rated currents 460 V Y/Y (currents can be converted as inverse ratios of voltages from 460 V to the desired special voltage)
cos φ	Power factors
I_A/I_N	Relative starting currents
M_A/M_N	Relative breakaway torques
M_S/M_N	Relative pull-up torques
M_K/M_N	Relative breakdown torques
J_{rot}	Mass moment of inertia of the rotor

Operation with frequency converter 5...70 Hz

The figures given in the table below are for Bauer motors operating in conjunction with the frequency inverter. The torques referred to in tables can be entered for the respective frequencies in continuous operation (S1 = duty factor 100%).

Motor torques for frequency-converter range 5 Hz - 70 Hz, line frequency 50 Hz

P	**Type**	Connec-tion	5 Hz	10 Hz	20 Hz	30 Hz	50 Hz	60 Hz	70 Hz	5 Hz	10 Hz	20 Hz	30 Hz	50 Hz	60 Hz	70 Hz
			M	M	M	M	M	M	M	I	I	I	I	I	I	I
kW			Nm	Nm	Nm	Nm	Nm	Nm	Nm	A	A	A	A	A	A	A
0,03	**D04LA4**	Y	0,125	0,155	0,185	0,205	0,210	0,210	0,180	0,190	0,193	0,198	0,200	0,200	0,230	0,230
0,04	**D04LA4**	Y	0,165	0,210	0,250	0,275	0,280	0,275	0,205	0,190	0,193	0,198	0,200	0,200	0,230	0,200
0,06	**D04LA4**	Y	0,250	0,315	0,375	0,410	0,420	0,420	0,320	0,290	0,295	0,300	0,300	0,300	0,340	0,305
0,09	**D04LA4**	Y	0,375	0,470	0,56	0,62	0,63	0,63	0,52	0,435	0,440	0,450	0,450	0,450	0,51	0,495
0,12	**D04LA4**	Y	0,50	0,63	0,75	0,82	0,84	0,69	0,50	0,440	0,450	0,455	0,460	0,460	0,460	0,450
0,06	**D05LA4**	Y	0,250	0,315	0,375	0,410	0,420	0,420	0,360	0,300	0,315	0,340	0,350	0,350	0,395	0,400
0,09	**D05LA4**	Y	0,375	0,470	0,56	0,62	0,63	0,63	0,54	0,355	0,365	0,375	0,380	0,380	0,430	0,430
0,12	**D05LA4**	Y	0,51	0,63	0,76	0,83	0,85	0,81	0,59	0,370	0,385	0,410	0,420	0,420	0,455	0,410
0,18	**D05LA4**	Y	0,76	0,96	1,15	1,26	1,28	1,28	0,97	0,59	0,60	0,62	0,63	0,63	0,72	0,64
0,25	**D05LA4**	Y	1,05	1,31	1,57	1,72	1,75	1,74	1,28	0,85	0,86	0,87	0,88	0,88	1,00	0,88
0,06	**D06LA4**	Y	0,250	0,315	0,375	0,410	0,420	0,420	0,360	0,300	0,315	0,340	0,350	0,350	0,395	0,400
0,09	**D06LA4**	Y	0,375	0,470	0,56	0,62	0,63	0,63	0,54	0,355	0,365	0,375	0,380	0,38	0,430	0,430
0,12	**D06LA4**	Y	0,51	0,63	0,76	0,83	0,85	0,81	0,59	0,37	0,385	0,41	0,420	0,42	0,455	0,41
0,18	**D06LA4**	Y	0,76	0,96	1,15	1,26	1,28	1,28	0,97	0,59	0,60	0,62	0,63	0,63	0,72	0,64
0,25	**D06LA4**	Y	1,05	1,32	1,58	1,73	1,76	1,75	1,29	0,85	0,87	0,88	0,89	0,89	1,01	0,89
0,3	**D07LA4**	Y	1,27	1,59	1,9	2,0	2,1	2,1	1,81	1,25	1,27	1,29	1,30	1,30	1,47	1,47
0,37	**D07LA4**	Y	1,57	1,96	2,3	2,5	2,6	2,5	1,83	1,30	1,32	1,34	1,35	1,35	1,46	1,34
0,37	**DHE08MA4**	Y	1,47	1,83	2,2	2,4	2,4	2,4	2,1	1,18	1,19	1,2	1,2	1,2	1,36	1,36
0,55	**DHE08LA4**	Y	2,2	2,8	3,3	3,6	3,7	3,7	2,8	1,13	1,21	1,3	1,36	1,36	1,54	1,38
0,75	**DHE08XA4**	Y	3	3,8	4,5	4,9	5	5	4,2	1,68	1,75	1,83	1,88	1,88	2,2	2,2
0,75	**DHE09SA4**	Y	3	3,8	4,5	4,9	5	5	4,2	1,59	1,66	1,75	1,8	1,8	2,1	2,1
1,1	**DHE09LA4**	Y	4,3	5,4	6,5	7,2	7,3	7,3	6,2	2,2	2,4	2,5	2,6	2,6	2,9	2,9
1,5	**DHE09XA4**	Y	5,9	7,4	8,9	9,8	9,9	9,9	8,5	2,8	3,1	3,2	3,4	3,4	3,8	3,8
2,2	**DHE09XA4C**	Y	8,7	10,8	13	14,3	14,5	14,5	12,4	3,8	4,2	4,5	4,8	4,8	5,4	5,4
2,2	**DHE11SA4**	Y	8,7	10,8	13	14,3	14,5	14,5	12,4	3,6	3,9	4,4	4,6	4,6	5,2	5,3
3	**DHE11MA4**	Y	12	15	18	19,7	20	20	17,1	4,9	5,4	5,9	6,3	6,3	7,2	7,2
4	**DHE11LA4**	Y	15,9	19,8	23,5	26	26,5	26,5	22,5	6,5	7,2	7,9	8,4	8,4	9,5	9,5
5,5	**DHE11LA4C**	Y	21,5	27	32	35,5	36	36	30,5	8,1	9	10	10,7	10,7	12,1	12,1

Field weakening for frequencies above 50 Hz, winding for standard voltage **400 V Y / 50 Hz**, Temperature Class F.

P Rated output
n Guideline value for rated speed at the rotor shaft
M Permissible load torque (S1-100%) for operation with frequency inverter
M_N Rated torque at the rotor shaft
I Load current for operation with frequency inverter

Motors with standard windings can be switched from Y- to Δ- circuit for operation with a converter having a single-phase mains connection. This has no effect on the torques and frequencies as listed in the table above. As regards the choice of converter, however, note that currents are higher than those of the Y-circuit by a factor of 1.73.

The load currents in the table are guideline values for selecting the size of frequency inverter. Load current is lower if the load torque is below the values permitted for 30-70 Hz and the frequency inverter used is of the high-grade type. This means that a smaller inverter can sometimes be used, particularly in conjunction with large motors.

Operation with frequency converter 5 Hz - 100 Hz

Motor torques for frequency-converter range 5 Hz - 100 Hz, line frequency 50 Hz

P kW	**Type**	Connection	5 Hz M Nm	8,7 Hz M Nm	10 Hz M Nm	20 Hz M Nm	87 Hz M Nm	100 Hz M Nm	5 Hz I A	8,7 Hz I A	10 Hz I A	20 Hz I A	87 Hz I A	100 Hz I A
0,03	**D04LA4**	D	0,125	0,15	0,155	0,185	0,21	0,21	0,33	0,335	0,335	0,345	0,35	0,38
0,04	**D04LA4**	D	0,165	0,2	0,21	0,25	0,28	0,28	0,33	0,335	0,335	0,345	0,35	0,38
0,06	**D04LA4**	D	0,25	0,3	0,315	0,375	0,42	0,42	0,51	0,51	0,51	0,52	0,52	0,57
0,09	**D04LA4**	D	0,375	0,45	0,47	0,56	0,63	0,63	0,76	0,76	0,77	0,78	0,78	0,86
0,12	**D04LA4**	D	0,5	0,6	0,63	0,75	0,84	0,75	0,76	0,77	0,78	0,79	0,8	0,8
0,06	**D05LA4**	D	0,25	0,3	0,315	0,375	0,42	0,42	0,52	0,54	0,55	0,59	0,61	0,67
0,09	**D05LA4**	D	0,375	0,45	0,47	0,56	0,63	0,63	0,62	0,63	0,63	0,65	0,66	0,73
0,12	**D05LA4**	D	0,51	0,61	0,63	0,76	0,85	0,85	0,64	0,67	0,67	0,71	0,73	0,8
0,18	**D05LA4**	D	0,76	0,92	0,96	1,15	1,28	1,28	1,01	1,04	1,04	1,07	1,1	1,2
0,25	**D05LA4**	D	1,05	1,25	1,31	1,57	1,75	1,75	1,46	1,48	1,49	1,51	1,53	1,68
0,06	**D06LA4**	D	0,25	0,3	0,315	0,375	0,42	0,42	0,52	0,54	0,55	0,59	0,61	0,67
0,09	**D06LA4**	D	0,375	0,45	0,47	0,56	0,63	0,63	0,62	0,63	0,63	0,65	0,66	0,73
0,12	**D06LA4**	D	0,51	0,61	0,63	0,76	0,85	0,85	0,64	0,67	0,67	0,71	0,73	0,8
0,18	**D06LA4**	D	0,76	0,92	0,96	1,15	1,28	1,28	1,01	1,04	1,04	1,07	1,1	1,2
0,25	**D06LA4**	D	1,05	1,26	1,32	1,58	1,76	1,76	1,47	1,49	1,5	1,53	1,55	1,69
0,3	**D07LA4**	D	1,27	1,52	1,59	1,9	2,1	2,1	2,2	2,2	2,2	2,2	2,3	2,5
0,37	**D07LA4**	D	1,57	1,88	1,96	2,3	2,6	2,6	2,2	2,3	2,3	2,4	2,4	2,6
0,37	**DHE08MA4**	D	1,47	1,76	1,83	2,2	2,4	2,4	2,1	2,1	2,1	2,1	2,1	2,3
0,55	**DHE08LA4**	D	2,2	2,6	2,8	3,3	3,7	3,7	1,95	2,1	2,1	2,2	2,4	2,6
0,75	**DHE08XA4**	D	3	3,6	3,8	4,5	5	5	3	3,1	3,1	3,2	3,3	3,6
0,75	**DHE09SA4**	D	3	3,6	3,8	4,5	5	5	2,8	2,8	2,9	3,1	3,2	3,5
1,1	**DHE09LA4**	D	4,3	5,2	5,4	6,5	7,3	7,3	3,8	4	4	4,2	4,5	4,9
1,5	**DHE09XA4**	D	5,9	7,1	7,4	8,9	9,9	9,9	4,6	5	5,1	5,5	5,9	6,4
2,2	**DHE09XA4C**	D	8,7	10,4	10,8	13	14,5	14,5	6,7	7,1	7,2	7,8	8,3	9,1
2,2	**DHE11SA4**	D	8,7	10,4	10,8	13	14,5	14,5	6,2	6,7	6,8	7,5	8	8,8
3	**DHE11MA4**	D	12	14,3	15	18	20	20	8,4	9,1	9,3	10,3	11	12
4	**DHE11LA4**	D	15,9	19	19,8	23,5	26,5	26,5	11,9	12,6	12,8	13,9	14,6	16
5,5	**DHE11LA4C**	D	21,5	25,5	27	32	36	36	14,2	15,6	15,9	17,8	19,1	21

Field weakening for frequencies above 87 Hz, winding for
230 V Δ/ 50 Hz (U_{max} = 400 V Δ/87 Hz), Temperature Class F.

P	Rated output
n	Guideline value for rated speed at the rotor shaft
M	P0ermissible load torque (S1-100%) for operation with frequency inverter
M_N	Rated torque at the rotor shaft
I	Load current for operation with frequency inverter

The load currents in the table are guideline values for selecting the size of frequency inverter. Load current is lower if the load torque is below the values permitted for 30-100 Hz and the frequency inverter used is of the high-grade type. This means that a smaller inverter can sometimes be used, particularly in conjunction with large motors.

Operation with frequency converter 6 Hz - 84 Hz

Motor torques for frequency-converter range 6 Hz - 84 Hz, line frequency 60 Hz

P kW	**Type**	Connec- tion	6 Hz M Nm	12 Hz M Nm	24 Hz M Nm	36 Hz M Nm	60 Hz M Nm	72 Hz M Nm	84 Hz M Nm	6 Hz I A	12 Hz I A	24 Hz I A	36 Hz I A	60 Hz I A	72 Hz I A	84 Hz I A
0,03	**D04LA4**	Y	0,115	0,140	0,165	0,180	0,180	0,180	0,150	0,176	0,178	0,180	0,185	0,180	0,205	0,205
0,04	**D04LA4**	Y	0,145	0,180	0,215	0,235	0,230	0,230	0,180	0,176	0,178	0,180	0,185	0,180	0,205	0,190
0,06	**D04LA4**	Y	0,220	0,275	0,325	0,355	0,350	0,350	0,300	0,275	0,275	0,280	0,290	0,280	0,320	0,320
0,09	**D04LA4**	Y	0,330	0,410	0,485	0,53	0,520	0,520	0,445	0,400	0,400	0,400	0,415	0,400	0,455	0,455
0,12	**D04LA4**	Y	0,445	0,55	0,65	0,71	0,70	0,63	0,465	0,410	0,415	0,420	0,435	0,420	0,435	0,415
0,06	**D05LA4**	Y	0,220	0,275	0,325	0,355	0,350	0,350	0,300	0,280	0,295	0,315	0,330	0,320	0,365	0,365
0,09	**D05LA4**	Y	0,330	0,410	0,485	0,53	0,520	0,520	0,445	0,335	0,340	0,350	0,360	0,350	0,395	0,400
0,12	**D05LA4**	Y	0,445	0,55	0,65	0,71	0,70	0,70	0,53	0,345	0,36	0,375	0,395	0,38	0,43	0,385
0,18	**D05LA4**	Y	0,67	0,83	0,99	1,08	1,06	1,06	0,87	0,54	0,56	0,58	0,60	0,58	0,66	0,64
0,25	**D05LA4**	Y	0,92	1,14	1,36	1,48	1,45	1,45	1,15	0,78	0,79	0,8	0,83	0,8	0,91	0,85
0,06	**D06LA4**	Y	0,22	0,275	0,325	0,355	0,35	0,35	0,3	0,28	0,295	0,315	0,330	0,32	0,365	0,365
0,09	**D06LA4**	Y	0,33	0,41	0,485	0,53	0,52	0,52	0,445	0,335	0,34	0,35	0,360	0,35	0,395	0,4
0,12	**D06LA4**	Y	0,445	0,55	0,65	0,71	0,70	0,70	0,53	0,345	0,36	0,375	0,395	0,38	0,43	0,385
0,18	**D06LA4**	Y	0,67	0,83	0,99	1,08	1,06	1,06	0,87	0,54	0,56	0,58	0,60	0,58	0,66	0,64
0,25	**D06LA4**	Y	0,92	1,14	1,36	1,48	1,45	1,45	1,15	0,78	0,79	0,8	0,83	0,8	0,91	0,85
0,3	**D07LA4**	Y	1,12	1,38	1,65	1,80	1,76	1,76	1,5	1,18	1,19	1,20	1,24	1,2	1,36	1,36
0,37	**D07LA4**	Y	1,37	1,69	2,0	2,2	2,1	2,1	1,64	1,24	1,25	1,26	1,30	1,26	1,43	1,28
0,55	**D08MA4**	Y	1,98	2,4	2,9	3,1	3,1	3,1	2,4	1,29	1,36	1,44	1,51	1,47	1,66	1,55
0,75	**DHE08XA4**	Y	2,4	3,1	3,7	4,1	4,1	4,1	3,7	1,45	1,5	1,56	1,6	1,6	1,78	1,81
0,75	**DHE09SA4**	Y	2,4	3,1	3,7	4,1	4,1	4,1	3,7	1,34	1,43	1,53	1,6	1,6	1,78	1,81
1,10	**DHE09LA4**	Y	3,6	4,5	5,4	5,9	6	6	5,4	1,85	1,99	2,2	2,2	2,2	2,5	2,6
1,50	**DHE09XA4**	Y	4,9	6,1	7,3	8,1	8,2	8,2	7,3	2,4	2,6	2,8	3	3	3,3	3,4
2,2	**DHE09XA4C**	Y	7,2	9	10,8	11,8	12	12	10,8	3,5	3,7	3,9	4	4	4,5	4,5
2,2	**DHE11SA4**	Y	7,2	9	10,8	11,8	12	12	10,8	3,1	3,5	3,8	4	4	4,5	4,5
3,0	**DHE11MA4**	Y	9,9	12,3	14,8	16,2	16,5	16,5	14,8	4,2	4,7	5,2	5,5	5,5	6,1	6,3
4,0	**DHE11LA4**	Y	13	16,2	19,5	21	21,5	21,5	19,5	5,6	6,2	6,9	7,3	7,3	8,1	8,3
5,5	**DHE11LA4C**	Y	18	22,5	27	29,5	30	30	27	7	7,8	8,6	9,2	9,2	10,2	10,4

Field weakening for frequencies above 60 Hz, winding for standard voltage **460 V Y / 60 Hz**, Temperature Class F.

P	Rated output
n	Guideline value for rated speed at the rotor shaft
M	permissible load torque (S1-100%) for operation with frequency inverter
M_N	Rated torque at the rotor shaft
I	Load current for operation with frequency inverter

Motors with standard windings can be switched from Y- to Δ- circuit for operation with a converter having a single-phase mains connection. This has no effect on the torques and frequencies as listed in the table above. As regards the choice of converter, however, note that currents are higher than those of the Y-circuit by a factor of 1.73.

The load currents in the table are guideline values for selecting the size of frequency converter. Load current is lower if the load torque is below the values permitted for 36-84 Hz and the frequency inverter used is of the high-grade type. This means that a smaller inverter can sometimes be used, particularly in conjunction with large motors.

Operation with frequency converter 6 Hz - 120 Hz

Motor torques for frequency-converter range 6 Hz - 120 Hz, line frequency 60 Hz

P kW	**Type**	Connec-tion	6 Hz M Nm	12 Hz M Nm	24 Hz M Nm	36 Hz M Nm	104 Hz M Nm	120 Hz M Nm	6 Hz I A	12 Hz I A	24 Hz I A	36 Hz I A	104 Hz I A	120 Hz I A
0,03	**D04LA4**	D	0,105	0,13	0,155	0,18	0,17	0,17	0,245	0,25	0,26	0,325	0,26	0,29
0,04	**D04LA4**	D	0,145	0,18	0,215	0,235	0,23	0,23	0,28	0,28	0,28	0,325	0,28	0,305
0,06	**D04LA4**	D	0,22	0,275	0,325	0,355	0,35	0,35	0,455	0,465	0,48	0,5	0,485	0,54
0,09	**D04LA4**	D	0,33	0,41	0,485	0,53	0,52	0,52	0,72	0,73	0,74	0,72	0,75	0,82
0,12	**D04LA4**	D	0,445	0,55	0,65	0,71	0,7	0,65	0,63	0,65	0,67	0,75	0,68	0,7
0,06	**D05LA4**	D	0,22	0,275	0,325	0,355	0,35	0,35	0,48	0,51	0,55	0,57	0,56	0,61
0,09	**D05LA4**	D	0,33	0,41	0,485	0,53	0,52	0,52	0,58	0,59	0,61	0,63	0,61	0,67
0,12	**D05LA4**	D	0,445	0,55	0,65	0,71	0,7	0,7	0,6	0,62	0,65	0,68	0,66	0,73
0,18	**D05LA4**	D	0,67	0,83	0,99	1,08	1,06	1,06	0,93	0,96	1	1,04	1,01	1,11
0,25	**D05LA4**	D	0,92	1,14	1,36	1,48	1,45	1,45	1,34	1,36	1,38	1,43	1,39	1,53
0,06	**D06LA4**	D	0,22	0,275	0,325	0,355	0,35	0,35	0,48	0,51	0,55	0,57	0,56	0,61
0,09	**D06LA4**	D	0,33	0,41	0,485	0,53	0,52	0,52	0,58	0,59	0,61	0,63	0,61	0,67
0,12	**D06LA4**	D	0,445	0,55	0,65	0,71	0,7	0,7	0,6	0,62	0,65	0,68	0,66	0,73
0,18	**D06LA4**	D	0,67	0,83	0,99	1,08	1,06	1,06	0,93	0,96	1	1,04	1,01	1,11
0,25	**D06LA4**	D	0,92	1,14	1,36	1,48	1,45	1,45	1,34	1,36	1,38	1,43	1,39	1,53
0,3	**D07LA4**	D	1,12	1,38	1,65	1,8	1,76	1,76	2,1	2,1	2,1	2,2	2,1	2,3
0,37	**D07LA4**	D	1,37	1,69	2	2,2	2,1	2,1	2,2	2,2	2,2	2,2	2,2	2,4
0,55	**D08MA4**	D	1,98	2,4	2,9	3,1	3,1	3,1	2,2	2,4	2,5	2,7	2,6	2,8
0,75	**DHE08XA4**	D	2,4	3,1	3,7	4,1	4,1	4,1	2,6	2,6	2,7	2,8	2,8	3,1
0,75	**DHE09SA4**	D	2,4	3,1	3,7	4,1	4,1	4,1	2,4	2,5	2,7	2,8	2,8	3,1
1,1	**DHE09LA4**	D	3,6	4,5	5,4	5,9	6	6	3,2	3,5	3,8	3,9	3,9	4,3
1,5	**DHE09XA4**	D	4,9	6,1	7,3	8,1	8,2	8,2	4,2	4,5	4,9	5,1	5,2	5,7
2,2	**DHE09XA4C**	D	7,2	9	10,8	11,8	12	12	5,7	6,1	6,6	6,9	7	7,7
2,2	**DHE11SA4**	D	7,2	9	10,8	11,8	12	12	5,4	5,9	6,5	6,9	7	7,7
3	**DHE11MA4**	D	9,9	12,3	14,8	16,2	16,5	16,5	7,4	8,1	9	9,5	9,6	10,5
4	**DHE11LA4**	D	13	16,2	19,5	21	21,5	21,5	10,7	11,4	12,2	12,6	12,7	13,9
5,5	**DHE11LA4C**	D	18	22,5	27	29,5	30	30	12,4	13,8	15,4	16,4	16,5	18,1

Field weakening for frequencies above 87 Hz, winding for standard voltage 265 V Δ / 60 Hz (Umax = 460 V Δ / 104 Hz), Temperature Class F.

P	Rated output
n	Guideline value for rated speed at the rotor shaft
M	permissible load torque (S1-100%) for operation with frequency inverter
M_N	Rated torque at the rotor shaft
I	Load current for operation with frequency inverter

The load currents in the table are guideline values for selecting the size of frequency converter. Load current is lower if the load torque is below the values permitted for 36-120 Hz and the frequency inverter used is of the high-grade type. This means that a smaller inverter can sometimes be used, particularly in conjunction with large motors.

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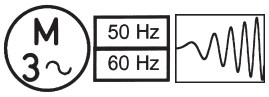
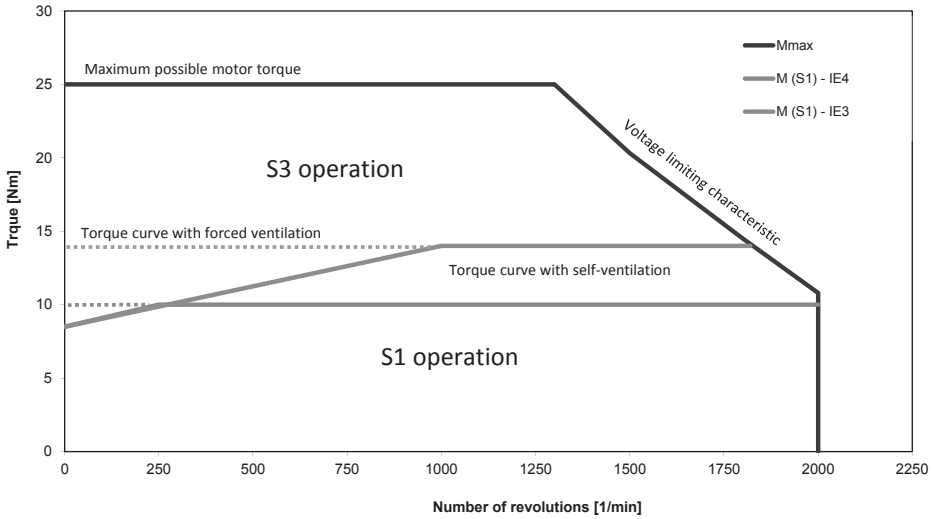


Drive configuration

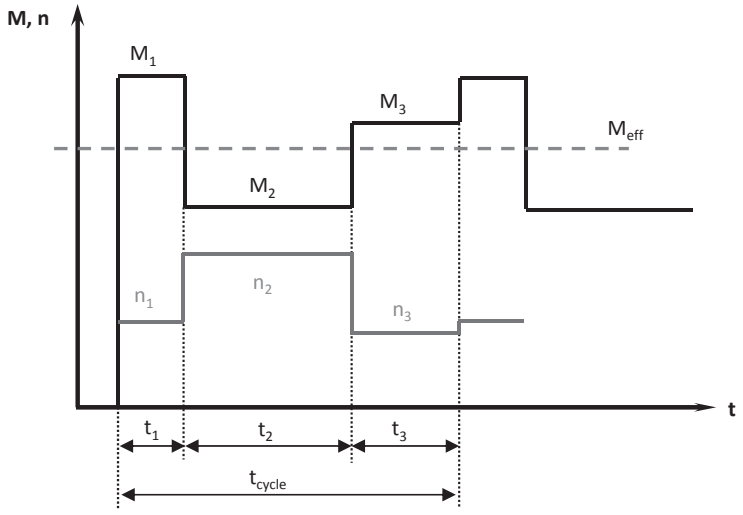
Torque–speed characteristic

The torque versus speed curve shows the operating characteristics of the BM.
The reference points shown schematically on the torque versus speed curve are significant criteria for motor selection.

Torque vs. Speed Curve



The motor is determined by the effective motor torque and the average motor speed. Both values M_{eff} and n_{eff} must be below the S1 limit characteristic curve of the motor to be selected.



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Drive configuration

Effective torque

$$M_{eff} = \sqrt{\frac{M_1^2 \cdot t_1 + M_2^2 \cdot t_2 + M_3^2 \cdot t_3 + \ldots + M_n^2 \cdot t_n}{t_1 + t_2 + t_3 + \ldots + t_n}}$$

Effective rpm

$$n_{eff} = \frac{n_1 \cdot t_1 + n_2 \cdot t_2 + n_3 \cdot t_3 + \ldots + n_n \cdot t_n}{t_1 + t_2 + t_3 + \ldots + t_n}$$

Acceleration

Dynamic power
The dynamic power is the power used to accelerate the entire system (load, transmission components, gears and motor).

$$P_{dyn} = \frac{m \times a \times v}{\eta}$$

P_{dyn}	dynamic power [W]
m	mass [kg]
a	acceleration [m/s²]
v	velocity [m/s]
η	efficiency

Dynamic load torque

$$M_{dyn_1} = m \cdot a \cdot \frac{1}{\eta} \cdot \frac{D}{2} \cdot \frac{1}{i}$$

D	bogie wheel diameter
i	gear reduction ratio

Constant velocity

Static performance
Static performance takes all forces that occur in the unaccelerated state into account. These include: rolling friction, frictional forces, lifting capacity on slopes and wind force.

$$P_S = \frac{F_F \times v}{\eta}$$

P_S	static performance [W]
F_F	driving resistance [N]

Static load torque (simplified)

$$M_{statt} = m \cdot g \cdot \frac{1}{\eta} \cdot \frac{D}{2} \cdot \frac{1}{i}$$

g	acceleration due to gravity

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Drive configuration

Deceleration

Deceleration torque

$$M_{dyn2} = m \cdot (-a) \cdot \eta_L \cdot \frac{D}{2} \cdot \frac{1}{i}$$

$$M_{VER} = M_{stat} + M_{dyn2}$$

M_{Verz} Deceleration torque

Load torques in the driving cycle

Acceleration phase

$$M_{Motor} = M_{stat} + M_{dyn1}$$

Constant velocity

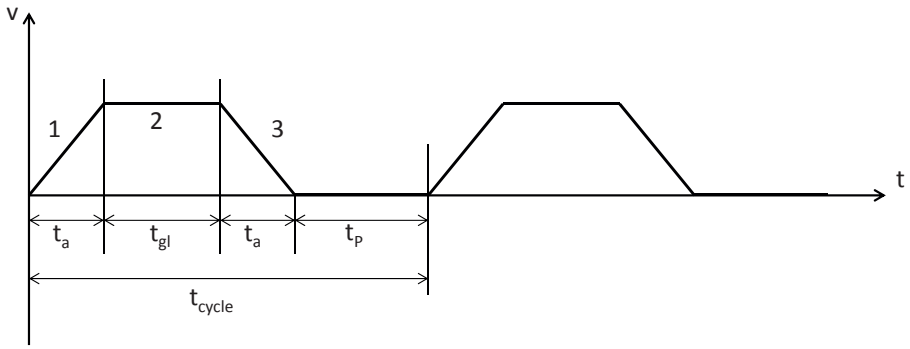
$$M_{Motor} = M_{stat}$$

Braking phase

$$M_{Motor} = M_{stat} + M_{dyn2}$$

Selection of the motor

Example:



Required dynamic torque on the motor (acceleration):	M1	= 20Nm
Required static torque on the motor:	M2	= 8,0Nm
Deceleration torque:	M3	= 10Nm
Acceleration time/deceleration time	t_a	= 0,5s
Constant travel duration	t_{gl}	= 5s
Cycle time	t_{Zykl}	= 10s
Motor speed for constant travel	n	= 1450 1/min

Effective motor torque and moderate motor speed

$$M_{eff} = \sqrt{\frac{M_1^2 \cdot t_a + M_2^2 \cdot t_{gl} + M_3^2 \cdot t_a}{t_{Zykl}}} = 7{,}55 \text{ Nm}$$

$$n_{eff} = \frac{n \cdot t_a + n \cdot t_{gl} + n \cdot t_a}{t_{Zykl}} = \frac{n \cdot (2 \cdot t_a + t_{gl})}{t_{Zykl}} = 870 \text{ min}^{-1}$$

Drive configuration

The following motor is selected:

Type: S08LA4
Rated output P_n = 1,5 kW
Rated torque: M_n = 9,55 Nm
Rated speed n_n = 1500 min^{-1}

Motor Data		S08LA4					
Rated output P_n	kW	1,1	1,5	1,65	2,2	2,2	3
Rated torque M_n	Nm	7	9,55	7	9,55	7	9,55
Rated current I_n	A	2,5	3,4	4,4	6	5,1	6,9
No. of Motor Poles 2p		4	4	4	4	4	4
Motor power n_n	1/min	1500	1500	2250	2250	3000	3000
Nominal Frequency	Hz	50	50	75	75	100	100
Motor efficiency η	%	IE4 - 88,0	IE3-85,3	IE4-89,3	IE3-86,7	IE4-91,0	IE4-89,8
Motorcircuit		Y	Y	D	D	Y	Y
Phase Resistance U-V R_{20}	Ohm	11,34	11,34	3,74	3,74	2,86	2,86
Winding Resistance Rs_{20}	Ohm	5,64	5,67	5,67	5,67	1,43	1,43
Inductance D-Axis Ld	mH	80	80	26,7	26,7	20,2	20,2
Inductance Q-Axis Lq	mH	118	118	39,3	39,3	29,4	29,4
Spannungs-Konstante ke	V/1000 1/min	174	174	100	100	84	84
Torque constant kt	Nm/A	2,8	2,8	1,6	1,6	1,4	1,4
Peak Torque $M_{max\ (60s)}$	Nm	16	16	16	16	16	16
Peak Current $I_{max\ (60s)}$	A	5,9	5,9	10,5	10,5	12	12
Moment of inertia	kgm^2	0,0015					

With proper utilisation of the gears by doubling the reduction and increasing the revs of the motor to 3000 min-1, the torque requirement for the motor can be halved, and this makes it possible to decrease the size of the motor.

Instead of the S08LA4, the following motor could be selected in this case:

Type: S08MA4
Rated output P_n=1,5 kW
Rated torque: M_n=4,75 Nm
Rated speed n_n=3000 min^{-1}

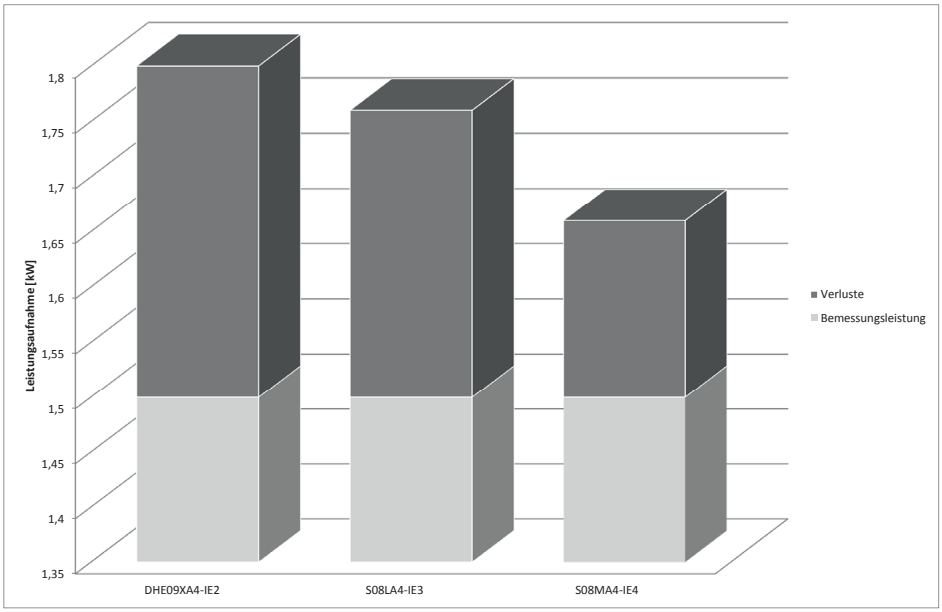
Motor Data		S08MA4				
Rated output P_n	kW	0,75	1,1	1,65	1,5	2,2
Rated torque M_n	Nm	4,75	4,75	7	4,75	7
Rated current I_n	A	1,7	2,9	4,3	3,4	5
No. of Motor Poles 2p		4	4	4	4	4
Motor power n_n	1/min	1500	2250	2250	3000	3000
Nominal Frequency	Hz	50	75	75	1000	100
Motor efficiency η	%	IE4-87,4	IE4-89,0	IE3-84,7	IE4-90,1	IE3-87,8
Motorcircuit		Y	D	D	Y	Y
Phase Resistance U-V R_{20}	Ohm	18,8	6,27	6,27	4,8	4,8
Winding Resistance Rs_{20}	Ohm	9,4	9,4	9,4	2,4	2,4
Inductance D-Axis Ld	mH	114	38	38	29,3	29,3
Inductance Q-Axis Lq	mH	136	45	45	34,2	34,2
Spannungs-Konstante ke	V/1000 1/min	177	102	102	89	89
Torque constant kt	Nm/A	2,8	1,6	1,6	1,4	1,4
Peak Torque $M_{max\ (60s)}$	Nm	12	12	12	12	12
Peak Current $I_{max\ (60s)}$	A	4,5	7,5	7,5	8,9	8,9
Moment of inertia	kgm^2	0,00115				

Drive configuration

This both increases the efficiency of the motor and simultaneously reduces the package length. The result is a cheaper drive with increased energy savings.

The diagram below shows the potential energy savings of using the different IE efficiency motors.

With the utilisation of the gears and the use of the S08MA4 IE4 motor, compared with the IE3 S08LA4 the power loss can be reduced by 36.24% and by 45.58% compared with the IE2 DHE09XA4.
At 8 hours of operation on 5 days a week across 50 weeks of a year, this results in an energy saving of 187.37 kW/h compared with the IE3 S08LA4 and 276.14 kW/h compared with the IE2 DHE09XA4.



Geared motors for electric overhead conveyors series BM Motors

Technical data of the motors with Rated speed 1500 $^{1}/_{min}$

Rated speed 1500 $^{1}/_{min}$

Motor	P_n	M_n	I_n	2p	n_n	f	η	Circuit	R_{20}	R_{s20}	L_d	L_q	ke	kt	$M_{max\ (60s)}$	$I_{max\ (60s)}$	J
	kW	Nm	A		1/min	Hz	%		Ω	Ω	mH	mH	V/1000 1/min	Nm/A	Nm	A	kgm^2
SU08MA4	0,55	3,5	1,28	4	1500	50	IE4-87,7	Y	18,8	9,4	114	136	177	2,72	10	3,7	0,00115
SU08MA4	0,75	4,75	1,75	4	1500	50	IE3 – 85,6	Y	18,8	9,4	114	136	177	2,72	10	3,7	0,00115
S08MA4	0,75	4,75	1,7	4	1500	50	IE4-87,4	Y	18,8	9,4	114	136	177	2,8	12	4,5	0,00115
SU08LA4	0,75	4,75	1,75	4	1500	50	IE4-89,9	Y	11,34	5,67	80	118	174	2,73	12	4,3	0,00115
S08LA4	1,1	7	2,5	4	1500	50	IE4 - 88,0	Y	11,34	5,64	80	118	174	2,8	16	5,9	0,00115
SU09SA4	1,1	7	2,2	4	1500	50	IE4 - 88,5	Y	9,9	4,95	79	113	200	3,2	20	6,5	0,00245
S08LA4	1,5	9,55	3,4	4	1500	50	IE3-85,3	Y	11,34	5,67	80	118	174	2,8	16	5,9	0,00115
S09SA4	1,5	10	3,1	4	1500	50	IE4 - 89,2	Y	9,9	4,95	79	113	200	3,2	25	8	0,00245
SU09XA4	1,5	10	3,1	4	1500	50	IE4 - 90,0	Y	5,3	2,65	50,8	71,3	204	3,2	25	8	0,0038
S09SA4	2,2	14	4,3	4	1500	50	IE3 - 86,7	Y	9,9	4,95	79	113	200	3,2	25	8	0,00245
S09XA4	2,2	14	4,35	4	1500	50	IE4 - 89,8	Y	5,3	2,65	50,8	71,3	204	3,2	35	11	0,0038
SU11SA6	2,2	14	4,5	6	1500	75	IE4 – 91,2	Y	3,4	1,7	20,5	29	207	3,15	30	9,5	0,012
S09XA4	3	19	5,9	4	1500	50	IE3 - 87,7	Y	5,3	2,65	50,8	71,3	204	3,2	35	11	0,0038
S11SA6	3	19,1	6	6	1500	75	IE4 - 90,6	Y	3,4	1,7	20,5	29	207	3,15	50	17,5	0,012
SU11MA6	3	19,1	6,2	6	1500	75	IE4 – 92,5	Y	1,78	0,89	12,5	18,3	201	3,1	50	17	0,0175
S11SA6	4	25,5	8	6	1500	75	IE3-88,6	Y	3,4	1,7	20,5	29	207	3,15	50	17,5	0,012
S11MA6	4	25,5	8,15	6	1500	75	IE4-92,5	Y	1,78	0,89	12,5	18,3	201	3,1	70	23	0,0175
SU11LA6	4	25,5	8,2	6	1500	75	IE4 – 91,9	Y	1,23	0,615	9,5	13,8	206	3,1	60	20	0,0215
S11MA6	5,5	35	11,2	6	1500	75	IE3-90,8	Y	1,78	0,89	12,5	18,3	201	3,1	70	23	0,0175
S11LA6	5,5	35	10,8	6	1500	75	IE4-92,4	Y	1,23	0,615	9,5	13,8	206	3,2	90	30	0,0215
S11LA6	7,5	48	14,9	6	1500	75	IE3 – 91,4	Y	1,23	0,615	9,5	13,8	206	3,2	90	30	0,0215

P_n	Rated output
M_n	Rated torque:
I_n	Rated current
2p	No. of Motor Poles
n_n	Rated speed
f	Nominal Frequency
η	Motor efficiency
Circuit	Motorcircuit
R_{20}	Phase Resistance U-V
R_{s20}	Winding Resistance
L_d	Inductance D-Axis
L_q	Inductance Q-Axis
ke	Voltage constant
kt	Torque constant
$M_{max\ (60s)}$	Peak Torque
$I_{max\ (60s)}$	Peak Current
J	Moment of inertia

All motors: converter supply voltage 380 to 500 V

Technical data of the motors with Rated speed 2250 $^{1}/_{min}$

Rated speed 2250 $^{1}/_{min}$

Motor	P_n	M_n	I_n	2p	n_n	f	η	Circuit	R_{20}	R_{s20}	L_d	L_q	ke	kt	$M_{max\ (60s)}$	$I_{max\ (60s)}$	J
	kW	Nm	A		1/min	Hz	%		Ω	Ω	mH	mH	V/1000 1/min	Nm/A	Nm	A	kgm^2
SU08MA4	**0,85**	**3,5**	**2,2**	**4**	**2250**	**75**	**IE4-90,0**	**D**	**6,27**	**9,4**	**38**	**45**	**102**	**1,6**	**10**	**6,5**	**0,00115**
S08MA4	**1,1**	**4,75**	**2,9**	**4**	**2250**	**75**	**IE4-89,0**	**D**	**6,27**	**9,4**	**38**	**45**	**102**	**1,6**	**12**	**7,5**	**0,00115**
SU08LA4	**1,1**	**4,75**	**2,95**	**4**	**2250**	**75**	**IE4-91,5**	**D**	**3,74**	**5,67**	**26,7**	**39,3**	**100**	**1,6**	**12**	**7,5**	**0,00115**
S08MA4	**1,65**	**7**	**4,3**	**4**	**2250**	**75**	**IE3-84,7**	**D**	**6,27**	**9,4**	**38**	**45**	**102**	**1,6**	**12**	**7,5**	**0,00115**
S08LA4	**1,65**	**7**	**4,4**	**4**	**2250**	**75**	**IE4-89,3**	**D**	**3,74**	**5,67**	**26,7**	**39,3**	**100**	**1,6**	**16**	**10,5**	**0,00115**
SU09SA4	**1,65**	**7**	**3,9**	**4**	**2250**	**75**	**IE4 - 90,3**	**D**	**3,3**	**4,95**	**26,3**	**37,5**	**115**	**1,8**	**20**	**11**	**0,00245**
S08LA4	**2,2**	**9,55**	**6**	**4**	**2250**	**75**	**IE3-86,7**	**D**	**3,74**	**5,67**	**26,7**	**39,3**	**100**	**1,6**	**16**	**10,5**	**0,00115**
S09SA4	**2,2**	**10**	**5,5**	**4**	**2250**	**75**	**IE4 - 91,1**	**D**	**3,3**	**4,95**	**26,3**	**37,5**	**115**	**1,8**	**25**	**14**	**0,00245**
SU09XA4	**2,2**	**10**	**5,7**	**4**	**2250**	**75**	**IE4 - 91,2**	**D**	**1,76**	**2,65**	**16,9**	**23,8**	**118**	**1,8**	**25**	**14**	**0,0038**
S09SA4	**3**	**12,75**	**6,8**	**4**	**2250**	**75**	**IE3 - 89,2**	**D**	**3,3**	**4,95**	**26,3**	**37,5**	**115**	**1,8**	**25**	**14**	**0,00245**
S09XA4	**4**	**17,5**	**9,2**	**4**	**2250**	**75**	**IE4 - 90,8**	**D**	**1,76**	**2,65**	**16,9**	**23,8**	**118**	**1,8**	**35**	**19**	**0,0038**

P_n	Rated output
M_n	Rated torque:
I_n	Rated current
2p	No. of Motor Poles
n_n	Rated speed
f	Nominal Frequency
η	Motor efficiency
Circuit	Motorcircuit
R_{20}	Phase Resistance U-V
R_{s20}	Winding Resistance
L_d	Inductance D-Axis
L_q	Inductance Q-Axis
ke	Spannungs-Konstante
kt	Torque constant
$M_{max\ (60s)}$	Peak Torque
$I_{max\ (60s)}$	Peak Current
J	Moment of inertia

All motors: converter supply voltage 380 to 500 V

Geared motors for electric overhead conveyors series BM Motors

Technical data of the motors with Rated speed 3000 $^1/_{min}$

Rated speed 3000 $^1/_{min}$

Motor	P_n	M_n	I_n	2p	n_n	f	η	Circuit	R_{20}	R_{s20}	L_d	L_q	ke	kt	$M_{max\ (60s)}$	$I_{max\ (60s)}$	J
	kW	Nm	A		1/min	Hz	%		Ω	Ω	mH	mH	V/1000 1/min	Nm/A	Nm	A	kgm^2
SU08MA4	1,1	3,5	2,4	4	3000	100	IE4-91,3	Y	4,8	2,4	29,3	34,2	89	1,45	10	7,0	0,00115
S08MA4	1,5	4,75	3,4	4	3000	100	IE4-90,1	Y	4,8	2,4	29,3	34,2	89	1,4	12	8,9	0,00115
SU08LA4	1,5	4,75	3,5	4	3000	100	IE4-92,2	Y	2,86	1,43	20,2	29,7	84	1,4	12	8,7	0,00115
S08MA4	2,2	7	5	4	3000	100	IE3-87,8	Y	4,8	2,4	29,3	34,2	89	1,4	12	8,9	0,00115
S08LA4	2,2	7	5,1	4	3000	100	IE4-91,0	Y	2,86	1,43	20,2	29,4	84	1,4	16	12	0,00115
SU09SA4	2,2	7	4,6	4	3000	100	IE4 - 91,0	Y	2,46	1,23	19,3	27,4	100	1,6	20	13	0,00245
S08LA4	3	9,55	6,9	4	3000	100	IE4-89,8	Y	2,86	1,43	20,2	29,4	84	1,4	16	12	0,00115
SU09XA4	3	10	6,5	4	3000	100	IE4 - 92,7	Y	1,31	0,655	12,7	17,9	102	1,6	25	15	0,0038
S09SA4	4	12,75	7,9	4	3000	100	IE4 - 91,5	Y	2,46	1,23	19,3	27,4	100	1,6	25	17	0,00245
SU11SA6	4	12,75	8,3	6	3000	150	IE4 – 93,0	Y	0,867	0,434	5,2	7,6	103	1,54	30	19,5	0,012
S09XA4	5,5	17,5	10,7	4	3000	100	IE4 – 93,0	Y	1,31	0,655	12,7	17,9	102	1,6	40	27	0,0038
S11SA6	5,5	17,5	11	6	3000	150	IE4-91,4	Y	0,867	0,434	5,2	7,6	103	1,59	50	34	0,012
SU11MA6	5,5	17,5	11,7	6	3000	150	IE4 – 93,2	D	0,454	0,681	3,4	4,7	102	1,5	45	30	0,0175
S11SA6	7,5	23,9	15,2	6	3000	150	IE3-90,7	Y	0,867	0,434	5,2	7,6	103	1,59	50	34	0,012
S11MA6	7,5	23,9	15,4	6	3000	150	IE4-92,1	D	0,454	0,681	3,4	4,7	102	1,55	70	48	0,0175
SU11LA6	7,5	23,9	15,3	6	3000	150	IE4 – 93,7	D	0,344	0,516	2,8	3,7	108	1,55	60	39	0,0215
S11MA6	9,5	30,2	19,3	6	3000	150	IE3-91,3	D	0,454	0,681	3,4	4,7	102	1,55	70	48	0,0175
S11LA6	9,5	30,2	18,2	6	3000	150	IE4 – 92,7	D	0,344	0,516	2,8	3,7	108	1,6	90	58	0,0215
S11MA6	11	35	22,5	6	3000	150	IE3-91,2	D	0,454	0,681	3,4	4,7	102	1,55	70	48	0,0175
S11LA6	11	35	21,1	6	3000	150	IE4 – 92,9	D	0,344	0,516	2,8	3,7	108	1,6	90	58	0,0215
S11LA6	15	48	29,6	6	3000	150	IE3 – 91,9	D	0,344	0,516	2,8	3,7	108	1,6	90	58	0,0215

P_n	Rated output
M_n	Rated torque:
I_n	Rated current
2p	No. of Motor Poles
n_n	Rated speed
f	Nominal Frequency
η	Motor efficiency
Circuit	Motorcircuit
R_{20}	Phase Resistance U-V
R_{s20}	Winding Resistance
L_d	Inductance D-Axis
L_q	Inductance Q-Axis
ke	Voltage constant
kt	Torque constant
$M_{max\ (60s)}$	Peak Torque
$I_{max\ (60s)}$	Peak Current
J	Moment of inertia

All motors: converter supply voltage 380 to 500 V

Operation with frequency converter

The figures given in the table below are for Bauer motors operating in conjunction with the frequency inverter. The torques referred to in tables can be entered for the respective frequencies in continuous operation (S1 = duty factor 100%).

Motor torques in the adjusting range 150 1/min - 1800 1/min, duty type S1

Type	Speed	Torque	Power	Voltages	Current	Frequency	Circuit
	1/min	Nm	kW	V	A	Hz	
S08MA4	150	5	0,08	66	1,9	5	Y
	500	5,6	0,29	138	2,1	16,7	Y
	1000	6,5	0,68	235	2,3	33,3	Y
	1500	6,5	1,0	340	2,3	50	Y
	1800	6,5	1,2	378	2,3	60	Y
S08LA4	150	6,5	0,10	55	2,5	5	Y
	500	8,0	0,42	125	3	16,7	Y
	1000	9,55	1,0	225	3,5	33,33	Y
	1500	9,55	1,5	315	3,5	50	Y
	1800	9,55	1,8	378	3,5	60	Y
S09SA4	150	8	0,13	56	2,5	5	Y
	500	10	0,53	140	3,2	16,7	Y
	1000	13	1,36	258	4,0	33,33	Y
	1500	13	2	370	4,0	50	Y
	1800	11,5	2,2	375	4,0	60	Y
S09XA4	150	12,5	0,2	53	4	5	Y
	500	16	0,84	134	5	16,66	Y
	1000	20	2,1	253	6,3	33,33	Y
	1500	20	3,1	364	6,3	50	Y
	1800	19	3,6	380	6,3	60	Y
S11SA6	150	17,5	0,3	53	5,8	7,5	Y
	500	21,5	1,1	134	7,2	25	Y
	1000	25	2,6	253	8	50	Y
	1500	25	3,9	346	8	75	Y
	1800	25	4,7	380	8	90	Y
S11MA6	150	25	0,4	44	8,3	7,5	Y
	500	28	1,5	134	9	25	Y
	1000	35	3,7	253	11,2	50	Y
	1500	35	5,5	328	11,2	75	Y
	1800	35	6,6	380	11,2	90	Y
S11LA6	150	35	0,5	44	11,2	7,5	Y
	500	41	2,1	134	13,1	25	Y
	1000	50	5,2	253	15,5	50	Y
	1500	50	7,9	340	15,5	75	Y
	1800	50	9,4	380	15,5	90	Y

Converter Settings:

Minimum clock frequency: 3 kHz
Short-term current limit: 160 % * $I_{1500/min}$
Maximum overload time: 60 s
Minimum frequency: 5 Hz
Maximum frequency: 60 Hz
Permissible operating time below fmin: 60 s (in open loop mode)Alle übrigen All other settings must be selected according the requirements of the drive.
The maximum overload time and the permissible operating time below fmin are based on an interval of 10 minutes.
Non-standard operating conditions on request.

All motors: converter supply voltage 380 to 500 V

Operation with frequency converter

Motor-Drehmomente bei Stellbereich 150 1/min - 3600 1/min, Duty type S1

Type	Speed	Torque	Power	Voltages	Current	Frequency	Circuit
	1/min	Nm	kW	V	A	Hz	
S08MA4	150	5	0,08	34	3,7	5	Y
	500	5,6	0,29	68	4,1	16,7	Y
	1000	6,5	0,7	119	4,7	33,3	Y
	3000	6,5	2,0	308	4,7	100	Y
	3600	6,5	2,5	372	4,7	120	Y
S08LA4	150	6,5	0,10	23	5	5	Y
	500	8,0	0,42	63	5,9	16,7	Y
	1000	9,55	1,0	114	7,0	33,33	Y
	3000	9,55	3,0	296	7,0	100	Y
	3600	9,55	3,6	358	7,0	120	Y
S09SA4	150	8	0,13	28	5,2	5	Y
	500	10	0,53	70	6,4	16,7	Y
	1000	13	1,36	129	8,25	33,33	Y
	3000	13	4	342	8,25	100	Y
	3600	11	4,15	374	6,9	120	Y
S09XA4	150	12,5	0,196	26	8	5	Y
	500	16	0,84	66	9,9	16,7	Y
	1000	20	2,1	124	12,5	33,33	Y
	3000	20	6,3	334	12,5	100	Y
	3600	14,5	5,5	380	9,2	120	Y
S11SA6	150	17,5	0,3	27	12	7,5	Y
	500	21,5	1,1	68	14,5	25	Y
	1000	25	2,6	126	16	50	Y
	3000	25	7,9	340	16	150	Y
	3600	21	7,9	380	14	180	Y
S11MA6	150	25	0,4	26	16	7,5	Y
	500	28	1,5	68	18,5	25	Y
	1000	35	3,7	126	22,5	50	Y
	3000	35	11,0	325	22,5	150	Y
	3600	30	11,3	380	20	180	Y
S11LA6	150	35	0,5	26	23	7,5	Y
	500	41	2,1	68	26,5	25	Y
	1000	50	5,2	125	31	50	Y
	3000	50	15,7	345	31	150	Y
	3600	42	15,8	380	27	180	Y

Converter Settings:

Minimum clock frequency: 3 kHz
Short-term current limit: 160 % * $I_{3000/min}$
Maximum overload time: 60 s
Minimum frequency: 5 Hz
Maximum frequency: 120 Hz
Permissible operating time below fmin: 60 s (in open loop mode)Alle übrigen All other settings must be selected according the requirements of the drive.
The maximum overload time and the permissible operating time below fmin are based on an interval of 10 minutes.
Non-standard operating conditions on request.

All motors: converter supply voltage 380 to 500 V

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S08MA4**

Rated parameters and data of the motor

Rated output Pn	1,0	1,75	kW
Rated torque: Mn	6,5	6,5	Nm
Rated current In	2,3	4,0	A
No. of Motor Poles2p	4	4	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	50	87	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	9,35*		Ohm
Strang-Inductance D-Axis Ld	97*		mH
Strang-Inductance Q-Axis Lq	170*		mH
Voltage constant ke	180	103	V / 1000 1/min
Torque constant kt	2,82	1,62	Nm / A
Peak TorqueMmax (60s)	10	10	Nm
Peak CurrentImax (60s)	3,7	6,4	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	5,0	5,6	6,5	6,5	6,5	Nm
Power	0,08	0,29	0,68	1,0	1,2	kW
Voltages *	66	138	243	340	378	V
Current	1,9	2,1	2,3	2,3	2,3	A
Frequenz	5	16,66	33,33	50	60	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

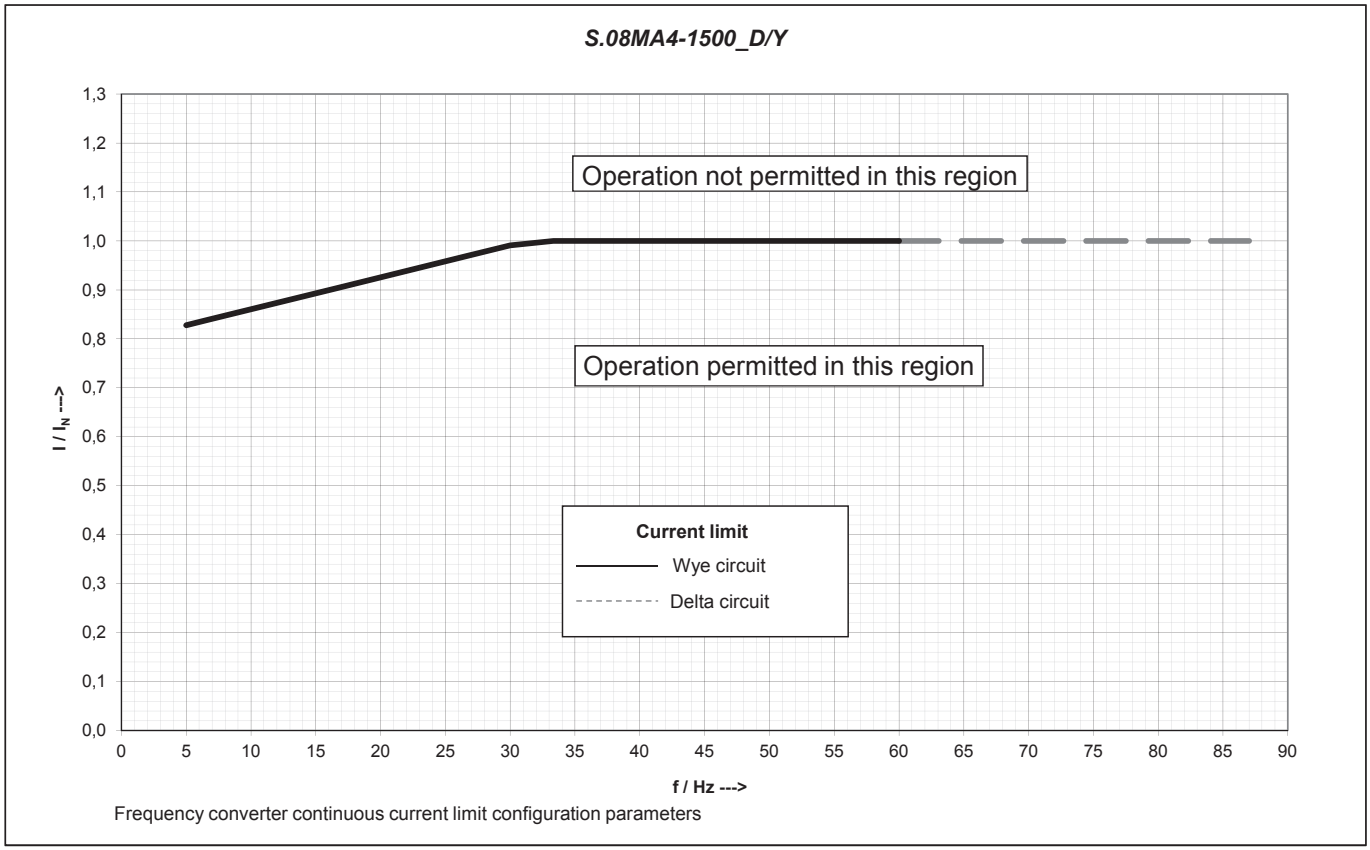
Data operation with frequency converter S1 operation, delta circuit

Torque	5,0	5,6	6,5	6,5	6,5	Nm
Power	0,08	0,29	0,68	1,0	1,75	kW
Voltages *	38	79	142	198	320	V
Current	3,3	3,6	4,0	4,0	4,0	A
Frequenz	5	16,66	33,33	50	87	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S08LA4**

Rated parameters and data of the motor

Rated output Pn	1,50	2,45	kW
Rated torque: Mn	9,55	9,0	Nm
Rated current In	3,5	5,9	A
No. of Motor Poles2p	4	4	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	50	87	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	5,5 *		Ohm
Strang-Inductance D-Axis Ld	70 *		mH
Strang-Inductance Q-Axis Lq	117 *		mH
Voltage constant ke	171	99	V / 1000 1/min
Torque constant kt	2,73	1,52	Nm / A
Peak TorqueMmax (60s)	15	14	Nm
Peak CurrentImax (60s)	5,6	9,5	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	6,5	8,0	9,55	9,55	9,55	Nm
Power	0,1	0,42	1,0	1,5	1,8	kW
Voltages *	55	125	225	315	378	V
Current	2,5	3,0	3,5	3,5	3,5	A
Frequenz	5	16,66	33,33	50	60	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

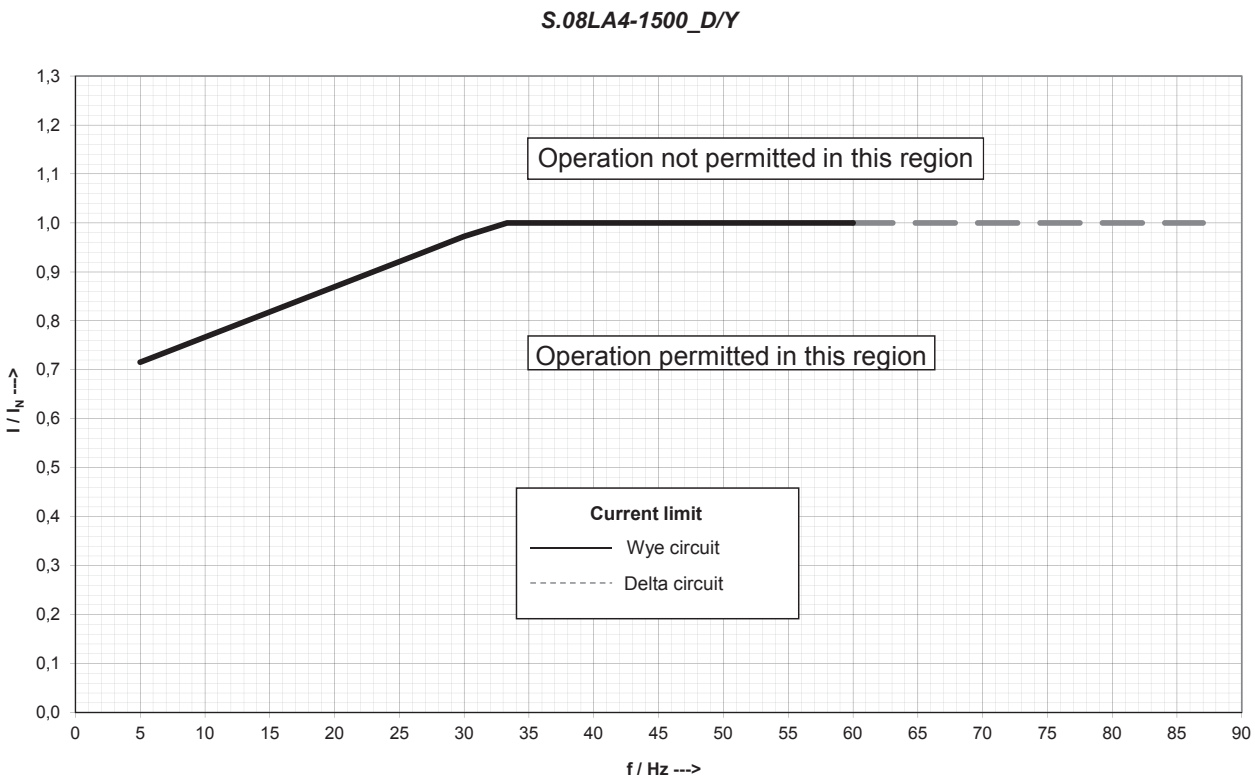
Data operation with frequency converter S1 operation, delta circuit

Torque	6,25	8,0	9,0	9,0	9,0	Nm
Power	0,10	0,39	0,94	1,4	2,45	kW
Voltages *	33	72	131	182	300	V
Current	4,3	5,0	5,9	5,9	5,9	A
Frequenz	5	16,66	33,33	50	87	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S09SA4**

Rated parameters and data of the motor

Rated output Pn	2,0	3,5	kW
Rated torque: Mn	13	13	Nm
Rated current In	4,0	7,0	A
No. of Motor Poles2p	4	4	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	50	87	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	4,95*		Ohm
Strang-Inductance D-Axis Ld	64,1*		mH
Strang-Inductance Q-Axis Lq	109,8*		mH
Voltage constant ke	208	120	V / 1000 1/min
Torque constant kt	3,2	1,85	Nm / A
Peak TorqueMmax (60s)	20	20	Nm
Peak CurrentImax (60s)	6,4	11,0	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	8	10	13	13	11,5	Nm
Power	0,13	0,53	1,36	2	2,2	kW
Voltages *	56	140	258	370	375	V
Current	2,5	3,2	4,0	4,0	4,0	A
Frequenz	5	16,66	33,33	50	60	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

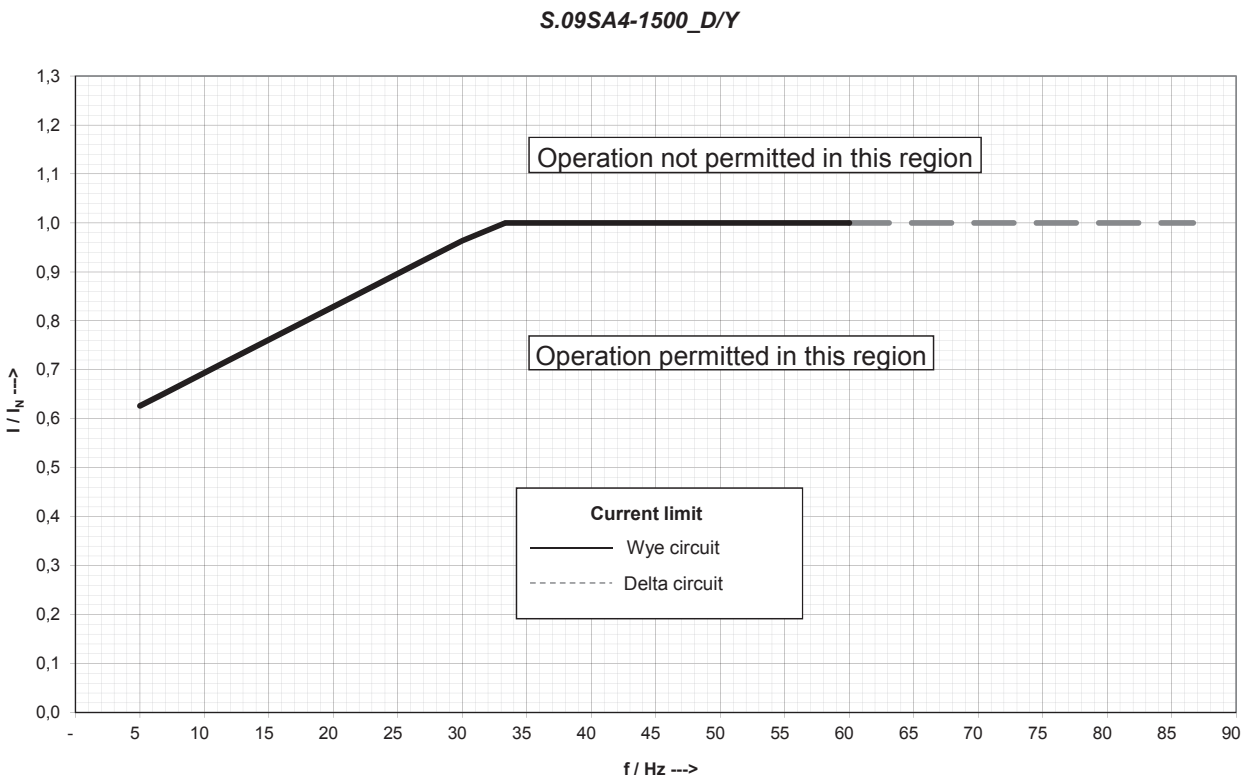
Data operation with frequency converter S1 operation, delta circuit

Torque	8	10	13	13	13	Nm
Power	0,13	0,53	1,36	2	3,5	kW
Voltages *	33	81	149	214	370	V
Current	4,3	5,5	7,0	7,0	7,0	A
Frequenz	5	16,66	33,33	50	87	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S09XA4**

Rated parameters and data of the motor

Rated output Pn	3,1	5,5	kW
Rated torque: Mn	20	20	Nm
Rated current In	6,3	10,9	A
No. of Motor Poles2p	4	4	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	50	87	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	2,625*		Ohm
Strang-Inductance D-Axis Ld	41,2*		mH
Strang-Inductance Q-Axis Lq	70,1*		mH
Voltage constant ke	209	120	V / 1000 1/min
Torque constant kt	3,2	1,85	Nm / A
Peak TorqueMmax (60s)	31	29	Nm
Peak CurrentImax (60s)	10	16	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	13	16	20	20	19	Nm
Power	0,20	0,84	2,1	3,1	3,6	kW
Voltages *	53	134	253	364	380	V
Current	4,0	5,0	6,3	6,3	6,3	A
Frequenz	5	16,66	33,33	50	60	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

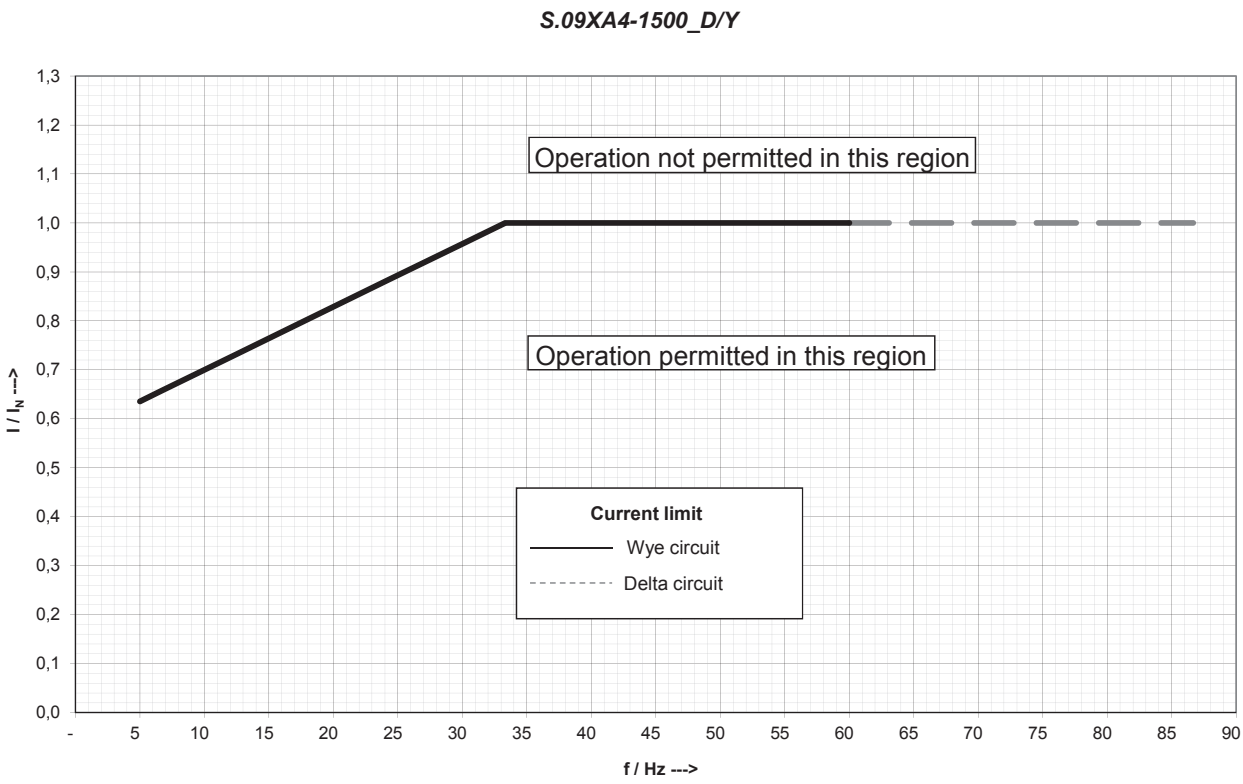
Data operation with frequency converter S1 operation, delta circuit

Torque	13	16	20	20	20	Nm
Power	0,2	0,84	2,1	3,1	5,5	kW
Voltages *	31	78	146	210	348	V
Current	7,0	8,7	10,9	10,9	10,9	A
Frequenz	5	16,66	33,33	50	87	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Typ : **S11SA6**

Rated parameters and data of the motor

Rated output Pn	3,5	6,1	kW
Rated torque: Mn	22,5	22,5	Nm
Rated current In	7,0	12,5	A
No. of Motor Poles 2p	6	6	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	75	130	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	1,76*		Ohm
Strang-Inductance D-Axis Ld	20*		mH
Strang-Inductance Q-Axis Lq	30*		mH
Voltage constant ke	210	121	V / 1000 1/min
Torque constant kt	3,20	1,80	Nm / A
Peak Torque Mmax (60s)	35	35	Nm
Peak Current Imax (60s)	11	19	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	18	20	22,5	22,5	22,5	Nm
Power	0,28	1,0	2,4	3,5	6,1	kW
Voltages *	54	132	245	351	381	V
Current	5,6	6,2	7,0	7,0	7,0	A
Frequenz	7,5	25	50	75	90	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

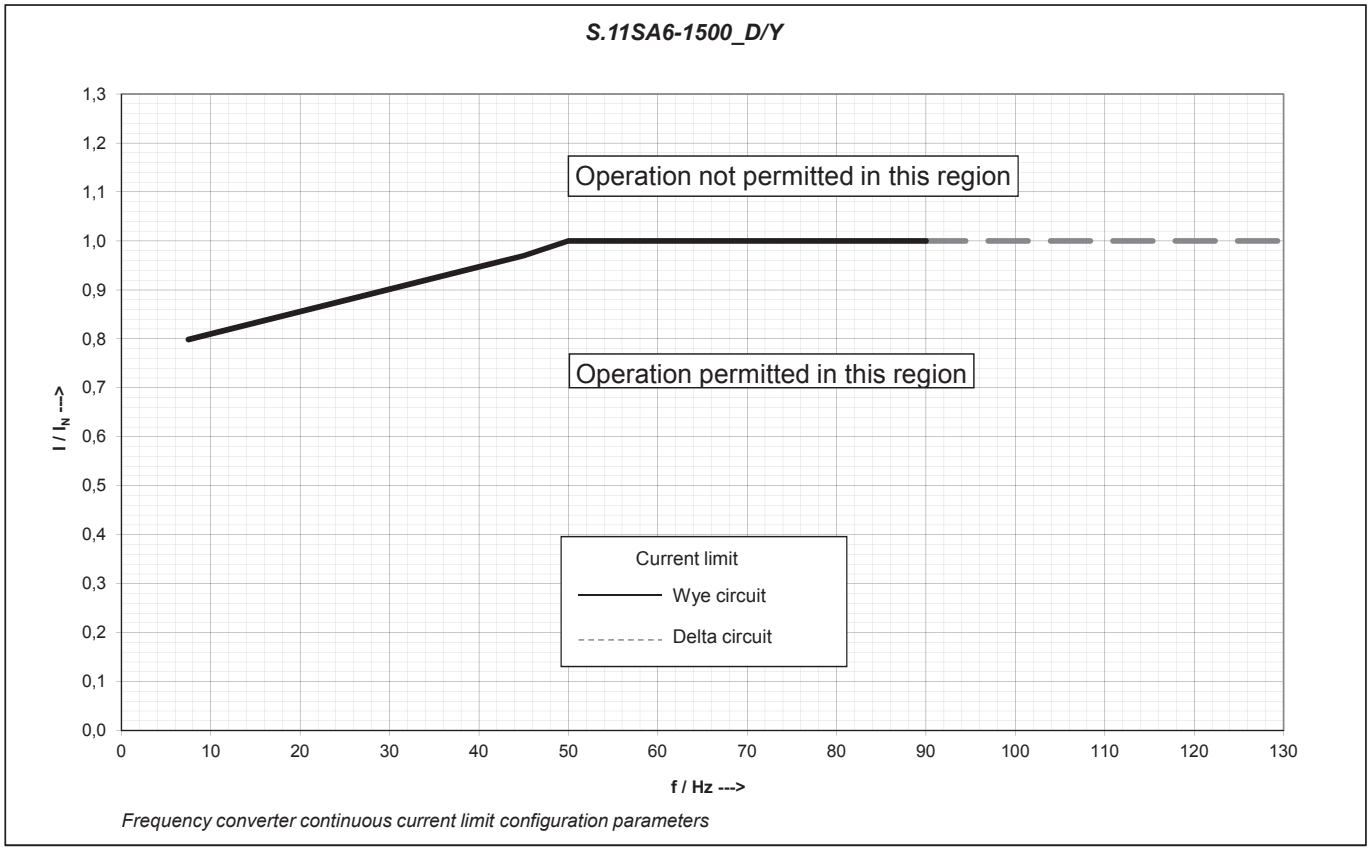
Data operation with frequency converter S1 operation, delta circuit

Torque	18	20	22,5	22,5	22,5	Nm
Power	0,28	1,0	2,4	3,5	6,1	kW
Voltages *	31	76	142	203	341	V
Current	10	11	12,5	12,5	12,5	A
Frequenz	7,5	25	50	75	130	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S11MA6**

Rated parameters and data of the motor

Rated output Pn	5,50	9,50	kW
Rated torque: Mn	35	35	Nm
Rated current In	11,0	19,1	A
No. of Motor Poles2p	6	6	
Rated speed n_n	1500	3600	1/min
Nominal Frequency	75	130	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	0,892*		Ohm
Strang-Inductance D-Axis Ld	12*		mH
Strang-Inductance Q-Axis Lq	18,4*		mH
Voltage constant ke	206	117	V / 1000 1/min
Torque constant kt	3,15	1,79	Nm / A
Peak TorqueMmax (60s)	55	55	Nm
Peak CurrentImax (60s)	17	30	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	26,5	30	35	35	35	Nm
Power	0,42	1,6	3,7	5,5	6,5	kW
Voltages *	46	121	229	331	377	V
Current	8,5	9,5	11,0	11,0	11,0	A
Frequenz	7,5	25	50	75	90	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

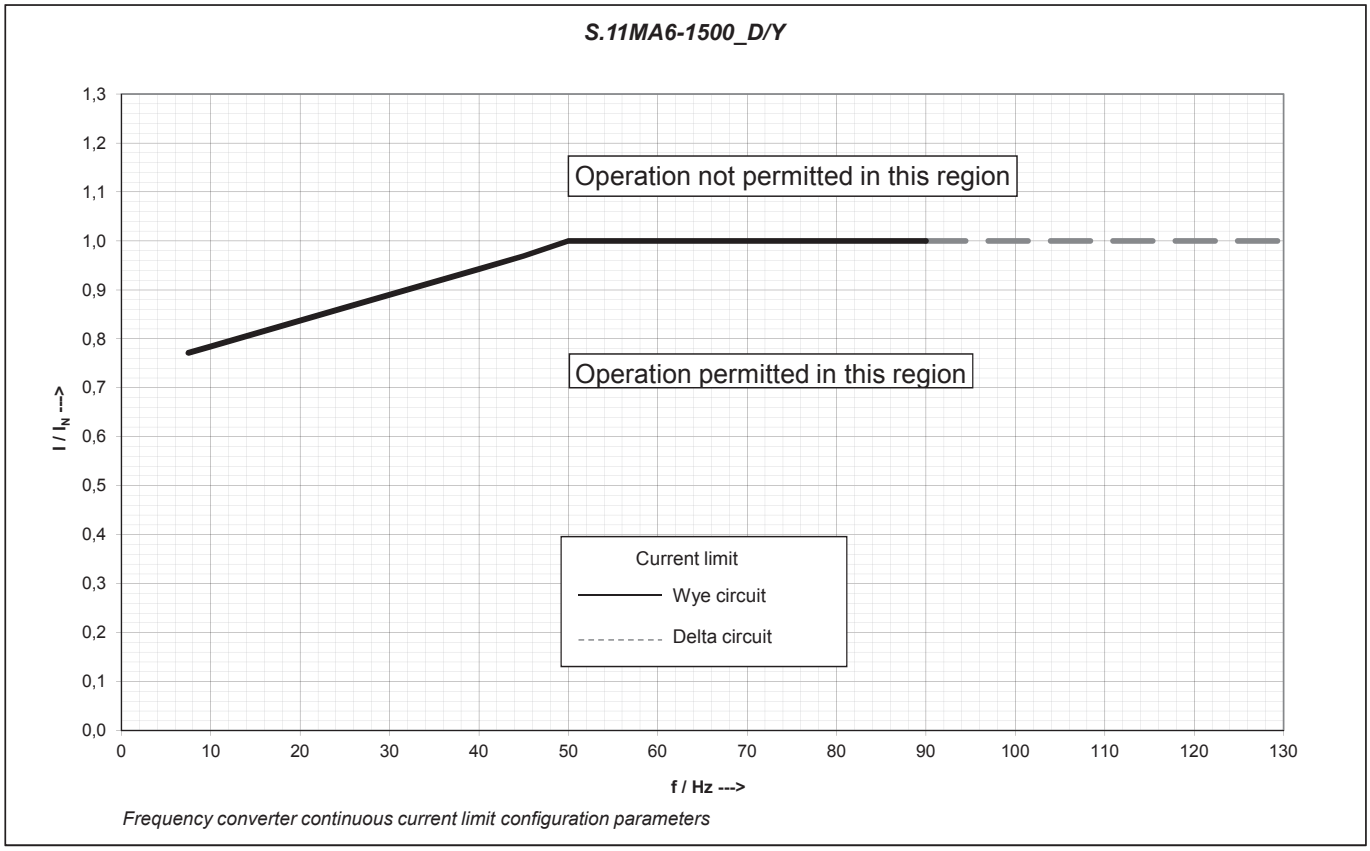
Data operation with frequency converter S1 operation, delta circuit

Torque	26,2	30	35	35	35	Nm
Power	0,41	1,6	3,7	5,5	9,5	kW
Voltages *	27	70	132	190	321	V
Current	14,7	16,7	19,1	19,1	19,1	A
Frequenz	7,5	25	50	75	130	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Rated data of the motor

Type : **S11LA6**

Rated parameters and data of the motor

Rated output Pn	7,50	13	kW
Rated torque: Mn	48	48	Nm
Rated current In	14,7	26	A
No. of Motor Poles2p	6	6	
Rated speed n_n	1500	2600	1/min
Nominal Frequency	75	130	Hz
Motorcircuit	wye circuit	delta circuit	
Strang-Resistance Rs20	0,605*		Ohm
Strang-Inductance D-Axis Ld	9,3*		mH
Strang-Inductance Q-Axis Lq	13,9*		mH
Voltage constant ke	210	121	V / 1000 1/min
Torque constant kt	3,25	1,84	Nm / A
Peak TorqueMmax (60s)	75	75	Nm
Peak CurrentImax (60s)	23	40	A
Converter supply voltage	380 - 500		V

Δ * Input value Danfoss Frequency converter FC302 => delta circuit 1/3 of the phase value

Data operation with frequency converter S1 operation, wye circuit

Torque	32,5	39,4	48	48	47,5	Nm
Power	0,51	2,0	5,0	7,5	9,0	kW
Voltages *	44	121	231	338	375	V
Current	9,8	12,0	14,7	14,7	14,7	A
Frequenz	7,5	25	50	75	90	Hz
Speed	150	500	1000	1500	1800	1/min
Duty type	S1					

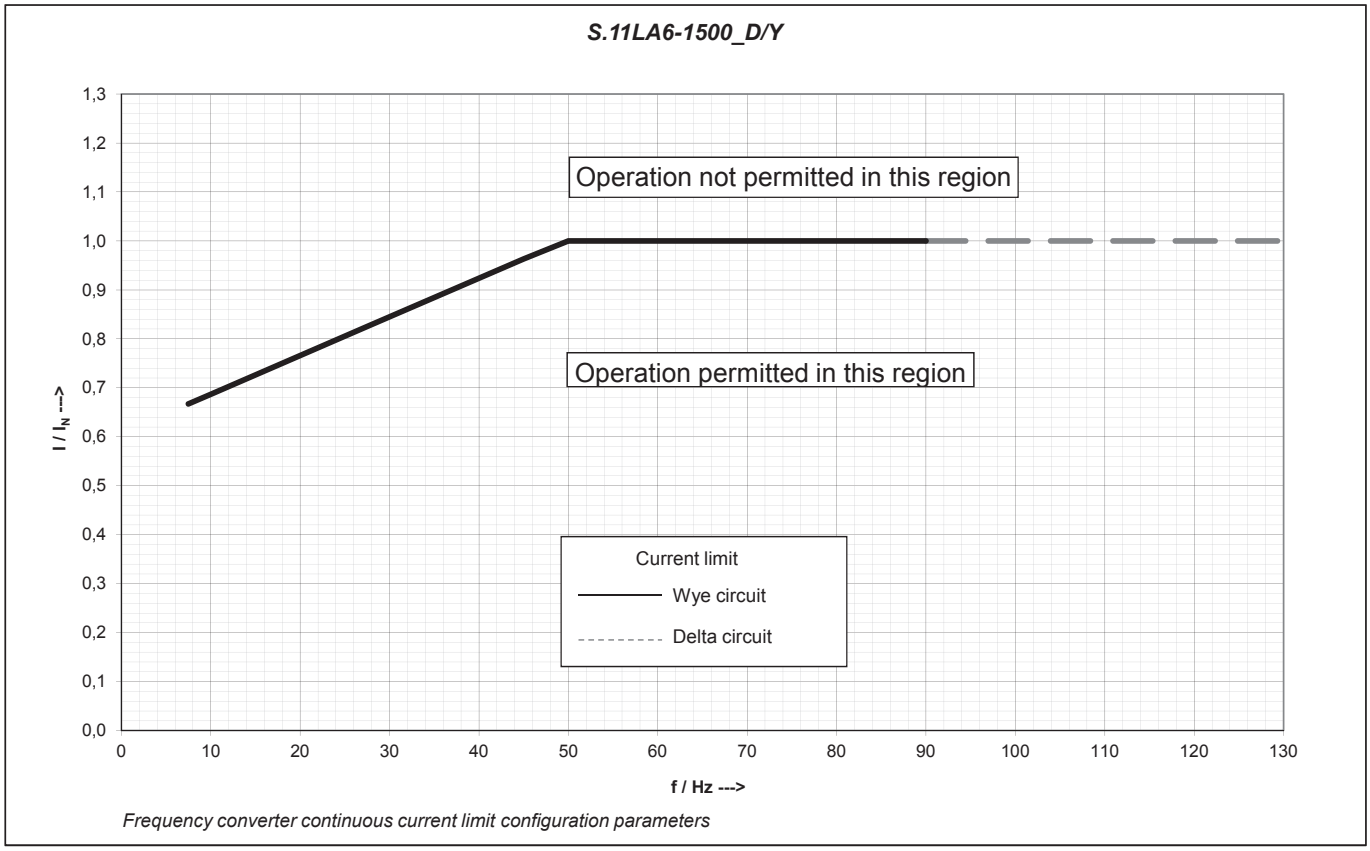
Data operation with frequency converter S1 operation, delta circuit

Torque	32,5	39,5	48	48	48	Nm
Power	0,51	2,0	5,0	7,5	13	kW
Voltages *	26	71	134	197	328	V
Current	17,6	21,1	26	26	26	A
Frequenz	7,5	25	50	75	130	Hz
Speed	150	500	1000	1500	2600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 1500 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S08MA4**

Rated parameters and data of the motor

Rated output Pn	2,0	kW
Rated torque: Mn	6,50	Nm
Rated current In	4,7	A
No. of Motor Poles2p	4	
Rated speed n_n	3000	1/min
Nominal Frequency	100	Hz
Motorcircuit	wye circuit	
Strang-Resistance Rs20	2,36	Ohm
Strang-Inductance D-Axis Ld	24,7	mH
Strang-Inductance Q-Axis Lq	43,5	mH
Voltage constant ke	90	V / 1000 1/min
Torque constant kt	1,28	Nm / A
Peak TorqueMmax (60s)	10	Nm
Peak CurrentImax (60s)	7,5	A
Converter supply voltage	380 - 500	V

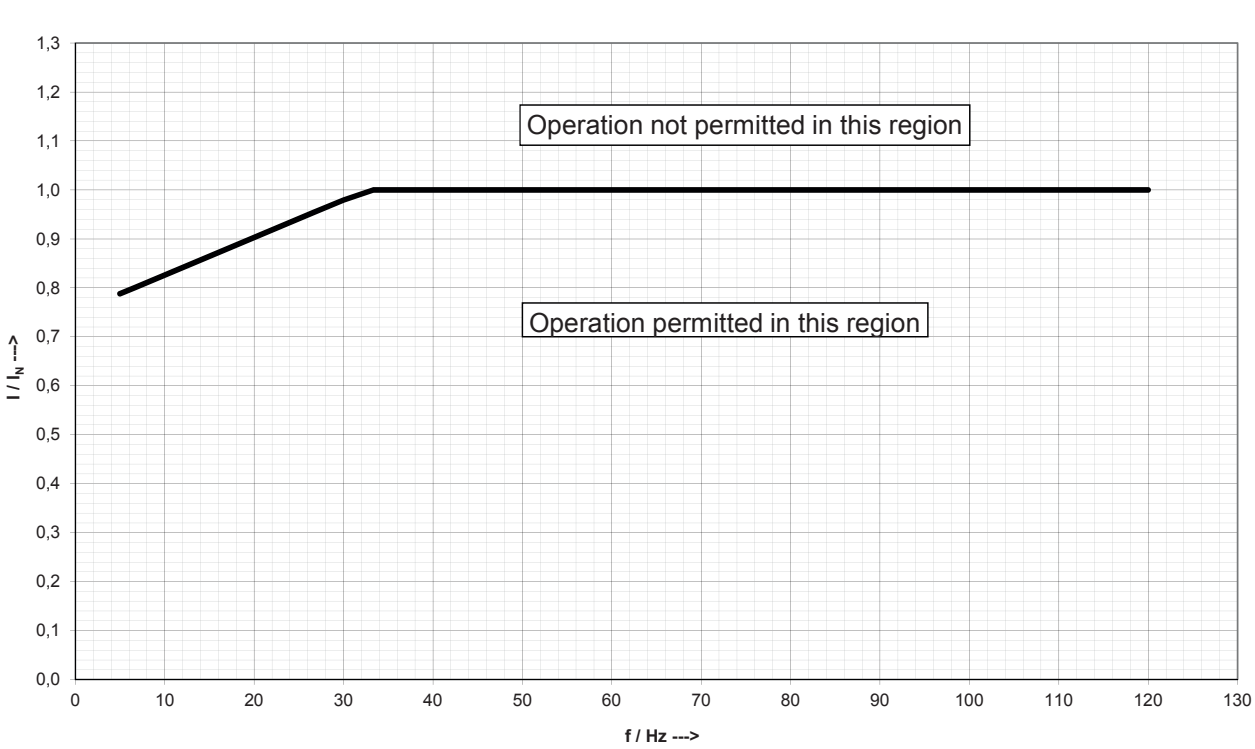
Operation with frequency converter

Torque	5,0	5,6	6,5	6,5	6,5	Nm
Power	0,08	0,29	0,68	2,0	2,5	kW
Voltages *	34	68	119	308	372	V
Current	3,7	4,1	4,7	4,7	4,7	A
Frequenz	5	16,66	33,33	100	120	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S08LA4**

Rated parameters and data of the motor

Rated output Pn	3,0	kW
Rated torque: Mn	9,55	Nm
Rated current In	7,0	A
No. of Motor Poles2p	4	
Rated speed n_n	3000	1/min
Nominal Frequency	100	Hz
Motorcircuit	wye circuit	
Strang-Resistance Rs20	1,41	Ohm
Strang-Inductance D-Axis Ld	16,8	mH
Strang-Inductance Q-Axis Lq	29,6	mH
Voltage constant ke	87	V / 1000 1/min
Torque constant kt	1,36	Nm / A
Peak TorqueMmax (60s)	15	Nm
Peak CurrentImax (60s)	11,2	A
Converter supply voltage	380 - 500	V

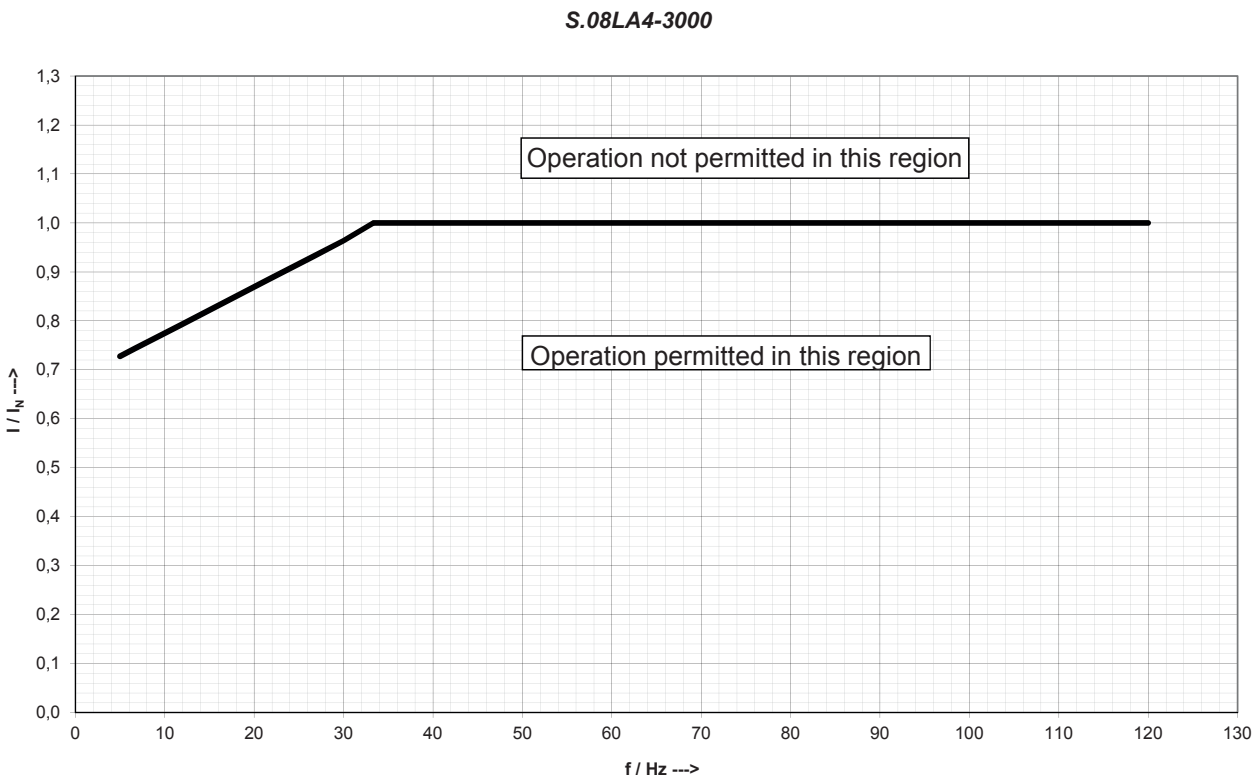
Operation with frequency converter

Torque	6,5	8,0	9,55	9,55	9,55	Nm
Power	0,1	0,42	1,0	3,0	3,6	kW
Voltages *	28	63	114	296	358	V
Current	5,2	5,9	7,0	7,0	7,0	A
Frequenz	5	16,66	33,33	100	120	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S09SA4**

Rated parameters and data of the motor

Rated output Pn	6,3	kW
Rated torque: Mn	20	Nm
Rated current In	12,5	A
No. of Motor Poles2p	4	
Rated speed n_n	3000	1/min
Nominal Frequency	100	Hz
Motorcircuit	wye circuit	
Phase Resistance U-V R20	1,305	Ohm
Strang-Resistance Rs20	0,653	Ohm
Strang-Inductance D-Axis Ld	12,7	mH
Strang-Inductance Q-Axis Lq	17,9	mH
Voltage constant ke	102	V / 1000 1/min
Torque constant kt	1,60	Nm / A
Peak TorqueMmax (60s)	30	Nm
Peak CurrentImax (60s)	20	A
Converter supply voltage	380 - 500	V

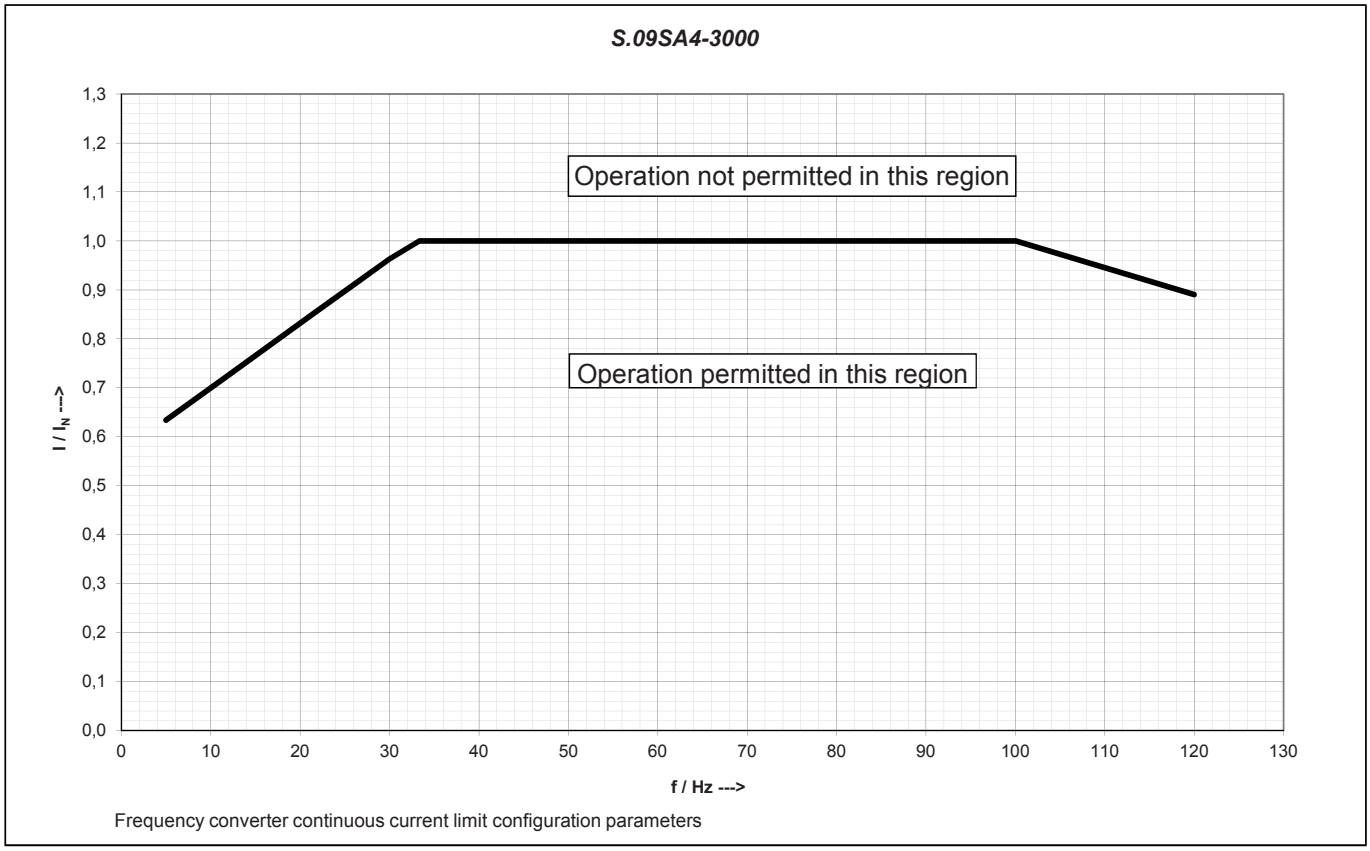
Operation with frequency converter

Torque	12,5	15,7	20	20	14,5	Nm
Power	0,196	0,84	2,1	6,3	5,5	kW
Voltages *	26	66	124	334	380	V
Current	8	9,9	12,5	12,5	9,2	A
Frequenz	5	16,66	33,33	100	120	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S09XA4**

Rated parameters and data of the motor

Rated output Pn	6,3	kW
Rated torque: Mn	20	Nm
Rated current In	12,5	A
No. of Motor Poles2p	4	
Rated speed n_n	3000	1/min
Nominal Frequency	100	Hz
Motorcircuit	wye circuit	
Phase Resistance U-V R20	1,305	Ohm
Strang-Resistance Rs20	0,653	Ohm
Strang-Inductance D-Axis Ld	12,7	mH
Strang-Inductance Q-Axis Lq	17,9	mH
Voltage constant ke	102	V / 1000 1/min
Torque constant kt	1,60	Nm / A
Peak TorqueMmax (60s)	30	Nm
Peak CurrentImax (60s)	20	A
Converter supply voltage	380 - 500	V

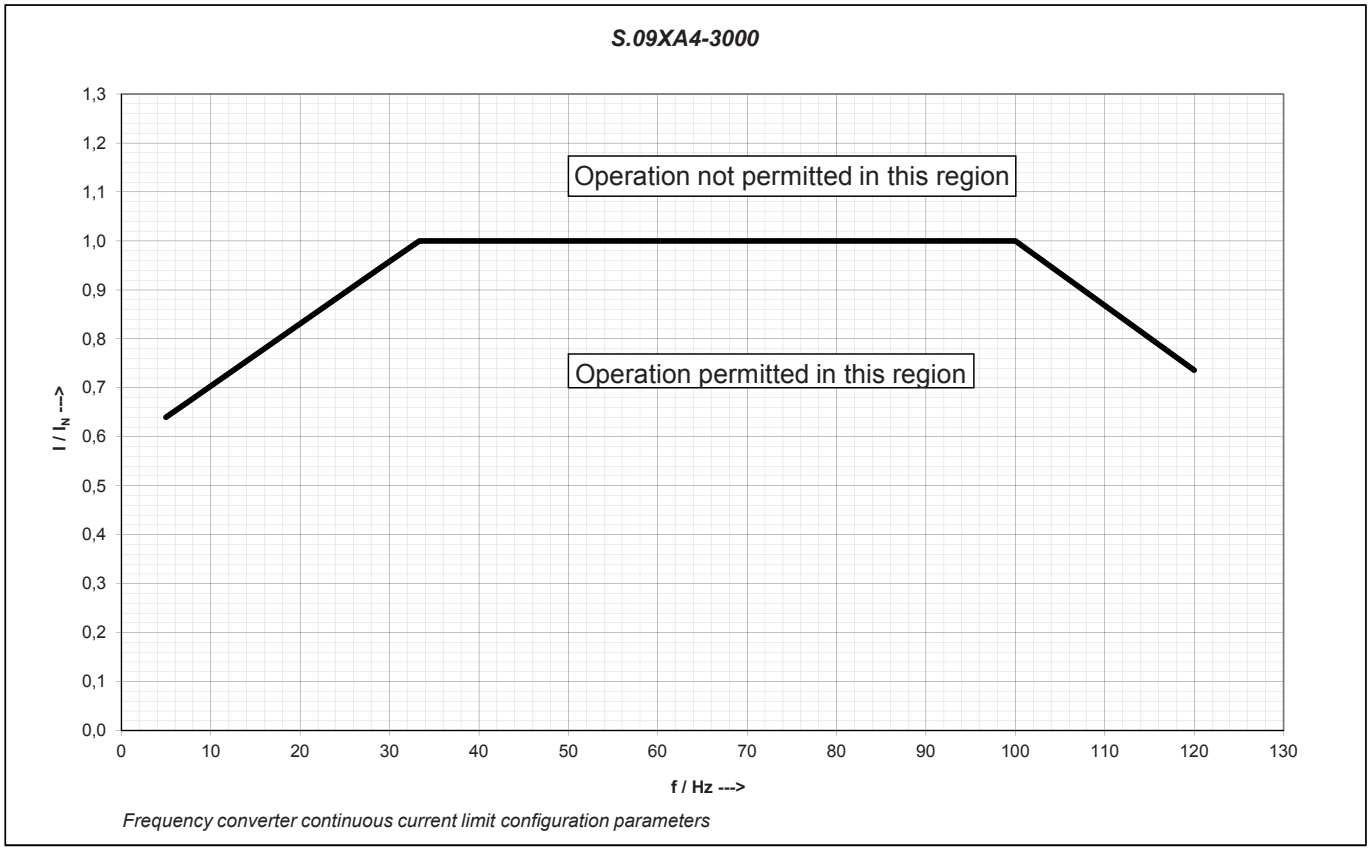
Operation with frequency converter

Torque	12,5	15,7	20	20	14,5	Nm
Power	0,196	0,84	2,1	6,3	5,5	kW
Voltages *	26	66	124	334	380	V
Current	8	9,9	12,5	12,5	9,2	A
Frequenz	5	16,66	33,33	100	120	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

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Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S11SA6**

Rated parameters and data of the motor

Rated output Pn	7,1	kW
Rated torque: Mn	22,5	Nm
Rated current In	15,0	A
No. of Motor Poles2p	6	
Rated speed n_n	3000	1/min
Nominal Frequency	150	Hz
Motorcircuit	wye circuit	
Strang-Resistance Rs20	0,447	Ohm
Strang-Inductance D-Axis Ld	5,0	mH
Strang-Inductance Q-Axis Lq	7,7	mH
Voltage constant ke	106	V / 1000 1/min
Torque constant kt	1,55	Nm / A
Peak TorqueMmax (60s)	35	Nm
Peak CurrentImax (60s)	23	A
Converter supply voltage	380 - 500	V

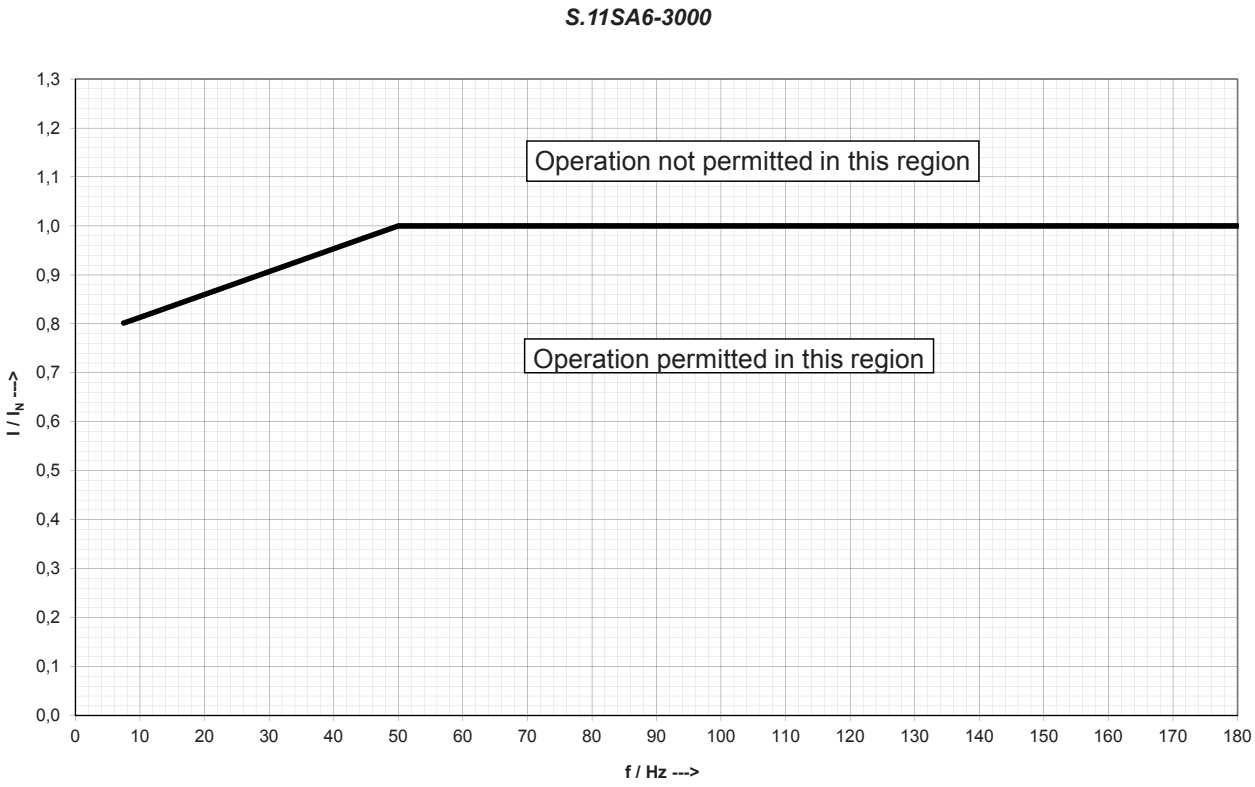
Operation with frequency converter

Torque	18	20	22,5	22,5	22,5	Nm
Power	0,28	1,0	2,4	7,1	8,5	kW
Voltages *	28	66	122	333	368	V
Current	12	13,3	15	15	15	A
Frequenz	7,5	25	50	150	180	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

The voltage at the motor terminals depends on the input voltage from the frequency converter, the loss of voltage at the filter and in the motor supply cable and may not fall below the rated value by more than 10% according to IEC 60034 - 1 Range „B", even with minimum input voltage from the frequency converter. In the event of reduced voltage at the motor terminals, the permissible motor torque must be reduced proportionally to the change in voltage. This must be taken into account when sizing the motor, and the parameterisation of the converter and for the converter minimum input voltage.
The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S11MA6**

Rated parameters and data of the motor

Rated output Pn	11,0	kW
Rated torque: Mn	35	Nm
Rated current In	22,5	A
No. of Motor Poles2p	6	
Rated speed n_n	3000	1/min
Nominal Frequency	150	Hz
Motorcircuit	wye circuit	
Strang-Resistance Rs20	0,217	Ohm
Strang-Inductance D-Axis Ld	3,0	mH
Strang-Inductance Q-Axis Lq	4,6	mH
Voltage constant ke	104	V / 1000 1/min
Torque constant kt	1,55	Nm / A
Peak TorqueMmax (60s)	55	Nm
Peak CurrentImax (60s)	35	A
Converter supply voltage	380 - 500	V

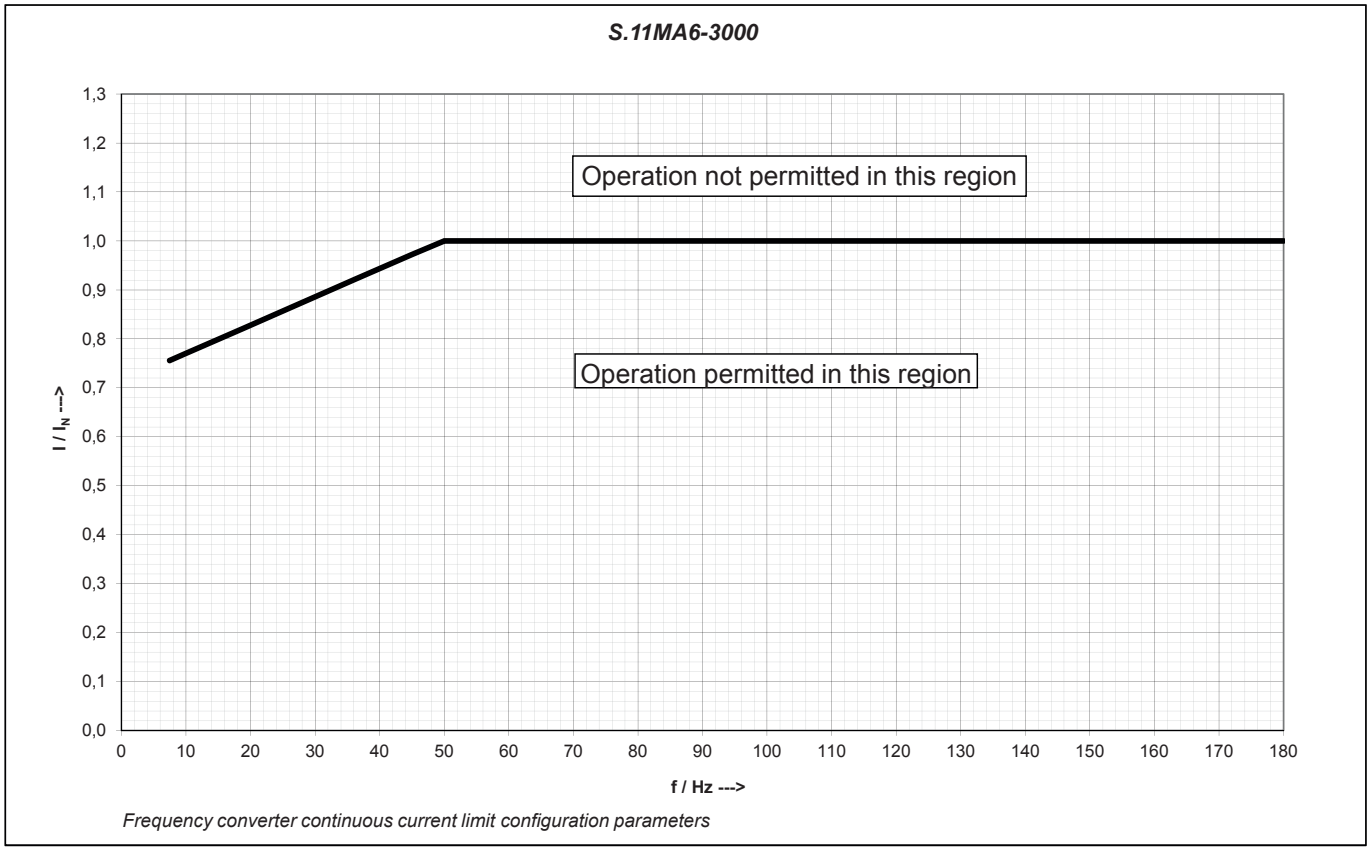
Operation with frequency converter

Torque	26,5	30	35	35	34,3	Nm
Power	0,42	1,6	3,7	11	12,9	kW
Voltages *	23	61	115	320	368	V
Current	17	19,3	22,5	22,5	22,5	A
Frequenz	7,5	25	50	150	180	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

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The maximum permissible frequency converter input voltage is 500 V +10%, 50/60 Hz.
Changes to the rated values (torque, speed adjusting range) within the permissible operating range are permissible and are determined by the manufacturer. Permissible continuous current limit, torque and speed adjusting range are specified on the nameplate.

Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Rated data of the motor

Type : **S11LA6**

Rated parameters and data of the motor

Rated output Pn	15,0	kW
Rated torque: Mn	48	Nm
Rated current In	30	A
No. of Motor Poles2p	6	
Rated speed n_n	3000	1/min
Nominal Frequency	150	Hz
Motorcircuit	wye circuit	
Strang-Resistance Rs20	0,150	Ohm
Strang-Inductance D-Axis Ld	2,4	mH
Strang-Inductance Q-Axis Lq	3,5	mH
Voltage constant ke	105	V / 1000 1/min
Torque constant kt	1,59	Nm / A
Peak TorqueMmax (60s)	75	Nm
Peak CurrentImax (60s)	48	A
Converter supply voltage	380 - 500	V

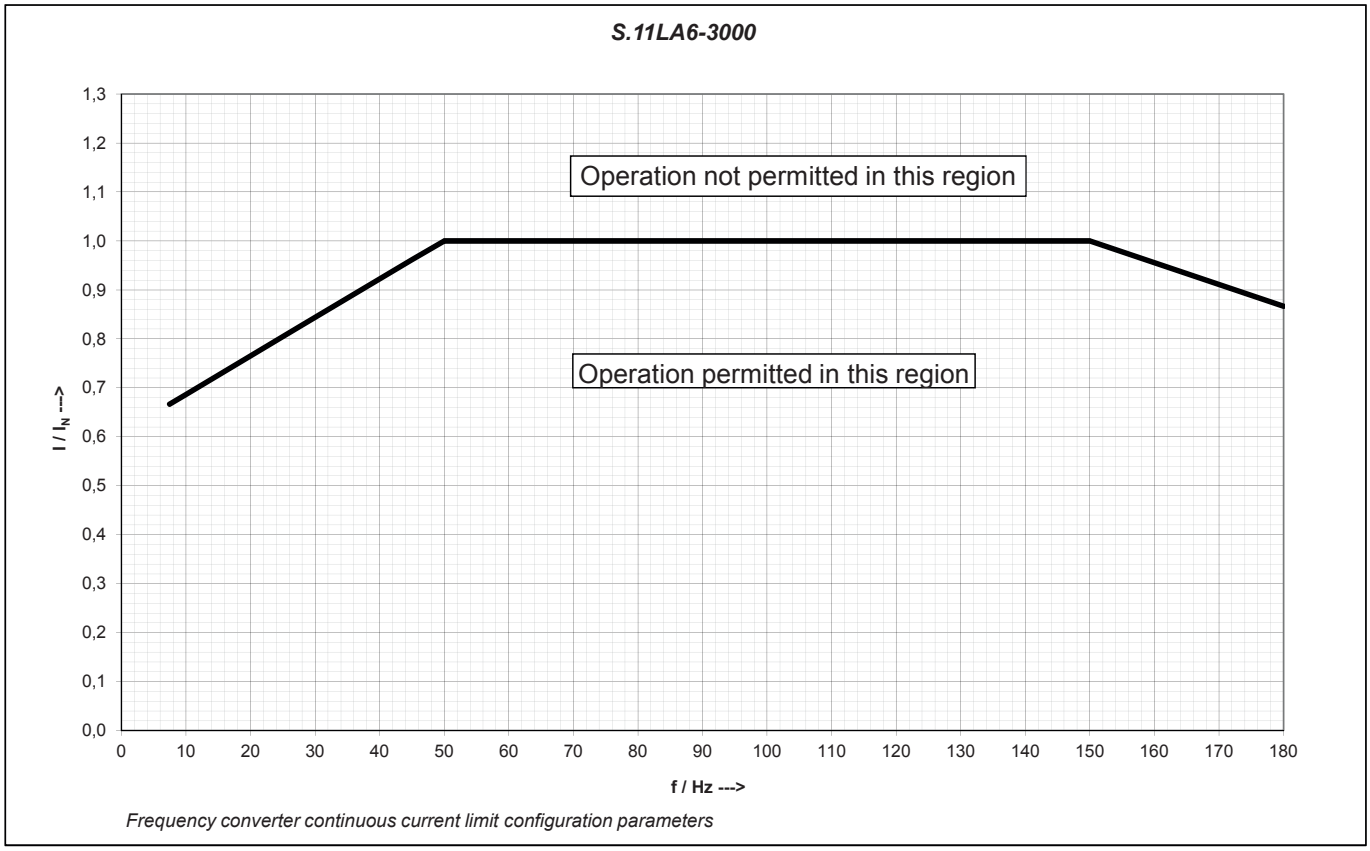
Operation with frequency converter

Torque	32,5	39,4	48	48	40	Nm
Power	0,5	2,1	5,0	15,0	15,0	kW
Voltages *	22,6	61,4	116	327	368	V
Current	20	24	30	30	25,8	A
Frequenz	7,5	25	50	150	180	Hz
Speed	150	500	1000	3000	3600	1/min
Duty type	S1					

* Basic oscillation at the motor terminals (output voltage of the frequency converter)

Characteristic curve the motors with Rated speed 3000 $^{1}/_{min}$

Frequency converter continuous current limit configuration parameters



Frequency converter continuous current limit configuration parameters

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Max. permissible ambient temperature range -20 °C to +50 °C

Converter Settings:

Minimum clock frequency:	3 kHz
Short-term current limit:	160% * In
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	60 Hz
Permissible operating time below f_{min}:	60 s

All other settings must be selected according the requirements of the drive.

The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes

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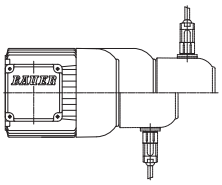


Page

Brake

Functional description

The compression springs act on the anchor disc, which is free to move in the axial direction and presses the brake disc, which is keyed to the rotor shaft, against the friction plate or the motor bearing plate. This produces the braking torque.

When a DC voltage is applied to the coil in the electromagnet housing, it generates a magnetic force that opposes the spring force and causes the anchor disc to be pulled toward the electromagnet enclosure. This releases the brake disc and disengages the brake.

Brakes are classified into two types according to how they are used: holding brakes and service brakes.

Holding brake ES.. / ZS..
brake that in normal operation does not convert kinetic energy into frictional energy but is only used to hold a mechanism in a particular position, but which can also be used for motion braking in an emergency.

Service brake ESX.. / ZSX..
A brake that converts kinetic energy into frictional energy in normal operation, which means that it brakes mechanical motion.
When a service brake is used as a holding brake, the braking torque tolerance of up to -30% (in new condition) must be taken into account.

Product description of type ES(X) spring-actuated brakes

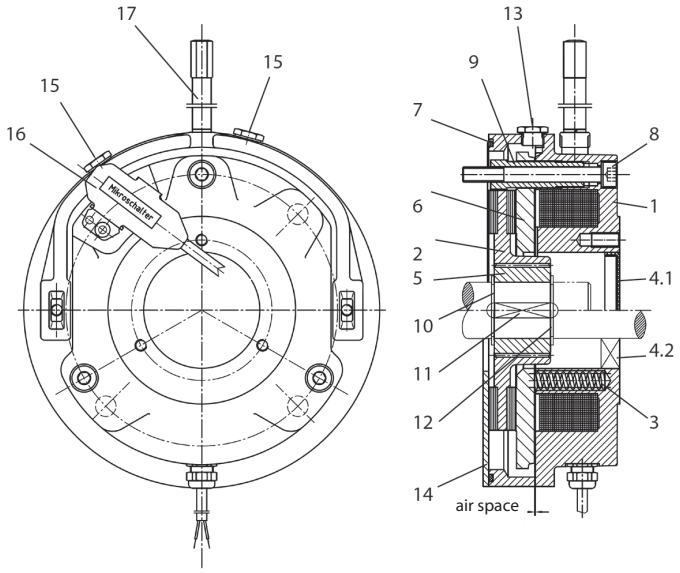


Figure 1: Construction of ES(X) brake

Brake mounting

ES and ESX: Brake mounting is under the fan cover
EH and EHX: Brake mounting is on the fan cover

Brake

Options

- Manual release, non-locking or locking
- Microswitch for monitoring operation or wear

Construction

1	Electromagnet housing
2	Brake disc
3	Compression spring
4.1	Cover plate with closed brake
4.2	Shaft seal with through shaft
5	Drive bush
6	Anchor disc
7	O-ring
8	Fitting screw with copper washer
9	Hollow screw
10	Retaining ring
11	Key
12	Retaining ring
13	Screw plug for checking air gap
14	Friction plate (only with motor size Dxx08 or Dxx09)
15	Screw plug for checking microswitch setting
16	Microswitch (optional)
17	Manual release (optional)

Product description of type ZS(X) spring-actuated brakes

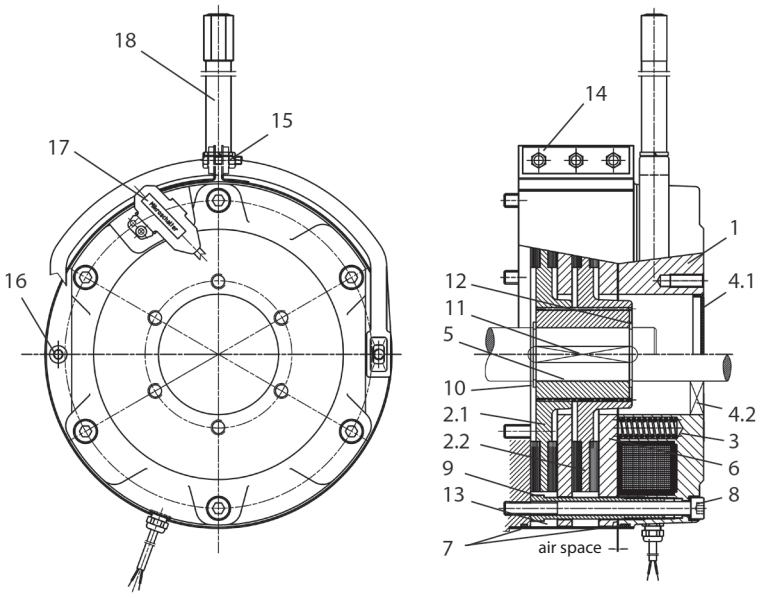


Figure 2: ZS(X) brake construction

Brake

Options

- Manual release, non-locking or locking
- Microswitch for monitoring operation or wear

Construction

1	Electromagnet housing
2	Brake disc 2.1 and 2.2
3	Compression spring
4.1	Cover plate
4.2	Shaft seal with through shaft
5	Drive bush
6	Anchor disc
7	O-ring
8	Fitting screw with copper washer
9	Hollow screw
10	Retaining ring
11	Key
12	Retaining ring
13	Cover
14	Fitting screws
15	Bracket
16	Assembly screw/assembly aid
17	Microswitch (optional)
18	Manual release (optional)

Brake selection and sizing

If the service brake is undersized, it will have increased wear and a shorter lifetime. If it is oversized, the resulting mechanical forces may overload the drive.

If specific application data is not available, in the case of horizontally driven equipment we recommend selecting a braking torque with a safety factor (K) of 1 to 1.5 times the rated torque of the motor.
For braking to standstill, the selected braking torque should be at least 80% of the rated torque of the drive.

Rated torque:

$$M_{Berf} = \frac{P \times 9550}{n_2} \times K$$

M_{Berf}	Braking torque	[Nm]
P	Motor power	[kW]
n	Rated speed at rotor shaft [rpm]	

For lifting operation, a braking torque equal to twice the rated motor torque should always be chosen for safety reasons.

If the moment of inertia, speed and allowable deceleration time of the machine are known, the braking torque can be calculated as described below.

External moments of inertia

If the masses to be decelerated by the brake do not run at the same speed as the rotor shaft, the moment of inertia (J_{ext}) must be reduced to the value at the rotor shaft

$$J_{ext'} = \frac{J_{ext1} \times n_1^2 + J_{ext2} \times n_2^2 + \ldots + J_{extn} \times n_n^2}{i^2}$$

or the external moment of inertia reduced by the gear ratio of the gear unit to the value at the rotor shaft.

Brake

$$J_{ext'} = \frac{J_{ext}}{i^2}$$

J_{ext}	Total external moment of inertia [kgm²]
$J_{ext'}$	Total external moment of inertia referenced to the rotor shaft [kgm²]
$J_{ext1,2,...}$	Individual external moments of inertia [kgm²]
i	Gear reduction ratio
n	Rotor shaft speed
$n_{1,2}...$	Speeds of the individual moments of inertia [rpm]

Load torque under static load

$$M_L = F \times r$$

M_L	Load torque [Nm]
F	Force [N]
r	radius [m]

Braking torque with dynamic load

A purely dynamic load is present when flywheels, rolls, etc. must be decelerated and the static load torque is negligible.

$$M_a = \frac{J \times n}{9{,}55 \times t_a}$$

J_{br}	Moment of inertia of the brake [kgm²]
J_{rot}	Moment of inertia of the rotor shaft and rotor [kgm²]
M_a	Deceleration torque [Nm]
n_a	Initial speed at start of deceleration [rpm]
t_a	Total deceleration time (from switch-off until drive is stationary) [s]
t_A	The response time of the brake for braking corresponds to t_{AC} or t_{DC} in the specification tables [s]

Dynamic and static loads

In most application situations, both static and dynamic loads are present.

$M_{Berf} = (M_a \pm M_L) \times K$ where $M_{Berf} \leq M_{Br}$ must hold true.

M_L braking (positive) or driving (negative) load torque [Nm]

Heat generated by each brake cycle

Friction converts the kinetic energy of the moving masses into heat.
This amounts to

$$W = \frac{J_{ges} \times n^2}{182{,}5} = \frac{(J_{ext'} + J_{rot} + J_{Br}) \times n_a^{\,2}}{182{,}5}$$ where $W \leq W_{max}$ must hold true.

W	Braking energy for each brake cycle [J]
M_{max}	Maximum permissible frictional energy per brake cycle (see brake tables)

Brake

Thermally allowable braking energy of service brakes

With a uniform sequence of brake cycles, which means a certain average number of brake cycles per hour, the temperature rises until an equilibrium between heat input and heat dissipation is reached. The temperature rise must be sized to avoid overheating the coil and the friction layer, taking the ambient temperature into account.

Braking to standstill:

$$W_Z = W \times Z \leq W_{th}$$

W_{th} Maximum allowable braking energy per hour
W_Z Braking energy with Z brake cycles
Z Number of brake cycles per hour

Lifting operation

In lowering operation, the drive motor acts as a generator and its braking effect results in a steady downward motion (constant speed). If we ignore transmission losses, under full load the drive must brake the load with the rated motor torque. If a mechanical brake with a braking torque equal to the braking torque of the motor is applied after the drive is switched off, the downward motion will continue at the same speed. This means that additional braking torque is necessary to stop the motion of the load. For example, if the brake is dimensioned for 200% braking torque, approximately 100% is used for "static" deceleration and the rest is used for "dynamic" deceleration.
If part of the braking torque is required for braking the load during lowering (downward motion), the brake engagement time is greater, and the thermal load is therefore greater.

In this case

$$W_H = \frac{M_{Br}}{M_{Br} - M_L} \times W_Z$$

W_H Friction energy per hour in lifting operation
M_{Br} Braking torque of the brake

Brake lifetime
The energy absorbed during braking causes the brake disc to wear, which increases the air gap. If the air gap increases beyond a certain maximum gap size, the magnetic field is so weak that the pulling force of the electromagnet is no longer sufficient to release the brake. A proper air gap must be restored by adjusting the air gap or by replacing the brake disc, depending on the type of brake construction.

The maximum number of brake cycles until service is necessary can be calculated as follows:

$$Z_L = \frac{W_L}{W}$$

Z_L Number of brake cycles until the air gap limit is reached
W_L Maximum allowable braking energy until maintenance; i.e. replacing the brake disc or adjusting the air gap. Adjustment of the air gap is possible only with type ZXSxx brakes.

Deceleration time
The pure braking time from the start of mechanical braking to standstill depends on the braking deceleration.
Especially with lifting operation, but also in other types of operation, it is necessary to check whether the load torque reinforces the braking effect or counters the braking effect.

The deceleration time is therefore calculated as follows:

$$t_a = \frac{J_{ges} \times n_a}{9{,}55 \times (M_{Br} \pm M_L)}$$

Brake

Electrical connection

General

There are two basic options for providing the supply voltage for the DC electromagnet:
1. Externally from an existing DC control voltage mains or a rectifier in the cabinet.
2. From a rectifier built into the motor or brake terminal box. In this case, the rectifier can be powered either directly from the motor terminal board or from the mains.

Note that in the following cases the rectifier is not allowed to be connected to the terminal board of the motor:

- Pole-changing motors and motors with wide operating voltage range
- Operation from a frequency converter
- Other configurations in which the motor voltage is not constant, such as operation with soft-start devices, start-up transformers, etc.

Release

When the rated voltage is applied to the electromagnet coil, the current through the coils increases exponentially and with it the generated magnetic field. The current must rise to a certain value ($I_{release}$) before it overcomes the spring force and starts to release the brake.

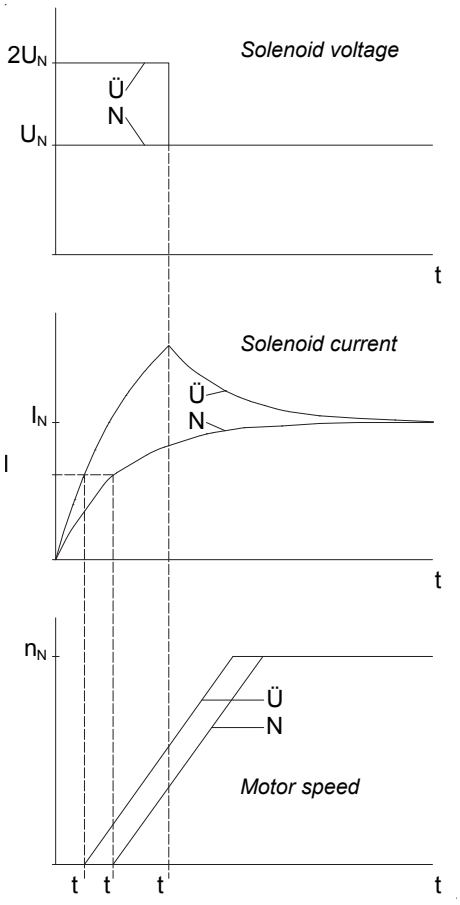


Figure 3: Idealised curves of coil voltage, coil current and motor speed with normal excitation (N) and overexcitation (Ü). $t_{Ü}$: overexcitation time; t_{AN}, $t_{AÜ}$: Response time with normal excitation and overexcitation.

Brake

Two different situations can arise during the response time tA, assuming that the voltage is applied to the motor and the brake simultaneously:

- The motor is locked if $M_A < M_L + M_{Br}$
  The motor draws its locked-rotor current, which increases the thermal load on the motor.
  This situation is illustrated in Figure 3.
- The brake slips if $M_A > M_L + M_{Br}$
  In this case, the brake is also thermally stressed during start-up and wears faster.

M_A: locked rotor torque of the motor; M_L: load torque; M_{Br}: braking torque

As can be seen, there is an additional load on the motor and brake in both cases. The effect of the response time increases with increasing brake size. Consequently, it is advisable to reduce the response time, especially with medium-sized and large brakes and with a high cycle rate. This can be achieved relatively easily by means of electrical overexcitation. With this approach, the coil is briefly operated at twice its rated voltage after switch-on.

This causes the current to rise faster than with normal excitation, and it reduces the response time by approximately 50%. This overexcitation function is built into the type MSG special rectifier.

The release current increases with increasing air gap, and with it the response time. When the release current exceeds the rated coil current, the brake will not be released with normal excitation and the brake has reached its wear limit.

Braking
The brake does not start generating braking torque immediately after the coil voltage is switched off. First the magnetic energy must decline to the point that the spring force can overcome the magnetic force. This occurs at the holding current I_{hold}, which is lower than the release current.
The response time depends on how the voltage is switched off.

Switching off the AC supply voltage to a type SG standard rectifier

a) Rectifier powered from the motor terminal board (Figure 4, curve 1)
Response time t_{A1}: very long

Cause: Due to the residual magnetism of the motor, after the motor voltage is switched off a slowly decaying voltage is induced, and it continues to supply power to the rectifier and thereby to the brake. In addition, the magnetic energy of the brake coil is dissipated relatively slowly in the freewheel circuit of the rectifier.

b) Rectifier powered separately (Figure 4, curve 2)
Response time t_{A2}: long

Cause: After the rectifier voltage is switched off, the magnetic energy of the brake coil is dissipated relatively slowly in the freewheel circuit of the rectifier.

If the supply voltage is interrupted on the AC side, no significant switch-off voltage occurs on the electromagnet coil.

Brake

Interrupting the DC circuit of the electromagnet coil (Figure 4, curve 3)

a) By a mechanical switch
- with separate power supply from a DC control voltage mains or
- at the DC switch contacts (A2 and A3) of the type SG standard rectifier
Response time t_{A3}: very short

Cause: The magnetic energy of the brake coil is dissipated very quickly by arcing across the switch contacts.

b) Electronic

Using a type ESG or MSG special rectifier
Response time t_{A3}: short

Cause: The magnetic energy of the brake coil is dissipated quickly by a varistor integrated in the rectifier.

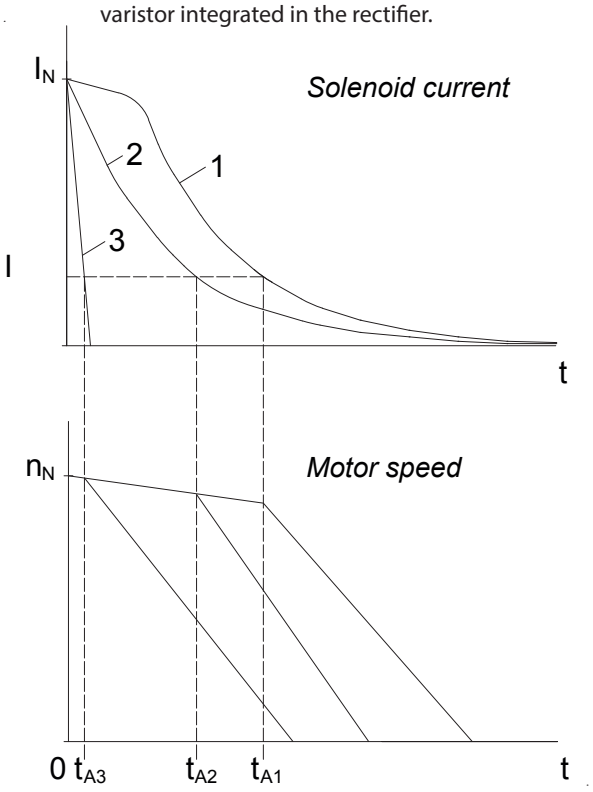


Figure 4: Idealised coil current and motor speed curves after switching off power on the AC side (1 and 2) or DC side (3)

If the circuit is interrupted on the DC side, a high voltage u_q is induce by the electromagnet coil. The magnitude of this voltage depends on the inductance L of the coil and the switch-off speed di/dt according to the formula

$$u_q = L \cdot \frac{di}{dt}$$

Due to the winding design, the inductance L increases with increasing rated coil voltage. Consequently, the voltage spikes induced at switch-off can reach hazardous levels with relatively high coil voltages. For this reason, a varistor is included in the circuit for all brakes with voltages greater than 24 V.
This varistor is solely intended to protect the electromagnet coil; it is not intended to protect adjacent electronic components or devices against electromagnetic interference. On request, brakes with rated voltages of 24 V or less can also be fitted with a varistor.
If the circuit is interrupted on the DC side by a mechanical switch, the resulting arcing over the switch contacts causes strong erosion of the contacts. For this reason, only special DC contactors or adapted AC contactors with contacts rated for use class AC3 as specified in EN 60947-4-1 may be used.

Brake

Specifications of holding brakes with emergency stop capability

The maximum allowable friction energy values stated here do not apply to brake motors for use in areas with potentially explosive atmospheres.
Refer to separate data in appropriate documents for explosion-proof drives.

Type	M_{Br} [Nm]	W_{max} [10^3 J]	W_{th} [10^3 J]	W_L [10^6 J]	t_A [ms]	t_{AC} [ms]	t_{DC} [ms]	P_{el} [W]	J [10-3 kgm^2]
E003B9	3	1,5	-	-	35	150	15	20	0,01
E003B7	2,2	1,8	-	-	28	210	20		
E003B4	1,5	2,1	-	-	21	275	30		
E004B9	5	2,5	-	-	37	125	15	30	0,017
E004B8	4	3	-	-	30	160	18		
E004B6	2,8	3,6	-	-	23	230	26		
E004B4	2	4,1	-	-	18	290	37		
E004B2	1,4	4,8	-	-	15	340	47		
ES010AX	15*	3	-	-	110	-	30	35	0,045
ES010A9	10	3	-	-	60	100	15		
ES010A8	8	3	-	-	55	150	20		
ES010A5	5	3	-	-	45	220	20		
ES010A4	4	3	-	-	30	250	20		
ES010A2	2,5	3	-	-	25	350	25		
ES027AX	32*	2,5	-	-	80	-	30	50	0,172
ES/EH027A9	27	2,5	-	-	120	100	15		
ES/EH027A7	20	2,5	-	-	100	130	20		
ES/EH027A6	16	2,5	-	-	80	170	25		
ES/EH040A9	40	3,5	-	-	100	100	20	65	0,45
ES/EH040A8	34	3,5	-	-	80	200	25		
ES/EH040A7	27	3,5	-	-	70	250	30		
ES070AX	90*	3,5	-	-	120	-	40	85	0,86
ES070A9	70	3,5	-	-	120	150	18		
ES070A8	63	3,5	-	-	120	200	20		
ES070A7	50	3,5	-	-	90	220	25		
ES/EH125A9	125	4,5	-	-	170	220	25	105	1,22
ES/EH125A8	105	4,5	-	-	150	320	28		
ES/EH125A7	85	4,5	-	-	135	350	30		
ES/EH125A6	70	4,5	-	-	120	440	35		
ES125A5	57	4,5	-	-	100	600	40		
ES125A3	42	4,5	-	-	90	700	45		
ES/EH200A9	200	8	-	-	400	150	22	105	2,85
ES/EH200A8	150	8	-	-	280	250	35		
ES/EH200A7	140	8	-	-	200	320	35		

* Requires overexcitation; permissible only with MSG rectifier

Braking torque tolerance: -10 / +30%

W_{th} and WL are not specified because little or no braking energy is dissipated by holding brakes when they are used as intended.

For versions with braking torque marked with *, which may only be used with an MSG rectifier, the values of t_A and t_{DC} apply to operation with an MSG rectifier; i.e. t_A for overexcitation or t_{DC} for electronic circuit interruption on the DC side.

Due to the effects of operating temperature and manufacturing tolerances, actual response times may differ from the guideline values listed here.

Brake

Specifications of service brakes

The maximum braking energy values stated here do not apply to brake motors for use in areas with potentially explosive atmospheres.
Refer to separate data in appropriate documents for explosion-proof drives.

Type	M_{Br} [Nm]	W_{max} [10^3 J]	W_{th} [10^3 J]	W_L [10^6 J]		t_A [ms]	t_{AC} [ms]	t_{DC} [ms]	P_{el} [W]	J [10^{-3} kgm^2]
				without HL	with HL					
E003B9	3	1,5	36	55	55	35	150	15	20	0,01
E003B7	2,2	1,8	36	90	90	28	210	20		
E003B4	1,5	2,1	36	140	140	21	275	30		
E004B9	5	2,5	60	50	50	37	125	15	30	0,017
E004B8	4	3	60	100	100	30	160	18		
E004B6	2,8	3,6	60	180	180	23	230	26		
E004B4	2	4,1	60	235	235	18	290	37		
E004B2	1,4	4,8	60	310	310	15	340	47		
ESX010AX	15*	3	250	120	120	110	-	30	35	0,045
ESX010A9	10	3	250	120	120	60	100	15		
ESX010A8	8	3	250	150	150	55	150	20		
ESX010A5	5	3	250	240	240	45	220	20		
ESX010A4	4	3	250	300	240	30	250	20		
ESX010A2	2,5	3	250	390	240	25	350	25		
ESX027AX	27*	10	350	150	150	80	-	30	50	0,172
ESX/EHX027A9	22	10	350	150	150	120	100	15		
ESX/EHX027A7	16	10	350	300	300	100	130	20		
ESX/EHX027A6	13	10	350	350	350	80	170	25		
ESX/EHX040A9	32	20	450	420	420	100	100	20	65	0,45
ESX/EHX040A8	27	20	450	560	490	80	200	25		
ESX/EHX040A7	22	20	450	700	490	70	250	30		
ESX070AX	72*	28	550	700	700	120	-	40	85	0,86
ESX070A9	58	28	550	500	500	120	150	18		
ESX070A8	50	28	550	800	700	120	200	20		
ESX070A7	40	28	550	1200	700	90	220	25		
ESX/EHX125AX	100*	40	700	1900	1900	100	-	70	105	1,22
ESX/EHX125A9	85	40	700	1700	1700	150	320	28		
ESX/EHX125A8	70	40	700	1900	1700	135	350	30		
ESX/EHX125A7	58	40	700	2700	1700	120	440	35		
ESX125A5	45	40	700	3300	1700	100	600	40		
ESX125A3	34	40	700	3300	1700	90	700	45		
ESX/EHX200AX	160*	60	850	2000	2000	105	-	70	105	2,85
ESX/EHX200A9	120	60	850	1700	1700	280	250	35		
ESX/EHX200A8	110	60	850	2600	2600	200	320	35		

* Requires overexcitation; permissible only with MSG rectifier

Braking torque tolerance:
E003 / E004: -10 / +30%
ESXxx / EHXxx: -20 / +30% after run-in; up to -30% in new condition.

For versions with braking torque marked with *, which may only be used with an MSG rectifier, the values of t_A and t_{DC} apply for operation with an MSG rectifier; i.e. t_A for overexcitation or t_{DC} for electronic circuit interruption on the DC side.

The values for W_L are guidelines; actual values may vary significantly depending on the application situation. Periodic inspection of the air gap or brake disc thickness is recommended.

Actual response times may differ from the times listed here due to the effects of operating temperature, brake disc wear and manufacturing tolerances.

Brake

Key to symbols

M_{Br}	Rated braking torque
W_{max}	Maximum allowable friction energy for an emergency stop with a holding brake
W_{max}	Maximum allowable friction energy for each brake cycle with service brakes
W_{th}	Maximum allowable braking energy per hour
W_L	Maximum allowable braking energy until maintenance; i.e. brake disc replacement or air gap adjustment. Air gap adjustment is possible only with type ZSXxx brakes.
H_L	Manual release
t_A	Response time for release with normal excitation. Overexcitation with a type MSG special rectifier reduces the response time by approximately 50%.
t_{AC}	Response time for brakes with AC-side switch-off, i.e. by switching off the supply voltage to a separately powered standard rectifier. If the supply voltage for the rectifier is taken from the motor terminals, considerably longer response times should be expected (depending on the motor size and winding design).
t_{DC}	Response time for braking with DC-side circuit interruption by a mechanical switch. In the case of electronic circuit interruption on the DC side by a type ESG or MSG special rectifier, the response times will be approximately two to three times as long.
P_{el}	Electromagnet coil power consumption at 20 °C. Depending on the rated voltage of the coil, the actual power may differ from the guideline value stated here.
J	Moment of inertia of the drive bush and brake disc(s)

Brake

Connection

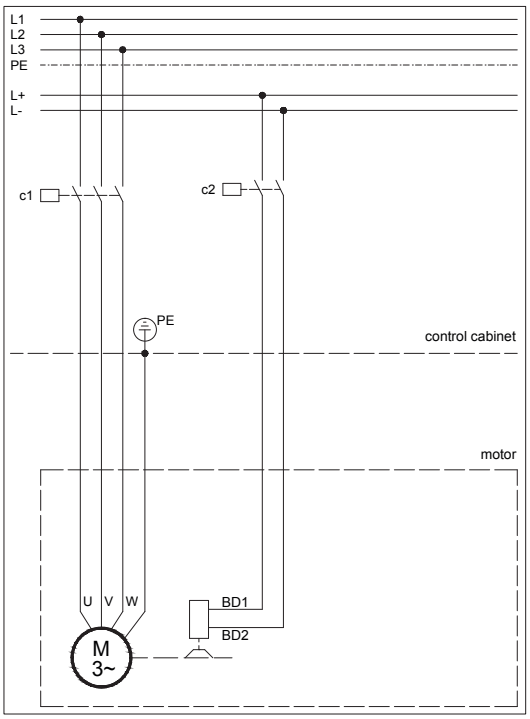
The electrical connections to the brake are made in the motor terminal box using terminals or the rectifier. Standard voltages:

380–420 V 50/60 Hz (brake coil voltage 180 V DC)
220–230 V 50/60 Hz (brake coil voltage 105 V DC)
24 V DC (brake coil voltage 24 V DC)

Other voltages are available at additional cost.

DC connection via terminals (K)

The brake must be connected via separate terminals in the motor or brake terminal box directly to the DC voltage. The standard voltages are 180 V DC, 105 V DC and 24 V DC. Brakes with other operating voltages are available at additional cost.



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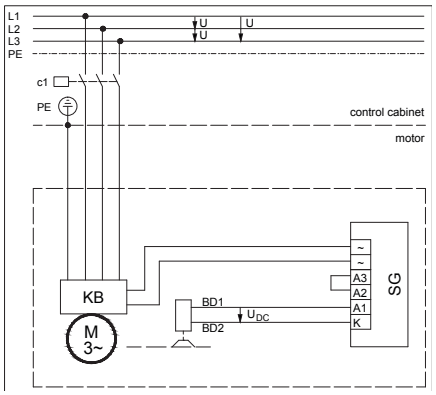
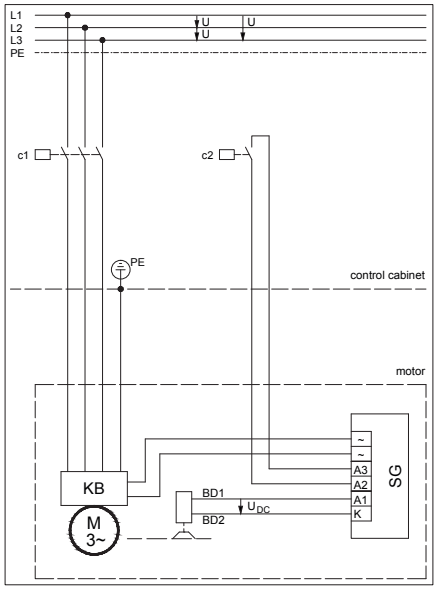
Brake

Standard rectifier (S)

Working principle	Half-wave rectifier with switch contacts for DC-side circuit interruption
Input voltage U1	max. 575 VAC +5%
Output voltage	0.45 x U1 VDC
Max. output current	2.5 A DC
Ambient temperature	-40 to +40 °C
Connection	Caged Clamp terminals with clamp lever
Clampable conductor cross-section	max. 1.5 mm^2 without wire end sleeve max. 1.5 mm^2 with wire end sleeve
Approvals	c-CSA-us c-UL-us (only in combination with B2000 geared motors and brakes in the ES(X) or ZS(X) product series

The brake must be connected to the AC supply via the standard rectifier in the motor terminal box or brake terminal box. The standard voltages are 380 ... 420 V 50/60 Hz or 220 ... 230 V 50/60 Hz. Other voltages up to 575 V are available at extra cost. In a configuration with standard rectifier, the brake circuit can be interrupted by an extra contact on the d.c. side in order to reduce the response time. This significantly reduces the braking time and overtravel distance.





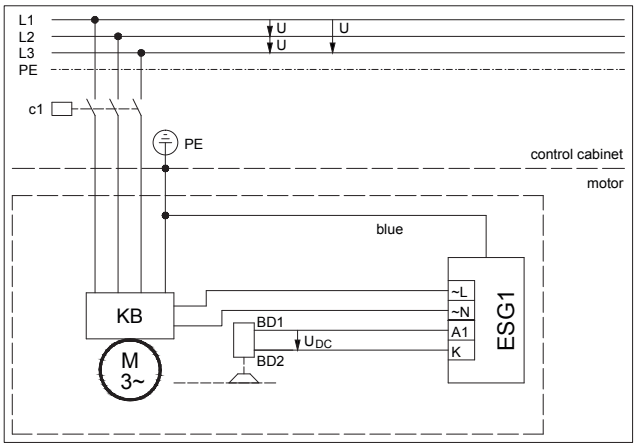
Voltage connection for the rectifier from the motor terminal block or cage clamp (see Rectifier Connection on Motor Terminal Block or Cage Clamp)

Brake

Rectifier for electronic rapid shutdown (E)

Working principle	Half-wave rectifier with electronic DC-side circuit interruption
Input voltage U1	220–460 V AC ±5%, 50/60 Hz
Output voltage	0.45 x U1 V DC
Max. output current	1 A DC
Ambient temperature	-20 °C to +40 °C
Clampable conductor cross-section	max. 1.5 mm^2

This rectifier permits electronic DC-side interruption of the brake circuit. No additional cable to the rectifier is necessary. The rectifier is supplied complete with a protective resistor which prevents a mains short- circuit via the shutdown arc of the high-speed motor contactor. Brake response times are significantly shorter than those achievable by AC-side interruption of the brake circuit. They are, however, longer than those achievable with DC-side interruption by a mechanical switch. The brake must be connected to the alternating current via the rapid shutdown rectifier in the motor terminal box or the brake terminal box. The standard voltages are 380 ... 420 V 50/60 Hz or 220 ... 230 V 50/60 Hz. Other voltages up to 460 V are available at extra cost.



Voltage connection for the rectifier from the motor terminal block or cage clamp (see Rectifier Connection on Motor Terminal Block or Cage Clamp)

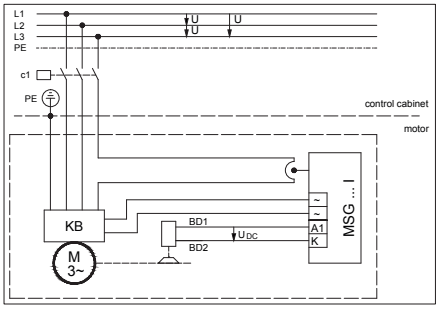
Brake

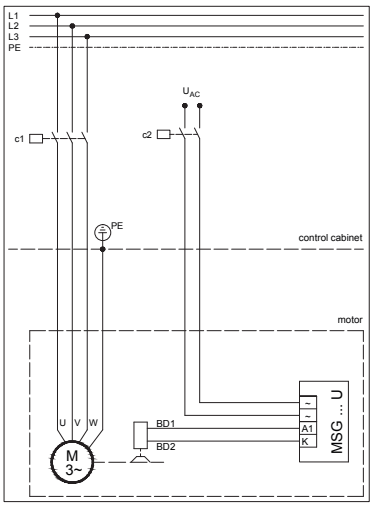
Standard rectifier (M)

Working principle	MSG 1.5.480I Half-wave rectifier with time-limited overexcitation and electronic DC-side circuit interruption Fast shutdown due to no motor current in one phase
Input voltage U1	220–480 V AC +6 / -10%, 50/60 Hz
Output voltage	0.9 x U1 V DC during overexcitation 0.45 x U1 V DC over overexcitation period
Overexcitation time	0.3 s
Max. output current	1.5 A DC
Ambient temperature	-20 °C to +40 °C
Clampable conductor cross-section	max. 1.5 mm²

Working principle	MSG 1.5.500U Half-wave rectifier with time-limed overexcitation and electronic DC-side circuit interruption Fast shutdown due to the absence of input voltage
Input voltage U1	220–500 V AC ±10%, 50/60 Hz
Output voltage	0.9 x U1 V DC during overexcitation 0.45 x U1 V DC over overexcitation period
Overexcitation time	0.3 s
Max. output current	1.5 A DC
Ambient temperature	-20 °C to +40 °C
Clampable conductor cross-section	max. 1.5 mm²

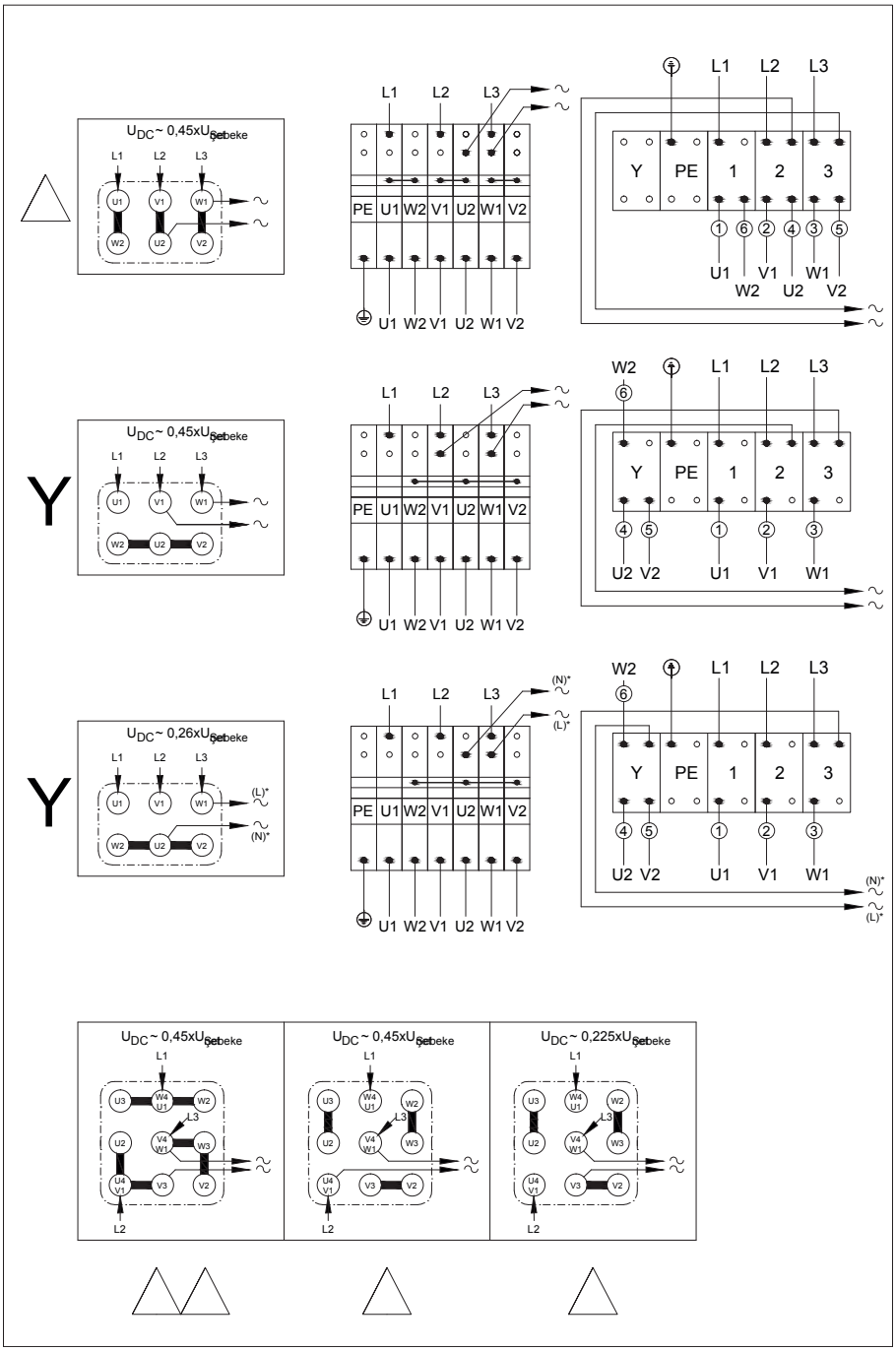
In cases where there are high motor switching frequencies, the brake can be de-energised more rapidly with this rectifier thereby significantly reducing the thermal stress on the motor. In addition, interrupting the brake's DC circuit by electronic means significantly reduces response times. Depending on the circumstances in which they are to be used, either the MSG 1.5.500 U (rapid shutdown brought about by removed supply voltage) or MSG 1.5.480 I (rapid shutdown brought about by removed motor current in a phase) is used. Power supply 220 to 480 V AC.





Brake

Rectifier Connection on Motor Terminal Block or Cage Clamp



Brake

Brake connection, operation with frequency converter

The voltage present at the motor terminal block when operating with a frequency converter is frequency-dependent. Brakes require a constant voltage, so they need a seperate electrical connection. This is the reason why the brake is not connected to the motor terminals ex- works.

Brake connection, pole-changing motors

The brakes of pole-changing motors need a seperate electrical connection. As is the case with motors for operation with frequency inverters, the brake is not connected to the motor terminals ex-works.

Manual release (HA, HN)

All brakes are available with mechanical manual release on request. Non-latching manual release is the standard version (HN). A latching manual release (HA) can be supplied if required for all brake sizes.

Degree of protection

All BAUER brakes comply with degree of protection IP 65.

Special corrosion protection

If high requirements for corrosion resistance apply, the brakes are available with two levels of enhanced corrosion protection:

CORO1 (C1): Finished with two-component paint to protect against chemically aggressive gases and vapours.

CORO2 (C2): Same finish as CORO1. The screws for the terminal-box cover are non- rusting steel. The mechanical internals of the brake are made of corrosion- proofed material.

CE mark

BAUER geared motors with externally mounted spring-loaded brakes bear the CE mark.

The brakes comply with:

- the **Machinery Directive (2006/42/EG)**
  Manufacturer's declaration available on request
- the **Low-Voltage Directive (2006/95/EG)**
  Documented by the CE mark
- the **EMC Directive (2004/108/EG)**
  Documented by the CE mark

See BAUER special print SD33.. for more information.

Explosion protection

Brakes for use in hazardous areas are subject to special regulations. Please consult our support specialists in these special cases.

Back stop (RR, RL)

Motors of size D..09 (1,1kW) up to D..18 (30kW) are available with backstop. The locking rotational direction clockwise (RR) or anticlockwise (RL) is to given in the order. The reference is the connection side of the gearbox. Should the connection side not be clearly defined, gearbox side "V" (front) will be assumed (see chapter 17 Dimensions drawing "Motor with back stop").

Note that the back-stop functionality on a motor operating with a frequency converter is guaranteed only at rotor speeds above 670/min.

It is advisable to consult BAUER for applications in corrosive atmospheres, especially for motor-down installed positions.

Brake

Second motor shaft extension (ZW, ZV)

The motors are also available on request with a second motor shaft extension in design ZW (shaft with key) or ZV (shaft with square end).

Half the central motor's rated power is available at each of the two shafts. Permissible radial loads available on request. Guards are not included in the scope of supply (for dimensional drawing see chapter 17).

Motors with brakes are available on request with a second shaft stub extended through the brake.

Protective fan cowl (D)

A protective hood over the fan cowl is recommended for outdoor installations where the motor is pointing upward and subject to severe or prolonged exposure to water (dimensional drawing, see chapter 17).

This protective hood is mandatory for upright explosion-proof motors.

A special fan cowl for the textiles industry is available on request at extra cost. This design prevents airborne fibres and fluff clogging the fan cowl.

Motor-independent fan (FV)

For special applications, standard motors and brake motors of size D08 and larger are available with externally mounted motor-independent fans. The standard line voltage of the motor-independent fan matches the voltage of the geared motor (dimensional drawing for motor-independent fan, see chapter 17).

The independent fans are supplied as standard with Bayonet-fitting for standard motors sizes D..16 and D..18 and brake motors sizes D..11 to D..18. Standard enclosure IP66.

Technical Data:
Multivolt Conception Running capacitor for single phase duty enclosed as standard.

Mode	Frame size	Blower diameter	Range of voltage		max. permissible current	max. power input
		(mm)	50 Hz	60 Hz	(A)	W
1 ~ ⊥ (Δ)	63	118	230-277	230-277	0,12	32
	71	132	230-277	230-277	0,12	33
	80	150	230-277	230-277	0,14	37
	90	169	230-277	230-277	0,29	65
	100	187	230-277	230-277	0,30	75
	112	210	230-277	230-277	0,37	94
	132	250	230-277	230-277	0,60	149
	160-200	300	230-277	---	0,96	236
3 ~ Y	63	118	380-500	380-575	0,06	28
	71	132	380-500	380-575	0,06	29
	80	156	380-500	380-575	0,06	34
	90	169	380-500	380-575	0,19	75
	100	187	380-500	380-575	0,17	94
	112	210	380-500	380-575	0,17	99
	132	250	380-500	380-575	0,25	148
	160-200	300	380-500	380-575	0,54	360
3 ~ Δ	63	118	220-290	220-332	0,10	28
	71	132	220-290	220-332	0,10	28
	80	156	220-290	220-332	0,10	34
	90	169	220-290	220-332	0,33	78
	100	187	220-290	220-332	0,31	87
	112	210	220-290	220-332	0,31	103
	132	250	220-290	220-332	0,45	146
	160-200	300	220-290	220-332	0,91	360

Encoder System

Shaft encoder (G)

Bauer gear motors can be fitted with either an incremental encoder or an absolute encoder for special applications. Both the standard incremental encoder and the absolute encoder are optimised and suitable for use with all modern inverters.

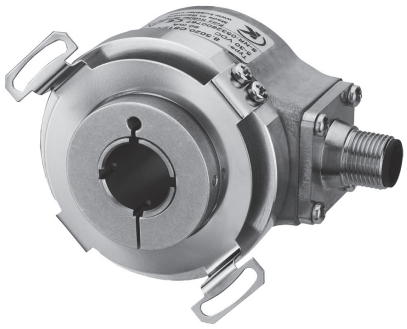
Bauer standard encoders as from motor frame size D05 (0,18kW) are protected against mechanical damage by means of a protective cover (Additional Dimension Sheet see chapter 17).

Special features: standard incremental encoder:
- Robust mount
- Degree of protection IP66
- EMC-tested
- Protected against polarity reversal
- Supply voltage 8-30 V DC
- A-, B- and N-lines and inverted signals or output signals as preferred
- HTL output circuit (TTL on request)
- 1024 pulses per revolution

Special features: standard absolute encoder
- Enclosure: IP66
- Steps per revolution: 8192 (13 Bit)
- Number of turns: 4096 (12 Bit) shaft turns
- Execution of electronic: SSI (Synchronous-Serial Interface)
- Output code: Gray-Code
- Supply voltage: 11-27 VDC
- Loss efficiency (no load): ≤ 3 Watt
- Output driver: RS-422 (2-wire)

Incremental rotary encoder

Functional description



Incremental encoders are used to determine motor shaft positions. An incremental encoder detects rotary motion and coverts it into an electrical output signal. An encoder disc with a specific number of periods per rotation senses angular motion. The optoelectronic scanning unit generates signals and issues pulses after the signals have been processed in trigger stages. The resolution is defined by the number of opaque and clear segments on the encoder disc. For example, an encoder with 1024 lines will generate a sequence of 1024 pulses for one full rotation.

The combination of an incremental encoder and a frequency converter allows optimised solutions to be developed, such as

- speed controllers with a wide adjustment range
- accurate speed control
- constant-speed control
- position control

Supply voltage:	10–30 V DC with HTL 5 V DC with differential TTL
Output signals:	HTL A, B and N tracks; optional TTL
Pulses per revolution:	1024 Optional 512, 2048, ..., 4096, or others on request
Enclosure rating:	IP 65 (optional IP 67)
Temperature range:	-40 °C to +85 °C

Electrical specifications

Output voltage	RS 422 (TTL compatible)	RS 422 (TTL compatible)	Differential	Differential (7272)
Supply voltage	5–30 V DC	5 V ±5%	10–30 V DC	5–30 V DC
No-load current consumption With inversion:	typ. 40 mA / max. 90 mA	typ. 40 mA max. 90 mA	typ. 50 mA / max. 100 mA	typ. 50 mA max. 100 mA
Allowable load per channel: Pulse rate:	max. ±20 mA max. 300 kHz	max. ±20 mA max. 300 kHz	max. ±20 mA max. 300 kHz	max. ±20 mA max. 300 kHz[3]
High signal level:	min. 2.5 V	min. 2.5 V	min. UB – 1 V	min. UB – 2.0 V
Low signal level:	max. 0.5 V	max. 0.5 V	max. 0.5 V	max. 0.5 V
Rise time t_r	max. 200 ns	max. 200 ns	max. 1 µs	max. 1 µs
Fall time t_f	max. 200 ns	max. 200 ns	max. 1 µs	max. 1 µs
Outputs short-circuit proof[1]	Yes[2]	Yes[2]	Yes	Yes
Supply voltage reverse polarity protection:	Yes	No	Yes	No
CE compliant in accordance with EN 61000-6-2, EN 61000-6-3 and EN 61000-6-4				

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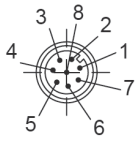
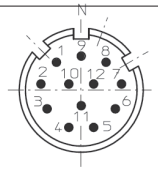
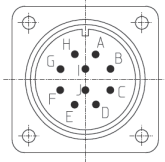
[1] With applied supply voltage within specified range
[2] Only one channel may be shorted at the same time:
(with UB = 5 V, shorting to another channel, 0 V or +UB is allowed)
(with UB = 5–30 V, shorting to another channel or 0 V is allowed)
[3] Maximum cable length 30 m

Incremental rotary encoder

Plug end view with male pin insert

Connector type	8-pin M12 plug	12-pin M23 plug	MIL connector 10-pin
Layout			
Order code:	8.5000.XXX3.XXXX 8.5000.XXX4.XXXX	8.5000.XXX7.XXXX 8.5000.XXX8.XXXX	8.5000XXXY.XXXX
Mating connector:	05.CMB-8181-0	8.0000.5012.0000	8.0000.5062.0000

Signal assignments

Signal:	0 V GND	+U_B	0 V Sens	+Ub Sens	A	A	B	B	Z	Z	Shield
M23 Multifast, 12-pin connector; pin assignments: M12 Eurofast, 8-pin connector; pin assignments:	10 1	12 2	11	2	5 3	6 4	8 5	1 6	3 7	4 8	1) 1)
Military version; 10-pin connector; pin assignments:	F	D		E	A	G	B	H	C	I	J[1])
Cable; lead colour:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	Shield

[1] Shield connected to plug housing. **Insulate unused outputs before putting into service.**

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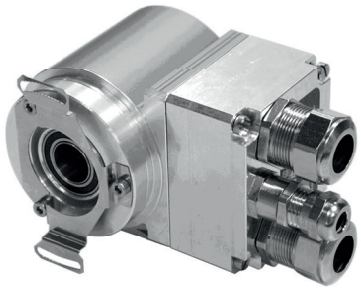
Absolute rotary encoders

Functional description

Absolute encoders detect both angular and rotational motions and convert them into electrical signals. In contrast to incremental encoders, with absolute encoders the current position is directly available. If an absolute encoder is moved mechanically while it is switched off, after the power is switched on again the current position can be read out immediately and directly. Absolute encoders are available in single-turn and multi-turn versions.

Profibus DP interface



Specifications

Supply voltage	11–27 VDC
No-load current consumption	< 350 mA
Total resolution [1]	≤ 33 bits
Number of steps per revolution, standard/extended [1]	≤ 8,192 / ≤ 32,768
Number of turns, standard/extended [1]	≤ 4,096 / ≤ 256,000
Profibus DP V0	IEC 61158, IEC 61784
PNO encoder profile	Class 1/Class 2
parameters [1]	Counting direction switchover, scaling function, etc.
Output code [1]	Binary, Gray, truncated Gray
Address	3–99, set using a rotary switch
Baud rate	9.6 kbit/s to 12 Mbit/s
TR-specific functions [1]	Gear and speed outputs
Data width on bus for actual position	≤ 25 bits
Permissible mechanical speed	≤ 12,000 rpm
Shaft load	Own mass
Bearing life	≥ 3.9 x 10^{10} revolutions at
- speed	≤ 6,000 rpm
- operating temperature	≤ 60 °C
Shaft diameter [mm]	10H7
Permissible angular acceleration	≤ 10^4 rad/s^2
Moment of inertia	2.5 x 10^{-6} kg m^2 (typical)
Start-up torque at 20 °C	2 Ncm (typical)
Weight	0.3–0.5 kg

1 Configurable parameter

Ambient conditions

Vibration (EN 60068-2-6:1996)	≤ 100 m/s^2, sinusoidal 50–2,000 Hz
Shock (EN 60068-2-27:1995)	≤ 1000 m/s^2, half-cycle sinusoidal 11 ms
EMC	
- Interference emission compliant with EN 61000-6-3:2007	
- Interference immunity compliant with EN 61000-6-2:2006	
Operating temperature	0 °C to +60 °C; optionally -20 °C to +70 °C
Storage temperature	-30 °C to +80 °C, dry
Relative humidity (EN 60068-3-4:2002)	98%, non condensing
Enclosure rating (EN 60529:1991)[2]	IP 65

2 With mating connector fitted and/or cable glands fitted and tightened

Absolute rotary encoders

SSI interface

Specifications

Supply voltage	11–27 VDC
No-load current consumption	< 350 mA
Total resolution [1]	≤ 25 bits
Number of steps per revolution [1]	≤ 8,192
Number of rotations, standard [1]	≤ 4,096
Number of rotations, extended [1]	≤ 256,000
SSI	Synchronous Serial Interface
Clock input	Optocoupler
Data output	RS-422, 2-wire
Clock frequency	80 kHz – 1 MHz
Monostable time t_M	16 µs ≤ t_M ≤ 25 µs (20 µs typical)
Output code [1]	Binary, Gray, BCD
Output format [1]	Standard, Tannenbaum, SSI + CRC, 26-bit cycle, variable number of data bits
Negative values [1]	Sign and magnitude, twos complement
SSI or parallel special bits [1]	Limit switch, overspeed, direction indication, motion indication, error indication, parity
F/R [1]	Counting direction
Preset [1]	Electronic alignment
Logic levels	"0" < +2 VDC; "1" = supply voltage
Permissible mechanical speed	≤ 12,000 rpm
Shaft load	Own mass
Bearing life	≥ 3.9 x 10^{10} revolutions at
- speed	≤ 6,000 rpm
- operating temperature	≤ 60 °C
Shaft diameter [mm]	10H7
Permissible angular acceleration	≤ 10^4 rad/s^2
Moment of inertia	2.5 x 10^{-6} kg m^2 (typical)
Start-up torque at 20 °C	2 Ncm (typical)
Weight	0.3–0.5 kg
Optional	
- incremental signals, RS422 levels	K1+, K1-, K2+, K2- with 1024 or 2048 pulses

[1)] Configurable parameter

Ambient conditions

Vibration (EN 60068-2-6:1996)	≤ 100 m/s^2, sinusoidal 50–2,000 Hz
Shock (EN 60068-2-27:1995)	≤ 1000 m/s^2, half-cycle sinusoidal 11 ms
EMC	
- Interference emission compliant with EN 61000-6-3:2007	
- Interference immunity compliant with EN 61000-6-2:2006	
Operating temperature	0 °C to +60 °C; optionally -20 °C to +70 °C
Storage temperature	-30 °C to +80 °C, dry
Relative humidity (EN 60068-3-4:2002)	98%, non condensing
Enclosure rating (EN 60529:1991)[2]	IP 65

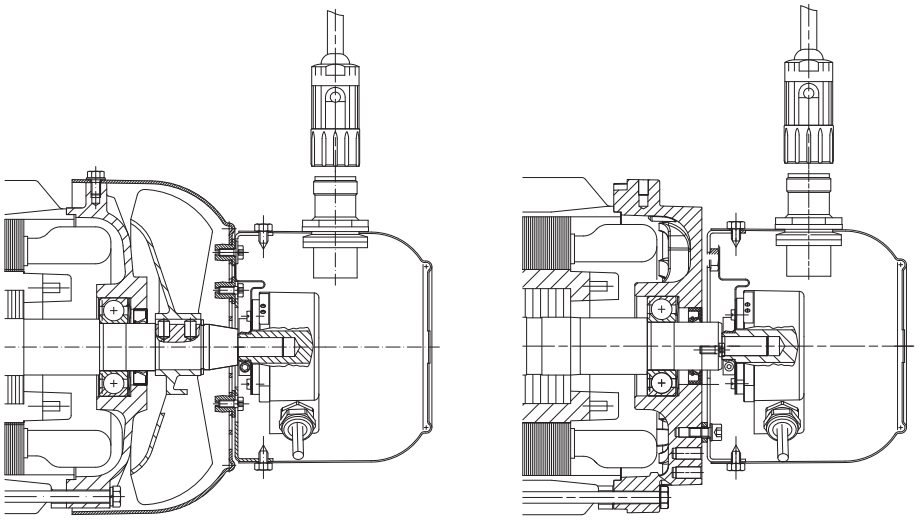
[2)] With mating connector fitted and/or cable glands fitted and tightened

In addition to the angular position within a rotation, multiturn encoders detect multiple rotations. An internal reduction gear mechanism connected to the motor shaft is used to detect the number of turns. Consequently, the value measured by a multiturn encoder consists of the current angular position and the number of turns. As with incremental encoders, the reading is calculated and output via various interface modules, depending on the interface.

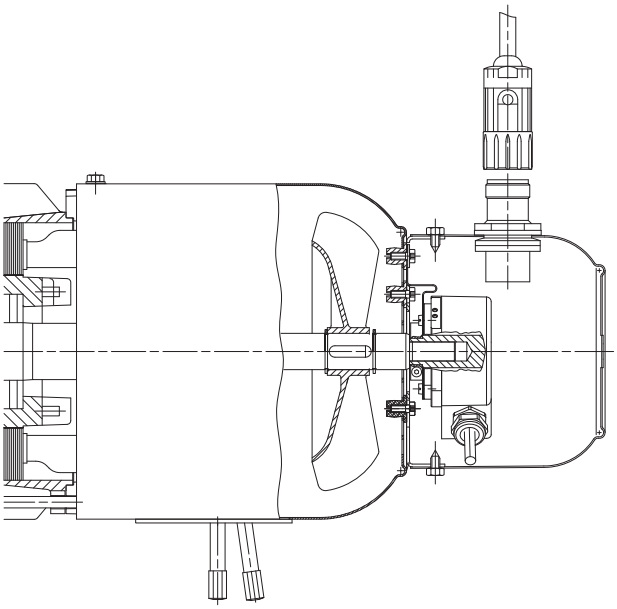
On request, a large range of motor frames can be fitted with sensor bearings. The output signal from the sensor allows the direction of rotation to be determined, among other things. The number of possible pulse counts depends on the frame size. Please enquire for more information.

Modular Motorsystem

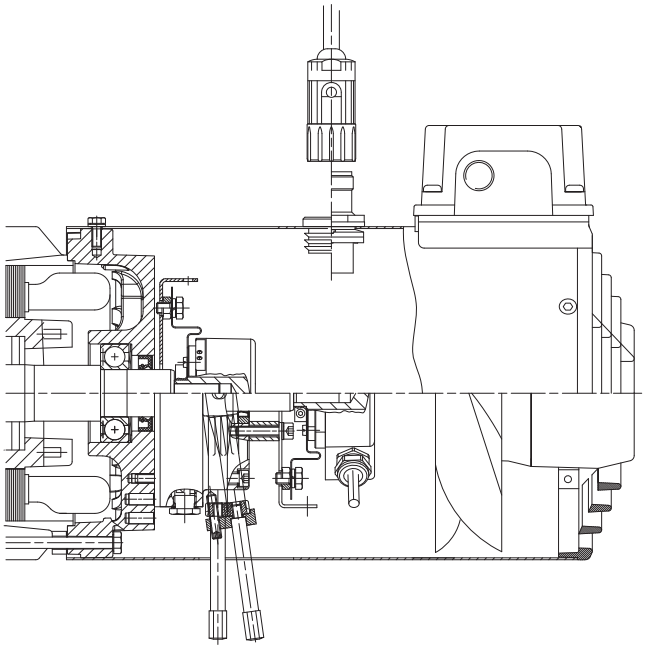
Motor and encoder



Motor, brake and encoder



Motor and forced ventilation



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Sweden	AB Carl A. Nilssons Elektriska Reparationsverkstad	Industrigatan 60 25229 Helsingborg	**Phone** **Fax**	+46 (421) 80085 +46 (421) 36592	info@carlanilsson.se http://www.carlanilsson.se
Switzerland	Electro Müller AG	Bözingenstrasse 37 2500 Biel	**Phone** **Fax**	+41 (32) 344 10 10 +41 (32) 3441019	info@electro-mueller.ch http://www.electro-mueller.ch
Switzerland	Meier + Co AG Integrale Antriebstechnik	Oltnerstrasse 92 5013 Niedergösgen	**Phone** **Fax**	+41 (62) 8586700 +41 (62) 8586711	info@meico.ch http://www.meico.ch
United Kingdom	Bauer Gear Motor Limited	Unit1 Nat Lane Business Park CW7 3BS Winsford	**Phone** **Fax**	+44 (1606) 868600 +44 (1606) 868603	info.uk@bauergears.com http://uk.bauergears.com

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Belarus	Energopro	prospekt Nezavisimosti, 169 220114 Minsk	**Phone**	+375 172181177	inverter@energopro.by
Kazakhstan	Silumin-Vostok	Revolucionnaya st., 10 070010 Ust-Kamenogorsk	**Phone** **Fax**	+7 (7232) 558982 +7 (7232) 552058	info@silumin.kz
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Russian Federation	Epos Plus	Turgenevskaya st., 72 344002 Rostov-na-Donu	**Phone** **Fax**	+7 (863) 2623570 +7 (863) 2623570	ermakova@epos-plus.ru http://www.epos-plus.ru
Russian Federation	NPF Inger	423800 Naberezhnye Chelny, BSI	**Phone**	+7 8552778300	info@inger.ru
Russian Federation	Pribor-Service	Uchebnaya st, 90 644010 Omsk	**Phone** **Fax**	+7 (3812) 534598 +7 (3812) 534598	info@pribor-servis.ru http://www.pribor-servis.ru
Russian Federation	Privod Service	Nikitina st., 20 634062 Tomsk	**Phone** **Fax**	+7 (3822) 535347 +7 (3822) 535347	privodservice@bk.ru http://ps.tomsk.ru
Russian Federation	Privod+	16th Parkovaya st, 30 105484 Moscow	**Phone** **Fax**	+7 (495) 9885773 +7 (495) 9885774	info@privodplus.ru http://www.privodplus.ru
Russian Federation	SP Reduktor	Perovskoe st, 21 Moscow	**Phone** **Fax**	+7 (495) 2585460 +7 (495) 2585460	derevitskiy a@privod.ru
Russian Federation	S-Tek	Karl Marks st, 29a 443082 Samara	**Phone** **Fax**	+7 (846) 2790479 +7 (846) 2790479	s-tec@-tec.ru http://www.s-tec.ru
Russian Federation	Stek-Master	Kosmonavtov st. 39 B 420061 Kazan	**Phone** **Fax**	+7 (843) 2796468 +7 (843) 2796468	master@stekmaster.ru http://www.stekmaster.ru
Russian Federation	Tet-RS	Borisa Bogatkova st., 63 630008 Novosibirsk	**Phone** **Fax**	+7 (383) 2135521 +7 (383) 2663326	koroleva@tet-rs.ru http://www.tet-rs.ru
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Russian Federation	Uraltehmarket	Serafima Deryabninoy st., 24 20149 Ekaterinburg	**Phone**	+7 (343) 3805141 +7 (343) 3805141	info@uraltm.ru http://www.uraltm.ru
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Ukraine	CHP Rychko	Artelnaya str, 10 49081 Dnepropetrovsk	**Phone** **Fax**	+38 (067) 5654420	serg_64@ua.fm
Ukraine	Comfort Company	N.Grinchenko str., 4 03038 Kyiv	**Phone** **Fax**	+38 (044) 3623676 +38 (044) 3623686	info@comfort-co.com http://www.comfort-co.com
Ukraine	Comfort Group	Bykova str., 16 50036 Krivoy Rog	**Phone**	+38 (050) 3218998	dir@komfortgroup.com.ua http://www.comfortgroup.com.ua
Ukraine	Fedama	Dragomannova str., 48 79005 Lvov	**Phone**	+38 (032) 2445560	fedama@lviv.farlep.net
Ukraine	Leko Trade	Akademicheskaya str, 6/1 83037 Donetsk	**Phone**	+38 (062) 633905	leko_trade@bk.ru www.leko.dn.ua
Ukraine	Nadezhda	Lenina st, 47 61103 Kharkov	**Phone**	+38 (057) 7177698	nadezhda@ilt.kharkov.ua
Ukraine	Pryvid Plus LLC	Krasnopolskaya str.9, of.434 49000 Dnepropetrovsk	**Phone**	+38 (056) 7637701	ot@privod-plus.com.ua http://www.privod-plus.com.ua
Ukraine	Service-Avtomatika	Peremogi st, 56 04080 Kiev	**Phone** **Fax**	+38 (044) 3325423 +38 (044) 2230913	serv-avtomatika@ukr.net http://www.s-a.org.ua
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South Africa	Bauer a Division of Hudaco Trading (Pty) Ltd.	72 Acacia Road 1401 Primrose	**Phone** **Fax**	+27 (11) 8289715 +27 (11) 8224135	johnB@gbauer.co.za
Turkey	CEFIP - Makina & Endüstriyel Ürünler San. ve Dis Tic. Ltd. Sti.	Perpa Ticaret Merkezi A Blok Kat: 2 No: 9-0033 34384 Okmeydani - Istanbul	**Phone** **Fax**	+90 (212) 2101890 +90 (212) 2101597	cefip@cefip.com.tr http://www.cefip.com.tr
Turkey	Senka Enerji Sanayi ve Ticaret Ltd Sti	Kara Hasan Atli Is Merkezi Sok. No: 1203/11 Kat.: 4/419 Yenisehir / Izmir	**Phone** **Fax**	+90 (232) 4695555 +90 (232) 4334371	senka@senka.org
United Arab Emirates	Dubai Drydocks Afloat Repair Division	P.O. BOX 8988 Dubai	**Phone** **Fax**	+971 (4) 3451353 +971 (4) 3450116	drydocks@drydocks.gov.ae http://www.drydocks.gov.ae

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Japan	Leybold Co., Ltd.	5th Floor, Tokyo Tatemono Bldg 1-9-9, Yaesu 1-Chome, Chuo-Ku 103-0028 Tokyo	**Phone** **Fax**	+81 (3) 32721861 +81 (3) 32814490	koki@leybold-kk.com
Korea, Republic Of	Chemiko Trading Co. Ltd.	Rm 1612, Namwoon Officetel, 229-10, Mooguh-Dong Nam-Gu Ulsan	**Phone** **Fax**	+82 (52) 2772107 +82 (52) 2472195	chemiko@choillian.net http://www.chemiko.net
Korea, Republic Of	Chemiko Trading Co. Ltd.	Chung Rok Bldg, 721-29 Yeoksam – Dong, Kangnam-Gu Seoul	**Phone** **Fax**	+82 (2) 5675336 +82 (2) 5541284	chemiko@chol.com http://www.chemiko.net
Malaysia	Greenvi Technologies (M) Sdn Bhd Industrial Automation	No. 64-02, Jalan Molek 2/2 Taman Molek 81100 Johor Bahru, Johor	**Phone** **Fax**	+60 (7) 3543006 +60 (7) 3542006	bpchin@greenvi-tech.com http://www.greenvi-tech.com
Philippines	Optima Equipment Corporation	Unit 503 I-Care Building 167 Legazpi St. Corner Dela Rosa St. 1229 Legazpi Village, Makati City	**Phone** **Fax**	+63 (2)) 845-0765 +63 (2) 893-6768	vandel@optima-equipment.com
Singapore	AVM Diesel (F.E.) Pte Ltd Gear Centre Southeast Asia	BLK 27 TUAS AVE 13 #01-23 638993 Singapore	**Phone** **Fax**	+65 (6) 8636933 +65 (6) 8636900	sales@avmdiesel.com http://www.avmdiesel.com
Singapore	AVM Diesel (F.E.) PTE Gear Centre Southeast	AVM Diesel (F.E.) PTE Ltd. Gear Centre Southeast Asia 638993 Singapore	**Phone** **Fax**	+65 (6) 8636933 +65 (6) 8636900	sales@avmdiesel.com http://www.avmdiesel.com
Thailand	Kasetphand Industry Co.,LTD	100 M. 3 SOI Suksawad 76 Suksawad rd. Bangjark, Phrapradaeng 10130 Samutprakarn	**Phone** **Fax**	+66 (2) 8176410 +66 (2) 8176437	sakchai_engineer@hotmail.com http://www.ksp.co.th
Vietnam	GNN CO., LTD.	33 Hoa hong 2, W. 2 Phu Nhuan District	**Phone** **Fax**	+84 (8) 35174923 +84 (8) 35174924	 http://www.gnnvietnam.com

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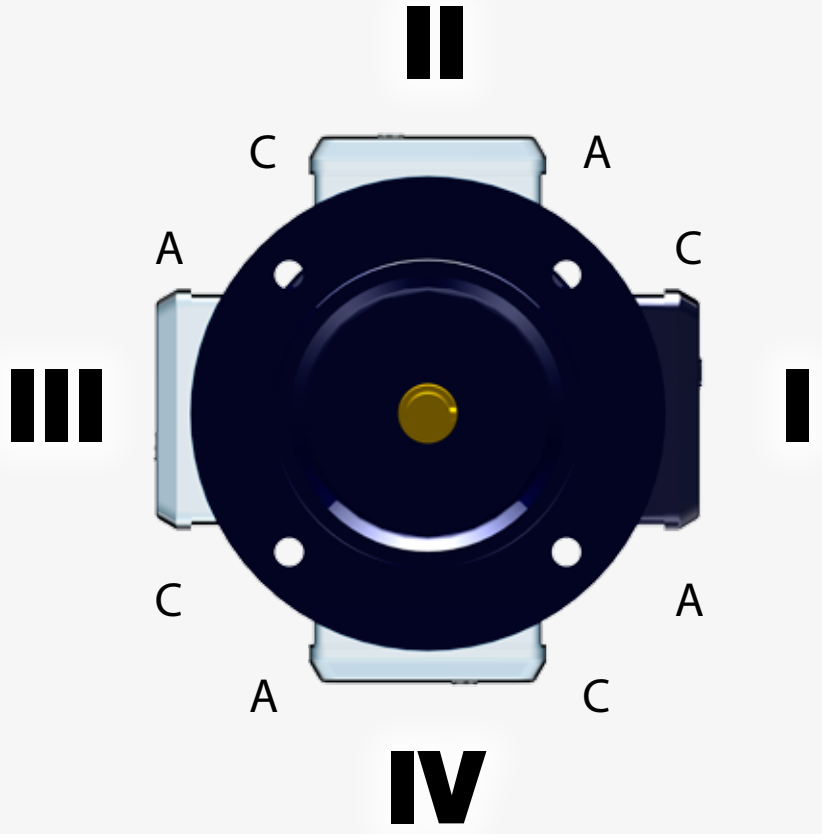
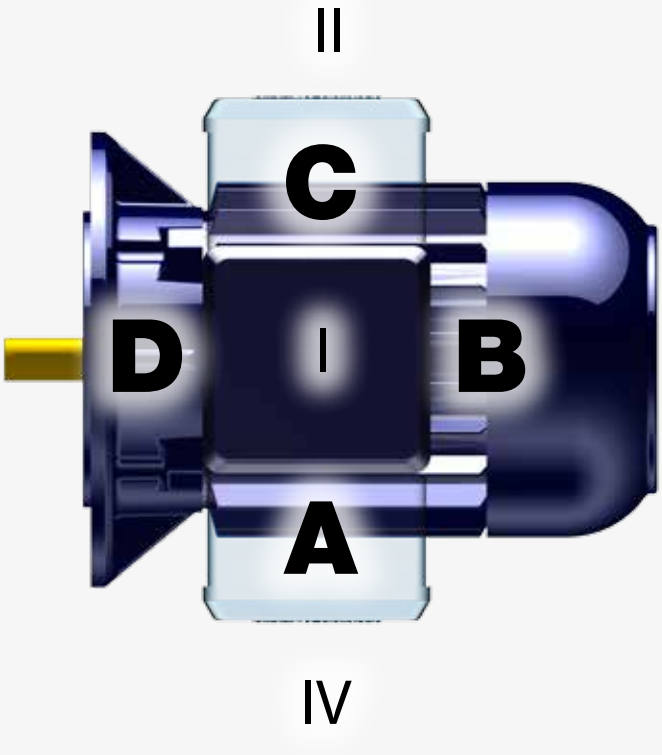
China	Shanghai Jinxin Inverter Company	No. 248-5, Xinshi Road 200083 Shanghai	**Phone** **Fax**	+86 (21) 65618877 +86 (21) 65600454	http://www.sinodrive.com
Hong Kong	A-CALL Company	Flat 8A, 8th Floor Wing Cheong Industrial Building 109 How Ming Street Kwun Tong Kowloon	**Phone** **Fax**	+852 (27) 930250 +852 (27) 930620	kent@a-call.com.hk http://www.a-call.com.hk
Taiwan	Saturn Power Ltd.	9F, No. 69-5, Sec. 2 Chung Cheng E. Rd. Tanshui District 105 New Taipei City	**Phone** **Fax**	+886 (2) 28095890 +886 (2) 28096770	service@saturnpowerltd.com http://www.saturnpowerltd.com

Notes

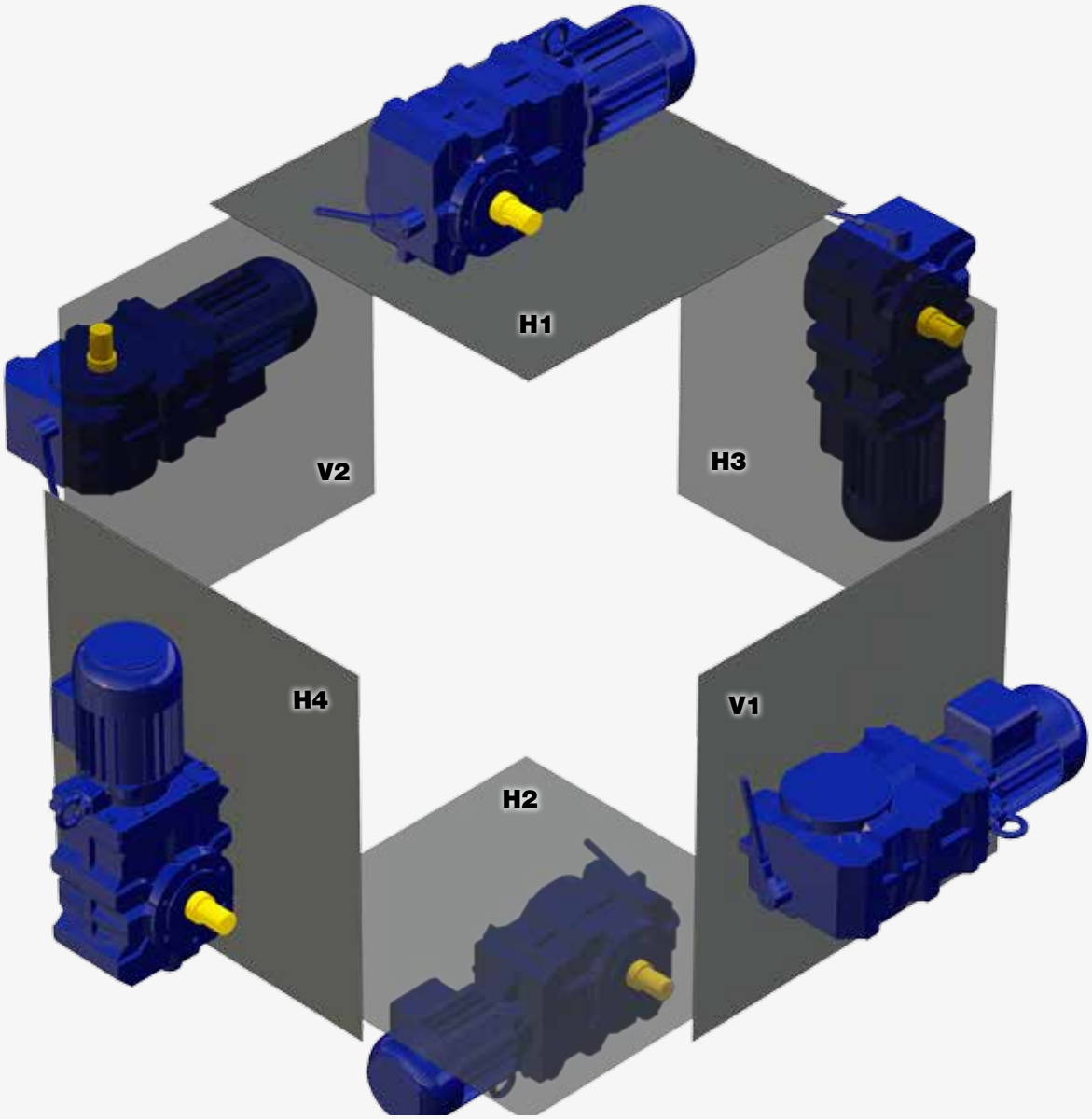
Terminal Box Position



Cable entry Position



Mounting Positions



Investment security for the future

Electrically driven machinery accounts for around 70% of overall energy demand for industrial consumption. Energy savings of 135 billion kilowatt-hours per year would be possible within Europe with the use of modern drive systems.

Bauer Gear Motor GmbH pursues its goals with minimum consumption of raw materials and energy, the lowest possible environmental impact, and efficient utilisation of resources. This philosophy is reflected in our product strategy, and we want to share it with our customers in ....

What we offer

- Over 85 years of experience in drive technology
- Advice from gear motor specialists
- A high level of engineering expertise for custom drive solutions
- A high level of application expertise
- Global availability
- Exceptional flexibility
- A broad product spectrum
  - Pioneering technologies for energy-efficient drives
  - Standard Efficiency (IE1) and Premium Efficiency (IE3) with standard induction motor technology
  - Super Premium Efficiency (IE4) – the highest efficiency class technologically possible – with permanent magnet synchronous motors (PMSMs)
- Sector-specific solutions as standard

The benefits for you

- A partner on your side:
  - that speaks your language
  - that understands you
  - that gives top priority to customer satisfaction
- More added value by using:
  - The Bauer brand, with
    - a good reputation worldwide
    - sturdy and durable drives
    - a high enclosure protection rating of IP65 as standard lying above the market standard
    - extremely high quality awareness
  - Products that are tailored to your applications and give you the benefit of:
    - our expertise as drive manufacturers for over 85 years
    - our knowledge of the industry
  - Higher flexibility
    - adaptation of standard drives to your needs
    - fast time to market for product launch with custom drive solutions (SSD)
- Expert advice for fully exploiting potential energy savings
- Acquiring technology leadership by using IE4 motors
- Achieving investment security by complying with statutory provisions for energy efficiency extending
  beyond 2017

Altra Industrial Motion

All Customer Service phone numbers shown in bold

Couplings

Ameridrives Couplings
Mill Spindles, Ameriflex, Ameridisc
Erie, PA - USA
1-814-480-5000
Gear Couplings
San Marcos, TX - USA
1-800-458-0887

Bibby Turboflex
Disc, Gear, Grid Couplings, Overload Clutches
Dewsbury, England
+44 (0) 1924 460801
Boksburg, South Africa
+27 (0) 11 918 4270

TB Wood's
Elastomeric Couplings
Chambersburg, PA - USA
1-888-829-6637– Press #5
For application assistance: 1-888-829-6637 – Press #7
General Purpose Disc Couplings
San Marcos, TX - USA
1-888-449-9439

Ameridrives Power Transmission
Universal Joints, Drive Shafts, Mill Gear Couplings
Green Bay, WI - USA
1-920-593-2444

Huco Dynatork
Precision Couplings and Air Motors
Hertford, England
+44 (0) 1992 501900
Chambersburg, PA - USA
1-888-829-6637

Lamiflex Couplings
Flexible Couplings, Bearing Isolators, and Coupling Guards
São Paulo, SP - Brasil
+55 **(11) 5679-6533**

Guardian Couplings
Flywheel, Jaw, Shear, Gear, Grid, Disc and Engine Couplings
Michigan City, IN - USA
1-219-874-5248

Engineered Bearing Assemblies

Kilian Manufacturing
Engineered Bearing Assemblies
Syracuse, NY - USA
1-315-432-0700

Electromagnetic Clutches and Brakes

Warner Electric
Electromagnetic Clutches and Brakes
New Hartford, CT - USA
1-800-825-6544
For application assistance: 1-800-825-9050
Saint Barthélémy d'Anjou, France
+33 (0) 2 41 21 24 24
Precision Electric Coils and Electromagnetic Clutches and Brakes
Columbia City, IN - USA
1-260-244-6183

Matrix International
Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes
Brechin, Scotland
+44 (0) 1356 602000
New Hartford, CT - USA
1-800-825-6544

Inertia Dynamics
Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes
New Hartford, CT - USA
1-800-800-6445

Overrunning Clutches

Formsprag Clutch
Overrunning Clutches and Holdbacks
Warren, MI - USA
1-800-348-0881– Press #1
For application assistance: 1-800-348-0881 – Press #2

Marland Clutch
Roller Ramp and Sprag Type Overrunning Clutches and Backstops
South Beloit, IL - USA
1-800-216-3515

Stieber Clutch
Overrunning Clutches and Holdbacks
Heidelberg, Germany
+49 (0) 6221 30 47 0

Belted Drives and Sheaves

TB Wood's
Belted Drives
Chambersburg, PA - USA
1-888-829-6637 – Press #5
For application assistance: 1-888-829-6637 – Press #7

Heavy Duty Clutches and Brakes

Wichita Clutch
Pneumatic Clutches and Brakes
Wichita Falls, TX - USA
1-800-964-3262
Bedford, England
+44 (0) 1234 350311

Twiflex Limited
Caliper Brakes and Thrusters
Twickenham, England
+44 (0) 20 8894 1161

Industrial Clutch
Pneumatic and Oil Immersed Clutches and Brakes
Waukesha, WI - USA
1-262-547-3357

Svendborg Brakes
Industrial Brakes and Brake Systems
Vejstrup. Denmark
+45 63 255 255

Gearing

Boston Gear
Enclosed and Open Gearing, Electrical and Mechanical P.T. Components
Charlotte, NC - USA
1-800-825-6544
For application assistance: 1-800-816-5608

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Geared Motors
Esslingen, Germany
+49 (711) 3518-0
Somerset, NJ - USA
1-732-469-8770

Nuttall Gear and Delroyd Worm Gear
Worm Gear and Helical Speed Reducers
Niagara Falls, NY - USA
1-716-298-4100

Linear Products

Warner Linear
Linear Actuators
Belvidere, IL - USA
1-800-825-6544
For application assistance: 1-800-825-9050
Saint Barthélémy d'Anjou, France
+33 (0) 2 41 21 24 24

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