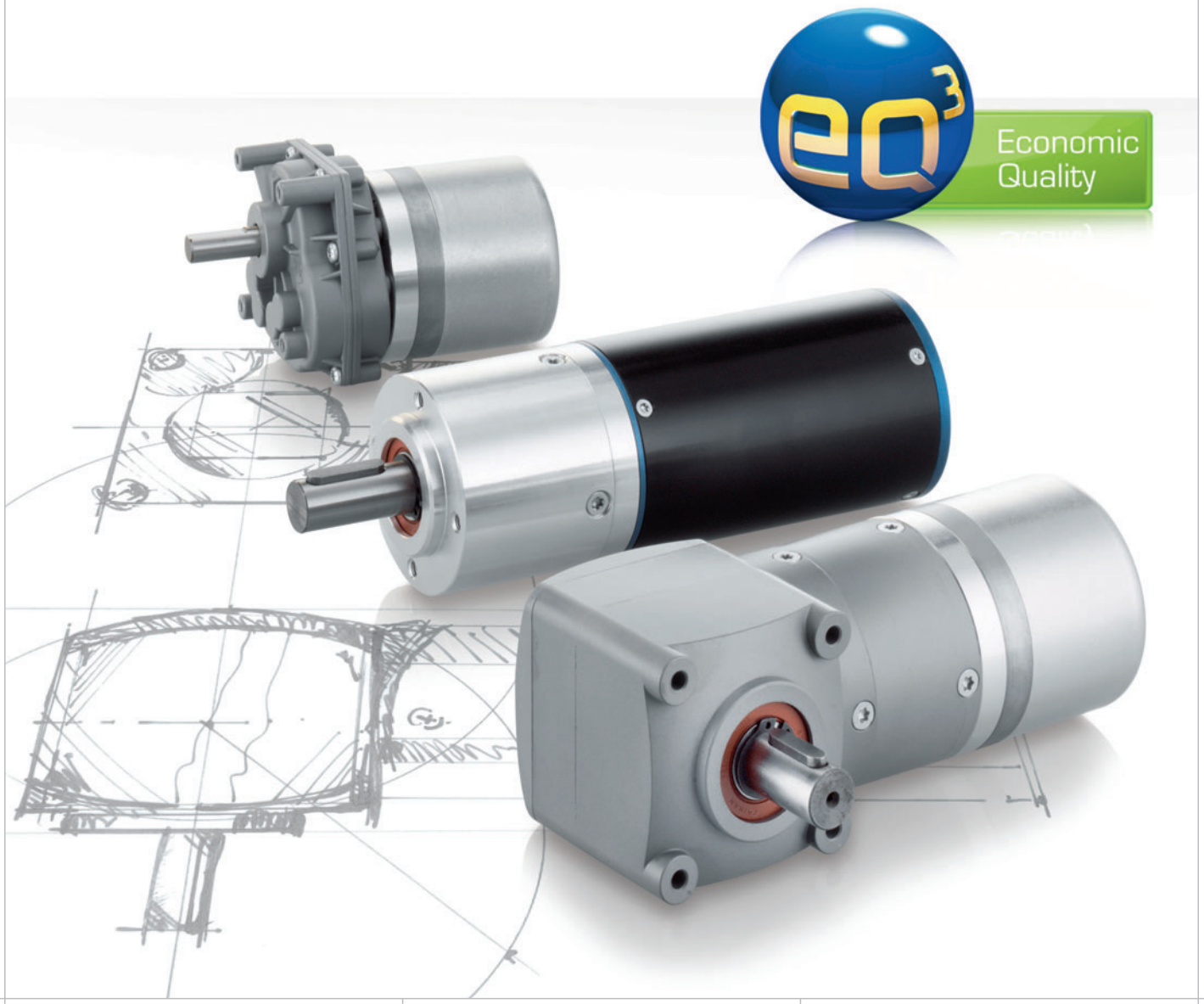
ZEITLAUF®

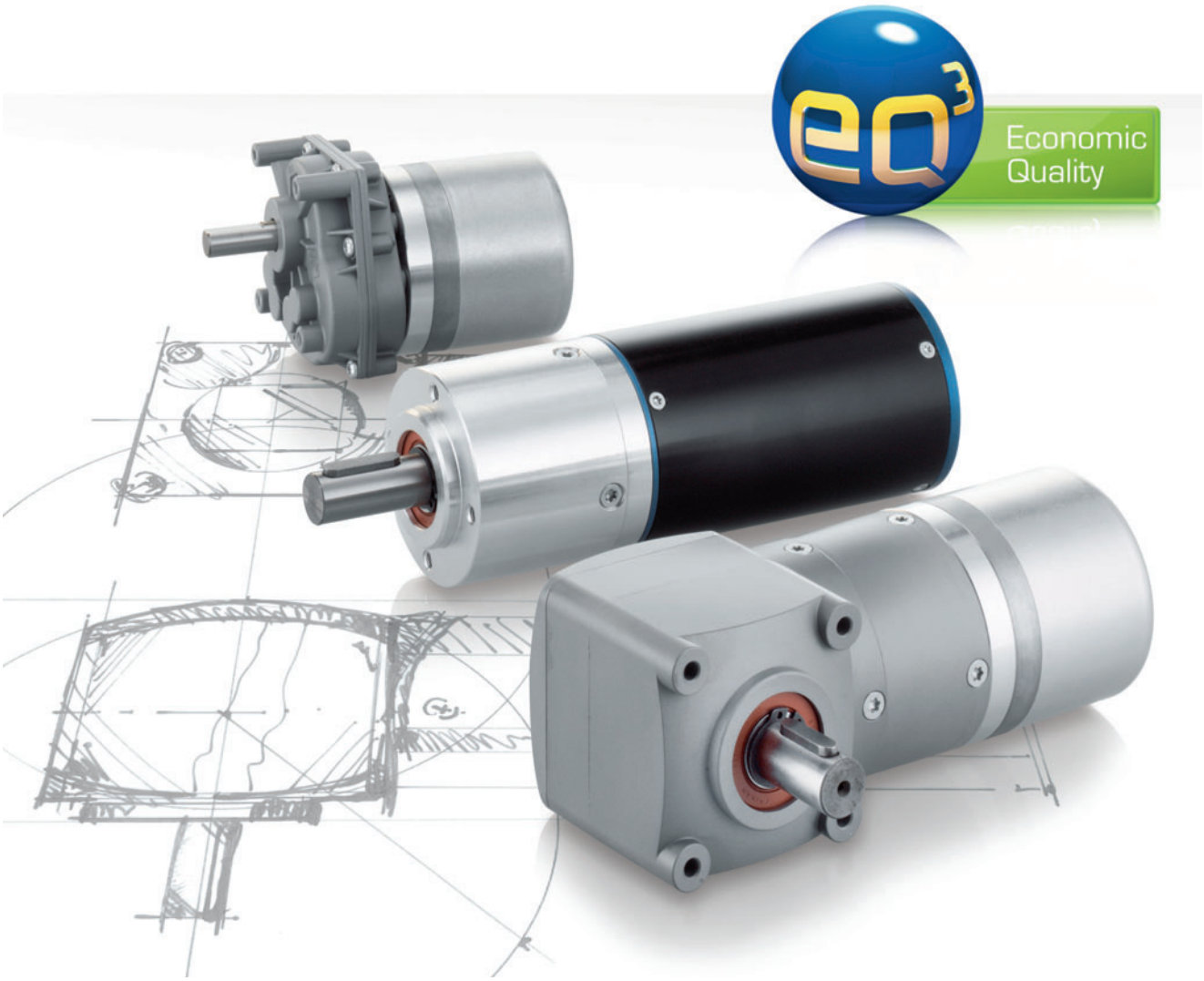
antriebstechnik

Standard Modular System 2013



it's time for tomorrow

Standard Modular System 2013



Our standard modular system offers rapid and practical solutions for your drive requirements - either with regard to the basic development steps of an application, or directly as the right drive component. You can use our standard modular system to develop rapid and customised combinations of required components for your gear motor from 4,209 drive solutions - for perfect „assembly on demand" and tailored drive technology.

Catalogue valid as of 1 November 2012. All previously published catalogues will no longer be valid as of the publication date of this catalogue.

EQ^3 – the concept with a future

With technically perfect drive concepts, ZEITLAUF® produces innovative gearmotors that are geared to the future like no others. EQ3 is a byword for engineering expertise of the superlative, for groundbreaking intelligent drive solutions incorporating three crucial performance features: energy efficiency – smoothness – lifetime.

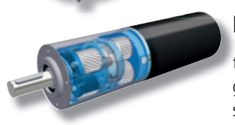
Shaping the future together – it's time for tomorrow!

η > 95 %
Pure performance capability

EtaCrown®

the innovative angle gearhead motor with unique performance through crown gear technology

<40 dB max.
Unbeatable smooth running



NoiselessPlus

the pioneering planetary gearhead offering unique smoothness

40,000 h
Unmatched lifetime

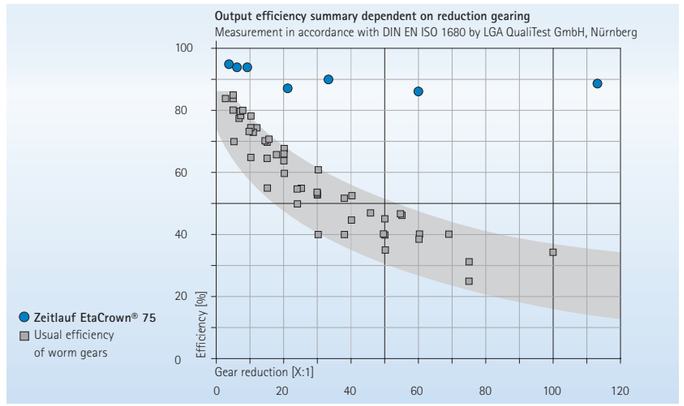
Special planetary gearhead

the special gearhead for maximum life with the highest standards

Energy efficiency

Rising energy costs, limited raw material deposits and the necessity of conserving valuable resources make "energy efficient drive technology" more important than ever.

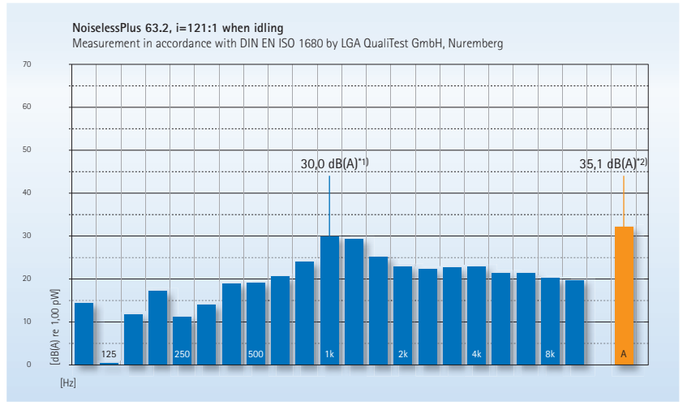
At ZEITLAUF®, energy efficiency is an important issue that has already been given priority for years throughout the entire production cycle and gearmotor life cycle. Our motors stand out for their high performance, their extreme efficiency and low energy requirement. Energy-optimised drive technology par excellence.



Smoothness

The unique smoothness properties of gearmotors from ZEITLAUF® puts them ahead of the entire sector and right at the technological forefront. Tests conducted at certified, independent noise laboratories confirm that our gear motors always come top in terms of low noise levels and noise reduction.

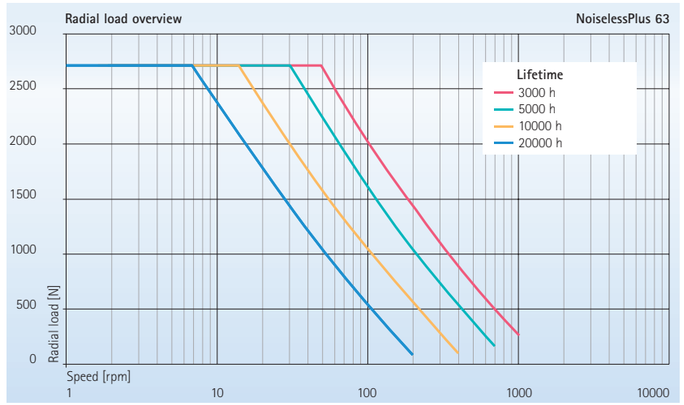
This extreme degree of smoothness is achieved by a combination of intelligent toothing design and expert precision manufacture of highest quality gear parts.



Lifetime

Cost-effective investment and operation combined with above average product durability are our contribution to resource conservation. Our exemplary vertical integration guarantees that our gear motors are of the highest quality. Our finely tuned quality management system comes into effect right at the outset of the development project and accompanies all subsequent phases.

- Very best engineering expertise with production machinery developed ourselves
- Efficient materials
- Sophisticated and seamless test procedures, intensive long-term tests plus 100 percent quality control



Contents

4,209 drive solutions

For each demand, we have the correct drive. A high standard of engineering competency and logistical finesse, for optimal achievement and maximum efficiency, in an unbeatable modular system:

- 4,209 different drive solutions with unique power densities and application ranges
- „Assembling on demand" – fast and customised combination of the components you need to the highest standard of perfection.

Make your selection using this catalogue, via our internet platform or use our telephone hotline.

48 hour service

We react flexibly to the demands of a market with short-lived tendencies. After receipt of order, we can deliver your specifically configured drive – up to 20 pieces – within 48 hours*. Even a large number of items and small batch items can be ordered from our standard modular system.

Keep-Word-Warranty

We push back the limits with a singular warranty promise and go to exceptional lengths:

- Replacement or repair of a defective gear motor, twice within a year – without question of blame.
- An error log for the cause of failure with each return consignment.
- In the case of overloading of the gear motor, you may exchange for a more powerful solution, which a full credit is applied to the price of the original drive cost.

3D data available free of charge

For the purpose of speeding up and simplifying project planning, our online shop provides the user with all the specific data concerning our entire standard range. Users also benefit from a free CAD data call-up facility (3D models) in around 30 standard formats. It is simply not possible to design drive solutions faster and to better effect.

*Subject to goods being sold.

**Our standard modular system –
a unique concept**

Standard modular system, online shop

Our unbeatable standard modular system is of course also available online. Our internet portal contains a unique product configurator which you can use to put together all of our 4,209 solutions according to your specific requirements. There are three possibilities for your product selection:

- **Configurator – selection via performance diagrams**
- **Selector – selection via a pull-down menu**
- **Search window – selection by entering details of performance values**

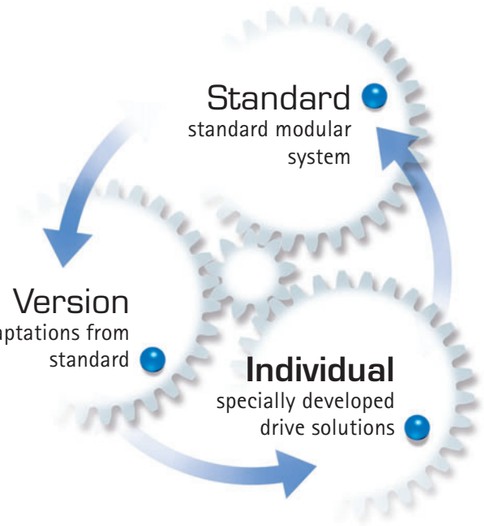
In this way, you select the product you require intuitively, conveniently and smoothly.

You also have the convenient possibility of generating an informative data sheet in pdf format for the product of your choice, which contains all performance values, technical drawings etc. for the complete gear motor, including the selected accessory components and electronic components.

The ordering process is almost automatic. Many integrated comfort functions make repeated tasks easier for you.

Click for our online shop: www.zeitlauf.com

Individual solutions for your demands



Examples of individual solutions

Belt drive
Packaging machine

Motor option
Switching technology

Special planetary gearhead
40.000 hours of strong performance

Our drive is achieving intelligent solutions.

High-quality drive solutions demand perfection. This is the drive we need to achieve maximum performance in all our activities. Consistently focussed on your requirements, to create an unbeatable advantage for you.

We develop innovations in drive technology for you, let our expertise and know how design a solution which will work for you. Precise and first-class, with a strong team that acts with passion and precision.

The focus is on your requirements.

We are your partner at every stage of the process chain, coming up with new ideas while keeping the solution of the whole project in mind:

- The basis is always formed by our **standards**, which contain our complete experience and engineering competence and covers a wide range or our customers requirements.
- During the qualification process we quickly recognize the need for **variations**. We can modify our drive solutions to help you achieve your objective effectively and economically.
- Quite often, we can achieve your objectives only through **individual development – our quite special strength**. This is where we prove our passion and performance capability at the highest level.

All our development results are optimised through functions that specify our customers needs. A wide range of accessories and the integration of electronic components provide the perfect solution every time.

Nothing is left to chance.

Every stage of the development process is subjected to our optimised quality and process management system. Combined with state-of-the-art technology and an unbeatable network of knowledge, we stand for your performance- and future-oriented solutions and for our joint success – we call it „Simultaneous Engineering".

In close conceptional cooperation we push what is feasible as far as possible. All process stages are part of our tried-and-trusted system, where everyone benefits from the know-how of the other divisions.

We create innovations through unique technologies

Thanks to the consistent analysis of technological innovations and a knowledge base built up over a period of 50 years, we have created an enormous competence lead for ourselves.

Our technology and design meet maximum quality and reliability for today's demand.

We achieve this by means of distinct quality management, best engineering practice , our exclusive production machine developments, competitive materials, complete testing methods to maximum perfection and intensive endurance tests. The daily evaluation and documentation of production results continually serve to increase the know how of our developments in technical excellence, and top quality products.

The results are innovations as a technical and economic optimum – for us, the best answer to fast-moving markets.

Today ZEITLAUF® is developing the standards of drive technology for tomorrow.

EtaCrown® –
gearhead technology
of the future.

EtaCrown® – The innovative bevel gearhead with crown gearhead technology.

EtaCrown® is an impressive and technically mature gearhead concept that aims to deliver the best results for all performance ranges. Our vision of making crown gearheads more powerful, smaller and more efficient, and above all, of manufacturing them more economically, has become reality.

EtaCrown® has become the undisputed number 1* among crown gearheads and offers an outstanding number of additional advantages.

- More output power
- More efficiency
- More torque
- More cost savings

It is backed by engineering performance at the highest technical and scientific level. In addition, the modular design significantly increases the range of possible design and application options. Each component impresses with excellent quality, ensuring low-wear operations and an extremely long service life.

EtaCrown® – a highlight that moves.

*the only crown gearhead with modular technology available

Focus on performance and efficiency

EtaCrown® significantly improves the energy efficiency and viability of your application. The modular design can be flexibly adapted for any drive task:

- Very compact design and space-saving geometry with a symmetrical structure and maximum performance density, modern industrial design
- Gear reductions of 4:1 to 113:1 available as standard, jolt-free start-up due to rolling tooth gripping
- Smooth running due to intelligent gear-tooth technology and gearhead design, maximum radial load thanks to double-sided support of the drive shaft
- Long lifetime thanks to high efficiency, optimized tooth gripping and adapted tooth materials
- Highest degree of safety in design and operation without self-locking and protection against vandalism
- Numerous possible combinations with various AC, DC and EC motors
- Unsurpassed economy in terms of investment and operations

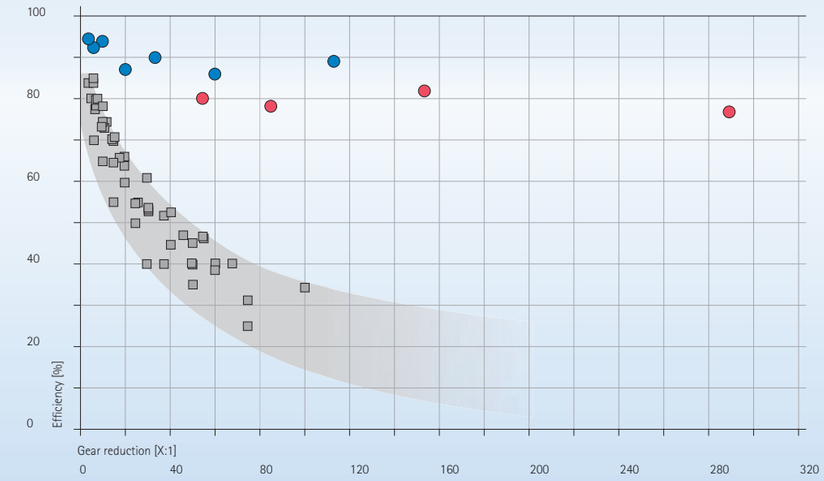
Innovation that cannot be more perfect!

The singular technology of the EtaCrown® family offers excellence performance with very good values for efficiency and especially energy efficiency:

Efficiency

EtaCrown® impresses with a very high average efficiency. The toothed wheels of a crown gearhead roll off one another and do not slide, as is the case with a worm gear. The loss of energy from rolling friction is significantly lower than with sliding friction, which is why with the crown gearhead a considerably greater share of the power supplied is available as output power. This means up to 70 % less loss of power.

Output efficiency summary dependent on reduction of the gearhead



EtaCrown®Plus – Upgrade of a successful concept.

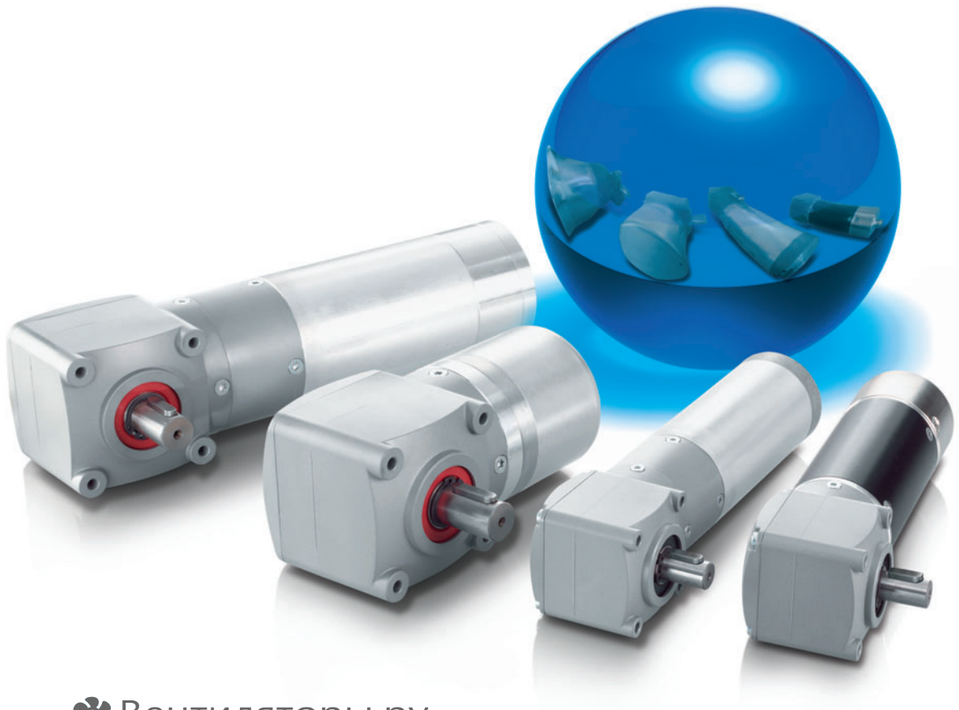
EtaCrown®Plus – double the strength in a redefined dimension of performance.

We consider our efforts at continuous technological innovations and the high requirements of our customers as challenges that motivate us to create pioneering engineering feats.

With EtaCrown®Plus, we are moving the success story of our unique bevel gearhead to a new dimension. Even on the outside, the elegant and compact design already points to the innovative and high-performance core.

The new gearhead concept is unbeatable in terms of performance density and output power. The key feature of this intelligent design is the combination of a crown and planetary gear stage in one gear unit – one plus one makes one!

EtaCrown®Plus – future technology and more.



Gear technology

The EtaCrown® bevel gearhead has progressed into an unbeatable drive concept. The numerous technological benefits, multi-faceted efficiency and the performance range itself speak their own language. With EtaCrown®Plus, we are moving performance into a new dimension:

Broad reduction series

EtaCrown®Plus allows us to achieve a high reduction density for our crown gearheads. Due to the performance range as regards the design space, this innovative gearhead is the world's most compact bevel gearhead, and is available as a modular system.

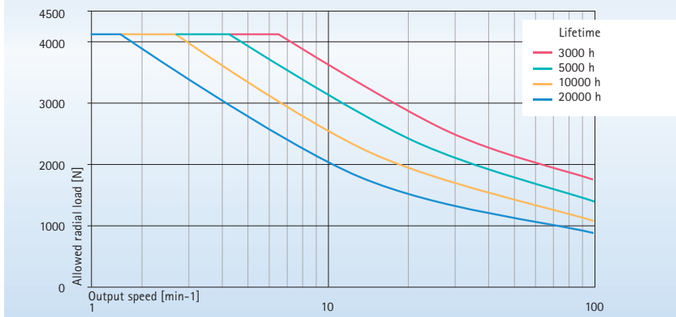
Small design space – maximum performance

The concept of the EtaCrown® gearhead family is based on the following premise: "Maximum performance in the smallest design space". As impressive as EtaCrown® already is in this regard, performance has been increased even further with EtaCrown®Plus. In the case of the EtaCrown®Plus, the improved performance density in terms of output power, a compact geometry and smaller motors make for even smaller installation dimensions (while retaining the output power level). The symmetrical design supports reduced space requirements for both concepts, and facilitates integration into an overall system.

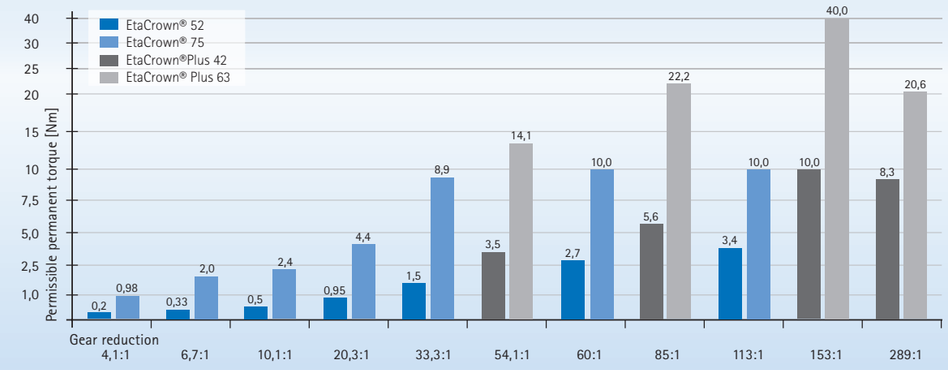
Maximum radial loads

The double-sided support of the drive shaft using deep groove ball bearings and high-quality plastic slide bearings facilitates maximum radial loads regardless of output speed and lifetime, and allows for a gear lifetime of 20,000 hours.

Rotational-speed-dependent radial load [N] performance summary at a constant axial loading of 500 N – EtaCrown® Plus 63



Reduction density of the EtaCrown® gearhead family



Planetary gearheads – technical masterpieces

Efficiently meeting the most stringent requirements

Powerful planetary gearheads from ZEITLAUF® are conceived according to the principle of maximum efficiency coupled with outstanding smoothness. They are amongst the world's top drive technology products. Their unbeatable breadth of performance is evident from the various ranges we produce for the most varied spectrum of needs:

- **Performax® – the powerful basis**
- **Performax® Plus – the robust variant**
- **Radial load stage HRL – powerful transmission of high radial loads**
- **NoiselessPlus – outstanding smoothness**
- **Focus – absolute precision**

With ultimate engineering expertise and logistics finesse we constantly force forward the process of further developing our gearheads in the direction of perfection – direct, right on target, solution-oriented. The results are optimised products, new products and performance-based design variants that confirm our position at the technological forefront and that provide the user with almost limitless application possibilities.

Performax® – powerful, top class planetary gearheads.

Planetary gearheads of the Performax® range: A milestone in gearhead technology!

Performax® is an innovative powerful planetary gearhead concept, patent pending. Advanced in design, Performax® gearheads are impressive by virtue of outstanding power density, ultimate smoothness and unique reduction ranges.

Transmissions of up to 17:1 in one stage allow the use of single-stage gearheads where competitors' products already require a twostage design.

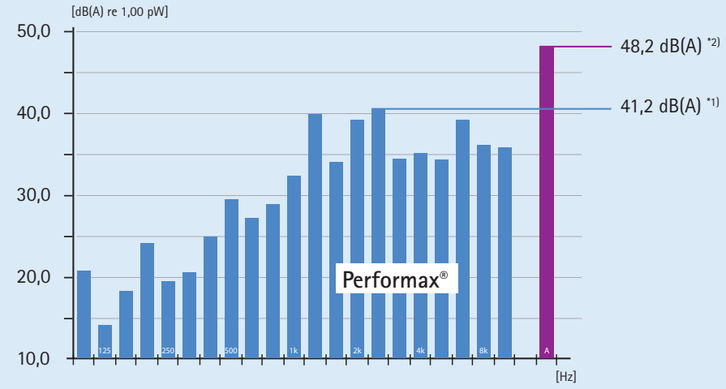
The design features of the series include helical plastic gear wheels in the first stage and – in the second stage – straight toothing in the zinc diecast casting with case hardened planetary wheels. Another special standard feature of Performax® gearheads is the second stage's planetary wheels that have needle bearings – this really sets the series apart from the usual planetary gearheads on the market.

Of course, the Performax® drives, like all ZEITLAUF® gear motors, have a ground and hardened output shaft available here in two different versions (feather key or face).

The motor assignment in the standard range modular system is power-oriented, meaning that a motor that optimally corresponds to the efficiency of the gearhead is assigned to each gear reduction.

At present, the Performax® series includes four sizes 32, 42, 52 and 63, and will be extended still further in the future.

The total sound power level with a twostage Performax®52 is less than 48,2 dB(A) when idling. The total sound power level is almost the same with a single-stage gearhead with a higher output speed.



Performax®52, i=54:1 when idling
Measurement in accordance with DIN EN ISO 374 and DIN EN ISO 1680 by LGA QualiTest GmbH, Nuremberg
*1) maximum sound pressure level at a frequency of 2500 Hz
*2) total sound power level

Gear reduction see diagram page 18

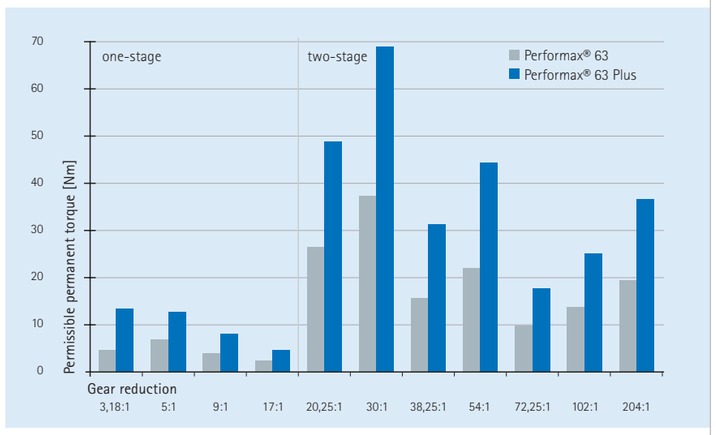
Performax® Plus – the power package for difficult conditions.

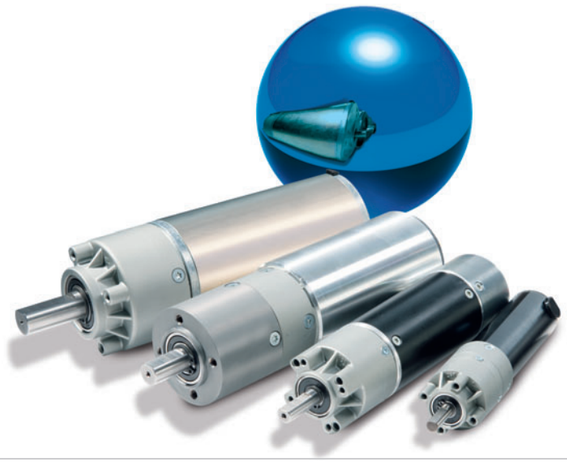
Performax® Plus – impressive performance

Everywhere where difficult conditions hold sway and robust construction as well as high output performance is required, Performax® Plus can demonstrate its special strengths.

Extra power transmission results from toothing in the input stage being up to 100 percent larger and from increased strength obtained from concave toothing in hardened steel. Another advantage of the steel casing is its higher impact resistance.

Using brushless electronically commutated motors plus optimum configuration and appropriate power density, we can permit very high input torques up to 1 Nm.





HRL radial load stage – ready for any maximum radial load.

HRL radial load stage – defining performance limits new

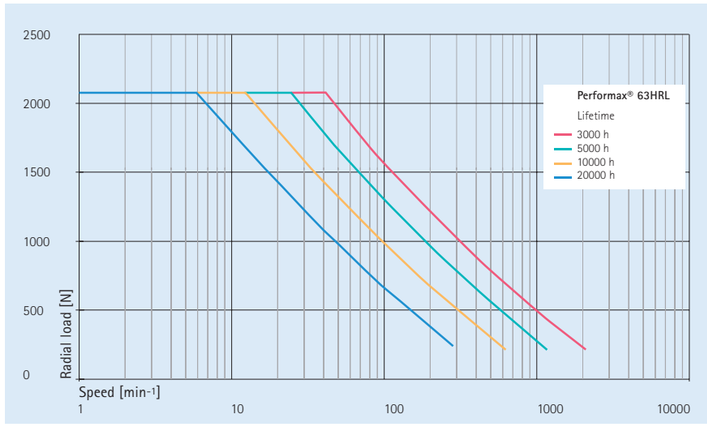
A special carrier enables bearing-mountings both sides and the planetary wheel needles to be precisely run. In turn, the carrier is properly supported by an efficient deep groove ball bearing. The resulting large bearing spacing is responsible for the significant increase in transferrable radial loads.

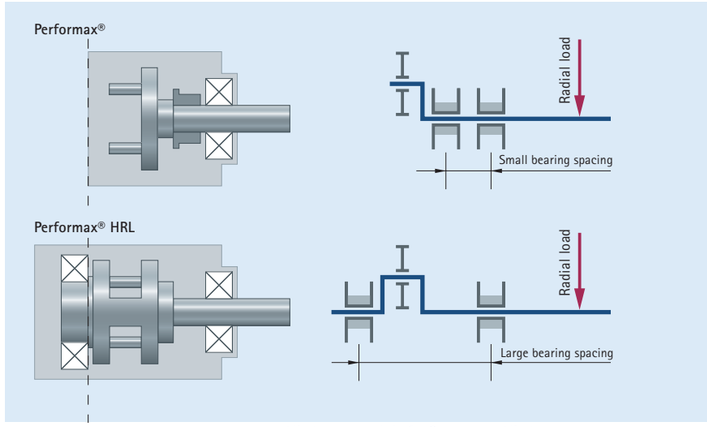
This optimum union of carrier and output shaft is able to guarantee very high torque values. The results are best possible rotation characteristics as well as superb smoothness – even given the highest radial loads.

Performax® Plus and HRL – an unbeatable duo

Combining Performax® Plus with the HRL radial load stage produces a drive power package that has no equal.

A powerful gearhead – designed for tough uses





NoiselessPlus – uniquely smooth planetary gearheads.

A versatile and well-balanced force: NoiselessPlus

NoiselessPlus planetary gearheads from ZEITLAUF® are the perfect combination of power and smooth running. Extremely quiet even under tough operating conditions, NoiselessPlus also copes with extreme radial loads and makes high reductions possible in one stage from 4.33 to 21 and in two stages from 26 to 231.

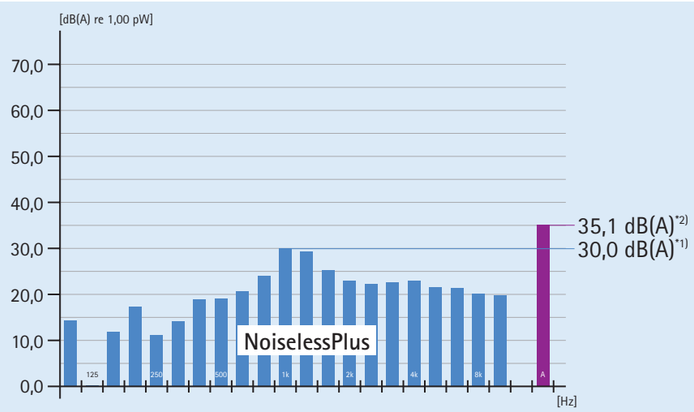
NoiselessPlus proves its strength in one and two-stage versions as well as in customer-specific variants with a wide range of different configurations. Or in its own modified tailor-made solutions adapted for special areas of application.

Gearhead technology – convincingly quiet

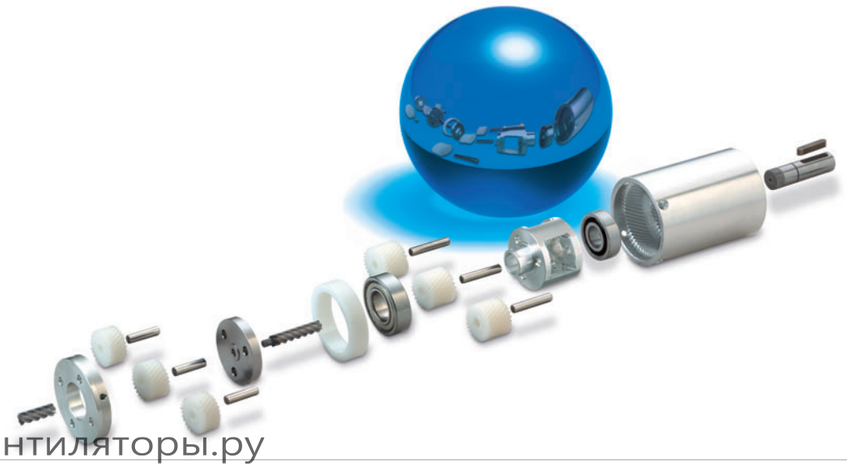
Wherever high efficiency is required under minimum noise development, the ZEITLAUF® planetary gearhead NoiselessPlus shows what it can do: Exemplary smooth running is achieved thanks to extremely sturdy, low-wear plastic planetary wheels in an aluminium housing with bevelled teeth. Double ball bearing output shafts efficiently absorb the forces acting on the shaft at high radial loads.

The output shafts of the NoiselessPlus gearheads are made of hardened and ground case-hardened steel and are thus particularly durable. Standard torque transfer is through a feather key connection or face. If required, however, shafts with double faces, offsets, (thread) bore holes, holes or serration can be used.

Standard NoiselessPlus gearheads are equipped with high-quality brushless EC motors and can be combined with all other standard motors as variants.



NoiselessPlus 63.2, i=121:1 when idling
Measurement in accordance with DIN EN ISO 1680 by
LGA QualiTest GmbH, Nuremberg
*1) maximum sound pressure level at a frequency of 1000 Hz
*2) total sound power level



Focus – high-precision planetary gearheads.

Planetary gearheads of the Focus series

When it is necessary to reduce motor speed with the least possible gear play, that's where the Focus series drives come in: due to their limited tolerances, a very torsion-resistant design and the use of high-quality production methods, Focus gearheads permit only minimum circumferential backlash.

In the first gear stage, plastic wheels with helical teeth engage in an aluminium housing. The planetary wheels are centred on a carrier cage mounted on ball bearings, which introduces the transferred torque to the second stage. This has a hardened hollow wheel with spur teeth and likewise hardened steel planetary wheels. The planetary wheels of the second stage run on needle bearings on the planet carrier, which in turn sits on the ground and hardened output shaft that also runs on double ball bearings.

Planetary gearheads, spur gearheads – what are the differences?

The basic difference between planetary and spur gearheads is in the position of the input axle and the output axle with respect to each other. In contrast to the spur gearhead, where there is normally an axial offset between the input and output shafts, both axles are flush in the case of planetary gearheads. This means that although planetary gearheads occupy less space than spur gearheads as far as their diameter is concerned, the gearhead length is greater due to the arrangement of the gear stages one behind the other and the more complex output shaft bearing assembly in the case of planetary gearhead. One clear advantage of the planetary gearhead is that here, several (normally three) gear wheels are simultaneously engaged, which enables higher torques to be transferred.

Flatline – extra-flat.

Spur gearheads of the Flatline series

By there very nature, gearheads of the Flatline design are particularly suitable for use in applications with limited installation lengths. The Flatline includes gearheads of the series 50, 78 and 85.

All drives in this group have helical plastic wheels in the first stage, thus achieving optimum noise reduction. The following gear stages are optimally configured in terms of running noise and torque to be transferred.

Ground and hardened output shafts and hardened gearwheels are standard in all Flatline series gearheads. Die-cast zinc is used as a housing material.

Flatline 50

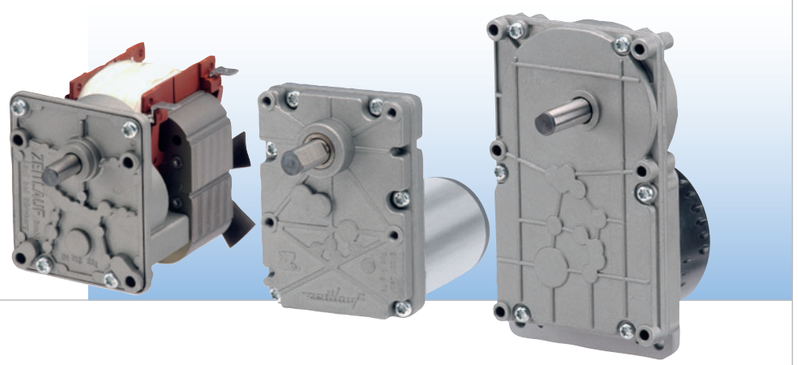
The Flatline 50 series offers an additional length advantage: The gear-side end plate of the attached shaded-pole motors is integrated in the gearhead housing.

Flatline 78

The gearheads of the Flatline 78 series cover the widest reduction range: The ranges from 39 : 1 in the three-stage gearhead to 2,136 : 1 in the five-stage gearhead.

Flatline 85

Flatline 85 drives can be called the "power packages" in the Flatline range: The torques that can be obtained extend up to 30 Nm!



Compactline – flexible and quiet.

Spur gearheads of the Compactline series

In the Compactline series, ZEITLAUF® offers the gearhead ranges 90, 91 and 92 in the standard range modular system.

When the wheel widths were dimensioned, in order to minimise noise particularly in the first stage, due attention was paid to having the greatest possible wheel width and therefore to a good contact ratio between the motor shaft and the combing gearwheel. The combination of greater wheel width in conjunction with the use of plastic materials for the gearwheel, that's what makes the drives of the Compactline series extremely quiet and efficient.

Ground and hardened output shafts and hardened gearwheels are standard in all Flatline series gearheads. Die-cast zinc is used as a housing material.

Compactline 90

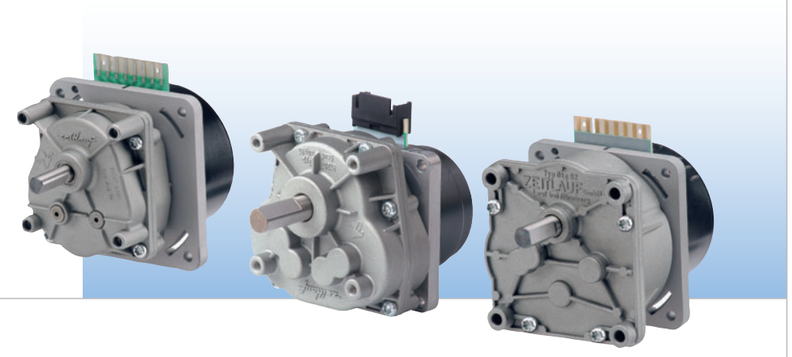
Compactline 90 drives cover the widest reduction range of all Compactline gearheads. The reductions available in the standard modular system are from 11 : 1 to 537 : 1.

Compactline 91

The Compactline 91 differs from the Compactline 90 in terms of the higher power that can be transferred. The reduction stages and the output speeds extend the scope of use for the Compactline gearheads. We also offer other applications which interface with the 10 mm output shaft diameter.

Compactline 92

Drives of the Compactline 92 series are characterised within the series by their high output torques. The torque that can be obtained on the shaft extends up to 15 Nm here.



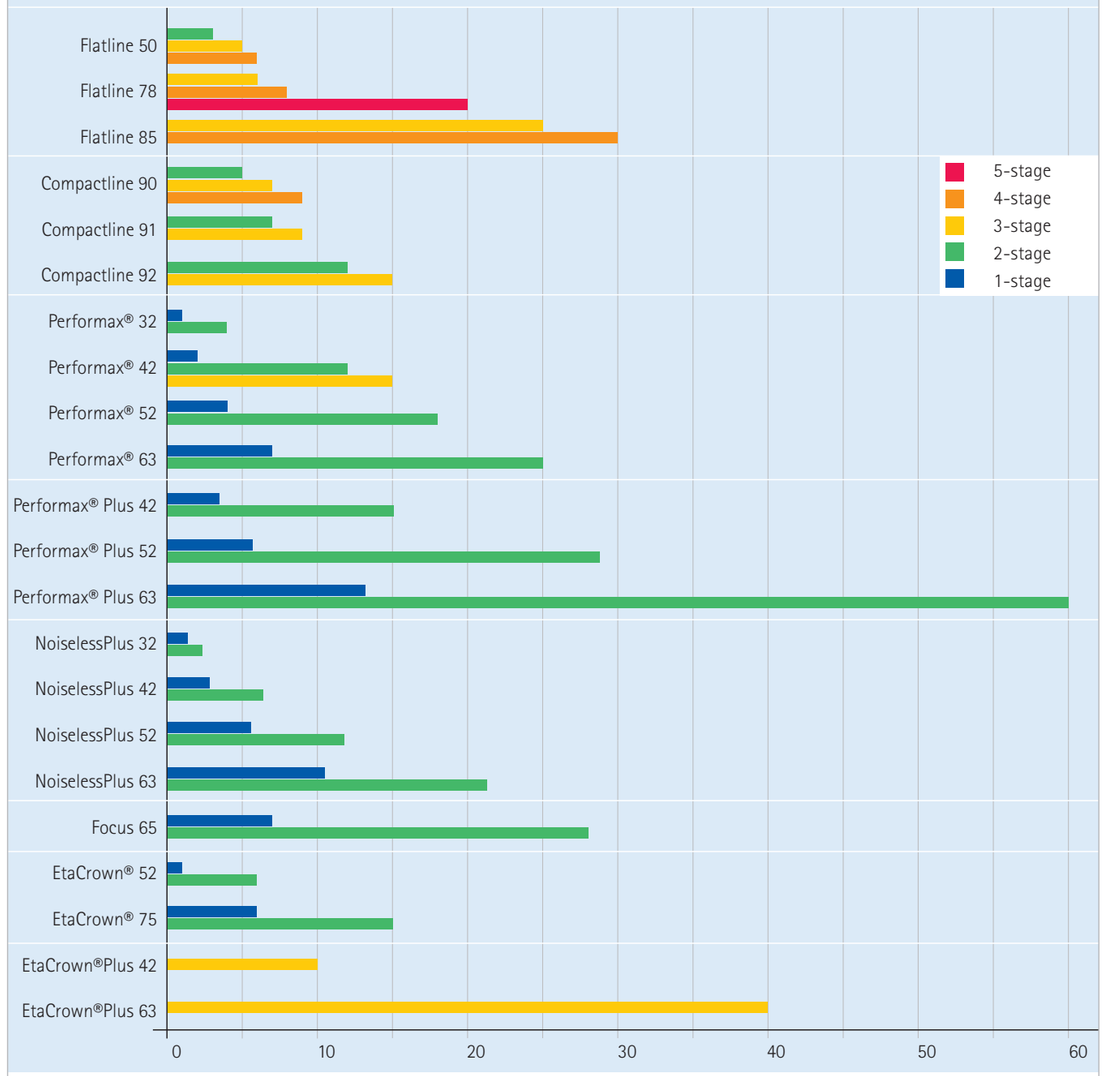
Power is not always power – we play on the safe side.

We make sure that you are always on the move – thanks to maximum demands on the quality and reliability of our products. Intensive endurance tests and decades of experience under tough day-to-day conditions bear a high application safety in mind. We fulfil this with fair specifications of power assuming permanent operation and long lifetime, even if significantly higher values can be achieved under certain operating conditions and in ideal situations.

The torques quoted in chapters A to Q refer to the respective gear motor combinations depending on the operating factor C_B=1. Taking our gear lifetime into account, the maximum gear output torques and longevity can be achieved by determining the operating conditions.

Under respective operation conditions, the maximum long-term torques shown in the adjacent table can be achieved. Short-term overload torque which can occur when starting the engine up or due to impact loads, may be up to 2.5 times the maximum gear permanent output torque, depending on the duration of the pulse.

Maximum gear permanent output torques M_{max} [Nm]



The short-term overload torque (start-up, impact load) may be 2.5 times the M_{max}.

The selection criteria „motor type" – direct or alternating voltage?

In the first stage of the drive design, you should consider the voltage supply of the drive you require. In the ZEITLAUF® product range, you have the choice between direct current and alternating current motors (DC / AC motors) for operation on 24 V direct voltage or 230 V or 400 V / 50 Hz alternating voltage.

In the range of motors operated with alternating voltage, ZEITLAUF® offers a choice of the following motor types in the standard modular system:

Shaded-pole AC motors –
robust and value for money.

Shaded-pole AC motors

This motor type stands out by virtue of its simple and robust design. Shaded-pole motors are self-starting, maintenance-free and interference-free, but can only be operated in one rotational direction (please state the rotational direction at order stage;
Standard = clockwise, facing the gearhead output shaft). Shaded-pole motors are rated with IP 00.

Induction AC motors –
a high degree of effectiveness and a long life span.

Open-frame induction AC motors

Compared with shaded-pole motors, induction motors offer a higher output power and better efficiency. The ball bearing assembly of the motor shaft guarantees a long lifetime. Open-frame induction motors have protection class IP 00.

Closed-frame induction AC motors

Closed-frame induction AC motors have the same technical features as open frame motors, but also provide protection against the ingress of dust and water in accordance with protection class IP 54.

Three-phase AC motors –
high power density and best efficiency.

Closed-frame three-phase AC motors

Three-phase motors, or three-phase asynchronous motors to be more exact, are designed for use with the three-phase network (3 x 230 V, 50 Hz). They are self-starting and, thanks to the ball bearings used, maintenance-free and durable. Their operating speed is prescribed by the network frequency and can thus only be influenced by means of an additional frequency converter. The direction of rotation can be changed by inverting the polarity of two wire strands.

The three-phase motors provided in the ZEITLAUF® standard range have been designed for operation in delta connection. Thanks to their sealed motor housing these motors comply with the requirements of protective rating IP 54*.

*with built-on gear

The following types are available in the ZEITLAUF® standard modular system in the direct current motors class:

Permanent magnet DC motors –
highly flexible and dynamic.

Mechanically commutated permanent magnet DC motors

Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide a nominal torque and a nominal speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3,000 hours (operating factor C_B=1 and nominal load) (carbon brush wear).

Permanent magnet EC motors –
pure power in a compact design.

Electronically commutated permanent magnet EC motors

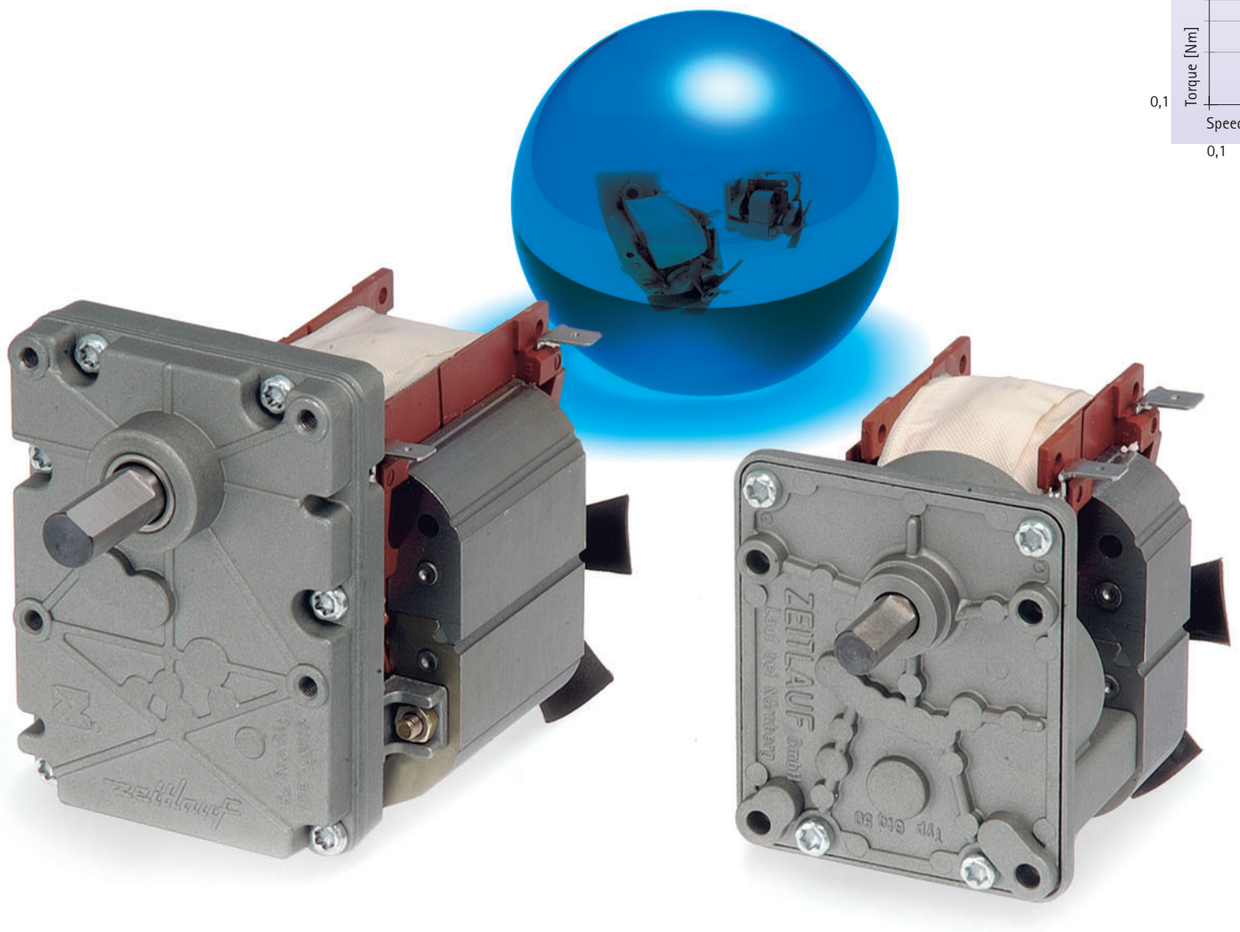
EC direct current motors have very long lifetimes due to their electronic commutation (normally over 10,000 hours). Speed control can be realised via the electronics integrated in most models. Electronically commutated motors normally provide high torque even at lower speeds.

DC gear motors are available as external and internal rotors.

The external rotor is characterised by a high torque and a high mass inertia of the rotor. The internal rotor captivates by its excellent dynamics.

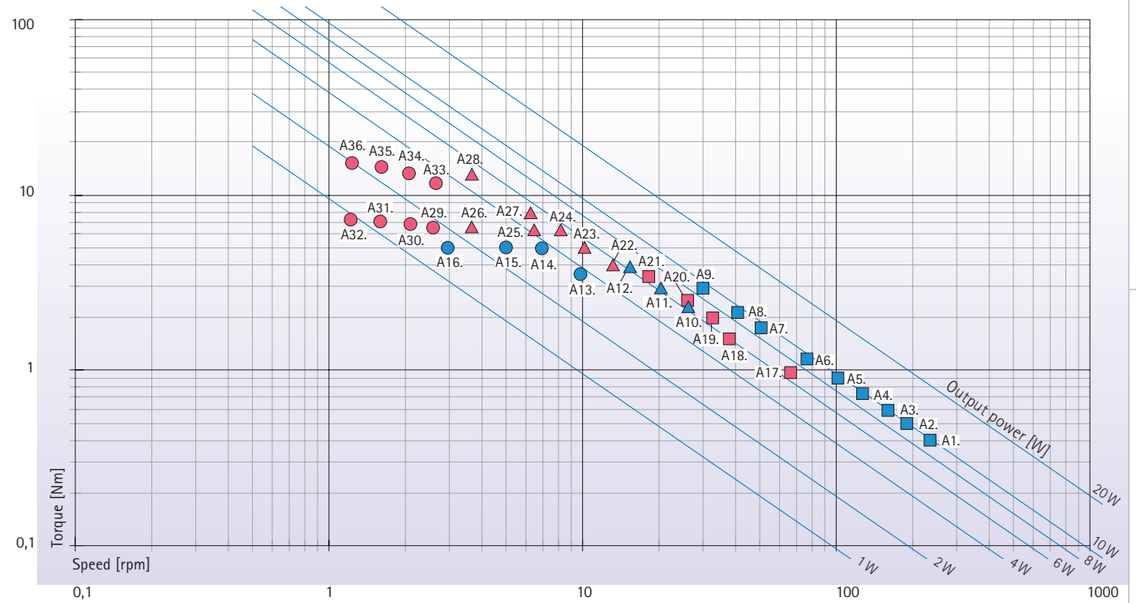
Shaded-pole AC motor with spur gearhead Flatline

Robust and powerful –
the workhorse!



Flatline 50 with EM3045
Flatline 50 with EM3030
Flatline 50 with EM3020
Flatline 78 with EM3045
Flatline 78 with EM3030
Flatline 78 with EM3020

Performance overview

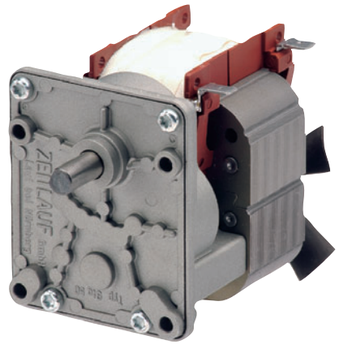


Shaded-pole AC motors with spur gearhead Flatline

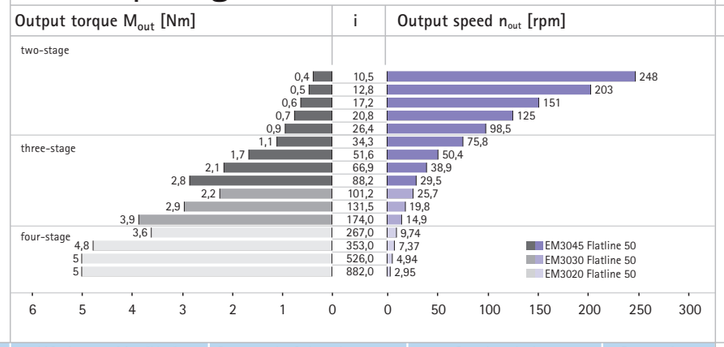
By their very nature, gearheads of the Flatline design are particularly suitable for use in applications with limited installation lengths. The Flatline series includes gearheads of the types 50, 78 and 85.

Shaded-pole AC motors are distinguished by their simple and robust design. Shaded-pole motors are self-starting, maintenance-free and cause no radio interference, but can only be operated in one rotational direction.

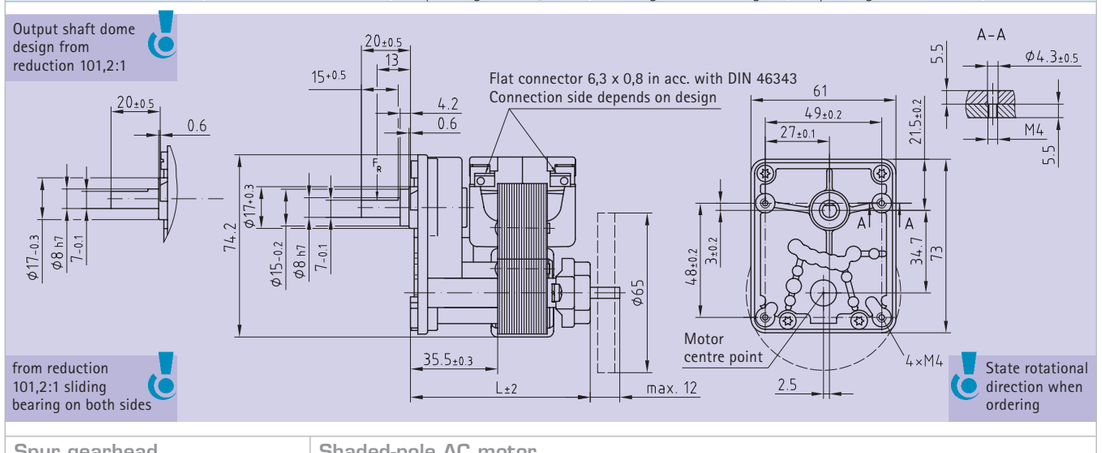
- flat gearhead design
- noise-optimised helical teeth in the input stage
- plastic wheels with optimum sliding properties in the first stage for additional noise reduction
- selectable in sintered material or in steel execution for Flatline 78
- ground and hardened output shaft (diameter tolerance h7)
- robust and durable AC motors
- insulation class B
- no rotational direction change possible due to the motor (please state the rotational direction required when ordering; Standard = clockwise, looking towards the gearhead output shaft).
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 00
- maintenance free – grease-lubricated for life
- ambient temperature 0 °C to +60 °C



Shaded-pole AC motor with spur gearhead Flatline 50



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
60 N	40 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,6° depending on reduction	IP 00



Spur gearhead	Shaded-pole AC motor
Flatline 50	EM3045 — 2600 rpm/12 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 1.	10,5 / 2	0,4	248	9,7	50.2.3045.F01				
A 2.	12,8 / 2	0,5	203	9,7	50.2.3045.F02				
A 3.	17,2 / 2	0,6	151	9,7	50.2.3045.F03		0,5	1,4	99
A 4.	20,8 / 2	0,7	125	9,7	50.2.3045.F04				
A 5.	26,4 / 2	0,9	98,5	9,7	50.2.3045.F05				
A 6.	34,3 / 3	1,1	75,8	8,7	50.3.3045.F06				
A 7.	51,6 / 3	1,7	50,4	8,7	50.3.3045.F07		0,5	1,5	99
A 8.	66,9 / 3	2,1	38,9	8,7	50.3.3045.F08				
A 9.	88,2 / 3	2,8	29,5	8,7	50.3.3045.F09				

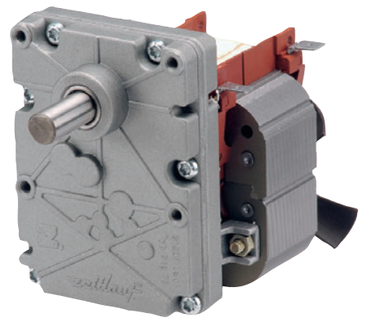
Spur gearhead	Shaded-pole AC motor
Flatline 50	EM3030 — 2600 rpm/8,3 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 10.	101,2 / 3	2,2	25,7	6,1	50.3.3030.F10				
A 11.	131,5 / 3	2,9	19,8	6,1	50.3.3030.F11		0,46	1,1	84
A 12.	174 / 3	3,9	14,9	6,1	50.3.3030.F12				

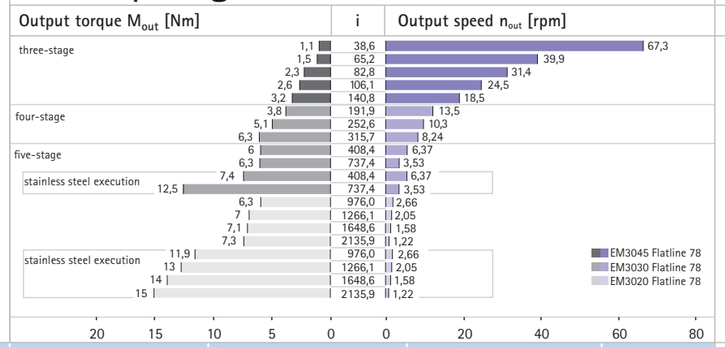
Spur gearhead	Shaded-pole AC motor
Flatline 50	EM3020 — 2600 rpm/5,6 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 13.	267 / 4	3,6	9,74	3,7	50.4.3020.F13				
A 14.	353 / 4	4,8	7,37	3,7	50.4.3020.F14				
A 15.	526 / 4	5	4,94	2,6	50.4.3020.F15		0,15	0,8	72
A 16.	882 / 4	5	2,95	1,5	50.4.3020.F16				

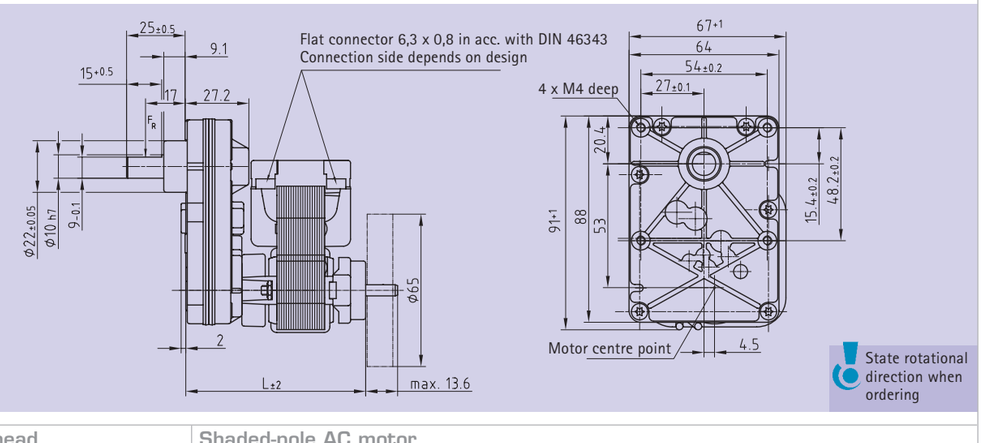
*maximum continuous output torque · M_{max}[Nm] see page 24-25



Shaded-pole AC motor with spur gearhead Flatline 78



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
300 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,8° to 1,8° depending on reduction	IP 00



Spur gearhead	Shaded-pole AC motor
Flatline 78	EM3045 — 2600 rpm/12 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 17.	38,6 / 3	1,1	67,3	7,8	78.3.3045.F20				
A 18.	65,2 / 3	1,5	39,9	6,3	78.3.3045.F21				
A 19.	82,8 / 3	2,3	31,4	7,6	78.3.3045.F22		0,5	1,5	102
A 20.	106,1 / 3	2,6	24,5	6,7	78.3.3045.F23				
A 21.	140,8 / 3	3,2	18,5	6,2	78.3.3045.F24				

Spur gearhead	Shaded-pole AC motor
Flatline 78	EM3030 — 2600 rpm/8,3 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 22.	191,9 / 4	3,8	13,5	5,4	78.4.3030.F25				
A 23.	252,6 / 4	5,1	10,3	5,4	78.4.3030.F26		0,46	1,1	87
A 24.	315,7 / 4	6,3	8,24	5,4	78.4.3030.F27				
A 25.	408,4 / 5	6	6,37	4	78.5.3030.F28		0,46	1,1	87
A 26.	737,4 / 5	6,3	3,53	2,3	78.5.3030.F29				
A 27.	408,4 / 5	7,4**	6,37	4,9	78.5.3030.F40		0,46	1,1	87
A 28.	737,4 / 5	12,5**	3,53	4,6	78.5.3030.F41				

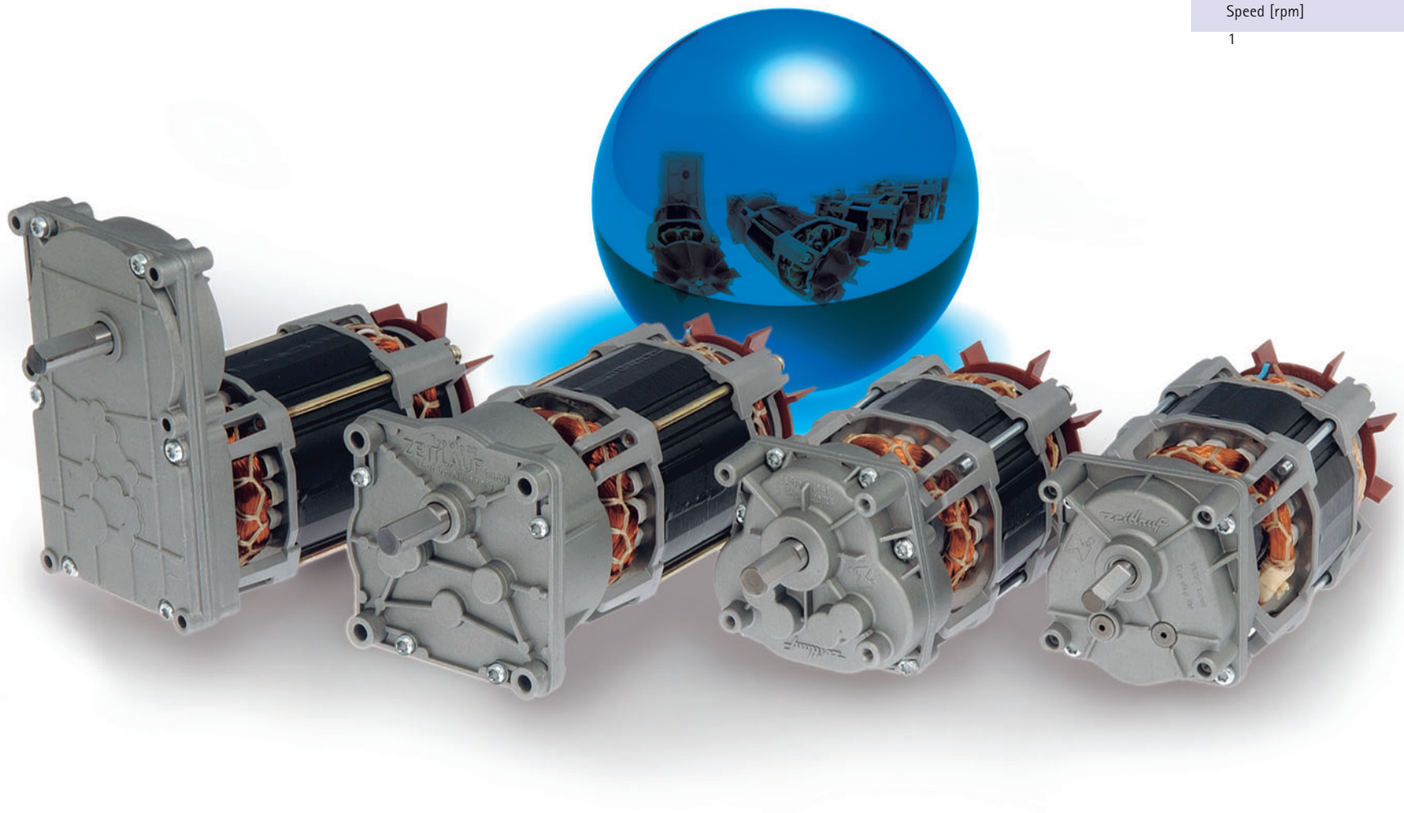
Spur gearhead	Shaded-pole AC motor
Flatline 78	EM3020 — 2600 rpm/5,6 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	State rotational direction	Rated current I [A]	Weight m [kg]	Length L [mm]
A 29.	976 / 5	6,3	2,66	1,8	78.5.3020.F30				
A 30.	1266,1 / 5	7	2,05	1,5	78.5.3020.F31		0,15	0,9	77
A 31.	1648,6 / 5	7,1	1,58	1,2	78.5.3020.F32				
A 32.	2135,9 / 5	7,3	1,22	0,9	78.5.3020.F33				
A 33.	976 / 5	11,9**	2,66	3,3	78.5.3020.F42				
A 34.	1266,1 / 5	13**	2,05	2,8	78.5.3020.F43		0,15	0,9	77
A 35.	1648,6 / 5	14**	1,58	2,3	78.5.3020.F44				
A 36.	2135,9 / 5	15**	1,22	1,9	78.5.3020.F45				

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · **stainless steel execution

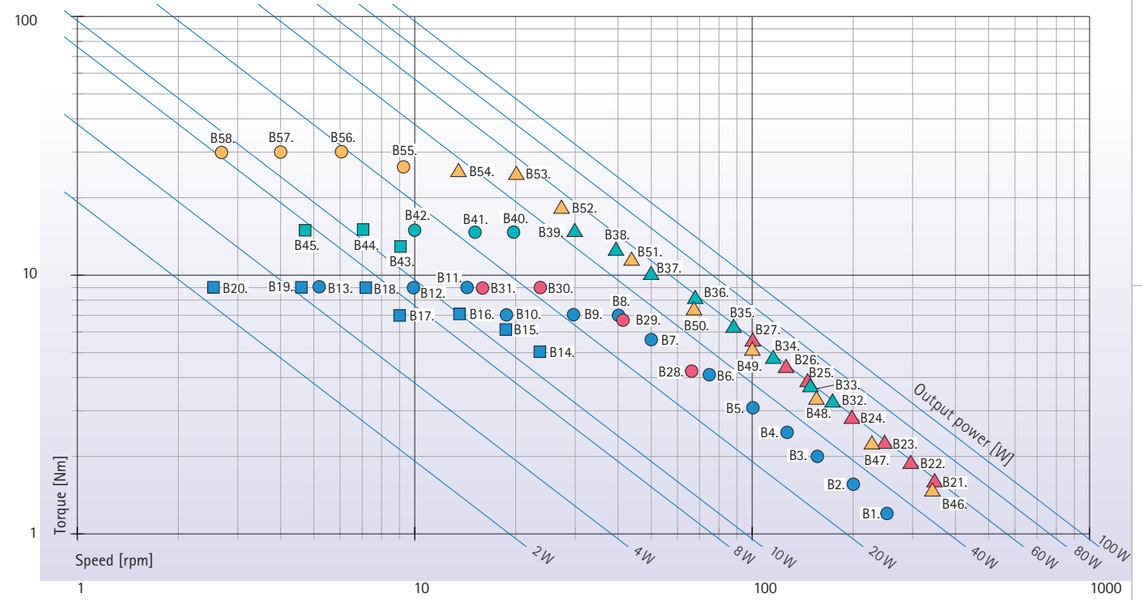
Open-frame AC induction motor with spur gearhead Compactline and Flatline

Flat or compact: The choice is yours – they all take up less space!



Compactline 90 with KM4030-2
Compactline 90 with KM4030-4
Compactline 91 with KM4050-2
Compactline 91 with KM4030-2
Compactline 92 with KM4050-2
Compactline 92 with KM4030-2
Compactline 92 with KM4030-4
Flatline 85 with KM4050-2
Flatline 85 with KM4030-2

Performance overview



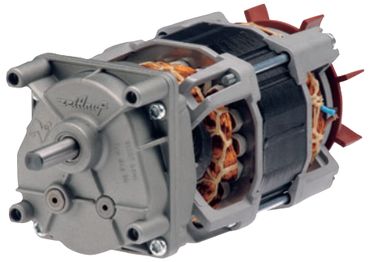
Open-frame induction AC motors with spur gearhead Compactline / Flatline

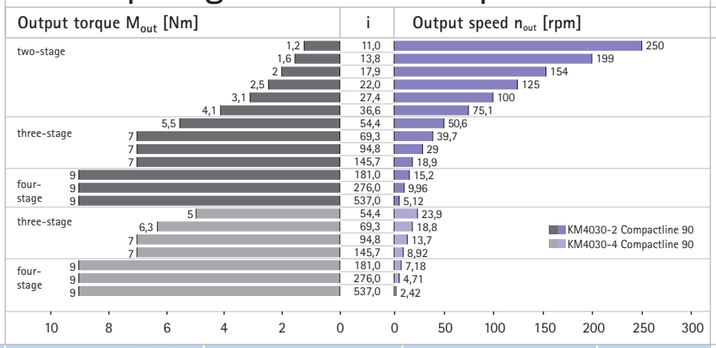
For the Compactline series we engineered the largest possible wheel width providing good overlap between the motor shaft and the combing gear wheel in the first stage. The first stage gear wheel is made of plastic. This design makes the gearhead extremely quiet. If it needs to be more flat, you should choose a gearhead from the Flatline series.

Compared with shaded-pole motors, induction motors offer a higher output power and better efficiency. The ball bearing assembly of the motor shaft guarantees a long lifetime.

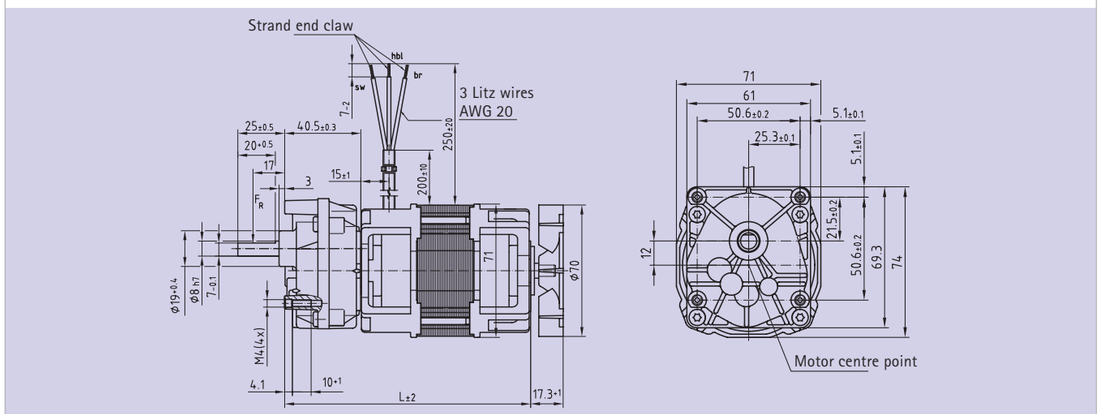
- flat and compact gearhead design
- noise-optimised helical teeth in the input stage
- plastic wheels with optimum sliding properties in the first stage for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- powerful and durable single-phase AC motors
- insulation class B
- the necessary operating capacitor is included
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 00
- maintenance free – grease-lubricated for life
- ambient temperature –20 °C to +80 °C

Open-frame AC induction motor with spur gearhead Compactline 90





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
120 N	40 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,6° depending on reduction	IP 00



Spur gearhead — Open-frame AC induction motor

Compactline 90 — KM4030-2

2750 rpm/40 W
230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 1.	11 / 2	1,2	250	32	90.2.4030.2.C01	0,38	3,5µF / 400 V	SB01 / 168	1,4	132
B 2.	13,8 / 2	1,6	199	32	90.2.4030.2.C02					
B 3.	17,9 / 2	2	154	32	90.2.4030.2.C03					
B 4.	22 / 2	2,5	125	32	90.2.4030.2.C04					
B 5.	27,4 / 2	3,1	100	32	90.2.4030.2.C05					
B 6.	36,6 / 2	4,1	75,1	32	90.2.4030.2.C06					
B 7.	54,4 / 3	5,5	50,6	29	90.3.4030.2.C07	0,38	3,5µF / 400 V	SB01 / 168	1,5	132
B 8.	69,3 / 3	7	39,7	29	90.3.4030.2.C08					
B 9.	94,8 / 3	7	29	21	90.3.4030.2.C09					
B 10.	145,7 / 3	7	18,9	14	90.3.4030.2.C10					
B 11.	181 / 4	9	15,2	14	90.4.4030.2.C11	0,38	3,5µF / 400 V	SB01 / 168	1,5	132
B 12.	276 / 4	9	9,96	9,4	90.4.4030.2.C12					
B 13.	537 / 4	9	5,12	4,8	90.4.4030.2.C13					

Spur gearhead — Open-frame AC induction motor

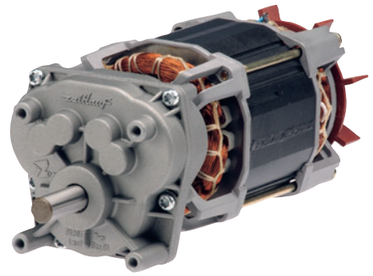
Compactline 90 — KM4030-4

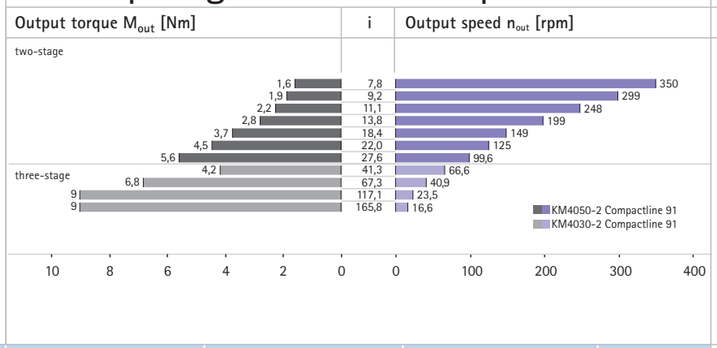
1300 rpm/17 W
230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 14.	54,4 / 3	5	23,9	12	90.3.4030.4.C14	0,2	1,5µF / 400 V	SB01 / 168	1,5	132
B 15.	69,3 / 3	6,3	18,8	12	90.3.4030.4.C15					
B 16.	94,8 / 3	7	13,7	10	90.3.4030.4.C16					
B 17.	145,7 / 3	7	8,92	6,5	90.3.4030.4.C17					
B 18.	181 / 4	9	7,18	6,8	90.4.4030.4.C18	0,2	1,5µF / 400 V	SB01 / 168	1,5	132
B 19.	276 / 4	9	4,71	4,4	90.4.4030.4.C19					
B 20.	537 / 4	9	2,42	2,3	90.4.4030.4.C20					

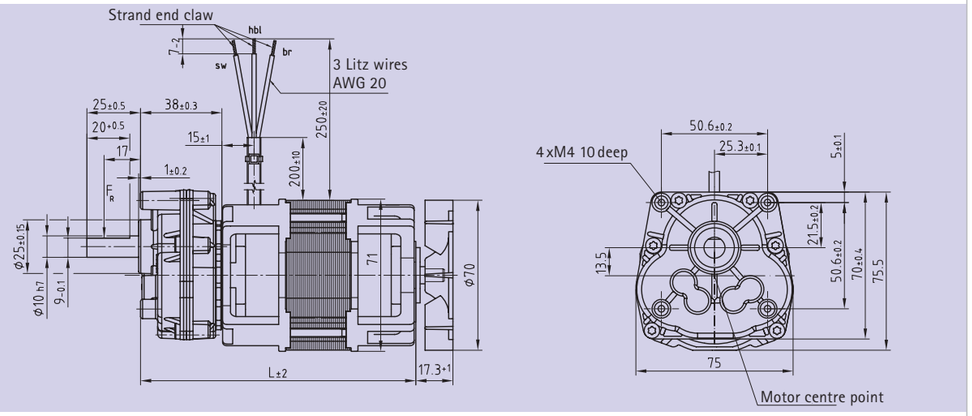
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Open-frame AC induction motor with spur gearhead Compactline 91





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 00



Spur gearhead — Open-frame AC induction motor

Compactline 91 — KM4050-2

2750 rpm/72 W
230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 21.	7,8 / 2	1,6	350	58	91.2.4050.2.C01	0,68	5µF / 400 V	SB01 / 168	2	150
B 22.	9,2 / 2	1,9	299	58	91.2.4050.2.C02					
B 23.	11,1 / 2	2,2	248	58	91.2.4050.2.C03					
B 24.	13,8 / 2	2,8	199	58	91.2.4050.2.C04					
B 25.	18,4 / 2	3,7	149	58	91.2.4050.2.C05					
B 26.	22 / 2	4,5	125	58	91.2.4050.2.C06					
B 27.	27,6 / 2	5,6	99,6	58	91.2.4050.2.C07					

Spur gearhead — Open-frame AC induction motor

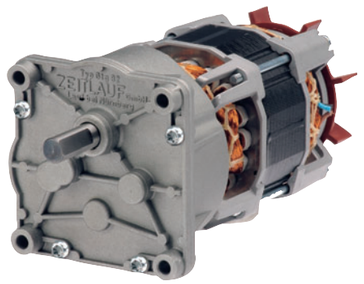
Compactline 91 — KM4030-2

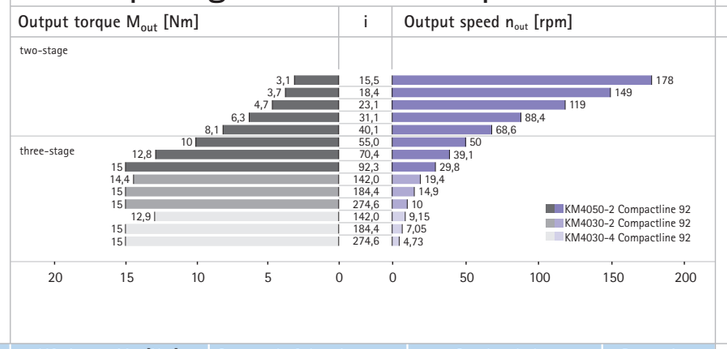
2750 rpm/40 W
230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 28.	41,3 / 3	4,2	66,6	29	91.3.4030.2.C08	0,38	3,5µF / 400 V	SB01 / 168	1,5	130
B 29.	67,3 / 3	6,8	40,9	29	91.3.4030.2.C09					
B 30.	117,1 / 3	9	23,5	22	91.3.4030.2.C10					
B 31.	165,8 / 3	9	16,6	16	91.3.4030.2.C11					

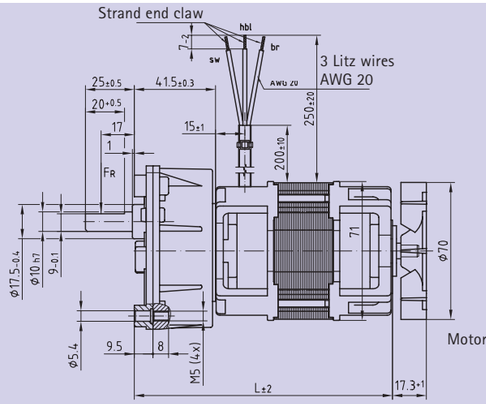
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Open-frame AC induction motor with spur gearhead Compactline 92





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 00



Spur gearhead	Open-frame AC induction motor
Compactline 92	KM4050-2 — 2750 rpm/72 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 32.	15,5 / 2	3,1	178	58	92.2.4050.2.C01					
B 33.	18,4 / 2	3,7	149	58	92.2.4050.2.C02					
B 34.	23,1 / 2	4,7	119	58	92.2.4050.2.C03	0,68	5µF / 400 V	SB01 / 168	2	153
B 35.	31,1 / 2	6,3	88,4	58	92.2.4050.2.C04					
B 36.	40,1 / 2	8,1	68,6	58	92.2.4050.2.C05					
B 37.	55 / 3	10	50	52	92.3.4050.2.C06					
B 38.	70,4 / 3	12,8	39,1	52	92.3.4050.2.C07	0,68	5µF / 400 V	SB01 / 168	2,1	153
B 39.	92,3 / 3	15	29,8	47	92.3.4050.2.C08					

Spur gearhead	Open-frame AC induction motor
Compactline 92	KM4030-2 — 2750 rpm/40 W, 230 V/50 Hz

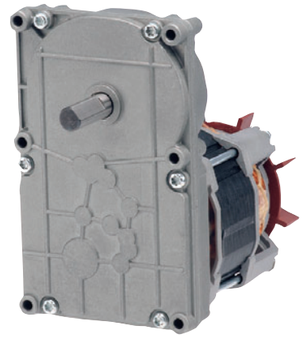
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 40.	142 / 3	14,4	19,4	29	92.3.4030.2.C09					
B 41.	184,4 / 3	15	14,9	23	92.3.4030.2.C10	0,38	3,5µF / 400 V	SB01 / 168	1,6	133
B 42.	274,6 / 3	15	10	16	92.3.4030.2.C11					

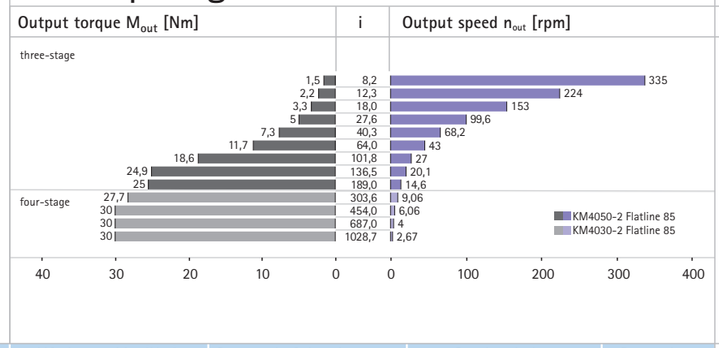
Spur gearhead	Open-frame AC induction motor
Compactline 92	KM4030-4 — 1300 rpm/17 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 43.	142 / 3	12,9	9,15	12	92.3.4030.4.C12					
B 44.	184,4 / 3	15	7,05	11	92.3.4030.4.C13	0,2	1,5µF / 400 V	SB01 / 168	1,6	133
B 45.	274,6 / 3	15	4,73	7,4	92.3.4030.4.C14					

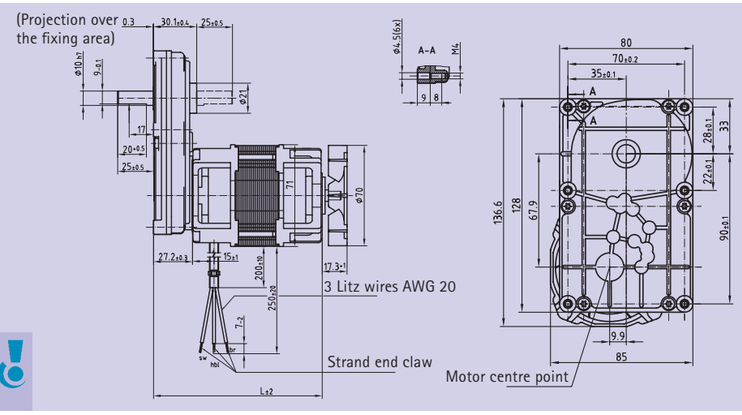
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Open-frame AC induction motor with spur gearhead Flatline 85





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,7° to 1,6° depending on reduction	IP 00



Spur gearhead	Open-frame AC induction motor
Flatline 85	KM4050-2 — 2750 rpm/72 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 46.	8,2 / 3	1,5	335	52	85.3.4050.2.F01					
B 47.	12,3 / 3	2,2	224	52	85.3.4050.2.F02					
B 48.	18 / 3	3,3	153	52	85.3.4050.2.F03					
B 49.	27,6 / 3	5	99,6	52	85.3.4050.2.F04					
B 50.	40,3 / 3	7,3	68,2	52	85.3.4050.2.F05	0,68	5µF / 400 V	SB01 / 168	2,1	139
B 51.	64 / 3	11,7	43	52	85.3.4050.2.F06					
B 52.	101,8 / 3	18,6	27	52	85.3.4050.2.F07					
B 53.	136,5 / 3	24,9	20,1	52	85.3.4050.2.F08					
B 54.	189 / 3	25	14,6	38	85.3.4050.2.F09					

Spur gearhead	Open-frame AC induction motor
Flatline 85	KM4030-2 — 2750 rpm/40 W, 230 V/50 Hz

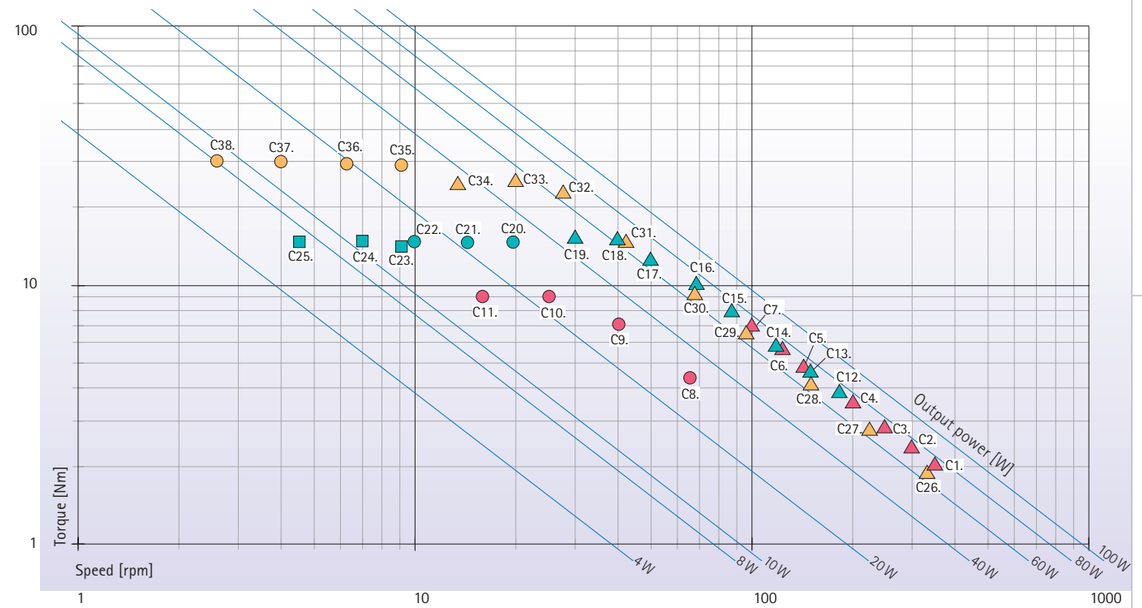
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
B 55.	303,6 / 4	27,7	9,06	26	85.4.4030.2.F10					
B 56.	454 / 4	30	6,06	19	85.4.4030.2.F11	0,38	3,5µF / 400 V	SB01 / 168	1,7	119
B 57.	687 / 4	30	4	13	85.4.4030.2.F12					
B 58.	1028,7 / 4	30	2,67	8,4	85.4.4030.2.F13					

*maximum continuous output torque · M_{max}[Nm] see page 24-25

Flat, compact and suitable
for almost any environment.

Compactline 91 with Eg7150-2
Compactline 91 with Eg7130-2
Compactline 92 with Eg7150-2
Compactline 92 with Eg7130-2
Compactline 92 with Eg7130-4
Flatline 85 with Eg7150-2
Flatline 85 with Eg7130-2

Performance overview



Closed-frame AC induction motor

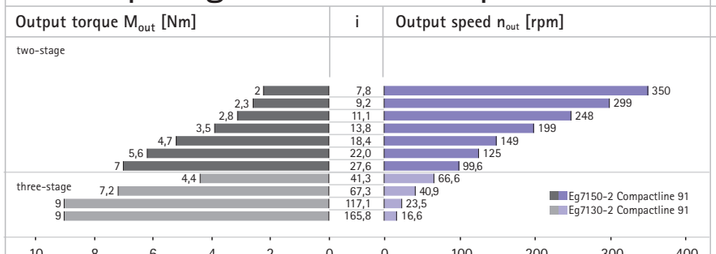
Closed-frame AC induction motor with spur gearhead Compactline / Flatline

For the Compactline series we engineered the largest possible wheel width providing good overlap between the motor shaft and the combing gear wheel in the first stage. The first stage gear wheel is made of plastic. This design makes the gearheads extremely quiet. If it needs to be more flat, you should choose a gearhead from the Flatline series.

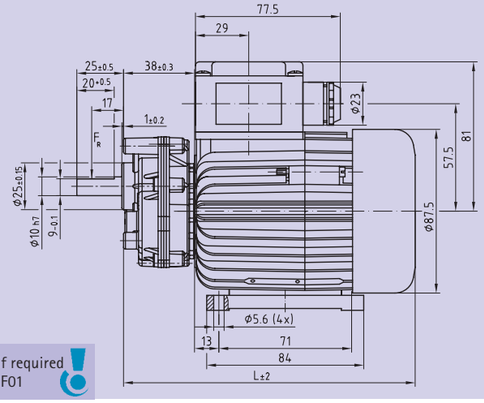
Compared with the robust shaded-pole AC motors, the induction motors offer a higher output power and better efficiency. The ball bearing assembly of the motor shaft guarantees a long lifetime.

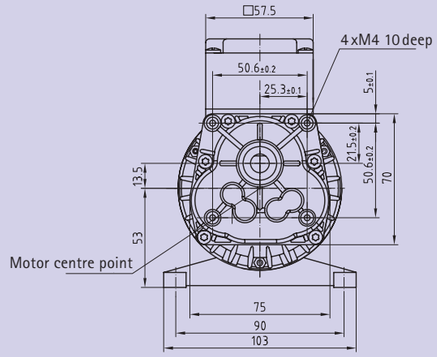
- flat and compact gearhead design
- noise-optimised helical teeth in the input stage
- plastic wheels with optimum sliding properties in the first stage for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- Powerful and durable AC motors
- insulation class B
- the necessary operating capacitor is included
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 54
- maintenance free – grease-lubricated for life
- ambient temperature –20 °C to +80 °C

Closed-frame AC induction motor with spur gearhead Compactline 91



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 54





Motor foot if required
Order code: F01

Spur gearhead	Closed-frame AC induction motor
Compactline 91	Eg7150-2 — 2750 rpm/90 W, 230 V/50 Hz

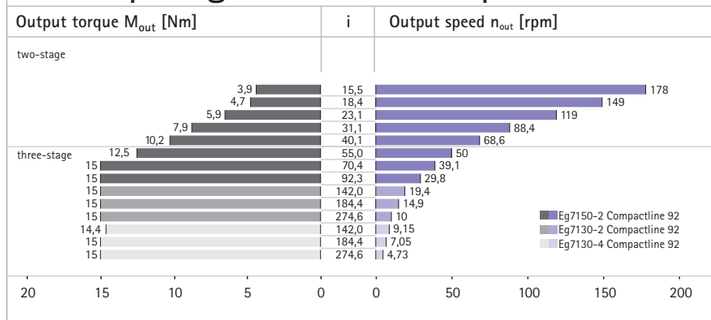
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 1.	7,8 / 2	2	350	73	91.2.7150.2.C01	0,7	5µF / 450 V	SB02 / 168	2,3	176
C 2.	9,2 / 2	2,3	299	73	91.2.7150.2.C02					
C 3.	11,1 / 2	2,8	248	73	91.2.7150.2.C03					
C 4.	13,8 / 2	3,5	199	73	91.2.7150.2.C04					
C 5.	18,4 / 2	4,7	149	73	91.2.7150.2.C05					
C 6.	22 / 2	5,6	125	73	91.2.7150.2.C06					
C 7.	27,6 / 2	7	99,6	73	91.2.7150.2.C07					

Spur gearhead	Closed-frame AC induction motor
Compactline 91	Eg7130-2 — 2750 rpm/42 W, 230 V/50 Hz

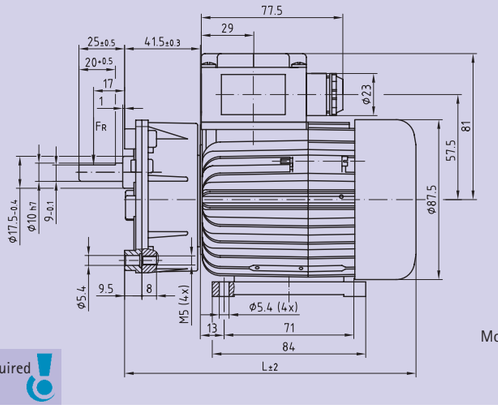
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 8.	41,3 / 3	4,4	66,6	31	91.3.7130.2.C08	0,45	3,5µF / 450 V	SB02 / 168	1,8	156
C 9.	67,3 / 3	7,2	40,9	31	91.3.7130.2.C09					
C 10.	117,1 / 3	9	23,5	22	91.3.7130.2.C10					
C 11.	165,8 / 3	9	16,6	16	91.3.7130.2.C11					

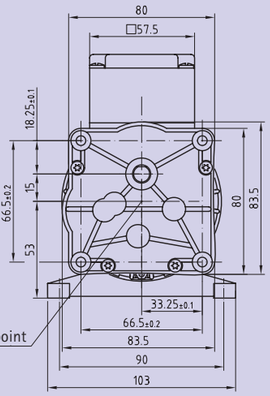
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Closed-frame AC induction motor with spur gearhead Compactline 92



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 54





Motor foot if required
Order code: F01

Spur gearhead	Closed-frame AC induction motor
Compactline 92	Eg7150-2 — 2750 rpm/90 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 12.	15,5 / 2	3,9	178	73	92.2.7150.2.C01	0,7	5µF / 450 V	SB02 / 168	2,4	180
C 13.	18,4 / 2	4,7	149	73	92.2.7150.2.C02					
C 14.	23,1 / 2	5,9	119	73	92.2.7150.2.C03					
C 15.	31,1 / 2	7,9	88,4	73	92.2.7150.2.C04					
C 16.	40,1 / 2	10,2	68,6	73	92.2.7150.2.C05					
C 17.	55 / 3	12,5	50	66	92.3.7150.2.C06	0,7	5µF / 450 V	SB02 / 168	2,4	180
C 18.	70,4 / 3	15	39,1	61	92.3.7150.2.C07					
C 19.	92,3 / 3	15	29,8	47	92.3.7150.2.C08					

Spur gearhead	Closed-frame AC induction motor
Compactline 92	Eg7130-2 — 2750 rpm/42 W, 230 V/50 Hz

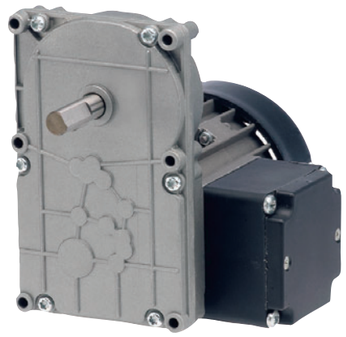
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 20.	142 / 3	15	19,4	30	92.3.7130.2.C09	0,45	3,5µF / 450 V	SB02 / 168	1,9	160
C 21.	184,4 / 3	15	14,9	23	92.3.7130.2.C10					
C 22.	274,6 / 3	15	10	16	92.3.7130.2.C11					

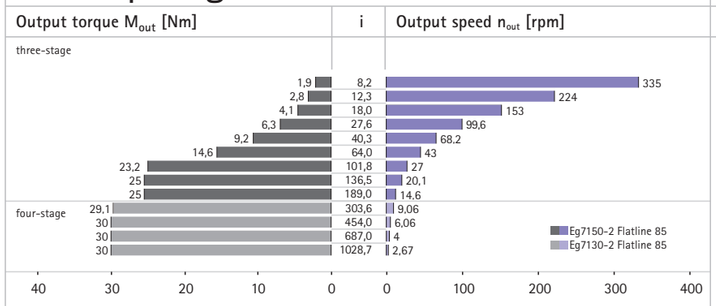
Spur gearhead	Closed-frame AC induction motor
Compactline 92	Eg7130-4 — 1300 rpm/19 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 23.	142 / 3	14,4	9,15	14	92.3.7130.4.C12	0,3	4µF / 400 V	SB03 / 168	1,9	160
C 24.	184,4 / 3	15	7,05	11	92.3.7130.4.C13					
C 25.	274,6 / 3	15	4,73	7,4	92.3.7130.4.C14					

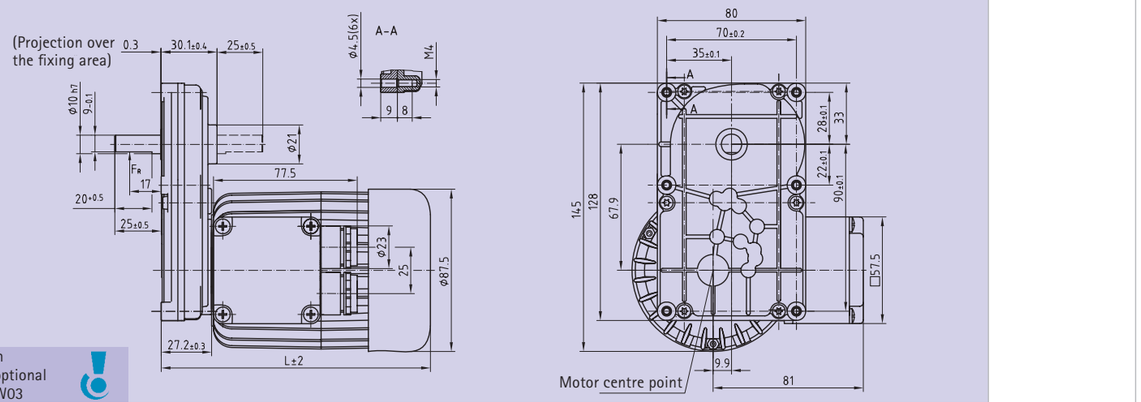
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Closed-frame AC induction motor with spur gearhead Flatline 85





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,8° to 1,6° depending on reduction	IP 54



Output shaft on opposite side, optional
Order add on: W03

Spur gearhead	Closed-frame AC induction motor
Flatline 85	Eg7150-2 — 2750 rpm/90 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 26.	8,2 / 3	1,9	335	66	85.3.7150.2.F01					
C 27.	12,3 / 3	2,8	224	66	85.3.7150.2.F02					
C 28.	18 / 3	4,1	153	66	85.3.7150.2.F03					
C 29.	27,6 / 3	6,3	99,6	66	85.3.7150.2.F04					
C 30.	40,3 / 3	9,2	68,2	66	85.3.7150.2.F05	0,7	5µF / 450 V	SB02 / 168	2,5	165
C 31.	64 / 3	14,6	43	66	85.3.7150.2.F06					
C 32.	101,8 / 3	23,2	27	66	85.3.7150.2.F07					
C 33.	136,5 / 3	25	20,1	53	85.3.7150.2.F08					
C 34.	189 / 3	25	14,6	38	85.3.7150.2.F09					

Spur gearhead	Closed-frame AC induction motor
Flatline 85	Eg7130-2 — 2750 rpm/42 W, 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Capacitor	Circuit diagram No./page	Weight m [kg]	Length L [mm]
C 35.	303,6 / 4	29,1	9,06	28	85.4.7130.2.F10					
C 36.	454 / 4	30	6,06	19	85.4.7130.2.F11	0,45	3,5µF / 450 V	SB02 / 168	2	145
C 37.	687 / 4	30	4	13	85.4.7130.2.F12					
C 38.	1028,7 / 4	30	2,67	8,4	85.4.7130.2.F13					

*maximum continuous output torque · M_{max}[Nm] see page 24-25

4209 4,209 drive solutions

48 48 hour service

KEEP WORD WARRANTY Keep-Word-Warranty

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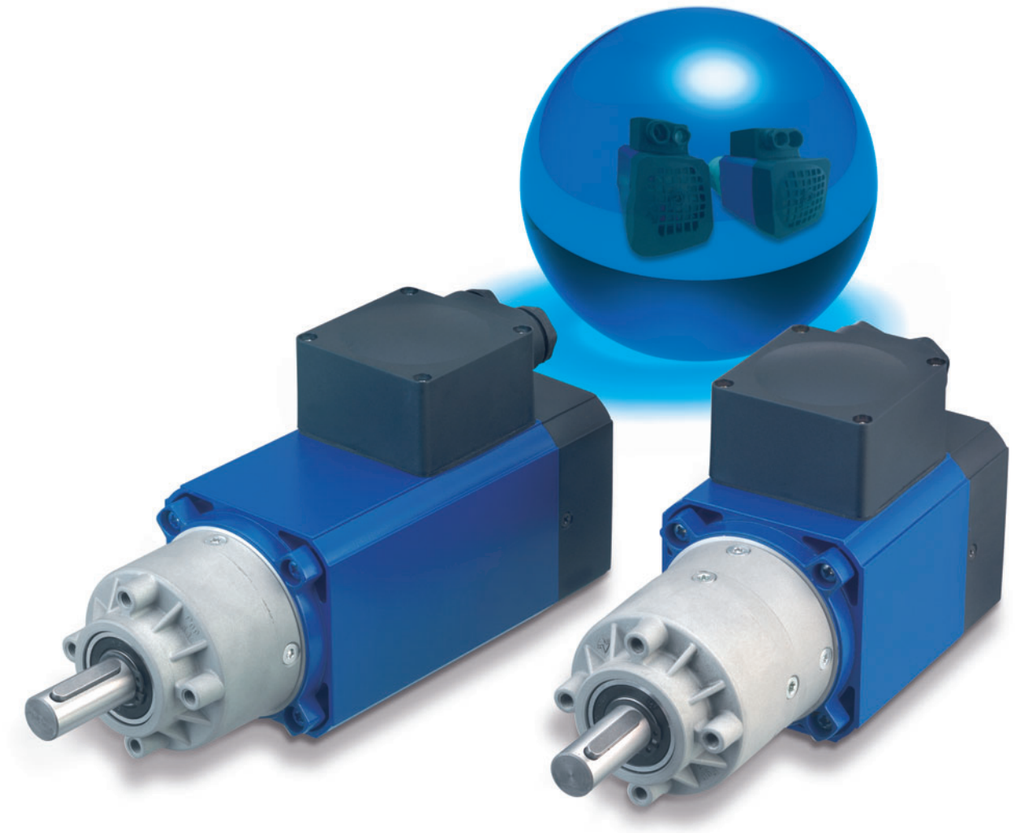
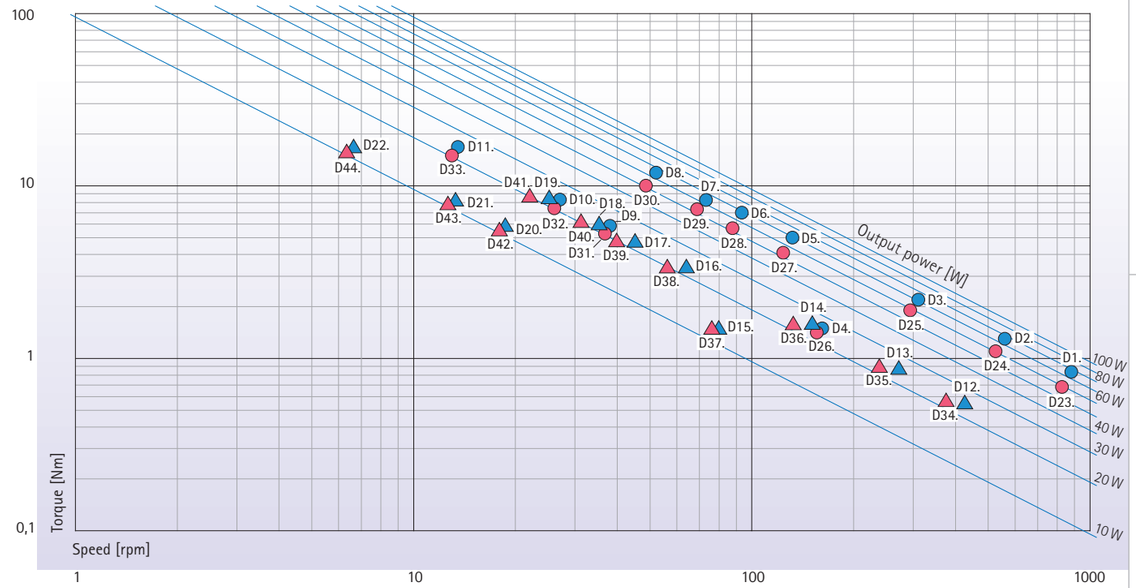
Closed-frame AC induction motor with planetary gearhead Performax®

High power density combined with maximum efficiency.



Performax® 63 with AC induction motor, 2-pole
Performax® 63 with AC induction motor, 4-pole
Performax® 63 with AC 3-phase motor, 2-pole
Performax® 63 with AC 3-phase motor, 4-pole

Performance overview



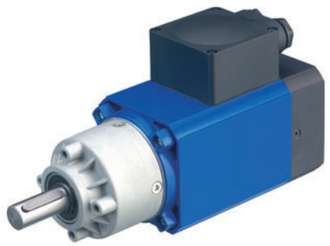
Closed-frame AC induction motor with planetary gearhead Performax®

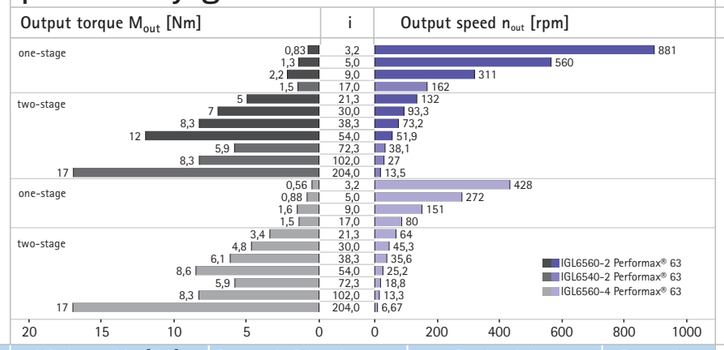
The drives of the Performax® series are a milestone in gearhead technology. An innovative (patent pending) planetary gearhead assembly concept is being used for the first time. Performax® drives combine high performance and silent running. Compared with other similar specified products on the market, Performax® gearheads offer a very high power density, and excellent smooth running.

Induction motors (1-phase) and three-phase alternating current motors provide greater output power and better efficiency than robust shaded-pole AC motors. The ball bearings of the output shaft guarantee a long lifetime.

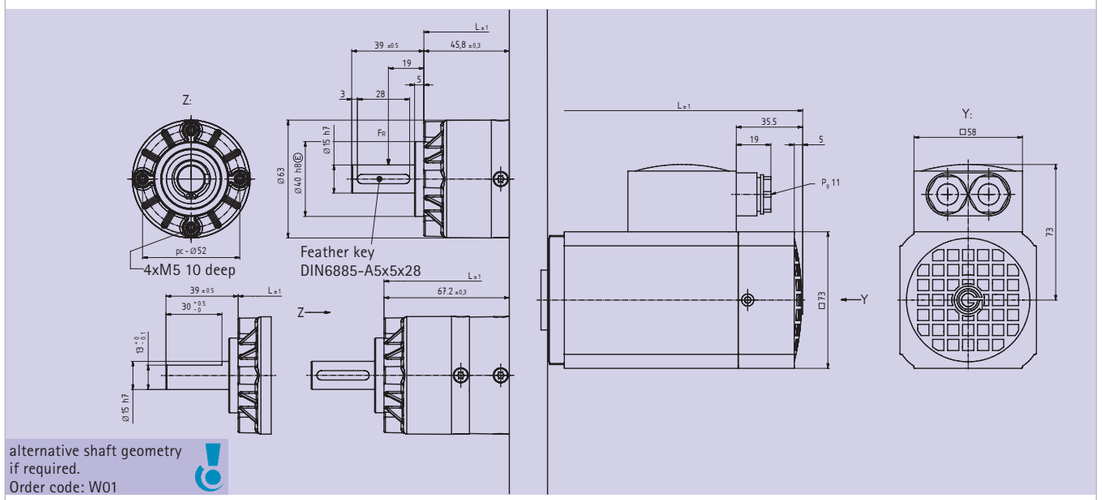
- modular design, patent pending
- noise-optimised helical teeth in the input stage
- planetary wheels and hollow wheel in the first stage made of plastic with optimised sliding properties for additional noise reduction
- hardened steel planetary wheels running on bearings with zinc diecast spur teeth in the second stage
- ground and hardened output shaft (diameter tolerance h7)
- two output shaft variants (feather key / face) available
- powerful and long-life AC motors
- insulation class B
- an operating capacitor is required for induction motors (included in the scope of supply)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 54
- maintenance-free grease lubricated for life
- ambient temperature -20°C to +80°C

Closed-frame AC induction motor with planetary gearhead Performax® 63





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 54



Planetary gearhead Performax® 63 — Closed-frame AC induction motor IGL6560-2 (2800 rpm/85 W 230 V/50 Hz) — IGL6540-2 (2750 rpm/45 W 230 V/50 Hz)

Circuit diagram SB02, page 168

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Capacitor	Weight m [kg]	Length L [mm]
D 1.	3,2 / 1	0,83	881	77	IGL6560	63.1.K6560.2.P01	0,6	4,5µF / 400 V	2,7	202
D 2.	5 /1	1,3	560	77	IGL6560	63.1.K6560.2.P02				
D 3.	9 /1	2,2	311	72	IGL6560	63.1.K6560.2.P03				
D 4.	17 /1	1,5	162	25	IGL6540	63.1.K6540.2.P04	0,45	3,5µF / 400 V	2,2	182
D 5.	21,3 / 2	5	132	69	IGL6560	63.2.K6560.2.P05	0,6	4,5µF / 400 V	2,8	224
D 6.	30 / 2	7	93,3	69	IGL6560	63.2.K6560.2.P06				
D 7.	38,3 / 2	8,3	73,2	64	IGL6560	63.2.K6560.2.P07				
D 8.	54 / 2	12	51,9	64	IGL6560	63.2.K6560.2.P08				
D 9.	72,3 / 2	5,9	38,1	24	IGL6540	63.2.K6540.2.P09	0,45	3,5µF / 400 V	2,3	204
D 10.	102 / 2	8,3	27	23	IGL6540	63.2.K6540.2.P10				
D 11.	204 / 2	17	13,5	23	IGL6540	63.2.K6540.2.P11				

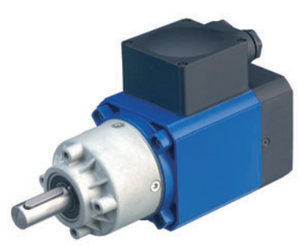
Planetary gearhead Performax® 63 — Closed-frame AC induction motor IGL6560-4 (1360 rpm/28 W 230 V/50 Hz)

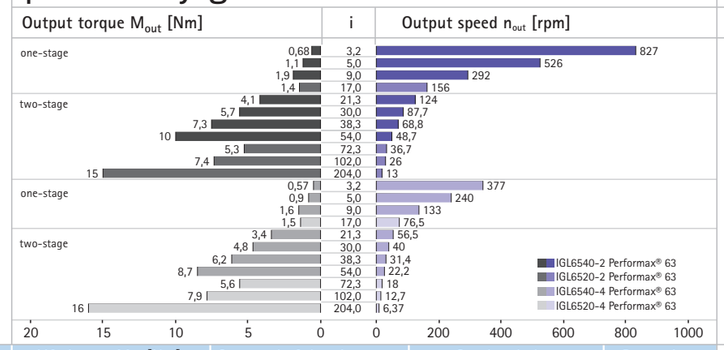
Circuit diagram SB03, page 168

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Capacitor	Weight m [kg]	Length L [mm]
D 12.	3,2 / 1	0,56	428	25	IGL6560	63.1.K6560.4.P01	0,38	4,5µF / 400 V	2,7	202
D 13.	5 / 1	0,88	272	25	IGL6560	63.1.K6560.4.P02				
D 14.	9 / 1	1,6	151	25	IGL6560	63.1.K6560.4.P03				
D 15.	17 / 1	1,5	80	13	IGL6560	63.1.K6560.4.P04				
D 16.	21,3 / 2	3,4	64	23	IGL6560	63.2.K6560.4.P05	0,38	4,5µF / 400 V	2,8	224
D 17.	30 / 2	4,8	45,3	23	IGL6560	63.2.K6560.4.P06				
D 18.	38,3 / 2	6,1	35,6	23	IGL6560	63.2.K6560.4.P07				
D 19.	54 / 2	8,6	25,2	23	IGL6560	63.2.K6560.4.P08				
D 20.	72,3 / 2	5,9	18,8	12	IGL6560	63.2.K6560.4.P09				
D 21.	102 / 2	8,3	13,3	12	IGL6560	63.2.K6560.4.P10				
D 22.	204 / 2	17	6,67	12	IGL6560	63.2.K6560.4.P11				

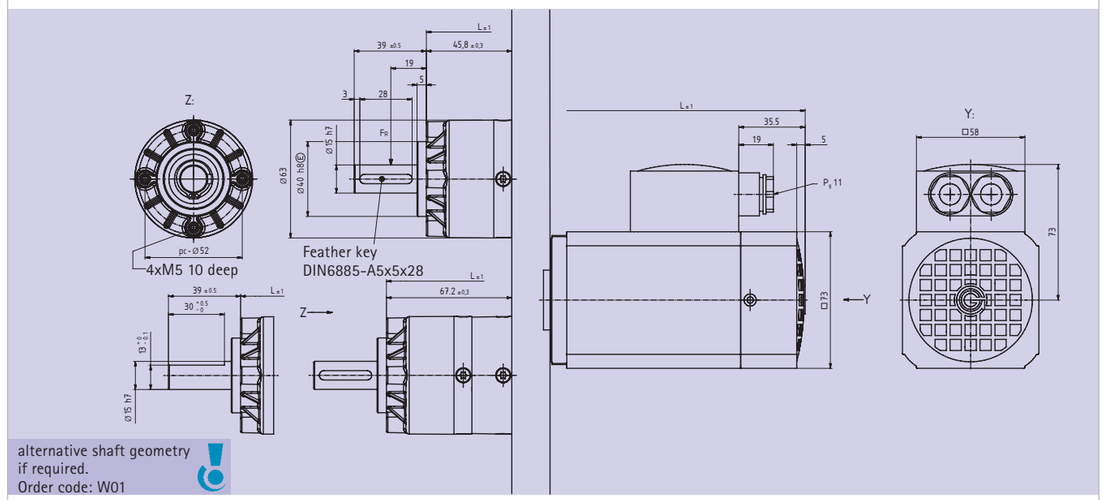
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Closed-frame AC 3-phase motor with planetary gearhead Performax® 63





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 54



Planetary gearhead Performax® 63 — Closed-frame AC 3-phase motor IGL6540-2 (2630 rpm/65 W 400 V/50 Hz) — IGL6520-2 (2650 rpm/25 W 400 V/50 Hz)

Circuit diagram SB10, page 171

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*w	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
D 23.	3,2 / 1	0,68	827	58	IGL6540	63.1.D6540.2.P01	0,25	2,2	182
D 24.	5 / 1	1,1	526	58	IGL6540	63.1.D6540.2.P02			
D 25.	9 / 1	1,9	292	58	IGL6540	63.1.D6540.2.P03			
D 26.	17 / 1	1,4	156	22	IGL6520	63.1.D6520.2.P04	0,17	1,7	162
D 27.	21,3 / 2	4,1	124	53	IGL6540	63.2.D6540.2.P05	0,25	2,3	204
D 28.	30 / 2	5,7	87,7	53	IGL6540	63.2.D6540.2.P06			
D 29.	38,3 / 2	7,3	68,8	53	IGL6540	63.2.D6540.2.P07			
D 30.	54 / 2	10	48,7	53	IGL6540	63.2.D6540.2.P08			
D 31.	72,3 / 2	5,3	36,7	20	IGL6520	63.2.D6520.2.P09	0,17	1,8	184
D 32.	102 / 2	7,4	26	20	IGL6520	63.2.D6520.2.P10			
D 33.	204 / 2	15	13	20	IGL6520	63.2.D6520.2.P11			

Planetary gearhead Performax® 63 — Closed-frame AC 3-phase motor IGL6540-4 (1200 rpm/25 W 400 V/50 Hz) — IGL6520-4 (1300 rpm/13 W 400 V/50 Hz)

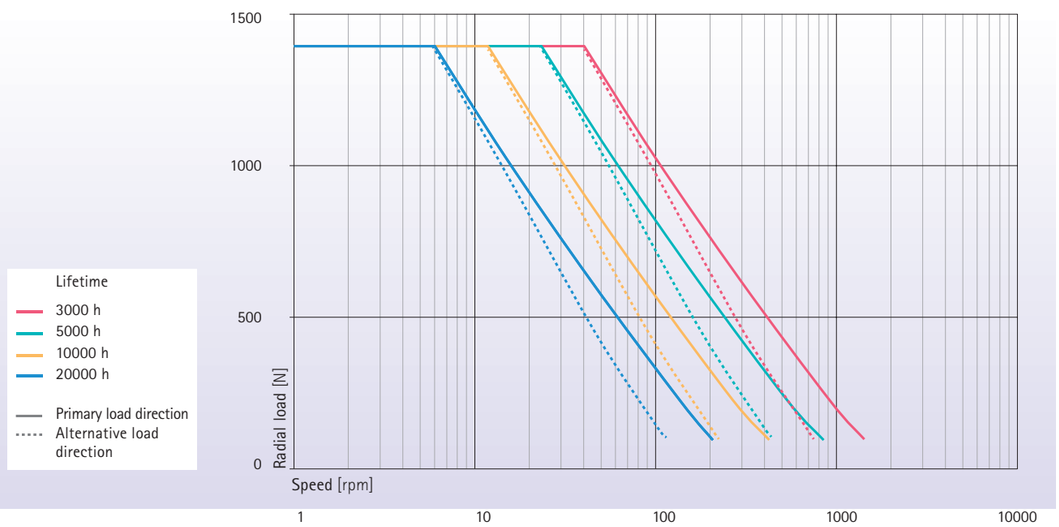
Circuit diagram SB10, page 171

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
D 34.	3,2 / 1	0,57	377	23	IGL6540	63.1.D6540.4.P01	0,16	2,2	182
D 35.	5 / 1	0,9	240	23	IGL6540	63.1.D6540.4.P02			
D 36.	9 / 1	1,6	133	22	IGL6540	63.1.D6540.4.P03			
D 37.	17 / 1	1,5	76,5	12	IGL6520	63.1.D6520.4.P04	0,11	1,7	162
D 38.	21,3 / 2	3,4	56,5	20	IGL6540	63.2.D6540.4.P05	0,16	2,3	204
D 39.	30 / 2	4,8	40	20	IGL6540	63.2.D6540.4.P06			
D 40.	38,3 / 2	6,2	31,4	20	IGL6540	63.2.D6540.4.P07			
D 41.	54 / 2	8,7	22,2	20	IGL6540	63.2.D6540.4.P08			
D 42.	72,3 / 2	5,6	18	11	IGL6520	63.2.D6520.4.P09	0,11	1,8	184
D 43.	102 / 2	7,9	12,7	11	IGL6520	63.2.D6520.4.P10			
D 44.	204 / 2	16	6,37	11	IGL6520	63.2.D6520.4.P11			

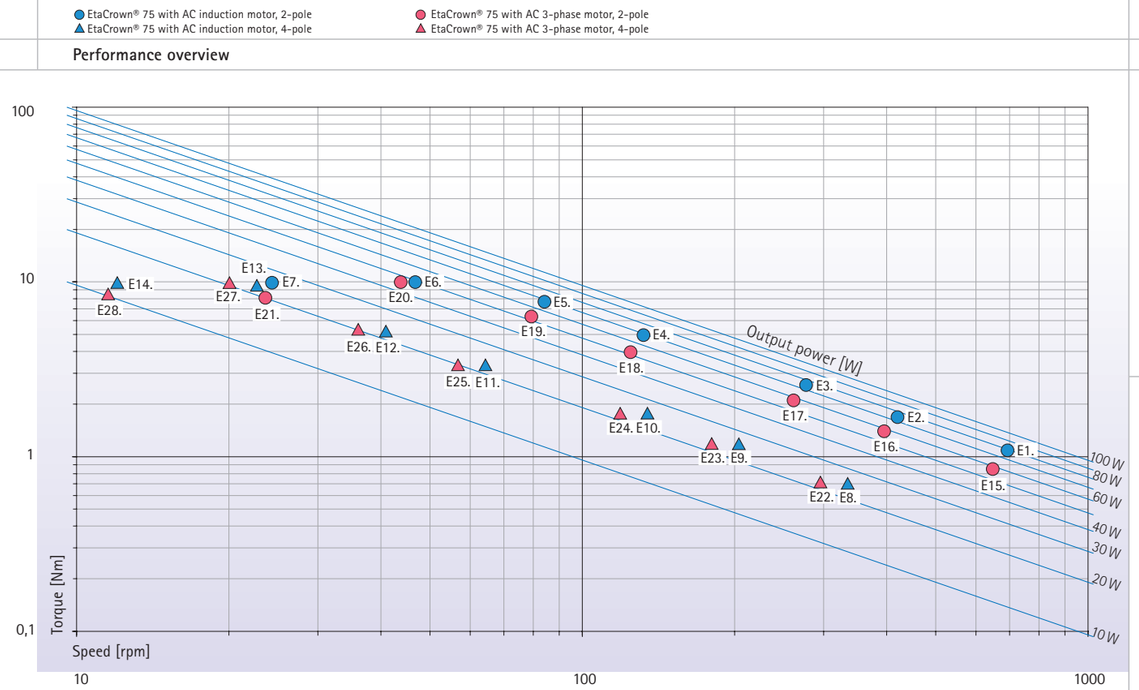
*maximum continuous output torque · M_{max}[Nm] see page 24-25

Closed-frame AC induction motor with crown gearhead EtaCrown®

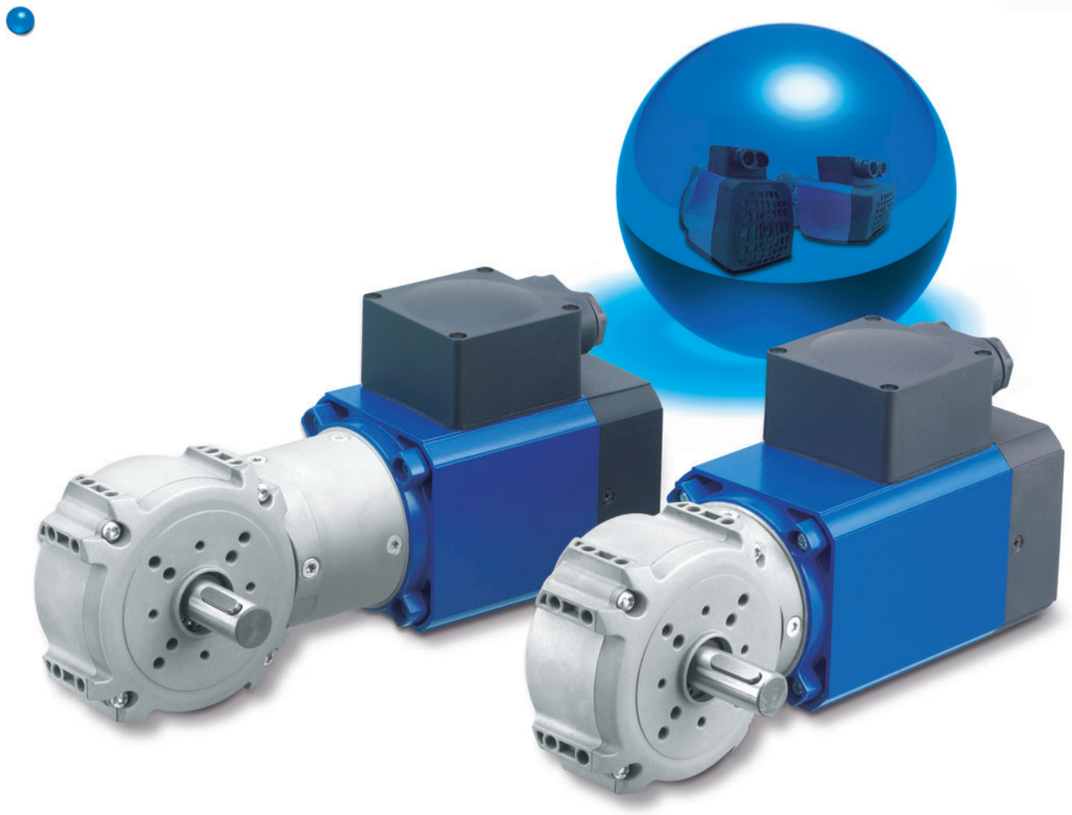
Radial load overview



Performance overview



The innovative bevel gearhead – smaller, more efficient, more powerful.



Closed AC motor with crown gearhead EtaCrown®

EtaCrown® – the bevel gearhead using crown gearhead technology breaks through technological boundaries and redefines application possibilities. Thanks to intensive development work, we have been able to make bevel gearheads more powerful, smaller and more efficient, and to manufacture them more economically. Their unique technology offers a multitude of advantages.

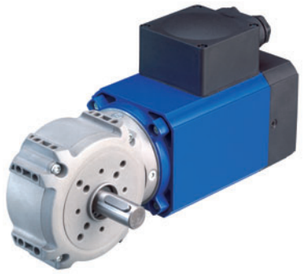
Thanks to its technological lead, EtaCrown® stands out in terms of power, design, energy efficiency and functionality. The efficiency rate is between 80 and 95 %.

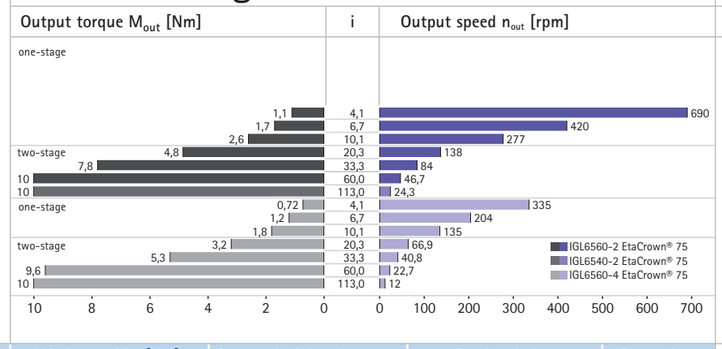
The perfectly optimised smooth running gears, typical for ZEITLAUF® are also applicable for the EtaCrown® series. The noise reduction is ensured by the optimised bearing design and intelligent selection of tooth materials.

Induction motors (1-phase) and three-phase alternating current motors provide greater output power and better efficiency than robust shaded-pole AC motors. The ball bearings of the drive shaft guarantee a long lifetime.

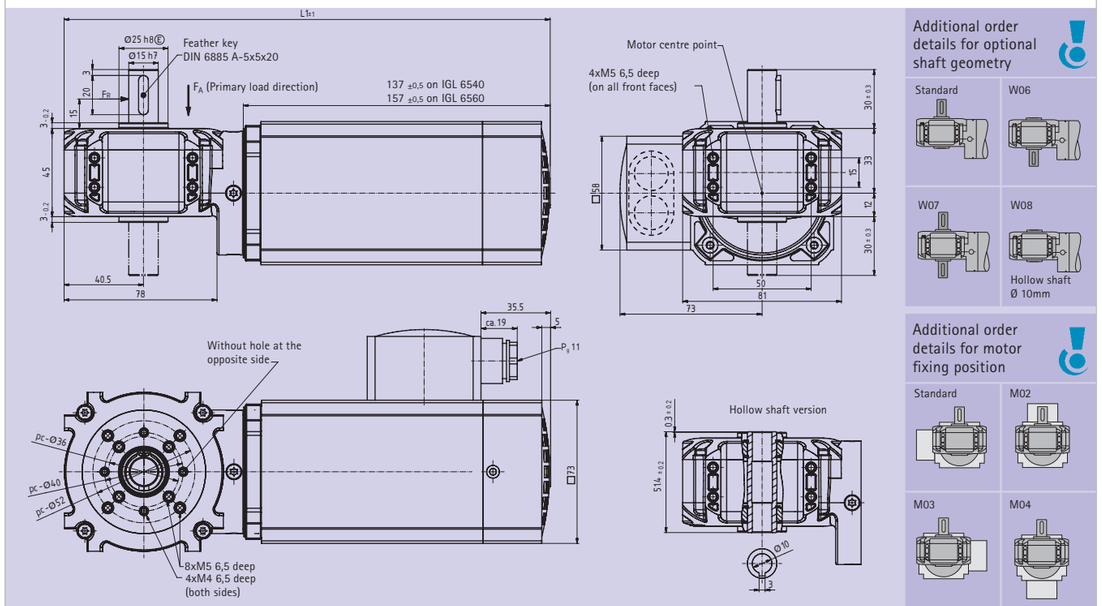
- optimum efficiency due to the use of crown technology
- no automatic lock
- large range of attachment possibilities with 5 fixing planes
- crown (with one-stage gears) or planetary wheels and hollow wheel (with two-stage gears) made of plastic with optimised sliding properties for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- four output shaft variants (one-sided, left / one-sided, right / two-sided / hollow shaft) available
- powerful and long-life AC motors
- insulation class B
- an operating capacitor is required for induction motors (delivery included)
- gearhead lifetime of 5,000 hours (operating factor c_B = 1)
- protection class IP 54
- maintenance-free grease lubricated for life
- ambient temperature -20°C to +80°C

Closed-frame AC induction motor with crown gearhead EtaCrown® 75





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 48	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 54



Additional order details for optional shaft geometry

Additional order details for motor fixing position

Crown gearhead EtaCrown® 75 — Closed-frame AC induction motor — Circuit diagram SB02, page 168

IGL6560-2 2800 rpm/85 W 230 V/50 Hz

IGL6540-2 2750 rpm/45 W 230 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Capacitor	Weight m [kg]	Length L [mm]
E 1.	4,1 / 1	1,1	690	77	IGL6560	75.1.K6560.2.E01				
E 2.	6,7 / 1	1,7	420	77	IGL6560	75.1.K6560.2.E02	0,6	4,5 µF / 400V	3,2	248
E 3.	10,1 / 1	2,6	277	77	IGL6560	75.1.K6560.2.E03				
E 4.	20,3 / 2	4,8	138	69	IGL6560	75.2.K6560.2.E04				
E 5.	33,3 / 2	7,8	84	69	IGL6560	75.2.K6560.2.E05	0,6	4,5 µF / 400V	3,6	284
E 6.	60 / 2	10	46,7	49	IGL6560	75.2.K6560.2.E06				
E 7.	113 / 2	10	24,3	25	IGL6540	75.2.K6540.2.E07	0,45	3,5µF / 400V	3,1	264

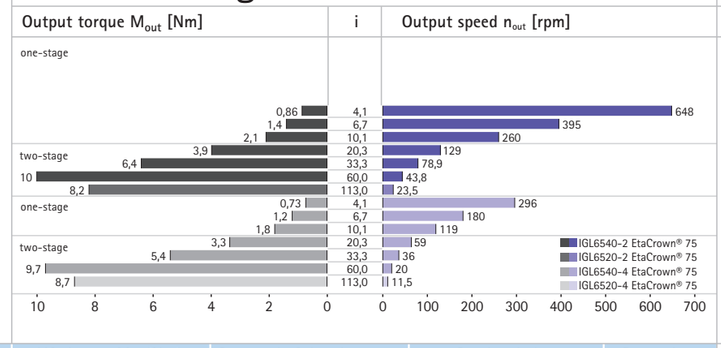
Crown gearhead EtaCrown® 75 — Closed-frame AC induction motor — Circuit diagram SB03, page 168

IGL6560-4 1360 rpm/28 W 230 V/50 Hz

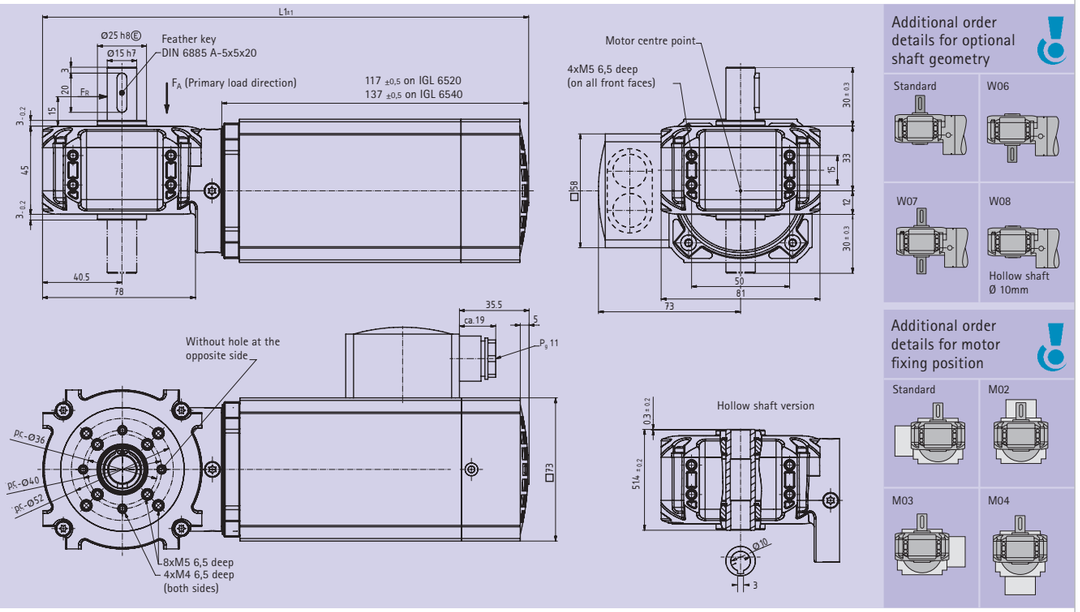
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Capacitor	Weight m [kg]	Length L [mm]
E 8.	4,1 / 1	0,72	335	25	IGL6560	75.1.K6560.4.E01				
E 9.	6,7 / 1	1,2	204	25	IGL6560	75.1.K6560.4.E02	0,38	4,5µF / 400V	3,2	248
E 10.	10,1 / 1	1,8	135	25	IGL6560	75.1.K6560.4.E03				
E 11.	20,3 / 2	3,2	66,9	23	IGL6560	75.2.K6560.4.E04				
E 12.	33,3 / 2	5,3	40,8	23	IGL6560	75.2.K6560.4.E05	0,38	4,5µF / 400V	3,6	284
E 13.	60 / 2	9,6	22,7	23	IGL6560	75.2.K6560.4.E06				
E 14.	113 / 2	10	12	13	IGL6560	75.2.K6560.4.E07				

*maximum continuous output torque · M_{max}[Nm] see page 24-25

Closed-frame AC 3-phase motor with crown gearhead EtaCrown® 75



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 48	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 54



Additional order details for optional shaft geometry

Additional order details for motor fixing position

Crown gearhead EtaCrown® 75 — Closed-frame AC 3-phase motor — Circuit diagram SB10, page 171

IGL6540-2 2630 rpm/65 W 400 V/50 Hz

IGL6520-2 2650 rpm/25 W 400 V/50 Hz

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
E 15.	4,1 / 1	0,86	648	58	IGL6540	75.1.D6540.2.E01			
E 16.	6,7 / 1	1,4	395	58	IGL6540	75.1.D6540.2.E02	0,25	2,7	228
E 17.	10,1 / 1	2,1	260	58	IGL6540	75.1.D6540.2.E03			
E 18.	20,3 / 2	3,9	129	53	IGL6540	75.2.D6540.2.E04			
E 19.	33,3 / 2	6,4	78,9	53	IGL6540	75.2.D6540.2.E05	0,25	3,1	264
E 20.	60 / 2	10	43,8	46	IGL6540	75.2.D6540.2.E06			
E 21.	113 / 2	8,2	23,5	20	IGL6520	75.2.D6520.2.E07	0,17	2,6	244

Crown gearhead EtaCrown® 75 — Closed-frame AC 3-phase motor — Circuit diagram SB10, page 171

IGL6540-4 1200 rpm/25 W 400 V/50 Hz

IGL6520-4 1300 rpm/13 W 400 V/50 Hz

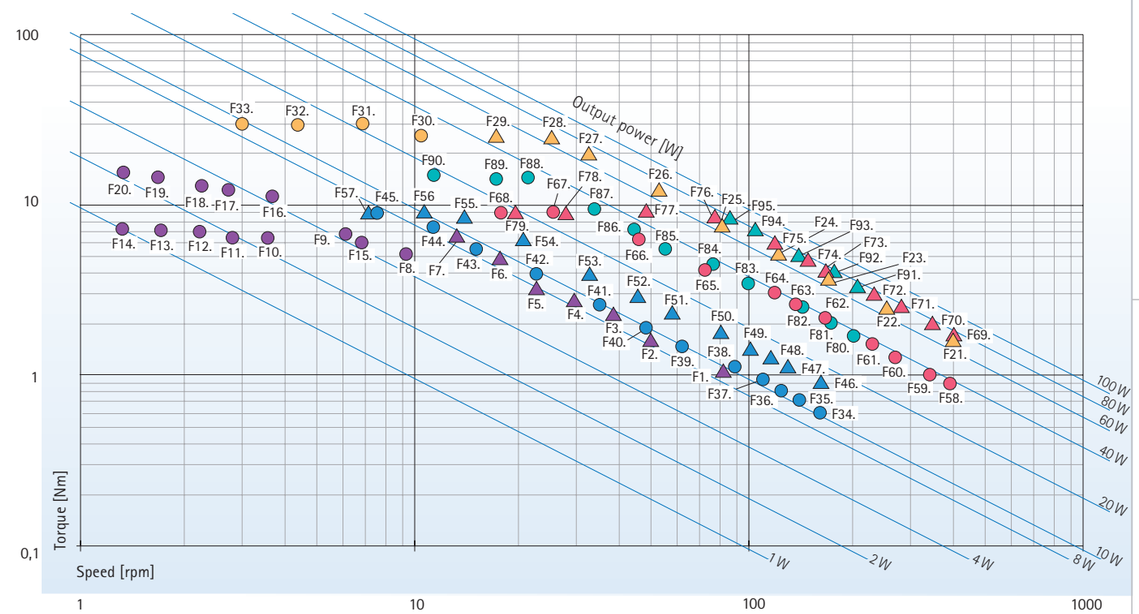
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
E 22.	4,1 / 1	0,73	296	23	IGL6540	75.1.D6540.4.E01			
E 23.	6,7 / 1	1,2	180	23	IGL6540	75.1.D6540.4.E02	0,16	2,7	228
E 24.	10,1 / 1	1,8	119	23	IGL6540	75.1.D6540.4.E03			
E 25.	20,3 / 2	3,3	59	20	IGL6540	75.2.D6540.4.E04			
E 26.	33,3 / 2	5,4	36	20	IGL6540	75.2.D6540.4.E05	0,16	3,1	264
E 27.	60 / 2	9,7	20	20	IGL6540	75.2.D6540.4.E06			
E 28.	113 / 2	8,7	11,5	11	IGL6520	75.2.D6520.4.E07	0,11	2,6	244

*maximum continuous output torque · M_{max}[Nm] see page 24-25

Compact design
and flexible speed.

Flatline 78 with BCI4225
Flatline 78 with M4210
Flatline 85 with BCI6355
Flatline 85 with BCI6325
Compactline 90 with BCI4225
Compactline 90 with BCI4240
Compactline 91 with BCI6325
Compactline 91 with BCI6355
Compactline 92 with BCI6325
Compactline 92 with BCI6355

Performance overview



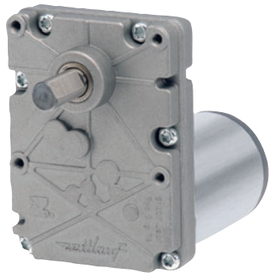
Permanent magnet DC motor with spur gearhead Compactline / Flatline

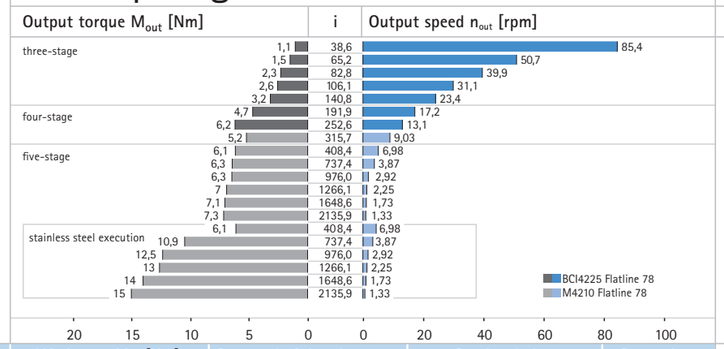
For the Compactline series we engineered the largest possible wheel width providing good overlap between the motor shaft and the combing gear wheel in the first stage. The first stage gear wheel is made of plastic. This design makes the gearhead extremely quiet. If it needs to be more flat, you should choose a gearhead of the Flatline series.

Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide nominal torque and speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop or closed-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3000 hours (operating factor c_B=1).

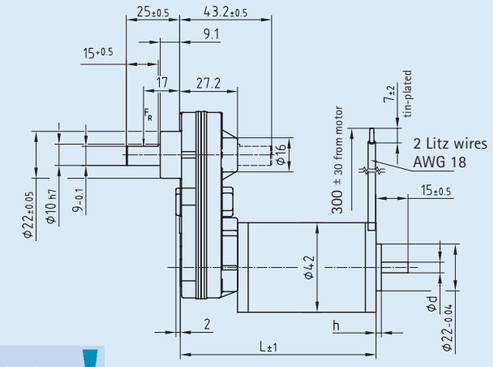
- flat and compact gearhead design
- noise-optimised helical teeth in the input stage
- plastic wheels with optimum sliding properties in the first stage for additional noise reduction
- selectable in sintered material or in steel execution for Flatline 78
- ground and hardened output shaft (diameter tolerance h7)
- motors can be fitted with suitable brake to the motor size and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power supplies are available optional (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance free – grease lubricated for life
- ambient temperature 0 °C to +40 °C

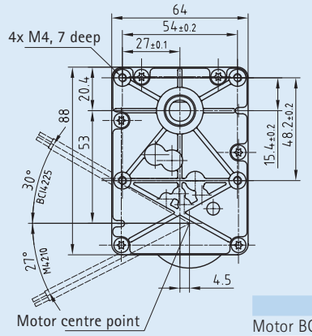
Permanent magnet DC motor with spur gearhead Flatline 78





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
300 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,8° to 1,8° depending on reduction	IP 40





	d	h
Motor BCI 4225	5g5	2
Motor M 4210	5k5	2,5

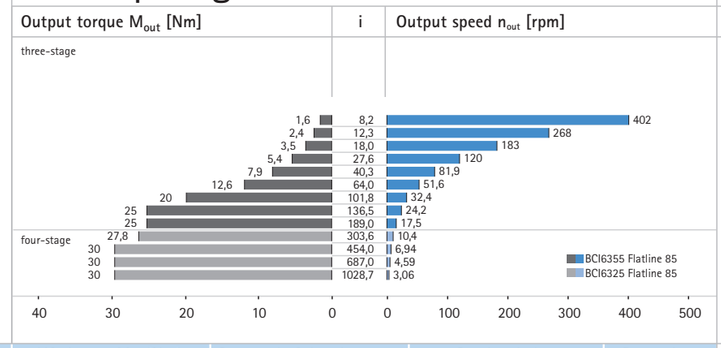
Output shaft on opposite side, optional order add on: W03

Spur gearhead	Permanent magnet DC motor							
Flatline 78	BCI4225	3300 rpm/13 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 1.	38,6 / 3	1,1	85,4	9,5	78.3.4225.F20	0,83	0,7	97
F 2.	65,2 / 3	1,5	50,7	8	78.3.4225.F21			
F 3.	82,8 / 3	2,3	39,9	9,5	78.3.4225.F22			
F 4.	106,1 / 3	2,6	31,1	8,5	78.3.4225.F23			
F 5.	140,8 / 3	3,2	23,4	7,9	78.3.4225.F24			
F 6.	191,9 / 4	4,7	17,2	8,5	78.4.4225.F25	0,83	0,7	97
F 7.	252,6 / 4	6,2	13,1	8,5	78.4.4225.F26			

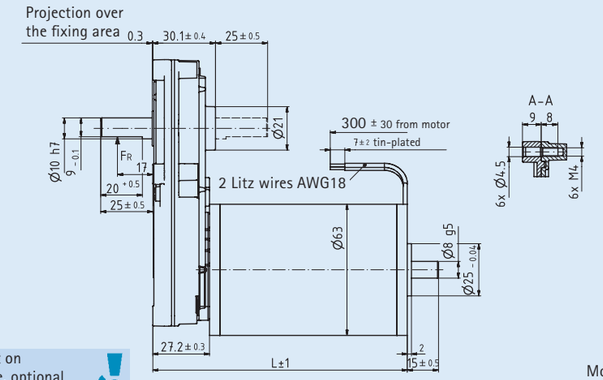
Spur gearhead	Permanent magnet DC motor							
Flatline 78	M4210	2850 rpm/7,5 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 8.	315,7 / 4	5,2	9,03	4,9	78.4.4210.F27	0,7	0,7	92
F 9.	408,4 / 5	6,1	6,98	4,4	78.5.4210.F28	0,7	0,7	92
F 10.	737,4 / 5	6,3	3,87	2,5	78.5.4210.F29			
F 11.	976 / 5	6,3	2,92	1,9	78.5.4210.F30			
F 12.	1266,1 / 5	7	2,25	1,6	78.5.4210.F31			
F 13.	1648,6 / 5	7,1	1,73	1,3	78.5.4210.F32			
F 14.	2135,9 / 5	7,3	1,33	1	78.5.4210.F33			
F 15.	408,4 / 5	6,1**	6,98	4,4	78.5.4210.F40	0,7	0,7	92
F 16.	737,4 / 5	10,9**	3,87	4,4	78.5.4210.F41			
F 17.	976 / 5	12,5**	2,92	3,8	78.5.4210.F42			
F 18.	1266,1 / 5	13**	2,25	3,1	78.5.4210.F43			
F 19.	1648,6 / 5	14**	1,73	2,5	78.5.4210.F44			
F 20.	2135,9 / 5	15**	1,33	2,1	78.5.4210.F45			

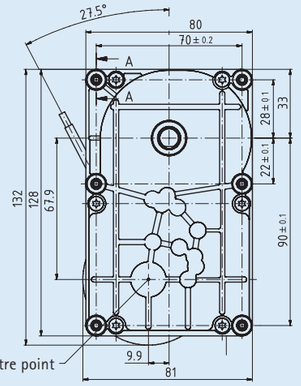
Add-on components	BCI4225			M4210		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B01	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02

Permanent magnet DC motor with spur gearhead Flatline 85



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,8° to 1,6° depending on reduction	IP 40





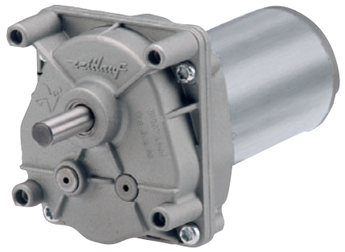
Output shaft on opposite side, optional order add on: W03

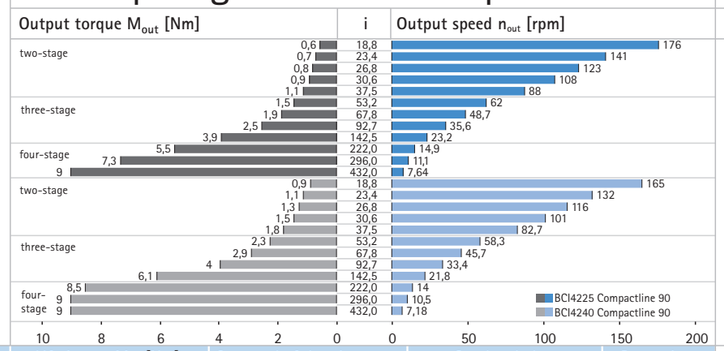
Spur gearhead	Permanent magnet DC motor							
Flatline 85	BCI6355	3300 rpm/93 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 21.	8,2 / 3	1,6	402	68	85.3.6355.F01	4,9	2,2	152
F 22.	12,3 / 3	2,4	268	68	85.3.6355.F02			
F 23.	18 / 3	3,5	183	68	85.3.6355.F03			
F 24.	27,6 / 3	5,4	120	68	85.3.6355.F04			
F 25.	40,3 / 3	7,9	81,9	68	85.3.6355.F05			
F 26.	64 / 3	12,6	51,6	68	85.3.6355.F06			
F 27.	101,8 / 3	20	32,4	68	85.3.6355.F07			
F 28.	136,5 / 3	25	24,2	63	85.3.6355.F08			
F 29.	189 / 3	25	17,5	46	85.3.6355.F09			

Spur gearhead	Permanent magnet DC motor							
Flatline 85	BCI6325	3150 rpm/46 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 30.	303,6 / 4	27,8	10,4	30	85.4.6325.F10	2,7	1,8	122
F 31.	454 / 4	30	6,94	22	85.4.6325.F11			
F 32.	687 / 4	30	4,59	14	85.4.6325.F12			
F 33.	1028,7 / 4	30	3,06	9,6	85.4.6325.F13			

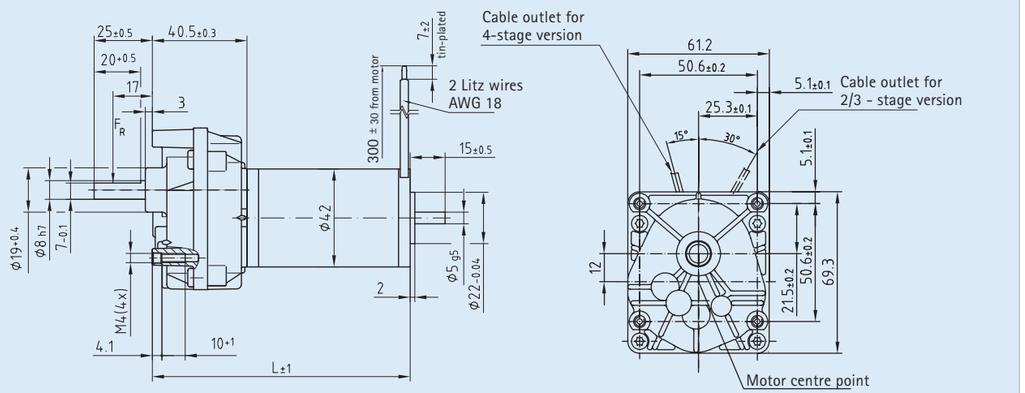
Add-on components	BCI6355			BCI6325		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02	B03	G01-G05	CAN01, E01-E08, S01-S02

Permanent magnet DC motor with spur gearhead Compactline 90





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
120 N	40 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,6° depending on reduction	IP 40



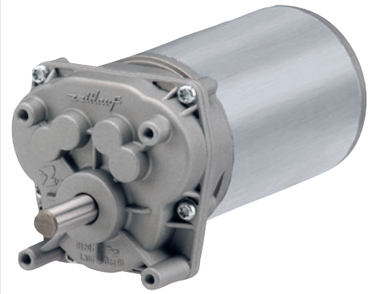
Spur gearhead	Permanent magnet DC motor		Add-on components		
Compactline 90	BCI4225	3300 rpm/13 W 24 V	Brake B01	Encoder G01-G05	Electronics CAN01, E01-E08, S01-S02

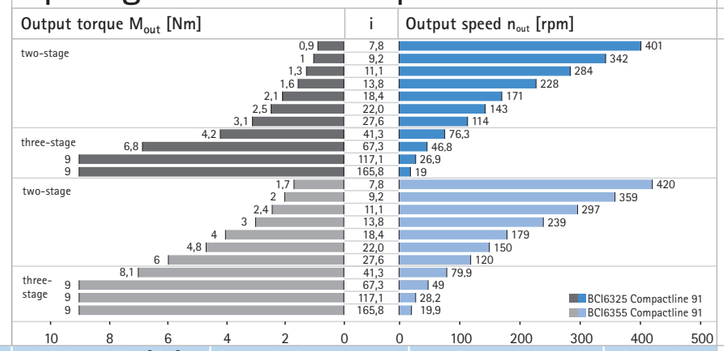
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 34.	18,8 / 2	0,6	176	11	90.2.4225.C01	0,83	0,7	111
F 35.	23,4 / 2	0,7	141	11	90.2.4225.C02			
F 36.	26,8 / 2	0,8	123	11	90.2.4225.C03			
F 37.	30,6 / 2	0,9	108	11	90.2.4225.C04			
F 38.	37,5 / 2	1,1	88	11	90.2.4225.C05			
F 39.	53,2 / 3	1,5	62	9,5	90.3.4225.C06	0,83	0,7	111
F 40.	67,8 / 3	1,9	48,7	9,5	90.3.4225.C07			
F 41.	92,7 / 3	2,5	35,6	9,5	90.3.4225.C08			
F 42.	142,5 / 3	3,9	23,2	9,5	90.3.4225.C09			
F 43.	222 / 4	5,5	14,9	8,5	90.4.4225.C10	0,83	0,8	111
F 44.	296 / 4	7,3	11,1	8,5	90.4.4225.C11			
F 45.	432 / 4	9	7,64	7,2	90.4.4225.C12			

Spur gearhead	Permanent magnet DC motor		Add-on components		
Compactline 90	BCI4240	3100 rpm/19 W 24 V	Brake B01	Encoder G01-G05	Electronics CAN01, E01-E08, S01-S02

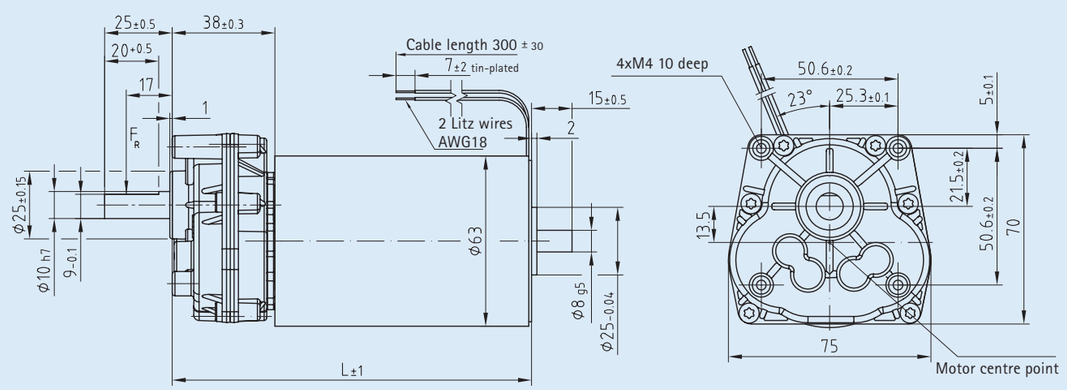
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 46.	18,8 / 2	0,9	165	15	90.2.4240.C13	1,2	0,8	126
F 47.	23,4 / 2	1,1	132	15	90.2.4240.C14			
F 48.	26,8 / 2	1,3	116	15	90.2.4240.C15			
F 49.	30,6 / 2	1,5	101	15	90.2.4240.C16			
F 50.	37,5 / 2	1,8	82,7	15	90.2.4240.C17			
F 51.	53,2 / 3	2,3	58,3	14	90.3.4240.C18	1,2	0,8	126
F 52.	67,8 / 3	2,9	45,7	14	90.3.4240.C19			
F 53.	92,7 / 3	4	33,4	14	90.3.4240.C20			
F 54.	142,5 / 3	6,1	21,8	14	90.3.4240.C21			
F 55.	222 / 4	8,5	14	12	90.4.4240.C22	1,2	0,9	126
F 56.	296 / 4	9	10,5	9,9	90.4.4240.C23			
F 57.	432 / 4	9	7,18	6,8	90.4.4240.C24			

Permanent magnet DC motor with spur gearhead Compactline 91





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



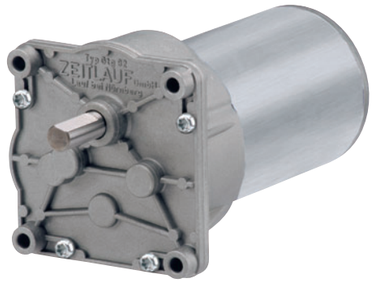
Spur gearhead	Permanent magnet DC motor		Add-on components		
Compactline 91	BCI6325	3150 rpm/46 W 24 V	Brake B03	Encoder G01-G05	Electronics CAN01, E01-E08, S01-S02

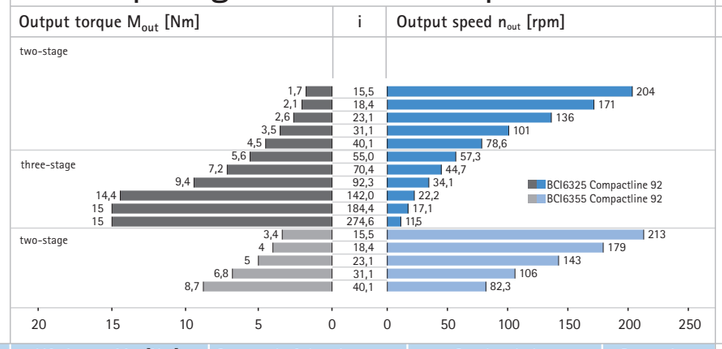
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 58.	7,8 / 2	0,9	401	37	91.2.6325.C01	2,7	1,6	133
F 59.	9,2 / 2	1	342	37	91.2.6325.C02			
F 60.	11,1 / 2	1,3	284	37	91.2.6325.C03			
F 61.	13,8 / 2	1,6	228	37	91.2.6325.C04			
F 62.	18,4 / 2	2,1	171	37	91.2.6325.C05			
F 63.	22 / 2	2,5	143	37	91.2.6325.C06			
F 64.	27,6 / 2	3,1	114	37	91.2.6325.C07			
F 65.	41,3 / 3	4,2	76,3	34	91.3.6325.C08	2,7	1,6	133
F 66.	67,3 / 3	6,8	46,8	34	91.3.6325.C09			
F 67.	117,1 / 3	9	26,9	25	91.3.6325.C10			
F 68.	165,8 / 3	9	19	18	91.3.6325.C11			

Spur gearhead	Permanent magnet DC motor		Add-on components		
Compactline 91	BCI6355	3300 rpm/93 W 24 V	Brake B03	Encoder G01-G05	Electronics CAN01, E01-E08, S02

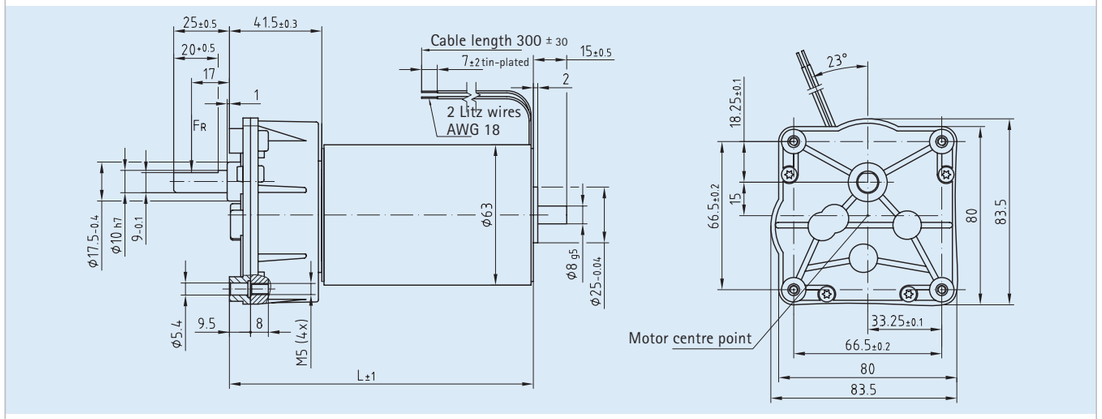
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 69.	7,8 / 2	1,7	420	75	91.2.6355.C01	4,9	2,1	163
F 70.	9,2 / 2	2	359	75	91.2.6355.C02			
F 71.	11,1 / 2	2,4	297	75	91.2.6355.C03			
F 72.	13,8 / 2	3	239	75	91.2.6355.C04			
F 73.	18,4 / 2	4	179	75	91.2.6355.C05			
F 74.	22 / 2	4,8	150	75	91.2.6355.C06			
F 75.	27,6 / 2	6	120	75	91.2.6355.C07			
F 76.	41,3 / 3	8,1	79,9	68	91.3.6355.C08	4,9	2,1	163
F 77.	67,3 / 3	9	49	46	91.3.6355.C09			
F 78.	117,1 / 3	9	28,2	27	91.3.6355.C10			
F 79.	165,8 / 3	9	19,9	19	91.3.6355.C11			

Permanent magnet DC motor with spur gearhead Compactline 92





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	Combined sliding needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



Spur gearhead	Permanent magnet DC motor							
Compactline 92	BCI6325	3150 rpm/46 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 80.	15,5 / 2	1,7	204	37	92.2.6325.C01	2,7	1,6	137
F 81.	18,4 / 2	2,1	171	37	92.2.6325.C02			
F 82.	23,1 / 2	2,6	136	37	92.2.6325.C03			
F 83.	31,1 / 2	3,5	101	37	92.2.6325.C04			
F 84.	40,1 / 2	4,5	78,6	37	92.2.6325.C05			
F 85.	55 / 3	5,6	57,3	34	92.3.6325.C06	2,7	1,7	137
F 86.	70,4 / 3	7,2	44,7	34	92.3.6325.C07			
F 87.	92,3 / 3	9,4	34,1	34	92.3.6325.C08			
F 88.	142 / 3	14,4	22,2	34	92.3.6325.C09			
F 89.	184,4 / 3	15	17,1	27	92.3.6325.C10			
F 90.	274,6 / 3	15	11,5	18	92.3.6325.C11			

Spur gearhead	Permanent magnet DC motor							
Compactline 92	BCI6355	3300 rpm/93 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
F 91.	15,5 / 2	3,4	213	75	92.2.6355.C12	4,9	2,1	167
F 92.	18,4 / 2	4	179	75	92.2.6355.C13			
F 93.	23,1 / 2	5	143	75	92.2.6355.C14			
F 94.	31,1 / 2	6,8	106	75	92.2.6355.C15			
F 95.	40,1 / 2	8,7	82,3	75	92.2.6355.C16			

Add-on components	BCI6325			BCI6355		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02	B03	G01-G05	CAN01, E01-E08, S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

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Permanent magnet DC motor with planetary gearhead Performax®

The unique new performance class with regard to power density, silent running and flexibility.

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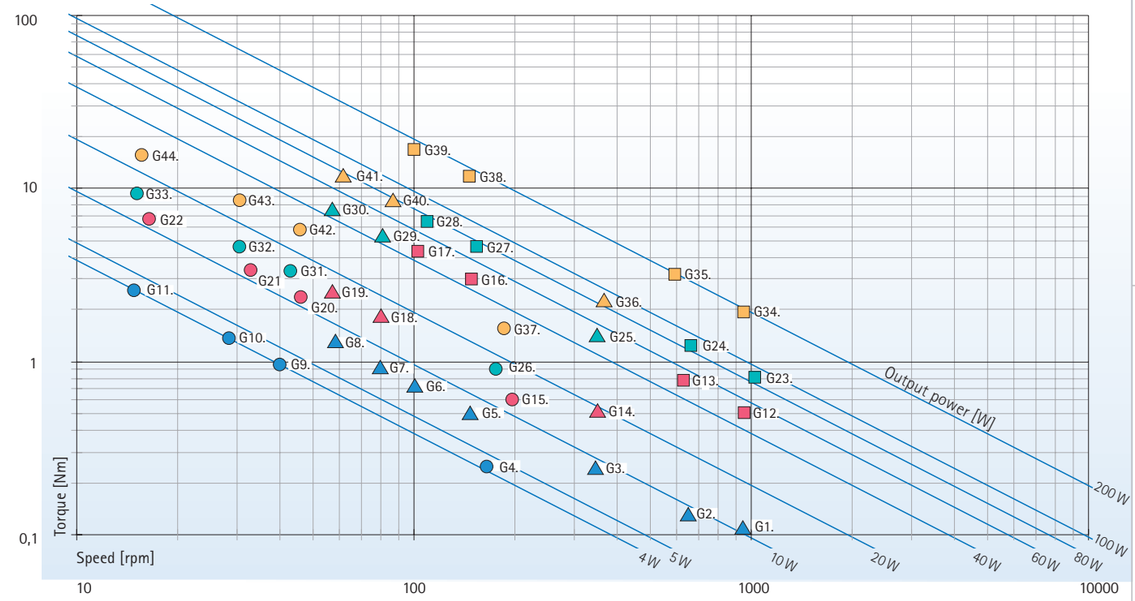
Performax® 32 with M2820
Performax® 42 with BCI4225
Performax® 42 with BCI4240
Performax® 42 with BCI5260
Performax® 52 with BCI4240
Performax® 52 with BCI5260
Performax® 52 with BCI6355
Performax® 63 with BCI6325
Performax® 63 with BCI6355
Performax® 63 with M8080

Performance overview



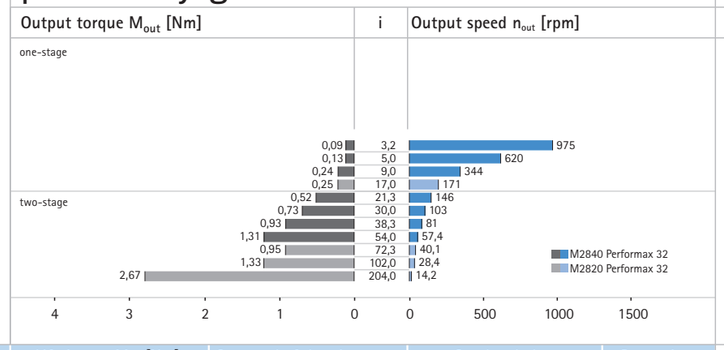
Permanent magnet DC motor with planetary gearhead Performax®

The drives of the Performax® series are a milestone in gearhead technology. An innovative (patent pending) planetary gearhead assembly concept is being used for the first time. Performax® drives combine high performance and silent running. Compared with other similar specified products on the market, Performax® gearheads offer very high power density and excellent smooth running.

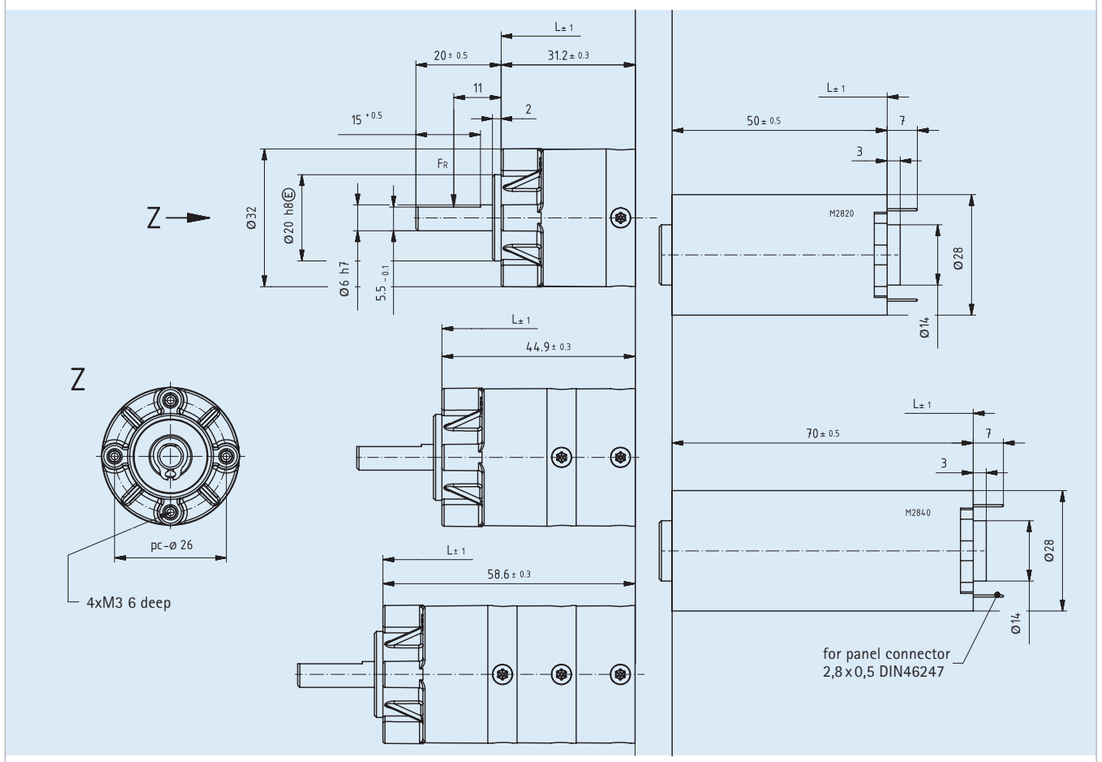
Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide nominal torque and nominal speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop or closed-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3000 hours (operating factor c_B=1).

- patent pending modular design
- noise-optimised helical teeth in the input stage
- planetary wheels and hollow wheel in the first stage made of plastic with optimised sliding properties for additional noise reduction
- hardened steel planetary wheels running on bearings (slide bearings in the case of Pgp32) with zinc diecast spur teeth in the second stage
- ground and hardened output shaft (diameter tolerance h7)
- two output shaft variants (feather key / face) available
- motors can be fitted with suitable brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power supplies are optional (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance free – grease lubricated for life
- ambient temperature 0 °C to +40 °C

Permanent magnet DC motor with planetary gearhead Performax® 32



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	150 N	5000 h Operating factor c_B=1	combined sliding/ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 30

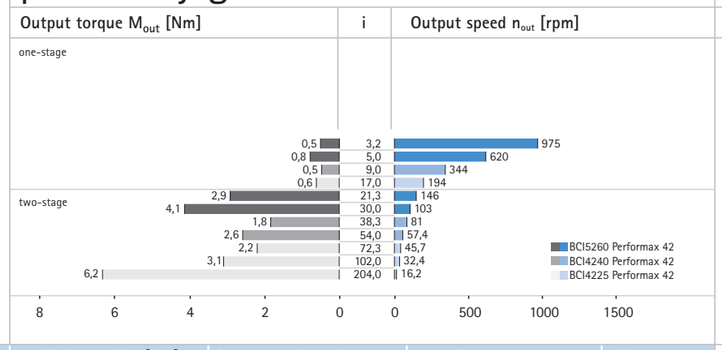


Planetary gearhead	Permanent magnet DC motor							
Performax® 32	M2840 3100 rpm/9,7 W 24 V				M2820 2900 rpm/4,9 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
G 1.	3,2 / 1	0,09	975	8,7	M2840	32.1.2840.P01	0,81	0,31	101
G 2.	5 / 1	0,13	620	8,7	M2840	32.1.2840.P02	0,81	0,31	101
G 3.	9 / 1	0,24	344	8,7	M2840	32.1.2840.P03	0,81	0,34	115
G 4.	17 / 1	0,25	171	4,4	M2820	32.1.2820.P04	0,45	0,27	95
G 5.	21,3 / 2	0,52	146	7,9	M2840	32.2.2840.P05	0,81	0,36	115
G 6.	30 / 2	0,73	103	7,9	M2840	32.2.2840.P06	0,81	0,36	115
G 7.	38,3 / 2	0,93	81	7,9	M2840	32.2.2840.P07	0,81	0,39	129
G 8.	54 / 2	1,31	57,4	7,9	M2840	32.2.2840.P08	0,81	0,39	129
G 9.	72,3 / 2	0,95	40,1	4	M2820	32.2.2820.P09	0,45	0,32	109
G 10.	102 / 2	1,33	28,4	4	M2820	32.2.2820.P10	0,45	0,32	109
G 11.	204 / 2	2,67	14,2	4	M2820	32.2.2820.P11	0,45	0,32	109

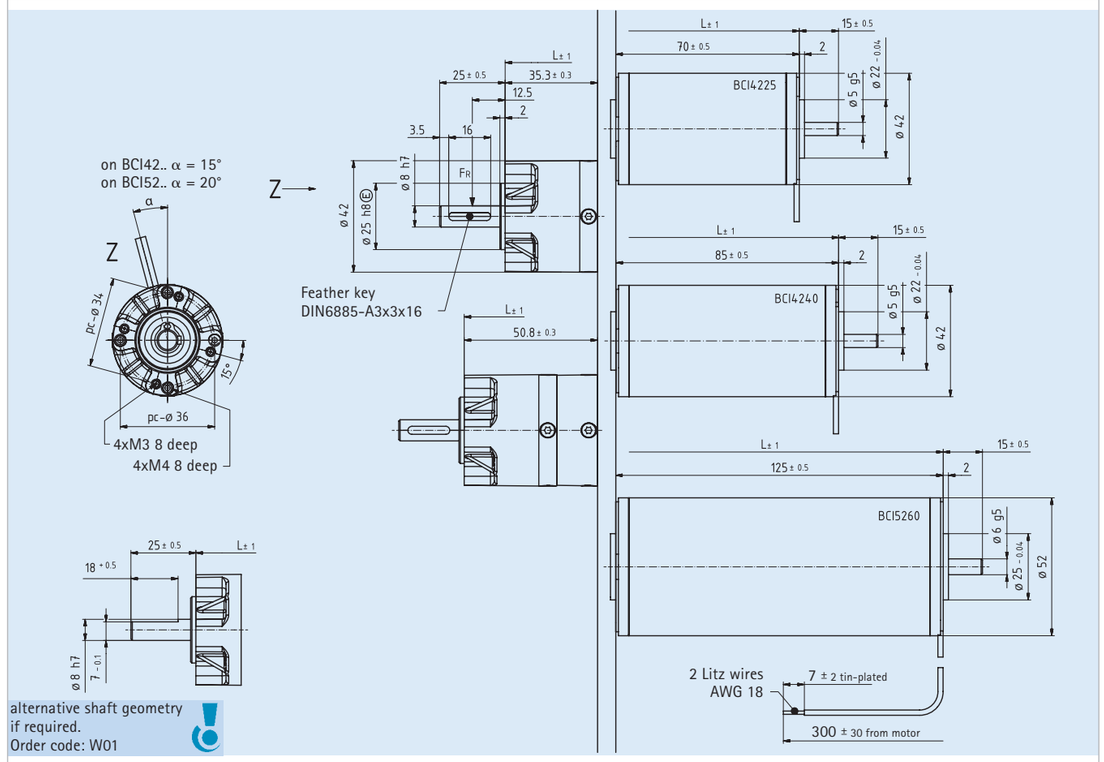
Add-on components	M2840	M2820
	Electronics	Electronics
	CAN01, E01-E08, S01-S02	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Electronics: Page 158-167

Permanent magnet DC motor with planetary gearhead Performax® 42



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
250 N	150 N	5000 h Operating factor c_B=1	combined sliding/ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40

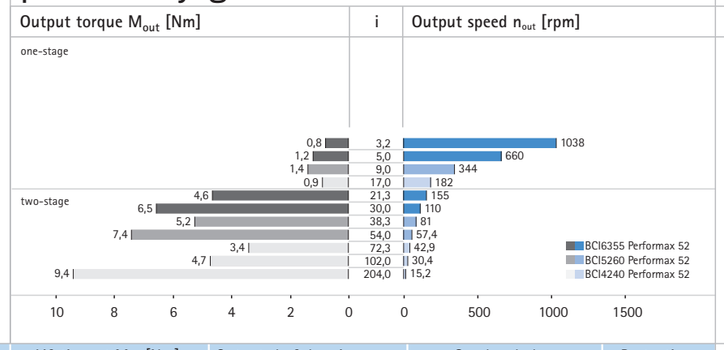


Planetary gearhead	Permanent magnet DC motor							
Performax® 42	BCI5260 3100 rpm/55 W 24 V				BCI4240 3100 rpm/19 W 24 V		BCI4225 3300 rpm/13 W 24 V	
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
G 12.	3,2 / 1	0,5	975	50	BCI5260	42.1.5260.P01	3	1,29	160
G 13.	5 / 1	0,8	620	50	BCI5260	42.1.5260.P02	3	1,29	160
G 14.	9 / 1	0,5	344	17	BCI4240	42.1.4240.P03	1,2	0,69	120
G 15.	17 / 1	0,6	194	12	BCI4225	42.1.4225.P04	0,83	0,59	105
G 16.	21,3 / 2	2,9	146	45	BCI5260	42.2.5260.P05	3	1,39	176
G 17.	30 / 2	4,1	103	45	BCI5260	42.2.5260.P06	3	1,39	176
G 18.	38,3 / 2	1,8	81	15	BCI4240	42.2.4240.P07	1,2	0,79	136
G 19.	54 / 2	2,6	57,4	15	BCI4240	42.2.4240.P08	1,2	0,79	136
G 20.	72,3 / 2	2,2	45,7	11	BCI4225	42.2.4225.P09	0,83	0,69	121
G 21.	102 / 2	3,1	32,4	11	BCI4225	42.2.4225.P10	0,83	0,69	121
G 22.	204 / 2	6,2	16,2	11	BCI4225	42.2.4225.P11	0,83	0,69	121

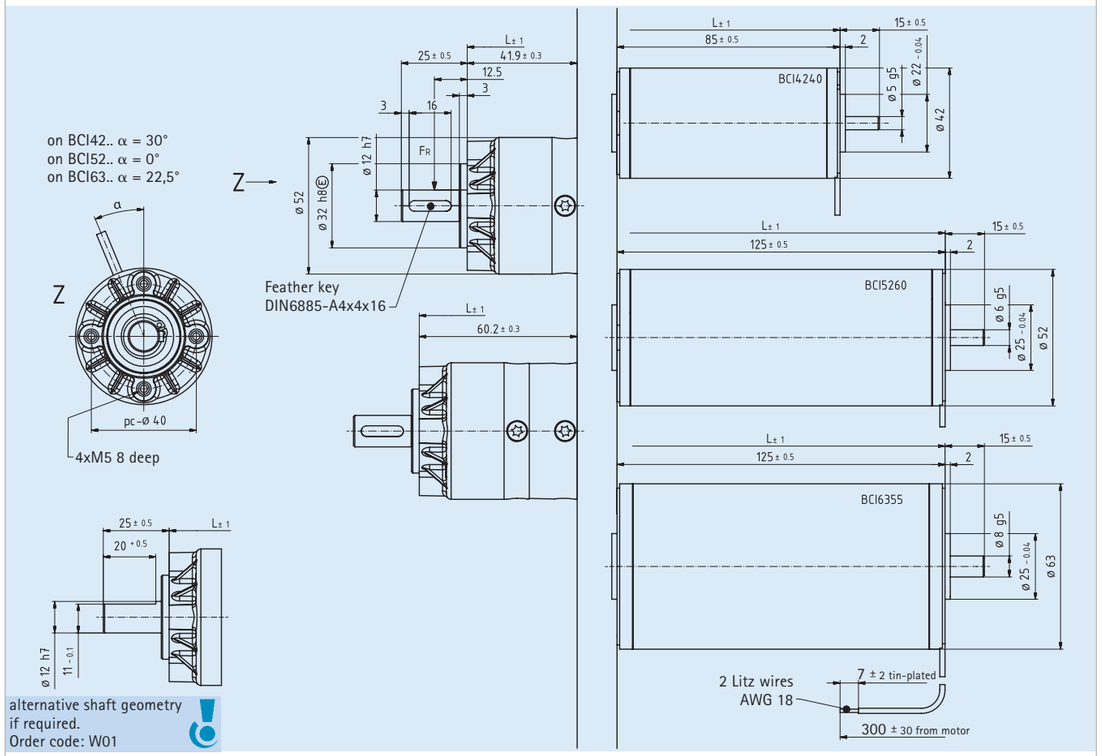
Add-on components	BCI5260			BCI4240			BCI4225		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B02	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

Permanent magnet DC motor with planetary gearhead Performax® 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



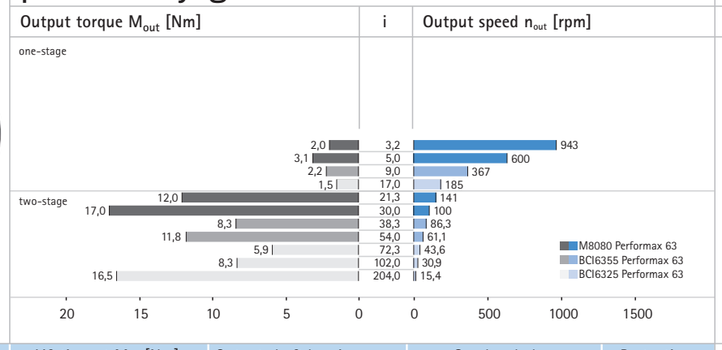
alternative shaft geometry if required.
Order code: W01

Planetary gearhead	Permanent magnet DC motor								
Performax® 52	BCI6355	3300 rpm/93 W 24 V	BCI5260	3100 rpm/55 W 24 V	BCI4240	3100 rpm/19 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
G 23.	3,2 / 1	0,8	1038	84	BCI6355	52.1.6355.P01	4,9	2,1	167
G 24.	5 / 1	1,2	660	84	BCI6355	52.1.6355.P02	4,9	2,1	167
G 25.	9 / 1	1,4	344	49	BCI5260	52.1.5260.P03	3	1,5	167
G 26.	17 / 1	0,9	182	17	BCI4240	52.1.4240.P04	1,2	0,9	127
G 27.	21,3 / 2	4,6	155	75	BCI6355	52.2.6355.P05	4,9	2,2	185
G 28.	30 / 2	6,5	110	75	BCI6355	52.2.6355.P06	4,9	2,2	185
G 29.	38,3 / 2	5,2	81	45	BCI5260	52.2.5260.P07	3	1,6	185
G 30.	54 / 2	7,4	57,4	45	BCI5260	52.2.5260.P08	3	1,6	185
G 31.	72,3 / 2	3,4	42,9	15	BCI4240	52.2.4240.P09	1,2	1	145
G 32.	102 / 2	4,7	30,4	15	BCI4240	52.2.4240.P10	1,2	1	145
G 33.	204 / 2	9,4	15,2	15	BCI4240	52.2.4240.P11	1,2	1	145

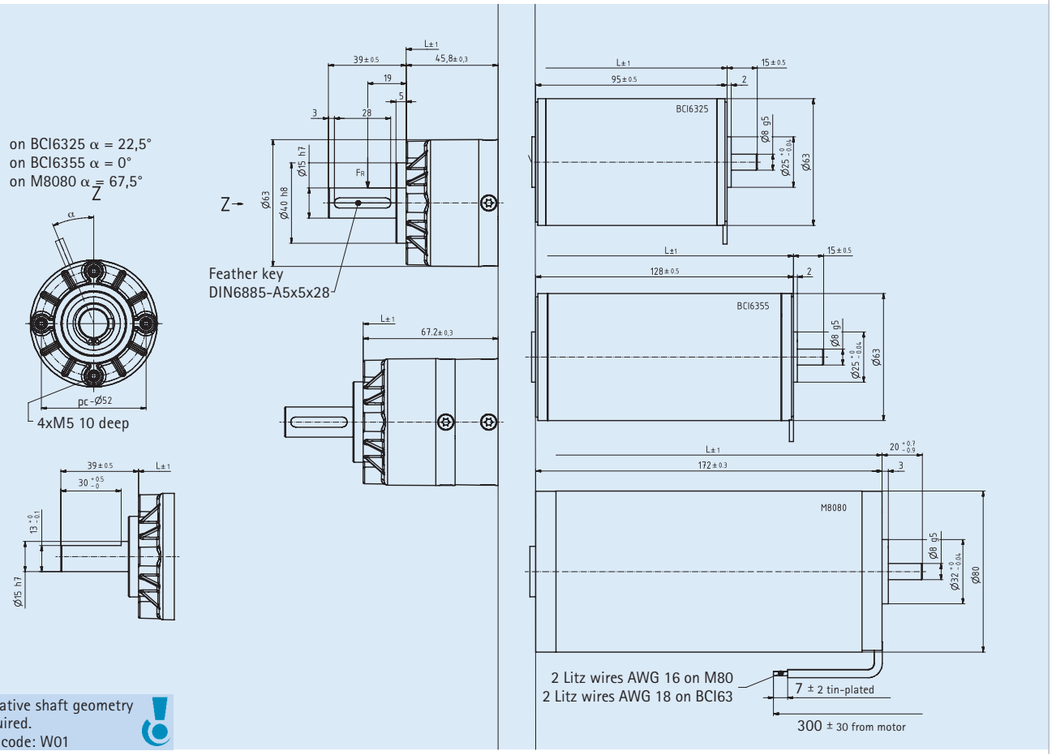
Add-on components	BCI6355			BCI5260			BCI4240		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN02, E07-E08, S03	B02	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

Permanent magnet DC motor with planetary gearhead Performax® 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



alternative shaft geometry if required.
Order code: W01

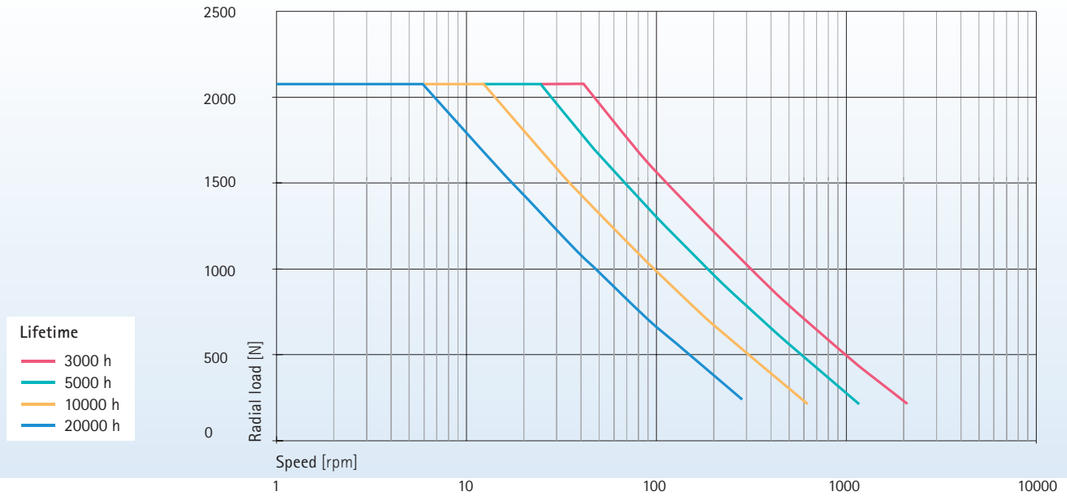
Planetary gearhead	Permanent magnet DC motor								
Performax® 63	M8080	3000 rpm/220 W 24 V	BCI6355	3300 rpm/93 W 24 V	BCI6325	3150 rpm/46 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
G 34.	3,2 / 1	2	943	200	M8080	63.1.8080.P01	11,8	4,1	218
G 35.	5 / 1	3,1	600	200	M8080	63.1.8080.P02	11,8	4,1	218
G 36.	9 / 1	2,2	367	84	BCI6355	63.1.6355.P03	4,9	2,1	174
G 37.	17 / 1	1,5	185	29	BCI6325	63.1.6325.P04	2,7	1,6	141
G 38.	21,3 / 2	12	141	180	M8080	63.2.8080.P05	11,8	4,2	239
G 39.	30 / 2	17	100	180	M8080	63.2.8080.P06	11,8	4,2	239
G 40.	38,3 / 2	8,3	86,3	75	BCI6355	63.2.6355.P07	4,9	2,2	195
G 41.	54 / 2	11,8	61,1	75	BCI6355	63.2.6355.P08	4,9	2,2	195
G 42.	72,3 / 2	5,9	43,6	27	BCI6325	63.2.6325.P09	2,7	1,7	162
G 43.	102 / 2	8,3	30,9	27	BCI6325	63.2.6325.P10	2,7	1,7	162
G 44.	204 / 2	16,5	15,4	27	BCI6325	63.2.6325.P11	2,7	1,7	162

Add-on components	M8080			BCI6355			BCI6325		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN02, E07-E08, S03	B03	G01-G05	CAN02, E07-E08, S03	B02	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

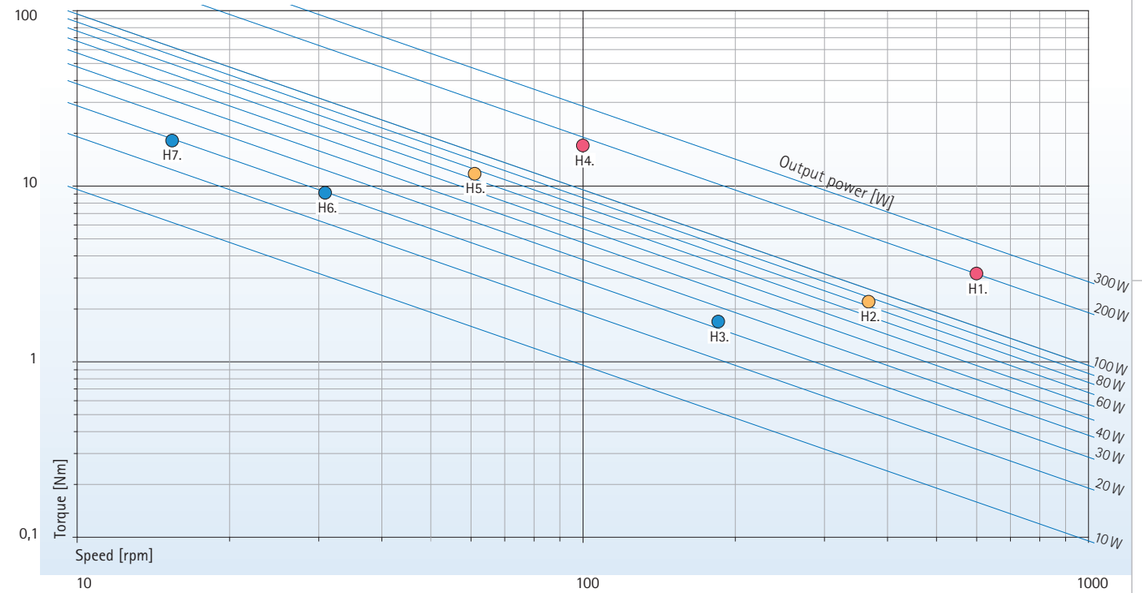
Permanent magnet DC motor with planetary gearhead Performax® 63HRL

Radial load overview

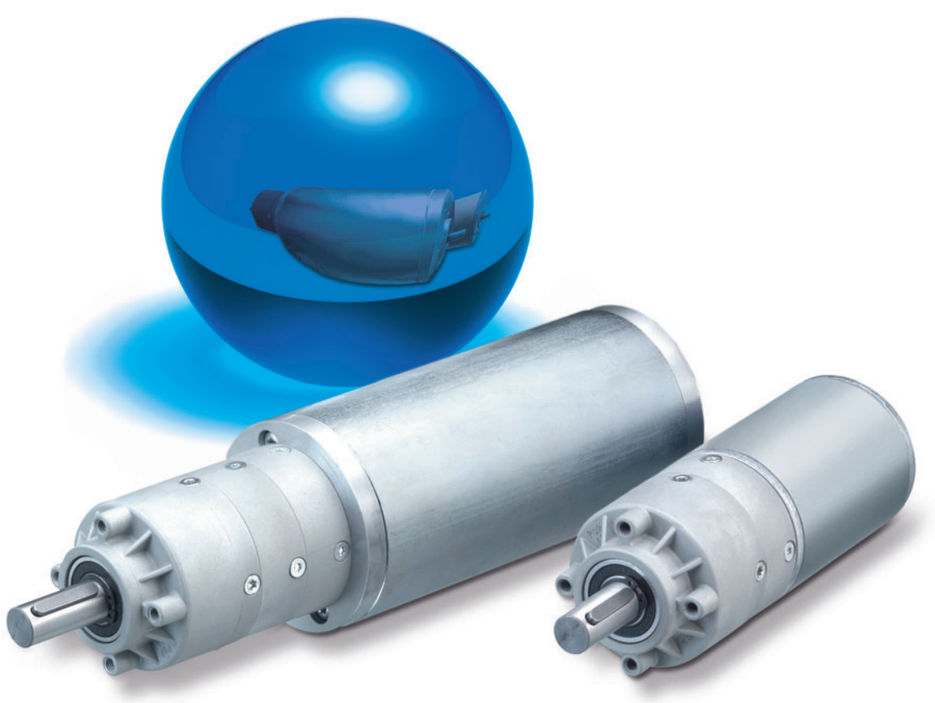


Performax® 63HRL with M8080
Performax® 63HRL with BCI6355
Performax® 63HRL with BCI6325

Performance overview



Outstanding performance and top marks in all disciplines!

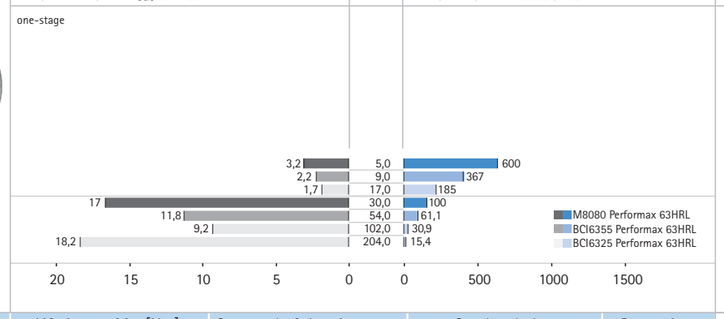


Permanent magnet DC-motor with planetary gear head Performax® 63 HRL

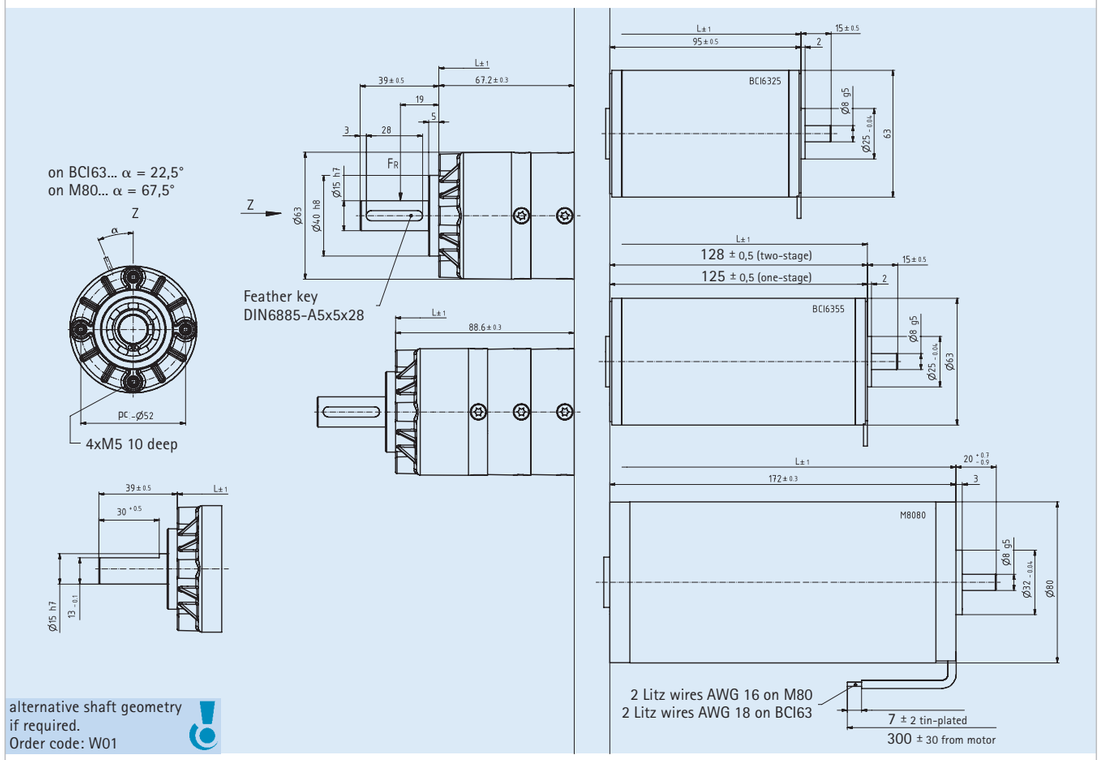
A true success story is continued in the form of Performax®HRL. The innovative (patent pending) concept of the Performax® series is now capable of managing the highest radial loads. This increases not only the application options of this excellent construction concept, but also its capabilities. Smoothness of running, gear reduction, torque, effectiveness or radial load – the top marks of Performax®HRL enhance performance every time. Deciding for Performax®HRL means deciding for durable performance without compromising. Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide a nominal torque and a nominal speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3000 hours (operating factor c_B=1 and nominal load) (carbon brush wear).

- double-faced with ball-bearings supported planetary output stage
- noise optimised helical teeth in the 1st stage
- additional noise reduction through glide optimised plastics of planetary gears and hollow wheel of the 1st stage
- planetary gears made from case-hardened steel with rolling contact bearing and straight toothing in the diecast zinc housing second stage
- double-sided supported planetary gears in the HRL bearing housing
- ground and hardened output shaft injected with the HRL bearing housing
- two variants of the output shaft (feather key/face) available
- motors can be fitted with suitable brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power supplies are available optional (see accessories)
- protection class IP 40
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C

Permanent magnet DC motor with planetary gearhead Performax® 63HRL



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 66	500 N	5000 h Operating factor c_B=1	2 groove ball bearing carrier housing	approx. 0,7° to 1,2° depending on reduction	IP 40



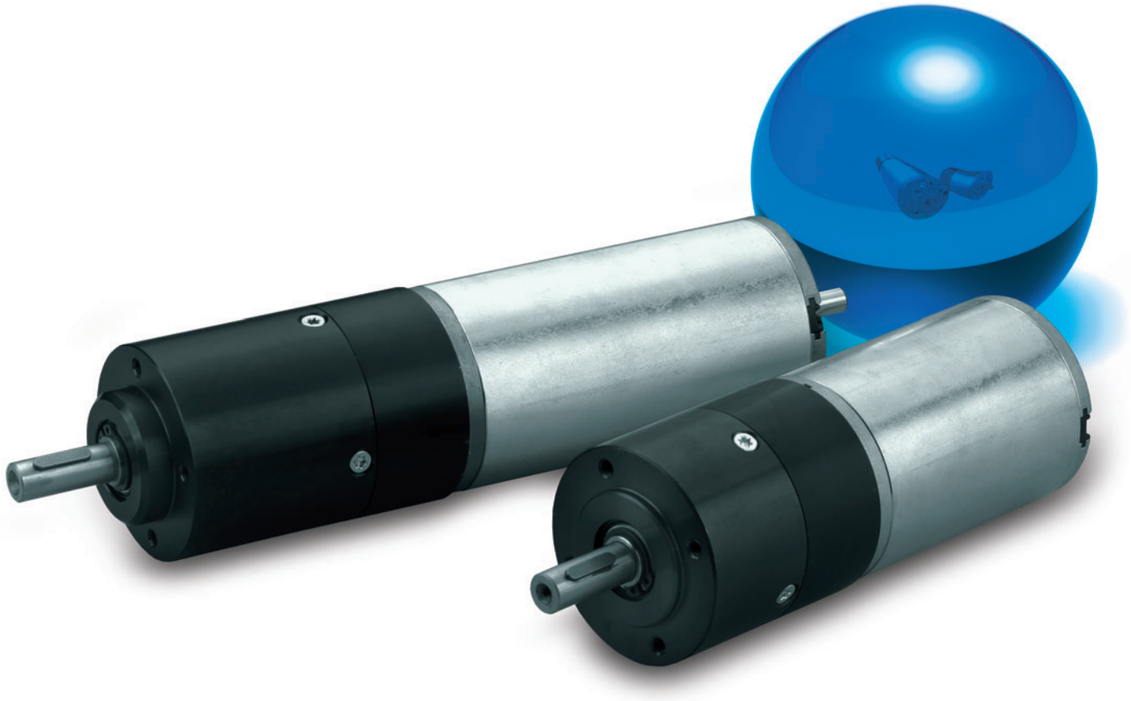
alternative shaft geometry if required. Order code: W01

Planetary gearhead	Permanent magnet DC motor								
Performax® 63HRL	M8080 3000 rpm/220 W 24 V			BCI6355 3300 rpm/93 W 24 V			BCI6325 3150 rpm/46 W 24 V		
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
H 1.	5 / 1	3,2	600	200	M8080	63.1.8080.H01	11,8	4,4	239
H 2.	9 / 1	2,2	367	84	BCI6355	63.1.6355.H02	4,9	2,4	192
H 3.	17 / 1	1,7	185	33	BCI6325	63.1.6325.H03	2,7	1,9	162
H 4.	30 / 2	17	100	180	M8080	63.2.8080.H04	11,8	4,8	261
H 5.	54 / 2	11,8	61,1	75	BCI6355	63.2.6355.H05	4,9	2,8	217
H 6.	102 / 2	9,2	30,9	30	BCI6325	63.2.6325.H06	2,7	2,3	184
H 7.	204 / 2	18,2	15,4	29	BCI6325	63.2.6325.H07	2,7	2,3	184

Add-on components	M8080			BCI6355			BCI6325		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S03	B03	G01-G05	CAN01, E01-E08, S02	B03	G01-G05	CAN01, E01-E08, S01-S02

Permanent magnet DC motor with planetary gearhead Focus

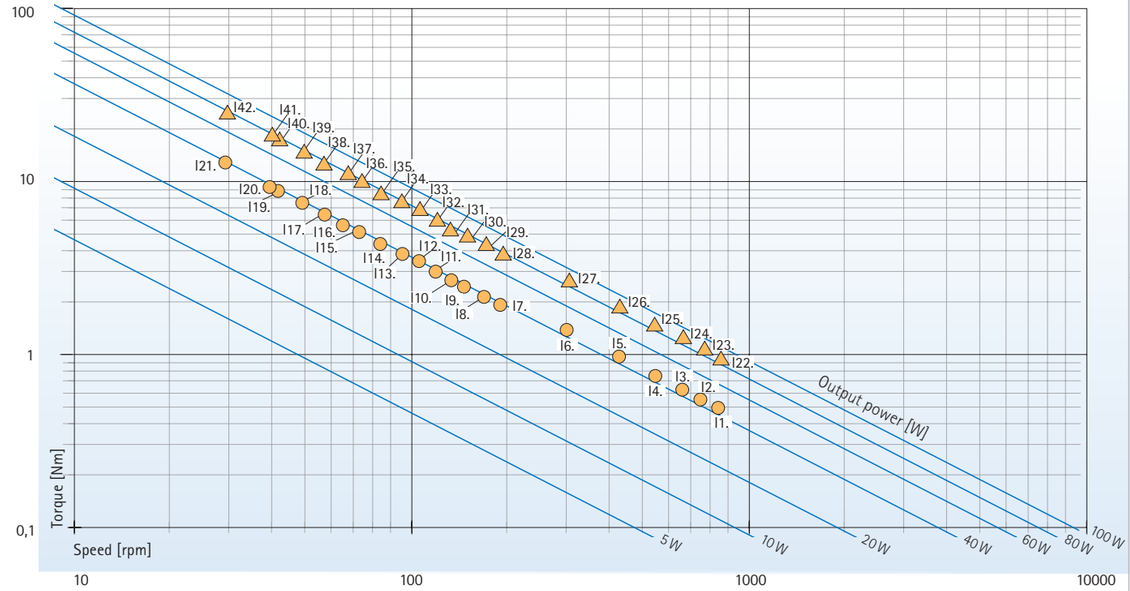
Maximum precision and excellent silent running.



NoiselessPlus with permanent magnet DC motors available on request

Focus 65 with GK6325
Focus 65 with GK6355

Performance overview



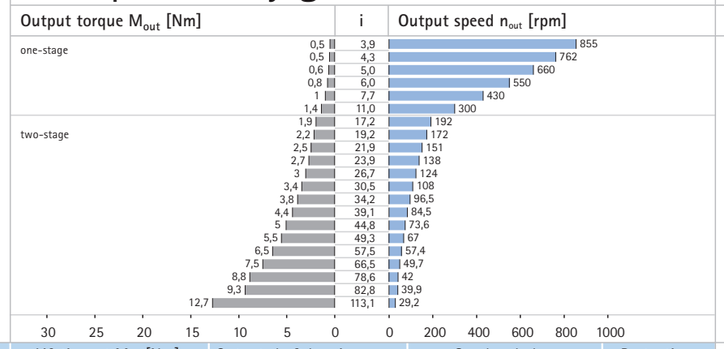
Permanent magnet DC motor with planetary gearhead Focus

When it is necessary to reduce a motor speed with the least possible gearhead play, that's where the Focus series drives come in: Due to their fine tolerances, torsion-resistant design and the employment of high-quality production methods, Focus gearheads permit only minimum circumferential backlash.

Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide a nominal torque and speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop or closed-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3000 hours (operating factor c_B=1).

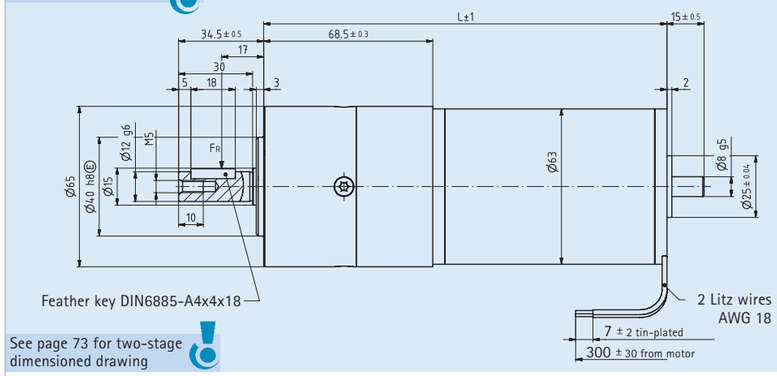
- noise-optimised helical teeth in the input stages
- hardened steel wheels in the second stage
- plastic wheels with optimum sliding properties for additional noise reduction
- ground and hardened output shaft running on double ball bearings (diameter tolerance h7)
- motors can be fitted with suitable brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power supplies are optional (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance-free grease lubricated for life
- ambient temperature -20 °C to +80 °C

Permanent magnet DC motor with planetary gearhead Focus 65



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
300 N	100 N	5000 h Operating factor c_B=1	2 tandem ball bearings	approx. 0,1° to 0,33° depending on reduction	IP 40

one-stage



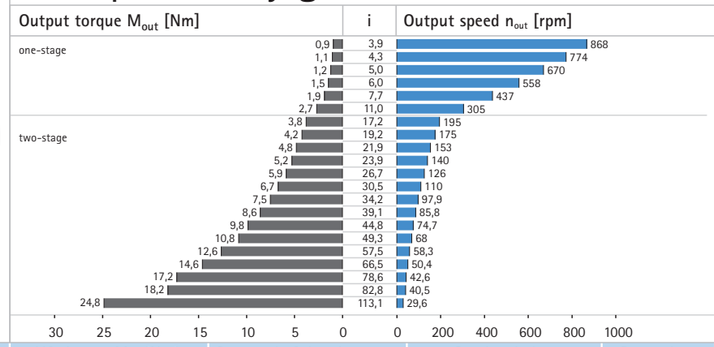
See page 73 for two-stage dimensioned drawing

Planetary gearhead	Permanent magnet DC motor
Focus 65	GK6325 3300 rpm/48 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
I 1.	3,9 / 1	0,5	855	43	65.1.6325.F01	2,7	1,87	166
I 2.	4,3 / 1	0,5	762	43	65.1.6325.F02			
I 3.	5 / 1	0,6	660	43	65.1.6325.F03			
I 4.	6 / 1	0,8	550	43	65.1.6325.F04			
I 5.	7,7 / 1	1	430	43	65.1.6325.F05			
I 6.	11 / 1	1,4	300	43	65.1.6325.F06			
I 7.	17,2 / 2	1,9	192	39	65.2.6325.F07	2,7	2,17	188
I 8.	19,2 / 2	2,2	172	39	65.2.6325.F08			
I 9.	21,9 / 2	2,5	151	39	65.2.6325.F09			
I 10.	23,9 / 2	2,7	138	39	65.2.6325.F10			
I 11.	26,7 / 2	3	124	39	65.2.6325.F11			
I 12.	30,5 / 2	3,4	108	39	65.2.6325.F12			
I 13.	34,2 / 2	3,8	96,5	39	65.2.6325.F13			
I 14.	39,1 / 2	4,4	84,5	39	65.2.6325.F14			
I 15.	44,8 / 2	5	73,6	39	65.2.6325.F15			
I 16.	49,3 / 2	5,5	67	39	65.2.6325.F16			
I 17.	57,5 / 2	6,5	57,4	39	65.2.6325.F17			
I 18.	66,5 / 2	7,5	49,7	39	65.2.6325.F18			
I 19.	78,6 / 2	8,8	42	39	65.2.6325.F19			
I 20.	82,8 / 2	9,3	39,9	39	65.2.6325.F20			
I 21.	113,1 / 2	12,7	29,2	39	65.2.6325.F21			

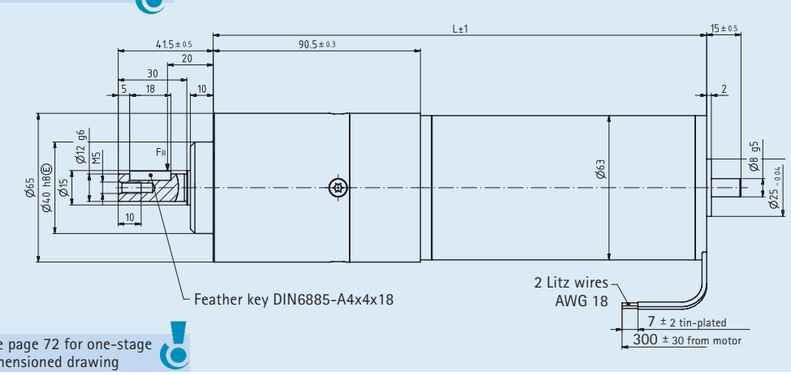
Add-on components	GK6325		
	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02

Permanent magnet DC motor with planetary gearhead Focus 65



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
300 N	100 N	5000 h Operating factor c_B=1	2 tandem ball bearings	approx. 0,1° to 0,33° depending on reduction	IP 40

two-stage



See page 72 for one-stage dimensioned drawing

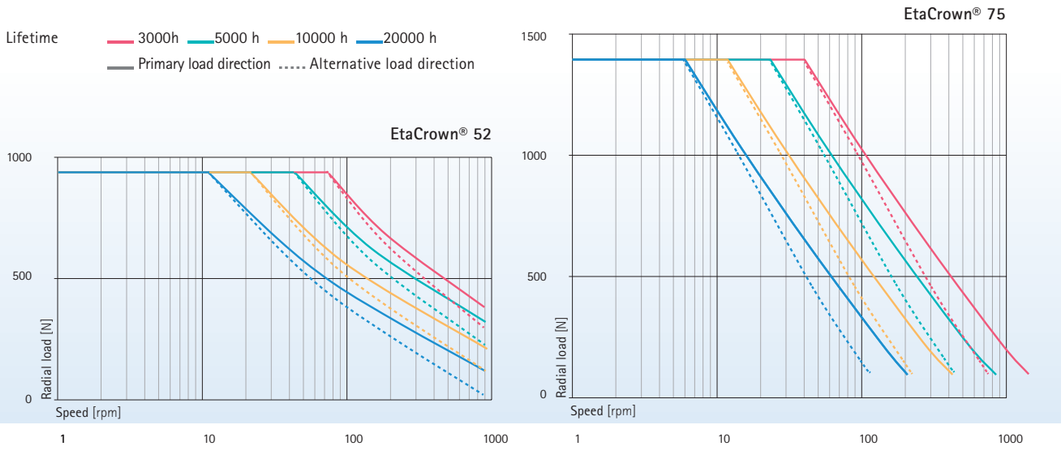
Planetary gearhead	Permanent magnet DC motor
Focus 65	GK6355 3350 rpm/95 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
I 22.	3,9 / 1	0,9	868	86	65.1.6355.F01	4,9	2,37	196
I 23.	4,3 / 1	1,1	774	86	65.1.6355.F02			
I 24.	5 / 1	1,2	670	85	65.1.6355.F03			
I 25.	6 / 1	1,5	558	85	65.1.6355.F04			
I 26.	7,7 / 1	1,9	437	86	65.1.6355.F05			
I 27.	11 / 1	2,7	305	85	65.1.6355.F06			
I 28.	17,2 / 2	3,8	195	77	65.2.6355.F07	4,9	2,67	218
I 29.	19,2 / 2	4,2	175	77	65.2.6355.F08			
I 30.	21,9 / 2	4,8	153	77	65.2.6355.F09			
I 31.	23,9 / 2	5,2	140	77	65.2.6355.F10			
I 32.	26,7 / 2	5,9	126	77	65.2.6355.F11			
I 33.	30,5 / 2	6,7	110	77	65.2.6355.F12			
I 34.	34,2 / 2	7,5	97,9	77	65.2.6355.F13			
I 35.	39,1 / 2	8,6	85,8	77	65.2.6355.F14			
I 36.	44,8 / 2	9,8	74,7	77	65.2.6355.F15			
I 37.	49,3 / 2	10,8	68	77	65.2.6355.F16			
I 38.	57,5 / 2	12,6	58,3	77	65.2.6355.F17			
I 39.	66,5 / 2	14,6	50,4	77	65.2.6355.F18			
I 40.	78,6 / 2	17,2	42,6	77	65.2.6355.F19			
I 41.	82,8 / 2	18,2	40,5	77	65.2.6355.F20			
I 42.	113,1 / 2	24,8	29,6	77	65.2.6355.F21			

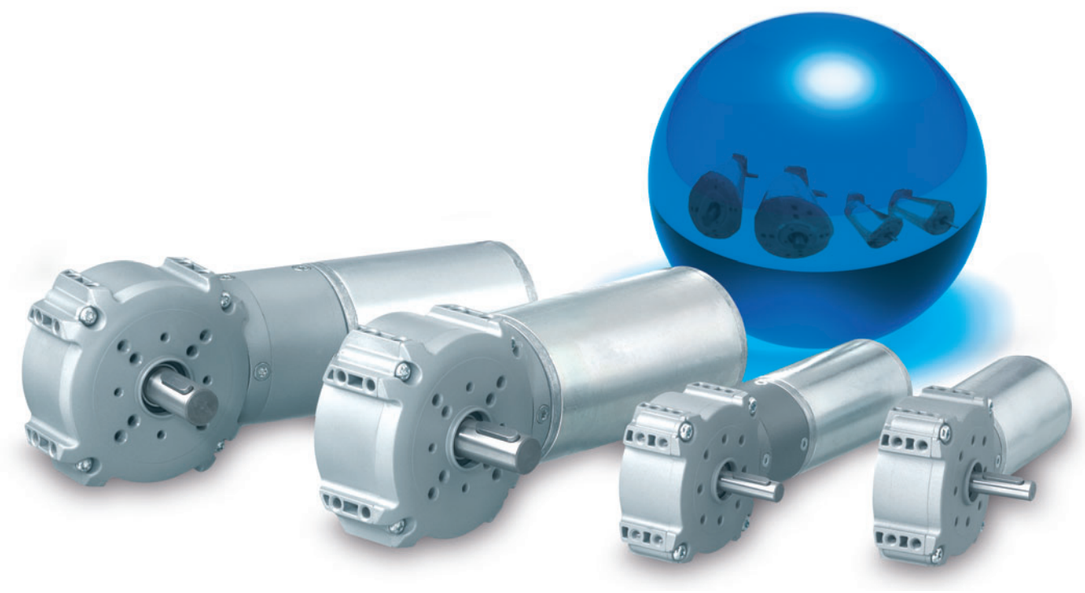
Add-on components	GK6355		
	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02

Permanent magnet DC motor with crown gearhead EtaCrown®

radial load overview

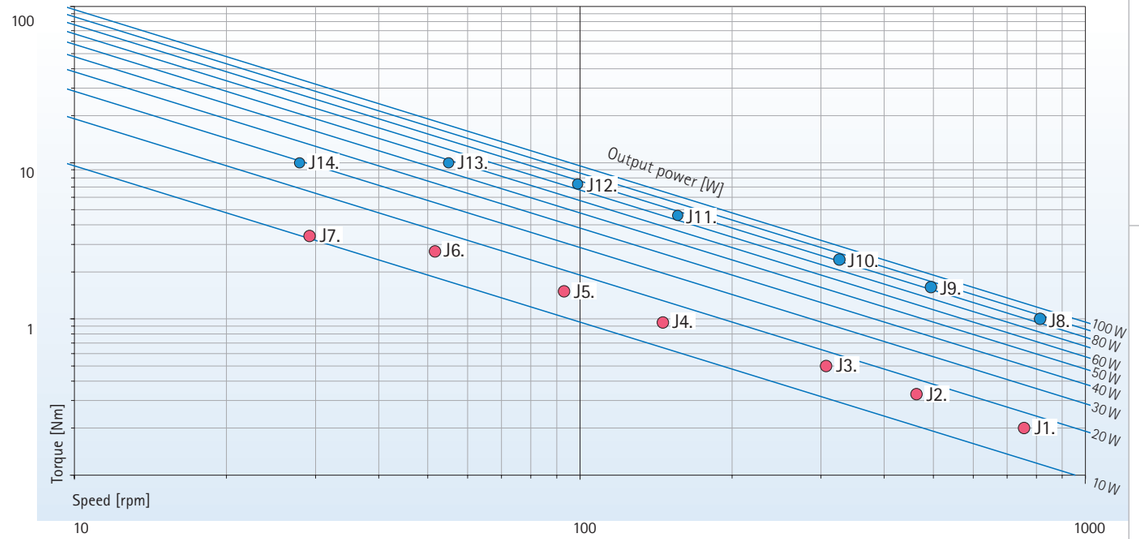


Technical lead thanks to maximum efficiency.



EtaCrown® 52 with permanent magnet DC motor
EtaCrown® 75 with permanent magnet DC motor

Performance overview



Permanent magnet DC motor with crown gearhead EtaCrown®

EtaCrown® – the bevel gearhead using crown gearhead technology breaks through technological boundaries and redefines application possibilities. Thanks to intensive development work, we have been able to make bevel gearheads more powerful, smaller and more efficient, and to manufacture them more economically. Their unique technology offers a multitude of advantages.

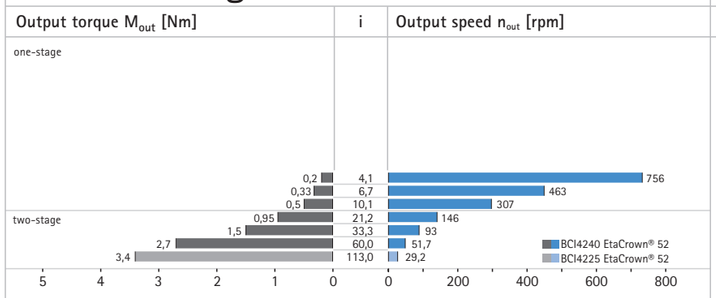
Thanks to its technological lead, EtaCrown® stands out in terms of power, design, energy efficiency and functionality. The efficiency rate is between 80 and 95 %.

The perfectly optimised smooth running gears, typical for ZEITLAUF® are also applicable for the EtaCrown® series. The noise reduction is ensured by the optimised bearing design and intelligent selection of tooth materials.

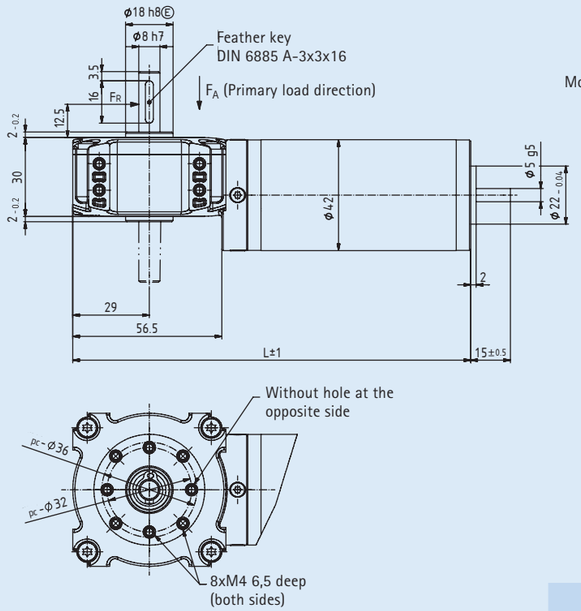
Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide nominal torque and nominal speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop or closed-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3,000 hours (operating factor c_B=1).

- optimum efficiency due to the use of crown technology
- no automatic lock
- large range of attachment possibilities with 5 fixing planes
- crown (with one-stage gears) or planetary wheels and hollow wheel (with two-stage gears) made of plastic with optimised sliding properties for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- four output shaft variants (one-sided, left / one-sided, right / two-sided / hollow shaft) available
- motors can be fitted with matching brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power suppliers are available as options (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance-free grease lubricated for life
- ambient temperature 0°C to +40°C

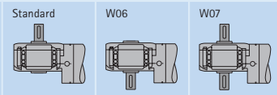
Permanent magnet DC motor with crown gearhead EtaCrown® 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 74	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 40



Additional order details for optional shaft geometry

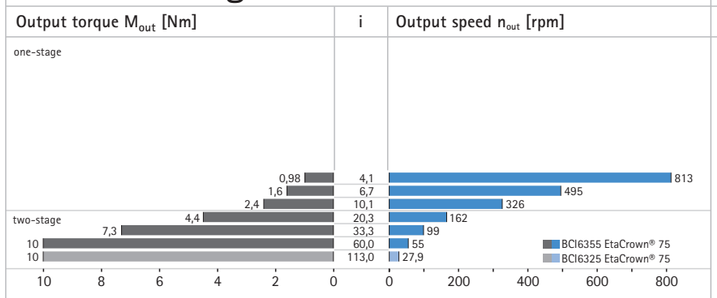


Crown gearhead	Permanent magnet DC motor							
EtaCrown® 52	BCI4240	3100 rpm-1/18 W 24 V		BCI4225	3300 rpm-1/13 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
J 1.	4,1 / 1	0,2	756	16	BCI4240	52.1.4240.E01	1,1	0,9	151
J 2.	6,7 / 1	0,33	463	16	BCI4240	52.1.4240.E02	1,1	0,9	151
J 3.	10,1 / 1	0,5	307	16	BCI4240	52.1.4240.E03	1,1	0,9	151
J 4.	21,2 / 2	0,95	146	15	BCI4240	52.2.4240.E04	1,1	1,15	180
J 5.	33,3 / 2	1,5	93	15	BCI4240	52.2.4240.E05	1,1	1,15	180
J 6.	60 / 2	2,7	51,7	15	BCI4240	52.2.4240.E06	1,1	1,15	180
J 7.	113 / 2	3,4	29,2	11	BCI4225	52.2.4225.E07	0,83	1,01	165

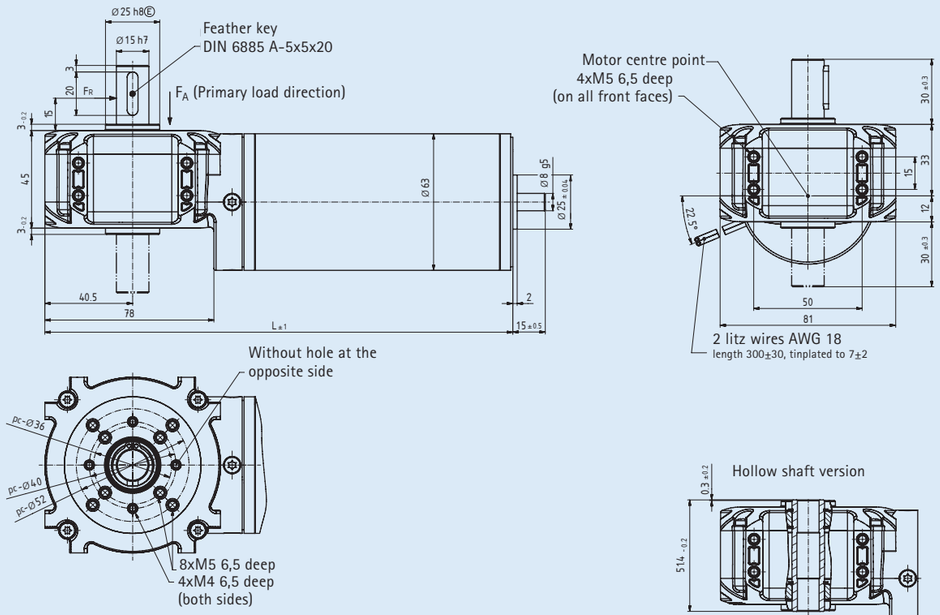
Add-on components	BCI4240			BCI4225		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B01	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

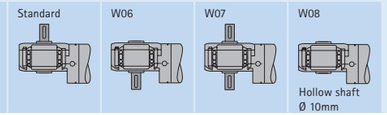
Permanent magnet DC motor with crown gearhead EtaCrown® 75



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 74	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 40



Additional order details for optional shaft geometry



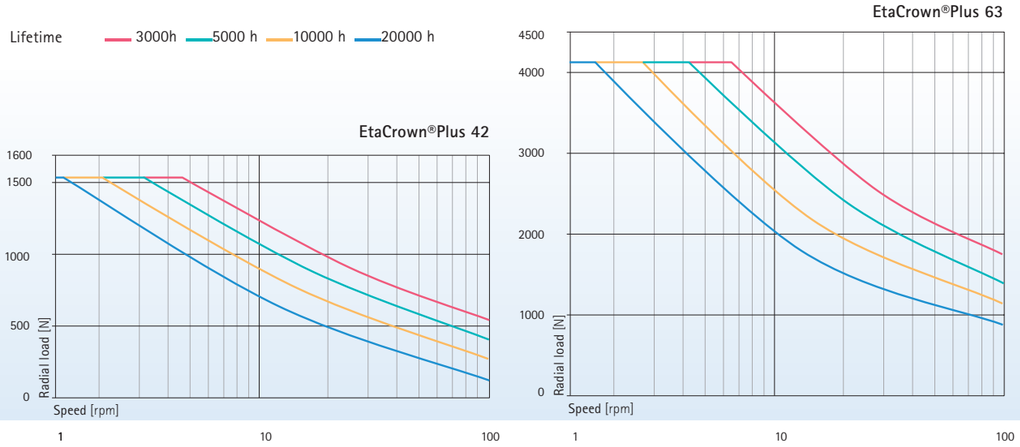
Crown gearhead	Permanent magnet DC motor							
EtaCrown® 75	BCI6355	3300 rpm/93 W 24 V		BCI6325	3150 rpm/46 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
J 8.	4,1 / 1	0,98	813	84	BCI6355	75.1.6355.E01	4,9	2,6	216
J 9.	6,7 / 1	1,6	495	84	BCI6355	75.1.6355.E02	4,9	2,6	216
J 10.	10,1 / 1	2,4	326	84	BCI6355	75.1.6355.E03	4,9	2,6	216
J 11.	20,3 / 2	4,4	162	75	BCI6355	75.2.6355.E04	4,9	3	252
J 12.	33,3 / 2	7,3	99	75	BCI6355	75.2.6355.E05	4,9	3	252
J 13.	60 / 2	10	55	58	BCI6355	75.2.6355.E06	4,9	3	252
J 14.	113 / 2	10	27,9	29	BCI6325	75.2.6325.E07	2,7	2,5	222

Add-on components	BCI6355			BCI6325		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02	B03	G01-G05	CAN01, E01-E08, S01-S02

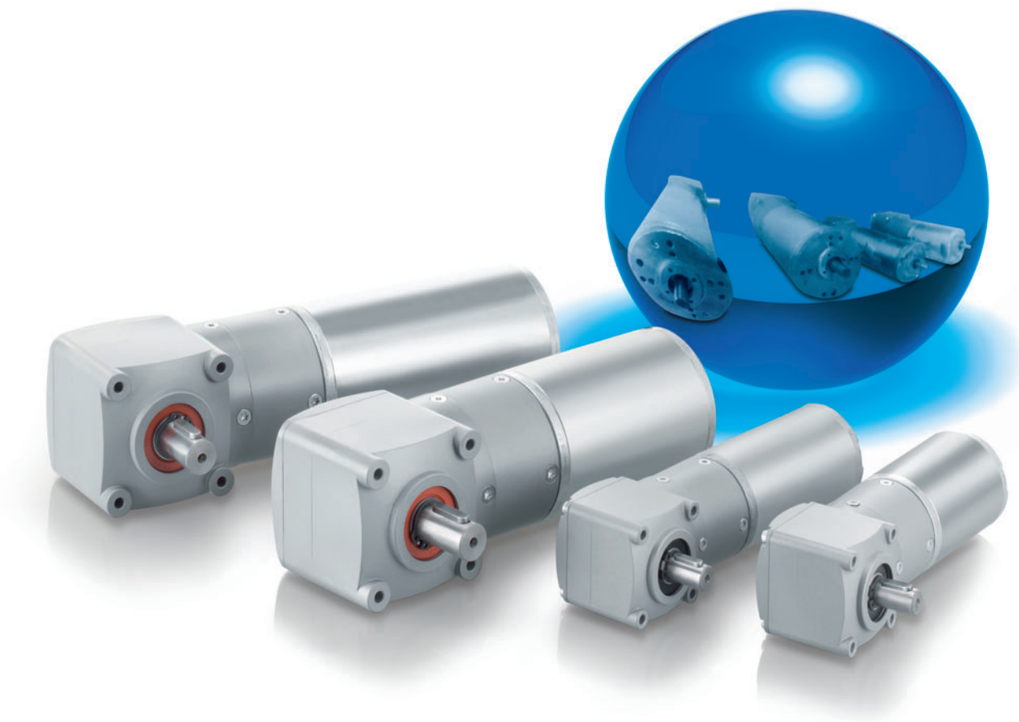
*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

Permanent magnet DC motor with crown gearhead EtaCrown®Plus

radial load overview

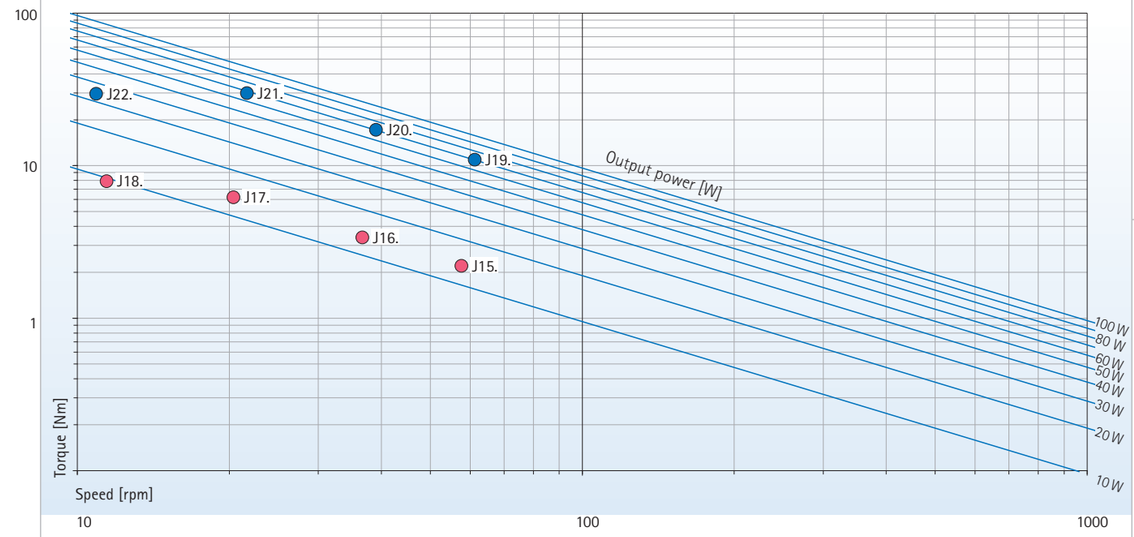


Maximum power density on smallest space



EtaCrown®Plus 42 with permanent magnet DC motor
EtaCrown®Plus 63 with permanent magnet DC motor

Performance overview



Permanent magnet DC motor with crown gearhead EtaCrown®Plus

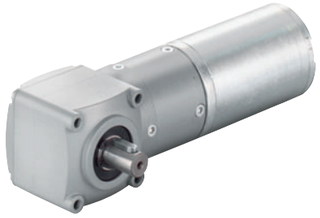
EtaCrown®Plus is the innovative enhancement of our proven EtaCrown®. The key feature of this intelligent design is the combination of a crown and planetary gear stage in one gear unit. This innovative gearhead is unique due to the performance range it offers with regard to available space. With reductions of 54:1 to 289:1 as part of the standard three-stage model, we offer a range with maximum performance.

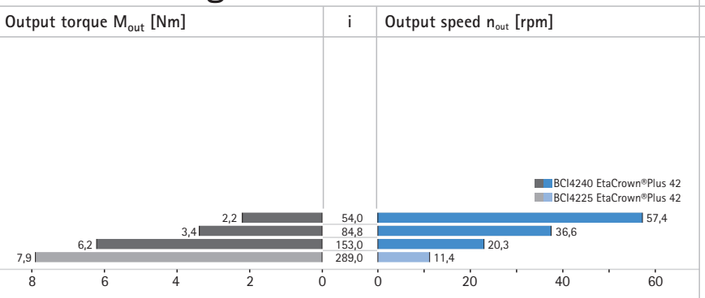
It provides optimum acoustic insulation through an upstream Performax® planetary gearhead stage with helical cut planet gears made of gliding optimised high-performance plastic, and also through the optimum bearing design of the crown stage.

Mechanically commutated permanent magnet motors are designed for operation with 24 V direct voltage and provide nominal torque and nominal speed with this voltage. The exact motor speed is dependent on the required torque, according to the motor characteristic. Speed control is possible in conjunction with external open-loop or closed-loop control. The lifetime of a mechanically commutated permanent magnet motor is designed for 3,000 hours (operating factor c_B=1).

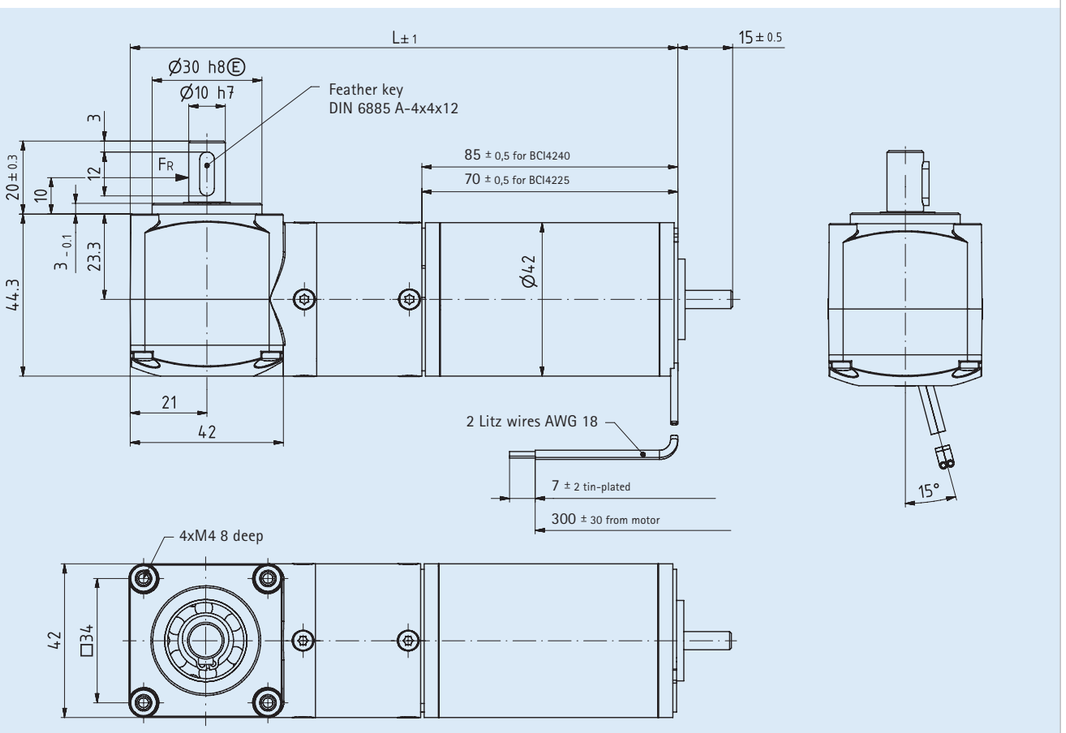
- Reductions of 54:1 to 289:1 as part of the standard series, with three-stage design
- Nominal torque 10 Nm (EtaCrown®Plus 42) and 40 Nm (EtaCrown®Plus 63), peak torque 25 or 100 Nm
- optimum efficiency due to the use of crown technology
- 5 planet gears at the planet output stage made of hardened sintered steel with optimum emergency operation properties through oil immersion
- no automatic lock
- ground and hardened output shaft (diameter tolerance h7)
- motors can be fitted with matching brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power suppliers are available as options (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance-free grease lubricated for life
- ambient temperature 0°C to +40°C

Permanent magnet DC motor with crown gearhead EtaCrown®Plus 42





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 78	200 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 40

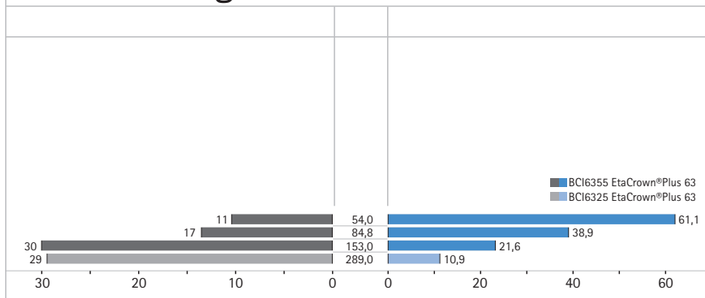


Crown gearhead	Permanent magnet DC motor								
EtaCrown®Plus 42	BCI4240	3100 rpm/18 W 24 V			BCI4225	3300 rpm/13 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
J 15.	54 / 3	2,2	57,4	13	BCI4240	42.3.4240.EP01	1,1	0,95	165
J 16.	84,8 / 3	3,4	36,6	13	BCI4240	42.3.4240.EP02	1,1	0,95	165
J 17.	153 / 3	6,2	20,3	13	BCI4240	42.3.4240.EP03	1,1	0,95	165
J 18.	289 / 3	7,9	11,4	9,5	BCI4225	42.3.4225.EP04	0,83	0,85	150

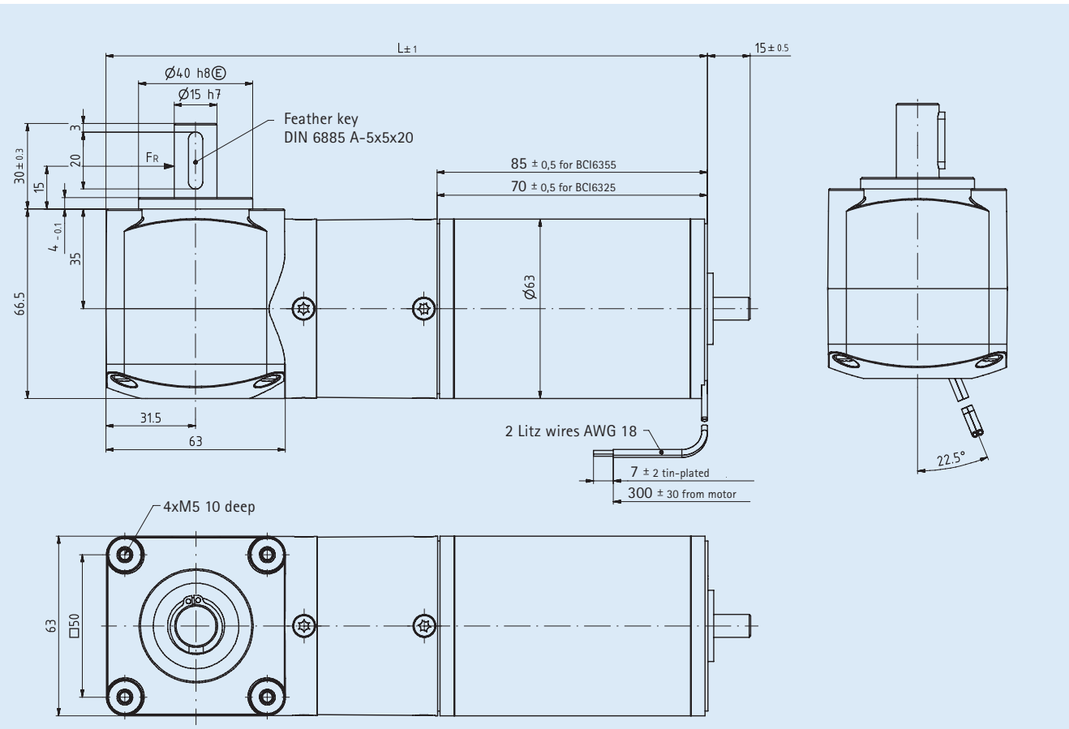
Add-on components	BCI4240			BCI4225		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B01	G01-G05	CAN01, E01-E08, S01-S02	B01	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

Permanent magnet DC motor with crown gearhead EtaCrown®Plus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 78	300 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



Crown gearhead	Permanent magnet DC motor								
EtaCrown®Plus 63	BCI6355	3300 rpm/93 W 24 V			BCI6325	3150 rpm/46 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
J 19.	54 / 3	11	61,1	68	BCI6355	63.3.6355.EP01	4,9	2,7	241
J 20.	84,8 / 3	17	38,9	68	BCI6355	63.3.6355.EP02	4,9	2,7	241
J 21.	153 / 3	30	21,6	68	BCI6355	63.3.6355.EP03	4,9	2,7	244
J 22.	289 / 3	29	10,9	34	BCI6325	63.3.6325.EP04	2,7	2,2	211

Add-on components	BCI6355			BCI6325		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	CAN01, E01-E08, S01-S02	B03	G01-G05	CAN01, E01-E08, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 158-167

Brushless EC motor, external rotor with spur gearheads Compactline and Flatline

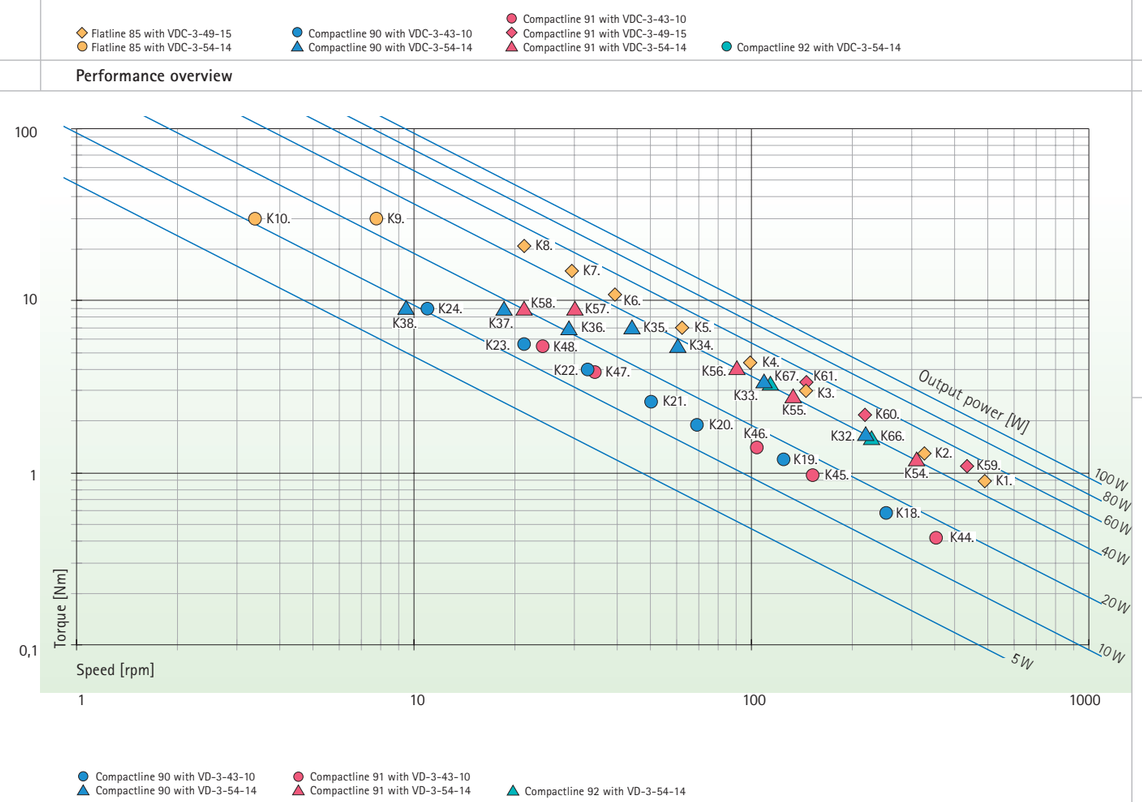
Compact and durable – perfection of drive technology

For the Compactline series we engineered the largest possible wheel width providing good overlap between the motor shaft and the combing gear wheel in the first stage. The first stage gear wheel is made of plastic. This design makes the gearhead extremely quiet. If it needs to be more flat, you should choose a gearhead of the Flatline series.

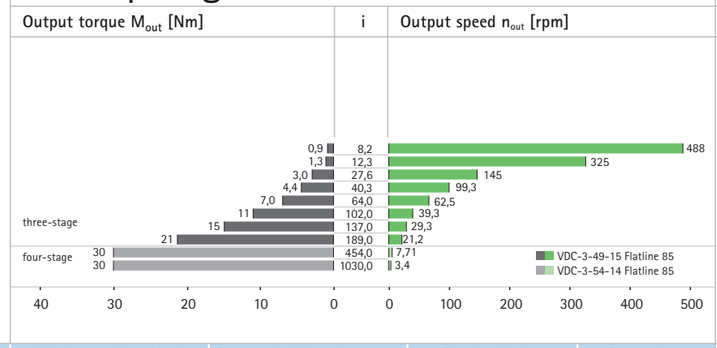
EC direct current motors have very long life time by virtue of electronic commutation (normally in excess of 10,000 hours). Speed control can be realised by integrated electronics, which is available with most models. Electronically commutated motors normally also provide high torques even at low speeds.

- flat and compact gearhead design
- noise-optimised helical teeth in the input stages
- plastic wheels in the first stage for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- motors adjustable - and controllable from nominal speed to the smallest motor speed of 300 rpm at almost constant motor torque
- suitable operating electronics and switched-mode power supplies are available as option
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 00, IP 40 and IP 54
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C
- CANopen Bus-interface (VDC-3-49-15)

Performance overview

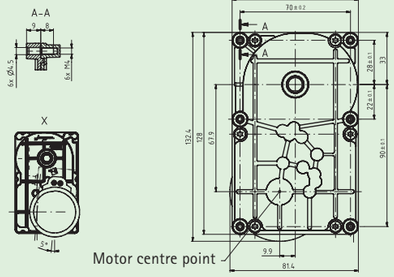


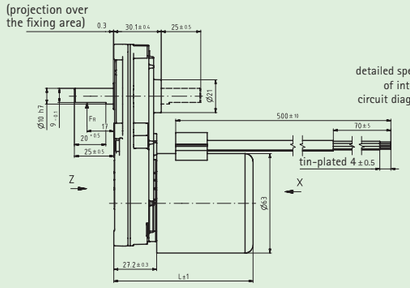
Brushless EC motor, external rotor with spur gearhead Flatline 85



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	needle bearing on both sides	approx. 0,8° to 1,6° depending on reduction	IP 54 (VDC-3-49-15) IP 00 (VDC-3-54-14)

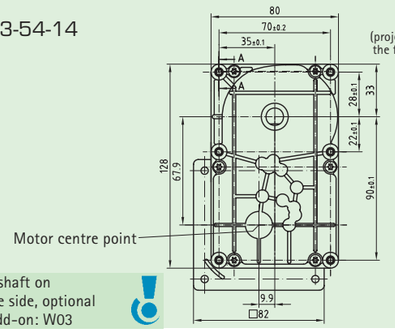
VDC-3-49-15

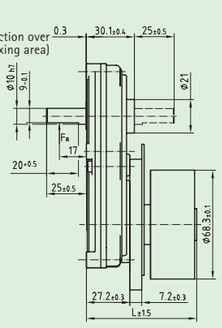




CANopen
CANopen-Bus-interface if required, order code: C01

VDC-3-54-14





output shaft on opposite side, optional order add-on: W03

elevation Z	C01 (Standard)	C01-K02	C01-K03	C01-K04
order code for motor fixing position	C02 (Standard)	C02-K02	C02-K03	C02-K04
VDC-3-49-15				
VDC-3-54-14	K01 (Standard)	K02	K03	K04

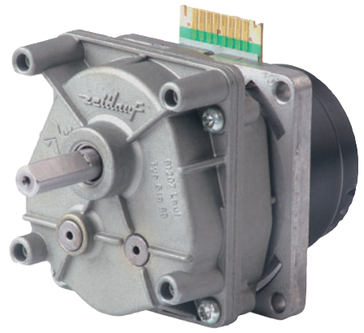
K01 not possible in combination with W03

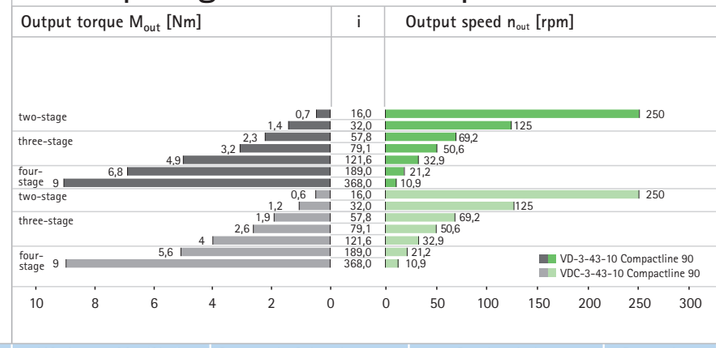
Spur gearhead	Brushless EC motor, external rotor							
Flatline 85	VDC-3-49-15	4000 rpm/63 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 1.	8,2 / 3	0,9	488	46	85.3.C4915.F01	3,5	1,4	88
K 2.	12,3 / 3	1,3	325	46	85.3.C4915.F02			
K 3.	27,6 / 3	3	145	46	85.3.C4915.F03			
K 4.	40,3 / 3	4,4	99,3	46	85.3.C4915.F04			
K 5.	64 / 3	7	62,5	46	85.3.C4915.F05			
K 6.	102 / 3	11	39,3	46	85.3.C4915.F06			
K 7.	137 / 3	15	29,3	46	85.3.C4915.F07			
K 8.	189 / 3	21	21,2	46	85.3.C4915.F08			

Spur gearhead	Brushless EC motor, external rotor							
Flatline 85		3500 rpm/47,6 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 9.	454 / 4	30	7,71	24	85.4.C5414.F11	2,8	1,1	70
K 10.	1030 / 4	30	3,4	11	85.4.C5414.F13			

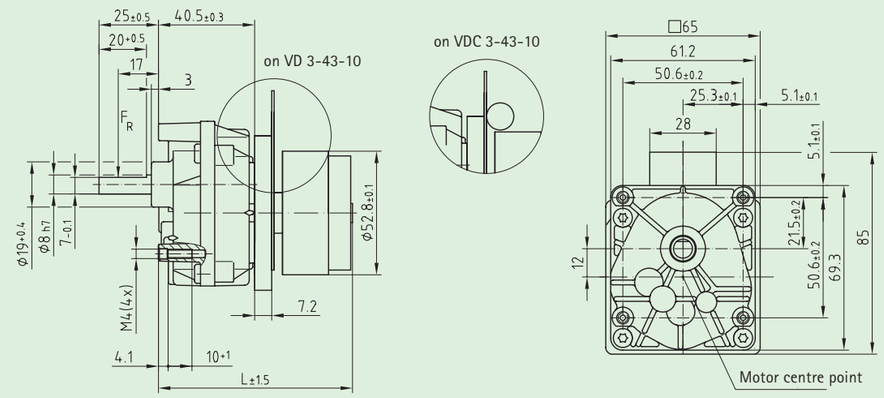
Add-on components	VDC-3-49-15		VDC-3-54-14	
	Electronics	Circuit diagram	Electronics	Circuit diagram
	S01–S02	SB12	S01–S02	SB05

Brushless EC motor, external rotor with spur gearhead Compactline 90





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
120 N	40 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,6° depending on reduction	IP 00

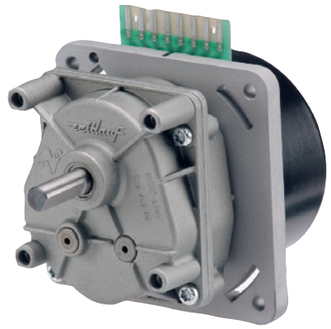


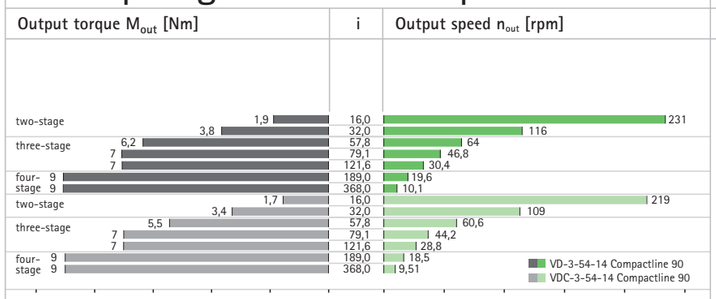
Spur gearhead	Brushless EC motor, external rotor							
Compactline 90	VD-3-43-10	4000 rpm/23 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 11.	16 / 2	0,7	250	19	90.2.4310.C01	1,6	0,5	81
K 12.	32 / 2	1,4	125	19	90.2.4310.C05			
K 13.	57,8 / 3	2,3	69,2	17	90.3.4310.C07	1,6	0,6	81
K 14.	79,1 / 3	3,2	50,6	17	90.3.4310.C08			
K 15.	121,6 / 3	4,9	32,9	17	90.3.4310.C09			
K 16.	189 / 4	6,8	21,2	15	90.4.4310.C10	1,6	0,6	81
K 17.	368 / 4	9	10,9	10	90.4.4310.C12			

Spur gearhead	Brushless EC motor, external rotor							
Compactline 90	VDC-3-43-10	4000 rpm/19 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 18.	16 / 2	0,6	250	15	90.2.C4310.C01	1,25	0,5	82
K 19.	32 / 2	1,2	125	15	90.2.C4310.C05			
K 20.	57,8 / 3	1,9	69,2	14	90.3.C4310.C07	1,25	0,6	82
K 21.	79,1 / 3	2,6	50,6	14	90.3.C4310.C08			
K 22.	121,6 / 3	4	32,9	14	90.3.C4310.C09			
K 23.	189 / 4	5,6	21,2	12	90.4.C4310.C10	1,25	0,6	82
K 24.	368 / 4	9	10,9	10	90.4.C4310.C12			

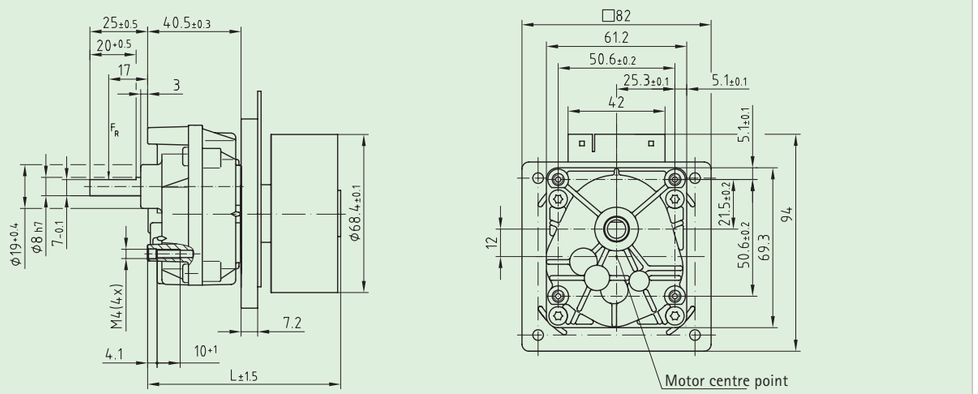
Add-on components	VD-3-43-10	VDC-3-43-10	
	Electronics	Electronics	Circuit diagram
	V02	S01–S02	SB05

Brushless EC motor, external rotor with spur gearhead Compactline 90





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
120 N	40 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,6° depending on reduction	IP 00



Spur gearhead	Brushless EC motor, external rotor
Compactline 90	VD-3-54-14 3700 rpm/57 W 24 V

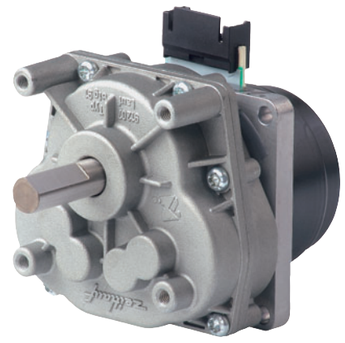
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 25.	16 / 2	1,9	231	46	90.2.5414.C01	3,6	0,8	84
K 26.	32 / 2	3,8	116	46	90.2.5414.C05			
K 27.	57,8 / 3	6,2	64	42	90.3.5414.C07	3,6	0,8	84
K 28.	79,1 / 3	7	46,8	34	90.3.5414.C08			
K 29.	121,6 / 3	7	30,4	22	90.3.5414.C09			
K 30.	189 / 4	9	19,6	18	90.4.5414.C10	3,6	0,9	84
K 31.	368 / 4	9	10,1	9,5	90.4.5414.C12			

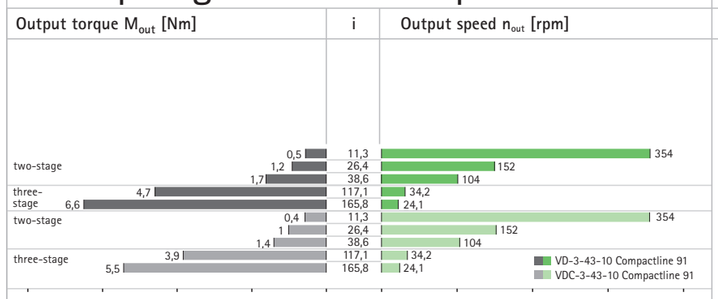
Spur gearhead	Brushless EC motor, external rotor
Compactline 90	VDC-3-54-14 3500 rpm/47,6 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 32.	16 / 2	1,7	219	39	90.2.C5414.C01	2,8	0,8	84
K 33.	32 / 2	3,4	109	39	90.2.C5414.C05			
K 34.	57,8 / 3	5,5	60,6	35	90.3.C5414.C07	2,8	0,8	84
K 35.	79,1 / 3	7	44,2	32	90.3.C5414.C08			
K 36.	121,6 / 3	7	28,8	21	90.3.C5414.C09			
K 37.	189 / 4	9	18,5	17	90.4.C5414.C10	2,8	0,9	84
K 38.	368 / 4	9	9,51	9	90.4.C5414.C12			

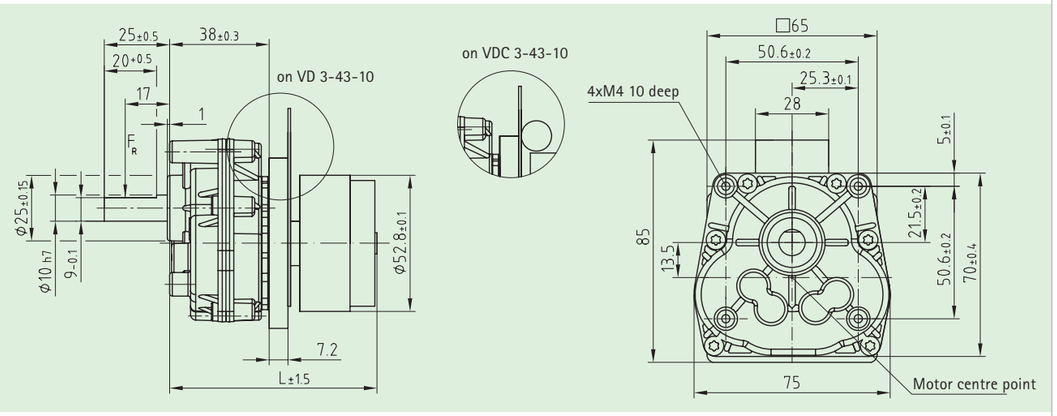
Add-on components	VD-3-54-14	VDC-3-54-14
	Electronics V02	Electronics S01–S02 / Circuit diagram SB05

Brushless EC motor, external rotor with spur gearhead Compactline 91





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 00



Spur gearhead	Brushless EC motor, external rotor
Compactline 91	VD-3-43-10 4000 rpm/23 W 24 V

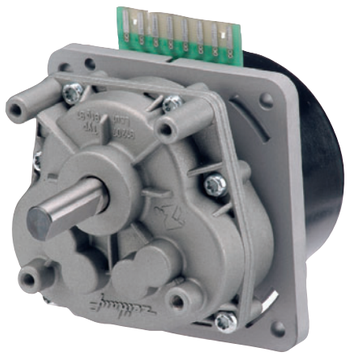
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 39.	11,3 / 2	0,5	354	19	91.2.4310.C01	1,6	0,6	79
K 40.	26,4 / 2	1,2	152	19	91.2.4310.C05			
K 41.	38,6 / 2	1,7	104	19	91.2.4310.C07			
K 42.	117,1 / 3	4,7	34,2	17	91.3.4310.C09	1,6	0,6	79
K 43.	165,8 / 3	6,6	24,1	17	91.3.4310.C10			

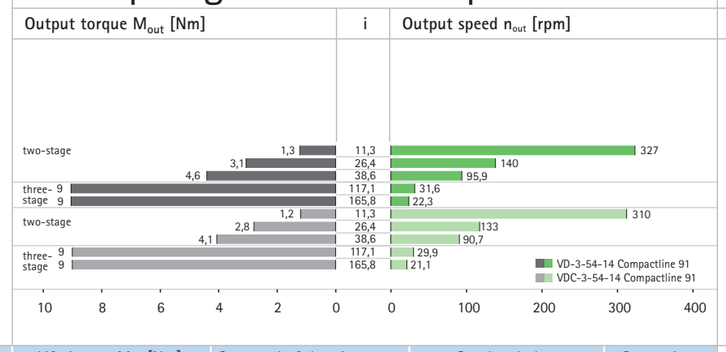
Spur gearhead	Brushless EC motor, external rotor
Compactline 91	VDC-3-43-10 4000 rpm/19 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 44.	11,3 / 2	0,4	354	15	91.2.C4310.C11	1,25	0,6	79
K 45.	26,4 / 2	1	152	15	91.2.C4310.C15			
K 46.	38,6 / 2	1,4	104	15	91.2.C4310.C17			
K 47.	117,1 / 3	3,9	34,2	14	91.3.C4310.C19	1,25	0,6	79
K 48.	165,8 / 3	5,5	24,1	14	91.3.C4310.C20			

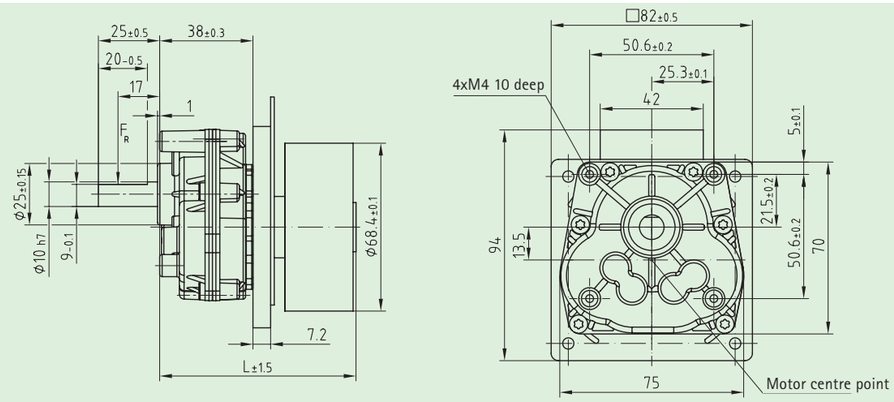
Add-on components	VD-3-43-10	VDC-3-43-10
	Electronics V02	Electronics S01–S02 / Circuit diagram SB04

Brushless EC motor, external rotor with spur gearhead Compactline 91





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 00



Spur gearhead	Brushless EC motor, external rotor
Compactline 91	VD-3-54-14 3700 rpm/57 W 24 V

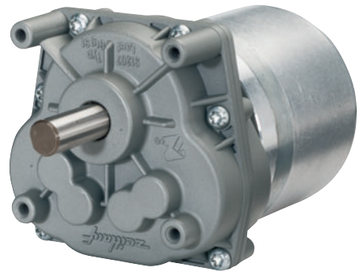
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 49.	11,3 / 2	1,3	327	46	91.2.5414.C01	3,6	0,6	81
K 50.	26,4 / 2	3,1	140	46	91.2.5414.C05			
K 51.	38,6 / 2	4,6	95,9	46	91.2.5414.C07			
K 52.	117,1 / 3	9	31,6	30	91.3.5414.C09	3,6	0,7	81
K 53.	165,8 / 3	9	22,3	21	91.3.5414.C10			

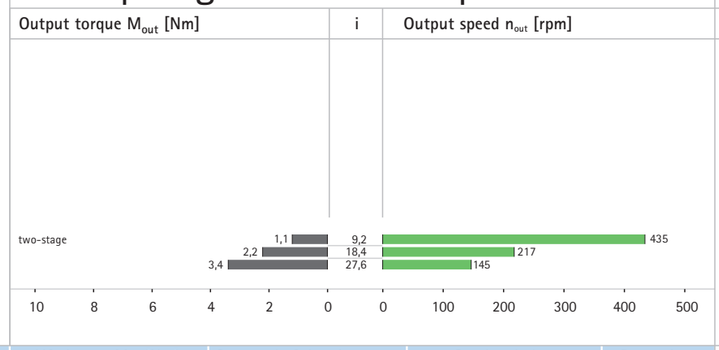
Spur gearhead	Brushless EC motor, external rotor
Compactline 91	VDC-3-54-14 3500 rpm/47,6 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 54.	11,3 / 2	1,2	310	39	91.2.C5414.C11	2,8	0,7	81
K 55.	26,4 / 2	2,8	133	39	91.2.C5414.C15			
K 56.	38,6 / 2	4,1	90,7	39	91.2.C5414.C17			
K 57.	117,1 / 3	9	29,9	28	91.3.C5414.C19	2,8	0,8	81
K 58.	165,8 / 3	9	21,1	20	91.3.C5414.C20			

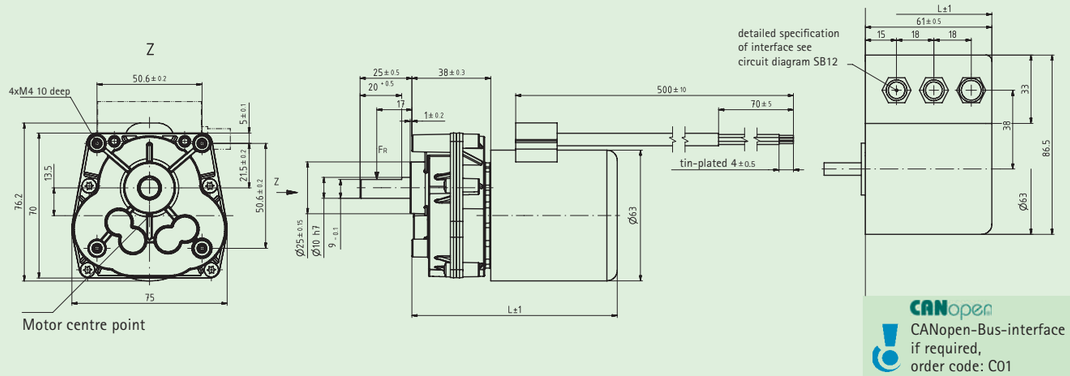
Add-on components	VD-3-54-14	VDC-3-54-14	
	Electronics	Electronics	Circuit diagram
	M02	S01-S02	SB05

Brushless EC motor, external rotor with spur gearhead Compactline 91





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 54



Spur gearhead	Brushless EC motor, external rotor
Compactline 91	VDC-3-49-15 4000 rpm/63 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 59.	9,2 / 2	1,1	435	51	91.2.C4915.C01	3,5	1,1	99
K 60.	18,4 / 2	2,2	217	51	91.2.C4915.C02			
K 61.	27,6 / 2	3,4	145	51	91.2.C4915.C03			

Add-on components	VDC-3-49-15	
	Electronics	Circuit diagram
	S01-S02	SB12

K
L
M
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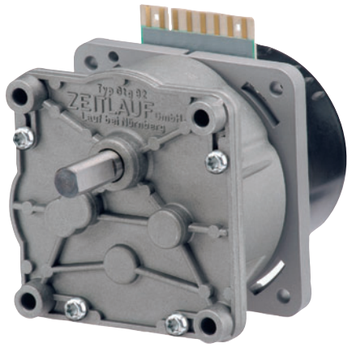
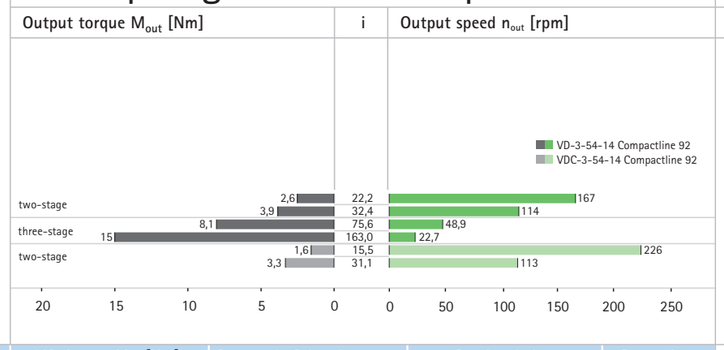
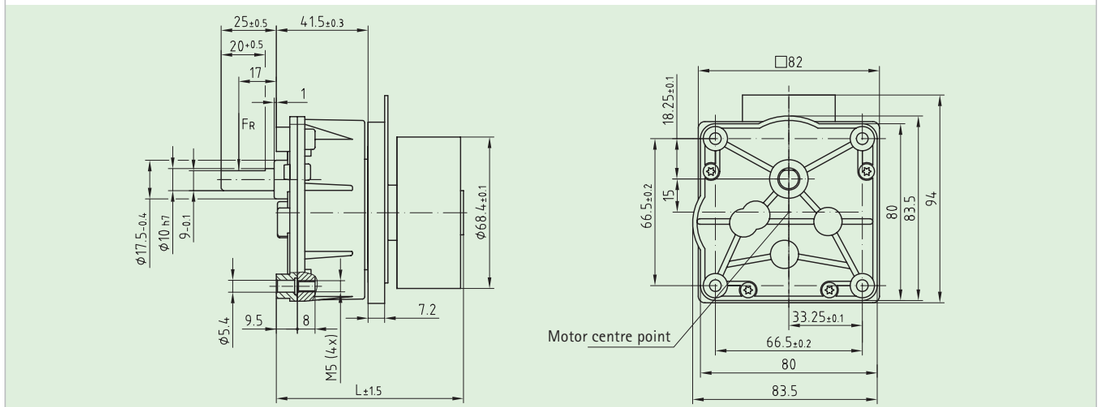
Brushless EC motor, external rotor with spur gearhead Compactline 92





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	50 N	5000 h Operating factor c_B=1	combined sliding/ needle bearing	approx. 0,7° to 1,2° depending on reduction	IP 00



Spur gearhead	Brushless EC motor, external rotor							
Compactline 92	VD-3-54-14	3700 rpm/57 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 62.	22,2 / 2	2,6	167	46	92.2.5414.C01	3,6	0,9	85
K 63.	32,4 / 2	3,9	114	46	92.2.5414.C03			
K 64.	75,6 / 3	8,1	48,9	42	92.3.5414.C06	3,6	1	85
K 65.	163 / 3	15	22,7	36	92.3.5414.C09			

Spur gearhead	Brushless EC motor, external rotor							
Compactline 92	VDC-3-54-14	3500 rpm/47,6 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
K 66.	15,5 / 2	1,6	226	39	92.2.C5414.C11	2,8	0,9	85
K 67.	31,1 / 2	3,3	113	39	92.2.C5414.C12			

Add-on components	VD-3-54-14	VDC-3-54-14	
	Electronics	Electronics	Circuit diagram
	V02	S01-S02	SB05

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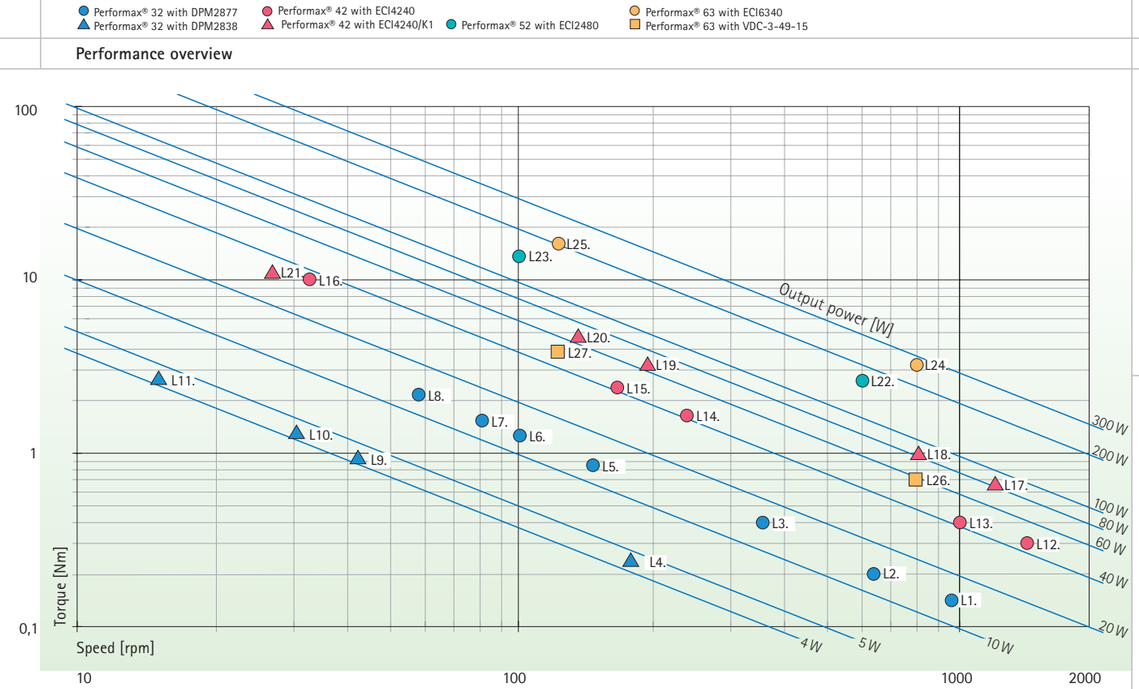
Brushless EC motor, external and internal rotor with planetary gearhead Performax®

Innovation combined with longevity:
top-class drives



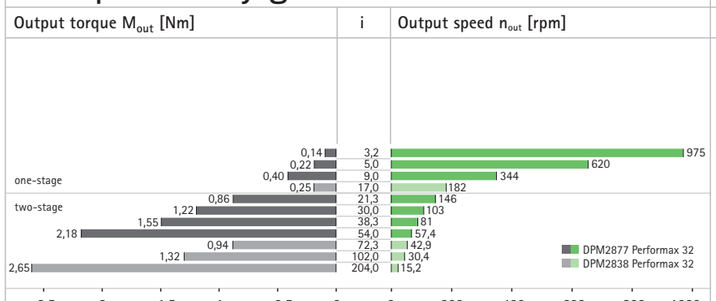
Brushless EC motor, external and internal rotor with planetary gearhead Performax®

The drives of the Performax® series are an innovation in gearhead technology. An innovative (patent pending) planetary gearhead modular assembly concept is being used for the first time. Compared with other similar specified products on the market, Performax® gearheads offer outstanding power delivery and excellent smooth running.

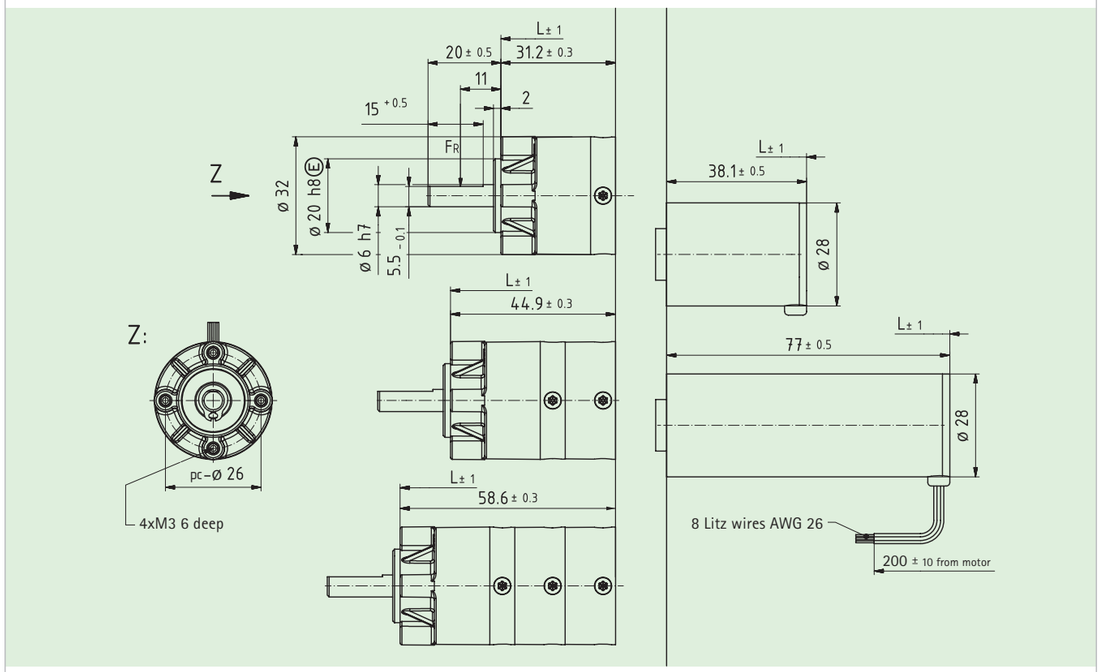
EC direct current motors have a very long life time by standards of electronic commutation (normally in excess of 10,000 hours). Speed control can be realised through integrated electronics, which is available with most models. Electronically commutated motors normally provide as a rule, high torques even at low speeds.

- patent pending modular design
- noise-optimised helical teeth in the input stage
- planetary wheels utilising one hollow plastic wheel with optimised sliding properties in the first stage for additional noise reduction
- hardened steel planetary wheels running on bearings (slide bearings in the case of Pgp32) with zinc diecast spur teeth in the second stage
- ground and hardened output shaft (diameter tolerance h7)
- two output shaft variants (feather key / face) available
- Motors adjustable - and controllable from nominal speed to the smallest motor speed of 300 rpm with constant motor torque
- matching operating electronics and switched-mode power supplies are available as option (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40 or IP54
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C
- CANopen Bus-interface (VDC-3-49-15)

Brushless EC motor, internal rotor with planetary gearhead Performax® 32



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
150 N	150 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



Planetary gearhead: Performax® 32

Brushless EC motor, internal rotor: DPM2877 (3100 rpm/16,2 W, 24 V) / DPM2838 (3100 rpm/5,2 W, 24 V)

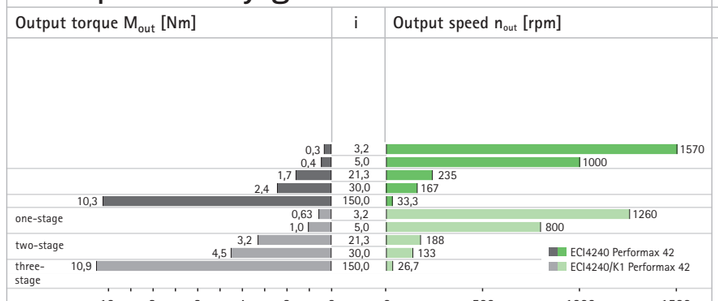
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 1.	3,2 / 1	0,14	975	15	DPM2877	32.1.D2877.P01	1	0,3	108
L 2.	5 / 1	0,22	620	15	DPM2877	32.1.D2877.P02	1	0,3	108
L 3.	9 / 1	0,40	344	15	DPM2877	32.1.D2877.P03	1	0,33	122
L 4.	17 / 1	0,25	182	4,7	DPM2838	32.1.D2838.P04	0,41	0,25	83
L 5.	21,3 / 2	0,86	146	13	DPM2877	32.2.D2877.P05	1	0,35	122
L 6.	30 / 2	1,22	103	13	DPM2877	32.2.D2877.P06	1	0,35	122
L 7.	38,3 / 2	1,55	81	13	DPM2877	32.2.D2877.P07	1	0,38	136
L 8.	54 / 2	2,18	57,4	13	DPM2877	32.2.D2877.P08	1	0,38	136
L 9.	72,3 / 2	0,94	42,9	4,2	DPM2838	32.2.D2838.P09	0,41	0,3	97
L 10.	102 / 2	1,32	30,4	4,2	DPM2838	32.2.D2838.P10	0,41	0,3	97
L 11.	204 / 2	2,65	15,2	4,2	DPM2838	32.2.D2838.P11	0,41	0,3	97

Add-on components

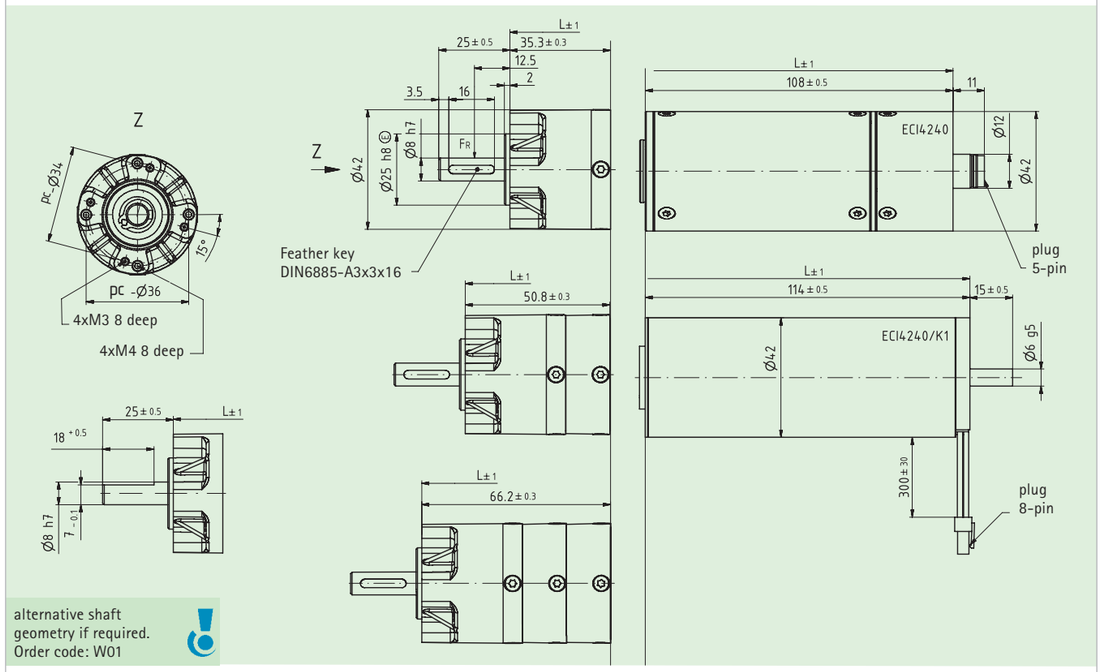
DPM2877 / DPM2838
Electronics: V04-V05, CAN01, S01-S02

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Electronics: Page 154-167

Brushless EC motor, internal rotor with planetary gearhead Performax® 42



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
250 N	150 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



Planetary gearhead: Performax® 42

Brushless EC motor, internal rotor: ECI4240 electronic integrated (5000 rpm/52 W, 24 V)

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 12.	3,2 / 1	0,3	1570	47	42.1.E4240.P01	3	0,9	143
L 13.	5 / 1	0,4	1000	47	42.1.E4240.P02	3	0,9	143
L 14.	21,3 / 2	1,7	235	42	42.2.E4240.P03	3	1,0	159
L 15.	30 / 2	2,4	167	42	42.2.E4240.P04	3	1,0	159
L 16.	150 / 3	10,3	33,3	36	42.3.E4240.P05	3	1,1	174

Performax® 42 — ECI4240/K1 (4000 rpm/92 W, 24 V)

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 17.	3,2 / 1	0,63	1260	83	42.1.E4240.P06	5,1	0,7	149
L 18.	5 / 1	1,0	800	83	42.1.E4240.P07	5,1	0,7	149
L 19.	21,3 / 2	3,2	188	63	42.2.E4240.P08	5,1	0,8	165
L 20.	30 / 2	4,5	133	63	42.2.E4240.P09	5,1	0,8	165
L 21.	150 / 3	10,9	26,7	30,5	42.3.E4240.P10	5,1	0,9	180

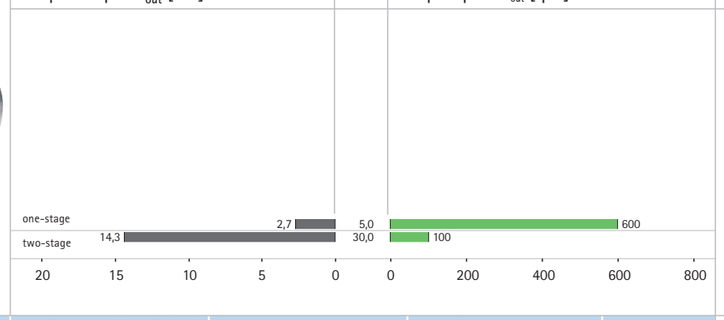
Add-on components

ECI4240
Electronics: CAN01, S02-S02 — Circuit diagram: SB07

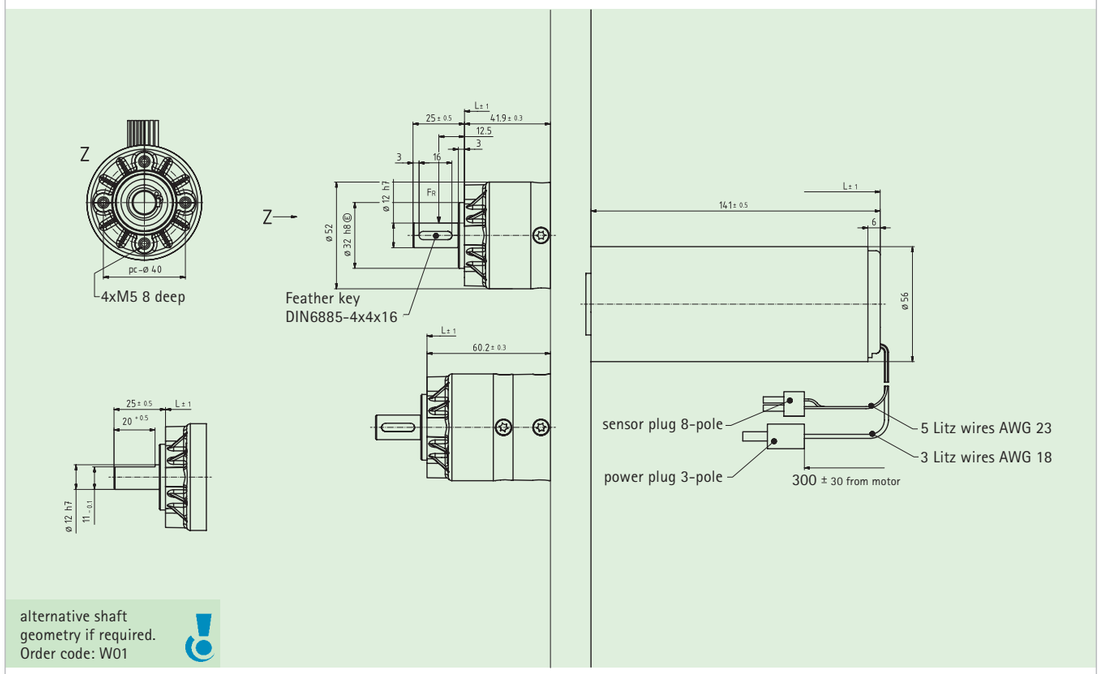
ECI4240/K1
Brake: B01 — Encoder: E04-E05, CAN01, S01-S02 — Electronics: CAN01, S02-S02 — Circuit diagram: SB07

*maximum continuous output torque · M_{max}[Nm] see page 24-25 · Brake: Page 145 · Encoder: 147 · Electronics: Page 154-167 · Circuit diagram: Page 154

Brushless EC motor, internal rotor with planetary gearhead Performax® 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40

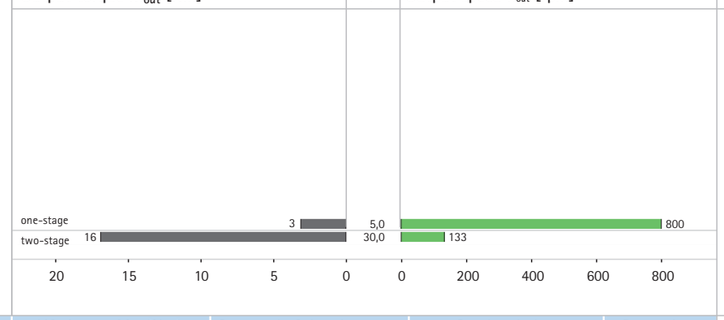


alternative shaft geometry if required. Order code: W01

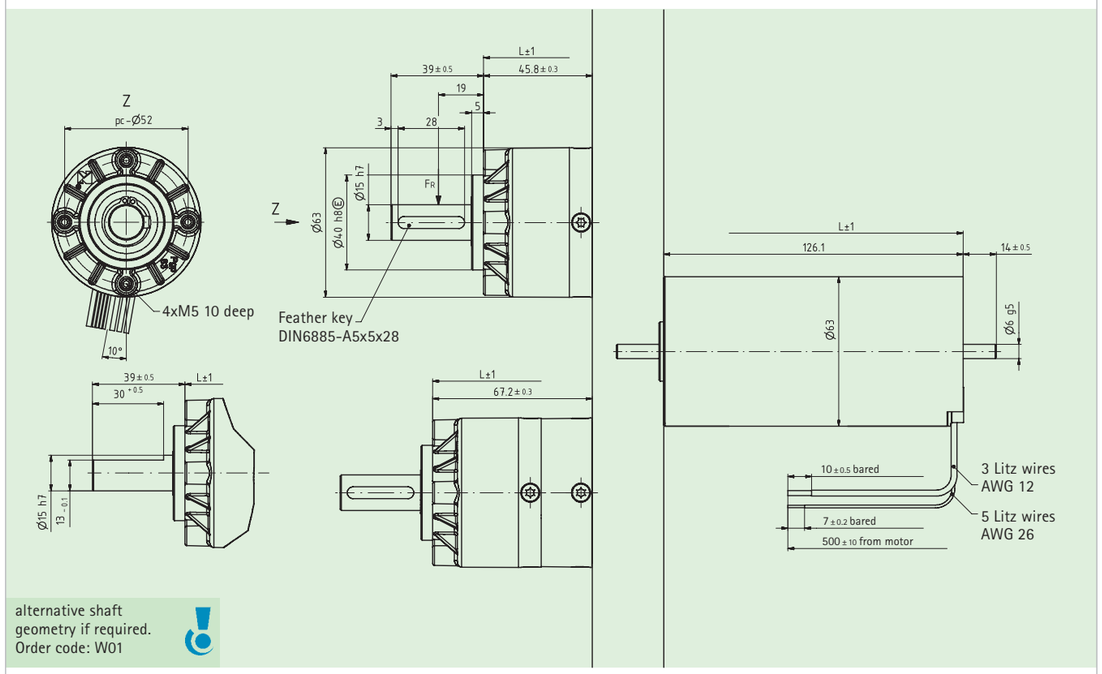
Planetary gearhead	Brushless EC motor, internal rotor							
Performax® 52	ECI2480	3000 rpm/185 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 22.	5 / 1	2,7	600	170	52.1.E2480.P01	11	1,7	183
L 23.	30 / 2	14,3	100	150	52.2.E2480.P02	11	1,9	201

Add-on components	ECI2480		
	Electronics	Circuit diagram	
	V04-V05, CANopen	SB08	

Brushless EC motor, internal rotor with planetary gearhead Performax® 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 54

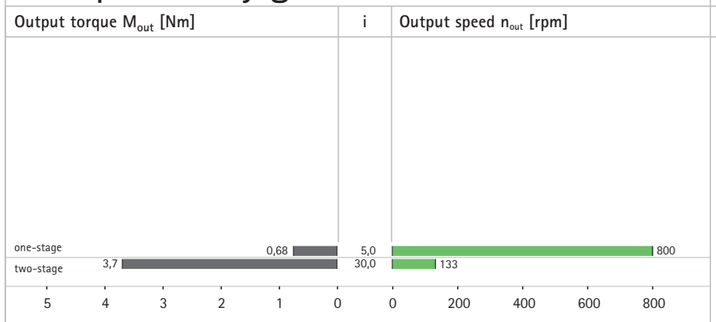


alternative shaft geometry if required. Order code: W01

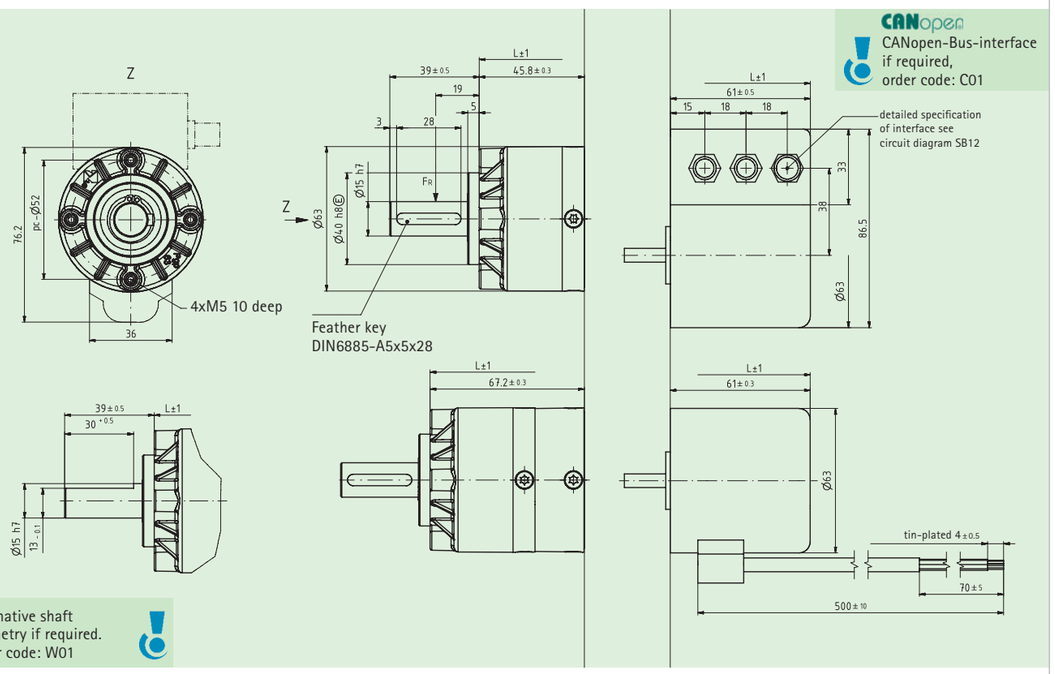
Planetary gearhead	Brushless EC motor, internal rotor							
Performax® 63	ECI6340	4000 rpm/280 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 24.	5 / 1	3	800	250	63.1.E6340.P03	14	1,9	172
L 25.	30 / 2	16	133	230	63.2.E6340.P04	14	2,2	193

Add-on components	ECI6340			
	Brake	Encoder	Electronics	Circuit diagram
	B03	G04	V04-V05, CANopen	SB08

Brushless EC motor, external rotor with planetary gearhead Performax® 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 54



CANopen
CANopen-Bus-interface
if required,
order code: C01

detailed specification
of interface see
circuit diagram SB12

alternative shaft
geometry if required.
Order code: W01

Planetary gearhead	Brushless EC motor, external rotor
Performax® 63	VDC-3-49-15 4000 rpm/63 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
L 26.	5 / 1	0,68	800	57	63.1.C4915.P01	3,5	1,3	107
L 27.	30 / 2	3,7	133	51	63.2.C4915.P02	3,5	1,6	128

Add-on components	VDC-3-49-15
	Electronics: SD1 SD2 · Circuit diagram: SB12

4209 4,209 drive solutions

48 48 hour service

KEEP WORD WARRANTY Keep-Word-Warranty

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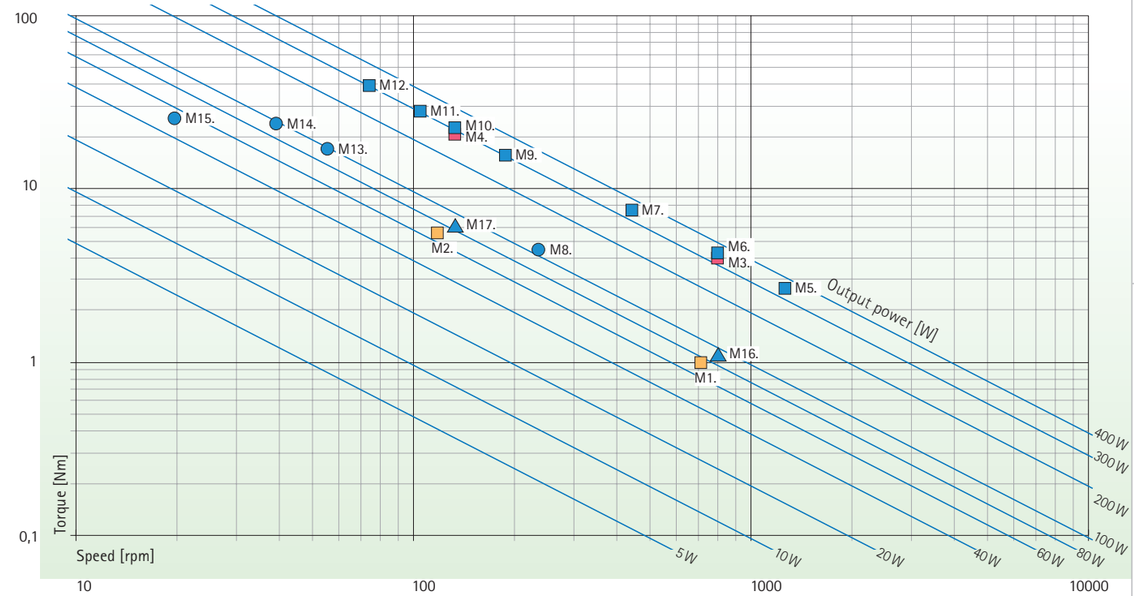
Brushless EC motor, external and internal rotor with planetary gearhead Performax® Plus

A powerful gearhead –
designed for tough uses

Performax® Plus 42 with ECM4860 | Performax® Plus 52 with ECI6360 | Performax® Plus 63 with ECI6320 | Performax® Plus 63 with ECI6360 | Performax® Plus 63 with VDC-3-49-15

Performance overview



Brushless EC motor, external and internal rotor with planetary gearhead Performax® Plus

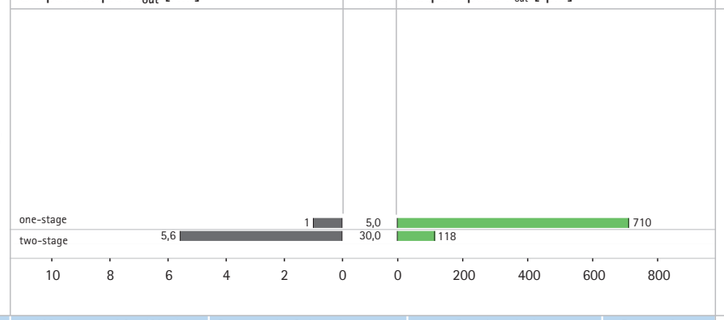
Everywhere where difficult conditions hold sway and robust construction as well as high output performance is required, Performax® Plus can demonstrate its special strengths.

Extra power transmission results from toothing in the input stage being up to 100 percent larger and from increased strength obtained from concave toothing in hardened steel. Another advantage of the steel casing is its higher impact resistance.

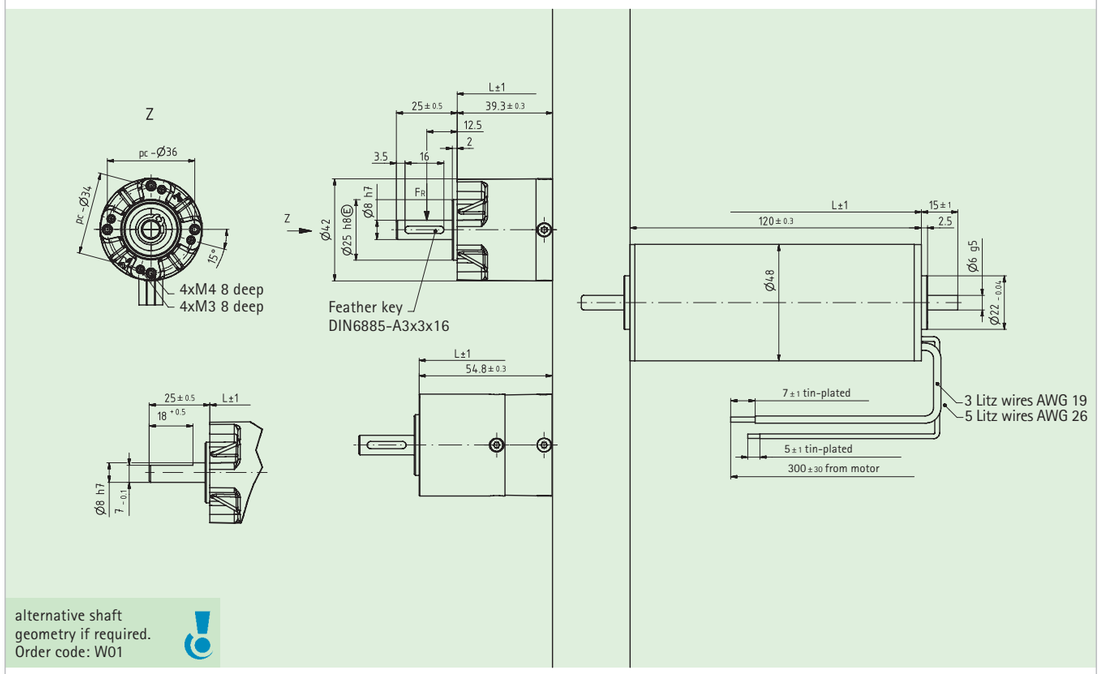
Using brushless electronically commutated motors plus optimum configuration and appropriate power density, we can permit very high input torques up to 1 Nm.

- Markedly widened (up to 100 %) in the first stage for increased torque transfer
- Housing made of hardened steel in the output stage for higher torque achieved by increasing the strength of the toothing
- hardened and polished output shaft (diameter tolerance h7)
- two output shaft variants (feather key / face) available
- Motors adjustable – and controllable from nominal speed to the smallest motor speed of 300 rpm with constant motor torque
- matching operating electronics and switched-mode power supplies are available as option (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 50 and IP 54
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C
- CANopen Bus-interface (VDC-3-49-15)

Brushless EC motor, internal rotor w. planetary gearhead Performax® Plus 42



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
250 N	150 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 50

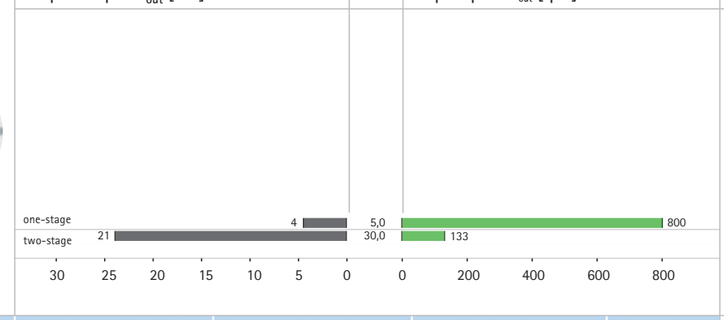


alternative shaft geometry if required. Order code: W01

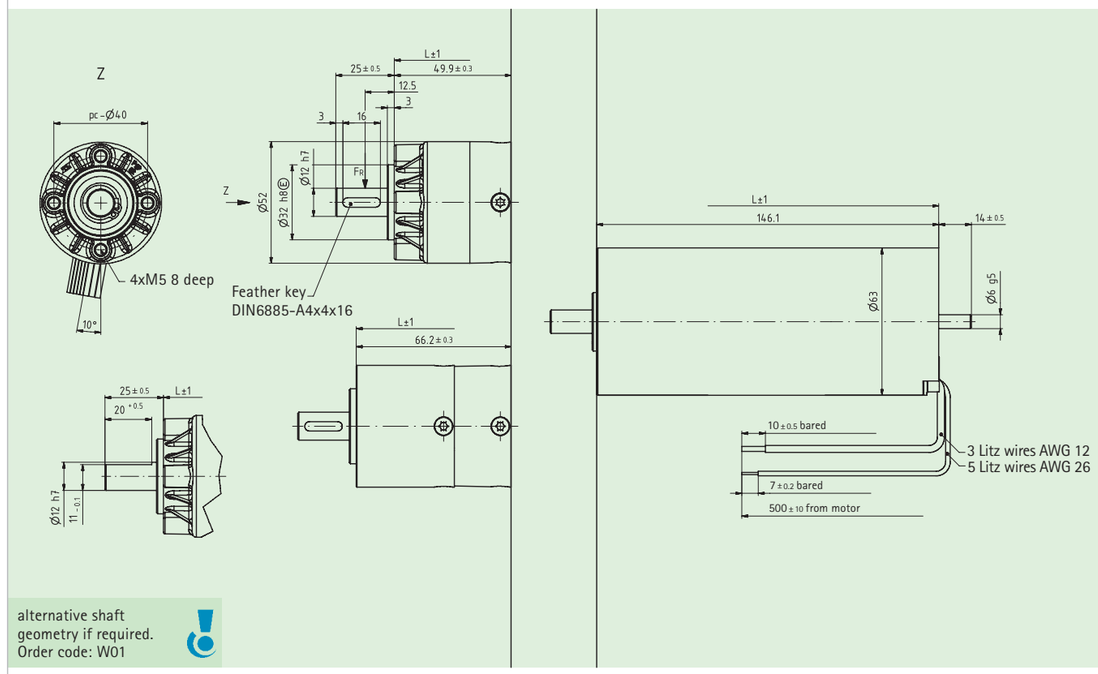
Planetary gearhead	Brushless EC motor, internal rotor							
Performax® Plus 42	ECM 48x60	3550 rpm/85 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
M 1.	5 /1	1	710	76	42.1.E4860.PP01	2,9	1,1	159
M 2.	30 / 2	5,6	118	69	42.2.E4860.PP02	2,9	1,2	175

Add-on components	ECM 48x60			
	Brake	Encoder	Electronics	Circuit diagram
	B02	G01 - G05	V04-V05, CAN01, S01-S02	SB11

Brushless EC motor, internal rotor w. planetary gearhead Performax® Plus 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 54

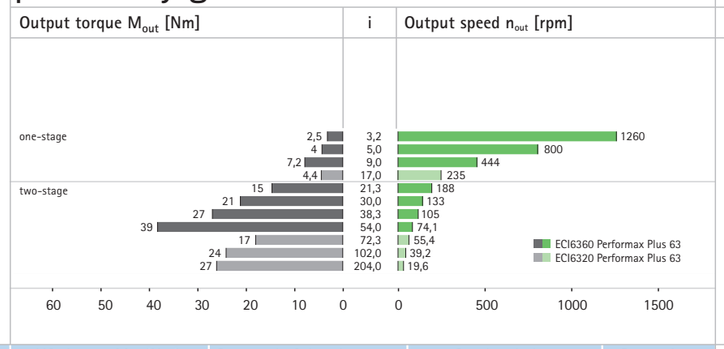


alternative shaft geometry if required. Order code: W01

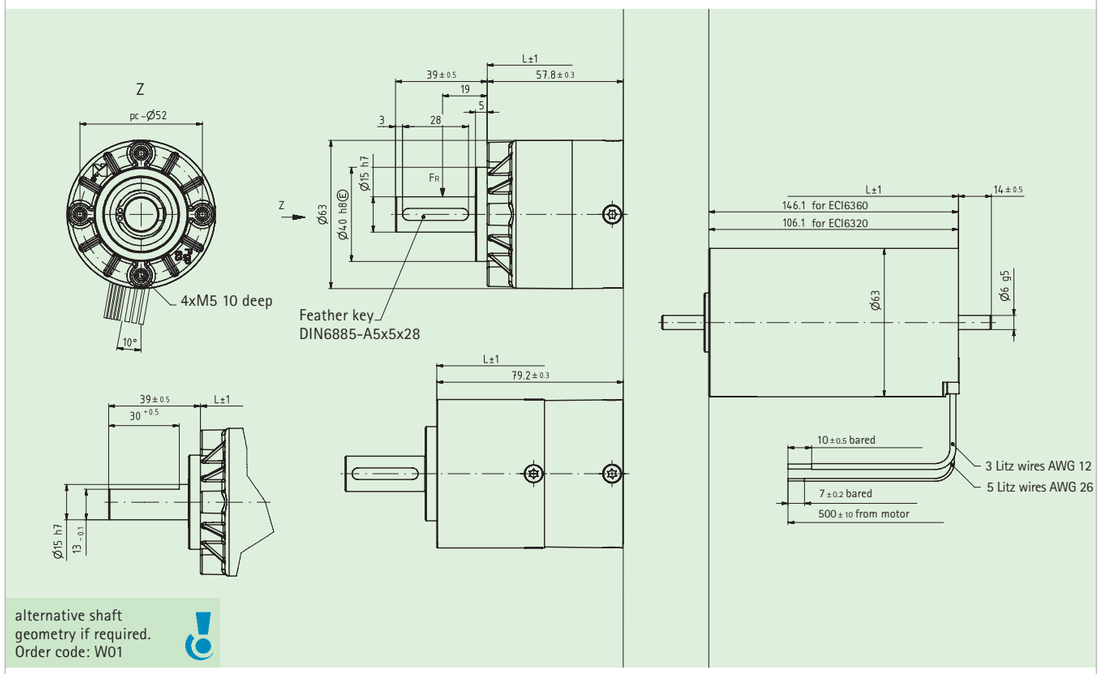
Planetary gearhead	Brushless EC motor, internal rotor							
Performax® Plus 52	ECI6360	4000 rpm/370 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
M 3.	5 / 1	4	800	330	52.1.E6360.PP01	17,6	1,9	194
M 4.	30 / 2	21	133	300	52.2.E6360.PP02	17,6	2,2	212

Add-on components	ECI6360			
	Brake	Encoder	Electronics	Circuit diagram
	B03	G04	V04-V05, CAN02, S03	SB12

Brushless EC motor, internal rotor w. planetary gearhead Performax® Plus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 54

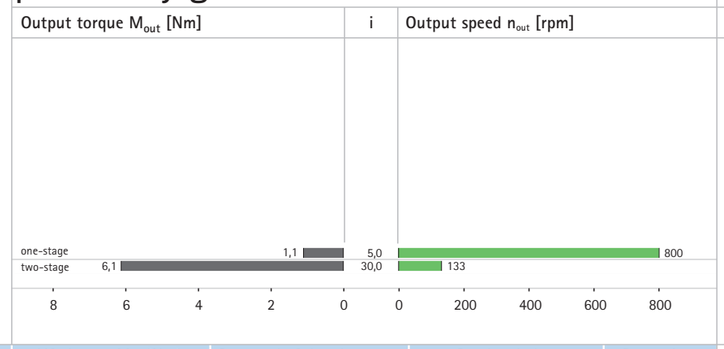


alternative shaft geometry if required.
Order code: W01

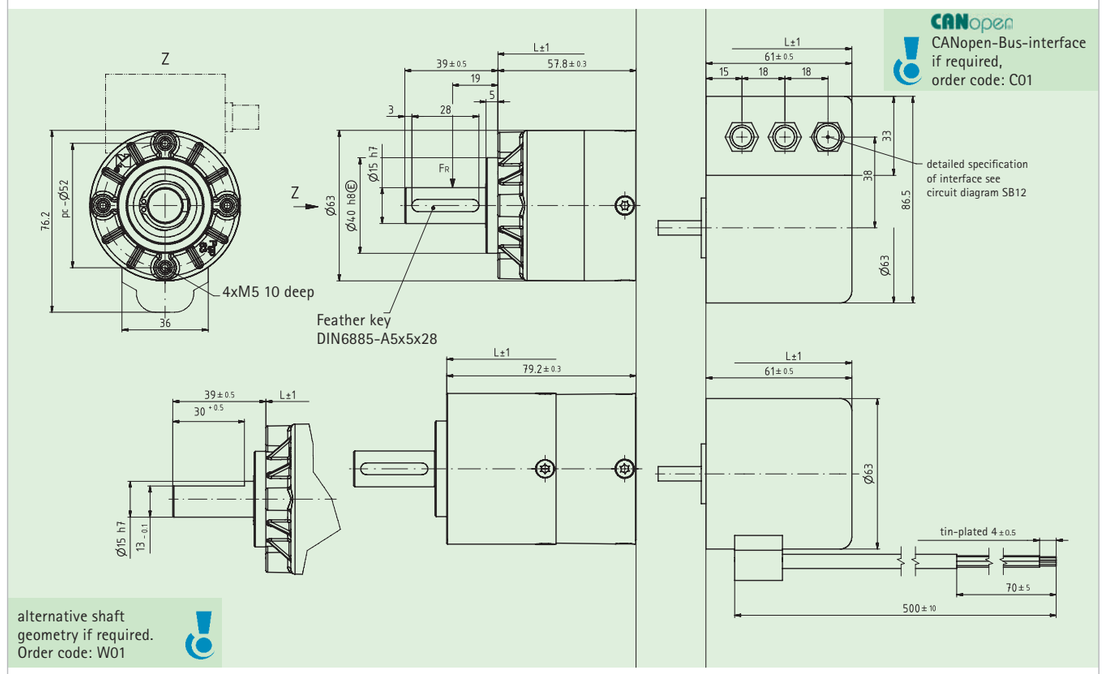
Planetary gearhead	Brushless EC motor, internal rotor								
Performax® Plus 63	ECI6360	4000 rpm/370 W 24 V			ECI6320	4000 rpm/150 W 24 V			
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
M 5.	3,2 / 1	2,5	1260	330	ECI6360	63.1.E6360.PP01	17,6	2,2	204
M 6.	5 / 1	4	800	330	ECI6360	63.1.E6360.PP02	17,6	2,2	204
M 7.	9 / 1	7,2	444	330	ECI6360	63.1.E6360.PP03	17,6	2,2	204
M 8.	17 / 1	4,4	235	110	ECI6320	63.1.E6320.PP04	8,5	1,6	164
M 9.	21,3 / 2	15	188	300	ECI6360	63.2.E6360.PP05	17,6	2,7	225
M 10.	30 / 2	21	133	300	ECI6360	63.2.E6360.PP06	17,6	2,7	225
M 11.	38,3 / 2	27	105	300	ECI6360	63.2.E6360.PP07	17,6	2,7	225
M 12.	54 / 2	39	74,1	300	ECI6360	63.2.E6360.PP08	17,6	2,7	225
M 13.	72,3 / 2	17	55,4	98	ECI6320	63.2.E6320.PP09	8,5	2,1	185
M 14.	102 / 2	24	39,2	98	ECI6320	63.2.E6320.PP10	8,5	2,1	185
M 15.	204 / 2	27	19,6	56	ECI6320	63.2.E6320.PP11	8,5	2,1	185

Add-on components	ECI6360				ECI6320			
	Brake	Encoder	Electronics	Circuit diagram	Brake	Encoder	Electronics	Circuit diagram
	B03	G04	V04-V05, CAN02, S03	SB08	B03	G04	V04-V05, CAN01, S02-S03	SB08

Brushless EC motor, external rotor w. planetary gearhead Performax® Plus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
350 N	500 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 54



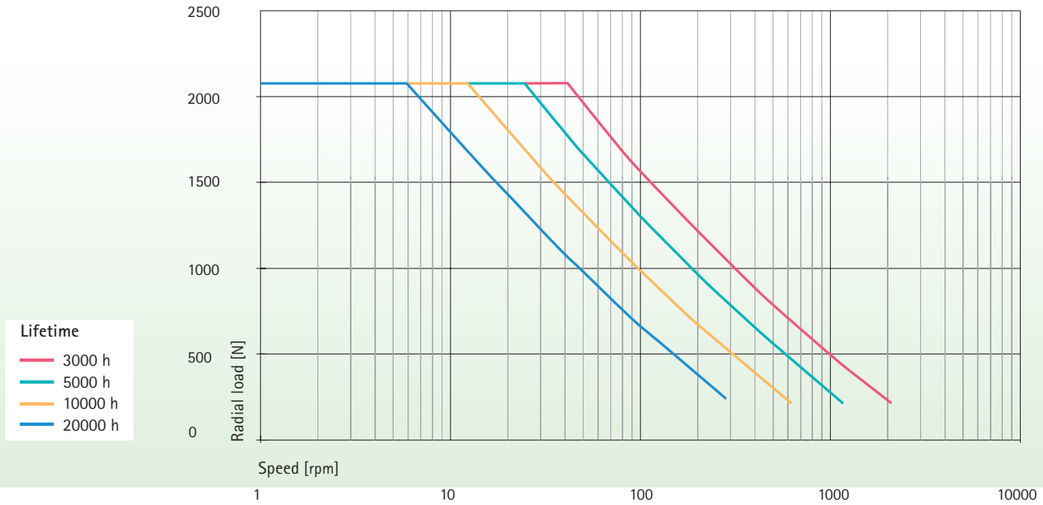
alternative shaft geometry if required.
Order code: W01

Planetary gearhead	Brushless EC motor, external rotor								
Performax® Plus 63	VDC-3-49-15	4000 rpm/105 W 48 V							
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]	
M 16.	5 / 1	1,1	800	95	63.1.C4915.PP01	2,9	1,3	119	
M 17.	30 / 2	6,1	133	85	63.2.C4915.PP02	2,9	1,9	140	

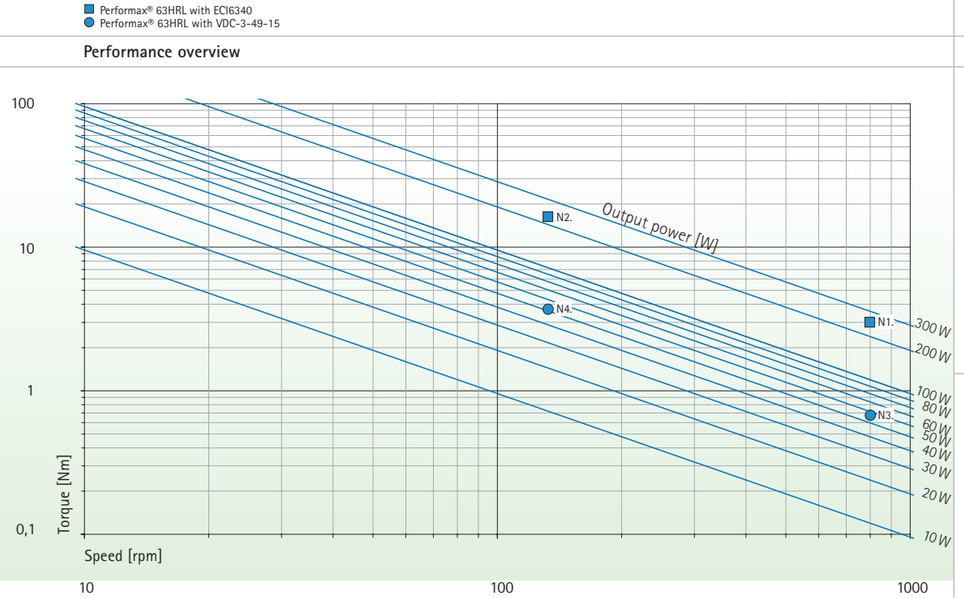
Add-on components	VDC-3-49-15		
	Electronics	Circuit diagram	
	S01-S02	SB12	

Brushless EC motor, external and internal rotor with planetary gearhead Performax® 63HRL

Radial load overview



Performance overview



Durable performance without compromising

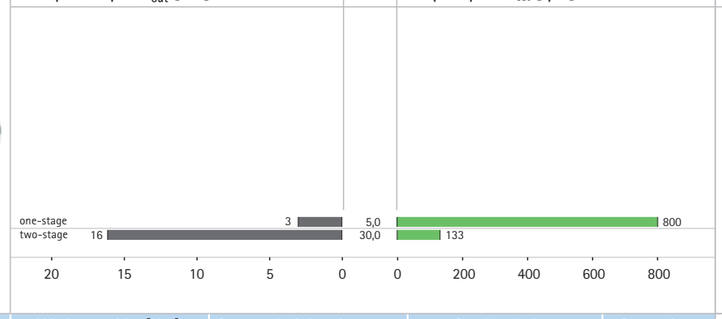
Brushless EC-motor, external and internal rotor with planetary gear head Performax® 63 HRL

A true success story is continued in the form of Performax®HRL. The innovative (patent pending) concept of the Performax® series is now able to manage the highest radial loads. This not only increases the application options of this excellent construction concept, but also its capabilities. Smoothness of running, gear reduction, torque, effectiveness or radial load – the top marks of Performax®HRL enhance performance every time. Performax®HRL means durablility without compromising.

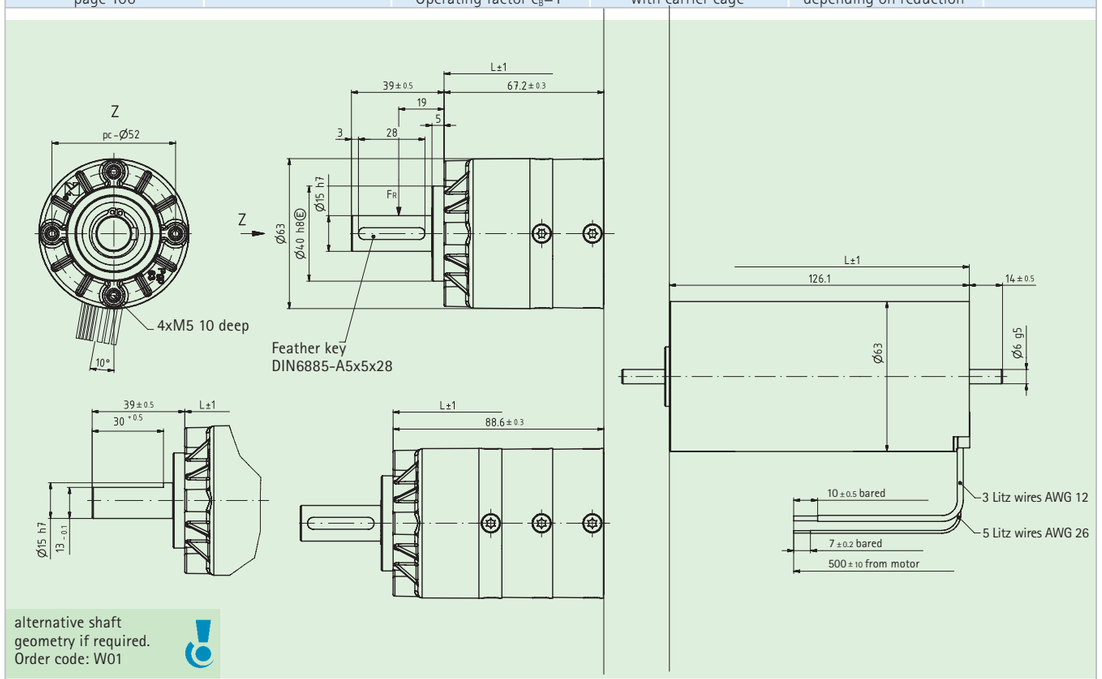
EC direct voltage motors have an extremely long life on account of the electronic commutation (usually more than 10,000 hours). Electronically commutated motors usually provide high torques even at lower speeds

- double-faced with ball-bearings supported planetary output stage
- noise optimised helical teeth in the first stage
- additional noise reduction through glide optimised plastics of planetary gears and hollow wheel of the first stage
- planetary gears made from case-hardened steel with rolling contact bearing and straight toothing in the diecast zinc housing second stage
- double-sided supported planetary gears in the HRL bearing housing
- ground and hardened output shaft injected with the HRL bearing housing
- two variants of the output shaft (feather key/surface) available
- motors adjustable - and controllable from nominal speed up to smallest motor speed of 300 rpm at almost constant motor torque
- suitable operating electronics and switched-mode power supplies are available optional (see accessories)
- protection class IP 54
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C for EC-motors
- CANopen Bus-interface (VDC-3-49-15)

Brushless EC motor, internal rotor with planetary gearhead Performax® 63HRL



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 106	500 N	5000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,7° to 1,2° depending on reduction	IP 54

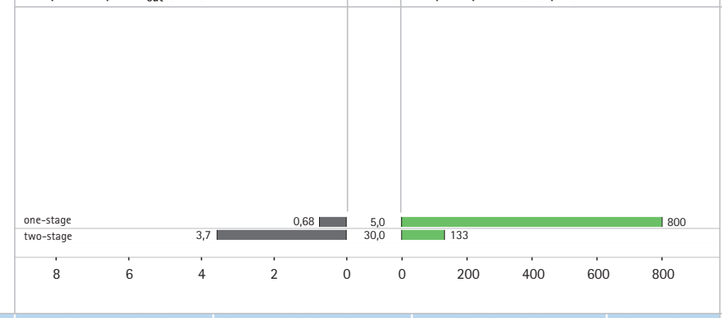


alternative shaft geometry if required.
Order code: W01

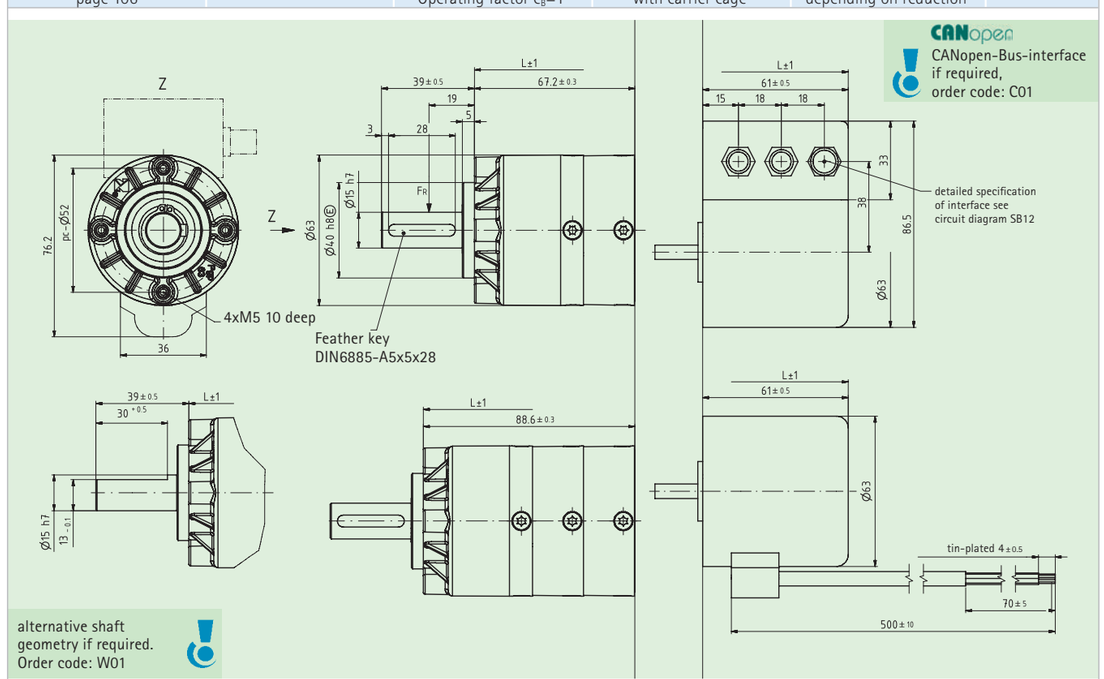
Planetary gearhead	Brushless EC motor, internal rotor							
Performax® 63HRL	ECI6340	4000 rpm/280 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
N 1.	5 / 1	3	800	250	63.1.E6340.H01	14	2,2	193
N 2.	30 / 2	16	133	230	63.2.E6340.H02	14	2,6	215

Add-on components	ECI6340			
	Brake	Encoder	Electronics	Circuit diagram
	B03	E04	V04-V05, CAN02, S03	SB08

Brushless EC motor, external rotor w. planetary gearhead Performax® 63HRL



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 106	500 N	5000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,7° to 1,2° depending on reduction	IP 54



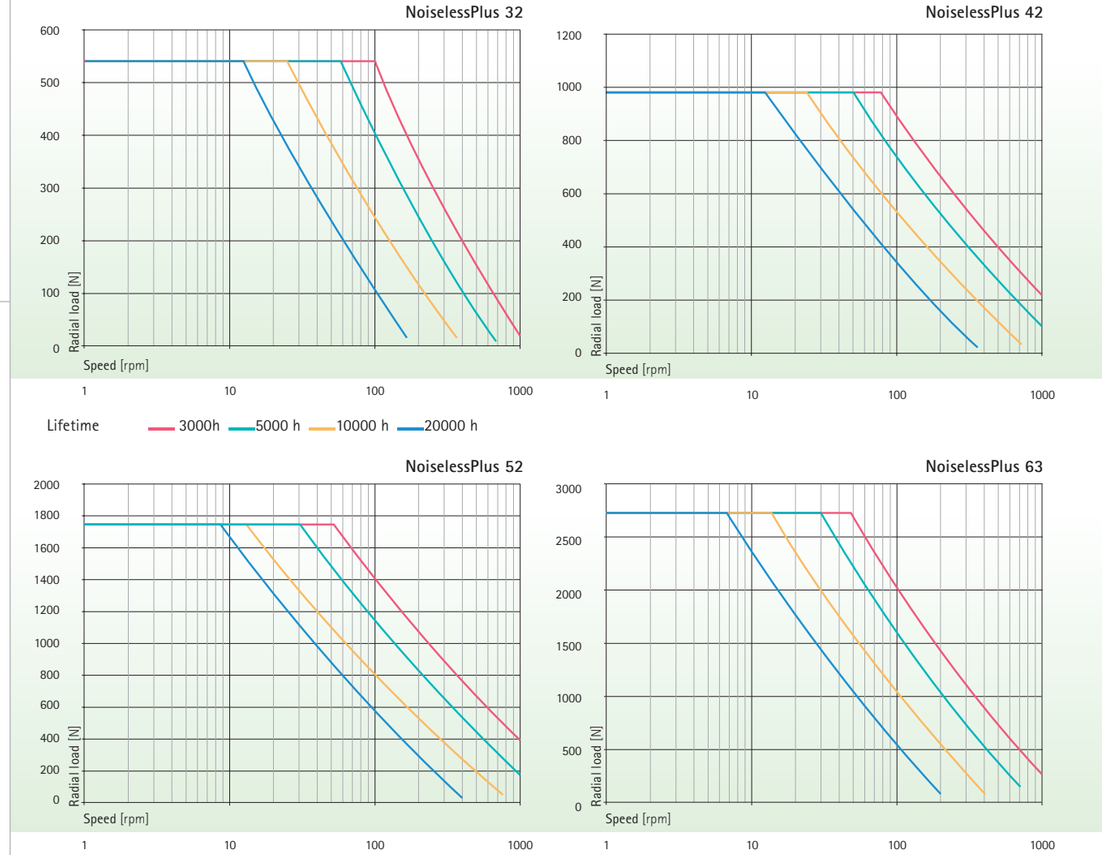
alternative shaft geometry if required.
Order code: W01

Planetary gearhead	Brushless EC motor, external rotor							
Performax® 63HRL	VDC-3-49-15	4000 rpm/63 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
N 3.	5 / 1	0,68	800	57	63.1.C4915.H01	3,5	1,2	128
N 4.	30 / 2	3,7	133	51	63.2.C4915.H02	3,5	1,9	150

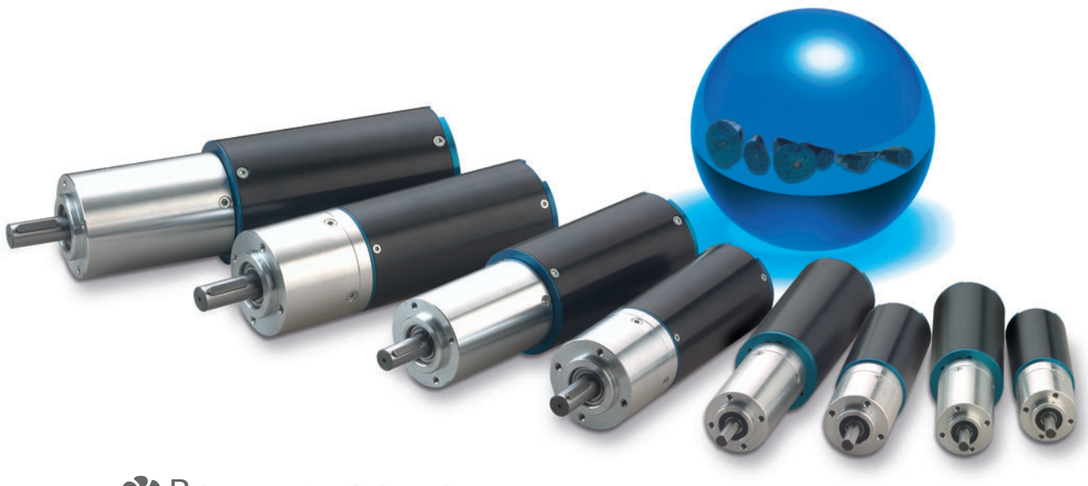
Add-on components	VDC-3-49-15	
	Electronics	Circuit diagram
	S01-S02	SB12

Brushless ECM motor, internal rotor with planetary gearhead NoiselessPlus

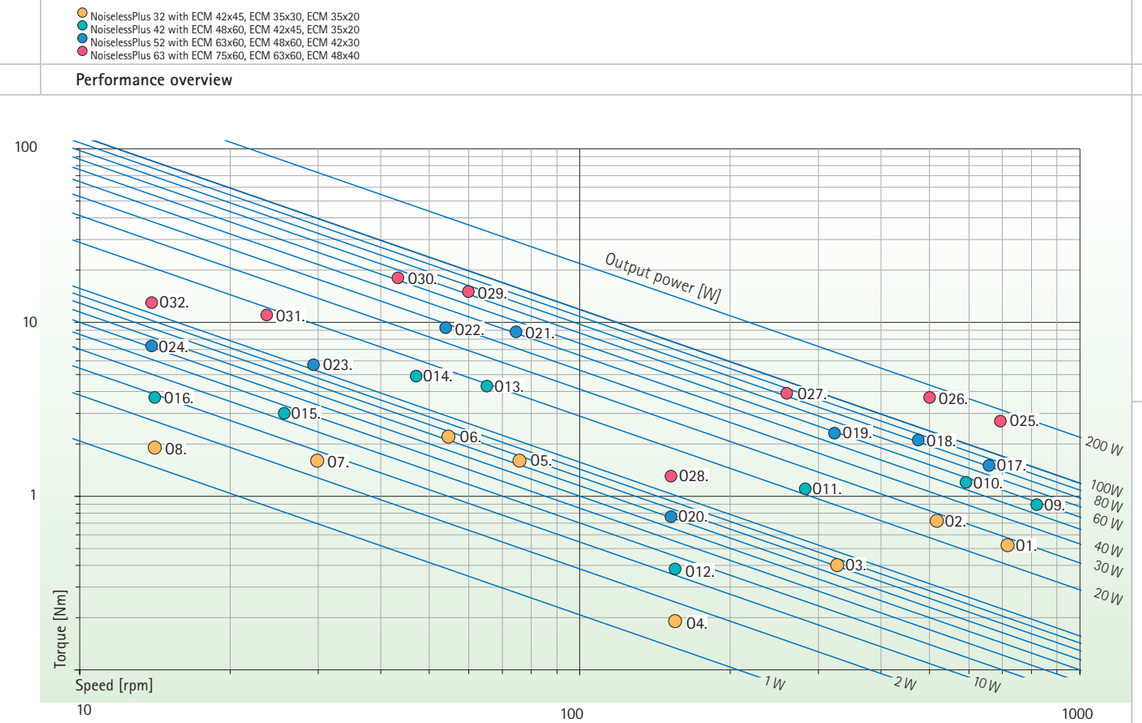
Radial load overview



High torques and reductions with maximum smooth running



Performance overview



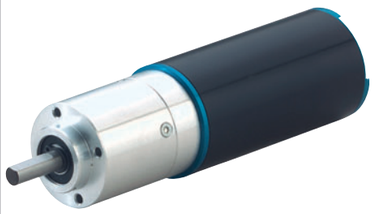
Brushless ECM-motor with NoiselessPlus planetary gearhead

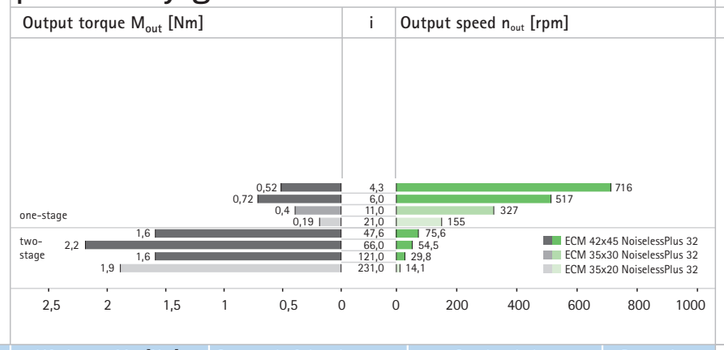
Planetary gearheads of the NoiselessPlus series are first choice for all application situations where smooth running and noise reduction are required in addition to power, energy efficiency and economy. The double ball bearing of the output shaft guarantees very low gearhead play. Planetary wheels made of low-wear plastic grip extremely precisely and smoothly into the noise-optimised bevelled teeth of the aluminium housing.

ECM direct voltage motors have an extremely long life on account of the electronic commutation (usually more than 10,000 hours). Electronically commutated motors usually provide high torques even at lower speeds

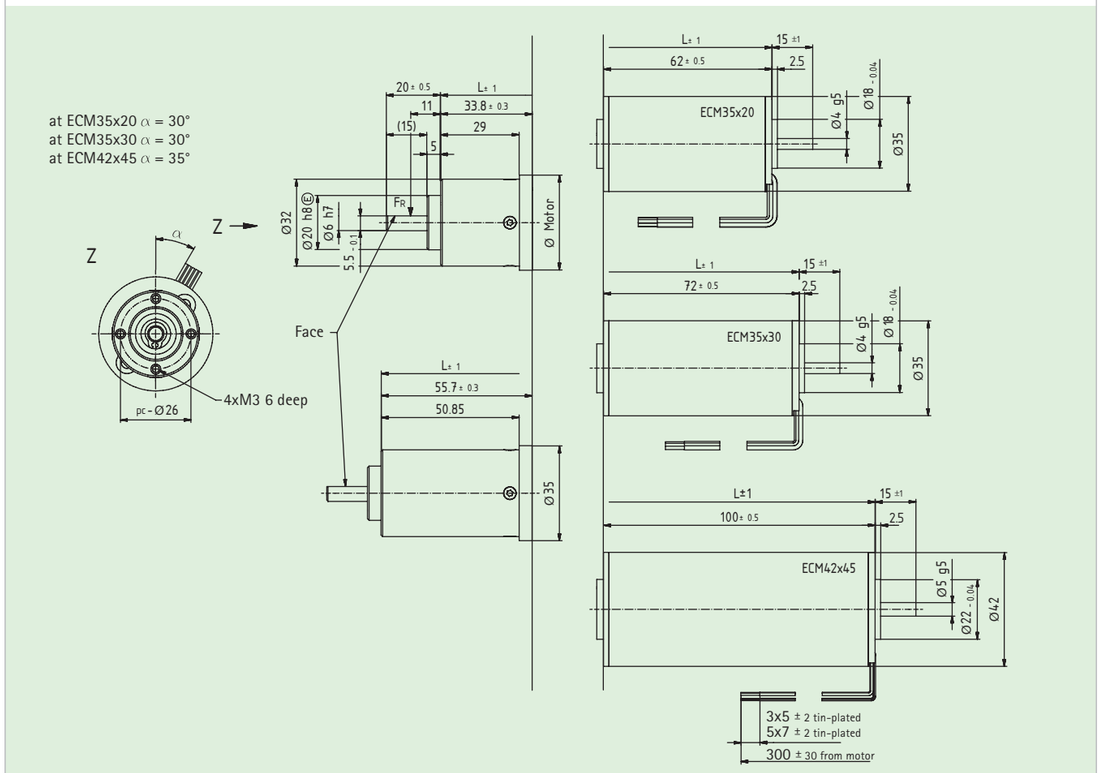
- noise reduction thanks to bevelled teeth in all stages
- optimised gliding of plastic planetary wheels for additional noise reduction
- hardened, ground and double ball-bearing output shaft made of sturdy case-hardened steel (diameter tolerance h7)
- eight reductions 4.3:1 to 21:1 and 47.6:1 to 231:1
- axial force up to 1,000 N at nominal speed
- ECM motors can be regulated with external electronics
- motors can be fitted with matching brake and various encoders (see accessories)
- operating electronics (CANopen) and switched power packs available as options (see accessories)
- gearhead lifetime of 10,000 hours (operating factor c_B=1)
- protection class IP 40
- maintenance-free grease lubricated for life
- ambient temperature -20 °C to +40 °C

Brushless ECM motor, internal rotor w. planetary gearhead NoiselessPlus 32





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 110	300 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 50

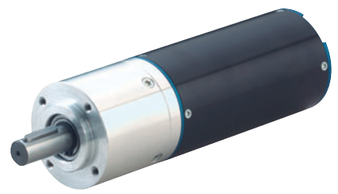


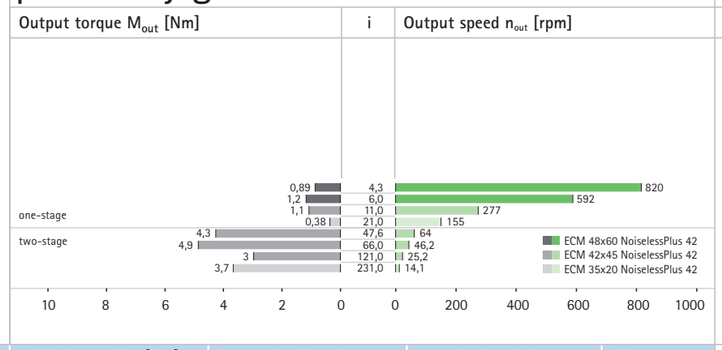
Planetary Gearhead	Brushless EC motor, internal rotor			Circuit diagram SB11, page 172
NoiselessPlus 32	ECM 42x45 3100 rpm-1/43 W 24 V	ECM 35x30 3600 rpm-1/15,2 W 24 V	ECM 35x20 3250 rpm-1/8,5 W 24 V	

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 1.	4,3 / 1	0,52	716	39	ECM 42x45	32.1.E4245.L01	2,71	0,6	134
0 2.	6 / 1	0,72	514	39	ECM 42x45	32.1.E4245.L02	2,71	0,6	134
0 3.	11 / 1	0,4	327	14	ECM 35x30	32.1.E3530.L03	1,08	0,36	106
0 4.	21 / 1	0,19	155	3,1	ECM 35x20	32.1.E3520.L04	0,66	0,36	106
0 5.	47,6 / 2	1,6	75,6	12	ECM 35x30	32.2.E3530.L05	1,08	0,41	128
0 6.	66 / 2	2,2	54,5	12	ECM 35x30	32.2.E3530.L06	1,08	0,41	128
0 7.	121 / 2	1,6	29,8	4,9	ECM 35x30	32.2.E3530.L07	1,08	0,41	128
0 8.	231 / 2	1,9	14,1	2,8	ECM 35x20	32.2.E3520.L08	0,66	0,36	118

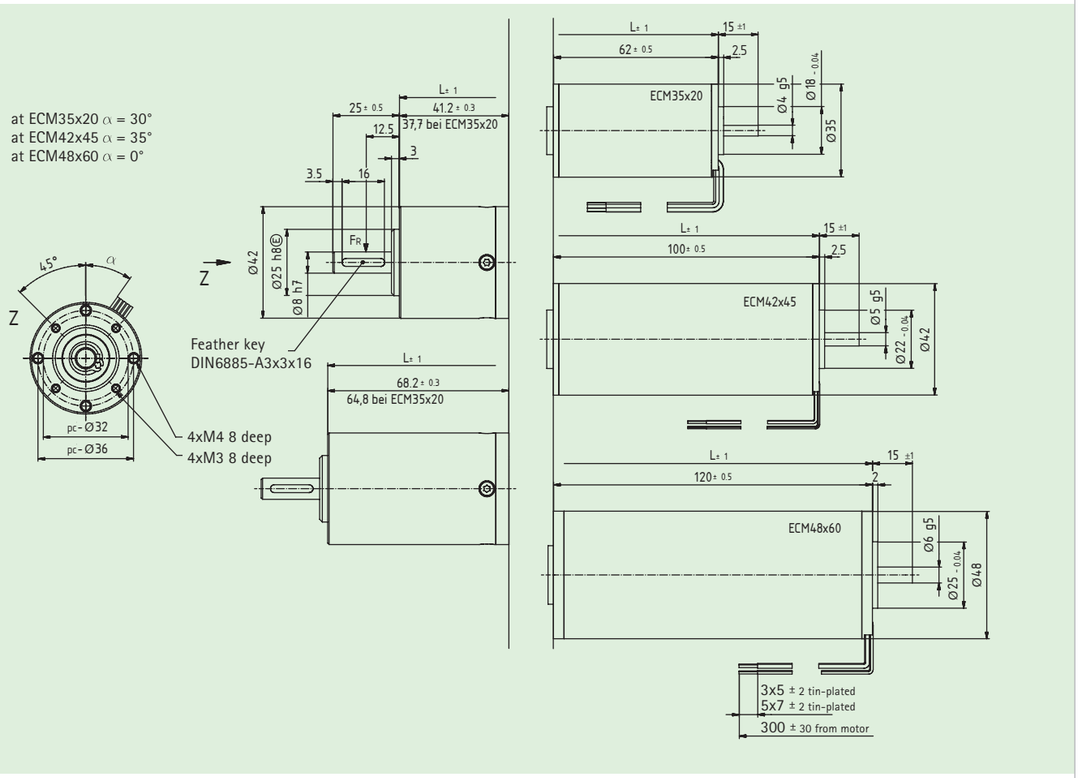
Add-on components	ECM 42x45			ECM 35x30	ECM 35x20
	Brake	Encoder	Electronics	Electronics	Electronics
	B01	G01-G05	V04-V05, CAN01, S01-S02	V04-V05, CAN01, S01-S02	V04-V05, CAN01, S01-S02

Brushless ECM motor, internal rotor w. planetary gearhead NoiselessPlus 42





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 110	500 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 50

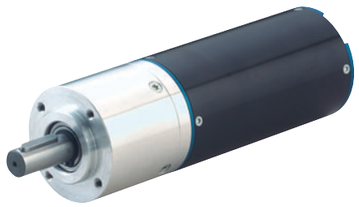


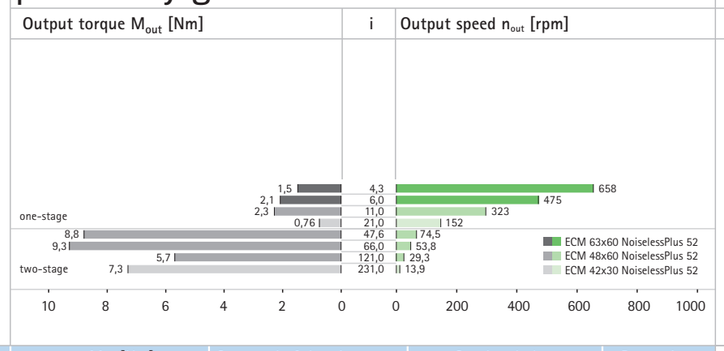
Planetary Gearhead	Brushless EC motor, internal rotor			Circuit diagram SB11, page 172
NoiselessPlus 42	ECM 48x60 3550 rpm-1/85 W 24 V	ECM 42x45 3100 rpm-1/43 W 24 V	ECM 35x20 3250 rpm-1/8,5 W 24 V	

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 9.	4,3 / 1	0,89	820	77	ECM 48x60	42.1.E4860.L01	2,9	1,07	161
0 10.	6 / 1	1,2	592	77	ECM 48x60	42.1.E4860.L02	2,9	1,07	161
0 11.	11 / 1	1,1	277	32	ECM 42x45	42.1.E4245.L03	2,71	0,73	141
0 12.	21 / 1	0,38	155	6,2	ECM 35x20	42.1.E3520.L04	0,66	0,44	100
0 13.	47,6 / 2	4,3	64	29	ECM 42x45	42.2.E4245.L05	2,71	0,8	168
0 14.	66 / 2	4,9	46,2	24	ECM 42x45	42.2.E4245.L06	2,71	0,8	168
0 15.	121 / 2	3	25,2	8	ECM 42x45	42.2.E4245.L07	2,71	0,8	168
0 16.	231 / 2	3,7	14,1	5,4	ECM 35x20	42.2.E3520.L08	0,66	0,51	127

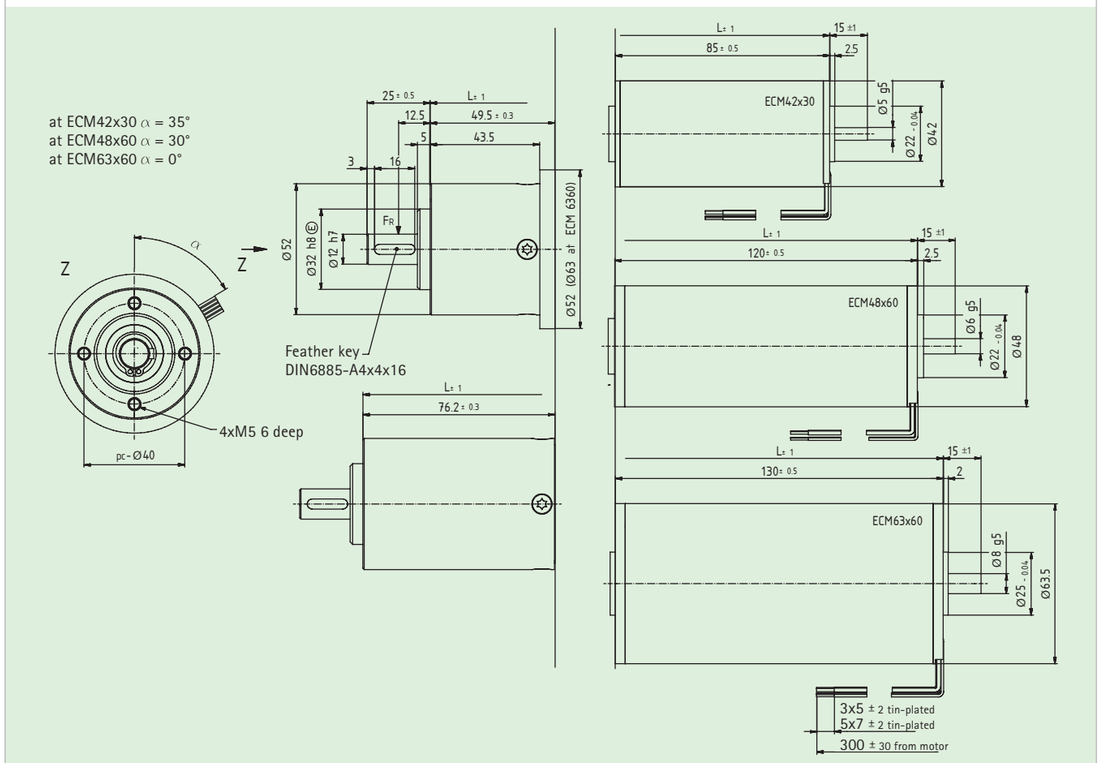
Add-on components	ECM 48x60			ECM 42x45			ECM 35x20
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Electronics
	B02	G01-G05	V04-V05, CAN01	B01	G01-G05	V04-V05, CAN01	V04-V05, CAN01 S01-S02

Brushless ECM motor, internal rotor w. planetary gearhead NoiselessPlus 52





Max. radial load (F_R)	Max. axial load	at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 110	500 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 50



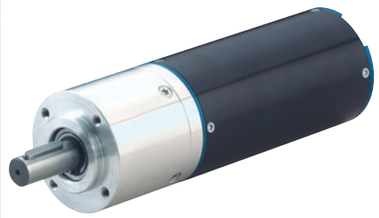
Planetary Gearhead	Brushless EC motor, internal rotor			Circuit diagram SB11, page 172
NoiselessPlus 52	ECM 63x60 2850 rpm⁻¹/118,5 W 24 V	ECM 48x60 3550 rpm⁻¹/85 W 24 V	ECM 42x30 3200 rpm⁻¹/24,9 W 24 V	

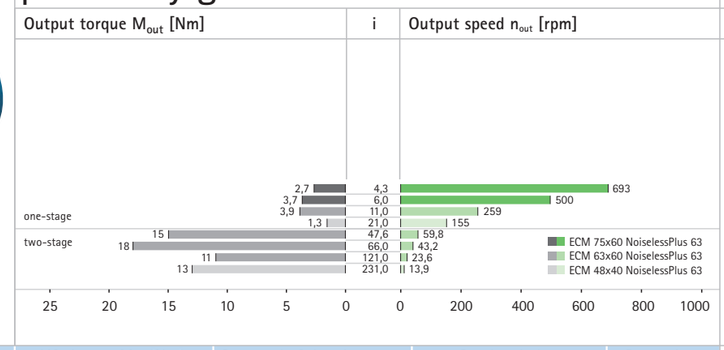
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
O 17.	4,3 / 1	1,5	658	110	ECM 63x60	52.1.E6360.L01	6,43	1,92	180
O 18.	6 / 1	2,1	475	110	ECM 63x60	52.1.E6360.L02	6,43	1,92	180
O 19.	11 / 1	2,3	323	76	ECM 48x60	52.1.E4860.L03	2,9	1,23	170
O 20.	21 / 1	0,76	152	12	ECM 42x30	52.1.E4230.L04	1,55	0,78	134
O 21.	47,6 / 2	8,8	74,5	69	ECM 48x60	52.2.E4860.L05	2,9	1,34	196
O 22.	66 / 2	9,3	53,8	52	ECM 48x60	52.2.E4860.L06	2,9	1,34	196
O 23.	121 / 2	5,7	29,3	17	ECM 48x60	52.2.E4860.L07	2,9	1,34	196
O 24.	231 / 2	7,3	13,9	11	ECM 42x30	52.2.E4230.L08	1,55	0,89	161

Add-on components	ECM 63x60			ECM 48x60			ECM 42x30		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B01	G01-G05	V04-V05, CAN01, S01-S02	B02	G01-G05	V04-V05, CAN01, S01-S02	B01	G01-G05	V04-V05, CAN01, S01-S02

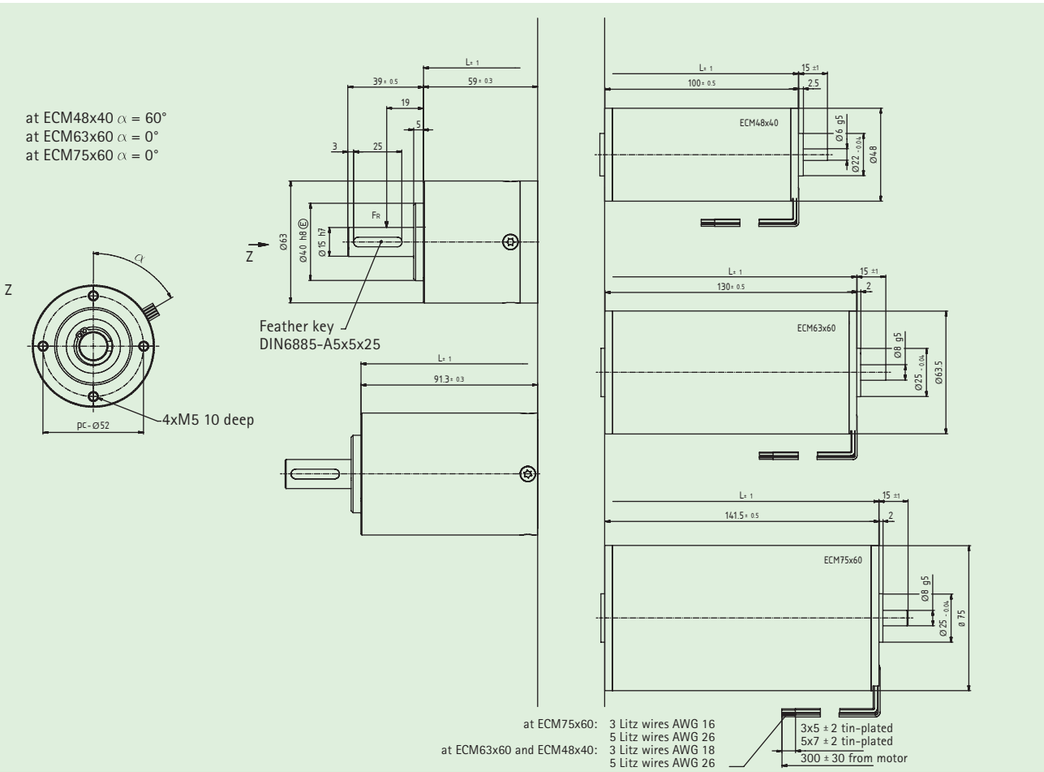
*maximum continuous output torque · Mmax[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 154-167

Brushless ECM motor, internal rotor w. planetary gearhead NoiselessPlus 63





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 110	1000 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 50



Planetary Gearhead	Brushless EC motor, internal rotor			Circuit diagram SB11, page 172
NoiselessPlus 63	ECM 75x60 3000 rpm⁻¹/218 W 24 V	ECM 63x60 2850 rpm⁻¹/118,5 W 24 V	ECM 48x40 3200 rpm⁻¹/59,5 W 24 V	

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
O 25.	4,3 / 1	2,7	693	200	ECM 75x60	63.1.E7560.L01	11,5	2,84	200
O 26.	6 / 1	3,7	500	200	ECM 75x60	63.1.E7560.L02	11,5	2,84	200
O 27.	11 / 1	3,9	259	110	ECM 63x60	63.1.E6360.L03	6,43	2,1	189
O 28.	21 / 1	1,3	152	21	ECM 48x40	63.1.E4840.L04	1,86	1,21	159
O 29.	47,6 / 2	15	59,8	96	ECM 63x60	63.2.E6360.L05	6,43	2,3	221
O 30.	66 / 2	18	43,2	79	ECM 63x60	63.2.E6360.L06	6,43	2,3	221
O 31.	121 / 2	11	23,6	26	ECM 63x60	63.2.E6360.L07	6,43	2,3	221
O 32.	231 / 2	13	13,9	18	ECM 48x40	63.2.E4840.L08	1,86	1,41	191

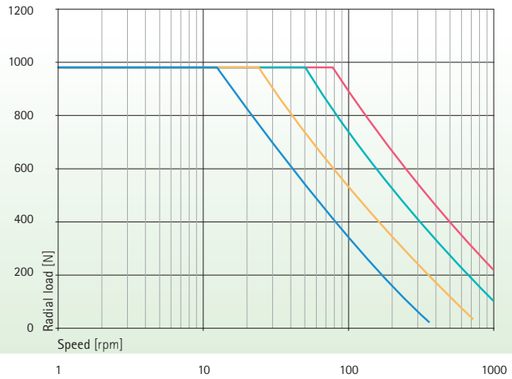
Add-on components	ECM 75x60			ECM 63x60			ECM 48x40		
	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics
	B03	G01-G05	V04-V05, CAN02, S03	B03	G01-G05	V04-V05, CAN02, S03	B02	G01-G05	V04-V05, CAN01, S01-S02

*maximum continuous output torque · Mmax[Nm] see page 24-25 · Brake: Page 145 · Encoder: Page 146-148 · Electronics: Page 154-167

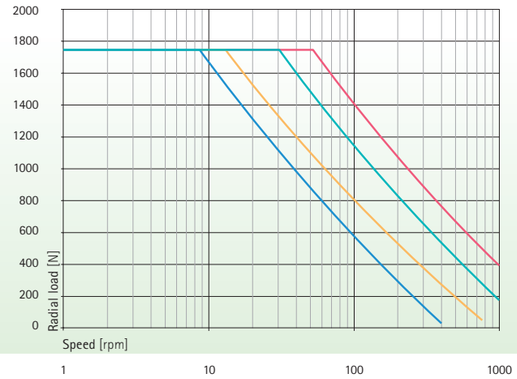
Brushless EC motor, external and internal rotor with planetary gearhead NoiselessPlus

Radial load overview

NoiselessPlus 42

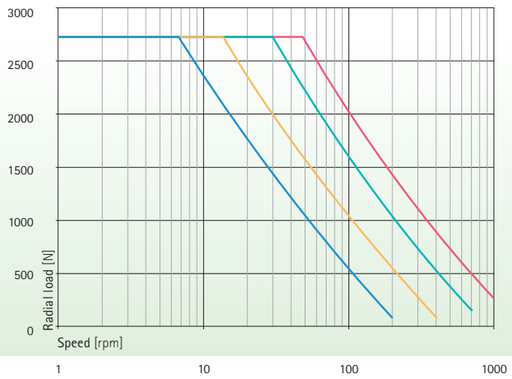


NoiselessPlus 52

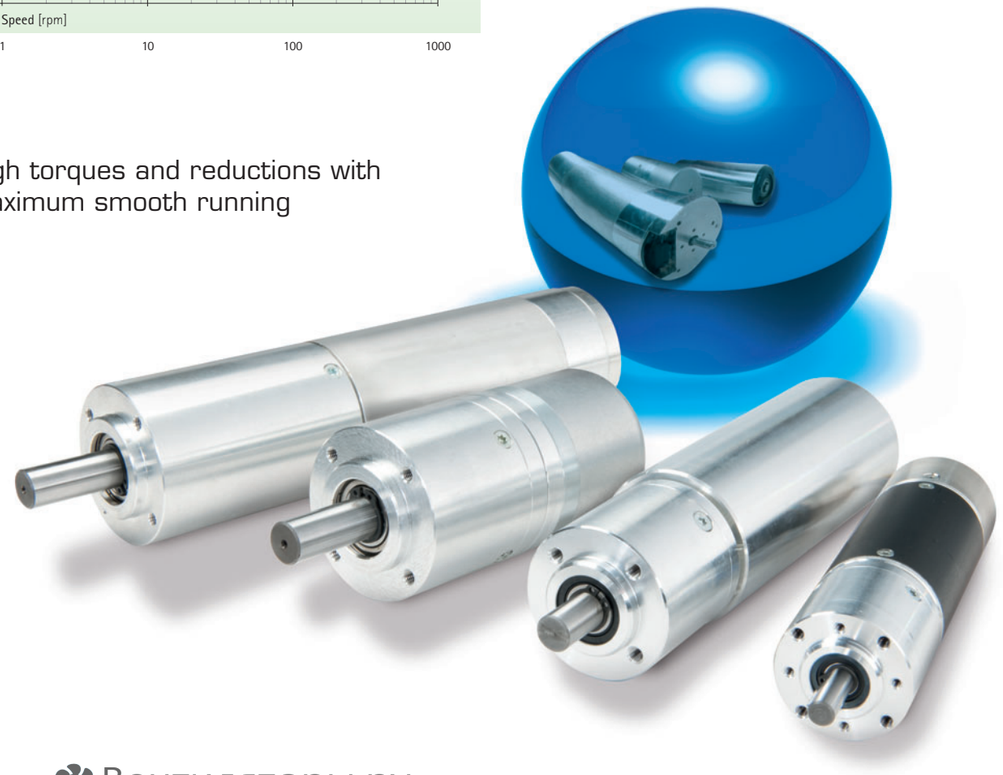


Lifetime 3000h 5000 h 10000 h 20000 h

NoiselessPlus 63

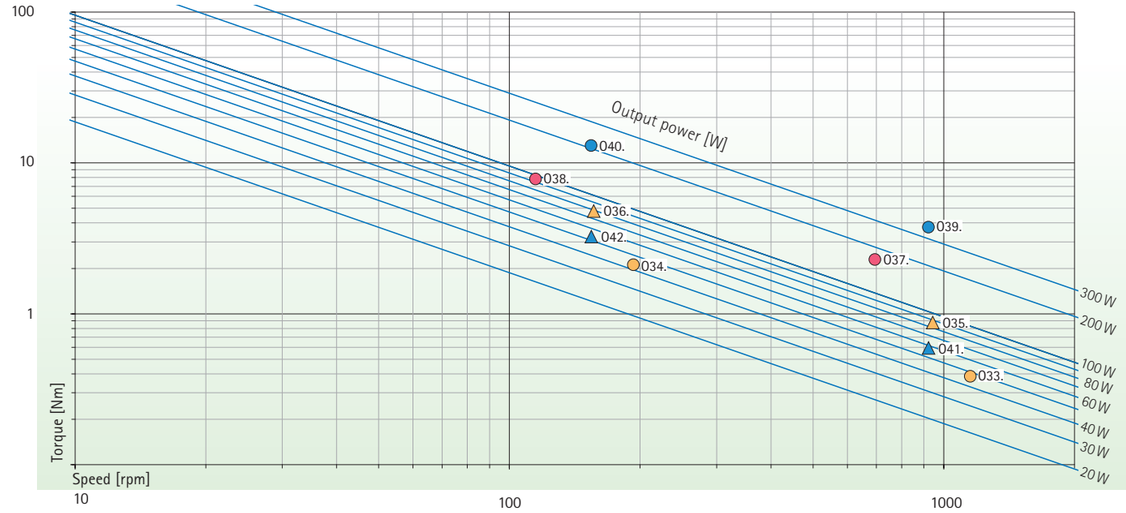


High torques and reductions with maximum smooth running



Performance overview

NoiselessPlus 42 with ECI4240
NoiselessPlus 42 with ECI4240/K1
NoiselessPlus 52 with ECI2480
NoiselessPlus 63 with ECI6360
NoiselessPlus 63 with VDC-3-49-15



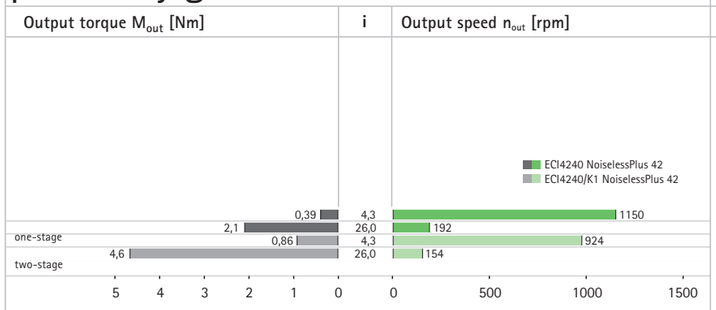
Brushless EC motor with NoiselessPlus planetary gearhead

Planetary gearheads of the NoiselessPlus series are first choice for all application situations where smooth running and noise reduction are required in addition to power, energy efficiency and economy. The double ball bearing of the output shaft guarantees very low gearhead play. Planetary wheels made of low-wear plastic grip extremely precisely and smoothly into the noise-optimised bevelled teeth of the aluminium housing.

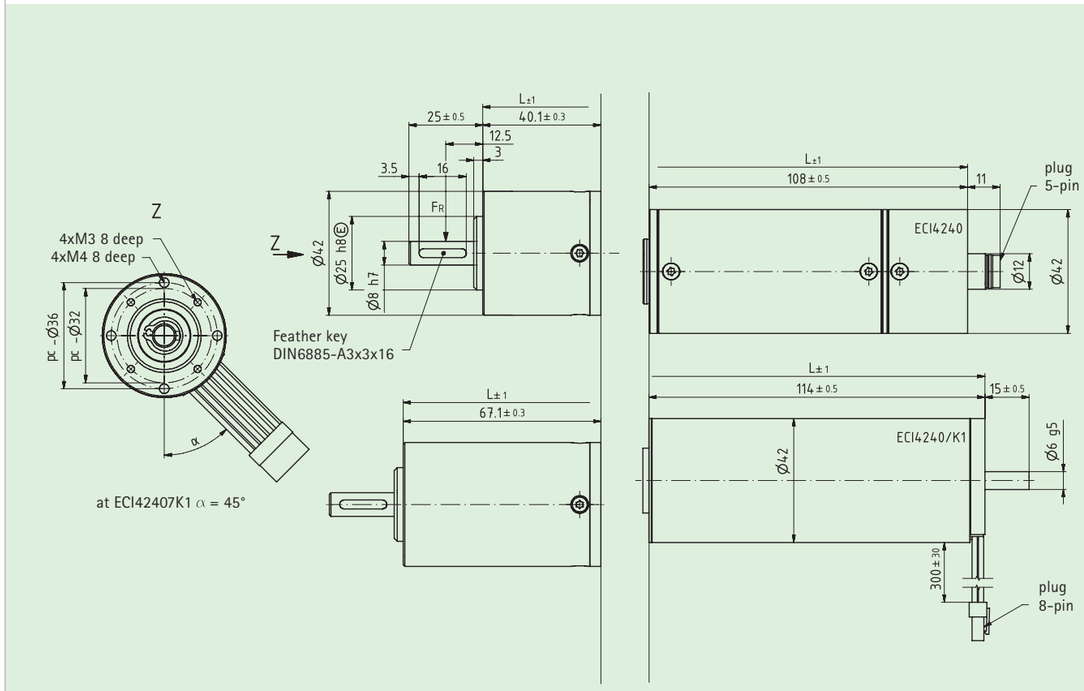
EC direct voltage motors have an extremely long life on account of the electronic commutation (usually more than 10,000 hours). Electronically commutated motors usually provide high torques even at lower speeds

- noise reduction thanks to bevelled teeth in all stages
- optimised gliding of plastic planetary wheels for additional noise reduction
- hardened, ground and double ball-bearing output shaft made of sturdy case-hardened steel (diameter tolerance h7)
- reduction 4.3:1 and 26:1
- axial force up to 1,000 N at nominal speed
- ECI motors can be regulated either by external or internal electronics
- motors can be fitted with matching brake and various encoders (see accessories)
- operating electronics and switched power packs available as options (see accessories)
- gearhead lifetime of 10,000 hours (operating factor c_B=1)
- protection class IP 40 and IP 54
- maintenance free – grease-lubricated for life
- ambient temperature 0 °C to +40 °C
- CANopen Bus-interface (VDC-3-49-15)

Brushless ECI motor, internal rotor with planetary gearhead NoiselessPlus 42



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 116	350 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 40



Planetary Gearhead	Brushless EC motor, internal rotor		
NoiselessPlus 42	ECI4240 electronic integrated	5000 rpm^{-1}/52 W	24 V

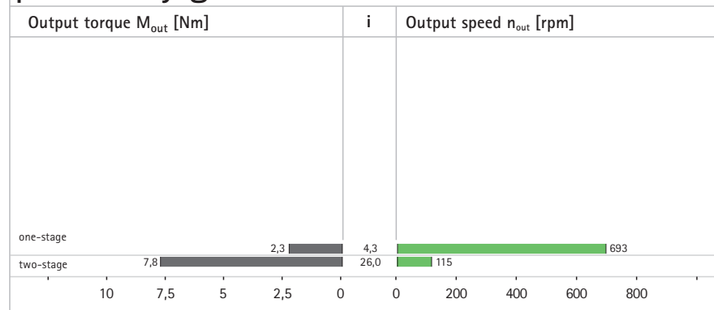
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 33.	4,3 / 1	0,39	1150	47	42.1.E4240.L01	3	0,93	149
0 34.	26 / 2	2,1	192	42	42.2.E4240.L02	3	1	176

NoiselessPlus 42	ECI4240/K1	4000 min^{-1}/92 W	24

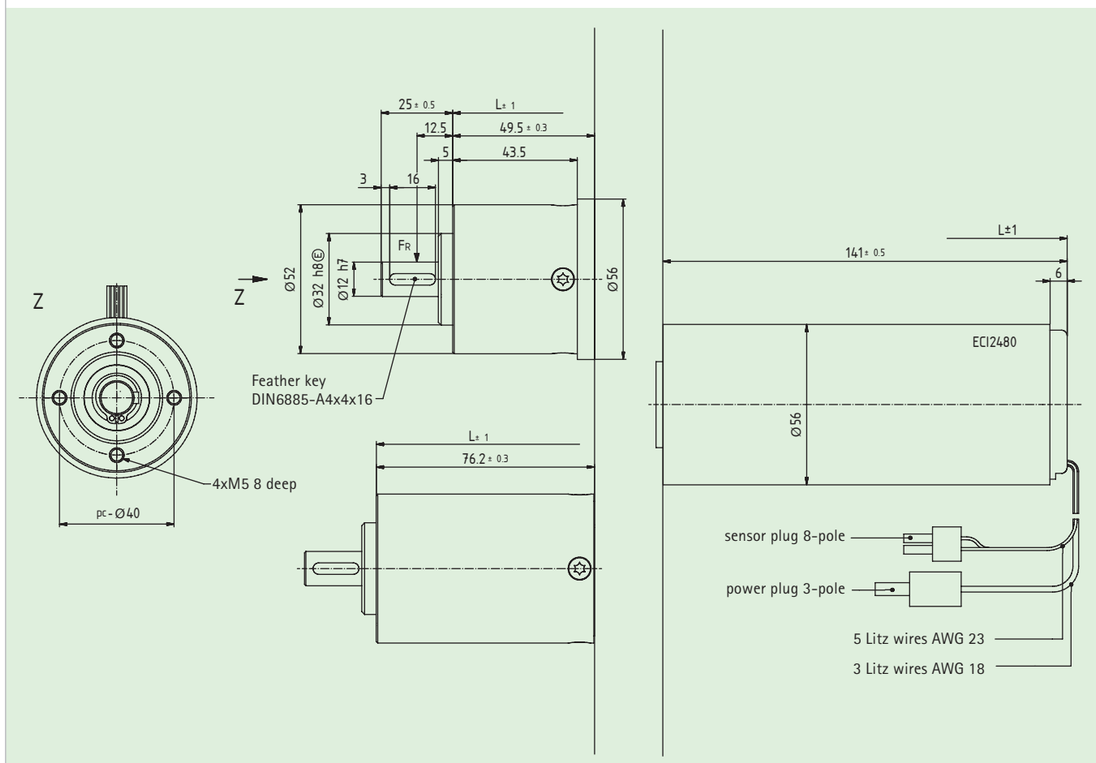
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 35.	4,3 / 1	0,86	924	83	42.1.E4240.L03	5,1	0,7	154
0 36.	26 / 2	4,6	154	75	42.2.E4240.L04	5,1	0,8	181

Add-on components	ECI4240		ECI4240/K1			
	Electronics	Circuit diagram	Brake	Encoder	Electronics	Circuit diagram
	CAN01, S01-S02	SB01	B01	G04	V04-V05, CAN01, S02-S03	SB08

Brushless ECI motor, internal rotor with planetary gearhead NoiselessPlus 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 116	500 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 40

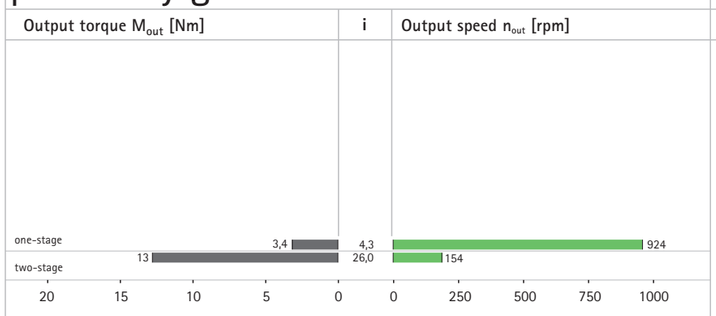


Planetary Gearhead	Brushless EC motor, internal rotor		
NoiselessPlus 52	ECI2480	3000 rpm^{-1}/185 W	24 V

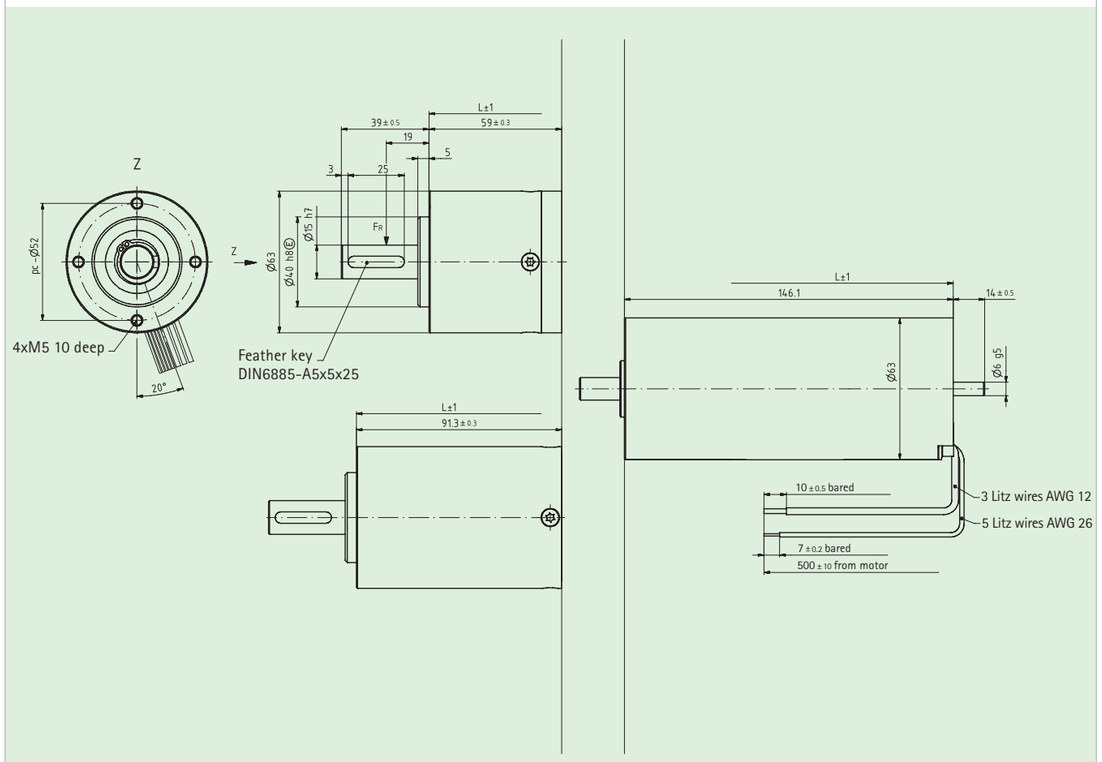
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 37.	4,3 / 1	2,3	693	170	52.1.E2480.L01	11	1,76	190
0 38.	26 / 2	7,8	115	94	52.2.E2480.L02	11	1,87	217

Add-on components	ECI2480	
	Electronics	Circuit diagram
	V04-V05, CAN02, S03	SB08

Brushless ECI motor, internal rotor w. planetary gearhead NoiselessPlus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 116	1000 N	10,000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 54

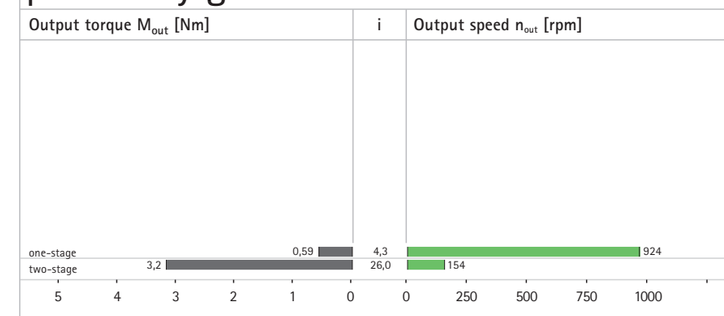


Planetary Gearhead	Brushless EC motor, internal rotor
NoiselessPlus 63	ECI6360 4000 rpm^{-1}/370 W 24 V

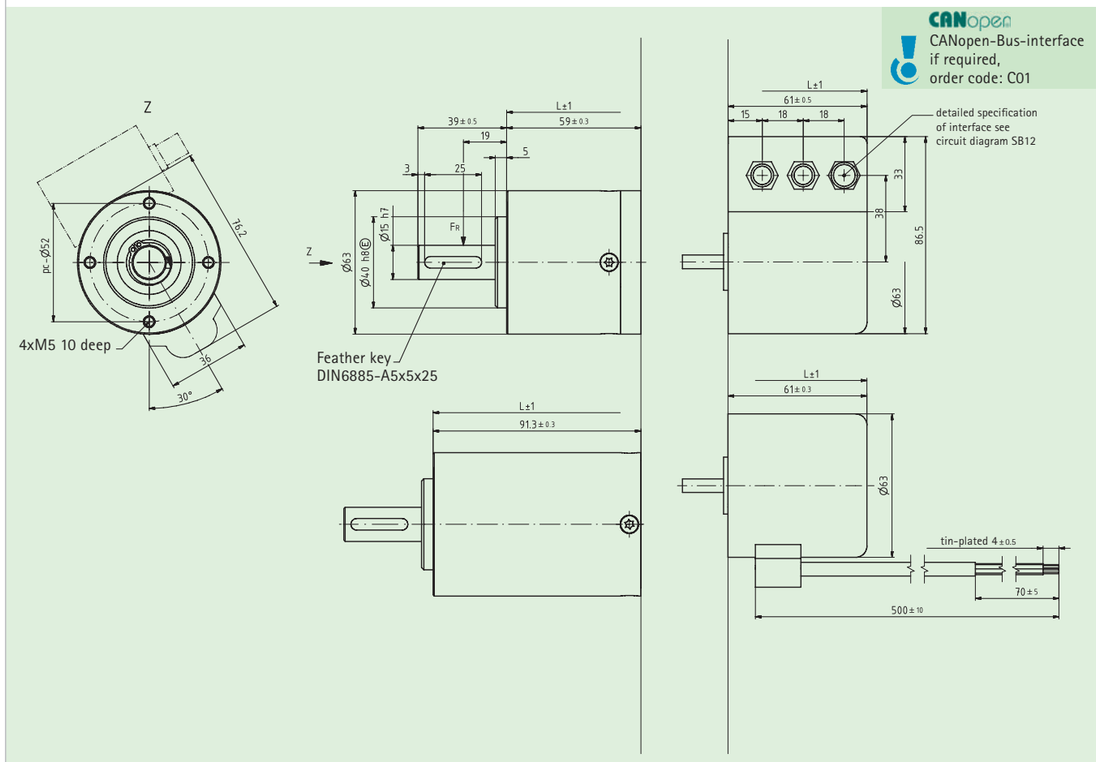
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 39.	4,3 / 1	3,4	924	330	63.1.E6360.L01	17,6	2,1	205
0 40.	26 / 2	13	154	200	63.1.E6360.L02	17,6	2,3	237

Add-on components	ECI6360			
	Brake	Encoder	Electronics	Circuit diagram
	B03	G04	A04-A05, CAN02, S03	SB08

Brushless EC motor, external rotor w. planetary gearhead NoiselessPlus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 116	1000 N	10.000 h Operating factor c_B=1	2 groove ball bearing with carrier cage	approx. 0,2° to 0,5° depending on reduction	IP 54

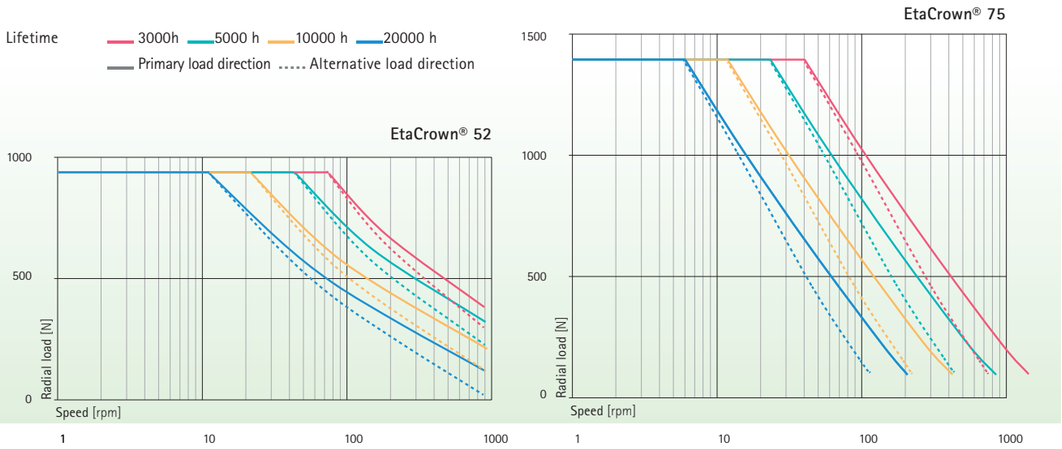


Planetary gearhead	Brushless EC motor, external rotor
NoiselessPlus 63	VDC-3-49-15 4000 rpm/63 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
0 41.	4,3 / 1	0,59	924	57	63.1.C4915.L01	3,5	1,3	120
0 42.	26 / 2	3,2	154	51	63.2.C4915.L02	3,5	1,5	152

Add-on components	VDC-3-49-15	
	Electronics	Circuit diagram
	S01-S02	SB12

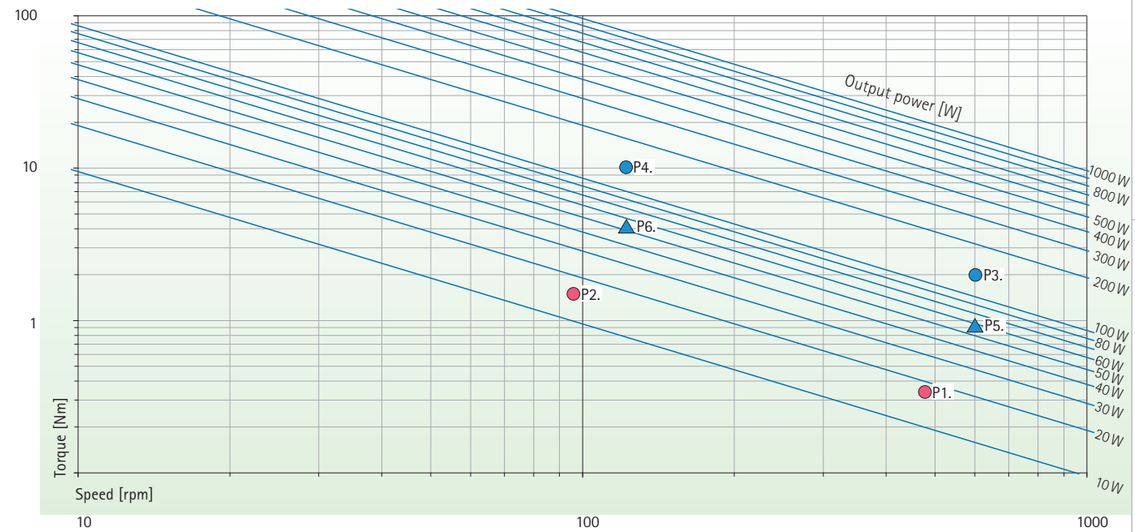
Brushless EC motor, external and internal rotor with crown gearhead EtaCrown®



Unbeatable in technology and design

EtaCrown® 52 with ECM 42x30
EtaCrown® 75 with ECI6320
EtaCrown® 75 with VDC-3-49-15

Performance overview



Brushless EC motor, external and internal rotor with crown gearhead EtaCrown®

EtaCrown® – the bevel gearhead using crown gearhead technology breaks through technological boundaries and redefines application possibilities. Thanks to intensive development work, we have been able to make bevel gearheads more powerful, smaller and more efficient, and to manufacture them more economically. Their unique technology offers a multitude of advantages.

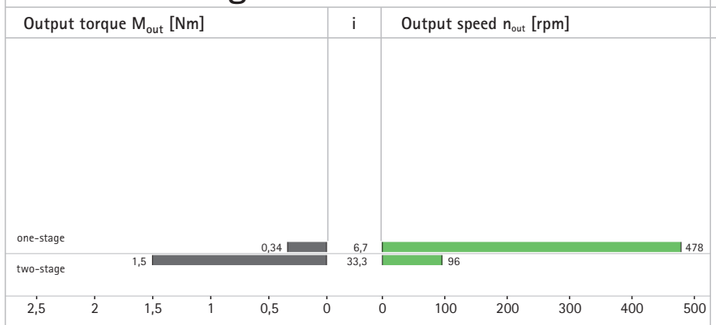
Thanks to its technological lead, EtaCrown® stands out in terms of power, design, energy efficiency and functionality. The efficiency rate is between 80 and 95 %.

The extremely smooth running typical for ZEITLAUF® gears is also applicable for EtaCrown®, of course. The optimum noise reduction is ensured by the optimised bearing design of the crown stage

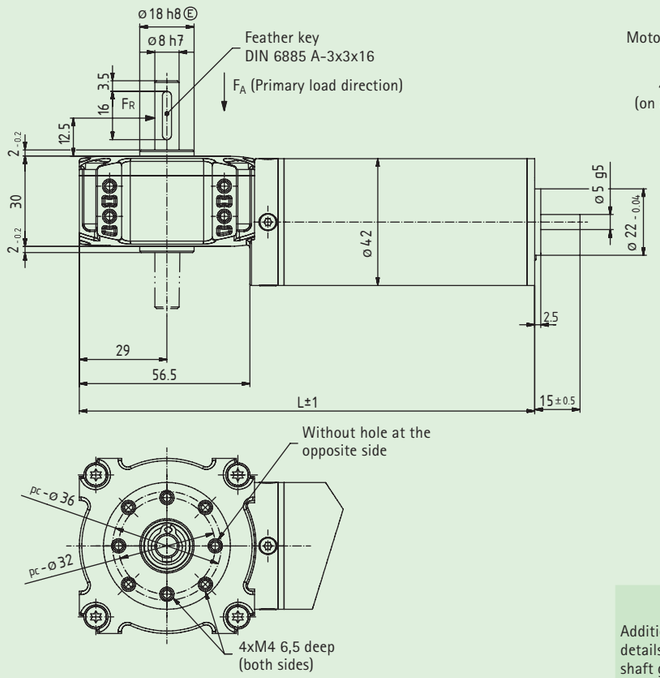
EC direct current motors have a very long life time by virtue of electronic commutation (normally in excess of 10,000 hours). Speed control can be achieved via integrated electronics, which is available with most models. Electronically commutated motors provide as a rule, high torques even at low speeds.

- optimum efficiency due to the use of crown technology
- no automatic lock
- large range of attachment possibilities with 5 fixing planes
- crown (with one-stage gears) or planetary wheels and hollow wheel (with two-stage gears) made of plastic with optimised sliding properties for additional noise reduction
- ground and hardened output shaft (diameter tolerance h7)
- four output shaft variants (one-sided, left / one-sided, right / two-sided / hollow shaft) available
- motors can be fitted with matching brake and various encoders (see accessories)
- motors can be controlled and regulated from nominal speed down to minimum motor speed 300 rpm at almost constant torque
- adapted electronics and switched-mode power suppliers are available as options (see accessories)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40 or IP 54 with VDC-3-49-15
- maintenance-free grease lubricated for life
- ambient temperature 0°C to +40°C
- CANopen Bus-interface (VDC-3-49-15)

Brushless EC motor, internal rotor with crown gearhead EtaCrown® 52



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 122	150 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 50



Additional order details for optional shaft geometry


Standard

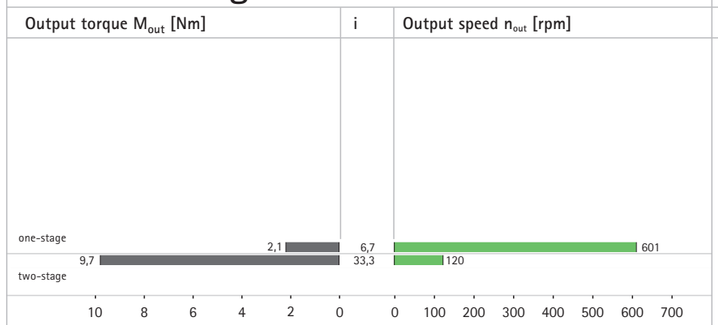

W06


W07

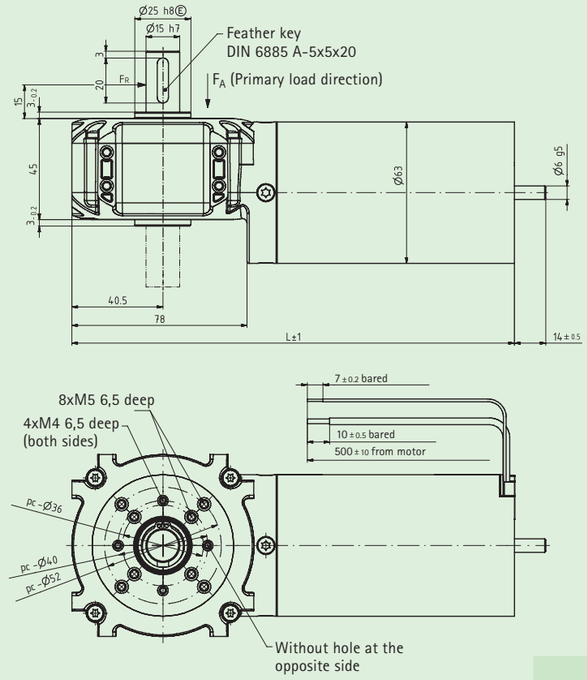
Crown gearhead	Brushless EC motor, internal rotor							
EtaCrown® 52	ECM 42x30	3200 rpm/30 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 1.	6,7 / 1	0,34	478	17	52.1.E4230.E01	1,55	0,81	151
P 2.	33,3 / 2	1,5	96	15	52.2.E4230.E02	1,55	1,05	180

Add-on components	ECM 42x30			
	Brake	Encoder	Electronics	
	B01	G01	V04-V05, CAN01, S01-S02	SB11

Brushless EC motor, internal rotor with crown gearhead EtaCrown® 75

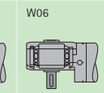


Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 122	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 54



Additional order details for optional shaft geometry


Standard


W06

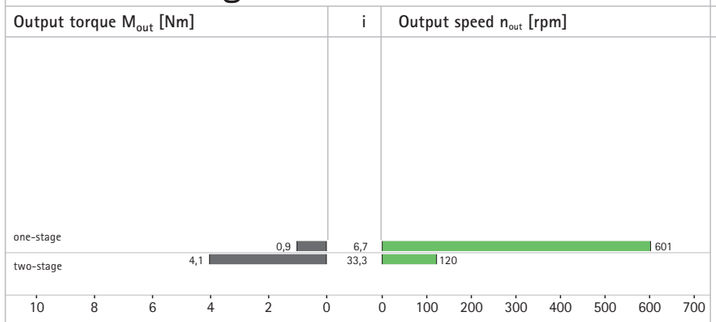

W07


W08
Hollow shaft Ø 10 mm

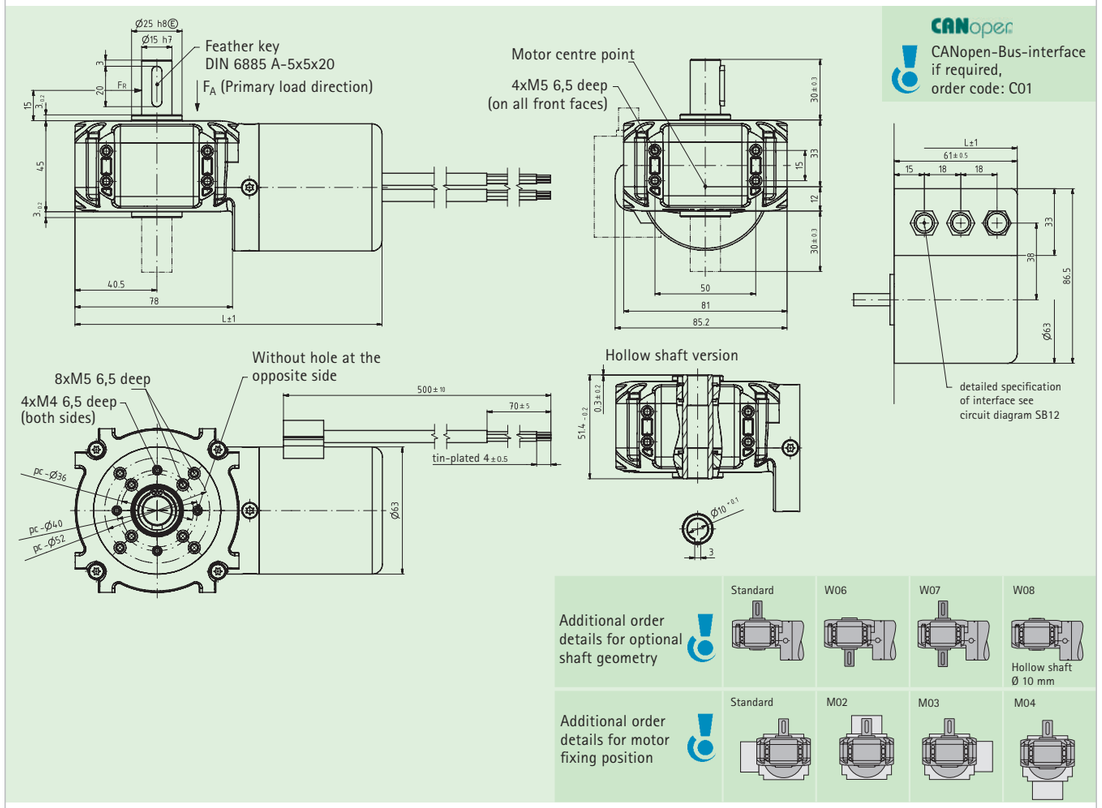
Crown gearhead	Brushless EC motor, internal rotor							
EtaCrown® 75	ECI6320	4000 rpm/150 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 3.	6,7 / 1	2,1	601	130	75.1.E6320.E01	8,5	2,2	197
P 4.	33,3 / 2	9,7	120	120	75.2.E6320.E02	8,5	2,7	233

Add-on components	ECI6320			
	Brake	Encoder	Electronics	Circuit diagram
	B03	G04	V04-V05, CAN01, S01-S02	SB11

Brushless EC motor, external rotor with crown gearhead EtaCrown® 75



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 122	500 N	5000 h Operating factor c_B=1	ball bearing	approx. 0,55° to 1,1° depending on reduction	IP 54



CANopen

CANopen-Bus-interface if required, order code: C01

Additional order details for optional shaft geometry

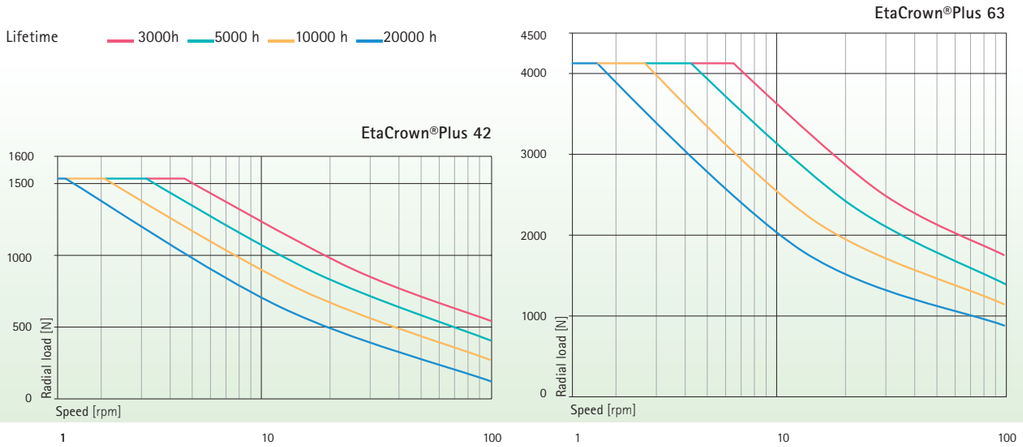
Additional order details for motor fixing position

Crown gearhead	Brushless EC motor, external rotor							
EtaCrown® 75	VDC-3-49-15	4000 rpm/63 W 24 V						
No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 5.	6,7 / 1	0,9	601	57	75.1.C4915.E01	3,5	1,6	152
P 6.	33,3 / 2	4,1	120	51	75.2.C4915.E02	3,5	2,1	188

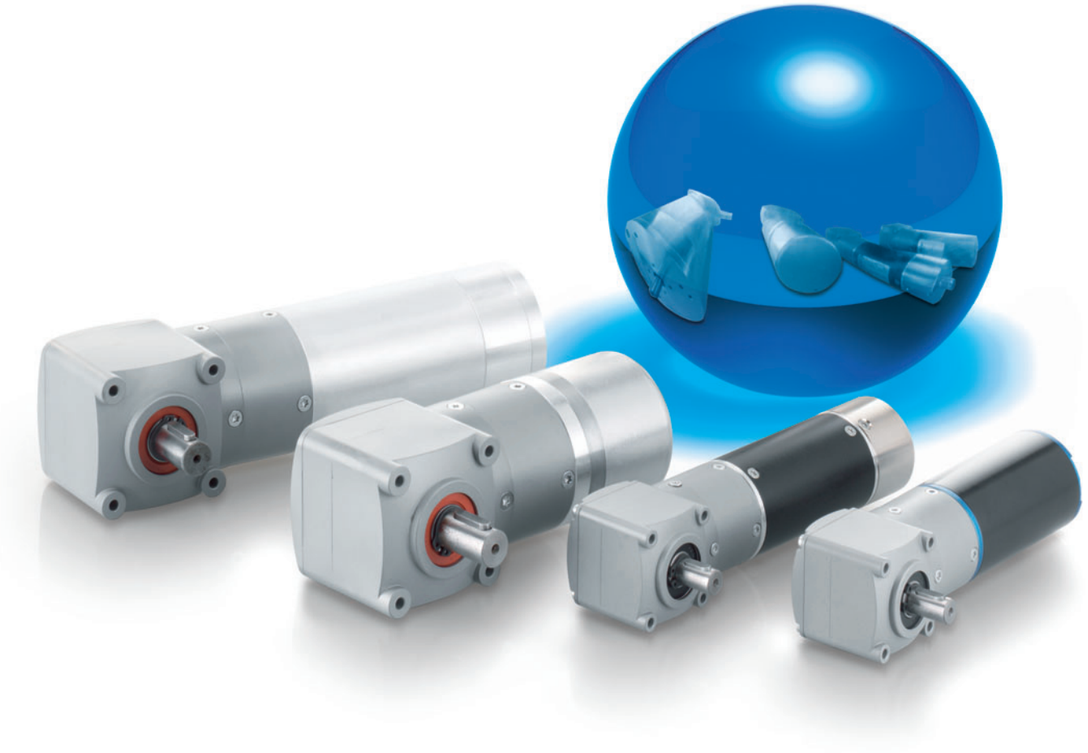
Add-on components	VDC-3-49-15	
	Electronics	Circuit diagram
	SO1 SO2	SB1

Brushless EC motor, external and internal rotor with crown gearhead EtaCrown®Plus

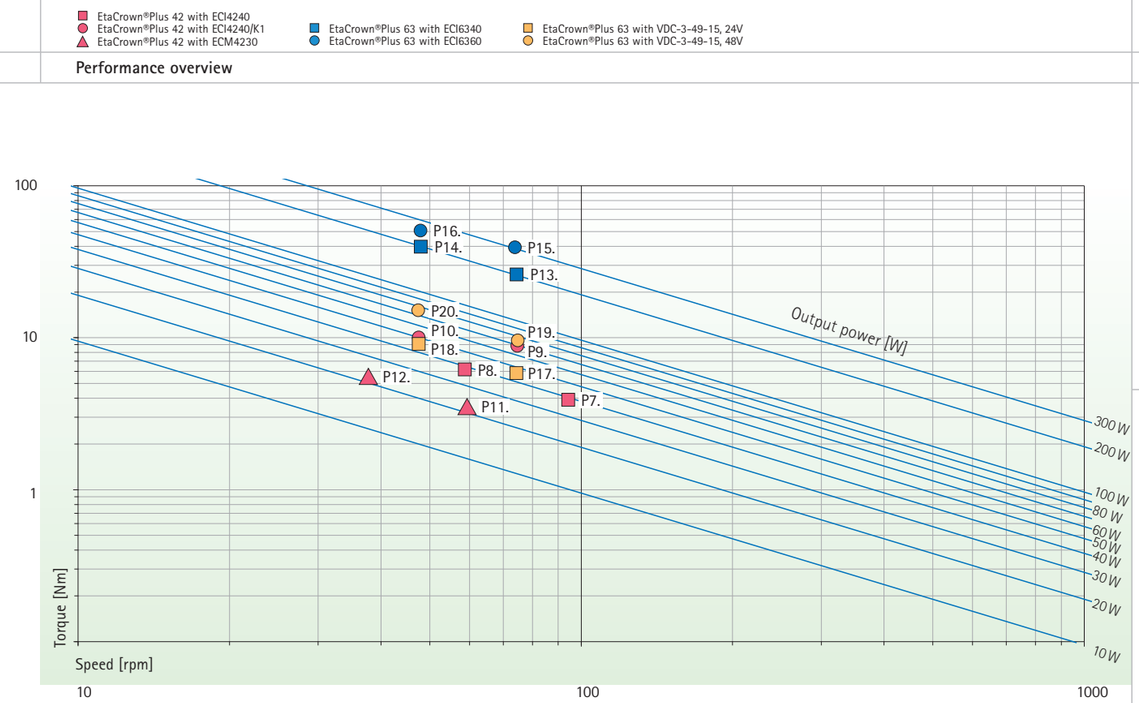
radial load overview



Maximum power density on smallest space



Performance overview



Brushless EC motor with crown gearhead EtaCrown®Plus

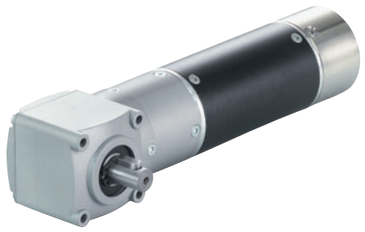
EtaCrown®Plus is the innovative enhancement of our proven EtaCrown®. The key feature of this intelligent design is the combination of a crown and planetary gear stage in one gear unit. This innovative gearhead is unique due to the performance range it offers with regard to available space. With reductions of 54:1 to 289:1 as part of the standard three-stage model, we offer a range with maximum performance.

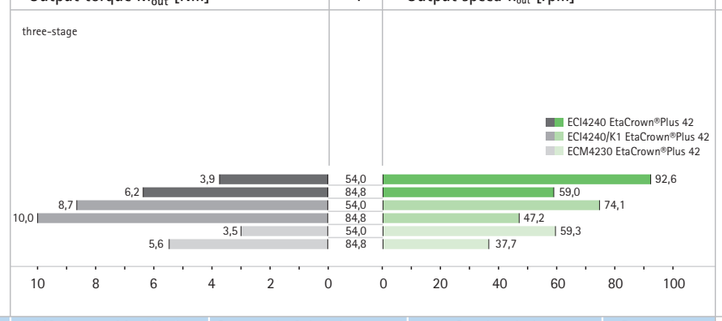
It provides optimum acoustic insulation through an upstream Performax® planetary gearhead stage with helical cut planet gears made of gliding optimised high-performance plastic, and also through the optimum bearing design of the crown stage.

EC direct current motors have a very long life time by virtue of electronic commutation (normally in excess of 10,000 hours). Speed control can be achieved via integrated electronics, which is available with most models. Electronically commutated motors provide as a rule, high torques even at low speeds.

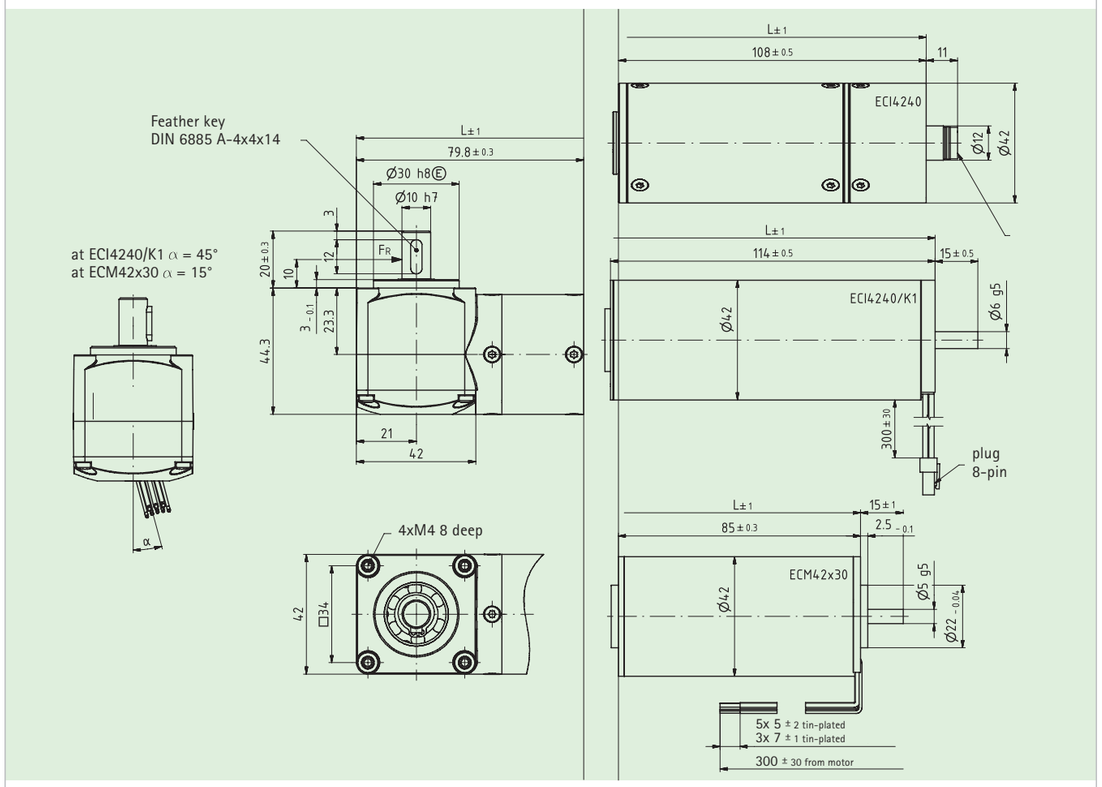
- Reductions of 54:1 to 289:1 as part of the standard series, with three-stage design
- Nominal torque 10 Nm (EtaCrown®Plus 42) and 40 Nm (EtaCrown®Plus 63), peak torque 25 or 100 Nm
- optimum efficiency through use of crown gear technology
- 5 planet gears at the planet output stage made of hardened sintered steel with optimum emergency operation properties through oil immersion
- no automatic lock
- ground and hardened output shaft (diameter tolerance h7)
- motors can be fitted with matching brake and various encoders (see accessories)
- operating electronics (CANopen) and switched-mode power suppliers are available as options (see accessories)
- CANopen Bus-interface (VDC-3-49-15)
- gearhead lifetime of 5,000 hours (operating factor c_B=1)
- protection class IP 40 resp. IP 54 with VDC-3-49-15
- maintenance-free grease lubricated for life
- ambient temperature 0 °C to +40 °C

Brushless EC motor, internal rotor with crown gearhead EtaCrown®Plus 42





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 128	200 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40

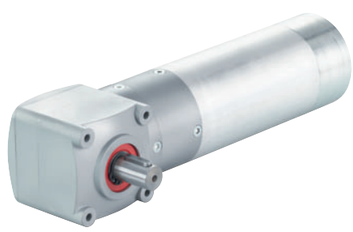


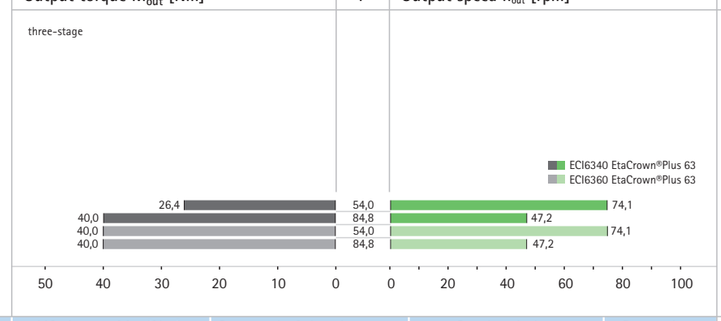
Crown gearhead	Brushless EC motor, internal rotor		
	Circuit diagram SB07, page 170	Circuit diagram SB08, page 170	Circuit diagram SB11, page 172
EtaCrown®Plus 42	ECI4240 electronic integrated 5000 rpm/52 W 24 V	ECI4240/K1 4000 rpm/92 W 24 V	ECM4230 3200 rpm/30 W 24 V

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 7.	54 / 3	3,9	92,6	38	ECI4240	42.3.E4240.EP01	3	1,05	188
P 8.	84,8 / 3	6,2	59	38	ECI4240	42.3.E4240.EP02	3	1,05	188
P 9.	54 / 3	8,7	74,1	67	ECI4240/K1	42.3.E4240.EP03	5,1	0,93	194
P 10.	84,8 / 3	10	47,2	49,4	ECI4240/K1	42.3.E4240.EP04	5,1	0,93	194
P 11.	54 / 3	3,5	59,3	22	ECM4230	42.3.E4230.EP05	1,55	0,85	165
P 12.	84,8 / 3	5,6	37,7	22	ECM4230	42.3.E4230.EP06	1,55	0,85	165

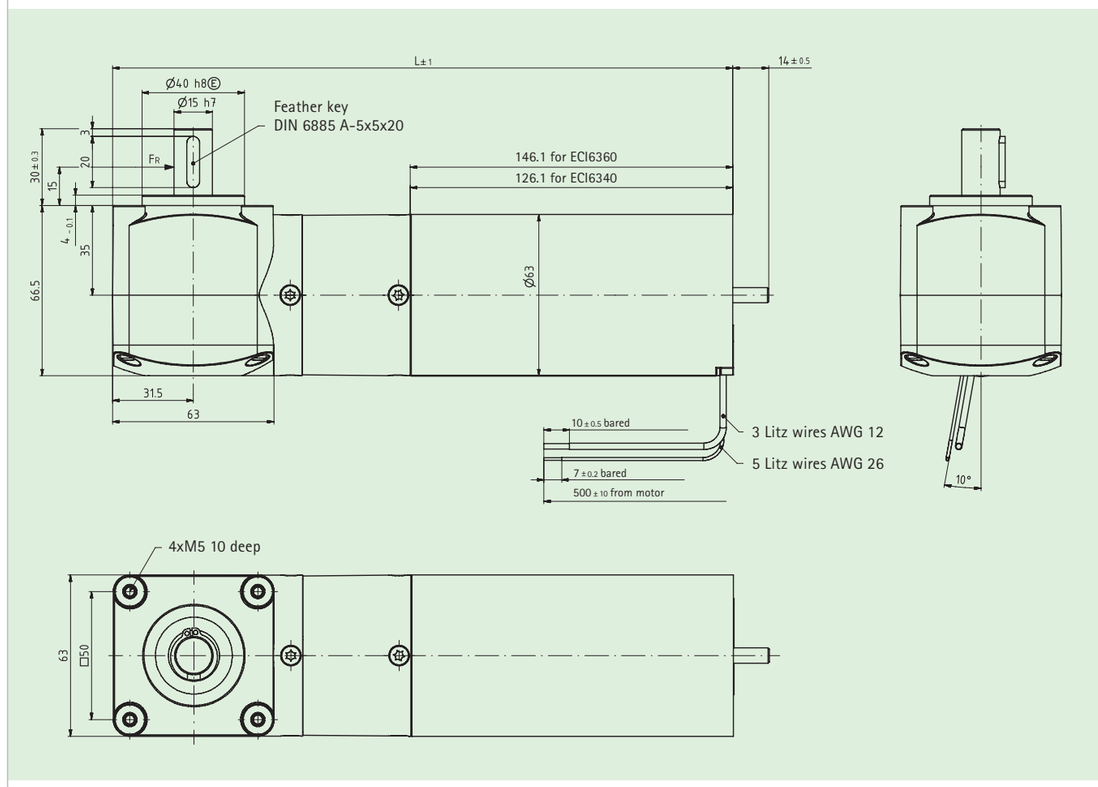
Add-on components	ECI4240			ECI4240/K1			ECM4230		
	Electronics	Brake	Encoder	Electronics	Brake	Encoder	Electronics	Brake	Encoder
	CAN01, S01-S02	B01	G04	V04-V05, CAN01, S01-S02	B01	G01-G05	V04-V05, CAN01, S01-S02	B01	G01-G05

Brushless EC motor, internal rotor with crown gearhead EtaCrown®Plus 63





Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 128	300 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40



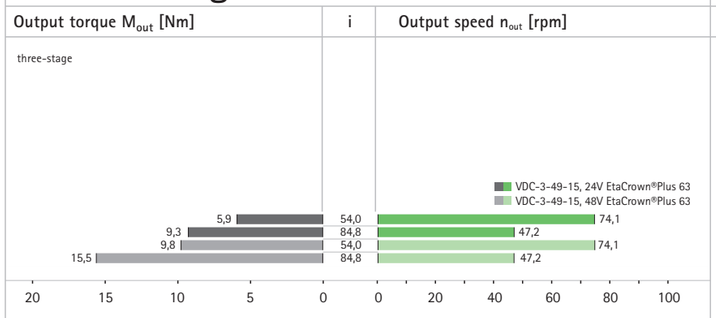
Crown gearhead	Brushless EC motor, internal rotor		Circuit diagram SB08, page 170
EtaCrown®Plus 63	ECI6340 4000 rpm/280 W 24 V	ECI6360** 4000 rpm/370 W 24 V	

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 13.	54 / 3	26,4	74,1	205	ECI6340	63.3.E6340.EP01	14	2,2	242
P 14.	84,8 / 3	40	47,2	200	ECI6340	63.3.E6340.EP02	14	2,2	242
P 15.	54 / 3	40	74,1	310	ECI6360	63.3.E6360.EP03	17,6	2,5	262
P 16.	84,8 / 3	40	47,2	270	ECI6360	63.3.E6360.EP04	17,6	2,5	262

**especially suitable for torque peaks

Add-on components	ECI6340			ECI6360		
	Brake	Encoder	Electronics	Brake	Encoder	Elektronik
	B03	G04	V04-V05, CAN02, S01	B03	G04	V04-V05, CAN02, S01

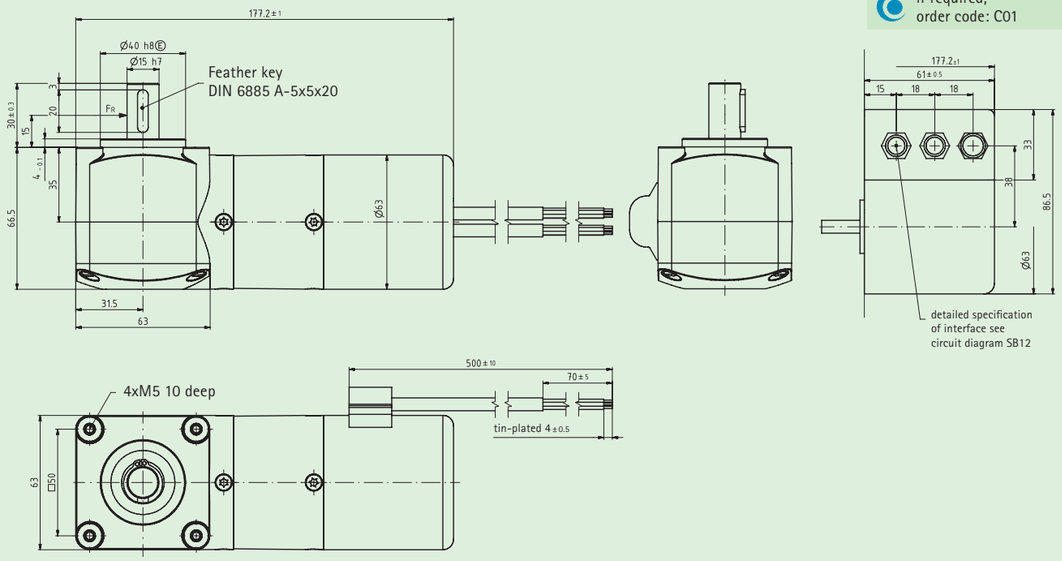
Brushless EC motor, external rotor with crown gearhead EtaCrown®Plus 63



Max. radial load (F_R)	Max. axial load	Lifetime at M_{out}[Nm]	Output shaft bearing assy.	Gearhead play	Protection
see graphic page 128	300 N	5000 h Operating factor c_B=1	combined sliding/ ball bearing	approx. 0,7° to 1,2° depending on reduction	IP 40

CANopen

CANopen-Bus-interface if required, order code: C01



Additional order details for motor fixing position

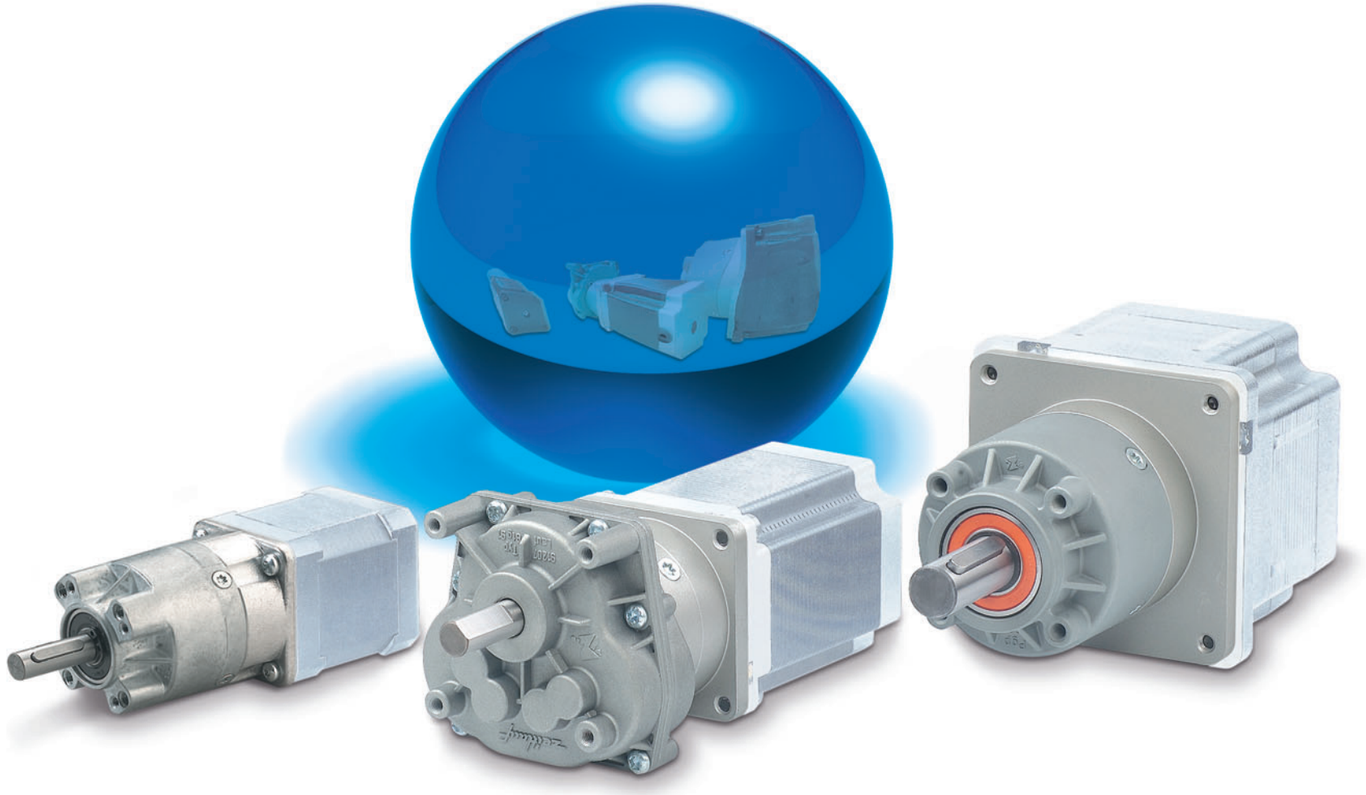
Crown gearhead	Brushless EC motor, external rotor		Circuit diagram SB12, page 173
EtaCrown®Plus 63	VDC-3-49-15 electronic integrated 4000 rpm/63 W 24 V	VDC-3-49-15 Elektronik integriert 4000 rpm/105 W 48 V	

No.	Reduction i / no. of stages	Output torque M_{out}[Nm]*	Output speed n_{out}[rpm]	Output power P_{out} [W]	Motor	Order No.	Rated current I [A]	Weight m [kg]	Length L [mm]
P 17.	54 / 3	5,9	74,1	46	VDC-3-49-15, 24V	63.3.C4915.EP01	3,5	1,6	177
P 18.	84,8 / 3	9,3	47,2	46	VDC-3-49-15, 24V	63.3.C4915.EP02	3,5	1,6	177
P 19.	54 / 3	9,8	74,1	77	VDC-3-49-15, 48V	63.3.C4915.EP03	2,9	1,6	177
P 20.	84,8 / 3	15,5	47,2	77	VDC-3-49-15, 48V	63.3.C4915.EP04	2,9	1,6	177

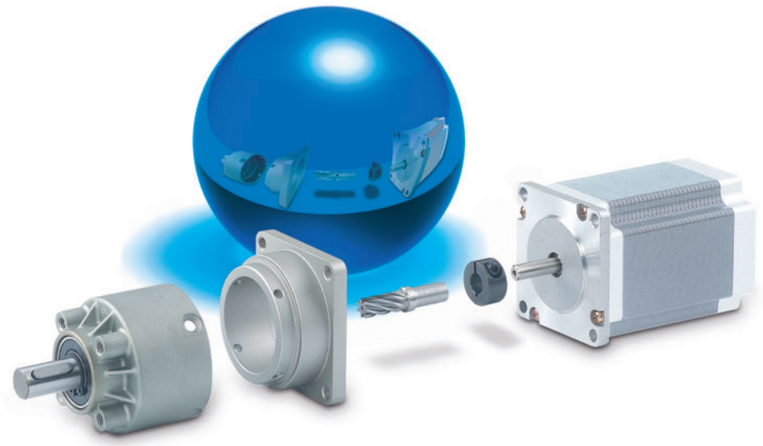
Add-on components	VDC-3-49-15
	Electronics S01 S02

*maximum continuous output torque · Mmax[Nm] see page 24-25 · Electronics: Page 166-167

Flexibility for many applications:
The intelligent modular system.



NEMA-Connection
for spur and planetary gearheads



NEMA – Power with methodic

Gearheads with NEMA-Flanges gives you the possibility to connect our gearheads with a wide range of motors e. g. stepper motors or brushless DC-motors with NEMA-Geometry. These gearhead solutions are designed for the NEMA sizes 17, 23 and 34. For all of these sizes, one of our gearheads from the Flatline, Compactline, Performax and Focus series are available.

- easy assembly through clamp connection
- highly precise centering of the pinion
- modular structure of the entire system
- 156 alternatives (gearheads, reduction, types of output shaft bearing) with outstanding performance
- noise optimised helical teeth in the 1st stage
- plastic wheels with optimum sliding properties for additional noise reduction
- hardend and ground output shaft
- gearhead lifetime 5,000 hours (operating mode C_B=1). Input speed 3,000 rpm.
- maintenance-free grease lubrication for life
- ambient temperature -20 °C to + 80 °C

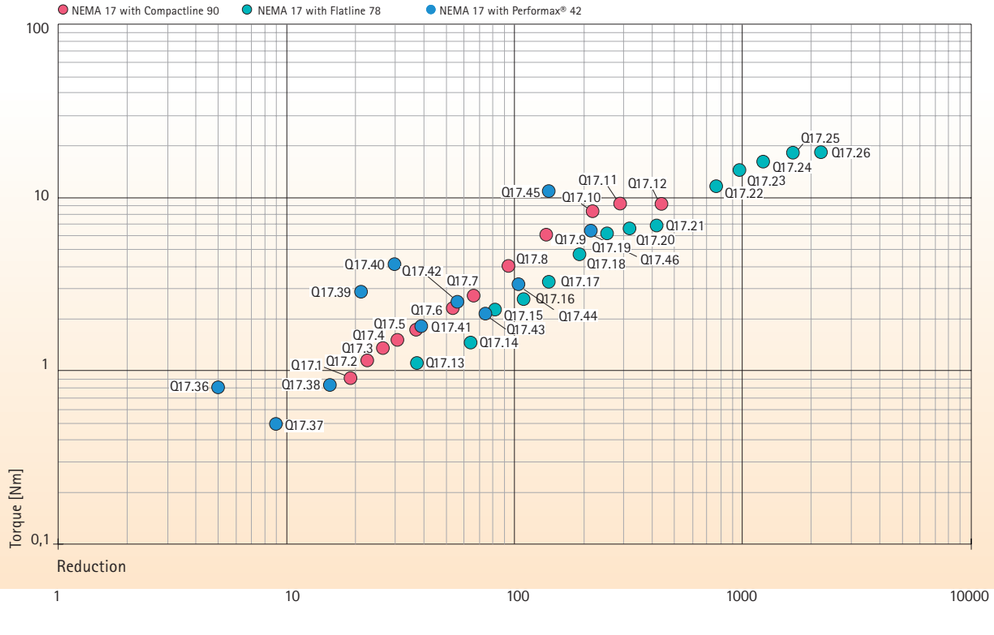
*NoiselessPlus, Performax® Plus, EtaCrown® and EtaCrown®Plus on request

Q

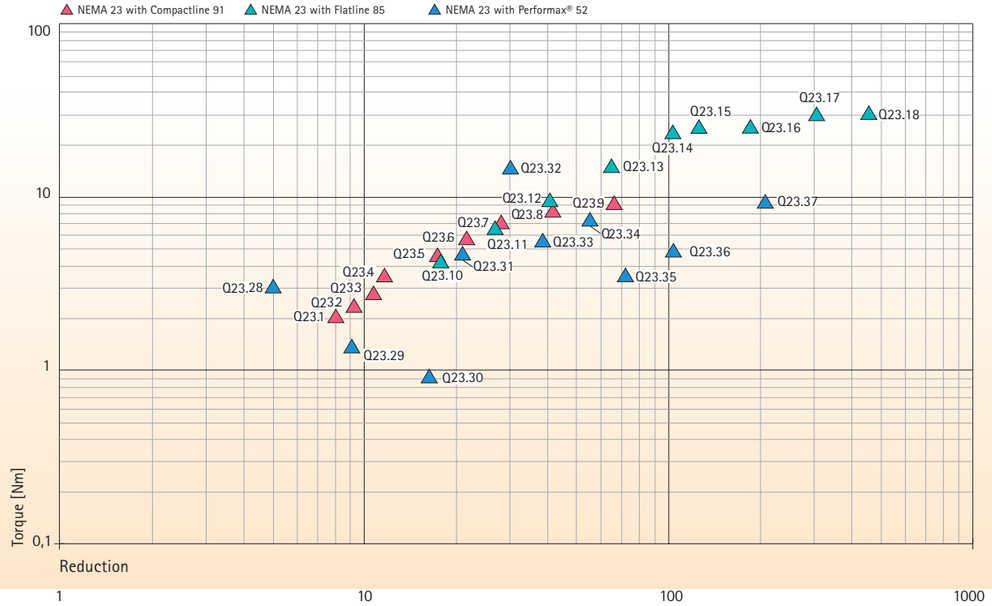
Q

NEMA-Connections
for spur and planetary gearheads

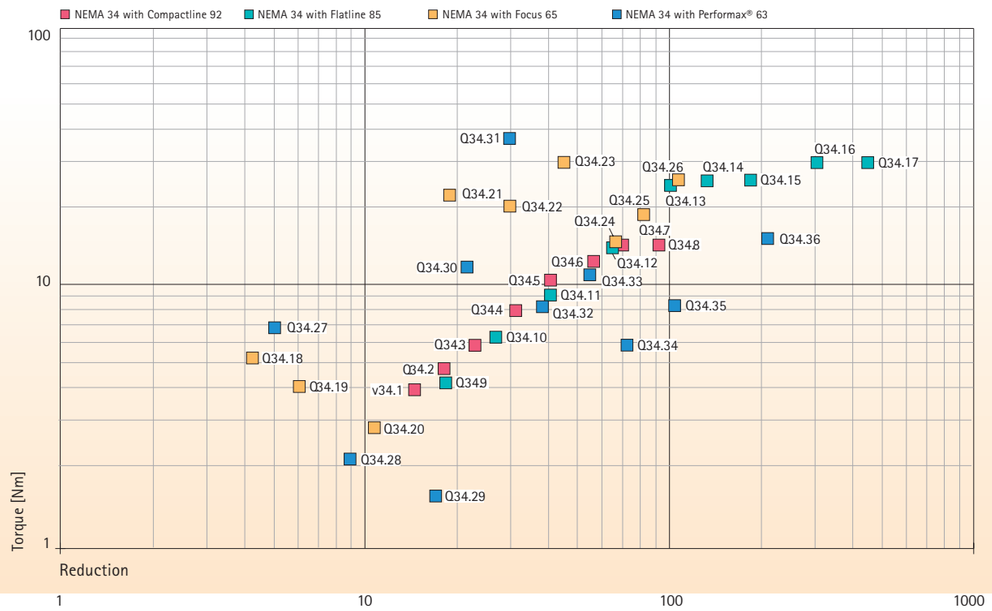
Performance overview NEMA 17



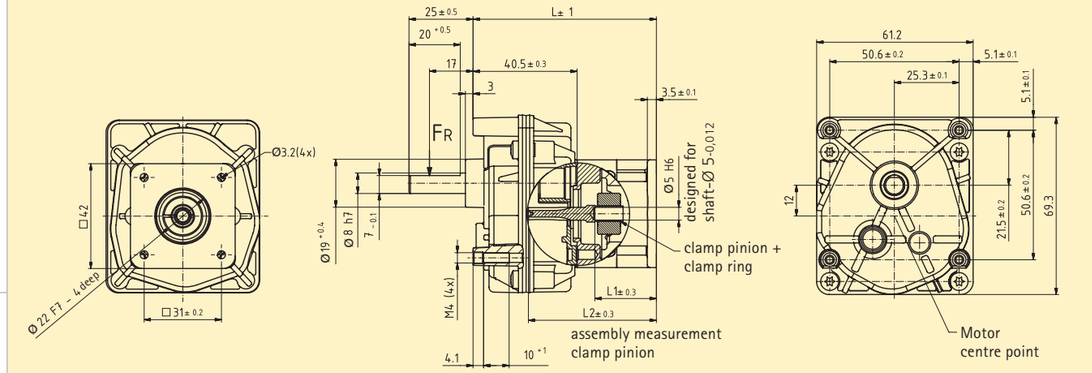
Performance overview NEMA 23



Performance overview NEMA 34

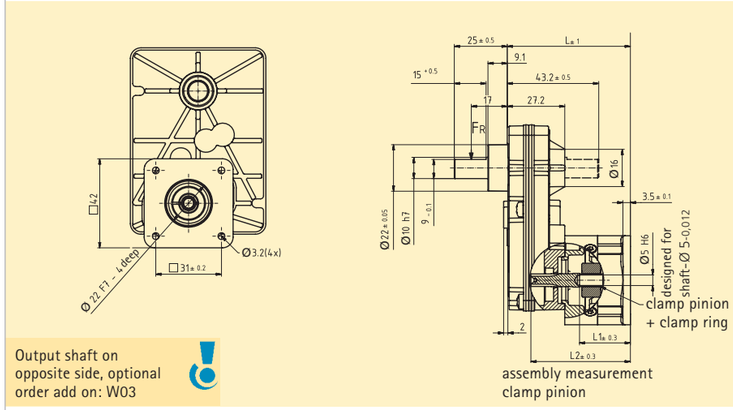


NEMA 17 Connection for spur gearheads



NEMA 17 with spur gearhead Compactline 90

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 17.1	18,8 / 2	0,9	90.2.N17.C01	24	50	72
Q 17.2	23,4 / 2	1,1	90.2.N17.C02			
Q 17.3	26,8 / 2	1,3	90.2.N17.C03			
Q 17.4	30,6 / 2	1,5	90.2.N17.C04			
Q 17.5	37,5 / 2	1,8	90.2.N17.C05			
Q 17.6	53,2 / 3	2,3	90.3.N17.C06	24	50	72
Q 17.7	67,8 / 3	2,9	90.3.N17.C07			
Q 17.8	92,7 / 3	4	90.3.N17.C08			
Q 17.9	142,5 / 3	6,1	90.3.N17.C09			
Q 17.10	222,0 / 4	8,5	90.4.N17.C10	22	48	72
Q 17.11	296,0 / 4	9	90.4.N17.C11			
Q 17.12	432,0 / 4	9	90.4.N17.C12			



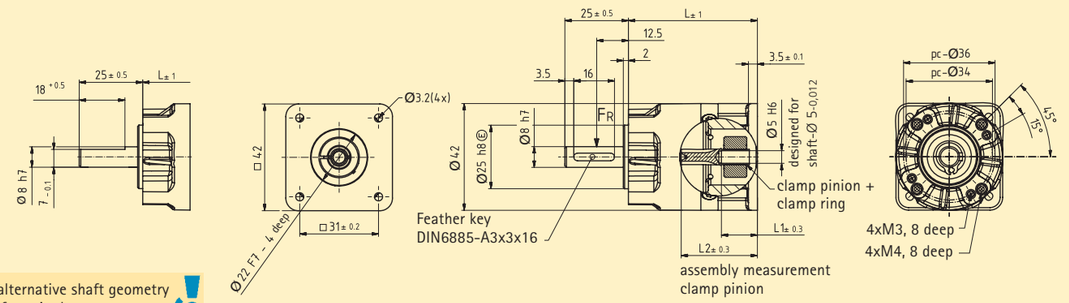
Output shaft on opposite side, optional order add on: W03

NEMA 17 with spur gearhead Flatline 78

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 17.13	38,6 / 3	1,1	78.3.N17.F01	24	47	58
Q 17.14	65,2 / 3	1,5	78.3.N17.F02			
Q 17.15	82,8 / 3	2,3	78.3.N17.F03			
Q 17.16	106,1 / 3	2,6	78.3.N17.F04			
Q 17.17	140,8 / 3	3,2	78.3.N17.F05			
Q 17.18	191,9 / 4	4,7	78.4.N17.F06	24	47	58
Q 17.19	252,6 / 4	6,2	78.4.N17.F07			
Q 17.20	315,7 / 4	6,3	78.4.N17.F08			
Q 17.21	408,4 / 5	6,8*	78.5.N17.F09			
Q 17.22	737,4 / 5	12*	78.5.N17.F10			
Q 17.23	976,0 / 5	14,6*	78.5.N17.F11	24	47	58
Q 17.24	1266,1 / 5	16,1*	78.5.N17.F12			
Q 17.25	1648,6 / 5	17,5*	78.5.N17.F13			
Q 17.26	2146,0 / 5	17,5	78.5.N17.F14			

*stainless steel execution

NEMA 17 Connection for planetary gearheads

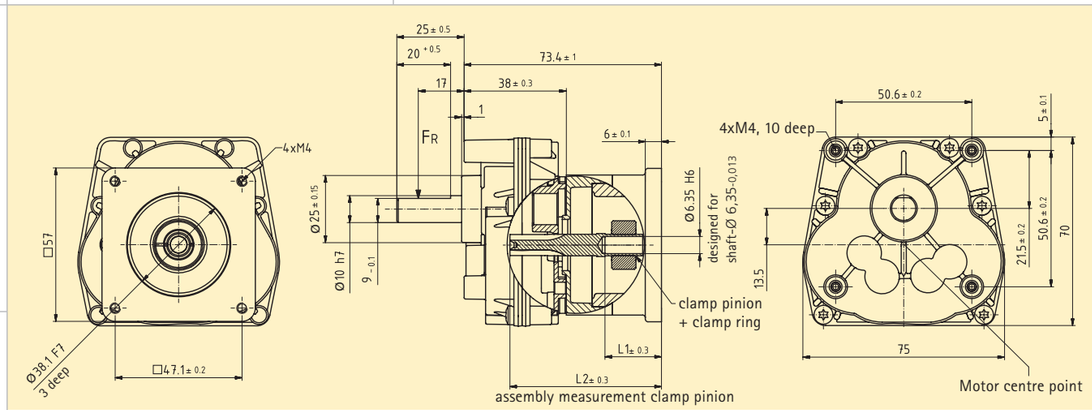


alternative shaft geometry if required. Order code: W01

NEMA 17 with planetary gearhead Performax 42

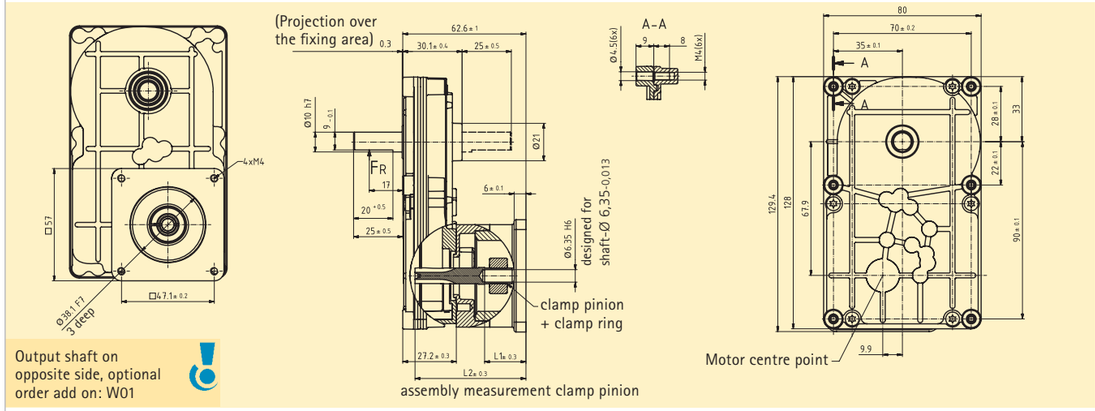
No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 17.36	5,0 / 1	0,8	42.1.N17.P01	14,1	30	51
Q 17.37	9,0 / 1	0,5	42.1.N17.P02	14,1	30	51
Q 17.38	17,0 / 1	0,8	42.1.N17.P03	15,1	30	51
Q 17.39	21,3 / 2	2,9	42.2.N17.P04	14,1	30	66
Q 17.40	30,0 / 2	4,1	42.2.N17.P05	14,1	30	66
Q 17.41	38,3 / 2	1,8	42.2.N17.P06	14,1	30	66
Q 17.42	54,0 / 2	2,6	42.2.N17.P07	14,1	30	66
Q 17.43	72,3 / 2	2,2	42.2.N17.P08	15,1	30	66
Q 17.44	102,0 / 2	3,2	42.2.N17.P09	15,1	30	66
Q 17.45	150,0 / 3	11	42.3.N17.P10	14,1	30	82
Q 17.46	204,0 / 2	6,2	42.2.N17.P11	15,1	30	66

NEMA 23 Connection for spur gearheads



NEMA 23 with spur gearhead Compactline 91

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 23.1	7,8 / 2	2	91.2.N23.C01	21	56,4	73
Q 23.2	9,2 / 2	2,3	91.2.N23.C02			
Q 23.3	11,1 / 2	2,8	91.2.N23.C03			
Q 23.4	13,8 / 2	3,5	91.2.N23.C04			
Q 23.5	18,4 / 2	4,7	91.2.N23.C05			
Q 23.6	22,0 / 2	5,6	91.2.N23.C06			
Q 23.7	27,6 / 2	7	91.2.N23.C07			
Q 23.8	41,3 / 3	8,1	91.3.N23.C08	18,2	53,6	73
Q 23.9	67,3 / 3	9	91.3.N23.C09			

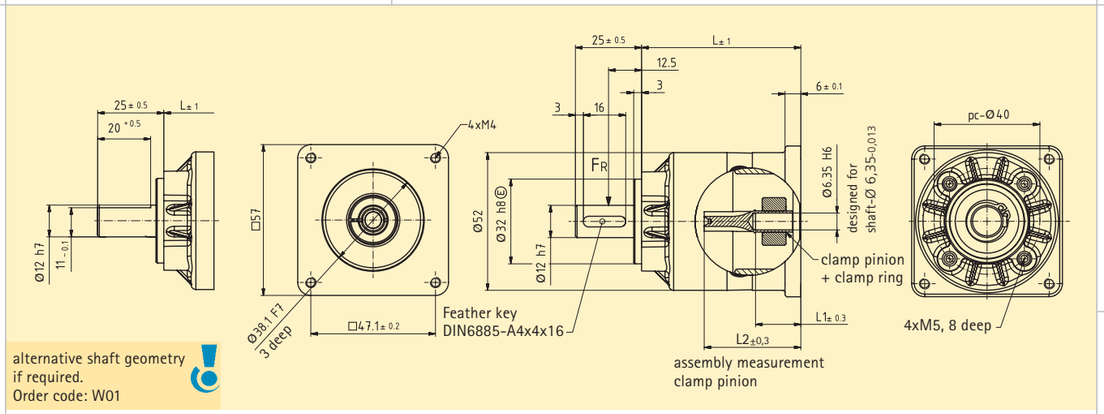


Output shaft on opposite side, optional order add on: W01

NEMA 23 with spur gearhead Flatline 85

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 23.10	18,0 / 3	4,1	85.3.N23.F01	21	56,4	63
Q 23.11	27,6 / 3	6,3	85.3.N23.F02			
Q 23.12	40,3 / 3	9,2	85.3.N23.F03			
Q 23.13	64,0 / 3	14,6	85.3.N23.F04			
Q 23.14	101,8 / 3	23,2	85.3.N23.F05			
Q 23.15	136,5 / 3	25	85.3.N23.F06			
Q 23.16	189,0 / 3	25	85.3.N23.F07			
Q 23.17	303,6 / 4	29,1	85.4.N23.F08	18,2	53,6	63
Q 23.18	454,5 / 4	30	85.4.N23.F09			

NEMA 23 Connection for planetary gearheads

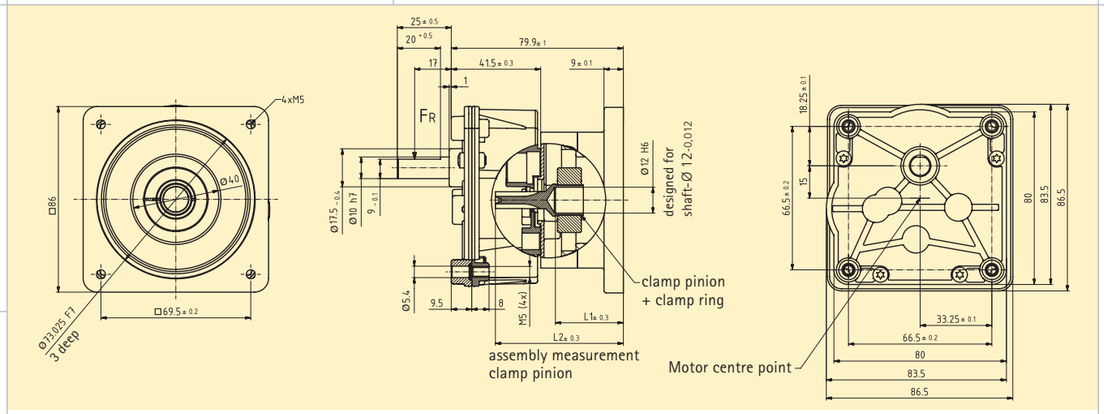


alternative shaft geometry if required. Order code: W01

NEMA 23 with planetary gearhead Performax 52

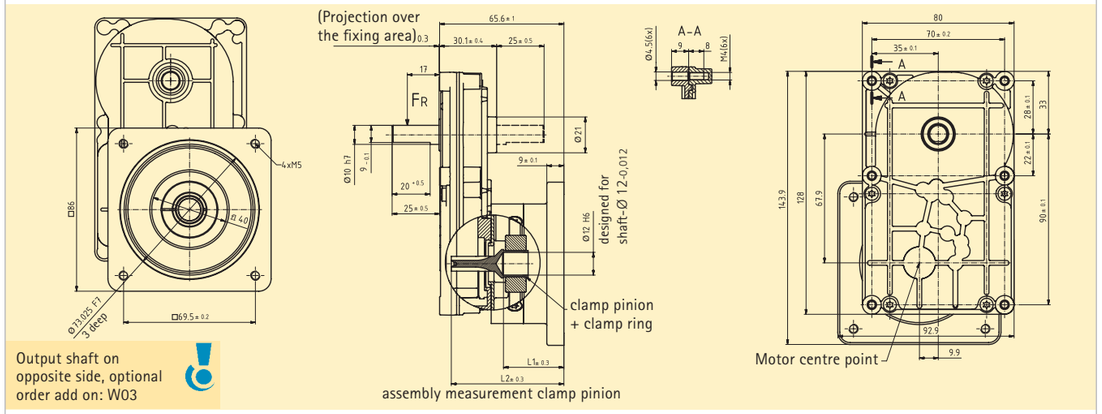
No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 23.28	5,0 / 1	3	52.1.N23.P01	17	36,6	60
Q 23.29	9,0 / 1	1,4	52.1.N23.P02	17	36,6	60
Q 23.30	17,0 / 1	0,9	52.1.N23.P03	18,5	36,6	60
Q 23.31	21,3 / 2	4,6	52.2.N23.P04	17	36,6	79
Q 23.32	30,0 / 2	14,9	52.2.N23.P05	17	36,6	79
Q 23.33	38,3 / 2	5,3	52.2.N23.P06	17	36,6	79
Q 23.34	54,0 / 2	7,4	52.2.N23.P07	17	36,6	79
Q 23.35	72,3 / 2	3,4	52.2.N23.P08	18,5	36,6	79
Q 23.36	102,0 / 2	4,7	52.2.N23.P09	18,5	36,6	79
Q 23.37	204,0 / 2	9,4	52.2.N23.P10	18,5	36,6	79

NEMA 34 Connection for spur gearheads



NEMA 34 with spur gearhead Compactline 92

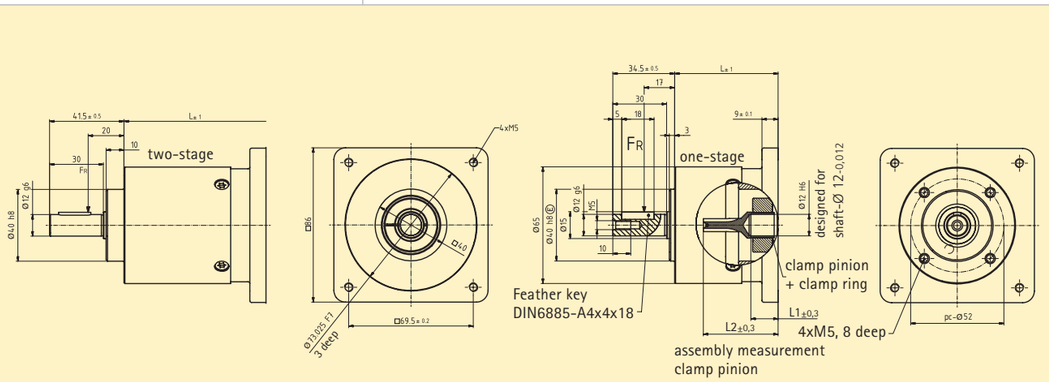
No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 34.1	15,5 / 2	3,9	92.2.N34.C01	31,5	59,4	80
Q 34.2	18,4 / 2	4,7	92.2.N34.C02			
Q 34.3	23,1 / 2	5,9	92.2.N34.C03			
Q 34.4	31,1 / 2	7,9	92.2.N34.C04			
Q 34.5	40,1 / 2	10,2	92.2.N34.C05			
Q 34.6	55,0 / 3	12,5	92.3.N34.C06	28,7	56,6	80
Q 34.7	70,4 / 3	15	92.3.N34.C07			
Q 34.8	92,3 / 3	15	92.3.N34.C08			



NEMA 34 with spur gearhead Flatline 85

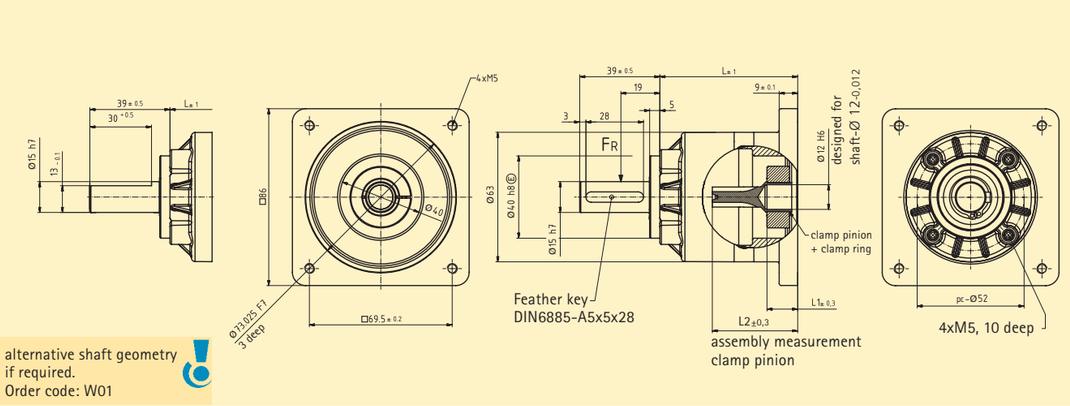
No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 34.9	18,0 / 3	4,1	85.3.N34.F01	31,8	59,4	66
Q 34.10	27,6 / 3	6,3	85.3.N34.F02			
Q 34.11	40,3 / 3	9,2	85.3.N34.F03			
Q 34.12	64,0 / 3	14,6	85.3.N34.F04			
Q 34.13	101,8 / 3	23,2	85.3.N34.F05			
Q 34.14	136,5 / 3	25	85.3.N34.F06			
Q 34.15	189,0 / 3	25	85.3.N34.F07			
Q 34.16	303,6 / 4	29,1	85.4.N34.F08	29	56,6	66
Q 34.17	454,5 / 4	30	85.4.N34.F09			

NEMA 34 Connection for planetary gearheads



NEMA 34 with planetary gearhead Focus 65

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 34.18	4,3 / 1	5,2	65.1.N34.F01	15,2	41,7	58
Q 34.19	6,0 / 1	4	65.1.N34.F02			
Q 34.20	11,0 / 1	2,7	65.1.N34.F03			
Q 34.21	19,2 / 2	22,2	65.2.N34.F04	15,2	41,7	80
Q 34.22	30,5 / 2	20,1	65.2.N34.F05			
Q 34.23	44,8 / 2	29,6	65.2.N34.F06			
Q 34.24	66,5 / 2	14,6	65.2.N34.F07			
Q 34.25	82,8 / 2	18,2	65.2.N34.F08			
Q 34.26	113,1 / 2	24,8	65.2.N34.F09			



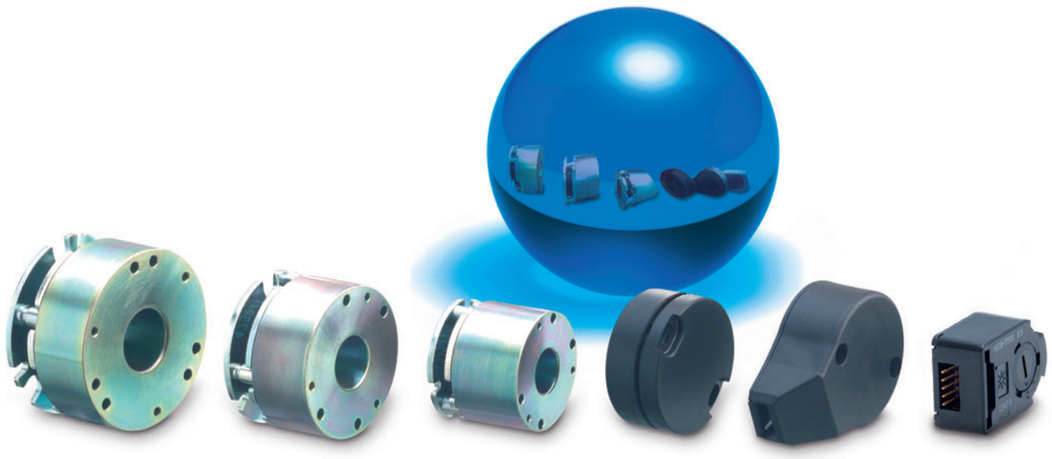
NEMA 34 with planetary gearhead Performax 63

No.	Reduction i / no. of stages	allowed torque M_{ab}[Nm]	Order No.	max. length of motor shaft L1 [mm]	assembly measurement L2 [mm]	total length L [mm]
Q 34.27	5,0 / 1	6,9	63.1.N34.P01	17,9	41,6	67
Q 34.28	9,0 / 1	2,2	63.1.N34.P02	14,9	41,6	67
Q 34.29	17,0 / 1	1,5	63.1.N34.P03	20,7	41,6	67
Q 34.30	21,3 / 2	12	63.2.N34.P04	17,9	41,6	89
Q 34.31	30,0 / 2	37,3	63.2.N34.P05	17,9	41,6	89
Q 34.32	38,3 / 2	8,3	63.2.N34.P06	14,9	41,6	89
Q 34.33	54,0 / 2	11,8	63.2.N34.P07	14,9	41,6	89
Q 34.34	72,3 / 2	5,9	63.2.N34.P08	20,7	41,6	89
Q 34.35	102,0 / 2	8,3	63.2.N34.P09	20,7	41,6	89
Q 34.36	204,0 / 2	16,5	63.2.N34.P10	20,7	41,6	89

Accessories

Overview

	Accessories	Order code	Page
R	Spring-loaded brake	B01.42	145
	Spring-loaded brake	B02.52	145
	Spring-loaded brake	B03.63	145
	Spring-loaded brake	B03.80	145
	Magnetic pulse encoder	G01.2.2	146
	Magnetic pulse encoder	G02.2.4	146
	Magnetic pulse encoder	G03.2.12	146
	Opto-electronic incremental encoder	G04.2.512	147
	Opto-electronic incremental encoder	G05.2.100	148

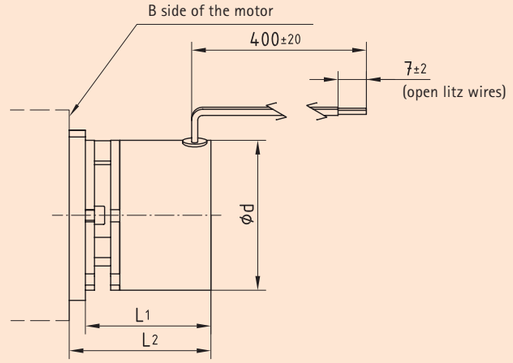


Spring-loaded brake
B01, B02, B03

Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
B01.42																
B02.52																
B03.63																
B03.80																

Attention: One accessory per gear motor only.



Technical data

Order code	B01.42	B02.52	B03.63	B03.80
Nominal power, coil [W] *	5,0	6,6	9,0	9,0
Braking torque [Nm] **	0,12	0,25	0,5	0,5
turn-on-time [ms]	11	8	12,5	12,5
turn-off-time [ms]	17	17	18	18
Max. speed [rpm]	5000	5000	5000	5000
Weight [kg]	0,2	0,27	0,4	0,4
d [mm]	37,0	47,0	56,0	56,0
L1 [mm]	31,3	31,0	31,8	31,8
L2 [mm]	35,3	37,0	37,3	37,3

* Nominal power at 20 °C
** Braking torque, referred to a speed change of around 100 rpm

Spring-loaded brake

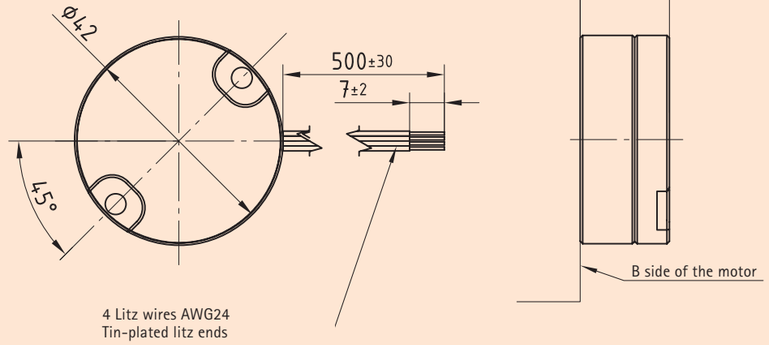
- Robust spring-loaded fail-safe brakes with braking torque of 0.12 to 0.5 Nm
- Insulation class F
- Protection IP 00 (with cover ring IP 54, available as option on request)
- Electrical protection IP 55
- Standard voltage 24 V

Magnetic pulse encoder G01, G02, G03

Fitting possibilities

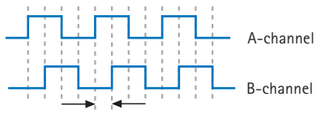
Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
G01.2.2																
G02.2.4																
G03.2.12																

Attention: One accessory per gear motor only.



Motor	L ± 05 [mm]
M4210	22,5*
BCI42...	18
ECM42...	24*
ECM48...	24*
BCI52...	18
BCI63...	18
GK63...	18
ECM63...	24*
ECM75...	24*
M8080	23*

* incl. additional flange



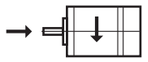


Diagram pattern with shaft rotating clockwise.
Looking towards motor shaft.

Technical data

Order code	G01.2.2	G02.2.4	G03.2.12	
No. of pulses [Z]	2	4	12	Pulses per revolution (A and B)
Output signal [A,B]	2 rectangular signals 90° ± 15° phase offset, 90° ± 15°, when G03 ±40° electr. phase offset			
Pulse ratio	Pulse: Pause = 180° : 180° ± 10°			
Edge steepness, rise	≤ 400 ns (U = 12 VDC, RL = 820 Ohm)			
Edge steepness, fall	≤ 400 ns (U = 12 VDC, CL = 20pF)			
Output load current [I_{load}]	≤ 12 mA (U = 12 VDC)			
Electronics configuration	Open collector output stage with internal pull-up resistors Supply voltage: U_B = 4,5 to 24 VDC (protected against polarity reversal) Output amplitude: U_{low} ≤ 0,4 V (at 12 VDC +20 mA)			
Electrical connection	4 individual litz wires AWG 24, 500 ± 30 mm long Litz ends stripped and tin-plated 7 ± 2 mm			
Assignment [colour]	red: + 5 V...24 V | yellow: A-channel | black: = 0V | green: B-channel			
Weight [kg]	0,03			

Magnetic pulse encoder

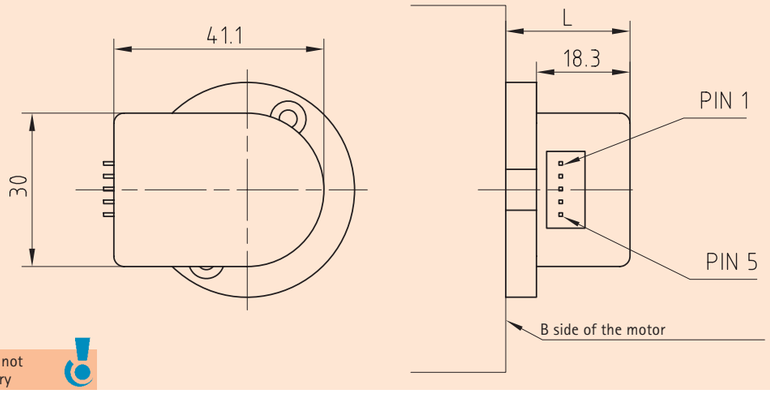
- Magnetic pulse encoder for direct current motors
- The encoder is designed for speed recording, control and positioning in conjunction with suitable electronics.
- The encoder is contactor-less and wear-free via 2 Hall sensors. The sensors are positioned around a magnet and generate two rectangular-pulse signals offset by 90°.
- The encoder unit is screwed onto the motor. The electrical connection is via litz wires.
- Electrical protection IP 40
- Temperature range -20 °C to +80 °C

Opto-electronic incremental encoder G04

Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
G04.2.512																

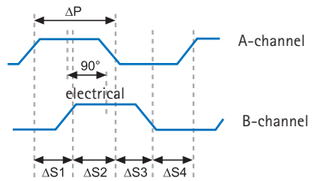
Attention: One accessory per gear motor only.



Connecting cable not included in delivery

Motor	L ± 05 [mm]
BCI42...	20,3
BCI5260	20,3
BCI63...	20,3
M4210	22,8*
M8080	24,8*
GK63...	23,8*
ECM 35x...	22,8*
ECM 42x...	22,8*
ECM 48x...	22,8*
ECM 63x...	23,8*
ECM 75x60	23,8*
ECI63...	18,3
ECI42.../K1	18,3

*incl. additional flange



Technical data

Order code	G04.2.512
No. of pulses Z	512 Pulses per revolution (A and B)
Output signal A, B	2 rectangular signals 90° ± 15° phase offset, when G03 ± 25° electr. phase offset
Limit frequency (f)	100 kHz
Supply voltage [U_B]	+ 5 V ± 10 %
Power consumption [I_B]	typ. 17 mA max. 40 mA
Deviation, pulse width [Δ_S]	typ. 5° (from electrical 90°)
Deviation, phase shift [Δ_P]	typ. 7° (between channel A and B from electrical 90°)
Electrical connection	AMP: 103686-4 or 600442-5
Connector type	Berg: 65039-032 mit 4825X-000 terminals or 65801-034 Molex: 2695 with 2759 terminals
Assignment	Pin: 1:Ground | 2:free | 3:A | 4:UB | 5:B
Weight [kg]	0,02

Opto-electronic 2-channel incremental encoder

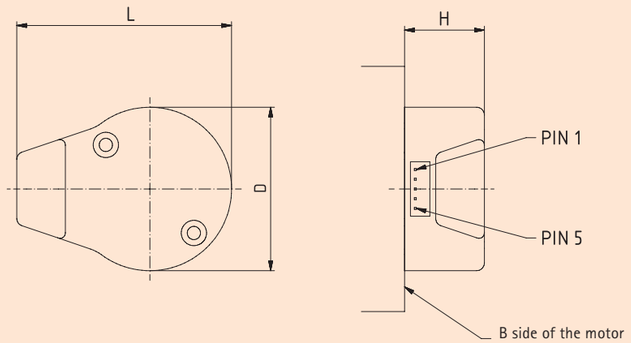
- Important! Do not use in applications in which failure of the encoder interferes with safety relevant functions. If in doubt, consult the manufacturer.
- Opto-electronic 2-channel incremental encoder. A corresponding evaluation in an external controller will achieve a resolution of max. 2048 increments per revolution.
- The encoder is contactor-less and wear-free. The rotary angle resolution is achieved by means of an LED, a metallic encoder disk and a photo-diode array.
- Electrical protection IP 40
- Temperature range -40 °C to +100 °C

Opto-electronic incremental encoder G05

Fitting possibilities

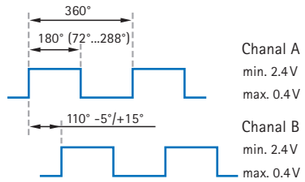
Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
G05.2.100																

Attention: One accessory per gear motor only.



Motor	L	D	H
M42...	55,2	42	20,5
BCI42...	55,2	42	20,5
ECM42...	55,2	42	20,5
ECM48...	57,4	46,6	20,5
BCI52...	57,4	46,6	20,5
BCI63...	57,4	46,6	20,5
ECI63...	57,4	46,6	20,5
ECM63...	57,4	46,6	20,5
ECM75...	57,4	46,6	20,5
M80...	57,4	46,6	25,5

Output signal



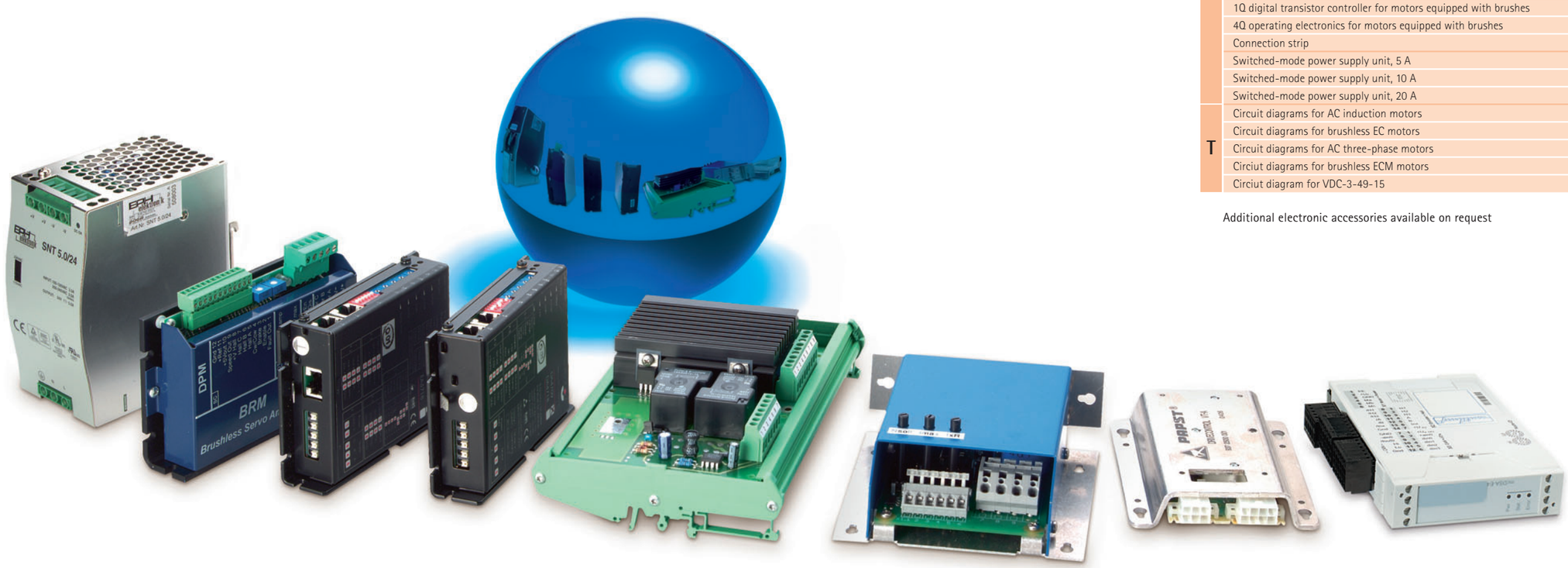
Technical data	
Order code	G05.2.100
No. of pulses [Z]	100 per revolution (channel A and B)
Output signal [A, B]	2 rectangular signals (90° phase offset; TTL-compatible)
Reaction frequency	7.5 Hz*
Supply voltage [U_B]	+ 5 V ± 10 %
Current consumption [I_B]	typ. 30 mA at 25°C (max. 65 mA)
Electrical connection	Molex: 5-pin, type 5051M with terminal 2759
Assignment	Pin: 1:Ground | 2:free | 3:A | 4:UB | 5:B
Weight [kg]	0.03

Opto-electronic 2-channel incremental encoder

- Important! Do not use in applications in which failure of the encoder interferes with safety relevant functions. If in doubt, consult the manufacturer.
- Opto-electronic 2-channel incremental encoder. A corresponding evaluation in an external controller will achieve a resolution of max. 400 increments per revolution.
- The encoder is contactor-less and wear-free. The rotary angle resolution is achieved by means of an LED, a metallic encoder disk and a photo-diode array.
- Electrical protection IP 30
- Temperature range 0 °C to +70 °C

*With enlargement of the phase offset to 115° and reduction of the pulse-pause ratio at channel B by 4%.

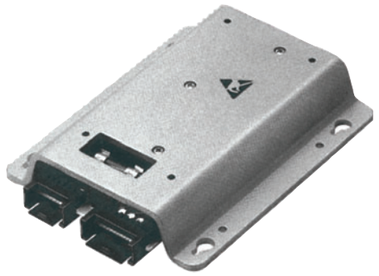
Electronics, accessories and circuit diagrams



	Accessories	Order code	Page
S	Operating electronics, regulated for brushless EC motors, external rotor	V02.VD.g	152-153
	1Q operating electronics, regulated for brushless EC motors	V04	154-155
	4Q operating electronics, regulated for brushless EC motors	V05	156-157
	Connection strip	A01	157
	Operating electronics CANopen	CAN01	158-159
	Operating electronics CANopen	CAN02	158-159
	Speed controller	E01.DS	160-161
	Speed controller with direction changes	E02.DS.Ir	160-161
	Module rack for speed controller	E05.MT.DS	161
	1Q digital transistor controller for motors equipped with brushes	E07	162-163
	4Q operating electronics for motors equipped with brushes	E08	164-165
	Connection strip	A01	165
	Switched-mode power supply unit, 5 A	S01.5A	166-167
	Switched-mode power supply unit, 10 A	S02.10A	166-167
	Switched-mode power supply unit, 20 A	S03.20A	166-167
T	Circuit diagrams for AC induction motors	SB01–SB03	168
	Circuit diagrams for brushless EC motors	SB04–SB08	168-170
	Circuit diagrams for AC three-phase motors	SB10	171
	Circiut diagrams for brushless ECM motors	SB11	172
	Circiut diagram for VDC-3-49-15	SB12	173

Additional electronic accessories available on request

Operating electronics
V02



Fitting possibilities

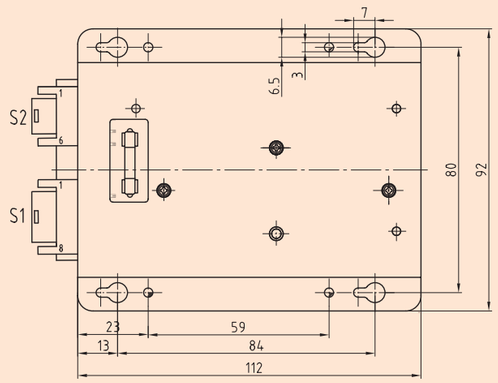
Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
V02.VD.g																

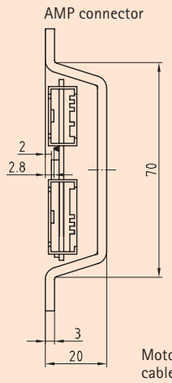
Technical data

	Unit	Regulated
Order code		V02.VD.g
Nominal voltage	V	24
Nominal voltage range	V	14...28
Max. output voltage *	V	U_B – 2 V
Output current, peak	A	2 – 5
Set value input	VDC	0...10
Speed control range		1 : 10
Speed control	Typ	P
Speed actual value		yes
Operating temperature range	°C	0...40 °C
Temperature monitoring		no
Weight	kg	0,2
Protection		IP 00

* U_B = Operating voltage

for motor VD-3-43-10



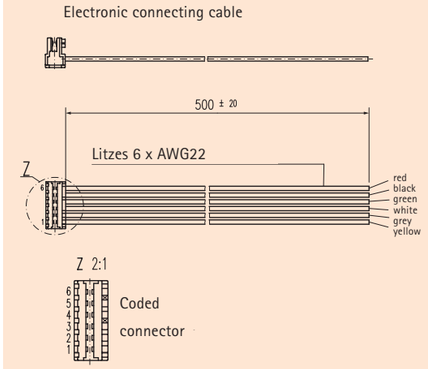


Motor- and electronic connecting cable included !

Plug - / pin designation

Connecting cable electronics (S2)

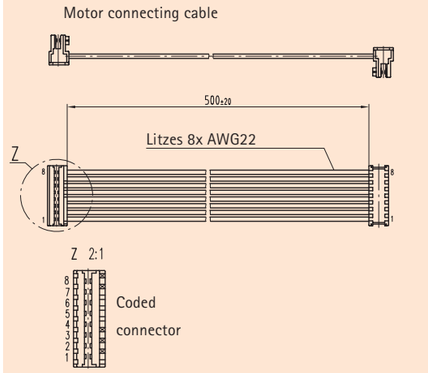
AMP	Molex	Colour		Designation	
6	4	red	UB	Supply voltage	24 V
5	1	black	GND	Ground for UB	0 V
4	3	green	$n_{command}$	Set-value	analog 0 - 10 V
3	2	white	A	Input A	0 V < low < 0,8 V 2,4 V < high < 28 V
2	5	grey	B	Input B	0 V < low < 0,8 V 2,4 V < high < 28 V
1	6	yellow	MF-Pin		



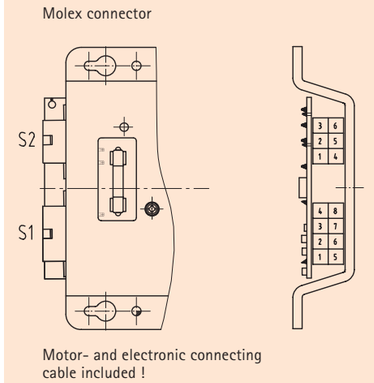
Plug - / pin designation

Connecting cable motor (S1)

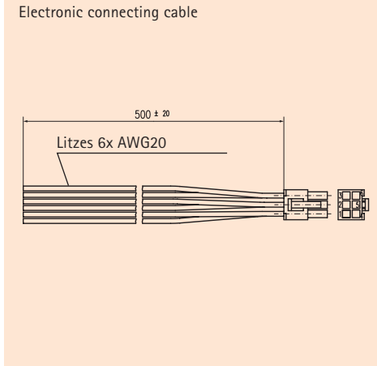
AMP	Molex	Colour		Designation	
8	6	blue	L1	Output 1	
7	5	blue	L2	Output 2	
6	1	blue	L3	Output 3	
5	4	blue	RLG1	Input 1	
4	3	blue	RLG2	Input 2	
3	8	blue	RLG3	Input 3	
2	7	blue	GND	Ground for UB	0 V
1	2	blue	UB	Supply voltage	24 V

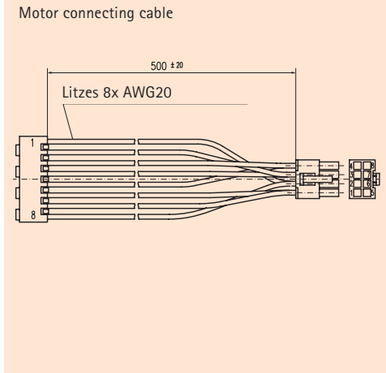


for motor VD-3-54-14



Motor- and electronic connecting cable included !





Operating electronics for controlling the 3-phase brushless EC motors, external rotor

Assembly and performance features

- Configured as a 1-quadrant controller. Positive set value changes are adjusted faster. In the case of negative set value changes, short-circuit braking occurs via the motor winding (increase in the intermediate circuit voltage possible).
- Default speed via a set value input (interface 0...10 VDC)
- Setting the operating modes via 2 control inputs
- Interpretation of hall-signals and set-value processing as well output via multi- function pin.
- Current and voltage monitoring
- Voltage supply with input filter, filtering and auxiliary voltage generation
- Version with circuit board connector or Molex connector, depending on the motor variant
- Only one supply voltage is necessary for the motor and electronics.

1. Control inputs

Regulated version		
A	B	
0	0	Output stage isolated
0	1	Rotational direction anticlockwise
1	0	Rotational direction clockwise
1	1	Braking*

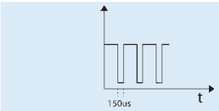
low (0) 0...0,8 V; high (1) 2,4...28 V

*Braking: The braking function is only for slowing down the drives. It is not a stop function for bringing the drive to a standstill.

2. Actual value output (MF-Pin)

Open Collector, which delivers a short pulse with every edge change of the motor's Hall signals!
The displayed signal pattern applies as the speed actual value output for the standard configuration

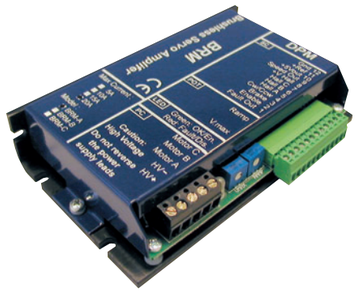
Voltage range U_{CE}	< 30 V
Max. current I_c	10 mA
Pull-up resistor	> 2000 Ohm at 24 V
Pulse length	150 µs
U_{CESat}	< 0,8 V



3. Set value input

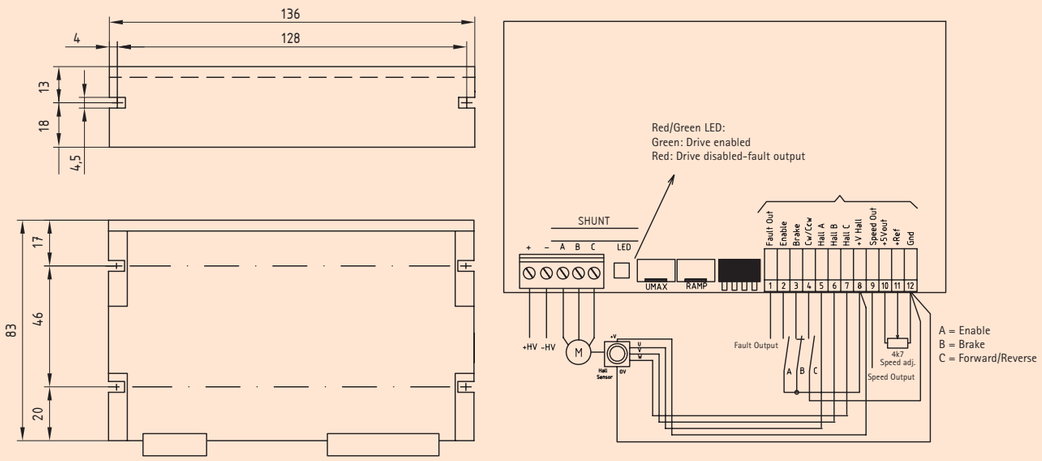
The set value is normally defined externally with a voltage in the range of 0...10 VDC. A voltage of 10 V corresponds here to the internally defined maximum speed. To reduce the set value, either an external potentiometer can be connected or the voltage can be defined externally. Further detailed information can be found in the respective specification data sheets. The direction's and the safety instructions from the operating manual must always be followed.

Operating electronics
V04



Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
V04																



Connectors input/output

Pin	Name	Colourcode for motor DPM 28... / page 94	Description
1	FAULT OUT	–	Open collector output becomes low during over current, under voltage, disable, wrong phasing of hall sensors.
2	ENABLE	–	This TTL level input signal turns on all power devices of the power bridge when pulled to high (+6 VDC).
3	BRAKE	–	This input provides to stop the motor when pulled to low level (0 V). Do not use with high inertia loads.
4	CW/CCW	–	Rotation direction: right/left viewing motor shaft from front. Pull this input to ground (Pin 12) to change rotation.
5	HALL A	blue	HALL sensor A
6	HALL B	orange	HALL sensor B
7	HALL C	brown	HALL sensor C
8	+ V HALL	yellow	Power for HALL sensors and Enable: +5 V- max. load 20 mA
9	SPEED OUT	–	Actual speed value output: 12 pulses per 360 ° (electrical) with 4 poles motor -Push Pull output
10	+ 5 V out	–	+ 6 VDC-Power supply for speed adjustment by potentiometer.
11	+ REF	–	Analog reference input: 0...6 VDC
12	GND	white	Ground

1-Q operating electronics for controlling the 3-phase brushless EC-motors

Pulse-width modulation

- Default speed via a set-value input 0...6 V and Hall signal feedback. The electronics can be operated in open-loop as well as in close-loop.
- Integral temperature limitation, short circuit protected and monitoring of Hall signals
- Clamp connection for power supply and motor
- AMP connector for control signals
- Only one power supply for motor and electronic necessary

Functions:

- V MAX: trimmer for adjustment of the maximal motor speed
- RAMP: adjustment of the acceleration and deceleration ramp
- SHUNT: limitation of maximum motor current
- Different ranges of voltages in one driver
- The current can be selected through dip switch
- Possibility to regulate the nominal and peak current.

Rated and Peak current adjustment with DIP-Switch-configuration

DIP 1	DIP 2	Peak current (Ip)	DIP 3	DIP 4	Rated current.(In)
Off	Off	6	Off	Off	Ip x 0,65
On	Off	10	Off	Off	Ip x 0,5
On	On	20	On	On	Ip x 0,33

Power connector

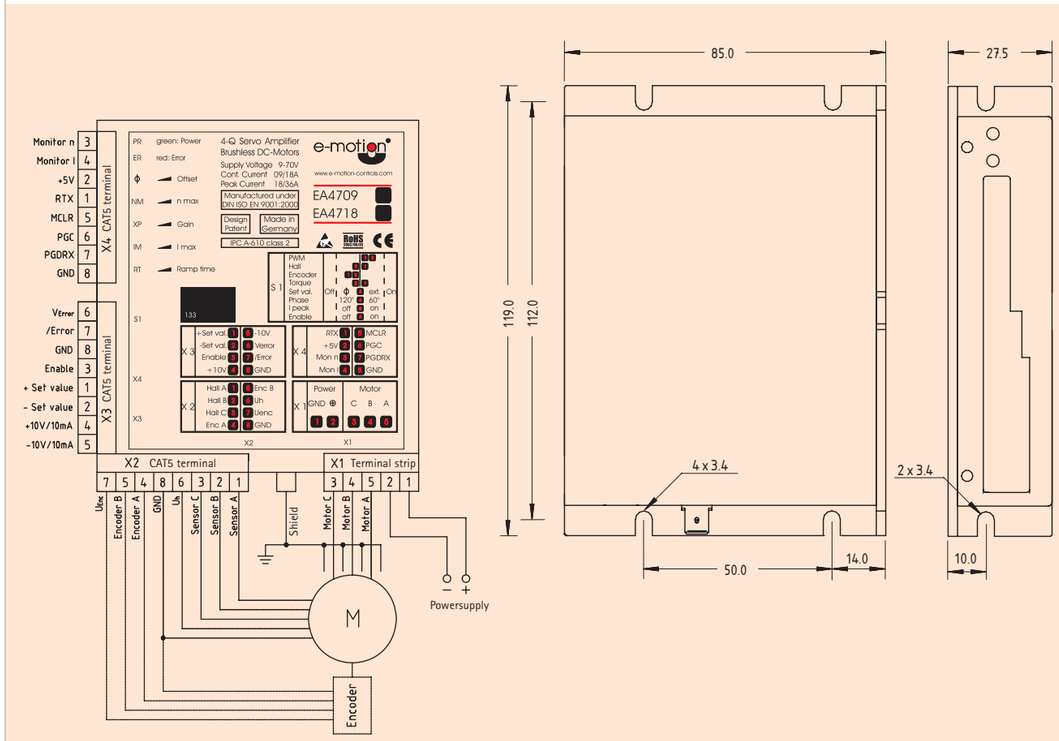
PIN	Name	Colourcode for motor DPM28... / page 94	Description
1	HV +		D.C. Power Supply +
2	HV -		D.C. Power Supply -
3	Motor A	green	Motor A (L1)
4	Motor B	red	Motor B (L2)
5	Motor C	black	Motor C (L3)

Order Code	V04
Supply voltage	23...29 VDC
Continuous current	15 A
Set value input	0...6 VDC
Output stage clocking frequency	20 kHz
Operating temperature range	0 – 40 °C
Stock temperature range	-10 – +70 °C
Temperature monitoring	75 °C
Protection	IP20
Weight [kg]	0,26

Operating electronics
V05

Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
V05																



4-Q operating electronics for triggering brushless EC motors.

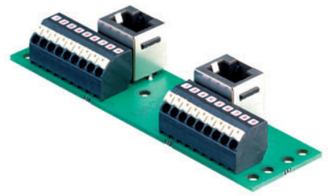
- Input voltage range from 9 - 70 VDC
- Nominal current up to 18 A
- Current limitation can be adjusted
- Protection against excess current
- Efficiency 97%
- MOSFet technology
- Protection against excess temperature
- Toolless attachment of the power terminal strips
- Inputs and outputs with RJ45 CAT5 plug
- Adjustment of operating mode via DIL switch
- Miniature aluminium housing
- Easy to integrate thanks to multiple attachment

Technical data

Order code		V05
Electrical data	Operating voltage	9 - 70 VDC
	Nominal current	18 A
	Pulse current	36 A
	Output stage clocking frequency	50 kHz
	Efficiency	97%
	Auxiliary voltage / Uerror	5 -24 VDC
	Maximum capacity with heat sink mounted	1260 W
Inputs	Set Value	-10...+10 VDC; Ri = 20 kOhm
	Enable	TTL / 24 V; Ri = 10 kOhm
Outputs	Current monitor "Monitor I"	0.5/1 V/A
	Speed monitor "Monitor n"	max. 10 V at nmax
	Monitoring output "Ready/Error"	Open Collector / Push Pull / TTL / 24 V
	Auxiliary voltage +Uh; +Uenc; + 5 V	+ 5 VDC / 50 mA
	Auxiliary voltage +Uh; +Uenc; + 5 V	+-10 VDC / 10 mA
Switches	PWM, Hall, Enc., Torque	Not Set/Set
	Set value via offset	Offset/ext
	Phase	120°/60 °
	Ipeak	on/off
	Enable	on/off
Potentiometer functions		Offset; nmax, Gain; Imax; Ramp time
Display	Two-colour LED	Green: Ready, Red: Error
Weight [kg]	With terminal connection	0,22
Temperature ranges	Operation	-10... +45 °C
	Storage	-40...+85 °C
Humidity range	Non-condensing	
Type of operation	Commutation amplifier	
	Speed control Hall	
	Speed control Encoder	
	Current regulation	
Dynamics	Cyclical pulse current limitation	
Use	For brushless EC motors	

Connection of control cables

Via adapter module (accessories: art. no. A01) with 2 x CAT5 terminals on 9-pole terminal strip or own layout.

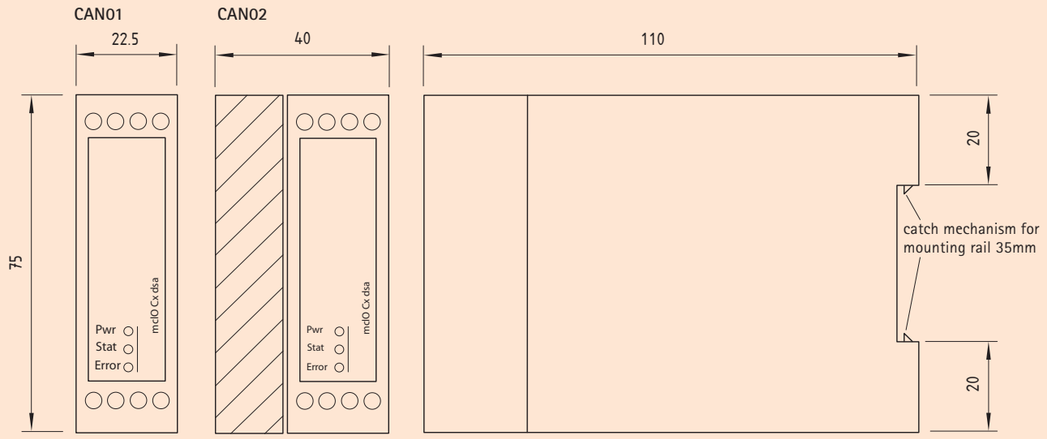


Operating electronics
CAN01, CAN02

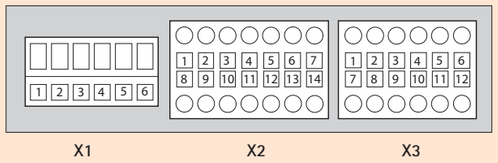
Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
CAN01																
CAN02																

CANopen



Plug -/Pin designation



Plug -/Pin designation

X1.1	PE	Earth
X1.2	+Up	Power supply +10 .. +30V(DC)
X1.3	GND	Ground 0V for power supply
X1.4	Ma	Motor phase A
X1.5	Mb	Motor phase B
X1.6	Mc	Motor phase C
X2.1	H1	Hall sensor 1
X2.2	H2	Hall sensor 2
X2.3	H3	Hall sensor 3
X2.4	A	Inc. encoder channel A
X2.5	B	Inc. encoder channel B
X2.6	INX	Inc. encoder index channel
X2.7	+U5V	Power supply hall/encoder +5V
X2.8	/H1	Hall sensor 1 inverted
X2.9	/H2	Hall sensor 2 inverted
X2.10	/H3	Hall sensor 3 inverted
X2.11	/A	Inc. encoder channel A inverted
X2.12	/B	Inc. encoder channel B inverted
X2.13	/INX	Inc. encoder index channel inverted
X2.14	GND	Ground 0V for power supply hall/encoder
X3.1	+Ue 24V	Power supply electronic +24V
X3.2	+AIN 0	Plus analog input
X3.3	DIN 0	Digital input 0
X3.4	DIN 1	Digital input 1
X3.5	DIN 2	Digital input 2
X3.6	DIN 3	Digital input 3
X3.7	GND	Ground 0V for power supply electronic
X3.8	-AIN 0	Minus anlog input
X3.9	DOUT 0	Digital output 0
X3.10	CAN_HI	CAN high
X3.11	CAN_LO	CAN low
X3.12	CAN_GND	CAN ground

Technical data

Order code	CAN01	CAN02
Master functionality (MPU integrated)	yes - MPU2	yes - MPU2
Voltage electronic supply [V (DC)]	8,5...30	10...30
Voltage power supply [V (DC)]	8,5...60	10...60
Current consumption at 24V [mA]	typ. 50	typ. 50
Peak output current [A]	30	30
Continuous output current at 40° C [A]	8	14
Digital input	4	4
Digital output	1	1
Analog input	1 (+/- 10V)	1 (+/- 10V)
Protection class	IP 20	IP 20
Ambient temperature [°C]	0...+70	0...+70
Rel. humidity (non condensing) [%]	20...80	20...80
Weight [g]	110	260

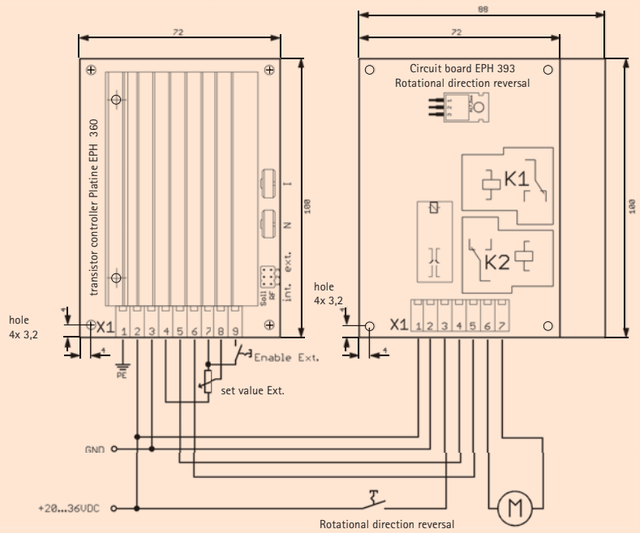
Motion control

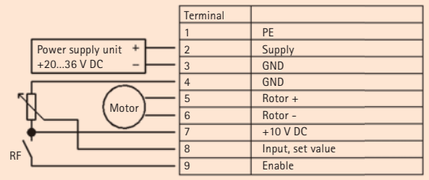
- Very compact 4-quadrant controller to control brushtype, brushless DC-motors and linear motors
- Freely programmable with integral Motion Process Unit. Allows stand-alone operation and stand-alone networks
- CAN interface (DSP402)
- The controller has over-voltage, low-voltage and overtemperature monitoring
- With display “power”, “status” and “error”
- The controller can be fixed by a hut-rail (35 mm) or fixing clips
- Three connection plugs are included in delivery

Speed controller
E01, E02

Fitting possibilities

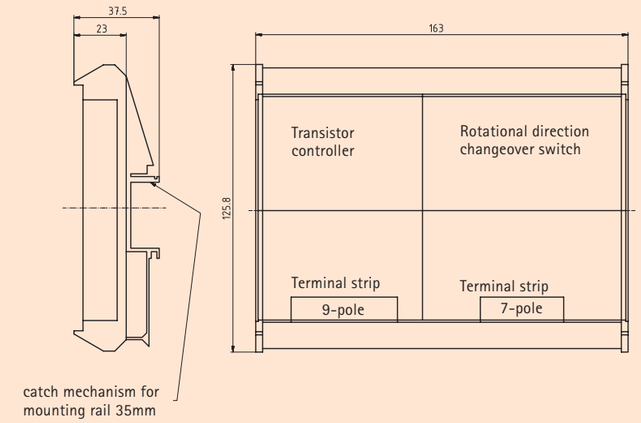
Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
E01.DS																
E02.DS.Ir																





Terminal	
1	PE
2	Supply
3	GND
4	GND
5	Rotor +
6	Rotor -
7	+10 V DC
8	Input, set value
9	Enable

Module rack E05 for E01, E02



Technical data

Order code	E01.DS	E02.DS.Ir
Supply voltage U_E [V DC]	12...36	12...36
Rotor voltage U_A * [V DC]	0...32	0...32
Rotor current I_N [A]	max. 10	max. 10
Dimensions [mm] (L x B x H)	100 x 72 x ca. 50	100 x 72/88 x ca. 50
Weight [kg]	0,25	0,30
External fuse [AT]	10	10
Output stage clocking frequency [kHz]	18	18
Motor current on board (adjustable)	0 – 100 %	0 – 100 %
Ambient temperature [°C]	5 – 45	5 – 45
Relative humidity, non-condensing [%]	15 – 85	15 – 85
Power supply unit	S02.10A, S03.20A	S02.10A, S03.20A
Control connections	All control connections are at the supply voltage potential	
Set value	Optional speed default: Internal potentiometer or external potentiometer, 10 kΩ (selectable via J1 internal / external) External voltage default 0...10 VDC, Potential same as supply voltage	
Enable	Input logic 12 – 30 VDC H-active. The output stage is activated by an enable signal. When the signal is removed, the output stage is blocked and the modulation is deactivated. Enable can be pre-selected via J2 internal / external.	
Circuit board attachment or module rack		

Transistor speed controller E01.DS and E02.DS.Ir (rotation of direction change) for continuous speed adjustment

Assembly and performance features

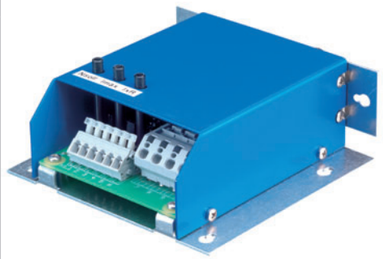
- Input voltage range 12...36 VDC, via direct battery operation, e.g. from on-board network or upstream switched-mode power supply unit **S02.10A** or **S03.20A** possible.
- Continuous speed adjustment optionally via internal / external potentiometer or external reference voltage 0...10 VDC
- As protection against overloading, the motor current can be stepless limited by an internal potentiometer
- High clocking frequency 18 kHz, providing minimal noise output
- Form factor F < 1,05, allowing for minimal motor heating and high torque reserves
- Module rack E05: Weight [kg] 0,15

E02.DS.Ir only

- Rotational direction change via relay possible at any time
- Clockwise/anticlockwise pre-selection via a control signal 12...48 VDC at standstill

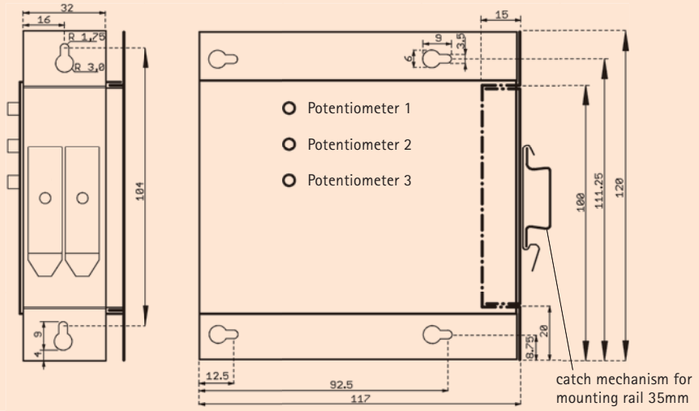
*UA maximum 88 % of the supply voltage UE

Transistor controller
E07

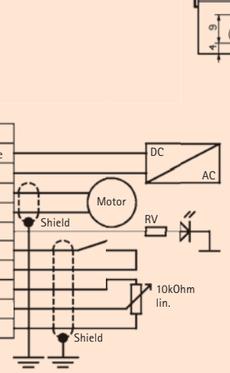


Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
E07																



Terminal	
10	Power supply voltage
9	GND
8	Motor +
7	Motor -
6	Ready / output
5	U_{enable}
4	$Controller_{enable}$
3	+5V
2	Nom. value speed
1	GND



Depending on the application case, control leads must also be designed as shielded cables.

1-Q digital transistor controller Type DLS 24/20

- Input voltage range from 12 -36 VDC
- Nominal current up to 20 A
- Current limitation can be adjusted
- High efficiency thanks to the use of Power MOSfets
- Overload protection through internal potentiometer
- Electrical connection via spring-action terminals
- Screw attachment or attachment on 35 mm mounting rail
- Speed regulation through EMF regulation with I x R compensation

Technical data

Order code		E07
Electrical data	Supply voltage U_E	12 -36 VDC
	Rotor voltage U_A	max. 95% U_E
	Nominal current	0 - 20 A
	Mechanical power	approx. 250 W
	Control range	up to 1: 60
	Controller/electronics	8-bit processor
	Clocking frequency	23 kHz
	Motor fuse	20 AT
Control connections	Set value speed	Terminal 1: GND
		Terminal 2: Tap external potentiometer (10 kOhm)
		Terminal 3: 5 VDC
	Control release	Terminal 4: Input 10 - 26 VDC H/active
	UE2	Terminal 5: Output (12 - 36 VDC, < 50 mA)
	Ready for operation	Terminal 6: Switchable output (12 - 36 VDC, < 50 mA)
Setting parameters	Set values assigned	external via 0..10 VDC interface or
		external via 0.0.5 VDC interface or
		external 10 kOhm potentiometer or
		use of the internal potentiometer (n-set) (Poti 1)
	Control release	for the activation of the controller, can be selected internally/externally via jumper
	Motor voltage	can be limited to max. 12 VDC or 24 VDC
	IxR compensation	Recording of actual values through EMF with IxR compensation. Pre selection with Poti 3 (IxR)
	Current limitation	Overload protection of the motor or gear units through settable current limitation Poti 2
	Acceleration/deceleration ramp	Fixed value 1.5 s.
Temperature ranges	Ambient temperature	5 - 45 °C
	Acceleration/deceleration ramp	Fixed value 1.5 s.
Humidity range	Non-condensing	18 - 85 %
Protective rating		IP00
Weight [kg]		0,30
Use	for motors equipped with brushes	

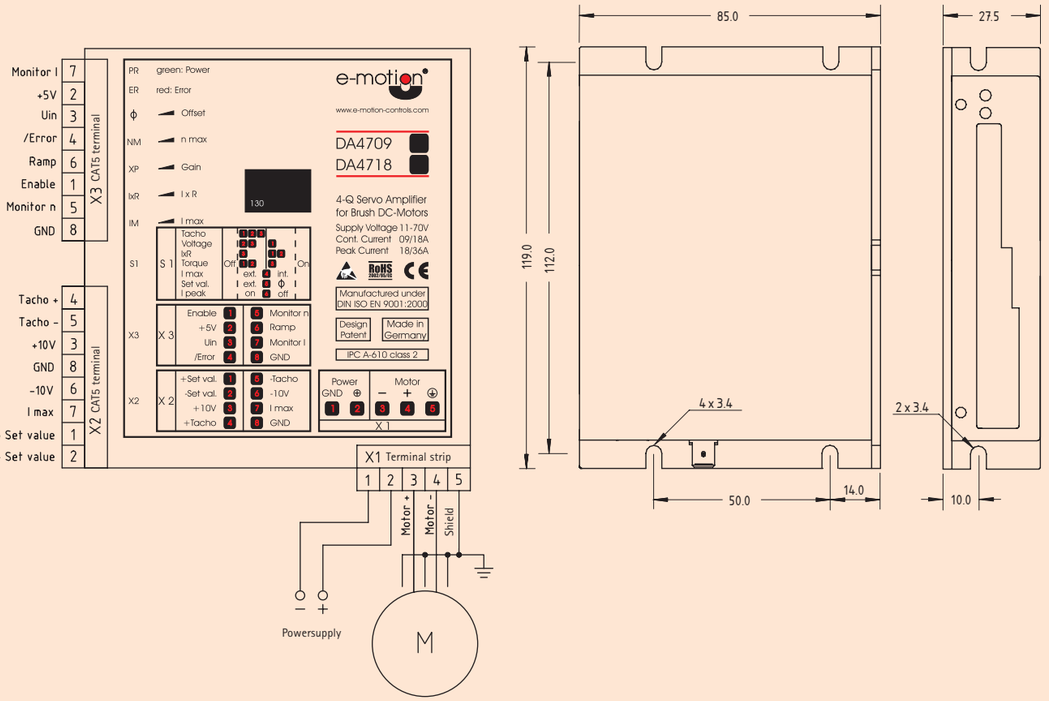
Jumper positions

Jumper	Position 1–2	Position 2-3
JP1	Set value internal	Set value external
JP2	12 V motor	24 V motor
JP3	Set value 5 V	Set value 10 V
JP4	Internal controller release	External controller release

Operating electronics
E08

Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
E08																



4-Q operating electronics for triggering DC motors equipped with brushes.

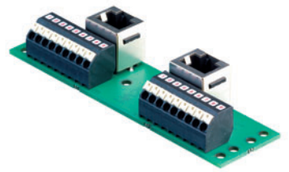
- Input voltage range from 11 - 70 VDC
- Nominal current up to 18 A
- Current limitation can be adjusted
- Protection against excess current
- Efficiency 95 %
- MOSFet technology
- Protection against excess temperature
- Toolless attachment of the power terminal strips
- Inputs and outputs with RJ45 CAT5 plug
- Adjustment of operating mode via DIL switch
- Miniature aluminium housing
- Easy to integrate thanks to multiple attachment

Technical data

Order code		E08
Electrical data	Operating voltage	11 - 70 VDC
	Nominal current	18 A
	Pulse current	36 A
	Output stage clocking frequency	50 kHz
	Efficiency	95 %
	Maximum capacity with heat sink mounted	1260 W
Inputs	Set Value	-10...+10 VDC; Ri = 20 kOhm
	Enable	TTL / 24 V; Ri = 4.7 kOhm
	Tacho	-50...+50 VDC; Ri = 50 kOhm
	Ramp	TTL / 24 V; Ri = 4.7 kOhm
	Imax	0...10 V; Ri = 100 kOhm
Outputs	Current monitor "Monitor I"	0.5/1 V/A
	Speed monitor "Monitor n"	0.1/1 Vmotor
	Monitoring output "Ready/Error"	Open Collector / Push Pull / TTL / 24 V
	Auxiliary voltage	+ 5 VDC / 50 mA
	Auxiliary voltage	+-10 VDC / 20 mA
Switches	V-mode; IxR-mode; I-mode	Not Set/Set
	Imax	ext/int
	Set value via offset	Offset/ext
	Ipeak	on/off
Potentiometer function		Offset; nmax; Gain; IxR; Imax
Display	Two-colour LED	Green: Ready, Red: Error
Weight [kg]	With terminal connection	0,22
Temperature ranges	Operation	-10...+45 °C
	Storage	-40...+85 °C
Humidity range	Non-condensing	20 - 80 % rel.
Type of operation	IxR regulation	
	DC tacho regulation	
	Current regulation	
	Voltage regulation	
Dynamics	Cyclical pulse current limitation	
Use	for DC motors equipped with brushes	

Connection of control cables

Via adapter module (accessories: art. no. A01) with 2 x CAT5 terminals on 9-pole terminal strip or own layout.

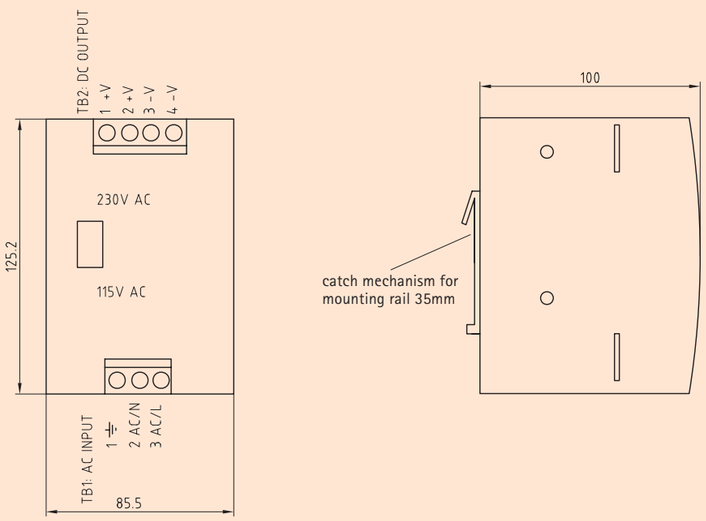


Switched-mode power supply unit S01, S02, S03

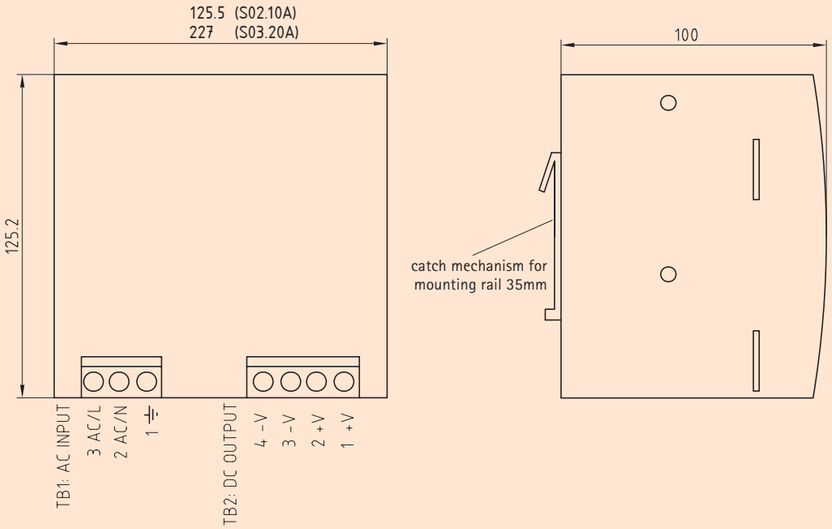
Fitting possibilities

Catalogue section	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
S01.5A																
S02.10A																
S03.20A																

S01.5A



S02.10A / S03.20A



Technical data

Order code	S01.5A	S02.10A	S03.20A
Input voltage [V AC]	100...120 / 200...240	100...240	180...264
Input current	3,3 A / 2,0 A	3,5 A	4A
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Secondary voltage [V]	24	24	24
Nominal current [A]	5,0	10,0	20,2
Short-circuit resistant	yes	yes	yes
Efficiency	84 %	84 %	89 %
Operating temperature	-10 – +60 °C	-10 – +70 °C	-20 - +70°C
Attachment for mounting rail 35mm	yes	yes	yes
Weight [kg]	0,75	1,2	2,1
Length L [mm]	85,5	125,5	227

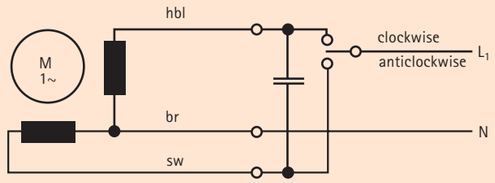
Switched-mode power supply units for the electrical supply of low-voltage control units

The switched-mode power supply units **S01.5A**, **S02.10A** and **S03.20A** were developed specially for use in an industrial environment and are designed among other applications for supplying control units with low voltage. The very high electrical specifications guarantee a reliable power supply.

Motor connection

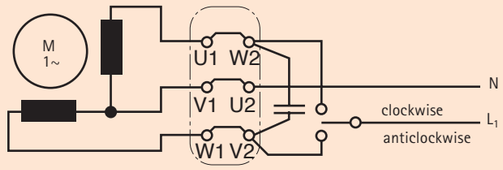
SB01

Motor
KM4030-2
KM4030-4
KM4050-2



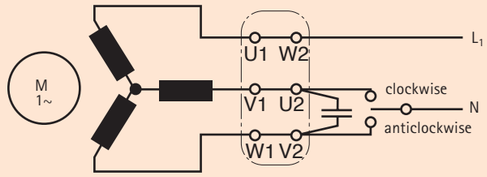
SB02

Motor
Eg7130-2
Eg7150-2
IGL6540 1-phase
IGL6560 1-phase



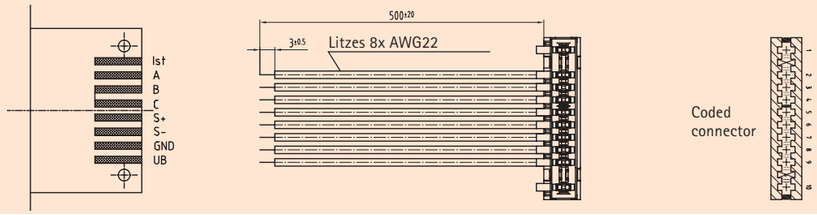
SB03

Motor
Eg7130-4
IGL6560-4



SB04

Motor
VDC-3-43-10



Pin	Colour		Designation	
2	yellow	IST	Actual speed value	
3	white	A	Input A	
4	grey	B	Input B	
5	violet	C	Not used	
6	green	S+	Set-value	analog 0...10 V
7	brown	S-	Reference ground for set-value	0 V
8	black	GND	Reference ground for UB	0 V
9	red	UB	Supply voltage	24 V

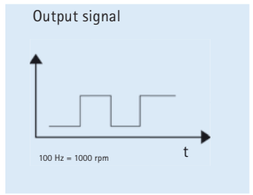
Motor cable included

1. Control inputs

A	B	
0	0	Output stage isolated
0	1	Anticlockwise rotational direction
1	0	Clockwise rotational direction
1	1	Braking*

* Braking: The braking function is only for slowing down the drives. It is not a stop function for bringing the drive to a standstill.
low (0) 0...0,8 V, high (1) 2,4...30 V

2. Actual evaluation



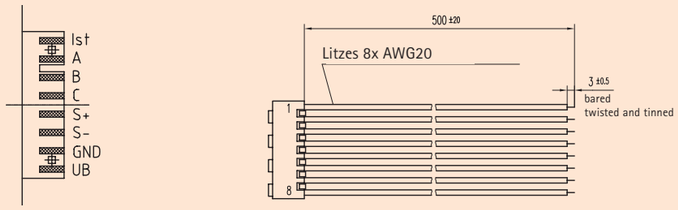
Design:
Open collector
$U_{ext.\ max}$ = 30 V
U_{CESAT} = 0,5 V
I_{CMAX} = 5 mA

3. Target value input

Stipulated revolutions for controlling revolutions by means of target value voltage (Interface 0...10 VDC)

SB05

Motor
VDC-3-54-14



Pin	Colour		Designation	
1	yellow	IST	Actual speed value	
2	white	A	Input A	0 V < low < 0,8 V 2,4 V < high < 28 V
3	grey	B	Input B	0 V < low < 0,8 V 2,4 V < high < 28 V
4	violet	C	Not used	
5	green	S+	Set-value	analog 0...10 V
6	brown	S-	Reference ground for set-value	0 V
7	black	GND	Reference ground for UB	0 V
8	red	UB	Supply voltage	24 V

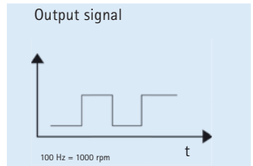
Motor cable included.

1. Control inputs

A	B	
0	0	Output stage isolated
0	1	Anticlockwise rotational direction
1	0	Clockwise rotational direction
1	1	Braking*

* Braking: The braking function is only for slowing down the drives. It is not a stop function for bringing the drive to a standstill.
low (0) 0...0,8 V, high (1) 2,4...30 V

2. Actual evaluation



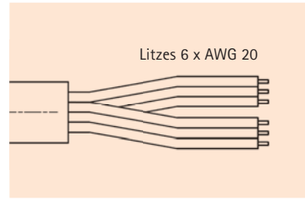
Design:
Open collector
$U_{ext.\ max}$ = 30 V
U_{CESAT} = 0,5 V
I_{CMAX} = 5 mA

3. Target value input

Stipulated revolutions for controlling revolutions by means of target value voltage (Interface 0...10 VDC)

SB06

Colour		Designation
yellow	Ist	Actual speed value
white	A	Input A
grey	B	Input B
--	C	Not used
green	S+	Set value input
--	S-	Not used
black	GND	Ground
red	+UB	Operating voltage

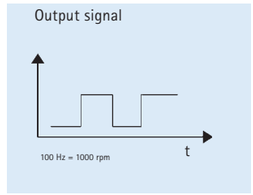


1. Control inputs

A	B	
0	0	Output stage isolated
0	1	Anticlockwise rotational direction
1	0	Clockwise rotational direction
1	1	Braking*

* Braking: The braking function is only for slowing down the drives. It is not a stop function for bringing the drive to a standstill.
low (0) 0...0,8 V, high (1) 2,4...30 V

2. Actual evaluation



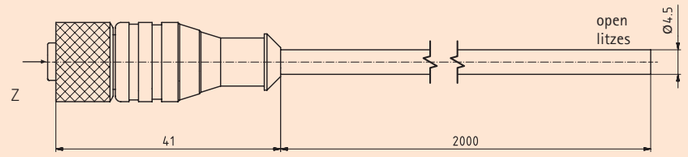
Design:
Open collector
$U_{ext.\ max}$ = 30 V
U_{CESAT} = 0,5 V
I_{CMAX} = 5 mA

3. Target value input

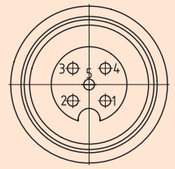
Stipulated revolutions for controlling revolutions by means of target value voltage (Interface 0...10 VDC)

SB07

Motor
ECI4240



Z (without measure)



Pin	Colour		Designation	
1	brown	UB	Supply voltage	24 V
2	white		Direction of rotation	0 V < low < 0,8 V right 2,4 V < high < 28 V left
3	blue	GND	Supply voltage	
4	black		Speed actual-value	
5	green/yellow		Speed set-value	analog 0 - 10 V

Motor cable included.

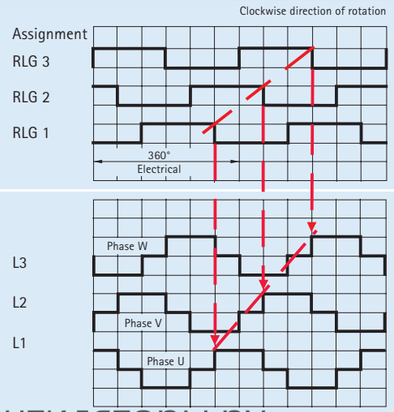
SB08

Motor ECI6320, ECI6340, ECI6360, ECI2480, ECI4240/K1

Pin	Colour		Designation	
1	yellow	W	Motor (L3)	
2	violet	V	Motor (L2)	
3	brown	U	Motor (L1)	

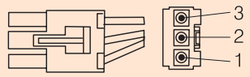
Pin	Colour		Designation	
1	-	-	-	
2	red	UB, Hall	Supply voltage	24 V
3	white	HALL B	Output motor signal	
4	green	HALL A	Output motor signal	
5	-	-	-	
6	-	-	-	
7	black	GND	Ground for UB	0 V
8	grey	HALL C	Output motor signal	

Commutation sequences

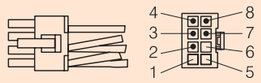


Pin configuration
for ECI2480

Type: Molex 19-09-1036



Type: Molex 39-01-2085



Commutation sequences

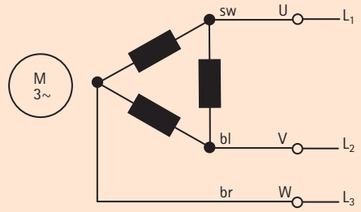
Chronological signal sequence of integrated Hall sensors (= RLG) at the corresponding connections.

Switching sequences of the power output stage

Required relationship between the signal change from RLG and the relevant change for the switching status of the power transistors in relation to the phase lead to the motor.

SB10

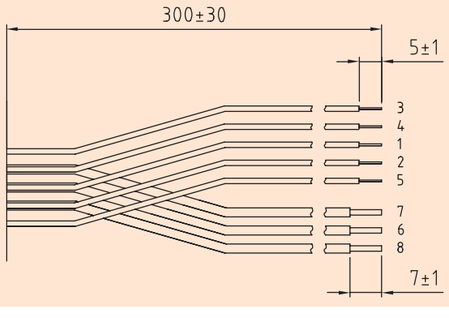
IGL6520-2 (3-phase)
IGL6540-2 (3-phase)
IGL6520-4 (3-phase)
IGL6540-4 (3-phase)



Circuit diagrams

SB11

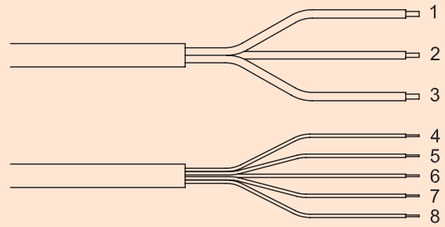
Motor
ECM 35x20
ECM 35x30
ECM 42x30
ECM 42x45
ECM 48x60
ECM 63x60
ECM 75x60



Pin	Colour	Designation	
1	brown	Supply Voltage	+5 V to 24 V
2	white	GND	0 V
3	green	Sensor 1	
4	yellow	Sensor 2	
5	grey	Sensor 3	
6	brown	Phase 1	
7	black	Phase 2	
8	blue	Phase 3	

SB12

Motor
VDC-3-49-15
Standard version
(open litzes)



Pin	Colour		Designation	
1	blue	GND	Supply ground	
2	brown	+UB	Logic supply voltage	
3	black	UZK	Supply voltage	
4	pink	S1	Speed control set value input	analog 0 ... 10V
5	grey/pink	A	Control Input A TTL Level	0V < low < 0,8V 2,4V < high < 30V
6	violet	B	Control Input B TTL Level	0V < low < 0,8V 2,4V < high < 30V
7	brown	S2	Current limitation (Torque)	analog 0 ... 5V
8	black	C	Control input C - hardware enable	

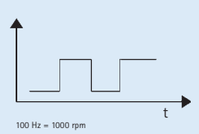
1. Control inputs

A	B	
0	0	Output stage enabled
0	1	Direction of rotation: counter-clockwise
1	0	Direction of rotation: clockwise
1	1	Brake function*

* Brake function: At motor standstill (0 rpm) the position can be held continuously with nominal torque or short-term with starting torque (I^2t function)
low (0) 0...0,8 V, high (1) 2,4...30 V

2. Actual speed value output

Output signal



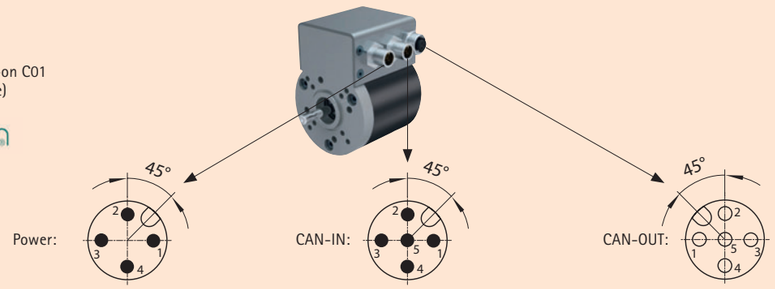
Design:
Open collector
$U_{ext.\ max}$ < 36 V
U_{CESAT} = 0,4 V
I_{CMAX} < 10 mA

3. Set value input

Speed setting for closed loop speed control via set value voltage (Interface 0...10 V DC)

Motor
VDC-3-49-15
Optional order add-on C01
(CANopen-interface)

CANopen



Pin1	UZK	Supply voltage motor
Pin 2	GND	Power-/Supply voltage electronics
Pin 3	UB	Supply voltage electronics
Pin 4	IN 1	Digital input

Pin1	n.c.	
Pin 2	IN 2	Digital input
Pin 3	CAN-GND	CAN-GND
Pin 4	CAN-H	CAN high signal
Pin 5	CAN-L	CAN low signal

Pin1	n.c.	
Pin 2	IN 3	Digital input
Pin 3	CAN-GND	CAN-GND
Pin 4	CAN-H	CAN high signal
Pin 5	CAN-L	CAN low signal

Motor speed

$$n_1 = i \cdot n_2 \qquad n_1 = \frac{P_1 \cdot 955}{M_1}$$

Gearhead output speed

$$n_2 = \frac{n_1}{i} \qquad n_2 = \frac{P_2 \cdot 955}{M_2}$$

Motor torque

$$M_1 = \frac{M_2}{i \cdot \eta} \qquad M_1 = \frac{P_1 \cdot 955}{n_1}$$

Gearhead output torque

$$M_2 = M_1 \cdot i \cdot \eta \qquad M_2 = \frac{P_2 \cdot 955}{n_2}$$

Gear reduction

$$i = \frac{n_1}{n_2}$$

Motor power

$$P_1 = \frac{P_2}{\eta} \qquad P_1 = \frac{M_1 \cdot n_1}{955}$$

Gearhead output power

$$P_2 = P_1 \cdot \eta \qquad P_2 = \frac{M_2 \cdot n_2}{955}$$

Torque		
1 Ncm =		
0,01 Nm	=	10 mNm
1,02 x 10^{-3} kpm	=	0,102 kpcm
1,416 oz-in	=	102 pcm

Power		
1 W =		
1 Nms^{-1}	=	60.000 mNm min^{-1}
0,102 kpm s^{-1}	=	1,02 x 106 pcm s^{-1}
141,6 oz-in-s^{-1}	=	8547 oz-in-min^{-1}
8,85 lbf-in-s^{-1}	=	0,7374 lbf-ft-s^{-1}

Temperature		
°Celsius =		
$\frac{\text{° Fahrenheit - 32}}{1{,}8}$	=	Kelvin - 273,15°
° Fahrenheit	=	1,8 x ° Celsius + 32
	=	1,8 x Kelvin - 459,67

Force		
1 N =		
3,6 oz	=	0,225 lbf
0,102 kp	=	1 kgm s^{-2}

Mass		
1 g =		
35,27 x 10^{-3} oz	=	2,2 x 10^{-3} ld
15,43 grain	=	1 x 10^{-3} kg

Length		
1 mm =		
0,0394 in	=	3,279 x 10^{-3} ft
1,094 x 10^{-3} yd	=	1 x 10^{-3} m

Variables used:

Formula symbol	Designation	Unit
n_1	Motor speed	rpm
n_2	Gearhead output speed	rpm
M_1	Motor torque	Ncm
M_2	Gearhead output torque	Ncm
i	Gear reduction	
P_1	Motor power	W
P_2	Gearhead output power	W
η (eta)	Efficiency	%

Operating factor c_B

To achieve a uniform lifetime for the gearheads and motors, the necessary torques M must be increased by the respective operating factor c_B under the various operating loads so as not to exceed the maximum permissible gearhead torque $M_{2\ max}$ (see table below).

Operating modes	Load			Operating period in h/day					
	even	gradual	sudden	3 h	8 h	24 h	3 h	8 h	24 h
				up to 10 switching ops./h			over 10 switching ops./h		
One rotation direction	•			1,00	1,00	1,20	1,00	1,20	1,52
Rotation direction change	•			1,00	1,30	1,59	1,20	1,59	1,92
One rotation direction		•		1,11	1,30	1,59	1,30	1,52	1,82
Rotation direction change		•		1,41	1,72	2,00	1,59	1,89	2,33
One rotation direction			•	1,20	1,52	1,82	1,52	1,82	2,22
Rotation direction change			•	1,59	2,00	2,33	2,00	2,33	2,86

Operating mode

It is necessary to define the operating mode under which a gear motor can be operated with certain nominal values in order to avoid overloading the motor and / or the gearhead. The values stated in this catalogue refer to S1 operation (continuous operation). This means that the gear motor can be constantly operated with the stated values, but can also have a higher load placed on it for a short time. Please contact us if you require more information about this.

Lifetime

The lifetime is limited by the various components in the drive. If frequently overloaded, the gearhead components are subjected to more wear than under nominal load. In the case of commutator motors, these are the collectors and (carbon) brushes, and in the case of induction motors the bearings of the shaft. Extreme ambient and operating conditions cause a reduction in the lifetime guaranteed for operation under operating factor $c_B = 1$.

For all* gearheads from the ZEITLAUF standard modular system, this is 5000 hours (at operating factor $c_B = 1$). (3000 hours in the case of mechanically commutated DC motors based on the motor lifetime!)

* The lifetime for NoiselessPlus is 10000 hours.

Efficiency η (eta)

The efficiency per gear stage is at least 90 % or 0.9. Depending on the tooth configuration and the manufacturing quality, far better levels of efficiency can be achieved. The following overall efficiencies are for multi-stage gearheads:

for 1-stage gearhead	$\eta = 0{,}9$
for 2-stage gearhead	$\eta = 0{,}9^2 = 0{,}81$
for 3-stage gearhead	$\eta = 0{,}9^3 = 0{,}73$
for 4-stage gearhead	$\eta = 0{,}9^4 = 0{,}66$
for 5-stage gearhead	$\eta = 0{,}9^5 = 0{,}59$

ZEITLAUF® antriebstechnik –
internationally present

- Austria
- Belgium
- Croatia
- Czechia
- Denmark
- England
- Estonia
- Finland
- France
- Hungary
- Israel
- Italy
- Luxemburg
- Netherlands
- Norway
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- China

Contact details of our distribution partners can be found on our website

www.zeitlauf.com

General terms and conditions of sales

I. General provisions – Scope of validity

ZEITLAUF® `s Terms and Conditions of Sale and Delivery shall be applicable for both this and each and every future Contract which is or will henceforth be concluded between you (hereinafter referred-to as "Buyer") and ZEITLAUF® GmbH antriebstechnik & Co KG. ZEITLAUF® (hereinafter referred-to as "ZEITLAUF® ") will not acknowledge or accept any of the Buyer`s conditions and terms which are contrary to its own conditions and terms and which diverge from ZEITLAUF® `s own Terms and Conditions of Sale and Delivery, unless it will have been expressly and specifically confirmed by ZEITLAUF® in writing that the same shall be valid and applicable.

ZEITLAUF® `s Sales Conditions and Terms shall also apply in those cases where ZEITLAUF® proceeds to the unconditional delivery of its products to the Buyer in full awareness and knowledge of the Buyer`s contradictory or diverging terms and conditions, or of the fact that the Buyer`s terms and conditions do diverge from ZEITLAUF®'s own Terms and Conditions of Sale and Delivery. ZEITLAUF® expressly and specifically objects to any and all purchasing terms and conditions of the Buyer, which are contrary to or conflicting with its own terms and conditions.

II. Offer and confirmation of purchase order

1. ZEITLAUF® 's offers are and shall be non-binding and subject to alteration. Supply and delivery contracts shall not be binding unless and until ZEITLAUF® will have confirmed any one order, unless a contract will have been made in writing. If any one order is to be qualified and considered as an offer made under the provisions of Section 145 of the German Civil Code, ZEITLAUF® can accept the same within a term of four weeks. No collateral covenants, agreements, commitments and undertakings shall become valid and effective unless and until they will have been included in and made part of the confirmation of the respective order or they will have been confirmed in writing.
2. If any offer were to be submitted without separately showing and indicating the pertinent statutory turnover or value-added tax, then it shall be deemed that the statutory turnover or value-added tax is to be added to the price or prices quoted in such offer.
3. ZEITLAUF® reserves any and all proprietary and copyrights in and to cost estimates, drawings and all of its other documentation and paperwork. Such documents and papers shall not be used, duplicated, reproduced or made accessible or available for any third party or parties for any other purposes, even if they are not subject to or covered by any statutory valid copyright protection titles.
4. The papers and documents which are part of the offer, such as figures, illustrations, drawings, weight and measurement data and dimensions shall be of an approximative governing character only, unless they are or will expressly be defined as binding.

III. Prices and conditions of payment

1. Unless it is or will be otherwise provided and agreed upon, prices shall be valid ex works (EXW according to incoterms 2010), plus shipment and packaging costs, with the respectively valid statutory value-added tax having to be added thereto.
2. ZEITLAUF® shall be entitled to correspondingly pass on any and all increases in salaries, wages and materials costs which will take place after the 31st of March of any one current year. This shall also apply for deliveries or partial deliveries which are or will be confirmed by a confirmation of an order that will be given prior to the 31st of March, but where it is agreed between the parties that such deliveries will not be made until after the 31st of March of any one current year.
3. As a matter of principle all payments shall be made within a time period of 30 days after the date of the invoice, such payments to be received by ZEITLAUF® within said term of 30 days. Payments for straight labour wages shall be owing and due within a term of 10 days after the date of the invoice. All costs and expenditures which will accrue on the part of and which will be charged by the Buyer`s bank for the payment order, shall be paid for by the Buyer. ZEITLAUF® draws the Buyer`s attention to the fact that ZEITLAUF® has introduced and adopted an extra-judicial dunning system which comprises two phases or dunning steps only.
4. If the Buyer were to give rise to any delay or default in delivery, such as, for instance, when it comes to the provision and supply of materials by the Buyer, then the payment term within which payment for such merchandise shall be due and owing, shall commence as per and with the date when notice is given that the merchandise concerned is ready for shipment and dispatch.
5. Retention of payments or setoff on the grounds of any counter-claims which are asserted by the Buyer but which are contested by ZEITLAUF® shall be inadmissible.

IV. Retention of title

1. Any and all merchandise which has or will have been delivered by ZEITLAUF® shall remain ZEITLAUF® `s property up to the time where all the claims, receivables and sums owing, which may be due to ZEITLAUF® as a result of or ensueing from the Buyer`s business relationship with ZEITLAUF® , as well as all those claims which may yet arise in a context with the object or objects, items, products or services sold as conditionally sold merchandise will have been paid in full. In any such case where the Buyer were not to comply with or commit any breach of any of the provisions of this contract, more particularly in the case of default in payment, ZEITLAUF® shall be entitled to cancel the sale and to take any such so sold object or objects, items or products back. Following the taking back and recovery of any such object or objects, items or products sold, ZEITLAUF® shall be entitled to realize or sell the same, with the proceeds of such realization or sale - less adequate costs incurred for any such realization or sale - to be deducted from the Buyer`s debts or amounts owing.
2. The Buyer shall be obliged to carefully treat and handle the object or objects sold to it, and the Buyer shall, more particularly, be obliged to sufficiently and at Buyer`s own expense, insure the same for the original or replacement value of such object or objects against fire, water and theft damage.
3. In case of attachments or seizures of property or any other interventions by any third party or parties the Buyer shall immediately advise ZEITLAUF® thereof in writing so that ZEITLAUF® may bring third-party action against any such execution.
4. The Buyer shall be entitled to, as part and in the course of Buyer`s regular business operations, (re-)sell ZEITLAUF® `s objects, items or products sold to it, but the Buyer shall already as of now transfer, cede and assign to ZEITLAUF® any and all claims and sums which are and will be due to the Buyer by its customers or by any third party or parties as a result of such (re-)sale by the Buyer, such transfer, cession and assignment to cover the amount of the final sum invoiced by ZEITLAUF® to the Buyer, which shall apply regardless of whether the object or objects sold was or were (re-)sold without or following further processing. ZEITLAUF® agrees and obliges itself not to collect any such claim as long as the Buyer will comply with Buyer`s payment obligations, making such payments out of its proceeds collected, as long as the Buyer will not be in default with its payments, and, more particularly, no petition for institution of bankruptcy or composition proceedings will have been filed, or Buyer`s payments are subject to cessation or suspension. In either one of these cases the Buyer shall be obliged to provide any and all information which is and will be required for purposes of collection and relating to the third party debtor or debtors, and it shall have to inform the latter of such transfer, cession and assignment to ZEITLAUF® .
5. If the object or objects, items or products sold is, are or will be processed or assembled with any other components, objects or items which do not belong to ZEITLAUF® , then ZEITLAUF® shall acquire a co-ownership right and title in and to the new object or objects, such co-ownership title to be equivalent to the value which the said object sold has in relation to the value which the said other processed or assembled objects or items have at the time of such processing or assembly.
6. In the event where it were to be required to enforce said claim ensueing from such retention of title, the Buyer already as of now declares that it will tolerate and allow for its respective business premises to be entered for the purposes of recovery of said conditionally sold merchandise.

V. Passage of risk

1. Delivery shall be made ex works (EXW according to incoterms 2010). Delivery shall be deemed to have been fulfilled as per and with the takeover and acceptance of the merchandise or as soon as the consignment will be ready for dispatch.
2. Even if it was agreed upon that delivery will be made carriage paid, the risk shall pass on to the Buyer as soon as the consignment is or will be made ready for shipment or collection or was collected at the place of manufacture.
3. In the absence of any pertinent instructions from the Buyer ZEITLAUF® reserves the right of determining shipping routes and transport means, it being understood that ZEITLAUF® shall not be obliged to chose the least expensive type of shipment.
4. Packaging costs will be invoiced by ZEITLAUF® at cost prices only. As far as this will be possible ZEITLAUF® shall covenant and agree on a low or reasonably priced type of shuttle or commuting packing with the Buyer.
5. If the Buyer so wishes ZEITLAUF® shall provide for transport insurance coverage for any one consignment, with the costs accrueing therefore to be paid for by the Buyer.

VI. Delivery and acceptance periods

1. All the information given with respect to delivery periods and delays shall at all times be of an approximative nature only and shall be non-binding, unless it will have been otherwise provided and agreed upon.
2. The due observation of any and all delivery delays and deadlines shall be subject to the timely receipt of all of the documentation, papers and information, required licenses and permits, releases, materials, components and supplies which are to be provided by the Buyer, as well as to the due compliance with the agreed-upon payment terms and conditions and all other appurtenant obligations. In those cases where any parts or components are to be provided and supplied to ZEITLAUF® by the Buyer, any and all delivery periods, delays and deadlines which will have been covenanted and agreed upon can only be duly respected and complied with, if such parts or components to be so provided and supplied will have been received in ZEITLAUF® `s premises at the latest four weeks prior to the expiration of the given delivery delay or deadline.
3. Any and all interruptions or stoppages of business and production operations of whatever kind or description, as well as all instances of force majeure or unforeseeable circumstances or impediments, which are or will be beyond ZEITLAUF® `s scope of influence or control, shall entail a reasonable extension of the delivery period. If this were to lead to or entail a situation where the adherence to and maintenance of the contract were to become inacceptable or intolerable for either the Buyer or ZEITLAUF® , then both contracting parties shall be entitled to rescind and terminate the contract.
4. In the event where ZEITLAUF® were to be responsible for any non-compliance with given time periods or deadlines, the Buyer shall, after having granted ZEITLAUF® a reasonable additional time period of at least 18 work days for ZEITLAUF® to either deliver and perform under the contract or provide for remedy (by either re-working and repair or replacement of defective prodcucts), be entitled to terminate and rescind the contract.Such right of rescission shall become nul and void in so far and to the extent where the neglect of duty which is constituted by any such non-compliance with given time periods or deadlines turns out to be of an insignificant character. Over and above that and provided that the Buyer will have unsuccessfully granted ZEITLAUF® a reasonable additional period of time for either delivery or remedy, the Buyer may claim damages subject to such claim or claims being duly supported by appropriate evidence. Any such claim asserted in case of belated delivery shall be limited to 0.5 % of the net value of the merchandise so delivered for each full week of belated delivery, but in each and every case it shall be limited to a maximum of 5 % of the net value of said merchandise. The right to claim damages shall be barred and precluded, if the neglect of duty which is contituted by ZEITLAUF® `s failure to comply with and respect given time limits or deadlines is of an insignificant character only. All further or farther-going claims for indemnification of the Buyer shall be barred and precluded, even in cases of belated delivery and following the expiration of an additional time period granted to ZEITLAUF®, unless such damage will be due to either intent or gross negligence on the part of ZEITLAUF® .
5. If any one order is to be delivered in the form of partial shipments, the Buyer shall be obliged to accept the same, if and when the delivery of the remainder of said merchandise will be made in two supplementary consignments at the most.

VII. Skeleton delivery orders

1. If a Skeleton Delivery Agreement is or will be made and concluded by the parties hereto, the period of time within which the Buyer will have to take and accept delivery shall be 12 months beginning on the date of the confirmation of the order, unless it will have been otherwise provided and agreed upon in writing. In accordance therewith deliveries which are to be made under such a Skeleton Delivery Agreement shall be scheduled for and over a period of 12 months following delivery and acceptance of the first partial shipment, such deliveries to be made in and by the resulting partial shipments. Following the expiration of said acceptance period ZEITLAUF® shall be entitled to, in its discretion and at its option, either invoice the remainder of the merchandise or give notice to the Buyer that Buyer is in default of acceptance, and ZEITLAUF® shall then be entitled to claim damages. The lump sum amount of such damages shall be 25% of the order value. The Buyer is given the express permission to submit evidence to prove that the damage has been less, but by the same token ZEITLAUF® reserves the right to submit evidence to prove that its damage was higher.
2. Unless it is or will be otherwise provided and agreed upon ZEITLAUF® shall be entitled to pass on and invoice any and all increases of materials costs and of salaries and wages costs to the Buyer, in so far and to the extent where the handling and processing of order/s given in the form of and under any one Skeleton Delivery Order will cover a time period which will be in excess of 12 months.

VIII. Provisions and supply of materials and components

1. ZEITLAUF® shall not be liable for the technical operability nor f or any quality defects or failures of any components or parts which will have been provided and supplied to it by the Buyer. ZEITLAUF® reserves the right to refuse to incorporate or assemble materials and semi-finished products so provided and supplied by the Buyer, if the same will not comply with ZEITLAUF® `s quality specifications, standards and requirements.
2. If the provision and supply of such materials will be effected as part of and under a skeleton order and agreement and if any such materials will be received after the expiration of an additional delay granted under No. VII.1 hereof, then the Buyer shall be obliged to accept delivery of and pay for the products sold to it by ZEITLAUF® under the contract without the materials so provided and supplied too late being incorporated in or assembled with the same.

IX. Warranty, Liability

It is by means of ZEITLAUF® `s DIN EN ISO 9001:2008 quality assurance system as well as by yet further and additional in-company quality assurance measures and procedures that ZEITLAUF® guarantees and warrants a maximum of reliability and faultlessness for its products. If any faults, defects or deficiencies were nevertheless to occur or were to be found in any individual specific instances, then the following provisions shall apply :

1. In those cases where articles are supplied from ZEITLAUF® `s standard program modular system it shall be deemed that the agreed-upon quality and features of the goods concerned is the quality or nature which is specified in the respective sales brochure(s).
2. If quantities delivered will be found to be slightly different from quantities specified in the confirmation of the order, the Buyer shall accept the same in so far as the Buyer can be reasonably expected to tolerate such difference. It shall be deemed to be a reasonably tolerable difference, if excess or short deliveries are or will be no more than 5 % of the quantity which was respectively ordered.
3. The Buyer`s warranty rights shall be valid and applicable subject to the Buyer having duly and properly complied with Buyer`s duties of inspection and verification and other obligations such as the same are provided and prescribed under Sections 377 and 378 of the German Commercial Code.
4. In the case of geared motors of which samples were supplied to and tested by the Buyer prior to the Buyer`s placing of a purchase order, no warranty will be given by ZEITLAUF® if such geared motors were not sufficiently tested to verify their performance, quiet running and useful life under working conditions.
5. In so far as the object or objects, items, products or services sold by ZEITLAUF® will have any defect or deficiency for which ZEITLAUF® is responsible, ZEITLAUF® shall, in its own discretion and at its option, be entitled to either correct and remedy such defect or deficiency by re-working or repair, or provide for substitute delivery in replacement thereof. In cases where a defect or deficiency is or will be corrected and remedied ZEITLAUF® shall pay for any and all expenses which will be required and will be incurred for the purposes of correction and remedy of such defect or deficiency, more particularly for transport, travelling, work and materials costs and expenses, except in so far as the same will be increased due to the fact that the object or objects sold was or were taken to a place other than the place of performance.
6. If ZEITLAUF® will either not be willing and prepared or unable to provide for the correction of and remedy for any such defects or deficiencies or to effect and ensure a substitute replacement delivery instead, more particularly if any such action were to be delayed beyond reasonable time limits for reasons for which ZEITLAUF® is or will be responsible, or if the correction of and remedy for or repair or of any such defects or deficiencies will in some other way turn out to fail, then the Buyer`s rights shall be limited to a right to delivery of non-defective products. The Buyer shall be and is expressly and specifically permitted to reserve the right to demand reduction of the purchase price, if remedy by re-working or repair of any such defects or deficiencies or delivery of non-defective products were to fail.
7. Any and all farther-reaching or further claims of the Buyer shall be barred and precluded, regardless of what the underlying legal grounds may be. ZEITLAUF® shall, therefore, not be liable for damages which were not occasioned or caused on the specific product or item delivered as such by ZEITLAUF® , and more particularly ZEITLAUF® shall not be liable for any losses of profit or other economic losses or losses of property, unless such damag e was cause d by either intent or gross negligence on the part of ZEITLAUF® . In case of a merely negligent neglect of duty by ZEITLAUF® , ZEITLAUF® `s liability shall be limited to foreseeable damage of a nature which is typical for the particular type of contract involved.
8. ZEITLAUF® warrants the faultlessness of its product or products for a period of one year following the delivery thereof.
9. Justified notices of defects or deficiencies shall not affect the execution and implementation of the contract in other parts thereof, more particularly of any partial deliveries which are to be made thereunder, nor shall they affect or have any bearing upon the dates which were agreed upon for payment. In any such instances the right to therefore withhold any payments which are or will be due and owing shall be barred and precluded, unless the value of the goods delivered is exceeded by the payments which have already been made.
10. If the Buyer is aware of any one defect or deficiency, and if improper changes, modifications and repair work were to be done on any such product or products by the Buyer, then any and all improper modification and repair work or improper use and handling by either the Buyer or by any third party or parties shall nullify and invalidate ZEITLAUF® `s warranty obligations. 11. By way of acknowledgement of the American and other applicable export legislation (especially German), the orderer undertakes the obligation to obtain all necessary export licenses and other required documents at his own expense prior to exporting products or technical information he has received from ZEITLAUF® GmbH antriebstechnik & Co KG.

X. Export Control

The customer undertakes not to directly or indirectly sell, export, re-export, to supply or pass on in some other way products and technical information to persons, companies or countries if this infringes American or other (particularly European and German) laws and ordinances.

The customer undertakes the obligation to inform all recipients of these products or technical information of the necessity to obey these laws and ordinances. Refusal of an export license does not entitle the customer to cancel the contract or to demand compensation.

XI. Severability clause

If any of the foregoing provisions were to be or become nul, invalid or void, then this shall, in case of doubt, not affect the validity of the other remaining provisions. The General Terms and Conditions of Sale and Delivery ZEITLAUF® GmbH antriebstechnik & Co. KG shall rather remain valid and in force, and the invalid or void clause shall then be replaced by a permissible clause which shall be as close to the purpose of the contract as will be possible.

XII. Place of jurisdiction and venue and applicable law

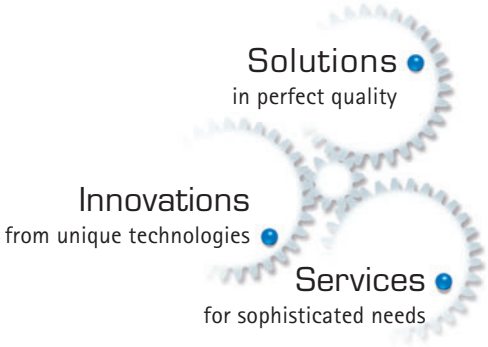
It is covenanted and agreed that the place of performance for all statutory and agreed-upon obligations which are to be met and fulfilled hereunder by the Contracting Parties, shalll be Lauf. The place of jurisdiction and venue for any and all disputes and cases of litigation arising or ensueing directly or indirectly out of existing contractual relations shall be the Court of Justice which will be competent for jurisdiction for the head office of ZEITLAUF® GmbH antriebstechnik & Co. KG.

All contractual relations existing between the Buyer and ZEITLAUF® shall exclusively be governed by German law and the German version of these Terms and Conditions shall be governing.

Status 06/2011

ZEITLAUF®

antriebstechnik



it's time for tomorrow

We push back the limits of what's feasible every day. Our longstanding engineering expertise gives us the capability to lead the way in technological development. We have a range of products with an enormous potential for efficient all-round solutions to meet each individual facet of your needs.

We're your partner at every phase of the process chain, coming up with new ideas while keeping the big picture in mind. We have a wide range of product-specific knowledge for building the right drive designs for you.

We're always in tune with the times to offer you excellent ideas, outstanding innovations and hands-on services.

Services for sophisticated needs

Our well-rounded range of effective services adds to your advantages. We assume responsibility for the finished, delivered product providing you with reliability, attentiveness and excellent performance throughout the entire product design and manufacturing cycles. Our employees, who daily live out their commitment to service, are your guarantee for success

The bottom line is service unparalleled in the market.

ZEITLAUF® GmbH antriebstechnik & Co KG

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