

Brushless internal rotor servomotors series ECI

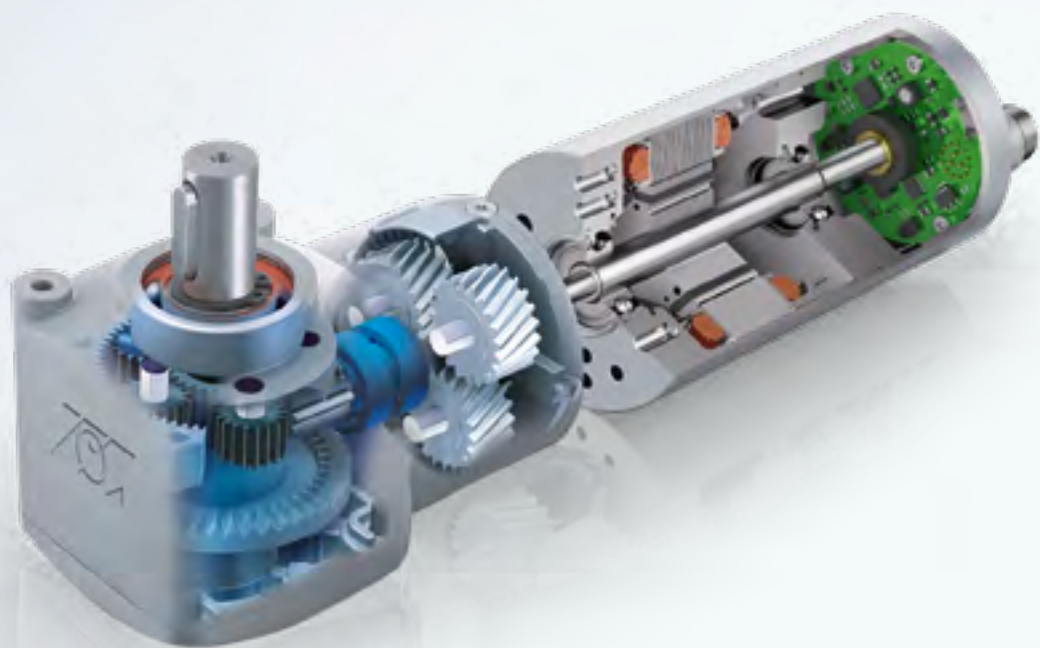
Drive solutions | Industrial drive engineering

Product Catalogue 2019-11

ebmpapst

the engineer's choice





Modular drive systems.
Motors with integrated logic and power
electronics – optional gearhead, encoder and brake.

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Brushless Servomotors

ECI series

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Information

ECI-Servomotor

Control electronics

Gearheads

Accessories

Information

Agents

About ebm-papst.

ebm-papst is a leader in ventilation and drive engineering technology and a much sought-after engineering partner in many industries. With around 20,000 different products, we have the perfect solution for practically every requirement. We believe the consistent further development of our highly-efficient GreenTech EC technology provides our customers with the best opportunities for the future in industrial digitization. With GreenIntelligence, ebm-papst already offers intelligent networked complete solutions that are unique anywhere in the world today.

Six reasons that make us the ideal partner:

Our systems expertise: as experts in advanced motor technology, electronics and aerodynamics, we provide system solutions from a single source.

Our spirit of invention: our 600 engineers and technicians will develop a solution that precisely fits your needs.

Our lead in technology: with our EC technology and GreenIntelligence, we combine the highest energy efficiency with the advantages of IoT and digital networking.

Closeness to our customers: at 49 sales offices worldwide.

Our standard of quality: our quality management is uncompromising, at every step in every process.

Our sustainable approach: we assume responsibility with our energy-saving products, environmentally-friendly processes, and social commitment.

GreenIntelligence. *Making Engineers Happy.*



Why do our customers look so happy? Because when it comes to the Internet of Things and the digital transformation, we provide them with a clear competitive edge with GreenIntelligence for intelligent control and interconnection of fans, drives and systems to make applications more powerful, processes more efficient, businesses more successful and their customers more satisfied.

For the wide range of automation tasks needed in **industrial drive technology**, what you need most is an experienced partner who understands your needs. The drive experts at ebm-papst have detailed applications expertise and, thanks to GreenIntelligence, can offer drive solutions with intelligent networking capabilities that cater for all requirements perfectly.

Here is how much GreenIntelligence there is in ECI Motors:

- integrated logic & power electronics
- network functionality
- Master/slave functionality
- Condition monitoring
- Predictive maintenance



Anna exploits the possibilities of the Industrial Internet of Things throughout her logistics and production processes.

The story of our success *to market and technology pioneer.*

- 1963** Founding of **Elektrobau Mulfingen GmbH & Co. KG** by Gerhard Sturm and Heinz Ziehl.
- 1965** First tubeaxial fan developed in EC-/DC technology.
- 1966** ebm`s success takes off with the new 68 motor.
- 1972** The first ebm foreign subsidiary is established in Sweden.
- 1988** Gerhard Sturm is awarded the Federal Cross of Merit.
- 1990** The sixty millionth external rotor fan was produced .
- 1992** Acquisition of **PAPST Motoren GmbH** in St. Georgen.
- 1997** Buyout of the **Landshut** (mvl) plant.
- 2003** Change of name to **ebm-papst**.
- 2007** Introduction of the gearhead "**EtaCrown®**".
- 2010** **GreenTech** – our sign for energy efficiency and resource preservation.
- 2012** Introduction of a new generation control electronics (**K4**) for BLDC motors.
- 2013** ebm-papst acquires the gear specialist, **Zeitlauf**, and wins the **German Sustainability Award**.
- 2014** Launch of the BLDC internal rotor motor, **ECI 80**.
- 2015** Introduction of the overload-capable planetary gear "**Optimax 63**".
- 2016** Expansion of the electronic production plant, St. Georgen **Hagenmoos**.
- 2017** Introduction of **intelligent compact drives** with bus interface K5
- 2018** **GreenIntellegence** – our symbol for high efficient and network capable EC motors.

Information for ECI motors

Key figures

- 3-phase, electronically commutated internal rotor motor with high-performance magnet
- Power range between 30 and 750 watts
- High power density realized in a compact design
- High overload capacity
- Long service life
- Very quiet operation
- Detection of rotor position via Hall sensors
- Customer-specific winding layouts
- Winding insulation as per insulation class E
- Protection class IP 54 as per EN 60 034-5: up to IP 65

- Various motor types which can be combined with planetary and crown gearheads
- Optional integrated control electronics
- Optional encoder and brake modules

Approvals

- Support with the accreditation of products in different economic areas and markets
- As an experienced and competent partner we would be happy to support you
- Possible approvals include CE, UL, CSA, EAC
- Additional approvals on request



RoHS

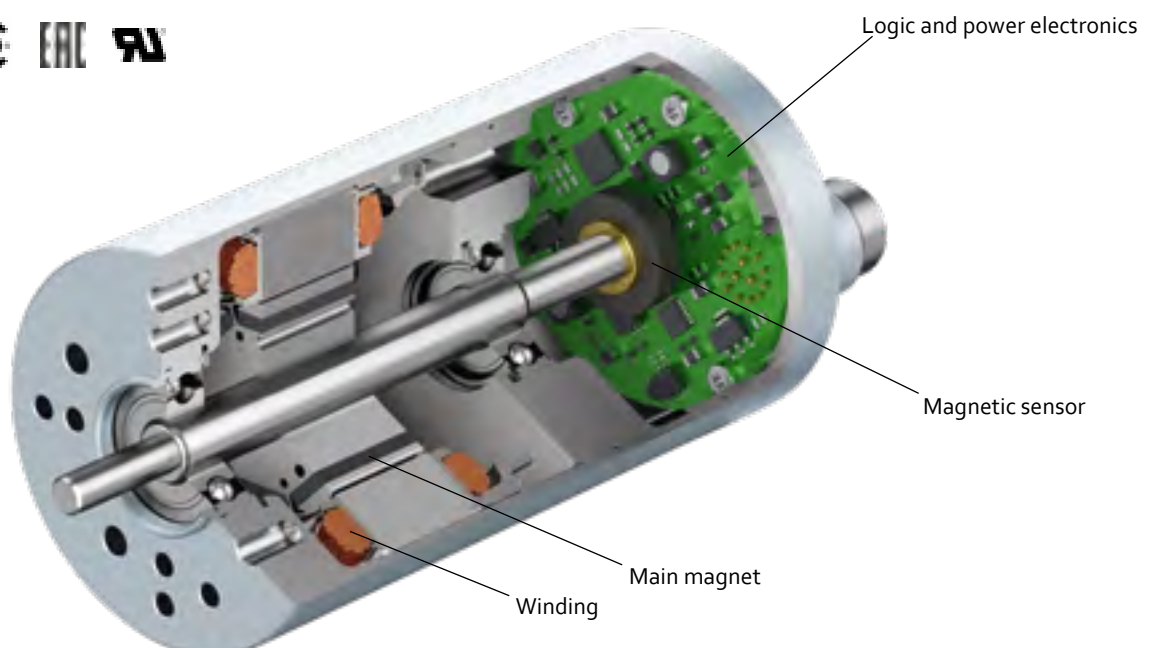
European Directive EC No. 2011/65/EU (RoHS)

Of course, all current products have been designed for conformity with European Directive 2011/65/EU (RoHS). All older products that do not yet conform to these directives or parts thereof will be consistently redesigned. Thus we can confirm that basically, all of our products listed in this catalog conform to the above-mentioned directive.

REACH Directive (EC Nr. 1907/2006)

The units you purchase from us are products as defined by REACH and thus do not require registration. However, in our own interest and to ensure a high degree of product safety, we track the implementation of REACH and the resulting requirements as part of our duty to provide information.

To comply with the requirements of REACH, we are in contact with all suppliers from whom we obtain chemicals (substances), preparations and components that we use as part of our production process. Within this framework, ebm-papst fulfills the obligations set forth in the REACH regulation. Also to possible questions to these two topics, we are always at your disposal.



The data in this catalog contain product specifications, but are not a guarantee of particular properties.

All information is based on the measuring conditions mentioned below. Operation of motors using reference electronics at an ambient temperature of max. 40°C when attached (thermally conductive) to a free-standing metal plate of the following size:

For motor ECI 42: 126 x 126 x 10 mm.

For motor ECI 63: 189 x 189 x 10 mm.

For motor ECI 80: 240 x 240 x 10 mm.

It should be noted that a brake integrated in the motor or a gearbox mounted on the motor will change the specification values

The **nominal operating point** is the basis for the electro-magnetic design of the motor from the point of view of the maximum possible continuous output of the motor and is specified by the nominal values described here.

The values mentioned are typical values for the design in question and are also subject to the tolerances included in the specifications or drawings. Unless otherwise stated, the supplements and safety notes contained in the relevant operating and assembly instructions must be kept at all times. Subject to availability and technical alterations.

Nominal output power P_N [W]

The output power which the motor can produce continuously; it is calculated from nominal torque and nominal speed. For the electro-magnetic design of the motor the determination of the nominal operating point is based on the fact that the nominal output power is close the maximum output power of the motor.

Nominal voltage U_{BN} , U_N , U_B [V DC]

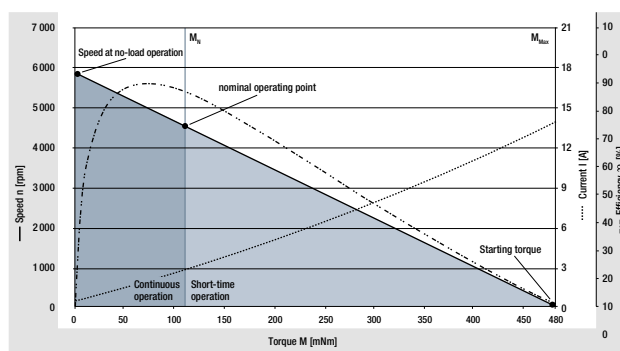
The DC voltage (i.e. DC voltage range) that is applied to the commutation electronics as a system supply voltage. All nominal values listed in the technical tables of the individual motors refer to this voltage. Motor applications are, however, not restricted to this voltage.

Nominal speed n_N [rpm]

The speed at which the motor may be operated continuously while delivering nominal torque at an ambient temperature of 40°C and nominal output torque. It is an operating point on the max. motor curve based on an ideal electronics with negligible losses.

Nominal torque M_N [mNm]

The torque that the motor can deliver continuously at an ambient temperature of 40°C and nominal speed.



The illustrated curves are idealized representations based on the figures in the tables.

Nominal current I_{BN}

The current that is drawn from the system supply when the motor delivers nominal torque at nominal speed.

Speed at no-load operation n_L [rpm]

The speed that takes effect at the nominal voltage and with unloaded motor. The theoretical possible speed at no-load operation can, in some cases, be limited by the mechanical ceiling speed.

No-load current I_{BL} [A]

Is established with nominal voltage and unloaded motor; is largely influenced by the bearing friction. For drive systems that have a separate supply for power and logic, the no-load current is called I_L . This no-load current is the sum of the power supply (I_{ZK}) and the low-power logic supply (I_B).

Definitions for ECI Servomotors

Permanent stall torque M_{Bn0} [mNm]

Is the maximum permissible torque with which the motor may be permanently loaded when the rotor is locked.

Permissible eff. continuous stall current I_{noeff} [A]

Is the maximum permissible current which at a stalled motor is allowed to flow into the motor lead as an effective value.

Continuous stall power P_{Bn0} [W]

Is an approximate value for the voltage-independent maximum permitted output ($P=U \times I$) that can be taken from the DC voltage source in holding status.

Permissible peak torque short-term M_{max} [mNm]

Is the torque which the motor can usually deliver for a short time. (M_A)

Permissible peak current, motor lead I_{max} [A]

Is the current that must flow in to the motor lead as a peak value to achieve the short-time peak torque.

Induced voltage U_{imax} [V/1 000 rpm]

Maximum value of the induced voltage between two motor leads at 1 000 rpm. It is a dimension for the electromagnetic utilization of the motor.

Connection resistance R_v [Ohm]

The winding resistance that is measured at 20°C between any two of three winding terminations.

Connection inductance L_v [mH]

The average inductance that is measured at 20°C between any two of three winding terminations using a sinusoidal wave measuring frequency of 1 kHz.

Rotor moment of inertia J_r [$kgm^2 \times 10^{-6}$]

The mass moment of inertia of the rotor and necessary dimension for the dynamic characteristics of the motor.

Protection class

Information on the protection class; it describes protection against foreign particles (Point 1) and water (Point 2).

Permissible ambient temperature range T_U [°C]

Defines the minimum and maximum permissible ambient temperature to which the mentioned performance values apply when the motor is in operation. The permissible winding temperature in the motor (115°C for insulation Class E, as per EN 60 034-1) </1125 should not be exceeded.

Weight m [kg]

Weight of the delivered unit without additional units or packaging.

Max. shaft load F_{radial}/F_{axial} [N]

The permissible forces are divided into radial and axial load values. They are based on the maximum permissible values for the motor bearing during operation at normal rating and a defined service life expectancy L_{10} .

Service life L_{10}

The values for the L_{10} service life specified in conjunction with the permitted bearing loads have been calculated to DIN ISO 281. In addition to the specified values, this calculation is based on operation of the motor at nominal conditions (nominal torque, nominal speed) and an ambient temperature of max. 40°C. Therefore, the service life information is explicitly not a guarantee of service life, but strictly a theoretical quality figure.

Max. reverse voltage [V DC]

When the braking function is activated and when the set value step change is negative, the motor operates in controlled braking mode. In this operating state, the large part of the braking energy is fed back to the intermediate circuit until the max. reverse voltage is reached and the electronics prevent a further increase beyond this value by chopped braking. This behavior should be given special consideration when selecting the system supply.

Set value input

Speed setting via an analogue interface for DC voltage. Depending on the drive design, the set speed can be configured in a range from 0 ... n_{max} where the minimum possible speed value (with limited control quality) is about 0 rpm (sine commutation) or approx. 50 to 100 rpm (block commutation). (Relevant only for drives with integrated operating electronics).

Recommended speed range [rpm]

Speed control range within which the speed control accuracy stipulated in the system specification is complied with.

Starting torque [mNm]

Is the torque that can be delivered over a short time when the motor is started based on the electromagnetic motor characteristics and the set current limitation.

Effective torque M_{eff} [mNm]

For cycle operation (e.g. "S5" operating mode – intermittent duty with the effect of the startup losses and the losses due to electrical braking on the heating), the effective torque corresponding to continuous operation ("S1" operating mode) is determined according to the following formula:

$$M_{eff} = \sqrt{\frac{M_A^2 \cdot t_A + M_L^2 \cdot t_B + M_{Br}^2 \cdot t_{Br}}{t_A + t_B + t_{Br} + t_{St}}}$$

M_A	Starting torque	M_{Br}	Braking
t_A	Acceleration time	t_{Br}	Braking time
M_L	Load torque	t_{St}	Standstill time
t_B	Load period		

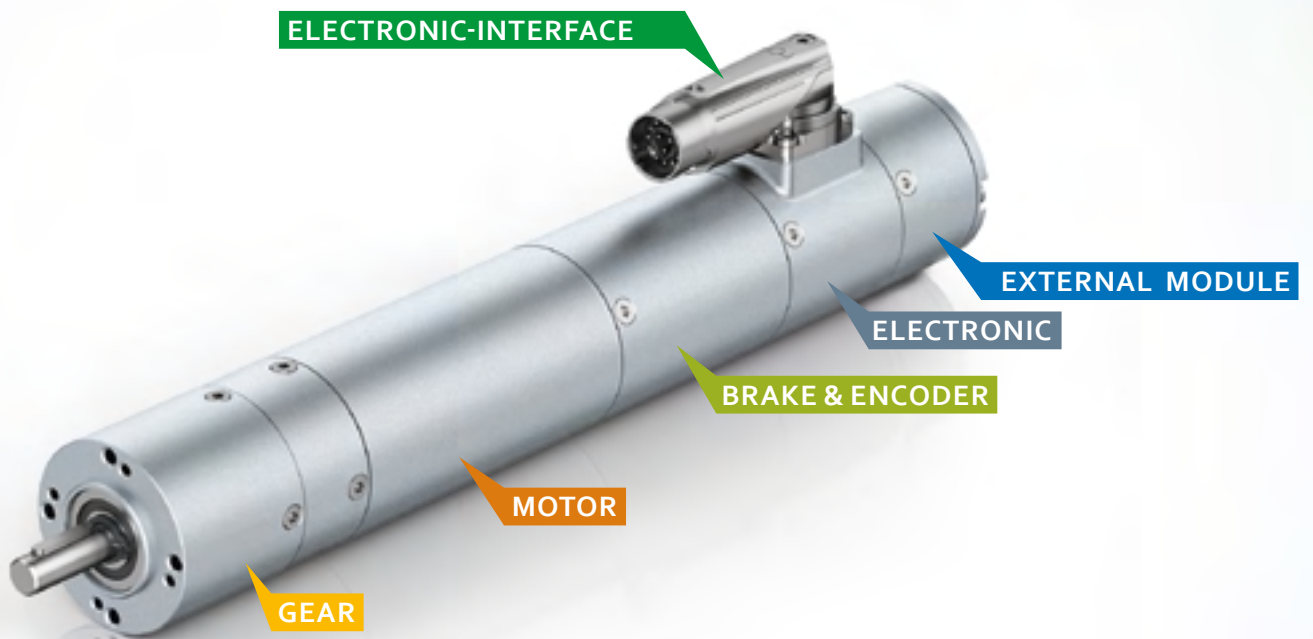
At an ambient temperature of 40°C this effective torque must not be greater than the nominal torque M_N listed in the catalog for the selected motor. For intermittent operation (operating mode S3 with tr = relative on period) the following permissible load moment applies:

$$M_L = M_N \cdot \sqrt{\frac{100}{t_r}}$$

System selection

When selecting a motor and operating for a drive system, consideration should be given to the fact that the values permitted for the motor should not be exceeded by the electronics. Likewise, the relationship shown in the commutation sequences between the sequence of Hall signals and the corresponding switching times and switching states of the output stage at the phase supply lines must be observed in order to attain optimum operation of the motor.

Please contact the manufacturer if the products are operated or stored under non standard environmental conditions.



ECI-Servomotors

Overview modular system

Brushless Servomotors ECI		ECI-42.20-K1 (p. 14)	ECI-42.40-K1 (p. 14)	ECI-63.20-K1 (p. 16)	ECI-63.40-K1 (p. 16)	ECI-63.60-K1 (p. 16)	ECI-63.20-K3/4/5 (p. 22)	ECI-63.40-K3/4/5 (p. 22)	ECI-63.60-K3/4/5 (p. 22)	ECI-80.20-K1 (p. 34)	ECI-80.40-K1 (p. 34)	ECI-80.60-K1 (p. 34)
U _N	V DC	24	24	24	24	24	24	24	24	24	24	24
		48	48	48	48	48	48	48	48	48	48	48
M _N	mNm	110	220	360	670	880	425	600	850	700	1 200	1 800
P	W	46	92	150	280	370	178	251	356	293	503	754
n _N	rpm	4 000	4 000	4 000	4 000	4 000	4 000	4 000	4 000	4 000	4 000	4 000
l	mm	104	124	106	126	146	112	132	152	96	116	136
d	mm	42	42	63	63	63	63	63	63	80	80	80
Control electronics (integrated)												
K1 (Hall sensor system)		•	○	•	•	○				•	•	•
K3 (Speed)							•	○	○			
K4 (Position)							•	○	○			
K5 (CANopen)							•	•	•			
Control electronics (extern)												
VTD-XX.XX-K3 (Speed) (p. 40)		•	•	•	•	•						
VTD-XX.XX-K4S (Position) (p.42)		•	•	•	•	•				•	•	•
VTD-60.13-K5SB (CANopen) (p. 44)		•	•	•	•	•						
VTD-60.35-K5SB (CANopen) (p. 46)				•	•	•				•	•	•
Gearheads												
NoiselessPlus 42 (Planetary gearhead) (p. 52)		•	•									
NoiselessPlus 63 (Planetary gearhead) (p. 54)				•	•	•	•	•	•			
Performax®Plus 42 (Planetary gearhead) (p. 56)		•	•									
Performax®Plus 63 (Planetary gearhead) (p. 58)				•	•	•	•	•	•	•	•	•
Optimax 42 (Planetary gearhead) (p. 60)		•	•									
Optimax 63 (Planetary gearhead) (p. 62)				•	•	•	•	•	•	•	•	•
EtaCrown® 52 (Crown gearhead) (p. 64)		•	•									
EtaCrown® 75 (Crown gearhead) (p. 66)				•	•	•	•	•	•			
EtaCrown®Plus 42 (Crown gearhead) (p. 68)		•	•									
EtaCrown®Plus 63 (Crown gearhead) (p. 70)				•	•	•	•	•	•			
Brake												
RFK (Power-off brake, spring-applied) (p. 76)		•	•	•	•	•	•	•	•			
Encoder systems												
Magnetic encoder systems (p. 78)		•	•	•	•	•				•	•	•
Subject to alternations		• Standard type ○ Preferred type: ready to ship in 48 hours										

With our **preferred type** products, we offer a selection of motors and gear motors which are available and ready to ship within 48 hours. Preferred type products can be ordered with a maximum order quantity of 20 products per order. With standard type products, we refer to a wide range of motors and gear motors which can be ordered using the stated order numbers with standard delivery times.

Further products for your project requirements are available **on request**. These products are generally available but cannot be ordered by means of an allocated material number. We reserve the right to make changes to the necessary order numbers after technical and economic evaluation of the requirement.



Servomotors ECI

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ECI-42.XX-K1	14
ECI-63.XX-K1	18
ECI-63.XX-K3	22
ECI-63.XX-K4	26
ECI-63.XX-K5	30
ECI-80.XX-K1	34

Servomotor ECI-42.XX-K1



Description

- Highly dynamic 3-phase internal rotor motor with EC technology
- Low cogging torque
- Robust, noise-optimized ball bearing system for a long service life
- High efficiency and high power density realized in a compact design
- Basic motor with electronic module K1 for operation with external control electronics
- Mechanical design and interfaces designed for modular flexibility
- Protection class IP 54 and connection by connector system

More at www.ebmpapst.com/eci-motoren

Type		ECI-42.20-K1-B00	ECI-42.20-K1-D00	ECI-42.40-K1-B00	ECI-42.40-K1-D00
Characteristic curve		A		B	
Nominal voltage (U_N)	V DC	24	48	24	48
Nominal speed (n_N) ²⁾	rpm	4 000	4 000	4 000	4 000
Nominal torque (M_N) ²⁾	mNm	110	110	220	220
Nominal current (I_N) ²⁾	A	2.50	1.30	5.10	2.60
Nominal output power (P_N) ²⁾	W	46.0	46.0	92.0	92.0
Starting torque (M_A)	mNm	480	480	960	960
Permissible peak current (I_{max}) ³⁾	A	14.0	7.00	21.0	11.0
Speed at no-load operation (n_0)	rpm	5 900	5 900	5 700	5 700
No-load current (I_0)	A	0.33	0.10	0.40	0.20
Permanent stall torque (M_{NO})	mNm	100	100	200	200
Recommended speed control range	rpm	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	3.42	3.42	6.70	6.70
Motor constant (K_E)	mVs/rad	35.2	84.2	42.8	83.9
Connection resistance (R_V)	Ω	0.85	3.20	0.39	1.50
Connection inductance (L_V)	mH	1 100	450	500	184
Overload protection		To be implemented via the control electronics			
Permissible ambient temperature range (T_U)	°C	0 ... +40	0 ... +40	0 ... +40	0 ... +40
Part number		932 4220 130	932 4220 131	932 4240 130	932 4240 131

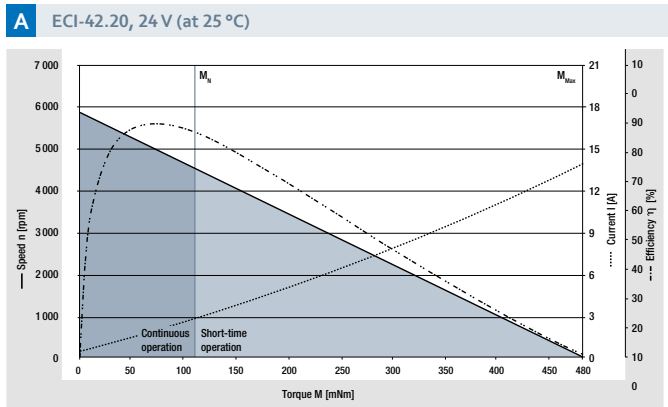
¹⁾ The degree of protection refers to the installed condition with sealing on the flange side

²⁾ At T_U max. 40 °C

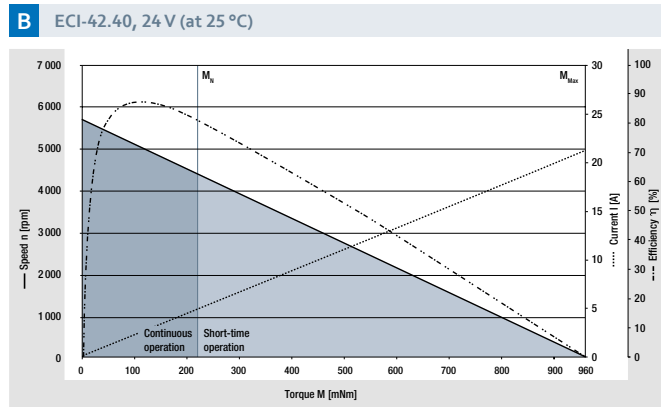
³⁾ Permissible maximum current duration: max. 3 seconds – can be repeated after complete cool down

Preferred type: ready to ship in 48 hours

Subject to alternations



Characteristic curve 48 V on request



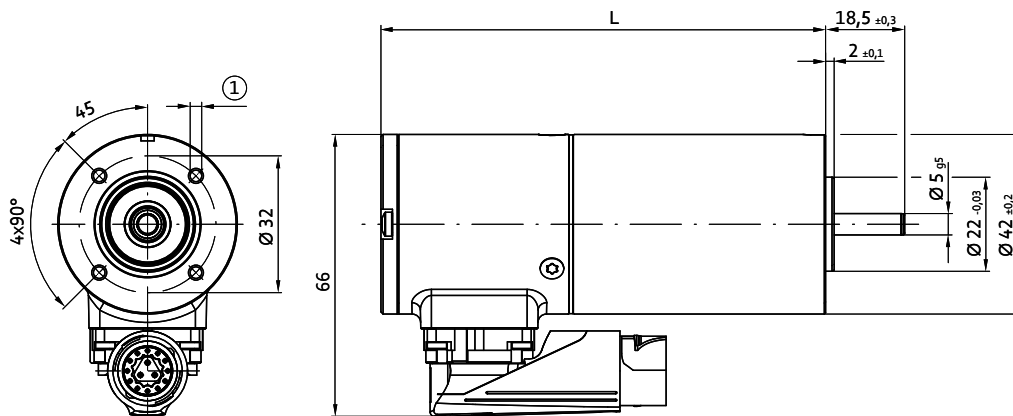
Characteristic curve 48 V on request

Modular system

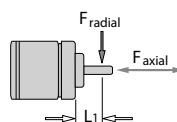
<p>Brake system Spring-applied RFK 0.3 Nm Page 76</p>	<p>Basic motor</p>	<p>Planetary gearhead NoiselessPlus 42 Page 52 Performax®Plus 42 Page 56</p>
<p>Encoder system magnetic incremental Page 78</p>		<p>Crown gearheads EtaCrown® 52 Page 64 EtaCrown®Plus 42 Page 68</p>
<p>Recommended external control trionics VTD-XX.XX-K3 Speed Page 40 VTD-XX.XX-K4S Position Page 42 VTD-60.13-K5SB Position Page 44</p>		

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L
ECI-42.20	104±0.4
ECI-42.40	124±0.4



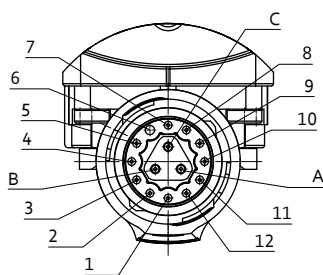
① 4 x for thread-forming screws M3 according to DIN 7500, screw-in depth max. 9.5 mm



Permissible shaft load

F_{axial} :	20 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L_{10} (in rated operation) from 20 000 h (at T_U max. 40 °C)
F_{radial} :	100 N	
L_1 :	10 mm	

Electrical connection without brake



	Pin	Wire color	Configuration	Function	recommended AWG
Signal	1	white	Hall A	Hall signal A	23
	2	brown	Hall B	Hall signal B	
	3	green	Hall C	Hall signal C	
	4	yellow	+12V	Power supply Hall	
	5	gray	GND	Ground Hall	
Encoder	6	pink	empty	empty	16
	7	blue	A	Encoder channel A	
	8	red	/A	Encoder channel A inverted	
	9	black	B	Encoder channel B	
	10	violet	/B	Encoder channel B inverted	
	11	gray / pink	+5V	Power supply encoder	
Power	12	red / blue	GND	Ground encoder	16
	A	gray	U	Winding connector U	
	B	brown	V	Winding connector V	
	C	black	W	Winding connector W	

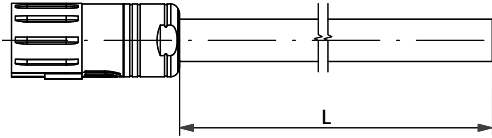
Subject to alternations

Electrical connection with brake see on page 76

Electrical connection cable

All dimensions in mm

Type	L	Part number
Cable (12 + 3 Pins)	1 000 ± 30	992 0160 200
Cable (12 + 3 Pins)	3 000 ± 30	992 0160 201



For self-assembly, cables can be obtained from Intercontec:

Intercontec plug series 915 with quick fastener \varnothing 10.5 - 12 mm. (Part number ESTA205NN00340003000)

Intercontec crimp contact socket 3 x, power, crimp range 0.5 - 1.5 mm² (Part number 60.251.11)

Intercontec crimp contact socket 12 x, signal, crimp range 0.05 - 0.75 mm² (Part number 60.252.11)

Servomotor ECI-63.XX-K1



Description

- Highly dynamic 3-phase internal rotor motor with EC technology
- Low cogging torque
- Robust, noise-optimized ball bearing system for a long service life
- High efficiency and high power density realized in a compact design
- Basic motor with electronic module K1 for operation with external control electronics
- Mechanical design and interfaces designed for modular flexibility
- Protection class IP 40 / IP 54 and connection by connector system

More at

www.ebmpapst.com/eci-motoren

Type		ECI-63.20-K1 -B00	ECI-63.20-K1 -D00	ECI-63.40-K1 -B00	ECI-63.40-K1 -D00	ECI-63.60-K1 -B00	ECI-63.60-K1 -D00
Characteristic curve		A		B			C
Nominal voltage (U_N)	V DC	24	48	24	48	24	48
Nominal speed (n_N) ²⁾	rpm	4 000	4 000	4 000	4 000	4 000	4 000
Nominal torque (M_N) ²⁾	mNm	360	360	670	670	800	880
Nominal current (I_N) ²⁾	A	8.50	4.50	14.0	6.50	17.6	8.50
Nominal output power (P_N) ²⁾	W	150	150	280	280	335	370
Starting torque (M_A)	mNm	1 800	1 800	3 300	3 300	5 300	4 400
Permissible peak current (I_{max}) ³⁾	A	55	30	95	45	150	57
Speed at no-load operation (n_L)	rpm	5 800	6 800	5 900	5 900	6 100	6 000
No-load current (I_L)	A	0.50	0.30	0.70	0.32	1.30	0.45
Recommended speed control range	rpm	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	19.0	19.0	38.0	38.0	57.0	57.0
Motor constant (K_E)	mVs/rad	41.4	73.3	40.4	83.8	40.4	83.8
Connection resistance (R_V)	Ω	0.14	0.42	0.08	0.24	0.04	0.15
Connection inductance (L_V)	mH	260	880	140	570	90.0	330
Overload protection		To be implemented via the control electronics					
Permissible ambient temperature range (T_U)	°C	0 ... +40	0 ... +40	0 ... +40	0 ... +40	0 ... +40	0 ... +40
Weight	kg	0.90	0.90	1.20	1.20	1.50	1.50
Part number (wire interface) ¹⁾	IP 40	932 6320 103	932 6320 105	932 6340 103	932 6340 105	932 6360 106	932 6360 108
Part number (connector interface) ¹⁾	IP 54	on request	on request	on request	on request	on request	on request

¹⁾The degree of protection refers to the installed condition with sealing on the flange side
The shaft geometry in the IP54 version is different from the displayed sketch

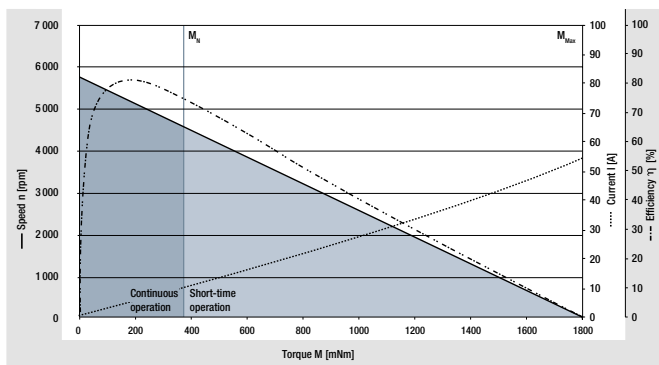
²⁾At T_U max. 40 °C

³⁾Permissible maximum current duration: max. 1 seconds – can be repeated after complete cool down

Preferred type: ready to ship in 48 hours

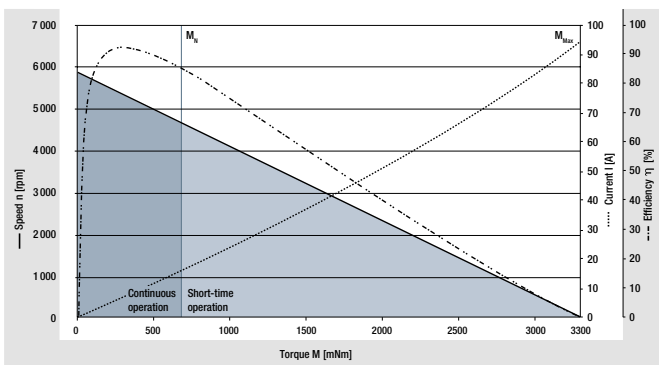
Subject to alternations

A ECI-63.20-K1, 24 V (at 25 °C)



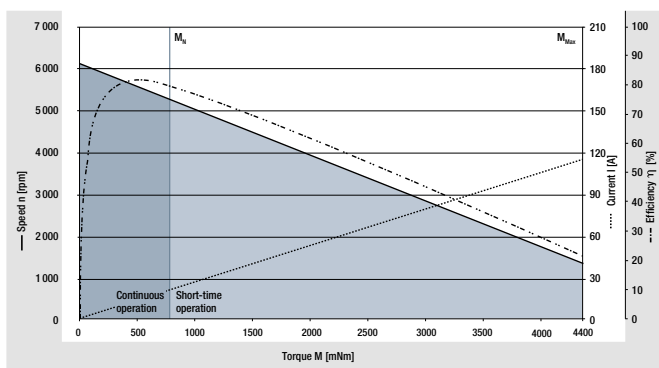
Characteristic curve 48 V on request

B ECI-63.40-K1, 24 V (at 25 °C)



Characteristic curve 48 V on request

C ECI-63.60-K1, 24 V (at 25 °C)



Characteristic curve 48 V on request

Modular system

Brake system

Spring-applied
RFK 1.0 Nm Page 76



Basic motor



Planetary gearhead

NoiselessPlus 63 Page 54
Performax®Plus 63 Page 58
Optimax 63 Page 62



Encoder system

magnetic
incremental Page 78



Crown gearheads

EtaCrown® 75 Page 66
EtaCrown®Plus 63 Page 70



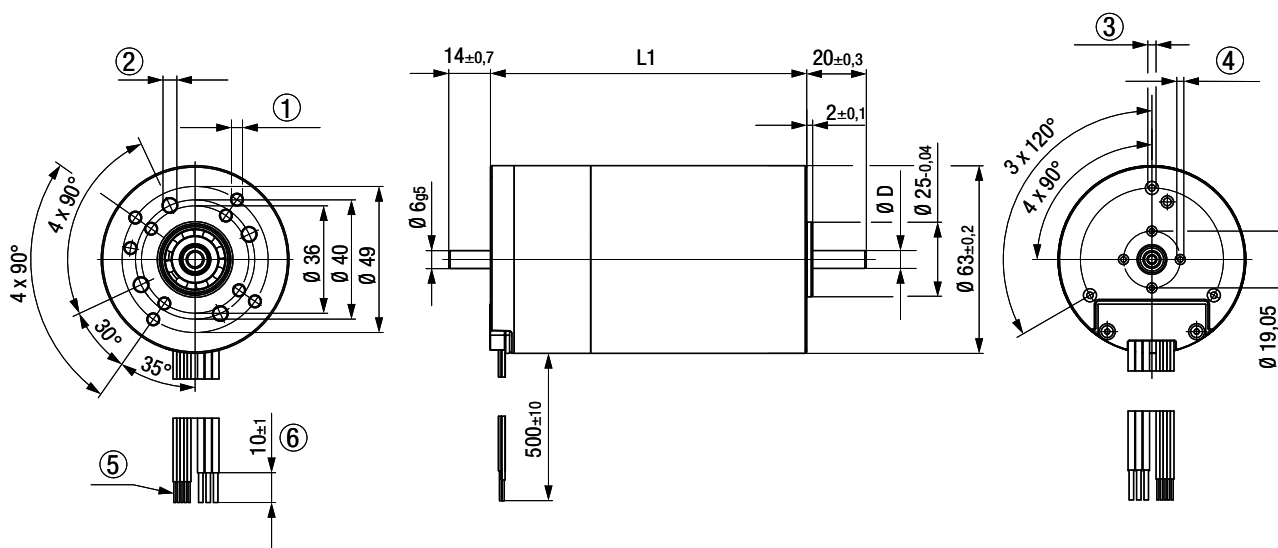
Recommended external control electronics

VTD-XX.XX-K4S Speed Page 42
VTD-60.13-K5SB Position Page 44
VTD-60.35-K5SB Position Page 46

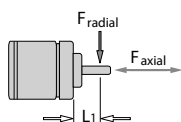


For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L	ØD
ECI-63.20	106.1±0.4	6 _{g5}
ECI-63.40	126.1±0.4	6 _{g5}
ECI-63.60	146.1±0.4	10 _{g5}



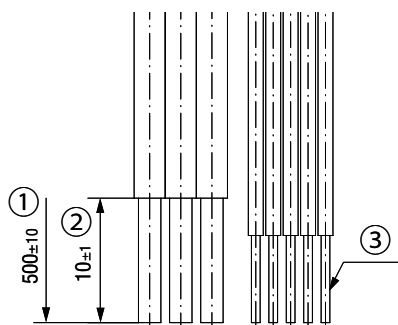
- ① 8 x for thread-forming screws M4 according to DIN7500, screw-in depth max. 10 mm
- ② 4 x for thread-forming screws M5 according to DIN7500, screw-in depth max. 10 mm
- ③ 3 x For thread-forming screws M3 according to DIN7500, screw-in depth max. 6 mm
- ④ 4 x for thread-forming screws M2,5 according to DIN7500, screw-in depth max. 6 mm
- ⑤ 5x ferrule
- ⑥ Tin-plated



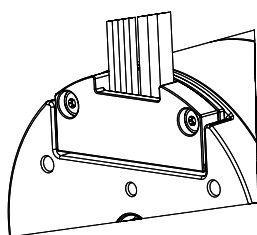
Permissible shaft load

F _{axial} :	150 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L ₁₀ (in rated operation) from 20 000 h (at T _U max. 40 °C)
F _{radial} :	150 N	
L ₁ :	20 mm	

Electrical connection



- ① Length from motor
- ② Tin-plated
- ③ 5x ferrule

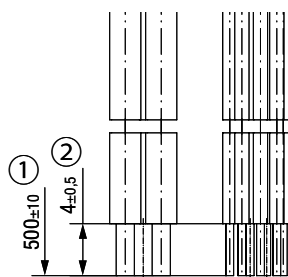


	Wire color	Configuration	Funkion
Signal	green	Hall A	Hall signal A
	white	Hall B	Hall signal B
	gray	Hall C	Hall signal C
	red	U _B	Supply voltage Hall
	black	GND	Ground
Power	brown	U	Winding connector U
	violet	V	Winding connector V
	yellow	W	Winding connector W

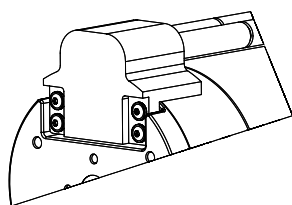
Subject to alternations

Electrical connection connector (connector interface on request)

All dimensions in mm



- ① Length from motor
- ② Tin-plated



	Wire color	Configuration	Function
Signal	green	Hall A	Hall signal A
	white	Hall B	Hall signal B
	gray	Hall C	Hall signal C
	red	+12V	Supply voltage Hall
	red / blue	GND	Ground encoder
Power	black	U	Winding connector U
	brown	V	Winding connector V
	blue	W	Winding connector W

Subject to alternations

Servomotor ECI-63.XX-K3



Description

- Motor with completely integrated K3 operation and control electronics
- Low cogging torque
- Integrated speed control
- Interface with analog and digital control inputs
- Output stage enabled via digital hardware enabling
- Field-oriented closed-loop control
- 15-pole plug

More at www.ebmpapst.com/eci-motoren

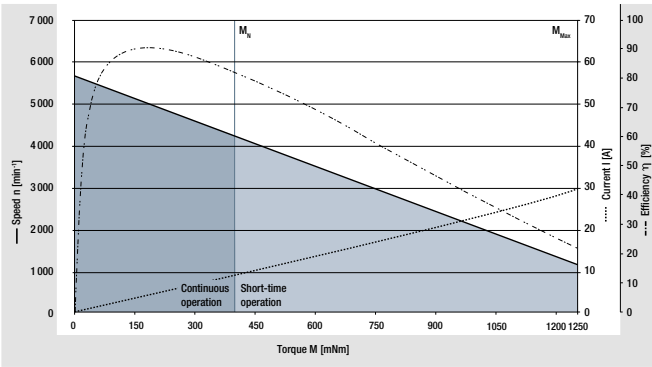
Type		ECI-63.20-K3 -B00	ECI-63.20-K3 -D00	ECI-63.40-K3 -B00	ECI-63.40-K3 -D00	ECI-63.60-K3 -D00
Characteristic curve		A		B		C
Nominal voltage (U_N)	V DC	24	48	24	48	48
Permissible supply voltage range (U_{ZK})	V DC	18 ... 30	18 ... 53	18 ... 30	18 ... 53	18 ... 53
Max. reverse voltage	V DC	35	58	35	58	58
Nominal speed (n_N)	rpm			4 000		
Nominal torque (M_N) ²⁾	mNm	425	450	600	600	850
Nominal current (I_N) ²⁾	A	8.50	5.40	12.3	7.20	8.60
Nominal output power (P_N) ²⁾	W	178	188	251	314	356
Starting torque (M_s)	mNm	1 480	1 890	1 500	3 000	2 550
Speed at no-load operation (n_l)	rpm	5 800	5 800	5 900	5 800	6 000
No-load current (I_l)	A	0.50	0.50	0.90	0.50	0.60
Recommended speed control range	rpm			0 ... 5 000		
Set value input				Analog (0 ... 10V)		
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	19	19	38	38	57
Function for motor protection at stall	Ω			thermal		
Overload protection				Integrated		
Permissible ambient temperature range (T_U)	°C			0 ... +40		
Weight	kg	0.85	0.85	1.15	1.15	1.50
Part number	IP 40			On request		
Part number	IP 54			On request		

¹⁾The degree of protection refers to the installed condition with sealing on the flange side
The shaft geometry in the IP54 version is different from the displayed sketch

²⁾At T_U max. 40 °C

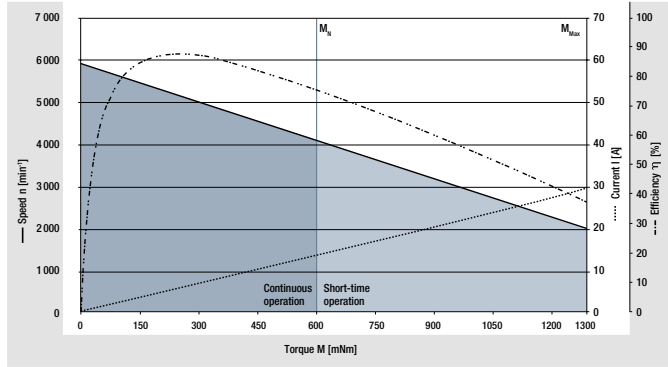
Subject to alternations

A ECI-63.20-K3, 24 V (at 25 °C)



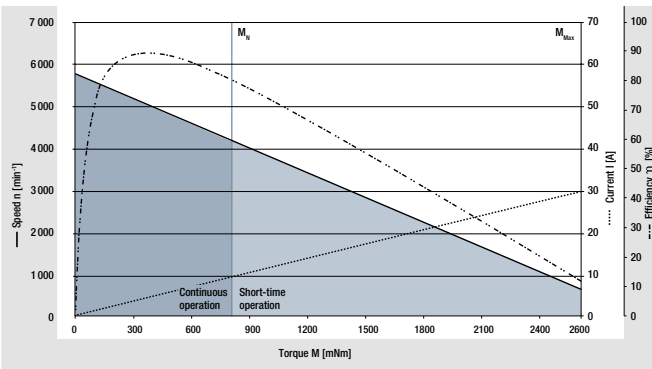
Characteristic curve 48 V on request

B ECI-63.40-K3, 24 V (at 25 °C)



Characteristic curve 48 V on request

C ECI-63.60-K3, 48 V (at 25 °C)

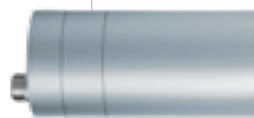


Modular system

Brake system

Spring-applied Integrated
 Brake module ECI 63-K4 Page 76

Basic motor



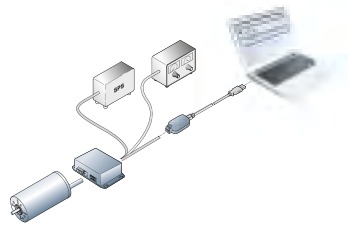
Planetary gearhead

NoiselessPlus 63 Page 54
 Performax®Plus 63 Page 58
 Optimax 63 Page 62



Commissioning tool

"driveSTUDIO" Page 74



Crown gearheads

EtaCrown® 75 Page 66
 EtaCrown®Plus 63 Page 70

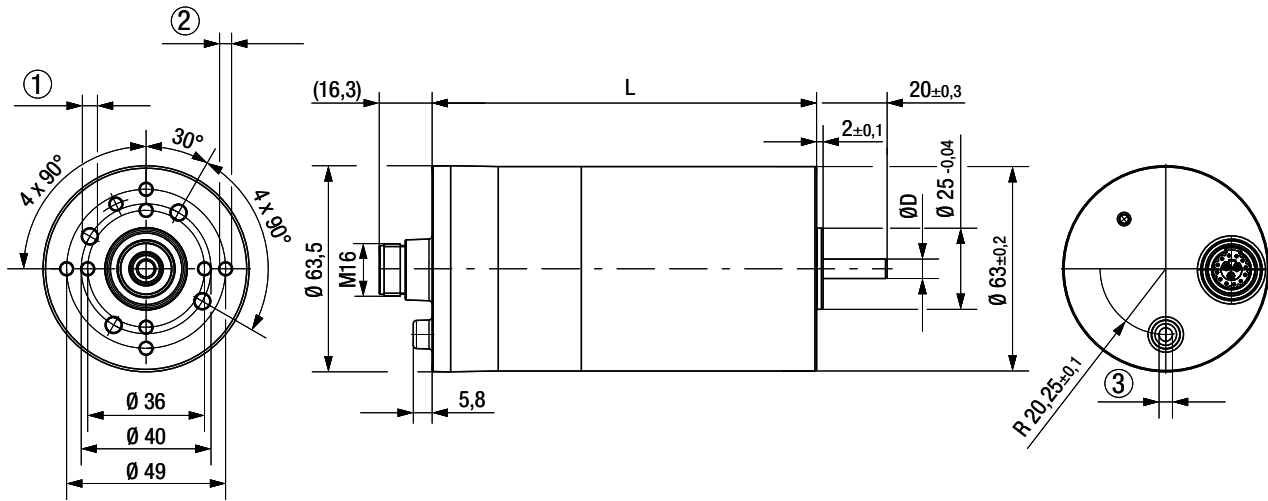


Cable

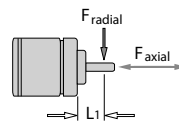
Connection cables have to be ordered separately Page 25

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L	ØD
ECI-63.20	118.5±0.4	6 ₉₅
ECI-63.40	138.5±0.4	6 ₉₅
ECI-63.60	158.5±0.4	10 ₉₅



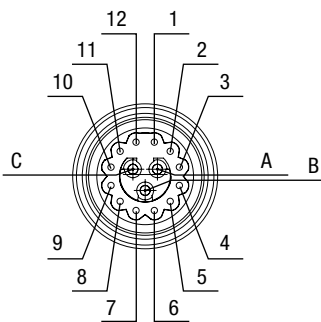
- ① 4 x for thread-forming screws M5 according to DIN7500, screw-in depth max. 10 mm
- ② 8 x for thread-forming screws M4 according to DIN7500, screw-in depth max. 10 mm
- ③ M5, 5 mm



Permissible shaft load

F _{axial} :	150 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L ₁₀ (in rated operation) from 20 000 h (at T _U max. 40 °C)
F _{radial} :	150 N	
L ₁ :	20 mm	

Electrical connection



	Pin	Wire color	Configuration	Function	recommended AWG
Signal	1	white	D-IN-A	Digital input A	24
	2	brown	D-IN-B	Digital input B	
	3	green	D-IN-1	Digital input 1	
	4	yellow	D-IN-2	Digital input 2 Analog 0... 10 V / brake	
	5	gray	D-OUT-1	Digital output 1	
	6	pink	D-OUT-2	Digital output 2	
	7	blue	D-OUT-3	Digital output 3	
	8	red	A-IN-1	0 ... 10 V (differential)	
	9	black	A-IN-GND	Ground for analog IN 1 (differential)	
	10	violet	RS485 A (+)	Prog.-bus	
	11	gray / pink	RS485 B (-)	Prog.-bus	
	12	red / blue	U _{Logic}	Logic power supply (24 V)	
Power	A	gray	Ballast	Ballast resistor	16
	B	brown	U _{ZK}	Power supply	
	C	black	GND	Power / signal ground	

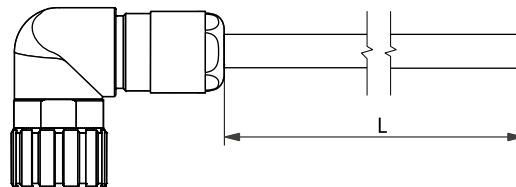
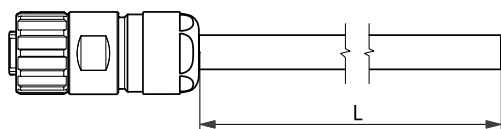
Subject to alternations

Electrical connection Cable

All dimensions in mm

Type	L	Part number
Cable (12 + 3 Pins)	1 000 ± 30	992 0160 034
Cable (12 + 3 Pins)	3 000 ± 30	992 0160 035

Type	L	Part number
Cable (12 + 3 Pins)	1 000 ± 30	992 0160 036
Cable (12 + 3 Pins)	3 000 ± 30	992 0160 037



For self-assembly, cables can be obtained from Hummel:

Hummel cable connector M16 for cable \varnothing 8-11 mm, Tightening torque: 5 Nm (Order no. 7.810.500.000)

Hummel crimp insert series M16, socket 12+3 with special coding (Order no. 7K11886034)

Hummel crimp contact socket 3 x, power, crimp range 0.5 - 1.5 mm² (Order no. 7.010.981.202)

Hummel crimp contact socket 12 x, signal, crimp range 0.08 - 0.34 mm² (Order no. 7.010.980.802)

Servomotor ECI-63.XX-K4



Description

- Motor with integrated 4Q controller
- Speed, torque or position mode possible
- Selection of operating modes and parameter setting via RS485
- Extensive interface with various inputs and outputs
- Integrated brake chopper
- Speed set values from $n=0$ with holding torque up to 5 000 rpm
- Excellent control behavior via field-oriented control with sine commutation
- High efficiency and high power density realized in a compact design
- User-friendly parameter setting with „driveSTUDIO“ PC software

More at www.ebmpapst.com/eci-motoren

Type		ECI-63.20-K4 -B00	ECI-63.20-K4 -D00	ECI-63.40-K4 -B00	ECI-63.40-K4 -D00	ECI-63.60-K4 -D00
Characteristic curve		A		B		C
Nominal voltage (U_N)	V DC	24	48	24	48	48
Permissible supply voltage range (U_{ZK})	V DC	18 ... 30	18 ... 53	18 ... 30	18 ... 53	18 ... 53
Max. reverse voltage	V DC	35	58	35	58	58
Nominal speed (n_N)	rpm	4 000	4 000	4 000	4 000	4 000
Nominal torque (M_N) ²⁾	mNm	425	450	600	750	850
Nominal current (I_N) ²⁾	A	8.50	5.40	12.3	7.20	8.60
Nominal output power (P_N) ²⁾	W	178	188	251	314	356
Starting torque (M_{max})	mNm	1 480	1 890	1 500	3 000	2 550
Speed at no-load operation (n_L)	rpm	5 800	5 800	5 900	5 800	6 000
No-load current (I_L)	A	0.50	0.50	0.90	0.50	0.60
Recommended speed control range	rpm	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000	0 ... 5 000
Set value input		Analog / PWM / Frequenz / Digital				
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	19	19	38	38	57
Function for motor protection at stall	Ω	thermal				
Overload protection		Integrated				
Permissible ambient temperature range (T_U)	°C	0 ... +40	0 ... +40	0 ... +40	0 ... +40	0 ... +40
Weight	kg	0.85	0.85	1.15	1.15	1.50
Part number	IP 40	932 6320 403	932 6320 405	932 6340 403	932 6340 405	932 6360 405
Part number	IP 54	932 6320 400	932 6320 402	932 6340 400	932 6340 402	932 6360 402

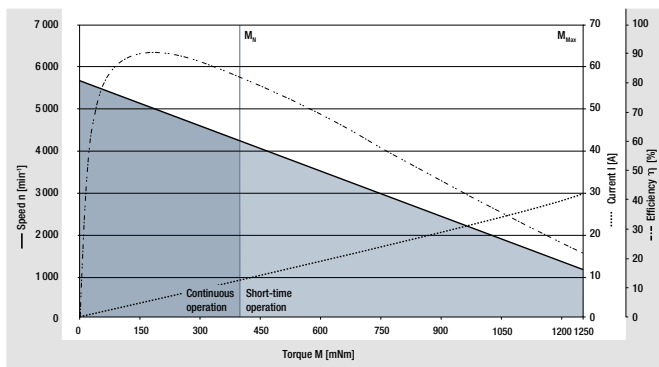
¹⁾The degree of protection refers to the installed condition with sealing on the flange side
The shaft geometry in the IP54 version is different from the displayed sketch

²⁾At T_U max. 40 °C

Preferred type: ready to ship in 48 hours

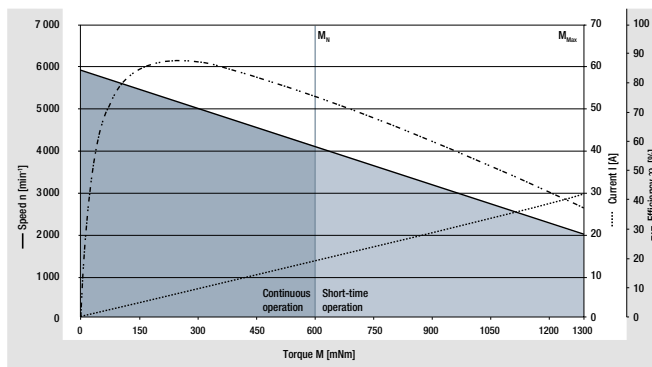
Subject to alternations

A ECI-63.20-K4, 24 V (at 25 °C)



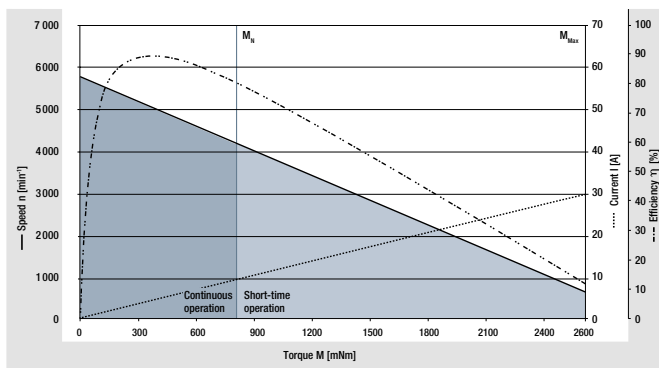
Characteristic curve 48 V on request

B ECI-63.40-K4, 24 V (at 25 °C)



Characteristic curve 48 V on request

C ECI-63.60-K4, 24 V (at 25 °C)



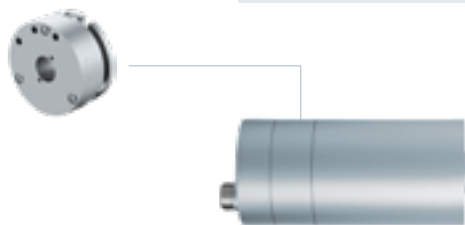
Characteristic curve 48 V on request

Modular system

Brake system

Spring-applied Integrated
Brake module ECI 63 Page 76

Basic motor

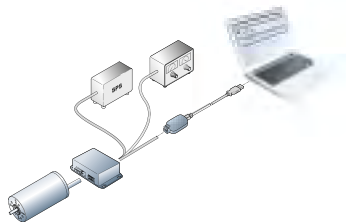


Planetary gearhead

NoiselessPlus 63 Page 54
Performax®Plus 63 Page 58
Optimax 63 Page 62

Commissioning tool

"driveSTUDIO" Page 74



Crown gearheads

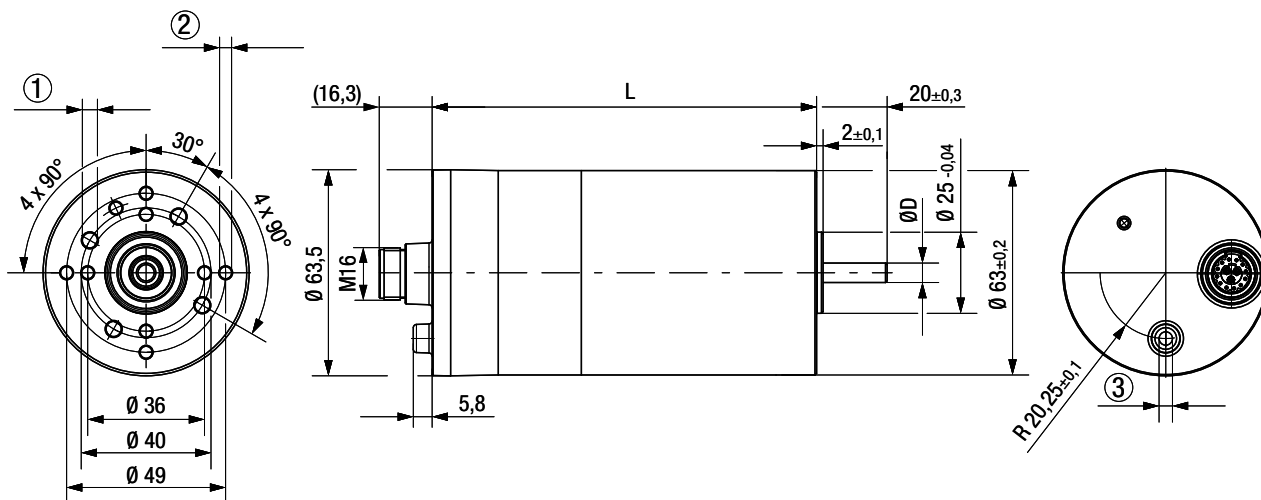
EtaCrown® 75 Page 66
EtaCrown®Plus 63 Page 70

Cable

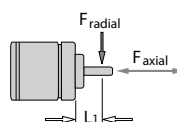
Connection cables have to be ordered separately Page 29

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L	ØD
ECI-63.20	118.5±0.4	6 ₉₅
ECI-63.40	138.5±0.4	6 ₉₅
ECI-63.60	158.5±0.4	10 ₉₅



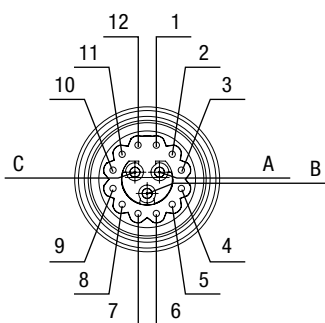
- ① 4 x for thread-forming screws M5 according to DIN7500, screw-in depth max. 10 mm
- ② 8 x for thread-forming screws M4 according to DIN7500, screw-in depth max. 10 mm
- ③ M5, 5 mm



Permissible shaft load

F _{axial} :	150 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L ₁₀ (in rated operation) from 20 000 h (at T _U max. 40 °C)
F _{radial} :	150 N	
L ₁ :	20 mm	

Electrical connection



	Pin	Wire color	Configuration	Function	recommended AWG
Signal	1	white	D-IN-A	Digital input A	24
	2	brown	D-IN-B	Digital input B	
	3	green	D-IN-1	Digital input 1	
	4	yellow	D-IN-2	Digital input 2 Analog 0 ... 10 V / brake	
	5	gray	D-OUT-1	Digital output 1	
	6	pink	D-OUT-2	Digital output 2	
	7	blue	D-OUT-3 ¹⁾	Digital output 3	
	8	red	A-IN-1	0 ... 10 V (differential)	
	9	black	A-IN-GND	Ground for analog IN 1 for differential	
	10	violet	RS485 A (+)	Prog.-bus	
	11	gray / pink	RS485 B (-)	Prog.-bus	
	12	red / blue	U _{Logic}	Logic power supply (24 V)	
Power	A	gray	Ballast	Ballast resistor	16
	B	brown	U _{ZK}	Power supply	
	C	black	GND	Power- / signal-ground	

¹⁾ Output (OUT 3) is only available on ECI-63.XX-K4

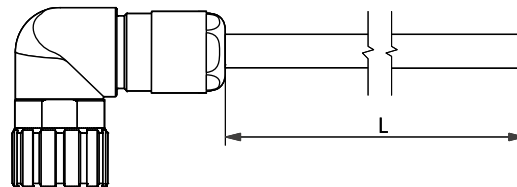
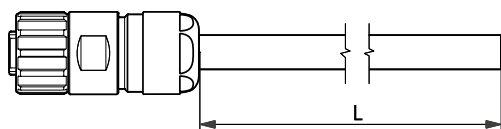
Subject to alternations

Electrical connection Cable

All dimensions in mm

Type	L	Part number
Cable (12 + 3 Pins)	1 000 ± 30	992 0160 034
Cable (12 + 3 Pins)	3 000 ± 30	992 0160 035

Type	L	Part number
Cable (12 + 3 Pins)	1 000 ± 30	992 0160 036
Cable (12 + 3 Pins)	3 000 ± 30	992 0160 037



For self-assembly, cables can be obtained from Hummel:

Hummel cable connector M16 for cable Ø 8-11 mm, Tightening torque: 5 Nm (Order no. 7.810.500.000)

Hummel crimp insert series M16, socket 12+3 with special coding (Order no. 7K11886034)

Hummel crimp contact socket 3 x, power, crimp range 0.5 - 1.5 mm² (Order no. 7.010.981.202)

Hummel crimp contact socket 12 x, signal, crimp range 0.08 - 0.34 mm² (Order no. 7.010.980.802)

Servomotor ECI-63.XX-K5



Description

- Motor with integrated K5 operation and control electronics with CANopen communication interface
- Sine commutation of the drives with field-oriented control
- Speed control range down to $n = 0$ rpm with holding torque up to 5 000 rpm possible
- Different operating modes according to DSP 402 (speed, torque, positioning) possible via software
- Connectors M16 and M12 in sealed industry standard
- Interface with analog and digital control inputs

More at www.ebmpapst.com/eci-motoren

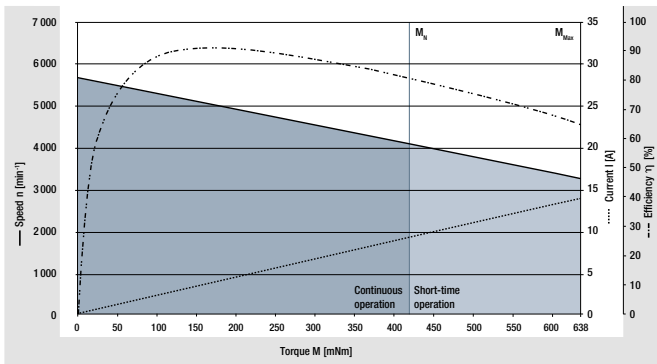
Type		ECI-63.20-K5 -B00	ECI-63.20-K5 -D00	ECI-63.40-K5 -B00	ECI-63.40-K5 -D00	ECI-63.60-K5 -D00
Characteristic curve		A		B		C
Nominal voltage (U_N)	V DC	24	48	24	48	48
Permissible supply voltage range (U_{ZK})	V DC	8 ... 30	18 ... 52	18 ... 30	18 ... 52	18 ... 52
Max. reverse voltage	V DC	35	58	35	58	58
Nominal speed (n_N) ²⁾	rpm			4 000		
Nominal torque (M_N) ²⁾	mNm	425	450	600	600	850
Nominal current (I_N) ²⁾	A	8.50	5.40	12.3	7.20	8.60
Nominal output power (P_N) ²⁾	W	178	188	251	314	356
Starting torque (M_s)	mNm	1 275	1 350	1 50	2 250	2 550
Speed at no-load operation (n_l)	rpm	5 800	5 800	5 900	5 800	6 000
No-load current (I_l)	A	0.50	0.20	0.90	0.46	0.48
Recommended speed control range	rpm			0 ... 4 00		
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	19	19	38	38	57
Function for motor protection at stall	Ω			thermal		
Overload protection				Integrated		
Permissible ambient temperature range (T_U)	°C			0 ... +40		
Weight	kg	0.95	0.95	1.25	1.25	1.55
Part number ¹⁾	IP 54	932 6320 550	932 6320 552	932 6340 550	932 6340 552	932 6360 552

¹⁾The degree of protection refers to the installed condition with sealing on the flange side
The shaft geometry in the IP54 version is different from the displayed sketch

²⁾At T_U max. 40 °C

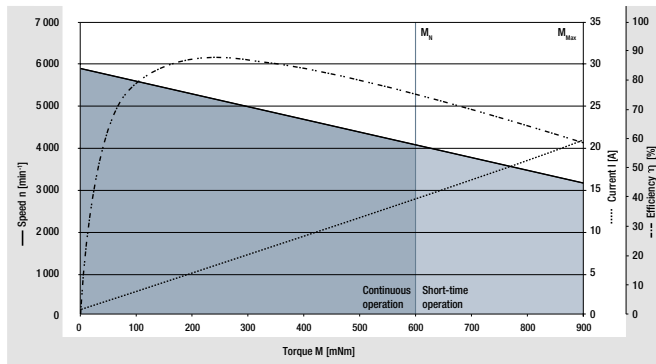
Subject to alternations

A ECI-63.20-K5, 24 V (at 25 °C)



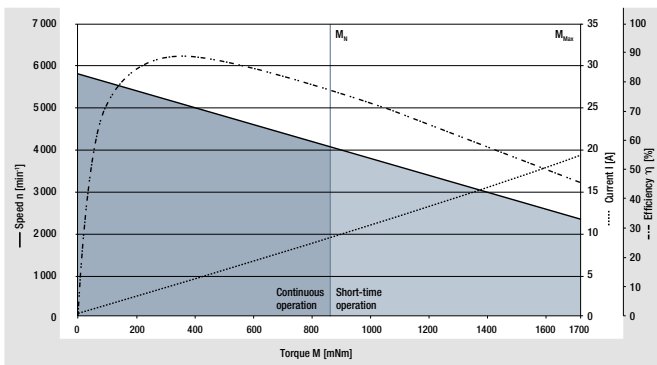
Characteristic curve 48 V on request

B ECI-63.40-K5, 24 V (at 25 °C)



Characteristic curve 48 V on request

C ECI-63.60-K5, 48 V (at 25 °C)



Modular system

Brake system

Spring-applied Integrated
Brake module ECI 63 Page 76

Basic motor

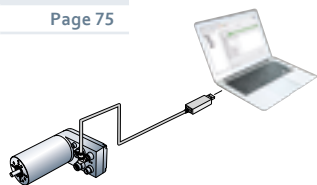


Planetary gearhead

NoiselessPlus 63 Page 54
Performax®Plus 63 Page 58
Optimax 63 Page 62

Commissioning tool

"EP-Tools" Page 75



Crown gearheads

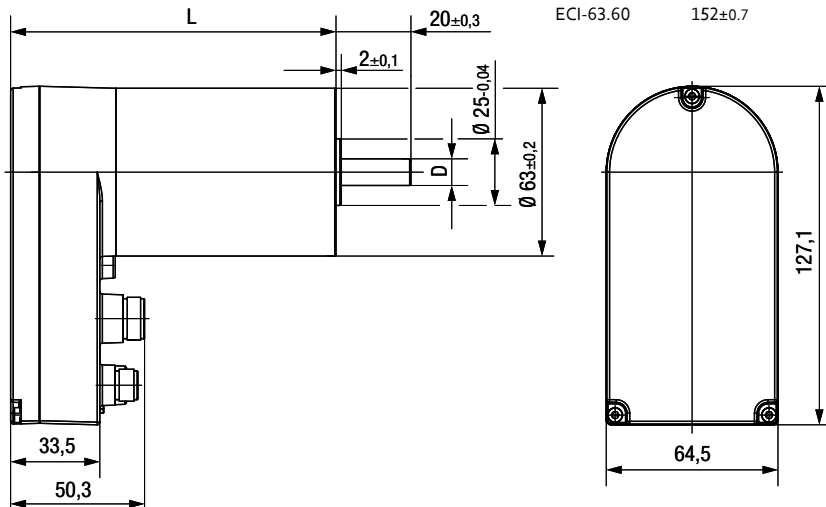
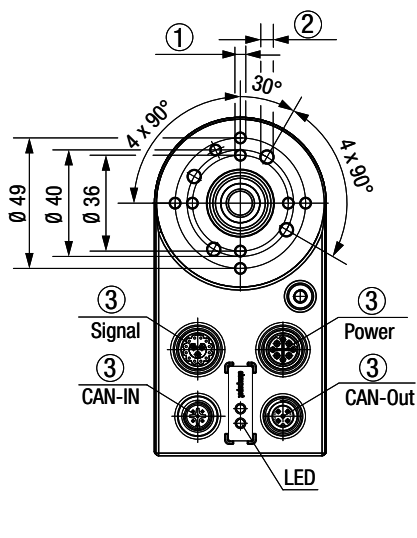
EtaCrown® 75 Page 66
EtaCrown®Plus 63 Page 70

Cable

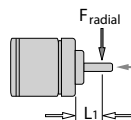
Connection cables have to be ordered separately Page 33

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L	ØD
ECI-63.20	112±0.7	6 ₉₅
ECI-63.40	132±0.7	6 ₉₅
ECI-63.60	152±0.7	10 ₉₅



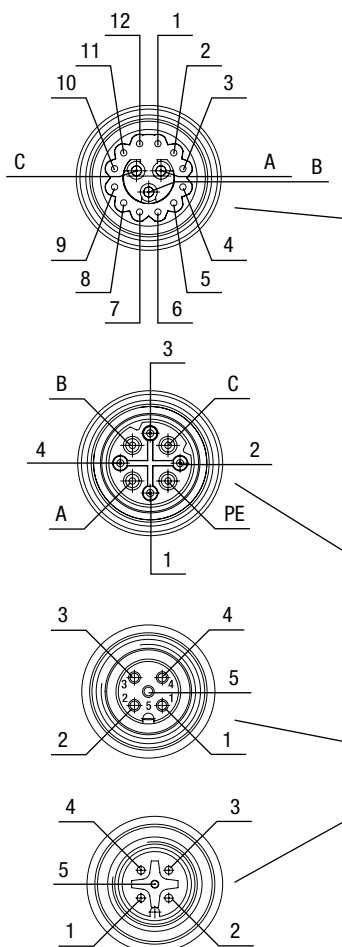
- ① 8 x for thread-forming screws M4 according DIN7500. screw-in depth max. 10.5 mm
- ② 4 x for thread-forming screws M5 according DIN7500. screw-in depth max. 10.5 mm
- ③ Plug



Permissible shaft load

F_{axial} :	150 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L_{10} (in rated operation) from 20 000 h (at T_U max. 40 °C)
F_{radial} :	150 N	
L_1 :	20 mm	

Electrical connection



	Pin	Wire color	Configuration	Function	recommended AWG	
Plug Signal	1	white	D-IN-1	Digital input 1	24	
	2	brown	D-IN-2	Digital input 2		
	3	green	D-IN-3	Digital input 3		
	4	yellow	D-IN-4	Digital input 4		
	5	gray	D-IN-5	Digital input 5		
	6	pink	D-IN-6	Digital input 6		
	7	blue	D-IN-7	Digital input 7		
	8	red	D-OUT-1	Digital output 1		
	9	black	D-OUT-2	Digital output 2		
	10	violet	Enable	Enable input		
	11	gray / pink	A-IN-1+	Analog input 1		
	12	red / blue	A-IN-2	Analog input 2		
Plug Power	A	gray	A-IN-1-	Analog input 1 GND	18	
	B	brown	U_{Logic}	Power supply for electronics		
	C	black	GND	Ground and reference for A-IN-2		
	A	brown	U_{ZK}	Power supply (ballast)		16
	B	gray	Ballast	Ballast resistor		
C	black	GND-Power	Power supply			
Plug CAN Out	FE	blue	FE	Functional earth	24	
	1	white	CAN H	CAN Bus high signal		
	2	brown	CAN L	CAN Bus low signal		
	3	green	Enable	Enable input		
Plug CAN IN	4	yellow	U_{Logic}	Logic power supply	24	
	4		CAN H	CAN Bus high signal		
Plug CAN IN	5		CAN L	CAN Bus low signal	24	
	4		CAN H	CAN Bus high signal		
Plug CAN IN	5		CAN L	CAN Bus low signal	24	
	5		CAN L	CAN Bus low signal		

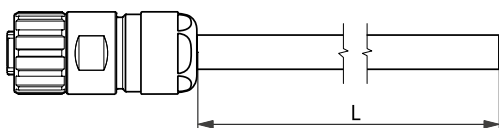
Subject to alternations

Electrical connection cable

All dimensions in mm

Type	L	Part number
Cable signal (12 + 3 Pins)	1 000 ± 30	992 0160 059
Cable signal (12 + 3 Pins)	3 000 ± 30	992 0160 060
Cable power (4 + 3 + FE)*	1 000 ± 30	992 0160 055
Cable power (4 + 3 + FE)*	3 000 ± 30	992 0160 056

* Wires Pin 1, Pin 2 (CAN_H, CAN_L) not executed

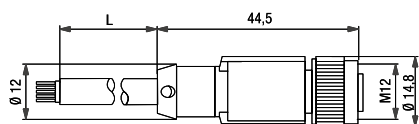


For self-assembly, cables can be obtained from Hummel:

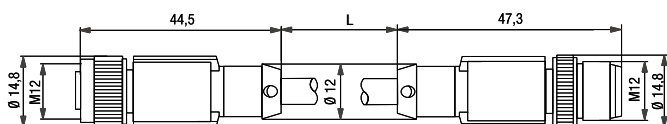
- Signal (straight)
- 1x cable connector M16 for cable Ø 8-11 mm, Order no. 7.810.500.000
 - 1x crimp insert series M16, socket 12+3 with special coding, Order no. 7K11886034
 - 3x crimp contact socket power crimp range 0.5-1.5mm², Order no. 7.010.981.202
 - 12x crimp contact socket signal crimp range 0.08-0.34mm², Order no. 7.010.980.802

- Power (straight)
- 1x cable connector M16 for cable Ø 8-11 mm, Order no. 7.810.500.000
 - 1x crimp insert series M16, socket 4+3+PE, Order no. 7.003.943.102
 - 4x crimp contact 1.6 mm² / crimp range 0.34-1.5mm², Order no. 7.010.981.602
 - 2x crimp contact 0.8 mm² / crimp range 0.08-0.34mm², Order no. 7.010.980.802

Type	L	Part number
CANopen socket	5 000 ± 30	992 0160 017

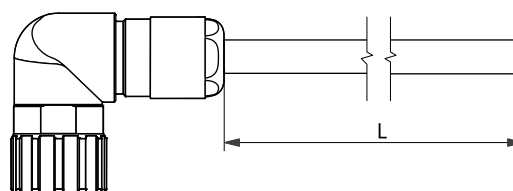


Type	L	Part number
CANopen connecting cable	2 000 ± 30	992 0160 019



Type	L	Part number
Cable signal (12 + 3 Pins)	1 000 ± 30	992 0160 061
Cable signal (12 + 3 Pins)	3 000 ± 30	992 0160 062
Cable power (4 + 3 + FE)*	1 000 ± 30	992 0160 057
Cable power (4 + 3 + FE)*	3 000 ± 30	992 0160 058

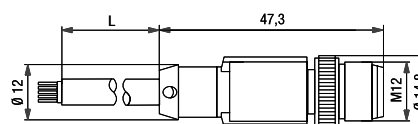
* Wires Pin 1, Pin 2 (CAN_H, CAN_L) not executed



- Signal (angled)
- 1x cable connector M16 for cable Ø 8-11 mm, Order no. 7.831.500.000
 - 1x crimp insert series M16, socket 12+3 with special coding, Order no. 7K11886034
 - 3x crimp contact socket power crimp range 0.5-1.5mm², Order no. 7.010.981.202
 - 12x crimp contact socket signal crimp range 0.08-0.34mm², Order no. 7.010.980.802

- Power (angled)
- 1x cable connector M16 for cable Ø 8-11 mm, Order no. 7.831.500.000
 - 1x crimp insert series M16, socket 4+3+PE, Order no. 7.003.943.102
 - 4x crimp contact 1.6 mm² / crimp range 0.34-1.5mm², Order no. 7.010.981.602
 - 2x crimp contact 0.8 mm² / crimp range 0.08-0.34mm², Order no. 7.010.980.802

Type	L	Part number
CANopen plug	5 000 ± 30	992 0160 018



Servomotor ECI-80.XX-K1



Description

- Highly dynamic 3-phase internal rotor motor with EC technology
- Low cogging torque
- Robust, noise-optimized ball bearing system for a long service life
- High efficiency and high power density realized in a compact design
- Basic motor with electronic module K1 for operation with external control electronics
- Mechanical design and interfaces designed for modular flexibility

More at www.ebmpapst.com/eci-motoren

Type		ECI-80.20-K1 -B00	ECI-80.20-K1 -D00	ECI-80.40-K1 -B00	ECI-80.40-K1 -D00	ECI-80.60-K1 -D00
Characteristic curve		A		B		C
Nominal voltage (U_N)	V DC	24	48	24	48	48
Nominal speed (n_N) ²⁾	rpm			4 000		
Nominal torque (M_N) ²⁾	mNm	700	700	1 200	1 200	1 800
Nominal current (I_N) ²⁾	A	13.5	7...50	25.0	12.0	18.0
Nominal output power (P_N) ²⁾	W	293	293	503	503	754
Starting torque (M_A)	mNm	2 400	2 500	3 900	5 000	5 600
Permissible peak current (I_{max}) ³⁾	A	100	60	100	100	100
Permanent stall torque (M_{NO})	mNm	700	700	1 200	1 200	1 800
Speed at no-load operation (n_L)	rpm	4 800	4 800	4 700	4 850	6 100
No-load current (I_L)	A	1.00	0.70	1.50	0.90	1.00
Recommended speed control range	rpm			0 ... 4 000		
Rotor moment of inertia (J_R)	kgm ² x10 ⁻⁶	54	54	104	104	155
Motor constant (K_E)	mVs/rad	47.2	94.1	48.2	96.0	72.2
Connection resistance (R_V)	Ω	0.07	0.30	0.03	0.10	0.04
Connection inductance (L_V)	mH	300	1300	200	600	200
Overload protection				integrated		
Permissible ambient temperature range (T_U)	°C			-30 ... +40		
Weight	kg	1.40	1.40	2.10	2.10	2.70
Part number (wire interface) ¹⁾	IP 40	932 8020 103	932 8020 105	932 8040 103	932 8040 105	932 8060 105
Part number (cable routing) ¹⁾	IP 54			on request		

¹⁾ The degree of protection refers to the installed condition with sealing on the flange side
The shaft geometry in the IP54 version is different from the displayed sketch

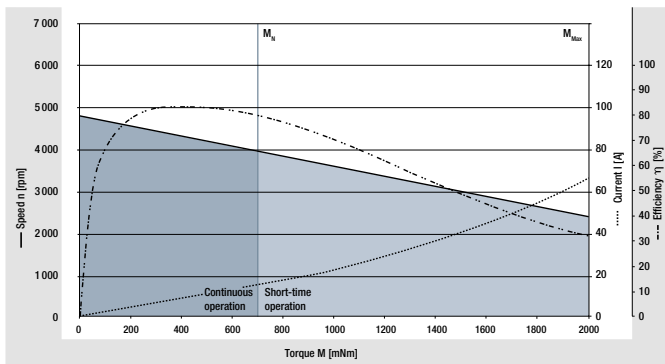
²⁾ At T_U max. 40 °C

³⁾ Permissible maximum current duration: max. 5 seconds – can be repeated after complete cool down

Preferred type: ready to ship in 48 hours

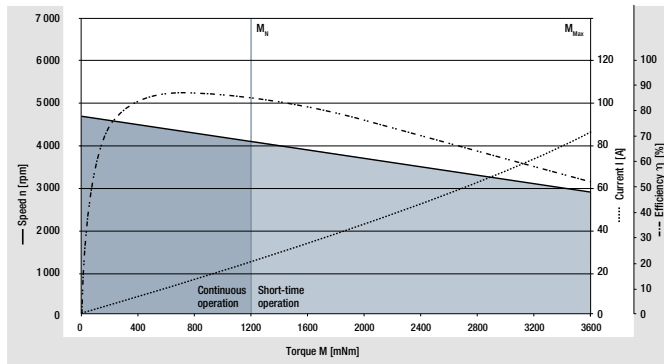
Subject to alternations

A ECI-80.20-K1, 24 V (at 25 °C)



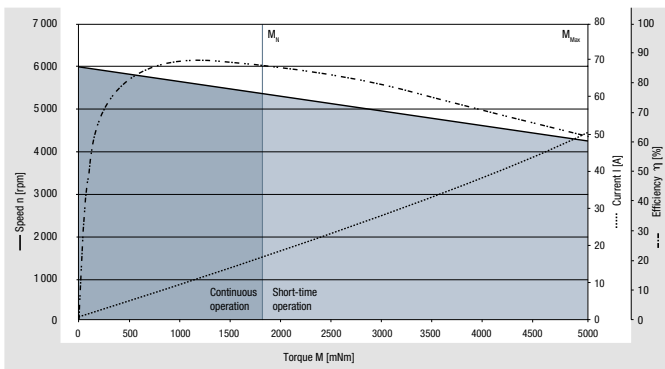
Characteristic curve 48 V on request

B ECI-80.40-K1, 24 V (at 25 °C)



Characteristic curve 48 V on request

C ECI-80.60-K1, 48 V (at 25 °C)

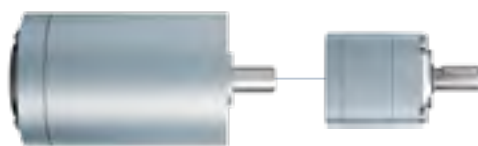


Modular system

Brake system

on request Page 76

Basic motor



Planetary gearhead

Performax®Plus 63 Page 58
Optimax 63 Page 62

Encoder system

on request Page 78



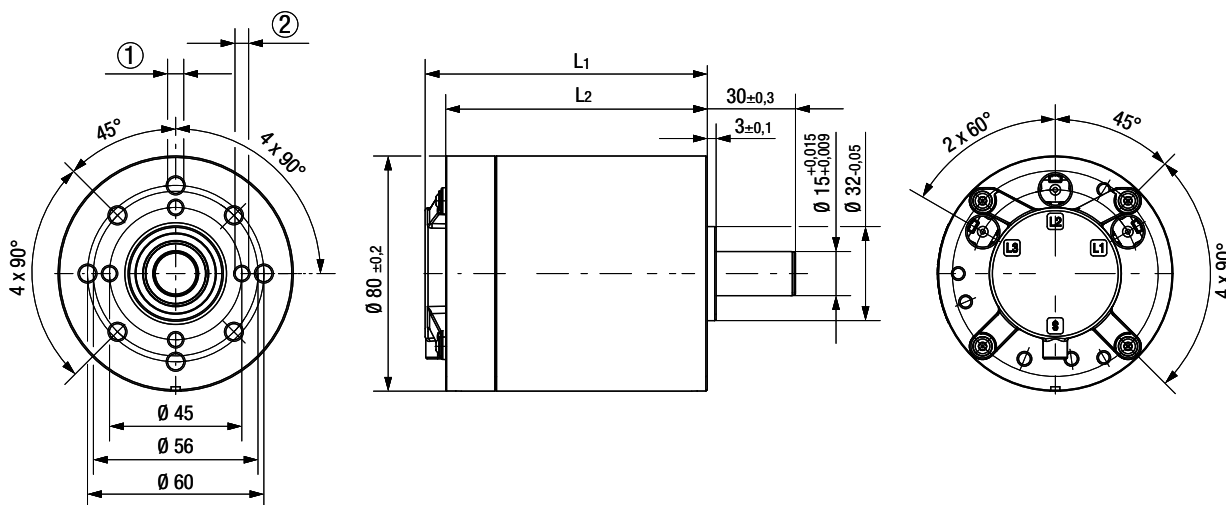
Recommended external control electronics

VTD-XX.XX-K4S Speed Page 42
VTD-60.13-K5SB Position Page 44
VTD-60.35-K5SB Position Page 46

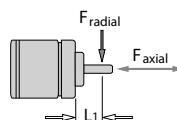


For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

Type	L1	L2
ECI-80.20	89±0.3	69±0.3
ECI-80.40	109±0.3	116±0.3
ECI-80.60	129±0.3	136±0.3



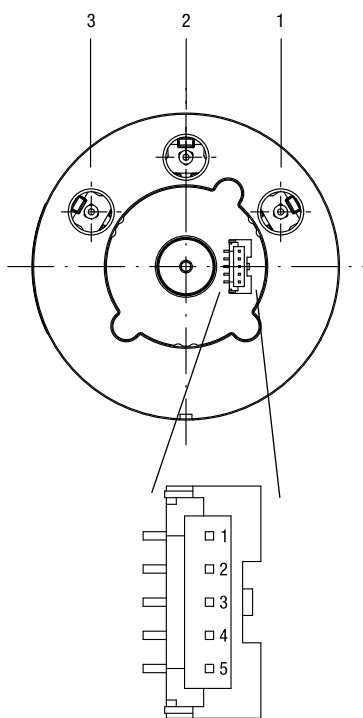
- ① 8 x for thread-forming screws M6 according DIN7500, screw-in depth max. 13 mm
- ② 4 x for thread-forming screws M5 according DIN7500, screw-in depth max. 13 mm



Permissible shaft load

F_{axial} :	70 N	Permissible simultaneous shaft loads at rated speed and service life expectancy L_{10} (in rated operation) from 20 000 h (at T_U max. 40 °C)
F_{radial} :	330 N	
L_1 :	15 mm	

Electrical connection wire



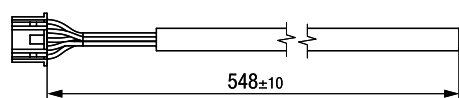
	Pin	Wire color	Configuration	Function	recommended AWG
Power	1	brown	U	Winding connector U	12
	2	violet	V	Winding connector V	
	3	yellow	W	Winding connector W	

	Pin	Wire color	Configuration	Function	recommended AWG
Signal	1	red	U_B	supply voltage	24
	2	black	GND	Ground Hall	
	3	green	Hall A	Hall signal A	
	4	white	Hall B	Hall signal B	
	5	gray	Hall C	Hall signal C	

Electrical connection cable

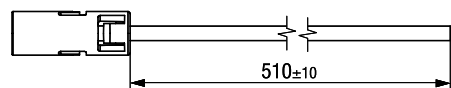
All dimensions in mm

Motor side

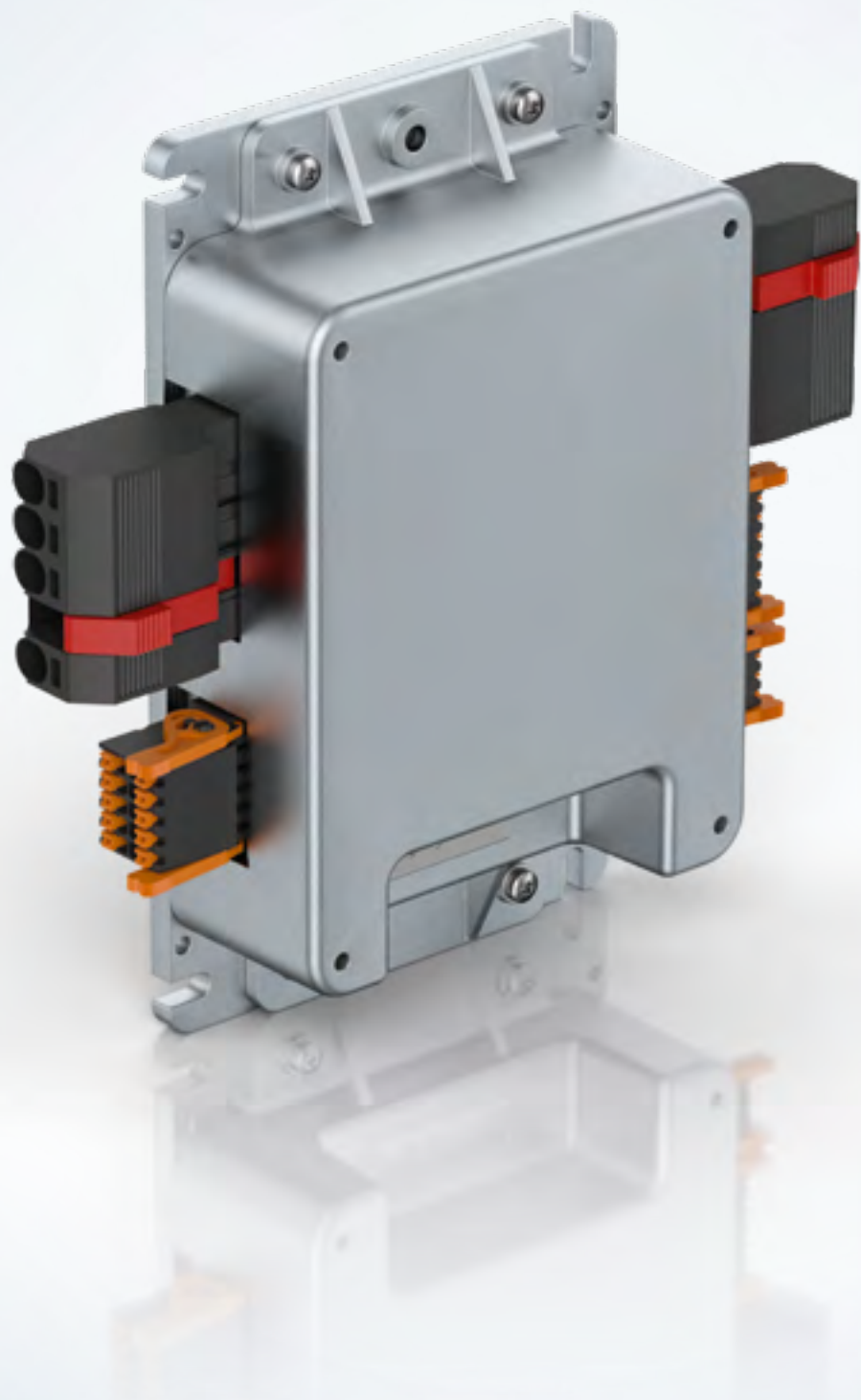


Type	Part number	AWG
Sensor cable with mating plug	992 0800 001	24

Motor side



Type	Wire color	Part number	AWG
Winding connection lead U	brown	992 0800 012	
Winding connection lead V	violet	992 0800 011	12
Winding connection lead W	Yellow	992 0800 010	



Control electronics

ebmpapst

the engineer's choice

	Page
VTD-XX.XX-K3 (speed)	40
VTD-XX.XX-K4S (position)	42
VTD-60.13-K5SB (CANopen)	44
VTD-60.35-K5SB (CANopen)	46

Control electronics VTD-XX.XX-K3



Description

- Motor commutation and speed control via microcontroller
- Control parameters are each specifically designed for the motor
- Four-quadrant controller
- Speed setting via analog nominal value 0 ... 10 V DC
- Speed actual value processing and output
- Setting of the operating mode via 2 control inputs
- Monitoring function for output current and voltage

More at www.ebmpapst.com/eci-motoren

Type		VTD-24.XX-K3	VTD-48.XX-K3
Nominal voltage (Power supply U_N)	V DC	24	48
Permissible supply voltage range (U)	V DC	18 ... 30	30 ... 52
Permissible continuous output current ¹⁾	A	3 - 12 depending on model	3 - 6 depending on model
Maximum commutation frequency	kHz	2	2
Switching frequency	kHz	20	20
Minimum connection inductance	mH	0.1	0.1
Digital inputs	Number	2	2
Digital outputs	Number	1	1
Analog inputs	Number	1	1
Efficiency (in optimum working range)	%	95	95
Permissible ambient temperature range (T_U)	°C	0 ... +40	0 ... +40
Permissible ambient humidity ²⁾	%	5 ... 93	5 ... 93
Protection class		IP 00	IP 00
Weight	kg	0.2	0.2
Part number (IP 20)		on request	on request

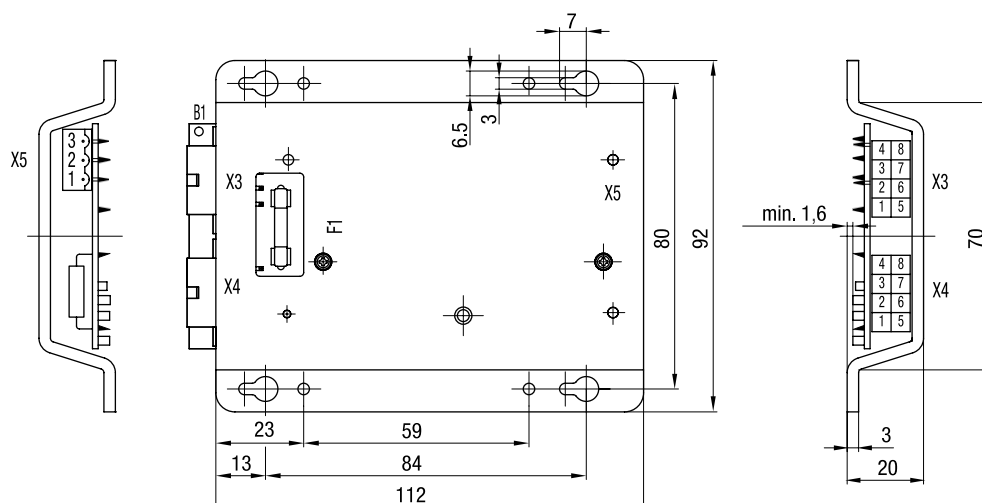
¹⁾ Applicable at rated temperature $T_U = 40^\circ\text{C}$

²⁾ Condensation not permitted

Subject to alternations

Technical drawing

All dimensions in mm



Electrical connection

Pin	Control plug X3		Motor plug X4		Capacitor plug X5	
	Configuration	Function	Configuration	Function	Configuration	Function
1	A	Operating mode A	L3	Motor phase 3	U+	Capacitor connector
2	+U _b	Supply voltage	+U-Hall	Hall sensor supply	U-	Capacitor connector
3	n.c.	Not allocated	RLG2	Hall signal 2	BR	Braking resistor
4	S+	Set value input	RLG1	Hall signal 1		
5	B	Operating mode B	L2	Motor phase 2		
6	Ist	Actual speed value	L1	Motor phase 1		
7	GND	Ground Supply voltage	GND Hall	Ground Hall sensor supply		
8	S-	Ground set value input	RLG3	Hall signal 3		

Subject to alternations

Accessories

Type	Part number
Control plug X3	
Motor plug X4	On request
Capacitor plug X5	

Control electronics VTD-XX.XX-K4S

With speed-, torque- and positioning



Description

- Operating electronics for driving 3-phase BLDC motors up to 1 000 watt output power
- Four-quadrant controller
- Speed, torque and positioning mode
- Selection of operating modes and parameter setting via RS 485
- User-friendly parameter setting with „driveSTUDIO“ software
- Integrated brake ballast-control
- Device status notification by 2 LEDs
- Mating connectors are included in delivery

More at www.ebmpapst.com/eci-motoren

Type		VTD-24.40-K4S	VTD-48.20-K4S
Nominal voltage (Power supply U_N)	V DC	24	48
Permissible supply voltage range (U)	V DC	18 ... 30	18 ... 53
Maximum output current (max. 5 sec.) ¹⁾	A	100	100
Permissible continuous output current ¹⁾	A	40	20
Nominal voltage (Logic supply U_L)	V DC	24	24
Logic current draw (at 24 V DC) ²⁾	mA	< 100	< 100
Maximum commutation frequency	kHz	2	2
Switching frequency	kHz	20	20
Minimum connection inductance	mH	0.10	0.10
Digital inputs	Number	4	4
Digital outputs	Number	3	3
Analog inputs	Number	1	1
Parameterization interface		RS485	RS485
Efficiency (in optimum working range)	%	> 95	> 95
Permissible ambient temperature range (T_U)	°C	-30 ... +40	-30 ... +40
Permissible ambient humidity ³⁾	%	5 ... 85	5 ... 85
Protection class		IP 20	IP 20
Weight	kg	ca. 0.50	ca. 0.50
Part number		994 2440 000	994 4820 000

¹⁾ Applicable at rated temperature $T_U = 25^\circ\text{C}$, Derating at deviating (higher) temperatures

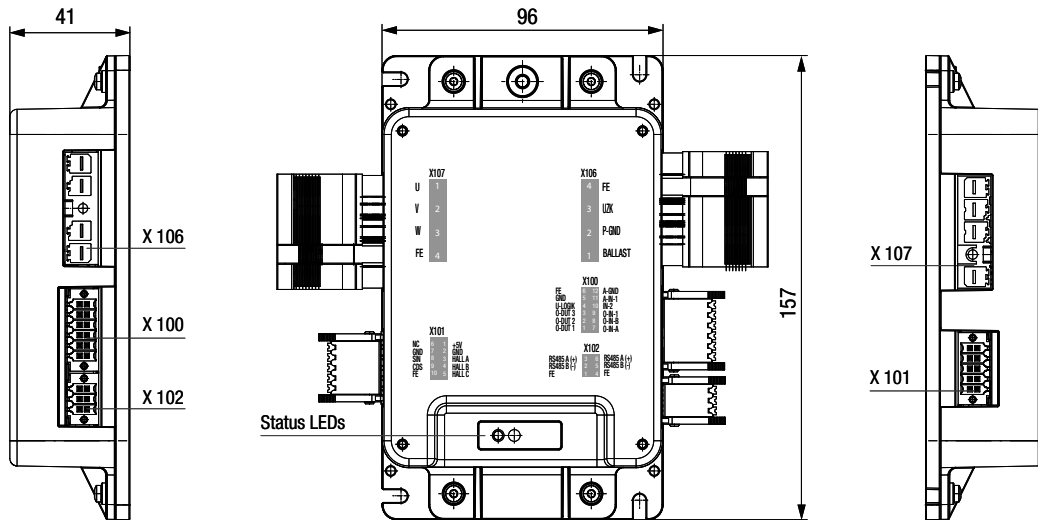
²⁾ Current draw without current requirement of digital outputs

³⁾ Condensation not permitted

Subject to alternations

Technical drawing

All dimensions in mm



Mating connectors are included in delivery

Electrical connection

Pin	X100 Signals Logic supply		X101 Hall sensors		X102 Parameterization interface		X106 Power supply, controller		X107 Power supply, motor	
	Configu- ration	Function	Configu- ration	Function	Configu- ration	Function	Configu- ration	Function	Configu- ration	Function
1	D-OUT-1	Digital output 1	+U Hall (5V)	Hall sensor supply	FE	Functional earth	Ballast	Ballast resistor	U	Winding connector U
2	D-OUT-2	Digital output 2	GND	Ground Hall-sensors	RS485 B (-)	Parameteriza- tion interface	P-GND	Ground Power supply	V	Winding connector V
3	D-OUT-3	Digital output 3	Hall A	Hall signal A	RS485 A (+)	Parameteriza- tion interface	U _{ZK}	Power supply	W	Winding connector W
4	U _{Logik}	Logic supply	Hall B	Hall signal B	FE	Functional earth	FE	Functional earth	FE	Functional earth
5	GND	Ground Logic supply	Hall C	Hall signal C	RS485 B (-)	Parameteriza- tion interface				
6	FE	Functional earth	+U _{sin/cos} (5V)	supply voltage encoder	RS485 A (+)	Parameteriza- tion interface				
7	D-IN-A	Digital input A	GND	Ground encoder						
8	D-IN-B	Digital input B	SIN	SIN singal encoder						
9	D-IN-1	Digital input 1	COS	COS signal encoder						
10	D-IN-2	Digital input 2	FE	Functional earth						
11	A-IN-1	Analog input 1								
12	A-IN-GND	Analog input 1 Ground								
AWG	22 (0,34mm ²)		22 (0,34mm ²)		22 (0,34mm ²)		8 (10mm ² at 40A)		8 (10mm ² at 40A)	

Subject to alternations

Accessories

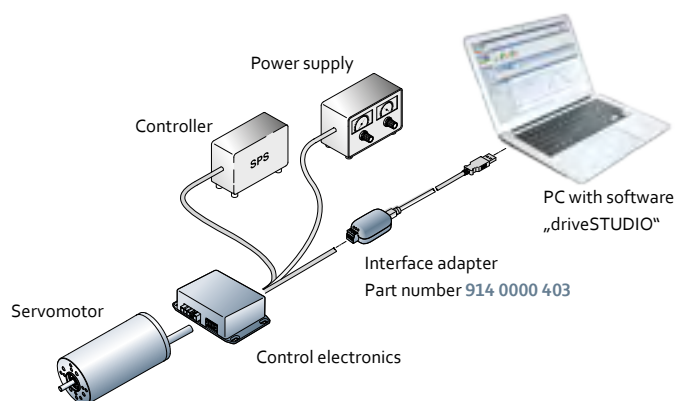
Commissioning tool

„driveSTUDIO“ (Page 70)

„drivesSTUDIO“ PC software for commissioning/ parametrization of the drive controller



Image of „driveSTUDIO“ PC-Software



Arrangement Commissioning

Control electronics VTD-60.13-K5SB

With speed-, torque- and positioning



Description

- Compact four-quadrant controller for BLDC motors
- Compact four-quadrant controller for BLDC motors
- Integrated digital inputs
- Integrated digital outputs
- Integrated analog inputs
- Overvoltage, undervoltage and overtemperature monitoring
- Device status notification by 3 LEDs (Power, Status, Error)
- Hex switch for setting the device node ID
- Freely programmable due to built in MPU (Motion Process Unit)

More at www.ebmpapst.com/eci-motoren

Type	VTD-60.13-K5SB		
Nominal voltage (Power supply U_N)	V DC	24	48
Permissible supply voltage range (U)	V DC	9 ... 60	9 ... 60
Maximum output current ¹⁾	A	50	50
Permissible continuous output current ¹⁾	A	12.5 (at 24V)	12.5 (at 24V)
Nominal voltage (Logic supply U_L)	V DC	9 ... 30	9 ... 30
Logic current draw (at 24 V DC) ²⁾	mA	60	60
Maximum commutation frequency	kHz	2	2
Switching frequency	kHz	32	32
Minimum connection inductance	mH	0.20	0.20
Digital inputs	Number	8	8
Digital outputs	Number	2	2
Analog inputs	Number	2	2
Parameterization interface		CANopen	CANopen
Efficiency (in optimum working range)	%	95	95
Permissible ambient temperature range (T_U)	°C	0 ... +70	0 ... +70
Permissible ambient humidity ³⁾	%	5 ... 85	5 ... 85
Protection class		IP 20	IP 20
Weight	kg	ca. 0.31	ca. 0.31
Part number		994 6013 000	994 6013 000

¹⁾ Applicable at rated temperature $T_U = 25^\circ\text{C}$, Derating at deviating (higher) temperatures

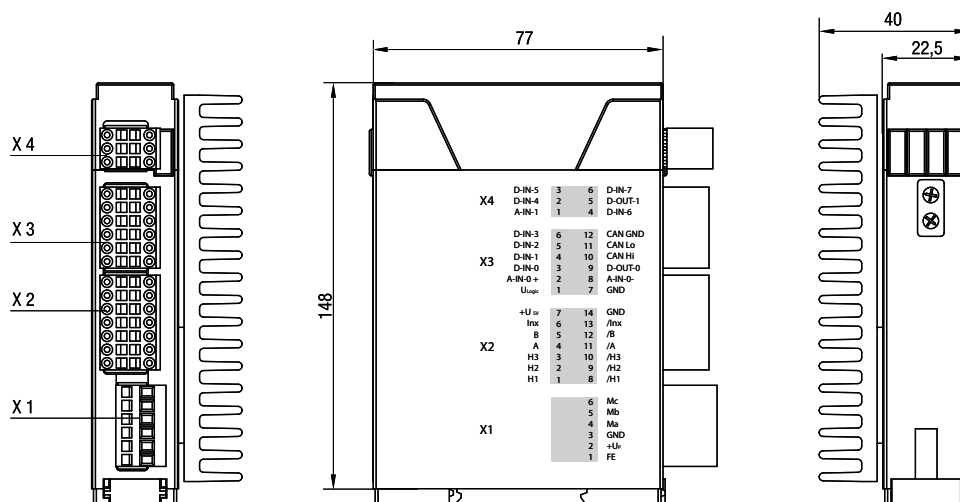
²⁾ Current draw without current requirement of digital outputs

³⁾ Condensation not permitted

Subject to alternations

Technical drawing

All dimensions in mm



Mating connectors are included in delivery

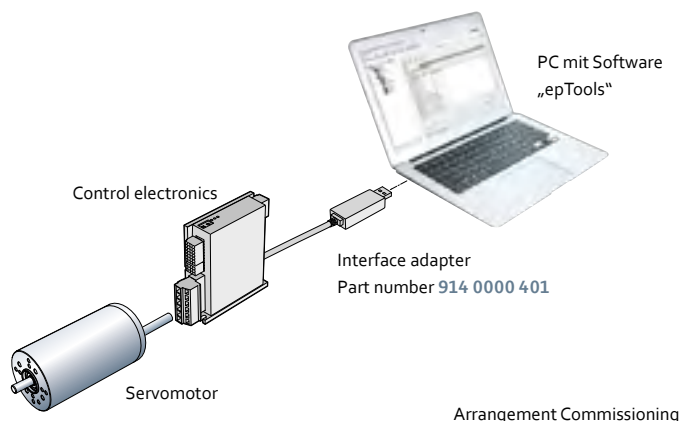
Electrical connection

Pin	Motor X1		Hall sensors and encoder X2		I/O's und CAN X3		I/O's X4	
	Configu-ration	Function	Configu-ration	Function	Configu-ration	Function	Configu-ration	Function
1	FE	Functional earth	Hall 1	Hall sensor signal 1	U _{Logik}	Logic supply	A-IN-1	Analog input 1
2	+Up	Power supply	Hall 2	Hall sensor signal 2	A-IN-0 +	Analog input 0, plus	D-IN-4	Digital input 4
3	GND	Ground for power	Hall 3	Hall sensor signal 3	D-IN-0	Digital input 0	D-IN-5	Digital input 5
4	Ma	Phase A	A	Incremental encoder- A channel	D-IN-1	Digital input 1	D-IN-6	Digital input 6
5	Mb	Phase B	B	Incremental encoder- B channel	D-IN-2	Digital input 2	D-OUT-1	Digital input 1
6	Mc	Phase C	Inx	Incremental encoder – index channel	D-IN-3	Digital input 3	D-IN-7	Digital input 7
7			+U _{sv}	5V auxiliary voltage supply (Hall and encoder)	GND	Ground for electronic supply voltage		
8			/H1	Hall sensor signal 1 inverted	A-IN-0 -	Analog input 0, minus		
9			/H2	Hall sensor signal 2 inverted	D-OUT-0	Digital output 0		
10			/H3	Hall sensor signal 3 inverted	CAN Hi	CAN bus high signal		
11			/A	Incremental encoder- A channel inverted	CAN Lo	CAN bus low signal		
12			/B	Incremental encoder- B channel inverted	CAN GND	CAN ground		
13			/Inx	Incremental encoder – index channel inverted				
14			GND	Ground for auxiliary voltage				

Subject to alternations

Accessories

Commissioning tool
„epTools“ (Page 70)



Arrangement Commissioning

Control electronics VTD-60.35-K5SB

With speed-, torque- and positioning



Description

- Compact four-quadrant controller for BLDC motors
- CANopen interface (Protocol DS301, Device profile DS402)
- Integrated digital inputs
- Integrated digital outputs
- Integrated analog inputs
- Overvoltage, undervoltage and overtemperature monitoring
- Device status notification by 3 LEDs (Power, Status, Erro)
- Hex switch for setting the device node ID
- Freely programmable due to built in MPU (Motion Process Unit)

More at www.ebmpapst.com/eci-motoren

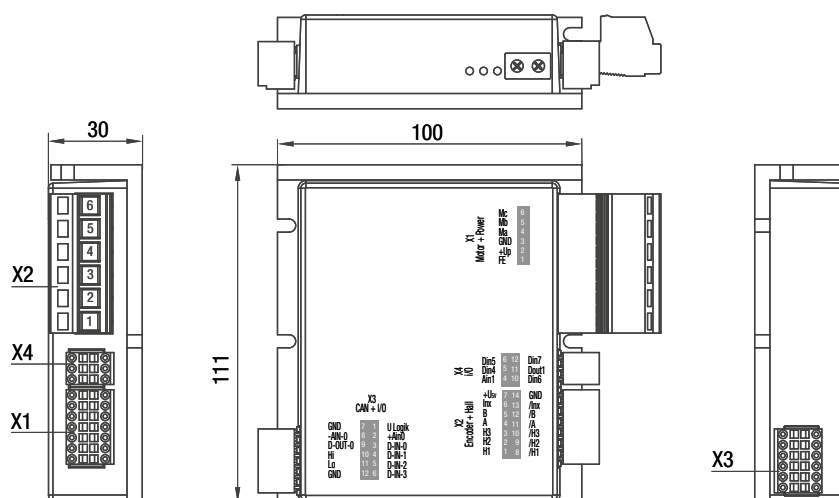
Type	VTD-60.35-K5SB		
Nominal voltage (Power supply U_N)	V DC	24	48
Permissible supply voltage range (U)	V DC	9 ... 60	9 ... 60
Maximum output current ¹⁾	A	100	100
Permissible continuous output current ¹⁾	A	35 (at 24V)	35 (at 24V)
Nominal voltage (Logic supply U_L)	V DC	9 ... 30	9 ... 30
Logic current draw (at 24 V DC) ²⁾	mA	70	70
Maximum commutation frequency	kHz	2	2
Switching frequency	kHz	32	32
Minimum connection inductance	mH	0,20	0,20
Digital inputs	Number	8	8
Digital outputs	Number	2	2
Analog inputs	Number	2	2
Parameterization interface		CANopen	CANopen
Efficiency (in optimum working range)	%	95	95
Permissible ambient temperature range (T_U)	°C	0 ... +70	0 ... +70
Permissible ambient humidity ³⁾	%	5 ... 85	5 ... 85
Protection class		IP 20	IP 20
Weight	kg	ca. 0.38	ca. 0.38
Part number		994 6035 000	994 6035 000

¹⁾ Applicable at rated temperature $T_U = 25\text{Å}^\circ\text{C}$, Derating at deviating (higher) temperatures

²⁾ Current draw without current requirement of digital outputs

³⁾ Condensation not permitted

Subject to alternations



Mating connectors are included in delivery

Electrical connection

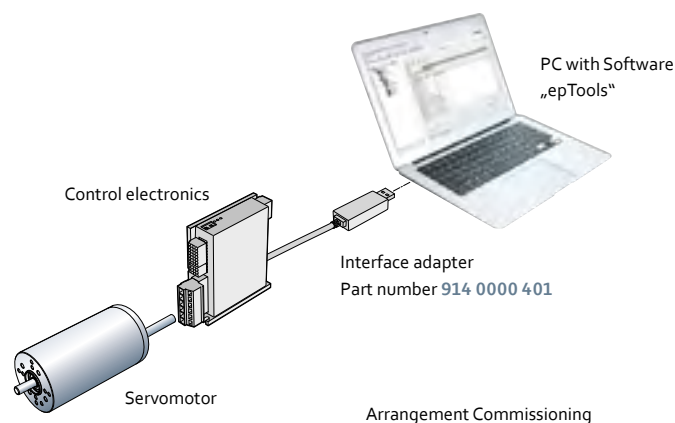
	X1	Motor	X2	Hall sensors and encoder	X3	I/O's and CAN	X4	I/O's
Pin	Configu-ration	Function	Configu-ration	Function	Configu-ration	Function	Configu-ration	Function
1	FE	Functional earth	H1	Hall sensor signal 1	U _{Logik}	Logic supply	A-IN-1	Analog input 1
2	+Up	Supply voltage power	H2	Hall sensor signal 2	A-IN-0 +	Analog input 0, plus	D-IN-4	Digital input 4
3	GND	Ground	H3	Hall sensor signal 3	D-IN-0	Digital input 0	D-IN-5	Digital input 5
4	Ma	Phase A	A	Incremental encoder - A channel	D-IN-1	Digital input 1	D-IN-6	Digital input 6
5	Mb	Phase B	B	Incremental encoder- B channel	D-IN-2	Digital input 2	D-OUT-1	Digital output 1
6	Mc	Phase C	Inx	Inkrementalgeber - Index	D-IN-3	Digital input 3	D-IN-7	Digital input 7
7			+U _{sv}	5V auxiliary voltage supply (Hall and encoder)	GND	Ground for electronic		
8			/H1	Hall sensor signal 1 inverted	A-IN-0 -	Analog input 0, minus		
9			/H2	Hall sensor signal 2 inverted	D-OUT-0	Digital output 0		
10			/H3	Hall sensor signal 3 inverted	CAN Hi	CAN bus high signal		
11			/A	Incremental encoder - A channel inverted	CAN Lo	CAN bus low signal		
12			/B	Incremental encoder- B channel inverted	CAN GND	Ground CAN		
13			/Inx	Inkrementalgeber - Index inverted				
14			GND	Ground for auxiliary voltage				

Subject to alternations

Accessories

Commissioning tool

„epTools“ (Page 70)





Gearheads

ebmpapst

the engineer's choice

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Information for gearheads

In the gearbox product range, we offer three types of transmission technologies. These include planetary gearing, crown gearhead units and spur gears, all individually adapted to the requirements of the customer according to the modular principle. Deciding which of these technologies will render the best results for the respective application, ultimately depends on the application itself.

Planetary gearhead

- Higher reduction ratios within first and second stage
- Very quiet operation
- Extremely high performance
- Compact design
- No offset axle
- Comprehensive range of products with three model types
 - Noiseless Plus " unique quiet operation
 - Performax " extreme performance
 - Optimax " robust and long lifetime



Crown gearheads

- Outstanding efficiency
- Large reduction ratio range
- No self-locking
- Highest power density
- No offset axle
- Two different model ranges
 - EtaCrown
 - EtaCrown Plus



The comprehensive range of **planetary gearbox** products is used when high power densities are required.

When it comes to achieving high efficiency with minimal noise, the **NoiselessPlus** is the impressive, obvious choice. Its exemplary smooth operation is achieved thanks to extremely sturdy, helical planetary wheels made of high-strength plastic.

Performax®Plus delivers smooth operation and high performance. Helical planetary wheels made of high-strength plastic ensure excellent smooth operation in the first stage. The combination with a hardened ring gear in the output stage means that high outputs can be achieved.

Optimax offers maximum robustness at the highest power density. Straight-toothed planetary wheels made of high-strength steel in the first and second gear stage allow high peak loads and also ensure that the transmission has a long life. If there are increased noise requirements, high-strength plastic planetary wheels can be implemented in the input stage as an option.

ebm-papst impresses with innovative **crown gearhead** technology in its family of crown gearheads.

The **EtaCrown®** is a convincing offering with its wide reduction range and compact design. Space can always be saved during installation thanks to zero axle misalignment with a symmetrical structure. High radial loads can also be incorporated via a double ball bearing on the output shaft.

The **EtaCrown®Plus** requires minimum assembly space while achieving maximum power. Thanks to a downstream planetary stage, it can achieve significantly higher torques compared to the EtaCrown of the same size.

The output shafts of the ebm-papst transmission are generally made of hardened and ground case-hardened steel, meaning that they are particularly durable. Torque is transmitted via a keyway connection as standard.

Planetary gearhead NoiselessPlus 42



Image of 1-stage gearhead

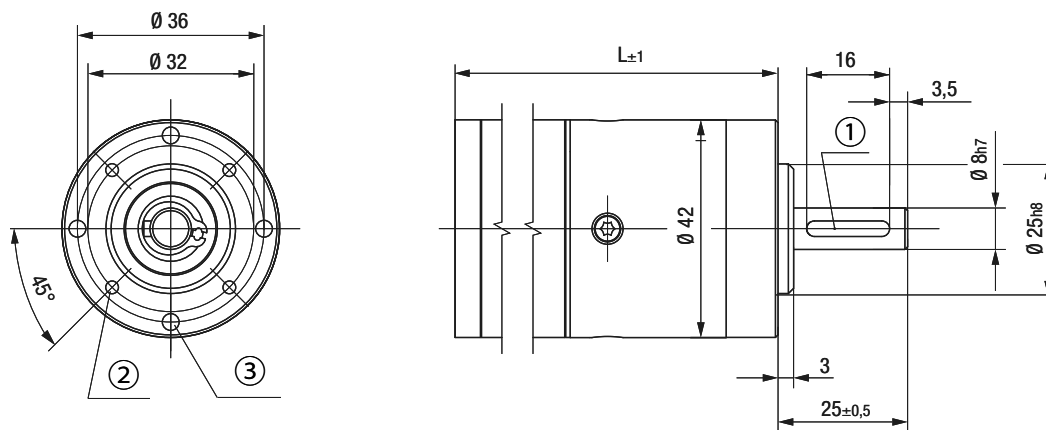
Description

- Very quiet operation due to helical-tooth gear stages
- Toothed parts made of plastic with optimized sliding properties ensure smooth operation
- Higher reduction ratios within first and second gear stage
- High radial loads due to double ball bearing in the output shaft
- Flexible connection to customer applications (shaft variants, centering and fastening)

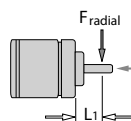
More at www.ebmpapst.com/eci-motoren

Type	NoiselessPlus 42.1					NoiselessPlus 42.2							
	Reduction ratio	4.30	6.00	11.0	21.0	26.0	47.6	66.0	121	231			
No. of stages	1	1	1	1	2	2	2	2	2				
Efficiency	0.90	0.90	0.90	0.90	0.81	0.81	0.81	0.81	0.81				
Max. input speed (n_1)	rpm				6 000								
Rated output torque (M_{ab})	Nm				2.52	1.96	1.10	0.38	4.00	4.28	4.94	3.02	3.66
Short term torque (M_{max})	Nm				6.30	4.90	2.75	0.95	10.0	10.7	12.4	7.55	9.15
Gear play	°				0.2 ... 0.5								
Permissible operating temperature range	°C				-20 ... +80								
Operating mode	S1												
Protection class	IP 50												
Weight	kg	0.22	0.22	0.22	0.22	0.25	0.25	0.25	0.25				
Shaft load radial / axial	N	50 / 350	80 / 350	175 / 350	220 / 350	250 / 350	520 / 350	680 / 350	900 / 350	1 000 / 350			
Service life	h	10 000											
Lubrication	Maintenance free grease lubrication for life												
Installation position	any												
Length	mm	40.1	40.1	40.1	40.1	67.1	67.1	67.1	67.1	67.1			

Subject to alternations



- ① Feather key DIN 6885 A-3x3x16
- ② 4 x M3, 8 deep
- ③ 4 x M4, 8 deep



Permissible shaft load

F_{axial} : 350 N
 F_{radial} : see table
 L_1 : 12.5 mm

At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 10 000 h (at T_U max. 40°C in rated operation)

Length motor / gearhead combinations

All dimensions in mm

		Length L				1-stage reduction ratios					Length L		2-stage reduction ratios				
		1-stage	4.30	6.00	11.0	21.0	2-stage	26.0	47.6	66.0	121	231					
ECI-42.20-NP42	24V	144.1	•	•	•	X	171.1	•	•	•	X	X					
	48V		•	•	•	X		•	•	•	X	X					
ECI-42.40-NP42	24V	164.1	○	•	X	X	191.1	○	X	X	X	X					
	48V		•	•	X	X		•	X	X	X	X					

Subject to alternations

• Standard ○ Preferred type X on request

Planetary gearhead NoiselessPlus 63



Image of 1-stage gearhead

Description

- Very quiet operation due to helical-tooth gear stages
- Toothed parts made of plastic with optimized sliding properties ensure smooth operation
- Higher reduction ratios within first and second gear stage
- High radial loads due to double ball bearing in the output shaft
- Flexible connection to customer applications (shaft variants, centering and fastening)

More at www.ebmpapst.com/eci-motoren

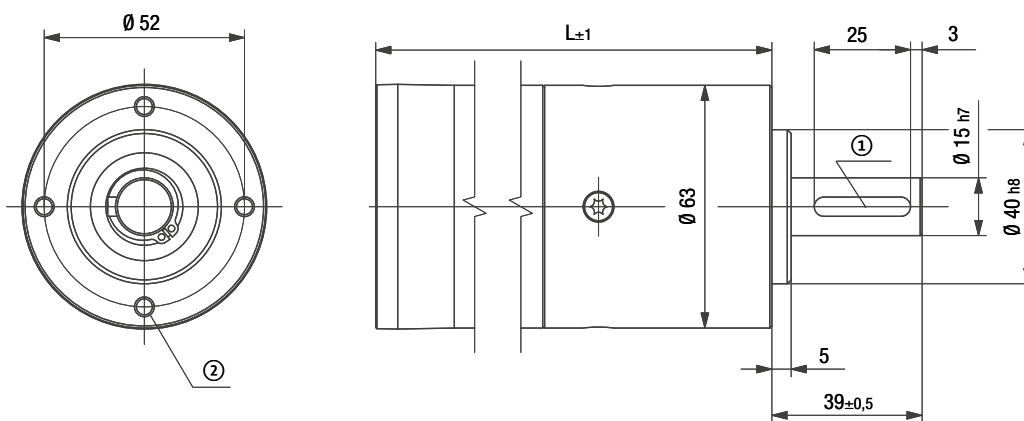
Type	NoiselessPlus 63.1					NoiselessPlus 63.2				
Reduction ratio	4.30	6.00	11.0	21.0	26.0	47.6	66.0	121		
No. of stages	1	1	1	1	2	2	2	2		
Efficiency	0.90	0.90	0.90	0.90	0.81	0.81	0.81	0.81		
Max. input speed (n_1)	rpm		6 000							
Rated output torque (M_{ab})	Nm	8.99	7.13	3.98	1.32	12.6	14.7	17.5	10.6	
Short term torque (M_{max})	Nm	22.5	17.8	9.95	3.30	31.5	36.8	43.8	26.5	
Gear play	°		0.2 ... 0.5							
Permissible operating temperature range	°C		-20 ... +80							
Operating mode	S1									
Protection class	IP 50									
Weight	kg	0.56	0.56	0.56	0.56	0.80	0.80	0.80	0.80	
Shaft load radial / axial	N	50 / 1 000	50 / 1 000	50 / 1 000	100 / 1 000	780 / 1 000	1 000 / 1 000	1 000 / 1 000	1 550 / 1 000	
Service life	h	10 000								
Lubrication	Maintenance free grease lubrication for life									
Installation position	any									
Length	mm	59	59	59	59	91.4	91.4	91.4	91.4	

Subject to alternations

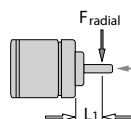
Technical drawing

Image of 1-stage gearhead

All dimensions in mm



- ① Fitted key DIN 6885 A-5x5x25
- ② 4 x M5, 10 deep



Permissible shaft load

F_{axial} : 1000 N
 F_{radial} : see table
 L_1 : 19 mm

At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 10 000 h (at T_U max. 40°C in rated operation)

Length motor / gearhead combinations

All dimensions in mm

		Length L				1-stage reduction ratios				Length L	2-stage reduction ratios			
		1-stage	4.30	6.00	11.0	21.0	2-stage	26.0	47.6		66.0	121		
ECI-63.20-K1-NP63	24V	165.1	•	•	•	X	197.5	•	•	•	X			
	48V		•	•	•	X		•	•	•	X			
ECI-63.40-K1-NP63	24V	185.1	○	•	X	X	217.5	○	X	X	X			
	48V		•	•	X	X		•	X	X	X			
ECI-63.60-K1-NP63	24V	205.1	•	•	X	X	237.5	•	X	X	X			
	48V		○	•	X	X		○	X	X	X			
ECI-63.20-K3-NP63	24V	177.5	•	•	•	X	209.9	•	•	•	X			
	48V		•	•	•	X		•	•	•	X			
ECI-63.40-K3-NP63	24V	197.5	•	•	X	X	229.9	•	X	X	X			
	48V		•	•	X	X		•	X	X	X			
ECI-63.60-K3-NP63	48V	217.5	•	•	X	X	249.9	•	X	X	X			
ECI-63.20-K4-NP63	24V	177.5	•	•	•	X	209.9	•	•	•	X			
	48V		•	•	•	X		•	•	•	X			
ECI-63.40-K4-NP63	24V	197.5	○	•	X	X	229.9	○	X	X	X			
	48V		•	•	X	X		•	X	X	X			
ECI-63.60-K4-NP63	48V	217.5	○	•	X	X	249.9	○	X	X	X			
ECI-63.20-K5-NP63	24V	171	•	•	•	X	203.4	•	•	•	X			
	48V		•	•	•	X		•	•	•	X			
ECI-63.40-K5-NP63	24V	191	•	•	X	X	223.4	•	X	X	X			
	48V		•	•	X	X		•	X	X	X			
ECI-63.60-K5-NP63	48V	211	•	•	X	X	243.4	•	X	X	X			

Subject to alternations

- Standard
- Preferred type
- X on request

Planetary gearhead Performax®Plus 42



Image of 2-stage gearhead

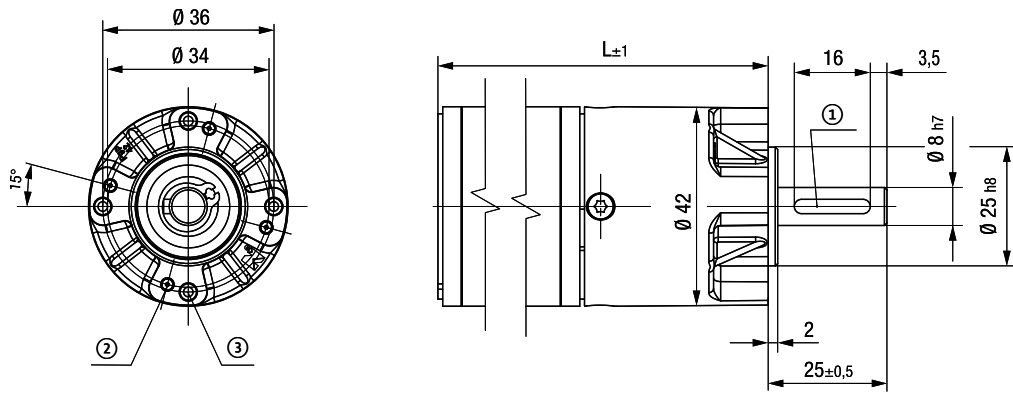
Description

- High torques thanks to large gearing width in the first gear stage
- Good shock resistance due to housing made of case-hardened steel with linear tooth profile in the output stage
- Very quiet operation due to helical teeth in the first gear stage
- Planetary wheels made of plastic with optimized sliding properties in the first stage ensure smooth operation
- Large effective diameter thanks to radial screw connection

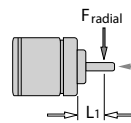
More at www.ebmpapst.com/eci-motoren

Type	Performax®Plus 42.1		Performax®Plus 42.2	
Reduction ratio	5.00	9.00	30.0	54.0
No. of stages	1	1	2	2
Efficiency	0.90	0.90	0.81	0.81
Max. input speed (n_1)	rpm		6 000	
Rated output torque (M_{ab})	Nm	2.00	1.12	4.48
Short term torque (M_{max})	Nm	5.00	2.80	11.2
Gear play	°		0.7 ... 1.2	
Permissible operating temperature range	°C		-20 ... +80	
Operating mode			S1	
Protection class			IP 50	
Weight	kg	0.22	0.22	0.33
Shaft load radial / axial	N		250 / 150	
Service life	h		5 000	
Lubrication			Maintenance free grease lubrication for life	
Installation position			any	
Length	mm	39.3	39.3	54.8

Subject to alternations



- ① Fitted key DIN 6885 A-3x3x16
- ② 4 x M3, 8 deep
- ③ 4 x M4, 8 deep



Permissible shaft load

F_{axial} : 150 N
 F_{radial} : 250 N
 L_1 : 12.5 mm

At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 5 000 h (at T_U max. 40°C in rated operation)

Length motor / gearhead combinations

All dimensions in mm

	Voltage	Length L	1-stage reduction ratios		Length L	2-stage reduction ratios	
			1-stage	5.00		9.00	2-stage
ECI-42.20-K1-PP42	24V	143.3	•	•	158.8	•	•
	48V		•	•		•	•
ECI-42.40-K1-PP42	24V	163.3	○	X	178.0	○	X
	48V		•	X		•	X

Subject to alternations

- Standard
- Preferred type
- X on request

Planetary gearhead Performax®Plus 63



Image of 2-stage gearhead

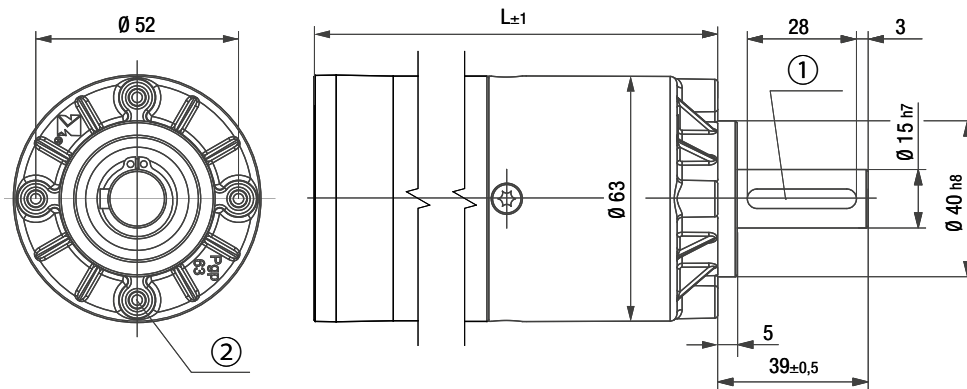
Description

- High torques thanks to large gearing width in the first gear stage
- Good shock resistance due to housing made of case-hardened steel with linear tooth profile in the output stage
- Very quiet running due to helical teeth in the first gear stage
- Planetary wheels made of plastic with optimized sliding properties in the first stage ensure smooth operation
- Large effective diameter thanks to radial screw connection

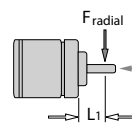
More at www.ebmpapst.com/eci-motoren

Type	Performax®Plus 63.1						Performax®Plus 63.2					
Reduction ratio	3.20	5.00	9.00	17.0	21.3	30.0	38.3	54.0	72.3	102	204	
No. of stages	1	1	1	1	2	2	2	2	2	2	2	
Efficiency	0.90	0.90	0.90	0.90	0.81	0.81	0.81	0.81	0.81	0.81	0.81	
Max. input speed (n_1)	rpm					6 000						
Rated output torque (M_{ab})	Nm	6.50	11.9	7.60	4.40	45.2	64.0	28.9	41.0	16.9	23.9	27.4
Short term torque (M_{max})	Nm	16.3	29.8	19.0	11.0	113	160	72.3	102.5	42.3	59.8	68.5
Gear play	°						0.7 ... 1.2					
Permissible operating temperature range	°C						-20 ... +80					
Operating mode						S1						
Protection class						IP 50						
Weight	kg	0.66	0.66	0.66	0.66	1.20	1.20	1.20	1.20	1.20	1.20	
Shaft load radial / axial	N						350 / 500					
Service life	h						5 000					
Lubrication	Maintenance free grease lubrication for life											
Installation position	any											
Length	mm	57.7	57.7	57.7	57.7	79.1	79.1	79.1	79.1	79.1	79.1	

Subject to alternations



- ① Fitted key DIN 6885 A-5x5x28
 ② 4 x M5, 10 deep



Permissible shaft load

F_{axial} :	500 N	At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 5 000 h (at T_U max. 40°C in rated operation)
F_{radial} :	350 N	
L_1 :	19 mm	

Length motor / gearhead combinations

All dimensions in mm

		Length L	1-stage reduction ratios				Length L	2-stage reduction ratios							
			1-stage	3.20	5.00	9.00		17.0	2-stage	21.3	30.0	38.3	54.0	72.3	102
ECI-63.20-K1-PP63	24V	163.8	•	•	•	•	185.2	•	•	•	•	•	•	•	X
	48V		•	•	•	•		•	•	•	•	•	•	•	X
ECI-63.40-K1-PP63	24V	183.8	•	○	•	X	205.2	•	○	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.60-K1-PP63	24V	203.8	•	•	•	X	225.2	•	•	•	•	X	X	X	
	48V		•	○	•	X		•	○	•	•	X	X	X	
ECI-63.20-K3-PP63	24V	176.2	•	•	•	•	197.6	•	•	•	•	•	•	X	
	48V		•	•	•	•		•	•	•	•	•	•	X	
ECI-63.40-K3-PP63	24V	196.2	•	•	•	X	217.6	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.60-K3-PP63	24V	216.2	•	•	•	X	237.6	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.20-K4-PP63	24V	176.2	•	•	•	•	197.6	•	•	•	•	•	•	X	
	48V		•	•	•	•		•	•	•	•	•	•	X	
ECI-63.40-K4-PP63	24V	196.2	•	○	•	X	217.6	•	○	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.60-K4-PP63	24V	216.2	•	○	•	X	237.6	•	○	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.20-K5-PP63	24V	169.7	•	•	•	•	191.1	•	•	•	•	•	•	X	
	48V		•	•	•	•		•	•	•	•	•	•	X	
ECI-63.40-K5-PP63	24V	189.7	•	•	•	X	211.1	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-63.60-K5-PP63	24V	209.7	•	•	•	X	231.1	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-80.20-K1-PP63	24V	146.7	•	•	•	X	168.1	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-80.40-K1-PP63	24V	166.7	•	•	•	X	188.1	•	•	•	•	X	X	X	
	48V		•	•	•	X		•	•	•	•	X	X	X	
ECI-80.60-K1-PP63	24V	186.7	•	•	X	X	208.1	•	•	X	X	X	X	X	
	48V		•	•	X	X		•	•	X	X	X	X	X	

Subject to alternations

• Standard ○ Preferred type X on request

Planetary gearhead Optimax 42



Image of 1-stage gearhead

Description

- Extreme high overload capability to cope with peak torques
- Robust gearhead concept for extended service life
- Modular design and interfaces for maximum flexibility within ebm-papst modular system
- High efficiency in compact design
- Noise optimized version with planetary wheels made from high-strength plastic

More at www.ebmpapst.com/eci-motoren

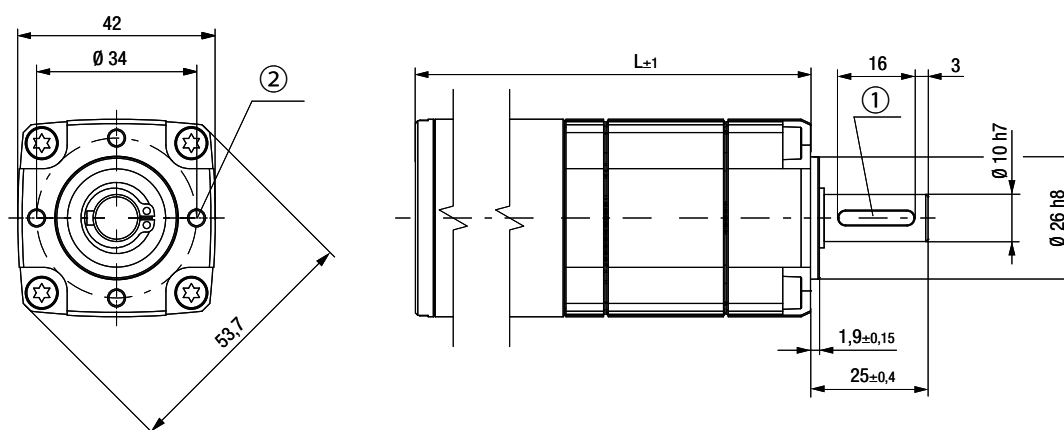
Type	Optimax 42.1				Optimax 42.2			
Reduction ratio	3.00	5.00	9.00	9.00	15.0	25.0	45.0	
No. of stages	1	1	1	2	2	2	2	
Efficiency	0.90	0.90	0.90	0.81	0.81	0.81	0.81	
Max. input speed (n_1)	rpm			6 000				
Rated output torque (M_{ab}) ¹⁾	Nm	16 ²⁾ (5.3) ³⁾	16 ²⁾ (5.3) ³⁾	10 ²⁾ (2.5) ³⁾	27 ²⁾ (14) ³⁾	27 ²⁾ (23) ³⁾	27 ²⁾ (23) ³⁾	23 ²⁾ (11) ³⁾
Short term torque (M_{max})	Nm	48 ²⁾ (16) ³⁾	48 ²⁾ (16) ³⁾	30 ²⁾ (7.5) ³⁾	81 ²⁾ (42) ³⁾	81 ²⁾ (69) ³⁾	81 ²⁾ (69) ³⁾	69 ²⁾ (32) ³⁾
Gear play	°	< 0.9	< 0.9	< 0.9	< 1.2	< 1.2	< 1.2	< 1.2
Permissible operating temperature range	°C			-30 ... +90				
Operating mode	S1/S3							
Protection class	IP 54							
Weight	kg	0.45	0.45	0.45	0.70	0.70	0.70	0.70
Shaft load radial / axial	N	210 / 210						
Service life	h	10 000						
Lubrication	Maintenance free grease lubrication for life							
Installation position	any							
Length	mm	51.2	51.2	51.2	72.2	72.2	72.2	72.2

¹⁾In S1 operation

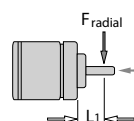
²⁾Default: made of high-strength steel / Value applies to planet gears (first stage)

³⁾Optional: made of high-strength plastic / Value applies to planet gears (first stage)

Subject to alternations



- ① Fitted key DIN 6885 A-3x3x16
 ② 4 x M4, 10 deep



Permissible shaft load

F_{axial} :	210 N	At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 10 000 h (at T_U max. 40°C in rated operation)
F_{radial} :	210 N	
L_1 :	12 mm	

Length motor / gearhead combinations

All dimensions in mm

		Length L			1-stage reduction ratios				Length L		2-stage reduction ratios		
		1-stage	3,00	5,00	9,00	2-stage	9,00	15,0	25,0	45,0			
ECI-42.20-K1-O42	24V	155.2	•	•	•	176.2	•	•	•	•			
	48V	155.2	•	•	•	176.2	•	•	•	•			
ECI-42.40-K1-O42	24V	175.2	•	○	X	196.2	•	•	○	X			
	48V	175.2	•	•	X	196.2	•	•	•	X			

Subject to alternations

• Standard ○ Preferred type X on request

Planetary gearhead Optimax 63



Image of 1-stage gearhead

Description

- Extreme high overload capability to cope with peak torques
- Robust gearhead concept for extended service life
- Modular design and interfaces for maximum flexibility within ebm-papst modular system
- High efficiency in compact design
- Noise optimized version with planetary wheels made from high-strength plastic
- Protection class IP 50 (optional IP 54)

More at www.ebmpapst.com/eci-motoren

Type	Optimax 63.1				Optimax 63.2			
Reduction ratio	3.00	5.00	9.00	9.00	15.0	25.0	45.0	
No. of stages	1	1	1	2	2	2	2	
Efficiency	0.90	0.90	0.90	0.81	0.81	0.81	0.81	
Max. input speed (n_1)	rpm			6 000				
Rated output torque (M_{ab}) ¹⁾	Nm	40.0 ²⁾ (13.0) ³⁾	40.0 ²⁾ (13.0) ³⁾	25.0 ²⁾ (6.00) ³⁾	68.0 ²⁾ (35.0) ³⁾	68.0 ²⁾ (35.0) ³⁾	58.0 ²⁾ (27.0) ³⁾	
Short term torque (M_{max})	Nm	120 ²⁾ (39.0) ³⁾	120 ²⁾ (39.0) ³⁾	75.0 ²⁾ (18.0) ³⁾	81.0 ²⁾ (42) ³⁾	150 ²⁾ (105) ³⁾	150 ²⁾ (81.0) ³⁾	
Gear play	°	< 0.9	< 0.9	< 0.9	< 1.2	< 1.2	< 1.2	
Permissible operating temperature range	°C	-30 ... +90						
Operating mode	S1/S3							
Protection class	IP 50							
Weight	kg	1.30	1.30	1.30	1.90	1.90	1.90	
Shaft load radial / axial	N	500 / 500						
Service life	h	10 000						
Lubrication	Maintenance free grease lubrication for life							
Installation position	any							
Length	mm	71.2	71.2	71.2	102.4	102.4	102.4	

¹⁾In S1 operation

²⁾Default: made of high-strength steel / Value applies to planet gears (first stage)

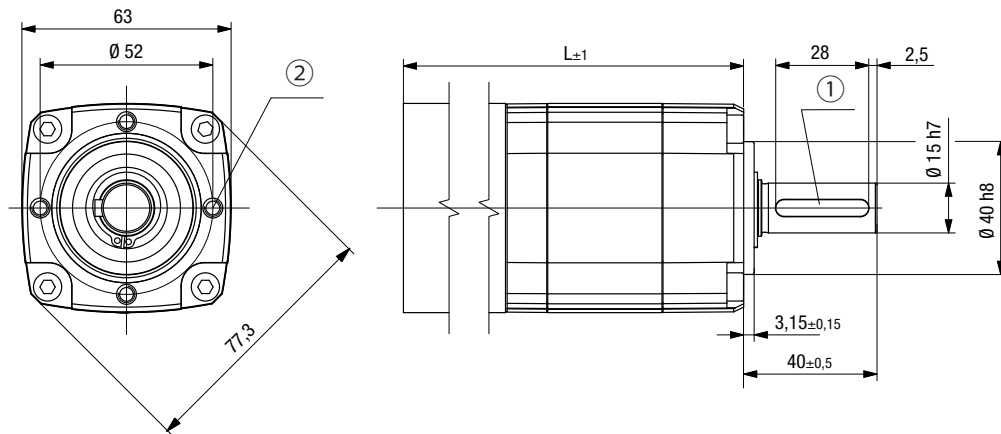
³⁾Optional: made of high-strength plastic / Value applies to planet gears (first stage)

Subject to alternations

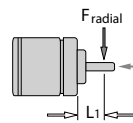
Technical drawing

Image of 1-stage gearhead

All dimensions in mm



- ① Fitted key DIN 6885 A-5x5x28
 ② 4 x M4, 15 deep



Permissible shaft load

F_{axial} : 500 N At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 10 000 h (at T_U max. 40°C in rated operation)
 F_{radial} : 500 N
 L_1 : 20 mm

Length motor / gearhead combinations

All dimensions in mm

		Length L	1-stage reduction ratios			Length L	2-stage reduction ratios			
			1-stage	3.00	5.00		9.00	2-stage	9.00	15.0
ECI-63.20-K1-O63	24V	177.3	•	•	•	208.5	•	•	•	•
	48V		•	•	•		•	•	•	•
ECI-63.40-K1-O63	24V	197.3	•	○	•	228.5	•	•	○	•
	48V		•	•	•		•	•	•	•
ECI-63.60-K1-O63	24V	217.3	•	•	X	248.5	•	•	•	X
	48V		•	○	X		•	•	○	X
ECI-63.20-K3-O63	24V	189.7	•	•	•	220.9	•	•	•	•
	48V		•	•	•		•	•	•	•
ECI-63.40-K3-O63	24V	209.7	•	•	•	240.9	•	•	•	•
	48V		•	•	•		•	•	•	•
ECI-63.60-K3-O63	48V	229.7	•	•	X	260.9	•	•	•	X
ECI-63.60-K4-O63	24V	189.7	•	•	•	220.9	•	•	•	•
	48V		•	•	•		•	•	•	•
ECI-63.40-K4-O63	24V	209.7	•	○	•	240.9	•	•	○	•
	48V		•	•	•		•	•	•	•
ECI-63.60-K4-O63	48V	229.7	•	○	X	260.9	•	•	○	X
ECI-63.20-K5-O63	24V	183.2	•	•	•	214.4	•	•	•	•
	48V		•	•	•		•	•	•	•
ECI-63.40-K5-O63	24V	203.2	•	○	•	234.4	•	•	○	•
	48V		•	•	•		•	•	•	•
ECI-63.60-K5-O63	48V	223.2	•	○	X	254.4	•	•	○	X
ECI-80.20-K1-O63	24V	160.2	•	•	X	191.4	•	•	•	X
	48V		•	•	X		•	•	•	X
ECI-80.40-K1-O63	24V	180.2	•	○	X	211.4	•	•	○	X
	48V		•	•	X		•	•	•	X
ECI-80.60-K1-O63	48V	200.2	•	○	X	231.4	•	•	○	X

Subject to alternations

• Standard ○ Preferred type X on request

Crown gearhead EtaCrown® 52



Image of 2-stage gearhead

Description

- Maximum safety in design and operation, as well as optimal vandalism protection; no automatic lock due to high efficiency of the crown wheel technology
- Space-saving installation due to zero offset axle and symmetrical structure
- Flexible application possibilities with various optional shaft outlets and available shaft geometries
- Wide reduction range by means of upstream / downstream planetary stage
- High radial loads due to double ball bearing in the output shaft

More at www.ebmpapst.com/eci-motoren

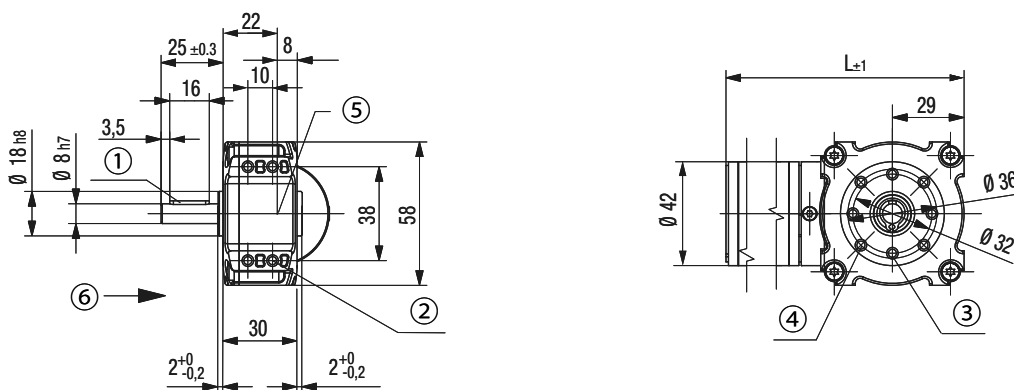
Type	EtaCrown® 52.1				EtaCrown® 52.2			
Reduction ratio	4.10	6.70	10.1	21.2	33.3	60.0	113	
No. of stages	1	1	1	2	2	2	2	
Efficiency	0.90	0.90	0.90	0.81	0.81	0.81	0.81	
Max. input speed (n_1)	rpm			6 000				
Rated output torque (M_{ab})	Nm	0.21	0.34	0.52	0.98	1.54	2.77	3.48
Short term torque (M_{max})	Nm	0.53	0.85	1.30	2.45	3.85	6.93	8.70
Gear play	°	0.55 ... 1.1						
Permissible operating temperature range	°C	-20 ... +80						
Operating mode	S1							
Protection class	IP 50							
Weight	kg	0.40	0.40	0.40	0.65	0.65	0.65	0.65
Shaft load radial / axial	N	200 / 150	200 / 150	210 / 150	240 / 150	270 / 150	350 / 150	440 / 150
Service life	h	5 000						
Lubrication	Maintenance free grease lubrication for life							
Installation position	any							
Length	mm	65.9	65.9	65.9	94.6	94.6	94.6	94.6

Subject to alternations

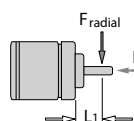
Technical drawing

Image of 1-stage gearhead with right shaft end (W05)

All dimensions in mm



- ① Fitted key DIN 6885 A-3x3x16
- ② 4 x M4, 6.5 deep (on all front faces)
- ③ 8 x M4, 6.5 deep (both sides)
- ④ Without hole at the opposite side
- ⑤ Motor centre point
- ⑥ Preferred direction of load



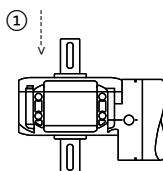
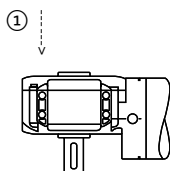
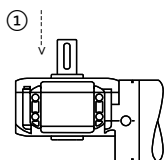
Permissible shaft load

F_{axial} : 150 N
 F_{radial} : see table
 L_1 : 12.5 mm
 At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 5 000 h (at T_U max. 40°C in rated operation)

Shaft end, right (W05) (standard)

Shaft end, left (W06)

Shaft end, both sides (W07)



- ① Preferred direction of load

Length motor / gearhead combinations

All dimensions in mm

	Length L	1-stage reduction ratios			Length L	2-stage reduction ratios				
		1-stage	4.10	6.70		10.1	2-stage	21.2	33.3	60.0
ECI-42.20-K1-E52	24V	169.9	○	X	X	198.6	○	○	X	X
	48V		●	X	X		●	●	X	X
ECI-42.40-K1-E52	24V	189.9	X	X	X	218.6	X	X	X	X
	48V		X	X	X		X	X	X	X

Subject to alternations

● Standard ○ Preferred type X on request

Crown gearhead EtaCrown® 75



Image of 2-stage gearhead

Description

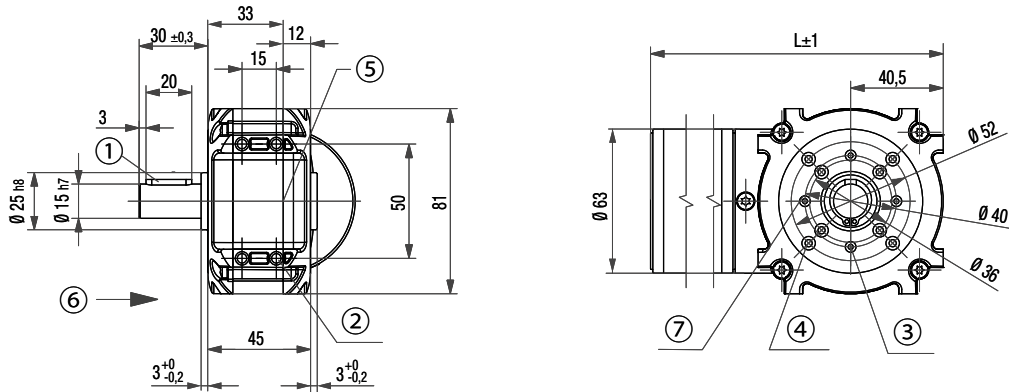
- Maximum safety in design and operation, as well as optimal vandalism protection; no automatic lock due to high efficiency of the crown wheel technology
- Space-saving installation due to zero offset axle and symmetrical structure
- Flexible application possibilities with various optional shaft outlets and available shaft geometries
- Wide reduction range by means of upstream / downstream planetary stage
- High radial loads due to double ball bearing in the output shaft

More at www.ebmpapst.com/eci-motoren

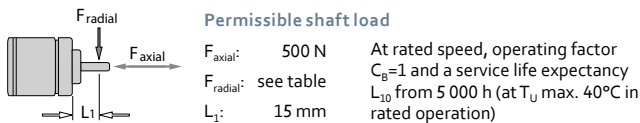
Type	EtaCrown® 75.1				EtaCrown® 75.2			
Reduction ratio	4.10	6.70	10.1	20.3	33.3	60.0	113	
No. of stages	1	1	1	2	2	2	2	
Efficiency	0.90	0.90	0.90	0.81	0.81	0.81	0.81	
Max. input speed (n_1)	rpm			6 000				
Rated output torque (M_{ab})	Nm	6.00	5.00	2.43	10.0	10.0	10.0	10.0
Short term torque (M_{max})	Nm	15.0	12.5	6.08	25.0	25.0	25.0	25.0
Gear play	°			0.55 ... 1.1				
Permissible operating temperature range	°C			-20 ... +80				
Operating mode	S1							
Protection class	IP 50							
Weight	kg	0.90	0.90	0.90	1.30	1.30	1.30	1.30
Shaft load radial / axial	N	390 / 500	380 / 500	370 / 500	450 / 500	460 / 500	580 / 500	700 / 500
Service life	h	5 000						
Lubrication	Maintenance free grease lubrication for life							
Installation position	any							
Length	mm	91	91	91	133.3	133.3	133.3	133.3

Subject to alternations

Technical drawing Image of 1-stage gearhead with right shaft end (W05) All dimensions in mm



- ① Fitted key DIN 6885 A-5x5x20
- ② 4 x M5, 6.5 deep (on all front faces)
- ③ 4 x M4, 6.5 deep (both sides)
- ④ 8x M5, 6.5 deep
- ⑤ Motor centre point
- ⑥ Preferred direction of load
- ⑦ Without hole at the opposite side



Shaft end, right (W05) (standard) Shaft end, left (W06) Shaft end, both sides (W07) Hollow shaft (W08)



① Preferred direction of load

Length motor / gearhead combinations All dimensions in mm

	Length L	1-stage reduction ratios			Length L	2-stage reduction ratios				
		1-stage	4.10	6.70		10.1	2-stage	20.3	33.3	60.0
ECI-63.20-K1-E75	24V	197.1	•	•	•	239.4	•	•	X	X
	48V		•	•	•		•	•	X	X
ECI-63.40-K1-E75	24V	217.1	○	•	X	259.4	○	○	X	X
	48V		•	•	X		•	X	X	X
ECI-63.60-K1-E75	24V	237.1	•	•	X	279.4	•	X	X	X
	48V		○	•	X		○	○	X	X
ECI-63.20-K3-E75	24V	209.5	•	•	•	251.8	•	•	X	X
	48V		•	•	•		•	•	X	X
ECI-63.40-K3-E75	24V	229.5	•	•	X	271.8	•	X	X	X
	48V		•	•	X		•	X	X	X
ECI-63.60-K3-E75	48V	249.5	•	•	X	291.8	•	X	X	X
ECI-63.20-K4-E75	24V	209.5	•	•	•	251.8	•	•	X	X
	48V		•	•	•		•	•	X	X
ECI-63.40-K4-E75	24V	229.5	○	•	X	271.8	○	○	X	X
	48V		•	•	X		•	X	X	X
ECI-63.60-K4-E75	48V	249.5	○	•	X	291.8	○	○	X	X
ECI-63.20-K5-E75	24V	203	•	•	•	245.3	•	•	X	X
	48V		•	•	•		•	•	X	X
ECI-63.40-K5-E75	24V	223	•	•	X	265.3	•	X	X	X
	48V		•	•	X		•	X	X	X
ECI-63.60-K5-E75	48V	243	•	•	X	285.3	•	X	X	X

Subject to alternations

• Standard ○ Preferred type X on request

Crown gearhead EtaCrown®Plus 42



Image of 3-stage gearhead

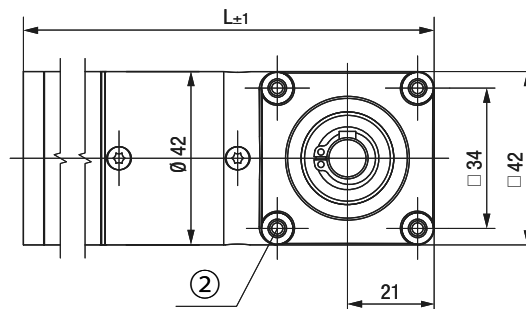
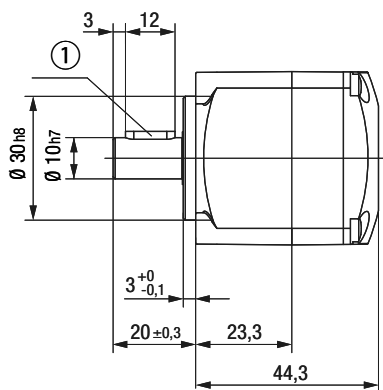
Description

- Compact design due to combination of the crown wheel and planetary stage in one housing
- No automatic lock due to high efficiency of the crown wheel technology
- High torques by using 5 straight toothed planetary gears made of case-hardened sintered steel in the integrated planetary gear stage
- Wide reduction range thanks to possibility of an upstream planetary stage
- Improved quiet operation thanks to the optimized design of the crown wheel stage when using an upstream helical planetary gear stage made of plastic with optimized sliding properties

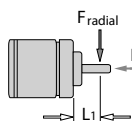
More at www.ebmpapst.com/eci-motoren

Type	EtaCrown®Plus 42.3				
Reduction ratio	54.0	84.8	153	289	
No. of stages	3				
Efficiency	0.73				
Max. input speed (n_1)	rpm	6 000			
Rated output torque (M_{ab})	Nm	10.00	10.00	6.70	8.40
Short term torque (M_{max})	Nm	25.0	25.0	16.8	21.0
Gear play	°	0.7 ... 1.2			
Permissible operating temperature range	°C	-20 ... +80			
Operating mode	S1				
Protection class	IP 50				
Weight	kg	0.45			
Shaft load radial / axial	N	300 / 200			
Service life	h	5 000			
Lubrication	Maintenance free grease lubrication for life				
Installation position	any				
Length	mm	79.8			

Subject to alternations



- ① Fitted key DIN 6885 A-4x4x12
- ② 4 x M4, 8 deep



Permissible shaft load

F_{axial} : 200 N At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 5 000 h (at T_U max. 40°C in rated operation)
 F_{radial} : 300 N
 L_1 : 10 mm

Length motor / gearhead combinations

All dimensions in mm

		Length L	3-stage reduction ratios			
		3-stage	54.0	84.8	153	289
ECI-42.20-K1-EP42	24V	183.8	•	•	X	X
	48V		•	•	X	X
ECI-42.40-K1-EP42	24V	203.8	○	○	X	X
	48V		•	•	X	X

Subject to alternations

- Standard
- Preferred type
- X on request

Crown gearhead EtaCrown®Plus 63



Image of 3-stage gearhead

Description

- Compact design due to combination of the crown wheel and planetary stage in one housing
- No automatic lock due to high efficiency of the crown wheel technology
- High torques by using 5 straight toothed planetary gears made of case-hardened sintered steel in the integrated planetary gear stage
- Wide reduction range thanks to possibility of an upstream planetary stage
- Improved quiet operation thanks to the optimized design of the crown wheel stage when using an upstream helical planetary gear stage made of plastic with optimized sliding properties

More at <https://idt.ebmpapst.com>

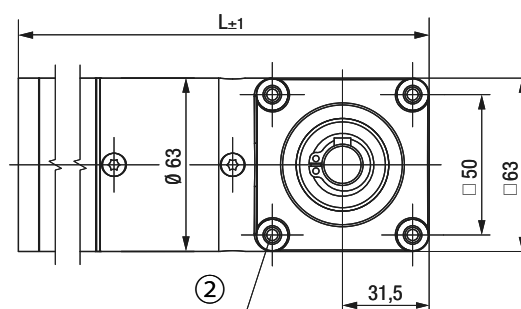
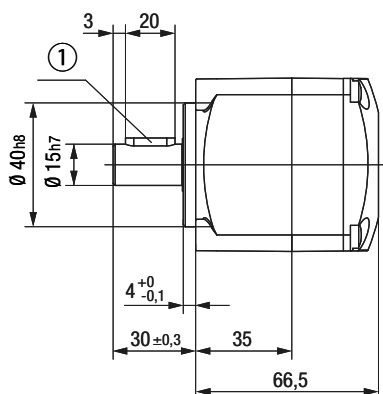
Type	EtaCrown®Plus 63.3			
Reduction ratio	54.0	84.8	153	289
No. of stages	3			
Efficiency	0.73			
Max. input speed (n_1)	rpm	6 000		
Rated output torque (M_{ab})	Nm	40.0	40.0	30.1
Short term torque (M_{max})	Nm	100	100	75.3
Gear play	°	0.7 ... 1.2		
Permissible operating temperature range	°C	-20 ... +80		
Operating mode	S1			
Protection class	IP 50			
Weight	kg	1.00		
Shaft load radial / axial	N	600 / 300		
Service life	h	5 000		
Lubrication	Maintenance free grease lubrication for life			
Installation position	any			
Length	mm	116.3		

Subject to alternations

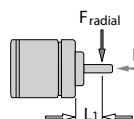
Technical drawing

Image of 3-stage gearhead

All dimensions in mm



- ① Fitted key DIN 6885 A-5x5x20
- ② 4 x M5, 10 deep



Permissible shaft load

F_{axial} : 300 N
 F_{radial} : 600 N
 L_1 : 15 mm

At rated speed, operating factor $C_B=1$ and a service life expectancy L_{10} from 5 000 h (at T_U max. 40°C in rated operation)

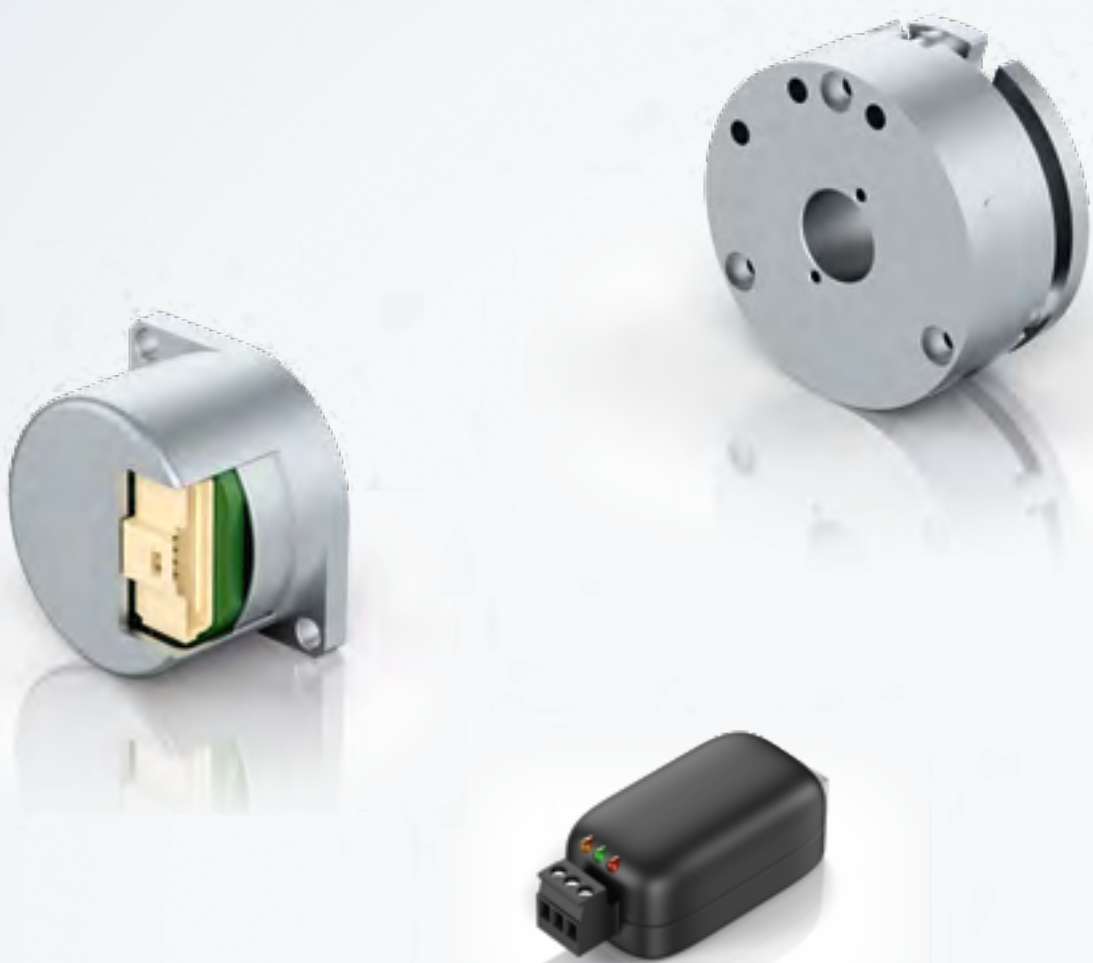
Length motor / gearhead combinations

All dimensions in mm

		Length L	3-stage reduction ratios			
			3-stage	54.0	84.8	153
ECI-63.20-K1-EP63	24V	222.4	•	•	•	X
	48V		•	•	•	X
ECI-63.40-K1-EP63	24V	242.4	○	○	X	X
	48V		•	•	X	X
ECI-63.60-K1-EP63	24V	262.4	•	•	X	X
	48V		○	○	X	X
ECI-63.20-K3-EP63	24V	234.8	•	•	•	X
	48V		•	•	•	X
ECI-63.40-K3-EP63	24V	254.8	•	•	X	X
	48V		•	•	X	X
ECI-63.60-K3-EP63	48V	274.8	•	•	X	X
ECI-63.20-K4-EP63	24V	234.8	•	•	•	X
	48V		•	•	•	X
ECI-63.40-K4-EP63	24V	254.8	○	○	X	X
	48V		•	•	X	X
ECI-63.60-K4-EP63	48V	274.8	○	○	X	X
ECI-63.20-K5-EP63	24V	228.3	•	•	•	X
	48V		•	•	•	X
ECI-63.40-K5-EP63	24V	248.8	•	•	X	X
	48V		•	•	X	X
ECI-63.60-K5-EP63	48V	268.3	•	•	X	X

Subject to alternations

Standard
 Preferred type
 X on request



Accessories

ebmpapst

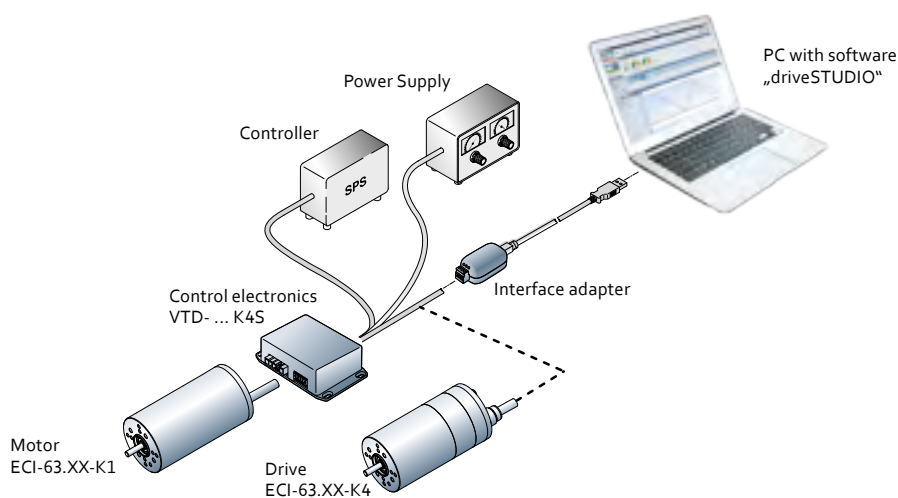
the engineer's choice

	Page
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Brakes	76
Magnetic encoder systems	78

Commissioning tools

K4

Parameterization and commissioning



The RS485 interface serves as an interface for parameterization and diagnosis. It can be operated using the freely available "driveSTUDIO" PC software. This requires a PC and the ebm-papst USB-RS485 adapter. Load your detailed operating manual and the PC software "driveSTUDIO" under www.ebmpapst.com.



Interface adapter for „driveSTUDIO“ PC software	Part number
USB-RS485-adapter	914 0000 403

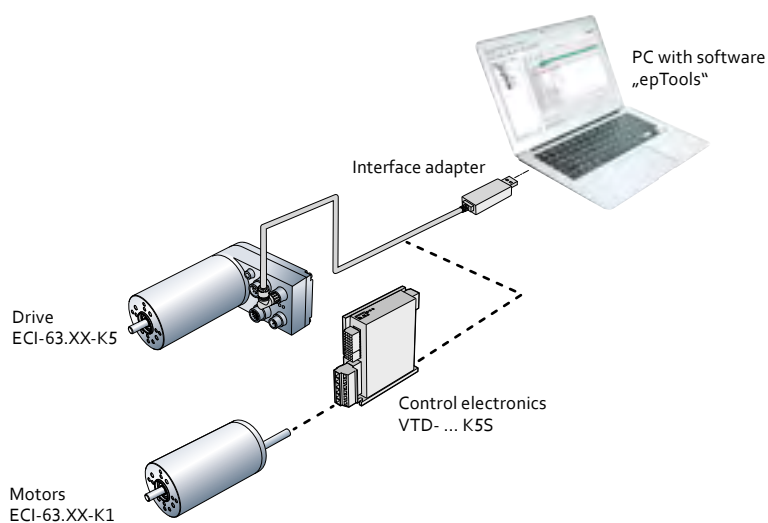
Electrical connection	
PIN	Configu- ration
A	RS485+
B	RS485-
X	--

Functional description of the LED displays

LED name	Color	Display	Function assignment
TxD	red	flashes	Flashes with outgoing message
		does not light up	No outgoing message
RxD	green	flashes	Flashes with outgoing message
		does not light up	No outgoing message
ON	orange	lights up	Normal operation

Commissioning tools K5

Parameterization and commissioning



The CAN interface serves as an interface for parameterization, process and diagnosis. This requires a PC and the ebm-papst USB CAN adapter. It can be operated using the freely available „epTools“ PC software. Load your detailed operating manual and the PC software “epTools” under www.ebmpapst.com.



Commissioning tool for “EP-Tools” PC software	Part number
USB to CANStick	914 0000 401

Electrical connection	
X1	Configuration
1	reserved
2	CAN hi
3	CAN lo
4	reserved
5	CAN GND

Functional description of the LED displays

LED name	Color	Display	Function assignment
LED0 „Power“	green	lights up	Normal operation
		does not light up	No power supply
		blinks	Bootloader mode (no firmware)
LED1 „State“	yellow	does not light up	Normal operation
		flashes	Bootloader mode (flashes with incoming message)
LED2 „Error“	red	lights up	Error
		does not light up	No error (normal operation)
LED3 „Rx“	green	flashes	Flashes with incoming message
		does not light up	No incoming message
LED4 „Tx“	yellow	flashes	Flashes with outgoing message
		does not light up	No outgoing message

Brakes



Image integrated Brake

Description

- Spring-applied brake
- Single-disk brake with 2 friction contact surfaces
- Braking torque effective in powerless state
- Braking force is eliminated by electromagnetic force
- Holding brake with emergency stop function
- Currentless-operated brake with high power density
- Reduced inertia for optimum dynamics

More at www.ebmpapst.com/eci-motoren

Type		integrated RFK 0.3 Nm brake module ECI 42	integrated RFK 1.0 Nm brake module ECI 63	external RFK 1.0 Nm brake module ECI 63	external RFK 1.0 Nm brake module ECI 80
Nominal voltage	V DC	24	24	24	24
Nominal power	W	6	9	9	16
Braking torque	Nm	0.3	1	1	5
Engagement time	ms	25	20	20	40
Disengagement time	ms	85	60	60	52

Subject to alternations

Technical drawing

All dimensions in mm

Image integrated brake for ECI 42.XX and ECI 63.XX-K3/K4/K5

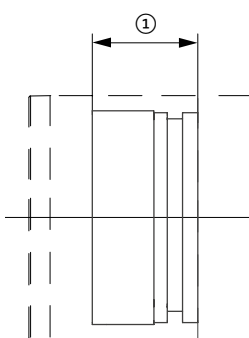


Image integrated brake for ECI 63.XX-K1

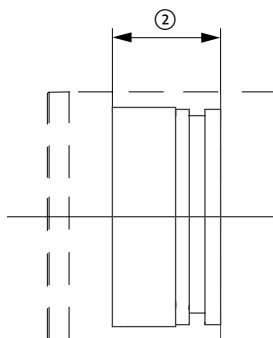


Image external brake for ECI 63.XX-K1

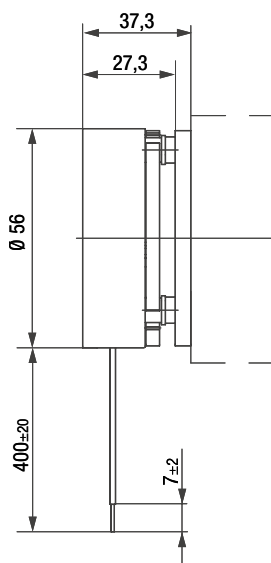
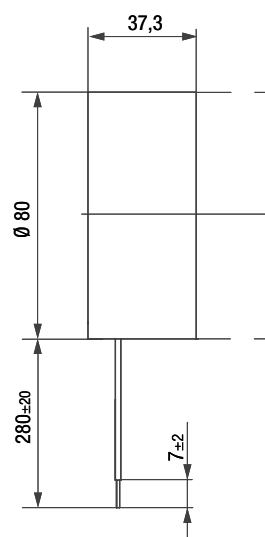


Image external brake for ECI 80



- ① Installing the brake module extends the length of the drive housing by 57 mm
- ② Installing the brake module extends the length of the drive housing by 20 mm

Electrical connection

Plug integrated brake (ECI 42.XX)



	Pin	Configuration	Function
integrated brake	nn ¹⁾	+24 V	Supply voltage
	nn ¹⁾	GND	Ground

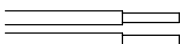
¹⁾ Depends on the overall technical configuration of the motor

Cable external brake (ECI 63.XX)



	Color	Configuration	Function
external brake	violet	+24 V	Supply voltage
	gray / pink	GND	Ground

Wire integrated brake (ECI 63.XX / ECI80.XX)



	Color	Configuration	Function
external brake	red	+24 V	Supply voltage
	black	GND	Ground

Magnetic encoder systems



Image integrated Encoder

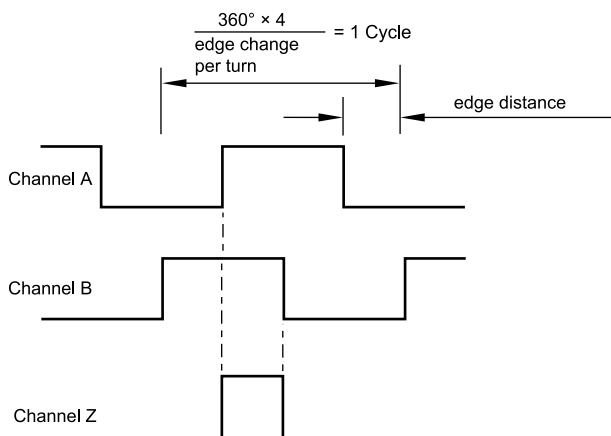
Description

- Magnetic 3 channel incremental encoder
- A resolution of max. 4.096 increments per revolution is attained by appropriate evaluation in an external control
- The encoder is contactless and wearfree
- Temperature range -40 °C ... +105 °C
- Additional resolutions and interfaces possible

More at www.ebmpapst.com/eci-motoren

Type		RM22 / RMC22
No. of pulses		4.096 per revolution
Output signal A. B. Z		3 rectangular signals. channel A. B (90° phase offset) and index
Reaction frequency (f)	kHz	0.5
Supply voltage (U _B)		+5 ±10%
Power consumption (I _B)	mA	Type. 30
Precision		±0.5°
Hysteresis		Type. 0.17°
Electrical connection		Molex: 501568-1107
Connector type		Molex: 501330-110 with contact 501344-XX
Weight	kg	0.02
Protection class	IP	54 / 40

Signal processing



Technical drawing

All dimensions in mm

Image RM22 for ECI 63 and ECI 80

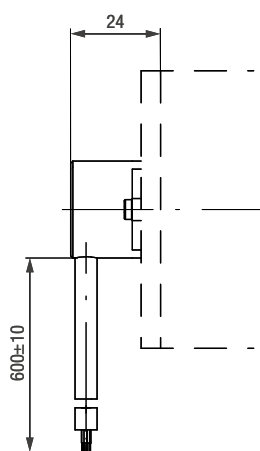


Image RMC22 for ECI 63 and ECI 80

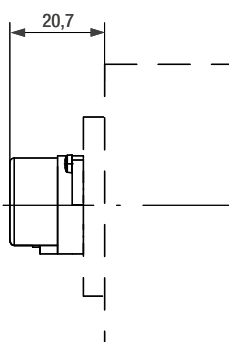
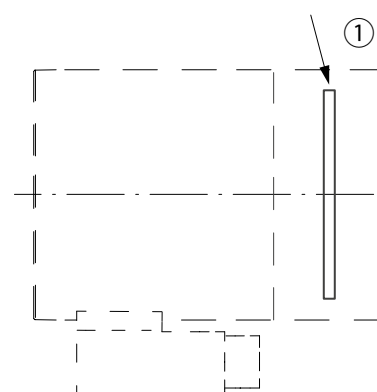


Image with integrated encoder for ECI 42



① Installing the encoder extends the length of the drive housing by 57 mm

Electrical connection external encoder

Image RM22

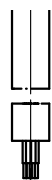
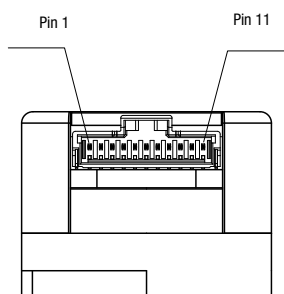
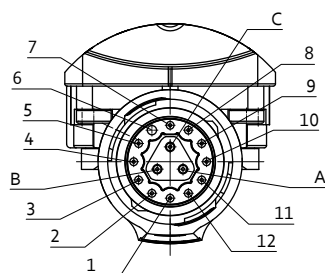


Image RMC22



	Pin	Wire color	Function
Signal	1	white	Z
	2	green	B)
	3	gray	A
	4	red	V _{dd}
	5	brown	Z-
	6	yellow	B-
	7	pink	A-
	8	blue	GND
	9		
	10	unused	
	11		

Electrical connection integrated encoder for ECI 42



	Pin	Configuration	Function
Encoder	7	A	encoder channel A
	8	/A	encoder channel A inverted
	9	B	encoder channel B
	10	/B	encoder channel B inverted
	11	+5V	Supply voltage
	12	GND	Ground

Operating factor, lifetime, 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/days					
	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 over-loading the motor and/or the gearhead. The values stated in this catalog 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

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. Extreme ambient and operating conditions cause a reduction in the lifetime guaranteed for operation under operating ratio $c_B = 1$.

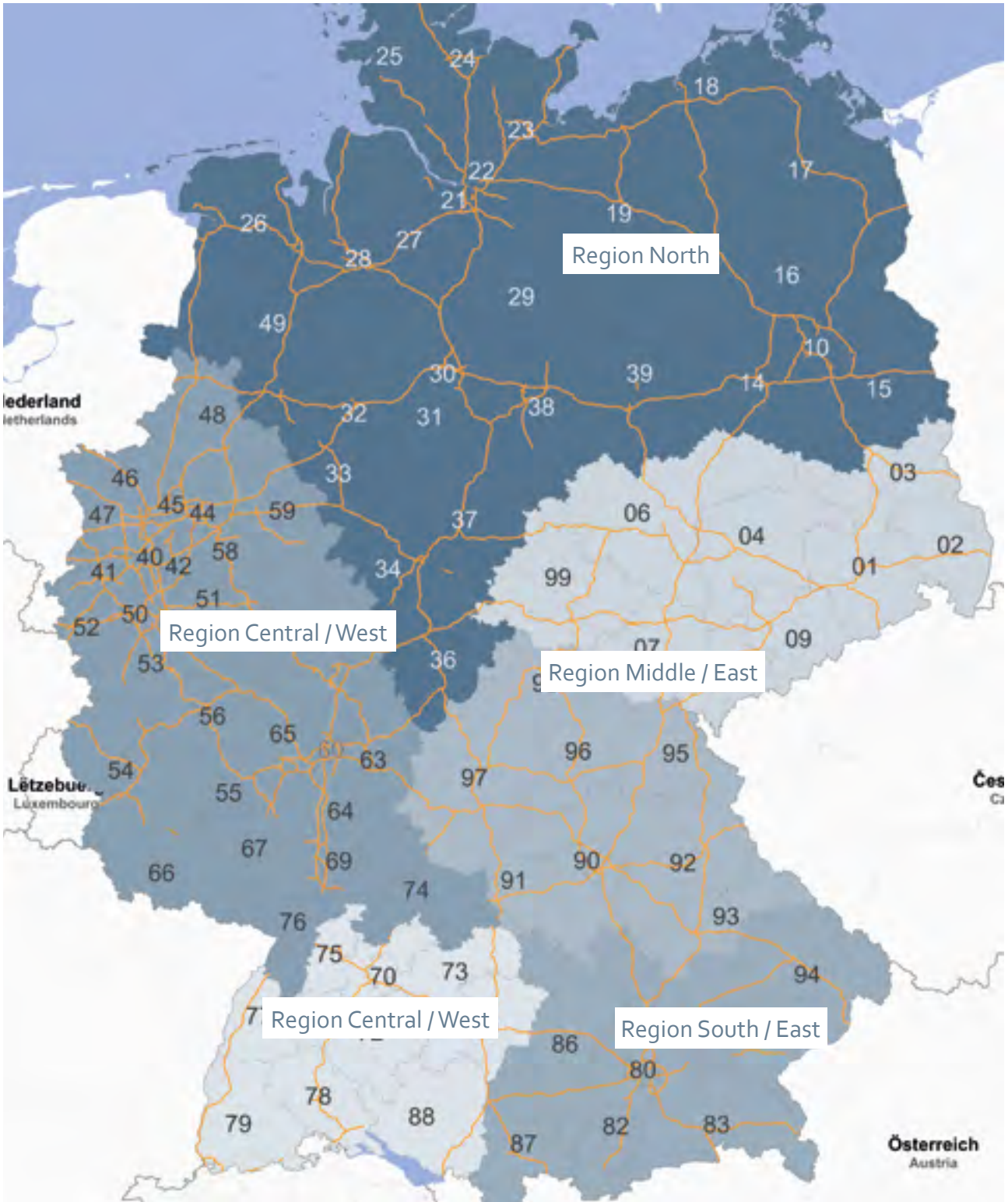
Efficiency η (eta)

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

Overall efficiency	
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	$\eta = 0.9^5 = 0.59$








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