As technological leader for ventilation and drive engineering, *ebm-papst* is in demand as an engineering partner in many industries. With over 15,000 different products, we provide the right solution for just about any challenge. Our fans and drives are reliable, quiet and energy-efficient.

**Six reasons that make us the ideal partner:**

**Our systems expertise.**
You want the best solution for every project. The interrelationships between ventilation and drive engineering must thus be considered as a whole. And that’s what we do – with **motor technology** that sets standards, sophisticated **electronics** and **aerodynamic designs** – all from a single source and perfectly matched. These system solutions release unique synergies worldwide. And in particular – they relieve you of a lot of work, so that you can concentrate on your core competency.

**The *ebm-papst* spirit of invention.**
In addition to our wide range of products, we are always able to develop customized solutions for you. A diversified team of 600 engineers and technicians works at our three locations in Germany: Mulfingen, Landshut and St. Georgen. Contact us to discuss your next project.

**Our lead in technology.**
As pioneer and trail-blazer for developing highly efficient EC technology, we are way ahead of other motor manufacturers. Almost all our products are also available with GreenTech EC technology. The list of benefits is long: higher efficiency, maintenance-free, longer service life, sound reduction, intelligent control characteristics and unrivalled energy efficiency with savings of up to 80% compared to conventional AC technology. Let our technology be your competitive advantage as you lead in your industry.

**Closeness to our customers.**
*ebm-papst* has 25 production locations worldwide (including facilities in Germany, China and the USA), together with 49 sales offices, each of which has a dense network of sales representatives. You will always have a local contact, someone who speaks your language and knows your market.

**Our standard of quality.**
Of course you can rely on the highest standards of quality with our products. Our quality management is uncompromising, at every step in every process. This is underscored by our certification according to international standards including DIN EN ISO 9001, TS declaration of conformity and DIN EN ISO 14001.

**Our sustainable approach.**
Assuming responsibility for the environment, for our employees and for society is an integral part of our corporate philosophy. We develop products with an eye to maximum environmental compatibility, in particular resource-preserving production methods. We promote environmental awareness among our young staff and are actively involved in sports, culture and education. That’s what makes us a leading company – and an ideal partner for you.
Our success story to becoming market leader and technological innovator.

1963 Elektrobau Mulfingen GmbH & Co. KG founded by Gerhard Sturm and Heinz Ziehl.
1965 Development of the first compact fan in the field of EC/DC technology.
1966 The ebm-papst success story started to take off with the release of the new 68 motor.
1972 The first foreign subsidiary was founded in Sweden.
1988 Gerhard Sturm receives the German Cross of Merit.
1990 The sixty millionth external rotor fan was produced.
1992 Acquisition of PAPST Motoren GmbH in St. Georgen.
1997 Purchase of the Landshut plant (mvl).
2003 Change of name to ebm-papst.
2007 Introduction of the gearhead “EtaCrown®”.
2010 GreenTech – our symbol for energy-efficiency and resource conservation.
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 electronics manufacturing by the new production facility at St. Georgen Hagenmoos.
Modular drive systems.
Motors with integrated logic and power electronics – optional gearhead, encoder and brake.
Drive technology catalog.

- Brushless internal rotor motors
  - ESC series
- Brushless external rotor motor
  - VDC series
- Brushed internal rotor motors
  - BCI series
- Customized drive systems
  - Components / assembly
Brushless internal rotor motors – ECI.

**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, CCC, UL, CSA, EAC
- Additional approvals on request

---

Logic and power electronics

Magnetic sensor

Main magnet

Winding
## Overview of ECI motors

### Brushless Internal Rotor Motors ECI

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<tr>
<td>( P ) W</td>
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<td>220</td>
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<td>670</td>
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<td>178</td>
<td>251</td>
<td>356</td>
<td>293</td>
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<td>754</td>
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<td>( n_n ) rpm</td>
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<td>4 000</td>
<td>4 000</td>
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<td>4 000</td>
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<td>4 000</td>
<td>4 000</td>
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<td>4 000</td>
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<tr>
<td>( L ) mm</td>
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<td>114</td>
<td>106</td>
<td>126</td>
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<td>112</td>
<td>132</td>
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<td>96.0</td>
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<tr>
<td>( d ) mm</td>
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<td>42.0</td>
<td>63.0</td>
<td>63.0</td>
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<td>80.0</td>
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### Control Electronics (Integrated)

- K1 (Hall sensor system)
  - Standard type: ●, Preferred type: ○
- K3 (Speed)
  - Standard type: ●, Preferred type: ○
- K4 (Position)
  - Standard type: ●, Preferred type: ○
- K5 (CANopen)
  - Standard type: ●, Preferred type: ○

### Control Electronics (External)

- VTD-XX.XX-K3 (Speed)
  - Standard type: ●, Preferred type: ○
- VTD-XX.XX-K4S (Position)
  - Standard type: ●, Preferred type: ○
- VTD-60.13-K5SB (CANopen)
  - Standard type: ●, Preferred type: ○
- VTD-60.35-K5SB (CANopen)
  - Standard type: ●, Preferred type: ○

### Gearheads (from page 12)

- NoiselessPlus 42 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- NoiselessPlus 63 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- Performax® 42 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- Performax® 63 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- Performax® Plus 42 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- Performax® Plus 63 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- Optimax 63 (Planetary Gearhead)
  - Standard type: ●, Preferred type: ○
- EtaCrown® 52 (Crown Gearhead)
  - Standard type: ●, Preferred type: ○
- EtaCrown® 75 (Crown Gearhead)
  - Standard type: ●, Preferred type: ○
- EtaCrown® Plus 42 (Crown Gearhead)
  - Standard type: ●, Preferred type: ○
- EtaCrown® Plus 63 (Crown Gearhead)
  - Standard type: ●, Preferred type: ○

### Brakes (from page 16)

- BFK (Spring-Applied)
  - Standard type: ●, Preferred type: ○

### Encoder Systems (from page 16)

- HEDS 5500/512 (Incremental)
  - Standard type: ●, Preferred type: ○

---

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.
Brushless external rotor motors – VD/VDC.

**Key figures**
- 3-phase, electronically commutated external rotor motor
- Output range between 5 and 125 watts
- High power density realized in a compact design
- Very quiet operation across the entire speed range
- High overload capacity
- Very high power density
- Rigid speed/torque curve
- Extremely wide speed control range
- Robust housing and bearings
- Protection class IP 54 as per EN 60 034-5: up to IP 65
- Various motor types which can be combined with planetary, crown and spur gearheads

**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, CCC, UL, CSA, EAC
- Additional approvals on request
Overview of VD/VDC motors.

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.

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### Brushless external rotor motors VD/VDC

<table>
<thead>
<tr>
<th>Control electronics (integrated)</th>
<th>K1 (Hall sensor system)</th>
<th>K3 (speed)</th>
<th>K4 (position)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTD-XX.XX-K3</td>
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</tr>
<tr>
<td>VTD-XX.XX-K4S</td>
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<tr>
<td>VTD-60.13-K5 SB</td>
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<tr>
<td>Subject to alterations</td>
<td>Standard type</td>
<td>Preferred type: ready to ship in 48 hours</td>
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### Specifications

<table>
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<tr>
<th>Model</th>
<th>U_n (V)</th>
<th>M_n (mNm)</th>
<th>P (W)</th>
<th>n_n (rpm)</th>
<th>L (mm)</th>
<th>d (mm)</th>
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<td>VD-25.07</td>
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<td>8.00</td>
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<td>VD-49.15</td>
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<td>VDC-54.14</td>
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<td>47.6</td>
<td>4,000</td>
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<td>235</td>
<td>100</td>
<td>4,000</td>
<td>63.0</td>
<td>63.0</td>
</tr>
<tr>
<td>VDC-49.15</td>
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<td>300</td>
<td>125</td>
<td>4,000</td>
<td>63.0</td>
<td>63.0</td>
</tr>
</tbody>
</table>
Brushed internal rotor motors – BCI.

Key figures
- DC motor with permanent magnets
- Power range between 13 and 93 watts
- High power density realized in a compact design
- High overload capacity
- Highly efficient
- Mechanical commutation through a multi-piece collector
- Customer-specific winding layout
- Winding insulation as per insulation class B
- Protection class IP 40, optionally higher
- Various motor types which can be combined with planetary, crown and spur gearheads
- 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, CCC, UL, CSA, EAC or other certification marks
### Overview of BCI motors.

#### Brushed internal rotor motors BCI

<table>
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<tr>
<th>Parameter</th>
<th>BCI-42.25</th>
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<th>BCI-52.30</th>
<th>BCI-52.50</th>
<th>BCI-63.25</th>
<th>BCI-63.55</th>
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</thead>
<tbody>
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<td>$U_{\text{in}}$ (V)</td>
<td>24</td>
<td>24</td>
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<td>24</td>
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<td>$M_{\text{in}}$ (mNm)</td>
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<td>57.0</td>
<td>100</td>
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<tr>
<td>$P$ (W)</td>
<td>13.0</td>
<td>19.0</td>
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<td>$n_0$ (rpm)</td>
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<td>3 600</td>
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<td>$l$ (mm)</td>
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<td>125</td>
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<td>$d$ (mm)</td>
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<td>52.0</td>
<td>52.0</td>
<td>63.0</td>
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</tr>
</tbody>
</table>

#### Gearheads (from page 12)

- Performax® 42 (planetary gearhead)
- Performax® 52 (planetary gearhead)
- Performax® 63 (planetary gearhead)
- EtaCrown® 52 (crown gearhead)
- EtaCrown® 75 (crown gearhead)
- EtaCrown®Plus 42 (crown gearhead)
- EtaCrown®Plus 63 (crown gearhead)
- Compactline 90 (spur gearhead)
- Compactline 91 (spur gearhead)
- Compactline 92 (spur gearhead)
- Flatline 78 (spur gearhead)
- Flatline 85 (spur gearhead)

#### Brakes (from page 16)

- BFK (spring-applied)

#### Encoder systems (from page 16)

- PMG 2-2/2-12 (magnetical)
- HEDS 5500/512 (optical, incremental)

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.
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.

**Characteristics of the individual transmission technologies:**

**Planetary gearheads**
- 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

**Spur gearheads**
- Highest power density
- Flat, compact design
- Large reduction ratio range
- High radial loads permitted
- Good price/performance ratio
- Two different model ranges
  - Flatline
  - Compactline
**Planetary gearheads.**

<table>
<thead>
<tr>
<th>Gearheads*</th>
<th>Noiseless Plus 42</th>
<th>Noiseless Plus 63</th>
<th>Performax® 42</th>
<th>Performax® 52</th>
<th>Performax® 63</th>
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<td>Up to 11.9</td>
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<td>4.30</td>
<td>3.20</td>
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<td>ECI-80</td>
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<td>VD/VDC-49.15</td>
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<td>BCI motors</td>
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</table>

Subject to change

*This overview of the gear units displays all possible reduction ratios. To check compatibility of the required reduction ratio with the desired motor, please refer to our catalog or our website, or inquire with us directly.*

*ECI motors

ECI-42
ECI-63
ECI-80

*VD/VDC motors

VD/VDC-43.10
VD/VDC-54.14
VD/VDC-49.15

*BCI motors

BCI-42
BCI-52
BCI-63
## Crown gearheads

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### Combinations possible with

**ECI motors**
- ECI-42    
- ECI-63    
- ECI-80

**VD/VDC motors**
- VD/VDC-43.10
- VD/VDC-54.14
- VD/VDC-49.15

**BCI motors**
- BCI-42
- BCI-52
- BCI-63

Subject to change

---

* This overview of the gear units displays all possible reduction ratios. To check compatibility of the required reduction ratio with the desired motor, please refer to our catalog or our website, or inquire with us directly.
**Spur gearheads.**

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<tr>
<th>Gearheads*</th>
<th>Compactline 90</th>
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<td>Torque (M&lt;sub&gt;e&lt;/sub&gt;) Nm</td>
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<td>Up to 15</td>
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<td>Reduction ratio i</td>
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<td></td>
<td>Reduction ratio i</td>
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**Combinations possible with**

**VD/VDC motors**
- VD/VDC-43.10
- VD/VDC-54.14
- VD/VDC-49.15

**BCI motors**
- BCI-42
- BCI-52
- BCI-63

Subject to change

*This overview of the gear units displays all possible reduction ratios. To check compatibility of the required reduction ratio with the desired motor, please refer to our catalog or our website, or inquire with us directly.
Controllers, encoders, brakes.

Control electronics
- Integrated and external modules to control BLDC motors
- Models with variable-speed operation and analog set value input
- Models for torque- and position-controlled operation
- Models with CANopen bus interface (DS 402-compatible)

Encoder systems
- Magnetic and optical encoder systems
- Encoders run silently and without wear
- When paired with suitable electronics, encoders serve to determine/control speed and control positioning

Braking systems
- Spring-applied braking
- Single-disk brakes with 2 friction contact surfaces
- Braking torque effective in powerless state
- Braking force is eliminated by electromagnetic force
## Control electronics

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<thead>
<tr>
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<th>K3 (integrated)</th>
<th>K4 (integrated)</th>
<th>K5 (integrated)</th>
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<tbody>
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<td><strong>Bus interface</strong></td>
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<td>Nominal voltage</td>
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<tr>
<td>Speed control</td>
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</tr>
<tr>
<td>Torque control</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Position control</td>
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## Encoder systems

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<td>Pulses per revolution</td>
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<td>512</td>
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<td>Nominal voltage</td>
<td>V DC 24</td>
<td>24</td>
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## Braking systems

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<th>BRK 457-03</th>
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<td>ECI 63-X4</td>
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<td><strong>Nominal output</strong></td>
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<td><strong>Power-on time</strong></td>
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<td><strong>Power-off time</strong></td>
<td>ms 17.0</td>
<td>17.0</td>
<td>18.0</td>
<td>35.0</td>
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Region in Germany.

- Region north
- Region Middle / East
- Region Central / West
- Region South / East 1
- Region South / West
- Region South / East 2
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