K4 servo drive systems
Brilliantly versatile
Drive solutions | Industrial drive engineering

Product Catalogue 2020-02
Modular drive systems. Motors with integrated logic and power electronics – optional gearhead, encoder and brake.
# Contents

*K4 servo drive systems model series ECI und VDC*

<table>
<thead>
<tr>
<th>Information</th>
<th>Page</th>
<th>About ebm-papst / Green Intelligence</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The story of our success</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The K4 can do (almost) everything</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K4 servo drive</th>
<th>Page</th>
<th>VDC-49.15-K4</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ECI-63.XX-K1</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K1 servomotor in combination with external control electronics</th>
<th>Page</th>
<th>ECI-80.XX-K1</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VDT-XX.XX-K4S (position)</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commissioning</th>
<th>Page</th>
<th>The K4 can do (almost) everything</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26</td>
<td>Easy integration into Profinet networks</td>
<td>27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agents around the world</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28</td>
</tr>
</tbody>
</table>
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.

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

Here is how much GreenIntelligence there is in ECI Motors:

- integrated logic & power electronics
- network functionality
- Master/slave functionality
- Condition monitoring
- Predictive maintenance
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 servomotor, 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 GreenIntelligence – our symbol for high efficient and network capable BLDC drives.
The K4 can do (almost) everything ...

Basic functions of K4 electronics
– Speed, torque and positioning control for BLDC motors

Benefits for you with K4 electronics
– Excellent control mode using field-oriented control
– Choice of operating modes and parameters using RS485
– Extensive interface with various inputs and outputs
– Activation of the power amplifier via digital input
– Integrated braking chopper function
– Set rotation speed control range from \( n = 0 \) U/min (with holding torque) up to max. speed (depending on motor)
– High efficiency and power density in compact construction

Up to 750 Watts power output

<table>
<thead>
<tr>
<th>VDC-3-49.15-K4</th>
<th>ECI-61.XX-K4</th>
<th>ECI-80.XX-K1 &amp; VTD K45</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 W</td>
<td>400 W</td>
<td>750 W</td>
</tr>
<tr>
<td>300 mNm</td>
<td>850 mNm</td>
<td>1800 mNm</td>
</tr>
</tbody>
</table>
Operating it is like child's play

– Parameterization and commissioning using PC software „driveSTUDIO”
– Intuitive operation even without knowledge of programming languages
– No BUS knowledge required
## Servo drive VDC-49.15-K4

### Description
- 3-phase BLDC external rotor motor
- High-poled motor structure for optimum power density
- Drive with completely integrated K4 operation and control electronics
- Integrated speed, torque and position control
- Parameter setting via RS485
- Interface with analog and digital control inputs
- Integrated brake chopper
- Robust mechanical design in IP 54 for industrial applications

### Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>VDC-49.15-K4-B00</th>
<th>VDC-49.15-K4-D00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage ( (U_N) ) V DC</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Nominal speed ( (n_N) ) rpm</td>
<td>4 000</td>
<td>4 000</td>
</tr>
<tr>
<td>Nominal torque ( (M_N) ) mNm</td>
<td>235</td>
<td>300</td>
</tr>
<tr>
<td>Nominal current ( (I_N) ) A</td>
<td>5.20</td>
<td>3.20</td>
</tr>
<tr>
<td>Nominal output power ( (P_N) ) W</td>
<td>99.0</td>
<td>126</td>
</tr>
<tr>
<td>Starting torque ( (M_A) ) mNm</td>
<td>795</td>
<td>900</td>
</tr>
<tr>
<td>Permissible peak current ( (I_{max}) ) A</td>
<td>15.6</td>
<td>9.60</td>
</tr>
<tr>
<td>Speed at no-load operation ( (n_L) ) rpm</td>
<td>5 000</td>
<td>5 000</td>
</tr>
<tr>
<td>No-load current ( (I_L) ) A</td>
<td>0.40</td>
<td>0.25</td>
</tr>
<tr>
<td>Recommended speed control range rpm</td>
<td>0 ... 4 000</td>
<td>0 ... 4 000</td>
</tr>
<tr>
<td>Rotor moment of inertia ( (J_R) ) kgm² × 10⁻⁴</td>
<td>108</td>
<td>108</td>
</tr>
<tr>
<td>Overload protection</td>
<td>Integriert</td>
<td>Integriert</td>
</tr>
<tr>
<td>Permissible ambient temperature range ( (T_{ja}) ) °C</td>
<td>0 ... +40</td>
<td>0 ... +40</td>
</tr>
<tr>
<td>Weight kg</td>
<td>0.59</td>
<td>0.59</td>
</tr>
<tr>
<td>Part number ( (IP54) )</td>
<td>937 4915 400</td>
<td>937 4915 402</td>
</tr>
</tbody>
</table>

1) The degree of protection refers to the installed condition with sealing on the flange side
2) The shaft geometry in the IP54 version is different from the displayed sketch
3) Permissible time for peak current: max. 1 sec. – to be repeated only after complete cool down
4) At \( T_{ja} \) max. 40 °C

**Preferred type: ready to ship in 48 hours**

Subject to alternations
Modular system

**Commissioning tool**
*driveSTUDIO* Seite 26

**Basic motor**

**Planetary gearhead**
- NoiselessPlus 63
- Performax® 63
- Performax®Plus 63

**Crown gearheads**
- EtaCrown® 75
- EtaCrown®Plus 63

**Spur gearheads**
- Compactline 91
- Flatline 85

For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.
Servo drive VDC-49.15-K4

Technical drawing

All dimensions in mm

Permissible shaft load

<table>
<thead>
<tr>
<th>Load Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible shaft load</td>
<td>20 N</td>
</tr>
<tr>
<td>Permissible simultaneous shaft loads at rated speed and service life expectancy (L_{10}) (in rated operation) from 20 000 h (at (T_{\text{max}}) max. 40 °C)</td>
<td>60 N</td>
</tr>
<tr>
<td>(L_{10})</td>
<td>10 mm</td>
</tr>
</tbody>
</table>

Electrical connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color</th>
<th>Configuration</th>
<th>Function</th>
<th>recommended AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>white</td>
<td>D-IN-A</td>
<td>Digital input A</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>brown</td>
<td>D-IN-B</td>
<td>Digital input B</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>green</td>
<td>D-IN-1</td>
<td>Digital input 1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>yellow</td>
<td>D-IN-2</td>
<td>Digital input 2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>gray</td>
<td>D-OUT-1</td>
<td>Digital output 1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>pink</td>
<td>D-OUT-2</td>
<td>Digital output 2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>red</td>
<td>A-IN-1</td>
<td>0 ... 10 V (differential)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>black</td>
<td>A-IN-GND</td>
<td>Ground for analog IN 1 (differential)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>violet</td>
<td>RS485 A (+)</td>
<td>Prog.-bus</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>gray / pink</td>
<td>RS485 B (−)</td>
<td>Prog.-bus</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>red / blue</td>
<td>(U_{\text{logic}})</td>
<td>Logic power supply (24 V)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>gray</td>
<td>Ballast</td>
<td>Ballast resistor</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>brown</td>
<td>(U_{\text{P}})</td>
<td>Power supply</td>
<td>16</td>
</tr>
<tr>
<td>C</td>
<td>black</td>
<td>GND</td>
<td>Power- / signal-ground</td>
<td></td>
</tr>
</tbody>
</table>

Subject to alternations
## Servo drive ECI-63.XX-K4

### Description
- 3-phase BLDC internal rotor servomotor
- Excellent control behavior via field oriented control with sine commutation
- High-poled motor structure for optimum power density
- Drive with completely integrated K4 operation and control electronics
- Integrated speed, torque and position control
- Parameter setting via RS485
- Interface with analog and digital control inputs
- Integrated brake chopper
- Robust mechanical design in IP 54 for industrial applications

### Characteristic curve

<table>
<thead>
<tr>
<th>Type</th>
<th>ECI-63.20-K4-B00</th>
<th>ECI-63.20-K4-D00</th>
<th>ECI-63.40-K4-B00</th>
<th>ECI-63.40-K4-D00</th>
<th>ECI-63.60-K4-D00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage (U&lt;sub&gt;N&lt;/sub&gt;)</td>
<td>V DC</td>
<td>24</td>
<td>48</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Permissible supply voltage range (U&lt;sub&gt;zK&lt;/sub&gt;)</td>
<td>V DC</td>
<td>18 ... 30</td>
<td>18 ... 53</td>
<td>18 ... 30</td>
<td>18 ... 53</td>
</tr>
<tr>
<td>Max. reverse voltage</td>
<td>V DC</td>
<td>35</td>
<td>58</td>
<td>35</td>
<td>58</td>
</tr>
<tr>
<td>Nominal speed (n&lt;sub&gt;N&lt;/sub&gt;)</td>
<td>rpm</td>
<td>4 000</td>
<td>4 000</td>
<td>4 000</td>
<td>4 000</td>
</tr>
<tr>
<td>Nominal torque (M&lt;sub&gt;N&lt;/sub&gt;)&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>mNm</td>
<td>425</td>
<td>450</td>
<td>600</td>
<td>750</td>
</tr>
<tr>
<td>Nominal current (I&lt;sub&gt;N&lt;/sub&gt;)&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>A</td>
<td>8.50</td>
<td>5.40</td>
<td>12.3</td>
<td>7.20</td>
</tr>
<tr>
<td>Nominal output power (P&lt;sub&gt;N&lt;/sub&gt;)&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>W</td>
<td>178</td>
<td>188</td>
<td>251</td>
<td>314</td>
</tr>
<tr>
<td>Starting torque (M&lt;sub&gt;stmax&lt;/sub&gt;)</td>
<td>mNm</td>
<td>1 480</td>
<td>1 890</td>
<td>1 500</td>
<td>3 000</td>
</tr>
<tr>
<td>Speed at no-load operation (n&lt;sub&gt;L&lt;/sub&gt;)</td>
<td>rpm</td>
<td>5 800</td>
<td>5 800</td>
<td>5 900</td>
<td>5 800</td>
</tr>
<tr>
<td>No-load current (I&lt;sub&gt;L&lt;/sub&gt;)&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>A</td>
<td>0.50</td>
<td>0.50</td>
<td>0.90</td>
<td>0.50</td>
</tr>
<tr>
<td>Recommended speed control range</td>
<td>rpm</td>
<td>0 ... 5 000</td>
<td>0 ... 5 000</td>
<td>0 ... 5 000</td>
<td>0 ... 5 000</td>
</tr>
<tr>
<td>Set value input</td>
<td>analog / PWM / frequency / digital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotor moment of inertia (J&lt;sub&gt;R&lt;/sub&gt;)</td>
<td>kgm&lt;sup&gt;2&lt;/sup&gt; x10&lt;sup&gt;-6&lt;/sup&gt;</td>
<td>19</td>
<td>19</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Function for motor protection at stall</td>
<td>Ω</td>
<td>thermal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload protection</td>
<td>Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permissible ambient temperature range (T&lt;sub&gt;au&lt;/sub&gt;)</td>
<td>°C</td>
<td>0 ... +40</td>
<td>0 ... +40</td>
<td>0 ... +40</td>
<td>0 ... +40</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>0.85</td>
<td>0.85</td>
<td>1.15</td>
<td>1.15</td>
</tr>
<tr>
<td>Part number</td>
<td>IP 40</td>
<td>932 6320 403</td>
<td>932 6320 405</td>
<td>932 6340 403</td>
<td>932 6340 405</td>
</tr>
<tr>
<td>Part number</td>
<td>IP 54</td>
<td>932 6320 402</td>
<td>932 6320 402</td>
<td>932 6340 402</td>
<td>932 6340 402</td>
</tr>
</tbody>
</table>

1) The degree of protection refers to the installed condition with sealing on the flange side
2) The shaft geometry in the IP54 version is different from the displayed sketch
3) At T<sub>au</sub> max. 40 °C

### Preferred type: ready to ship in 48 hours
Subject to alternations

More at [www.ebmpapst.com/eci-motoren](http://www.ebmpapst.com/eci-motoren)
For motor-gearbox combinations, depending on the choice of the single components, the maximum allowable torque (gearbox) can be exceeded or respectively not reached.

**Modular system**

**Brake system**
- Spring-applied integrated
- Brake module ECI 63

**Basic motor**
- Performax®Plus 63
- Optimax 63

**Planetary gearhead**
- NoiselessPlus 63
- Performax®Plus 63
- Optimax 63

**Crown gearheads**
- EtaCrown® 75
- EtaCrown®Plus 63

**Commissioning tool**
- "driveSTUDIO"  Page 26

**Cable**
- Connection cables have to be ordered separately  Page 17
4 x for thread-forming screws M5 according to DIN7500, screw-in depth max. 10 mm
8 x for thread-forming screws M4 according to DIN7500, screw-in depth max. 10 mm
M5, 5 mm

Permissible shaft load
F_radial: 150 N
F axial: 150 N
L1: 20 mm
Permissible simultaneous shaft loads at rated speed and service life expectancy L10 (in rated operation) from 20 000 h (at T_c max. 40 °C)

Electrical connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color</th>
<th>Configuration</th>
<th>Function</th>
<th>recommended AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>white</td>
<td>D-IN-A</td>
<td>Digital input A</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>brown</td>
<td>D-IN-B</td>
<td>Digital input B</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>green</td>
<td>D-IN-1</td>
<td>Digital input 1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>yellow</td>
<td>D-IN-2</td>
<td>Digital input 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analog 0 ... 10 V / brake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>gray</td>
<td>D-OUT-1</td>
<td>Digital output 1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>pink</td>
<td>D-OUT-2</td>
<td>Digital output 2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>blue</td>
<td>D-OUT-3</td>
<td>Digital output 3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>red</td>
<td>A-IN-1</td>
<td>0 ... 10 V (differential)</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>black</td>
<td>A-IN-GND</td>
<td>Ground for analog IN 1 (differential)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>violet</td>
<td>RS485 A (+)</td>
<td>Prog.-bus</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>gray / pink</td>
<td>RS485 B (-)</td>
<td>Prog.-bus</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>red / blue</td>
<td>U_logic</td>
<td>Logic power supply (24 V)</td>
<td></td>
</tr>
</tbody>
</table>

Signal

Power

- A: gray  Ballast  Ballast resistor
- B: brown  U_x  Power supply  16
- C: black  GND  Power / signal-ground

Subject to alternations
**Electrical connection Cable**  
*All dimensions in mm*

<table>
<thead>
<tr>
<th>Type</th>
<th>L</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable (12 + 3 Pins)</td>
<td>1 000 ± 30</td>
<td>992 0160 034</td>
</tr>
<tr>
<td>Cable (12 + 3 Pins)</td>
<td>3 000 ± 30</td>
<td>992 0160 035</td>
</tr>
</tbody>
</table>

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)
# K1 servomotor in combination with external control electronics

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECI-80.XX-K1</td>
<td>20</td>
</tr>
<tr>
<td>VTD-XX.XX-K4S (position)</td>
<td>21</td>
</tr>
</tbody>
</table>
Servomotor ECI-80.XX-K1

Description
- 3-phase BLDC internal rotor servomotor
- 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
- Protection class IP 40/IP 54 and connection by connector system
- 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

<table>
<thead>
<tr>
<th>Characteristic curve</th>
<th>ECI-80.20-K1</th>
<th>ECI-80.20-K1</th>
<th>ECI-80.40-K1</th>
<th>ECI-80.40-K1</th>
<th>ECI-80.60-K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage (U_N)</td>
<td>24</td>
<td>48</td>
<td>24</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Nominal speed (n_N)</td>
<td>4 000</td>
<td>4 000</td>
<td>4 000</td>
<td>4 000</td>
<td>4 000</td>
</tr>
<tr>
<td>Nominal torque (M_N)</td>
<td>700</td>
<td>700</td>
<td>1 200</td>
<td>1 200</td>
<td>1 800</td>
</tr>
<tr>
<td>Nominal current (I_N)</td>
<td>13.5</td>
<td>7.50</td>
<td>25.0</td>
<td>12.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Nominal output power (P_N)</td>
<td>2 400</td>
<td>2 500</td>
<td>3 900</td>
<td>5 000</td>
<td>5 600</td>
</tr>
<tr>
<td>Permissible peak current (I_(max))</td>
<td>100</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Permanent stall torque (M_(stall))</td>
<td>700</td>
<td>700</td>
<td>1 200</td>
<td>1 200</td>
<td>1 800</td>
</tr>
<tr>
<td>Speed at no-load operation (n_L)</td>
<td>4 800</td>
<td>4 800</td>
<td>4 800</td>
<td>4 850</td>
<td>6 100</td>
</tr>
<tr>
<td>No-load current (I_L)</td>
<td>1.00</td>
<td>0.70</td>
<td>1.50</td>
<td>0.90</td>
<td>1.00</td>
</tr>
<tr>
<td>Recommended speed control range</td>
<td>0 ... 4 000</td>
<td>0 ... 4 000</td>
<td>0 ... 4 000</td>
<td>0 ... 4 000</td>
<td>0 ... 4 000</td>
</tr>
<tr>
<td>Rotor moment of inertia (J_(r))</td>
<td>54</td>
<td>54</td>
<td>104</td>
<td>104</td>
<td>155</td>
</tr>
<tr>
<td>Motor constant (K_e)</td>
<td>47.2</td>
<td>94.1</td>
<td>48.2</td>
<td>96.0</td>
<td>72.2</td>
</tr>
<tr>
<td>Connection resistance (R_(c))</td>
<td>0.07</td>
<td>0.30</td>
<td>0.03</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Connection inductance (L_(c))</td>
<td>300</td>
<td>1300</td>
<td>200</td>
<td>600</td>
<td>200</td>
</tr>
<tr>
<td>Overload protection</td>
<td>integrated</td>
<td>integrated</td>
<td>integrated</td>
<td>integrated</td>
<td>integrated</td>
</tr>
<tr>
<td>Permissible ambient temperature range (T_(a))</td>
<td>-30 ... +40</td>
<td>-30 ... +40</td>
<td>-30 ... +40</td>
<td>-30 ... +40</td>
<td>-30 ... +40</td>
</tr>
<tr>
<td>Weight</td>
<td>1.40</td>
<td>1.40</td>
<td>2.10</td>
<td>2.10</td>
<td>2.70</td>
</tr>
<tr>
<td>Part number (wire interface)</td>
<td>IP 40</td>
<td>932 8020 103</td>
<td>932 8020 105</td>
<td>932 8040 103</td>
<td>932 8040 105</td>
</tr>
<tr>
<td>Part number (cable routing)</td>
<td>IP 54</td>
<td>on request</td>
<td>on request</td>
<td>on request</td>
<td>on request</td>
</tr>
</tbody>
</table>

1) The degree of protection refers to the installed condition with sealing on the flange side
2) The shaft geometry in the IP54 version is different from the displayed sketch
3) At T_a max. 40 °C
4) Permissible maximum current duration: max. 5 seconds – can be repeated after complete cool down

Preferred type: ready to ship in 48 hours
Subject to alterations
## Control electronics VTD-XX.XX-K4S

### Description
- Operating electronics for driving 3-phase BLDC servomotors 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" PC software
- Integrated brake ballast-control
- Device status notification by 1 LED

### Table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>VTD-24.40-K4S</th>
<th>VTD-48.20-K4S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage (power supply Uₜ)</td>
<td>24 V DC</td>
<td>48 V DC</td>
</tr>
<tr>
<td>Permissible supply voltage range (U)</td>
<td>18 ... 30 V DC</td>
<td>18 ... 30 V DC</td>
</tr>
<tr>
<td>Maximum output current (max. 5 sec)³</td>
<td>100 A</td>
<td>100 A</td>
</tr>
<tr>
<td>Permissible continuous output current³</td>
<td>40 A</td>
<td>40 A</td>
</tr>
<tr>
<td>Nominal voltage (Logic supply Uₜ)</td>
<td>24 V DC</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Logic current draw (at 24 V DC)³</td>
<td>&lt; 100 mA</td>
<td>&lt; 100 mA</td>
</tr>
<tr>
<td>Maximum commutation frequency</td>
<td>2 kHz</td>
<td>2 kHz</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>20 kHz</td>
<td>20 kHz</td>
</tr>
<tr>
<td>Minimum connection inductance</td>
<td>0.10 mH</td>
<td>0.10 mH</td>
</tr>
<tr>
<td>Digital inputs Number</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Digital outputs Number</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Analog inputs Number</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Parameterization interface</td>
<td>RS485</td>
<td>RS485</td>
</tr>
<tr>
<td>Efficiency (in optimum working range)</td>
<td>&gt; 95 %</td>
<td>&gt; 95 %</td>
</tr>
<tr>
<td>Permissible ambient temperature range (Tₜ)</td>
<td>-30 ... +40 °C</td>
<td>-30 ... +40 °C</td>
</tr>
<tr>
<td>Permissible ambient humidity²</td>
<td>5 ... 85 %</td>
<td>5 ... 85 %</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 20</td>
<td>IP 20</td>
</tr>
<tr>
<td>Weight (ca. kg)</td>
<td>ca. 0.50</td>
<td>ca. 0.50</td>
</tr>
<tr>
<td>Order number (IP 20)</td>
<td>994 2440 000</td>
<td>994 4820 000</td>
</tr>
</tbody>
</table>

³ Applicable at rated temperature Tₜ=25°C, Derating at deviating (higher) temperatures
² Current draw without current requirement of digital outputs
²² Condensation not permitted

### Preferred type: ready to ship in 48 hours
- Subject to alternations
K4 servo drive systems · Edition 2020-02

Permissible shaft load

Faxial: 70 N
Permissible simultaneous shaft loads at rated speed and service life expectancy $L_{10}$ (in rated operation) from 20 000 h (at $T_1$ max. 40 °C)

 radial: 330 N

$L_1$: 15 mm

Technical drawing

Electrical connection wire

Electrical connection cable

Motor side

Motor side

Servomotor ECI-80.XX-K1
Modular system

- **Brake system**
  - on request

- **Basic motor**

- **Encoder system**
  - on request

- **Planetary gearhead**
  - Performax® Plus 63
  - Optimax 63

- **Recommended external control electronics**
  - VTD-XX.XX-K4S speed
Control electronics VTD-XX.XX-K4S

Technical drawing

Mating connectors are included in delivery

Accessories

Commissioning tool
„driveSTUDIO“ (page 26)

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

Image of „driveSTUDIO“ PC-Software

Power supply
Controller
Servomotor
Control electronics

PC with software „driveSTUDIO“
Interface adapter
Part number 914 0000 403

Arrangement Commissioning

K4 servo drive systems · Edition 2020-02
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.


<table>
<thead>
<tr>
<th>Functional description of the LED displays</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LED name</strong></td>
</tr>
<tr>
<td>TxD</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>RxD</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ON</td>
</tr>
</tbody>
</table>

**Electrical connection**

<table>
<thead>
<tr>
<th>PIN</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>RS485+</td>
</tr>
<tr>
<td>B</td>
<td>RS485-</td>
</tr>
<tr>
<td>X</td>
<td>--</td>
</tr>
</tbody>
</table>
Easy integration into PROFINET® networks

The SIEMENS ET 200SP allows easy integration of our K4 drivers in the Profinet networks via communication module CM PtP

Advantages
- Automatic parameterization of the drive (K4 knowledge not required)
- Automatic controller setting
- Application setting in physical values
- Various statistics and diagnostic information
- Speed/position commands
- Automatic determination of the start-up time using integrated mechatronic model
- HMI control displays allow intuitive interaction

Schematic layout
- The RS485 interface available on the compact drive allows integration into Profinet networks
- Functional components allow simple contro
Regions in Germany

Region North

Region Middle / East

Region Central / West

Region South / East
Agents around the world

Germany

- **Northern region**
  - Breuell & Hilgenfeldt GmbH
  - Udo Wildenblanck
  - Regionalleitung Vertrieb Antriebstechnik
  - Oststraße 96
  - 22844 Norderstedt
  - Phone +49 9123 945-7291
  - Fax +49 9123 945-5291
  - Udo.Wildenblanck@de.ebmpapst.com

- **Central / Ost region**
  - Breuell & Hilgenfeldt GmbH
  - Udo Wildenblanck
  - Regionalleitung Vertrieb Antriebstechnik
  - Oststraße 96
  - 22844 Norderstedt
  - Phone +49 9123 945-7291
  - Fax +49 9123 945-5291
  - Udo.Wildenblanck@de.ebmpapst.com

- **Central / Western region**
  - Hemsbach
  - Markus Psik
  - Am Dreispitz 16
  - 69502 Hemsbach
  - Phone +49 9123 945-7293
  - Fax +49 9123 945-5294
  - Markus.Psik@de.ebmpapst.com

- **Southern / Western region**
  - Ihringen
  - Mario Rudmann
  - Hauptstraße 27
  - 79244 Ihringen
  - Phone +49 9123 945-7294
  - Fax +49 9123 945-5294
  - Mario.Rudmann@de.ebmpapst.com

- **Southern / Eastern region**
  - Baierbrunn
  - Patrick Christleven
  - Bernhard-Pankok-Weg 4
  - 82065 Baierbrunn
  - Phone +49 9123 945-7203
  - Fax +49 9123 945-5203
  - Patrick.Christleven@de.ebmpapst.com

Europe

- **Austria**
  - ebm-papst Motoren & Ventilatoren GmbH
  - Straubingstraße 17
  - 4030 Linz
  - Phone +43 732 321150-0
  - Fax +43 732 321150-20
  - info@at.ebmpapst.com
  - www.ebmpapst.at

- **Benelux**
  - ebm-papst Benelux B.V.
  - Polbeemd 7 – 5741 TP Beek en Donk
  - P.O. Box 140 – 5740 AC Beek en Donk
  - Phone +31 492 502-900
  - Fax +31 492 502-950
  - verkoop@nl.ebmpapst.com
  - www.ebmpapst.nl

- **France**
  - ebm-papst sarl
  - Parc d'Activités Nord
  - 1 rue Mohler – BP 62
  - 67212 Obermai Cedex
  - Phone +33 3 88 66 88 03
  - info@ebmpapst.fr
  - www.ebmpapst.fr

- **Great Britain**
  - ebm-papst UK Ltd.
  - Chelmsford Business Park
  - Chelmsford Essex CM2 SEZ
  - UNITED KINGDOM
  - Phone +44 1245 468555
  - Fax +44 1245 466336
  - sales@uk.ebmpapst.com
  - www.ebmpapst.co.uk

- **Italy**
  - ebm-papst Srl
  - Via Cornaggia 108
  - 22076 Mozzone (Co)
  - Phone +39 0331 8362013
  - Fax +39 0331 821510
  - info@it.ebmpapst.com
  - www.ebmpapst.it

- **Switzerland**
  - ebm-papst AG
  - Rütisbergstraße 1t
  - 8156 Oberhasli
  - Phone +41 44 73220-70
  - Fax +41 44 73220-77
  - verkauf@ebmpapst.ch
  - www.ebmpapst.ch

- **Sweden**
  - ebm-papst AB
  - Äggelundavägen 2
  - 17562 Järfalla
  - Phone +46 10 6544400
  - Fax +46 8 362306
  - info@ebmpapst.se
  - www.ebmpapst.se

- **Switzerland**
  - ebm-papst AG
  - Rütisbergstraße 1t
  - 8156 Oberhasli
  - Phone +41 44 73220-70
  - Fax +41 44 73220-77
  - verkauf@ebmpapst.ch
  - www.ebmpapst.ch

America

- **USA**
  - ebm-papst Inc.
  - P.O. Box 4009
  - 100 Hyde Road
  - Farmington, CT 06034
  - UNITED STATES
  - Phone +1 860 674-1515
  - Fax +1 860 674-8536
  - sales@us.ebmpapst.com
  - www.ebmpapst.us

Asia

- **China**
  - ebm-papst Ventilator (Shanghai) Co., Ltd
  - No. 418, Huajing Road
  - WaiGaoQiao Free Trade Zone
  - 200131 Shanghai
  - Phone +86 21 5046-0183
  - Fax +86 21 5046-1119
  - sales@cn.ebmpapst.com
  - www.ebmpapst.com.cn

- **India**
  - ebm-papst India Pvt. Ltd.
  - 26/3, G.N.T. Road Erukkencherry
  - 600 118 Chennai
  - Phone +91 44 25371249
  - Fax +91 44 25371249
  - sales@in.ebmpapst.com
  - www.ebmpapst.in