

**Control  
Regulate  
Drive**  
with inverter  
driven geared  
motors series  
**EtaK2.0**



 **Bauer®**  
Gear Motor

An Altra Industrial Motion Company

## Efficient and ideal for decentral systems

EtaK2.0 geared motors help you cut costs in several areas: in planning and installation, in operation and in maintenance. They help you control the efficiency of your installations, protect your mechanical components and reduce mains loading. In this way EtaK2.0 geared motors make a significant contribution to energy savings and efficiency optimisation in your application.

All EtaK2.0 geared motors are a combination of helical, shaft-mounted, bevel and worm geared motors and a variable frequency drive (VFD). They give you compact drive solutions with continuously variable speed and rated motor power up to 7.5 kW, with the VFD mounted directly on the motor. Thanks to their compact design, the entire drive needs only slightly more installation space than a conventional geared motor.

EtaK2.0 geared motors are smart power components for future-oriented system designs and can easily be adapted to specific working conditions and required process speeds. They are preferably controlled using a field bus system, but they also support control through digital and analogue inputs and outputs. The VFD provides valuable additional information for system protection and monitoring.

- Employing variable speed control usually increases the efficiency of the drive system.
- A variety of control schemes have become established as optimal solutions in different application areas.
- Bauer works with experts to determine the best solution for the control tasks in the application environment for each specific application. For example, the demands in the automobile industry, the metals industry and the food processing industry are distinctly different.
- Bauer's application experts work closely with our system partners to further optimise the electromechanical drive train.



## Flexibility through modular design



### The Drive Unit – power unit with low diversity

- Power units are available in three models with ten power ratings  
BF1: 3ph. 380–500 V, 0.37 to 1.5 kW  
BF2: 3ph. 380–500 V, 2.2 to 3.0 kW  
BF3: 3ph. 380–500 V, 4.0 to 7.5 kW
- Enclosure IP65



### The Communication Unit– localised functionality

- Communication over CANopen, Profibus, Profinet, EtherCAT, EtherNet/IP and AS-i
- Safety functions in accordance with EN 60204 (STO, SS1)
- I/O signal processing
- Without field bus: I/O via cable glands
- With field bus: bus and two input signals via M12
- Customisable up to 8x M12
- Prefabricated M12 connectors available as accessories



### The Connection Unit– flexible connection options

- Cable glands and various plug-and-socket connectors
- Brake resistor connector
- Control of spring-actuated brake





## Functions and features

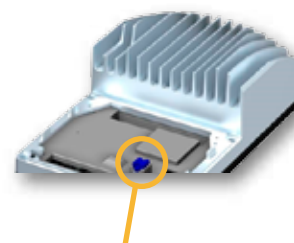
|                                  |   |
|----------------------------------|---|
| <b>Control types</b>             | Suitable for asynchronous and synchronous motors  |
| <b>Control algorithms</b>        | <ul style="list-style-type: none"> <li>- VFCplus: V/f control (linear or quadratic)</li> <li>- SLVC: Sensorless vector control (motor speed)</li> <li>- VFCplus eco: Energy-efficient V/f control</li> </ul>                      |
| <b>Basic functions</b>           | User-definable menu<br>Parameter switching<br>DC braking function<br>Trap-and-trace<br>S ramps for gentle acceleration<br>PID controller<br>Three fixed frequencies<br>Exclusion frequencies                                      |
| <b>Engineering applications</b>  | Variable speed servo drive<br>Switch-off positioning  |
| <b>Monitoring and protection</b> | Short circuit<br>Frame fault<br>Overvoltage<br>Motor phase dropout<br>Overcurrent<br>I <sup>2</sup> t motor monitoring<br>Motor overheating<br>Mains phase dropout<br>Protection against cyclic mains switching<br>Motor stalling |
| <b>Diagnostics</b>               | Data logger, logbook  |
| <b>Status indication</b>         | Readily visible LED   |
| <b>Diagnostic interface</b>      | Integrated<br>For USB diagnostic adapter or keypad (hand-held terminal)   |
| <b>Braking</b>                   | Integrated brake management<br><ul style="list-style-type: none"> <li>- Integrated brake chopper</li> <li>- Braking resistor accessory module or external braking resistor</li> </ul>   |
| <b>Power range</b>               | 0.75 to 7.5 kW  |
| <b>Overload current</b>          | 200% (3 s); 150% (60 s)   |
| <b>Wall mounting</b>             | Possible  |



- **Diagnostic interface**
  - For hand-held terminal
  - For PC through USB adapter
- **Potentiometer**
  - For 0–100% speed control
- Large **LED status indicator** for good visibility, even under difficult installation conditions



Hand-held terminal



- All parameter settings are stored in a **memory module** for quick transfer to a new unit in the event of service exchange.
- The memory module can also be duplicated using a copying station.
- Parameter download to memory module through USB adapter

# Communication unit

The communication modules support the following functions:

- VFD control using digital and analogue signals
- VFD control using field bus systems
- Supports Safe Torque Off functionality
- Connection options for sensors and actuators
- Internal 24 V supply for sensor power (max. 100 mA)
- Connections can be made using cable glands and M12 connectors. Up to eight cable glands and/or connectors in total are possible. The individual communication units are provided with suitable connection options according to their functions.

| Interfaces                   |                   |                |                 |               |                 |            |                         |
|------------------------------|-------------------|----------------|-----------------|---------------|-----------------|------------|-------------------------|
|                              | Controller enable | Digital inputs | Digital outputs | Relay outputs | Analogue inputs | Safety STO | External 24 V DC supply |
|                              | Number            | Number         | Number          | Number        | Number          | Number     | Number                  |
| <b>I/O modules</b>           |                   |                |                 |               |                 |            |                         |
| Standard I/O                 | 1                 | 5              | 1               | 1             | 1               |            | 1                       |
| <b>Field bus</b>             |                   |                |                 |               |                 |            |                         |
| AS-i                         | 1                 | 5              | 1               |               |                 |            |                         |
| CANopen                      | 1                 | 5              | 1               |               |                 |            |                         |
| EtherCAT                     | 1                 | 5              | 1               |               |                 |            | 1                       |
| EtherNet/IP                  | 1                 | 5              | 1               |               |                 |            | 1                       |
| Profibus                     | 1                 | 5              | 1               |               |                 |            | 1                       |
| Profinet                     | 1                 | 5              | 1               |               |                 |            |                         |
| <b>Field bus with safety</b> | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| AS-i STO                     | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| CANopen STO                  | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| EtherCAT STO                 | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| EtherNet/IP STO              | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| Profibus STO                 | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |
| Profinet STO                 | 1                 | 5              | 1               | 1             | 1               | 1          | 1                       |

## Flexible and versatile

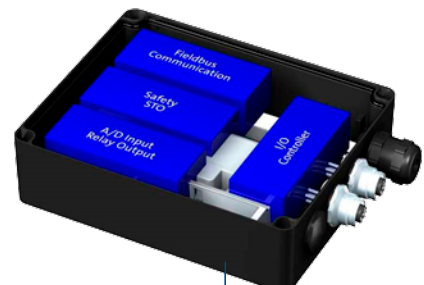
Without field bus



With field bus



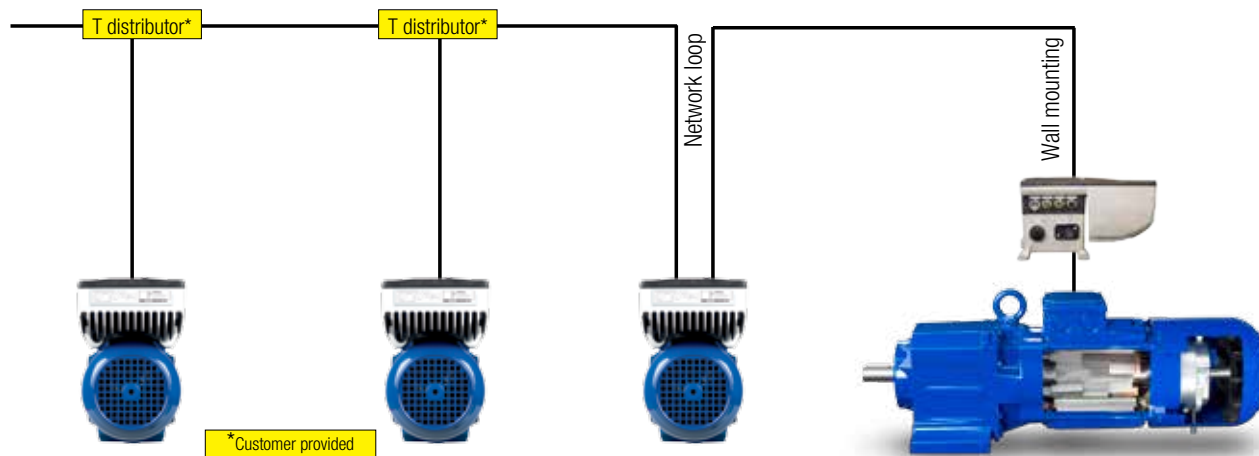
With field bus and STO



Supported field busses



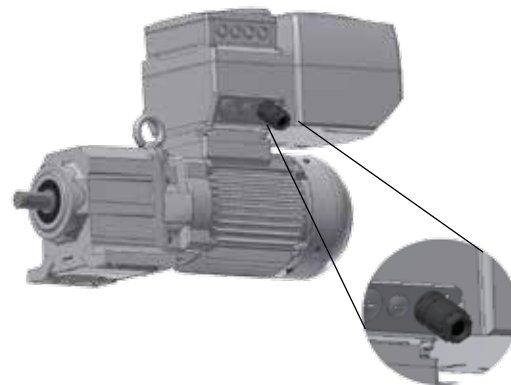
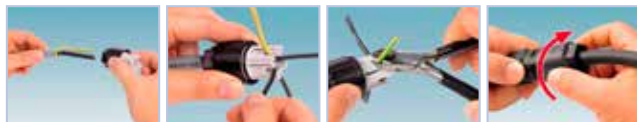
## Power distribution scheme



## Mains connection scheme

Standard

- Up to 7.5 kW
- Mains connection through integrated QuickOn power connector
- Max. load 20 A
- For inverters up to 7.5 kW
- Insulation displacement terminals
- Faster and easier connection



Option

- Up to 3 kW
- Mains connection through integrated M12 power connector
- Max. load 12 A
- For inverters up to 3.0 kW
- Straight and angle mating connectors available
- Pre-wired mating connectors available



## Power bus – alternative connection options (special versions)



## Wall mounting

Up to 3.0 kW

This wall mount option, with or without cable glands, is available for power levels up to **3.0 kW**.



4.0 to 7.5 kW

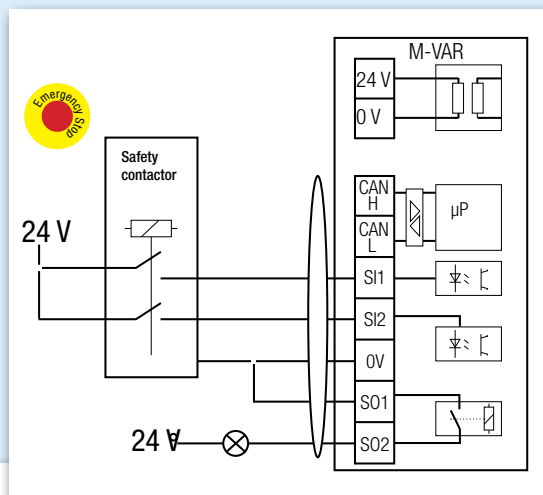
This wall mount option is available for power levels from **4.0 to 7.5 kW**.



## Drive based safety

### Safe Torque Off (STO)

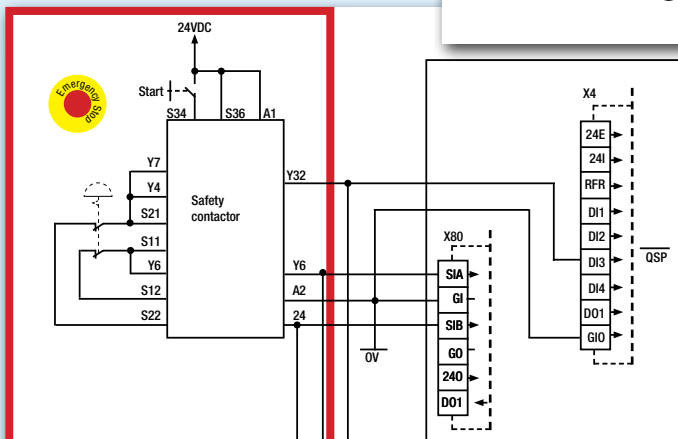
Corresponds to EN 60204 stop category 0. Power to the drive is cut off immediately and the drive is brought to an uncontrolled stop. PL e Cat. 4 according to EN ISO 13849-1



### Advantages

- Mains contactor not necessary
- Fast restart
- Selective switch-off
- Communication remains active

\* Additional safety contactor



### Safe Stop 1 (SS1)

Corresponds to EN 60204 stop category 1. The drive is brought to a controlled stop, and then the STO safety function is activated. PL e Cat. 4 according to EN ISO 13849-1

## Compact geared motor solution

- **Adapted motor windings** matched to VFD for optimised efficiency
- **Optimised motor parameters** over the entire speed and torque range
- Motor and VFD **combinations surpass** IES 2 system efficiency class according to EN 50598-2 and IEC 61800-9-2
- **All necessary options** integrated very compactly, including safety functions

## Motor combinations

### Permanent magnet synchronous motors (PMSM)

| P <sub>N</sub> [kW] | Type   | n <sub>N</sub> [rpm] | P <sub>VFD</sub> [kW] |
|---------------------|--------|----------------------|-----------------------|
| 0.55                | S08MA4 | 3000                 | 0.55                  |
| 0.55                | S08MA4 | 1500                 | 0.55                  |
| 0.75                | S08MA4 | 3000                 | 0.75                  |
| 0.75                | S08MA4 | 1500                 | 0.75                  |
| 1.1                 | S08MA4 | 3000                 | 1.1                   |
| 1.1                 | S08LA4 | 1500                 | 1.1                   |
| 1.5                 | S08MA4 | 3000                 | 1.5                   |
| 1.5                 | S08LA4 | 1500                 | 1.5                   |
| 1.5                 | S09SA4 | 1500                 | 1.5                   |
| 2.2                 | S08MA4 | 3000                 | 2.2                   |
| 2.2                 | S08LA4 | 3000                 | 2.2                   |
| 2.2                 | S09SA4 | 1500                 | 2.2                   |
| 2.2                 | S09XA4 | 1500                 | 2.2                   |
| 3                   | S08LA4 | 3000                 | 3                     |
| 3                   | S09XA4 | 1500                 | 3                     |
| 3                   | S11SA6 | 1500                 | 3                     |
| 4                   | S09SA4 | 3000                 | 4                     |
| 4                   | S11SA6 | 1500                 | 4                     |
| 4                   | S11MA6 | 1500                 | 4                     |
| 5.5                 | S09XA4 | 3000                 | 5.5                   |
| 5.5                 | S11MA6 | 1500                 | 5.5                   |
| 5.5                 | S11LA6 | 1500                 | 5.5                   |
| 7.5                 | S11SA6 | 3000                 | 7.5                   |
| 7.5                 | S11MA6 | 3000                 | 7.5                   |
| 7.5                 | S11LA6 | 1500                 | 7.5                   |



### Asynchronous motors (ASM)

|                              |          | Base frequency<br>50 Hz<br>Motor:<br>350V/50Hz/Y |                       | Base frequency<br>87 Hz<br>Motor:<br>202V/50Hz/D |                       |
|------------------------------|----------|--|-----------------------|--|-----------------------|
| P <sub>N</sub> 50 Hz<br>[kW] | Type     | P <sub>VFD</sub><br>[kW]                         | I <sub>N</sub><br>[A] | P <sub>VFD</sub><br>[kW]                         | I <sub>N</sub><br>[A] |
| 0.12                         | DHE06LA4 | 0.37   | 1.3                   | 0.37   | 1.3                   |
| 0.18                         | DHE06LA4 | 0.37   | 1.3                   | 0.37   | 1.3                   |
| 0.25                         | DHE07LA4 | 0.37   | 1.3                   | 0.55   | 1.8                   |
| 0.37                         | DHE08MA4 | 0.37   | 1.3                   | 0.75   | 2.4                   |
| 0.55                         | DHE08LA4 | 0.55   | 1.8                   | 1.1  | 3.2                   |
| 0.75                         | DHE08XA4 | 0.75   | 2.4                   | 1.5  | 3.9                   |
| 1.1                          | DHE09LA4 | 1.1  | 3.2                   | 2.2  | 5.6                   |
| 1.5                          | DHE09XA4 | 1.5  | 3.9                   | 3  | 7.3                   |
| 2.2                          | DHE09XB4 | 2.2  | 5.6                   | 4  | 9.5                   |
| 3                            | DHE11MA4 | 3  | 7.3                   | 5.5  | 13                    |
| 4                            | DHE11LA4 | 4  | 9.5                   | 7.5  | 16.5                  |
| 5.5                          | DHE11LB4 | 5.5  | 13                    | -  | -                     |
| 7.5                          | DHE13LA4 | 7.5  | 16.5                  | -  | -                     |

The motor combinations listed here are subject to change. Please contact our staff for more information.



## The benefits at a glance

The EtaK2.0 features maximum user friendliness in operation and installation. Especially for decentralised drive solutions, it demonstrates its high efficiency in terms of space, time and energy.

### Space advantages

- Integrated safety technology and field bus communication according to specific needs
- Modular structure minimises spare parts stock

### Time advantages

- Plug-and-socket connectors reduce assembly and installation time – „unpack, plug in and go“
- Easy memory module exchange simplifies series commissioning and enhances availability

### Energy efficiency

- VFC eco mode provides intelligent adjustment of magnetising current
- Energy savings of up to 30% possible under partial load conditions

### Mechanically and electrically robust

- Suited to extremely harsh environments thanks to IP65 enclosure rating

### Added benefits

- 200% overload current (3 s)
- V/f control with or without encoder
- Sensorless vector control
- Short-circuit and frame fault protection
- Direct current braking
- S ramps for gentle acceleration
- Maximum output frequency 300 Hz
- CANopen, Profibus, Profinet, EtherCAT, EtherNet/IP and AS-i
- STO safety function

### A plus for decentral applications

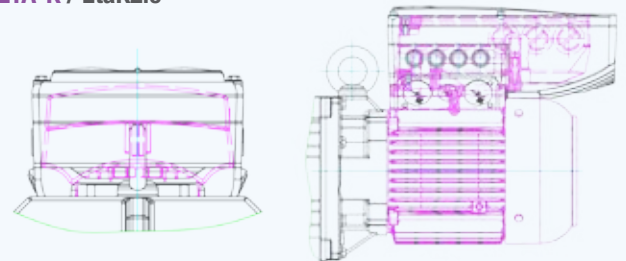
- The EtaK2.0 meets all demands on modern, universally deployable and cost-effective motor/VFD combinations. That makes it the ideal choice for decentral tasks in intralogistics domains, such as airports and distribution centres.

## Eta-K vs. EtaK2.0

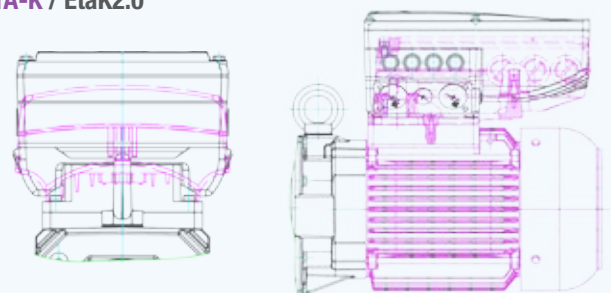
| Feature                            | Eta-K              | EtaK2.0  |
|------------------------------------|--------------------|--|
| Power range                        | 0.55 kW - 7.5 kW   | 0.37 kW - 7.5 kW   |
| PMSM enabled                       | ✗                  | ✓  |
| Sensorless vector control          | ✗                  | ✓  |
| V/f control                        | ✓                  | ✓  |
| Digital inputs                     | 4                  | 5  |
| Digital outputs                    | 1                  | 1 - 2  |
| Analogue in                        | 1                  | 1  |
| Field bus systems                  | RS 485<br>Profibus | Profinet<br>EtherCAT<br>CANOpen<br>Profibus<br>AS-i<br>EtherNet/IP |
| Safety options                     | ✗                  | ✓  |
| Brake chopper                      | ✗                  | ✓  |
| Brake resistor                     | ✗                  | ✓  |
| Operating Temperature              | -10°C to +40°C     | -30°C to +55°C   |
| Overload                           | 160% 60 s          | 200% 3 s;<br>150% 60 s   |
| Control of electromechanical brake | External           | Optional   |

## Contour comparison

### D08 asynchronous motor with 0.55 kW inverter ETA-K / EtaK2.0



### D09 asynchronous motor with 1.5 kW inverter ETA-K / EtaK2.0



# EtaK2.0

## ACCESSORIES

Encoder



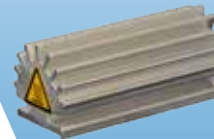
Holding brake



Hand-held terminal



Brake resistor



Wall mounting



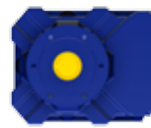
## TRANSMISSION COMPONENTS



BF series



BG series



BK series



BS series



BM series

## GEAR TECHNOLOGY

## CONTROL/ COMMUNICATION



Field bus



Digital / Analogue I/O



Permanent-magnet motors



Asynchronous motors

## MOTOR & CONTROL ELECTRONICS

| Couplings   | Electromagnetic Clutches and Brakes  | Heavy Duty Clutches and Brakes  | Bauer Gear Motor   |
|---|--|---|--|
| <p><b>Ameridrives Couplings</b><br/> <i>Mill Spindles, Ameriflex, Ameridisc</i><br/>                     Erie, PA - USA<br/> <b>1-814-480-5000</b></p> <p><i>Gear Couplings</i><br/>                     San Marcos, TX - USA<br/> <b>1-800-458-0887</b></p> <p><b>Bibby Turbobox</b><br/> <i>Disc, Gear, Grid Couplings, Overload Clutches</i><br/>                     Dewsbury, England<br/> <b>+44 (0) 1924 460801</b><br/>                     Boksburg, South Africa<br/> <b>+27 (0) 11 918 4270</b></p> <p><b>TB Wood's</b><br/> <i>Elastomeric Couplings</i><br/>                     Chambersburg, PA - USA<br/> <b>1-888-829-6637</b> – Press #5</p> <p><i>For application assistance:</i><br/>                     1-888-829-6637 – Press #7</p> <p><i>General Purpose Disc Couplings</i><br/>                     San Marcos, TX - USA<br/> <b>1-888-449-9439</b></p> <p><b>Ameridrives Power Transmission</b><br/> <i>Universal Joints, Drive Shafts, Mill Gear Couplings</i><br/>                     Green Bay, WI - USA<br/> <b>1-920-593-2444</b></p> <p><b>Huco Dynatork</b><br/> <i>Precision Couplings and Air Motors</i><br/>                     Hertford, England<br/> <b>+44 (0) 1992 501900</b><br/>                     Chambersburg, PA - USA<br/> <b>1-888-829-6637</b></p> <p><b>Lamiflex Couplings</b><br/> <i>Flexible Couplings, Bearing Isolators, and Coupling Guards</i><br/>                     São Paulo, SP - Brasil<br/> <b>+55 (11) 5679-6533</b></p> <p><b>Guardian Couplings</b><br/> <i>Flywheel, Jaw, Shear, Gear, Grid, Disc and Engine Couplings</i><br/>                     Michigan City, IN - USA<br/> <b>1-219-874-5248</b></p> <p><b>Engineered Bearing Assemblies</b></p> <p><b>Kilian Manufacturing</b><br/> <i>Engineered Bearing Assemblies</i><br/>                     Syracuse, NY - USA<br/> <b>1-315-432-0700</b></p> | <p><b>Warner Electric</b><br/> <i>Electromagnetic Clutches and Brakes</i><br/>                     New Hartford, CT - USA<br/> <b>1-800-825-6544</b></p> <p><i>For application assistance:</i><br/>                     1-800-825-9050</p> <p>Saint Barthélemy d'Anjou, France<br/> <b>+33 (0) 2 41 21 24 24</b></p> <p><i>Precision Electric Coils and Electromagnetic Clutches and Brakes</i><br/>                     Columbia City, IN - USA<br/> <b>1-260-244-6183</b></p> <p><b>Matrix International</b><br/> <i>Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes</i><br/>                     Brechin, Scotland<br/> <b>+44 (0) 1356 602000</b><br/>                     New Hartford, CT - USA<br/> <b>1-800-825-6544</b></p> <p><b>Inertia Dynamics</b><br/> <i>Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes</i><br/>                     New Hartford, CT - USA<br/> <b>1-800-800-6445</b></p> <p><b>Overrunning Clutches</b></p> <p><b>Formsprag Clutch</b><br/> <i>Overrunning Clutches and Holdbacks</i><br/>                     Warren, MI - USA<br/> <b>1-800-348-0881</b> – Press #1</p> <p><i>For application assistance:</i><br/>                     1-800-348-0881 – Press #2</p> <p><b>Marland Clutch</b><br/> <i>Roller Ramp and Sprag Type Overrunning Clutches and Backstops</i><br/>                     South Beloit, IL - USA<br/> <b>1-800-216-3515</b></p> <p><b>Stieber Clutch</b><br/> <i>Overrunning Clutches and Holdbacks</i><br/>                     Heidelberg, Germany<br/> <b>+49 (0) 6221 30 47 0</b></p> <p><b>Belted Drives and Sheaves</b></p> <p><b>TB Wood's</b><br/> <i>Belted Drives</i><br/>                     Chambersburg, PA - USA<br/> <b>1-888-829-6637</b> – Press #5</p> <p><i>For application assistance:</i><br/>                     1-888-829-6637 – Press #7</p> | <p><b>Wichita Clutch</b><br/> <i>Pneumatic Clutches and Brakes</i><br/>                     Wichita Falls, TX - USA<br/> <b>1-800-964-3262</b><br/>                     Bedford, England<br/> <b>+44 (0) 1234 350311</b></p> <p><b>Twiflex Limited</b><br/> <i>Caliper Brakes and Thrusters</i><br/>                     Twickenham, England<br/> <b>+44 (0) 20 8894 1161</b></p> <p><b>Industrial Clutch</b><br/> <i>Pneumatic and Oil Immersed Clutches and Brakes</i><br/>                     Waukesha, WI - USA<br/> <b>1-262-547-3357</b></p> <p><b>Svendborg Brakes</b><br/> <i>Industrial Brakes and Brake Systems</i><br/>                     Vejstrup, Denmark<br/> <b>+45 63 255 255</b></p> <p><b>Gearing</b></p> <p><b>Boston Gear</b><br/> <i>Enclosed and Open Gearing, Electrical and Mechanical P.T. Components</i><br/>                     Charlotte, NC - USA<br/> <b>1-800-825-6544</b></p> <p><i>For application assistance:</i><br/>                     1-800-816-5608</p> <p><b>Bauer Gear Motor</b><br/> <i>Geared Motors</i><br/>                     Esslingen, Germany<br/> <b>+49 (711) 3518-0</b><br/>                     Somerset, NJ - USA<br/> <b>1-732-469-8770</b></p> <p><b>Nuttall Gear and Delroyd Worm Gear</b><br/> <i>Worm Gear and Helical Speed Reducers</i><br/>                     Niagara Falls, NY - USA<br/> <b>1-716-298-4100</b></p> <p><b>Linear Products</b></p> <p><b>Warner Linear</b><br/> <i>Linear Actuators</i><br/>                     Belvidere, IL - USA<br/> <b>1-800-825-6544</b></p> <p><i>For application assistance:</i><br/>                     1-800-825-9050</p> <p>Saint Barthélemy d'Anjou, France<br/> <b>+33 (0) 2 41 21 24 24</b></p> | <p><b>Bauer Gear Motor GmbH</b><br/>                     Eberhard-Bauer-Straße 37<br/>                     73734 Esslingen - Germany<br/> <b>+49 711 3518 0</b><br/> <b>+49 711 3518 381</b> (Fax)</p> <p><b>Bauer Gear Motor Slovakia s.r.o.</b><br/>                     Tovarenská 49<br/>                     953 01 Zlate Moravce - Slovakia<br/> <b>+421 37 6926100</b><br/> <b>+421 37 6926181</b> (Fax)</p> <p><b>Bauer Gear Motor Limited</b><br/>                     Nat Lane Business Park<br/>                     Winsford, Cheshire<br/>                     CW7 3BS - United Kingdom<br/> <b>+44 1606 868600</b><br/> <b>+44 1606 868603</b> (Fax)</p> <p><b>Bauer Gear Motor LLC</b><br/>                     31 Schoolhouse Rd.<br/>                     Somerset NJ 08873-1212 - USA<br/> <b>+1 732 469 8770</b><br/> <b>+1 732 469 8773</b> (Fax)</p> <p><b>Altra Industrial Motion (Shenzhen) Co., Ltd.</b><br/>                     18 Huan Zhen Road Dabo Industrial Zone - BoGoang Village<br/>                     ShaJing Town - BaoAn District<br/>                     Guangdong Province<br/>                     518104 Shenzhen City - China<br/> <b>+86 755 27246308</b><br/> <b>+86 755 27246017</b> (Fax)</p> <p><b>Altra Industrial Motion 000</b><br/>                     Volokolamskoye sh., 142, bldg 6<br/>                     Business Center „Irbis“<br/>                     125464 Moscow - Russia<br/> <b>+7 495 6420468</b><br/> <b>+7 495 6420469</b> (Fax)</p> <p><b>Customer Centre Finland</b><br/>                     01510 Vantaa<br/> <b>+358 207 189700</b></p> <p><b>Customer Centre France-Benelux</b><br/>                     Brussel (Anderlecht)<br/> <b>+32 2 5295941</b></p> <p><b>Customer Centre Italy</b><br/>                     Grisignano di Zocco (VI)<br/> <b>+39 0444 414392</b></p> |

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