EC-Screwdriver, for stationary use

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>320E19-0002</td>
<td>405024 A</td>
</tr>
<tr>
<td>320E19-0008</td>
<td>405024 B</td>
</tr>
<tr>
<td>320E19-0005</td>
<td>405024 C</td>
</tr>
</tbody>
</table>

MICROMAT-E
Dear Customer:
This tool is the result of more than 75 years of experience in the design and manufacturing of tools for the industrial market. We kindly ask, that you read these operating instructions carefully, so that you will be able to use this tool safely and for many years to come. If you need additional information, please contact your DEPRAG Representative, one of our international support offices or us direct at DEPRAG. We will be happy to answer any questions. Please visit our website: www.deprag.com

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1 Safety Tips

1.1. General Safety Tips

Before operating tool, make sure to carefully read and always observe these operating instructions.

Generally, the operator of the equipment and/or machinery is responsible for the equipment’s perfect condition and operation, while observing all necessary safety regulations. This equipment has been constructed in accordance with the newest stage of the technology, while recognizing all necessary safety related requirements. Nevertheless, while operating the equipment and/or machinery there is a chance of bodily harm to the operator as well as damage to equipment and/or machinery and other property. Operate the equipment and/or machinery only

- if equipment/machinery is used for the task it was designed for and
- is in perfect working condition and safe to use.

It is important to observe the technical data of the equipment, especially in regards to the environmental temperatures.

Prerequisite for the safe conduct and the uninterrupted operation of the equipment is the knowledge of the basic safety tips and the safety regulations. Additionally, all current regulations for a safe operational area, for accident prevention guidelines of electrical and mechanical installations, as well as noise suppression demands must be observed. During any maintenance or repair work, a clean work surface is recommended. Also, it is not recommended to either eat or smoke during repair or maintenance. Arbitrary changes made to the equipment, which alter its designated use, voids the warranty and cancels the manufacturer’s liability.

- The equipment is insulated to protect against an electrical power surge.
- It is not recommended to use this tool in an explosive hazardous environment, unless it was specifically designed for such a use.

The operating instruction booklet, especially the safety symbols and safety notes attached to the equipment or included in the documentation, must be observed at all times by all persons coming in contact with the equipment.
1.2. General Safety Regulations for Electronic Screwdriver Spindles

- Disconnect the spindle from the power supply, prior to changing bits.
- Do not wear loose clothing or jewelry; for movable parts can seize them. Wear a hairnet, if operator has long hair.
- Keep hands off the installed bit or socket.
- Injury is possible, if the driver reacts with an unexpected motion or when driver is used with a broken bit.
- Injury is possible, if the driver or the installed bits/socket reacts with an unexpected motion.
- When using tool with a bit-adapter or bit-extension (i.e. Magnetic Bitholder), make sure that those items are in good condition and well suited for the application with this tool.
- When installing driver into a support arm, make sure that the tool is rigidly mounted. When not using any support arm or stand, place both feet securely on the floor. This enables the Operator to easily absorb any tool reaction force.
- Install a side-handle or counter-holder to the driver, if the reaction force cannot safely be absorbed by operator.
- After turning off the tool, the bit will continue to rotate (inertia).
- In no case is it permissible to exceed the rated voltage.
- In the case of a power interruption, it is necessary to reset the controller.

**Attention:**

The screwdriver spindle will heat-up in relation to its average load respectively sequence of operation. If the selection of the type of screwdriver spindle is incorrectly or its operation is not appropriate for the application, the tool might overheat which could result in injuries (burnings).
1.3. Owner Obligation

The owner is obliged to only let persons operate the equipment, who

- are familiar with basic work environment safety rules and accident-preventing regulations. Also, those persons must have been instructed in the correct use of the equipment.
- have read and understood all safety and warning notifications in the Operating Instruction Booklet, as well as all other documentation pertaining to this equipment.
- check and confirm at regular intervals, that a safety oriented operation is guaranteed.

Only qualified and authorized personnel is allowed to operate, maintain and repair this equipment. A malfunction, which impairs operator safety, must be immediately removed.

1.4. Operator Obligation

Personnel, who is engaged in the operation of the equipment, must always be committed to

- observe the basic safety and accident preventing regulations,
- read and observe the safety and warning notifications of this operating instruction booklet.
1.5. Warranty and Liability

Unless otherwise specified, our “General Sales and Delivery Conditions” apply. Warranty and liability claims in regards to persons or equipment damages are invalid, if one or several of the following causes apply:

- Use of the equipment in a non-designated application.
- Improper installation, operation, service or maintenance of the machine.
- Operation of the machine with either defective or removed safety and protection devices.
- Non-observance of the requirements stated in the operating instruction booklet, in regards to transportation, storage, mounting, installation, operation, maintenance and service of the equipment.
- Structural change or adjustment on the equipment to a non-designated use.
- Inadequate supervision of wear parts.
- Improper repair, inspection or maintenance.
- Catastrophic cases because of a war, acts of god or other reasons which are beyond our control.
1.6. Symbol Description

Read and observe the Operating Instruction Booklet, prior to and during operation of tool.

**DANGER**
Reference to an immediate danger to a person. May lead to serious injuries or even death, if unobserved!

Properly recycle environmentally damaging grease, cooling agents or detergents.

**RECOMMENDATIONS**
Important or additional information on the equipment or in the documentation.

Use eye protection or wear safety goggles.

Wear hearing protection.

Warning against hand-injuries.
Attention: Keep away your hands from areas, which are marked with this symbol!

Hands may be crushed, seized or otherwise injured.

ESD-protected area
Equipment may be damaged or destroyed by an electrostatic discharge.
Maintenance and repair on hydraulic and pneumatic equipment may only be performed by specially trained personnel!

Disconnect equipment from air supply, prior to repair of pneumatic or hydraulic equipment.

Provide regular preventive maintenance on hoses and airlines. Exchange hose lines, even if there is no visible damage! (Observe corresponding requirements of the manufacturer!)

After repair and maintenance, check the following items:
- make sure all detached and re-attached connections are solid.
- confirm that removed covers, screens or filters were re-installed
- during disconnecting or reconnecting of an air-operated equipment, injury may occur due to a whipping air-hose

After conclusion of maintenance or repair and prior to start of operation, make sure to
- remove all materials, tools and other supplies needed for the maintenance or repair from work area of the equipment
- remove leaking liquid or oils
- make sure all safety devices on the equipment work perfectly!

Only a trained electrician may perform repair work on the electrical components of the equipment!
- Check electric equipment regularly!
- Re-attach loose connections!
- Replace damaged cables or lines immediately!
- Keep control cabinet closed at all times. Access is only allowed for authorized persons with suitable key!
- Never hose down control cabinets and other housings of electrical equipment with water!
1.7. Observe Environmental Regulations

When working on or with the equipment, it is imperative to observe all requirements in regards to waste-disposal and proper recycling. Especially during installation, repair or maintenance, water damaging agents such as

- lubricating grease and oil
- hydraulic fluid
- cooling agents
- solvent-containing cleaning agents

must not leak into the ground or into the sewage system!

Such materials must be stored, transported, contained and recycled in suitable containers.

2 Designated Equipment Use

The EC-Screwdriving System is exclusively designed for screw-assembly in an industrial environment. The system is especially well suited for assembly areas with high demands in regards to quality, flexibility and documentation.

The Screwdriver Spindles of the series 320E... are designed for the stationary use in

- Construction Slide Units
- Multi-Spindle Screwdriving Stations
- Cartesian Screwdriving Robots
- Gantry Screwdriving Cells

The DEPRAG EC Screwdriver Spindles allow free programming of the screw tightening process. Within the power range of the selected spindle,

- the torque value,
- the speed,
- the stand-by and
- the direction of rotation

can be adjusted individually to the assembly requirement.
3 General

The EC-Screwdriver 320E… is part of the EC-Screwdriving System.

The essential characteristics of this screwdriver series are:
- brush-less EC-Drive with commutator over encoder
- torque- and angle-controlling

The EC-Screwdriving System is designed for the use in an industrial environment for a maximum torque of 0,2 / 0,5 resp. 0,8 Nm (depending on the screwdriver type – see chapter Technical Data).

This system is especially well suited for the use in an assembly area which has a high demand in regards to flexibility of the screw-assembly and documentation possibility.

The EC-Screwdriving System mainly consists of two components. They are:
- the EC-Screwdriver Spindle of the series 320E...
- the sequence controller AST10-1 with integrated amplifier

Further accessories – see Operating Instructions of the EC-Screwdriving System.

The operation of the screwdriver spindle requires a programmable sequence controller (AST10) with integrated amplifier and a motor cable. The cable is available in different lengths.

The sequence controller offers standard screwdriving programs for tightening screws to a specific torque value respectively loosening at a specific angle value. Their parameters are adjustable directly via the controller’s keyboard. Special screwdriving sequences are easy to create: standard assembly steps, already stored in the controller, can be selected and comfortably built up to form a complete assembly process. This happens via the integrated web server’s PC operator board.

- No special PC software is required – only a normal web browser (such as MS explorer) and an Ethernet port.

Additional software modules for documentation and screw join analysis (data logging, graphics, etc.) are available as optional accessories.

- Also optionally available is an update service for the die AST10 which provides continuous update of the controller’s function and control software.
The controller's integrated display and operating unit indicates the operating mode and assembly status. It also allows a direct change of parameters (such as speed, torque and angle values etc.) within the assembly process and without the need of a PC connection.

In automatic mode, the AST10 communicates with the system’s PLC. Screw-driving programs can be selected and started. After completion of the assembly process, the AST10 will report the status of the result to the PLC.

- An Ethernet port allows the network of more screwdriver spindles (i.e. multi spindle systems) with centralized process monitoring (graphics, statistics, individual data sets, etc.).
4 Installation

see item *Dimensional Drawing* as well as Operating Instructions EC-Screwdriving System

Sequence Controller AST10-1

Motor Cable KMO-AST10

EC-Screwdriver 320E...

Measuring Cable KN-AST10

Picture: Installation
5  Operation

Trained personnel may operate the EC-Screwdriver Spindle only.

Proceed with the operating according to the Operating Instructions of the EC-Screwdriving System - Operation.

6  Handling

**DANGER**

*Make sure to always disconnect the Screwdriver Spindle from the power supply, when performing maintenance, adjustments or disassembly.*

**Attention:**

The screwdriver spindle will heat-up in relation to its average load respectively sequence of operation. If the selection of the type of Screwdriver Spindle is incorrectly or its operation is not appropriate for the application, the tool might overheat which could result in injuries (burnings).

**NOTE**

If the guide bolt is not required and will be removed, the thread M5 of the screwdriver housing is to seal with a cylinder head screw (M5x8).
7 Change of bits

DANGER
Make sure to disconnect the Spindle from the power supply, prior to changing of bits. This will avoid that Spindle starts unintentionally and creates an injury.

INFORMATION
The Screwdriver Spindle is equipped with a quick change chuck. Use high-quality bits in accordance to the DIN-Norm 3126 only.

- To remove or insert the bit, push the sleeve into the screwdriver.
- Push the bit into the hex until it locks.
- Let the sleeve snap back.
- Drive A3 (3 mm).

Picture: Change of bits
8 Dimensional Drawing

**TECHNISCHE DATEN**

<table>
<thead>
<tr>
<th>Typ</th>
<th>320E19-0002</th>
<th>320E19-0008</th>
<th>320E19-0005</th>
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<tr>
<td>Bestell-Nr.</td>
<td>405024 A</td>
<td>405024 B</td>
<td>405024 C</td>
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<td>Leerlaufdrehzahl</td>
<td>1500 1/min</td>
<td>1000 1/min</td>
<td>1200 1/min</td>
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<td>Drehmoment min.</td>
<td>0,03 Nm</td>
<td>0,15 Nm</td>
<td>0,08 Nm</td>
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<td>Drehmoment max.</td>
<td>0,2 Nm</td>
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<td>Schallpegel</td>
<td>62 dB(A)</td>
<td>62 dB(A)</td>
<td>62 dB(A)</td>
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<tr>
<td>Gewicht</td>
<td>0,36 kg</td>
<td>0,41 kg</td>
<td>0,41 kg</td>
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*auf notwendiges Zubehör nicht im Lieferumfang, wie Anschlußkabel und Schraubablaufsteuerung wird in Druckschrift D3165 hingewiesen.*

**TECHNICAL DATA**

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<thead>
<tr>
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<td>Order-No.</td>
<td>405024 A</td>
<td>405024 B</td>
<td>405024 C</td>
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<tr>
<td>Speed (idling)</td>
<td>1500 1/min</td>
<td>1000 1/min</td>
<td>1200 1/min</td>
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<tr>
<td>Torque min.</td>
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<td>0,15 Nm</td>
<td>0,08 Nm</td>
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<tr>
<td>Torque max.</td>
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<td>0,5 Nm</td>
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<td>Noise Level</td>
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<tr>
<td>Weight</td>
<td>0,36 kg</td>
<td>0,41 kg</td>
<td>0,41 kg</td>
</tr>
</tbody>
</table>

*for additional technical data or required accessories please refer to leaflet D3165 E.*

Wenn Führungsbolzen nicht benötigt und demontiert wird, muß Gewinde M5 im Schraubergehäuse mit Zylinderschraube M5x8 verschlossen werden!

If guide bolt is not required and will be removed, thread M5 of the housing is to seal with cylinder head screw M5x8!

Bei max. Längenausgleich von 15mm ist der Angressdruck 20 N. Max. screwdriver stroke of 15 mm means down force of 20 N.
9 Maintenance and Upkeep

Disconnect screwdriver from power supply prior to disassembly, maintenance and repair!

Only trained DEPRAG personnel is authorized to perform disassembly or reassembly of this screwdriver.

Only a trained Electrician may perform inspection and maintenance. Incorrect assembly or disassembly can lead to injury of an operator and damage of the equipment.

When performing maintenance or repair, please observe that…

- screwdriver has to be disconnected from power supply.
- the work area is not disarray and the work surface is clean. Do not eat or smoke while performing maintenance.

If the following service rules are observed, the screwdriver will have a long life expectancy and will be safe to use.

- check tool on a regular basis for external damage.
- replace worn or damaged bits immediately for they can cause an injury.
- In case of tool malfunctions, we recommend sending the tool to DEPRAG.

10 Trouble Shooting

Please refer to the Operating Instructions of the EC-Screwdriving System.

11 Delivery Capacity

Unused machines should be stored in a dry, locked area.

<table>
<thead>
<tr>
<th>QUANTITY</th>
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<tr>
<td>1</td>
<td>Operating Instruction Booklet</td>
<td>012625EN</td>
</tr>
<tr>
<td>1</td>
<td>EC-Screwdriver</td>
<td>405024 A / B / C</td>
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12 Accessories - Optional Equipment

<table>
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<tr>
<th>NAME</th>
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<tbody>
<tr>
<td>Spring sleeve</td>
<td>403280 A</td>
</tr>
<tr>
<td>Spring sleeve with vacuum supply</td>
<td>403280 B</td>
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See also Operating Instructions of the EC-Screwdriving System and leaflet D 3165 E

All leaflets are available for download from our web site: [www.deprag.com](http://www.deprag.com)

<table>
<thead>
<tr>
<th>INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>You will find suitable inserting tools</td>
</tr>
<tr>
<td>• in our brochure D 3320 E or</td>
</tr>
<tr>
<td>• on the internet as follows: <a href="http://www.deprag.de">www.deprag.de</a> → Screwdriving Technology → Selection program: Inserting tools</td>
</tr>
</tbody>
</table>

13 Storage

Unused machines should be stored in a dry, locked area.
## Technical Data

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>DEPRAG SCHULZ GMBH u. CO.</th>
</tr>
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<tbody>
<tr>
<td>Address</td>
<td>Kurfürstenring 12 - 18</td>
</tr>
<tr>
<td></td>
<td>Postfach 1352</td>
</tr>
<tr>
<td></td>
<td>D-92224 Amberg</td>
</tr>
<tr>
<td></td>
<td>D-92203 Amberg</td>
</tr>
<tr>
<td>Phone</td>
<td>09621/371-0</td>
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<tr>
<td>Fax</td>
<td>09621/371-120</td>
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### Technical Data:

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<th>320E19-0005</th>
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<tbody>
<tr>
<td>PART NO.</td>
<td>405024 A</td>
<td>405024 B</td>
<td>405024 C</td>
</tr>
<tr>
<td><strong>Torque min. (Nm/in.lbs)</strong></td>
<td>0.03 / 0.3</td>
<td>0.15 / 1.5</td>
<td>0.08 / 0.7</td>
</tr>
<tr>
<td>*<em>Torque max. <em>) (Nm/in.lbs)</em></em></td>
<td>0.2 / 2</td>
<td>0.8 / 8</td>
<td>0.5 / 5</td>
</tr>
<tr>
<td><strong>Speed, unloaded min. (rpm)</strong></td>
<td>150</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>*<em>Speed, unloaded max. <em>) (rpm)</em></em></td>
<td>1500</td>
<td>1000</td>
<td>1200</td>
</tr>
<tr>
<td><strong>Diameter (mm)</strong></td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (kg/lbs)</strong></td>
<td>0.36 / 0.79</td>
<td>0.41 / 0.9</td>
<td>0.41 / 0.9</td>
</tr>
<tr>
<td><strong>Noise level (dB(A))</strong></td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Line Voltage (DC) (V)</strong></td>
<td>48</td>
<td></td>
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<tr>
<td><strong>Drive hex. female (DIN 3126)</strong></td>
<td>B3 (3 mm)</td>
<td></td>
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<tr>
<td><strong>Suitable inserting tools and connection parts with DIN 3126 inserting end</strong></td>
<td>A3 (3 mm)</td>
<td></td>
<td></td>
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</tbody>
</table>

*) as per VDI/VDE 2647 Directive
15 Disposal

Disassemble the machine for the required disposal complete. Observe local and environmental regulations for the separation and recycling of materials.
16 Declaration of Manufacturer

EC-Declaration of Manufacturer
in accordance with the CE-Machine-Guideline 98/37/EC,
appendix II B

DEPRAG SCHULZ GMBH u. CO.
Kurfürstenring 12 – 18   Postfach 1352
D-92204 Amberg   D-92203 Amberg

declares, that the construction of
the EC-Screwdriver Spindle

320E19-0002  320E19-0005  320E19-0008

is designated for the integration into another machine and operation of this
other machine is prohibited until it has been confirmed that it confirms with
the following guidelines:
- Low-Voltage Directive 2006/95/EC
- EC-Machine-Guidelines, Version 98/37/EC, Amendment No.1 and No. 2.2

Applicable Standard
- EN ISO 12100-1 and 12100-2   - DIN VDE 0846
- IEC 801                     - DIN VDE 0843
- EN50082-1                   - DIN VDE 0871
- EN 61000-4-11               - EN 55011 Kl. A

Amberg, 25.01. 2007

Dipl. Ing. (FH) A. Lang
Mr. Design Doc.
17  Service Locations and Authorized Partners

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