Feeding systems for handheld tools

Efficient and intelligent feeding with eacy feed, the new generation vibratory bowl feeder.

- Approx. 80 % energy savings
- Efficiency and worldwide application - one design for all markets

Our feeding systems consist of modules that are adapted to each other: one feeder with integrated controller, a handheld screwdriver or press-insertion devices and all other add-on components that fit the customer’s application.

This proven system with an extreme high feed rate, allows a rational and process-optimized assembly.
Efficient and intelligent feeding
The innovative feeder eacy feed provides ideal specifications for the sustainable production of tomorrow: With its approx. 80 % power saving accomplishment the eacy feed is extremely energy efficient. For manual assembly applications, eacy feed offers flexible and efficient solutions along with top quality DEPRAG screwdrivers.

Efficiency and worldwide application
We have developed an innovative feeder in eacy feed which is distinguished by its energy efficiency and countless application possibilities. The 24 V technology of the drive enables worldwide application. All you need is a universal power supply. Country specific variations are a thing of the past. Thanks to the 24 V technology, eacy feed ensures reliable running even in areas with poor network availability.
**SIMPLER FOR THE FITTER AND OPERATOR**

If several operators are using the same feeder at the same time, the efficiency of the process can often be compromised by the varying working speeds of each individual. DEPRAG feeders cleverly adapt to the individual working speeds of each operator. Once entered via the simple display, the specific operating parameters of each person are saved (storage of up to ten data sets) and can be recalled when there is a shift change. No one feels held back and no one feels overstretched.

**PRECISION AND TIMING**

The fill volume influences the feed rate in standard vibratory spiral feeders. If the feed bowl is full, the system works at a slower rate and if it is emptier the rate speeds up. As with the previous generation, the eacy feed is also fitted with a measurement transducer which records the oscillation amplitude in the feed bowl. This thereby adaptively regulates the feeder depending on the fill volume – ensuring reliability as the screws are continuously in readiness for processing.

The feed rate is adjustable using twelve different waveforms. The amplitude or frequency can be set in an instant. Individual settings can be used for example, to optimise the feed volume or reduce the noise level of the feeder. The adjustments can be carried out quickly and without mechanical intervention. When using eacy feed the required settings can simply be selected on the relevant controller.

**SOFTWARE SOLUTIONS**

**PFC100 Manager – the parameterization software for PFC100 controllers**

The PFC100 Manager facilitates the reading and saving of parameters as text files for every PFC100 controller. Saved parameters can be transferred to any PFC100 controller quickly and simply using the PFC100 Manager.

The PFC100 Manager software is supplied on CD. The connection cable 385520B required to connect PC and PFC100 controller is also supplied.

Available languages: German and English

Part number:
Software PFC100 Manager, including connection cable – part no. 121759
Activation key for the software – part no. 122000

Further information can be found in our catalog D3900E or on our website www.deprag.com.
DEPRAG feeders with a vibratory drive are particularly suitable for screws from M1 to M8. Shaft lengths of 5 mm to 50 mm can be processed. For countersunk head screws especially, vibratory bowl feeders are a functional solution. The high output of DEPRAG vibratory bowl feeders distinguishes them from other feeding systems.

**Size:**
- 0.15 l Feed volume Page 7
- 0.75 l Feed volume Page 7
- 1.20 l Feed volume Page 7
- 2.50 l Feed volume Page 7

Sword feeders or segment feeders are used when components are particularly sensitive and a more gentle feeding environment is required. They are also extremely quiet. Our sword feeders can be used for screw sizes M2 to M6. They are ideal for screws up to 25 mm in length. Balls with a diameter of 1 to 12 mm can also be fed.

**Size:**
- 0.15 l Feed volume Page 8
- 1.50 l Feed volume Page 8

DEPRAG step feeders are suitable for almost every type of feed part. Specifically designed for longer screws (e.g. countersunk screws from 25 mm long), the step feeder is a great alternative to the vibratory spiral feeder and sword feeder.

→ Catalog D3835E

The DEPRAG Mini Screw Feeder is perfectly suited for feeding very small rotationally symmetrical parts such as micro and mini screws. By means of a rotating disk, one fastener at a time is brought into a defined position and made available for picking. Picking can be performed via magnet or vacuum.

→ Catalog D3836E

If feeding via a hose system is not possible e.g. if the screw has a non favourable ratio in relation to the head diameter vs overall length, then we offer special solutions such as a pick-and-place procedure with vacuum pick or gripper pick devices.

Customised solution
Please contact our sales representatives.

**Screw presenter**

Screw presenters for manual screwdrivers for the processing of screws with a shaft-diameter of 1 - 5 mm and a shaft-length of max. 25 mm.

**Function:** The pickup of the screw is done by a magnetic bit or vacuum suction. An operator can comfortably pickup the screw with a forward motion.

The screw dispenser is optimised for use in manual workstations.

Function of the screw dispenser: The screws are shot from the feeding system into the container of the screw dispenser. The operator reaches into the extraction area, an optical sensor detects the hand and activates the opening of a slide. The screws fall from the container into the operator’s hand.

**Screw dispenser**

Screw presenters → D3840E  
Screw dispenser → D0066E

Our feeders can be used in combination with almost any electric or pneumatic screwdriver of the MICROMAT/MINIMAT range. Additionally we also offer screwdrivers with ESD compliance.

Information Page 11
FEEDERS FOR HANDHELD TOOLS

Our handheld press-insertion tools are combined with the suitable feeder. Our press-insertion systems are an adaptive solution for different applications. Some of the connection-elements, such as rivets, pins, sleeves and balls can be processed with this system both process reliable and efficient.

The DEPRAG Feed Module enables fatigue-free processing due to the integrated bit stroke.

The DEPRAG Concept for Technical Cleanliness - specifically designed components.

Information and technical data → Catalog D3821E

Press-insertion device for the feeding system

Information and technical data → Catalog D3837E

CleanFeed Concept

STRUCTURE OF A DEPRAG FEEDING SYSTEM

DEPRAG feeding systems consist of the feed bowl unit, screw separator, an air connection and air maintenance unit, a mains power switch and electronic controller, 2 m standard length hose set, the mouthpiece guide and the mouthpiece as well as an appropriate screwdriver receiver (adapter) and a sound enclosure cover.

With either vibratory bowl feeder or sword feeder

With single or double spiral bowl (for one or two screwdrivers) With single or double separator system

Can be combined with any screwdriver model
Hose set
Mouthpiece guide
Mouthpiece
Nosepiece single/split type or ball type

With hopper and sort segment for one feed rail
Sword feeder with a separator system

If feeding with a hose system is not possible, we offer special solutions, such as the pick-and-place procedure

Defined pick position with integrated screw pick control option
Basically all “shaft-heavy” screws with a head which fulfills the following criteria are suitable for processing with our feed systems:

For reliable feeding machines a DIN quality standard (allowable 3% bad parts) is not always sufficient.

Higher levels of screw/fastener quality improve the feeder’s reliability.

The goal should be a quality grade of 10 ppm (“parts per million”), i.e. in every 100,000 screws there can be 1 bad part.

For effective use of the handheld screw feeders the space available around the screw head on the assembled components is very important.

There is a certain space requirement for the nosepiece split type and ball type. An even surface simplifies the positioning and handling of the tool. Slanted surfaces with small diameter recessed screw-holes can only be accessed with templates which are available as optional equipment.

Using a dual spiral vibratory bowl (type 1522 and 1622) one feeding machine can supply two separate screw outlet positions/screwdrivers. Compared to the investment of two single feeding machines, investment in a twin device saves approximately 25%.

For the correct specification of your screw feeding machine the following data is required:

- Voltage / frequency
- Choice of screwdriver model (torque and speed)
- Screw dimension and screw type (if available – DIN no.)
- Torque (if known)
- Details dimensions of assembly components
- Hose length (if over the standard length of 2 m).

To process your order we require sample screws (approx. 1 feed bowl volume) and if possible some samples of the part to be assembled.
### Technical Data Vibratory Bowl Feeders

#### Eacy Feed
- **Type**: 11011-0.15, 11011-1.2, 11011-0.75, 11011-2.5

#### Controls
- **Unit**: PFC100 Controller

<table>
<thead>
<tr>
<th>Transport Principle</th>
<th>Vibratory Bowl Feeders *)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount of connectable drivers</strong>:</td>
<td>1</td>
</tr>
<tr>
<td><strong>Feed rate</strong>: Parts/min</td>
<td>45</td>
</tr>
<tr>
<td><strong>Filling capacity</strong>: liter/gal.</td>
<td>0.15 / 0.04</td>
</tr>
<tr>
<td><strong>Voltage</strong>: V/Hz</td>
<td>24 Volt DC</td>
</tr>
<tr>
<td><strong>Power consumption</strong>: W</td>
<td>max. 50</td>
</tr>
<tr>
<td><strong>Air pressure requirement</strong>: bar/PSI</td>
<td>6 / 85.2</td>
</tr>
<tr>
<td><strong>Air connection size</strong>: mm/in.</td>
<td>10 / 3/8</td>
</tr>
<tr>
<td><strong>Dimensions W x D x H</strong>: mm/in.</td>
<td>296 x 360 x 289</td>
</tr>
<tr>
<td><strong>Weight</strong>: kg/lbs</td>
<td>appr. 18/39.6</td>
</tr>
<tr>
<td><strong>Feed hose length</strong>: max. m/ft.</td>
<td>8 / 26.4</td>
</tr>
<tr>
<td><strong>Technical details on screws</strong>:</td>
<td></td>
</tr>
<tr>
<td><strong>Max. head diameter</strong>: mm/in.</td>
<td>5 / 13/64</td>
</tr>
<tr>
<td><strong>Max. shaft length</strong>: mm/in.</td>
<td>8 / 13/6</td>
</tr>
<tr>
<td><strong>Range of shaft diameter</strong>: mm/in.</td>
<td>1.25 / 0.048-0.1</td>
</tr>
<tr>
<td><strong>Technical details on nuts</strong>:</td>
<td></td>
</tr>
<tr>
<td><strong>Max. AF</strong>: mm/in.</td>
<td>4 / 13/64</td>
</tr>
<tr>
<td><strong>Max. height</strong>: mm/in.</td>
<td>3 / 0.12</td>
</tr>
</tbody>
</table>

#### Included in delivery:
- **Power unit**: 105535A, 105535A, 2041061

#### Required accessories:
- **Power cable**: 812587 (EU) or 812295 (US)

#### Optional accessories:
- **Housing stand**: 102483A
- **Stand (required for housing stand)**: 994449
- **Fill level indicator**: 414965J
- **Retaining plate**: 9198574

#### More optional accessories:
- **Hopper (see catalog D3850E)**
- **Special mouthpiece for critical screw head diameter to length relation**
- **Part template for positioning**

*) with plastic vibratory bowl

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Our software solutions undergo continuous improvements. We recommend that you regularly update your software. In this way you will always receive the most up-to-date security updates, upgraded features and drivers. With the most current version of the software you can be sure that your device is optimally prepared for Industry 4.0.

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A connecting cable is required to connect external controller with feeder. Part number will be assigned in case of an order.

Every feeding system contains all required attachments for the screwdriver such as mouthpiece guide, mouthpiece, locking sleeve and bits. Various specialised versions are available depending on application and the screwdriver in use.
A connecting cable is required to connect external controller with feeder. Part number will be assigned in case of an order.

Every feeding system contains all required attachments for the screwdriver such as mouthpiece guide, mouthpiece, locking sleeve and bits. Various specialised versions are available depending on application and the screwdriver in use.

SPECIAL SOLUTIONS

Please contact our sales representatives if you cannot find a screwdriving technique suitable to your application in this description of our standard solutions. As well as our standard solutions described in this catalog we also offer customer specific and application specific solutions.
CLEAN FEED - THE DEPRAG CONCEPT FOR TECHNICAL CLEANLINESS

In particular with the handling of small, sensitive components, the subject of Technical Cleanliness is becoming more in demand, for example in the manufacturing of light electronic or hydraulic products. In response to the rising trend of Technical Cleanliness we now offer a program of specifically designed solutions.

The assembly of critical parts, components and systems in conjunction with Technical Cleanliness is done in the so-called clean production environment. DEPRAG offers proven components that meet the requirements of Technical Cleanliness in automatic parts feeding and assembly. Particles are minimised using friction and/or vacuum with the help of a range of methods and components.

Your Advantage:
Integrated concept for Technical Cleanliness!
The complete program of all required components from a single source.

Application of the following equipment can help to produce the optimal results:
- Pre-cleaned assembly components (e.g. Arnold Cleancon® screws) - fewer particulates due to an additional cleaning process
- DEPRAG HSF Sword Feeder - vibration free part feeding and therefore less particle generation
- DEPRAG-inverted screw assembly unit - use gravity to your advantage – inverted screwdriving with the DEPRAG-inverted screw assembly unit
- DEPRAG Particle Killer - debris in the autofeed process is reduced selectively
- DEPRAG BitCleaner - suction of metallic abrasion
  Say goodbye to annoying particles during the fully automatic tightening process!
  The DEPRAG BitCleaner is the latest addition to our CleanFeed concept and removes unwanted particles that occur during the engagement process (connection of the bit with the screw drive) and can stick to the bit. Through a cyclical cleaning process, this innovative tool significantly improves Technical Cleanliness.
- DEPRAG SFM-V vacuum screwdriving module - debris created during the assembly process is extracted using vacuum sources

Technical data

<table>
<thead>
<tr>
<th>Required control components</th>
<th>Inline Variant</th>
<th>Pick&amp;Place Variant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections</td>
<td>Pneumatic Valve/Vacuum Generator</td>
<td>Pneumatic Valve/Vacuum Generator</td>
</tr>
<tr>
<td>Dimension (LxWxH) mm</td>
<td>24VDC PNP</td>
<td>24VDC PNP</td>
</tr>
<tr>
<td></td>
<td>170 x 30 x 120 (without hoses)</td>
<td>540 (due to 160 mm load stroke) x 50 x 125 (without hoses)</td>
</tr>
<tr>
<td>SCREWDRIVERS FOR FEEDERS</td>
<td>Technical information</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>MINIMAT–EC-SERVO-SCREWDRIVER with highest processing control</td>
<td>electronically controlled screwdriver with brushless direct-current motor and integrated sensor technology for torque and angle; cabled power supply - the stationary screwdriver in combination with components (e.g. handle) is suitable for the manual use</td>
<td>→ catalog D3161E</td>
</tr>
<tr>
<td>MINIMAT–EC-SCREWDRIVER with processing control</td>
<td>electronically controlled screwdriver with brushless direct-current motor, torque measurement based on a highly accurate measurement of the motor current; cabled power supply</td>
<td>→ catalog D3000E</td>
</tr>
<tr>
<td>ELECTRIC SCREWDRIVER with mechanical shut-off clutch</td>
<td>drive with brushless direct-current motor, shut-off via mechanical shut-off clutch</td>
<td>→ catalog D3480E</td>
</tr>
<tr>
<td>MICROMAT-Z/MINIMAT–Z - PNEUMATIC SCREWDRIVER</td>
<td>shut-off via highly accurate mechanical shut-off clutch</td>
<td>→ catalog D3420E and D3430E</td>
</tr>
<tr>
<td>ERGOMAT-Z -the pneumatic AUTO STROKE SCREWDRIVER</td>
<td></td>
<td>→ page 11</td>
</tr>
<tr>
<td>MICROMAT-FZ/MINIMAT–FZ - PNEUMATIC SCREWDRIVER WITH MULTI FUNCTION CONTROL</td>
<td>handheld screwdrivers in connection with a function controller and the pneumatic control; a complete solution for the process reliability of manual assemblies.</td>
<td>→ catalog D3440E</td>
</tr>
<tr>
<td>SENSOMAT–Z - PNEUMATIC HANDHELD SCREWDRIVER with a mechanical clutch-function</td>
<td></td>
<td>→ catalog D3460E</td>
</tr>
</tbody>
</table>
When using feeders with hand-screwdrivers, it is necessary for the bit to retract, so that a new screw can fall into the feed-channel. With the ERGOMAT-Z driver, this stroke is performed automatically within the driver.

The two components, clutch bearing and mouthpiece guide, are already integrated in the screwdriver housing. The stroke of the driver is activated by the feeder immediately after the screw is fed. The driver with the bit is positioned immediately above the screw head. When the screwdriver starts the screw cannot be pushed back into the mouth-piece. Because of the integrated stroke, the hand can guide the driver much closer to the screw hole.

Both features simplify the positioning process and ease handling. Additionally, the ERGOMAT-Z driver has all the advantages of the MINIMAT screwdriver series.

Technical data ERGOMAT-Z

<table>
<thead>
<tr>
<th>Screwdriver model</th>
<th>Motor Size 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push-to-start</td>
<td>Part no.</td>
</tr>
<tr>
<td>347V-218</td>
<td>0406859A</td>
</tr>
<tr>
<td>347V-318</td>
<td>0406859B</td>
</tr>
<tr>
<td>347V-518</td>
<td>0406859C</td>
</tr>
<tr>
<td>347V-718</td>
<td>0406859G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screwdriver right rotation, right shut-off</th>
<th>Type</th>
<th>347V-218</th>
<th>347V-318</th>
<th>347V-518</th>
<th>347V-718</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque min. Nm/in.lbs</td>
<td>0.3 / 2.7</td>
<td>0.3 / 2.7</td>
<td>0.2 / 1.8</td>
<td>0.2 / 1.8</td>
<td></td>
</tr>
<tr>
<td>Speed, idling rpm</td>
<td>1900</td>
<td>1300</td>
<td>900</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>Air consumption m³/min/cfm</td>
<td>0.23 / 8</td>
<td>0.23 / 8</td>
<td>0.23 / 8</td>
<td>0.23 / 8</td>
<td></td>
</tr>
<tr>
<td>Length mm/in.</td>
<td>250 / 9&quot;/32</td>
<td>250 / 9&quot;/32</td>
<td>250 / 9&quot;/32</td>
<td>250 / 9&quot;/32</td>
<td></td>
</tr>
<tr>
<td>Weight kg/lbs</td>
<td>0.8 / 1.8</td>
<td>0.8 / 1.8</td>
<td>0.8 / 1.8</td>
<td>0.8 / 1.8</td>
<td></td>
</tr>
<tr>
<td>Noise level dB(A)</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Air hose dia. mm/in.</td>
<td>6 / 1/4</td>
<td>6 / 1/4</td>
<td>6 / 1/4</td>
<td>6 / 1/4</td>
<td></td>
</tr>
<tr>
<td>Drive hex. female DIN ISO 1173</td>
<td>1/4</td>
<td>1/4</td>
<td>1/4</td>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>Quick change chuck, mounted</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>For screwfeeding: Max. head diameter mm/in.</td>
<td>8 / 5/16</td>
<td>8 / 5/16</td>
<td>8 / 5/16</td>
<td>8 / 5/16</td>
<td></td>
</tr>
</tbody>
</table>

Performance data relate to an air pressure of 6.3 bar (90 PSI)

Included in delivery: Set of coupler and connector plug · Set of torque adjustment tools · Set of clutch springs

Optional Equipment: Clamping flange with pistol grip part no. 405545A (for conversion to use as pistol grip screwdriver)