Automatic Fastener Feeding Systems

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Automatic Fastener Feeding Systems

The Improvement of productivity and quality has been the driving force in the development of the CP Desoutter range of fastener feeding systems. By automatically presenting the fastener to the tool, dramatic reductions in assembly cycle times, typically in region of 30-40%, can be achieved.

High Quality, Low Cost Automation

CP Desoutter has been supplying automatic feed machinery to manufacturers and OEM’s since 1960. Our reputation for good design, reliability and providing solutions has been earned in the only way possible – by getting it right for our customers.

We supply the means to reduce cycle times and improve quality of assembly, within a budget.

CP’s world-wide service network and application centres provide our customers with unrivalled product support across the world. There is no better partner for your automation projects wherever they are.

Application Based Product

The range includes a number of standard products of differing levels of automation along with the facilities to produce special units to match your specific application needs.

Screw Presenters

Generally used with smaller screws (M1.4-5.0) on bench assembly work with tools using magnetic or suction pick up or spring finder sleeves.

The main benefits of the screw presenters are:

- An increase in productivity due to less handling of screws
- A reduction in manufacturing cost due to:
  - Increased productivity
  - Less screw wastage

The screw presenter features a bowl in which the screws are stored. A brush then pushes the screws into a guide rail, which vibrates moving the screws to a position where the operator can locate on the head of the screw.
Automatic Feed Systems

The Automatic Feed Systems are larger units that feature a vibratory bowl for storing and presenting the fasteners to a customised escapement that releases the fastener to the tool at the appropriate time in the cycle. These units can be utilised in either manual operations or incorporated within a fully automated fastening system.

Automatic Feed Systems can offer:
- Productivity through faster cycle times by
  - Positioning the fastener at the tool tip prior to each cycle
  - The elimination of fastener handling by the operator
  - Introducing cost effective automation
- Improved ergonomics
  - Single driving action on manual systems
  - No fastener handling
- Quality of assembly
  - Less fastener handling
  - Can be used with shut off pneumatic or electric tools along with DC assembly systems
- Reduction in production costs
  - Higher production rates
  - Use within automation
  - Less waste and component rejection
Automatic Feed Systems

Two basic models make up the range:

**VCF Range**

Aimed at high volume production, the VCF range is modular and features a small programmable controller that controls the entire fastening cycle, ensuring the fastener is reliably fed to the tool. Each screw is correctly orientated by the vibratory action of the bowl, then presented to the gate selector for delivery into the feed tube. When not in use both the bowl vibration and aligning air vents are automatically shut off, thus saving energy.

The screw feeding system has been designed to operate with hand-operated and fixtured units. Its modular design enables it to be adjusted to suit a diverse range of customer applications including automation and multi drop.

**Features**

- Pneumatic powered nozzle advance and retract
- Screw retaining clip incorporated into nozzle
- High precision gate mechanism for screw selection
- Hardened tool steel gate and nozzle components
- Timed vibration/air blast shut-off

**Benefits**

- Eliminates workpiece damage and improves component accessibility by pushing the fastener through the nozzle jaws. Reduces force required by the operator to push the screw into the component.
- Improved ease of use as the screw shank is visible through the jaws and so easy to locate into the component.
- Reliable and durable operation.
- Extended service life and reduced maintenance.
- Energy saving and reduces exposure to noise.

**Typical VCF Cycle**

1. In the rest position a screw is held in the nozzle jaws for insertion into the joint. The gate selects a single orientated screw from the vibrating feed rails.

2. As the screw is inserted into the joint, it engages the bit and starts the tool. A signal to the piston then retracts the nozzle leaving both screw and bit free from the jaws. Simultaneously the gate drops a single screw into the feed tube.

3. Once the correct torque is reached the motor is shut off and piston advanced. A blast of air transports the next screw down the feed tube into position in the jaws for the next cycle.

**BM2100**

This unit has less features than the VCF range and is primarily for use on applications using wood or self tapping screws.

Again each screw is correctly orientated by the vibratory action of the bowl, then presented to the gate which delivers the screw to the nozzle. The BM2100 system can only be operated with hand-operated tools and incorporates a spring return nozzle.

All of the Automatic Feed Systems are fully self contained and have an integral regulator/lubricator for connection directly to a suitable air supply.
NJ Screw Presenter

- 3 Base models, NJ12, NJ23 and NJ45.
- Modular rail system to permit screws of 1.4 to 5.0mm diameter to be fed.
- Rail can be changed and the unit set up within 5 minutes.
- Simple brush and rail combination to prevent jamming.
- 30% faster feed rate due to a number of screws being fed into the rail in a single cycle.
- Presenter has built in height adjustment to allow the screw to be presented to the operator at the correct angle.

**Capacity**

<table>
<thead>
<tr>
<th>Model</th>
<th>Thread Diameter</th>
<th>Screw Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ12</td>
<td>1.4-1.7mm</td>
<td>&lt;10mm</td>
</tr>
<tr>
<td>NJ23</td>
<td>1.8-3.0mm</td>
<td>&lt;18mm</td>
</tr>
<tr>
<td>NJ45</td>
<td>3.1-5.0mm</td>
<td>&lt;18mm</td>
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</tbody>
</table>

**Dimensions**

- 130x215x136mm

**Weight**

- 3.2kg

**Max Feed Rate**

- 2 screws/second

**Bowl Capacity**

- Approximately 1200pcs (M3)

**Power Supply**

- 230/120V

**Rated Input**

- 12V, 500mA

All screw presenters include the appropriate rail assembly and AC adaptor.

**Model codes**

<table>
<thead>
<tr>
<th>MAX SCREW SIZE</th>
<th>SCREW PRESENTER</th>
<th>RAIL ASSEMBLY STANDARD</th>
<th>HOLDING PLATE SHORT/COUNTERSUNK SCREWS</th>
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</thead>
<tbody>
<tr>
<td>mm</td>
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<td></td>
<td></td>
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<td>1.4</td>
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<td>R14 2050111802</td>
<td></td>
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<td>R50 2050111882</td>
<td>R50 2050111922</td>
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</table>

VCF Automatic Feed System

**Capacity**

- Screw length: Must exceed 1.2 x Head Diameter
- VCF4532: Thread <M3.2, Screw Length <20mm
- VCF4565: Thread <M3.2, Screw Length >20mm, Thread >M3.2, <M6.5, Screw Length <40mm

**Dimensions**

- 435x140x370mm

**Weight**

- 39kg

**Max Feed Rate**

- 60 screws/second*

**Control Circuitry**

- PLC

**Max Screw Head (D)**

- 15mm

**Power Supply**

- 220-240V 50Hz

**Air Pressure**

- 6.3 bar

*Although the VCF can deliver 60 fasteners/minute, the practical max cycle rate (including fastener insertion) is approximately 40 fasteners/min when incorporated in an automated process.

**Options**

- Can be used in automated systems
- Multi drop systems available
- Special nozzles for applications with limited access
- Nut and set screw feed versions
- Can be used with all tool types, pneumatic and electric
**Product Range**

**BM2100 Automatic Feed System**

**Capacity**

- **Screw length**
  - Pan Head
  - Countersunk
- **Head Diameter**
  - Maximum 13mm
- **Thread Diameter**
  - Maximum 5.5mm
- **Dimensions**
  - 310x380x290mm
- **Max Feed Rate**
  - 25 screws/min
- **Control Circuitry**
  - Manual
- **Power Supply**
  - 220-240V 50Hz
- **Weight**
  - 21kg
- **Bowl Capacity**
  - 0.8 litres
- **Max Screw Head (D)**
  - 15mm
- **Air Pressure**
  - 6.3 bar

**Options**
- Depth control
- Special nozzles for applications with limited access

**Component Parts for Automation**

Many of the parts used by CP Desoutter for manufacturing assembly systems are available as component parts for the construction of machines or automated assembly.

Parts include:
- Nozzles
- Slides
- Stands
- Bowl feeders
- Offset heads
- Spring loaded shafts

**Important considerations**

**Fastener Types**

The standard fastener feeding systems are able to feed most shank heavy screws. It is important that the screw is sufficiently large to enable it to be retained by the nozzle jaws, and seat correctly in the bowl rails.

Nut set screws (grub screws) and screws with captive washers can usually be fed using special units but this will depend on the type of the fastener.

**Fastener Quality**

The reliability of the fastener feeding system is greatly affected by fastener quality. The components within the feeder are sized to provide the optimum performance for a certain fastener. If the fastener dimensions vary significantly, feeding cycle times can be reduced and/or blockages occur within the feeder or nozzle. It is always recommended that a good quality of fastener is used, preferably ones which have been checked or sorted (e.g. optically checked)

**Component Accessibility**

An important consideration when determining the suitability of an application is accessibility. Sufficient space around the area into which fastener is being placed is required to enable the nozzle to correctly position the fastener for tightening. Special nozzles and actuators are available for applications where access is limited, e.g. screw in a recess, other parts restricting access, etc.
Sample product will enable us to provide a better solution. We recommend that you provide CP Desoutter with 200 fasteners and an assembled component to establish the best solution for your application.

### TOOL INFORMATION

- **Tool Type**: Hand Held [ ] Automated Assembly [ ]
- **Tool**: Pneumatic [ ] Electric Low Voltage [ ] DC Brushless [ ]
- **Suspension**: Balancer [ ] Stand [ ] None [ ]
- **Approach**: Vertical [ ] Horizontal [ ] Upwards [ ]
- **Access**: Flat surface, no issues with access [ ] Access issues (sketch below) [ ]

### OTHER SCREW TYPE

- D = [ ]
- H = [ ]
- L = [ ]
- d = [ ]

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**Desoutter**