We aim to be much more than a machinery supplier. Our team has a vast range of winding experience and is able to offer help and advice on all aspects of coil winding, from tooling design to machine choice and set-up.

Ingrid West Machinery

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Bench-top
Bobbin winding
Machine range

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WH 800 Single spindle transformer winding machine.

**Specification**

**Program**
Microprocessor controlled, capable of holding 999 program sequences which may be run independently or in selected blocks for compound windings.

**Control**
Spindle drive - High torque brushless DC induction motor producing a max torque 78.5 Ncm. Traverse - Constant current driven 4-phase stepper motor.

**Application**
Wire guide is capable of holding four wires at the same time for multiple windings e.g. standard EI transformers.

**Package**
Includes wire guide, margin tape & cover tape attachments and wire feeder system, with comprehensive manual.

**Wire size**
0.02 – 1.0 mm

**Max pitch**
10 mm

**Winding width**
110 mm (max)

**Bobbin dia**
110 mm (max)

**Max speed**
6000, (optional) 3000 Rpm

**Power**
AC 230 / 110V ± 10%, 50-60hz

**Dims**
760 x 680 x 720 mm

**Net weight**
37 kg

**CE cert. no.**
AE9955093 01

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---

### WH 752 Heavy duty two spindle coil winding machine.

#### Specification

<table>
<thead>
<tr>
<th>Program</th>
<th>Microprocessor controlled, capable of holding 999 program sequences which may be run independently or in selected blocks for compound windings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Spindle drive - High torque brushless DC induction motor producing a max torque of 157 Ncm.</td>
</tr>
<tr>
<td>Traverse</td>
<td>Constant current driven 4-phase stepper motor.</td>
</tr>
<tr>
<td>Application</td>
<td>Roller type wire guide and separate tension unit for each spindle. Wire guides adjust for dual winding.</td>
</tr>
<tr>
<td>Package</td>
<td>Includes 2 x roller wire guides and 2 x tension units, with comprehensive manual.</td>
</tr>
<tr>
<td>Wire size</td>
<td>0.3 – 1.6 mm</td>
</tr>
<tr>
<td>Max pitch</td>
<td>10 mm</td>
</tr>
<tr>
<td>Winding width</td>
<td>110 mm (max)</td>
</tr>
<tr>
<td>Bobbin dia.</td>
<td>110 mm (max)</td>
</tr>
<tr>
<td>Max speed</td>
<td>3000 rpm</td>
</tr>
<tr>
<td>Power</td>
<td>AC 230 / 110 V ± 10%, 50 – 60 Hz</td>
</tr>
<tr>
<td>Dims</td>
<td>600 x 480 x 900 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>55 kg.</td>
</tr>
<tr>
<td>CE cert. no.</td>
<td>AE 9955093 01</td>
</tr>
</tbody>
</table>
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### WH 521 Single spindle “Fly winding” machine.

#### Specification

**Program**
Microprocessor controlled, capable of holding 999 program sequences which may be run independently or in selected blocks for compound windings.

**Control**
- Spindle drive: High torque brushless DC induction motor producing a max torque 78.5 Ncm.
- Traverse: Constant current driven 4-phase stepper motor.
- Index: Constant current driven 4-phase stepper motor.

**Application**
Nozzle type wire guides feed each spindle. Each guide is fed via a separate tension unit. With the *Fly winding* principle, wire is wound around the stationary core - ideal for motors.

**Package**
Includes nozzle wire guide, 1 x tension units and cover tape attachment, with comprehensive manual.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire size</td>
<td>0.03 – 0.8 mm</td>
</tr>
<tr>
<td>Max pitch</td>
<td>10 mm</td>
</tr>
<tr>
<td>Winding width</td>
<td>70 mm (max)</td>
</tr>
<tr>
<td>Motor OD</td>
<td>8 - 140 mm</td>
</tr>
<tr>
<td>Motor Height</td>
<td>30 mm (max)</td>
</tr>
<tr>
<td>Max speed</td>
<td>3000 rpm</td>
</tr>
<tr>
<td>Power</td>
<td>AC 230 / 110V ± 10%, 50-60hz</td>
</tr>
<tr>
<td>Dims</td>
<td>700 x 350 x 100 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>65 kg</td>
</tr>
<tr>
<td>CE cert. no.</td>
<td>AE9955093 01</td>
</tr>
</tbody>
</table>

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**Specification**

**Program**
Microprocessor controlled, capable of holding 999 program sequences, which may be run independently or in selected blocks for compound windings.

**Control**
Spindle drive - High torque brushless DC induction motor producing a max torque of 78.5Ncm.
Traverse - Constant current driven 4-phase stepper motor.

**Application**
Nozzle type wire feeder heads on each spindle; these have adjustable parallelism so that multiple winding may be carried out. Each spindle is fed via a separate tension unit.

**Package**
Includes 4 x nozzle type wire feeder heads, 4 x tension units, and comprehensive manual.

**Wire size**
0.02 – 0.6 mm

**Max pitch**
10 mm

**Winding width**
100 mm (max)

**Bobbin dia.**
100 mm (max)

**Max speed**
6000 rpm

**Power**
AC 230 / 110 V ± 10%, 50 – 60 Hz

**Dimensions**
1000 x 500 x 1000 mm

**Net weight**
60 kg

**CE cert. no.**
AE9955093 01
WH 766T Skeining Six spindle coil winding machine.

**Specification**

**Programming**
Microprocessor controlled, capable of holding 999 program sequences, which may be run independently or in selected blocks for compound windings.

**Control**
- Spindle drive - High torque brushless DC induction motor producing a max torque of 78.5Ncm.
- Traverse - Constant current driven 4-phase stepper motor.

**Application**
- Designed for thin wires that require skeining. Nozzle type wire feeder heads on each spindle; these have adjustable parallelism so that multiple winding may be carried out. Each spindle is fed via a separate tension unit through a skeining device.

**Automated skein function** - The winding is stopped a few turns from the end, and the machine automatically performs the skeining function. Half of the skeined length is then wound into the bobbin, and the remaining skeined length is used for the start of the next coil.

**Package**
Includes 6 x nozzle type wire feeder heads, 6 x skeiner units, and comprehensive manual.

**Wire size**
0.03 – 0.30mm

**Max pitch**
10 mm

**Winding width**
100 mm (max)

**Bobbin dia.**
100 mm (max)

**Turns**
- 9999.9 turn or
- 99999

**Max speed**
6000 rpm

**Power**
AC 230 / 110 V ± 10%, 50 – 60 Hz

**Net weight**
85 kg

**CE cert. no.**
AE9955093 01

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Working with local partners in the following countries:
Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
Heavy duty versatile single spindle coil winding machine WH 751.

**Specification**

**Program**
Microprocessor controlled, capable of holding 999 program sequences which may be run independently or in selected blocks for complex windings.

**Control**
Spindle drive - High torque brushless DC induction motor.

**Traverse**
Constant current driven 4-phase stepper motor.

**Application**
Bigger transformers and large wire windings, long coils, antennas.

**Package**
Base machine with belt selectable drive ratios for 3000 and 800 max. rpm, tensioner stand, tailstock, and comprehensive manual.

**Accessories**
Large choice of wire feeder heads and tensioners, taping attachments, variable speed foot switch.

**Wire size**
0.02 – 3.0 mm

**Max pitch**
10 mm

**Bobbin dia.**
200 mm (max)

**Winding width**
300 mm (max) 700 mm (option)*

**Net weight**
58 kg

**Dims**
950 x 520 x 600 mm

**Power**
AC 230/110 V±10% 50/60Hz

**CE cert. no.**
AE 9955093 0

<table>
<thead>
<tr>
<th>Max Speed (Rpm)</th>
<th>Max Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 / 3000</td>
<td>8.8 / 1.1</td>
</tr>
<tr>
<td>400 / 1600**</td>
<td>17.6 / 2.2</td>
</tr>
</tbody>
</table>

* This machine is also available with an extended bed for coils longer than 300mm.
** High Torque version available as an option.

For examples of wire feeder heads and other accessories, please see overleaf.

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WH 751a Air coil winder with hot-air bonding.

Many people believe that it is impossible to make air coils on a bench-top machine, but with the help of IWM YOU can do it!

The advantages of making your own air coils include:-
- Fast turn-around for prototypes
- Full control over the production process
- Flexibility and cost control

All you need is:-
- A Wey Hwang 751 air coil winding package
- Tooling design and manufacture
- & IWM know-how!

Package includes:-
- WH-751 bobbin winding machine
- Tensioner and wire guide as required
- Safety heat-shield
- Heat gun
- Manual tailstock

Precise control of the heat-gun air temperature and air flow rate, and exact positioning of the nozzle, warm the wire and the tooling just enough to guarantee perfect adhesion of wire to wire, with correct release from the tooling.

Careful design of the tooling, and Wey Hwang’s advanced machine controllability, ensure reliable wire entry and exit from the coil every time.

For the price of the tooling – refundable against machine order we can create tooling and wind you some samples to demonstrate quality (and cycle time) created from this package.

As these machines are custom made, please speak to us about the coil specification you wish to produce

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---

**WH 751 Air coil winder with hot air bonding.**

We want to show you **some examples of the capabilities of the machine.**

<table>
<thead>
<tr>
<th>Coil Data</th>
<th>Wire (mm)</th>
<th>ID (mm)</th>
<th>Turns</th>
<th>Cycle time (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.06</td>
<td>13</td>
<td>220</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>62 * 36</td>
<td>74</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>0.315</td>
<td>13</td>
<td>54</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>0.71</td>
<td>90</td>
<td>150</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>0.18</td>
<td>13</td>
<td>243</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>0.315</td>
<td>Triangular</td>
<td>277</td>
<td>45</td>
</tr>
</tbody>
</table>
Setting up a winding machine can be a long process, especially when adjustments can only be made mechanically. For a short production run – or even a one-off prototype - a fast solution is vital.

The Wey Hwang CWC-01 digital controller is designed for rapid programming. Its design philosophy is based on moving as many mechanical adjustments into software as possible, giving fast change-over times from one job to another.

**Simple setup**

Footswitch can be used to start winding or as ‘deadman switch’ Option for variable speed control footswitch

Parameter display shows Data Entered, or Turns Wound

Display shows Spindle speed or Quantity produced

Turns count can allow up to 99,999 turns to be wound in one operation

Memory allows up to 999 different coils to be stored

Set the machine to re-synchronise after 1 – 99 cycles – or on reset

Operator can lock spindle when in idle mode

The Start position and Winding Width can be set by jog buttons, physically moving the winding head to your chosen position, in steps of 0.02 mm.

Full Speed Control

Start Point

Width

Wire Size

<table>
<thead>
<tr>
<th>Speed</th>
<th>Turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Speed</td>
<td></td>
</tr>
<tr>
<td>Low Speed</td>
<td></td>
</tr>
</tbody>
</table>

Start of Winding: turns before acceleration to high speed

Typically: 0.5 - 5

Low Speed Start: (Deceleration turns, before end of winding)

Typically: ~ 0.5 - 2

End of Winding: Rate of Acceleration and deceleration can be set, useful for controlling fine wire.

The Wey Hwang digital controller...

“full of features” & “quick to set up”

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WH 737 Single spindle hand winder.

Specification

Program          Simple mechanical counter, push button to reset.

Application      Hand feed spreading for simple coil winding – ideal for low turns count & prototypes

Package          Sturdy machine base - no need to fix to a bench, drive handle, mechanical counter & tool holder

Turns ratio      One turn of handle produces five turns of bobbin

Dimensions       45 x 28 x 25 cm

Net weight       10 kg

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**Specification**

These mechanical tensioners provide precision control of winding tension for wires in the range from 0.02mm to 2.0 mm.

The arm position provides feedback to the system, adjusting the main friction wheel to regulate and maintain constant tension during the winding cycle.

Felt pads provide pre-tension and remove dust and other debris from the wire.

Ceramic eyelets and roller guides at each point of contact protect insulation from mechanical damage, guide the wire.

The performance of these units is exceptional given the low cost, providing outstanding value for money.

* The wire sizes shown are a guide only, for copper magnet wire at recommended “Standard Tension”. The tension required in practical applications may vary considerably.

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Min Tension (grams)</th>
<th>Max Tension (grams)</th>
<th>Min Wire Gauge (mm) *</th>
<th>Max Wire Gauge (mm) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC3S</td>
<td>2</td>
<td>11</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>TCSS-X</td>
<td>7</td>
<td>30</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>TCSS</td>
<td>9</td>
<td>50</td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>TCS-E</td>
<td>30</td>
<td>130</td>
<td>0.06</td>
<td>0.13</td>
</tr>
<tr>
<td>TCS</td>
<td>40</td>
<td>200</td>
<td>0.08</td>
<td>0.16</td>
</tr>
<tr>
<td>TCM</td>
<td>90</td>
<td>500</td>
<td>0.16</td>
<td>0.25</td>
</tr>
<tr>
<td>TCL-X</td>
<td>200</td>
<td>2000</td>
<td>0.20</td>
<td>0.60</td>
</tr>
<tr>
<td>T CLL-X</td>
<td>1000</td>
<td>5000</td>
<td>0.50</td>
<td>1.2</td>
</tr>
<tr>
<td>TC3L</td>
<td>2000</td>
<td>10000</td>
<td>0.70</td>
<td>2.0</td>
</tr>
</tbody>
</table>

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Working with local partners in the following countries:

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Magnetic Tensioners. Providing stable & consistent tension control over long periods.

Wire tension is one of the critical parameters of any coil winding process, having an influence on product characteristics, particularly DC resistance. Tensioning devices are therefore required to ensure constant wire tension throughout the winding process.

One major disadvantage of mechanical tensioning devices is that the friction materials are in contact with each other, resulting in mechanical wear. Therefore the tension may change from the set value over time.

Key advantages of Magnetic Tensioners:

These magnetic tensioners use a permanent magnet as a non-contact method of generating a variable friction on the main wheel of the tensioner, maintaining wire tension at the set value for long periods with no requirement for adjustment.

The arm position provides feedback to the system, adjusting the main friction wheel to regulate and maintain constant tension during the winding cycle.

Felt pads provide pre-tension and remove dust and other debris from the wire.

Ceramic eyelets and roller guides at each point of contact protect insulation from mechanical damage, and guide the wire.

The performance of these units is exceptional given the low cost, providing outstanding value for money.

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Min Tension (grams)</th>
<th>Max Tension (grams)</th>
<th>Min Wire Gauge (mm)</th>
<th>Max Wire Gauge (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTCSS</td>
<td>4</td>
<td>40</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>MTCS</td>
<td>10</td>
<td>120</td>
<td>0.04</td>
<td>0.14</td>
</tr>
<tr>
<td>MTCM</td>
<td>50</td>
<td>400</td>
<td>0.08</td>
<td>0.25</td>
</tr>
<tr>
<td>MTCL</td>
<td>80</td>
<td>600</td>
<td>0.12</td>
<td>0.35</td>
</tr>
</tbody>
</table>

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Magnetic Tensioners with tension release
Providing stable & consistent tension control over long periods.

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The arm position provides feedback to the system, adjusting the main friction wheel to regulate and maintain constant tension during the winding cycle.

Felt pads provide pre-tension and remove dust and other debris from the wire.

Ceramic eyelets and roller guides at each point of contact protect insulation from mechanical damage, and guide the wire.

The models shown here have a pneumatic cylinder (controllable from the winding machine) for tension release as required during pin wrapping operations.

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Min Tension (grams)</th>
<th>Max Tension (grams)</th>
<th>Min Wire Gauge (mm)</th>
<th>Max Wire Gauge (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTASS</td>
<td>4</td>
<td>40</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>MTAS</td>
<td>7</td>
<td>120</td>
<td>0.04</td>
<td>0.14</td>
</tr>
<tr>
<td>MTAM</td>
<td>15</td>
<td>430</td>
<td>0.06</td>
<td>0.25</td>
</tr>
</tbody>
</table>

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Ingrid West Machinery Ltd
Unit 5L, Delta Drive, Tewkesbury, Glos. GL20 8HB, United Kingdom
Tel. +44(0) 1684 273164  Fax. +44(0) 1684 273171
E-mail enquiry@ingridwest.co.uk Website www.coilwindingmachines.eu

Fine wire and High speed

Arm position gives feedback to the system, adjusting the main friction wheel to regulate and maintain constant tension during the winding cycle. Back tension arm spring position scaled in grams and calibrated at the factory.

<table>
<thead>
<tr>
<th>Model</th>
<th>F71</th>
<th>M65</th>
<th>DMA300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>137.000.1</td>
<td>135.000.1</td>
<td>120.000.1</td>
</tr>
<tr>
<td>Working Range</td>
<td>1.5 gr (0.01 mm)</td>
<td>50 grs (0.08 mm)</td>
<td>15 grs (0.04 mm)</td>
</tr>
<tr>
<td>Max speed</td>
<td>15 M/s</td>
<td>20M/s</td>
<td>25M/s</td>
</tr>
<tr>
<td>Options</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Part number</td>
<td>Part number</td>
<td>Part number</td>
</tr>
<tr>
<td>Cut out switch</td>
<td>137.000.2</td>
<td>135.000.2</td>
<td>120.000.2</td>
</tr>
<tr>
<td>Pneumatic release</td>
<td>137.000.8</td>
<td>135.000.8</td>
<td>120.000.8</td>
</tr>
<tr>
<td>Double arm pulley</td>
<td>N / A</td>
<td>135.000.3</td>
<td>120.000.6</td>
</tr>
</tbody>
</table>

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**A Revolution in Wire tension technology for the COIL WINDING industry**

The new generation wire constant feeding device

- **Advanced Digital Display**
  - With ergonomic Keys for easy operation

- **Automatic compensating arm**
  - Wire ‘Storage and Release’ capable to manage sudden wire absorption or release during the working process and simultaneously keeping the wire feeding tension at the set value (Patent).
  - Motor Driven and suitable to self adjust accordingly to the set Tension Profile.

- **Dual Drive Feeding System**
  - Control and maintain a constant winding feeding (input) tension during the entire process.

- **Motor torque control System**
  - **CONSTANT WIRE TENSION CONTROL**

- **Tension Sensor** – precision load cell

- **Fully programmable**
  - easy parameter setting (Tension Profiler, % tolerances, ...) for diversified working conditions.

**High Tech Digital Technology**

Featuring simultaneous dual control on both wire feeding tension and wire running speed for a complete feeding control.

**Tension Profiler Function**

- Possibility to program up to 2 different wire feeding tension values without any interface/connection to the coil winding machine or up to 4 different wire feeding tension values during winding cycle, utilising two digital inputs.

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**BENEFITS**

**Impressive Versatility**

Fully programmable parameters according to the wire and application requirements and possibility to dynamically modify tension according to the manufacturing process stage (‘Tension Profiler’ Function).

**A wide application range**

A single device able to cover a wide wire tension and diameter range.

**Production Process Efficiency Maximisation**

Able to work at maximum machine speed, thus dramatically reducing wire breakage.

**Minimises Labour Costs**

Minimised machine operator time, thanks to advanced and user-friendly programming options.

**Centralised**

programming and monitoring Matrix controller external unit able to program and control CWF units at a glance and monitoring the whole process production status also in graphical form.

**Performance**

drastic process simplification, simultaneous TOP Quality, Accuracy and Repeatability results.

**Fully programmable**

easy parameter setting (Tension Profiler, % tolerances, ...) for diversified working conditions.

**A compact Solution**

easy plug & play installation.

**Programmable**

tension range ; two version available -
- 5~1500g(cN) Wire diameters 0.04~0.5mm (52~24 AWG) resolution +/-1g
- 1~200g(cN) Wire diameters 0.015~0.12mm (52~24 AWG) resolution +/-0.1g
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**Feeder head /Guide heads**

**Multi wire and tape Feeder Head**
- Used for producing multi-winding transformers at one workstation
- Allows use of up to 4 different wire sizes without rethreading
- Felt pads for cleaning of wire and back tension
- Includes margin tape and cover tape attachment

**Guide tube feeder head**
- Ceramic parts at every wire contact point, to protect the wire coating
- Guide tube places wire accurately
- Independent micro-adjustment for more than one spindle.
- Felt pad for cleaning of wire and back tension
- Takes guide tubes of inside diameter 0.3 ~ 1.2 mm

**Fixed roller feeder head with micro adjustment**
- Durable brass rollers to control heavy gauge wire
- Independent micro-adjustment for more than one spindle.
- Felt pad for cleaning of wire

**Variable angle roller feeder head**
- Durable brass rollers to control heavy gauge wire
- Adjustable angle of feed.
- Adjustable roller position enables wire pre-bend / straightening.
Tailstocks.

Large bobbins / solenoids and air coils need a tailstock to support the outer flange during winding.

The WH-751 machine can be fitted with either a manual or a pneumatic tailstock, and either option can be mounted or removed in minutes. All tailstocks are adjustable for left-to-right position, and are provided with a removable precision angular contact bearing.

<table>
<thead>
<tr>
<th>Heavy Duty</th>
<th>Specifications</th>
<th>Pneumatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm</td>
<td>Stroke length</td>
<td>50 mm</td>
</tr>
<tr>
<td>180 mm</td>
<td>Maximum clearance when open, from tool holder face to tailstock bearing face</td>
<td>150 mm</td>
</tr>
<tr>
<td>10mm</td>
<td>Bearing ID to locate tool</td>
<td>8mm</td>
</tr>
<tr>
<td>N/A</td>
<td>Air supply</td>
<td>5 Bars</td>
</tr>
</tbody>
</table>

De-spooler Drum

Key features:-
- Internal Diameter  224 mm
- Internal Height  295 mm
- Ceramic grommet at wire exit point to prevent damage to wire coating
- Anti-slip mat to secure wire spool
- Easy assembly for fast changeover

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Floor Standing Heavy Duty Bobbin winding Machine range

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EZ-2500 WINDING MACHINE

DESCRIPTION.
The EZ-2500 is a floor standing style winding machine, large size to be easily placed in a factory or workshop, equipped with head and bench in galvanized steel and covered in stainless steel, face plate, tailstock with security closure, guider system and foot pedal.

The machine is governed by numeric control and CNC electronic programming.

This machine is specially designed for the manufacture of re-winds, large rotor coils for use in wind turbine industry, using aluminium or copper wires, including rectangular or flat wires with a special guider.

The concept and design facilitates the placement of necessary accessories such as end-fillers or insulation paper in foil, of various levels.

TECHNICAL CHARACTERISTICS.

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Ø</td>
<td>Ø 0.01 – 30 mm</td>
</tr>
<tr>
<td>Winding speed</td>
<td>0 - 60 r.p.m</td>
</tr>
<tr>
<td>Max. winding length</td>
<td>2,250 mm</td>
</tr>
<tr>
<td>Max. Distance between points</td>
<td>2,500 mm</td>
</tr>
<tr>
<td>Spindle height (from floor)</td>
<td>1,300 mm</td>
</tr>
<tr>
<td>Tailstock movement</td>
<td>1,500 mm</td>
</tr>
<tr>
<td>Guider precision</td>
<td>Manual</td>
</tr>
<tr>
<td>Main shaft motor</td>
<td>7.5 HP</td>
</tr>
<tr>
<td>Guider motor</td>
<td>0,3HP (Brushless)</td>
</tr>
<tr>
<td>Power source</td>
<td>3 x 380Vca - 50Hz</td>
</tr>
<tr>
<td>Weight</td>
<td>1,500 Kgs</td>
</tr>
</tbody>
</table>

PROGRAMMING CHARACTERISTICS.

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard with the machine, turns counter</td>
<td>CMZ240</td>
</tr>
<tr>
<td>By request, electronic control</td>
<td>CMZ240</td>
</tr>
<tr>
<td>Max. No. of programmable windings</td>
<td>Max. 130</td>
</tr>
<tr>
<td>Max. No. of windings per coil</td>
<td>Max. 12</td>
</tr>
<tr>
<td>Type of programming</td>
<td>CNC</td>
</tr>
<tr>
<td>DELIVERY TIME</td>
<td>60 Days from order confirmation</td>
</tr>
</tbody>
</table>

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DESCRIPTION.
The E-1200 is a floor standing style winding machine, medium sized to be easily placed in a factory or workshop, equipped and covered in stainless steel, fixation plate, tailstock with security closure, guider system protection and pedal. The machine is governed by numeric control and CNC electronic programming.
This machine is specially designed for the manufacture of solenoids and power and distribution transformers from 10 to 1,200 KVA, using aluminium or copper wires, including rectangular or flat wires with a special guider.
The wide range of velocities, up to 500 r.p.m, permits primary and secondary windings on the same machine, thus reducing the production processes.
The concept and design facilitates the placement of necessary accessories such as end-fillers, insulation paper or foil, of various types.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Wire Ø (and profile wire)</th>
<th>Max winding length</th>
<th>Max distance between points</th>
<th>Max winding Ø</th>
<th>Guiding precision</th>
<th>Winding shaft speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 – 30 mm</td>
<td>1.100 mm</td>
<td>1.200 mm</td>
<td>800 mm</td>
<td>0.01 mm</td>
<td>500/250 rpm *</td>
</tr>
</tbody>
</table>

* The standard machine is available in two models, high speed and low speed, other combinations available on request

<table>
<thead>
<tr>
<th>Belt Position **</th>
<th>High Speed 500 RPM</th>
<th>Low Speed 250 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Torque (Nm)</td>
<td>Speed (Rpm)</td>
</tr>
<tr>
<td>1</td>
<td>172</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>1033</td>
<td>96</td>
</tr>
</tbody>
</table>

** The head has two belt positions; the position directly depends on the product to be wound

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E-1200-SGB WINDING MACHINE

DESCRIPTION.
The EZ-1200-SGB provides ultimate flexibility in terms of torque and winding speeds, provided by the innovative four ratio gearbox. It is available in two versions – “Standard” and “High Torque”, according to the customer’s requirement.

It is a floor standing winding machine, medium sized, equipped with head and bench in heavy gauge galvanised and welded steel, fixture plate, tailstock with security closure, guider system protection and foot pedal.

The machine is controlled by a state-of-the-art CNC with electronic programming, and is designed for the manufacture of solenoids and power and distribution transformers from 10 to 2000 KVA.

Aluminium or copper wires, including rectangular or flat wires, can be wound with a special guider.

The wide range of winding speeds, (up to 750 r.p.m.) allows primary and secondary windings to be carried out on the same machine, thus reducing the number of production processes.

The concept and design allows various accessories to be mounted as required, for end-fillers, insulation paper or foil.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Wire Ø (and profile wire)</th>
<th>Max winding length</th>
<th>Max distance between points</th>
<th>Max winding Ø</th>
<th>Guiding precision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.01mm</td>
</tr>
</tbody>
</table>

The standard machine is available with either high speed or low speed gear ratios.

TORQUE AND SPEED

<table>
<thead>
<tr>
<th>Gear Position</th>
<th>500 RPM Low Speed</th>
<th>750 RPM High Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Torque (Nm)</td>
<td>Speed (Rpm)</td>
</tr>
<tr>
<td>1</td>
<td>168</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>252</td>
<td>333</td>
</tr>
<tr>
<td>3</td>
<td>504</td>
<td>166</td>
</tr>
<tr>
<td>4</td>
<td>756</td>
<td>111</td>
</tr>
</tbody>
</table>

Various gear ratio and motor combinations are available according to the customer’s requirement, including high torque versions.

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**DESCRIPTION.**

The E-1200 “SERVOTECH” is a state-of-the-art winding machine with highly advanced features, including an automatic gearbox, energy efficient servo motors, and intelligent torque boosting technology.

It is equipped with head and bench in heavy gauge welded and galvanised steel, faceplate, tailstock with rotating centre, guider system, security closure and foot pedal.

The machine is operated by a powerful CNC with user-friendly electronic programming. The energy efficient design concept reduces power consumption. All motors are synchronous and each movement has been optimised for maximum energy efficiency.

The automatic gearbox is a new feature of the “SERVOTECH” model, enabling the appropriate gear ratio to be selected by software.

This machine is specially designed for the manufacture of solenoids and power and distribution transformers from 10 to 2000 KVA, using aluminium or copper wires, including rectangular or flat wires with a special guider.

The wide range of winding speeds (up to 485 r.p.m) permits primary and secondary windings on the same machine, thus reducing the cycle time for many production processes.

The concept and design allows various accessories to be mounted as required for end-fillers, insulation paper or foil.

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Automatic Gear No.</th>
<th>Low speed Version</th>
<th>Flexible Version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Torque (Nm)</td>
<td>Speed (Rpm)</td>
</tr>
<tr>
<td>1</td>
<td>410</td>
<td>244</td>
</tr>
<tr>
<td>2</td>
<td>1232</td>
<td>81</td>
</tr>
</tbody>
</table>

- Main shaft motor: Brushless servo motor
- Guider motor (Brushless): 0.4 HP / 300 W
- Air supply: Not required
- Electrical supply: 3 x 400Vca - 50Hz
- Max load between points (coil weight): 1,000 Kgs
- Approx machine weight: 1,300 Kgs

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Ingrid West Machinery Ltd
Unit 5L, Delta Drive, Tewkesbury, Glos. GL20 8HB, United Kingdom
Tel. +44(0) 1684 273164  Fax. +44(0) 1684 273171
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E-900 SGB WINDING MACHINE

Medium-sized bench Winding Machine. Equipped with:

- Traverse head
- Sturdy base - constructed from welded steel for strength and durability.
- Face plate.
- Guider system
- Safety shielded foot pedal.
- CNC motion controller and simple electronic programming.
- Tailstock - with security lock.

The applications of this machine include the manufacture of solenoids, inductors, and transformers, with capacity to make multiple windings and even distribution and power transformers from 10 to 600 KVA.

There are various configurations of speed ranges, up to 3,000 r.p.m. This allows winding of primaries easily and with very short production cycle times.

TECHNICAL CHARACTERISTICS.

Wire Ø and profile wire .................................................. 0.01 – 10mm
Max winding length ....................................................... 800 mm
Max distance between points ......................................... 900 mm
Max Winding Ø ............................................................ 560 mm
Guider precision .......................................................... 0.01 mm
Winding shaft speed ...................................................... 1,500 /3,000 r.p.m**

Torque and speed (** There are two versions of this machine each having four gear positions)

<table>
<thead>
<tr>
<th>Gear Position</th>
<th>1500 RPM version</th>
<th>3000 RPM version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Torque (Nm)</td>
<td>Speed (Rpm)</td>
</tr>
<tr>
<td>1</td>
<td>26</td>
<td>1500</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>1000</td>
</tr>
<tr>
<td>3</td>
<td>156</td>
<td>250</td>
</tr>
<tr>
<td>4</td>
<td>234</td>
<td>166</td>
</tr>
</tbody>
</table>

✓ Traverse head
✓ Sturdy base - constructed from welded steel for strength and durability.
✓ Face plate.
✓ Guider system
✓ Safety shielded foot pedal.
✓ CNC motion controller and simple electronic programming.
✓ Tailstock - with security lock.

✓ Traverse head
✓ Sturdy base - constructed from welded steel for strength and durability.
✓ Face plate.
✓ Guider system
✓ Safety shielded foot pedal.
✓ CNC motion controller and simple electronic programming.
✓ Tailstock - with security lock.
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E-900 SERVOTECH WINDING MACHINE

Medium-sized bench Winding Machine. Equipped with:

- Traverse head
- Sturdy base - constructed from welded steel for strength and durability.
- Face plate.
- Guider system
- Safety shielded foot pedal.
- CNC motion controller and simple electronic programming.
- Tailstock - with security lock.

State-of-the-art winding machine with highly advanced features, including an automatic gearbox, energy efficient servo motors, and intelligent torque boosting technology.

The applications of this machine include the manufacture of solenoids, inductors, and transformers, with capacity to make multiple windings and even distribution and power transformers from 10 to 600 KVA.

The automatic gearbox is a new feature of the “SERVOTECH” model, enabling the appropriate gear ratio to be selected by software.

This allows winding of primaries easily and with very short production cycle times.

TECHNICAL CHARACTERISTICS.

<table>
<thead>
<tr>
<th></th>
<th>0.01 – 10mm</th>
<th>800 mm</th>
<th>900 mm</th>
<th>560 mm</th>
<th>0.01 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Ø and profile wire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max winding length</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max distance between points</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Winding Ø</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guider precision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The standard machine is available with speed torque shown below, however please contact us should you require other ratings

<table>
<thead>
<tr>
<th>Gear Position</th>
<th>1500 RPM version**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Torque (Nm)</td>
</tr>
<tr>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>2</td>
<td>261</td>
</tr>
</tbody>
</table>

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**E-600 WINDING MACHINE**

**DESCRIPTION** Medium-sized “Power house!” Winding Machine.

Equipped with:
- ✓ Traverse head
- ✓ Sturdy base
- ✓ Tailstock - with security lock,
- ✓ Guider system
- ✓ & Safety shielded foot pedal.
- ✓ Controlled by numeric PLC and electronic programming.

This machine is designed for the manufacture of solenoids, inductors, distribution and power transformers, with capacity to make multiple windings and a wide range of wire sizes.

There are various configurations of speed ranges, (depending machine version). This produces a fast cycle time for high turn primary windings.

**TECHNICAL CHARACTERISTICS.**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Distance between points</td>
<td>650mm</td>
</tr>
<tr>
<td>Max winding length.</td>
<td>600mm</td>
</tr>
<tr>
<td>Max. Ø of winding.</td>
<td>420mm</td>
</tr>
<tr>
<td>Height from center face plate to machine base</td>
<td>300mm</td>
</tr>
<tr>
<td>Face plate diameter.</td>
<td>220mm</td>
</tr>
<tr>
<td>Tailstock Morse Cone</td>
<td>Nº 2</td>
</tr>
<tr>
<td>Guider precision</td>
<td>0,001 mm</td>
</tr>
<tr>
<td>Spindle Resolution</td>
<td>0,01 turns</td>
</tr>
<tr>
<td>Main shaft motor (Parker)</td>
<td>Brushless servomotor</td>
</tr>
<tr>
<td>Guider motor (Brushless servomotor)</td>
<td>1.2Nm</td>
</tr>
<tr>
<td>Weight (approx)</td>
<td>250 Kg</td>
</tr>
<tr>
<td>Electrical source</td>
<td>220Vac - 50Hz</td>
</tr>
</tbody>
</table>

**TORQUE AND SPEED**

Winding shaft speed…………………………………………………………………………………400 rpm / 300 rpm

(** There are many version of this machine, two examples are shown here)

<table>
<thead>
<tr>
<th>Belt Position</th>
<th>version - 400 RPM</th>
<th>version - 300 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Speed (Rpm)</td>
<td>Torque (Nm)</td>
</tr>
<tr>
<td>1</td>
<td>400</td>
<td>70</td>
</tr>
</tbody>
</table>

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- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
E-300 WINDING MACHINE

DESCRIPTION Small-sized bench Winding Machine.
Equipped with:
✓ Traverse head
✓ Sturdy base
✓ Tailstock - with security lock,
✓ Guider system
✓ & Safety shielded foot pedal.
✓ Controller by numeric PLC and electronic programming.
The applications of this machine is intended for the manufacture of solenoids, reactances, transformers, with capacity to make multiple windings and even distribution and power transformers. There are various configurations of speed ranges, up to 9,000 r.p.m. This allows winding of primaries easily and with very short production cycle times.

TECHNICAL CHARACTERISTICS.

<table>
<thead>
<tr>
<th>Wire Ø</th>
<th>Max. Winding length</th>
<th>Max. distance between Centres.</th>
<th>Max. Winding Ø</th>
<th>Guider precision</th>
<th>Main shaft motor power</th>
<th>Guiding motor power</th>
<th>Electrical source</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 – 2.5mm</td>
<td>390 mm</td>
<td>500 mm</td>
<td>250 mm</td>
<td>0,001 mm</td>
<td>2 HP</td>
<td>0,4HP (Brushless)</td>
<td>3 x 380Vca - 50Hz</td>
</tr>
</tbody>
</table>

TORQUE AND SPEED

Winding shaft speed…..3000 rpm / 6000 rpm / 9000 rpm
Torque and speed (** There are three version of this machine each having three belt positions)

<table>
<thead>
<tr>
<th>Belt Position</th>
<th>G version - 3000 RPM</th>
<th>N version - 6000 RPM</th>
<th>R version - 9000 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Speed (Rpm)</td>
<td>Torque (Nm)</td>
<td>Speed (Rpm)</td>
</tr>
<tr>
<td>1</td>
<td>3000</td>
<td>6</td>
<td>6000</td>
</tr>
<tr>
<td>2</td>
<td>1500</td>
<td>12</td>
<td>3000</td>
</tr>
<tr>
<td>3</td>
<td>750</td>
<td>24</td>
<td>1500</td>
</tr>
</tbody>
</table>

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E-300W WINDING MACHINE – “Industry 4.0”

DESCRIPTION
Small-sized bench winding machine.
Equipped with:
✓ Traverse head
✓ Sturdy base
✓ Tailstock - with security lock,
✓ Guider system
✓ Controlled by numeric PLC and electronic programming.
✓ Safety shielded foot pedal (Optional).

This machine is designed for the manufacture of solenoids, inductors and transformers, (with capacity to make multiple windings).

There are various configurations of speed ranges, up to 13,000 rpm (depending on machine version). This produces a fast cycle time for high turn primary windings.

TECHNICAL CHARACTERISTICS.

<table>
<thead>
<tr>
<th></th>
<th>Max. Winding length</th>
<th>Max Wire pitching Ø</th>
<th>Max. distance between points</th>
<th>Max. Winding Ø</th>
<th>Face plate diameter</th>
<th>Guider precision</th>
<th>Spindle Resolution</th>
<th>Main shaft motor (Brushless servomotor)</th>
<th>Guider motor (Brushless servomotor)</th>
<th>Electrical source</th>
<th>Dimensions (L<em>W</em>H)</th>
<th>Net Weight (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>285 mm</td>
<td>99 mm</td>
<td>370 mm</td>
<td>240 mm</td>
<td>60 mm</td>
<td>0,001 mm</td>
<td>0,01 turns</td>
<td>2,6Nm/5500 r.p.m</td>
<td>1,4 NM</td>
<td>230Vac - 50 Hz</td>
<td>1000 x 520 x 310 mm</td>
<td>140 Kg</td>
</tr>
</tbody>
</table>

Torque and speed
There are many versions of the drive system, please contact your local representative to discuss your requirements.

<table>
<thead>
<tr>
<th>E300W</th>
<th>E300W -1 speed</th>
<th>E300W -1 speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct Drive</td>
<td>Direct Drive</td>
</tr>
<tr>
<td>SPEED</td>
<td>TORQUE (Nm)</td>
<td>SPEED (Nm)</td>
</tr>
<tr>
<td>rpm</td>
<td></td>
<td>rpm</td>
</tr>
<tr>
<td>13,000</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2,750</td>
<td>5</td>
<td>300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E300W R</th>
<th>E300W N</th>
<th>E300W G</th>
<th>E300W G+</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEED (rpm)</td>
<td>TORQUE (Nm)</td>
<td>SPEED (rpm)</td>
<td>TORQUE (Nm)</td>
</tr>
<tr>
<td>9,000</td>
<td>2</td>
<td>6,000</td>
<td>3</td>
</tr>
<tr>
<td>6,000</td>
<td>3</td>
<td>3,000</td>
<td>6</td>
</tr>
</tbody>
</table>

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PROGRAMMING CHARACTERISTICS.

User interface .............................................................. 7 inch (178mm) Colour Touch Screen
No. of programmable windings .................................................. Max. 1,000
No. of windings per coil .......................................................... Max. 20
  - when upgraded to SD card storage ...................... 10,000 program & 200 winding per program
  - when connected to a local network ................................. Virtually infinite storage
Software language ........................................................................ Main European
Type of programming ...................................................................... CNC
Network Connectivity (Ethernet plug) ........................................ RJ45

Delivery Time ........................................................................... 60 Days from order confirmation

KEY BENEFITS OF THE NEW E-300W

The new range of solutions has been designed in accordance with the "Industry 4.0" concept, providing capabilities for traceability, remote control and process monitoring. The E-300W provides a combination of high performance with reduced cost and a "state-of-the-art" control system.

The new hardware platform reads variables and parameters in “real time” and makes them available online.

Operators, managers, quality controllers and engineers can view the “live” information via the Internet from anywhere in the world using any “smart” device - for example, a laptop, tablet computer or even a Smartphone.

Built-in network functionality:

• Save and recall programs from the main company server,
• Check the status of the winding machine from anywhere in the world.
• Setup using the touch screen or remote control using laptop or tablet.
• Programs are easily searched and selected.
• Easy back up to Cloud storage.

This is the first in a new line of machines from ERASAN - “value engineered” without losing the focus on maximum performance.

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DESCRIPTION.

Robust and reliable, the E-1200C winding machine is a floor standing style winding machine.

The sturdy chassis is manufactured from heavy gauge welded steel for durability, painted for ease of cleaning and maintenance.

The machine consists of a headstock with speed change, face plate, and pedal.

Due to the intended application of this machine, it does not have a bench or wire guiding system.

This machine is specially designed for the manufacture of solenoids and power and distribution transformers from 10 to 1,200 KVA, using aluminium or copper wires, including rectangular or flat wires.

TECHNICAL CHARACTERISTICS.

Maximum winding shaft speed.............................................. 500 r.p.m
Winding shaft slow speed..................................................0 – 20-60-120 r.p.m
Maximum coil diameter.....................................................1,600 mm
Maximum torque (low speed)...............................................80 Kgm
Main motor................................................................. 5 HP (3.7 kW)
Power source............................................................... 3 x 380Vca - 50Hz
Air supply........................................................................... 6 bar (minimum)
Delivery...........................................................................90 DAYS from confirmation of the order.

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Please contact your local partner for more information

TECHNICAL CHARACTERISTICS.
Various configurations of machine available depending on your application requirements.

For example:
1 foil, 1 insulator // 1 foil, 2 insulators // 2 foils, 2 insulators.

Max foil width ........................................ 600, 900 up to 1500 mm
Guider precision ....................................... built in sensor detecting the foil edge creates a continuous feedback loop to ensure precise turn on turn foil layering
Type of programming ................................. CNC- industrial PC
DELIVERY TIME....................................... 6-9 months from order confirmation.
(Please confirm at time of order)

Various stages / process of automation can be added to the function of the machine according to your requirements.
Shown here is a cold pressure welding station, used for fixing the terminal leads “in-line” during the winding.
STRIP FOIL WINDING MACHINE SERIES

One of the latest developments at Erasan Technology is the range of foil winding equipment, with high-tech control features, improving quality of winding and reducing maintenance to a minimum.

Primarily used for winding of *Cast Resin / Air Cooled* transformers, the machines shown below are some of those already delivered, along with concept drawings showing a basic machine layout.

There are various configurations possible, with coil widths up to 2.3M with a winding area of **1.8M**. This allows winding of a wide range of transformer sizes and number of strips as required.

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Ingrid West Machinery Ltd
Unit 5L, Delta Drive, Tewkesbury, Glos. GL20 8HB, United Kingdom
Tel. +44(0) 1684 273164  Fax. +44(0) 1684 273171
E-mail enquiry@ingridwest.co.uk  Website www.coilwindingmachines.eu

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Please contact your local partner for more information
Erasan’s range of Winding machine accessories

The Erasan range of heavy duty coil winders often require a tensioning device mounted behind the machine. For wire sizes greater than 1.0mm the best method is to apply a braking force to the supply spool itself and not the wire.

Shown below are some the devices previously commissioned.

<table>
<thead>
<tr>
<th>Number of spools</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image 1" /></td>
<td><img src="image2.png" alt="Image 2" /></td>
<td><img src="image3.png" alt="Image 3" /></td>
<td><img src="image4.png" alt="Image 4" /></td>
<td></td>
</tr>
</tbody>
</table>

Example layout drawing of 4 spool version.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire Ø</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spool Diameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braking method</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1, 2, 4, 32 versions available
0.01 – 99 mm
up to 500/750 mm
pneumatic controlled hydraulic caliper
60 Days from order confirmation

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4 Coil De-spooler

This is a floor standing de-coiling machine, medium sized and easily placed in a factory or works. Profile wire de-coiling device, two levels, 4 spool capacity, with hydraulic disc braking system pneumatically controlled. All controls brought up to the machine, as shown below with hydraulic gauge indicators, and tension release switch:-

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Weight per coil</td>
<td></td>
<td>250 Kgs</td>
</tr>
<tr>
<td>Max coil (spool) Ø</td>
<td></td>
<td>750 mm</td>
</tr>
<tr>
<td>Max No Spools</td>
<td></td>
<td>4 pcs</td>
</tr>
</tbody>
</table>

Please note that 1, 2, 8 & 32 spool versions are also available

Please speak with your local representative for further information or custom requirements.

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Erasan Servo driven spool tensioning system

The Erasan range of heavy duty coil winders often require a tensioning device mounted behind the machine. For wire sizes greater than 1.0mm the best method is to apply a braking force to the supply spool itself and not the wire.

To meet the growing customer demand, working to improve control of the higher wire tensions required for larger wires and profile.

**A new generation in profile wire tensioning and de-coiling.**

Working similar to a foil machine in “torque following” mode, the torque to the winding axis is monitored and the reverse torque to driven de-coiler is controlled according to the required tension.
The operator can program a digital tension value that is measured and kept constant during the winding cycle.

Shown below: a previously commissioned device.

The range is available in standalone fixed units similar to the DP series of 1,2,4 up to 32 spool varieties.

**GB - (Guider Base) options**

However as shown above, there is the option to mount the whole de-coiler onto a ballscrew carriageway.
Reducing factory space requirements, the servo-driven de-coiler monitors the exact position of the guider on the machine, so the spool moves the same distance and with the same speed as the machine guider.

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TECHNICAL CHARACTERISTICS.

Number of spools .......................................................... 1, 2, 4, 32 versions available
Wire Ø ................................................................. 0.01 – 99 mm
Spool Diameter .......................................................... up to 500/750 mm
Standard spool shaft Ø ................................................ 36 mm (others configurations on request)
Tension control method ................................................... Servo motor "torque control"
Max torque (for DP1-SD model) ...................................... 87 Nm (others configurations on request)
Power supply (for DP1-SD model) .................................. 2 Kw (others configurations on request)
Max weight per coil ...................................................... 250 Kg
Delivery time .............................................................. 60 Days from order confirmation

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---

TH3- ELECTRONIC TENSIONER

For Heavy Duty Winding Machines

DESCRIPTION.

The TH3 is a floor standing style heavy duty tensioner. Suitable for wires 0.5 to 3mm in diameter.

For maximum stability, provision has been made to enable this unit to be bolted to the floor.

The wire is perfectly guided as soon as it leaves the supply spool, through ceramic eyelets with soft felt pads and a set of adjustable pulleys to give the desired pre-tension, according to the thickness of the wire and without damaging the insulation.

The brake pulley is controlled by electrically powered braking system, giving highly repeatable settings, adjustable by potentiometer or integrated digitally into the main winding machine software.

There are 3 different versions of the tensioner TH3. In the TH3-S (standalone) version, the tensioner is independent of the winding machine, and includes a small control box for regulation of the tension, which is set by adjusting a potentiometer.

There is adjustable height positioning of the de-reeling cone on the column to match your supply spool height.

The TH3-IS (Integrated Simple) version - This version is also available without the support stand and ideal to mount onto your machine traverse.

The supply voltage is 230V single phase and the maximum power consumption is 25W.
In the TH3-I (integrated) full version, the tensioners are integrated with the machine and its controller.

The tension is controlled from the machine’s operating software, setting the desired tension independently for each winding and stored with that program / coil setup.

SPECIFICATION.

<table>
<thead>
<tr>
<th></th>
<th>TH3-S</th>
<th>TH3-IS</th>
<th>TH3-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand included</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Control Box</td>
<td>Yes / Pot</td>
<td>Yes / Pot</td>
<td>No (in winding machine program)</td>
</tr>
</tbody>
</table>

Maximum spool diameter ......................................................... 500 mm
Maximum spool height .............................................................. 650 mm
Working method ................................................................. ELECTRICAL
Max. Torque ................................................................. 12Nm
Diameter TH3 ................................................................. 137 mm
  Max. Tension ................................................................. 18 Kg
  Max. Speed ................................................................. 2000 rpm
  Min. Speed ................................................................. 40 rpm
  Max. Working Temp ......................................................... 70º C
Dimensions (mm) ................................................................. 670x540x1755
Weight ................................................................. 95 Kg
DELIVERY TIME ................................................................. 60 Days from order confirmation
(Please confirm at time of order)

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Profile Wire Guider GP1 - Single wire

The Erasan range of heavy duty coil winders require a guide head system suitable for the application to be wound, many factors influence the choice of guide head, from wire size to wire type / profile etc. Shown below is the single profile wire guider, please do ask your local agent if you require a custom solution.

The guide head angle is adjustable; Course adjustment in steps of 18° Fine adjustment from bolt underneath

The guide head has four profile rollers - adjustable width & wire insulation protecting Teflon side walls, as well as outer “V” groove roller for round wire

The front roller is also adjustable in height / angle. This “negative effect” roller can be used to produce an upward curve on the wire. When wound onto the flat sides of the bobbin the inverse curve of wire presses against the long flat edges of the bobbin, reducing the bow effect

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Profile Wire Guider GP2 - Multiple wires

The Erasan range of heavy duty coil winders require a guide head system suitable for the application to be wound, many factors influence the choice of guide head, from wire size to wire type / profile. Shown below is the multi profile wire guider, however please do ask your local agent if you require a custom solution.

This guide has at the rear, a series of four parallel roller sets, each mounted at 90° to the previous one and independently adjustable.

The reason for this is to bring multiple wires coming from different supply spools together – forming a single packet to then wind onto the core / bobbin.

The front section of the guider head has two profile rollers - adjustable width & Teflon side walls to protect the wire insulation.

The front roller is also adjustable in angle. This “negative effect” roller can be used to produce an upward curve on the wire, meaning when wound onto flat sides of bobbin, the inverse curve of wire presses against the long flat edges, reducing the bow effect.

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Range of Expandable Mandrels - For Heavy Duty Winding Machines

ROUND STYLE - DESCRIPTION.

Customers often need to wind the foil or wire onto a mandrel which can be expanded during the winding process and then collapsed to allow the finished coil to be removed. Iron cores or laminations can then be inserted later in the process.

Shown below are some examples of the previous designs we have made.

As can be seen in the photos, the expanding mandrel are finished with aluminium bars and wood mounted on the outer diameter. Each mandrel has a built in gearbox which is driven by a pneumatic hand tool, which expands the mandrel for winding and then collapses it for easy removal of the coil at the end of the winding process. Larger versions can be provided with an expanding and contracting mechanism that is powered by hydraulics.

TYPICAL TECHNICAL CHARACTERISTICS.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Min</th>
<th>Max.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>250</td>
<td>425</td>
<td>1800</td>
</tr>
<tr>
<td>400</td>
<td>400</td>
<td>650</td>
<td>1800</td>
</tr>
<tr>
<td>500</td>
<td>500</td>
<td>820</td>
<td>2000</td>
</tr>
<tr>
<td>820</td>
<td>820</td>
<td>1300</td>
<td>2000</td>
</tr>
</tbody>
</table>

However, please do note that this is only a representative range, and nearly 90% of these mandrels are made to customer order and specifications.

Please tell us your requirements:

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Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
Range of Expandable Mandrels - For Heavy Duty Winding Machines

RECTANGULAR STYLE - DESCRIPTION.

The new generation of expandable mandrels provide the possibility of winding with rectangular, circular or ovoid shape coils, without changing mandrel. Allows winding with round & flat / profile wires as well as foil. Over the main tile the customer can assemble supplements with geometry according to the application. Simple manual opening & can be mounted in cantilever or between points.

Both the main body and tiles are made of treated steel which ensures robustness and protection against rust and corrosion.

Wide range of opening add to its' versatility. Strong and robust design leads to high loading capacity.

Faceplate & Tailstock as well as dimensions of mandrel are configurable to your requirements.

Additional supplements can be mounted on the main mandrel to allow a variety of rectangular or ovoid cores to be wound.

We aim to be much more than a machinery supplier. Our team has a vast range of winding experience and is able to offer help and advice on all aspects of coil winding, from tooling design to machine choice and set-up.

Ingrid West Machinery

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Fully Automatic Bobbin winding Machine range

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4 Spindle Multi Axis Automatic Winding Machine

Application:
Relays, Automotive ABS coils, LCD coils, transformers, ignition coils, inductors, sensor coils, solenoids DVD reader, Inverter, Switching Power Supplies, Ballast Transformer and other bobbin-wound products. . .

Main features:
- The wire guide movement can be freely programmed in all 3 axes (X, Y, and Z).
- Wraps either radial or axial pins, - programmable nozzle movement through 0° and 90° angles.
- Wire cutting on bobbin pin, nozzle cut or nipper. Method can be chosen by operator and setup in the program.
- Simplified programming with teach-in programming system using 15” touch screen, windows based interface, industrial PC with USB, Ethernet network and DVD ROM facilities.
- Easy to change tooling and machine set-up recalled from the onboard computer when changing product.
- Fully CE compliant.

Options:
- Air nipper for larger wire.
- Load and unload shuttle transfer system.
- Skeining (twisting) unit.
- Customised accessories to suit your application.

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### Main technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of spindles</td>
<td>4</td>
</tr>
<tr>
<td>Wire size</td>
<td>0.02-0.5 mm</td>
</tr>
<tr>
<td>Max traverse width</td>
<td>85 mm</td>
</tr>
<tr>
<td>Spindle pitch</td>
<td>105 mm</td>
</tr>
<tr>
<td>Max bobbin diameter</td>
<td>100 mm – less if load unload system used</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>9,000 rpm</td>
</tr>
<tr>
<td>Spindle position accuracy</td>
<td>± 0.1°</td>
</tr>
<tr>
<td>Guide head drive motor</td>
<td>200W AC servomotor X, Y and Z axis</td>
</tr>
<tr>
<td>Max movement of guide head</td>
<td>X(left/right) 100 mm, Y(front/back) 75 mm, Z(up/down) 65 mm</td>
</tr>
<tr>
<td>Nozzle positions</td>
<td>0°, 90° or 120°</td>
</tr>
<tr>
<td>Max pin wrap speed</td>
<td>150 Turns / min</td>
</tr>
<tr>
<td>Control system</td>
<td>Windows interface PC with USB connector &amp; DVD ROM</td>
</tr>
<tr>
<td>Interface</td>
<td>RS232 or USB</td>
</tr>
<tr>
<td>Touch screen</td>
<td>15 inch</td>
</tr>
<tr>
<td>Air supply</td>
<td>6 Bar</td>
</tr>
<tr>
<td>Power supply</td>
<td>single phase 220V +/−10% 50Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>3kwA</td>
</tr>
<tr>
<td>Weight</td>
<td>450 Kg</td>
</tr>
<tr>
<td>Dimensions (cm)</td>
<td>110(W) x 130(L) x 155(H) – excluding wire spool stand</td>
</tr>
</tbody>
</table>
6 Spindle Multi Axis Automatic Winding Machine

Application:
Relays, Automotive ABS coils, LCD coils, transformers, ignition coils, inductors, sensor coils, solenoids DVD reader, Inverter, Switching Power Supplies, Ballast Transformer and other bobbin-wound products.

Main features:
- The wire guide movement can be freely programmed in all 3 axes (X, Y, and Z).
- Wraps either radial or axial pins, programmable nozzle movement through 0° and 90° angles.
- Wire cutting on bobbin pin, nozzle cut or air nipper. Method can be chosen by operator and setup in the program.
- Password function, prevent accidental program change.
- Simplified programming with teach-in programming system using 15" touch screen.
- Easy to change tooling and machine set-up recalled from the onboard computer when changing product.
- Fully CE compliant.

Options:
- Air nipper for larger wire.
- Load and unload shuttle transfer system (as shown).
- Skeining (twisting) unit (as shown).
- Customised accessories to suit your application.

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8 Spindle Multi Axis Automatic Winding Machine.

Application:

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Main features:

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12 Spindle Multi Axis Automatic Winding Machine

Application:
Relays, Automotive ABS coils, LCD coils, transformers, ignition coils, inductors, sensor coils, solenoids DVD reader, Inverter, Switching Power Supplies, Ballast Transformer and other bobbin-wound products.

Main features:
- The wire guide movement can be freely programmed in all 3 axes (X, Y, and Z).
- Wraps either radial or axial pins, programmable nozzle movement through 0° and 90° angles.
- Wire cutting on bobbin pin, nozzle cut or nipper. Method can be chosen by operator and setup in the program.
- Password function, prevent accidental program change.
- Simplified programming with teach-in programming system using 15” touch screen.
- Easy to change tooling and machine set-up recalled from the onboard computer when changing product.
- Fully CE compliant.

Options:
- Automatic load / unload system.
- Load and unload shuttle transfer system (as shown below).
- Skeining (twisting) unit.
- Customised accessories to suit your application.

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**Optional accessories for multi spindle series**

When configuring the range of multi spindle machinery, several customer / application specific accessories may be required, we like to think we have one of the most comprehensive available, and can offer a solution to almost any winding requirement.

**Options:**

- **Air Nipper for wire range 0.2mm – 0.8mm.**
  
  For cutting larger wire diameters the pin tear method will no longer work. In this case we can fit air operated cutters close to the nozzle head.

- **Tensioners stand**

  An essential piece of equipment to mount all supply spools of wire, the unit can be built to hold the required number of spools for the number of spindles on the winding machine. Offered with mobile options, changing reels can be done away from the machine.

- **Load and unload Turret Tailstock.**

  Allows automated load & unload, improving the machine throughput / cycle, and allowing easy access for extra stations to be added to the line, e.g. soldering, welding etc.

- **Skeining unit.**

  When making a solder connection to fine wire, the mechanical strength of a single strand of wire may not be sufficient. The skeining unit reinforces the start and finish leads of the winding by twisting multiple strands of the wire together, so that they will then withstand the soldering process.

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---

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Working with local partners in the following countries: Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
Fully automatic “Air coil” winding machine

Application:
For winding self supporting coils using thermo-plastic coated wire.

The wire is heated using hot air as it is wound onto a former, bonding the turns together. At the end of the cycle, the former is then removed and the finished coil ejected from the machine. Typical products include: RFID coils, laser heads, voice coils, magnet coils, sensor coils, vibrator coils and pancake motor coils.

Main features:
- Clamp/cut system, layer winding, coil unloading arm, wire lead picker, all fully automatic during each cycle - operatorless.
- Freely programmable pitch control & guider movements enabling precise layer winding.
- Freely programmable servo driven tailstock movements provides programmable coil width.
- Easy to integrate to other devices utilising available I/O; such as:-
  - Cold air jet,
  - Skeining unit,
  - Alcohol dispensing.
  - Electronic tensioner - with selectable tension during the wind cycle.
- 15” touch screen for easy setup, with industrial PC, network card, simple program backup to USB memory stick.
- Synchronously driven tailstock ensures precise tool alignment and allows for smaller core ID’s.
- Temperature & Air flow of the hot air system is freely programmable.

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RFID CHIP INDUCTOR WINDING.
Multi Axis Automatic Winding Machine

Application:
0603, 0805, 1008 chip sizes and other ferrite-wound products....

Main features:
- The wire guide movement can be freely programmed in all 3 axes (X, Y, and Z).
- Built-in welding system to connect start and finish leads.
- Bowl feed ferrite component, Wire cutting on tooling clamp, guide over start pad on ferrite, weld, winding, guide over end pad, weld, cut end wire, remove ferrite, unload - all performed in a fully automatic way.
- Password function, prevent accidental program change.
- Simplified programming with teach-in programming system using 15” touch screen.
- Easy to change tooling and machine set-up recalled from the onboard computer when changing product.
- Fully CE compliant.

Options:
- Load and unload to tape and reel.
- Various tooling can be designed depending on component requirements.
- Customised accessories to suit your application.

<table>
<thead>
<tr>
<th>Main technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of spindles</td>
</tr>
<tr>
<td>Wire size</td>
</tr>
<tr>
<td>Spindle speed</td>
</tr>
<tr>
<td>Spindle position accuracy</td>
</tr>
<tr>
<td>Nozzle movement</td>
</tr>
<tr>
<td>Spindle control</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Welding machine</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Adjustable parameters</td>
</tr>
<tr>
<td>Control system</td>
</tr>
<tr>
<td>Interface</td>
</tr>
<tr>
<td>Touch screen</td>
</tr>
<tr>
<td>Air supply</td>
</tr>
<tr>
<td>Power supply</td>
</tr>
<tr>
<td>Power consumption</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Dimensions (cm)</td>
</tr>
</tbody>
</table>
DESCRIPTION.
This is a special machine for conducting coils used in alternators. As a single head, it produces one coil per cycle. This machine is built on a steel chassis welded and aluminium profiles. The wire guide system is placed on linear bearing guides, which ensures a precise guide control and great robustness.

KEY FEATURES
- Programmable aperture of “nose tooling”, using slip rings and servo motor
- Motor of wire guide Brushless servo motor
- Main motor Brushless servo motor with break
- Table positioning motor Brushless servo motor
- Protection Shield with pneumatic function controlled by program
- Specific software for this application.
- CE normative.

TECHNICAL CHARACTERISTICS
Max Wire Ø (round) ........................................................................................................... 1.2mm
Max winding length ................................................................................................................ 150 mm
Max. Ø of winding .................................................................................................................. 270 mm
Main Motor, Brushless, (Medium Inertia) ........................................................................... 6.36 Nm
Wire guide motor, Brushless ................................................................................................. 2.2 Nm
Drive motors .......................................................................................................................... By 3 Hi-tech Servos
Max. Winding speed .................................................................................................................. (1500 r.p.m)
Main controller ....................................................................................................................... CTE-240
Software language (others available on request) ................................................................. English
Max. Programmable Pitch ....................................................................................................... 9mm
Spindle Accuracy ..................................................................................................................... 1/10
Guiding precision .................................................................................................................... 0.01mm
Dimensions (approx) ............................................................................................................. 1250 x 1050 x 1250
Weight approx. ....................................................................................................................... 450 Kg

PROGRAMMING CHARACTERISTICS.
Max. No. of programmable windings (Standard 50) ............................................................... Max. 175
Max. No. of windings per coil (Standard 20) ........................................................................... Max. 200
Type of programming ............................................................................................................ CNC
DELIVERY TIME ..................................................................................................................... 60 Days from order confirmation.

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Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
WH 900 Toroid winding machine.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program</td>
<td>TWC-01 digital controller holds up to 999 program sequences</td>
</tr>
<tr>
<td>Control</td>
<td>DC 400 W spindle motor with stepping motor for spreading</td>
</tr>
<tr>
<td>Features</td>
<td>Choice of Belt or Slider type winding heads both available in 4 or 6 inch versions</td>
</tr>
<tr>
<td>Package</td>
<td>Includes base, core rotator, winding head and your first shuttle</td>
</tr>
<tr>
<td>Wire size</td>
<td>0.05 – 1.1 mm (depending on machine head type and shuttle size)</td>
</tr>
<tr>
<td>O D Range</td>
<td>8 – 60 mm</td>
</tr>
<tr>
<td>Min finished I D</td>
<td>3 mm (depends on shuttle size &amp; core height)</td>
</tr>
<tr>
<td>Min wire size</td>
<td>depends on shuttle size and head type</td>
</tr>
<tr>
<td>Max speed</td>
<td>1500 rpm (depending on winding head)</td>
</tr>
<tr>
<td>Power</td>
<td>AC 230 /110 V ± 10%, 50 - 60hz</td>
</tr>
<tr>
<td>Dims</td>
<td>600 x 620 x 640 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>70 kg</td>
</tr>
<tr>
<td>CE cert. no.</td>
<td>AE9955093 01</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>HEAD TYPE</th>
<th>B4 BELT TYPE</th>
<th>B6 BELT TYPE</th>
<th>S4 SLIDER TYPE</th>
<th>S6 SLIDER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICTURE</td>
<td><img src="image1.png" alt="Picture" /></td>
<td><img src="image2.png" alt="Picture" /></td>
<td><img src="image3.png" alt="Picture" /></td>
<td><img src="image4.png" alt="Picture" /></td>
</tr>
</tbody>
</table>

- **COIL O.D.**
  - B4, S4: 5~60mm
  - B6, S6: 8~60mm

- **MIN. FIN. I.D.**
  - B4, S4: 3mm
  - B6, S6: 6mm

- **MAX. HEIGHT**
  - B4, S4: 25mm
  - B6, S6: 45mm

- **WIRE SIZE**
  - B4, S4: 0.12~0.8mm
  - B6, S6: 0.25~0.9mm

- **SHUTTLE DIA.**
  - B4, S4: 100mm
  - B6, S6: 150mm

- **SHUTTLE TYPE**
  - B4: 2.4, 2.5, 2.8, 3.4
  - S4: 4.7, 6.3, 7.9, 9.5
  - B6: 2.4, 2.5, 2.8, 3.4
  - S6: 4.7, 6.3, 7.9, 9.5

Min. Finished I.D. Will be different by shuttle size and coil height.

### SHUTTLE WIRE CAPACITY CHART (IN FEET) 1 FOOT = 304.8 mm

<table>
<thead>
<tr>
<th>SHUTTLE WIDTH</th>
<th>FOR B4 &amp; S4 TYPE</th>
<th>FOR B6 &amp; S6 TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.912MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.813MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.724MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.643MM</td>
<td></td>
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</tr>
<tr>
<td>0.574MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.511MM</td>
<td></td>
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</tr>
<tr>
<td>0.455MM</td>
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<td></td>
</tr>
<tr>
<td>0.404MM</td>
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</tr>
<tr>
<td>0.361MM</td>
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</tr>
<tr>
<td>0.320MM</td>
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<tr>
<td>0.287MM</td>
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<td>0.254MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.226MM</td>
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<td></td>
</tr>
<tr>
<td>0.203MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.180MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.160MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.142MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.127MM</td>
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</tr>
<tr>
<td>0.114MM</td>
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</tr>
<tr>
<td>0.102MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.099MM</td>
<td></td>
<td></td>
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<tr>
<td>0.079MM</td>
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<tr>
<td>0.064MM</td>
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<td></td>
</tr>
<tr>
<td>0.056MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.051MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.046MM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COLOUR INDICATION**

- **WHITE**: FOR B4 TYPE
- **YELLOW**: FOR B4 & S4 TYPE
- **GREEN**: FOR S4 TYPE
- **WHITE**: FOR B6 TYPE
- **YELLOW**: FOR B6 & S6 TYPE
- **GREEN**: FOR S6 TYPE
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**Specification**

**WH 900A Toroid winding machine.**

**Program**
TWC-01 digital controller holds up to 999 program sequences

**Control**
DC 400 W spindle motor with stepping motor for spreading

**Features**
Choice of Belt or Slider type winding heads both available in 8 or 12 inch versions

**Package**
Includes base, core rotator, winding head, your first shuttle, and comprehensive manual

**Wire size**
0.3 – 1.2 mm (depending on machine head type and shuttle size)

**O D Range**
40 – 200 mm

**Min finished I D**
12 mm (depends on shuttle size & core height)

**Min wire size**
depends on shuttle size and head type

**Max speed**
1200 rpm (depending on winding head)

**Power**
AC 230 / 110 V ± 10%, 50 - 60hz

**Dims**
770 x 690 x 550 mm

**Net weight**
80 kg

**CE cert. no.**
AE9955093 01

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Working with local partners in the following countries:

Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
## HEAD TYPE

<table>
<thead>
<tr>
<th></th>
<th>B8 BELT TYPE</th>
<th>S8 SIDE SLIDER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PICTURE</strong></td>
<td><img src="image1" alt="Picture" /></td>
<td><img src="image2" alt="Picture" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEAD TYPE</th>
<th>B8 BELT TYPE</th>
<th>S8 SIDE SLIDER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COIL O.D.</strong></td>
<td>40~120mm</td>
<td>40~120mm</td>
</tr>
<tr>
<td><strong>MIN. FIN. I.D.</strong></td>
<td>12mm</td>
<td>15mm</td>
</tr>
<tr>
<td><strong>MAX. HEIGHT</strong></td>
<td>80mm</td>
<td>80mm</td>
</tr>
<tr>
<td><strong>WIRE SIZE</strong></td>
<td>0.3~1.1mm</td>
<td>0.3~0.8mm</td>
</tr>
<tr>
<td><strong>SHUTOFF DIA.</strong></td>
<td>220mm</td>
<td>220mm</td>
</tr>
</tbody>
</table>

**SHUTTLE TYPE**: 8, 10, 12, 15, 17, 20

* Finished ID will vary according to shuttle specification and coil height

## SHUTTLE WIRE CAPACITY CHART (FEET)

1 FOOT = 304.8 mm

<table>
<thead>
<tr>
<th>SHUTTLE WIDTH</th>
<th>FOR B8 &amp; S8 TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td>1.290MM</td>
<td>AWG NO.16</td>
</tr>
<tr>
<td>1.151MM</td>
<td>AWG NO.17</td>
</tr>
<tr>
<td>1.024MM</td>
<td>AWG NO.18</td>
</tr>
<tr>
<td>0.912MM</td>
<td>AWG NO.19</td>
</tr>
<tr>
<td>0.813MM</td>
<td>AWG NO.20</td>
</tr>
<tr>
<td>0.724MM</td>
<td>AWG NO.21</td>
</tr>
<tr>
<td>0.643MM</td>
<td>AWG NO.22</td>
</tr>
<tr>
<td>0.574MM</td>
<td>AWG NO.23</td>
</tr>
<tr>
<td>0.511MM</td>
<td>AWG NO.24</td>
</tr>
<tr>
<td>0.455MM</td>
<td>AWG NO.25</td>
</tr>
<tr>
<td>0.404MM</td>
<td>AWG NO.26</td>
</tr>
<tr>
<td>0.361MM</td>
<td>AWG NO.27</td>
</tr>
<tr>
<td>0.320MM</td>
<td>AWG NO.28</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>HEAD TYPE</th>
<th>G10S WINDING</th>
<th>G10B WINDING</th>
<th>G13 WINDING</th>
<th>T10S TAPING</th>
<th>T10B TAPING</th>
<th>T13 TAPING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICTURE</td>
<td>Picture of winding heads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COIL O.D.</strong></td>
<td>40~150mm</td>
<td>60~150mm</td>
<td>80~250mm</td>
<td>40~150mm</td>
<td>60~150mm</td>
<td>80~250mm</td>
</tr>
<tr>
<td><strong>MIN.FIN. I.D.</strong></td>
<td>25mm</td>
<td>35mm</td>
<td>45mm</td>
<td>25mm</td>
<td>35mm</td>
<td>45mm</td>
</tr>
<tr>
<td><strong>MAX. HEIGHT</strong></td>
<td>80mm</td>
<td>80mm</td>
<td>120mm</td>
<td>80mm</td>
<td>80mm</td>
<td>120mm</td>
</tr>
<tr>
<td><strong>WIRE SIZE</strong></td>
<td>0.5~1.5mm</td>
<td>0.5~2.2mm</td>
<td>0.5~2.6mm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>SHUTTLE DIA.</strong></td>
<td>250mm</td>
<td>250mm</td>
<td>350mm</td>
<td>250mm</td>
<td>250mm</td>
<td>350mm</td>
</tr>
<tr>
<td><strong>SHUTTLE TYPE</strong></td>
<td>8, 12, 16, 20, 25</td>
<td>8, 12, 16, 20, 25</td>
<td>11, 14, 17 20, 23, 26</td>
<td>TAPE WIDTH 4~8mm</td>
<td>TAPE WIDTH 8~15mm</td>
<td>TAPE WIDTH 12~25mm</td>
</tr>
</tbody>
</table>

Min. Finished I.D. Will be different by shuttle size and coil height.

**SHUTTLE WIRE CAPACITY CHART (FEET)** 1 FOOT=304.8mm

<table>
<thead>
<tr>
<th>SHUTTLE WIDTH</th>
<th>G10B</th>
<th>G10S</th>
<th>G13</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.000MM</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>2.590MM</td>
<td>50</td>
<td>71</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>114</td>
<td>136</td>
<td>158</td>
</tr>
<tr>
<td>2.300MM</td>
<td>68</td>
<td>95</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>153</td>
<td>182</td>
<td>211</td>
</tr>
<tr>
<td>2.050MM</td>
<td>86</td>
<td>122</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>231</td>
<td>267</td>
<td></td>
</tr>
<tr>
<td>1.830MM</td>
<td>170</td>
<td>192</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>307</td>
<td>365</td>
<td>422</td>
</tr>
<tr>
<td>1.630MM</td>
<td>134</td>
<td>192</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>307</td>
<td>365</td>
<td>422</td>
</tr>
<tr>
<td>1.500MM</td>
<td>50</td>
<td>71</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>114</td>
<td>136</td>
<td>158</td>
</tr>
<tr>
<td>1.290MM</td>
<td>68</td>
<td>95</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>153</td>
<td>182</td>
<td>211</td>
</tr>
<tr>
<td>1.151MM</td>
<td>86</td>
<td>122</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>231</td>
<td>267</td>
<td></td>
</tr>
<tr>
<td>1.000MM</td>
<td>170</td>
<td>192</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>307</td>
<td>365</td>
<td>422</td>
</tr>
<tr>
<td>0.912MM</td>
<td>50</td>
<td>71</td>
<td>93</td>
</tr>
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<td>158</td>
</tr>
<tr>
<td>0.813MM</td>
<td>68</td>
<td>95</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>153</td>
<td>182</td>
<td>211</td>
</tr>
<tr>
<td>0.724MM</td>
<td>86</td>
<td>122</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>231</td>
<td>267</td>
<td></td>
</tr>
<tr>
<td>0.643MM</td>
<td>170</td>
<td>192</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>307</td>
<td>365</td>
<td>422</td>
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<tr>
<td>0.574MM</td>
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</tr>
<tr>
<td>0.511MM</td>
<td>68</td>
<td>95</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>153</td>
<td>182</td>
<td>211</td>
</tr>
</tbody>
</table>

Note: TAPE WIDTH for TAPING is different from WINDING.
WH 900 T6 Toroid Taping machine.

**Specification**

- **Program**: TWC-01 digital controller holds up to 999 program sequences
- **Control**: DC 400 W spindle motor with stepping motor for spreading
- **Package**: Includes base, core rotator, Taping head and your first shuttle
- **Tape Width**: 4 mm - 10 mm (depends on shuttle Width)
- **O D Range**: 8 – 60 mm
- **Min finished I D**: 15 mm (depends on shuttle size & core height) 45mm Max. Height
- **Shuttle Dia**: 150 mm
- **Max speed**: 300 rpm (depending on winding head)
- **Power**: AC 230 /110 V ± 10%, 50 - 60hz
- **Dims**: 780 x 780 x 1250 mm
- **Net weight**: 90 kg
- **CE cert. no.**: AE9955093 01

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**Specifcation**

**Program**
Digital controller capable of holding data for 999 winding operations. Fully programmable pitch per turn (wire spacing). Start position, winding direction and segment winding angle programmable. In semi-automatic mode, hold-time is programmable at top and bottom of stroke.

**Control**
Pneumatically operated hook. Mechanically adjustable stroke length. Turns counted digitally.

**Full control of core rotation using stepping motor**

**Package**
Includes full height cabinet, digital controller and one hook. Air cylinder, filter & regulator; stepper motor system.

**Hook sizes**
3 standard hook sizes, with specials available.

**Wire size**
0.3 ~ 2.2 mm

**O.d. range**
15 ~ 80 mm

**Air supply**
Typically 5 Bar

**Power supply**
AC 230 /110 V ± 10%, 50 – 60 Hz

**Dimensions**
70 x 55 x 150 cm

<table>
<thead>
<tr>
<th>Hook type</th>
<th>H5</th>
<th>H8</th>
<th>H10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hook size</td>
<td>5 mm</td>
<td>8 mm</td>
<td>10 mm</td>
</tr>
<tr>
<td>Min. finished i.d.</td>
<td>8 mm</td>
<td>11 mm</td>
<td>14 mm</td>
</tr>
</tbody>
</table>

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Toroidal Tape winder - "AIR JET"

The Air jet is a rapid way to tape small Toroidal cores, giving machine wound repeatability and quality on every product run.

- Cutting length between 20-999mm
- Tape width from 7mm upto 50mm

Simple operation process…

Place the core

Hold tape over top of toroid

With the help of “Air Jet”, the tape will be pushed through the core, after that, we have to bring the tape over the top of the toroid to produce the wound tape turns...

The finished taped core

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Coil Handling / Packing Trays.

Damage, rework and scrap currently adds to manufacturing costs, making companies uncompetitive in World markets. Prevention is the key; maintain the conformance of each part by using good work handling practices.

A range of standard containers available for protection of precision components. We can also create customised containers to protect even the most complex shapes and sizes. These are precision moulded to offer smart presentation and protection, especially ideal for transportation of coils. Made from High density EPS, these trays very light (55 Gramms / Litre) whilst still very strong means they can be used again and again and again...

Features and benefits include:

**EXCELLENT PROTECTION:**
Prevent accidental impact, Protection from contamination / oil, Thermal properties protect from extreme temperatures. Protection when shipped to and from subcontractors

**PRECISION MOULDED:**
Smart presentation and good part location

**PARTS SEGREGATION:**
Reduces transit damage and rework. upto 250 stock sizes / types available, however this method of tray production results in LOW tooling costs, meaning we can produce New designs to exactly match your product / assembly. Option available for foam lined base for use with PCB / Pin type bobbins.

**CONDUCT-A-PAK:**
Option for material to be static/electrical compliant

**STACKABILITY:**
Fitted lids are available to make trays stackable to minimise storage costs

**PRODUCT ENHANCEMENT:**
Can be made with embossed company logo for clear identification. Available in range of colours, either to support corporate identity or for product coding

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**E I lamination stacking machines.**

These machines stack standard E I laminations in a wide range of sizes, from EI-19 to EI-180 & UI & EE ranges.

Other sizes are available; please contact us to discuss your requirements.

<table>
<thead>
<tr>
<th>Standard range, manual:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EI-43</td>
<td>EI-48</td>
</tr>
<tr>
<td>EI-84</td>
<td>EI-85.8</td>
</tr>
<tr>
<td>EI-152.4</td>
<td>EI-162</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard range, automatic:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EI-76.2</td>
<td>EI-85.8</td>
</tr>
</tbody>
</table>

Laminations of 0.35 mm to 0.5 mm are stacked at up to 300 pieces per minute, manually or automatically, full interleaving.

Other sizes & OEM laminations available to order.

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Range of Wire Stripping machines

We offer three types of enamel Wire removal systems, the choice between them mainly depends of wire size and application.

**WH-S03**

<table>
<thead>
<tr>
<th>Features</th>
<th>Wire Range (mm)</th>
<th>Stripping</th>
<th>Dimensions (mm)</th>
<th>Product Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>A fast and inexpensive method of wire stripping, Removal of enamel coating on copper wire with automatic dust collection</td>
<td>0.4 – 5.0</td>
<td>Single wire only</td>
<td>280L * 160W * 200H</td>
<td></td>
</tr>
<tr>
<td>In-feed length</td>
<td></td>
<td>(round)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7mm - how close the machine can strip from coil body</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tooling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five blades to remove wire enamel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WH-S02**

Removal of enamel coating on copper wire with fine adjustability for small wire diameters

<table>
<thead>
<tr>
<th>Tooling</th>
<th>Max 0.4</th>
<th>Single wire only</th>
<th>230L * 160W * 195H</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiberglass wheel to remove wire enamel</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WH-S01**

To strip the wire, simply insert the end of the enamelled wire, turn by 90 degrees and then remove the stripped wire.

There are 3 brush types available, each suited to a specific wire range.

<table>
<thead>
<tr>
<th>P/N</th>
<th>Wire range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S01-0.06mm</td>
<td>0.1mm - 0.2mm</td>
<td>Steel brushes with 0.06mm wire Set of two</td>
</tr>
<tr>
<td>S01-0.1mm</td>
<td>0.2mm - 0.3mm</td>
<td>Steel brushes with 0.1mm wire Set of two</td>
</tr>
<tr>
<td>S01-0.2mm</td>
<td>&gt; 0.3mm</td>
<td>Steel brushes with 0.2mm wire Set of two</td>
</tr>
</tbody>
</table>

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Digital Tensioner Display.

B500 / TD-J1000 tension measurement indicators can be mounted on a winding machine independently of the tension unit for real-time measurements, easy installation features, access to DC24V power required.

E1000 This tension monitor tension values, in addition to real-time display, its highlight feature is the ability to connect to the computer, gathering accurate records through the PC software, you can carry out after the required data analysis or set the alarm. This software can work simultaneously detecting / recording 100 measuring points, to enhance the quality of your wound product.

- Direct display of real time measurement reading
- Wide tension range
- Independent operation ; for single or multi-spindle applications.
- Compact design, simple operation.
- Accuracy: +/- 1% FS
- Power: 24V DC (external power sources required.)
- Dimensions 25 (W) x 140mm(H) x 45mm (D)
- Weight : 126g

** Range Options **

<table>
<thead>
<tr>
<th>Model</th>
<th>Range</th>
<th>Resolution</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>B500</td>
<td>3g-500g</td>
<td>0.5g</td>
<td>Real-time display of tension / plastic housing</td>
</tr>
<tr>
<td>J1000</td>
<td>3g-1000g</td>
<td>1 g</td>
<td>Real-time display of tension / aluminum alloy housing</td>
</tr>
<tr>
<td>**</td>
<td>3g-1000g</td>
<td>2 g</td>
<td>Tension computer records the data real-time display / aluminum alloy shell</td>
</tr>
</tbody>
</table>

** Available soon **

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Ceramic Roller Guides

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>IWM1001</td>
<td>20</td>
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Standard stock sizes are highlighted in green; all other sizes are available subject to minimum order quantities.

Our ceramic roller guides are made from fine Alumina (Al₂O₃), which provides excellent resistance to wear from heat and friction.

The ceramic surfaces are polished to a mirror finish in order to reduce friction to a minimum.

the ceramic ring is enclosed with plastic flanges to reduce weight and inertia, the core of the ceramic parts is mounted onto a bearing to optimise performance.

These rollers are normally used for guiding the wire during coil winding operations, but also have many applications in the wire manufacturing and textile industries.

We aim to be much more than a machinery supplier. Our team has a vast range of winding experience and is able to offer help and advice on all aspects of coil winding, from tooling design to machine choice and set-up.

Ingrid West Machinery
~ Coil winding solutions you can rely on ~

Working with local partners in the following countries:
Austria, Czech Republic, Germany, Hungary, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
Our ceramic captive rollers are made from fine Alumina (Al₂O₃), which provides excellent resistance to wear and reduces heat and friction.

The ceramic surfaces are polished to a mirror finish in order to reduce friction to a minimum.

The wire jump preventer is used in instances in which there are radical changes in direction and prevents wire jumping out of the pulley during winding processes.

There is a high speed bearing within the pulley’s porcelain circle which keeps the sliding distance between the enamelled wire and the OD under 0.2mm.

Normally used for guiding the wire during coil winding operations, but also have many applications in the wire manufacturing and textile industries.

Standard stock sizes are highlighted in green; all other sizes are available subject to minimum order quantities.

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## Ceramic Eyelet Guides and Grommets

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Our ceramic eyelet guides are made from fine Alumina (Al₂O₃), which provides excellent resistance to wear from heat and friction.

The ceramic surfaces are polished to a mirror finish in order to reduce friction to a minimum.

These eyelets are normally used for guiding the wire during coil winding operations, but also have many applications in the wire manufacturing and textile industries.

Standard stock sizes are highlighted in green; all other sizes are available subject to minimum order quantities.
GUIDE TUBES - IWM Standard stock sizes

Part number format

W ABCD-E-FGHI

How to specify the tube...
AB = Bore size in mm (12>1.2; 08>0.8; 03>0.3 etc..)
CD = Tube length in mm (30>30mm; 45>45mm etc...)
E = Tube OD in mm (030>3mm is standard)
FG = Shank Diameter in mm (12>1.2; 08>0.8; 03>0.3 etc..)
HI = Shank Length in mm (15>15mm; 06>6mm etc...)

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Custom guide tubes
- Made to order

We can produce a vast range of custom guide tubes, for many applications.

Simply send us your drawings for a competitive quote.
Special Ceramic Guide Tubes (Nozzles)

Description:

The coil winding guide tube (or nozzle) is a vital component for high quality coil winding.

Our ceramic guide tubes are made for advanced coil winding requirements. They are precision engineered for high speed winding with excellent accuracy, and minimise stress to the wire.

Advantages:

**Precision:** Concentricity between the clamping diameter and the outlet diameter is 0.01 mm. The inner bore diameter’s tolerance is 0.01 mm - excellent for precision coil layering.

**Minimum Friction:** Made of a solid piece of high grade ceramic; there are no joints for easy threading, which also ensures a smooth path for wire travel. Every inner bore is fully polished. Both the inlet and outlet radius are carefully calculated, shaped and polished to a mirror finish to minimize stress to the wire.

**High Wear Resistance:** The characteristics of these ceramic guide tubes offer significant advantages over both tungsten carbide and ruby guide tubes. The special ceramics are harder than tungsten carbide and are more rigid than the stainless sleeve of ruby guide tubes.

Ordering Information:

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## Our European Partners

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<th>Contact Details</th>
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<td>Austria &amp; Slovenia</td>
<td>Thomas Stummer</td>
<td>Wien 23Bez, Perfektastraße 59, A-1230 Wien, Austria</td>
<td>Tel: +43 80 42 87 123 Fax: + 43 804 28 71 10 Email: <a href="mailto:thomas.stummer@thonauer.com">thomas.stummer@thonauer.com</a></td>
</tr>
<tr>
<td>Hungary</td>
<td>Alcsuti Bálint</td>
<td>Tiefenweg u. 14-16. H-2092 Budakeszi, Hungary</td>
<td>Tel:+36 23 457 003 Mob: +36 20 320 7444 Email: <a href="mailto:info.bud@thonauer.com">info.bud@thonauer.com</a></td>
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<tr>
<td>Czech Republic</td>
<td>Petr Pavelka</td>
<td>Cacovická 47, Brno CZ - 61400, Czech Republic</td>
<td>Tel: +420 545243454 Fax: +420 545243408 Email: <a href="mailto:info.bra@thonauer.com">info.bra@thonauer.com</a></td>
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<tr>
<td>Slovakia</td>
<td>Peter Ziska</td>
<td>Cukrová 14, SK-81339 Bratislava, Slovakia</td>
<td>Tel:+42 12 527 33 664 Fax:+42 12 527 33 665 Email: <a href="mailto:info.bra@thonauer.com">info.bra@thonauer.com</a></td>
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<tr>
<td>Poland</td>
<td>Pawel Domazer</td>
<td>Ul. Strazacka 63,63-400 Ostrów Wlkp Poland.</td>
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<tr>
<td>Germany</td>
<td>Christoph Klein</td>
<td>Römerstraße 6, 86922 Eresing, Germany</td>
<td>Tel: +49(0)8193 5728, Fax: +49(0)8193 5735 Email: <a href="mailto:credo@credotech.de">credo@credotech.de</a></td>
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<tr>
<td>Romania</td>
<td>Sergiu Czompi</td>
<td>Str Diligentei nr. 5, Bucuresti, 031555, Romania</td>
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<tr>
<td>Spain &amp; Portugal</td>
<td>José María Mora</td>
<td>Ronda Auguste y Louis Lumiere, 45 nave 3, Parque tecnologico Paterna., 46980 Paterna, VALENCIA Spain.</td>
<td>Tel: +34 961 986 373 E-mail: <a href="mailto:mora@erasan.es">mora@erasan.es</a></td>
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**Ingrid West Machinery**

~ Coil winding solutions you can rely on ~