



WM 3000



WM 4100



WM 5000

# Automatic Winding Machines



Made in Germany

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E04/18

# WM3000euroline



Picture: WM3000 euroline with electrical adjustable winding arm

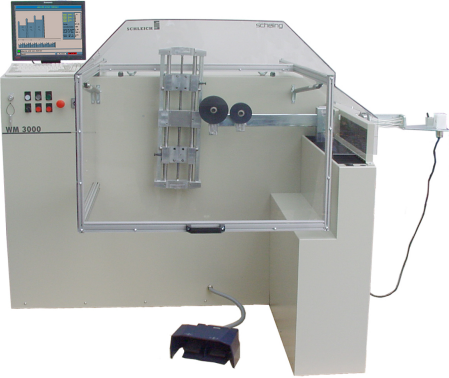
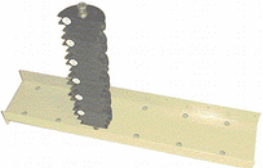


## Technical Data WM 3000euroline

<b>Drive</b>	Motor power-nominal Motor power max. load Torque nominal Torque max. load Connection voltage Connection power Winding speed	1.5 kW 2 kW 100 Nm (up to 100 rpm) 160 Nm (up to 100 rpm) 400 V, PE, 50 Hz 3 kVA 25 – 500 rpm infinitely variable
<b>Controls</b>	General    Number of counters Number of windings Braking Wire guiding	Integrated graphical winding machine control, built-in flash fixed storage device, TFT-display, keyboard nomenclature according to country, all programmes for standard formers pre-stored in software, data base for motor data, backup on USB, easy graphical creation of former shapes and special winding sequences without programming knowledge, feasibility checking of various entries  unlimited 0 – 99999 fully automatic depending on wire diameter, number of layers, or jumps
<b>Working range</b>	for IEC frame sizes	56 – 225
<b>Coil dimensions</b>	Coil dia.            min max Coil circum.        min max (max depending on former) Layer width        max	50 mm 750 mm 160 mm 2355 mm 400 mm
<b>Winding wire</b>	No. of parallel wires Wire entry height	8 wires 1.32 mm diameter 1000 mm
<b>Dimensions</b>	Measurement LxHxW Height with open cover Weight	1600 x 1490 x 1200 mm approx. 2400 mm approx. 515 kg

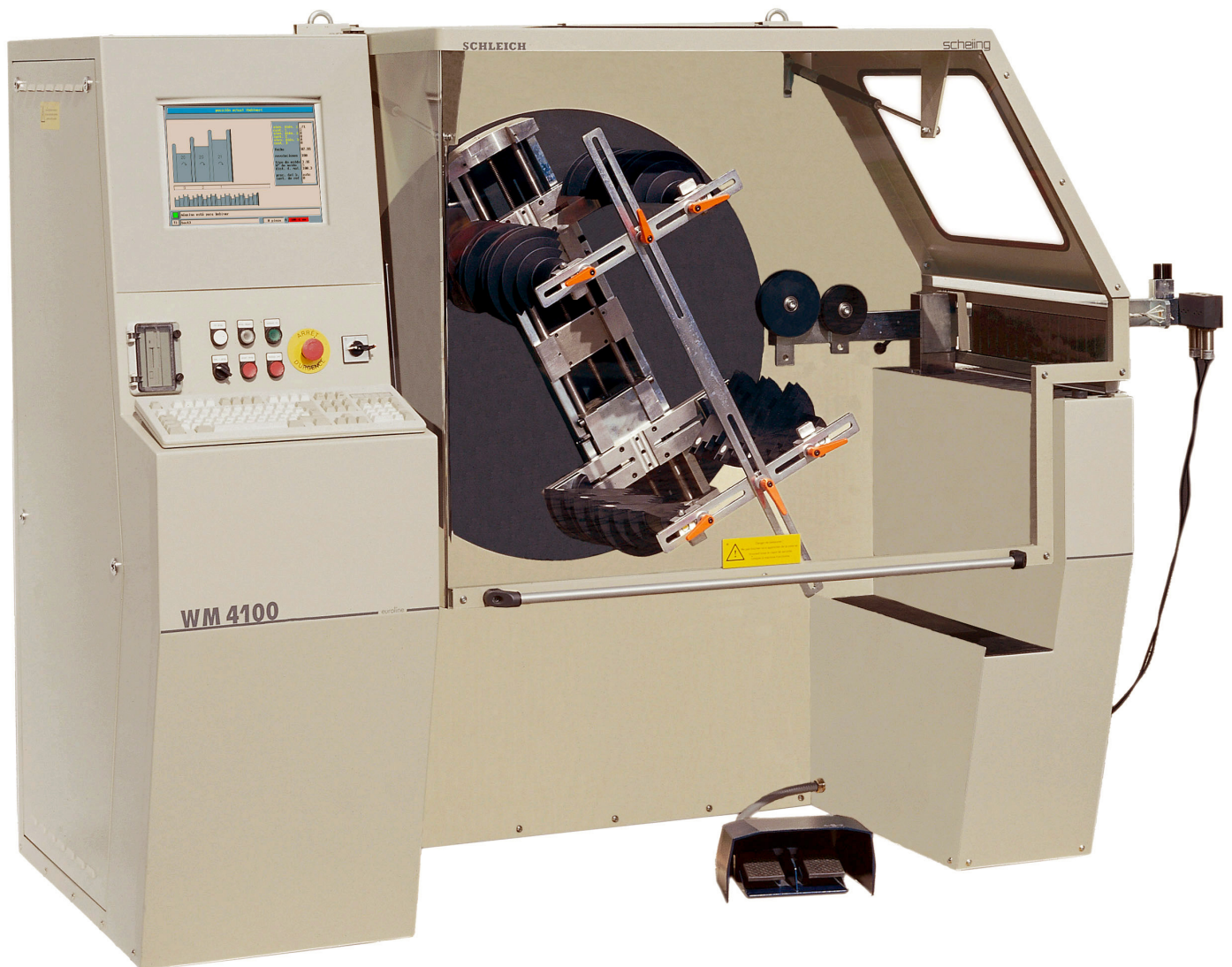
## Options

<b>Special accessories</b>	device for insulation sleeving insertion manually adjustable winding fixture (centric spindle with hand crank) increased torque or different max. RPM automatic opening of the security cover (closing manual) individual wire monitoring system for as many wires as desired three slot formers 3/16 four slot formers 4/11 and 4/24 adapter mandrels WD10 and formers 3/12 for the smallest motor coils reinforced former holders for winding without front support manufacture of special formers according to drawing or sample former storage facility and storage pins for formers 3/16 de-reeling and storage units of various types different supply voltages, separating transformer for RCD-operation
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# WM3000euroline

Article	Description	
 <p>Picture: WM3000euroline</p>	<p><b>WM3000euroline</b></p> <p><b>Basic Equipment:</b>            1.5 kW-drive with 2.2 kW frequency inverter            speed: 500 rpm            voltage: 380-480 V 3-phase            integrated graphical winding machine control            wire tension device on layering arm            former holder for formers 3/16, 4/11, 4/24            2 slide rails of different lengths            2 sets of spacers for types 3/16, 4/11, 4/24 without formers            colour: pebble gray RAL 7032, will become light gray RAL 7035            weight: approx. 515 kg            comprehensive documentation</p> <p><b>Electrically adjustable winding fixture</b>            The arbour distance of the winding fixture is adjusted by an electric motor. The adjustment is either in accordance with the pre-selected distance of the formers, or by pressing the double foot pedal. The later has the functions „smaller“ and „larger“. Before starting the winding process, the required coil dimension can easily be adjusted. After the winding job is finished, the pressure on the winding fixture can quickly be released in order to ease the take-off of the finished coils. When the coils have been taken off, the arbour distance returns to the original winding position by just pressing the foot pedal once.</p>	
 <p>Picture: Former storage facility with storage pin</p>	<p><b>Former storage facility</b></p> <p>The winding machine WM3000 can be delivered with a facility to carry the storage pins for the winding formers 3/16 no. 1, 2, 3, 4, 5 and 6.</p> <p>Price for storage facility only (without storage pins)</p>	
<p><b>Increased torque 140 Nm</b></p>	<p><b>Increased torque</b></p> <p>The torque is increased to 140 Nm, the max. load torque is increased to 220 Nm. The max. speed is reduced to 300 rpm.</p>	
 <p>Picture: Pneumatic-cylinder to open the security cover</p>	<p><b>Automatic opening of the security cover</b></p> <p>At the end of the winding cycle the protective cover is opened automatically by a pneumatic cylinder. The user can then directly take off the wound coil sets. Before the start of the next winding cycle the hood has to be closed manually again.</p>	
 <p>Picture: WM3000 with manually adjustable winding arm</p>	<p><b>WM3000 with manual winding arm</b></p> <p>Instead of the electrically adjustable winding arm the distance between the arbours is adjustable using a manual winding arm with a centric spindle via a hand crank. The entire construction is lighter and thus allows higher winding speed.</p>	

# WM4100euroline



Picture: WM 4100 euroline

## Technical Data WM 4100euroline

<b>Drive</b>	Motor power-nominal Motor power max. load Torque nominal Torque max. load Connection voltage Connection power Winding speed	3,0 kW 5,0 kW 160 Nm (up to 160 rpm) 280 Nm (up to 160 rpm) 400 V, PE, 50 Hz 7 kVA 25 – 500 rpm infinitely variable
<b>Controls</b>	General    Number of counters Number of windings Braking Wire guiding	Integrated graphical winding machine control, built-in flash fixed storage device, TFT-display, keyboard nomenclature according to country, all programmes for standard formers pre-stored in software, data base for motor data, backup on USB, easy graphical creation of former shapes and special winding sequences without programming knowledge, feasibility checking of various entries  unlimited 0 – 99999 fully automatic depending on wire diameter, number of layers, or jumps
<b>Working range</b>	for IEC frame sizes	56 – 315
<b>Coil dimensions</b>	Coil dia.           min max Coil circum. (depending on former)   min max Layer width           max	50 mm 1060 mm 160 mm 3330 mm 400 mm
<b>Winding wire</b>	No. of parallel wires Wire entry height	20 wires 1.32 mm diameter 1000 mm
<b>Dimensions</b>	Measurement LxHxW Height with open cover Weight	2130 x 1700 x 1200 mm approx. 2430 mm approx. 650 kg

## Options

<b>Special accessories</b>	device for insulation sleeving insertion automatic opening of the security cover (closing manual) individual wire monitoring system for as many wires as desired three slot arbours 3/16 four slot arbours 4/11 and 4/24 adapter mandrels WD10 and formers 3/12 for the smallest motor coils manufacture of special formers according to drawing or sample reinforced former holders for winding without front support fixture for rectangular and rhombus windings with WD19 mandrels centric adjustable fixture for 4-edge windings with 6 slot formers 6/25 adjustable former with layer winding programme for large DC-fields storage pins for formers 3/16 de-reeling and storage units of various types tool storage box in the winding cabinet different supply voltages
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# WM4100euroline

Article	Description	
 <p>Picture: WM 4100euroline with electrical adjustable winding fixture</p>	<p><b>WM4100euroline with winding motor 3 kW</b></p> <p><b>Standard equipment:</b>                      3 kW drive with 4 kW frequency inverter                      speed: 500 rpm                      voltage: 380 - 480 V 3-phase                      integrated graphical winding machine control                      electrically adjustable winding fixture                      wire tension device on layering arm                      former holder for formers 3/16, 4/11, 4/24                      2 slide rails of different lengths                      2 sets of spacers for types 3/16, 4/11, 4/24 without formers                      colour: light gray RAL 7035                      weight: 650 kg                      comprehensive documentation</p>	
<p><b>Automatic opening of the security hood</b></p>	<p><b>Automatic opening of the security cover</b></p> <p>At the end of the winding cycle the protective cover is opened automatically by a pneumatic cylinder. The user can then directly take off the wound coil sets. Before the start of the next winding cycle the hood has to be closed manually again.</p>	
 <p>Picture: WM4100euroline in mirror-imaged design</p>	<p><b>Machine in Mirror-Imaged Design</b></p> <p>It is possible to make the machine in a mirror-imaged version.</p> <p>That is of importance if a manufacturer has two machines which should be served by one operator. In this case the machines are placed opposite to each other and the operator has an easy access to both. Whilst one machine is winding coils the other is ready for tying and removing from the machine and visa-versa.</p> <p>As the operator works between two machines and the wire intake direction should not be changed, one machine should be designed mirror-imaged.</p>	
 <p>Picture: WM4100euroline with automatic security curtain</p>	<p><b>Machine with automatic security curtain</b></p> <p>Instead of the normal security cover a large cabinet with an automatic electrical security curtain is installed.</p> <p>For production it may be required to use a transfer tool or a hoist to take of the coils automatically. This can require a lot of space in the cabinet, as well as the option to automatically open this cabinet when the winding is done.</p> <p>The new height of the machine in this version is approx. 2320 mm.</p>	
 <p>Picture: Pressure sensitive mat</p>	<p><b>Pressure Sensitive Mat</b></p> <p>By means of this mat the winding area can be protected. It is put on the floor adjacent to the winding machine.</p> <p>If a person steps on the mat, the machine shuts off immediately. It is only possible to operate the machine by push buttons. Only if the pressure is removed, the automatic operation is in use again.</p> <p>The pressure sensitive mat should avoid an automatic operation if a person is present in the winding area with closed safety hood for safety reasons.</p>	

# WM4500euroline



Picture: WM 4500 euroline





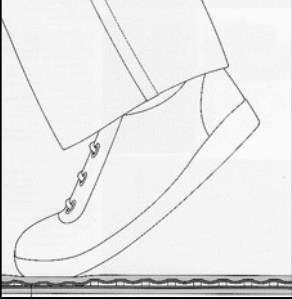
## Technical Data WM 4500euroline

<b>Drive</b>	Motor power-nominal Motor power max. load Torque nominal Torque max. load Connection voltage Connection power Winding speed	3.0 kW 5.0 kW 350 Nm (up to 75 rpm) 610 Nm (up to 75 rpm) 400 V, PE, 50 Hz 7 kVA 15 – 200 rpm infinitely variable
<b>Controls</b>	General  Number of counters Number of windings Braking Wire guiding	Integrated graphical winding machine control, built-in flash fixed storage device, TFT-display, keyboard nomenclature according to country, all programmes for standard formers pre-stored in software, data base for motor data, backup on USB, easy graphical creation of former shapes and special winding sequences without programming knowledge, feasibility checking of various entries  unlimited 0 – 99999 fully automatic depending on wire diameter, number of layers, or jumps
<b>Working range</b>	for IEC frame sizes	56 – 355
<b>Coil dimensions</b>	Coil dia. min max Coil circum. min (depending on former) max Layer width max	50 mm 1260 mm 160 mm 3950 mm 400 mm
<b>Winding wire</b>	No. of parallel wires Wire entry height	35 wires 1.32 mm diameter 1000 mm
<b>Dimensions</b>	Measurement LxHxW Height with open cover Weight	2130 x 1700 x 1200 mm approx. 2430 mm approx. 650 kg (Transport weight approx. 800 kg)

## Options

<b>Special accessories</b>	<p>device for insulation sleeving insertion</p> <p>increased torque by stronger main motor</p> <p>automatic opening of the security cover (closing manual)</p> <p>individual wire monitoring system for as many as desired wires</p> <p>adapter mandrel WD10 and arbours 3/12 for the smallest motor coils</p> <p>three slot arbours 3/16</p> <p>four slot arbours 4/11 and 4/24</p> <p>manufacture of special arbours according to drawing or sample</p> <p>reinforced arbour holders for winding without front support</p> <p>fixture for rectangular and rhombus windings with WD19 mandrels</p> <p>centric adjustable fixture for 4-edge windings with 6 slot formers 6/25</p> <p>adjustable former with layer winding programme for large DC-fields</p> <p>storage pins for formers 3/16</p> <p>de-reeling and storage units of various types</p> <p>tool storage box in the winding cabinet</p> <p>different supply voltages</p>
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# WM 4500euroline

Article	Description	
 <p>Picture: WM 4500euroline with electrical adjustable winding fixture</p>	<p><b>WM4500euroline with winding motor 3 kW</b> <i>(most common model)</i></p> <p><b>Standard equipment:</b>                      3 kW drive with 4 kW frequency inverter                      speed: 200 rpm                      voltage: 380 - 480 V 3-phase                      integrated graphical winding machine control                      extra strong electrical adjustable winding fixture                      wire tension device on layering arm                      former holder for formers 3/16, 4/11, 4/24                      2 slide rails of different lengths                      2 sets of spacers for types 3/16, 4/11, 4/24 without formers                      colour: light gray RAL 7035                      weight: approx. 650 kg                      comprehensive documentation</p>	
<p><b>Automatic opening of the security hood</b></p>	<p><b>Automatic opening of the security cover</b></p> <p>At the end of the winding cycle the protective cover is opened automatically by a pneumatic cylinder. The user can then directly take off the wound coil sets. Before the start of the next winding cycle the hood has to be closed manually again.</p>	
 <p>Picture: Machine in mirror-imaged design (sample)</p>	<p><b>Machine in Mirror-Imaged Design</b></p> <p>It is possible to make the machine in a mirror-imaged version.</p> <p>That is of importance if a manufacturer has two machines which should be served by one operator. In this case the machines are placed opposite to each other and the operator has an easy access to both. Whilst one machine is winding coils the other is ready for tying and removing from the machine and visa-versa.</p> <p>As the operator works between two machines and the wire intake direction should not be changed, one machine should be designed mirror-imaged.</p>	
 <p>Picture: Pressure sensitive mat</p>	<p><b>Pressure Sensitive Mat (large)</b></p> <p>By means of this mat the winding area can be protected. It is put on the floor adjacent to the winding machine.</p> <p>If a person steps on the mat, the machine shuts off immediately. It is only possible to operate the machine by push buttons. Only if the pressure is removed, the automatic operation is in use again.</p> <p>The pressure sensitive mat should avoid an automatic operation if a person is present in the winding area with closed safety hood for safety reasons.</p>	

# WM5000euroline



Picture: WM 5000 euroline



## Technical Data WM 5000euroline

<b>Drive</b>	Motor power-nominal Motor power max.load Torque nominal Torque max. load Connection voltage Connection power Winding speed	4.0 kW 7.0 kW 500 Nm (up to 65 rpm) 1000 Nm (up to 65 rpm) 400 V, PE, 50 Hz 9 kVA 15 – 200 rpm infinitely variable
<b>Controls</b>	General  Number of counters Number of windings Braking Wire guiding	Integrated graphical winding machine control, built-in flash fixed storage device, TFT-display, keyboard nomenclature according to country, all programmes for standard formers pre-stored in software, data base for motor data, backup on USB, easy graphical creation of former shapes and special winding sequences without programming knowledge, feasibility checking of various entries  unlimited 0 – 99999 fully automatic depending on wire diameter, number of layers, or jumps
<b>Working range</b>	for IEC frame sizes	56 – 400
<b>Coil dimensions</b>	Coil dia. min Coil dia. max Coil circum. min (depending on former) max Layer width max	50 mm 1450 mm 160 mm 4500 mm 400 mm
<b>Winding wire</b>	No. of parallel wires Wire entry height	30 wires 1.50 mm diameter 1000 mm
<b>Dimensions</b>	Measurement LxHxW Weight	2400 x 2300 x 1450 mm approx. 1000 kg

## Options

<b>Special accessories</b>	<p>device for insulation sleeving insertion</p> <p>increased torque or different winding speeds</p> <p>increased winding diameter 2 m</p> <p>individual wire monitoring system for as many as desired wires</p> <p>three slot formers 3/16</p> <p>four slot formers 4/11 and 4/24</p> <p>adapter mandrels WD19 for formers 3/16, 4/11, and 4/24</p> <p>adapter mandrels WD10 and formers 3/12 for the smallest motor coils</p> <p>manufacture of special formers according to drawing or sample</p> <p>reinforced former holders for winding without front support</p> <p>fixture for rectangular and rhombus windings with WD19 mandrels</p> <p>centric adjustable fixture for 4-edge windings with 6 slot formers 6/25</p> <p>adjustable former with layer winding programme for large DC-fields</p> <p>de-reeling and storage units of various types</p> <p>tool storage box in the winding cabinet</p> <p>different supply voltages</p>
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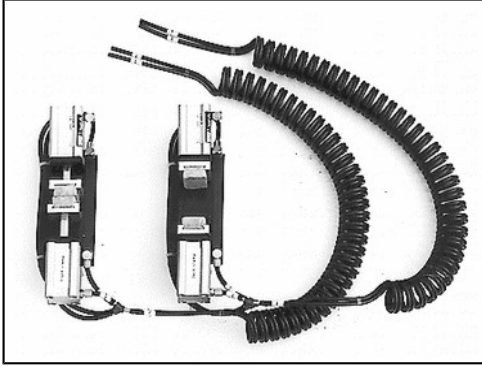
# WM5000euroline

Article	Description	
 <p>Picture: WM 5000euroline</p>	<p><b>WM 5000euroline</b></p> <p><b>Standard equipment:</b>            4 kW drive with 7.5 kW frequency inverter            speed: 200 rpm            voltage: 380 - 480 V, PE, 50 Hz            integrated graphical winding machine control            heavy duty electrical adjustable winding fixture            wire tension device on layering arm            wire entry height: 1000 mm            without former holders            without formers            colour: light gray RAL 7035            weight: 1000 kg            comprehensive documentation</p>	
<p><b>Increased torque 1000 Nm</b></p>	<p><b>Increased torque</b></p> <p>Torque is increased by approx. 100% to 1000 Nm, max. load torque to 2000 Nm, whereas the speed is reduced to 100 rpm.</p>	
<p><b>Increased torque 2000 Nm</b></p>	<p><b>Increased torque</b></p> <p>Torque is increased by approx. 200% to 2000 Nm, max. load torque to 3500 Nm, whereas the speed is reduced to 50 rpm.</p>	
 <p>Picture: WM5001euroline with 2000 mm winding diameter</p>	<p><b>WM 5001 - extended winding diameter 2 m</b></p> <p>The maximum winding diameter is increased to 2000 mm. Thereby the width of the machine is enlarged by approx. 900 mm to approx. 3300 mm.</p> <p><b>Attention:</b> The scope of delivery <u>includes</u> the increased torque 1000 Nm option with max. speed reduction to 100 rpm.</p>	

# Wire Detectors

 <p>Picture: Wire detectors on layering arm</p>	<p><b>Wire end detector units on layering arm</b></p> <p>The machine comes without wire detector device in the standard scope of delivery. It is possible to have wire detectors for max. 12 wires attached to the layering arm before the string tensioning device.</p> <p><b>Detector for max 4 parallel wires on layering arm:</b></p> <p><b>Detector for max 8 parallel wires on layering arm:</b></p> <p><b>Detector for max 12 parallel wires on layering arm:</b></p>	
 <p>Picture: Pedestal with 48 wire detectors</p>	<p><b>Pedestal for wire detectors</b></p> <p>A pedestal is necessary to hold more detectors for more than 12 wires, or if automatic sleeve release will be used. The pedestals have 2 sockets to extend the number of monitored wires in units of 12 wires. A storage cup is attached to the wire detector pedestal which can hold the unused sensor pins. The pedestal has to be fixed to the floor by 3 screws.</p> <p><b>Pedestal with sensors for 12 wires (max. 36):</b></p> <p><b>Pedestal with sensors for 24 wires (max. 48):</b></p>	
 <p>Picture: Tensioning assembly with brake</p>	<p><b>Tensioning assembly for pedestal</b></p> <p>If required, it is also possible to attach a string brake type wire tensioning device to the pedestal (required for use with sleeve release). The existing wire brake can be disassembled from the layering arm and attached to the pedestal using the tensioning fixing assembly for the pedestal. At the layering arm then an entry nozzle or a cross-rolls assembly must be installed as a substitute to guide the wire. If necessary, a larger wire brake is also available, e.g. if very many parallel wires are to be used or shaped (rectangular) wire is to be wound.</p> <p><b>Fixing assembly for string brake (without brake):</b></p> <p><b>Small string tensioning brake for max 18 x 1.18 mm wires:</b></p> <p><b>Large string tensioning brake for max 50 x 1.50 mm wires:</b></p> <p><b>Entry nozzle small (18 x 1.18 mm wires):</b></p> <p><b>Entry nozzle large (50 x 1.50 mm wires):</b></p> <p><b>Cross-Rolls assembly (for sleeve release):</b></p>	
 <p>Picture: Wire detector extension for 12 wires</p>	<p><b>12 Wire extension for pedestal</b></p> <p>The extension of the wire detector device on the pedestal is always possible by blocks of 12 wires. These can be easily screwed to the pedestal and plugged in. Each pedestal has 2 free sockets.</p> <p>If more than 48 wires are to be monitored, several pedestals can be hooked up one behind the other. The additional pedestal then is simply plugged into a free socket of the existing pedestal.</p>	

# Sleeve Release



Picture: sleeve insertion clamps (delivery)

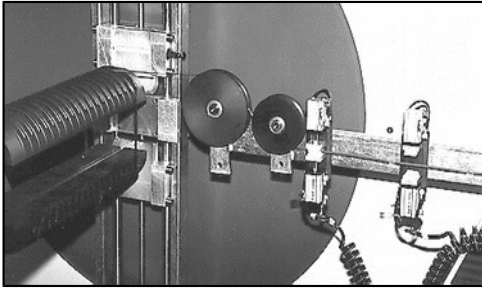
## Sleeve Release complete

With the automatic sleeve release device it is possible to wind pieces of insulating sleeveings into the coil to protect cross-overs. It is imperative to push the cut pieces on to the magnet wire in advance.

The PC-control releases a sleeve according to the pre-set programme whenever it is required. The remainder which is stored on the wire are held back by a clamp. The device works pneumatically. An air-pressure of at least 6 bar is required. Supplied air must be clean and dry.

The software is able to position the sleeves on any spot required. Even the number of sleeve pieces required during the winding process can be pre-set. By means of a sleeve numbering counter the exact amount can be monitored. If there are not enough sleeveings left the next winding job, the machine reports and new pieces may be put on.

**Attention:** The wire monitoring and tensioning unit that can be attached to the layering arm cannot be used in conjunction with sleeve release. For this reason a pedestal for the wire monitoring units and a separate fixing assembly for the wire brake that comes with the machine has to be ordered separately. Additionally a cross-rolls assembly for the wire entry at the end of the layering arm has to be ordered (see above),



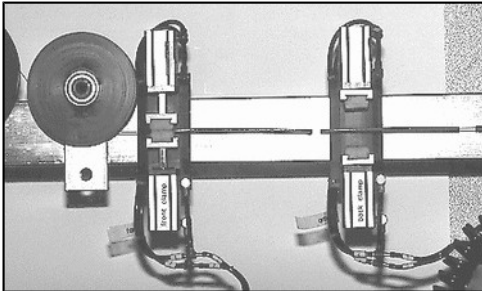
Picture: sleeve insertion fixed at the wire guide

## Sleeve Release as a Later Option

(only possible with sleeve release preparation installed)

If sleeve insertion is required for an already delivered machine, it is possible to equip the machine with the unit, but only if the corresponding machine already has the required preparation installed. To this the layering arm has to be exchanged (scope of delivery), just as the corresponding clamps are connected.

**Attention:** The wire monitoring and tensioning unit that can be attached to the layering arm cannot be used in conjunction with sleeve release. For this reason a pedestal for the wire monitoring units and a separate fixing assembly for the wire brake that comes with the machine has to be ordered separately. Additionally a cross-rolls assembly for the wire entry at the end of the layering arm has to be ordered (see above),



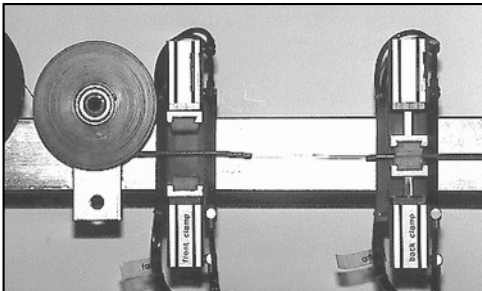
Picture: the front sleeve is held back during the winding

**Scope of delivery:** clamps and software.

## Preparation for Installation as a Later Option

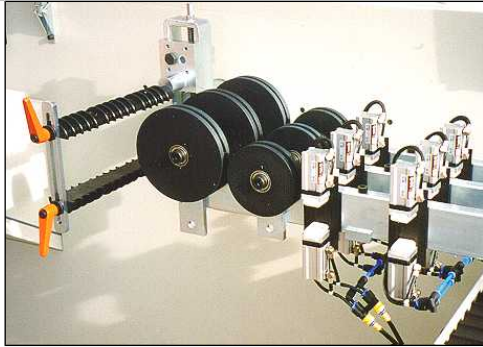
The necessary internal preparations of the machine to be able to use the sleeve insertion option later on are made. To this the connections for the valves, the air-tubes, etc. are installed.

**Attention:** The installation of the sleeve release unit without this preparation requires a lot of additional work and causes substantial extra costs!



Picture: for sleeve insertion the front sleeve is now free and the other sleeves are held back

# Different Options for all Machines



Picture: Parallel wire guides with sleeve release

## Additional Wire Guide with Rolls

The machine can be operated with several parallel wire guides. Here several groups are wound at the same time and thus the total winding time is substantially shortened. Up to 3 parallel wire guides are possible. The price refers to 1 additional wire leader without wire break monitoring or tensioning.

## Fixed distance cross beams for wire guides

These cross beams are needed for the attachment of the 2nd and/or 2nd and 3rd wire guide. Hereby 2 different not changeable distances of the wire guides can be realized. These distances are former dependent and must be indicated at the time of order.

## Different Machine Colour

## Machine Colour

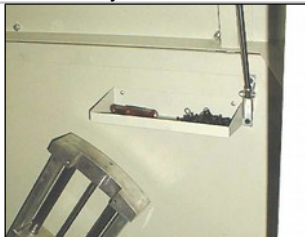
It is possible to order a different machine colour. The machine is powder-coated. For this reason it is mandatory to contact the manufacturer beforehand, since only certain RAL colours where the required coating-powder is available are possible.



Picture: Key switch

## Key Switch

The mode select switch "Run"/"Program" is replaced by a key switch. It is not possible to changed any stored winding data in "Run"-mode. The key switch prevents that someone unauthorised changes into "Program"-mode where data can be changed or erased.

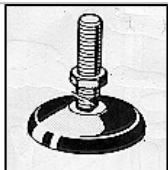


Picture: Tool storage box

## Tool Storage Box

(not for WM 3000 and WM 3002)

Within the corner of the winding space below the security cover a tool box is mounted. Here the frequently used set-up tools, coil fixing clamps, etc can be stored.

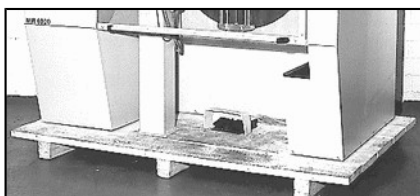


Picture: Machine balancing shoe

## Machine Balancing Shoes

In case of uneven floor or floors with limited point pressure these screws are available for balancing purpose.

Diameter: 90 mm (3.55")  
Scope of delivery: 4 pieces



Picture: Machine on a transport pallet

## Transport Pallet

Every shipment is carried out on a special one way pallet.

**WM 3000:**

**WM 4100 – WM 5000:**

**WM 5001 – WM 5002:**

**Wooden Box:**

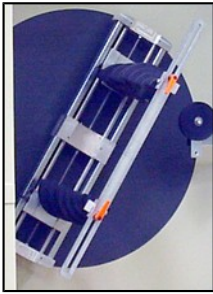
**Wooden Box seaworthy:**



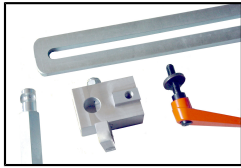
 <p>Picture: wire guide pulley</p>  <p>Picture: Example with a slot for rectangular wire</p>	<p><b>Wire Guide Pulley with Special Groove</b></p> <p>If there is a requirement for a special design of the guide pulley, e.g. for thinner wires or multi-parallel or wire strip, it is possible to make this to customer's requirement.</p> <p>The pulley is double-mounted in bearings and the groove is made to customer's design.</p>	
 <p>Picture: Width-adjustable wire guide pulley</p>	<p><b>Width-adjustable wire guide pulley</b></p> <p>To wind with many different wires in parallel or rectangular wires an adjustable wire guide pulley in connection with a wide rear pulley can be used.</p> <p>Ø of guide pulley: 108 mm inside, 134 mm outside. Width: 0 - 20 mm          Ø of rear pulley: 73 mm inside, 99 mm outside. Width: 24 mm</p> <p><b>Attention:</b> Requires supportless winding preparation.</p> <p><b>Scope of delivery:</b> adjustable front pulley and wide rear pulley.</p>	
 <p>Picture: Storage pin with magnetic foot</p>	<p><b>Storage pins with magnetic foot</b></p> <p>For an easy storage of winding heads it is possible to take storage pins with a magnetic foot. Due to the magnet the pins are very stable and can be stored vertically or horizontally.</p> <p>On the front side of the pins there is a bore which fits into the thread of the winding fixture. It is possible to slip the heads onto the winding fixture which is time-saving.</p> <p><b>for winding heads type 3/12 (WD 10)</b></p> <p><b>for winding heads type 3/16, 4/11, and 4/24 (WD 19)</b></p> <p>The price is for one pin.</p>	
 <p>Picture: Setting up formers using storage pin</p>  <p>Picture: Storage pin for 6 formers</p>	<p><b>Storage pins for winding heads type 3/16</b>          (not for WM 3002, WM 3000 only with optional storage facility)</p> <p>At the machine there is a facility for storage of the formers. The pins can be put vertically into holes. The pins can take winding heads type 3/16 only. All other formers (type 3/12, 4/11 and 4/24) cannot be stored. There are 12 pins necessary to take up all 6 sets of 3/16.</p> <p>On the front side of the pins there is a bore which fits into the thread of the winding fixture. It is possible to slip the heads onto the winding fixture which is time-saving.</p> <p>The price is for one pin.</p>	

# Standard winding mandrels

## Standard Mandrels with 19 mm Hex bar



Picture: WD19-Mandrels



Picture: Quick-locking Front Support

## Standard WD19 former holders

(Included in the scope of delivery for WM 3000, WM 4100 and WM 4500)

If the below listed standard formers Type 3/16, 4/11, or 4/24 shall be used in winding, the corresponding winding mandrels with 19 mm hex bars are required.

### Scope of delivery:

2 former holders WD19, 2 sets of spacers, 2 sliding rail front support bars, 2 quick-action locking blocks

## Additional blocks for quick locking device

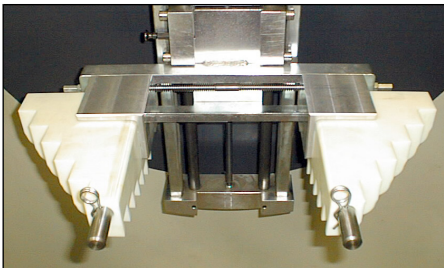
The scope of delivery of the standard former holders contains 3 sliding rail front support bars, which are fitted according to the winding diameter. To avoid the time-consuming reconstruction off the locking blocks at the exchange the front support bar, 4 further quick-action locking blocks can be used.

### Scope of delivery:

4 quick-action locking blocks

# Rectangular Winding Heads

## Former holder for 4-edge windings with centric quick-adjustment



Picture: Former holder with formers mounted on winding arm

## Former holder for 4-edge windings

(1 group)

A special arbour holder with cross-bars for 4-edge formers can be assembled on the winding arm. Using these 4-edge formers, one group of can be wound without the need of a front support, to easily take off the wound coils when the winding cycle is finished. The cross-bar dimensions can be adjusted very quickly using a centric spindle and a hand crank.

Standard traverse (cross bar) length is 480 mm for WM 4500 and WM 5000, also available with 580 mm for machines with ext. diameter, and 380 mm for WM 4100.

Coil dimensions (in mm):

	WM4100		WM5000		WM5001	
	380mm		480mm		580mm	
NA25:	small	large	small	large	small	large
A	300	550	400	650	500	750
B	870	990	1270	1390	1770	1890
C	2340	3080	3340	4800	4540	5000
<b>Equal Size:</b>						
A	420		520		620	
B	980		~1380		~1880	
C	2800		~3800		~5000	

C = max. circumference

## 4-edge Rectangular Formers

The 4-edge rectangular former have 6 winding slots each are used with the former holder for 4-edge windings. A set consists of 4 pieces.

4-edge rectangular formers with 6 slots equal size

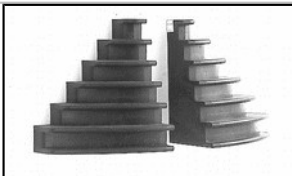
4-edge rectangular formers with 6 slots for stator slot distance 15 mm

4-edge rectangular formers with 6 slots for stator slot distance 20 mm

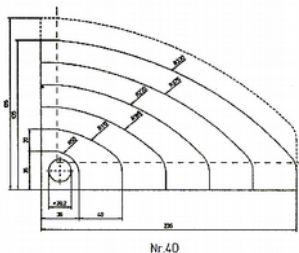
4-edge rectangular formers with 6 slots for stator slot distance 25 mm

4-edge rectangular formers with 6 slots for stator slot distance 30 mm

4-edge rectangular formers with 6 slots for stator slot distance 40 mm

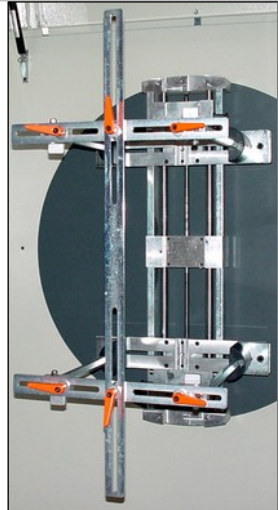


Picture: 4-edge formers with 6 slots

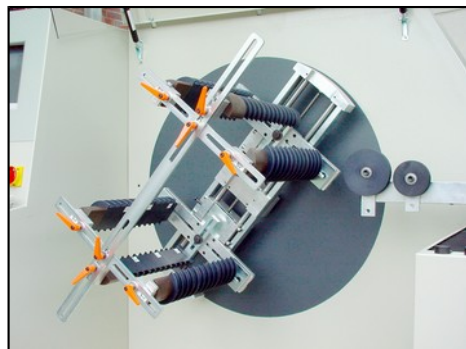


Nr. 40

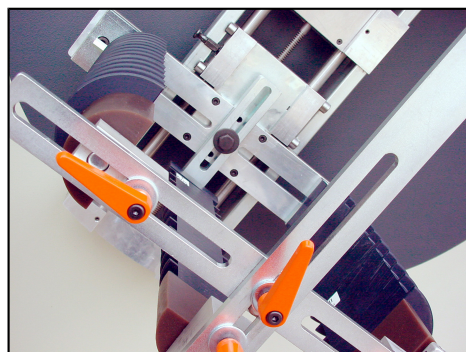
# 4-edge / 6-edge Winding Fixture



Picture: 4-edge arbour holder, without formers mounted on WM4100



Picture: Diamond (6-edge) arbour holder with formers Mounted on WM4100



Picture: Details of 6-edge arbour holder, with cross bars and formers mounted on WM4100

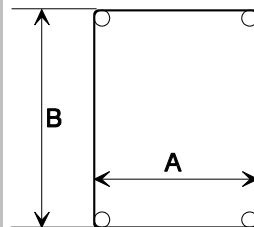
## Arbour holder 4-edge with WD 19 hex bars

The 4-edge arbour holder can be used to wind rectangular coil forms. Because the identical 19 mm hex bar is used to hold the arbours, the same formers as with the standard arbour holders can be utilised.

It consists of the following parts:

1. Two cross bars which mount into the winding arm
2. Four hex bars with mounting plates which are adjustable on the cross bars to required coil widths
3. Front end supports to hold the fixture in position with quick-release

The following coil dimensions (mm) are possible:



	Min	max
A	100	370
B	170	720

Measured for WM 4100

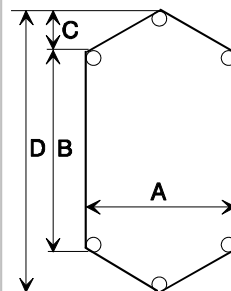
## Extension 6-edge (Diamond) with WD 19 hex bars, only for equal size

The 4-edge arbour holder can be extended with two additional hex bars to achieve 6-edge (diamond) coil forms.

It consists of the following parts:

1. 2 hex bars with mounting plates which are adjustable on cross bars to the required coil widths
2. 2 additional quick release holder blocks for the front support

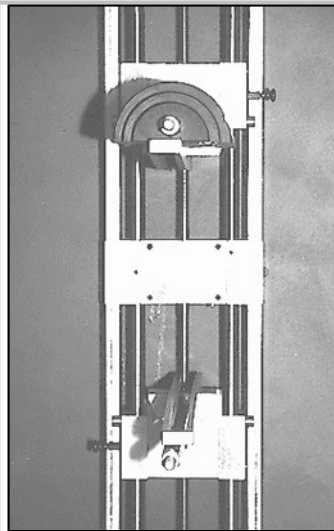
The following coil dimensions (mm) are possible:



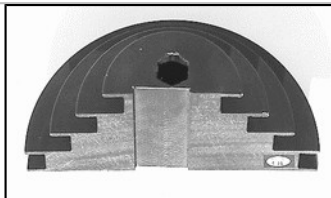
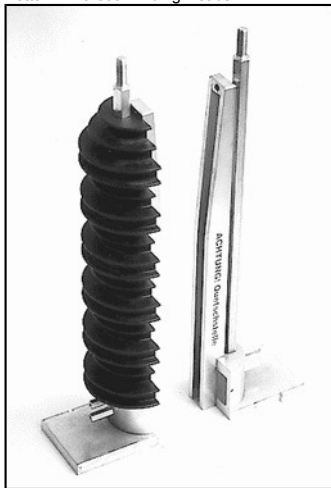
	min	max
A	120	370
B	170	690
C	75	150
D	330	1000

measured for WM 4100

# Supportless Winding



Picture: Supportless Winding Device.  
Top: With Winding Heads  
Bottom: Without Winding Heads



Picture: machined winding head for supportless winding device

## Supportless winding device for winding heads 3/16, 4/11, and 4/24 (only for machines with electrical adjustable winding fixture)

With this device it is possible to wind coils without the front support, i.e. to fix the time-wasting slide-rails.

This is achieved by a supportless winding device. It can be used for up to 10 wires of 1.32 mm $\varnothing$  in parallel.

More than 10 wires will require a mechanical reinforcement of the winding beam. The limitation goes up to 20 wires 1.32 mm $\varnothing$  in parallel. The reinforcement of the winding beam is not retrofitable and has to be ordered in beforehand with the machine.

If more than 10/20 wires are required, it is essential to fix an end support slide-rail fixture (optional, not in the scope of delivery).

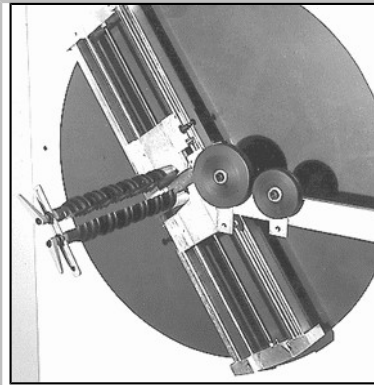
The price includes the winding head holders (without the winding heads) and the machining of the complete set winding heads of type 3.16 consisting of No. 1, 2, 3, 4, 5, and 6.

## Winding Heads for „Supportless Winding“

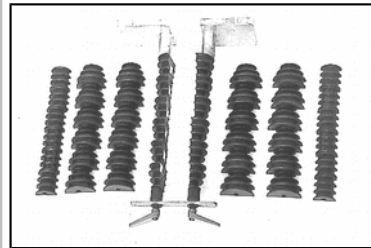
The winding heads have to be machined for the application with the supportless winding device, i.e. a groove has to be cut underneath by a milling machine.

The price is to be understood for a complete set of each winding heads (6 pairs 4/11 or 3 pairs 4/24).

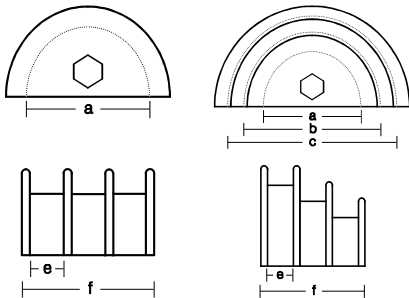
# Winding Heads Type 3/12



Picture: Small Winding Beam



Picture: Scope of Delivery



## Small winding beam for small coil

To wind small coils the small winding beam is required.

It consists of the following components:

1. two winding fixtures with a 10 mm hexagonal bore with ground plate
2. one face plate (slide rails) with fixing levers
3. three sets of formers type 3/12 No. 1, 2, 3 eccentric
4. one set of formers type 3/12 No. 1 concentric

## Winding heads type 3/12 equal size

One pair always consists of 2 heads.  
The winding fixture can take max. 6 pairs.

Type	a mm	e mm	f mm	Winding- shaft
3/12.1	35	12	52	WD10

## Winding heads type 3/12 concentric

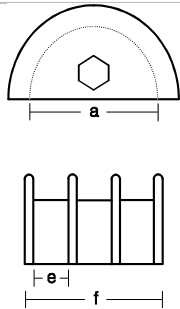
One pair always consists of 2 heads.  
The winding fixture can take max. 6 pairs.

Type	a mm	b mm	c mm	e mm	f mm	Winding- shaft
3/12.1	35	43	51	12	52	WD10
3/12.2	35	46	57	12	52	WD10
3/12.3	35	49	63	12	52	WD10

# Winding Heads Type 3/16



Picture: Former Type 3/16 No. 1



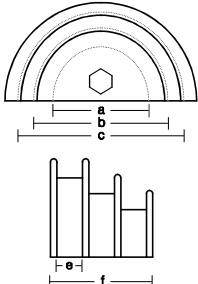
## Winding heads type 3/16 equal size

One pair always consists of 2 heads.  
The winding fixture can take max. 6 pairs (or 12 pairs with the 4-edge winding fixture, 18 pairs with the 6-edge fixture).

Type	a mm	e mm	f mm	Winding- shaft
3/16.1	60	16	64	WD19



Picture: Former Type 3/16 No. 6

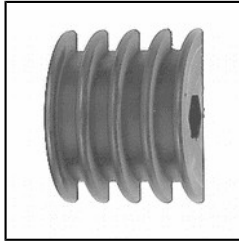
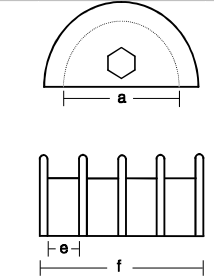

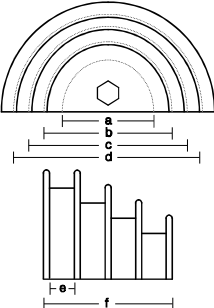


## Winding heads type 3/16 concentric

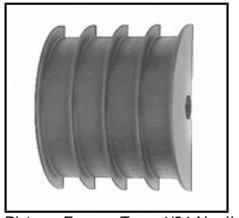
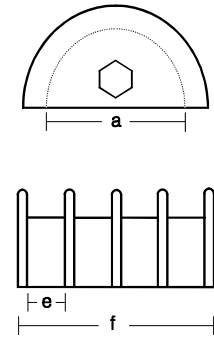
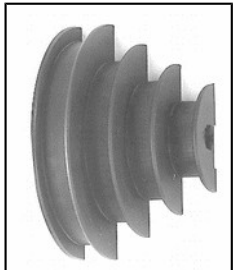
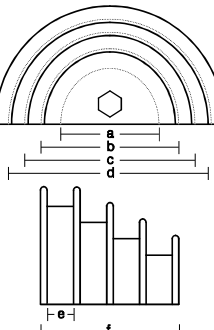
One pair always consists of 2 heads.  
The winding fixture can take max. 6 pairs (or 12 pairs with the 4-edge winding fixture).

Type	a mm	b mm	c mm	e mm	f mm	Winding- shaft
3/16.2	60	71	82	16	64	WD19
3/16.3	60	74	88	16	64	WD19
3/16.4	60	77	94	16	64	WD19
3/16.5	60	80	100	16	64	WD19
3/16.6	60	83	106	16	64	WD19

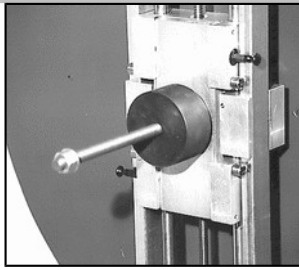
# Winding Heads Type 4/11

 <p>Picture: Former Type 4/11 No. I</p>		<p><b>Winding heads type 4/11 equal size</b></p> <p>One pair always consists of 2 heads. The winding fixture can take max. 6 pairs.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>a mm</th> <th>e mm</th> <th>f mm</th> <th>Winding- shaft</th> </tr> </thead> <tbody> <tr> <td>4/11.I</td> <td>60</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> </tbody> </table>	Type	a mm	e mm	f mm	Winding- shaft	4/11.I	60	11	64	WD19																																							
Type	a mm	e mm	f mm	Winding- shaft																																															
4/11.I	60	11	64	WD19																																															
 <p>Picture: Former Type 4/11 No. 6</p>		<p><b>Winding heads type 4/11 concentric</b></p> <p>One pair always consists of 2 heads. The winding fixture can take max. 6 pairs.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>a mm</th> <th>b mm</th> <th>c mm</th> <th>d mm</th> <th>e mm</th> <th>f mm</th> <th>Winding- shaft</th> </tr> </thead> <tbody> <tr> <td>4/11.2</td> <td>60</td> <td>71</td> <td>82</td> <td>93</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> <tr> <td>4/11.3</td> <td>60</td> <td>74</td> <td>88</td> <td>102</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> <tr> <td>4/11.4</td> <td>60</td> <td>77</td> <td>94</td> <td>111</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> <tr> <td>4/11.5</td> <td>60</td> <td>80</td> <td>100</td> <td>120</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> <tr> <td>4/11.6</td> <td>60</td> <td>83</td> <td>106</td> <td>129</td> <td>11</td> <td>64</td> <td>WD19</td> </tr> </tbody> </table>	Type	a mm	b mm	c mm	d mm	e mm	f mm	Winding- shaft	4/11.2	60	71	82	93	11	64	WD19	4/11.3	60	74	88	102	11	64	WD19	4/11.4	60	77	94	111	11	64	WD19	4/11.5	60	80	100	120	11	64	WD19	4/11.6	60	83	106	129	11	64	WD19	
Type	a mm	b mm	c mm	d mm	e mm	f mm	Winding- shaft																																												
4/11.2	60	71	82	93	11	64	WD19																																												
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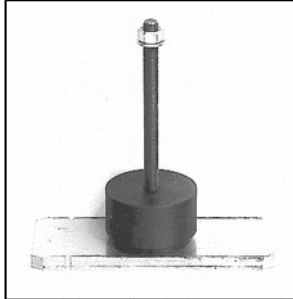
# Winding Heads Type 4/24

 <p>Picture: Former Type 4/24 No. II</p>		<p><b>Winding heads type 4/24 equal size</b></p> <p>One pair always consists of 2 heads. The winding fixture can take max. 3 pairs (6 pairs with the 4-edge winding fixture, 9 pairs with the 6-edge fixture).</p> <table border="1"> <thead> <tr> <th>Type</th> <th>a mm</th> <th>e mm</th> <th>f mm</th> <th>Winding- shaft</th> </tr> </thead> <tbody> <tr> <td>4/24.I</td> <td>60</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.II</td> <td>120</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.III</td> <td>90</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.IV</td> <td>200</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> </tbody> </table>	Type	a mm	e mm	f mm	Winding- shaft	4/24.I	60	24	116	WD19	4/24.II	120	24	116	WD19	4/24.III	90	24	116	WD19	4/24.IV	200	24	116	WD19																																																																								
Type	a mm	e mm	f mm	Winding- shaft																																																																																															
4/24.I	60	24	116	WD19																																																																																															
4/24.II	120	24	116	WD19																																																																																															
4/24.III	90	24	116	WD19																																																																																															
4/24.IV	200	24	116	WD19																																																																																															
 <p>Picture: Former Type 4/24 No. 10</p>		<p><b>Winding heads type 4/24 concentric</b></p> <p>One pair always consists of 2 heads. The winding fixture can take max. 3 pairs (6 pairs with 4-edge winding fixture).</p> <table border="1"> <thead> <tr> <th>Type</th> <th>a mm</th> <th>b mm</th> <th>c mm</th> <th>d mm</th> <th>e mm</th> <th>f mm</th> <th>Winding- shaft</th> </tr> </thead> <tbody> <tr> <td>4/24.2</td> <td>60</td> <td>71</td> <td>82</td> <td>93</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.3</td> <td>60</td> <td>74</td> <td>88</td> <td>102</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.4</td> <td>60</td> <td>77</td> <td>94</td> <td>111</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.5</td> <td>60</td> <td>80</td> <td>100</td> <td>120</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.6</td> <td>60</td> <td>83</td> <td>106</td> <td>129</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.7</td> <td>60</td> <td>86</td> <td>112</td> <td>138</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.8</td> <td>60</td> <td>89</td> <td>118</td> <td>147</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.9</td> <td>60</td> <td>92</td> <td>124</td> <td>156</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.10</td> <td>60</td> <td>95</td> <td>130</td> <td>165</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.12</td> <td>95</td> <td>136</td> <td>177</td> <td>218</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> <tr> <td>4/24.14</td> <td>95</td> <td>142</td> <td>189</td> <td>236</td> <td>24</td> <td>116</td> <td>WD19</td> </tr> </tbody> </table>	Type	a mm	b mm	c mm	d mm	e mm	f mm	Winding- shaft	4/24.2	60	71	82	93	24	116	WD19	4/24.3	60	74	88	102	24	116	WD19	4/24.4	60	77	94	111	24	116	WD19	4/24.5	60	80	100	120	24	116	WD19	4/24.6	60	83	106	129	24	116	WD19	4/24.7	60	86	112	138	24	116	WD19	4/24.8	60	89	118	147	24	116	WD19	4/24.9	60	92	124	156	24	116	WD19	4/24.10	60	95	130	165	24	116	WD19	4/24.12	95	136	177	218	24	116	WD19	4/24.14	95	142	189	236	24	116	WD19	
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4/24.3	60	74	88	102	24	116	WD19																																																																																												
4/24.4	60	77	94	111	24	116	WD19																																																																																												
4/24.5	60	80	100	120	24	116	WD19																																																																																												
4/24.6	60	83	106	129	24	116	WD19																																																																																												
4/24.7	60	86	112	138	24	116	WD19																																																																																												
4/24.8	60	89	118	147	24	116	WD19																																																																																												
4/24.9	60	92	124	156	24	116	WD19																																																																																												
4/24.10	60	95	130	165	24	116	WD19																																																																																												
4/24.12	95	136	177	218	24	116	WD19																																																																																												
4/24.14	95	142	189	236	24	116	WD19																																																																																												

# Transformer- and Field-Coils



Picture: mounted transformer adapter



Picture: Transformer adapter with thread bar

## Adapter for mounting special coil formers

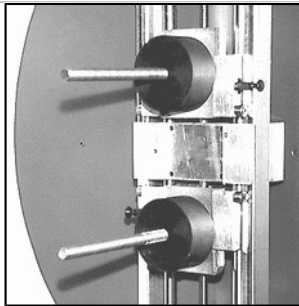
Type: small

With the transformer adapter it is possible to wind coils by mounting special bobbins onto the device. It is directly attached to the winding beam instead of the standard winding fixtures. Assembling is very easy by disengaging the winding fixture from the winding beam without additional tools.

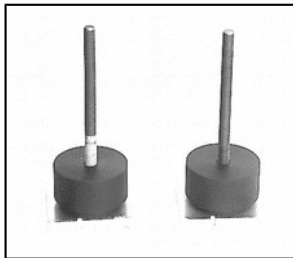
The necessary spacer is already assembled. The required bobbin has to be fastened against this disc and to be fixed by means of a central threaded spindle.

### Scope of Delivery:

adapter plate  
distance piece with 60 mm (2.362") width



Picture: transformer adapter



Picture: scope of delivery

## Adapter for mounting special coil formers

Type: large

With this transformer adapter it is possible to wind larger or heavier coils by mounting special bobbins onto the device. It is directly attached to the winding beam instead of the standard winding fixtures. Assembling is very easy by disengaging the winding fixture from the winding beam without additional tools.

The necessary spacer is already assembled. The required bobbin has to be fastened against this disc and to be fixed by means of a central threaded spindle.

### Scope of Delivery:

two adapter plates  
two distance pieces with 60 mm (2.362") width

# Special Winding Heads



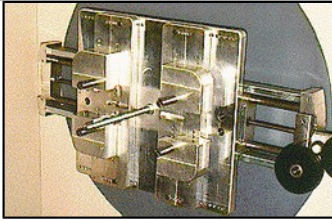
Picture: special winding heads

## Special winding heads to customer's requirement

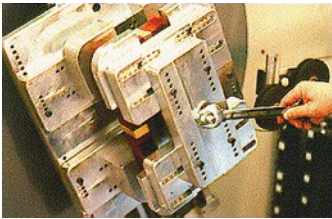
We manufacture special winding heads (different dimensions, forms and materials) to customer's requirement.

For the design we need accurate drawings.

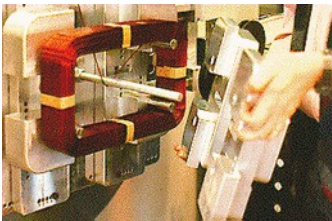
# DC-Field Former



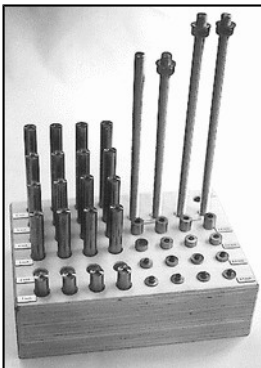
Picture: part of the DC-field former



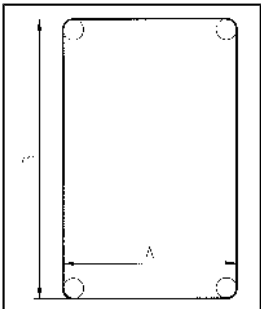
Picture: DC-field-former with coil



Picture: „open“ DC-field-former with coil



Picture: storage for bolts and thread bolts



Dimension drawing

## Adjustable former for DC-fields

With the adjustable Former for DC-fields it is possible to wind DC-field coils very fast. This former is adjustable in all dimensions. The dimensions are adjustable in steps of 0.1 inch.

In the 4 edges are bolts with a radius of 0.4 inch.

It is easy to assemble the former. In the software of the winding machine are additionally 15 pictures (photos) which shows the DC-former and a sample of the final winding result.

The software is able to layer-wind standard DC-fields or fields with steps on top. The steps can be different on both sides.

Dimensions:

	min	max	
A	2 inch	8 inch	in 0.1 inch steps (71 mm – 289 mm, 0,25 mm)
B	8 inch	18 inch	in 0.1 inch steps (112 mm – 487 mm, 0,25 mm)
width	1 inch	8 inch	in 0.1 inch steps

### Scope of Delivery:

DC-field former

distance bolts

thread bolts

storage out of wood (for tools, distance bolts, thread bolts)

## Middle support for DC-former

The middle support is required to achieve better form stability for very large (long) DC-field coils.

### Scope of Delivery:

Middle support

additional distance bolts

additional thread bolts

additional storage out of wood (for distance bolts, thread bolts)

## Enlarged version of the DC-former + 12 “

It is possible to order the adjustable DC-field former in an enlarged version. This enlarged version is technically identical to the standard version, however comes with a larger base plate and head piece.

Herewith the measure B is increased by 12” (304 mm), which allows you to wind everything possible on the normal version, plus coils up to and additional length of 12”.

## Enlarged version of the DC-former + 16 “ (only usable on WM 4500 and larger)

It is possible to order the adjustable DC-field former in an enlarged version. This enlarged version is technically identical to the standard version, however comes with a larger base plate and head piece.

Herewith the measure B is increased by 16” (408 mm), which allows you to wind everything possible on the normal version, plus coils up to and additional length of 16”.

## Large Edges for the DC-former

The max. slot depth for the DC-former (defined by the edge pieces) normally is 65 mm. For special applications larger edges with a maximum slot depth of 95 mm are available. These allow winding thicker coils (with more turns).



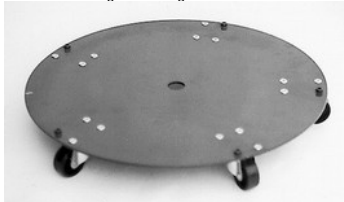
# Dereeling Shelves



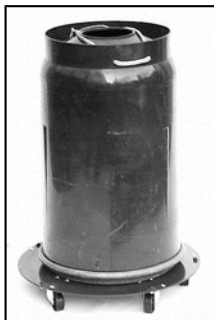
Picture: AR 4000 dereeling shelf with 90° panel, version for 8 x K200, 12 x K250, 6 long containers with wheel plates



Picture: Dereeling unit for large containers



Picture: Wheel-plate



Picture: Wheel-plate with container



Picture: Stack storage with wheel-plates

## AR 4000 base shelf

The base shelf AR 4000 has room for 18 bobbins K250 and 6 long containers A250, or alternatively for 6 bobbins K250 and 12 containers A250. The solid metal construction suffices supreme stability requirements. The large metal funnels make a problem-free over head de-reeling of the wire possible.

Entry- and exit-nozzles from metal in the funnels and at the panel ensure good wire guidance. Fixing bolts underneath the exit nozzles prevent the wire from sliding back. Panels exist to the linear annex or annex in the 90° angle, a corresponding tool to pull through the wires belongs to the scope of delivery.

### Funnels for 8 K200 instead of 6 K250

The individual floors can be supplied in place of 6 large funnels for bobbins K250 or A250 with 8 smaller funnels for bobbins K200.

### Additional compartment floor

The lowest level can optionally be fitted with a compartment floor without funnels, if in place of coil containers A250 further place for bobbins K250 or K200 is required.

### 3 external long coil container de-reeling adapters

In addition 3 external long coil container adapters can be connected. These adapters are composed of a flexible sleeve with a plastic material cover which fits directly in the bore of the protective container.

### Extension shelf

The base shelf can be extended with maximum 2 extension shelves. There exist the same modification possibilities as for the base shelf. The wires are led to the wire exit panel of the base shelf. Place for the there required additional exit nozzles is anticipated already.

## Dereeling shelves in different versions

We can offer de-reeling shelves in different sizes and completions according to your request if desired.

## Wheel-plates for coils

The wheel-plate allows the simple and fast transport as well as the storage of the copper wire. The wheel-plate is interesting especially for the production however also for the repair-shop.

The screws at the outer edge of the plate prevent the copper bobbin from sliding from the plate when rolling. The plate is furnished with a central hole, to be able to store the plates simply. The wheel-plates can be ordered in certain RAL colours at your request at an order quantity of 25 or more.

for A250, 5 wheels, 300 mm (11.8") diameter

for A315, 5 wheels, 380 mm (15") diameter

for A400, 8 wheels, 490 mm (19.3") diameter

## Stack storage for wheel-plates

The stack storage makes possible the fast storage of the unused wheel-plates.

The stack storage allows the storage of up to 20 wheel-plates. To the safety the stack storage must be fastened on the floor.