



Adams-Maxwell  
Winding Systems

Operating Manual

## *1400 Bobbin Winder*





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## Section 1 - Introduction

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Congratulations on your purchase of the Adams-Maxwell Series 1400 Bobbin Winder. There are five different models depending on your operational requirements for speed and torque. The Series 1400 Bobbin Winder combines a precision counter-head assembly and motor-controlled drive to give a compact and efficient machine.

The winder includes the following features:

- Foot Rheostat to control winding speed in each speed range
- Reversible Operation
- Multiple Predetermining Electronic Counter
- Dynamic Braking for rapid stopping
- Hand Wheel allowing hand adjustment

Optional features:

- Option P for external memory modules
- Option T Optical Encoder to allow interface to the Model 1260 Traverse

### Limited Warranty

Adams-Maxwell warrants this equipment for ONE full year from the date of Invoice against defects in workmanship and components except: Breakage of parts and/or Damage caused by misuse or mishandling. Misuse includes operation of the equipment outside of its intended range or evidence of tampering (i.e. opening the machine, attempted repairs). Any evidence of tampering or attempted repairs will void the warranty.

Adams-Maxwell reserves the right to make repairs or replacements either at its plant or at the customer's location at Adams-Maxwell option. Equipment is to be returned to Adams-Maxwell at owner's expense and is subject to inspection for verification of warranty repairs. If repairs are covered by this warranty, the equipment will be repaired at Adams-Maxwell's expense. All warranty repairs are to be made by Adams-Maxwell. This warranty is in lieu of any and all other warranties, including but not limited to warranties of marketability and fitness for a particular purpose. In no event shall Adams-Maxwell be liable for indirect or consequential damages or special expense of any kind as a result of breach of express warranty or as a result of the use or misuse of the equipment.

The MOSS-MAGNUSON warranty act of 1975 provides certain specific rights to the purchaser. This warranty is termed a LIMITED WARRANTY as defined in that act but, as such, in no way compromises the high quality of performance, workmanship and customer service of Adams-Maxwell.

## Unpacking and Inspection

Upon receipt, the machine should be unpacked and checked to see that there is no apparent shipping damages and that all attachments and accessories ordered are included. The initial responsibility for any damage or loss resulting from shipping lies with the cosignee. Please refer to the notice (FRM020.ADM) accompanying the shipper for details of this responsibility.

## Performance Specifications

Model	Arbor	Speed Chart (rpm)				Torque	AWG
		Range 1	Range 2	Range 3	Range 4		
1400-2	3/4 in	0-650	0-1300	0-1950	0-2600	20 in-lb	#15x1 #22x4
1400-3AX	3/4 in	0-325	0-650	0-975	0-1300	40 in-lb	#12x1 #19x4
1400-3AR	3/4 in	0-150	0-300	0-450	0-600	60 in-lb	#10x1 #16x4
1400-3A	3/4 in	0-75	0-150	0-225	0-300	120 in-lb	#7x1 #13x4
1400-3	3/4 in	0-40	0-75	0-115	0-150	240 in-lb	#5x1 #10x4

(Figure 1)

## Winding Speed

Speed range is selected by rotating the Speed Switch knob to the various settings. Speed within the range is determined by the degree to which the Foot Speed Control (Foot Rheostat) is depressed. See Figure 1 for speed ranges for the various models.

## Torque Rating

Suggested maximum operating torque demand is given in Figure 1 . These limits are those which are judged to be compatible with acceptable machine life. For the 1400-2 machine the motor will stall before belt slippage. Stalling the Series 1400-3 Machines in maximum power configuration could damage the motor gear reduction unity and should be avoided.

## Winding Direction

The machine is initially programmed to a “Top Going” rotation with a corresponding positive count when the machine is powered on. The machine can be reprogrammed to a “Top Coming” rotation with positive count. The actual rotation of direction of the arbor is controlled by the Direction Switch.

## Counter

The range of the electronic counter is from 0 to 99,999.9. Program groups store multiple programmable winding sequences.

## Overrun

Overrun from the preset at maximum speed of 3600 rpm is approximately 3 turns. This is very consistent and may be compensated by setting the preset accordingly. At lower speeds overrun is proportional to speed.

## Electrical and Physical Specifications

Motor Type:	DC motor, triac type motor speed circuitry
Braking:	Dynamic
Speed Control:	Multi-range electronic foot control
Voltage Requirements:	117 Volts, 48-63 Hz
Power Requirements:	Approximately 100 VA
Weight:	26 lbs
Size:	15" Wide, 15" Deep, 12" High
Cosmetic:	Blue Polyester Finish
Arbor Diameter:	0.75 in
EPROM Version:	GNERIC_0.HEX 6/10/93

The winder is adjusted at the facility for 60 Hertz operations. To operate the winder at other than 60 Hertz (48-63) contact Customer Service at (323) 936-8042 or [sales@adamsmaxwell.com](mailto:sales@adamsmaxwell.com)

## Section 2 - Operation & Programming

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### Basic Winder Configuration

The basic winder as supplied includes:

- Bobbin Winder
- Foot Speed Control
- Power Cord
- Spare set of motor brushes and spare belt

### Machine Setup

The machine must be set up on a sturdy surface and adequately secured. Unpack all components, and assemble as follows:

- 1 Connect the Foot Speed Control (Foot Rheostat) male plug to the corresponding female receptacle on the left of the machine. Rotate plug clockwise to lock in place.
- 2 Connect the power cord female plug to the corresponding male receptacle on the left of the machine and connect the power cord male plug to a power source.

### Machine Operation (Refer to Figure 2, pg. 9)

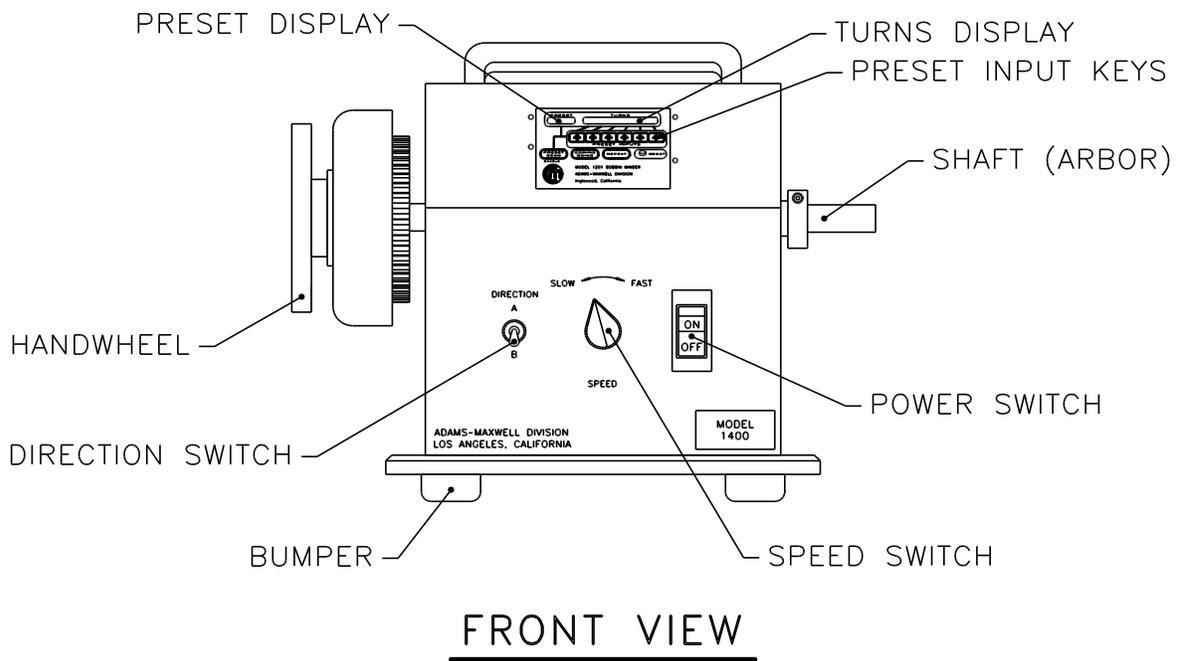
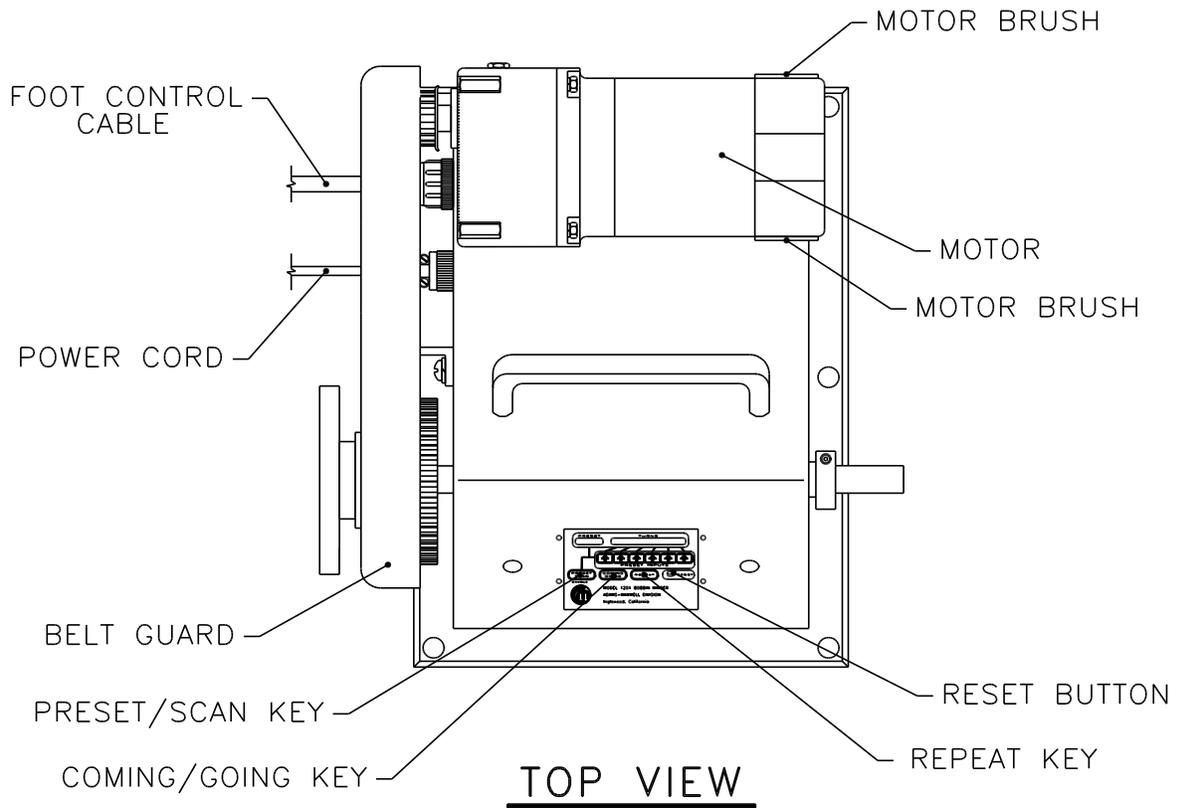
1. **Toggle the Power Switch to “ON”**
2. **Set the directional switch to “A” (Forward)**
3. Set the Speed Range switch to the desired speed. It is recommended that first time users select **“SLOW” while familiarizing themselves with the machine.**
4. Secure a bobbin or winding form on the mandrel and secure the winding wire
5. Reset the counter to zero by pressing the Reset button
6. Depress the foot control to begin winding and to control speed during winding. The turns window displays the current turns count.
7. The machine will automatically stop upon reaching the first preset. If necessary adjust the turns with the hand wheel. If multiple presets are programmed, then the next sequential preset will begun once the foot control is depressed. When the last winding sequence is completed secure the winding wire and remove the bobbin or winding form from the mandrel.

In operation, a program with multiple presets would operate as follows: When the first preset is hit the winder automatically stops. When the foot pedal is pressed again, the winder will start the next preset. This sequence continues until all programmed presets are cycled through. To begin the winding sequence from the first preset, press the Reset button.

The machine will overrun the preset at higher speeds. Simple experimentation will demonstrate the allowance that is needed to accommodate the overrun (e.g. for 200 turns at high speed, set the preset to “196” turns).

The hand wheel is used to give precise control at the start and finish of the winding when the machine is stopped or turning very slowly. Do not use the hand wheel to stall the machine. Also, holding or touching **the hand wheel when it is rotating can cause rapid heat build up which can cause a burn to the operator’s hand and places excess strain on the motor.**

**DO NOT REVERSE THE MOTOR WHILE RUNNING.** This places electrical and mechanical transient loads on the machine and can shorten the life of the components.



(Figure 2)

## Winding Sequences (Programs)

A winding sequence or program is made up of 1 to 99 program steps (presets). Differing winding sequences can be programmed, stored, and later recalled from memory to perform specific winding sequence. The programs are stored in nonvolatile memory, which means the programs will remain in memory even when the machine is turned off. Programs can be added or changed at any time. Each program is given a unique number, e.g. 01, 02, 03 which is selected in the “Function Mode” using Function Code 4 (see both the Program Groups Section and Function Mode section).

As mentioned above, a winding program is made up of program steps, usually referred to as presets. Each preset is defined by three items:

1. Number of Turns
2. Absolute or Additive Count
3. Preset End or Preset Continue

**Number of Turns:** Each preset has a defined number of turns which establishes the completion point of that winding. For example, if 85 turns are required then the preset is programmed to 85 turns. In operation, the winder would wind 85 turns and then automatically stop.

**Preset Continue (PC) and Preset End (PE):** Since the winding program can have multiple presets we need to establish which preset will be last in a sequence by marking it with a Preset End (PE). All other presets would be marked as Preset Continue (PC). For example, a sequence of 3 windings will have presets one and two marked as “PC” and preset three marked as “PE.” In operation, when the winder encounters a preset with a “PE” it will automatically end the winding program. Pressing the Reset button is required to reset the counter back to zero and to ready the winder to again start the winding sequence. Note: All presets must be marked as either “PE” or “PC.”

**Absolute ‘vs’ Additive:** In addition to each preset being defined with the number of turns and as either PC or PE, it must also be labeled as either Absolute (ABS) or Additive (ADD). When the preset is marked as Absolute the counter starts from zero. When marked as Additive the counter continues from the previous preset.

This is best explained with the following example. The transformer’s winding sequence has 80 turns on the primary and 240 turns on the secondary with a tap at 180 turns. The winding sequence would be as follows:

Preset 1	80 Turns	PC	ABS
Preset 2	180 Turns	PC	ABS
Preset 3	240 Turns	PE	ADD

As shown in the example the winder would start at zero and stop at 80 turns. When the pedal is pressed, the winder would then proceed to preset 2 by again starting at zero and stopping at 180 turns. Now for **preset 3, since it is marked with the “ADD” it would not start from zero but would continue from 180 turns** until 240 turns are reached. Since preset 3 is designated as PE, the winder automatically ends the sequence and thus would reset back to preset 1 when the Reset button is pressed (All presets must be marked as either ADD or ABS. Preset 1 must always be marked as ABS. When marking a preset as ADD it must be a larger number than the previous preset).

## Operational Modes

There are five operational modes for the 1201 Bobbin Winder. Moving between modes is best described by reviewing Figure 3. Each of these operation modes have a specific purpose of which are described as follows:

**Program Mode** is where program sequences are created or edited. A program sequence is made up of one or more program steps. A program step consist of defining a preset with its number of turns, PC or PE, and ABS or ADD.

**Run Mode** is where the actual winding takes place. When the bobbin winder is turned on “Run Mode” is the default, which means the winder is ready to wind the programmed sequence.

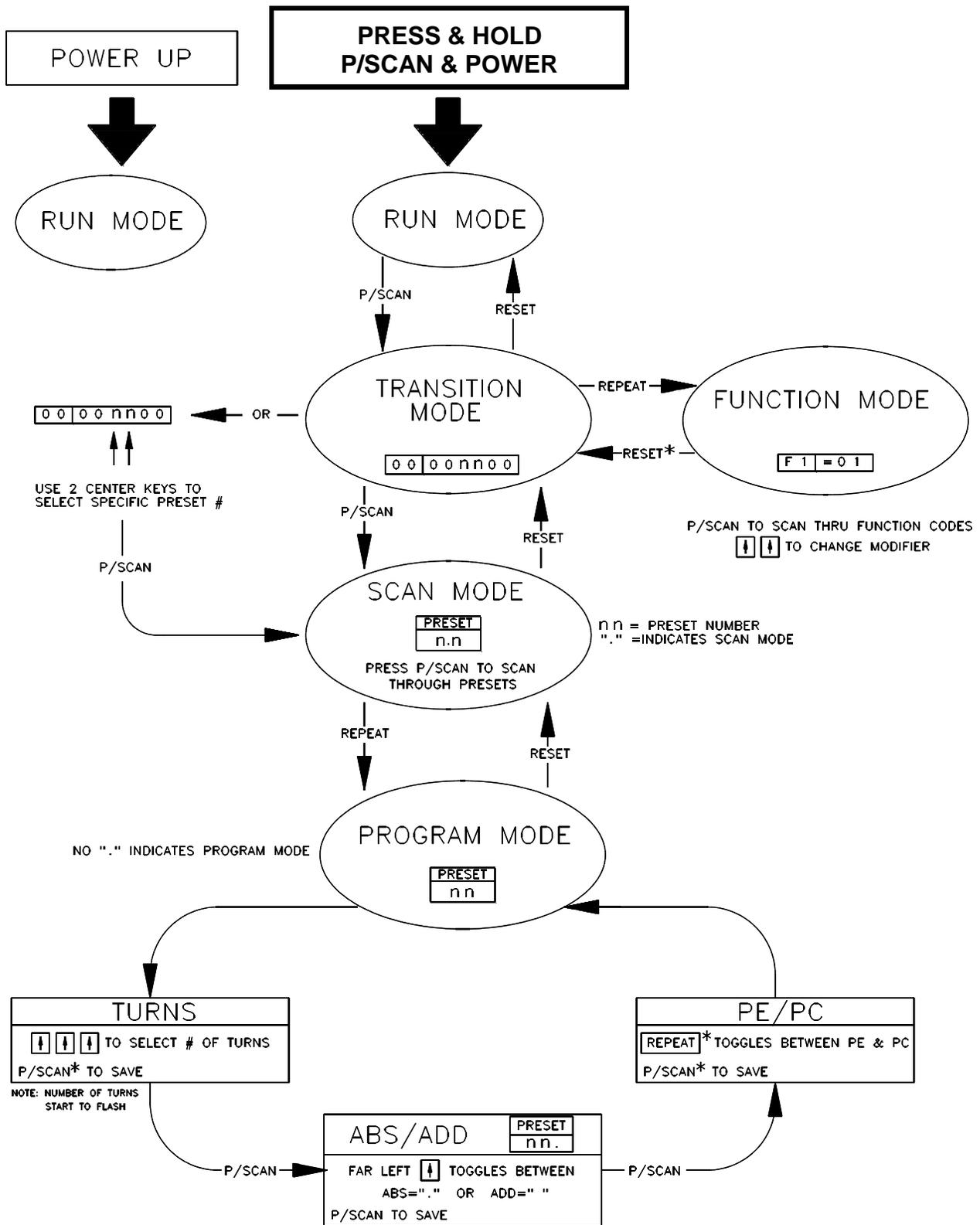
**Transition Mode** is the mode when switching between “Run Mode,” “Function Mode,” or “Scan Mode.” In “Transition Mode” the display will indicate all zeros, 00 000000.

**Scan Mode** allows you to serially scan through all presets to make program changes and/or to verify data has been entered correctly. In “Scan Mode” the display indicates “x.x.”, where xx represents the preset number and the “.” represents “Scan Mode.” For example, “1.6” means Preset 16 and the “.” indicates “Scan Mode.” Note that you cannot scan past a preset that has been set as “PE.”

**Function Mode** contains special functions such as defining your program group, selection of your program sequence and shaft rotation. See additional information in the Function Mode Section (page 15).

## Keypad Lockout

When powered on the keypad is locked out except for: the Reset Button, the Repeat Key and the Coming/Going key. Press and hold the Preset Scan Key while the machine is powered on to enable the keypad. This allows the winder to be programmed (see page 13).



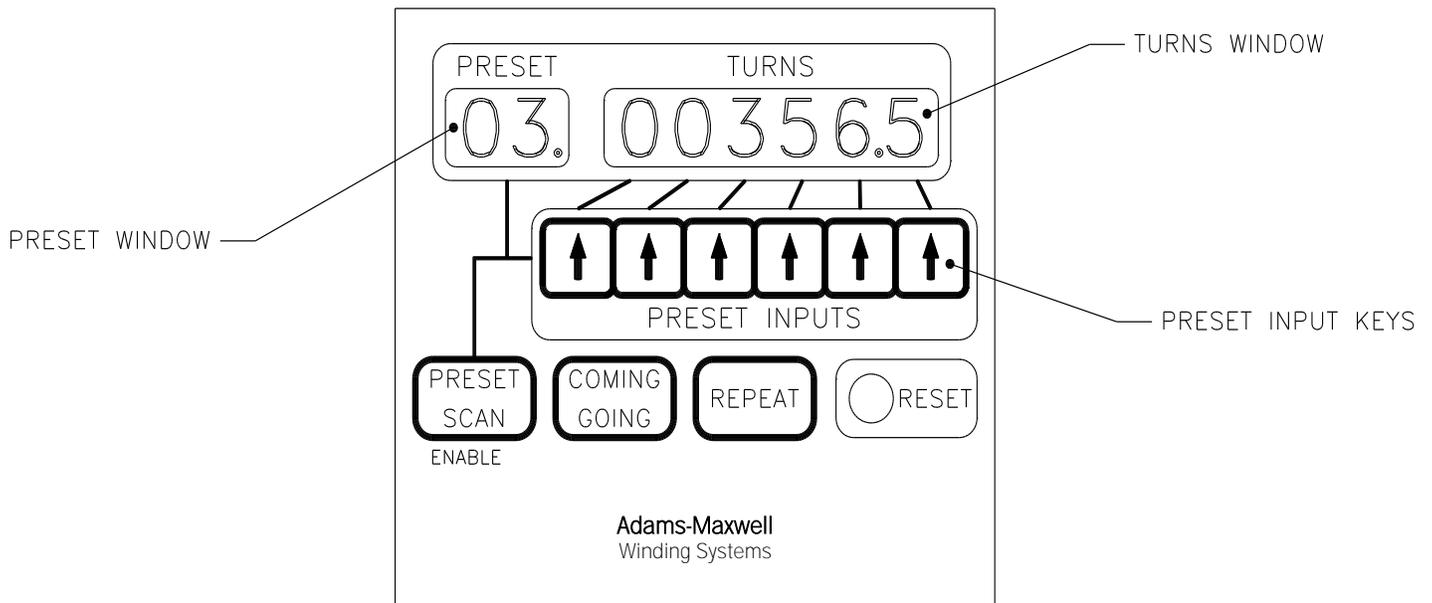
\* = MUST HOLD FOR 1 SECOND

(Figure 3)

## Programming Procedure (refer to figure 3 and figure 4)

- Step 1: To program the bobbin winder press down and hold the Preset Scan key and then turn on the Power Switch. This will take you into “Run Mode.”
- Step 2: **Press the Preset Scan key to take you into “Transition Mode.”** Note the display is “00 00000” to indicate you are in Transition Mode.
- Step 3: **Press the Preset Scan key to enter the “Scan Mode.”** You can now scan through all the presets by repetitively pressing the Preset Scan key. Note that the Preset Display has a “.” which indicates you are in “Scan Mode.”
- Step 4: To program a particular preset you must press the Repeat key. You are now in the “Program Mode” and can define the selected preset. Note that the absence of the decimal point “.” in the Preset Display indicates that you are in “Program Mode.”
- Turns: Press the Preset Input keys to select the number of turns. Press the Preset Scan key to save. Note that the display starts to flash when you press the Preset Input keys.
- ABS/ADD: Press the far left Preset Input key to mark as either Absolute or Additive. A decimal point “.” will appear in the preset display to indicate Absolute is selected. The absence of a decimal point indicates that Additive is selected. Once established, press and hold the Preset Scan key to save.
- PE/PC Press the Repeat key to select between PE or PC. Once Once established, press and hold the Preset Scan key for 3 seconds to save.
- Step 5: **To return to the “Scan Mode” press the Reset key**
- Step 6: **To return to the “Transition Mode” press the Reset key**
- Step 7: **To return to the “Run Mode” press the Reset key**

Multiple presets can be defined by repeating Steps 3 through 5.



(Figure 4)

### Program Groups

The 1400 Series Bobbin Winder can be user configured to any one of five program groups. By default the factory settings is Program Group 1. This provides the ability to program one winding sequence with a maximum of 99 presets. Either Program Group 1, 2, 3, 4 or 5 must be selected. Each program group has a specific maximum number of winding sequences (programs) associated with it and the maximum number of preset (program steps) for each of these winding sequences. The program groups are as follows:

Program Group	# of Winding Sequences	# of Pre Sets per Winding Sequence
1	1	99
2	2	80
3	4	40
4	8	20
5	16	10

The flexibility allows the user to best configure the winder to their application. If a user has winding sequences that requires up to 40 program steps then Program Group 3 should be selected. On the other hand if the winding sequences are never greater than 10 program steps then Program Group 5 should be selected. Program group 5 would allow you to program/access up to 16 different winding sequences (programs), each with up to 10 program steps (presets). A preset consists of defining the number of turns, PC or PE, and ABS or ADD.

The Bobbin Winder must be set to one of these five program groups. **Please note that once a program group is selected and winding sequence entered in, changing the Program Group will lose the old winding program.**

All programs are stored in non-volatile memory which means that the programs are always stored even when the winder is turned off. The programs can be reprogrammed as often as needed. Programs can also be saved on a removable memory module (see Option P, page 22).

Selection of the Program Group is done through the Function Mode F3 (See Function Mode Section)

Accessing a particular winding sequence to either perform a winding or to program a winding sequence is done through the Function Mode F4 (See Function Mode Section).

## Function Mode

Function Mode is used to specify bobbin winder operation parameters. Entering the function Mode is **done by pressing the Repeat key while in the “Transition Mode.”** The display will show:

F1 = nn        (where nn is referred to as a modifier and can be changed depending upon the specific requirement—explained on page 16)

The Modifier can be changed by pressing and holding the Preset Input keys directly below the Modifier. Once the change is made you can either save it by pressing and holding the Preset Scan key to access **the next Function Code, or by pressing and holding the Reset key to return to the “Transition Mode.”** Pressing the Preset Scan key would display:

F2 = nn

You can access all the Function Codes by scanning through with Preset Scan key. At any time you can **return to the “Transition Mode” by pressing and holding the Reset key.**

## Function Code 04

**Modifier = nn**

**Description** Selects the specific program number to either run a winding sequence or to program a winding sequence. The nn represents this program number within the selected Program Group. For example, if Program Group 04 is selected (F3=04), then the modifier can be set from 01 to 08 to select any one of the eight available programs. If on the other hand Program Group 05 has been selected (F3=05), then the modifier can be set from 01 to 016 to select any one of the sixteen available programs

Function Codes 05, 06, & 07 are not used and must be set as follows:

F5 = 01  
F6 = 01  
F7 = 00

**Function Codes and Modifiers:**

The function Codes and Modifiers are describe as follows:

<u>Function Code 01</u>		
	<u>Modifier</u>	<u>Description</u>
	01	All programming is entered from the keypad of the Winder
	02	Inactive
<u>Function Code 02</u>		
	<u>Modifier</u>	<u>Description</u>
	01	When the direction of the Shaft is Top Going – Counter will be positive counting
	02	When the direction of the shaft is Top Coming– Counter will be positive counting
<u>Function Code 03</u>		
	<u>Modifier</u>	<u>Description</u>
	01	Configures the Bobbin Winder for 1 winding program with up to 99 presets
	02	Configures the Bobbin Winder for 2 winding programs with each program having up to 80 presets
	03	Configures the Bobbin Winder for 4 winding programs with each program having up to 40 presets
	04	Configures the Bobbin Winder for 8 winding programs with each program having up to 20 presets
	05	Configures the Bobbin Winder for 16 winding programs with each program having up to 10 presets

To gain direct access to the “Function Mode” turn on the winder while at the same time pressing down on the Preset/Scan and the Coming/Going key. To return to “Run Mode” press and hold the Reset Button for three seconds.

### Random Preset Access

**Program Mode:** When programming or editing a winding sequence you may like to go directly to a specific preset without having to scan through all the previous presets. This is done by accessing the preset directly as follows: While in the “Transition Mode” enter the desired preset by pressing the two center Preset Input keys. Once the desired preset is entered, press the Preset Scan key. The entered preset will now appear in the preset window with the corresponding turns count in the turns window. Since the winder is now in the “Scan Mode” the Repeat key must be pressed to enter into the “Program Mode.” Changes can now be made to the preset as described in the Programming Sequence Section (see page 13).

**Run Mode:** To access any preset while in the “Run Mode” and operate the winder using that preset. Press the Preset Scan key to activate the “Transition Mode,” and then enter the desired preset by pressing the two center Preset Input keys. Now press the Reset button and the winder will be in the “Run Mode” at the selected preset. The winder can now be operated using that preset.

### Repeat Key

When the winder is in “Run Mode,” the Reset button will reset the winder back to preset 01 (a.k.a. Hard Reset). To reset the winder to the current preset (a.k.a. Soft Reset), press the repeat key.

### Top Going/ Top Coming

The machine is initially programmed to a “TOP GOING” rotation with a corresponding positive count when the machine is powered on. The machine can be re-programmed to a “TOP COMING” rotation with a positive count by changing Function Code F2 to the “02” modifier. Once the machine is programmed “TOP COMING” or “TOP GOING” it will stay that way even if the winder is powered off. The machine can be temporarily re-programmed to “TOP GOING” or “TOP COMING” at any time by pressing the Coming/Going key when the winder is in the “Run Mode” as follows:

Display Nomenclature : CG = G (Top Going with Positive Count)  
CG = C (Top Coming with Positive Count)

When the machine is powered off and back on the winder will divert back to the direction mode established by Function Code F2.

Note:

This feature does not change the direction of the arbor, only the positive direction of the Count. The direction switch must be switched in order to change the shaft rotation direction.

## Section 3 - Maintenance

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The winder has been designed to minimize maintenance requirements. With proper use and maintenance, your machine should operate trouble free for many years. The following maintenance is suggested:

### GEAR BOX

The 1201-3 Series Motor should occasionally be checked for the oil level in the motor gear box. To check oil, remove the red plastic plug and insert a clean stick into the motor gear box. Measure the oil level. **The oil should be 1" deep. Add industrial type oil as required.**

### MOTOR

The motor brushes should be checked for wear approximately every 1000 hours of use and replaced when worn.

Remove the screw caps from the two brush casings. Remove brushes. If the brushes are worn to less than **3/8"**, replace them. **To replace them, insert in brush casing, rotating to proper orientation. Be sure** springs are square. For Bodine motors on all -3 models only, detach the springs from the old brushes and attach them to the new brushes. For all other models, the new brushes have new springs.

### BELT

Periodical inspection of the drive belt should be made. Belt should be replaced if cracked, frayed, or loose.

To replace the belt, remove the belt guard by removing the two screws on the left side of the machine. Gently work the belt off the front gear by easing the belt toward the machine, and turning the hand wheel. Then remove the belt from the rear gear. Lift the belt off over the hand wheel. To install the new belt, slip the belt over the hand wheel. Then fit the belt over the rear gear. Work the belt onto the front gear by easing it onto the gear and turning the hand wheel until the belt is properly seated on the front gear. Replace the belt guard and the two screws. Machine must not be operated without the belt guard securely attached.

### ARBOR

Every three months, depending on amount of use, the bushing and the roller bearing on the arbor should be lubricated with a drop of light machine oil

### CORDS

Periodic inspection of all cords should be made. To prevent the risk of electrical shock replace damaged, worn or frayed cords immediately. Do not use a cord that has been damaged in any way.

**FOOT SPEED CONTROL**

To greatly extend the life of the Foot Speed Control, clean every six months by opening the case and blowing out any accumulated dust

**OVERHAUL**

It is recommended that the machine be returned to the factory for an overhaul at about 4000 hours of service (two years of daily use). Service include:

1. reconditioning the counter
2. replacing the motor bearings
3. replacing the belt
4. checking all other components and replacing as needed

**Trouble Shooting**

The winder is manufactured in such a way that operating malfunctions will be rare. The following is offered, however, to aid in the location of a inoperative condition:

Possible Problem	Possible Solutions
No Power	Check all power cords, ensure that the power switch is in the on position, and check your power source
Resetting	<b>Press the Reset button, resetting the count to "00000." Be sure the preset is not set to "00000."</b>
Motor brushes worn	Replace the motor brushes

## Section 4 - Accessories

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### Auto Controller

Replaces the foot rheostat pedal of the bobbin winder with an adjustable speed control dial to provide a constant speed. The deceleration rate can be controlled by adjusting the variable brake dial.

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### Chuck Adapter

Standard Jacobs Chuck which mounts on the arbor as a quick method of holding mandrels. The chuck is secured to the arbor with two set screws.

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### Tail Stock

The tailstock is used when additional support is required during the winding operation. Comes with a live center, one stroke action and mounts on the 1217 baseplate. Made of sturdy cast aluminum.

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### Mounting Baseplate

1/2" thick aluminum mounting base used to mount the 1201 Bobbin Winder, 1230 Tailstock and 1250 Traverse on a common platform. Measures 33" in length by 12" in depth.



### Flexible Tensioning

Dereelers (tensioners) are used to provide tension on the wire during the winding process. A spool of wire is placed on the base of dereeler and the wire feeds through a series of spring tensioning rings and pulleys. A variety of dereelers are available according to the range of wire size and spool diameter.



### Wisker Discs

A wisker disk helps prevent wire from waterfaling, ballooning, breaking and tangling by maintaining a slight, constant tension at all times. A wisker disk also creates the pretensioning necessary when using other tensioning equipment and provides instant wire control during the quick starts and stops. The wisker disks are inserted between two plates (wisker disc holder) and placed on top of a spool of wire. L=light (35 AWG or finer) H=Heavy (35 to 25 AWG)



### Option P Memory Module

This memory module plugs into the back of the bobbin winder where a winding program can be stored, removed and then recalled at a future date.

Note: Bobbin winder must have Option P.

### Mandrels

Custom mandrels designed and built for your company's specific winding needs.

### 1260 Traverse

The 1260 Automatic Traverse can be interfaced to the 1400 series Bobbin Winders to automatically lay the wire into the work piece by traversing back and forth relative to the wire diameter and speed of the bobbin winder. This eliminates the operator from having to hand lay the wire onto the work piece. The 1260 Automatic Traverse is physically mounted on the 1417 baseplate and located to the right and slightly behind the winder. The wire is tensioned controlled by a dereeler located behind the traverse and fed over the traverse's wire support arm to the workpiece. The 1260 Automatic Traverse uses a high precision stepper motor with a powerful microprocessor which provides high precision settings and movement controls to provide excellent layering capability. The traverse is easily set up by simply setting the wire diameter (pitch) and the traverse length by thumbwheel switches and establishing the home(s) and starting traverse direction. The number of turns and **speed are established by the bobbin winder. It's that simple. Flexible tooling for wire feeding** allows for multiple bobbins to be wound at the same time to increase your production output.







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