

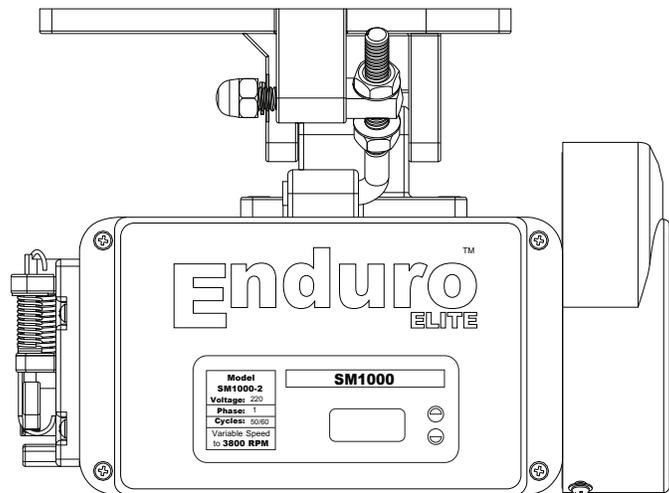
# Enduro<sup>TM</sup> ELITE

## SM1000-2

NON-POSITIONER SERVO MOTOR USER INSTRUCTIONS & PARTS LISTING

INSTRUCTION ET LISTE DES PIÈCES DE L'UTILISATERU  
DU MOTERU SERVOE DE NON-POSITIONNEUR

INSTRUCCIÓN DE USE DE MOTOR SERVO CON POSICIONADOR  
& LISTA DE PARTES



**SM1000-2 ENDURO<sup>TM</sup> ELITE**

ENGLISH INSTRUCTIONS - PAGE 2 >  
ENGLISH PARTS LISTING - PAGE 6 >

INSTRUCTIONS DU FRANCAIS - PAGE 7 >  
LISTE DES PIECES DU FRANCAIS - PAGE 11 >

INSTRUCCIÓN EN ESPAÑOL - PÁGINA 12 >  
LISTA DE PARTES EN ESPAÑOL - PÁGINA 16 >

# SM1000-2 ENDURO™ ELITE NON-POSITIONER SERVO MOTOR USER INSTRUCTIONS

## Congratulations!

You have purchased the Enduro™ Elite SM1000 motor that pays for itself with 60% to 80% energy savings compared to clutch motors. With the high and rising cost of electricity, you just can't afford to run a clutch motor any longer. The power and dependability of the brushless Enduro™ Elite SM1000 is exceptional. This workhorse just won't quit.

Please read these instructions carefully before installation, operation or maintenance.

## General Introduction

The Enduro™ Elite SM1000 Servo Motor is designed to meet almost all basic heavy duty and continuous use requirements of various industrial sewing machines. It utilizes extremely powerful rare-earth Neodymium permanent magnets. The motor produces almost no noise, saves energy and is brushless, speed adjustable and durable. It provides a high starting torque even at low speed or from a complete stop.

By using a modern technologically advanced microprocessor, Hall sensor and Pulse-Width Modulation technology, the Enduro™ Elite SM1000 can be set to rotate at different maximum speeds, in either normal or reverse directions, and can start with different accelerating speeds. It will stop automatically with any interruption such as in-line voltage, electrical surge, radio frequency interference or overloading. It is fully protected by the software and will give error messages indicating which problem is encountered. It even works well in environments with an unstable electrical power supply.

## CAUTION

1. Remove your foot from the pedal when turning the power ON.
2. Turn the power switch OFF before replacing or threading the needle.
3. Turn the power OFF when leaving the machine.
4. **When performing maintenance on the sewing machine, turn the motor power switch to the OFF position. Remove the power cord from the back of the motor to completely disable all power to the sewing machine.**
5. Always ground the grounding wire.
6. **Always turn off the power switch before connecting or disconnecting each connector.**
7. **To avoid an accident, do not alter this motor and control box.**

## Warranty

This product is covered with a 1 year limited warranty. If the motor fails to perform its designed function due to manufacturer's defects, contact the place you purchased it from for repair or replacement.

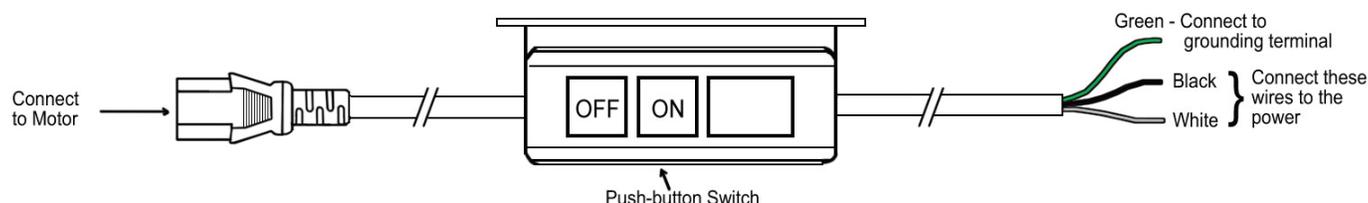
This warranty does not cover defects due to dropping, power surge, spikes or misuse.

## Installation

Put the mounting bracket of the motor upwards to the bottom of the tabletop and fix the motor to the tabletop with the bolts provided. Connect the treadle rod with the connecting rod joint. Install the female plug of the cable from the switch box into the power inlet socket in the back of the motor box.

## Wiring

**For 220 volt single phase motor follow the diagram below:**



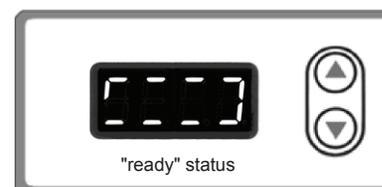
**Note:** When wiring the motor to the power source, connect both the black and white wires to achieve 220 Volts (green to ground). If you are in an area (China / Europe) that supplies 220 Volts from a single lead, then connect the power source to the black wire. The white wire will then be the neutral and the green wire will be the ground.

## Error Message and Trouble Shooting

- E2: Motor Phase signal error.
- E3: Motor protected against over-current.
- E4: Circuit board error.
- E5: Display module and control module communication error.
- E6: Pedal position sensor error.

## Setting Up

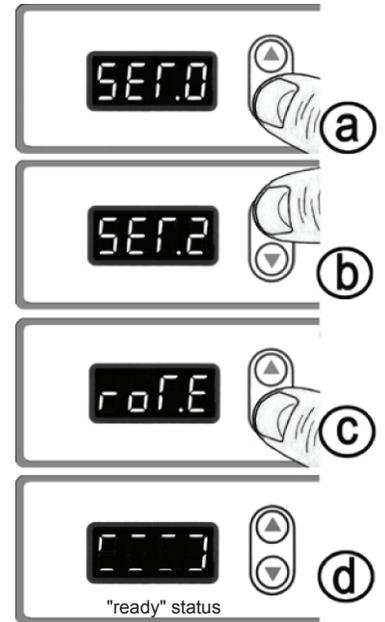
Turn on the switch located on the switchbox. The display will show roughly a circle with a running blinking bar, this means the motor is now in **"ready" status**, ready to work or be set.



### Motor Rotating Direction Setting

#### Setting up Number 2

- a. Keep "▼" button pressed for several seconds, until LED display indicates **"SET.0"**.
- b. Press "▲" button 2 times. It will now indicate **"SET.2"**, which means **"Setting up No. 2"**.
- c. Press "▼" button until the LED indicates **"roT.E"** or **"roT.P"**. Press "▼/▲" to switch between E and P, to meet the desired requirement.  
 "E" means the motor will run in reversed direction.  
 "P" means the motor will run in normal direction.
- d. Setting will be automatically saved 5 seconds after no buttons are pressed. The motor returns to **"ready" status**.

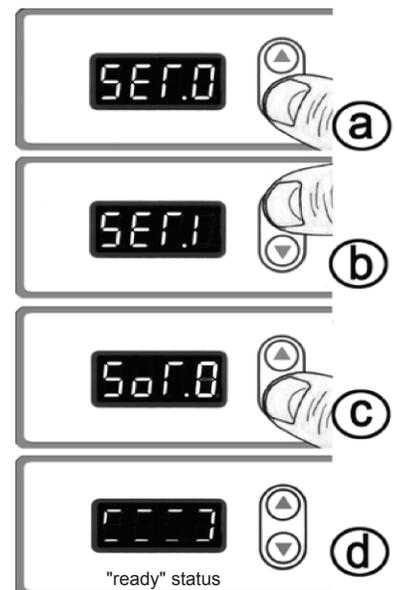


### Slow Starting Speed

#### Setting up Number 1

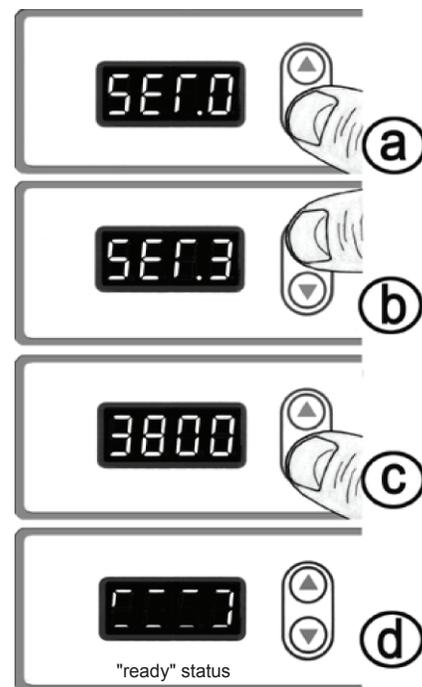
1. The "slow period time" = 128milliseconds \* X, (slow starting setting), X = 0~9 (as setting up in the motor).
2. Example: The treadle is depressed approximately half way down producing a motor speed of about 2,000 RPM and if the Slow Starting is set at **9**, then the time from 0 to 2000RPM is theoretically 128 milliseconds X 9 = 1152 milliseconds, plus the electrical-mechanical delay which is about 0.8 seconds.
3. If the Slow Starting is set at 0, the "real starting time" and time from 0-2000RPM is about 0.8 seconds, which is due to the unavoidable electrical-mechanical delay only.

- a. Keep "▼" button pressed for several seconds, until LED display indicates **"SET.0"**.
- b. Press "▲" button 1 time to indicate **"SET.1"**, which means **"Setting up No. 1"**.
- c. Press "▼" button and LED indicates **"SOT.X"** (X is 0-9). Press "▼/▲" to adjust from 0 to 9 according to your own application. 0 means the quickest. 9 means the slowest. The manufacturer's default setting is 0.
- d. Setting will be automatically saved 5 seconds after no buttons are pressed. The motor returns to **"ready" status**.



### Maximum Speed Setting Setting up Number 3

- a. Keep "▼" button pressed for several seconds, until LED display indicates "SET.0".
- b. Press "▲" button 3 times to indicate "SET.3", which means "Setting up No. 3".
- c. Then press "▼" button and LED shows 100-3800, which means the highest motor speed in RPM.  
  
Press "▼/ ▲" to adjust the Maximum Speed from 100rpm to 3800rpm. The manufacturer's default setting is 3800rpm.
- d. Setting will be automatically saved 5 seconds after no buttons are pressed. The motor returns to "ready" status.



STITCHES PER MINUTE AT 3800 RPM MOTOR SPEED						
MOTOR PULLEY DIAMETER	SEWING MACHINE HANDWHEEL PULLEY SIZE					
MM / INCHES	50 = 2	60 = 2-3/8	70 = 2-3/4	85 = 3-3/8	115 = 4-5/8	150 = 6
50 = 2	3800	3200	2800	2200	1700	1300
60 = 2-3/8	4500	3800	3300	2700	2000	1500
75 = 3	5700	4800	4200	3400	2500	1900
80 = 3-1/4	6200	5200	4500	3700	2700	2100
90 = 3-5/8	7000	5800	5000	4100	3000	2300
100 = 4	7600	6400	5500	4500	3300	2500

### Changing the Pulley

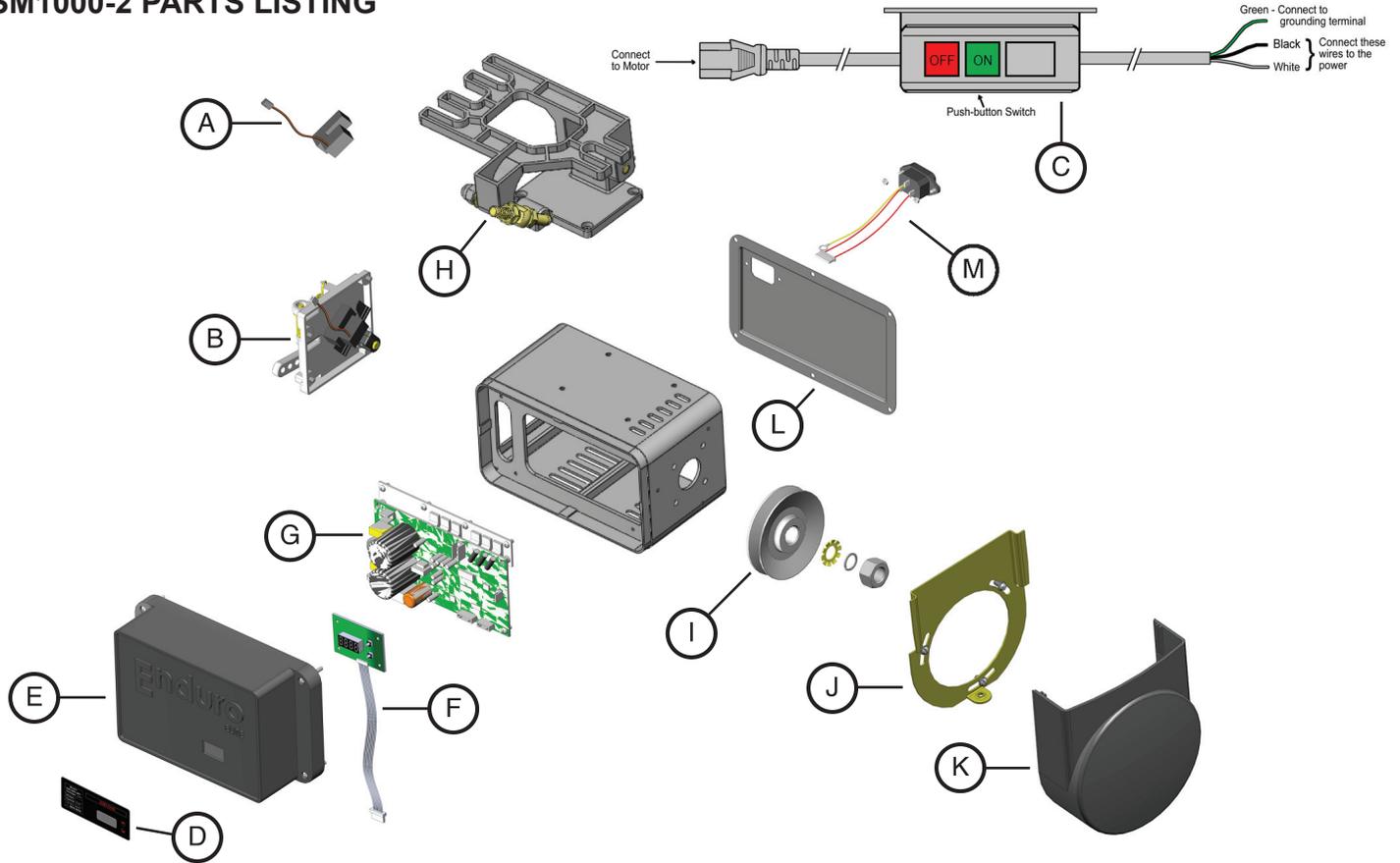
Remove pulley cover and pulley.

Securely tighten the new chosen pulley.

**Caution** – Incomplete tightening may cause malfunctions. Also, be sure the pulley cover is correctly positioned to avoid rubbing against the pulley or the V-belt.

Motor pulley outer diameter (mm)	=	$\frac{\text{Normal sewing machine speed}}{(*) \text{ Motor Speed}}$	x	Sewing machine pulley diameter	+ 5 mm
----------------------------------	---	--	---	--------------------------------	--------

**SM1000-2 PARTS LISTING**



**No. Fig. Description**

SM68	A	Sensor only with screws (single channel for non-positioner motor)
SM103	B	Treadle sensor plate assembly complete with 4 screws (single channel for non-positioner motor) (877C)
SM78	C	Complete horizontal wire harness for 220 volt models (431C)
SM105	D	SM1000-2 label
SM108	E	SM1000 Elite control box cover with 4 screws (431C Matte)
SM109	F	4 Digit LED display with screws
SM110	G	SM1000-2 circuit board with 6 Screws
SM113	H	Motor mounting bracket complete with 4 screws (877C)
SM50	I	50mm pulley with mounting hardware
SM60	I	60mm pulley with mounting hardware
SM75	I	75mm pulley with mounting hardware
SM80	I	80mm pulley with mounting hardware
SM90	I	90mm pulley with mounting hardware
SM100	I	100mm pulley with mounting hardware
SM79	J	Pulley cover bracket with screws and washers
SM86	K	Pulley cover with screw and washer (431C Matte)
SM115	L	Rear motor cover panel SM1000-2 with 6 screws (877C)
SM81	M	Power inlet receptacle with wires, terminals and screws complete