

# 99400 Series Electric Rolling Motor

For 3/4" – 3" (19.1mm – 76.2mm) Tube O.D.



Tube & Pipe Cleaners ◦ Tube Testers ◦ Tube Plugs ◦ Tube Removal ◦ Tube Installation



## Operating and Maintenance Instructions

Read these instructions before using this tool.



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# **Introduction**

Thank you for purchasing this Elliott product. More than 100 years of experience have been employed in the design and manufacture of this tool, representing the highest standard of quality, value and durability. Elliott tools have proven themselves in thousands of hours of trouble free field operation.

If this is your first Elliott purchase, welcome to our company; our products are our ambassadors. If this is a repeat purchase, you can rest assured that the same value you have received in the past will continue with all of your purchases, now and in the future.

The Elliott 99400 Series Electric Rolling Motor may be used with or without the Elliott Model ELC110220 Electronic Torque Controller to expand tubes in the following types of equipment:

**Boilers**

**Heat Exchangers**

**Condensers**

**Chillers**

**Evaporators**

**Air Conditioners**

If you have any questions regarding this product, manual or operating instructions, please call Elliott at +1 800 332 0447 toll free (USA only) or +1 937 253 6133, or fax us at +1 937 253 9189 for immediate service.

# Safety Instructions



1. Read all safety and operating instructions contained in this manual prior to use of the tool. Failure to follow all instructions listed below may result in electrical shock, fire and/or serious injury.
2. Do not operate this tool while under the influence of drugs or alcohol.
3. Do not operate this tool in an explosive atmosphere, such as in the presence of flammable liquids, gases or dust.
4. Check the motor, cable and plug prior to every use of the tool. Repair or replace any defective parts prior to use of the tool.
5. Do not use motor in wet conditions.
6. Use only extension cords and plugs approved for outdoor use when working outdoors.
7. Use appropriate safety equipment (i.e. safety glasses, ear plugs, dust masks, etc.) when using this tool.
8. Ensure that long hair or loose fitting clothes are secure prior to use of the tool.
9. Do not use motor without the Rapid Hawk.
10. Never apply the motor to an unsecured work piece.
11. Power cable should be located to the rear of the motor during operation, away from the rotating spindle.
12. Stay clear of any objects that may interfere with the operator's ability to maintain control of the motor as it reaches maximum torque.
13. Always disconnect the motor from the power source prior to performing any maintenance or repairs.

## **Protection**

To avoid damage to the tool and/or possible injury to the operator:

Do not continue to run the motor after the motor has reached its maximum torque.

Do not operate the motor beyond the maximum amperage rating shown on the name plate.

**Use only original replacement parts from the motor manufacturer.**

# Safety Recommendations



- Tasks should be performed in such a manner that the wrists are maintained in a neutral position which is not flexed, hyperextended, or turned side to side.
- Stressful postures should be avoided and can be controlled through tool selection and work location.

Any user suffering from prolonged symptoms of tingling, numbness, blanching of fingers, clumsiness or weakened grip, nocturnal pain in the hand, or any other disorder of the shoulders, arms, wrists, or fingers is advised to consult with a physician. If it is determined that the symptoms are job related or aggravated by movements and postures dictated by the job design it may be necessary for the employer to take steps to prevent further occurrences. These steps might include, but are not limited to, repositioning the workpiece or redesigning the workstation, reassigning workers to other jobs, rotating jobs, altering work pace, and/or changing the type of tool used so as to minimize stress on the operator. Some tasks may require more than one type of tool to obtain the optimum operator/tool/task relationship.

The following recommendations will help reduce or moderate the effects of repetitive work motions and/or extended vibration exposure.

- Use a minimum hand grip force consistent with proper control and safe operation.
- Keep wrists as straight as possible.
- Keep body and hands warm and dry.
- Avoid anything that inhibits blood circulation
  - Smoking tobacco
  - Cold temperatures
  - Certain drugs
- Avoid highly repetitive movements of hands and wrists, and continuous vibration exposure.

# Setup

## Speed Selection

**DO NOT ATTEMPT TO CHANGE THE SPEED WHILE THE MOTOR IS RUNNING!**

This motor is equipped with a mechanical four-speed gearbox. To select high speed, turn both dials to the position indicated with a single dot. To select low speed, turn both dials to the position indicated with 2 dots. If the dial will not turn completely, rotate the spindle slightly by hand while still turning the dial until the gearbox engages and the dial turns the full distance.

Operating this motor in the high speed selection will yield faster RPMs for higher productivity and less torque than the low speed selection.

If the motor is running in the high speed selection and the torque controller is set at it's highest limit setting and the tubes are being under-expanded, switch the motor to the low speed selection and rerun the torque controller setup. For increased productivity and to keep the motor cool, a higher RPM setting is recommended.

## Connect to Torque Controller

Reference ELC Setup information in TM-71.

To get full use of the torque shut-off feature, this motor must be used with the Elliott Model ELC110220 Electronic Torque Controller. Connect the power cord on the motor to one end of the included adapter cord and then connect the 7-pin connector on the adapter cord to the torque controller receptacle. The controller will automatically detect that the motor is 220V. (Note: The operating voltage must correspond with the voltage indicated on the motor's name plate. 99400-220 motors designed for 220V can be used with 240V as well.

Be sure to familiarize yourself with the ELC110220 Operating and Maintenance Instructions (TM-71).

## NOTICE

NOTICE: Before rotating the handle, read all documentation below. Failure to do so may result in actions that void the warranty. .

## Handle

To rotate the handle:

1. **Disconnect motor from any power source.**
2. Remove carbon brushes (reference pg. 10 "Brush Replacement").
3. Remove (4) front screws (Item 23).
4. **DO NOT separate the gearbox (Item 70) from the gearbox plate (Item 18). Doing this may void the warranty.**
5. Separate gearbox plate (Item 18) from motor housing (Item 12) by no more than what is needed for rotation (approximately 0.25").
6. Rotate the handle to desired position.
7. Replace (4) front screws to secure the gearbox plate to the motor housing.
8. Replace carbon brushes (reference pg. 10 "Brush Replacement").

# Troubleshooting Electric Rolling Motors

Symptom	Possible Causes	Solution	
<b>Motor won't run.</b>	Loose plug connections.	Ensure all plug connections are secure.	
	Motor voltage doesn't match power source voltage.	Ensure that motor voltage matches the voltage of the power source.	
	Torque controller is in "Auto" or "Assisted" mode & is waiting for additional input.	Check the torque controller dialog screen & enter info required.	
<b>Motor will not shut off at controller setting.</b>	Limit setting on the torque controller is set too high.	Recalculate or reduce limit setting.	
	Torque required exceeds motor capacity.	Set motor speed (if 2 or 4-speed) to lower speed or switch to larger motor.	
	Motor set at low speed setting (2-or 4 speed motors only).	Set motor to high speed setting.	
	Motor is too large for application.	Switch to a smaller motor.	
	Trigger switch needs repair.	Replace the trigger switch.	
	Motor needs assessed by repair specialist.	Have the motor serviced by an authorized repair specialist.	
<b>Motor runs hot.</b>	Motor is operating at high temperatures and is hot to the touch.	Run the motor outside of the tube in free speed for 3 to 5 minutes to increase motor air flow and decrease motor temperature. Ensure the air vents on the motor cap are rotated to the 12 o'clock and 6 o'clock positions.	
	Motor is operating at or above its max. amperage rating.	Set motor speed (if 2-or 4 speed) to lower gear or switch to larger motor.	
	Ambient temperature are high.	See Care & Maintenance on page 9.	
	Air supply is being obstructed.	Check motor's air vents for debris or obstruction. Ensure operator is not obstructing vents with hand during operation.	
	Motor needs assessed by repair specialist.	Have the motor serviced by an authorized repair specialist.	
<b>Motor will not auto-reverse.</b>	Loose plug connection.	Ensure plug connection to torque controller is secure.	
	Motor is not auto-reversible	Motor must be manually reversed.	
<b>Motor is losing power.</b>	Carbon brushes need replaced.	Replace brushes. See "Brush Replacement" on page 10.	
	Proper amperage is not reaching motor.	Ensure power cord is proper length and gauge.	



# Care & Maintenance

Environments with high ambient temperatures require closer attention to care and use. In order to achieve optimal motor performance consider the following:

- **Clean Power**—The use of a reliable, consistent power supply will help minimize voltage fluctuations that can be harmful to the motor.
- **Ambient Temperature**—As the ambient temperature rises, so does the need for cooling. When used in high ambient temperature conditions, operators should run the motor under no load for 10 to 15 seconds periodically during the shift to enable ambient air to pass through the motor and cool the internal parts. Frequency and duration of cooling periods are dependent on the ambient temperature. If using in conjunction with Elliott ELC110220, this practice will not adversely affect the performance of the controller. If the motor becomes hot to the touch, run the motor outside of the tube in free speed for 3 to 5 minutes to increase motor air flow and decrease motor temperature.
- **Cooling Motors**—In the event that conditions are so extreme that the cooling recommendation above is not sufficient, operators should consider implementing a multiple motor system where motors are run for a short period of time then allowed to rest while a secondary motor is put into service. Alternating motors in this manner will allow the motor to cool and avoid damage due to overheating.
- **Internal Operation Temperature**—The operating temperature of the internal components must not reach 284 degrees Fahrenheit (140 degrees Celsius).

To ensure years of reliable operation, follow these simple care and maintenance suggestions:

- Keep the motor clean and free of dirt and other contaminants.
- Do not allow contaminants inside the motor housing. Clean debris out of air vents using compressed air on a daily basis.
- As a best practice the brushes should be inspected approximately every 1,000 expansions. Check for different wear patterns or wear rates between the brushes, or severe breakdown of edges of the brush where it contacts the commutator. It is normal for the outside of the motor to get warm in a few minutes under typical usage. However, if the motor shows any signs of the temperature continuing to rise in particular too hot to touch, see “Ambient Temperature” above and replace the brushes. In each of these cases it is important to replace the brushes, they should not be reworked. When the brush lengths are .25” (6.35mm) or less, brushes need to be replaced. (Typically after 100 hours of use). Brushes should be replaced by a maintenance technician. They must be run in by a 20 minute idle run of the tool. Also, the condition of the commutator must be checked. In case of irregular coloring of the individual blades and surface crashes, send the tool to an authorized service center.



## **Environmental Protection**

### **Raw Material Recycling instead of Waste Disposal**

The components that make up this tool, as well as its packaging, are made of recyclable materials and should be disposed of in accordance with local rules and regulations.

# Brush Replacement

## **When To Replace The Carbon Brushes:**

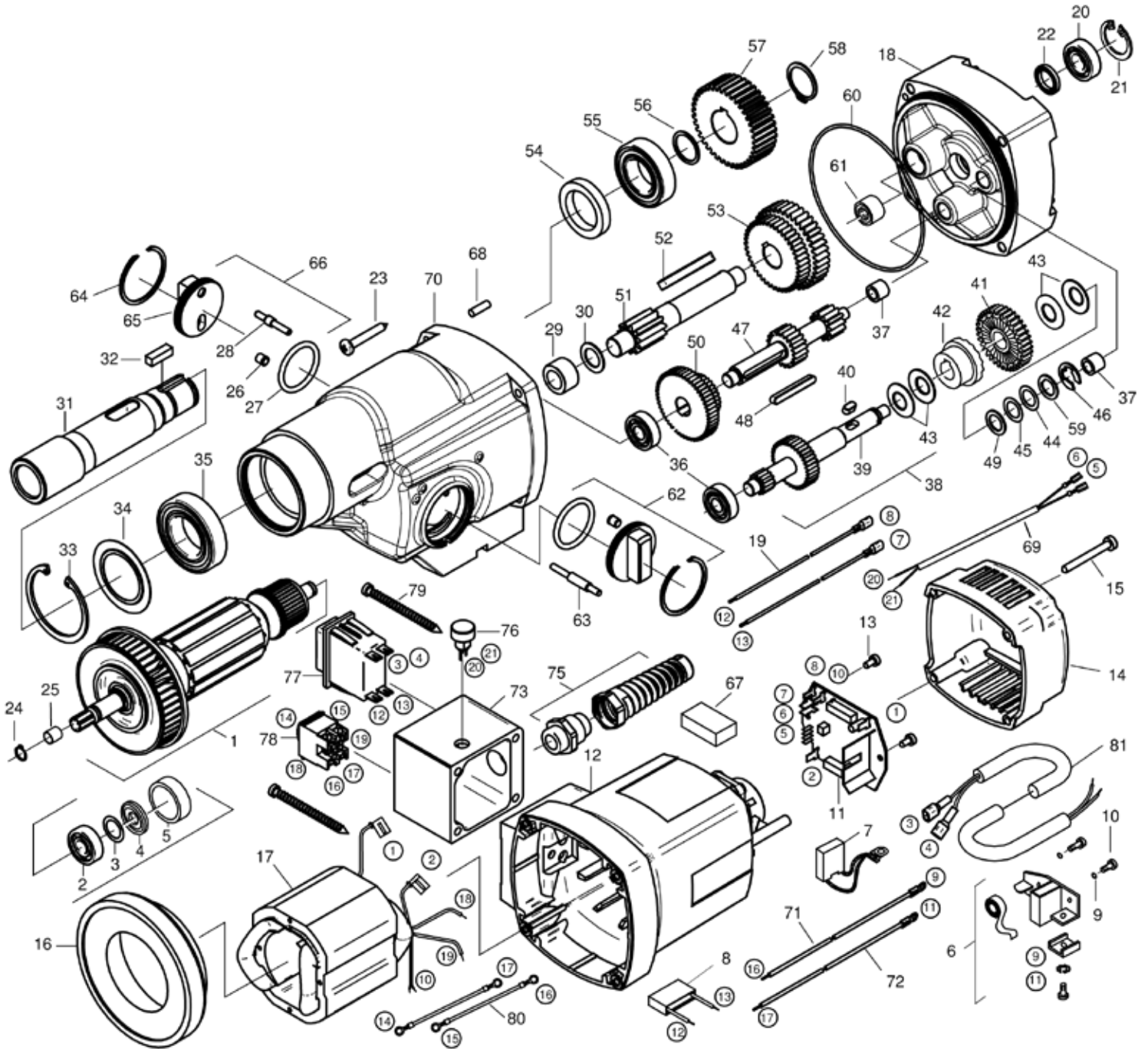
When the brush lengths are .25" (6.35mm) or less, brushes need to be replaced. Brushes are field-serviceable components and should be replaced by a maintenance technician.

- 1. Disconnect motor from any power source.**
2. Remove (4) back screws (Item 18) & remove motor cap (Item 17).
3. Lift up the flat spring to remove the carbon brush (Item 7) from the brush holder (Item 5).
4. Remove the screw & lock washer holding the wire terminal attached to the carbon brush & detach the carbon brush from the holder.
5. Attach the wire terminal of the new carbon brush with the screw & lock washer. (IMPORTANT: Ensure that the wire lead on the carbon brush terminal is under the contact washer).
6. Lift up the flat spring & insert the new carbon brush into the brush holder & release the flat spring to hold the carbon brush in place.
7. Repeat steps 2 thru 5 for replacing the carbon brush on the other side of the rotor complete (Item 1).
8. Replace motor cap (Item 17) and (4) back screws (Item 18). Be sure the air vents are located at the 12 o'clock and 6 o'clock positions (Exception: If handle is installed at the 6 o'clock position, then air vents will be located at the 3 o'clock and 9 o'clock positions.)

## **NOTICE**

NOTICE: Always remove carbon brushes before changing the handle position.

# 99400 Series Parts Diagram



# 99400 Series Parts List

Nr.	Description	Part Number	QTY	Nr.	Description	Part Number	QTY
1	Rotor Assembly	40-74643100	1	42	Coupling half	40-71540560	1
2	Deep Groove Ball Bearings 6000 2Z	40-80410021	1	43	Cup Spring 28/12,2x1	40-80200713	4
3	Seal 10x14x1	40-83000507	1	44	Shim 12/18x0,5	40-80200503	1
4	Magnetic Disk Assembly	40-7633J325	1	45	Shim 12/18x0,2	40-80200502	1
5	Bearing Cap	40-83000031	1	46	Lock Washer 9	40-80201361	1
6	Carbon Brush Holder Assembly	40-80201199	2	47	Intermediate Shaft 2	40-74641500	1
7	Carbon Brush Pair	40-80700021-2	1	48	Keyway A5x5x40	40-80200612	1
8	Suppression Capacitor	40-80500010	1	49	Pressure Washer 1	40-71540607	1
9	Corrugated Spring Washer B4	40-80201385	4	50	Cluster Gear 1	40-74641440	1
10	Self-Tapping Screw ZM4x12	40-80201180	4	51	Intermediate Shaft 3	40-74641510	1
11	PCB/Circuit Board	40-74522280	1	52	Keyway 6x6x50	40-80200610	1
12	Motor Housing	40-7455K201	1	53	Cluster Gear 2	40-74641450	1
13	Self-tapping Screw HC 4.2 x 9.5	40-80201269	2	54	Shaft Seal 30x42x7	40-83000071	1
14	Motor Housing Cap	40-80900082	1	55	Deep Groove Ball Bearing 6005 2RS	40-80410061	1
15	Tapping Screw HC4,8x45	40-80201267	4	56	Shim 25x0,1	40-80200512	1
16	Air Guide Assembly	40-73511141	1	57	Spindle Wheel	40-74554430	1
17	Stator Complete	40-74643150	1	58	Snap Ring 24/1,2	40-80201326	1
18	Gearbox Bearing Plate, Green	40-7455U610	1	59	Pressure Washer 2	40-71540606	1
19	Switch Braid	40-74555180	2	60	O-Ring 106x2	40-83000092	1
20	Deep Groove Ball Bearings 6201 LUZ	40-80410101	1	61	Needle Sleeve HK 1212	40-80420130	1
21	Snap Ring 32/1,2	40-80201351	1	62	Selector, Long	40-71641545	1
22	Shaft Seal 15x21x3 KEIV	40-83000042	1	63	Switching Pin, Long	40-71641542	1
23	Tapping Screw HC 5,5x80	40-80201227	4	64	Seeger Snap-Ring SB42	40-80201355	2
24	Snap Ring 12/1	40-80201321	1	65	Selector	40-71641540	2
25	Bearing Ring	40-80420160	1	66	Selector, Short	40-71641535	1
26	Spring Plunger	40-85000157	2	67	Filler	40-80600306	1
27	O-Ring 36x1,5	40-83000022	2	68	Grooved Dowel Pin 5x16	40-80200580	1
28	Switching Pin, Short	40-71641532	1	69	Control Wire	40-77314187	1
29	Needle Bearing RNA 4900	40-80420001	1	70	Gearbox, Black	40-7455U400	1
30	Needle Bearing Washer	40-71540517	1	71	Carbon Holder Braid 1	40-74555181	1
31	Working Spindle	40-7455U420	1	72	Carbon Holder Braid 2	40-74555182	1
32	Keyway B6x6x20	40-80200606	1		Side Handle (Not Illustrated)	40-71527260	1
33	Snap Ring 55/2	40-80201338	1		Butt Splice (Not Illustrated)	40-7227K23	1
34	Groove Ball Bearing Disk	40-71540426	1		Locking Flange (Not Illustrated)	40-71540330	1
35	Deep Groove Ball Bearing 6006 2RS	40-80410071	1		4.2 X 16 Screw (Not Illustrated)	40-80201271	2
36	Deep Groove Ball Bearing 6000	40-80410020	2				
37	Needle Sleeve HK 0810	40-80420110	2	78	Reversing Switch	40-80600103	1
38	Clutch Assembly	40-74643493	1		14 GA. Red Wire (Not Illustrated)	07131-6	8"
39	Intermediate Shaft 1	40-74641490	1	80	Interconnecting Wire	40-80600243	2
40	Key 5x5x10	40-80200600	1	81	Lead	40-7455K340	1
41	Clutch	40-74326550	1		Spacer (Not Illustrated)	99400-220S	1

# Technical Information

Rated Voltage:	220V / 240V (99400-220)
Rated Power Input (Watts):	2300
Frequency:	40 – 60 Hz
Max. Amperage:	20A (220V)
ELC110220 Limit Setting:	500 (220V)
Free Speed (No Load):	80 (1st Gear) / 130 (2nd Gear) / 360 (3rd Gear) / 570 (4th Gear)
Max. Torque (Ft.-Lbs. / N*m):	60 / 81.3 @ 500 RPM (High Gear) 203 / 275.2 @ 80 RPM (Low Gear)

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## **Dimensions:**

Length (Inches / mm):	21 / 533.4
Width (Inches / mm):	5.5 / 139.7
Height (Inches / mm):	14 / 355.6
Weight (Lbs. / Kg):	19.5 / 8.8

## **Noise Emission:**

Noise emission figures are based on DIN 45 649, part 2, DIN 45 635, part 21, and DIN EN 27 574 (ISO 7574).

- noise level ( $L_{WA_c}$ ) (115+3) dB re 1 pW  
working place-related emission figure ( $L_{pA}$ ) 105 dB per DIN 45635 – 21 – KL 2
- noise level ( $L_{WA}$ ) 107 dB re 1 pW  
working place-related emission figure ( $L_{pA}$ , cyc) 100 dB per DIN 45635.



## Contact Us

Elliott Tool offers a complete line of precision tube tools to meet your needs. Contact us or your local support.

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