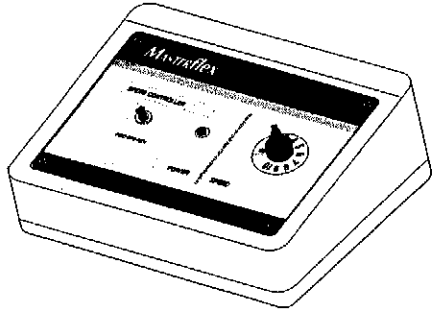
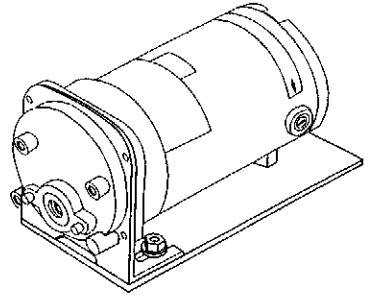
OPERATOR'S MANUAL

MASTERFLEX® L/S
LABORATORY STANDARD VARIABLE SPEED DRIVE SYSTEM

MODEL NO.
7553-70, 115V, 600 RPM
7553-80, 115V, 100 RPM
7553-75, 230V, 600 RPM
7553-85, 230V, 100 RPM





The drive/controller system provides variable speed drive capability for Masterflex L/S pumps. The controller also permits forward and reverse motor operation.

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WARNINGS/DANGER

Danger: ***High voltages exist and are accessible in the Drive/Controller. Do not remove cover.***

Warning: ***Disconnect the AC power input line cord before connecting the drive motor cable.***

Warning: ***No user serviceable parts are inside of this instrument. Refer servicing to your dealer.***

WARNING: PRODUCT USE LIMITATION

This product is not designed for, nor intended for use in patient connected applications; including, but not limited to medical and dental use and accordingly, has not been submitted for FDA approval.

INTRODUCTION

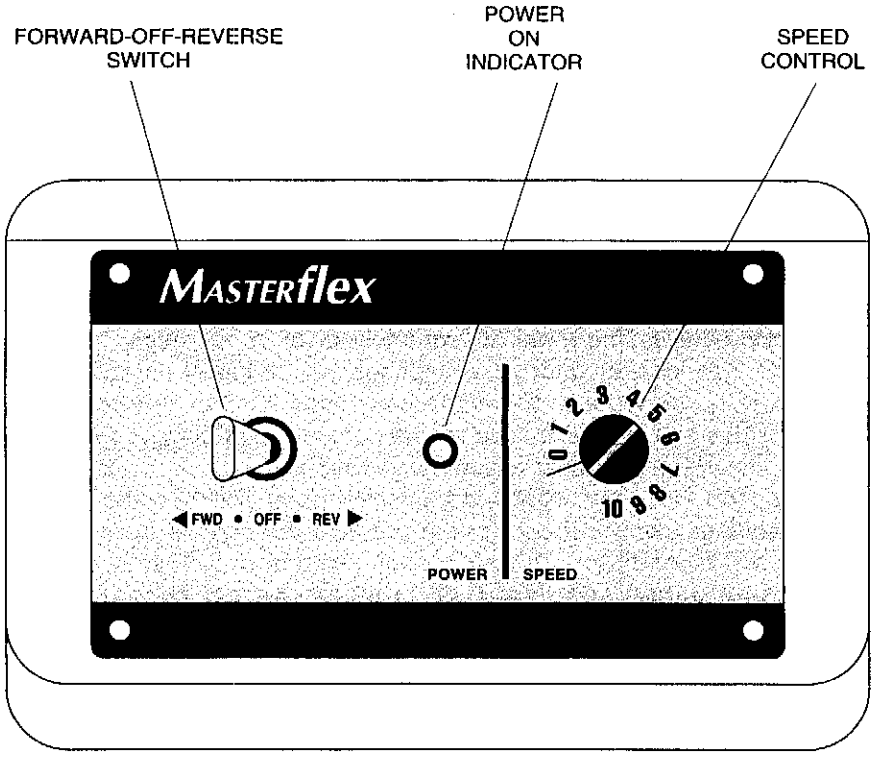
Each of these drive/controller systems incorporate a permanent magnet, 0.1 horsepower DC motor, designed for driving L/S (laboratory/standard) Masterflex pumps. The motor is extremely quiet in operation, has long brush life, has increased torque at high speeds, is totally enclosed, and permanently lubricated. The drive/controller system automatically compensates for changes in load torque demands. Utilizing an electronic control circuit, the controller assures accurate, dependable motor speed (flow) control, with "soft start" and smooth gradual acceleration to the speed setting. Motor current limiting protects the system in case of a locked rotor condition. Output circuit protection protects against inadvertent output shorting. Built-in motor current compensation minimizes speed drift with warm-up. Excellent speed regulation and improved line noise immunity, even with line voltage and load variations, is designed into the electronic control. Motor rotation (pump flow direction) is reversible.

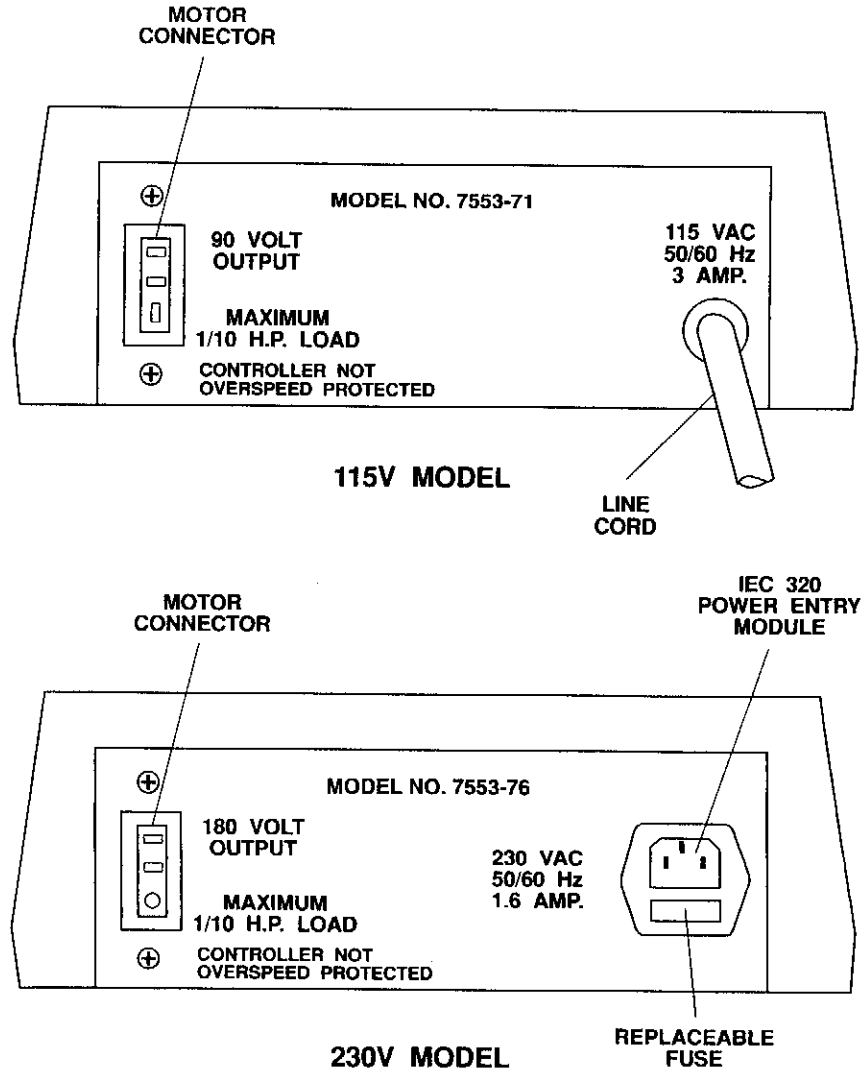
Drive Catalog Number	Motor RPM	Power Requirement*	No. of L/S Heads Accepted
7553-70	6 to 600	90 to 130 VAC	1 or 2
7553-75	6 to 600	190 to 260 VAC	1 or 2
7553-80	1 to 90	90 to 130 VAC	Up to 4
7553-85	1 to 100	190 to 260 VAC	Up to 4

* AC voltage can be either 50 or 60 Hz.

Included in this manual are Application, Description, Installation/Setup, Operation, Troubleshooting and Maintenance, and Specification Data.

READOUTS AND CONTROLS





CONTROLLER REAR PANEL

APPLICATIONS DATA

Each of the drive/controller systems incorporate a permanent magnet, 0.1 horsepower DC motor, designed for driving L/S Masterflex pumps. The motor shaft has a slotted end for positive mating with a Masterflex pump. (Refer to the Introduction table for the number of pumps that may be used with each drive/controller system.

DESCRIPTION

The motor, with mounting, is approximately 8 inches long, 4 inches wide, and 5 inches high. It is designed for bench mounting, with a 6-foot, 3-wire cable for connection to the controller unit. The 0.1 horsepower DC motor is totally enclosed and permanently lubricated. Over its speed range, each motor is free of pulsations and other erratic speed variations. It rotates in either the forward or reverse direction, based on the controller setting.

The controller enclosure, including top-mounted operator controls, is 7 inches long, 5 inches wide, and 3-1/2 inches high. The enclosure is a modular design, providing convenient control accessibility and easy motor cable connection. The 115V controller has a 6-foot, 3-wire, permanently attached line cord for connection to the power line. The 230V controller has a detachable 6-foot, 3-wire line cord. The controller power switch (FWD-OFF-REV) also controls the direction of motor rotation. The switch has a hesitation feature that requires a complete stop in the OFF position and release of pressure on the handle prior to changing motor direction. This prevents unintentional motor direction changes which could cause damage to the motor or controller and possibly disrupt the pumping operation. The speed control provides settings from 0 through 10, to aid in operator adjustment of the motor speed. Two threaded studs with acorn nuts are provided on the bottom of the controller for mounting the controller to an optional pivot mount bracket.

INSTALLATION/SETUP

The motor of the drive/controller system rests on four vibration isolator pads for installation on a bench, desk or table. The motor input signals are applied through a 3-wire cable with a keyed, 3-prong connector. The motor cable must be connected to the rear of the controller enclosure, before power is applied through the controller.

The controller is designed for installation on a bench, desk or table, but may also be rack mounted using the optional controller pivot mount bracket. The controller has a 6-foot, 3-wire, line cord for connection to the power line. The 230V controller comes with an IEC 320 power entry module and European cordset. See page 10 under replacement parts for other cordsets.

Caution: ***Be sure available power matches unit requirements. Units are either 115V 50/60 Hz or 230V 50/60 Hz.***

1. Select pump head(s) and tubing using the following table.

Note: The following table shows the number of Masterflex L/S pump heads which can be used depending upon tubing size and flow rates.

Catalog Number	Motor RPM	No. of L/S Heads Accepted	Power (VAC) 50/60 Hz	Flow Ranges in ml/min for Standard and Quick Load® Heads					
				TUBING SIZE					
				13	14	16	15/25	18	17/24
7553-70 7553-80	6-600 6-600	1 or 2 1 or 2	115 230	0.36 to 36	1.3 to 130	4.8 to 480	10 to 1000	23 to 2300	17 to 1700
7553-75 7553-85	1-100 1-100	up to 4 up to 4	115 230	.06 to 6	0.21 to 21	0.8 to 80	1.7 to 170	3.8 to 380	2.8 to 280

2. Check that the FWD-OFF-REV switch on the controller panel is in the OFF position.

Warning: Disconnect the AC power input line cord before connecting the drive motor cable.

3. Connect the drive motor cable to the receptacle on the rear side of the controller.
4. Connect the AC power input line cord to the AC receptacle.
5. Set speed control to zero.
6. This completes the basic connections.

OPERATION

After Installation/Setup is complete, the operator must position the FWD-OFF-REV switch to either FWD or REV to reverse motor rotation. The POWER indicator glows green, when the switch is in either the FWD or REV position.

The operator must then turn the SPEED control clockwise to a setting that provides the desired flow rate. Allow about 20 minutes run-in time to allow for warm-up drift to become minimal.

IMPORTANT: Before *changing* pump direction, always turn the SPEED SET knob to *zero*. This will prevent excessive current surges from harming the motor or controller and minimize tubing rupture.

TROUBLESHOOTING & MAINTENANCE

Troubleshooting

SYMPTOM	CAUSE	REMEDY
Motor Does Not Rotate, when switched to FWD or REV. POWER Indicator Does Not Glow.	Defective line cord or fuse.	1. Check that unit is plugged into a live line. 2. On 230V units only, check line cord for continuity and replace if defective. 3. On 230V units only, check fuse and replace if defective. 4. On 115V units, return for servicing.
Motor Does Not Rotate, when switched to FWD or REV. POWER Indicator glows. SPEED control setting is greater than 0.	Defective Motor or Controller.	1. Place the FWD-OFF-REV switch in the OFF position. 2. Disconnect the AC line cord from the AC receptacle. 3. Check the drive motor cable connector on the rear of the controller and insert the connector fully into the controller receptacle. 4. If motor still does not rotate, disconnect the AC line cord from the AC receptacle. Disconnect the drive motor cable connector on the rear of the controller. 5. Replace motor, with similar unit. Reconnect the drive motor cable connector on the rear of the controller. Reconnect the AC line cord to the AC receptacle. Move the FWD-OFF-REV switch to the desired setting. 6. If motor still does not rotate, disconnect the AC line cord from the AC receptacle. Disconnect the drive motor cable connector on the rear of the controller. 7. Replace controller with similar unit. Reconnect the drive motor cable connector on the rear of the controller. Reconnect the AC line cord to the AC receptacle. Move the FWD-OFF-REV switch to the proper setting.

Motor Brush Check/Replacement

Note: Brushes should be checked every 6 months or 2000 operating hours.

1. Place the FWD-OFF-REV switch in the OFF position.
2. Disconnect the AC line cord from the AC receptacle.
3. Disconnect the drive motor cable from the receptacle on the rear of the controller.
4. Carefully unscrew each brush holder on opposite sides of the motor. Withdraw the brush, and examine it for wear.

Note: Replace both brushes, if either brush is less than 0.300" long from base to point. The replacement brushes (set of 2) is P/N 7520-04.

5. Screw brushes into brush holder on each side of motor.
6. Connect motor to rear panel connector on controller.
7. Connect controller to primary power source.

Fuse Replacement

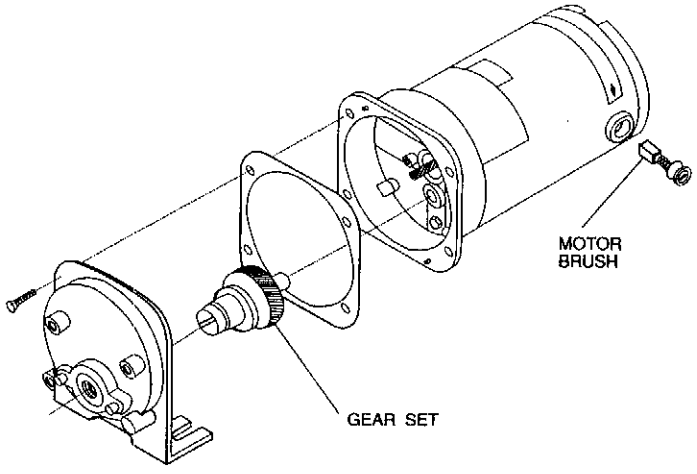
Note: 115V units have an internal fuse. Unit must be returned for servicing.

1. On 230V units, place the FWD-OFF-REV switch in the OFF position.
2. Disconnect the AC line cord from the rear of the unit.
3. Remove and check the fuse located on the rear panel below the AC power connector and replace if defective.
4. Reconnect AC line cord.

Gear Replacement

The motor gears are located in the housing on the front of the motor. Two different gear sets are available. One provides a maximum output speed of 100 RPM, the second provides a maximum output speed of 600 RPM. To change or replace the gear set proceed as follows:

1. Disconnect motor cord from controller.
2. Remove motor from base plate by removing the two hex head bolts, flat washers, lock washers and hex nuts.
3. Place motor on flat surface and remove the four phillips head screws attaching the front cover.
4. Lift off cover and gasket and remove the gear.
5. Install new gear set following instructions supplied with the replacement gear set.
6. Reattach cover and gasket with the four phillips head screws.
7. Reattach motor to the base plate with the two hex head bolts inserted through the base plate and secured with the flat washers, lock washers and hex nuts.
8. Connect motor to controller.



GEAR SET AND MOTOR BRUSH REPLACEMENT (TYPICAL)

Cleaning the Drive/Controller System

Keep the Drive Motor housing and the Controller enclosure clean by using a mild detergent. Never immerse or use excess fluid.

Replacement Parts

The following parts are user replaceable:

Description	Part Number
Motor, 600 RPM, 115V	7553-02
Motor, 600 RPM, 230V	7553-04
Motor, 100 RPM, 115V	7553-12
Motor, 100 RPM, 230V	7553-14
Controller, 115V	7553-71
Controller, 230V	7553-76
Motor IP54 Upgrade Kit	7553-03
Motor Brushes (set of 2)	7520-04
Cordset - European (230V units)	50001-70
Cordset - British (230V units)	50001-72
Cordset - Swiss (230V units)	50001-74
Cordset - Italian (230V units)	50001-76
Cordset - NEMA (230V units)	50001-78
Fuse - International 5 x 20 mm (230V units)	77500-11
Gear Kit 600 RPM	7553-06
Nylon Gear Only (600 RPM)	7553-09
Gear Kit 100 RPM	7553-08
Speed Control Knob	B-1083-0035

Contact your dealer if you have service needs.

Return of Items

Authorization must be obtained from your dealer before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned.

SPECIFICATIONS

Maximum Speed:	
Model 7553-70 and 7553-75	600 RPM
Model 7553-80 and 7553-85	100 RPM
Minimum Speed:	
Model 7553-70 and 7553-75	6 RPM
Model 7553-80 and 7553-85	1 RPM
Operating Temperature:	0°C to 40°C
Storage Temperature:	-45°C to 65°C
Chemical Resistance:	Exposed Material is paint, plastic, aluminum, and vinyl
Line Voltage Limits:	90-130 V or 190-260 V, 50/60 Hz
Max. and Typical Power:	
Motor:	0.1 horsepower
Controller:	6 watts, max. dissipation
Max. Current:	
115V Units:	Controller: 2.2 amps, shorted output conditions
230V Units:	Controller: 1.2 amps, shorted output conditions
Torque:	
600 RPM Units:	168 oz.-in.
100 RPM Units:	360 oz.-in.
Speed Regulation:	± 1% Line Regulation ± 2% Load Regulation ± 10% Warm-Up Drift
Enclosure Rating:	IP53
Motor Rating:	IP21
Humidity	0% to 90% non-condensing
Display:	Green LED