

07575-00 pump drive.

OPERATING MANUAL:
PUMP DRIVE

MODE D'EMPLOI:
**ENTRAÎNEMENT DE
POMPE**

BETRIEBSANLEITUNG:
PUMPENANTRIEB

MANUAL DE FUNCIONAMIENTO:
MOTOR DE BOMBA

MANUALE DI ISTRUZIONI:
**UNITÀ DI
CONTROLLO POMPA**

Model No.
N° de modèle
Modellnummer
Número de modelo
Modello n°

07575-00



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Edition 02

EU Declaration of Conformity

Name of Apparatus: Masterflex[®] Digital Console L/S[®] Pump Drive

Model Number: 07575-00

Description of Apparatus: Digital-controlled, variable speed, peristaltic pump motor drive with remote I/O. Used with pump head and tubing to pump fluids.

Barnant Company declares that the above model is in conformity to the following harmonized standards and directives:

Applicable Directives	Applicable Specifications	Manufacturer's Report Number
73/23/EEC 93/68/EEC	EN61010-1/A2:1995	TR0389
89/336/EEC 92/31/EEC 93/68/EEC	EN61326-1/A2:2001	TR0390

The last two digits of the year in which the current configuration of the above model was assessed per the Low Voltage Directive is: 03.

Manufacturer: Barnant Company Division
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Manufacturer's Signature:



Scott Akins
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30 June 2003

Date

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SAFETY PRECAUTIONS

DANGER: *High voltages exist and are accessible in the Console Drive. Use extreme caution when servicing internal components.*



WARNINGS: *Tubing breakage may result in fluid being sprayed from pump. Use appropriate measures to protect operator and equipment.*



Turn drive off before removing or installing tubing. Fingers or loose clothing could get caught in drive mechanism.

CAUTIONS: *Power must be turned off before connecting the external remote control cable to prevent damage to the drive.*



Do not stack drives. Keep 3” minimum distance around and above drive for proper cooling.



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. If drive is used in a manner not specified in this manual the protection provided by the equipment may be impaired.

INTRODUCTION

The Console Drive controls the speed of Masterflex® L/S® pump heads to provide flow rates from 0.10 to 3400 mL/min or 0.001 to 54 gallons/hr.

Mount up to 2 Masterflex® L/S® pump heads and all Masterflex-compatible pump heads.

CONTROL/DISPLAY FUNCTIONS

Press keys to activate function. Use INC/DEC (▲, ▼) arrow keys to correct/change a flashing display. Press any key to enter new values.

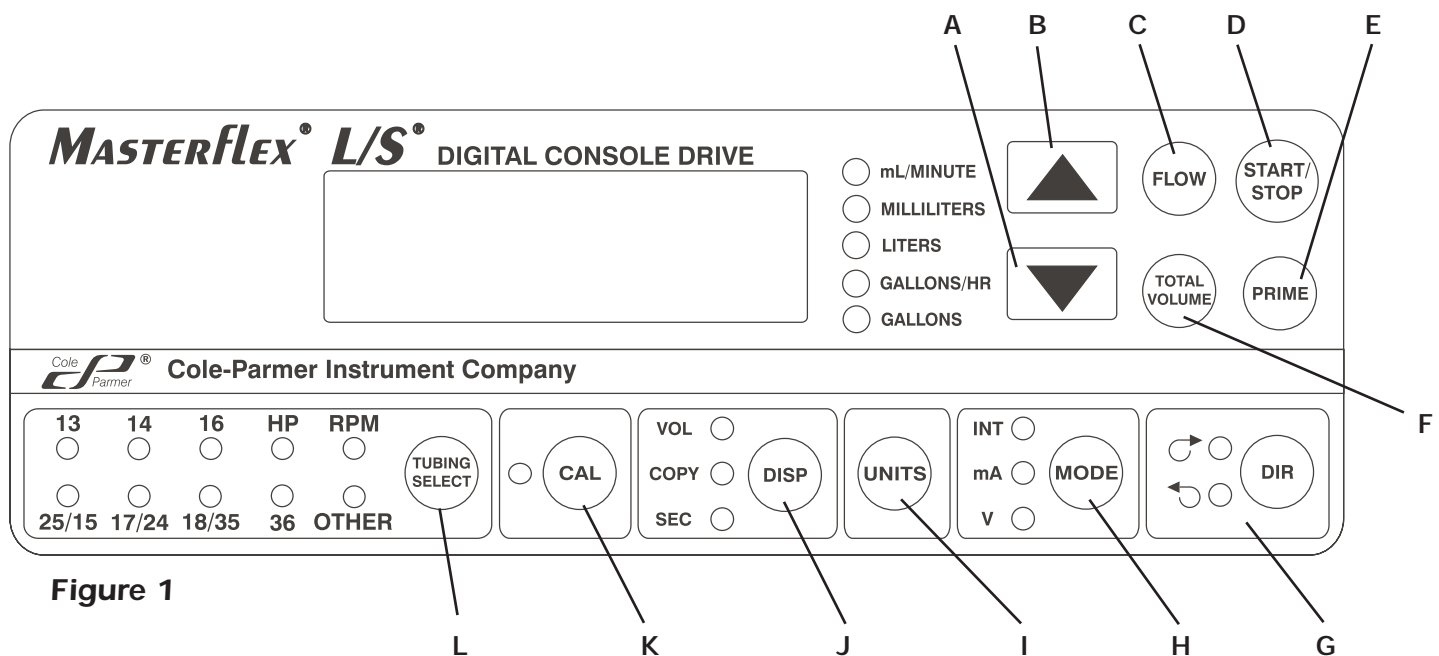


Figure 1

- A. DOWN ARROW (DECREMENT)**—Decrease value of a flashing display.
- B. UP ARROW (INCREMENT)**—Increase value of a flashing display.
- C. FLOW CONTROL**—Set flow rate for selected tubing size. To change flow rate, press ▲ or ▼ arrows. (If pump is running, its speed will change with new settings.)
- D. START/STOP**—Start/Stop motor.
- E. PRIME**—Run pump at full speed to fill or clear lines.
- F. TOTAL VOLUME**—Display cumulative dispensed volume.
- G. DIRECTION**—To change motor direction.
- H. MODE SELECT**—INT for internal control; mA for remote current control; V for remote voltage control.
- I. UNITS**—Select between metric (milliliters and liters) and English (U.S. gallons) displayed units.
- J. DISPENSE/COPY**—Select dispensed volume, copy volume, or the dispense/copy interval.
- K. CAL CONTROL**—Refine built-in calibration using a measured volume.
- L. TUBING SELECT**—Select tubing size.

SETUP AND DRIVE OPERATION

1. Mount pump head and load tubing (see pump head manual).

NOTE: The pump head may be oriented in any of four (4) positions, 90° apart. Rotation is accomplished by removing and reinstalling the front plate, to which pumps are mounted. See “Troubleshooting and Maintenance, Shaft Seal Inspection” for directions.

2. Turn drive on and select tubing size by pressing “TUBING SELECT.”

NOTE: If CAL LED is lit, that tubing size has been previously field calibrated. If LED is not lit, the drive is operating with the built-in factory calibration. To clear a field calibration, press and hold the CAL key until the CAL light goes out. This will take about 3 seconds. To recalibrate for better accuracy, see Calibration section.

3. Select MODE (INT, mA, V).
4. Select motor DIRection (CW or CCW).
5. PRIME and CALibrate the pump (if required).
6. Press FLOW key and watch display to set the flow rate with INC/DEC (▲, ▼) keys.
7. Press START/STOP key to begin pumping.

NOTE: While in INTernal mode, drive will not restart automatically after a brownout or powerout condition unless operator changes default setting. If speed is being controlled by an external signal, drive will automatically start with a non-zero speed command in power-up.

AUTOMATIC START ENABLE/DISABLE (Internal mode only)

Press and hold START/STOP on power-up. After five (5) seconds, display will change to all dashes. Then, while holding START/STOP, press PRIME five (5) times. Display will flash “ON” or “OFF”. Use INC/DEC (▲, ▼) arrow keys to enable or disable automatic start option. Press any other key to exit. When “ON” is selected, drive will start automatically at power-up if it was “ON” when powered down.

CALIBRATION

Use only MASTERFLEX precision tubing with MASTERFLEX pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

1. Select correct tubing size and flow rate.
2. Press CAL; calibration volume appears.
3. Press START/STOP; the pump will use its stored memory to dispense the specified calibration sample quantity. The pump will stop automatically.
4. Weigh/measure the sample.
5. Use INC/DEC (▲, ▼) arrow keys to correct the flashing display.

NOTE: If the adjusted calibration is too great, “Err” will appear in the display. If this occurs, press the CAL control and repeat the calibration procedure. The microprocessor will retain one special calibration value per tubing size, even when power is turned off. The next calibration will replace the existing value.

6. Press TUBING SELECT to exit the calibration cycle.

MAXIMUM FLOW RATE (“OTHER” Tubing)

1. To set the maximum flow rate for non-standard pump heads or “OTHER” tubing sizes, press CAL, then FLOW. The maximum flow rate will then flash on the display.
2. Use INC/DEC (▲, ▼) arrow keys to change flow rate.
3. Press TUBING SELECT to exit

DISPENSE/COPY

A first press of the DISP key results in the last entered dispense volume being displayed. The VOL annunciator will illuminate and flash. The INC/DEC (▲, ▼) keys are used to change the dispense volume, if desired. The START/STOP key then initiates delivery of the set volume. The amount remaining to be dispensed will be displayed during countdown. Resetting cumulative dispensed volume can be done by pressing and holding the TOTAL VOLUME key until zero is displayed (3 seconds). Display flashes “99999” when cumulative volume is greater than 99999. The dispense function is exited by the FLOW key.

A second press of the DISP key causes the COPY annunciator to illuminate and flash. The START/STOP key is then used to deliver the desired volume without the need to know the volume in specific units. A third press of the DISP key enters the volume dispensed. The COPY annunciator stops flashing. The START/STOP key is then used to initiate delivery of the copied volume. The number of copies dispensed is displayed after each dispense. The maximum number of copies is 99999. The START/STOP key is used to pause the copy dispense during dispensing; copy dispense can then be continued using the START/STOP key.

A fourth press of the DISP key results in the last entered dispense interval being displayed. The SECONDS annunciator will illuminate and flash. The INC/DEC (▲, ▼) keys are used to change the time interval between dispenses, if desired, from 0 to 99999 seconds. The START/STOP key then initiates delivery for the set volume, with the drive automatically initiating a new dispense after each time out. The remaining time will be displayed during countdown. The START/STOP key is used to stop the dispense cycle. A time of 0 seconds (default) will require initiation of each dispense through the START/STOP key or the Remote START/STOP contact closure. Pressing the DISP key a fifth time exits this mode.

KEYPAD LOCKOUT ENABLE/DISABLE

Press/hold FLOW. After five (5) seconds, display changes to all dashes. While holding FLOW, press PRIME five (5) times.

REMOTE CONTROL

Selectable input (0–20 mA, 4–20 mA, 0–10V DC)

±0.5% linearity control

±50V common mode range with earth ground

START/STOP; CW/CCW; PRIME via contact closure

REMOTE CONTROL SETUP

1. Place the power switch in the off position.

CAUTION: *Power must be turned off before connecting the external remote control cable to prevent damage to the drive.*



2. Connect the cable from the external remote control to the mating receptacle on the rear panel.

3. Select type of remote control input and output required as follows:

- a. Press and hold the MODE control while turning the power switch to the on position. After two seconds, release the MODE control. The initial display will show: “inP”. After two seconds, the display shows either 0–20 or 4–20.

NOTE: Press the INC (▲) or DEC (▼) arrow keys to select between 4–20 and 0–20 for current loop control.

- b. Press the MODE control again. The initial display will show: “out”. After two seconds, the display shows either 0–10, 0–20, or 4–20.

NOTE: Press the INC (▲) or DEC (▼) arrow keys to select between 4–20, 0–20, or 0–10 for current loop or voltage output.

4. Press the MODE control to select mode of operation. The LEDs indicate the selected mode. Select either mA or V.

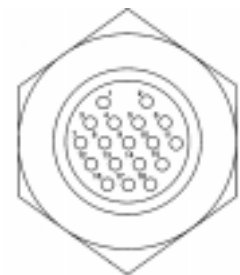
NOTE: If using only remote START/STOP, PRIME and/or CW/CCW, the MODE control can be set to any of the three positions.

5. To adjust the voltage or current scaling for other than zero to full scale, Press and hold the MODE key while pressing the FLOW key. This display will show "LO" for 2 seconds and then a flow rate. Use the INC/DEC (▲, ▼) arrow keys to set the minimum control level. Press the FLOW key again. The display will show "HI" for 2 seconds and then a flow rate. Use the INC/DEC (▲, ▼) arrow keys to set the maximum control level. Press any other key to exit. The same scaling will be used for both input and output levels.

NOTE: Tubing size should be selected before adjusting the voltage or current scaling.

To provide sufficient hysteresis between minimum speed and off, a 0.2 mA and 0.1 V offset is added to the current and voltage inputs and outputs as shown in the following table. This offset is only added when the input/output scaling is set with a minimum speed of zero (default)

Speed (rpm)	4-20 mA In/Out	0-20 mA In/Out	0-10 V In/Out
0	4-4.2 mA	0-0.2 mA	0-0.1 V
1	4.2263 mA	0.233 mA	0.1165 V
600	20 mA	20 mA	10V



07575-00

NOTE: Colors are those of Remote Cable 77300-32.

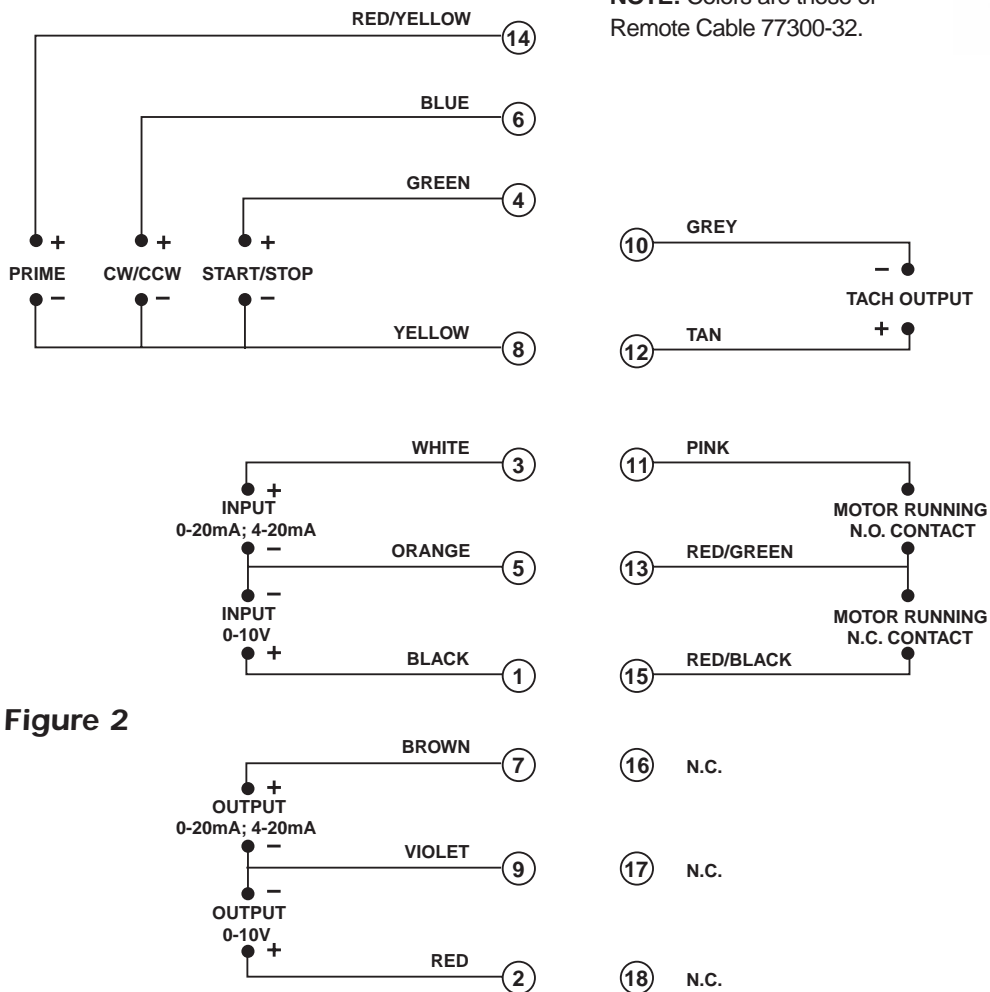
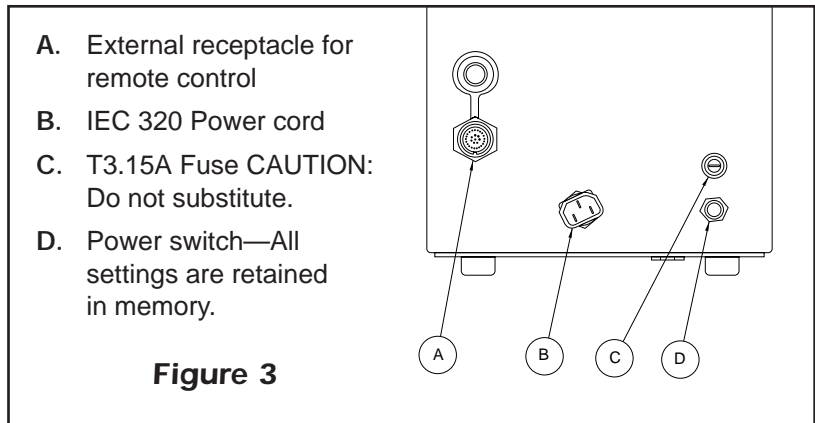


Figure 2

TROUBLESHOOTING AND MAINTENANCE

FUSE REPLACEMENT

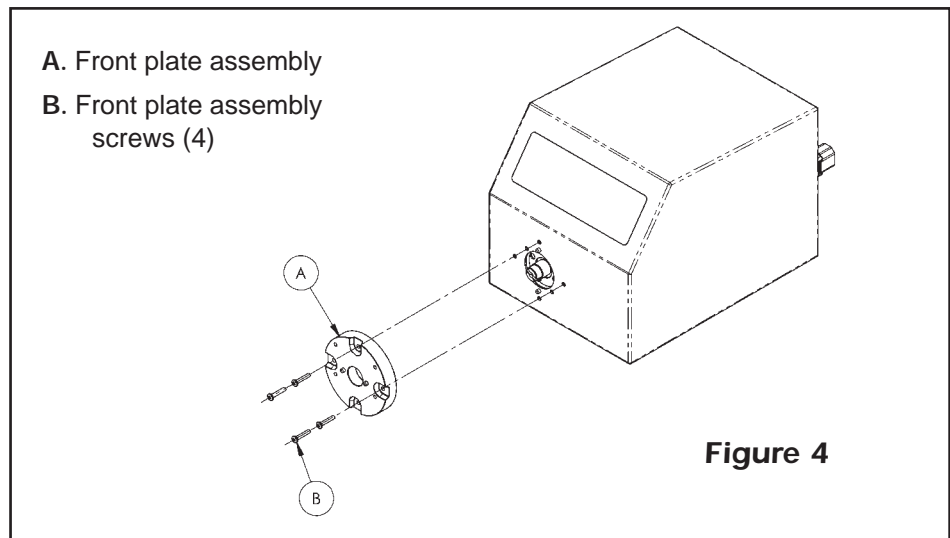
1. Place the power switch in the off position.
2. Disconnect the AC power input line cord from the attached line and receptacle.
3. Remove and check the fuse and replace if defective
4. Reconnect the AC power input line cord to the receptacle.



SHAFT SEAL INSPECTION

1. Remove any pump(s) attached to the front of the drive. Clean any foreign material from the outside diameter of the drive shaft.
2. Remove the (4) screws (Item B) that hold the front plate assembly (Item A) to the drive, and pull the front plate assembly off the drive. #8-32 screws may be installed in the pump-mounting holes to provide handles for pulling the plate assembly off. Retain Item B screws for Step 8. DO NOT substitute other screws.

3. Turn the front plate over so that the seal side is visible. Wipe the elastomeric seal lips with a clean cloth to remove any grease and foreign material.
4. Inspect the elastomeric seal lips for tears or cuts or missing material. If any of the mentioned conditions exist, replace the seal assembly using the 07575-01 replacement seal kit.



5. Wipe the exposed part of the drive shaft with a clean cloth. Wipe from the drive outward, to remove all grease and foreign matter.
6. Inspect the shaft surface in the area touched by the seal. Look for a rough finish, or grooves parallel to the shaft length. If the shaft end is worn or damaged, as described above, replace the gear and shaft with the 07575-02 kit. A polished groove, concentric to the outside of the shaft, is not a defect, as long as the groove is no more than 0.002 inches deep.
7. Prior to re-assembly, re-lubricate the shaft and the seal with the food-grade lubricant provided with the unit. CAUTION: Do not contaminate the lubricant in the container, on the shaft or on the seal with foreign material. Failure to observe this precaution may result in damage to the seal and premature failure of the seal.
8. Slide the front plate assembly back over the shaft and onto the locating pins, in the orientation desired. (4 configurations, each 90 degrees of rotation apart, are possible). Reinstall the 4 screws, removed in Step 2 above. CAUTION: No foreign matter should be allowed under the gasket on the back of the front plate or under the heads of the screws. Failure to observe this precaution may result in leakage during washdown of the drive.

TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
<p>A. Motor does not rotate. Display does not light.</p>	<p>A. No power.</p>	<ol style="list-style-type: none"> 1. Check fuse and replace if defective (Fig. 3). 2. Check that unit is plugged into a live line. 3. Check connection of power cord. 4. Check the line cord for continuity and replace if defective. 5. Return for servicing.
<p>B. Motor does not rotate. Display lights.</p>	<p>B1. Defective remote control.</p>	<ol style="list-style-type: none"> 1. Place power switch in off position. 2. Check that remote cable connector is inserted fully into the receptacle (Fig. 2 and 3) 3. If motor still does not rotate, select INTernal with the MODE control and press the START/STOP control (Fig. 1). 4. If the motor rotates, replace the remote control with similar unit. If motor does not rotate, return drive for servicing.
	<p>B2. MODE control not properly set.</p>	<ol style="list-style-type: none"> 1. Check that the MODE control is set to INT for operation with front panel control or to mA or V for operation with remote control (Fig. 1). 2. If motor still does not rotate, return for servicing.

Troubleshooting continued on page 10.

TROUBLESHOOTING (Continued)

If an **error message** is displayed, refer to the following list for possible corrective actions you can take. If these do not correct the problem, contact your dealer.

ERROR MESSAGE	CAUSE	REMEDY
"Err 2"	Motor over-speed	<ol style="list-style-type: none"> 1. Clear by pressing any key. 2. Check for proper tube loading and pump operation. 3. Return unit for repair if the error persists.
"Err 3" "Err 5" "Err 12"	Overload	<ol style="list-style-type: none"> 1. Clear by pressing any key. 2. Check for proper tube loading and pump operation. 3. Return unit for repair if the error persists.
"Err 7"	Bad data. Operator parameters set to default values.	<ol style="list-style-type: none"> 1. Clear by pressing any key. 2. Reprogram operator parameters. 3. Return unit for repair if the error persists.
"Err 10" "Err 11"	Voltage out of range	<ol style="list-style-type: none"> 1. Clear by pressing any key. 2. Check that AC line voltage is within specified voltage ranges. 3. Return unit for repair if AC line voltage is correct and the error persists.
"Err 14"	Over temperature	<ol style="list-style-type: none"> 1. Check for heat sources or obstructions to cooling. 2. Check for proper tube loading and pump operation. 3. Allow unit to cool. Clear by pressing any key. 4. Return unit for repair if no cause for overheating is found and the error persists.
All other errors	Internal error or failure.	<ol style="list-style-type: none"> 1. Clear (if possible) by turning power off and on. 2. Return unit for repair if the error persists.

CLEANING

Keep the drive enclosure clean with mild detergents. Do not immerse.

REPLACEMENT PARTS & ACCESSORIES

Description	Part Number	Description	Part Number
Fuse—T3.15A 5 x 20 mm	77500-25	Footswitch	07595-43
Hand-held remote control	07592-83	Remote control cable, 25 ft (7.62 m)	77300-32
Replacement Seal Kit	07575-01		
Replacement Gear and Shaft Kit	07575-02		

SPECIFICATIONS

Output:

Speed:	1 to 600 rpm
Torque output, Maximum:	
Continuous	180 oz-in (13 kg•cm)
Start-up	540 oz-in (39 kg•cm)
Speed regulation:	
Line	±0.25% F.S.
Load	±0.25% F.S.
Drift	±0.25% F.S.
Display:	Five-digit, seven-segment LED
Remote outputs:	Voltage speed output (0–10V DC @ 1 kΩ min) Current speed output (0–20 mA or 4–20 mA @ 0–600 Ω) Tach output (TTL, 10 to 6000 Hz, 50% duty cycle 10 Hz/rpm) Motor running output (N.O. & N.C. contact closure, 1A @ 28V AC/DC)

Input:

Supply voltage limits:	Dual voltage—Automatically selected 90 to 130 Vrms @ 50/60 Hz, or 200 to 260 Vrms @ 50/60 Hz
Current, max.:	2.2A @ 115 Vrms, or 1.1A @ 230 Vrms
Remote Inputs:	START/STOP, CW/CCW, PRIME (Contact closure) Voltage input (0–10V DC @ 10 kΩ) Current input (0–20 mA or 4–20 mA @ 250 Ω)

Construction:

Dimensions (L x W x H):	14.0" x 9" x 9.3" (35 cm x 23 cm x 24 cm)
Weight:	22 lb (10 kg)
Enclosure Rating:	IP 66 per IEC 60529/NEMA 4 X - indoor use

Environment:

Temperature, Operating:	0° to 40°C (32° to 104°F)
Temperature, Storage:	–25° to 65°C (–13° to 149°F)
Humidity (non-condensing):	10% to 100%
Altitude:	Less than 2000 m
Pollution Degree:	Pollution Degree 3 (Indoor use—sheltered locations)

Chemical Resistance: Enclosure is 316 stainless steel

Compliance:

UL508C, CSA C22.2, No. 14
(For CE Mark):
EN61010-1 (EU Low Voltage Directive) and
EN61326-1 (EU EMC Directive)

WARRANTY

Use only MASTERFLEX precision tubing with MASTERFLEX pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

The Manufacturer warrants this product to be free from significant deviations from published specifications. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part, as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

The warranty period for this product is noted on the Warranty Card.

PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

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