Micro Interface Design

MIDEXX OPERATING MANUAL

Peristaltic or Positive Displacement
Metering Pump Controller

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CE

WARNING!

Do not remove cover!

Operators should never attempt to service the components inside the unit. To avoid electric shock refer servicing to qualified personnel!

Failure to follow the correct cable connection procedure will result in damage to the circuit board, and voids the warranty!

Please check the labels on the Midexx unit and read the manual before connecting any cables!

MIDEXX

CONTENTS:

INTRODUCTION AND FEATURES

MIDEXX is an easy to use plug and play self-contained liquid color pump system. Operation is possible in both volumetric and gravimetric modes. The motor utilizes stepper technology thus no gearbox is required which results for weight savings on the unit and provides a couple of key advantages in operation. Midexx can pump within an accuracy range of 0.05 grams and features an injection recovery time as fast as 0.5 seconds.

The enclosure is made of heavy duty anodized aluminum. The metal coupling connects different types of pump heads to the stepper motor. The four-line LED display, numerical keypad and control keys combine to create a simple and user friendly interface.

MIDEXX CONTROLLER CONSISTS OF

1. Controller box
2. Power, Signal cables
3. USB male to male cable
4. Universal pump mounting flange
5. Motor coupling
6. Operational Manual

ACCESSORIES & PUMP HEADS

A variety of accessories are available

Container Holder

MID-CH is a 20 liter container holder, it enables fast color changes and very small waste of colorant. It will accommodate both pail and bag in the box containers.

Peristaltic Pump

MID-15 is an aluminum peristaltic pump head with three stainless steel rollers, which provides high levels of strength and durability as well accuracy and precision. The hose replacement mechanism employs a quick separation structure, this allows for very quick and easy tube replacement (i.e. color changes). Only recommended for usage with MID specified tubing.

Progressive Cavity Pump

Our line of progressive cavity pumps can offer minimum flow rates as low as 0.001 L/min and maximum flow rates as high as 1.50 L/min thusly ensuring feasibility for a wide spectrum of applications. Applications can range from small-flow conveying to large-flow extrusion.

Extrusion Cable

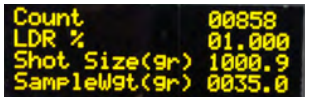
Allows the Midexx/Midexx Gravimetric to be used with extrusion machines that provide outputs in the range of 0-10 V.

CONTROL SWITCHES AND INDICATORS

The front panel contains all of the switches and LED's except for the main power ON/OFF switch which is located at the back with the main power plug connection.

Power ON/OFF

Upon Power up the unit will run through a self diagnostic routine. The first screen that comes up will contain the model, the serial number and the version of software for the unit. This first screen will last a few seconds and is followed by the operating screen indicating that the controller is ready to run.



Start/Stop

This allows the unit to begin operation. The previous information entered into the unit is assumed to be the required settings, thusly once the START button is pushed the START LED will remain lit and operation will begin on those settings.

Forward/Reverse (Priming controls)

This allows the unit to be primed by manually pressing the FORWARD or REVERSE buttons. Pressing the FORWARD button will light up the FORWARD LED and the controller is programmed to run at a fixed RPM for 1 minute or until the STOP button is pressed. For the REVERSE mode the REVERSE button must be held.

Numerical Keypad

To enter new values the "Up" or "Down" arrows can be used to choose a value. The numeric keypad can also be used to enter a value. Upon pressing enter the value will be saved in the Midexx memory. If an incorrect value is entered the "Up" and "Down" buttons can be used to retrieve the last value that was saved.

Calibrate

This allows the unit to be calibrated automatically. In order to be able to calibrate, the unit must be in STOP mode. Once the pump has been primed and all the tubing is full (no air gaps) you can calibrate the pump by collecting a sample weight. For better accuracy multiple samples should be taken and the average weight will be considered as the sample weight.

Calibrate Sequence

1. Press CALIBRATE button.
2. CALIBRATE LED will be lit and START LED will flash.
3. Place a container under the outlet tube.
4. Press the START button. The CALIBRATE LED will flash and the motor will run for a preset time of 30 seconds at a preset RPM.
5. When the motor stops running, weigh the sample collected and enter this value in the "Sample Weight" field using the onboard keypad.

Auto Calibration is available in both the Injection or Extrusion modes. In Injection Mode you must enter the LDR%, Shot Size and Sample Weight. The controller will automatically determine the correct Count. In Extrusion mode you must enter the LDR%, Production Rate and Sample Weight. The controller will automatically determine the correct RPM.

Signal

Signal cable input is typically the screw recovery signal for an injection molding machine. For extrusion applications this is a continuous power supply from the extruder that is on when the extruder is running and off when the extruder is stopped. (24-240 VAC/DC)

Tracking (Option)

This allows the unit, in extrusion mode, to follow the extrusion signal and increase or decrease speed in relation to the extruder speed. The input signal is selected when the TRACK option is activated by pressing the numeric buttons "1" and "2" simultaneously. The RPM on the screen is assumed to be the required speed. The controller is designed to accept a tracking signal of 0-10 VDC. The tracking cable provided will attach to the option port (DB9) on the MIDEXX, this cable has been tagged to show the polarity of the connection to extrusion.

Indicator LED's

The front panel consists of the following visual LED indicators:

- **Motor LED:** When the stepper motor is running this will be lit.
- **Signal LED:** When injection signal is detected this will be lit.
- **Injection LED:** When the unit is operating in the Injection mode this will be lit.
- **Extrusion LED:** When the unit is operating in the Extrusion mode this will be lit.
- **Error LED:** When the unit is operating outside maximun or minimum speed this will be lit.

STARTUP & OPERATING PROCEDURES

1. Install the required pump and tubing.
2. Connect the signal cable to the injection or extrusion machine. For injection molding this is typically the screw recovery signal. For extrusion applications this is a continuous power supply from the extruder that is on when the extruder is running and off when the extruder is stopped. (24-240 VAC/DC)
   To change the operation mode (injection/ extrusion), hold the **STOP** button and **POWER ON** the unit.
3. If required for extrusion applications connect the Extrusion tracking cable. (0-10VDC or 4-20mA)
4. Connect the controller to power supply; this can be 110 VAC / 220 VAC, 50/60 Hz. Refer to power input label.

5. Turn on the main power switch and the controller will go through a diagnostics program. Once diagnostics is complete the **STOP LED** will be lit.
6. Press the **FORWARD** key to prime the pump.
7. Once the pump has been primed and all the pump tubing is full of product you can calibrate the pump output by collecting a Sample weight. See page 7 - 2.4 Calibrate procedure.
8. Press the **START** key and the controller will begin to function with the preset settings.
9. As a safety feature, the mode of operation (Injection or Extrusion) cannot be changed while the Midexx unit is running. To change mode of operation the Midexx unit must be first stopped and turned OFF.

Errors encountered by the controller will be:
If the speed of the stepper motor exceeds either the upper or lower limit of the unit. The Midexx will continue to operate at the limit and will send out an Error message.

SPECIAL BUTTONS ON MIDEXX AT POWER UP

"•"	Upgrading the software (Please read Upgrading Firmware section)
"3"	Reverse the direction of the motor (CW/CCW)
"6"	Setup the password (Please read Password Setup section)
"7"	Change the unit of measurement (Imperial / Metric)
"STOP"	Change the operation mode (Injection/Extrusion)

UPGRADING FIRMWARE W/ USB

1. Turn off Midexx.
2. Hold the "." button & turn Midexx back on. (Nothing will show on screen it will remain blank)
3. Connect the USB cable to the PC & the Midexx.
4. The Midexx will show up on your PC as a memory stick which contains a file named "ready.txt".
5. Firmware received from MID needs to be dragged & dropped into the folder containing the "ready.txt" file.
6. Now this folder will disappear then re-appear & will be renamed "success.txt".
7. Now if you disconnect the USB cables & turn the Midexx off then on again, your Midexx should be upgraded to the latest version of firmware.

PASSWORD SETUP

1. Turn off Midexx.
2. Hold the "." button & turn Midexx back on.
3. Enter the admin password. For the very first time this step will be skipped.
4. Enter the new admin and user password.
5. To disable password protection set the user and admin password to 00000.

ALARMS

Low Level Alarm:

Low level alarm happens if the container weight is below the low/minimum level setting on the screen. The Alarm is a 12V DC output which could be mated to MID's MID-STL-12 or to other systems such as PLCs.

TROUBLESHOOTING/ ERROR CODES

1. If the required speed exceeds the maximum capability of the stepper motor then the ERROR LED will flash rapidly on the unit. In ComPacer software a descriptive (Speed HI) error message will be displayed on the Monitor screen. The unit will continue to operate at its maximum output. Please correct by adjusting the tubing and/or parameters.
2. If the required speed is less than the minimum capability of the stepper motor then the ERROR LED will flash slowly on the unit. In ComPacer software a descriptive (Speed LOW) error message will be displayed on the Monitor screen. The unit will continue to operate at its minimum output. Please correct by adjusting the tubing and/or parameters.
3. If the internal self diagnostics have failed during power up then the ERROR LED will continue to flash.

SPECIFICATIONS

- Stepper Motor drive for precise color metering
- Pumping rate from 0.7 to 180 RPM
- Injection mode
- Extrusion tracking mode, 0-10 VDC (optional)
- Automatic adjustment for injection cycle recovery time variations
- Automatic adjustment of output based upon percentage of regrind
- Automatic calibration
- Automatic storage of settings during power down
- Non volatile EEPROM storage of settings
- Built-in separate signal timer (Optional)
- Electrical power input of 110 or 220 VAC, 50 or 60 Hz.• Dimensions, Height 7", Width 8", depth 7"
- Weight 20 pounds
- Two year warranty on hardware

Switches, LEDs & Back Plugs

Side view of the MIDEXX controller

Switches:

- Power on
- Start
- Stop
- Forward
- Reverse
- Calibrate

LEDs:

- Motor
- Signal
- Injection Mode
- Extrosion Mode
- ERROR

Back plugs:

- Power cord (110 or 220 VAC, 50/60 Hz)
- ON/OFF switch
- Fuse Holder (2A 220VAC)

WARRANTY

What the MICRO INTERFACE DESIGN Limited Warranty Covers:

Hardware: MICRO INTERFACE DESIGN (MID) warrants that hardware products listed ("Hardware Products") will be free from material defects in materials and workmanship for the term set forth on the Product warranty list. MICRO INTERFACE DESIGN warrants that software media will be free from material defects in materials and workmanship for a period of two years (2 years).

This Hardware Product warranty covers all MICRO INTERFACE DESIGN parts, accessories, and upgrades sold with your MICRO INTERFACE DESIGN Hardware Product. Unless otherwise set forth on the Product Warranty List, MICRO INTERFACE DESIGN accessories and upgrades purchased and added on to the Hardware Product after the initial Hardware Product purchase assume the warranty deliverables and term of the system into which they are installed

Software: MICRO INTERFACE DESIGN warrants that software media will be free from material defects in materials and workmanship for a period of two years (2 years).

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‣ MICRO INTERFACE DESIGN PRODUCTS are not suitable for use with Explosive or Corrosive fumes, dusts or gases or combinations of fumes, dusts or gases which become Explosive or Corrosive.

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