UniBatch™ 5000 Series
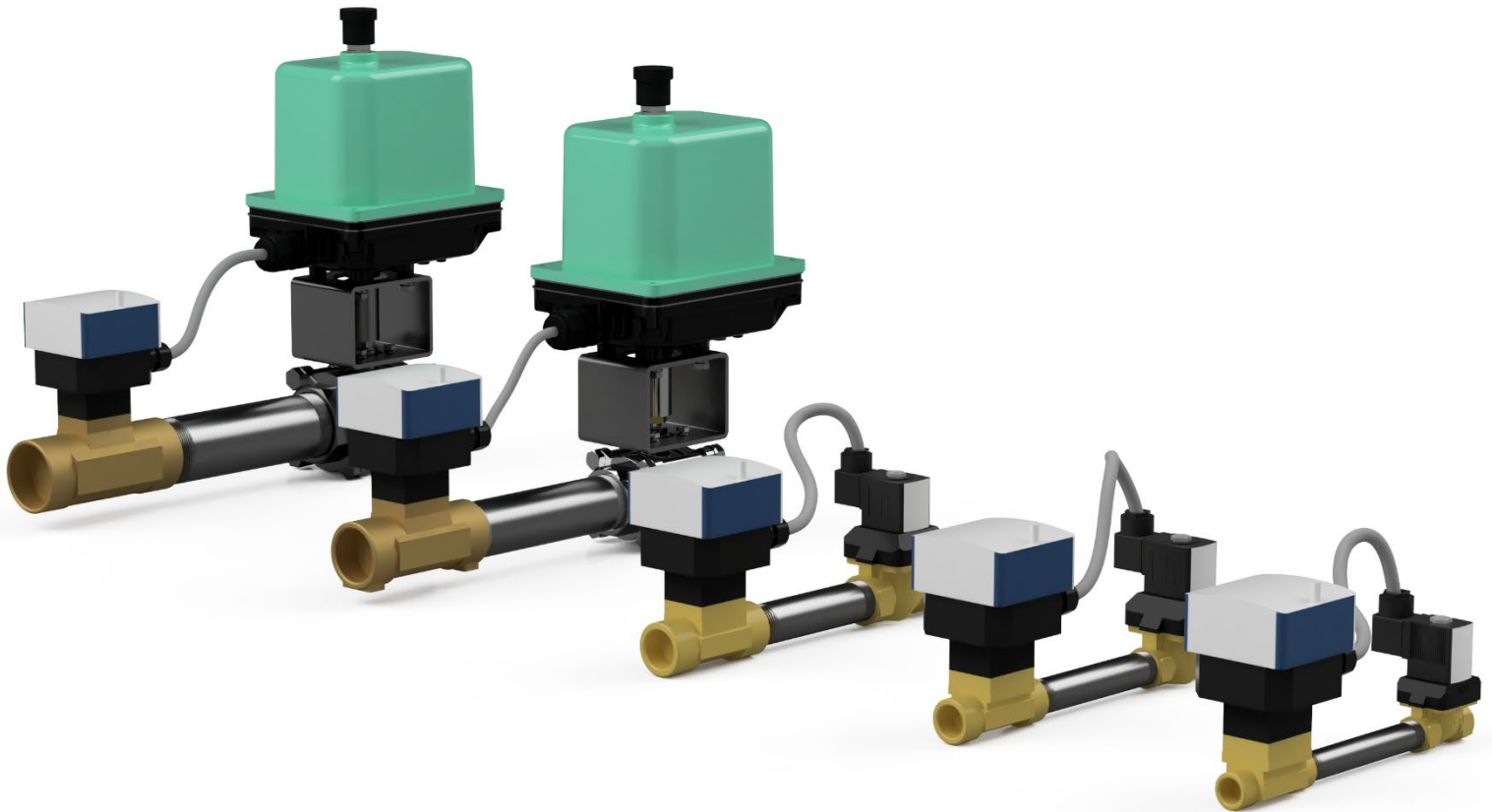# Drop-In Liquid Batching System

Operating Instructions

Contents

1 About these Operating Instructions

These operating instructions describe the operational lifecycle of the UniBatch. Please keep the Operating Instructions in a Safe Place, accessible to all users and any new owners. A copy is included with every UniBatch shipped by Don Johns Inc and is free upon request from donjohns.com. Additionally, a blank programming sheet is provided in Appendix D.

These Operating Instructions contain important safety information.
Failure to comply with these instructions can lead to hazardous situations. Pay attention to Chapter 4, *Intended Use* **and Chapter 5,** *Basic Safety Information.*

- **Whichever version of the UniBatch, these Operating Instructions must be read and understood.**

- **Where the symbols** ⚠ ⚠ ⚠ **appear, read carefully to understand important risks.**

1.1 Symbols Used

⚠ **DANGER**

Warns against an **imminent danger**

- Failure to observe this warning **will** result in death or in serious injury

⚠ **WARNING**

- Failure to observe this warning **can** result in serious injury or even death

⚠ **CAUTION**

- Failure to observe this warning **can** result in substantial or minor injuries

NOTICE
Warns against Material Damage

💡 Indicates additional information, advice, or important recommendations

📖 Refers to information in these Operating Instructions or in other documents

- ❖ Indicates an instruction to be carried out to avoid a danger, a warning, or a possible risk.
- ➢ Indicates a procedure to be carried out
- ✓ Indicates the result of a specific instruction

2 Definitions of the word "UniBatch"

- The word *"UniBatch"* used within these Operating Instructions always refers to the *UniBatch 5000 Series* Batching System, including all its parts.
- The words *"Batch Controller"* refer to the UniBatch Electronics
- The words *"Paddlewheel flowmeter"* refer to the pulse-generating meter that measures the amount of flow
- The words *"Batch Valve"* refer to either the 1-stage solenoid or 2-stage batch valves.

3 Validity of these Operating Instructions

The Operating Instructions are valid for the following UniBatch Assemblies:

- Serial numbers higher or equal to "3000-1000" ("<meter> - <controller>")
- Any product sold by Don Johns with the "UniBatch 5000 Series" label that includes a drop-in system consisting of a batch controller, paddlewheel flowmeter, and actuated valve for use in dry, indoor environments

- UniBatch models with any of the following Numbers:

Size	Material	Model
1/2"	Brass	5-050BB-SV1ST0
3/4"	Brass	5-075BB-SV1ST0
1"	Brass	5-100BB-SV1ST0
1-1/2"	Brass	5-150BB-BV1STE
2"	Brass	5-200BB-BV2STE
1/2"	Stainless	5-050BS-SV1ST0
3/4"	Stainless	5-075BS-SV1ST0
1"	Stainless	5-100BS-SV1ST0
1-1/2"	Stainless	5-150BS-BV2STE
2"	Stainless	5-200BS-BV2STE

Table 1

4   Intended Use

⚠️ **Use of the UniBatch 5000 Series that does not comply with these instructions could present risks to people, nearby installations, or the environment.**

The UniBatch 5000 Series is intended to work as a single unit, without external controls or equipment, unless specified and provided by Don Johns.

💡 Nevertheless:

- ❖ Protect the UniBatch against electromagnetic interference and ultraviolet rays
- ❖ Do not install the UniBatch outdoors
- ❖ Do not install the UniBatch in a wet environment
- ❖ Use in an approved application involving fluids with flowrate and viscosity within the UniBatch operational range 📘 *(See Chapter 8, Technical Data).*
- ❖ Use with fluids compatible with either brass or stainless steel pipe, depending on the model
- ❖ Never use for security applications. Custody transfer applications have different requirements not specified in this manual
- ❖ Perform common-sense preventative maintenance and safety measures
- ❖ Only operate a UniBatch in perfect working order.

5   Basic Safety Information

This safety information does not consider any contingencies or occurrences that may arise during installation, use, and maintenance of the product. Outside of the warnings included in this manual, common sense and skilled labor is expected when installing and operating.

The operating company (customer and/or end user) is responsible for observing local, public, and private safety regulations, including employee and contractor safety.

⚠️ **Danger due to electrical voltage.**

- ❖ Disconnect the electrical power from all the conductors and isolate them before carrying out work on the system.

⚠️ **Risk of injury due to high pressure in the installation.**

- ❖ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.
- ❖ Observe the fluid temperatures/fluid pressure depending on the fitting used.

⚠️ **Risk of injury due to high fluid temperatures.**

- ❖ Use safety gloves to handle the UniBatch
- ❖ Stop the circulation of fluid and drain the pipe before loosening the process connections

⚠️ **Risk of injury due to the nature of the fluid.**

- ❖ Observe the applicable regulations on accident prevention and safety relating to the use of aggressive fluids.

To avoid injury, take care to:

- ❖ Not use the UniBatch in explosive atmospheres
- ❖ Not use the UniBatch in an environment incompatible with the materials it is made of.
- ❖ Not to use fluid that is incompatible with the materials the UniBatch is made of.
- ❖ Not subject the UniBatch to mechanical stress
- ❖ Not make any modifications to the UniBatch
- ❖ Prevent any unintentional power supply switch-off
- ❖ Carry out the installation and maintenance work by qualified and skilled staff with the appropriate tools
- ❖ Guarantee a defined or controlled restarting of the process, after a power interruption.
- ❖ Observe general technical rules when installing and using the UniBatch.

⚠️ **Notice**

The UniBatch Batch Controller may be damaged by fluids it encounters

❖ Systematically check the chemical compatibility of the component materials of the assembly and the fluids likely to encounter it (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants, and chlorinated agents).

⚠️ **Elements / Components sensitive to electrostatic discharge**

The UniBatch Batch Controller contains electronic components sensitive to electrostatic discharge. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.

❖ To minimize or even avoid all damage due to an electrostatic discharge, take all the precautions describe in standard EN 61340-5-1.
❖ Also ensure that you do not touch any of the electrical components when LIVE. Handle electronics only when de-energized or OFF.

6   General Information

6.1   Sales, Service, and Support:

Don Johns Inc
701 N Raddant Rd
Batavia, IL 60510
(630) 454-4700

https://donjohns.com

6.2   Warranty Conditions

Any use of the UniBatch Assemblies other than the conditions described in these instructions will void the factory warranty. Authorized service provided by trained Don Johns technicians and sales staff is available for every UniBatch.

6.3   Information on the Internet

✓   You can find the Operating Instructions and Technical Data Sheets regarding the UniBatch models at donjohns.com

✓   2D and 3D CAD drawings and models are available and provided on request

✓   The UniBatch webpage is viewable with the following QR code:

7 Descriptions

7.1 Scope of Application

The UniBatch controls the opening or closing of its Batch Valve and accurately meters, totalizes, and batches the flow volume of the liquid out of the Discharge end.

The batching is controlled locally by pressing the navigation softkeys on the Batch Controller.

The batching principle is described in

7.2 Construction of the UniBatch Assembly

The UniBatch consists of **five basic components**:

1. **Batch controller**
2. **Paddlewheel Flow Meter**
3. **Intermediate pipe**
4. **Batch Valve**
5. **Actuator**

These componets are fitted with NPT threads with teflon tape. The assembly is intended to be a drop-in turnkey solution that does not require disassembly or mechanical reconfiguration.

The following page (*figures 1 and 2)* illustrate the constructions of the 1-stage and 2-stage UniBatch 5000 Series assemblies. 📘 These drawings are enlarged in

7.3 UniBatch Assembly Construction Overview Diagrams

SIGNAL CABLE
ACTUATOR
BATCH CONTROLLER
DISCHARGE END
INLET
BATCH VALVE
INTERMEDIATE PIPE
PADDLEWHEEL FLOWMETER

Fig 1, for sizes ½" to 1"

MANUAL OVERRIDE KNOB (LIFT AND TURN)
2-STAGE ACTUATOR
SIGNAL CABLE
BATCH CONTROLLER
MOUNTING KIT
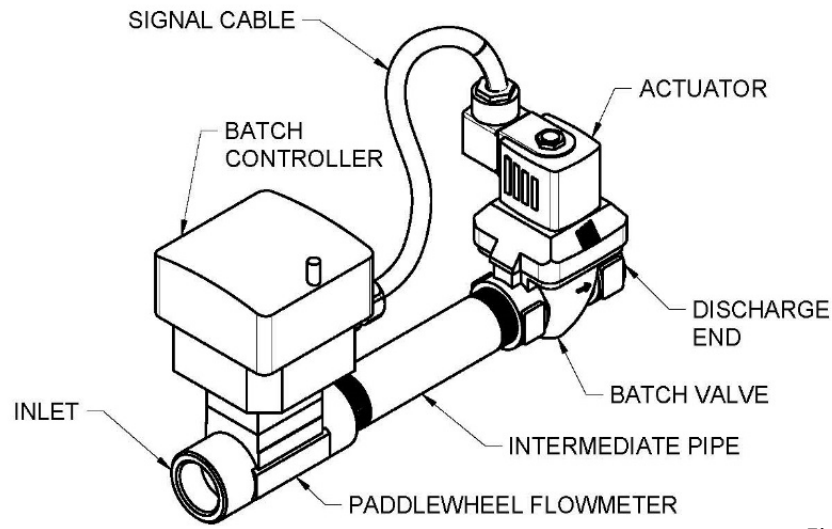DISCHARGE END
BATCH VALVE
INLET
INTERMEDIATE PIPE
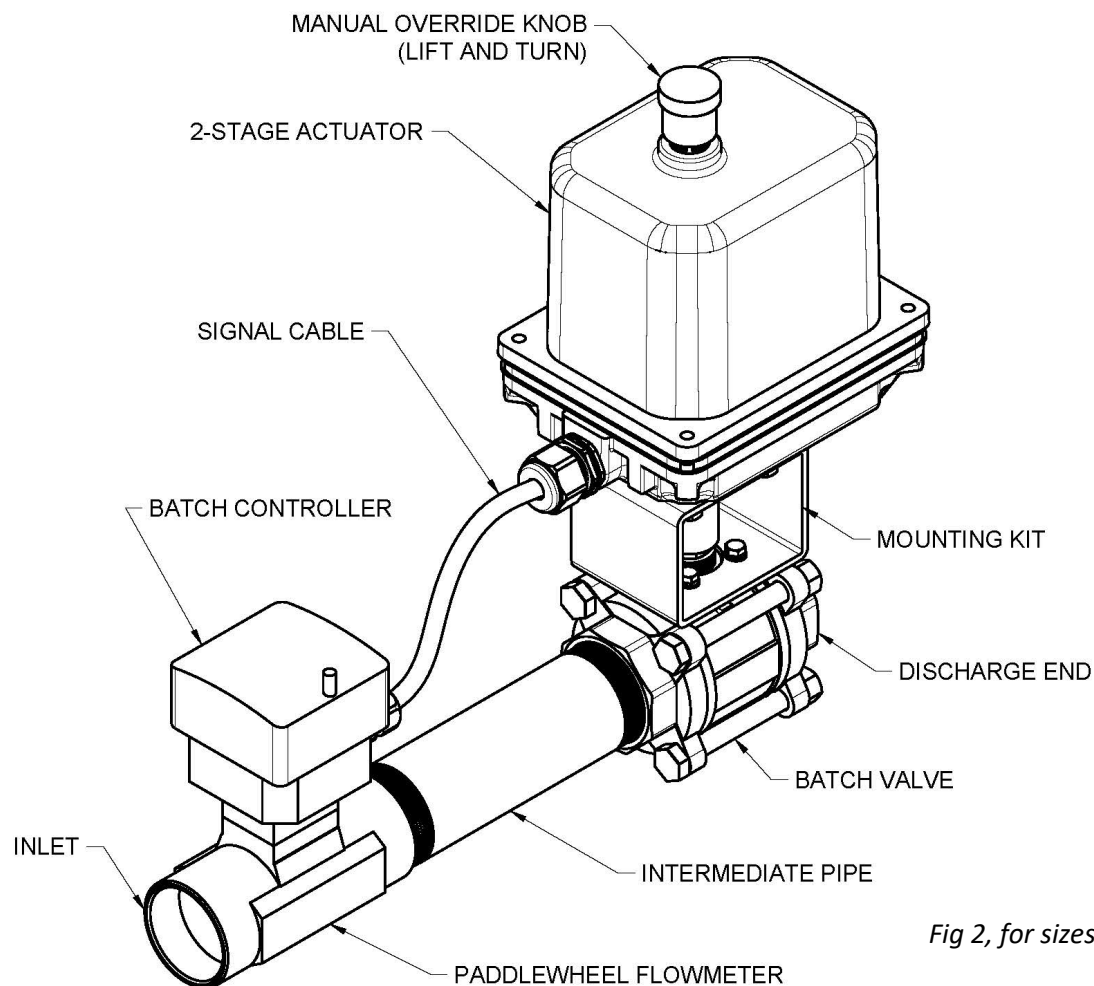PADDLEWHEEL FLOWMETER

Fig 2, for sizes 1-1/2" and 2"

Rotated full drawings in Appendix A

7.4 Construction of the UniBatch Components

7.4.1 Construction of the UniBatch Batch Controller

The UniBatch Batch Controller is shipped with control and power wiring running through a user-accessible cable gland *(figure 8)*. The other gland is for the signal cable run to the actuator.

The Batch Controller housing is Polycarbonate with Stainless Steel screws and a Polyester identification label.

7.4.2 Description of the Batch Controller Label
(See Figure 3)

1. Type of Batch Controller
2. Sensor specifications
3. IO specifications
4. Power Supply Voltage
5. Manufacturing code

6. Conformity marking
7. Certification
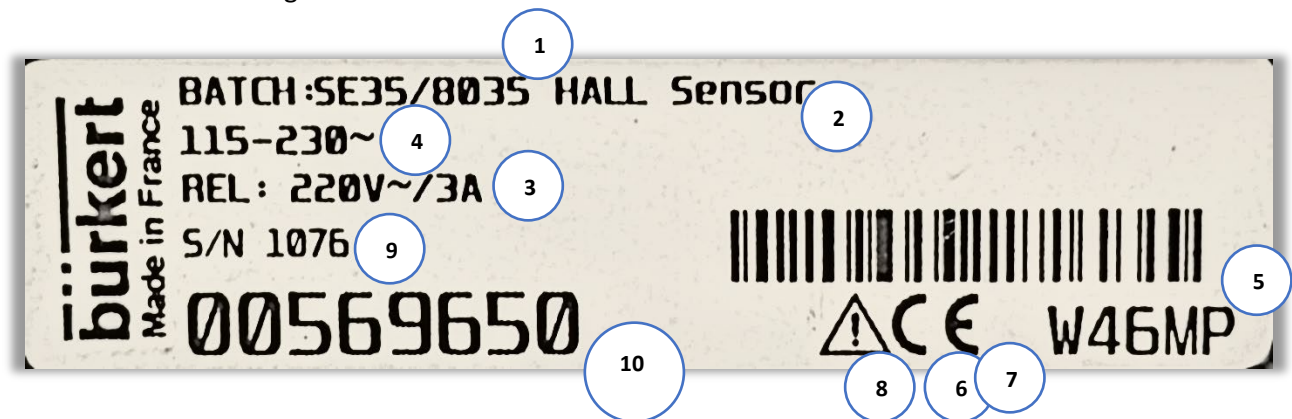8. Warning
9. **Serial Number**
10. **Part Number**

Fig 3

7.4.3 Construction of the Actuators

The UniBatch Actuator comes in 1-stage Solenoid and 2-stage Electric varieties. Both run at 120VAC, and the 2-stage actuator is expected to be wired into a separate AC circuit from the Batch Controller electronics.

8 Technical Data

8.1 Flow Characteristics for UniBatch Applications

List of UniBatch Compatible liquid specifications:

- Maximum Viscosity: 300 cSt (centistoke, mm^2/s)
- Maximum solid particle rating: 1.0%
- Maximum particle size: 0.5mm (0.020 inches)
- Maximum corrosiveness: stainless steel or brass compatible liquids

UniBatch flow and measurement characteristics:

- Measurement Range: 1 ft/s to 33 ft/s (2 to 241 Gallons Per Minute)
- Measurement deviation: +/- 2.5% with standard k-factors
                                     +/- 1% with calibrated k-factor
- Linearity: +/- 0.5% of full scale
- Repeatability: +/- 0.4% of measured value

8.2 Electrical Characteristics

The following table describe the characteristics of the Batch Valve actuators:

Pipe Size (in)	Coil Size (mm)	Inrush (VA)	Hold (VA)
1/2 - 1	32	24	8

Table 2

Pipe Size (in)	Motor Size (NEMA frame)	Full-Load (VA)	No-Load (VA)	Torque (in-lbs)
1-1/2, 2	26, 1/20 HP	264	192	600

Table 3

The Batch Controller Electronics characteristics are as follows:

Maximum current consumption	125 mA
Power	3VA
Integrated Protection	125 mA time-delay fuse
Integrated Power Supply	Filtered and regulated Oscillation ±10%

Table 4

Total power consumption:

- 1-stage assembly: 27 VA, use 16 AWG wire
- 2-stage assembly: 267 VA, use 14 AWG wire

8.3 K-Factors

The K-factor is the amount of pulses the paddlewheel meter generates per volume that flows through the UniBatch assembly and is most often expressed as "pulses per gallon" or "pulses per pound" (Water, specific gravity of 1). This is related to the diameter of the pipe of the assembly. The table below includes the K-factors for each of the five UniBatch sizes, along with their respective Minimum and Maximum flowrates in GPM:

Size	1/2"	3/4"	1"	1-1/2"	2"
Pulse/Gal	401.25	251.73	185.49	74.95	43.15
Pulse/lb (H$_2$O)	48.11	30.18	22.24	8.99	5.17
Min. Flowrate GPM	2	3	5	11	18
Max. Flowrate GPM	22	38	62	146	241

Table 5

$$K\ factor\ (divider) = pulses\ per\ unit$$

$$corrective\ k\ factor = (old\ k\ factor) \times \frac{amount\ registered}{amount\ delivered}$$

*If the **k-factor is too small**, the batcher will **over-count** and **under-deliver***

*If the **k-factor is too large**, the batcher will **under-count** and **over-deliver***

8.4 Ambient conditions for the UniBatch 5000 Series

A dry, indoor environment is expected for the UniBatch 5000 Series, as the Batch Controller is not rated for a "washdown" area. Additionally, the rating of the electronics is not suitable for Hazardous Areas that require Intrinsically Safe devices.

8.5 Conformity to standards and directives for the Batch Controller

UL Certification of Batch Controller

The Batch Controller is a UL Certified product and complies with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1
- Variable key for UL Recognition: PU01
- Variable key for UL Listing: PU02

Identification on the device	Certification	Variable key
c ᴿᵁ us	UL-recognized	PU01
c UL us Measuring Equipment EXXXXXX LISTED	UL-listed	PU02

Table 6

8.6 Overall Dimensions of UniBatch 5000 Series Assembly

The overall dimensions for the UniBatch 5000 Series assemblies are in the following table:

SIZE	Overall Length (in)	Pipe Center to top of Opened cover (in)	Pipe Center to top of Valve Unit (in)
1/2"	10.41	8.18	3.12
3/4"	10.66	8.18	3.74
1"	11.86	8.18	5.43
1-1/2"	16.42	8.38	14.4
2"	17.8	8.66	14.76

Table 7

Dimensional Overview Drawings:

- o For UniBatch sizes 1" and smaller, refer to drawing **B-76022-1**
- o For UniBatch sizes 1-1/2" to 2", refer to drawing **B-76024-1**

The following page includes previews of these drawings,
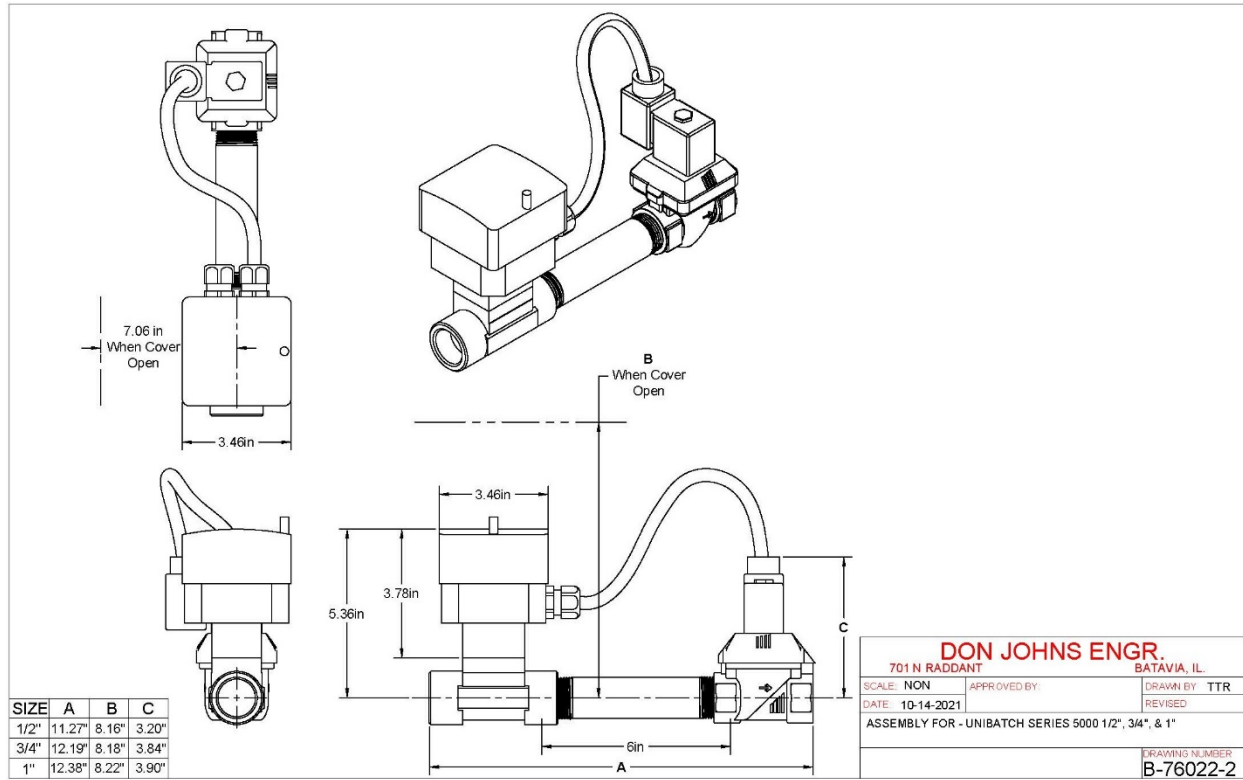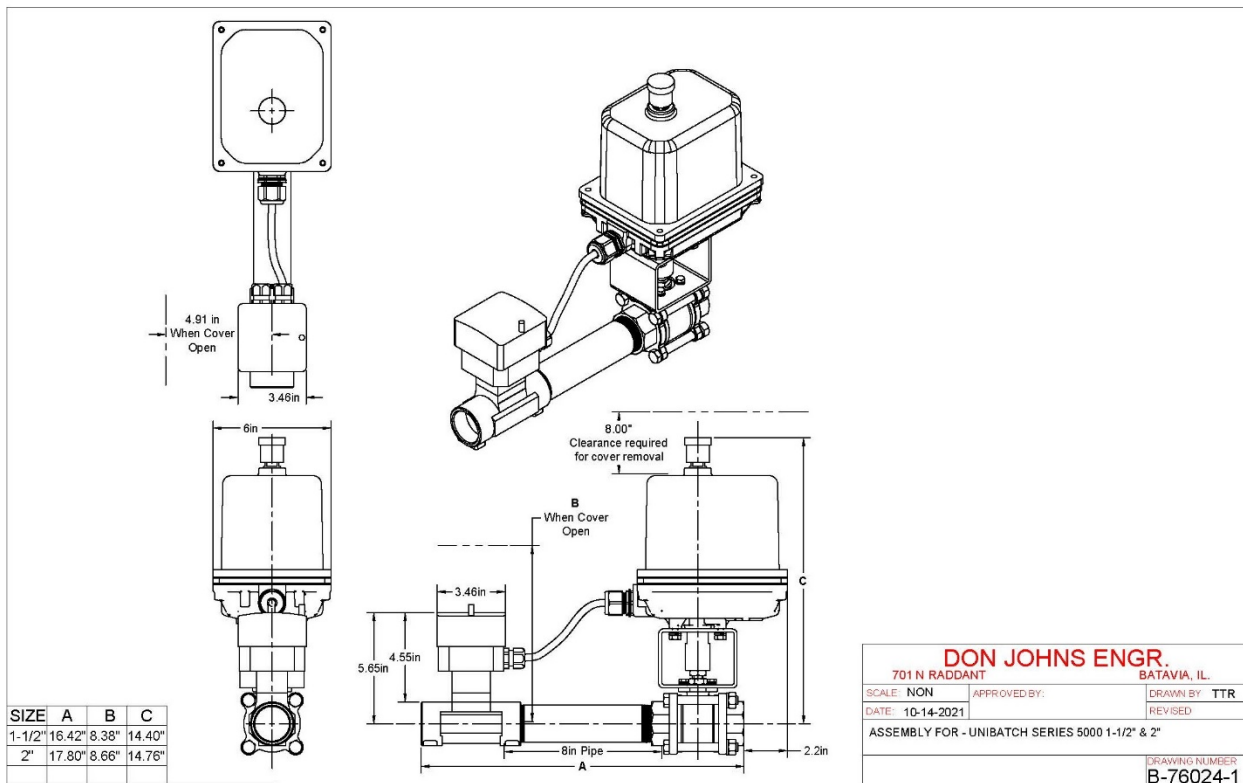and full-page prints are available in *Appendix B*

SIZE	A	B	C
1/2"	11.27"	8.16"	3.20"
3/4"	12.19"	8.18"	3.84"
1"	12.38"	8.22"	3.90"

DON JOHNS ENGR.
701 N RADDANT — BATAVIA, IL.
SCALE: NON | APPROVED BY: | DRAWN BY TTR
DATE: 10-14-2021 | | REVISED
ASSEMBLY FOR - UNIBATCH SERIES 5000 1/2", 3/4", & 1"
DRAWING NUMBER B-76022-2

Fig 4

SIZE	A	B	C
1-1/2"	16.42"	8.38"	14.40"
2"	17.80"	8.66"	14.76"

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701 N RADDANT — BATAVIA, IL.
SCALE: NON | APPROVED BY: | DRAWN BY TTR
DATE: 10-14-2021 | | REVISED
ASSEMBLY FOR - UNIBATCH SERIES 5000 1-1/2" & 2"
DRAWING NUMBER B-76024-1

Fig 5

Rotated full-page drawings in Appendix B

9 Fluid Application Installation

9.1 Safety Instructions

9.1.1 DANGERS

⚠ Danger due to electrical voltage

- ❖ Disconnect and isolate all electrical and pneumatic power sources before servicing the UniBatch assembly.
- ❖ Observe all accident protection and safety regulations for electrical equipment.

Risk of injury due to high pressure in installation

- ❖ Stop the circulation of liquid, cut off the pressure and drain the pipe before loosening any process connections of the UniBatch.
- ❖ Observe the liquid temperature and pressure related to the type and size of process connection

Risk of injury due to high fluid temperatures

- ❖ Use safety gloves to handle the UniBatch assembly
- ❖ Stop the circulation of fluid and drain the pipe before loosening the UniBatch process connections.

Risk of injury due to fluid properties

- ❖ Observe the applicable regulations on accident prevention and safety related to corrosive, caustic, volatile, flammable, or otherwise aggressive and hazardous fluids.

9.1.2 WARNINGS

⚠ Risk of injury due to non-conforming installation

- ❖ The liquid and electrical installation must only be performed by qualified and skilled electricians, pipe fitters, and mechanics.
- ❖ Observe mounting instructions for the UniBatch controller, paddlewheel assembly, intermediate pipe, and actuator.

Risk of injury due to unintentional switch on of power or uncontrolled restarting of UniBatch 5000 Series

- ❖ Take appropriate measures to avoid unintentional batch or flow activation.
- ❖ Ensure there is a way to reset the conditions of the system after any electrical or mechanical intervention.

Risk of injury if the fluid temperature or pressure is not considered

- ❖ Consider fluid temperature and pressure when selecting fittings, pipe, and construction of system to withstand the fluid pressure and temperature within a reasonable factor of safety

9.2 Installation Best Practices

The UniBatch performs best when the pipe cross-section is as full as possible with liquid since the Paddlewheel in the Flowmeter is positioned at the top of the pipe profile. Any configuration that ensures the pipe is flooded with liquid is recommended.

When sizing the proper UniBatch 5000 Series for the batching application, a rule of thumb is to choose a pipe size that guarantees a batch duration of at least one minute at the delivered flowrate.

9.3 Where and How to Mount UniBatch

Mounting the UniBatch is relatively simple and does not require any special tools, flanges, or positioning equipment. The assembly is intended as a drop-in system with turnkey operation. The Batch Valve is positioned downstream from the Paddlewheel Flowmeter, towards the Discharge of the batching system. A U-style trap *(figure 6)* is highly encouraged to ensure the

Fig 6

paddlewheel flowmeter is always flooded with liquid. If positioned vertically, the UNIBATCH system must have the liquid flow upwards, against the force of gravity.
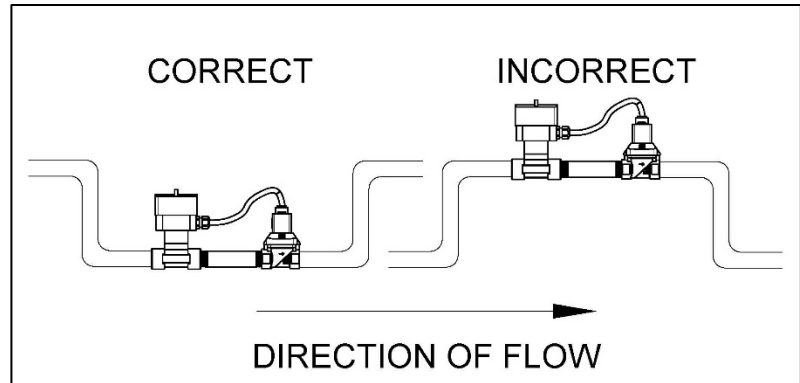
9.3.1 Process Connections

The UniBatch is offered in five sizes (1/2", 3/4", 1", 1-1/2", 2") with an NPT process connection and includes options for ANSI flange or sanitary "tri-clamp" process connections. Securing existing plumbing to the UniBatch ends is the customer's responsibility and is assumed to comply with pipefitting standards, and must include appropriate seals, gaskets, or thread compound/tape.

9.3.2 Inlet and Discharge Pipe Lengths to Diameter Ratio

When installing the UniBatch, care must be taken to ensure the upstream pipe length is sufficient for non-turbulent flow to the paddlewheel meter. For example, with a pipe reduction, a length 15 times the diameter of the assembly pipe size is recommended *(figure 7)*.
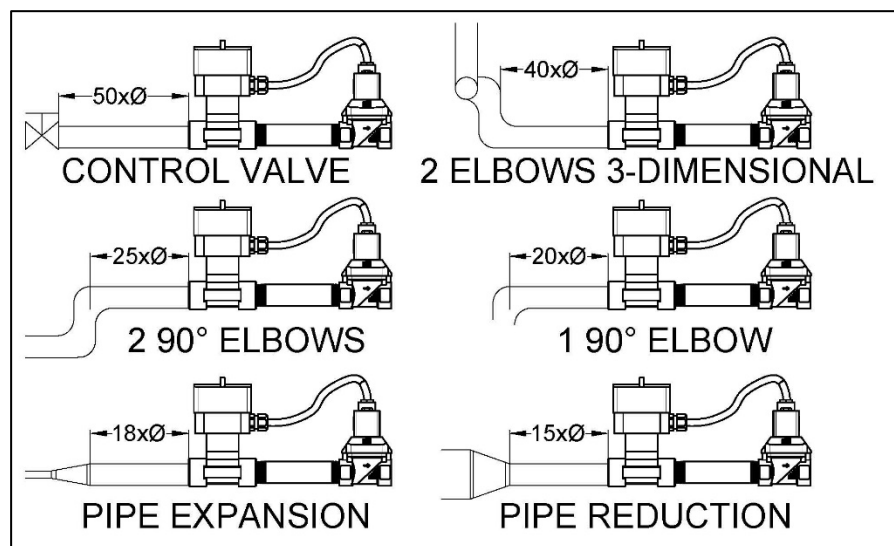
10 Electrical Installation and Wiring

10.1 Safety Instructions

10.1.1 Dangers

⚠ **Danger due to electrical voltage.**

- ❖ Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system
- ❖ Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to high pressure in the installation

- ❖ Stop the circulation of liquid, cut off the pressure and drain the pipe before loosening the process connections
- ❖ Observe the fluid temperature/fluid pressure depending on the fitting used

Risk of Injury due to high fluid temperatures

- ❖ Use safety gloves to handle the assembly
- ❖ Stop the circulation of fluid and drain the pipe before loosening the process connections

Risk of injury due to the nature of the fluid

- ❖ Observing the existing regulations on accident prevention and safety relating to the use of aggressive fluids.

10.1.2 Warnings

⚠ **Risk of injury due to non-conforming installations**

- ❖ The electrical installation can only be carried out by a qualified and skilled staff with the appropriate tools
- ❖ Install appropriate safety devices (correctly rated fuse and/or circuit breakers).
- ❖ Identify the circuit breaker or switch as the Batch Controller electrical power cut-off system
- ❖ It is imperative that circuit protection is used with the Batch Controller. Ensure that a circuit breaker or fuse is installed for the Batch Controller's circuits.
- ❖ Observe the standard NFC 15-100 / IEC 60364 standards.

⚠ **Warning**

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.

- ❖ Take appropriate measures to avoid unintentional activation of the installation
- ❖ Guarantee a controlled restart of the process after any intervention of the UniBatch.

10.1.3 Note

💡 **For correct operation of the UniBatch, observe the following recommendations during the electrical installation:**

➢ Do not install the cables near high voltage or high frequency cables. If a combined installation cannot be avoided, a minimum clearance of 1.25" (30cm) is recommended
➢ Use minimum 16 AWG recommended

Relay output DO2 and DO3	To use the relay outputs in a wet location, observe the following DANGER safety instruction.
▪ operating	▪ hysteresis, adjustable thresholds, normally open
▪ DO2 function	▪ valve 100 %, cannot be modified
▪ DO3 function	▪ alarm (can be configured and parametered)
▪ electrical data of the load (non UL recognized devices)	▪ 230 V AC / 3 A or 40 V DC / 3 A (resistive load)
▪ electrical data of the load (UL recognized devices)	▪ max. 30 V AC and 42 V peak / 3 A or max. 60 V DC / 1 A

Table 8

10.2 Specifications of the connection cables

10.2.1 UniBatch Electrical Connections

The UniBatch is powered by 120 VAC, and electrical connections are made on the three wire nuts inside the Batch Controller Housing:

1. 120VAC power
2. Neutral power
3. Earth Ground
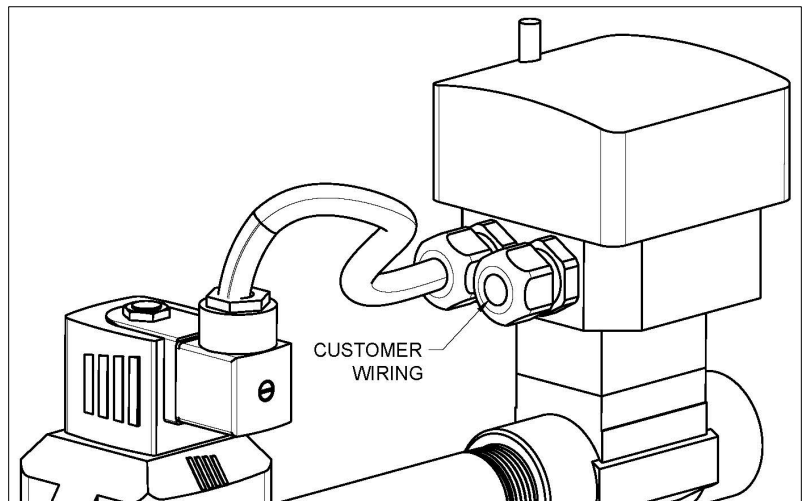
Fig 8

10.2.2 Grounding potential of the UniBatch assembly

➢ Properly ground the Batch Controller to a grounded metal surface or a grounded terminal in a nearby panel. Do not ground to Neutral or any non-zero potential conductor.

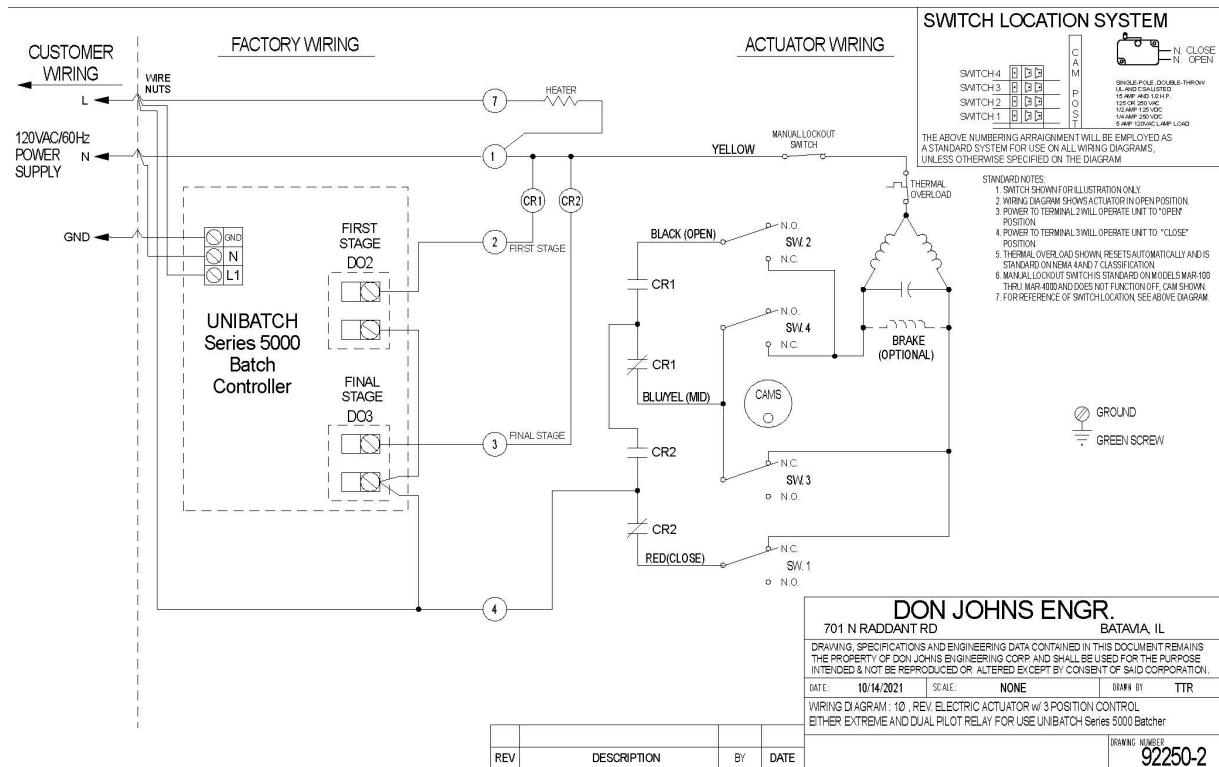## 10.3 Wiring the UniBatch

10.3.1 1-Stage UniBatch 5000 Series
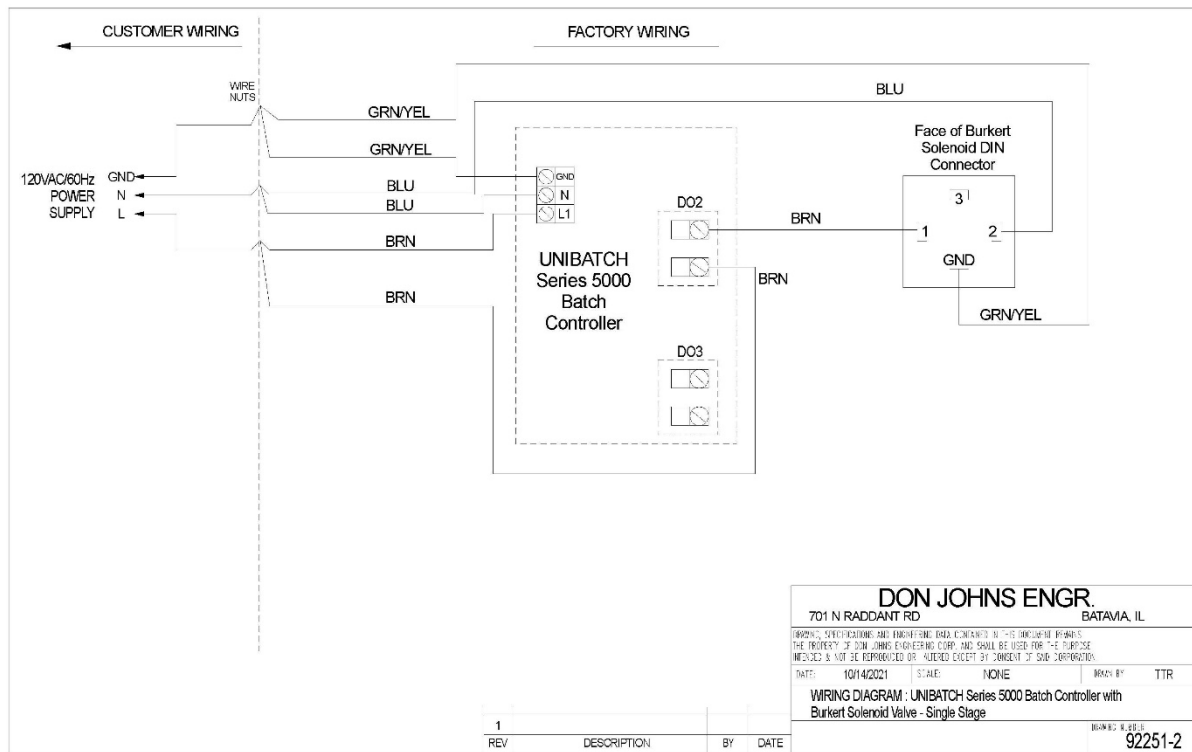
Drawing 92251   *Fig 9*

Rotated full drawing in Appendix C

10.3.2 2-Stage UniBatch 5000 Series

Drawing 92250   *Fig 10*

 Rotated full drawing in __Appendix C__

11 Commissioning

11.1 Safety Instructions

⚠️ Warning

Danger due to non-conforming commissioning

Non-conforming commissioning could lead to injuries and damage the UniBatch and its surroundings

- ❖ Before commissioning, make sure that the users have read and fully understand the contents of the operating instructions
- ❖ Observe the safety recommendations and intended use.
- ❖ The UniBatch / the installation must be commissioned by properly trained staff

💡 Protect this Batch Controller against electromagnetic interference, ultraviolet rays, and extreme temperatures

11.2 Commissioning Procedure

Before commissioning the UniBatch:

- ➢ Enter the K-factor of the fitting used. *(Chapter 8.2, K-Factors)*
- ➢ Wire the Batch Controller per the included drawings *(Appendix C, Wiring Diagrams)*
- ➢ The only modes relevant to the UniBatch 5000 Series assembly are **LOC.MANU, LOC.MEM, MEM+MANU, and LOC.REP.** Any modes with EXT are not relevant.
- ➢ Set the Batching Mode
  - o **LOC.MANU.-** Local Control Manual Mode **(Default mode from factory)**
    - ▪ This mode permits full control with the navigation keys and setting of exact batch size
  - o **LOC.MEM.-** Local Control Memory Mode
    - ▪ This mode permits full control with the navigation keys and selecting a preset batch size from memory
  - o **MEM+MANU**- Memory Plus Manual Mode
    - ▪ This mode combines the LOC.MANU and LOC.MEM modes for full control with navigation keys
  - o EXT.MEM- Externally Controlled Memory Mode
  - o EXT.+LOC.- External and Local Control Mode
  - o EXT.[T]- External Time Triggered
  - o EXT.REP- Externally Controlled Repeat Mode from Teach-In
  - o **LOC.REP**- Local Control Repeat Mode from Teach-In
    - ▪ The batch size is a repeat of the teach-in volume programmed, triggered locally with the navigation keys

- ➢ Calibrate the System
  - ○ Perform a test batch or a Teach-In using the Batch Controller
    - ▪ If possible, weigh the batch amount, convert to volume, and compare to Batch Controller digital register
    - ▪ Apply corrective K-factor or teach-in run if weighed amount deviates from metered volume converted to weight.

$$\boldsymbol{K\ factor\ (divider)} = pulses\ per\ unit$$

$$\boldsymbol{corrective\ k\ factor} = (old\ k\ factor) \times \frac{amount\ registered}{amount\ delivered}$$

*If the **k-factor is too small,** the batcher will **over-count** and **under-deliver***

*If the **k-factor is too large,** the batcher will **under-count** and **over-deliver***

12 Operating and Functions

12.1 Safety Instructions

⚠️ **Danger**

Danger due to electrical voltage

- ❖ Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- ❖ Observe all applicable accident protection and safety regulations for electrical equipment

⚠️ **Warning**

Risk of injury due to non-conforming operation

Non-conforming operation could lead to injuries and damage to the UniBatch and its surroundings

- ❖ The operators must have read and understand this manual
- ❖ Observe proper safety recommendations
- ❖ The UniBatch must be properly operated by trained staff

12.2 Operating levels of the Batch Controller

The UniBatch has two operating levels: Run and Program

Run:

- Starting a batch
- Reading totalizers and flow rate by day or since last reset
- Resetting totalizers by day or since last reset
- Accessing configuration menu

Program:

- Setting parameters
- Setting batch mode and preset volumes (if applicable)
- Teach-in calibrations (if applicable by mode)
- Reading fault messages
- Consulting past 10 batches in history

Fig 11

Choice of digit value Steps 0 to 9 Menu Selection

Direction downwards in menu or sideways for digit selection

Accept chosen parameter or adjusted value

Relay 2 (contact closed)
Relay 1 (contact closed)
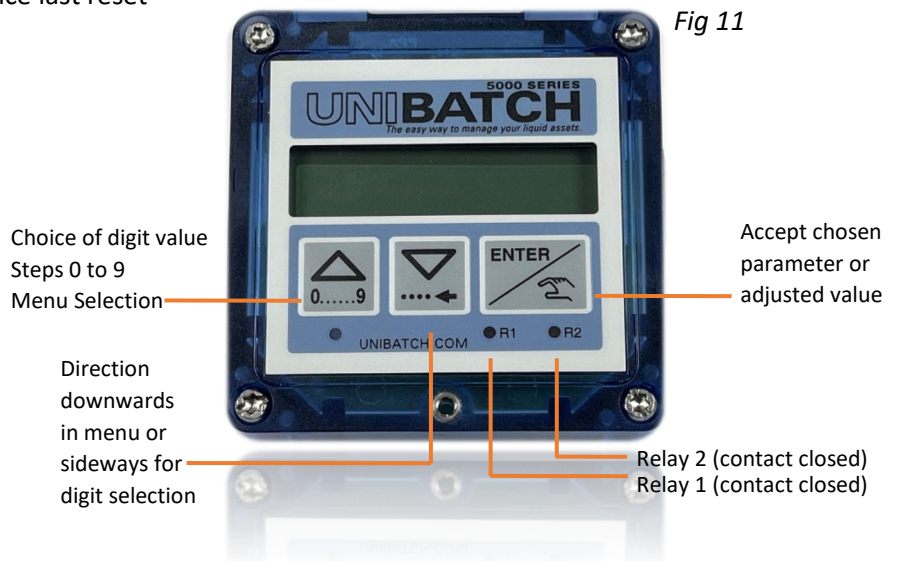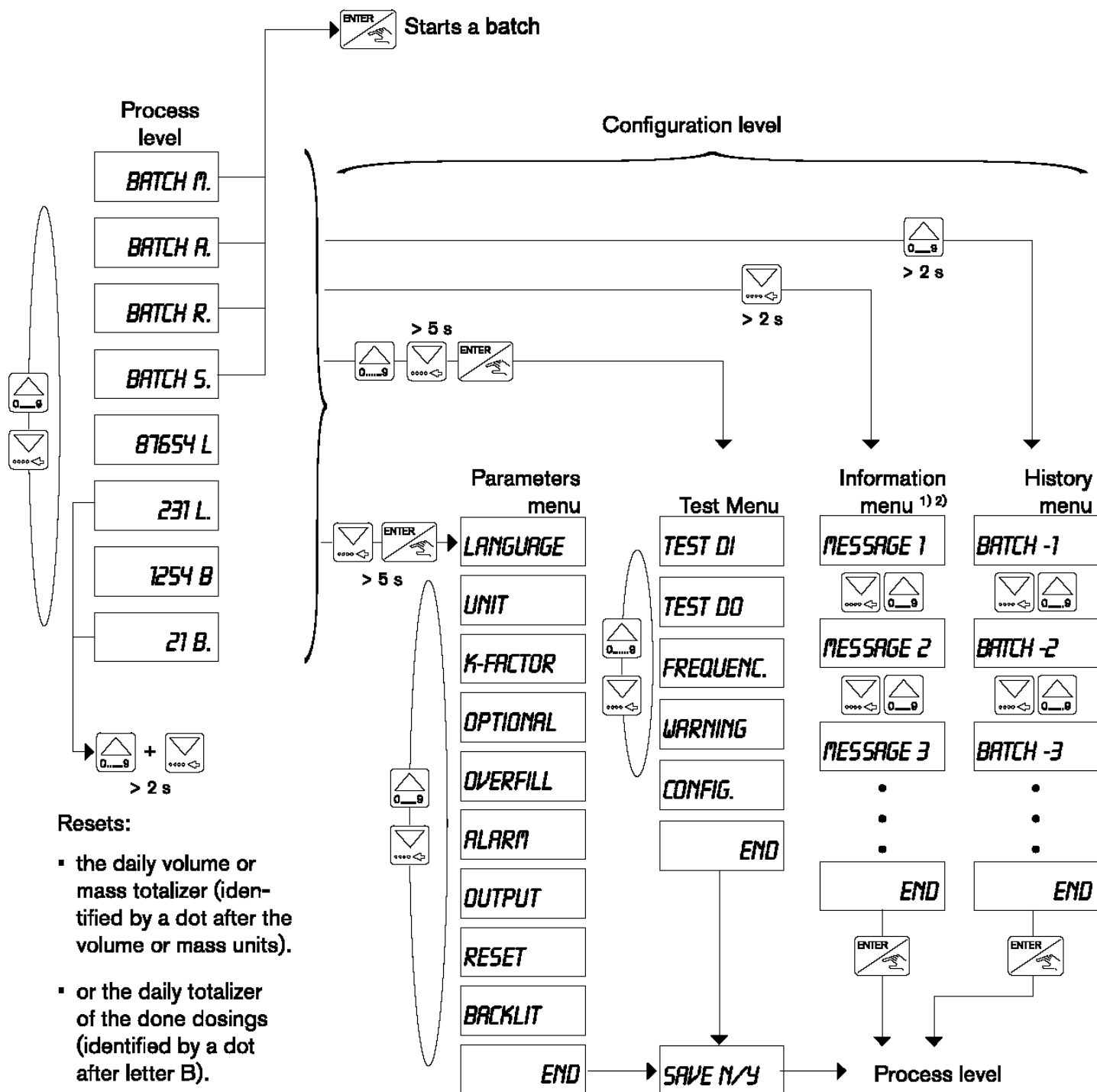
Fig 12

12.3 Performing a Teach-in Calibration

The teach-in feature can be performed in one of two methods:

- o Teach-in through known Volume
- o Teach-in through known Flowrate

Of the two options, Teach-in through known Volume is more accurate, as it depends on a statically measured quantity. Flowrate may change during a batch, and therefore may be less reliable for a teach-in calibration.

12.3.1 Teach-In Steps (Does not apply to 1-1/2", 2" assemblies)

- ➢ Place a tank of known volume at the discharge of the UniBatch 5000 Series or have a measured flowrate number ready from a reference measurement.
- ➢ Hold [▽] and [ENTER] together for approximately 5 seconds to enter the Programming menu
- ➢ Use [▽] or [△] to reach the *K-factor* menu item and press [ENTER] to enter it
- ➢ The K-factor is displayed
- ➢ Use [▽] or [△] to reach *Teach F or Teach V*
- ➢ Select "*Y* "or "*N*" and press [ENTER] on the chosen Teach-in type
- ➢ The valve will open, and the discharge will dispense liquid into the tank
- ➢ When the tank is full, confirm *Fill End* to terminate the batch
- ➢ Enter the volume or flowrate in Gallons or Gallons per Minute with [▽] and [△]. Then press [ENTER]
- ➢ The Batch Controller will calculate a new K-factor a display it.
- ➢ Save and exit the programming menu through *Return* and *End* in the menus.
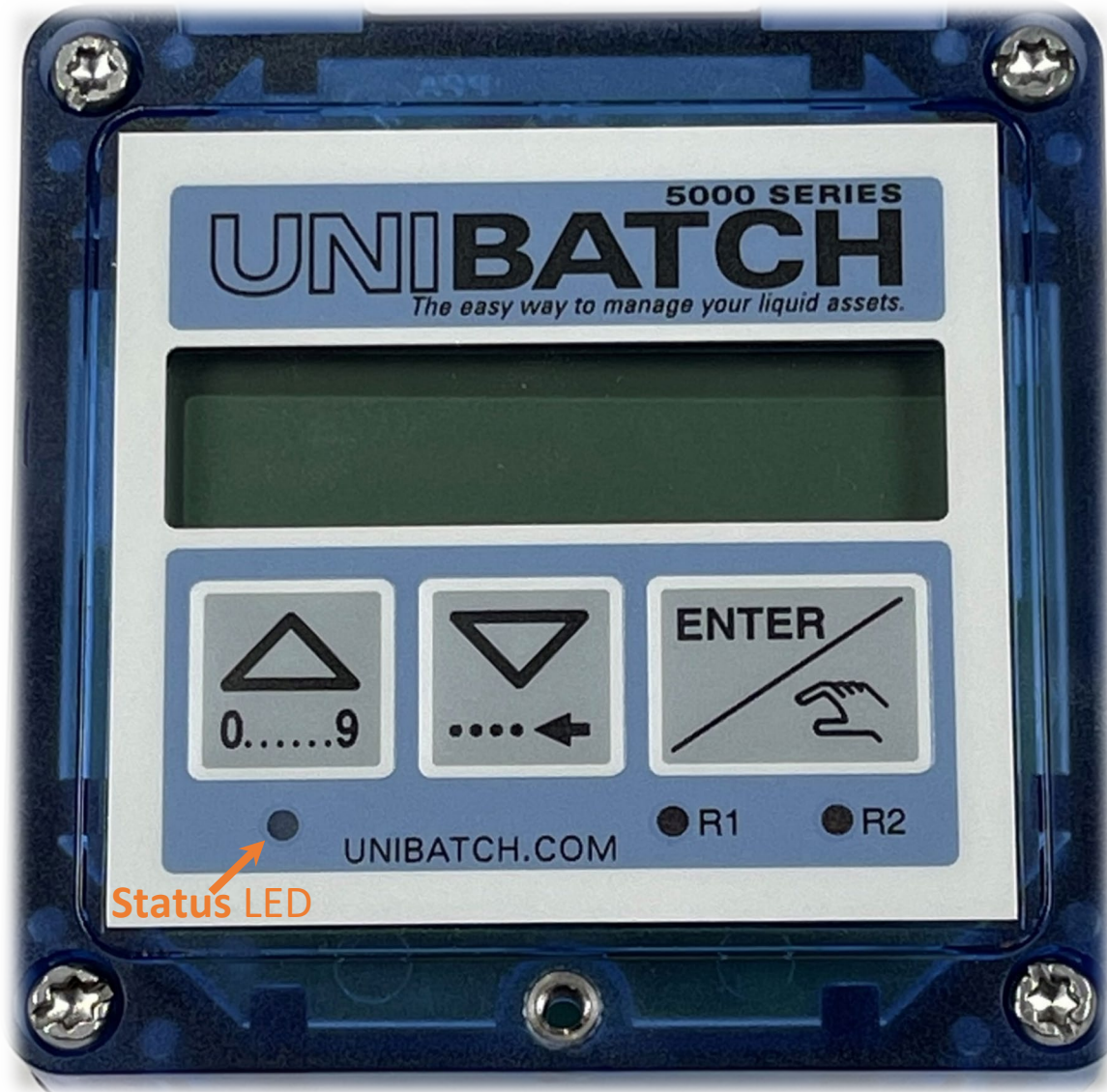
12.4 Running a first Batch

- ➢ At the *Batch M* prompt, press [ENTER]
- ➢ Using [▽] and [△]., submit the Preset quantity desired
- ➢ Press [ENTER] and again at the *Y/N* prompt to begin the batch
- ➢ The valve should open and the display will begin counting down the from the Preset quantity

12.5 Description of the status LED Colors

Color	Status
Green	The Batch Controller is operating correctly
Orange	An Alarm has been generated Press the ▽ key for 2 seconds to access the message while idle
Red	An Error message has been generated Press the ▽ key for 2 seconds to access the message while idle
Flashing (any color)	Slow flashing: batch has been interrupted Fast flashing: the batch has been interrupted by an alarm

Table 9

13 Maintenance and Troubleshooting

13.1 Safety Instructions

⚠ **DANGER**

Danger due to electrical voltage

- ❖ Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system
- ❖ Observe all applicable accident protection and safety regulations for electrical equipment

⚠ **WARNING**

Risk of injury due to non-conforming maintenance

- ❖ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools
- ❖ Ensure that the restart of the installation is controlled after any interventions

13.2 Cleaning the UNIBATCH Assembly

The controller and assembly can be cleaned with a damp cloth or a materially-compatible detergent. Contact Don Johns for additional information on cleaning, if necessary.

13.3 Troubleshooting

13.3.1 When the Batch Controller status LED is OFF

- Check wiring
- Check fuse of power supply
- Check power of installation
- Check that the integral power supply is working properly

13.3.2 Error message and the Batch Controller LED is RED (Electronic Errors)

Message Displayed	Possible Cause	Recommended Action
PWRFAIL	• Supply voltage too low • The controller isn't working	• Check that supply voltage is between 12 and 36VDC
ERROR3	• User parameters are lost	• Restart the controller • Re-configure the controller
ERROR4	• Totalizer values lost	• Restart the controller
ERROR5	• Both Error3 and Error4	• Restart the controller • Re-configure the controller
ERROR6	• Totalizers are lost and reset	
ERROR7	• Error3 and Error6	
Batching being done….	• Rotation frequency of the paddlewheel is above 2.2KHz	• Check the pipe flowrate • Adjust flowrate

Table 10

13.3.3 Warning message and the Batch Controller status LED is ORANGE (Flow Warnings)

Message Displayed	Possible Cause	Recommended Action
WARN.LOW or **ALARM**	• Low flowrate timeout	• Check flowrate in pipe
WARN.HIG or **ALARM**	• High flowrate timeout	• Clean flow sensor • Check that paddlewheel sensor is secured properly to UNIBATCH controller
W.OVER	• Batch exceeded overfill correction threshold	• Check process and solenoid or ball valve, actuators • Smoothen overfill correction parameter
WARN.VOL	• Daily volume totalizer has reached the value set in Test Menu	• Do planned maintenance • Reset daily totalizer
W. BATCH	• The number of batches have reached the value set in the Test Menu	

Table 11

Spare Parts and Accessories

00569650	Batch Controller

050BB-SV1ST0	1/2" Bronze UniBatch
423986	Paddlwheel Flow Meter
263096	Batch Valve with Solenoid
98100010	Actuator Cable Kit

050BS-SV1ST0	1/2" SS UniBatch
424010	Paddlwheel Flow Meter
273632	Batch Valve with Solenoid
98100010	Actuator Cable Kit

075BB-SV1ST0	3/4" Bronze UniBatch
423987	Paddlwheel Flow Meter
273552	Batch Valve with Solenoid
98100010	Actuator Cable Kit

075BS-SV1ST0	3/4" SS UniBatch
424011	Paddlwheel Flow Meter
273636	Batch Valve with Solenoid
98100010	Actuator Cable Kit

100BB-SV1ST0	1" Bronze UniBatch
423988	Paddlwheel Flow Meter
273556	Batch Valve with Solenoid
98100010	Actuator Cable Kit

100BS-SV1ST0	1" SS UniBatch
424012	Paddlwheel Flow Meter
280409	Batch Valve with Solenoid
98100010	Actuator Cable Kit

150BB-BV2STE	1.5" Bronze UniBatch
423990	Paddlwheel Flow Meter
EA-33NF-SE-150	Batch Valve
MAR50-2-4/3P2PR	2-Stage Actuator
2042008-KIT	Actuator Cable Kit

150BS-BV2STE	1.5" SS UniBatch
424014	Paddlwheel Flow Meter
EA-33NF-SE-150	Batch Valve
MAR50-2-4/3P2PR	2-Stage Actuator
2042008-KIT	Actuator Cable Kit

200BB-BV2STE	2" Bronze UniBatch
423991	Paddlwheel Flow Meter
EA-33NF-SE-200	Batch Valve
MAR50-2-4/3P2PR	2-Stage Actuator
2042008-KIT	Actuator Cable Kit

200BS-BV2STE	2" SS UniBatch
424015	Paddlwheel Flow Meter
EA-33NF-SE-200	Batch Valve
MAR50-2-4/3P2PR	2-Stage Actuator
2042008-KIT	Actuator Cable Kit

Table 12

Appendix A
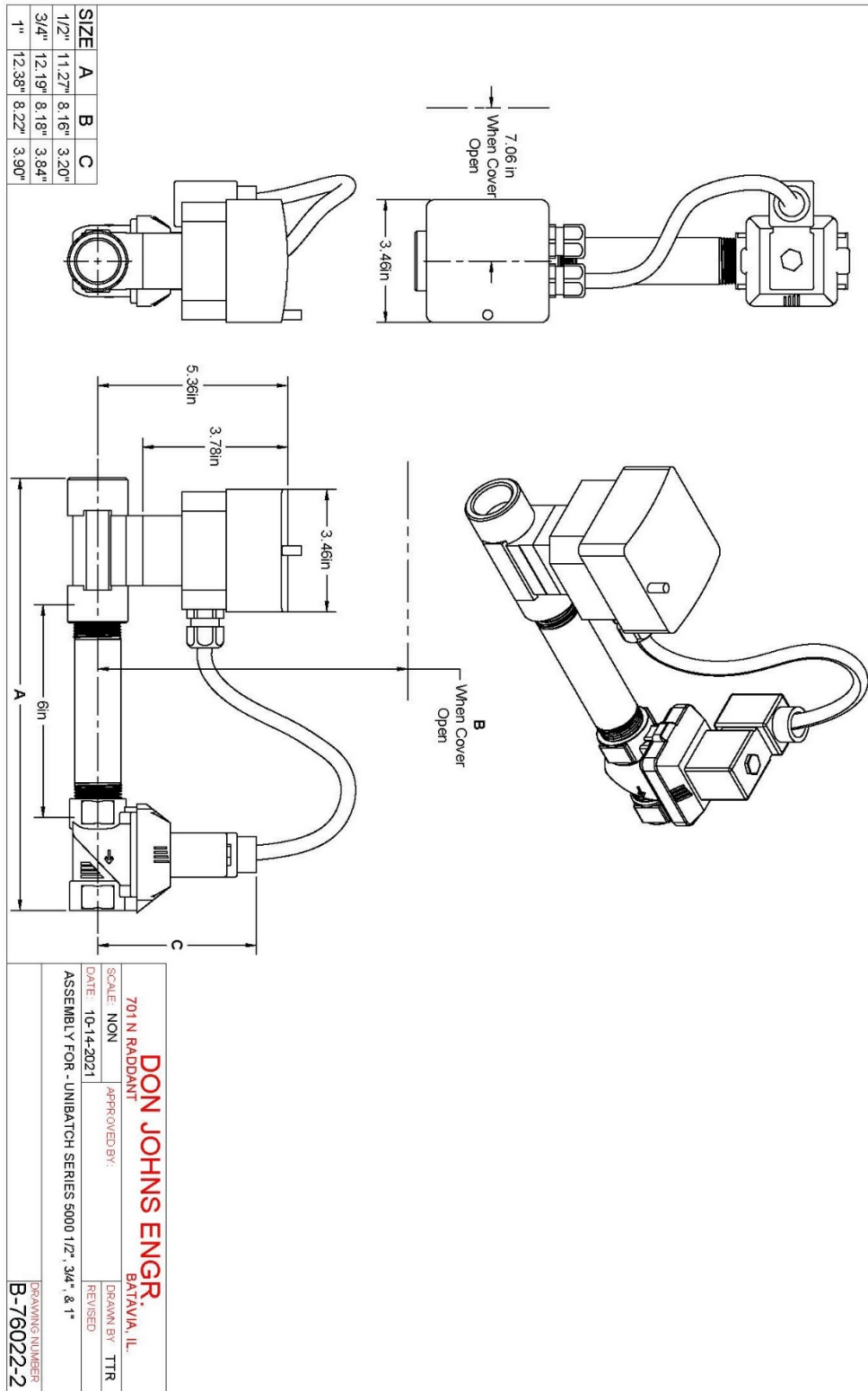### Construction Overview Diagrams

Single-Stage Assembly- sizes 1/2", 3/4", 1"

INLET

BATCH CONTROLLER

SIGNAL CABLE

2-STAGE ACTUATOR

MANUAL OVERRIDE KNOB
(LIFT AND TURN)

PADDLEWHEEL FLOWMETER

INTERMEDIATE PIPE

BATCH VALVE

DISCHARGE END

MOUNTING KIT
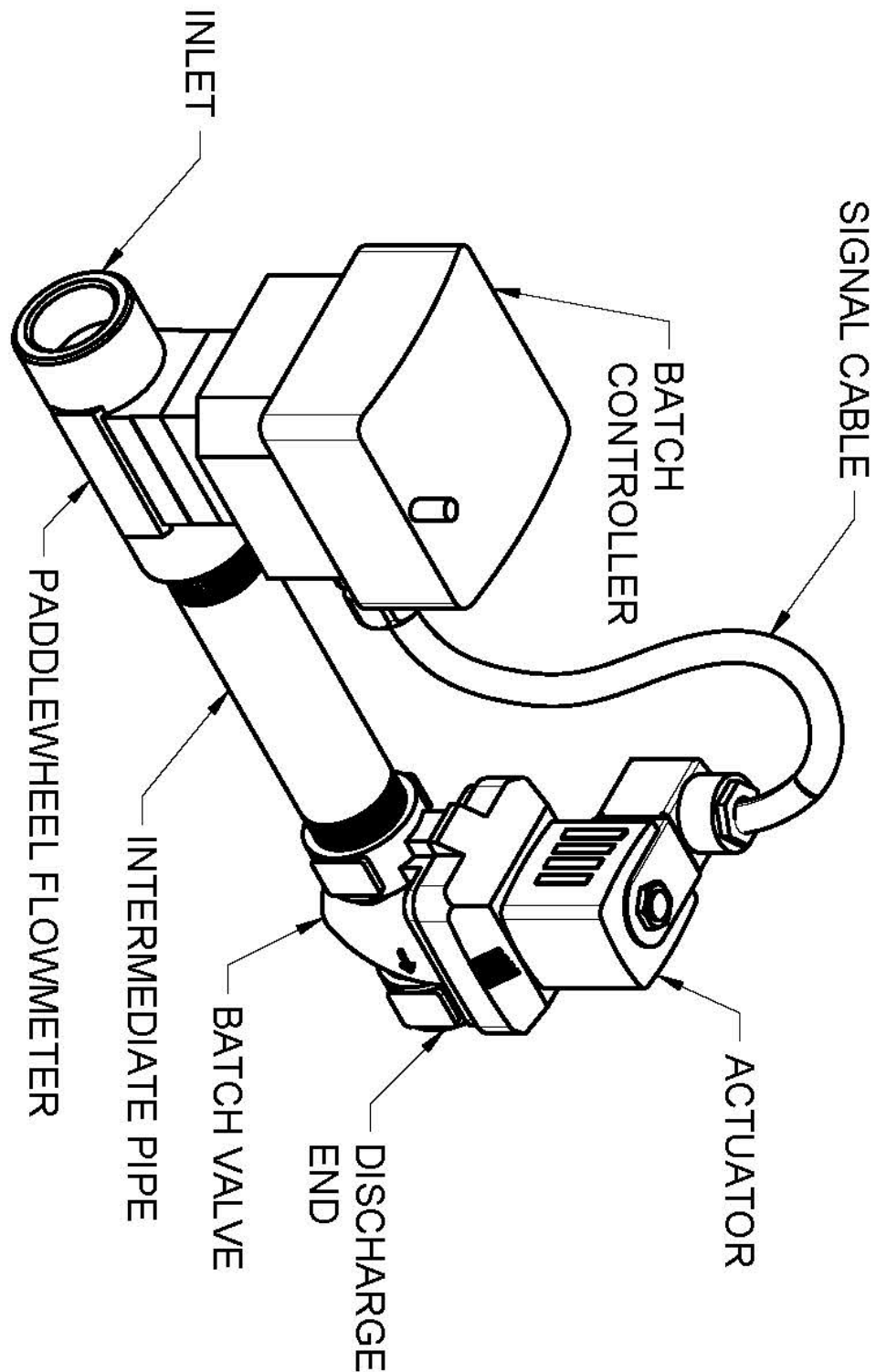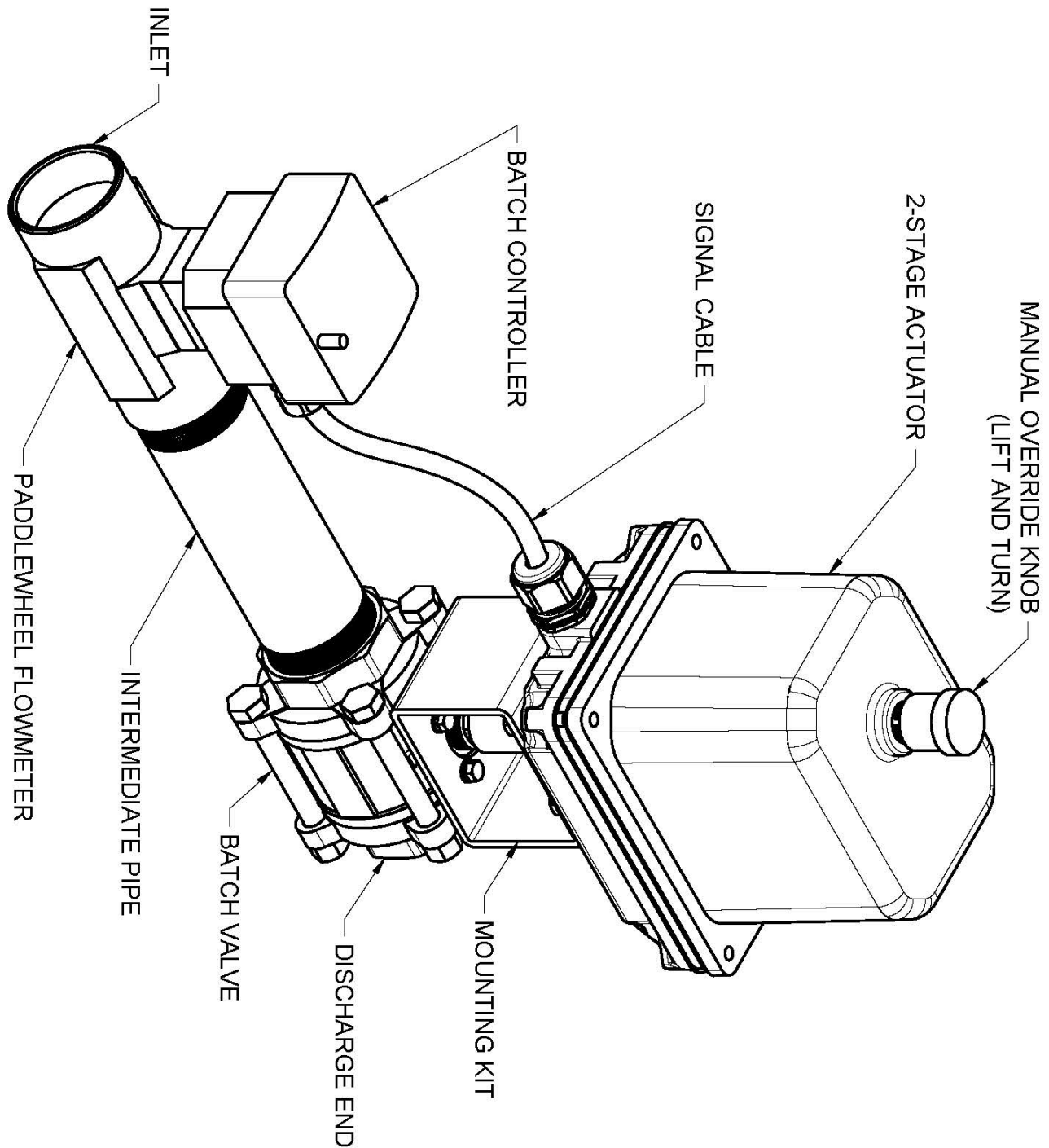
Appendix B
Dimensional Drawings
Single-Stage Assembly

SIZE	A	B	C
1/2"	11.27"	8.16"	3.20"
3/4"	12.19"	8.18"	3.84"
1"	12.38"	8.22"	3.90"

DON JOHNS ENGR.
701 N RADDANT
BATAVIA, IL.

SCALE: NON
DATE: 10-14-2021
APPROVED BY:
DRAWN BY: TTR
REVISED

ASSEMBLY FOR - UNIBATCH SERIES 5000 1/2", 3/4", & 1"

DRAWING NUMBER
B-76022-2

Two-Stage Assembly

SIZE	A	B	C
1-1/2"	16.42"	8.38"	14.40"
2"	17.80"	8.66"	14.76"

DON JOHNS ENGR.
BATAVIA, IL.
701 N RADDANT

ASSEMBLY FOR - UNIBATCH SERIES 5000 1-1/2" & 2"

| DATE: 10-14-2021 | | DRAWN BY: TTR |
| SCALE: NON | APPROVED BY: | REVISED |

DRAWING NUMBER
B-76024-1

Appendix C
Wiring Diagrams
Single-Stage Assembly

Appendix D
UniBatch Quick-Start and Programming Sheet

Customer:		Date:
Meter S/N:	**Controller S/N:**	
Sales Order:	**Purchase Order:**	

To Start a Batch:

Press the ⬇ button until Batch Mode or *"BATCH M" is highlighted*

Press the ENTER Button
Last batch amount will be shown

Press the ENTER Button
Display will read yes or no

Press the ENTER Button
Batch Valve will open, and batch will begin

To Pause a Batch:

Press the ENTER button.
Batch Valve will close, and batch will pause

To Stop a Batch:

Press the ENTER button
Batch Valve will close, and display will read "CONTINUE"

Press the ⬇ button:
Display will read "RESET"

Press the ENTER button.
Display will read current batch amount

Press the ENTER button.
Display will read "OK YES/NO"

Press the ⬇ button:
"NO" will be highlighted

Press the ENTER button.
You will return to Batch Mode and *display will read "BATCH M"*

To Change Batch Size:

In Batch Mode, press the [ENTER] button
Last batch amount will be shown

Use the [▽] button to move the selector the left.

Use the [△ 0......9] button to change the selected unit

When desired batch amount is entered; press the [ENTER] button to save

To Display FLOW Rate while Batch is Running:

Press the [▽] Button
Flow Rate will Display for five [5] Seconds

To Add or Remove a Decimal Point (To Read in Tenths or Hundredths)

When selecting your desired batch amount, press the [△ 0......9] and [▽] buttons simultaneously to add decimal.

Press [△ 0......9] and [▽] once again to remove it.

Don Johns Inc
UniBatch™ 5000 Series Programming Sheet

Customer:			Date:	
Meter S/N:		**Controller S/N:**		
Sales Order:		**Purchase Order:**		

Please enter and highlight programmed parameters

LANGUAGE		ENGLISH	DEUTSCH	FRANCAIS	ITALIAN	ESPANOL
UNIT	**BATCH**	US GAL	IMP GAL	POUNDS	KILOGRAMS	M LITRE
		LITRE	M3			
	FLOW	UNIT/SEC	UNIT/MIN	UNIT/HOUR		
	TOTAL	US GAL	IMP GAL	POUNDS	KILOGRAMS	M LITRE
		LITRE	M3			
	DEC POINT	0	1			
K-FACTOR	**K FACTOR**					
	TEACH VOLUME		*(ENTER VOLUME)*			
	TEACH FLOW		*(MEASURE)*			
OPTIONAL	**MODE**	LOC. MANU.	LOC. MEM.	MEM. MANU.	EXT. MEM.	EXT. LOC.
		EXT [T]	EXT. REP.	LOC. REP.		
	VOLUMES	V1 - N/A	V2 - N/A	V3 - N/A	V4 - N/A	V5 - N/A
		V6 - N/A	V7 - N/A	V8 - N/A		
OVERFILL		DISABLE	DIRECT	LOW	MEDIUM	HIGH
ALARM	**DURING**	DISABLE	ENABLE			
	AFTER	DISABLE	ENABLE			
OUTPUT	**DO1**	PULSE	ALARM	WARNING	END DOSE*	Batch Valve
	DO2	DEL - 000	100%			
		INV	YES	NO		
	DO3	ALARM	WARNING	END DOSE*	Batch Valve	
		INV	YES	NO		
	DO4	PULSE	STATE	ALARM	WARNING	END DOSE*
RESET	**TOTAL**	**RESET**	YES	NO		
	BATCH	**RESET**	YES	NO		
	HISTORIC	**RESET**	YES	NO		
BACKLIGHT		9	30 SEC			
END						

*The term "Dose" is synonymous with Batch

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