AgroChem Pump Systems

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Systems

- Why do we want dairies on our systems?
- They move **more** product!
- Its always consistently used
- They keep out competitors
- Great results=happy dairyman

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Footbath Dosing Systems

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Advanced Footbath System

System Capabilities

- Advanced Mode
  - Initial Fill
    - Replenish 9oz/cow
- Set on a Calendar
- 6 week
  - Usually 1-2 weeks
- Up to 8 baths
- Up to 2 Products
- System Saves Settings
- Can be Connected Gea Bladder System

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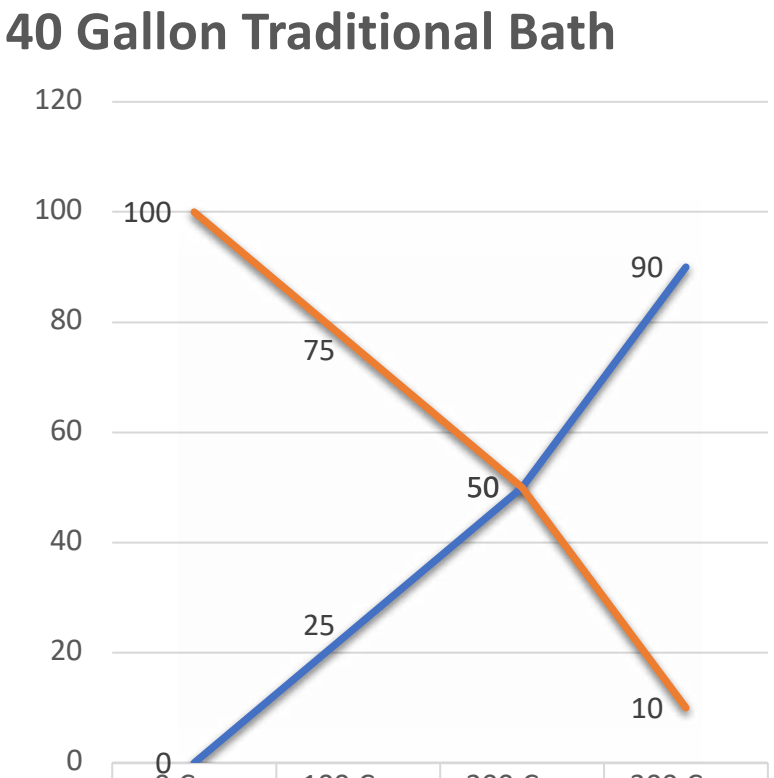
Benefits of FDS

- System Benefits
  - Set Up Unique to each Dairy
    - Bath Sizes, Cow Numbers, Shift Times, Cow Flow
  - Minimal Parts to Replace
  - Cost Savings with Replenish
  - Not Fully Automated
    - Employees Pay Attention
  - Can Control Fully Automated Baths
    - GEA Bladder

Traditional Foot Bath Protocol

Traditional baths Filled in the beginning and completely changed out

- At Start 100% Water and Chemical
- 9 oz kickout water, chemical, and manure
- Manure (organic load) only added
- Results
  - Low Level Bath
  - Dead Bath
    - High Organic Load 90%+



	0 Cow Passes	100 Cow Passes	200 Cow Passes	300 Cow Passes
Organic Load	0	25	50	90
Water and Chemical	100	75	50	10

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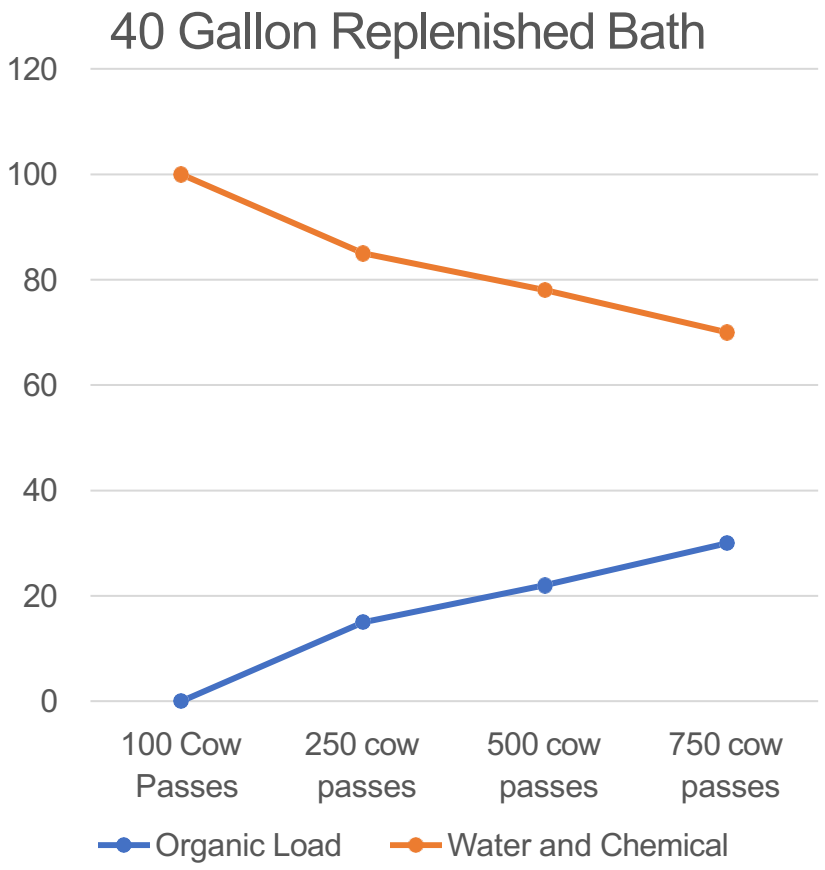
Replenishing Footbath Protocol



- Replenishing baths filled in the beginning and replenished every 30 minutes based on cow flow
  - At Start 100% Water and Chemical
  - 9 oz kickout water, chemical, and manure
    - *Effected by speed of cow passes
  - Additions
    - Manure (organic load)
      - Amount variable on pace of cows passing through bath
    - 9 oz of water and chemical solution/cow
- Results
  - Bath Level Maintained
  - Water/Chemical % Maintained for 1000-3000 cow passes
    - Effected by bath size and cow flow

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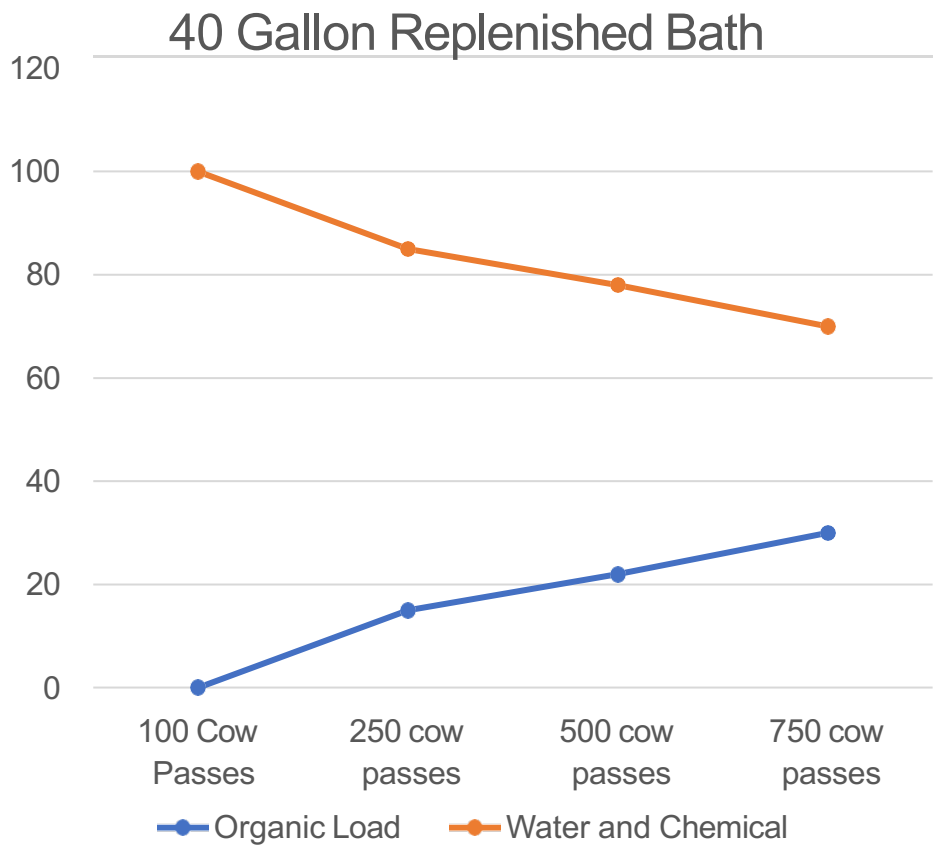
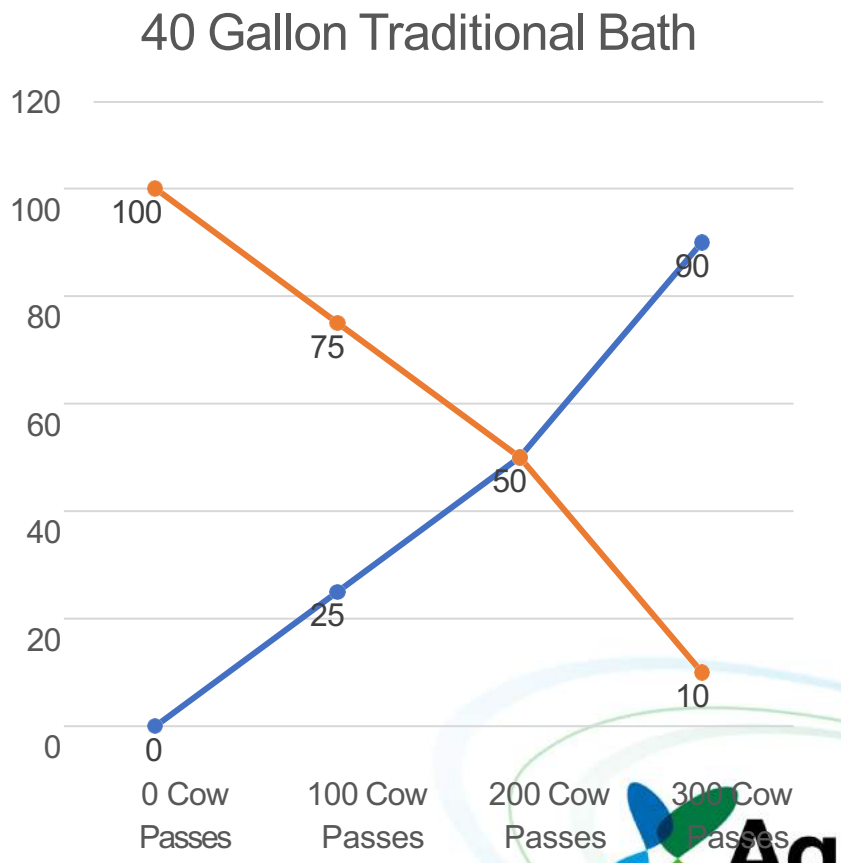
Replenished Bath Vs Traditional Bath Chemistry





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Traditional vs Replenish Costs

- 2000 Cow Dairy
  - 1- 80 gal bath
- HealMax Concentrate
  - $30/gallon
- Initial fill at 3%-2.4 $72
    - Bath Life=400 cows
    - 5 baths/day=$360/day of use
- 12 gallons HealMax/Day
  - $0.18/cow pass

- 2000 Cow Dairy
  - 1-80 gal bath
- HealMax Concentrate
  - $30/gallon
- Initial fill at 3%-2.4 $72
  - Bath Life=400 cows
  - 1700 cows replenish
  - 1700 x 9 oz x .03=459 oz HM 3.58 gal
- 5.98 gal HealMax/day
  - Total cost per day $179.40
- $0.09 per cow pass

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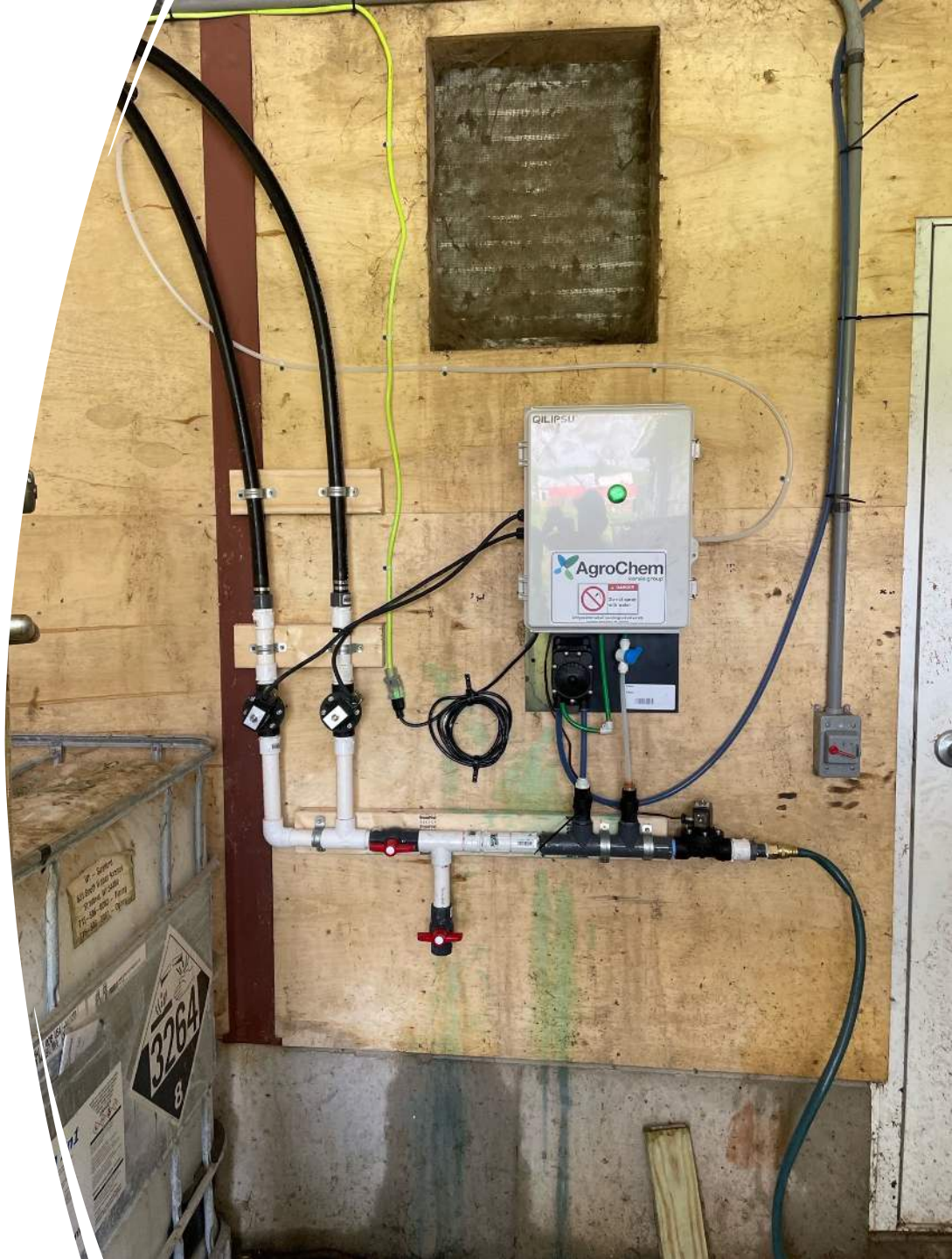
Simple Footbath System

- Manual Press Button to Fill
- Fills water, chemical, and air based on time
- Manual press button to Fill multiple baths
  - Can have a manual (spike) or replenish button
- Great option for:
  - Farm Sized: 300-1000 cows
  - Large Farms with Long Footbaths
  - Robotic Farms
  - Farms Unequal Bath Changes



What Do We Need to Install A System?

Dairy Needs for Install

- Location
  - Dry location
  - > Freezing Year Round
  - Space for two totes
- Air
  - Regulator
- Water
  - Consistent Flow
- Footbath
  - Depth Max 7 inches
  - Length Max 8 ft
  - Design Advice

FDS Box to the Footbath

- FDS box
- 1 multivalve for every footbath
  - Unless single bath
- ¾ in water backflow preventer,
- Recommend 1 inch line from footbath to system
  - Could be bigger if you want a faster fill
- Into the bath-stainless pipe or electrical conduit down the wall into bath
  - Straps to secure it

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Bath Being Filled

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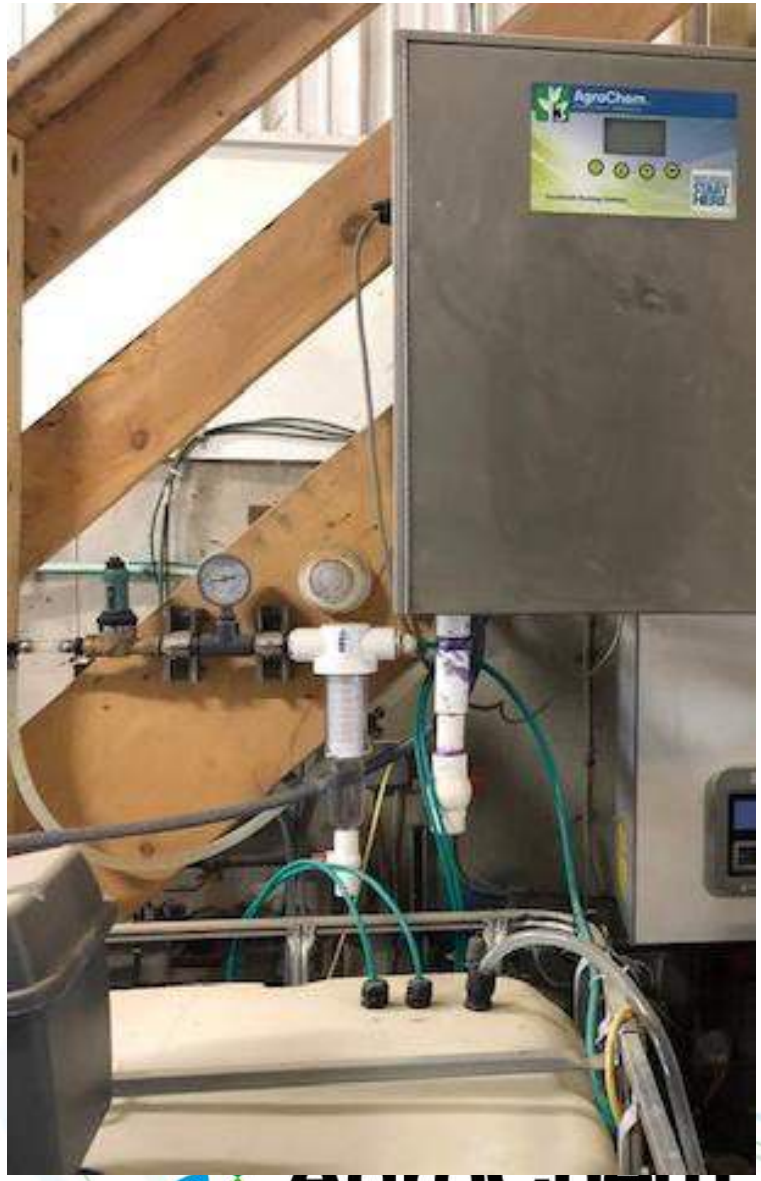
Water and Air Connections

- Air-1/4 line
  - An air regulator for 30-40 psi
  - If using an air pump needs 60-70 psi
- Water
  - Backflow preventor
  - Can use a separate pump and tote of water for constant if issues with water pressure
  - Contactor



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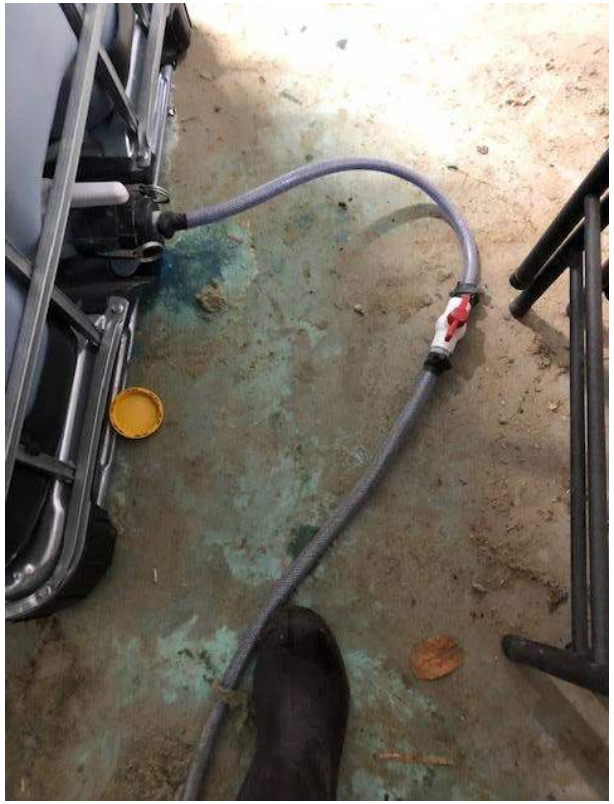
FDS System to the Product Tote



- Hose
- 1/2 ID 5/8 or ¾ OD hose
- Stinger
- ¾ PVC cut on an angle in the tote
- Valve
- Risks Leaks
- Different Totes
- Priming
- 3 way valve on exit pump with hose back to tote
- Back flow preventor on product hose
- Valve Connection with Two Way

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PVC and calibration drop line

- Calibration- from FDS to Multivalve
  - 1- 10 ft piece of Minimal Schedule 40 1 in PVC, 2 – 1 in PVC shutoffs, 2 1 in PVC T,
  - 1 in 90-degree Elbow,
  - 1 in PVC Union
  - 3-1 in Threaded PVC

- Out of Valves

  - 2 male 1 inch threaded to barb fitting to black poly
  - 1 inch pinch or hose clamps from barb fitting to black poly

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Multivalve Wiring

- Multivalve
- Needed for two or more baths
- Drill out two holes on side of FDS system for wiring
- Connect multivalve
- 18 gage 3 wire minimal
- Look at picture for diagram for two bath wiring
- No wiring needed for one bath

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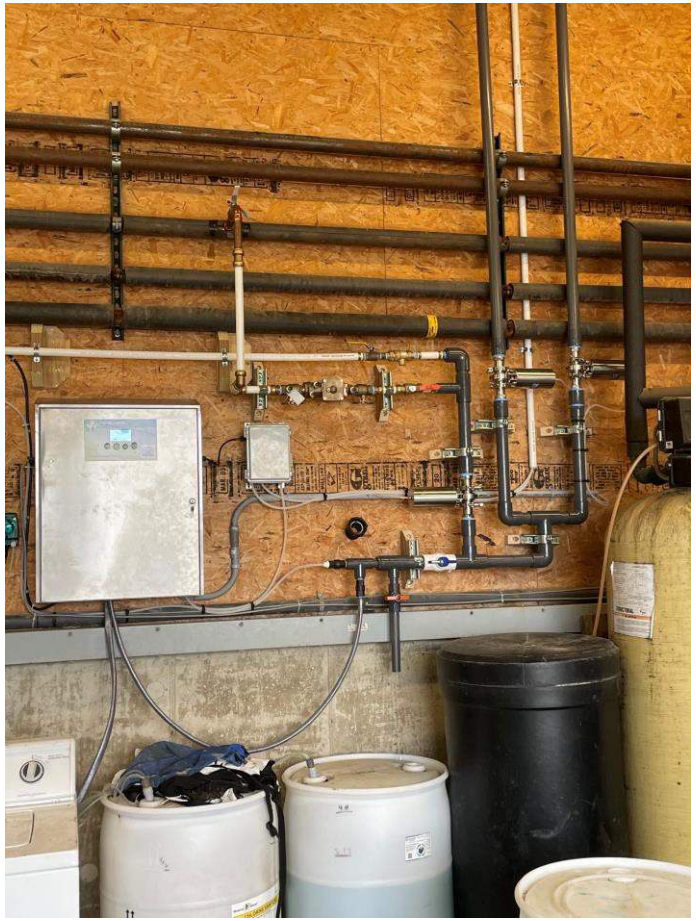
FDS Connected to GEA Bladder



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My System Does Not Work!

Trouble Shooting Common Problems and Solutions

Water In Baths But No Product

- Check for Prime in the line from Product Reservoir to the FDS Pump
- Prime the pump using the three-way valve
- Pump Lost Prime
- Air in the product Line
- Usually happens when tote is changed
- Can also happen if there is a kink in the line
- If pump goes dry, the seals can go bad
- Copper can clog the seals and need to be cleaned out
- If the seals go bad
- Change the seal in the pump, rebuild
- If pump is shaking when it is priming, it is working
- If it is not, replace the pump

FDS Is “Filling” But Nothing Is In the Bath

- Check the Water Valve inside System
- Likely Burned Out Solenoid Valve from Getting Wet
- Replace Water Valve with Multivalve
- Look for Leaks or Reasons that Liquid Could be Getting the Valve Wet

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Only One Bath Has Water and Chemical

- Check If the Lights are on the Bath Multivalves
- Feel for it to click on if it should be filling
- Burned out bath multivalve
- Usually due to burned out solenoid
- Replace entire valve
- Check for water leaking on it

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If the Screen Does not Light Up When the Machine is Plugged In

- Check the fuses, make sure the electric is on
- If bad, why?
- Put in new fuse and start system
- Investigate at which point in the bath cycle the fuse blows again
- Water valve, electric pump

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Screen is On, But Can Not Read It or Adjust It

- Front Board is Bad
- Before Replacing, try to take off settings using USB
- If the front board was replaced and it still did not run, back board is bad
- Backboard is only used for running multiple baths
- If it does not work, the entire system will not turn on

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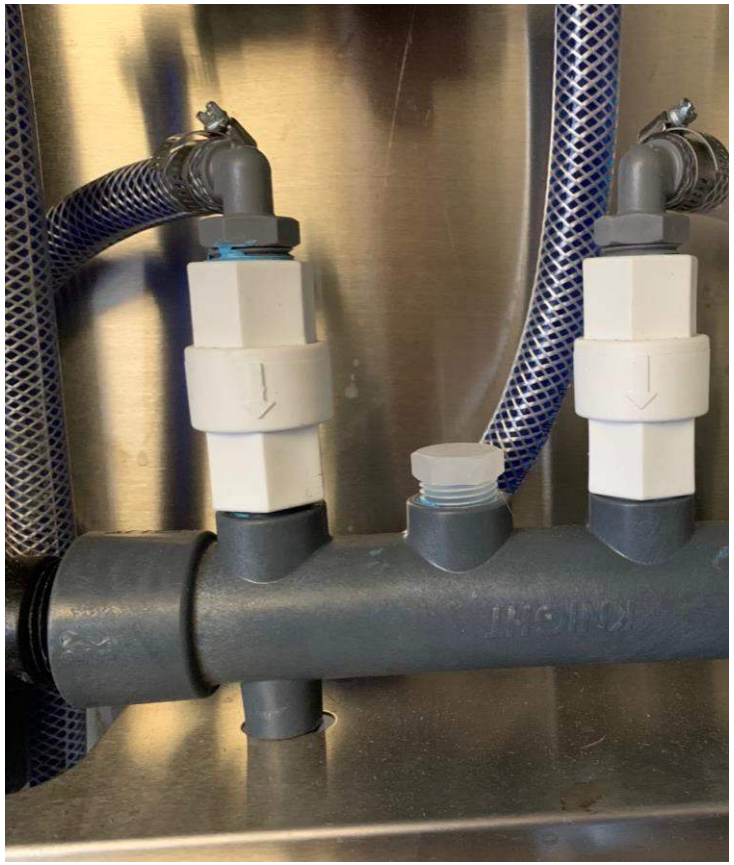
Airblow not Pushing



- No Slug of Air to the Bath
- Check That Air is on
- Check if Water Got into Airline
- Replace Check Valves on Manifold
- Check that Air Valve has not Burned Out

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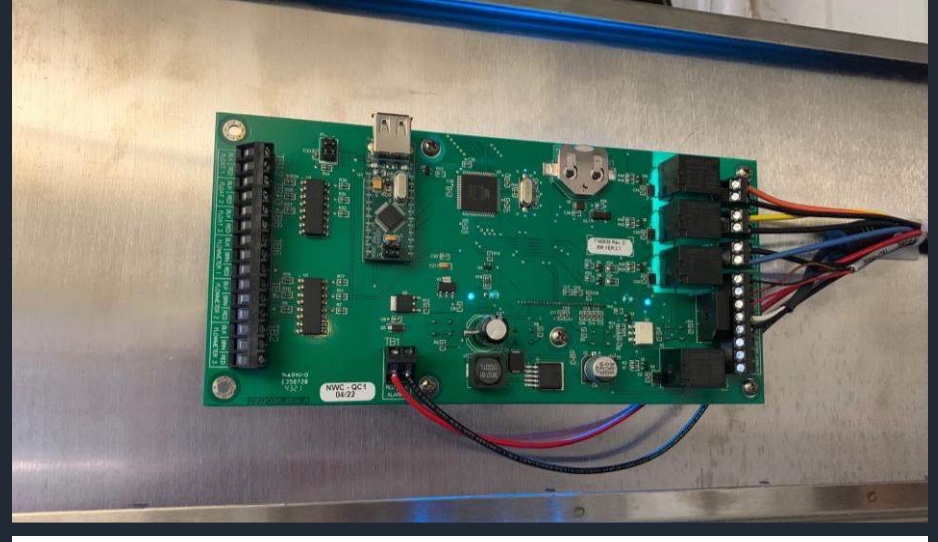
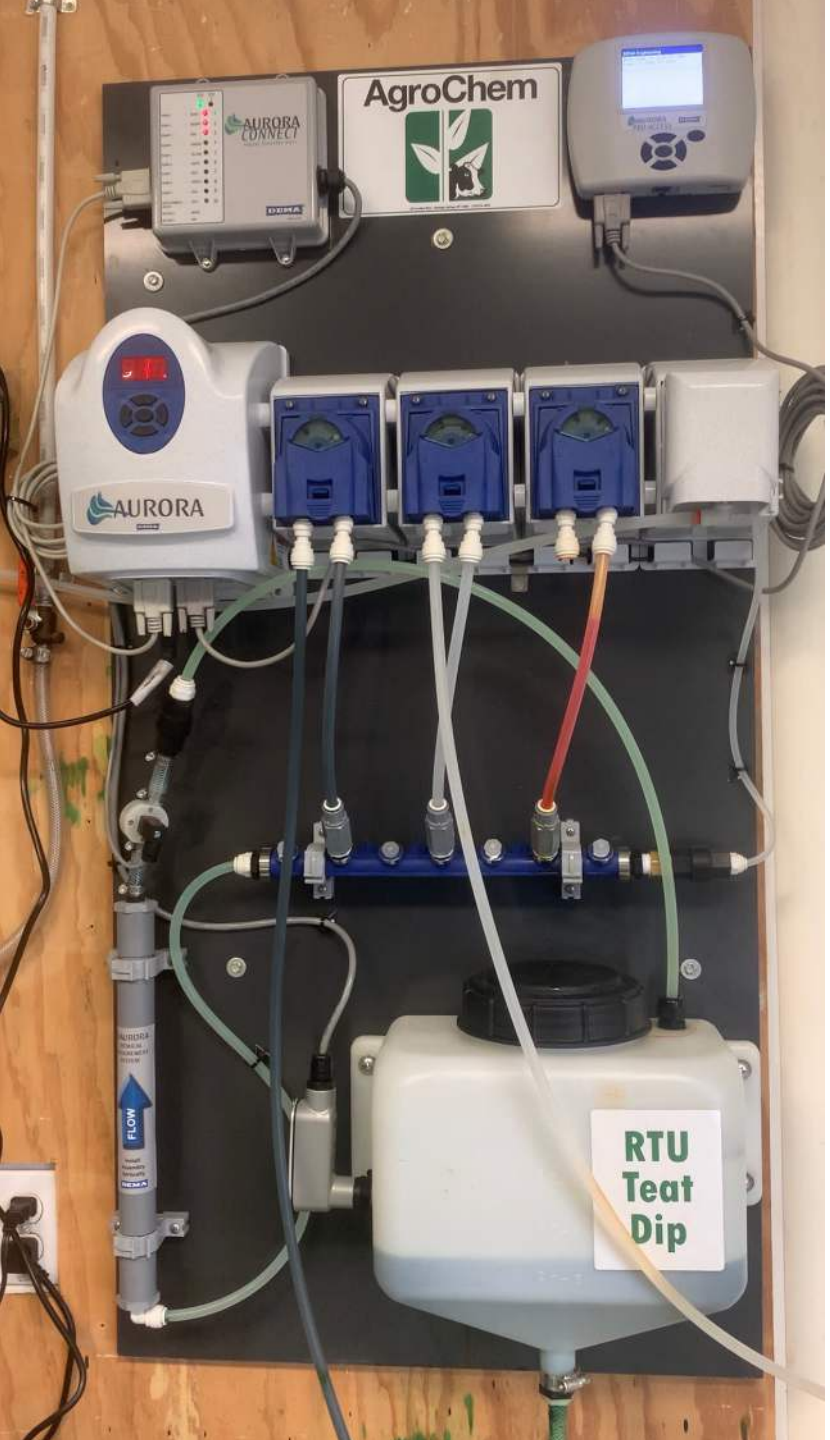
Items to Keep in Stock for Servicing FDS



- Knight electric pump
- Extra seals for the pumps
- 1 in. multivalves for baths and water valve
- Front board
- ½ in Check Valve
- Fuses



Aurora Concentrate System

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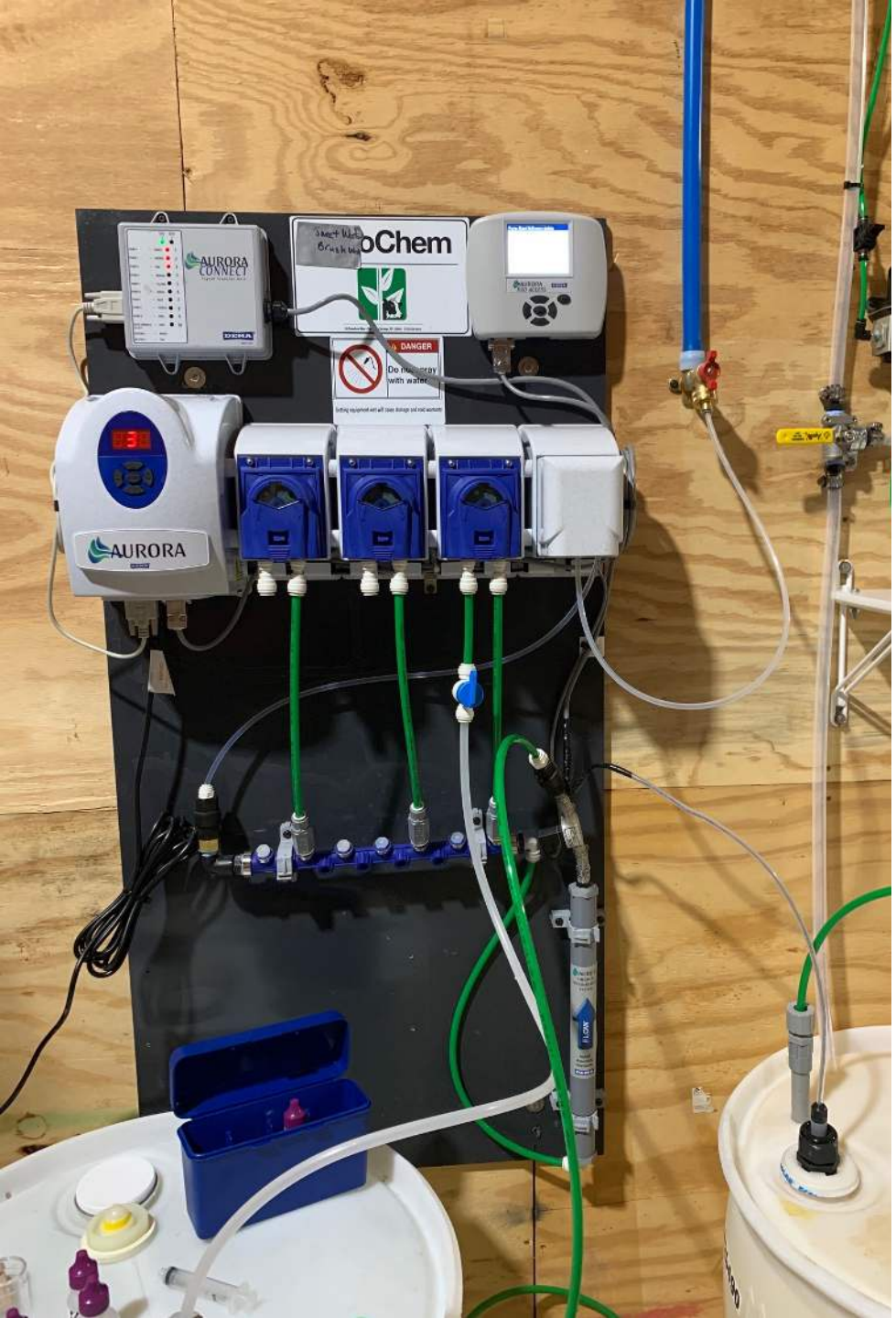

On Farm Aurora Uses

- Teat Dip Blending
  - Up to Four Part Teat Dip Blending
  - ¼ Gallon-7 Gallon Batches
- Robot Brush Wash Blending
  - Premixing AMS Brush Wash and Water Prior to Robots
- Chlorine Dioxide Disinfectant Blending
  - Large Farm/Large Usages

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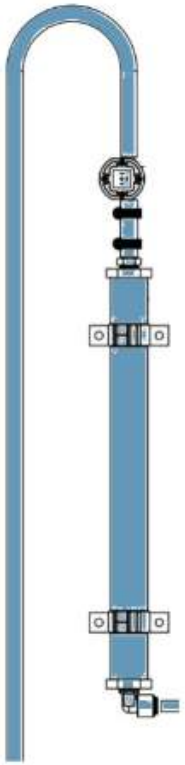
Aurora CMS

Adds Closed Loop Chemical Measurement and Control to the Aurora Laundry Dispenser

- Plug and Play set up
- Single flow meter handles all chemicals and flush
- No calibration required
- System is flushed on every dispense cycle
- Measures flow rates from 3 oz/min up to 200 oz/min
- Can be added to systems already installed in the field
- Adaptable for batching systems and industrial uses.

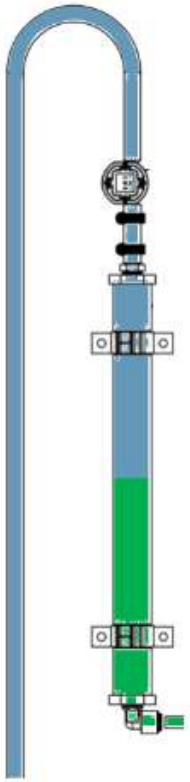
Patent Pending

Aurora CMS – Dosing Sequence

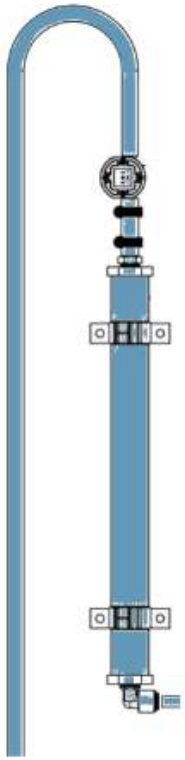


Aurora performs a pre-flush to fill the flush manifold and

CMS system.



Aurora pumps chemical into the flush manifold, water is displaced and measured by the flow meter water.



Aurora opens the flush valve delivering chemical to the RTU Container and cleaning out the CMS system.

Aurora CMS

Benefits

- Consistent mixing results
- Fast set-up – no calibration required
- Verifies flush water with each dispense cycle
- Serves as out of product alarm for each chemical
- Provides notification of squeeze tube wear
- Accurate dosing throughout the life of the squeeze tube
- Extends the life of the squeeze tube
- Accurate chemical use reporting with DEMA Connect app

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Making a Batch

- System Needs a Formula
  - Ounces Needed for Each Pump and Ounces of Water
- Triggered by Float
  - Red Lights
- Pre Flush
- Pump One Fill
- Flush
  - Will go back to Pump 1 if desired ounces are not achieved
- Pump 2 Fill
  - Will go back to Pump 2 if desired ounces are not achieved
- Flush
- Pump 3 Fill
  - Will go back to Pump 3 if desired ounces are not achieved
- Water Flush Until Total Water Ounces are Reached
- Will Make a Another Batch Until Float is Reached
  - Maximum number of batches is 1-5 depending on batch size

Installation

- Pump Stand Comes Pre-Assembled on a Board
- Needs
  - 48X24 in Wall Space
  - Conduit for Hoses in Barrels
    - We recommend foot valves on hoses to prevent back flowing
  - Water Hookup with Garden Hose Fitting
  - Water Filter
  - Hose from RTU Container to Parlor
    - RTU Container had 3/8 fitting
  - Programed Formulas
    - PROGRAMMED IN PROACCESS ONLY!

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Data Collection

Knowledge is Power

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AVD30

Cost Report
Machine(s): Aurora 1

Date: 8/29/2022
Account Number:

Report Period: 8/22/2022 - 8/28/2022

Formula		Loads	Cost / Load	Load Count / Shift			Formula Cost
				Shift 1	Shift 2	Shift 3	
1	2%XT UltraPre	269	$2.665	163	106	0	$716.89
	Total	**269**		**163**	**106**	**0**	**$716.89**
	Avg. Cost / Load		**$2.67**				

Chemical Name	Cost / Gallon		Consumption		Cost
Part A	$47.36		6.73	Gallon	$318.50
Part B	$47.36		6.73	Gallon	$318.50
Emollients	$14.08		5.67	Gallon	$79.89
					$716.89

Account Type	Formula	Cost
None	1	$716.89
		$716.89

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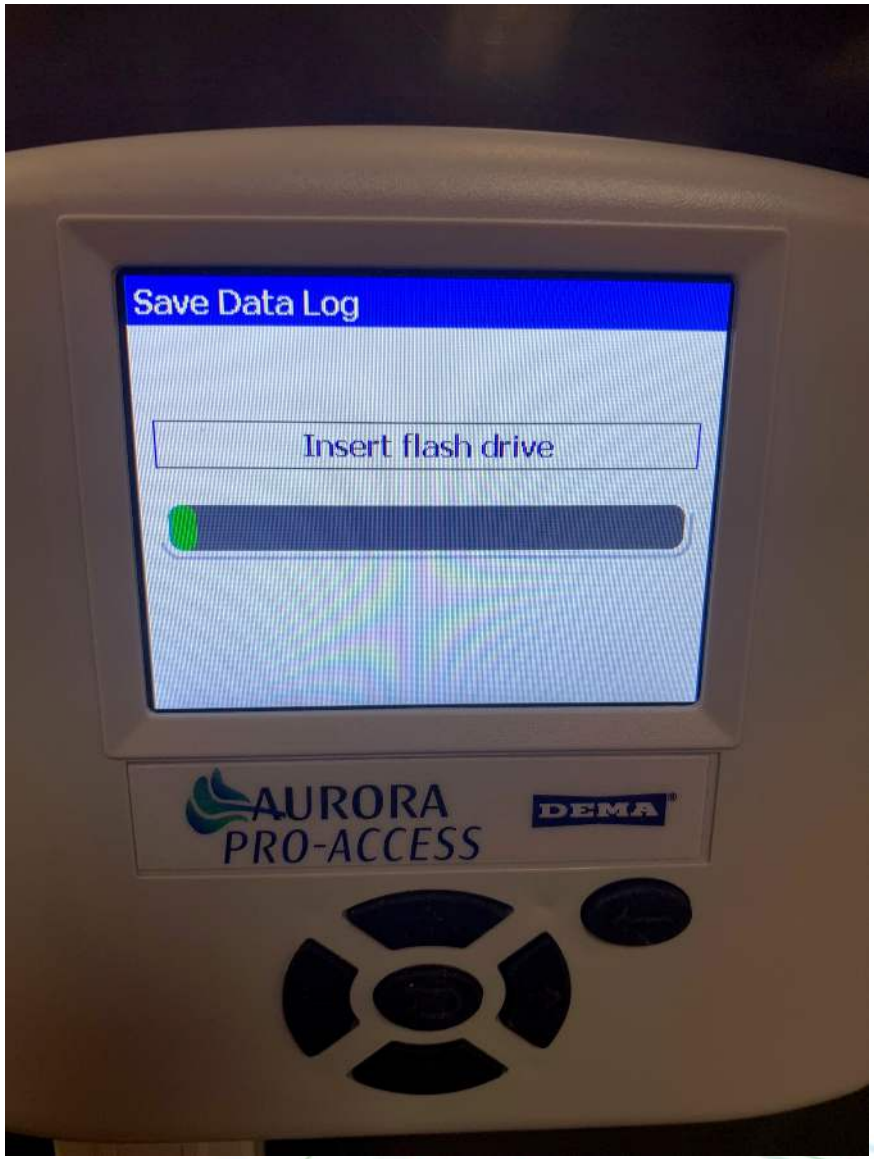
Data Collection

- Data Can Be Pulled from Aurora ProAccess with a USB Device
- Shares all Batches Made
  - Batch Times
  - Pump and Water Amounts
  - Alarms
- Follow Instructions to Pull From Aurora ProAccess
  - Data Report and Formula History
  - Email Data to AgroChem Rep



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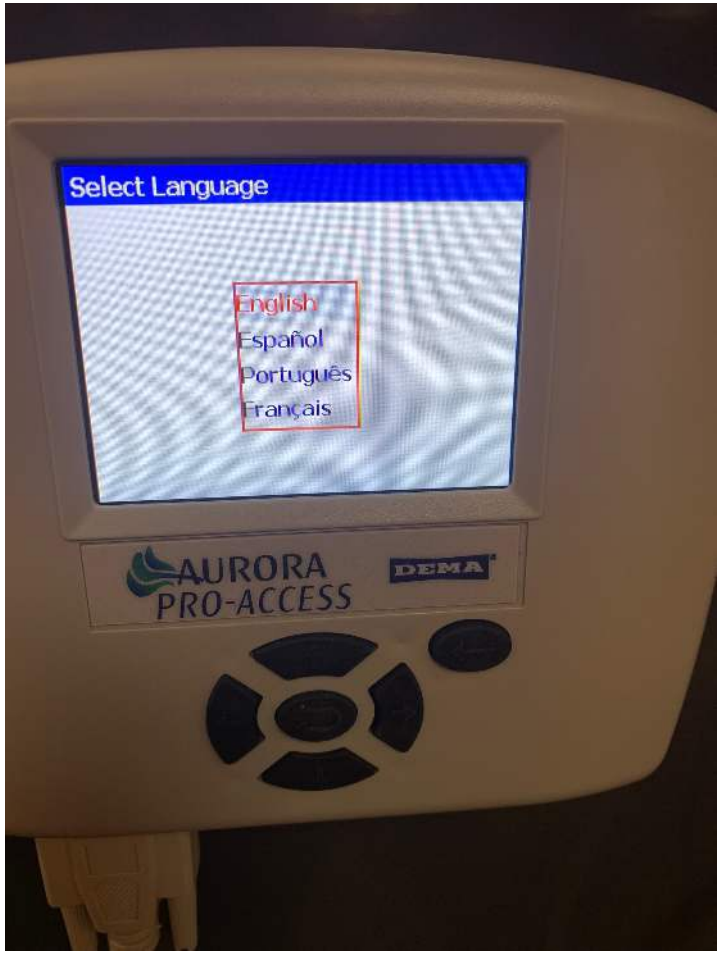
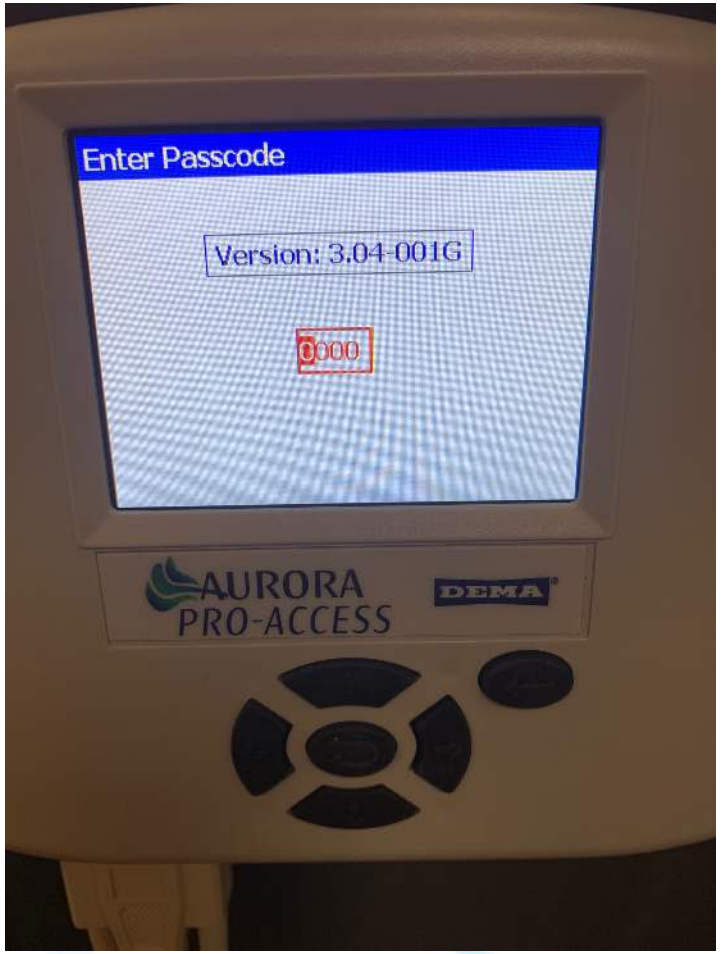
Data Collection





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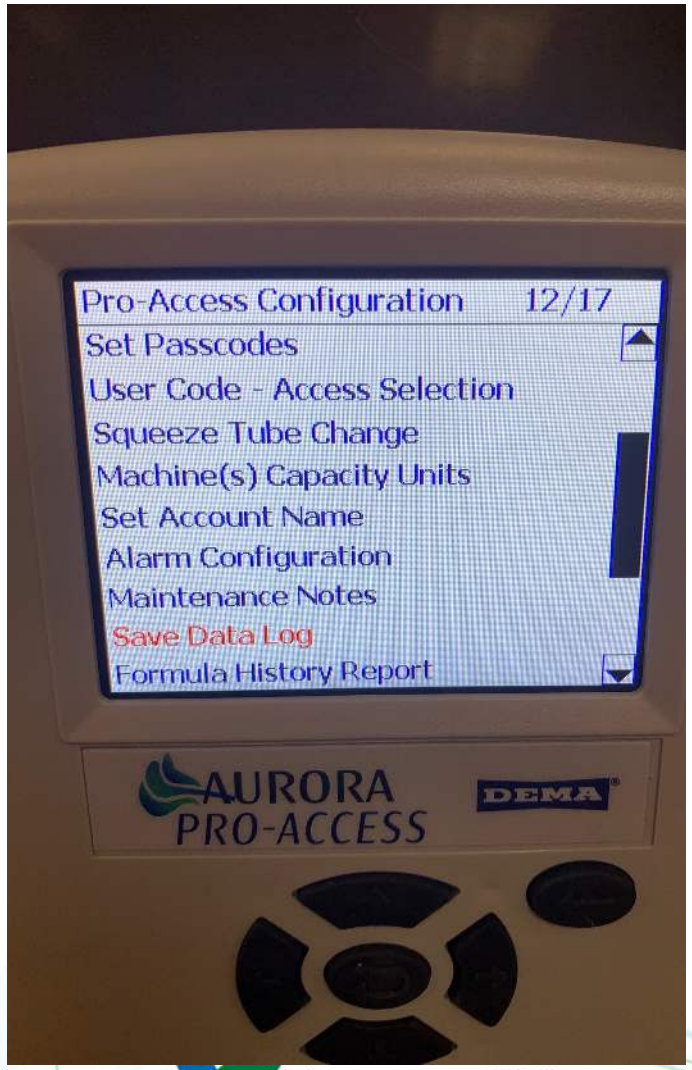
Data Log Collection



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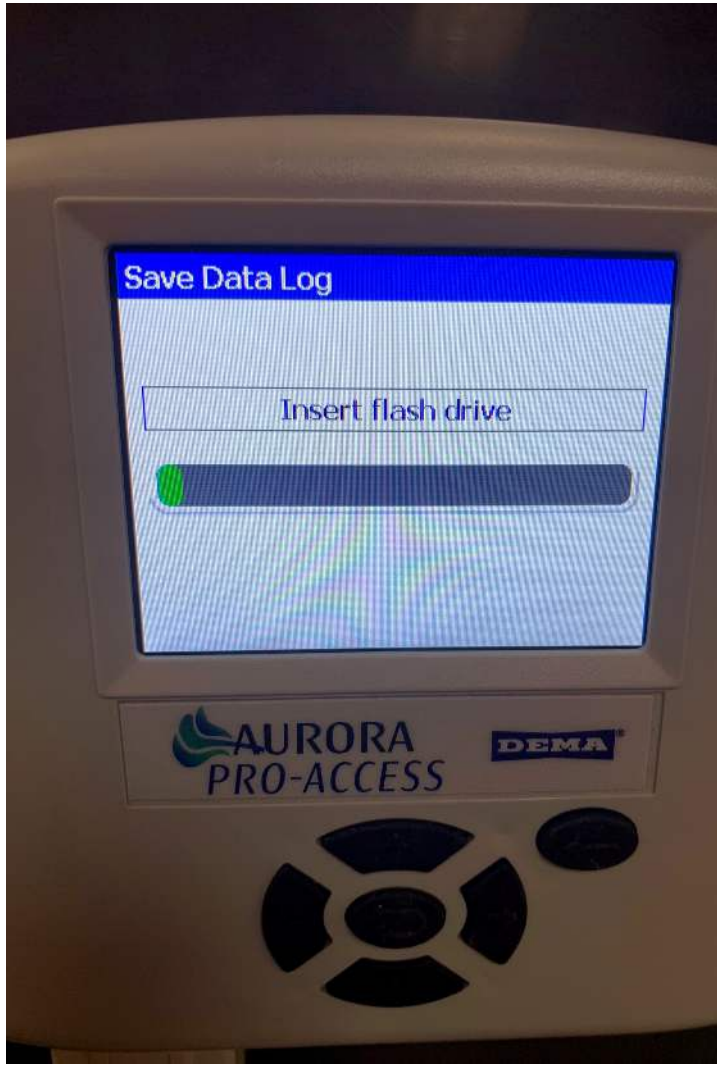
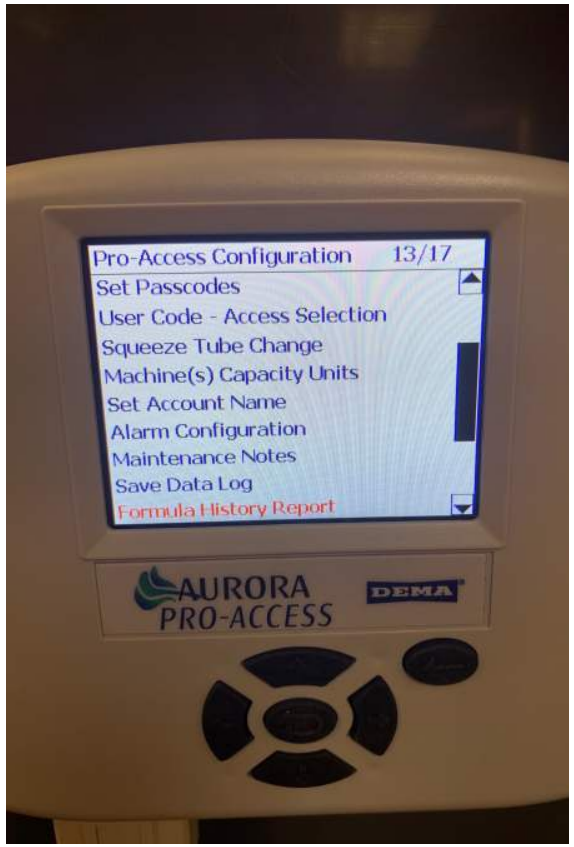
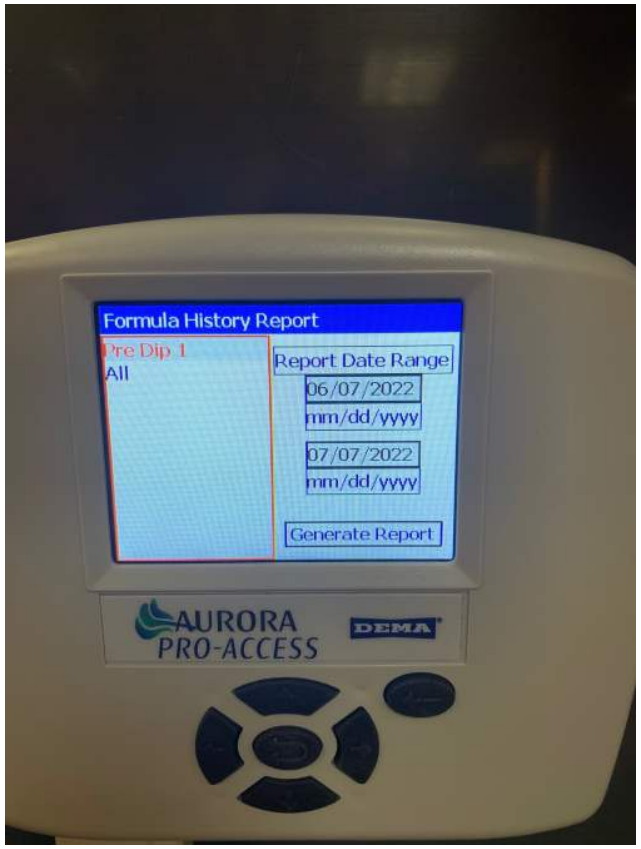
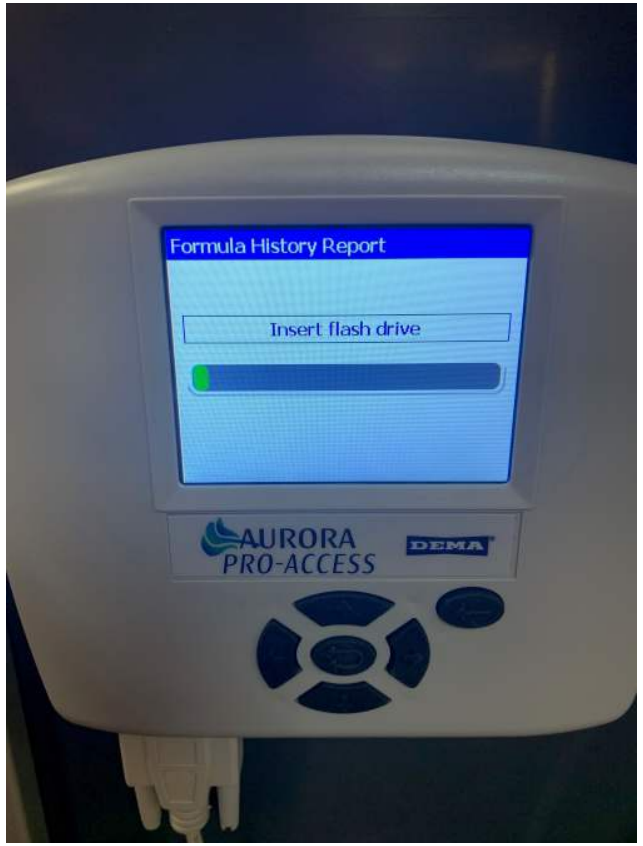
Data Collection









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My Pump System Isn’t Working

Before You Go There, Check These Alarms

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Squeeze Tube Alarm

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Squeeze Tube Alarm on Pro Access Screen

The Flow Meter recalibrates ever 10 batches so it constantly calibrates the flow of squeeze tubes as they break in

- It alarms when the squeeze tubes reach their half life
  - Half the speed of when they were last register as changes

Pro Access Squeeze Tube Alarm

- First Change the Squeeze Tubes
- Get into Aurora Pro Access
  - Select Pro Access
  - Select Squeeze Tube Change
  - Adjust the date that the squeeze tubes were last changed

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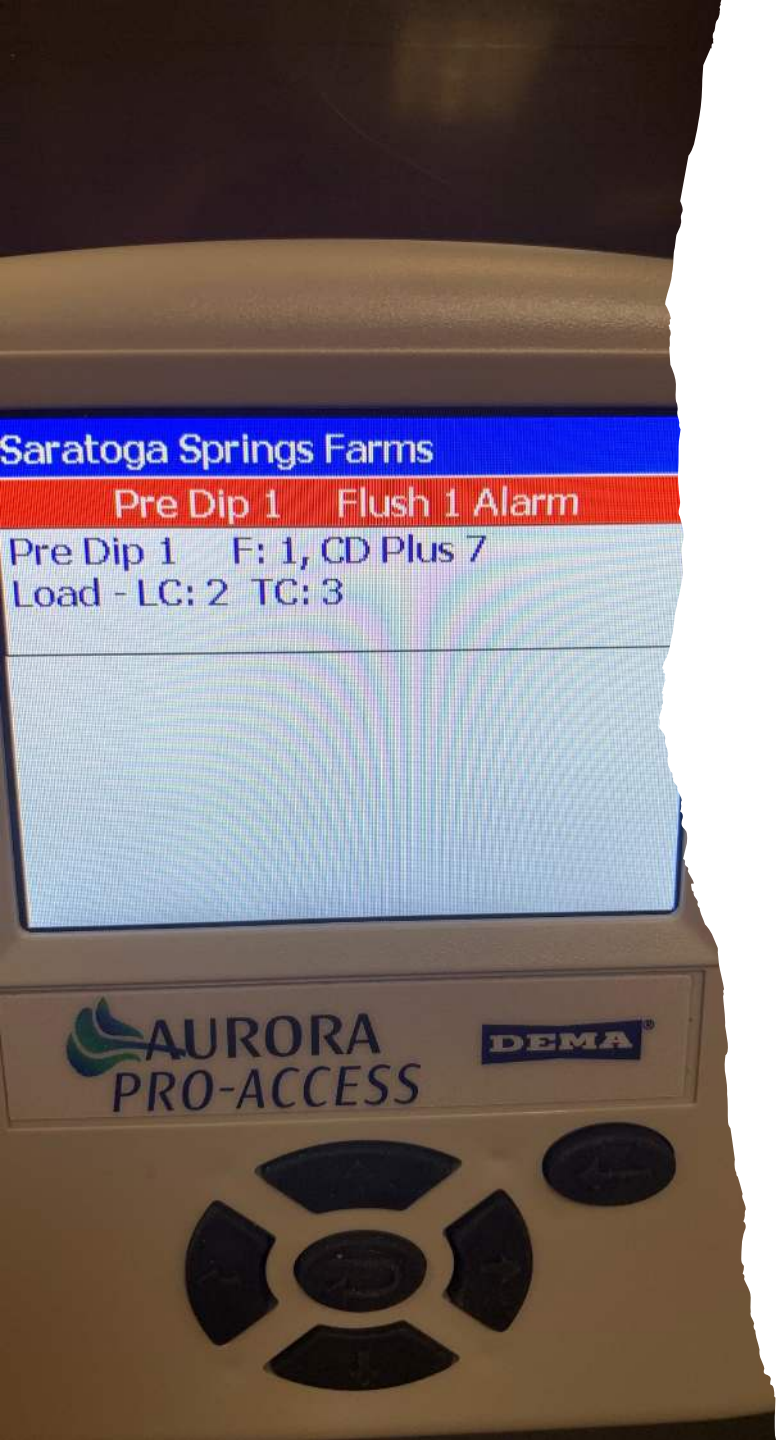
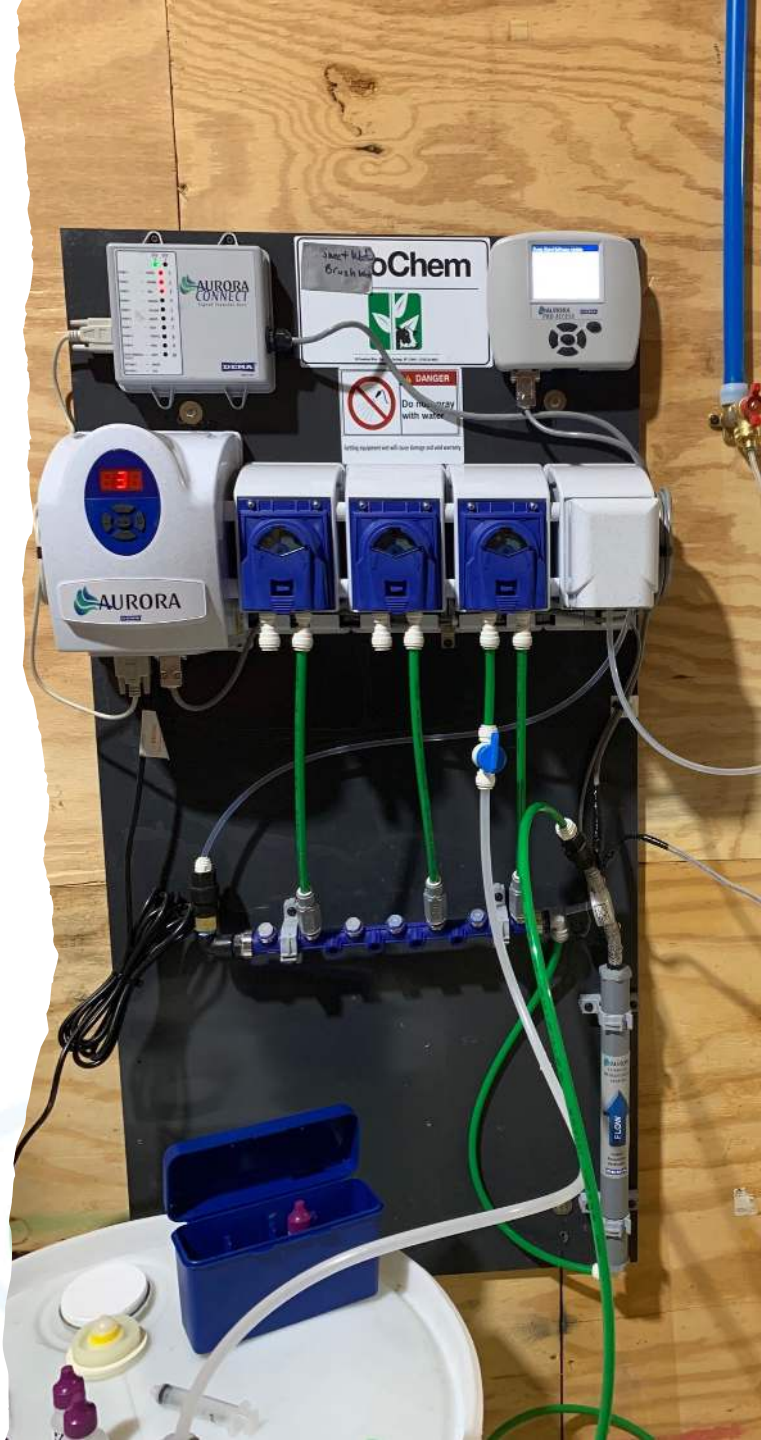


Alarms on Pro Access Screen

- Pro Access Screen -Red
- Flush Alarm 1
  - Water was unavailable when trying to make a batch
    - Check to ensure water is on
    - Restart Machine
- Pump 1 Low Flow
  - System is not registering any product flow from pump 1
    - Check for empty drum or air leak
    - Prime Pump
    - Restart Machine
- Pump 2 Low Flow
  - Same as Pump 1 Low Flow
- Pump 3 Low Flow
  - Same ad Pump 1 Low Flow



Prime Pumps on Pump Driver

- On the Pump Driver Below press the arrow pointing left. It should change to say P1.
- Press the up button to change the pump or flush selection
- P1-Pump 1
- P2-Pump 2
- P3-Pump 3
- F1-Flush
- Press and release the center button to prime until product reached the pump then press and release center button to stop pump

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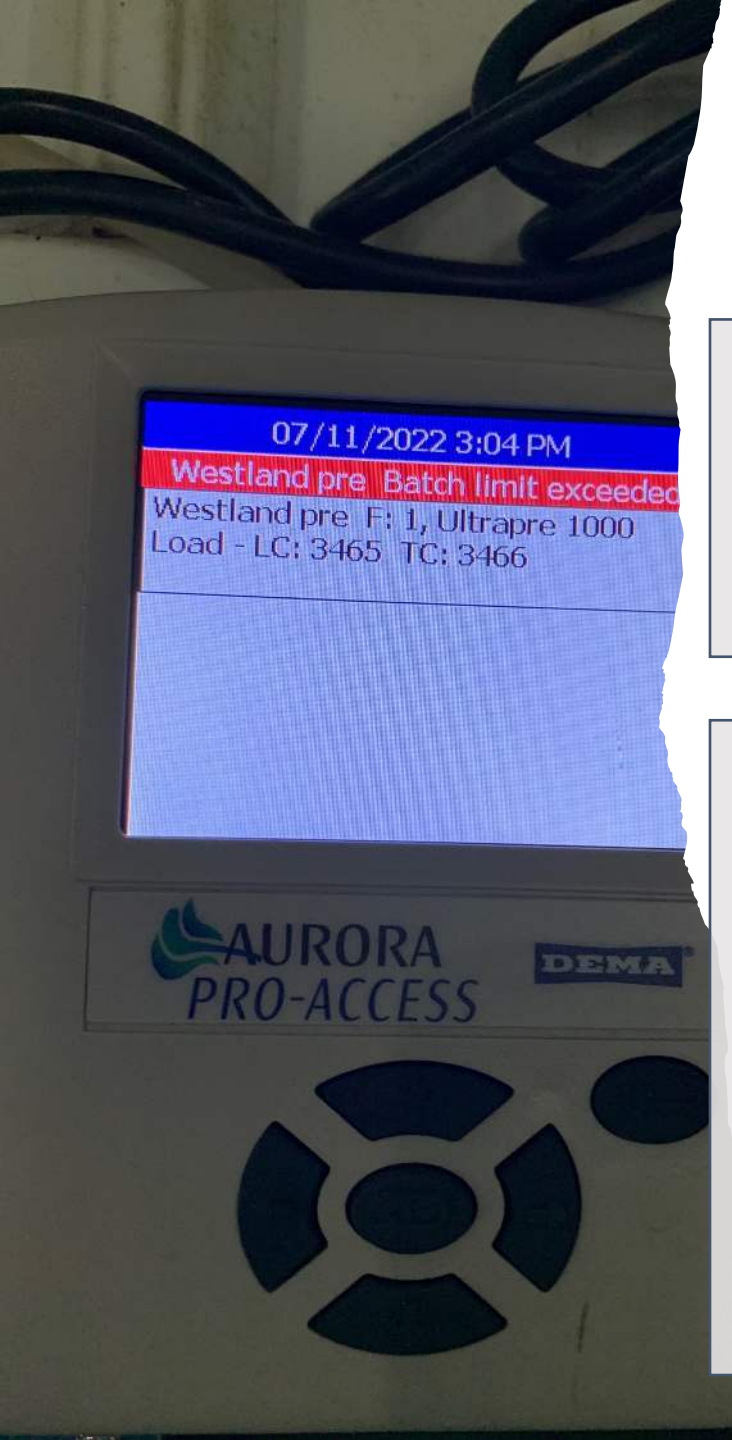


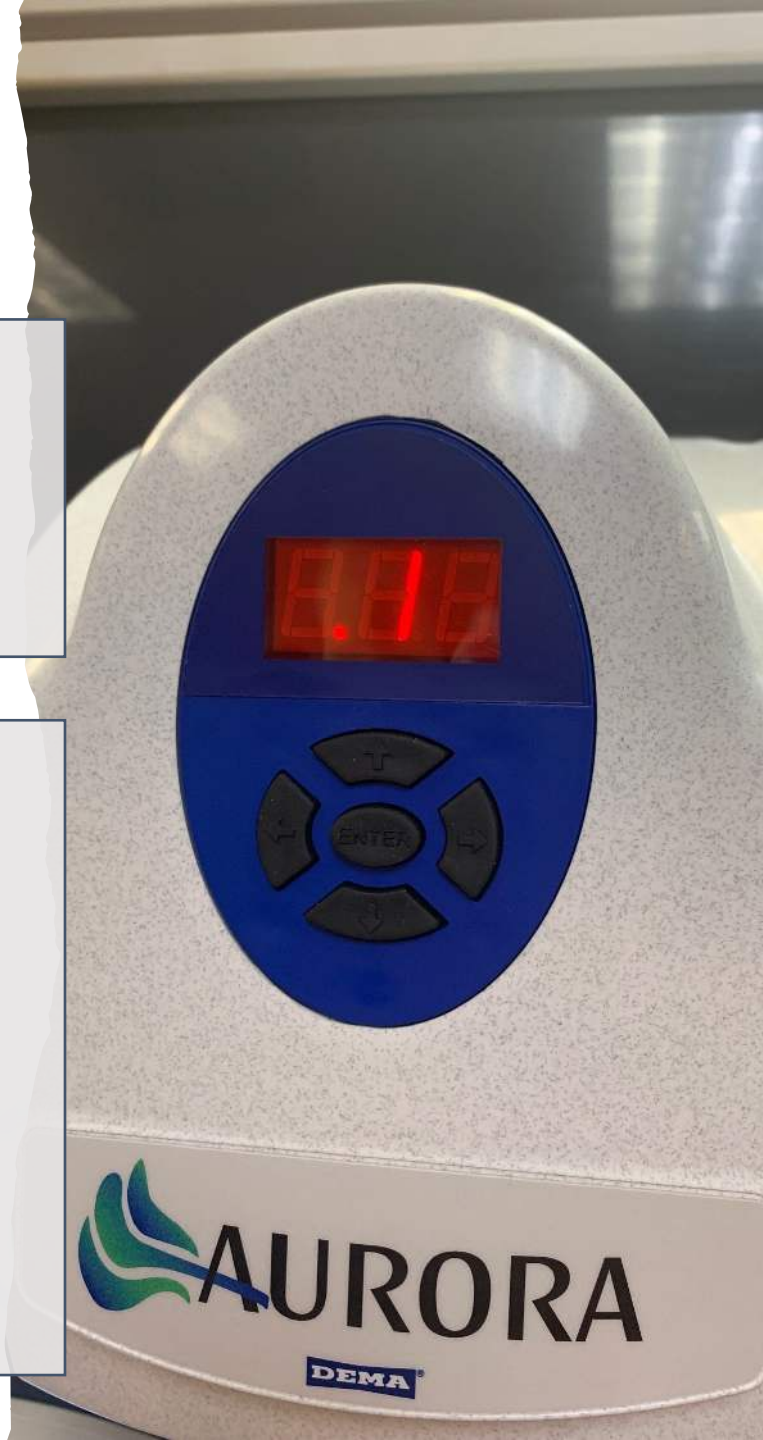
No Product in the RTU

Aurora Connect

- Indicates Float Triggers
- Red (Dot) Indicate Float is Triggered
- Float is Triggered Product is Made
- RTU Product Needs to Satisfy the Float in number of Batches to reach Container Size to Reset

Maximum Batches Have Been Reached

- Aurora Pro-Access-Red with Batch Limit Exceeded
- No Product in RTU Container
- Aurora Lit Up with a Red Light (Dot)
- System is On
- Restart the Machine
  - Make Sure not to Pull Product to Quickly
- Find Out Why Product Volume Was Used at a Faster Rate
- Broken Hose
- Gallons in the Parlor
- Consider Adjusting Container Size Volume for more Batches



Manifold Check Valve Issues

- 2 Part Products Going Down Unevenly
- Clear Product Could Change Color
- Check Valve Diagnosis
  - Remove Hoses From Check Valves
  - Use the Pump Driver to trigger F1-flush
    - Press Enter and Release on the Pump Driver.
    - Press Enter Again to Stop Flow
  - Observe if Any Water Comes Through the Check Valves
  - Replace Any Bad Check Valves
  - If None, Carefully Replace the Hose to the Check Valve
- Prime Pumps
  - If Pumps are Not Priming, Check Hoses for Airleaks
  - Replace Hoses if Needed

Newest Concentrate Pump

Newest Concentrate Pump

Benefits

Consistent mixing results

Unlimited formula possibilities

Accurate dosing throughout the life of the squeeze tube due to flow meter

Fast set-up – one time calibration required

Sends email notifications for out of product alarm for each chemical and water

Remote capabilities for adjustments

Accurate chemical reporting visible through the website

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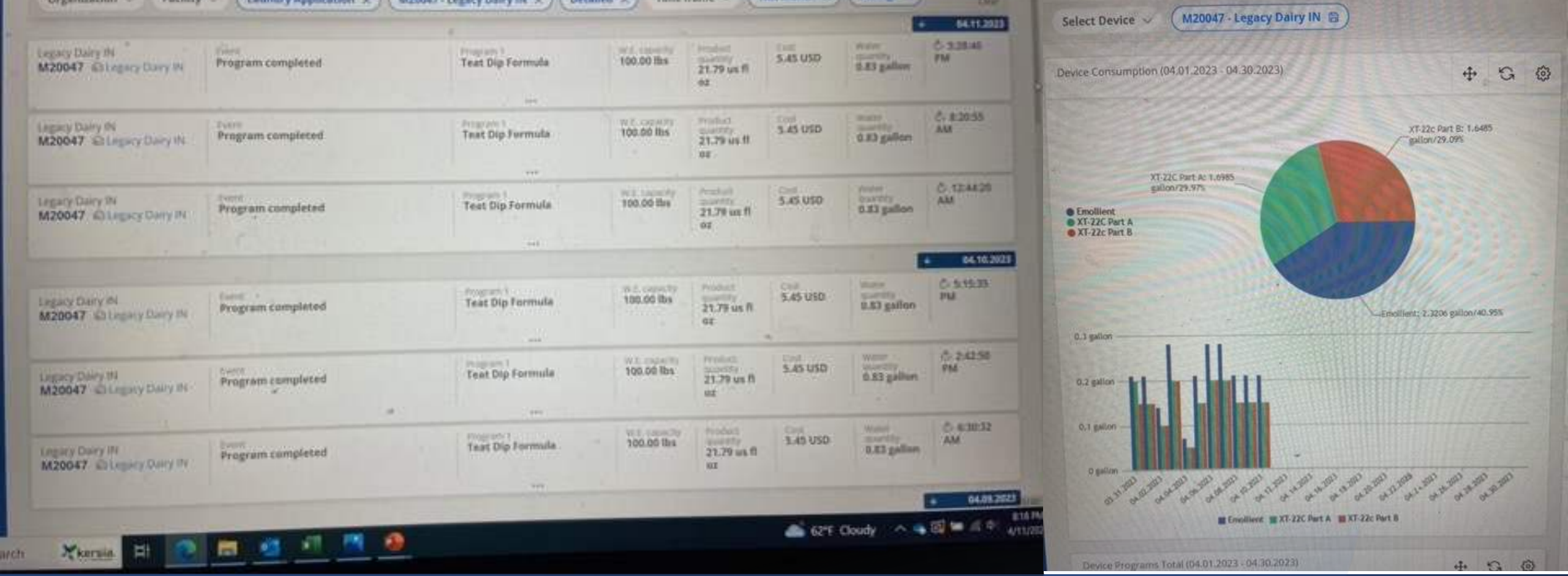
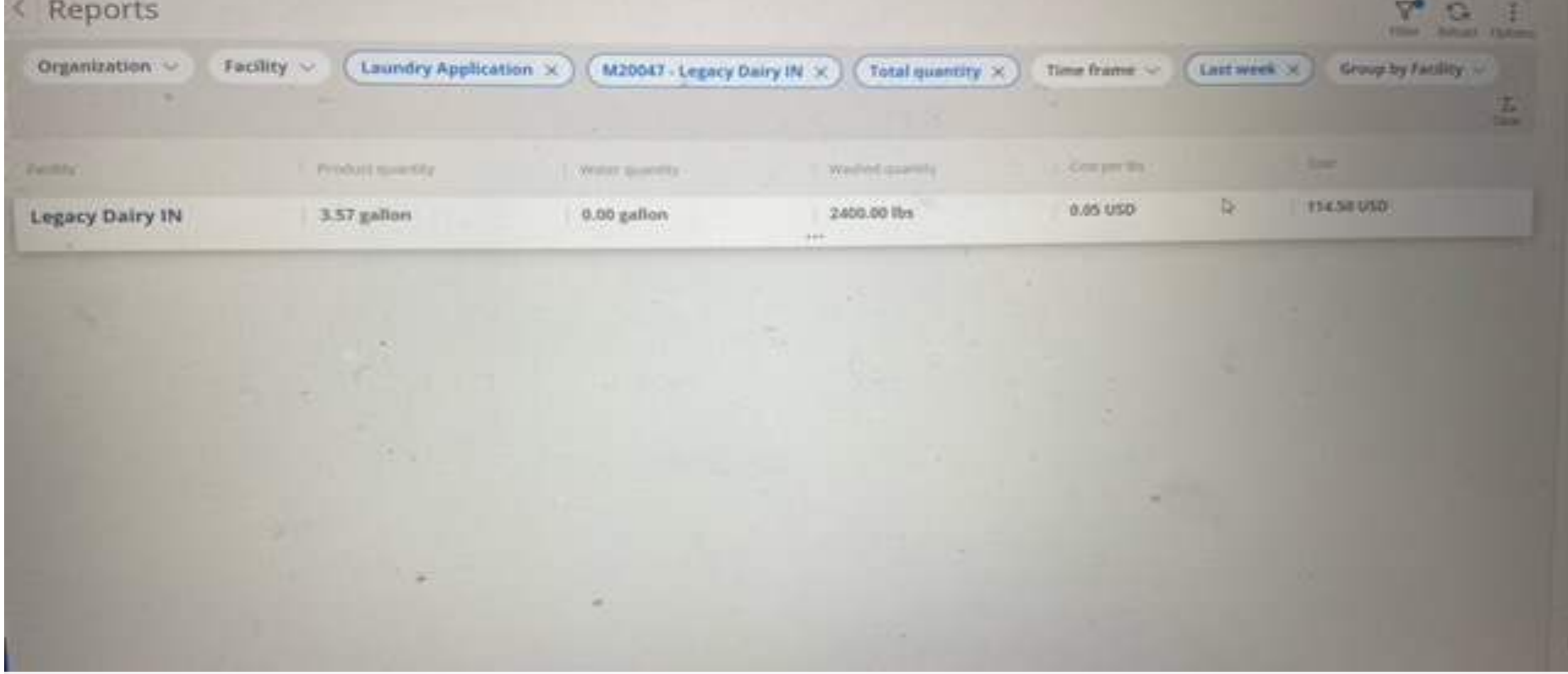
Needs for Install

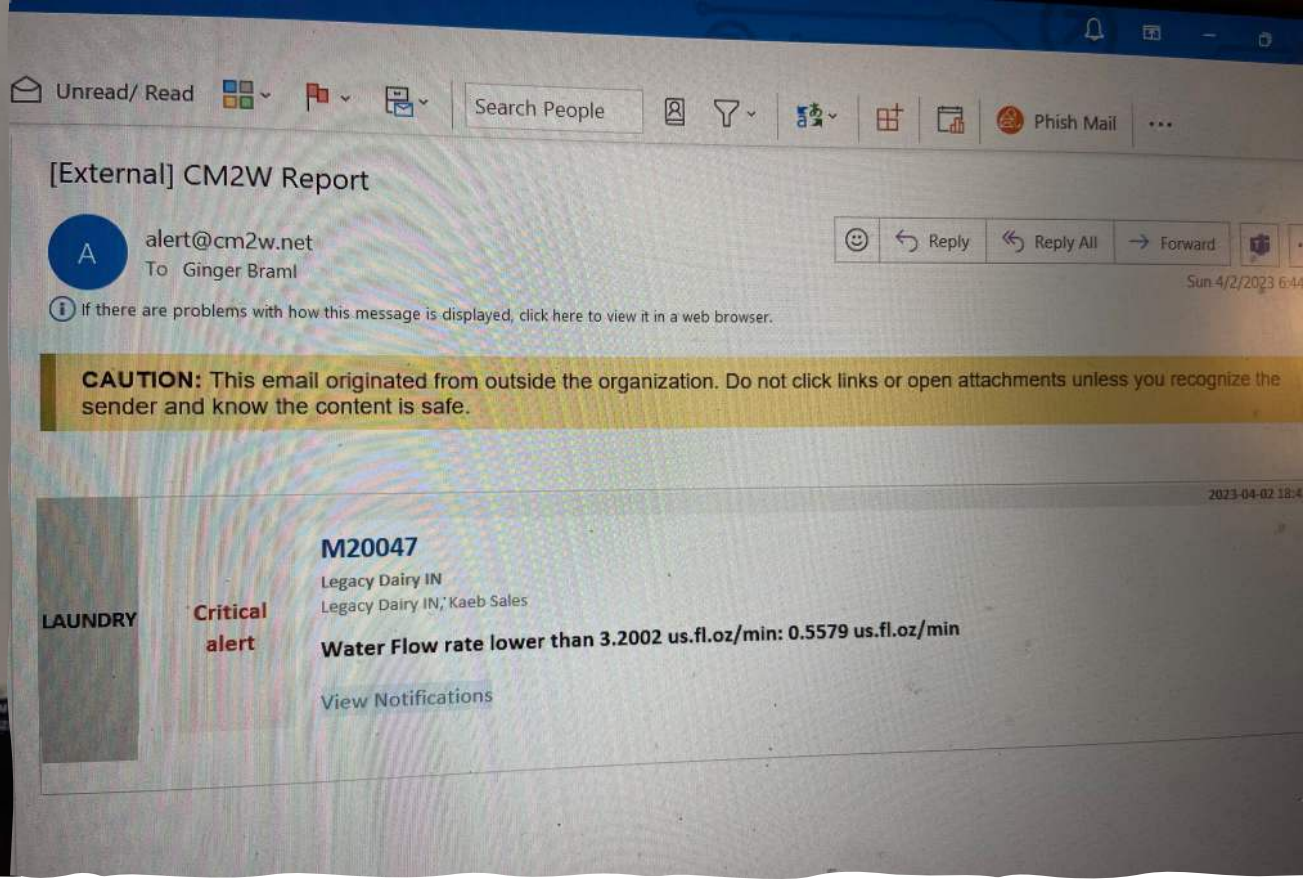
- 24X48 in Wall Space
- Water Filter
- BackFlow Preventer
- Materials
  - Hose clamps, ½ in hoses for products, ¾ in conduit w/ ¾ in female adapter for conduit, ¾ NPT to ½ in. core grip, water connection for ½ in barb, long drill screws



Live Usage Reports



Cost Reports



Emailed Alarm Notifications

CD 114 Pump

Pump options for on farm mixing of CD 114 for calf equipment

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CD114 pump

Needs for set-up:

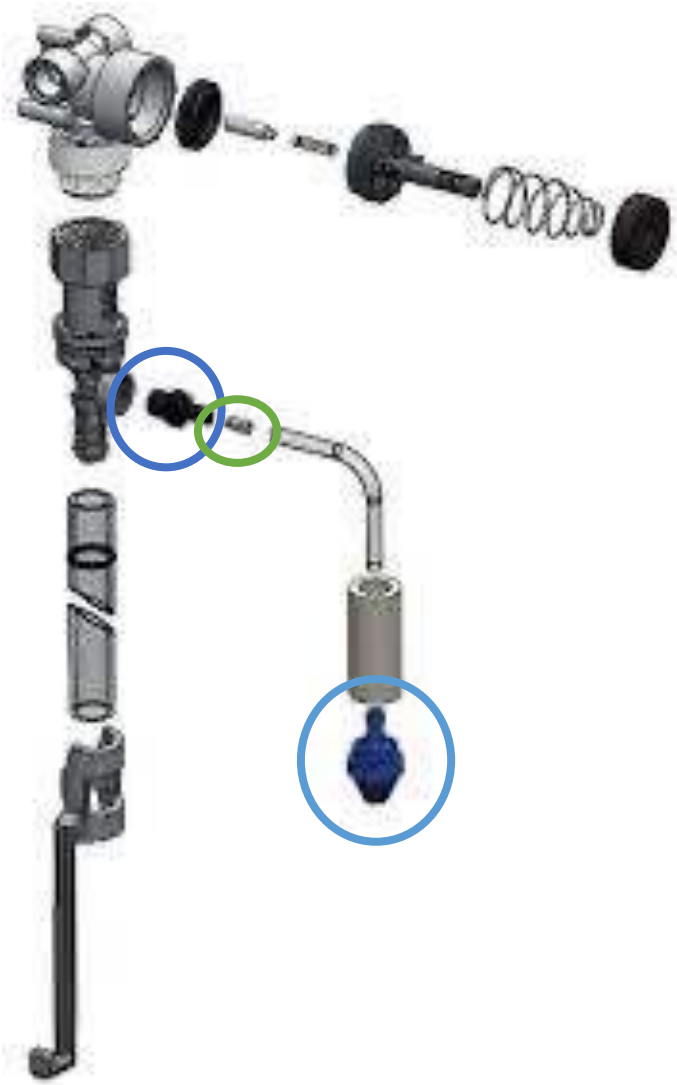
- Water hose hookup
- Space on the wall free of clutter

Mixing rate:

Dilution Rate	Active PPM	Recommended tip to achieve desired PPM
1:1:4	2000 ppm	Beige/Black Tip
1:1:14	600 ppm	White/Blue Tip
1:1:32	300 ppm	Yellow/Brown Tip
1:1:64	175 ppm	Light purple/Pink Tip

CD 114 Pump

- Maintenance
  - When?
  - What?
- Foot valve
- Inlet
- Tips



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Take Ownership of the Farm

- Don’t let them decide or change how its run
- Run it “my way or don’t run it at all”
  - Do not give them the passcodes

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