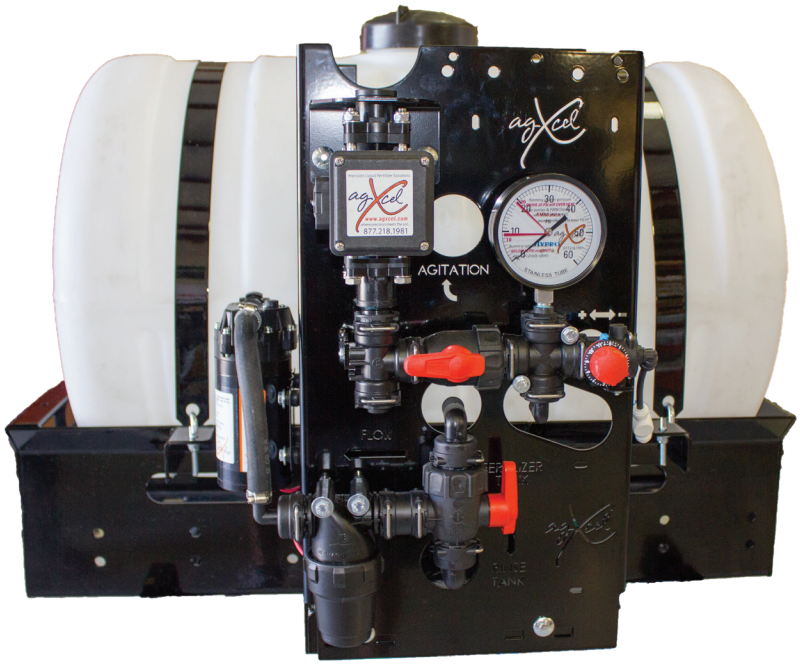
GX40 Synergist

Nano-Technology Application System



PRO 700

CASE IH AGRICULTURE

NOTE: This is only a guide! Please consult your CaseIH dealer for detailed instructions or troubleshooting!

REFERENCE MANUAL

Precision Liquid Fertilizer Solutions

agXcel **877-218-1981**
www.agxcel.com

where precision meets the soil...

www.agxcel.com **info@agxcel.com**

Important Information

The AgXcel Synergist® system is designed for low volume distribution of NutriSphere-N NH3 at a rate of 32 oz/acre. Higher rates are possible.

Note on ounces per acre

On the Pro 700 console display, the flow meter will be calibrated to measure this product in ***ounces***, not gallons. The display is programmed to show measurements in gallons, so be aware the numbers shown for this product will actually be in ***ounces***.

Ounces per acre means a very small amount of liquid is being distributed. At 6 mph on 30" spacing, 32 oz/acre means that each row is doing just under 1 oz/min. On a 12 row implement the total amount being distributed is less than 12 oz/min. AgXcel's Synergist system has been engineered to distribute this flow evenly and accurately.

AgXcel's Low Flow Magnetic Flow Meter

AgXcel's Synergist system uses an electromagnetic flow meter that is designed to accurately measure flow on to 10 oz/min. With no moving parts this flowmeter proves to be reliable, accurate, durable, and long lasting.

Dual Micro tube Solution

AgXcel's Synergist system uses our Dual Micro tube Solution. Micro tubing eliminates the need for an orifice. By using a micro tube with an opening 4 to 5 times larger than an orifice, the risks of plugging are greatly reduced.

By using a Dual Micro tube Solution (two micro tubes), the system will be able to handle a variety of rates and speeds. As well as handling a wide range of temperature changes that would affect the viscosity of the product.

Floating Ball Manifold

Each row will be evenly distributed through a visual flow indicator with one or two floating balls. While providing a good indication of the flow to each row, they do not indicate the exact flow. AgXcel recommends doing a catch test on each row to verify it's distribution.

Field Kit

The Synergist system has an optional field kit available (see pg.17 for details) containing key replacement parts for your system to reduce equipment downtime.

Product and Rinse Tank

The Synergist comes with a 55 or 110 gallon product tank and 3 gallon rinse tank. The rinse tank can be filled with RV anti-freeze to allow the system to be flushed when not in use for a period of time, thus protecting the system from freezing after rinsing.

AgXcel's Micro Control Valves

Implements that are 60' or wider can be split into 2 sections to allow section control. Standard single section setups are equipped with AgXcel's Micro Control Valve on each floating ball manifold. This allows the system pump to continuously run when application stops at the end of the field to allow for a quicker return to the target rate when application resumes. A two section system will have the same Micro Control Valves but can be configured for two sections.

Thank you for purchasing an AgXcel Precision Liquid Fertilizer Application System (FAS) for your liquid placement requirements. The AgXcel FAS system can be integrated into the following OEM controllers:

- Ag Leader
- John Deere Green Star
- Trimble
- Raven
- Top Con
- Outback

This integration into these displays will require each of the OEM's Liquid Control Module which will need to be purchased from your local OEM dealer. The rate controller will provide the data required to manage the speed of the AgXcel electric pump(s) based on the flow response of the flow meter and the vehicle speed. The FAS system is also capable of managing section controls, also referred to as swath control, to minimize overlap areas with optional section control valves.

INITIAL INSTALLATION STEPS

This guide contains information and settings for AgXcel's Synergist system for NutriSphere-N NH3. Changes to components or configuration settings can be made to improve operation of the system.

Below are some basic installation steps.

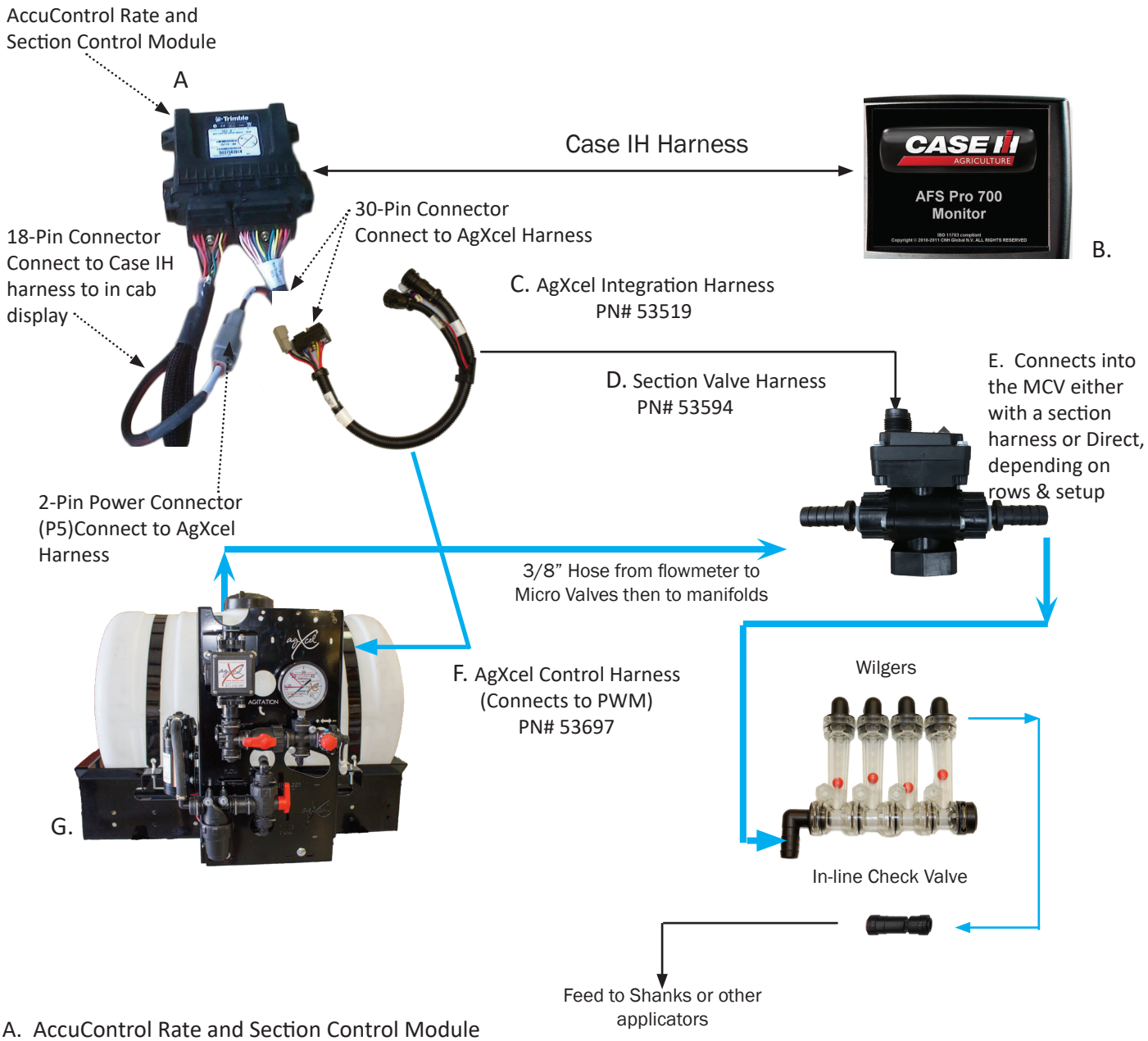
- Have your control module and display in the cab connected and set up by your display dealer. To apply anhydrous ammonia and NutriSphere-N NH3 you will need 2 rate control modules. One for the anhydrous ammonia and one for NutriSphere-N NH3, when using an Agxcel Integration kit. However, when using with the AgXcel AutoX Compact Plus, you only need 1 rate controller to control the NH3.
- Open and layout AgXcel's Synergist and any components and familiarize yourself with system. See the overview example for installation ideas.
- Mount the AgXcel Synergist system on your equipment.
- Install and mount any floating ball manifolds, plumbing, and check valves to each row delivery unit.
- Attach any integration harnesses.
- Apply settings that you find in this guide to your controller.
- Fill system with water and conduct flow and operation tests.
- Winterize the system with RV anti-freeze if freezing temperatures are expected.

AGXCEL INTEGRATION INTO CASE IH PRO 700 WITH ACCUCONTROL

System Overview

AgXcel Precision Fertilizer Application Systems begin at the AccuControl Rate and Section Control Module. The image below show this control module. You will need to purchase this module from you Case IH dealer. You will also need to purchase an unlock code for your Pro 700 display to enable rate control functions.

The rate controller has two harness connections. The first is the connection to the Case IH wiring harness that connects to the in-cab display. The second is where the AgXcel system harnesses begin.
This guide will provide instructions and screen shots of the Pro 700 display.

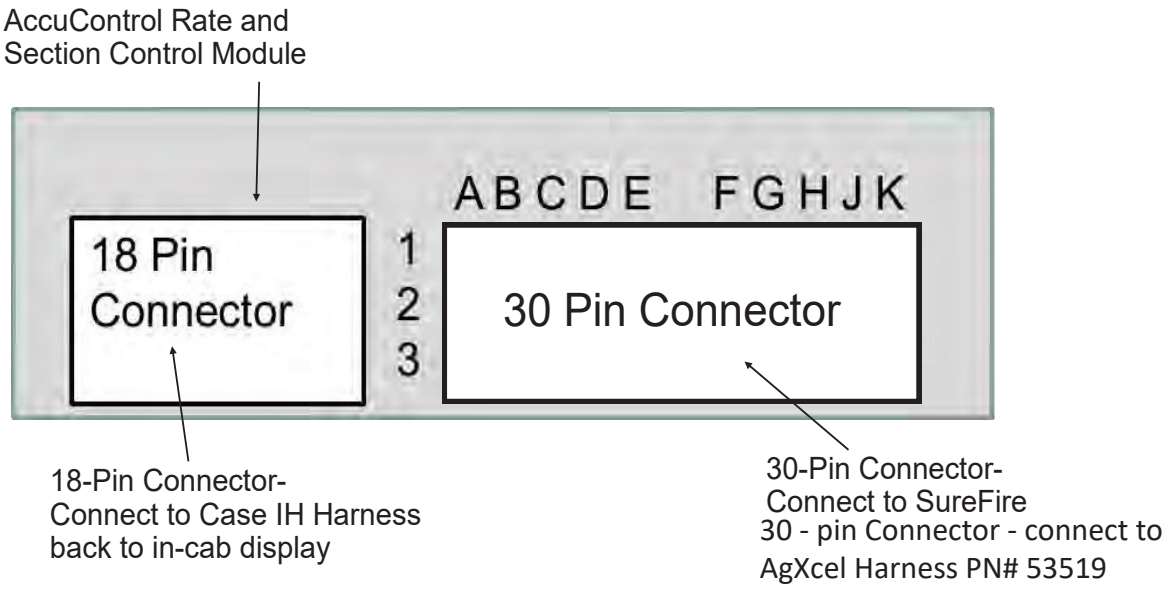


A. AccuControl Rate and Section Control Module
B. Pro 700 Display
C. AgXcel Integration Harness - Part #53519
D. AgXcel Section Valve Harness - Part #53594
E. MCV Harness PN# 54406
F. AgXcel Control Harness - PN#53697
G. AgXcel GX40 Synergist

Aux Master/Dump Valve (12-Pin Deutsch connector) Plugs into Aux I/O that comes from 18-pin connector. Only needed if using Aux Master/ Dump Valve

Case IH AFS AccuControl
Rate and Section Control Module

This chart shows you the output functions by pin location on the AccuControl Rate and Section Control Module. Use this information to verify if the AccuControl system is providing the correct output. If the module is not providing the correct output, contact your Case IH dealer to repair the problem. Also review any applicable settings on the display to verify the system is properly set up.

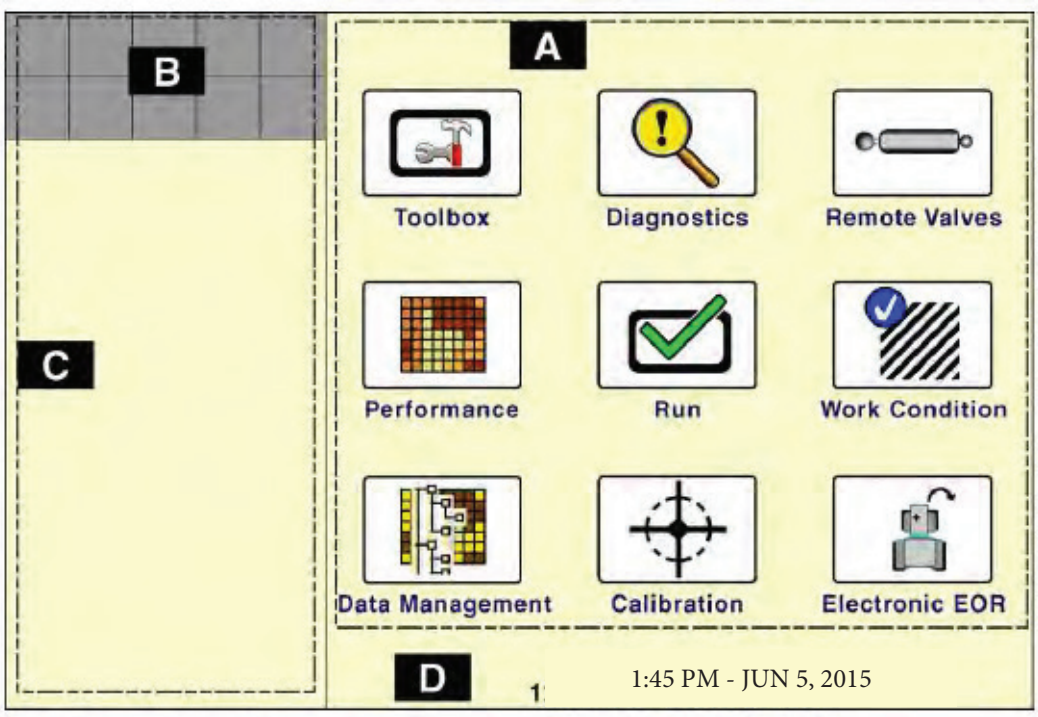


Common Troubleshooting:

PWM Signal to Pump: Pins E1 to E2 should have 0-12 volts to energize the EPD module to run the pump. Use manual mode to increase signal. Should get up to 12 volts after holding increase button.

Flowmeter Tap Test: Pins C2 and C3 are Flow Ground and Signal. If no flow is registering on the display, you can tap between these two pins with a short wire. This produces a pulse. The display should indicate a flow when this is done rapidly. *(Note: To help register flow for the tap test, change the flowmeter calibration to 10, so it will show a flow with fewer taps. Be sure to reset the flow cal to the proper number after the test.)*

Note: If applying 2 products (such as anhydrous ammonia and NutriSphere-N NH3) with the Pro 700 AccuControl you will need 2 Field-IQ Modules.



A **Home Screen**

B **Status and Warning**

C **Left-hand Area**—

-Created by the vehicle
-Is always displayed
-Some parts may be configurable on the Layout screen
-A window placed here has priority over the same window placed on a "Run" Screen

D **Current time and date**

Items in **Toolbox** will vary according to the products that are installed and activated. They could include:

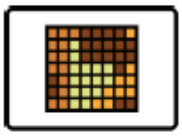
AccuCtrl	Activate	Contnr	Display	GPS
Impl	Layout	Manual	Marks	NAV
Operator	Overlap	Precision Farming	Print	Product
TC	Vehicle	VT		

Items in **Work Condition** include:

Layer Assignment	Valve Calibration	Operation Setup	Controller Setup	Product Calibration
Layer	Valve Cal	Operate	Control	Liquid Cal

You must create or select a Work Condition to complete the setup for product application.

Items in **Run** include Run1 through Run6.



Items under the **Performance** icon could include:

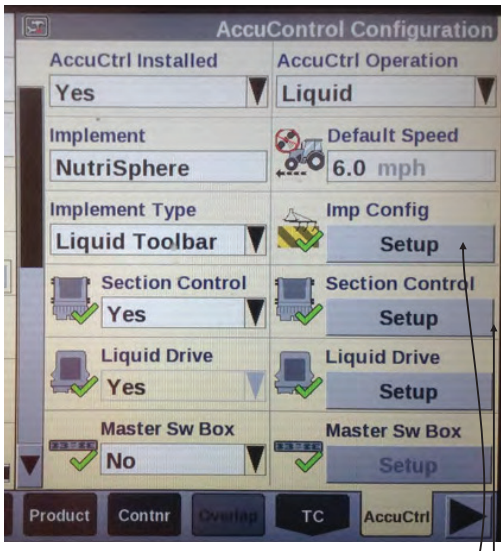
Profile	Sum1	Sum2	Rx Setup

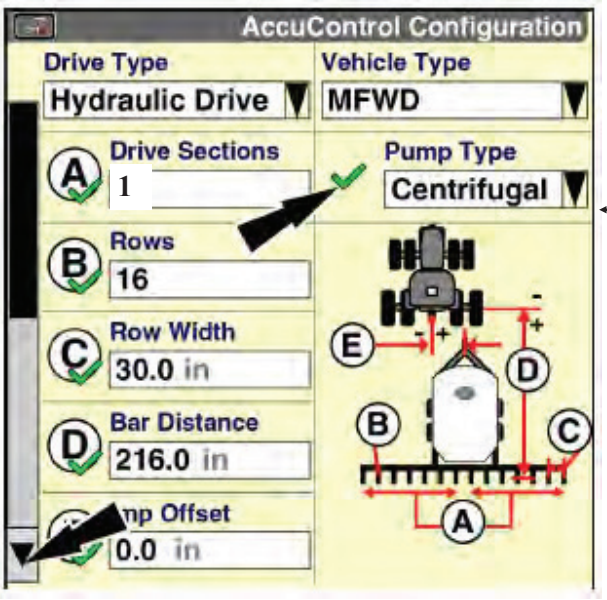
Items under the **Diagnostics** icon could include:

Version	CAN	Fault	Resource	GPS	GPS2

Your system may vary from the screens shown here. See the AFS AccuControl Rate Controller Software Operating Guide for additional information about configuring your system. The setup may not always happen in the order shown here. (There should be green check marks when things are set up correctly. (Red X's indicate a problem.)

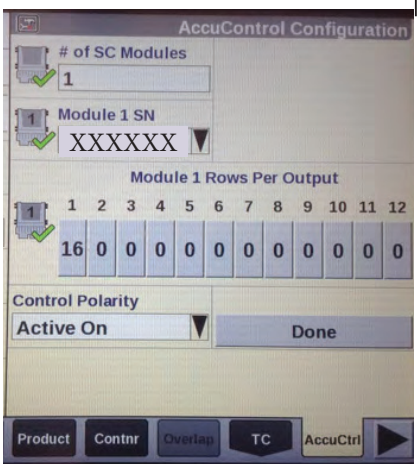
1. Create an Operator (**Toolbox > Oper**)
2. Check GPS Status (**Toolbox > GPS**)
3. Create Implement (**Toolbox > Impl**)
4. Set up Product (**Toolbox > Product**)
5. Set up Container (Optional) (**Toolbox > Container)**
6. Basic Setup (**Toolbox > AccuCtrl**)
   - A. Select AccuCtrl Operation (Liquid)
   - B. Select AccuCtrl Installed (Yes)
   - C. Select Implement Type (Liquid Toolbar)





7. Implement Configuration (**Toolbox > AccuCtrl > Imp Config**)
   - A. Press 'Setup'
   - B. Select Drive Type (will be Hydraulic Drive)
   - C. Select Vehicle Type
   - D. Set Number of Drive Sections (A) **Always = 1**
   - E. Pump Type will be set at Centrifugal
   - F. Set Total Number of Rows (B)
   - G. Enter Row Width (C)
   - H. Enter Bar Distance in Inches (axle to knife) (D)
   - I. Measure Implement Right/Left Offset
   - J. Scroll down to Enter Rows per Drive Section (same as Total Number of Rows)
   - K. Press 'Done'

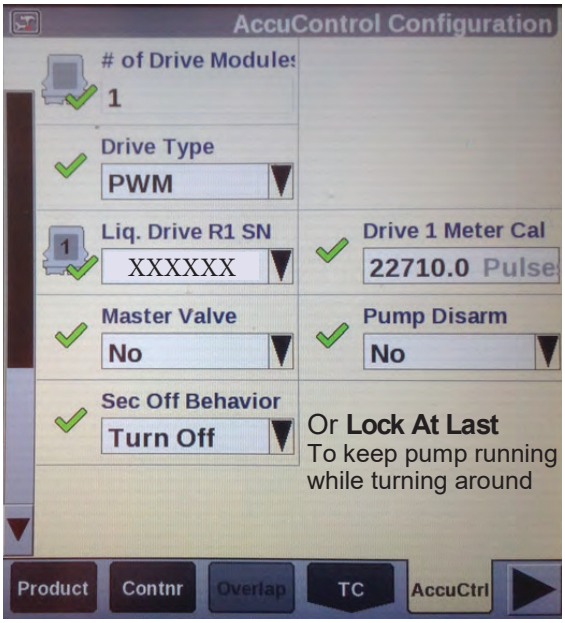
8. Section Control Setup ***Toolbox > AccuControl > Section Control***
   - A. Select Section Control (Yes)
   - B. Press 'Setup'
   - C. Assign Module Serial Numbers
   - D. Assign Rows per Output (number of rows per Section)
   - E. Select Control Polarity (Active On)
   - F. Select 'Done'
9. Overlap/ Boundary Control (**Toolbox > Overlap**)
   - A. Turn Overlap Control and Boundary Control ON.
   - B. Adjust values as desired.



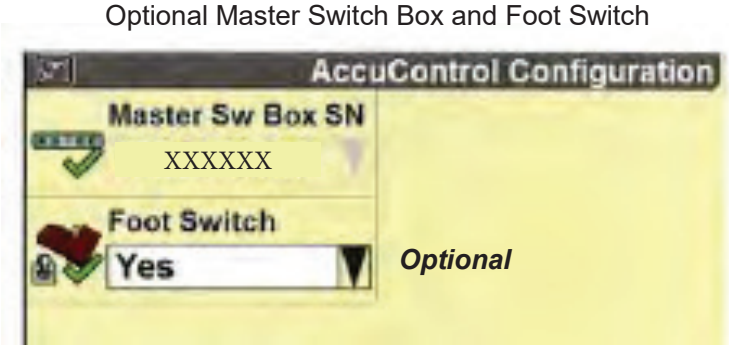
10. Liquid Drive Setup ***Toolbox > AccuControl > Liquid Drive***
    - A. Select Liquid Drive (Yes)
    - B. Press 'Setup'
    - C. Assign Liquid Drive Serial Numbers
    - D. Select Drive Type (**PWM**)
    - E. Select Master Valve Type (**NO**)
    - F. Select Pump Disarm (**No**)
    - G. Select Sec Off Behavior (**Turn Off** or **Lock at Last**)

(*Turn off the pump at the end of the field or keep it running at the same speed for a quicker return to Target Rate.)*

    - H. Enter Drive Meter Cal Number (**22710** pulses/gal)
    - I. Press 'Done'

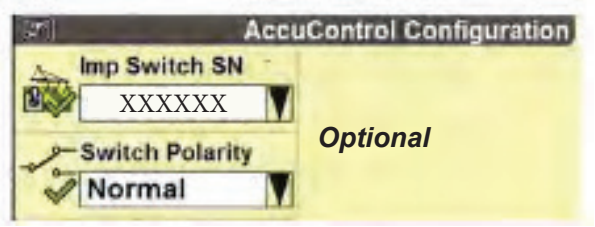


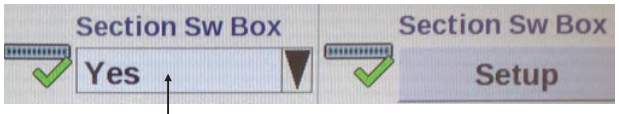
Optional Master Switch Box and Foot Switch



11. Master Switch Box (If equipped with External Switch Box)
    - A. Select Master Sw Box (Yes or No)
    - B. Press 'Setup'
    - C. Verify Serial Number
    - D. Select Foot Swiitch (if installed)
    - E. Press 'Done'

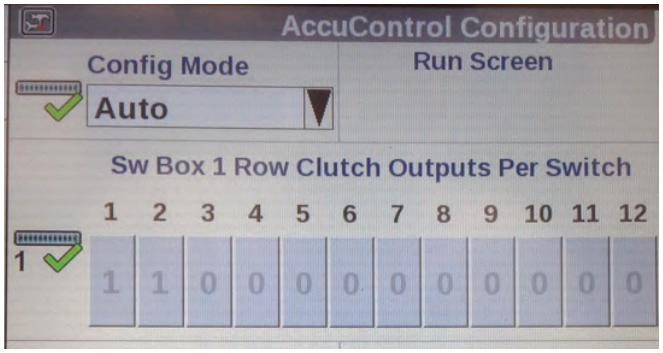
12. Implement Switch (if installed)
    - A. Select Imp Switch (Yes)
    - B. Press 'Setup'
    - C. Select Imp Switch Serial Number
    - D. Select Switch Polarity (Determine this by raising and lowering the implement and watch the Implement Status Arrow in Status/ Warning Area for proper operation.)
    - E. Press 'Done'





13. Section Switch Box (If system is equipped with External Section Switch Box or desire *Manual Valve Section Control through Run Screens*).
    - A. Select Section Switch Box (Yes)
    - B. Press 'Setup'
    - C. Select Config Mode (Auto) *(picture shows setup for 2 sections)*
    - D. Verify Sw Box Serial Number (if equipped)

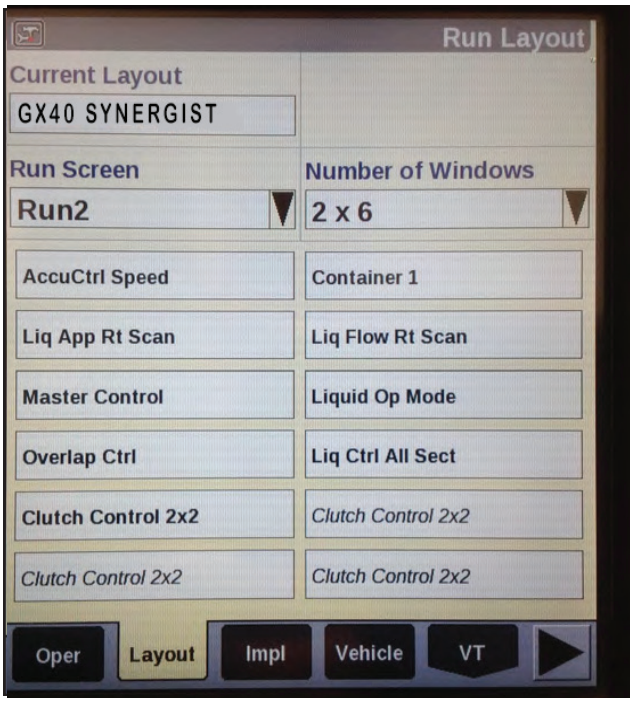
If no external switchbox is installed, User Defined Windows can be assigned to a Run Screen (Toolbox>Layout).



Create A Layout (sample)

Go to **Toolbox>Layout**
Select Current Layout and then select New.
Name the Layout. Under Run Screen select a screen.
In the white boxes consider adding the following items to a **Run Screen**:

- AccuControl Speed
- Master Control
- Liquid Op Mode
- Liquid Control
- Liq App Rate Scan Container
- Liq Flow Rt Scan
- Section Control
- Overlap Ctrl Overlap Control
- Clutch Control



The Run Screen Layout is largely a matter of operator preference. Some of these items may be added to the Left Hand Area if space is available there, or more than one Run Screen can be set up.

Valve Calibration

Work Condition > Valve Cal > Advanced Valve Calibration

The electric pump systems typically run well with the following default settings. Try the following default values as a starting point and make adjustments as needed for your system.

See the pictures on the following pages for other values.

	Integral Gain	Breakout	DeadZone	Integrator Upper Limit	Integrator Lower Limit	Comparator Limit
Electric	0.2	3	**2-3**	100	-100	100

If the system appears to adjust too slowly to rate or speed changes, increase the Integral Gain in increments of 0.1. If necessary, go in increments of 0.05. If the Integral Gain is too high, the system will be unstable and will go back and forth below and above the Target Rate.

Additional Tips for Getting Started

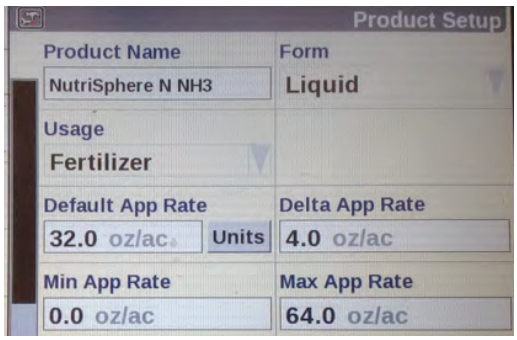
1. Set **the Flow Error Timeout at 30—45 seconds** until you get the system adjusted and operating correctly. The default is 5 seconds. This may result in the application being shut down before you have a chance to see how it is operating. After the system is operating correctly, this can be set lower to give you a quicker warning if something is wrong. **(Work Condition > Valve Cal > Advanced Calibration > Scroll down to 2nd page and Flow Error Timeout)**

2. **Set the Fault Speed to Slow or Off** until you get the system adjusted and operating correctly. The default is Normal. ***(Work Condition > Operate > Fault Speed)*** After the system is operating correctly, this can be set back to Normal. You can run this at Slow if the system gives too many Fault Warnings at Normal.

To start applying product (these are not necessarily all the setup you will need)
Go to **Toolbox>AccuCtrl>Default Speed**
Enter a default speed. The applicator will default to this speed if all ground speed sources are lost.
The **Master Apply** button may need to be cycled twice to start the application.

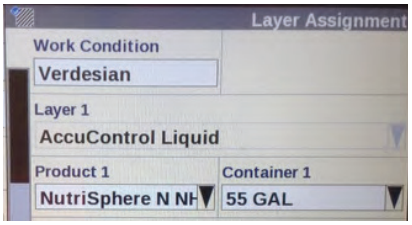
1. Preparation
   - A. Insert a data card in the display.
   - B. Create or Select a Grower/Farm/Field/Task & Crop Type (Performance > Profile)

2. Product Setup: **Toolbox > Product**



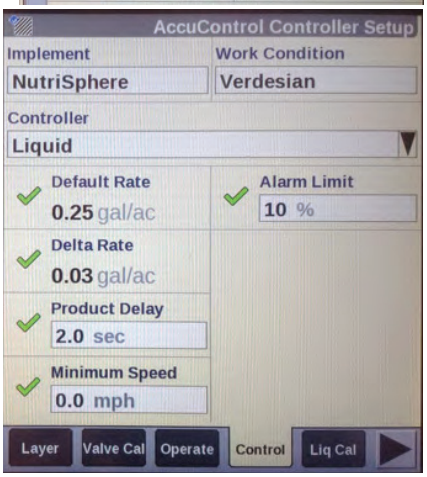
   - A. Name the product (NutriSphere N NH3)
   - B. Select the form for the product (Liquid)
   - C. Select Usage (Fertilizer)
   - D. Enter Default Application Rate
   - E. Enter Minimum and Maximum Application Rate.

3. Product Layer Assignment: **Work Condition > Layer** to assign a product to a control section of the applicator



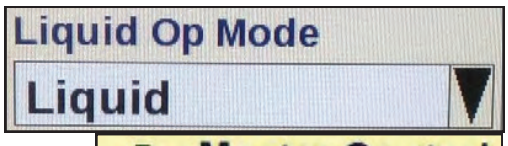
   - A. Select or Create a Work Condition.
   - B. Select Layer 1 Control Type (AccuControl Liquid)
   - C. Select Product for Layer 1 Control
   - D. Select Container if using the Container
   - E. Assign additional layers as needed.

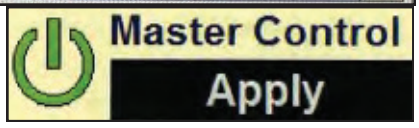
4. Controller Setup—Liquid: **Work Condition > Control**



   - A. Verify Implement
   - B. Verify Work Condition
   - C. Select Controller—Liquid
   - D. Default Rate set as 32 oz/acre in Product Setup will show up as 0.25 gal/ac here
   - E. Product Delay-set at 2.0 sec. Adjust as needed in the field.
   - F. Enter the Minimum Speed (if the speed drops below this, the applicator will keep applying at this speed)
   - G. Enter a value for Off-target Alarm Limit (probably 15-20%)

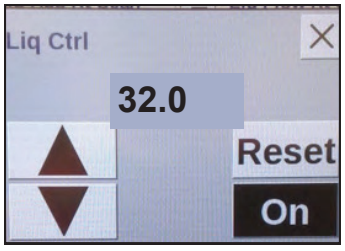
5. Enable Application: Run Screens





   - A. Liquid Op Mode—Select Liquid
   - B. Read the safety message and press Accept.
   - C. Master Control—Press Apply on display or switch on Master Switch on switchbox (if equipped)

6. Liquid Rate Control

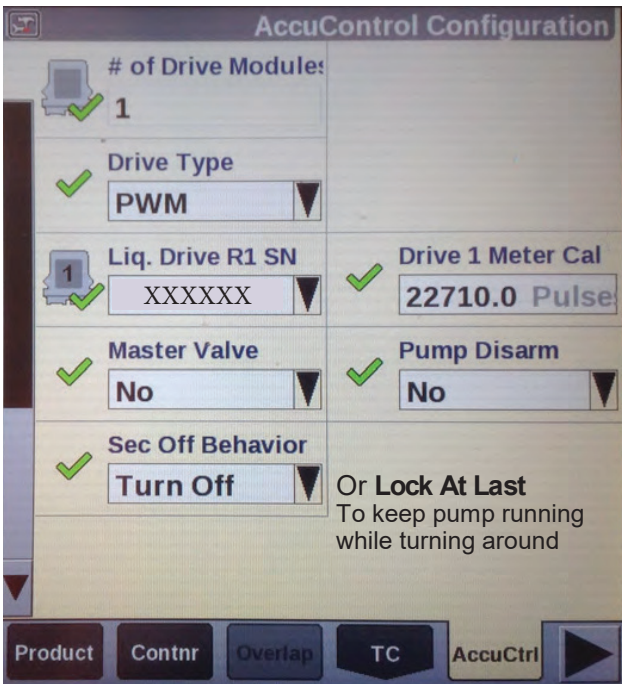


   - A. Liquid Control defaulted to ON
   - B. Increase or decrease rate if needed
   - C. Automatic rate control (prescription) is assigned in **Performance > Rx Setup**.

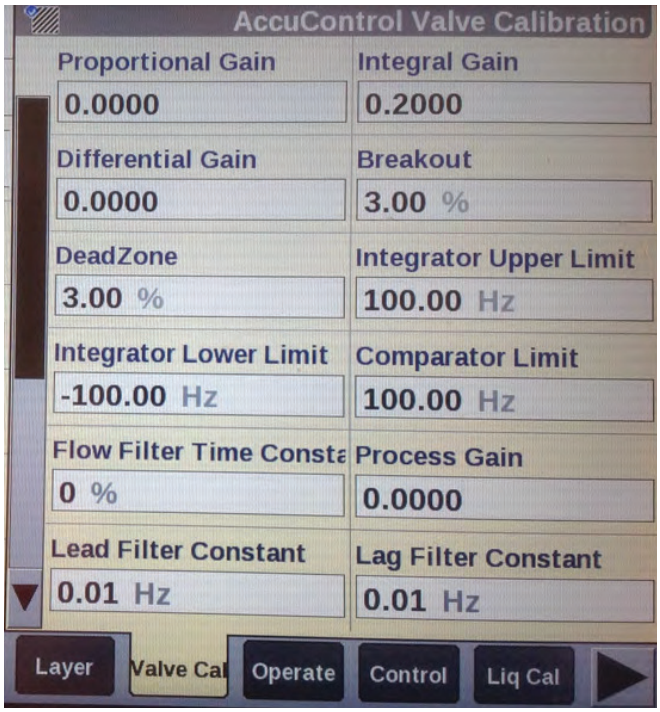
Possible Run Screen Layout for system with 2 sections

To use default AccuCtrl speed, turn Radar off.
Toolbox > Vehicle > Radar Installed > NO

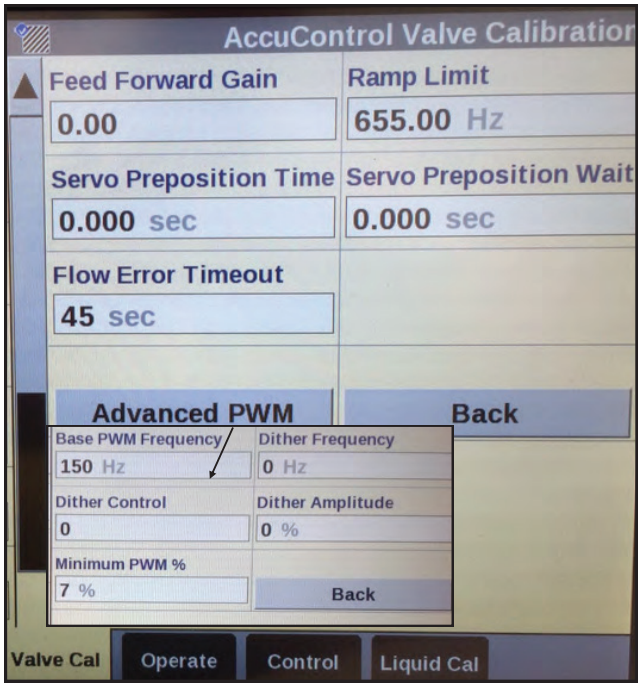
Screen showing AccuControl Liquid Drive Setup
Toolbox > AccuCtrl > Lquid Drive Setup



Start with these Valve Cal settings
Work Condition > Valve Cal > Advanced Calibration



Screen showing Flow Error Timeout set to 45 sec
Work Condition > Valve Cal > Advanced Calibration > Scroll down to 2nd page and Flow Error Timeout)



SETUP & TROUBLESHOOTING PRO 700 ACCUCONTROL LIQUID PWM SYSTEM (AKA: INTELLIVIEW IV INTELLIRATE)

(Read Instructions Completely before Beginning Installation)

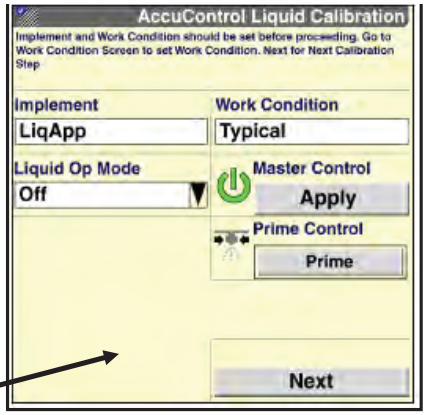
Note to AgXcel Customers: The Default speed setting that works on our test stand does not work when the tractor is not moving when the Pro 700 is plugged into a tractor that has Radar, Wheel, or GPS speed capability. This makes testing the system in a Run mode impossible without driving the tractor. Use the method below, instead. On our test stand, set the Default Speed to 0 (Toolbox > AccuCtrl > Default Speed > 0) before doing this.

To test the Pro 700 AccuControl on initial startup and in a troubleshooting situation, use the *Liquid Cal* mode. (Work Condition > Liquid Cal)

1. Set up the **Toolbox > AccuControl** configuration page so all AccuControl items are set.
2. Set up the Work Condition > Valve Cal > Advanced Calibration screen to match the settings shown in the manual for GX2. The Valve Calibration procedure is likely to give results that will not work. It may be fairly good except for an Upper Integrator Limit that is too low, or it may have totally unworkable numbers in Dead Zone and other fields.
3. Set the **Flow Error Timeout** (on page 2 of the Valve Calibration setup) to 45 sec. This will let the system run for a while before it shuts down if it is not detecting flow.
4. Go to **Work Condition > Liquid Cal**
5. If the **Prime** button does not show up here:

   Home > Toolbox > AccuControl > Imp Config > Setup > Scroll down > Liquid Prime > Enabled. (Pressing the Prime button will run the pump for 10 seconds. To keep the pump running, press and hold the Prime button.)
6. To run the system from here with a simulated speed and target rate:

   Liquid Op Mode > On Master Control > Apply > Next
7. Enter a **Simulated Speed** and **Target Rate** (these can be changed while running in this mode to test other speeds or rates). Press **Next**.
8. Press **Start** to start the pump. System should run at Simulated Speed and Target Rate. **Measured Output** should count up as product is pumped. To see actual flow in gpm, you need to set up a Layout for the Left Area with **Liq Flw Rt Scn.** This is very useful when diagnosing pump or system issues. It needs to be in the Left Area so you can see it while running in this mode. (*Remember, when testing with water, the pressure will be much less than it will be with a fertilizer product. If the pressure is too low, all the rows may not flow because there may not be enough pressure to open all the check valves. Increase the rate until all rows are flowing.)*



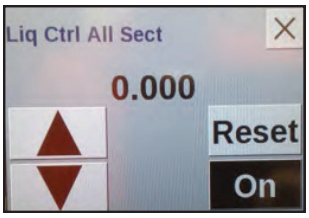
9. If the pump does not run here, perform the other troubleshooting tests for hydraulic or electric pumps. You can start the system here and use a voltmeter to verify that there is PWM voltage at the EPD or hydraulic valve. (*If it is not reading flow, it will quickly ramp up to maximum pump speed and shut off, giving a "Motor Stalled" error message. To make this happen more slowly, set the Integral Gain to 0.1 to allow time for diagnostic observation.)*
10. If the pump runs and liquid is flowing but no flow is showing in the Liq Flw Rt Scn box, check for 12 v at the flowmeter connection (pins B & C) and do a tap test (pins A & C) to see if flow will register on the display *(see note in #9 about setting Integral Gain)*.
11. If the pump runs, but is surging, lower the Integral Gain. If it is pumping, but getting to rate very slowly, raise this.
12. If the system has section valves, they should open when this test is started. If they don't open, check the AccuControl Configuration setup (Toolbox > AccuControl > Section Control > Setup {should have green checkmarks, Control Polarity is Active On}). Check Section Sw Box Setup > Config Mode > Auto (should say Run Screen in upper right corner). Set up a Run Screen layout with Clutch Control 2X2 to have section switches on the display. Be sure Boundary Control and Overlap Control are ON (Toolbox > Overlap). If they still don't open, check for constant voltage (pins A&B) and signal voltage (pins B&C) at valve.

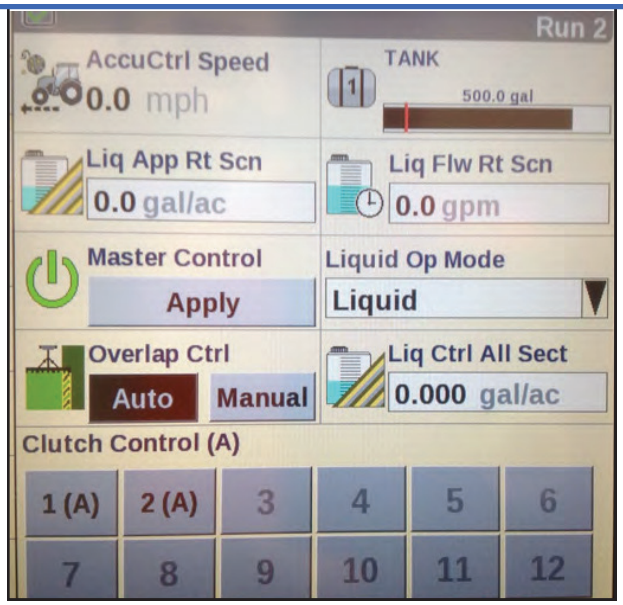
Troubleshooting Pump, PWM, Section Valves

The Pro 700 AccuControl system does not allow for true Manual operation. Troubleshooting and diagnosing pump issues can be difficult. To troubleshoot Pump, PWM, or Section Valve issues, set **Flow Error Timeout** to 45 sec. Turn **Fault Speed** to OFF. Set **Default Speed** to 5 mph. Set the **Default Application Rate or Target Rate to 0.00 GPA.** The Rate in **Liq Ctrl All Sect** should be 0.000. With this setting, you can turn on the Master Control—Apply to open the section valves and to begin testing the PWM voltage. (*Default Speed may not register when the Pro 700 is plugged into a tractor, unless the tractor is moving.)*

To test PWM voltage unplug the 2-pin PWM connector from the EPD module.

If a harness problem is indicated, check the voltage at the end of each harness from there back to the Field-IQ module. See wiring schematics for pin outs.





Master Contol —OFF

PWM Voltage—Check at 2-pin PWM connector that plugs into EPD.

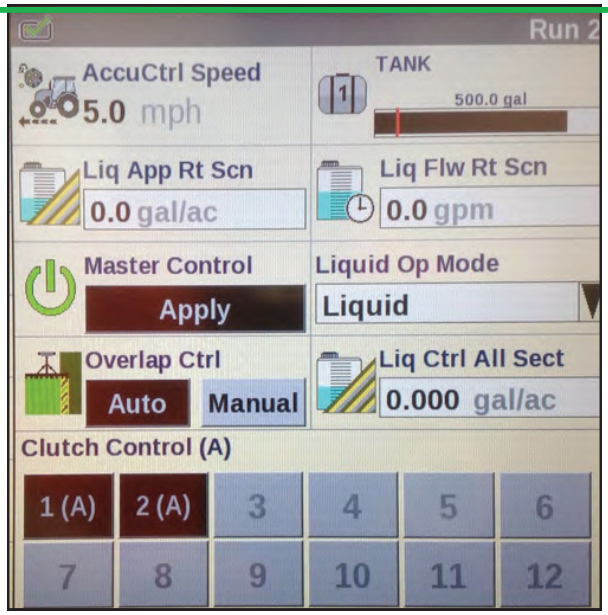
Section Valves

In this setting, the section valves should be closed.

On each 3-pin section valve connector:
A to B (red to black) 12—14 volts
B to C 0.0 volts

Section Valve Connectors:

Pin A	Constant 12 v power
Pin B	Ground
Pin C	Boom Signal—should have 12 v when valve should be open, 0 v when valve should be closed



Master Contol—APPLY

PWM Voltage—Unplug the 2-pin PWM connector from the EPD to test voltage:

Section Valves

In this setting, the section valves should be open.

On each 3-pin section valve connector:
A to B (red to black) 12—14 volts
B to C 12—14 volts

If a section valve won't open:

1. Plug another section connector that will open a valve into that valve.
2. Plug the section connector of the valve that won't open into a valve that is known to be working.
3. Check voltage at the end of each harness going back to the Field-IQ module to determine if there is a bad harness.
4. See wiring schematic for pin-outs of each harness.

Testing PWM Voltage—continued from previous page.

With Master Control ON (APPLY) and Liq Ctrl All Sect at 0.000, have voltmeter connected to the 2-pin PWM connector that connects to the EPD Module. As a second person presses the arrow on the Liq Ctrl All Sect screen to raise the rate the PWM voltage should increase steadily to 13+ volts.

PWM Voltage—should increase as target rate is raised. Voltage should end up around 13 volts.

If the PWM voltage does not register here, check the voltage at each harness connection back to the Field-IQ module. PWM voltage will be between Pins 3 & 4 on the 16-pin connectors and between pins E1 and E2 on the 30-pin block on the back of the Field-IQ module.

This method can be used to partially simulate Manual operation. By starting with the Rate at 0.00 and slowly increasing the Rate you can see how the pump operates as the Rate increases. This can help in diagnosing where the trouble might be.

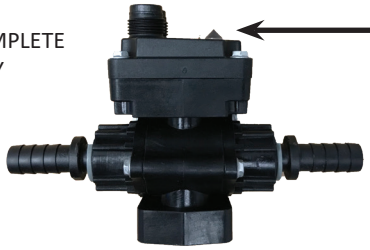
AgXcel's Micro Control Valve

AgXcel's micro control valves are designed to eliminate the need for large sectional valves. The small compact design makes them ideal for controlling flow through the manifolds.

Implements that are 60 ft and wider may be set up with 2 control valves, therefore half of the applicator can be shut off. These systems are setup similar to a single section setup. However, Section 1 of the boom harness will connect to one valve and Section 2 will connect to the other valve.

Please note, implements that are less than 60 feet wide need to be setup as one section on order to prevent range dropping below flow meter capabilities at lower speeds.

GX40 PRO STOP COMPLETE REPLACEMENT BODY
PN# 709



AgXcel's micro control valve (MCV) includes an indicator light. The red light shows voltage/power being supplied to the valve. It will turn Green when receiving a signal to open/close.

Pump Priming and Bleeder Valve

A bleeder valve is included on every AgXcel system. Every row has a check valve. These valves do not let air escape from the system unless it is pressurized. 12 volt electric pump are not good air compressors, so pumps can struggle to prime due to air trapped on the outlet side of the pump.

The bleeder valve is a small 1/4" valve that, when opened, lets air escape from the pump outlet at zero pressure. Open this valve until liquid comes out and then close the valve.

Bleeder Valve

AgXcel's Mag Flow Meter
0.08 - 1.6 GPM

AgXcel's Magnetic Flow Meters are superior to turbine flow meters in two ways. Magnetic flow meters have no moving parts. This eliminates any wear items or any potential for contaminants to jam a spinning turbine.

In addition, magnetic flow meters detect flow by electrically measuring the velocity of the liquid which make them independent of viscosity or density of the liquid measured. While extremely accurate when using the indicated calibration number, AgXcel strongly recommends performing a catch test to verify the system is properly installed and configured.

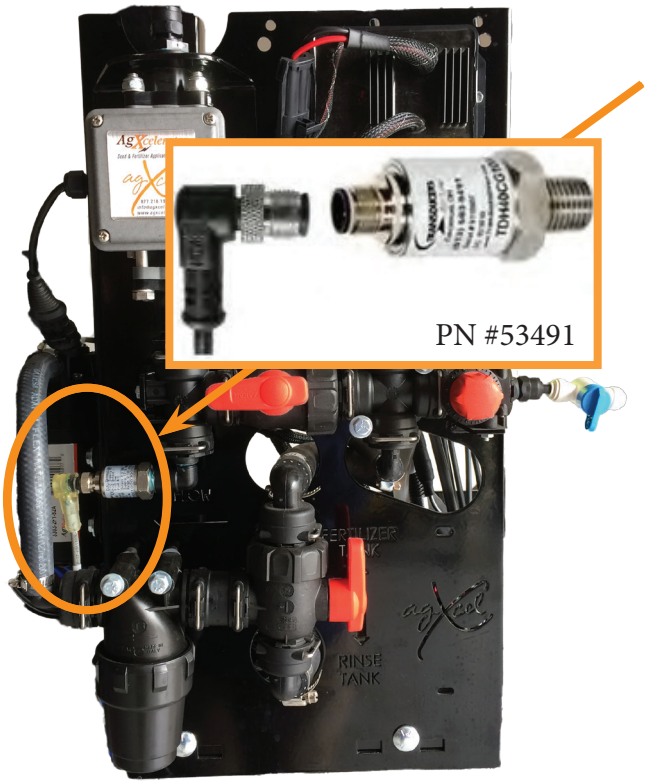
The flow meter included with your Synergist system is rated down to 10 oz/min, but will accurately measure flow down to 8 oz/min. Anything below 8 oz and the flow meter may not give a continuous pulse output.

tip

Caution: Before welding on the implement, disconnect the flow meter or damage to the flow meter electronics may occur.

Do not power wash the flow meter. High pressure spray directed at the back edge of the face plate or at the wire connector may allow water into the flow meter electronics.

Pressure Sensor



The GX40 Synergist comes equipped with a 100 psi pressure sensor to work with your controller. The sensor for the rate controller is a 3-wire type sensor. The Sensor has a 1/4" MPT fitting.

Your display will show the system pressure on the in cab screen. ***The pressure reading is only for informational purposes and is not used in the flow control process.*** Flow control uses the flowmeter feedback only.

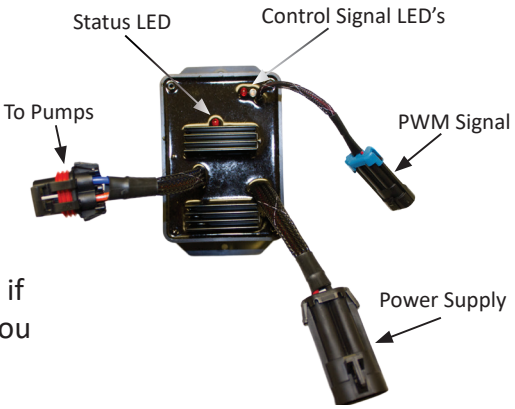
The pressure sensor is very helpful to optimize system performance and troubleshoot any issues.

The pressure transducer is factory calibrated and will display a very accurate pressure reading on your display. No manual gauge is required. However, the Synergist will have a visual gauge for quick reference when standing near the system and not in cab to see controller display.

When attaching connector to pressure sensor, make sure pins are aligned so they are not bent.

EPD LED Signals

AgXcel has 2 styles for EPD's. One of the models has three lights and the other model has five lights. Ensure that you are looking at the correct diagram to confirm the signals you are receiving.



The status LED on the PWM is a good indicator to determine if there's a problem with the system. It is especially helpful if you are calling in for tech support.

LED STATUS INDICATOR CODES	**EDP Status Lights**	
Light on steady		Unit is turned on and operating normally
Steady Flashing		Unit in HOLD. Check Run/Hold jumper or remote switch for correct operation.
1 Flash/pause		Open circuit detected. Check motor connections for open.
2 Flashes/pause		Output short circuit detected. Check motor wiring.
3 Flashes/pause		Over-current condition. Check total load.
4 Flashes/pause		Input Power fault. Check input power wiring.
5 Flashes/pause		Input frequency out of range.
NOTE: Cycle power with the controller ON/OFF switch to clear a fault code		

EDP Status Lights

	Color	Time Line	LED State	Condition
POWER	Power (12V) Green		Off	No power (or less then 6.8V)
	Power (12V) Green		1hz Flash	Under Voltage (less then 10.5V)
	Power (12V) Green		On Solid	12V supplied (power is acceptable)
PWM	PWM Blue		Off	No PWM Signal to the Module
	PWM Blue		1hz Flash	PWM signal present
	PWM Blue		On Solid	Maximum Duty Cycle
TEMP	High Temp Yellow		Off	Module within Temperature Range
	High Temp Yellow		1hz Flash	Module Temp is elevated
	High Temp Yellow		On Solid	Module Auto Shutdown from Temp
MOTOR CURRENT	Current Red		Off	Normal Operation (Under Max)
	Open Circuit Red		1hz Flash	Open Circuit Condition
	Over Current Red		On Solid	Over Current (Output Shorted)
MOTOR RUNNING	Motor Orange		Off	Motor is not running
	Motor Orange		On Solid	Motor is running

The PWM's take 12 volts for power and will send that voltage to the pumps to kick on and off. If the pumps are not turning on, then your PWM might not be getting 12 volts or your pumps might have gone bad.

Pumps run for a few seconds then turn off

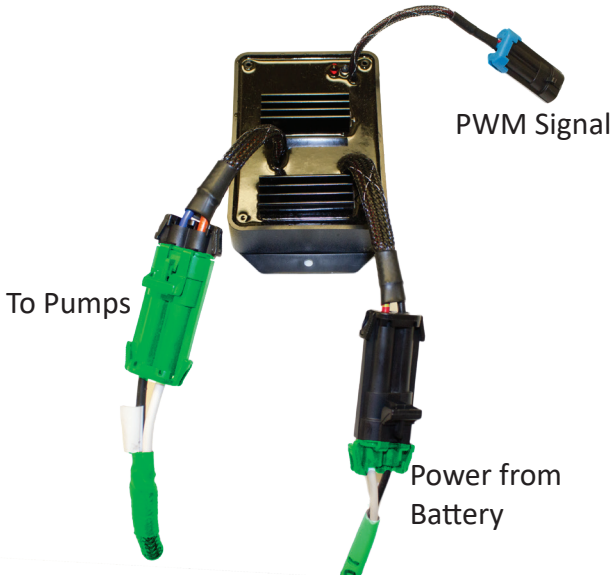
This symptom is due to the pumps drawing more current than the 40 amp limit of the EPD.

1. **Unplug the EPD** connector going to the battery for 2-3 seconds. Removing power from the EPD resets it.
2. **Go to Diagnostics**, Section Test to investigate this issue.
3. **In Section Test**, hold down "+" button for a few seconds. A single tap of this button produces a very small change in signal to the valve, so you must hold it.
4. Increase the flow slowly, checking the "1,2,3" screen to see you flow in GPM. Find the approximate flow where the EPD kicks out. If this is below the flow you need you will need to reduce system pressure by:
   - Looking for any unintended restrictions or plugged rows
   - Increase orifice size
   - Reduce ground speed
   - Reduce application rate

Electric pumps will not turn on

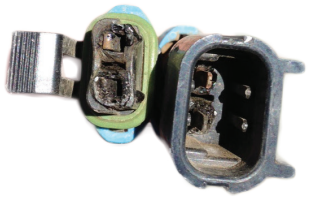
Connect pumps directly to battery

1. Find the EPD (electric pump driver) shown at right. Connect the two connectors (highlighted green, shown on the right) to each other. This will bypass the module and supply 12 volts directly to pumps.
2. Do the pumps run? If not, check the 40 amp fuse on the EPD harness that is connected to the tractor battery. Inspect harnesses and connections. Make sure wire colors match up. (white/white, black/black)
3. If using a dual pump system, test each pump by plugging one pump at a time directly to the battery.



Inspect connections for burned out connectors.

Inspect all connections for bent or burned out leads. Constantly running the system at a high pressure or getting more than the required voltage (12v) can result in burned out connections causing the system to not work properly.



IMPLEMENT SWITCH

(Read Instructions Completely before Beginning Installation)

GXIMPLEMENTSWITCH KIT

PN# 53824

PN# 53982 (2 PIN/JD STYLE)

KIT INCLUDES:

1- 15FT Extension (John Deere ***or*** 3pin connector)
1- Implement Switch with15FT Lead
1- Magnet Mount

IMPLEMENT SWITCH KIT:

1. Run/Hold optional connections (If not using be sure to use provided loop to close circuit)
   - For use with a N.O. (normally open) whisker switch, remove the dummy plug and connect to your run/hold switch wires. A smaller gauge wire (18 AWG minimum) may be used for this low current circuit.
   - For use with a hall-effect sensor, remove the dummy plug and attach the plug from your sensor.

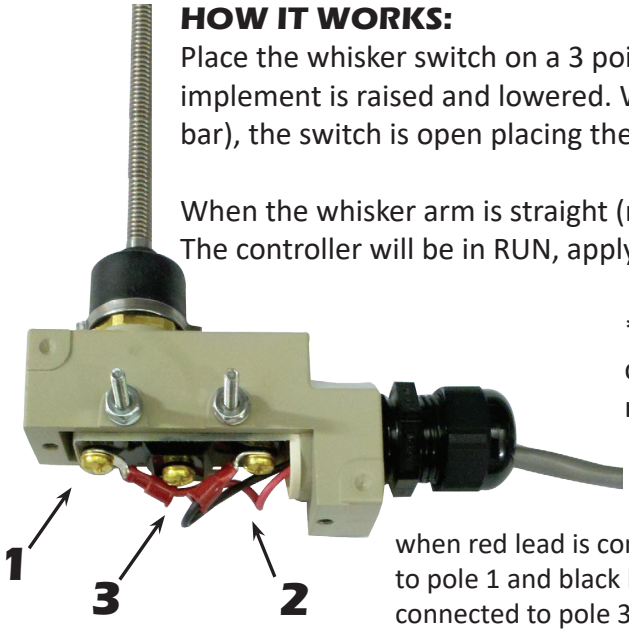
Illustration shown has a 3pin connector.

HOW IT WORKS:

Place the whisker switch on a 3 point arm or wheel frame that changes angle as the implement is raised and lowered. When the whisker arm is bent up (against the tool bar), the switch is open placing the controller in HOLD, not applying fertilizer.

When the whisker arm is straight (not touching the toolbar), the switch will be closed. The controller will be in RUN, applying fertilizer.

* The Whisker switch will work with many other controllers. However, the polarity might be reversed from the positions described above.



when red lead is connected to pole 1 and black lead is connected to pole 3 pumps will run when whisker is bent

when red lead is connected to pole 1 and black lead is connected to pole 2 pumps will run when whisker is straight

	EXTENSIONS AVAILABLE	
3PIN	2PIN	DESCRIPTION
17924	**55917**	GXH_EXT 15FT
54073	**55415**	GXH_EXT 30FT
Custom extension lengths can be special ordered - contact SALES for a price quote		

FLOATING BALL MANIFOLDS

(Read Instructions Completely before Beginning Installation)

In order to assure proper and even distribution to each row, the product being applied must be metered to each individual row. This metering is done by using metering tubes which create back pressure so an equal amount of liquid is applied to each row.

Flow indicators give a clear visual signal that a fertilizer system is working. These indicators use an o-ring and wire clip connection to snap together in any configuration necessary.

The flow to each row will pass through a flow column that has one or two balls that will float to indicate flow to that row. This gives an immediate visual confirmation of flow to each row. While the floating balls are a good visual indication of flow they are **not always** an indicator of exact flow to each row. ***Only a catch test will verify the evenness of the row-to-row distribution.***

Low Flow Column (usually 1/4" QC)

The low flow column has a smaller internal diameter. This means a heaver ball can be used to monitor a smaller flow.

AgXcel uses the low flow columns with 1/4" push to connect outlet fittings. The flow capability of 1/4" tubing and the low flow column is a great pair for rates on 30" rows under 10 GPA. Externally, the low flow column can only be identified by "**LOW FLOW**" molded into one side of the column. All the same fittings work with low flow and full flow columns.

NOTE: Manifold Configuration is situational Photos are for general reference.

manifold examples

Floating Balls

For most applications of Nutri-Sphere-N NH3 at 32 oz/acre, The Green plastic ball gives a good flow indication. If a heavier ball is needed, use the Red Plastic ball. See Fig.1

On the Gx40 Synergist low-volume system, the flow appears to be more stable if only one ball is used.

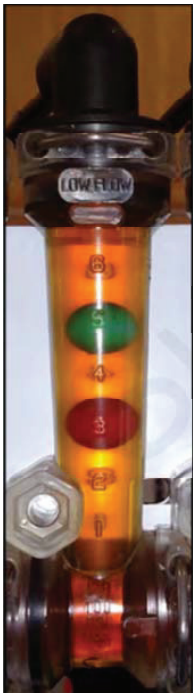
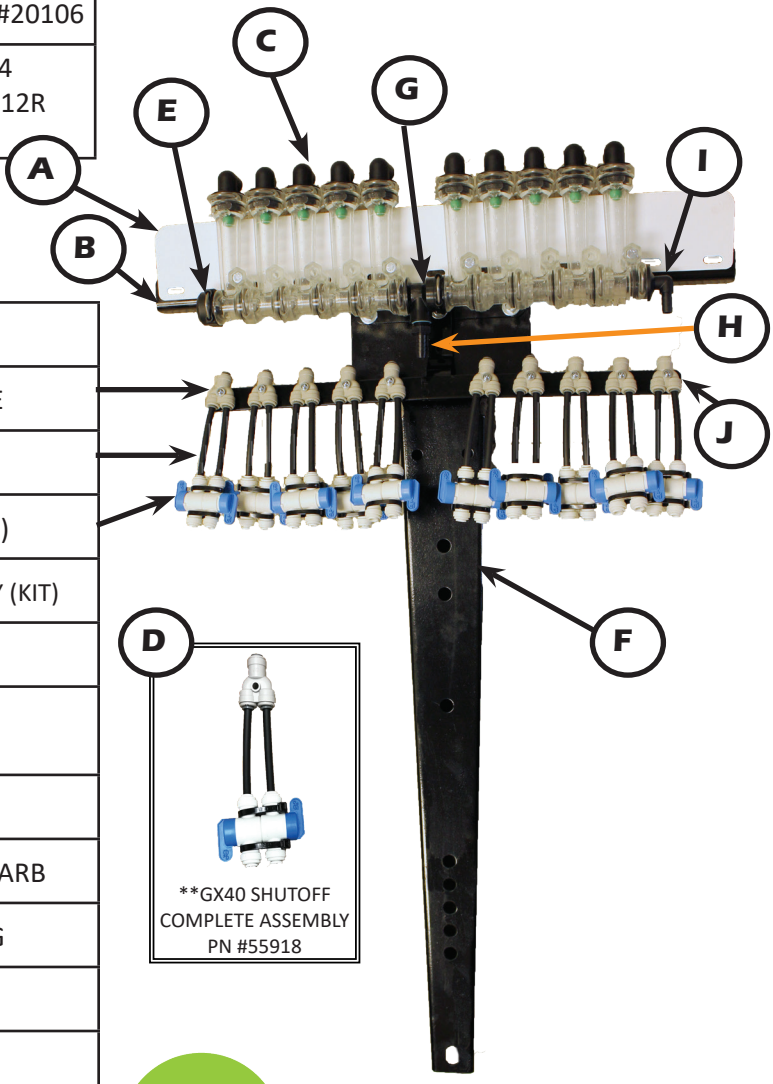


Fig. 1

Ball retainer - If top is removed, be sure that the ball retainer is in place when top is reinstalled.

GX40 SIGHT COLUMN BRACKETS		
PN#		DESCRIPTION
A	406	UP TO 6R WHT BACKDROP
	414	UP TO 8R WHT BACKDROP
	20106	UP TO 12R WHT BACKDROP
B	18082	MOUNTING BRACKET FOR PN#406
	18088	MOUNTING BRACKET FOR PN#414
	18083	MOUNTING BRACKET FOR PN#20106
SIGHT COLUMN HARDWARE KIT - PN#38324 HARDWARE KIT USED FOR MOUNTING UP TO 12R ONTO GX1 CHASSIS BRACKET		

HARDWARE TO MOUNT SHUTOFF ASSEMBLY		
	PN#	DESCRIPTION
1 OF EACH REQUIRED PER ROW	715	6-32 NYLON LOCK NUT
	714	6-32X1" PHIL RH MS
	18182	#6 SAE FLAT WASHER

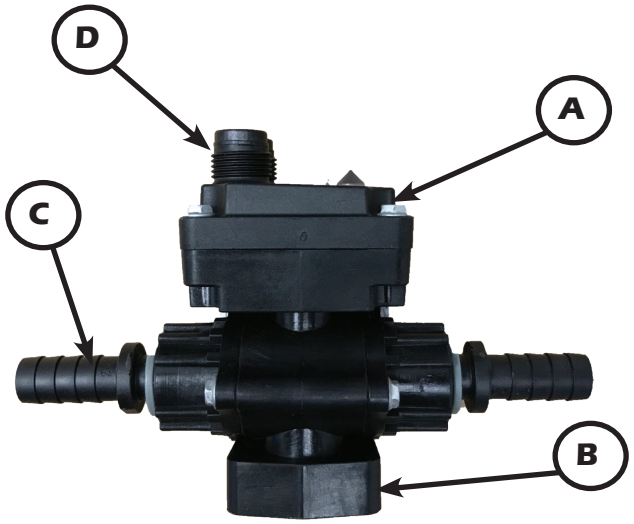


C	25709	1/4 PTC TOPS
D	37721	DIVIDER W/MOUNT HOLE
	19920	EVA14
	19848	1/4" PTC SHUTOFF (QTY 2)
	55918	**GX40 SHUTOFF ASSEMBLY (KIT)
E	18039	COLUMN END CAP & CLIP
F	38260	GX1 CHASSIS (TOMAHAWK ONLY)
G	18042	ISOLATED FEED
H	32264	3/8 MNPT TO 3/8 HOSE BARB
I	18033	3/8" HOSE SHANK-90 DEG
	25682	LOCK U-CLIP
J	17701	GX1SHUTOFFBRACKET
COMMON UBOLT(S)	17703	GXUBOLT 6 X 5 1/2" x 1/2"
	37726	GXUBOLT 4 X 7 X 5/8"
	55222	GXUBOLT 6 X 8 1/2" x 5/8"
	20554	GXUBOLT 6 X 8 X 5/8"

tip

Implements that are less than 60 ft. wide need to be setup as one section in order to prevent range dropping below flow meter capabilities at lower speeds. Using more sections is not recommended.

GX40 PRO STOP HARNESSING		
PN#	SIZE	M12 TO 3 PIN CONNECTORS
54406	3FT	
54408	6.5FT	
55410	9.8FT	
54412	13FT	
54414	19FT	
54416	29FT	
54418	39FT	
**CUSTOM GX40 BOOM EXTENSIONS AVAILABLE AT EXTRA COST **		



	GX40 VALVE BODY ASSEMBLY		
	PN#	DESCRIPTION	COMPLETE Gx40 BASE VALVE ASSEMBLY PN# 709
A	**55716**	GX30PROSTOP - E VALVE M12 (VALVE ONLY)	
B	**17720**	PRO STOP BODY BRACKET (NOT SHOWN)	
C	**20808**	3/8 TUBE TO 3/8 BARB (2 REQ'D)	
D	**37665**	GX40 M12CAP (NOT SHOWN)	

GX40 SIGHT COLUMNS		
PN#		DESCRIPTION
LOW FLOW	**25689**	Wilger Low Flow Column Only
	25687	Wilger Low Flow Column W/balls, clip, retainer (No Top)
	37617	Wilger Low Flow Complete Column(s) - 4 pack w/ End cap, clips & 1/4QC Tops
BALL SELECTION FOR THE GX40		
1-3 GPA	**18077**	Green Plastic* Ball
2-4 GPA	**18078**	Red Plastic* Ball
*For 32 oz/acre at 7mph or less the Green ball works the best. Higher speeds may work better with the Red ball **		

PN#	DESCRIPTION
55634	GX40 DUAL TUBING - 12 FT SKY/NAVY
55938	GX40 DUAL TUBING - 12 FT GREY/NAVY
38251	GXMT GREEN (SOLD BY THE FT) NOTE: GX40 USES 4FT OF GREEN MT PER ROW.
20121	1/4 PTC DIVIDER
55212	.3 LB X 1/4" QC CHECK VALVE

MICRO TUBE PLUMBING KITS

(Read Instructions Completely before Beginning Installation)

The GX40 Synergist system comes with a Dual micro tube distribution system. These plumbing kits will contain everything you need to distribute product from the flowmeter outlet down to the ground application device.

For most applications of NutriSphere-N NH3 at 32 oz/acre on 30" rows, the Gray micro tube will be what is used. When appying in cold weather and/or at high speeds, it may be necessary to use the Navy Blue micro tube. The system will work at pressures up to 50 psi, but for prolonged use above 45 psi, consider switching to a larger tube.

FIELD OPERATION OF DUAL MICRO TUBE

The best micro tube to use may change based upon temperature, application speed and product batch.

AgXcel recommends you start with the Gray tube (for typical 32 oz/acre and 30" row spacing). Conduct a test using calibration mode to determine your system pressure. Recommended pressure is between 10-40 psi.

The system will operate up to 50 psi. However, if prolonged application with pressure above 45 is anticipated consider changing to the Navy Blue Metering tube.

NOTE: Flow Tests with water will have very different pressure readings than what the system will have with NutriSphere-N. The pressure will be much less with water for a given flow than with NutriSphere-N.

ADVANTAGE OF DUAL MICRO TUBE

Micro tubes provides a larger passage way diameter than a comparable orifice. Typical NutriSphere-N NH3 applications apply around 1 to 1.5 oz/min/row. An orifice of this rate would have a 0.015" diameter opening. The GX40 Synergist uses micro tubes Navy Blue and Gray. This 12' tube with more than 3 times the diameter creates a system excellent in providing low volume row to row distribution.

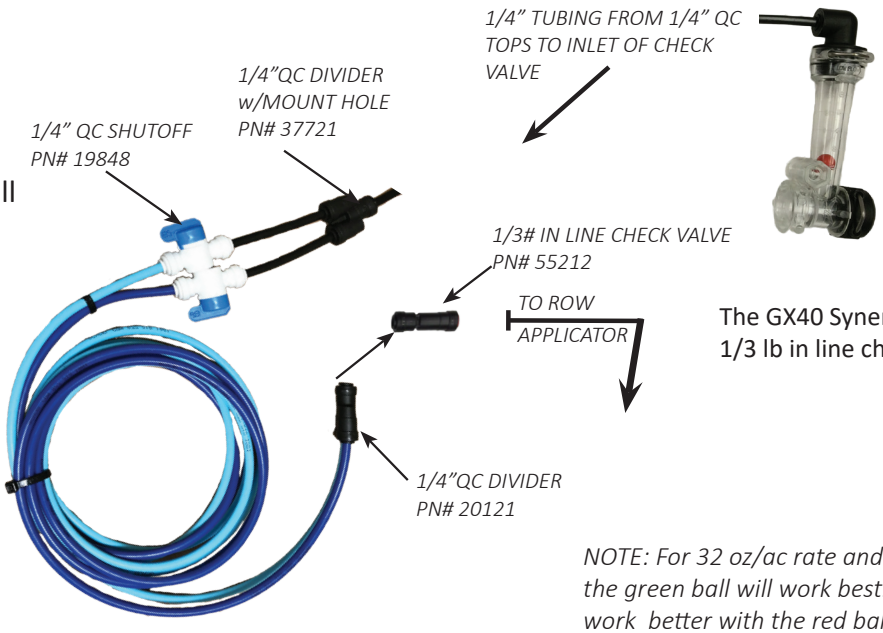
By using two micro tubes, the system can provide proper application as the product properties change due to temperature, mixtures and other factors.

CHECK VALVES

(Read Instructions Completely before Beginning Installation)

A standard dual check valve system with two micro tubes as shown on the left. This allows the flow to be directed to the small tube, large tube or to both tubes by opening or closing the valves by twisting the blue caps.

SAMPLE KIT CONFIGURATION



The GX40 Synergist will come with a 1/3 lb in line check valve.

NOTE: For 32 oz/ac rate and speeds 7mph or less, the green ball will work best. Higher speeds may work better with the red ball

Dual Navy Blue/Grey - PN# 55938 * - Standard kit
Dual Navy/Sky - PN# * PN# 55634 - Situational and dependent on speed of implement

12' lengths per row are standard for the GX40 Synergist and included in all kits.

TYPICAL PLUMBING SETUP

(Read Instructions Completely before Beginning Installation)

Your shanks and plumbing setup may vary from those shown here.

The 4’ green tube delivers the product to the shank.

1. Slide a 2’ piece of 3/8” hose over the green tube along with 2 clamps.
2. Slide the green hose in the tube on the shank as far as it will go.
3. Slide the 3/8” hose down over the tube. Clamp 3/8” hose at the top and at the bottom.
4. Connect Navy blue tube 1/4” QC x 1/4” QC. Cap both ends of the Sky Blue tube. *Sky Blue tube will be used when cold weather and/or high speeds create too high pressure in the Navy Blue tube.
5. Connect Navy blue tube to outlet side check valve provided.
6. Connect the black 1/4” tubing from top of flow indicator to inlet of check valve.

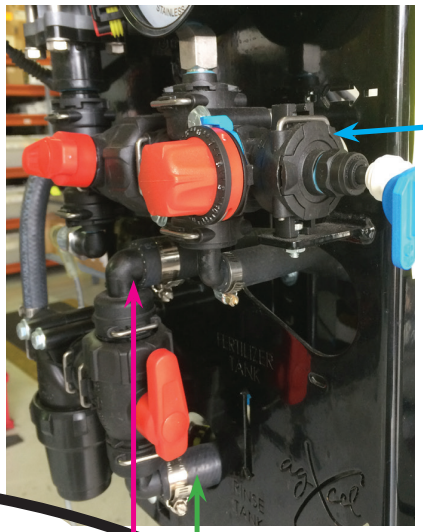
5

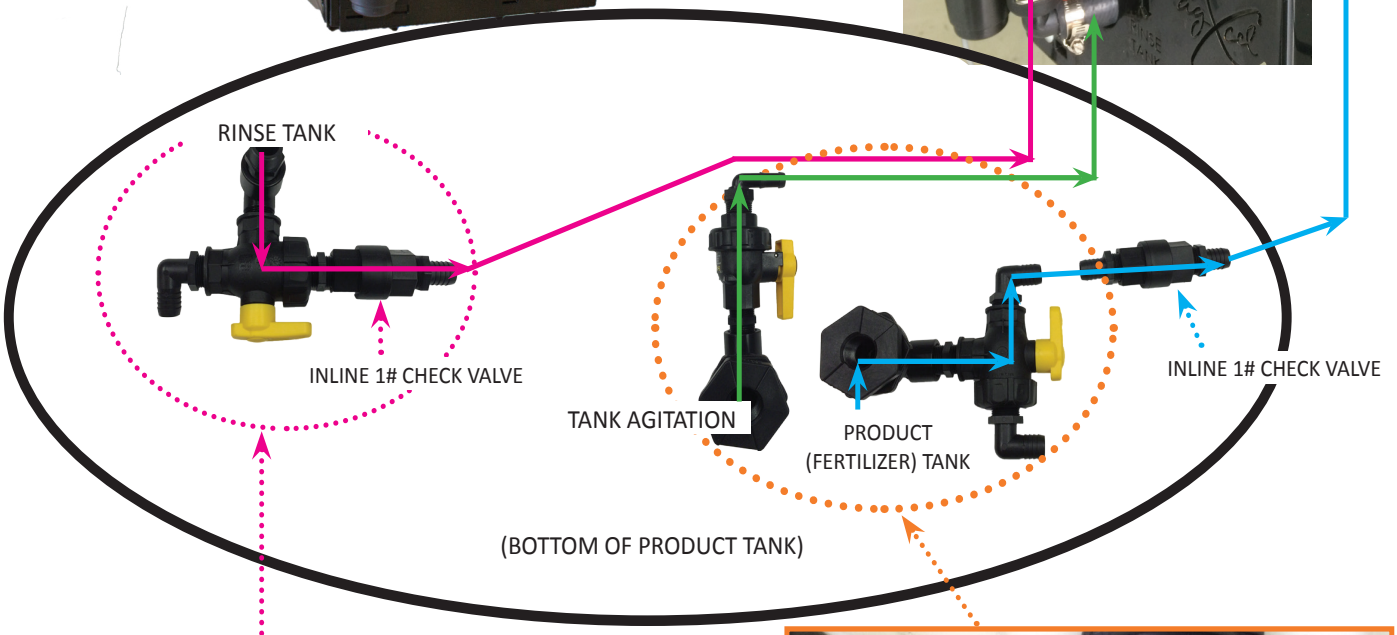
1/3# INLINE CHECK VALVE
PN# 55212

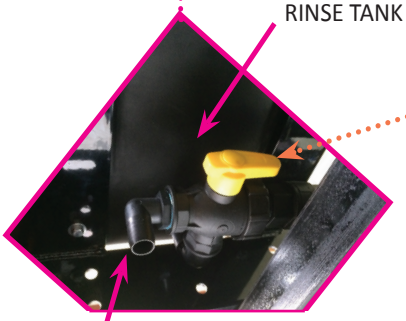
NOTE: For 32 oz/ac rate and speeds 7 mph or less, the green ball will work best. Higher speeds may work better with the red ball

GX40 TANK PLUMBING DETAIL

(Read Instructions Completely before Beginning Installation)







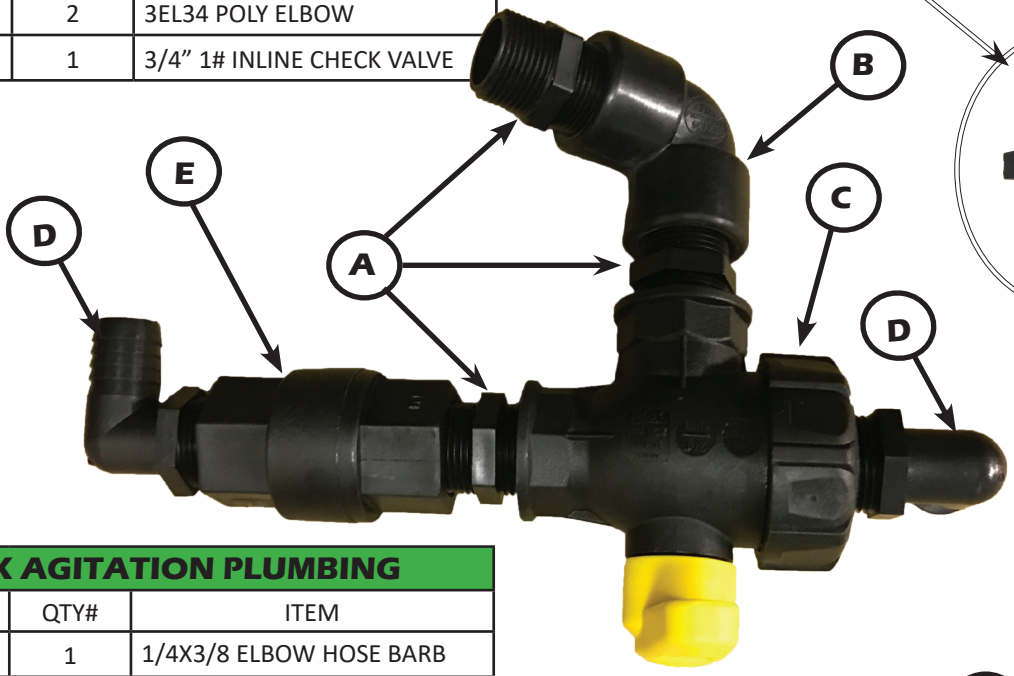
RINSE TANK

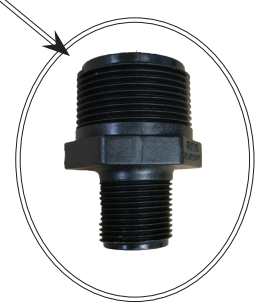
PRODUCT (FERTILIZER)TANK

TANK AGITATION

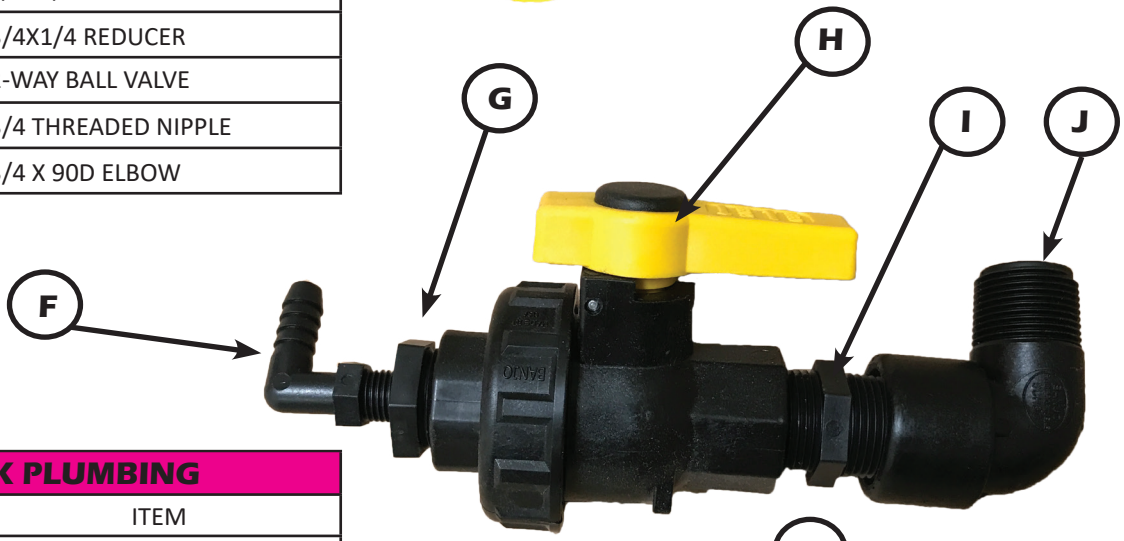
PRODUCT TANK PLUMBING			
	PN#	QTY#	ITEM
A	32399	3	3/4 THREADED NIPPLE
B	50577	1	3/4 PIPE ELBOW
C	37667	1	3-WAY BALL VALVE
D	32331	2	3EL34 POLY ELBOW
E	54022	1	3/4” 1# INLINE CHECK VALVE

A & B are used with a 55 gal tank. For a 110 gal tank substitute A & B for PN# 52108 (shown) 1-1/4 X 3/4 REDUCER

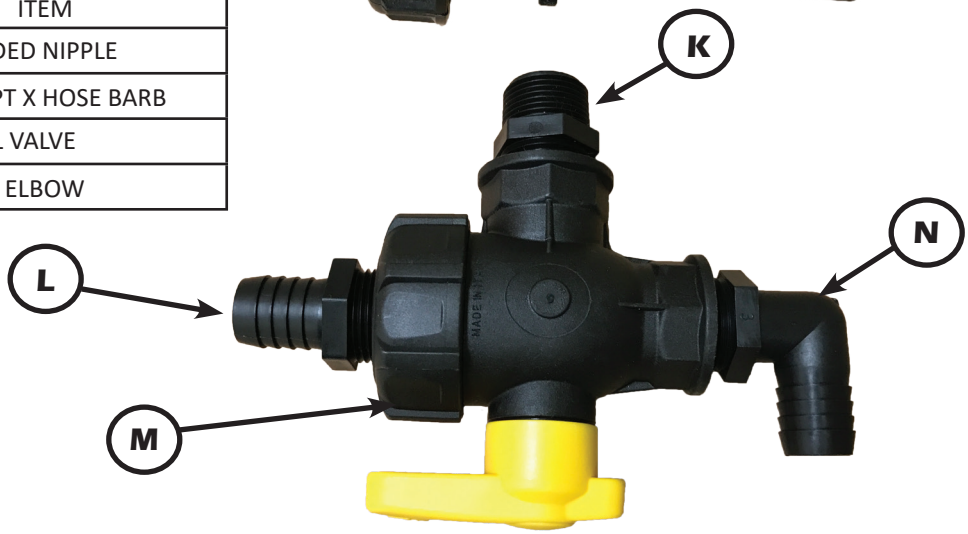




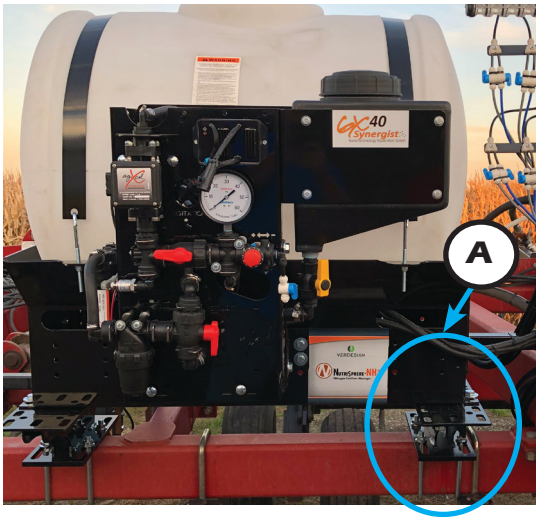
TANK AGITATION PLUMBING			
	PN#	QTY#	ITEM
F	32324	1	1/4X3/8 ELBOW HOSE BARB
G	32433	1	3/4X1/4 REDUCER
H	52169	1	2-WAY BALL VALVE
I	32399	1	3/4 THREADED NIPPLE
J	52146	1	3/4 X 90D ELBOW



RINSE TANK PLUMBING			
	PN#	QTY#	ITEM
K	32399	1	3/4 THREADED NIPPLE
L	18005	1	3/4x3/4 MPT X HOSE BARB
M	37667	1	3-WAY BALL VALVE
N	32331	1	3EL34 POLY ELBOW



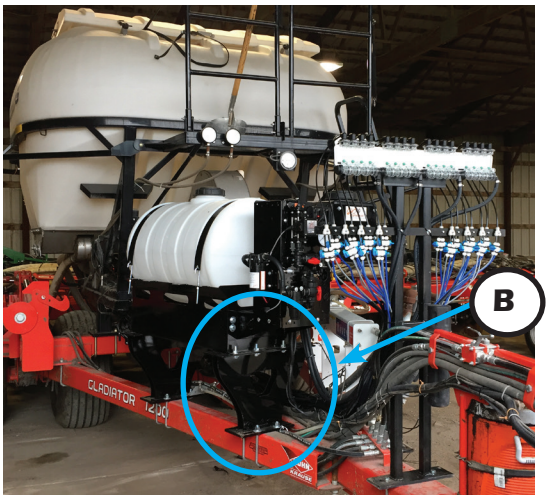
AGXCEL SYNERGIST MOUNTING OPTIONS



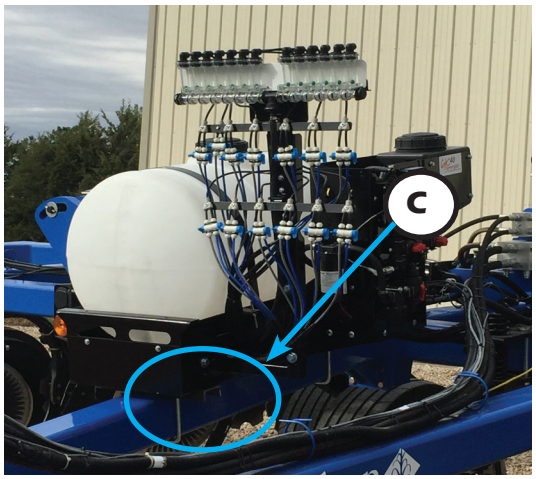
Various brackets and u-bolts are available to provide a way to mount the GX40 Synergist to almost any implement. Your AgXcel configuration specialist will get your implement information at ordering time to make sure that all of the hardware needed for your system is included.

ITEM#	PN#	DESCRIPTION
A	55598	GX40_UNIVERSALTANKMOUNT 6”
B	55597	GX40_UNIVERSALTANKMOUNT 16”
	55596	GX40_UNIVERSALTANKMOUNT 24”(NOT SHOWN)
	38327	GXUNIVERSALTANKMOUNTBOLT KIT

PN#38327 = BRACKET HARDWARE PACKAGE (USED TO MOUNT GX40 SYNERGIST TANK CRADLE TO UNIVERSAL MOUNT BRACKET 6”, 16”, 24” OR LOW PROFILE BRACKET)

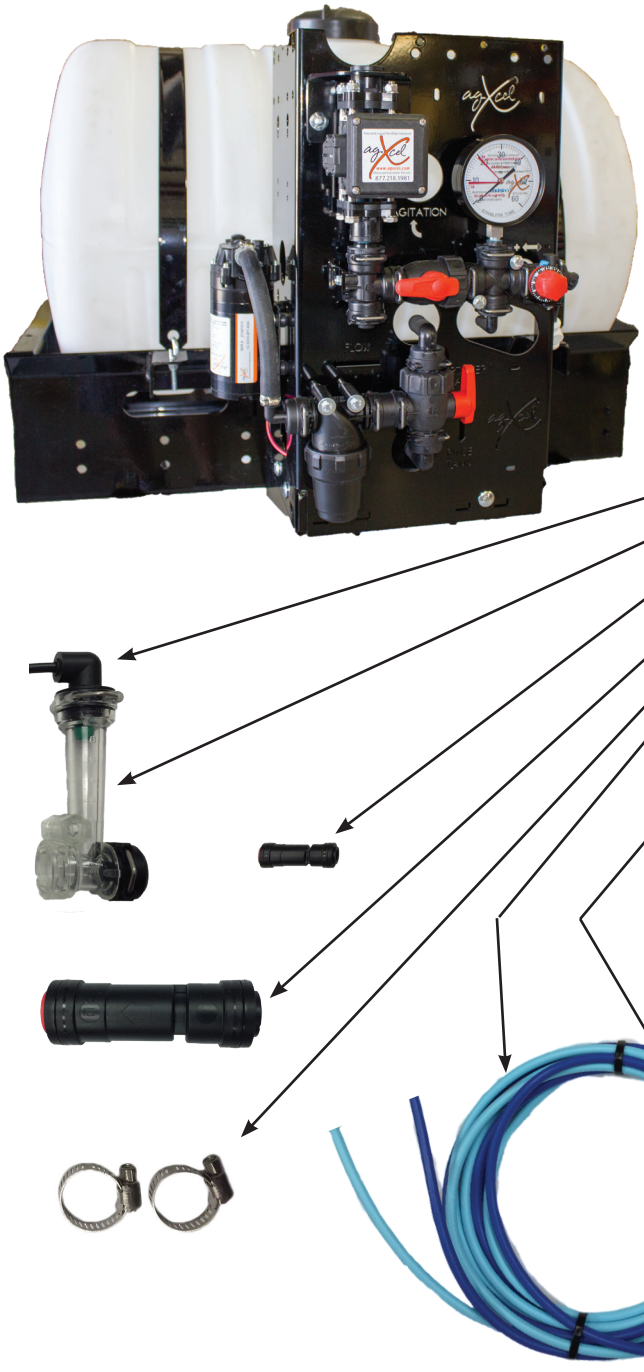


The most common mounting options are shown here. Also GX40 systems can be mounted directly to the tool bar as shown above. Agxcel carries a variety of sizes to fit majority of tool bar sizes.



ITEM#	PN#	DESCRIPTION
C	55625	GX40_LOWPROFILEBARMOUNT
	53719	9” BOLTS 5/8”
	38402	5/8” WASHER
	37601	5/8” SPIN NUT
	38327	GXUNIVERSALTANKMOUNTBOLT KIT

SYNERGIST FIELD KIT - PN#55558



COMPLETE AGXCEL GX40 SYNERGIST FIELD KIT CONTAINING CRITICAL COMPONENTS TO KEEP YOU RUNNING IN THE FIELD.

KIT INCLUDES:

SYNERGIST FIELD KIT PN#55558		
PN#	**ITEM**	**QTY**
25709	WILGER 1/4” CAP QC	**1**
37614	WILGER LOW FLOW COLUMN	**1**
262	QC3 (1/4” TO 1/4” QC)	**4**
55212	1/3# IN LINE CHECK VALVE	**2**
38412	SST #6 CLAMPS	**2**
55938	GX6MT DUAL NAVY/GREY 12FT	**2R**
37721	1/4” DIVIDER WITH MOUNT HOLE	**2**
20121	1/4” DIVIDER	**2**
32324	QA PUMP FITTINGS 3/8” BARB	**2**
709	MICRO-VALVE W/BODY	**1**
20064	2.0 QA PUMP	**1**

****OPTIONAL FIELD KIT AVAILABLE BEYOND BASIC FIELD KIT PROVIDED WITH EVERY SYSTEM****

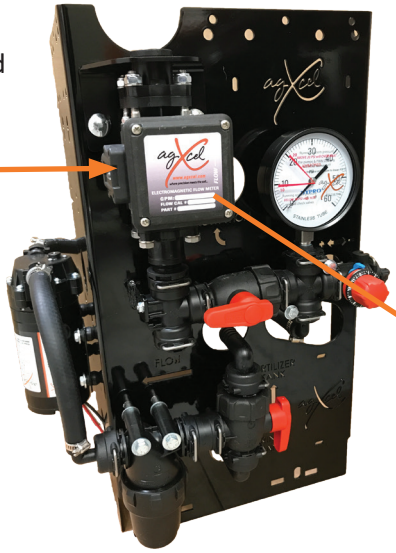
FLOWMETER OVERVIEW

(Read Instructions Completely before Beginning Installation)

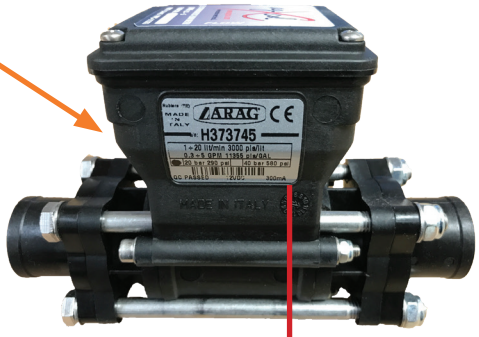
AGXCEL MAG FLOWMETER

The AgXcel Mag Flow meter is a magnetic flow meter, also technically known as an electromagnetic flow meter. A magnetic field is applied to the metering tube, which results in a potential difference proportional to the flow velocity perpendicular to the flux lines. The physical principle at work is electromagnetic induction. The Mag meter is superior to other flow meter since there are no moving parts to replace or maintain just as when dirt or fertilizer with particles is present. Also given that the Mag meter detects the flow of ions in the liquid, it can therefore accommodate for viscosity or liquid density changes. Given the superior features of the Mag flow meter, a quick catch test is always recommended to ensure precision application.

MAG Meter has an integrated AMP Super seal connector with visual power/flow indicator.



The Synergist uses special quick attach fittings that lock n clip into place making easy part replacement.



On the magnetic flowmeter there will be a sticker located on one of the sides. Find the pulses per gallon and use the chart in your OEM manual to determine your flowmeter calibration number.

FLOW RANGE (GPM)	PULSES PER GALLON
0.08 - 1.6*	22710
0.13 - 2.6	22710
0.3 - 5	11355
0.6 - 13	4542
1.3 - 26	2271
2.6 - 53	1135

When calling for tech support our technicians may ask if you have a “Divide by 8” cable connected to the flowmeter. The image to the right is what the cable looks like. This only applies to the magnetic flowmeter. This cable is easily identified by the small “pill box” in the middle of the harness.

**GX40 Synergist exclusively uses the .08-1.6 flowmeter. Special settings to read in oz/acre. See OEM manual for details.*

GX ACCESSORY - RECIRCULATION KIT

(Read Instructions Completely before Beginning Installation)

APPLICATIONS

1. Recirculation flow is required for product agitation.
2. IF a low flow rate is required, that would require pump to run less than 10-20% of maximum capacity. This kit will allow the pump to turn faster, while only applying a low rate of product. This makes the pump performance more stable under these circumstances. Make sure the flowmeter minimum flow is capable of metering the flow rate you wish to apply to the ground.

HOW IT WORKS

The recirculation valve diverts some pump flow before the flowmeter. The application rate is still measured by the flowmeter and everything that passes through the flowmeter is applied to the ground. Adjust the regulation valve to set the required recirculation.

USE OF THIS KIT LOWERS THE MAXIMUM RATE THAT CAN BE APPLIED

Do I need recirculation flow?

Recirculation flow allows the pump to run faster than if the total pump flow was applied to the ground. This may be helpful when operating at very low rates. The Synergist will typically operate with the recirculation valve closed. The metering tube on the recirculation loop can be changed to allow for more or less recirculation. Too much recirculation can result in unstable flow reading on the display.

RECOMMENDED CARE AND MAINTENANCE

(Read Instructions Completely before Beginning Installation)

WINTERIZATION

AgXcel recommends flushing your fertilizer pump and complete system with adequate amounts of water first. Next, use RV antifreeze to winterize your system by pumping an adequate amount through all components.

RECOMMENDED PRESSURE (GX ELECTRIC SYSTEMS ONLY)

Agxcel recommends to maintain a pressure between 10 and 20 psi. Doing so, and with proper winterization, will ensure the durability of the system, and reduce problems when preparing for the next season.

TESTING THE SYSTEM

Agxcel recommends testing your system with water first. Water testing will help determine if the plumbing and hardware is secure.

CALLING FOR TECH SUPPORT

Before calling for tech support, please check our troubleshooting section. If your problem cannot not be resolved please have your serial number handy so our technicians can easily look up your order. Serial numbers can be located on the chassis of the pump systems, or on the front page on the installation guide.

Installation, Operation, Repair and Parts Manual

Description

AgXcel offers various pump models for different applications. The information outlined in this manual is general and not specific to all 3300 series pumps. Be certain the pump materials are compatible with the fluid being pumped. Product data sheets, outlining detailed specifications such as thermal limits, load capacities, and performance curves are available for individual models, along with further technical data. If unsure about chemical compatibility or intended applications of a motor, please call AgXcel for assistance.

General Safety Information

⚠ **California Proposition 65 Warning** -- This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

NOTE

Notes are used to notify of installation, operation, or maintenance information that is important but not safety related.

⚠CAUTION

Caution is used to indicate the presence of a hazard, which will or may cause minor injury or property damage if the notice is ignored.

⚠WARNING

Warning denotes that a potential hazard exists and indicates procedures that must be followed exactly to either eliminate or reduce the hazard, and to avoid serious personal injury, or prevent future safety problems with the product.

⚠DANGER

Danger is used to indicate the presence of a hazard that will result in severe personal injury, death, or property damage if the notice is ignored.

⚠CAUTION

"Intermittent Duty" is defined as: operated and/or frequently started within a period of time that would cause the motor to reach its maximum thermal limits. Once the maximum thermal limit is obtained, the motor must be allowed to return to ambient temperature before resuming operation.

⚠CAUTION

DO NOT use to pump flammable liquids. Never operate the pump in an explosive environment. Arcing from the motor brushes, switch or excessive heat from an improperly cycled motor may cause an explosion.

⚠CAUTION

DO NOT assume fluid compatibility. If the fluid is improperly matched to the pump's elastomers, a leak may occur. Pumps used to transfer hazardous or hot (max. temperature 120°F [49°C] viton only) chemicals must be in a vented area to guard against the possibility of injury due to harmful or explosive liquid/vapors.

⚠CAUTION

DO NOT operate the pump at pressures which cause the motor to exceed the amperes rating indicated on the name plate. Various pump models are equipped with thermal breakers to interrupt operation due to excessive heat. Once the temperature of the motor is within proper limits, it will automatically reset, and the pump will start operation without warning.

⚠CAUTION

To prevent electrical shock, disconnect power before initiating any work. In the case of pump failure, the motor housing and/or the pumped fluid may carry high voltage to components normally considered safe.

Hazardous Substance Alert

1. Always drain and flush pump before servicing or disassembling for any reason (see instructions).
2. Never store pumps containing hazardous chemicals.
3. Before returning pump for service/repair, drain out all liquids and flush unit with neutralizing liquid. Then, drain the pump. Attach tag or include written notice certifying that this has been done.

NOTE

It is illegal to ship or transport any hazardous chemicals without United States Environmental Protection Agency Licensing.

Pressure Switch Operation

The pressure switch reacts to outlet pressure and interrupts power at the preset shut-off pressure indicated on the pump label. When outlet pressure drops below a predetermined limit (typically 15-20 psi [1-1.4 bar] less than the shut-off pressure), the switch will close and the pump will operate until the shut-off (high) pressure is achieved. The shut-off pressure is set to factory calibrated standards. See the motor label for specific pump specifications.

⚠CAUTION

Improper adjustment of the pressure switch may cause severe overload or premature failure. Failures due to improper adjustment of the pressure switch will not be covered under the limited warranty.

If the plumbing is restrictive or the flow rate is very low, the pump may re-pressurize the outlet faster than the fluid is being released, causing rapid cycling (ON/OFF within 2 seconds). If the pump is subjected to rapid cycling during normal operation, damage may occur. Applications which exhibit rapid cycling should have restrictions in the outlet minimized.

Bypass Operation

A bypass pump may be used for applications that normally induce frequent start/stop of the motor, and thereby create a potential for overheating. Models equipped with an internal bypass are designed to pump at high pressure while at low flow rates.

Bypass models equipped with a switch may operate for several seconds even though the outlet side has been closed off. Contact AgXcel for information regarding bypass pumps.

Mounting

The 3300 series pumps are self priming. Horizontal and vertical prime vary depending on the fluid viscosity and pump configuration.

The pump should be located in an area that is dry and provides adequate ventilation. If mounted within an enclosure, provisions to cool the motor may be necessary. If increased heat dissipation is necessary, motor mountable heat sinks are available from AgXcel.

⚠CAUTION

DO NOT locate the motor near low temperature plastics or combustible materials. The surface temperature of the motor may exceed 250°F [120°C].

The pump may be mounted in any position. However, if mounting the pump vertically, the pump head should be in the down position so that in the event of a leak, fluid will not enter the motor.

Secure the rubber feet with #8 hardware. DO NOT compress the feet: doing so will reduce their ability to isolate vibration/noise.

Plumbing

Flexible high pressure tubing compatible with the fluid should be used to connect the inlet/outlet ports. Tubing should be 1/2” [13 mm] I.D. and at least an 18 in. [46 cm] length is suggested to minimize stress on the fitting/ports and reduce noise. Allow for the shortest possible tubing route and avoid sharp bends that may kink over time.

NOTE

Restrictions on the inlet may cause vacuum levels to reach the fluid vapor pressure, causing cavitation, degassing, vapor lock, noise, and a loss in performance. Inlet pressure must not exceed 30 psi [2.1 bar] maximum.

NOTE

AgXcel does not recommend the use of metal fittings or rigid pipe to plumb the inlet/outlet ports. Standard plastic male and female-threaded fittings can be acquired at commercial plumbing supply stores. AgXcel also distributes swivel barb fittings and special fittings through its dealers.

1/2” Female NPT models: In some cases, the ports may require a suitable thread sealer applied sparingly. DO NOT over-tighten, max. torque 3.7 ft. lbs. [45 in. lbs. (5 Nm)].

1/2” Male-threaded models are intended to be used with SHURflo swivel barb fittings which seal with an internal taper when hand-tightened. Standard 1/2” NPT fittings may be used when tightened to a maximum torque of 3.7 ft.lbs [45 in.lbs (5 Nm)].

⚠CAUTION

Sealers and Teflon tape may act as a lubricant, causing cracked housings or stripped threads due to over-tightening. Care should be used when applying sealers. Sealers may enter the pump, inhibiting valve action, causing no prime or no shut-off. Failures due to foreign debris are not covered under warranty.

Installation of a 50-mesh strainer is recommended to prevent foreign debris from entering the pump.

If a check valve is installed in the plumbing, it must have a cracking pressure of no more than 2 psi (.14 bar).

Electrical

⚠CAUTION

Electrical wiring should be performed by a qualified electrician, in accordance with all local electrical codes.

The pump should be on a dedicated (individual) circuit, controlled with a double pole switch (VAC U.L./C-UL certified) rated at or above the fuse ampere indicated by the pump motor label. Depending on distance of the power source from the pump and ampere load on the circuit, wire may need to be heavier than indicated by the chart.

⚠CAUTION

All 115 VAC and 230 VAC pump motors and systems MUST be grounded per local and state electrical codes.

Improper duty cycle and/or rapid start & stop conditions may cause the internal thermal breaker (if equipped) to trip, or can result in premature motor or switch failure due to excessive heat.

For the pump to meet U.L./C-UL requirements, the circuit MUST be protected with a slow-blow fuse (U.L./C-UL certified) or equivalent circuit breaker as indicated on the motor label. Use an approved wire of the size specified or heavier.

⚠CAUTION

Circuit protection is dependent on the individual application requirements. Failure to provide proper overload/thermal devices may result in a motor failure, which will not be covered under warranty.

Voltage	Wire Leads	Wire Size	Fuse Rating
12 DC 24 DC 36 DC	Red (positive +) Black (negative -)	#14 AWG [2.5 Mm^2] (or heavier)	SEE PUMP MOTOR LABEL
115 AC	Black (common) White (neutral) Green (ground)	#16 AWG [1 Mm^2] C-UL - TEW / UL 1015 (or heavier depending on distance)	
230 AC	Brown (common) Blue (neutral) Green/Yellow (ground)		

Troubleshooting

Symptom	Corrective Action(s)
Pump will not start:	Check fuse or breaker. Check for correct voltage (±10%) and electrical connections. Check pressure switch operation and correct voltage at switch or motor wires (as equipped). Check rectifier or motor for open or grounded circuit. Check for locked drive assembly.
Pump will not prime: (no discharge/motor runs)	Check to see if out of product. Check strainer for debris. Check inlet tubing/plumbing for severe vacuum leak. Check to see if inlet/outlet tubing is severely restricted (kinked). Check for debris in pump inlet/outlet valves. Check for proper voltage with the pump operating (±10%). Inspect pump housing for cracks.
Leaks from pump head or switch:	Check for loose screws at switch or pump head. Check to see if switch diaphragm is ruptured or pinched. Check for punctured diaphragm if fluid is present at bottom drain.
Pump will not shut off: (pressure switch equipped)	Check to see if output line is closed and not leaking. Check for air trapped in outlet line or pump head. Check for correct voltage to pump (±10%) Check inlet/outlet valves for debris or swelling. Check for loose drive assembly or pump head screws. Check pressure switch operation and/or if adjustment incorrect.
Noisy / rough operation:	Check mounting feet to see if they are compressed too tight. Does the mounting surface multiply noise (flexible)? Check for loose pump head or drive screws. Is the pump plumbed with rigid pipe, causing noise to transmit?

WARRANTY:

AgXcel manufactured systems come with a 1 year limited warranty. Electronic components from our OEM vendors come with a 1 year limited warranty and some components only have a 90 day warranty. (e.g. the Garmin GPS devices)

AgXcel warrants that the products or services sold here shall be free from defects in material and workmanship under normal use and services when correctly installed, used, and maintained. This warranty of quality shall terminate 1 year after delivery of the product, and shall not apply to products which have been subject to misuse, abuse, neglect, improper storage, handling, or maintenance. If the product proves to be defective within the warranty period the purchaser must contact AgXcel technical support team to troubleshoot the product to verify the defect. If technical support feels there is an issue, at AgXcels' discretion a new or factory refurbished part will be shipped to replace the part in question. All product(s) replaced or repaired under warranty shall carry the remainder of the warranty left on the original purchase. Under no circumstances shall AgXcel be liable for special, indirect, or consequential damages. In particular AgXcel shall not be liable for damage to crops as the result of misuse or negligence in the application of chemicals or operation of AgXcel products.

Our warranty process is as follows:

- When a warranty claim is made; at AgXcels discretion a new or factory refurbished part will be shipped and invoiced. It is very important to note that the invoice is due in full within 30 days from the invoice date. Finance charges will be applied if not paid in full. Credit to your account will be processed when OEM validates and approves your warranty claim.
- It is the Authorized Dealers'/Customers' responsibility to return the warranty part to AgXcel for review within 15 days. (Note return procedure below)
- Once the part is received AgXcel will test the part to justify the claim.
- Part is then shipped to the original manufacturer to validate for warranty.
- If the original manufacturer determines that the part qualifies; your account will be credited for the new part sent.
- If the manufacture denies warranty and the part is in working order it will be returned to the authorized dealer.
- If the part is not in working order it will be discarded unless you request that it be returned to you.

RETURNS:

AgXcel will gladly accept returns for new items purchased directly from us if returned within 30 days of receipt. However returned items must be accompanied by the original product packaging, any associated components and informational tags (such as flow meter calibration tag). Metal brackets are not returnable unless they are in new condition and are not scratched. Authorized Dealers/Customers wishing to return items must contact AgXcel at 877-218-1981 or info@agxcel.com prior to returning any items to request a RMA number. **Packages sent with no RMA number are UNAUTHORIZED and will be refused byour receiving department and returned to sender at sender's expense.**

Once the return has been approved and a RMA number is obtained, AgXcel will contact the Authorized Dealer/Customer with RMA number and instructions on how to return the items.

Ensure that items are properly packaged; taking special care with items that can be scratched, damaged or broken during

shipping. Clearly write the RMA number on the outside of the package and return to AgXcel. {Return shipping and handling fees are the customer's responsibility and will not be reimbursed by AgXcel.} AgXcel highly recommends that a traceable method of shipping is used for your protection. AgXcel is not responsible for damaged or lost items due to shipping. Upon receipt of returned items AgXcel will inspect all the items and give the Authorized Dealer/Customer credit for the approved return within 30 days. Credit will not be given on items that are damaged, broken or used. This does not apply to warranty returns.

Credit for the RMA will be placed on the Authorized Dealers' account. To receive credit in the form of a check the Authorized Dealer must request this through AgXcel accounting. Customers' credit for the RMA will be issued when approved.

Returns will not be accepted for credit on items that are:

- Opened or used
- Special orders - Items that are specially ordered from an outside vendor not normally held in AgXcel stock
- Returned more than 30 days after delivery
- Returned without an RMA
- Returned in a package not well suited for the item
- Partial return of items sold as a kit

Products returned to AgXcel must be thoroughly cleaned and free of all chemical contamination. Items not properly cleaned will be returned to the owner at their expense.

A 20% re-stocking fee will be applied on all returned parts.


agXcel