



AgOtter



Installation Manual

AgOtter

Elevating Orchard and Weed Spraying Precision

AgOtter stands as a cutting-edge spray rate controller meticulously engineered for both commercial agriculture sprayers and weed sprayers. It harnesses the power of GPS, inertial sensors, and wheel sensors to deliver unparalleled precision in the specialty crop world.

The core functionalities of AgOtter encompass the measurement, recording, and meticulous control of spray rates tailored to suit the specific needs of full or partial orchard canopies.

However, the efficacy of AgOtter hinges on the precise installation and calibration of its diverse array of sensors, including the wheel sensor, flow meters, GPS receiver, and inertial sensor. Any lapses in installation or calibration can lead to malfunctions within the AgOtter system, with potentially significant consequences—chiefly, the provision of inaccurate data.

To unlock the full potential of the AgOtter system, it is imperative to approach the setup and calibration of these sensors with meticulous care and attention. Only through this dedicated precision can AgOtter guarantee optimal performance and consistently deliver accurate, reliable results in all agriculture liquid spraying applications.

Safety

A. Manual Guidelines

- 1) Read the entire manual thoroughly before initiating the installation of the AgOtter system.
- 2) For additional assistance, contact customer support:
 - a. Email: customerservice@inerosolutions.com
 - b. Phone: 559-206-0733

B. Pressure Relief Valve (PRV) Precautions

- 1) Identify the relief valve in the spraying system during installation.
- 2) Do not bypass or isolate the relief valve after plumbing installation.
- 3) The PRV protects the pump and system components from excessive pressure, preventing damage and safety hazards.

Pressure Relief Valve Requirements:

- 1) All positive displacement pumps (e.g., diaphragm and piston) **MUST** include a PRV in the plumbing.
- 2) Note: Some ****centrifugal pumps**** also use a PRV.

Critical Installation Instructions for PRV:

- 1) Inlet Port: Connect directly to the pump pressure outlet.
- 2) Outlet Port: Connect to an open port on the tank that cannot be shut off, or tee into the pump suction line.

*Note:

- When installing the AgOtter system, you may need to relocate the PRV valve if the control valve is mounted between it and the pump.
- If using a centrifugal pump with a PRV, follow the same connection guidelines.

C. System Pressure Guidelines

- 1) Proper Plumbing:
 - a. Sprayers operate at system pressures ranging from 35 psi to 350 psi.
 - b. Verify the system pressure and ensure that additional plumbing and fittings are certified to handle the pressure.
 - c. Use plumbing parts of the same diameter as the existing system to prevent pressure drop.
- 2) Handling Leaks:
 - a. Never attempt to plug a leak while the sprayer's pump is running.
 - b. Ensure the system pressure is at zero psi (atmospheric pressure) before addressing any leaks.
- 3) System Pressure Safety:
 - a. Do not open the system (e.g., replace or loosen a component) while it is pressurized to avoid injury from the pressurized liquid.

D. Safety Measures

- 1) Wear properly rated safety glasses at all times during the AgOtter system installation.

E. Chemical Handling

- 1) Sprayers dispense hazardous chemicals. Before installation, thoroughly wash the sprayer using a high-pressure washer to remove chemical residues.
- 2) To complete installation, the sprayer unit should be triple rinsed or equivalent before any lines are broken.
- 3) For information on the chemicals used, consult the sprayer owner and chemical supplier. When handling chemicals, follow all label guidelines.

Important Notes

A. Relief Valve Vitality

- 1) ALWAYS ensure the relief valve is present in the system after installation. Bypassing the valve can cause severe damage and personal injury.

*Note:

- Positive displacement pumps (e.g., piston and diaphragm) create pressure by trapping a fixed amount of liquid. The PRV is essential to prevent damage from the high pressure these pumps generate.
- Centrifugal pumps create pressure by accelerating liquid with a spinning impeller. If the liquid becomes trapped, it typically "slips" past the impeller without damaging the system. These pumps maintain more consistent pressure.

B. Schematic Variability

- 1) The provided schematics illustrate various plumbing configurations for the AgOtter system. Other plumbing methods may also be suitable for integration.

C. Flow Meter Orientation

- 1) During flow meter installation, ensure correct orientation to avoid inaccurate readings.
- 2) Refer to the "Flow Meter Installation" section for detailed instructions.

Table of Contents

AGOTTER INTRODUCTION 2

SAFETY NOTES AND WARNINGS 3-4

TABLE OF CONTENTS 5-6

PRINCIPLES OF RATE CONTROL 7

SYSTEM COMPONENT INSTALLATION 8

 AgOtter Functions 9

 Installation Orientation 10

 Installation Steps..... 11

 Flow Meters 12-17

 Flow Meter Dual Installation Diagram 14

 Flow Meter Single Installation Diagram 15

 Calculating Flow Meter Size 16

 Orientation and Mounting 17-18

 Flow Control Valve 19-24

 Install Image 1 20

 Install Image 2 21

 Install Image 3 22

 Control Valve Position..... 23

 Control Valve Position2..... 24

 Speed Sensor 25

 Speed Sensor Alignment 26

 Speed Sensor Verification 27-28

 GPS/GNSS Receiver Antenna 29

 Cabling 30-40

 Power Cable Red 30

 Power Cable Blue 31

 Flow Meter Cable & GPS/GNSS Cable 32

Valve Adapter Cable & Wheel Extension Cable	33
Battery Power Cable	34
Boom Sense Cable.....	35-39
Boom Sense Diagram	36
Install Image 1	37
Install Image 2	38
Install Image 3	39
Mounting the iPad	40
LED Indicators on Controller	41
Final Set-Up.....	42-49
Wheel Sensor Steps	43
AgOtter App Set-Up	44-49
Appendix	50-56
Cable Interfaces	50-54
Power Cable	50
Meter Connector	50
GPS/GNSS.....	51
On/Off Valves	51
Control Valve.....	52
Wheel Sensor Cable	52
LED Connector	53
Pressure Sensor	53
Serial Connector	54
Power Diagrams	55-56
Power Diagram (RED).....	55
Power Diagram (BLUE).....	56
References	57-59
AgOtter to AgHippo Connection	60
Contact Us	61

Principles of Rate Control

AgOtter uses three primary measurements to determine and control the spray rate:

- Flow: Measures liquid flow in gallons or liters per minute.
- Speed: Tracks the sprayer's movement.
- Row Width: Measures the width of the row being sprayed.

Rate Calculation Process:

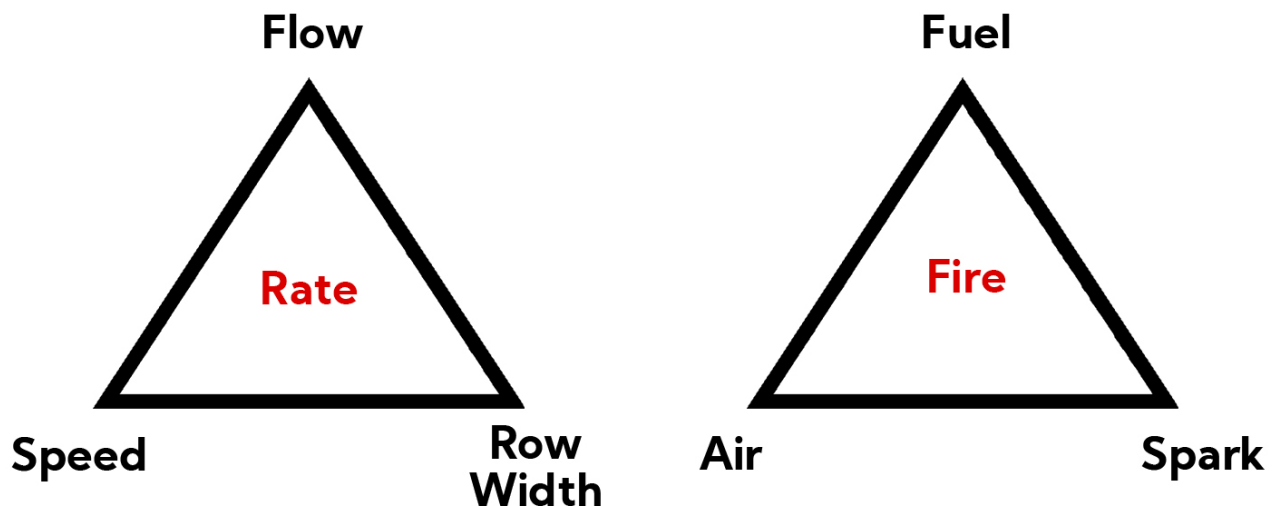
- The Actual Rate is determined by combining the flow, speed, and row width measurements.
- This Actual Rate is compared to the Desired Rate set by the user.
- The system uses a control valve to adjust the flow, either increasing or decreasing it as necessary.
- This process happens several times per second for real-time rate adjustments.

Accuracy and Calibration:

- AgOtter relies on these measurements for accuracy. If any of the measurements are:
 - Incorrect (due to improper calibration)
 - Unavailable (due to a damaged sensor)

*Note: The system will either provide an incorrect rate or no rate at all (indicated as RATE 0.0).

The following illustration may aid in the explanation:



**If any factor is missing of the triangle, then rate calculation is impossible.*

***If any Rate input is incorrectly calibrated Rate will be directly affected*

System Components Installation

AgOtter Controller - The System's Core Intelligence



AgOtter by Inzero Tempe, AZ	Part Number	ASSY-0005-A
	Serial No.	AGOTTER2009

Firmware Verification:

Check the controller firmware periodically, as new releases may follow the controller's shipment.

Voltage Compatibility:

An AgOtter Controller operates within the voltage range of 9 to 16 Volts.

AgOtter Functions



Controller Installation Instructions

The AgOtter Controller is responsible for receiving inputs and adjusting the system to maintain the desired spray rate. It records all operations internally and communicates with the AgOtter App via Bluetooth.

Controller Inputs:

- SPRAY STATUS L/R: Monitors the status of left and right spray sections.
- SPEED: Tracks the speed of the sprayer.
- FLOW: Measures the liquid flow rate.
- GPS: Tracks the location and positioning of the sprayer, creating an
- INERTIAL SENSOR: Aids in navigation for mapping if GPS is weak in dense canopies

Controller Functions:

- Adjusts the Rate Control Valve to maintain the desired spray rate.
- Communicates with the AgOtter App for data transmission and system control.
- Stores all operational data internally.

Installation Orientation

The controller must be installed vertically, squarely aligned with the sprayer.
(Refer to the diagram for clarity)



Correct Positioning



Incorrect Positioning



AgOtter Mounting Plate

**Note: The screws inserted as mounting studs for the controller*

Installation Steps

A. Location Selection:

- 1) Find a flat, vertical surface for mounting.
- 2) Ensure at least 12 inches of clearance below the Controller for cable connections.

B. Impact Protection:

- 1) Make sure the installation area is shielded from potential impacts from tree limbs, foliage, or other external objects.

C. Drill Mounting Holes:

- 1) Drill the appropriate holes for the mounting plate at the selected location.

D. Mount the Controller:

- 1) Secure the Controller onto the mounting plate using the provided screws.



Flow Meters

Precision Flow Measurement



What is the Role of a Flow Meter in AgOtter?

A flow meter in the AgOtter system ensures accurate and efficient liquid application. It measures the flow rate in real-time and sends signals to the AgOtter Controller, which adjusts the rate control valve to maintain the desired application rate. This ensures consistent coverage, reduces waste, and optimizes resource use.

The system also records flow data with GPS for analysis, helping improve efficiency and comply with regulations. When purchased from Insero, AgOtter includes a durable and precise electromagnetic flow meter for optimal performance.

Different Types of Meters Available in the Market:

Electromagnetic Flow Meters

- Measure fluid quantity without any moving parts.
- Superior durability and accuracy compared to turbine meters, as they do not rely on moving parts that can wear out or become clogged by debris.
- Ideal for long-term reliability and reduced maintenance, particularly in agricultural applications.

Turbine Flow Meters

- Operate using a spinning turbine that responds to fluid movement.
- A magnet detects the turbine blade's passage, generating pulses. The pulse frequency directly correlates with the flow rate.
- While effective, turbines are more prone to wear and can be impacted by contaminants in the fluid.

Why Choose an Electromagnetic Meter?

Electromagnetic meters excel in applications where accuracy, durability, and minimal maintenance are critical. Unlike turbine meters, they eliminate the risk of moving part failures, making them a more robust solution for agricultural systems.

Insero Advantage

When you buy an AgOtter system directly from Insero, it comes with an electromagnetic flow meter included in the package. This guarantees that you have access to the most reliable and accurate flow measurement technology available, providing you with peace of mind and enhancing system performance right from the start.

Installation Considerations

To ensure optimal performance:

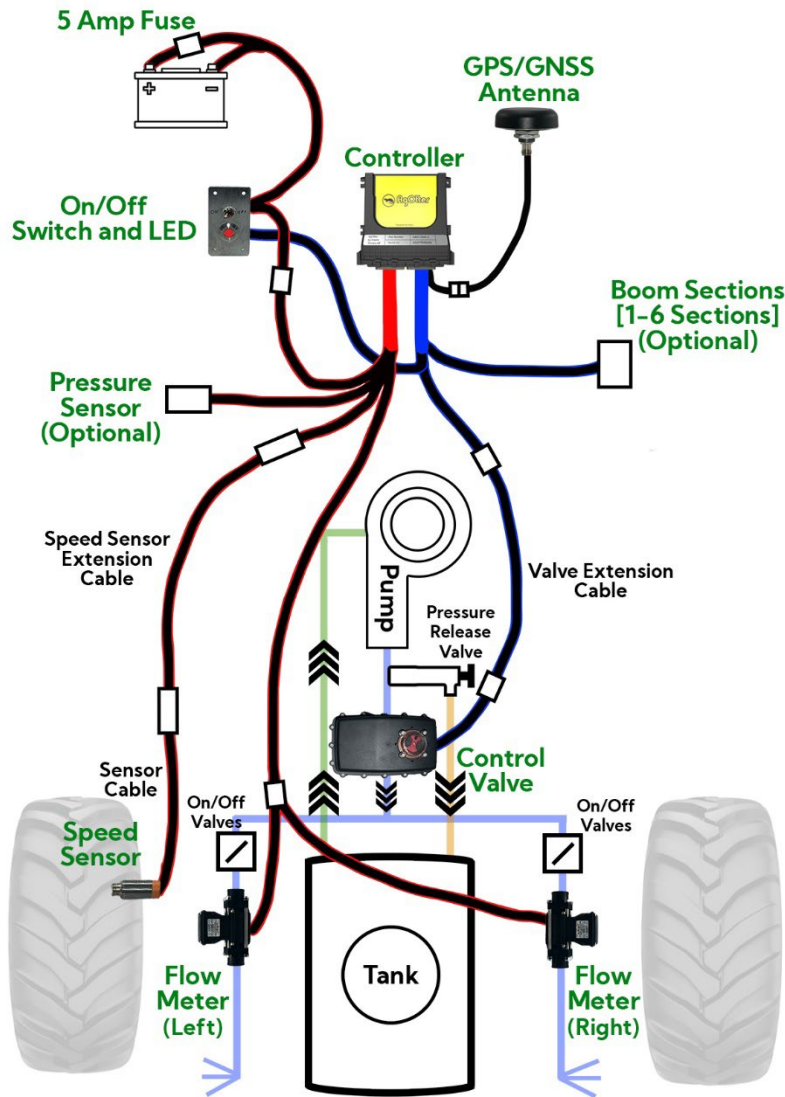
- Install flow meters at least 8 inches away from turbulence sources such as elbows, pumps, or control valves.
- Proper placement minimizes signal disruption and enhances accuracy.

Compatibility and Signal

The AgOtter controller is designed to support any flow meter emitting a pulses-per-gallon (pls/GAL) signal. This signal corresponds to the fluid flow rate:

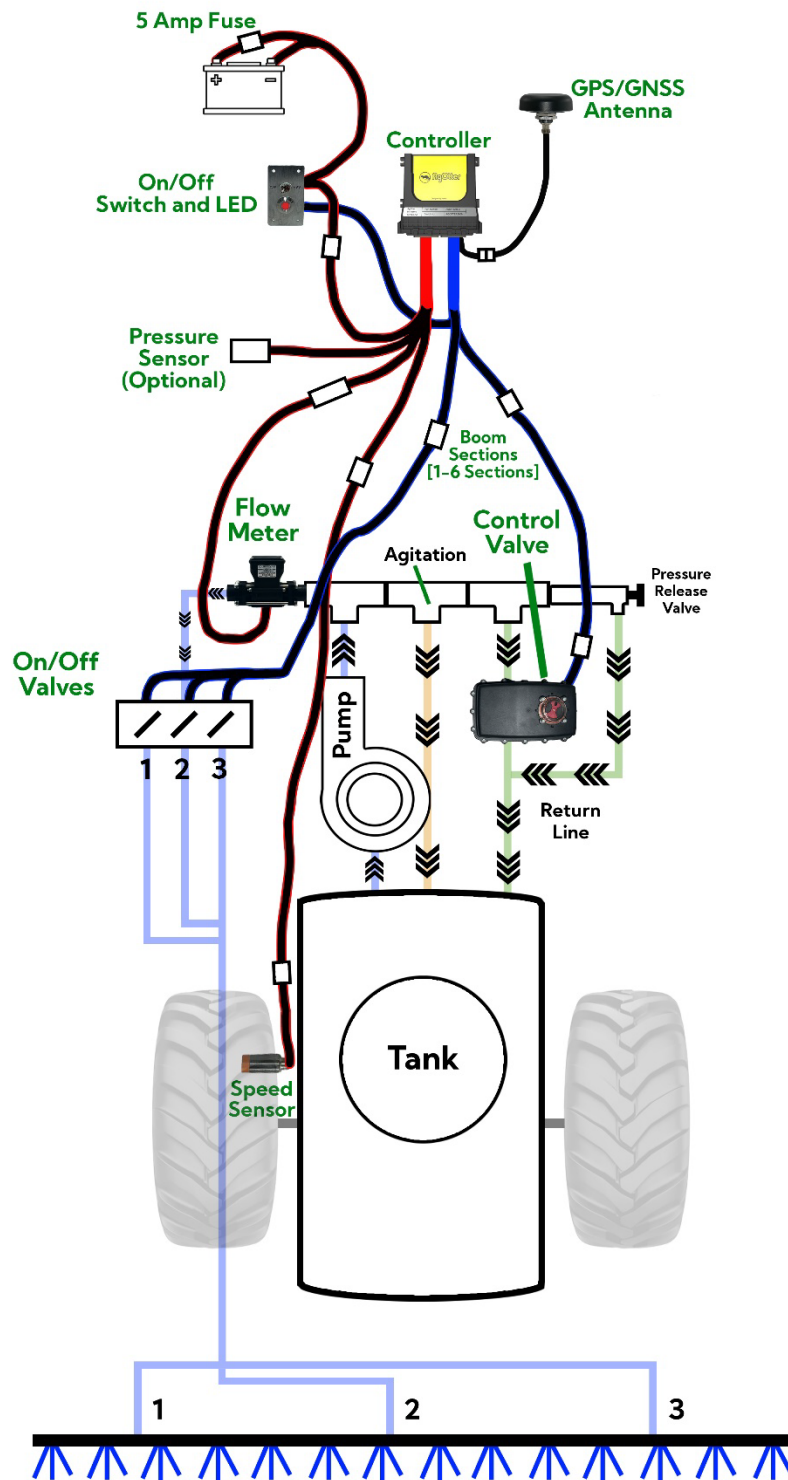
- Higher pulse frequency = Higher flow
- Lower pulse frequency = Lower flow

AgOtter Dual Flow Meter Installation (LEFT/RIGHT)



**Please note that AgOtter does not control any ON/OFF valves directly from the controller. Instead, it monitors the flow through the left and right flowmeters to determine when the sprayer is active. This functionality allows AgOtter to connect to various types of ON/OFF valves, including cable, hydraulic, and electric options.*

AgOtter Single Flow Meter Multi-Section Installation



Calculating Flow Meter Size

Requires the calculation of **Minimum and Maximum Gallons per Minute**

Low GPM Example: 50 Gallons per acre / 3.0 MPH / 18 FT Spacing

$$\frac{50 \times 3 \times 18}{495} = 5.45 \text{ GPM DIVIDED BY 2 FOR DUAL L/R}$$

$$= 2.725 \text{ GPM PER FLOWMETER}$$

High GPM Example: 1000 Gallons per acre / 1.2 MPH / 21FT Spacing

$$\frac{1000 \times 1.2 \times 21}{495} = 50.9 \text{ GPM DIVIDED BY 2 FOR DUAL L/R}$$

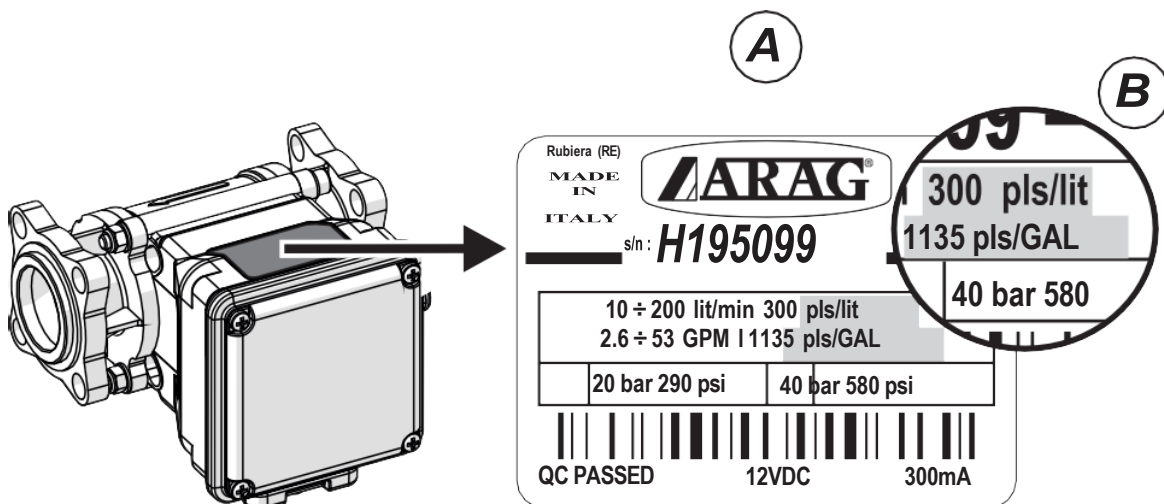
$$= 25.5 \text{ GPM PER FLOWMETER}$$

FLOWMETER SIZES

ORION 2

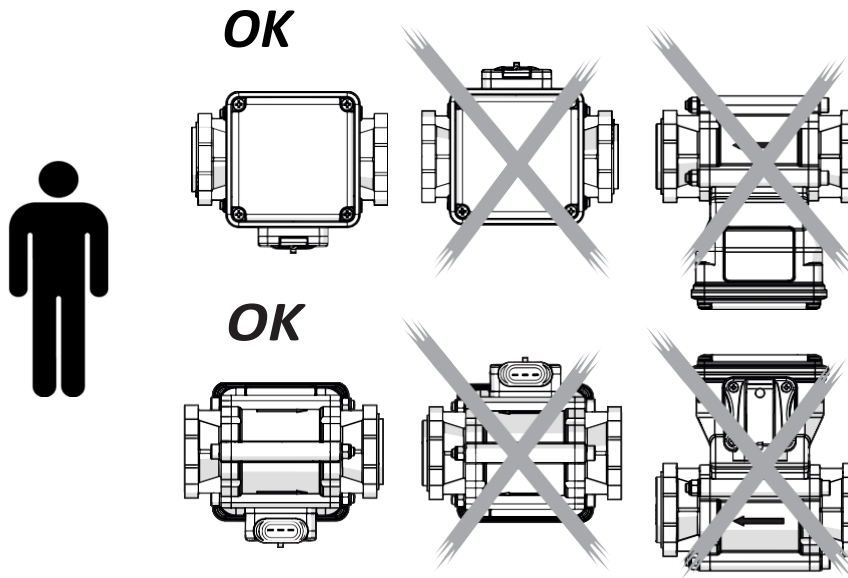
ORION 2 ELECTRO-MAGNETIC FLOWMETERS

	- F -	FLOW RATE	MAX PRESSURE	PULSES
https://www.aragnet.com/EN/USA/246/products/?PRD=115522	3/4" F NPT	0.6 ÷ 13US GPM	290PSI	4542pls/Gal
	1" F NPT	1.3 ÷ 26US GPM	290PSI	2271pls/Gal
	1" F NPT	2.6 ÷ 53US GPM	290PSI	1135pls/Gal

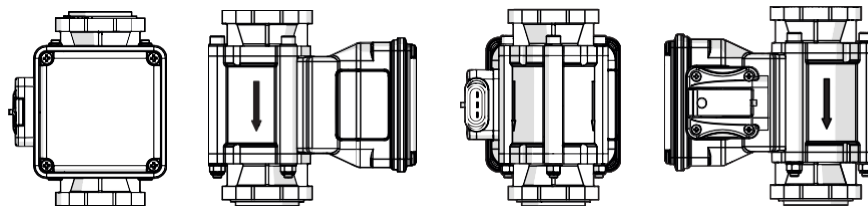


Orientation and Mounting:

1) **Horizontal Installation:** The cord must exit from the bottom (refer to diagram).

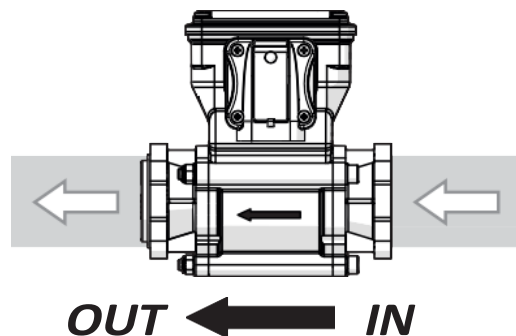


2) **Vertical Installation:** Cord orientation is flexible. Refer to the diagram for further details.



Directional Alignment:

- Install the flow meter with the arrow on the side pointing in the direction of fluid flow.



Flow Meter Install Image



Flow Meter Mounting:

When installing a flowmeter, it's important to carefully select the installation point and orientation. The image above illustrates a common installation that is both simple and durable. It should be positioned vertically, after the valve and filters, and should only bear the weight of the hoses. Avoid side loading and refrain from placing unsupported weight on the flowmeter fittings.

Flow Control Valve

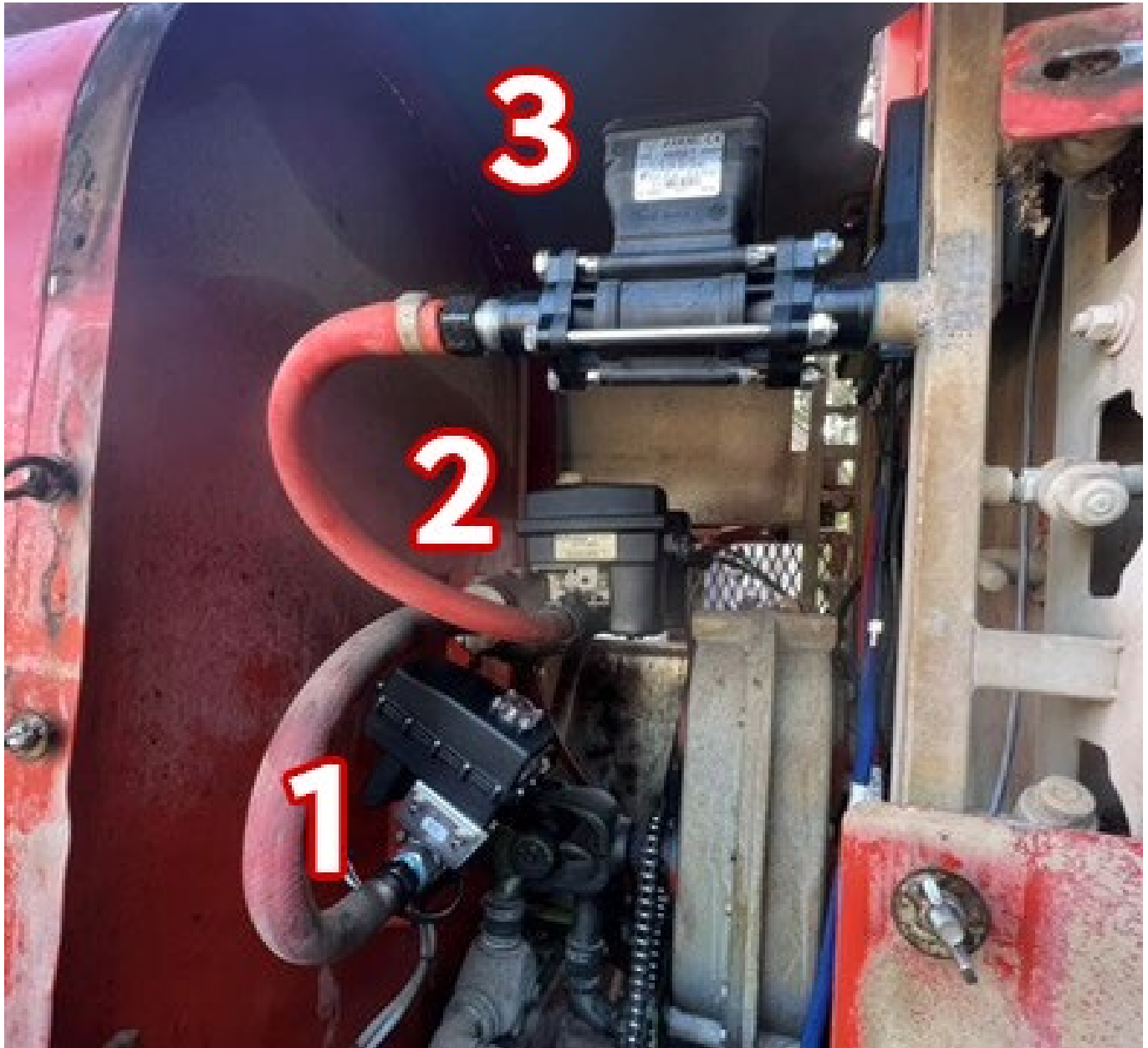
Used to control sprayer output flow



What is the Function of the Flow Control Valve on an AgOtter?

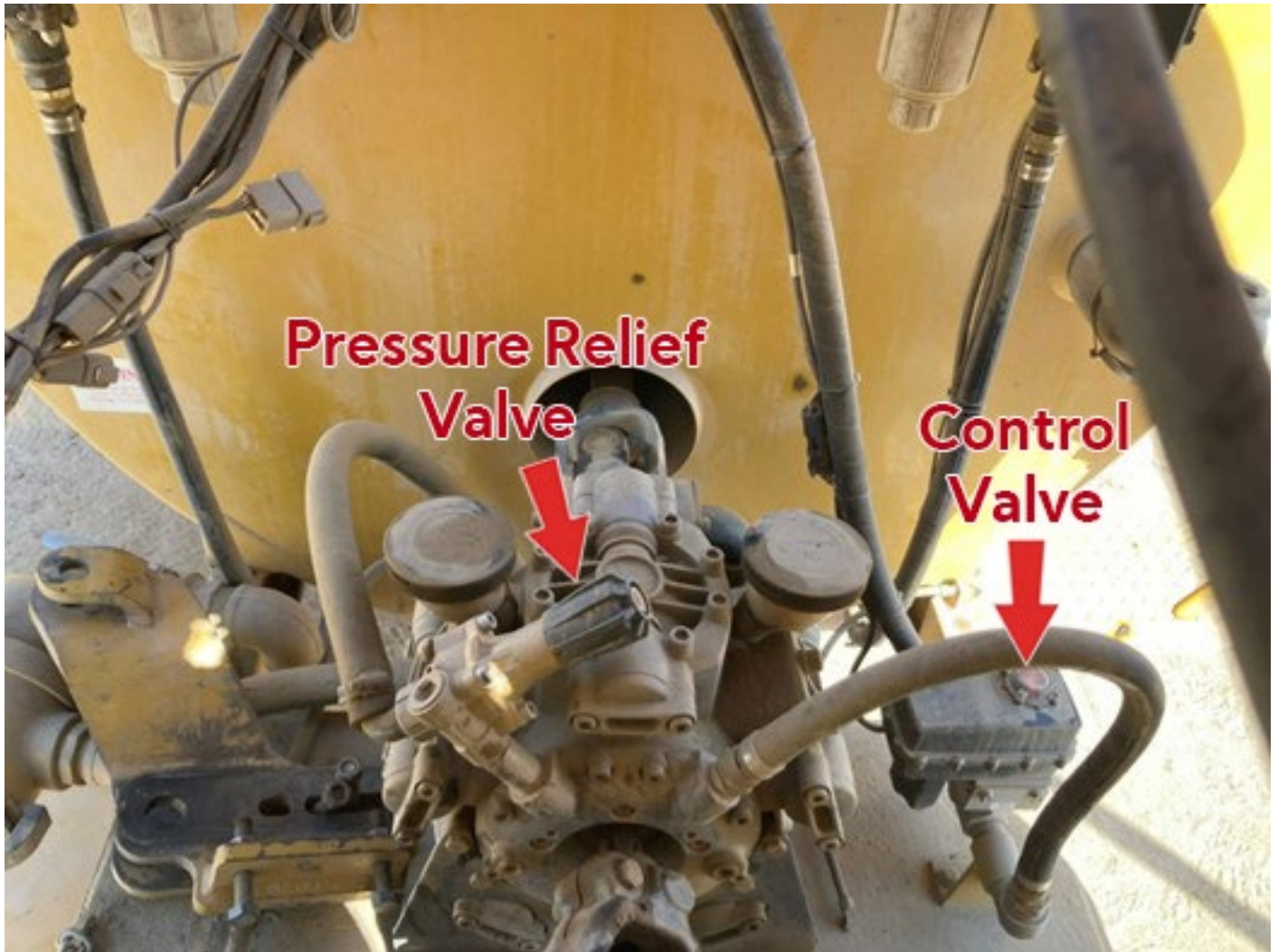
The **flow control valve** regulates liquid flow to maintain the desired application rate. Using real-time data from the flow meter, it adjusts flow to ensure consistent, accurate application, even as speed or conditions change. This prevents waste and ensures uniform coverage.

Control Valve Install Image 1

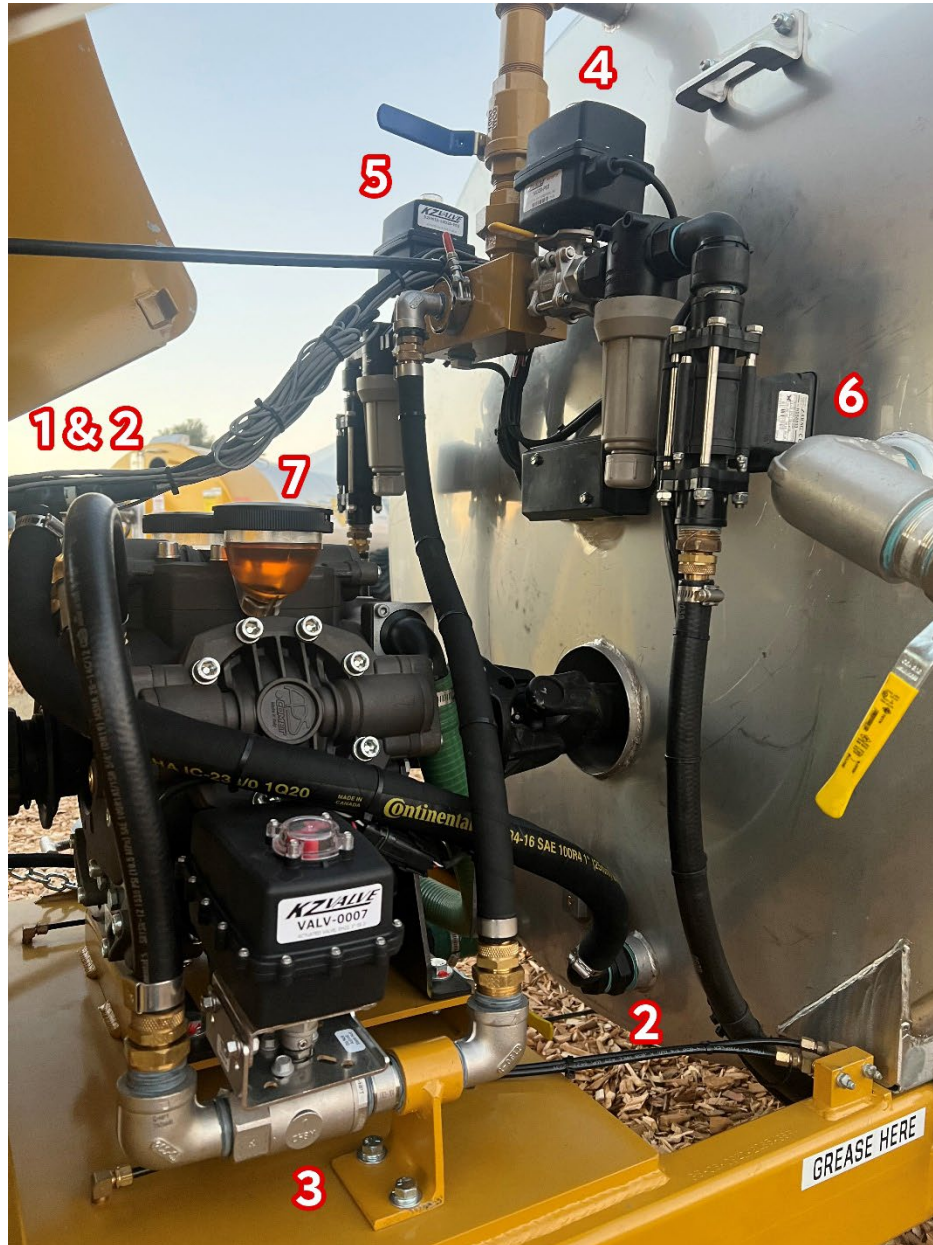


- 1. CONTROL VALVE
- 2. ON/OFF VALVE (LEFT)
- 3. FLOWMETER (LEFT)

Control Valve Install Image 2



Control Valve Install Image 3



1. PRESSURE RELIEF VALVE (PRV)
2. RETURN TO TANK FROM PRV
3. CONTROL VALVE
4. ON/OFF (LEFT)
5. ON/OFF (RIGHT)
6. FLOW METER (LEFT)
7. FLOW METER (RIGHT)

Control Valve Position



Closed Position



Open Position

RED indicator shows valve position, photos show valve in Closed Position ↓

(i.e → = Open Position in the above photos and ↓ = Closed Position)

Control Valve Position

35 Degrees



80% CLOSED

55 Degrees



75% OPEN

The AgOtter opens and closes the control valve based on the rate demands. When operating from the middle position, the AgOtter has the best range of control.

****NOTE:*** *There are no specific orientation mounting requirements for the KZ Control Valve.*

Speed Sensor

Tracking Sprayer Movement



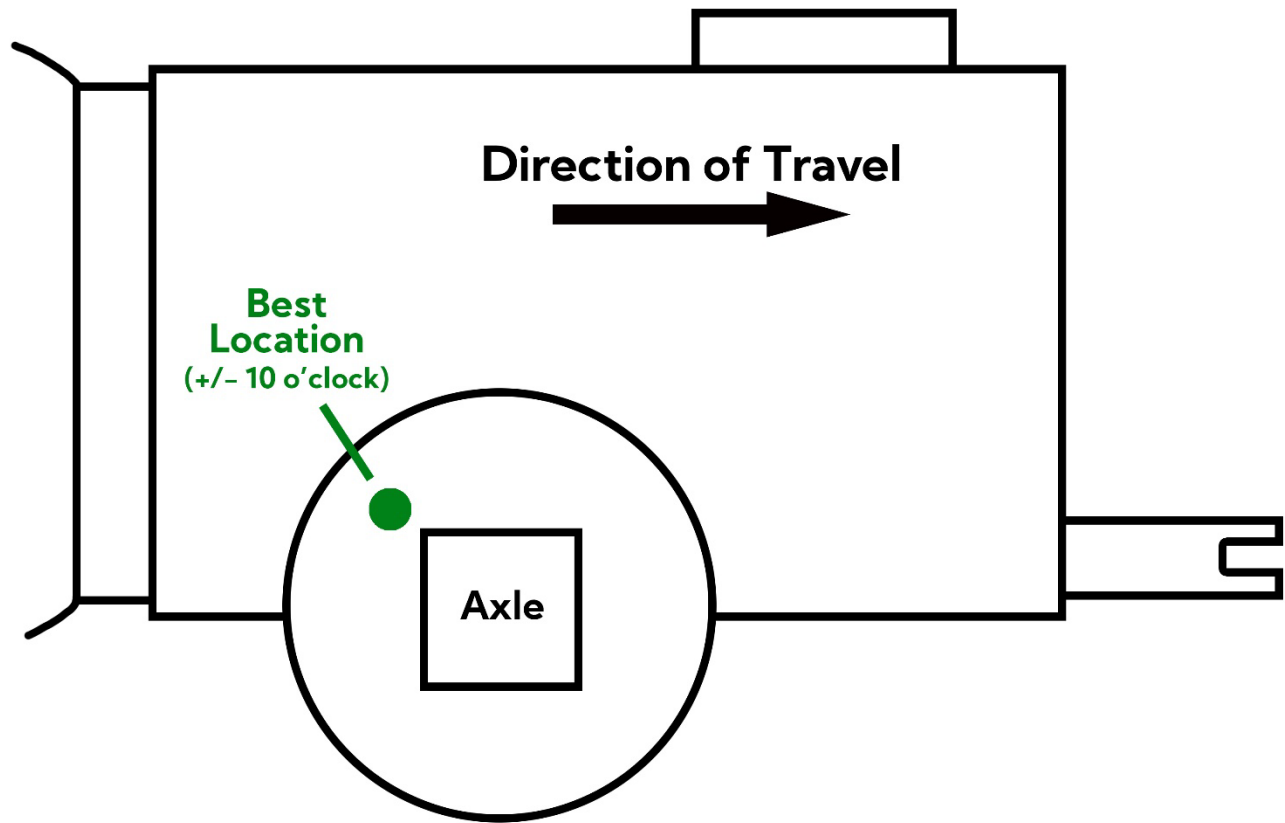
A. Functionality

Used to measure sprayer speed and Latitude/Longitude position when the GPS signal is unavailable.

B. Installation Guidelines

Install the Speed Sensor on one of the sprayer's wheels, specifically on the back side of the axle, to shield it from field objects.

Speed Sensor Alignment



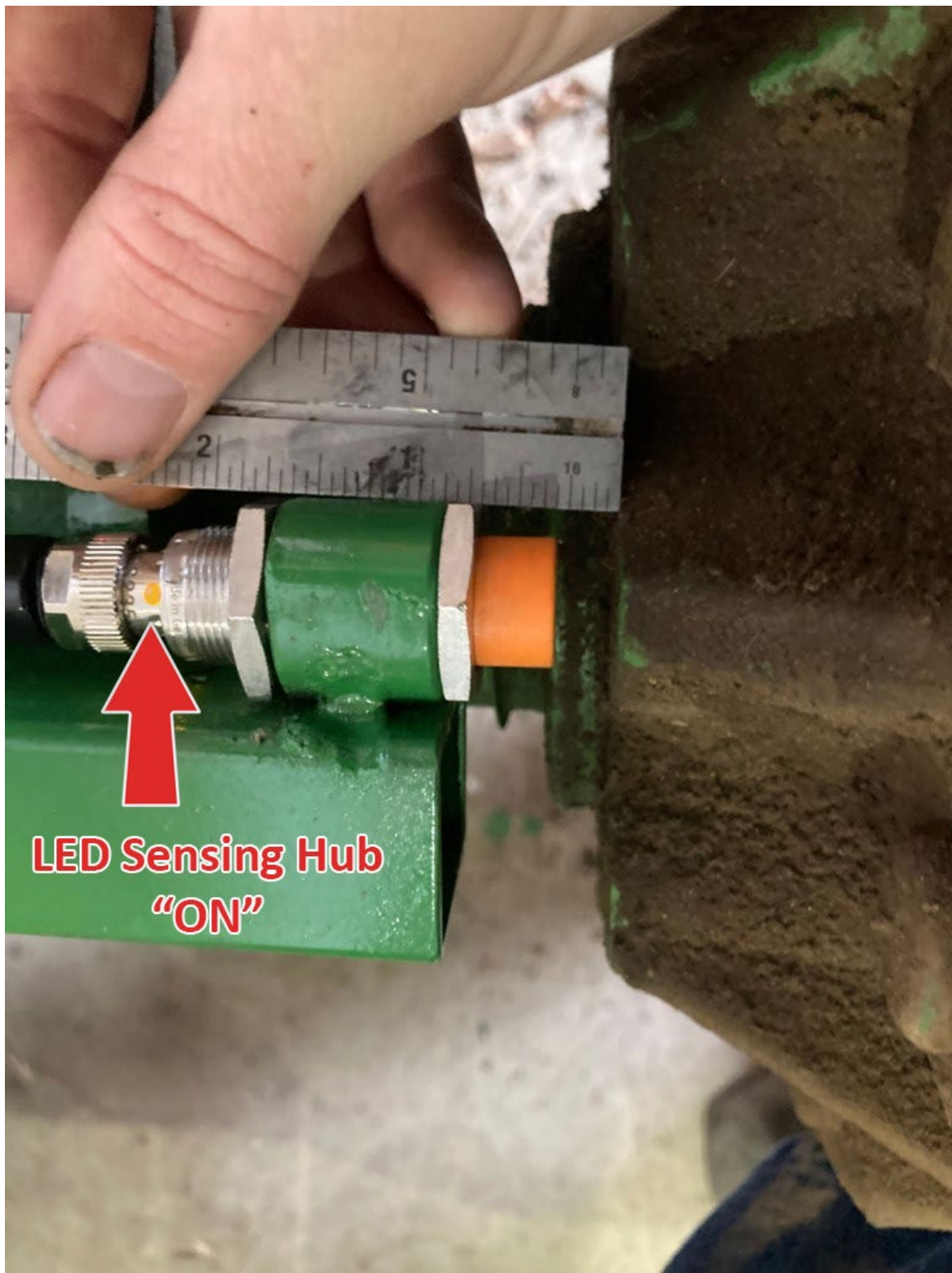
C. Sensor Alignment

The sensor must detect the hub castings as they pass by without making physical contact. It is important to maintain a gap of approximately $\frac{5}{16}$ of an inch between the sensor and the hub castings. A gap that is too wide (i.e., $\frac{3}{8}$ inch or more) may lead to inconsistent speed readings.

D. Verification Process

After installing the speed sensor, ensure it operates correctly for all hub castings. Connect the sensor and power up the AgOtter. The sensor features a small LED that will flash yellow when it detects the casting. Manually rotate the hub and observe the LED. It should flash with each casting and go dark during the gaps.





****NOTE: Make sure to note the number of hub casting ears, this number will be entered in the AO app under "WHEEL BOLTS"***

GPS Receiver Antenna

Precision Calibration and Mapping



A. GPS Receiver Integration

The GPS Receiver is internally housed within the AgOtter controller.

B. Antenna Activation

Ensure the GPS Receiver functions by connecting the antenna. For optimal performance, the antenna must be both plugged in and have an unobstructed view of the sky.

***NOTE:** *In areas with tree canopies, GPS functionality may be limited, but the AgOtter system will still record location, spray rate, and control spray rate beneath trees.*

C. Mounting Location Considerations

Ideally, mount the GPS antenna where it has an unobstructed view of the sky, avoiding interference from parts of the sprayer. Simultaneously, position it to minimize exposure to tree branches.

D. Mounting Steps

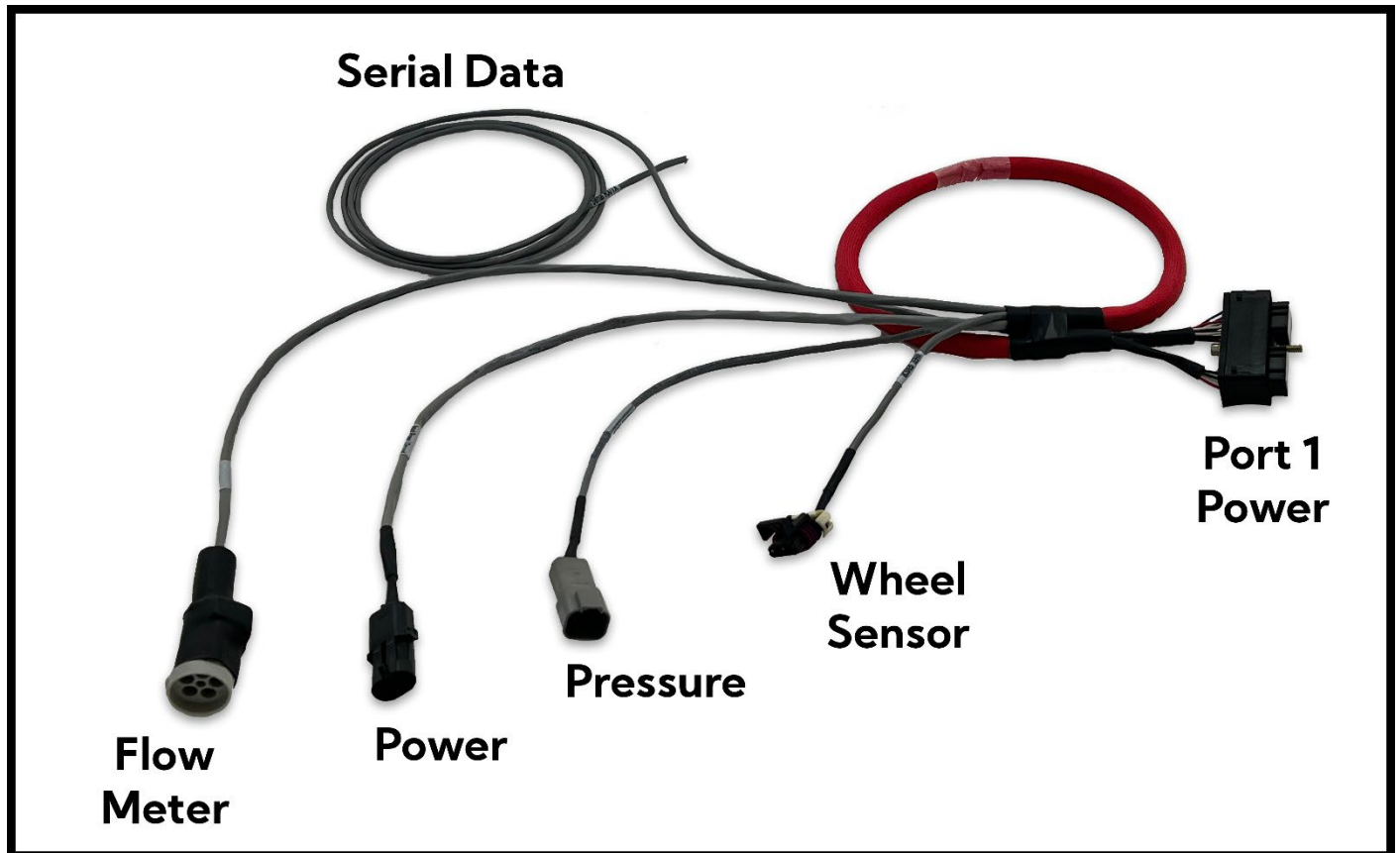
- 1) Drill a hole with a diameter of 23/32 to 3/4 inches (18 to 19 mm).
- 2) Pass the antenna with the rubber washer through the hole.
- 3) Follow with a metal washer and secure with two nuts on the antenna.
- 4) Tighten the first nut, then the second.

***NOTE:** *The system records the GPS antenna's location. In the AgOtter App, offsets can be specified to indicate the spray boom's location relative to the GPS antenna. See APP Set Up.*

Cabling

Used to interconnect system components.

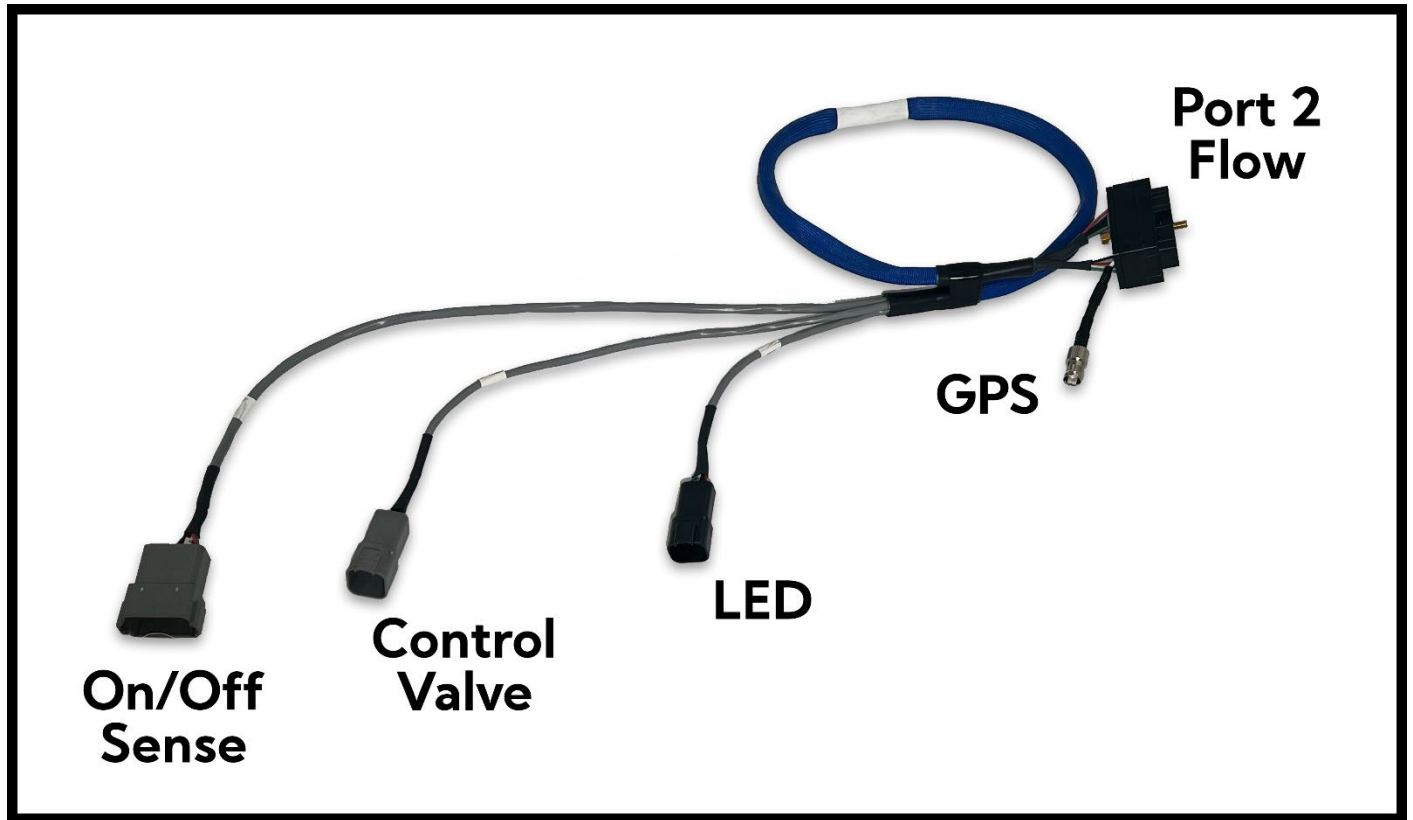
Power Cable (RED)- To Port 1 on Controller



Power Cable (RED)

- Left Side #1 (RED) Controller Cable
 - Speed Connection
 - Pressure Connection
 - POWER 12v Connection
 - Flow Meter Connection
 - Serial Data Connection

Flow Cable (BLUE) - To Port 2 on Controller



Flow Cable (BLUE)

- Right Side #2 (BLUE) Controller Cable
 - GPS
 - LED Connection
- Control Valve Connection
- Boom Sense Connection

Flow Meter Cable + 2 Flow Meters

Connects to the Main Cable and the Flow Meter(s)



GPS Antenna Cable

Connects to the GPS Antenna and the AgOtter Controller



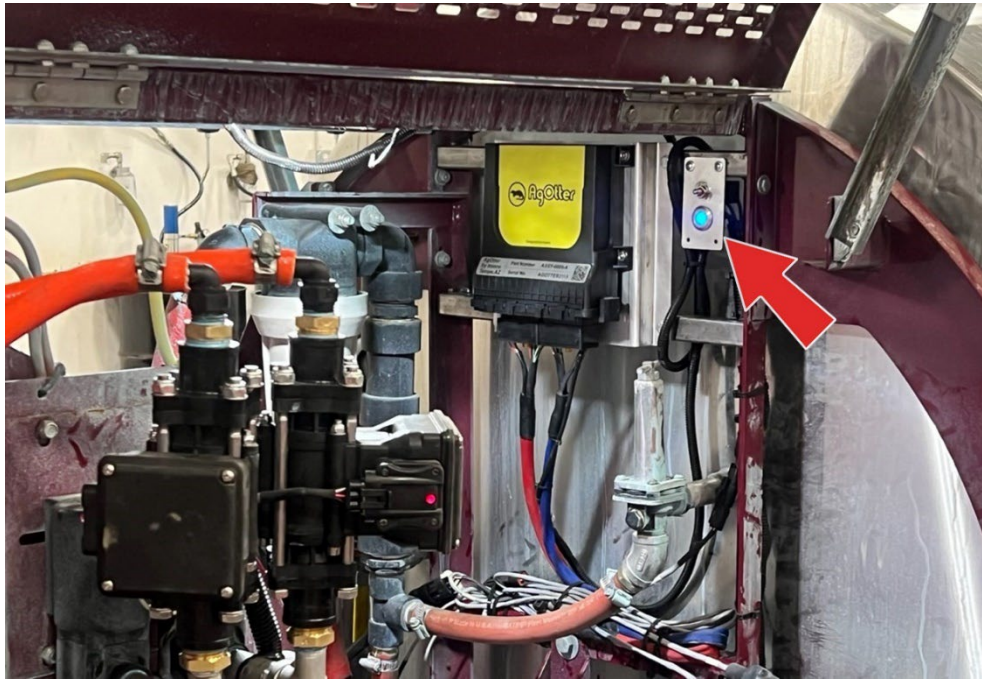
Valve Adapter Cable



Wheel Extension Cable



Battery Power Cable and LED/w Cable Mounted in Plate



- A) The AgOtter System operates within the 9 to 16 Volts range.
- B) Connect the Red lead of the power cable to the + or positive battery terminal.
- C) Connect the Black lead of the power cable to the - or negative battery terminal.

The provided power cable will typically reach the front of a tow-behind sprayer. The customer will need to bring power from the tractor batteries using a 5 amp fuse at the battery.

NOTE: Accessory power supplies, trailer plugs, or lighter plugs are not reliable sources of clean power for AgOtter. ANY POWER SOURCE USED OTHER THAN DIRECT TO THE BATTERY MAY VOID THE WARRANTY.

AgOtter Boom Sense Cable

Connection to On/Off Valves.



****NOTE: This is NOT used for control of the on/off valves, only to sense their position!***

White

Section 1 =

Section 2 = Blue

Section 3 = Green

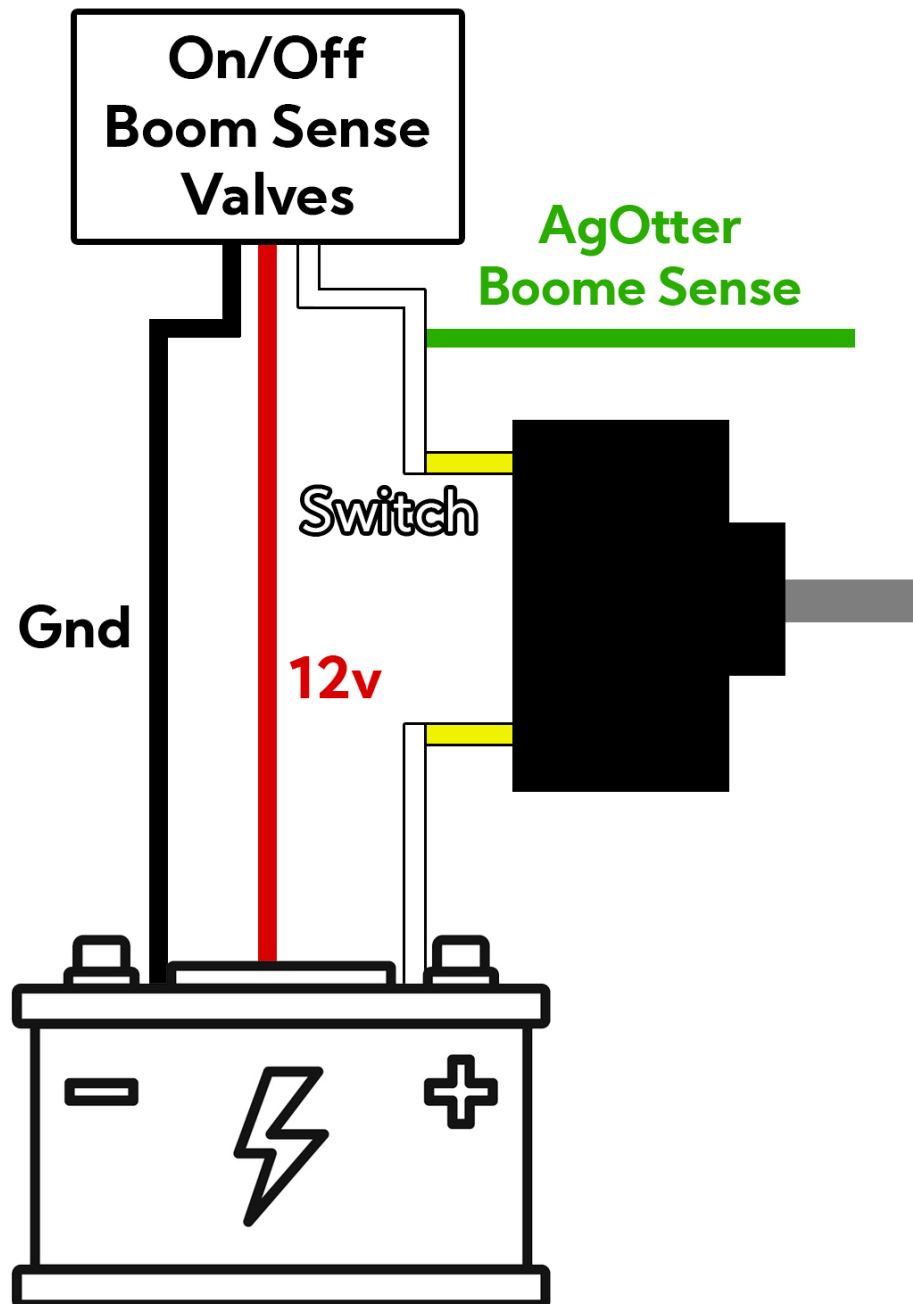
Section 4 = Red

Section 5 = Black

Section 6 = Brown

Boom Sense connects to the Switched Power circuit of existing motorized valves. *****DO NOT***** connect it to solenoid valves, as the voltage spikes produced by solenoids can damage the AgOtter controller and may void the warranty. Solenoids can be monitored through a relay, but never connected directly.

AgOtter Boom Sense Diagram



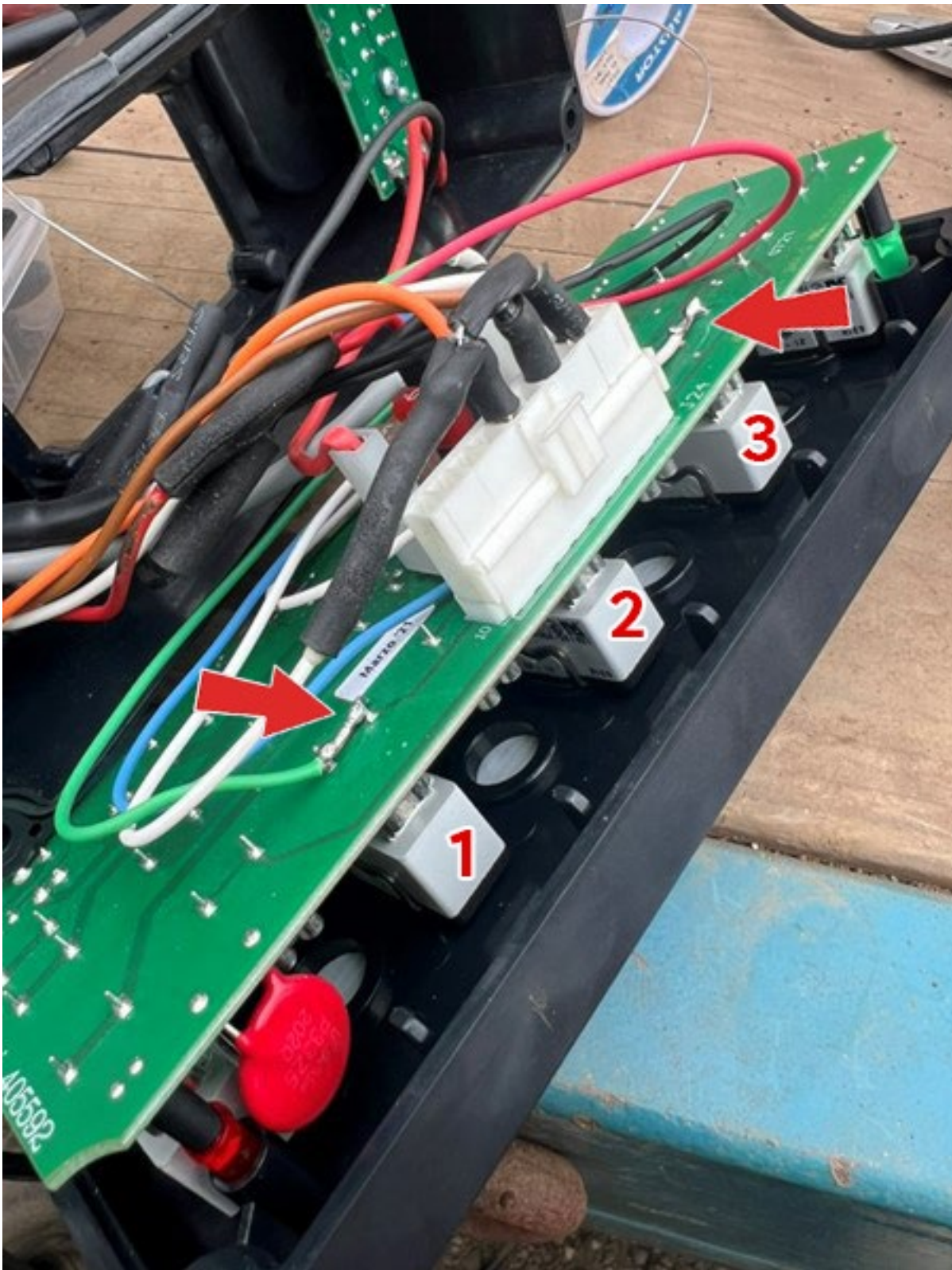
AgOtter Boom Sense Install Image 1



Tapping into existing boom wiring harness (soldered and heat shrunk)

SECTION 1 / LEFT = GREEN /
SECTION 2 / CENTER = YELLOW / BLUE
SECTION 3 / RIGHT = ORANGE / GREEN

AgOtter Boom Sense Install Image 2



Using an ARAG switchbox and attaching BOOM SENSE to circuit board at switch

AgOtter Boom Sense Install Image 3



Custom built switchbox attaching BOOM SENSE at the back of switches

Mounting the iPad

***NOTE:** An iPad or iPhone can be used to set up, monitor, and download files from the AgOtter Controller



LED Indicators on Controller

Power Up Sequence:

TWO BLUE FLASHES, SHORT SOLID RED, followed by SOLID BLUE, constitute the normal startup sequence.



Blue Flashing – Normal (Not Moving)



Blue/Green Alternating – Normal (Moving)

Upon receiving a signal from the wheel sensor, the LED alternates between green and blue. Each blink represents a "pulse" from the wheel sensor, signifying the passage of a lug bolt.



Orange – No GPS Signal

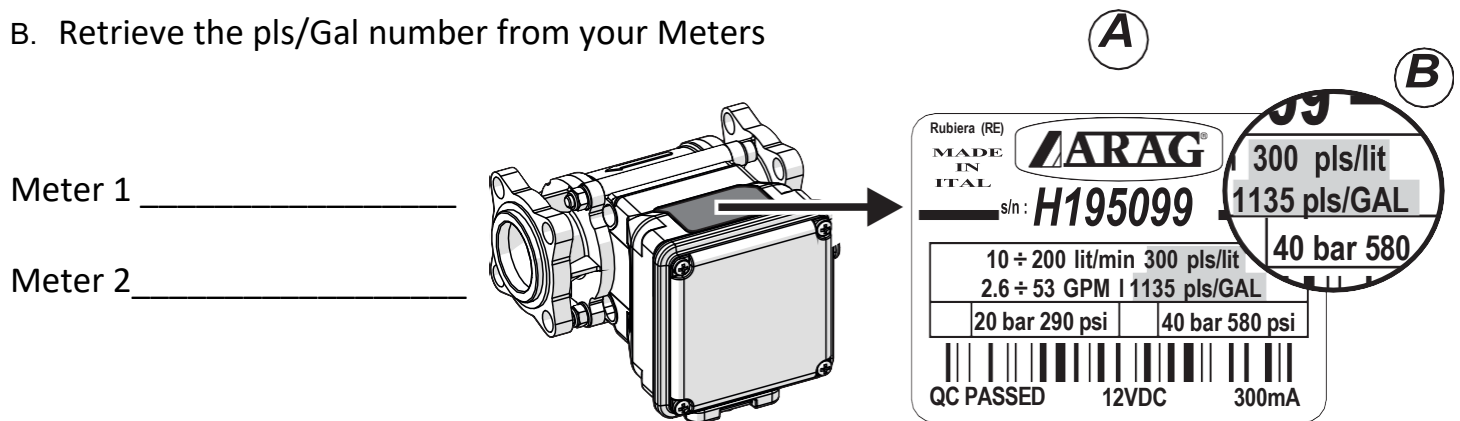


Red – Not Reading Wheel Sensor

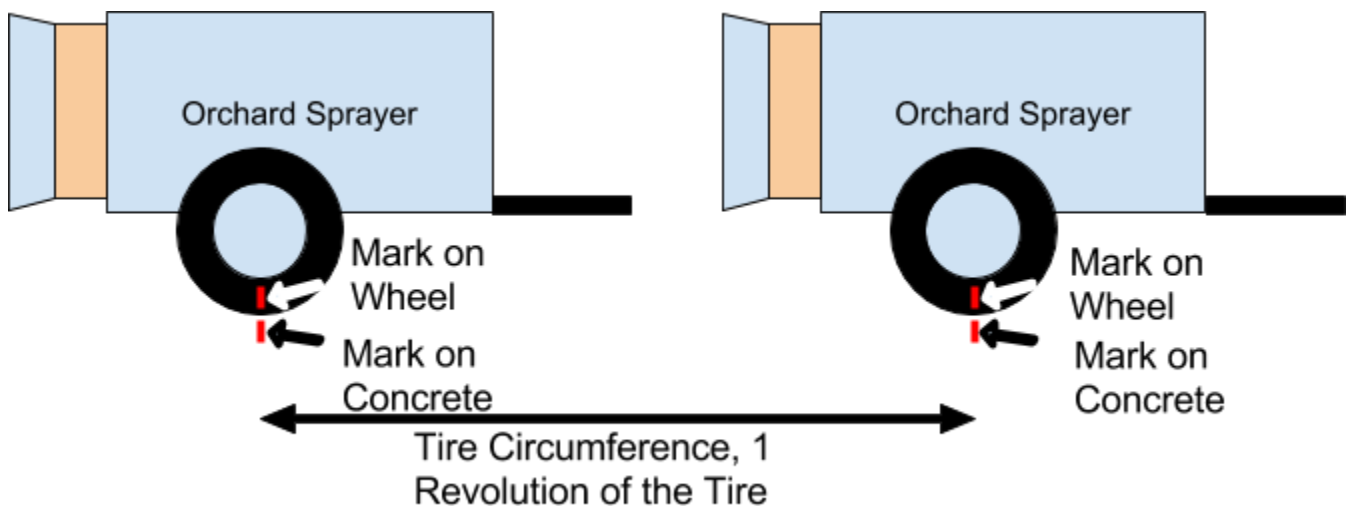
Final Set up of AgOtter

A. Once the AgOtter hardware, i.e. controller, valves, and cables, have been installed and the AgOtter system is powered on, it is time to setup AgOtter using the iPad.

B. Retrieve the pls/Gal number from your Meters



C. Wheel Sensor / Tire Circumference Calibration



***NOTE:** This meticulous calibration process ensures precise tracking of the distance covered with each revolution of the sprayer's tire, enhancing the AgOtter system's overall accuracy.

Wheel Sensor Steps

1. Preparation:

Fill the sprayer halfway with water to provide some weight on the tire.

2. Selection of Calibration Area:

Locate a concrete pad where you can drive the sprayer in a straight line for approximately 20 feet.

3. Positioning on Concrete:

Place the sprayer on the designated concrete pad.

4. Tire Marking:

Mark the bottom of the tire, as illustrated in the diagram below.

5. Concrete Marking:

Mark the concrete corresponding to the tire mark, as indicated in the diagram.

6. Driving Forward:

Drive the sprayer forward for one complete revolution of the tire.

7. Marking After Revolution:

Mark the concrete at the new tire position.

8. Measurement:

Measure the distance between the initial and final marks on the concrete.

Record Measurement: _____

9. Count the number of lug nuts/bolts/castings on the hub and record here:

Number of Bolts/Nuts _____

AgOtter App Set-Up

A. Now open the AgOtter app on your iPad or iPhone and select the Unit you are working with.



B. After Selecting the Unit now choose the SETUP button in the upper right of the screen



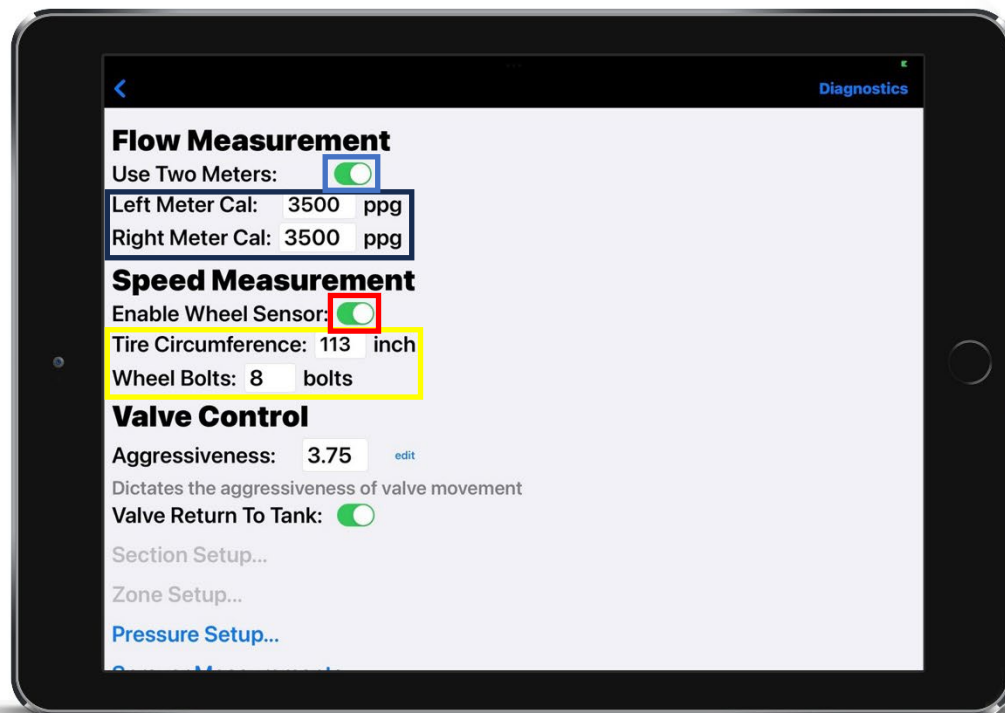
C. After Opening the Setup Page

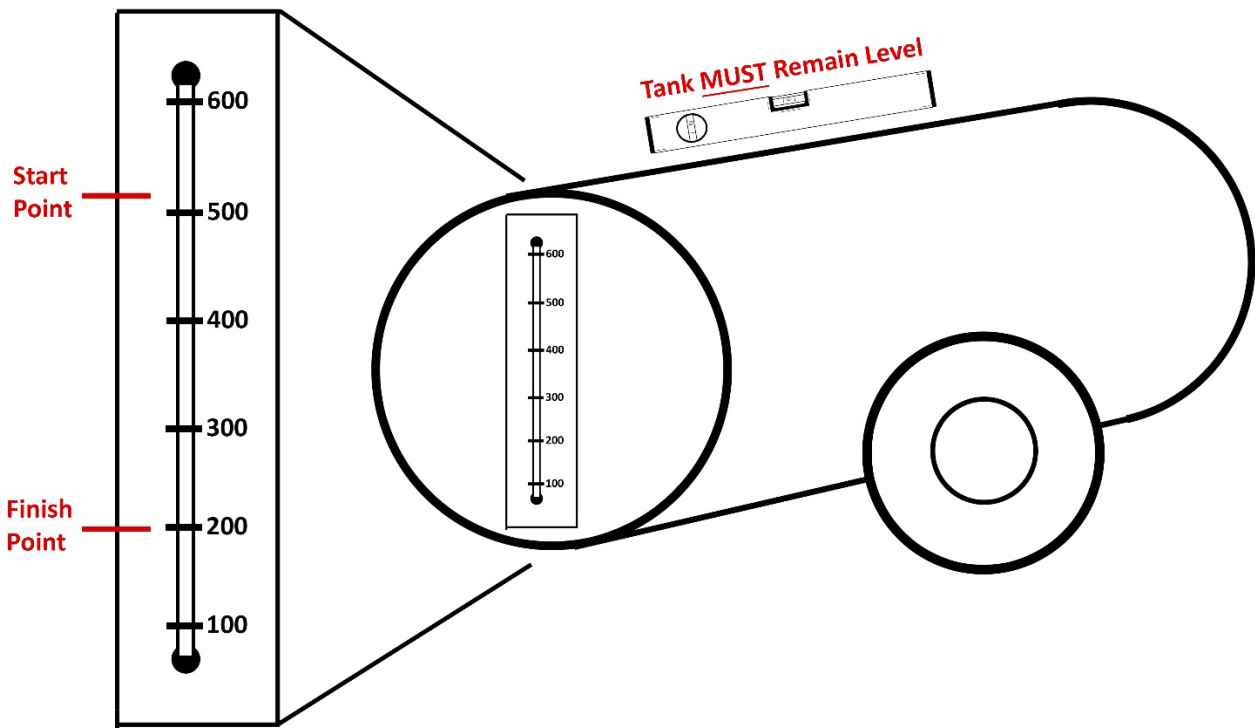
- 1) Set Target Rate
- 2) Set Row Width
- 3) Set the Tank Volume for the unit you are working with.



D. Once on the Advanced Page

- 1) If using a sprayer with just **ONE METER** make sure to click the “Use Two Meters” off before adding pls/GAL. (Blue Square)
- 2) Enter the flow measurement of your meters that are recorded above. (Black Square)
- 3) If using a wheel sensor, skip this step and go to the next step. If **NOT** using a wheel sensor, make sure to turn off the wheel sensor button. (Red Square)
 - a. Enter Sensor measurements. (Yellow Box)
 - i. Enter the tire circumference measures, which are recorded above in the wheel calibration section.
 - ii. Enter the number of lug bolts on the axle.





E. Verify the meter calibration:

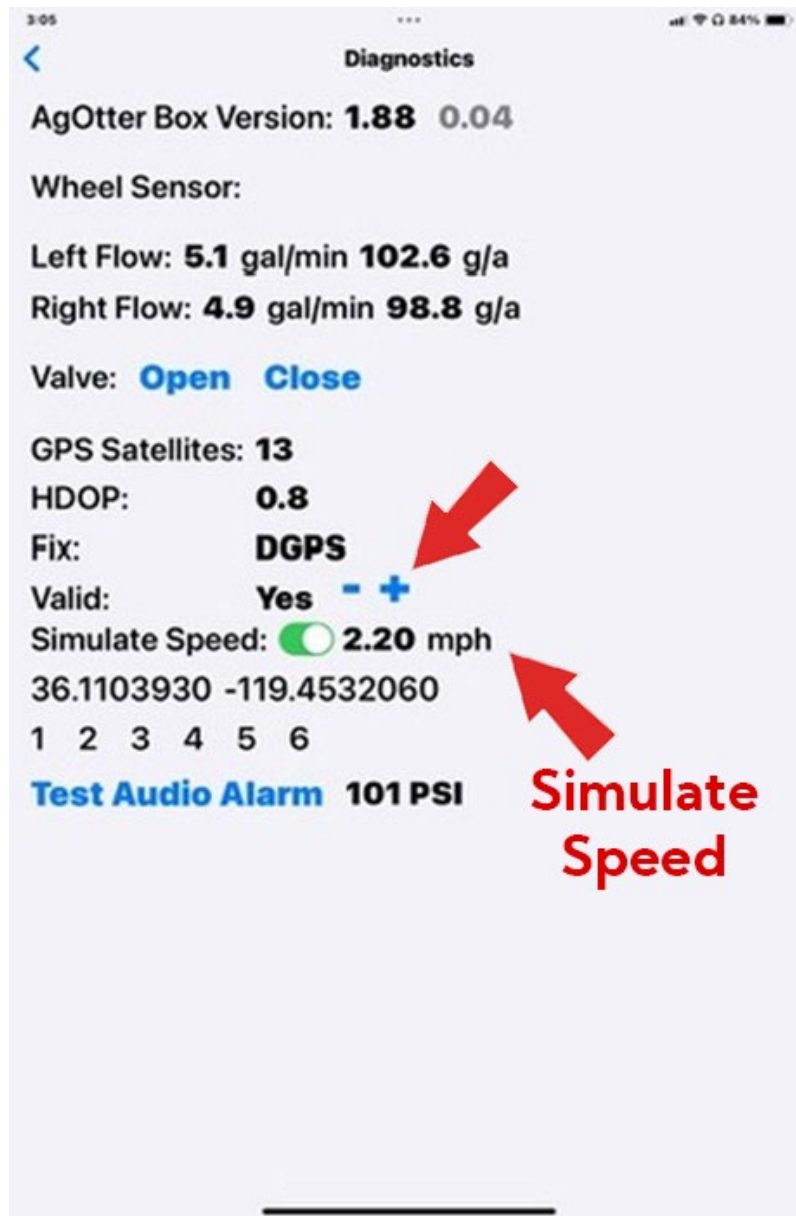
- 1) Fill the tank up to a visible mark on the tank.
- 2) Park the sprayer in a location where the tank can be leveled and where spraying several hundred gallons will not cause any damage.

Once the tank is level, carefully bring the sight tube down to a known mark.

Note: It is not recommended to use the first or last tank marks for this purpose. For a 1000-gallon tank, use the 200-gallon and 900-gallon marks for testing purposes, as illustrated.

When the tank's actual volume matches the correct level, enter this value into the TANK VOLUME (SETUP). Then, on the Home Screen, select FILL TANK.

F. Go to **Diagnostic Page** and turn on simulate speed- use - + adjust speed to expected field speed, in this case 2.2mph



G. Spray both sections until the desired volume is dispensed.

The largest sample should always be utilized for verification and subsequent calibration. In this example, starting at 500 gallons and spraying down to 200 gallons, a total of 300 gallons will be used.

****NOTE: Experience shows that it is unusual need to change the meter calibration of an ARAG electromagnetic flowmeter.***

$$\text{New Calibration Number} = \frac{\text{Perceived Value}}{\text{Actual Value}} \times \text{Original Calibration \#}$$

Please make a note of the following text:

Low Flow Meter Calibration (10%):

- AgOtter system indicated 300 gallons used, but 330 gallons were actually used.
- This resulted in 10% less coverage. A 600-gallon tank on 100 GPA would only cover 5.4 acres instead of 6 acres.

$$\text{New Calibration Number} = \frac{9 \text{ Gallons Used}}{10 \text{ Gallons Actually Used}} \times \text{Original Calibration \#}$$

Calibration of High Flow Meter (10%):

- The AgOtter system indicates 300 gallons used, but only 270 gallons were actually used.
- This results in a lower applied rate, reducing the spray effectiveness.

$$\text{New Calibration Number} = \frac{20 \text{ Gallons Used}}{18 \text{ Gallons Actually Used}} \times \text{Original Calibration \#}$$

Continuous Monitoring:

- Regularly monitor the calibration number, especially in the initial days of each season. For example, if the AgOtter System records 500 gallons sprayed, but the actual amount is 400 gallons, adjust the meter calibration accordingly.

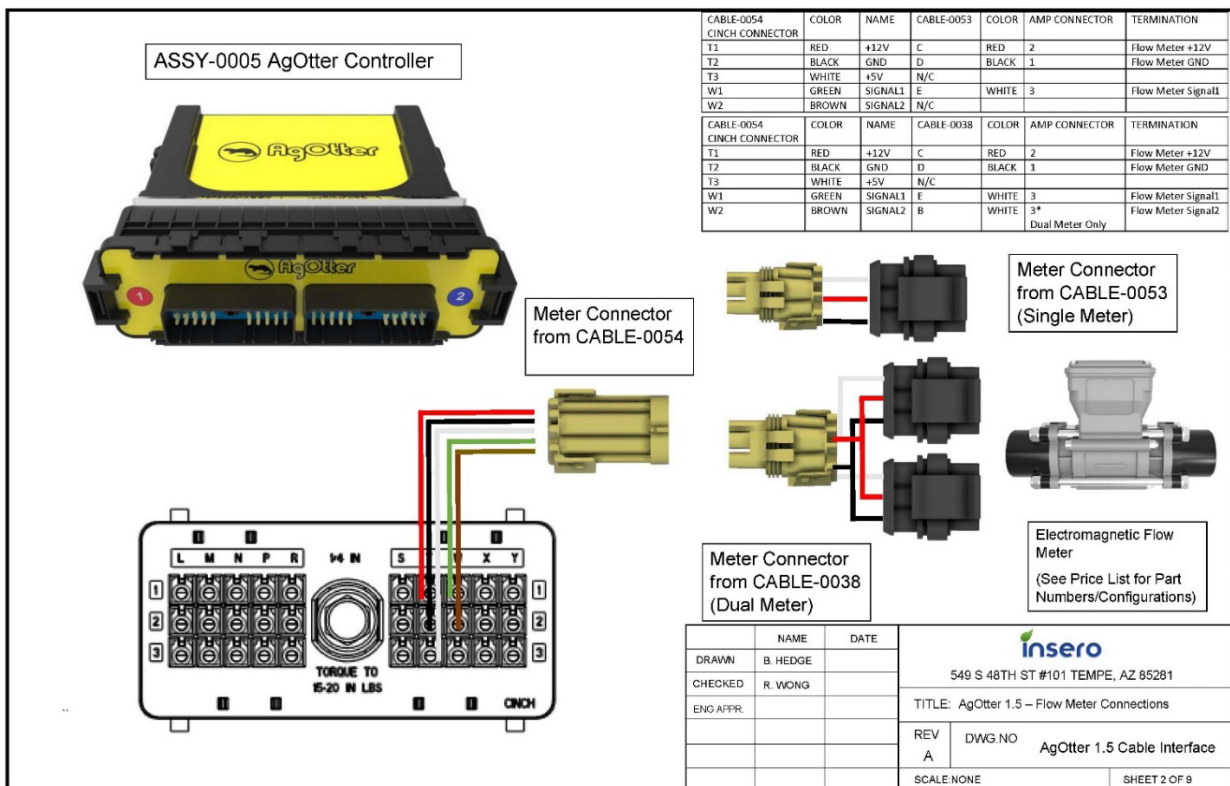
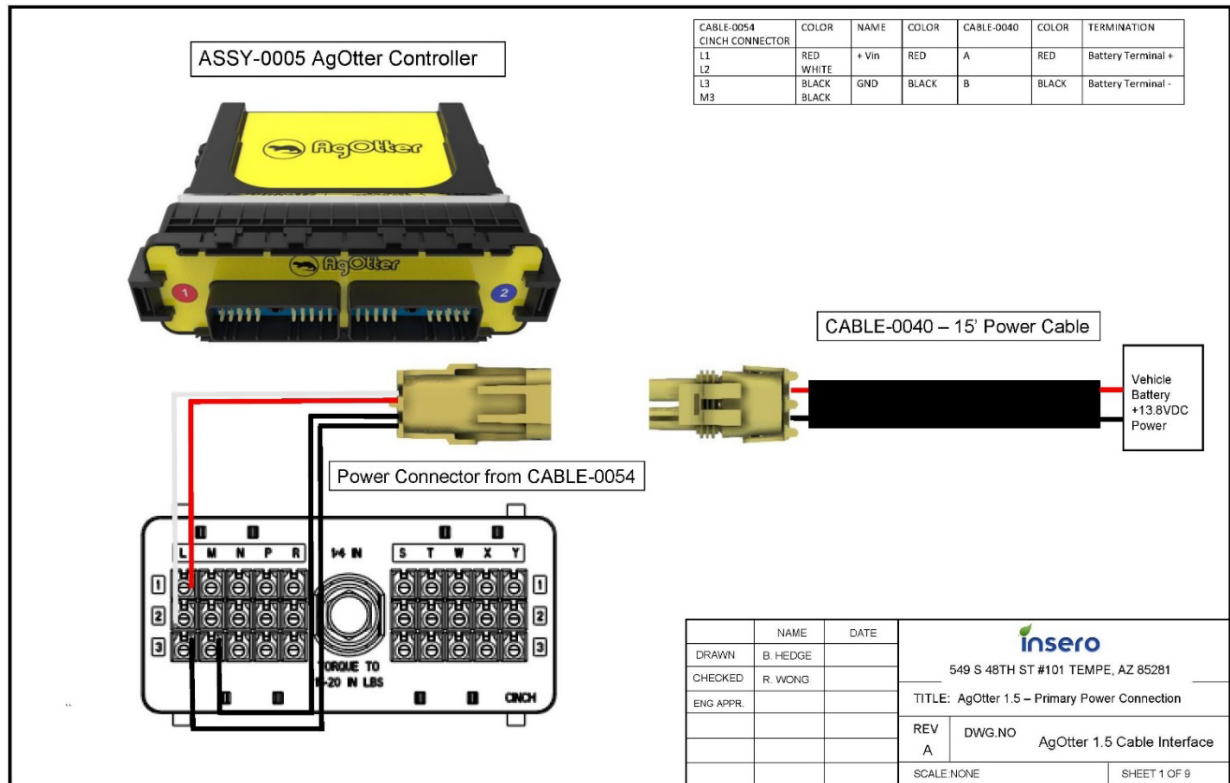
$$\text{New Calibration Number} = \frac{500 \text{ Gallons Used}}{400 \text{ Gallons Actually Used}} \times \text{Original Calibration \#}$$

This vigilance in calibration ensures continual accuracy, especially at the beginning of each spraying season, maintaining a temperature range from 32 °F (0 °C) to 140 °F (60 °C).

****NOTE: Experience shows that it is unusual need to change the meter calibration of an ARAG electromagnetic flow meter***

Appendix

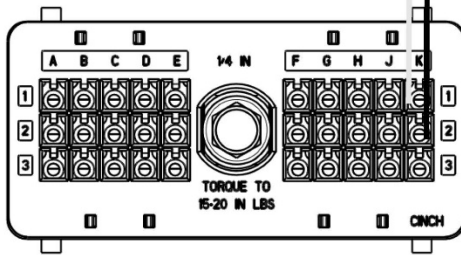
Cable Interface



ASSY-0005 AgOtter Controller



CABLE-0061 from
CABLE-0055
connector



CABLE-0055 CINCH CONNECTOR	COLOR	NAME	CABLE-0061 GPS CABLE	CABLE-0006 6' GPS CABLE	TERMINATION GPS ANTENNA
K1	WHITE	GND	GND		
K2	BLACK	SIGNAL	SIGNAL		

GANT-0002
GPS Antenna

CABLE-0006
6' GPS Cable
(Other Lengths Available)

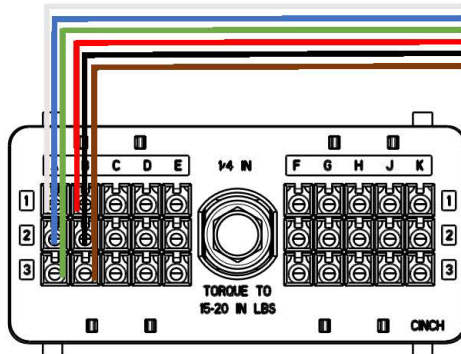
	NAME	DATE	 549 S 48TH ST #101 TEMPE, AZ 85281	
DRAWN	B. HEDGE		TITLE: AgOtter 1.5 – GPS Connection	
CHECKED	R. WONG		REV	DWG.NO
ENG APPR.			A	AgOtter 1.5 Cable Interface
			SCALE: NONE	SHEET 9 OF 9

ASSY-0005 AgOtter Controller



Connector for On/Off
Valve Signals from
CABLE-0055

CABLE-0059
On/Off Valves Pigtail



CABLE-0055 CINCH CONNECTOR	COLOR	NAME	DT04-12PA	CABLE-0059 DT06-12SA	CABLE-0059 BARE LEADS
A1	WHITE	INPUT1	9	9	WHITE
A2	BLUE	INPUT2	8	8	BLUE
A3	GREEN	INPUT3	7	7	GREEN
B1	RED	INPUT4	6	6	RED
B2	BLACK	INPUT5	4	4	BLACK
B3	BROWN	INPUT6	3	3	BROWN

	NAME	DATE	 549 S 48TH ST #101 TEMPE, AZ 85281	
DRAWN	B. HEDGE		TITLE: AgOtter 1.5 – On/Off Valves Signals	
CHECKED	R. WONG		REV	DWG.NO
ENG APPR.			A	AgOtter 1.5 Cable Interface
			SCALE: NONE	SHEET 8 OF 9

ASSY-0005 AgOtter Controller

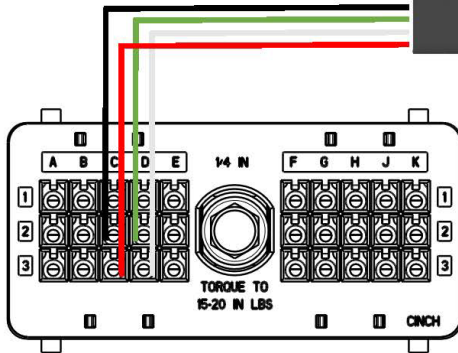


Connector for Valve Control from CABLE-0055

CABLE-0039 Valve Pigtail



Control Valve
(See Price List for Part Numbers/Configurations)



CABLE-0055 CINCH CONNECTOR	COLOR	NAME	CABLE-0055 DT04-6P	CABLE-0039 DT06-6S	COLOR	CABLE-0039 12015024
C2	BLACK	FEEDBACK SIG	1	1	BLACK	A
C3	RED	FEEDBACK 12V+	4	4	RED	D
D2	GREEN	VALVE OPEN	2	2	BLACK	B
D3	WHITE	VALVE CLOSE	3	3	WHITE	C

	NAME	DATE		
DRAWN	B. HEDGE		 549 S 48TH ST #101 TEMPE, AZ 85281 TITLE: AgOtter 1.5 – Control Valve Connection	
CHECKED	R. WONG			
ENG APPR.				
			REV A	DWG.NO AgOtter 1.5 Cable Interface
			SCALE: NONE SHEET 7 OF 9	

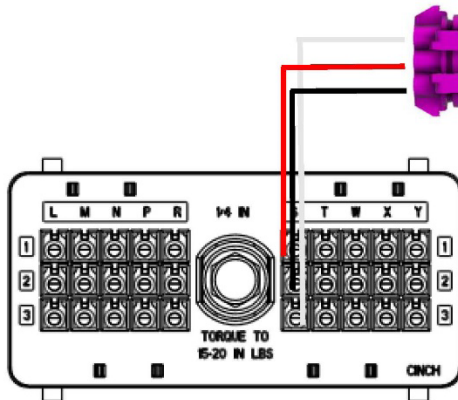
ASSY-0005 AgOtter Controller



Wheel Sensor Connector from CABLE-0054

CABLE-0014
Wheel Extension Cable 14'

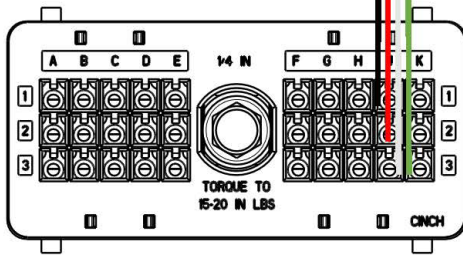
CABLE-0058-A
Wheel Sensor Pigtail with Sensor



CABLE-0054 CINCH CONNECTOR	COLOR	NAME	CABLE-0014	COLOR	CABLE-0058	COLOR	TERMINATION
S1	RED	+12V	B	RED	B	BROWN	Wheel Sensor Power
S2	BLACK	GND	C	BLACK	C	BLUE	Wheel Sensor GND
S3	WHITE	SIGNAL	A	WHITE	A	BLACK	Wheel Sensor SIGNAL

	NAME	DATE		
DRAWN	B. HEDGE		 549 S 48TH ST #101 TEMPE, AZ 85281 TITLE: AgOtter 1.5 – Wheel Sensor Connection	
CHECKED	R. WONG			
ENG APPR.				
			REV A	DWG.NO AgOtter 1.5 Cable Interface
			SCALE: NONE SHEET 4 OF 9	

ASSY-0005 AgOtter Controller



Connector for
LED Signals from
CABLE-0055

CABLE-0057
LED Pigtail

CABLE-0055 CINCH CONNECTOR	COLOR	NAME	CABLE-0055 DT04-4P-E004	CABLE-0057 DT06-4S-E004	COLOR	DIALIGHT LED
J1	BLACK	GND	1	1	BLACK	-
J2	RED	LED RED	2	4	RED	R
J3	WHITE	LED BLUE	3	2	WHITE	B
K3	GREEN	LED GREEN	4	3	GREEN	G

LED FUNCTIONS

Blinking Blue – Normal Operation
Blinking Orange – No GPS
Blinking Red – Wheel Sensor Not Detected
Alternate Blinking Between Blue and Green – Wheel Sensor Activity

	NAME	DATE
DRAWN	B. HEDGE	
CHECKED	R. WONG	
ENG APPR.		

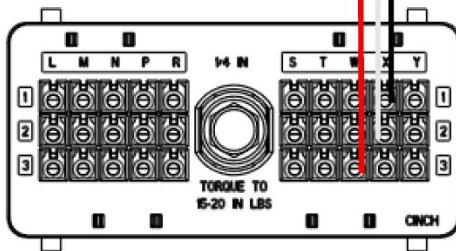
549 S 48TH ST #101 TEMPE, AZ 85281

TITLE: AgOtter 1.5 – LED Connection

REV A DWG.NO AgOtter 1.5 Cable Interface

SCALE: NONE SHEET 8 OF 9

ASSY-0005 AgOtter Controller



Pressure Sensor
Connector from
CABLE-0054

Pressure Sensor connection
may vary based on customer
requirements, but it must be 12V
compatible to work with AgOtter.

CABLE-0054 CINCH CONNECTOR	COLOR	NAME	TERMINATION DT04-4P
W3	RED	+12V	2
X1	BLACK	GND	1
X2	WHITE	SIGNAL	3

	NAME	DATE
DRAWN	B. HEDGE	
CHECKED	R. WONG	
ENG APPR.		

549 S 48TH ST #101 TEMPE, AZ 85281

TITLE: AgOtter 1.5 – Pressure Sensor Connection

REV A DWG.NO AgOtter 1.5 Cable Interface

SCALE: NONE SHEET 3 OF 9

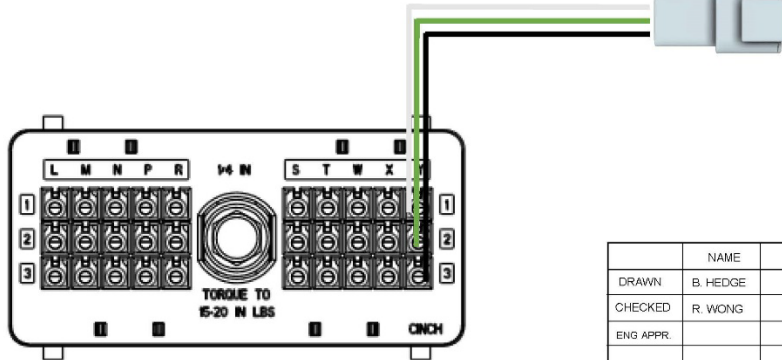
ASSY-0005 AgOtter Controller

CABLE-0054 CINCH CONNECTOR	COLOR	NAME	TERMINATION
Y1	WHITE	TX	1
Y2	GREEN	RX	2
Y3	BLACK	GND	3



Serial Connector
from CABLE-0054

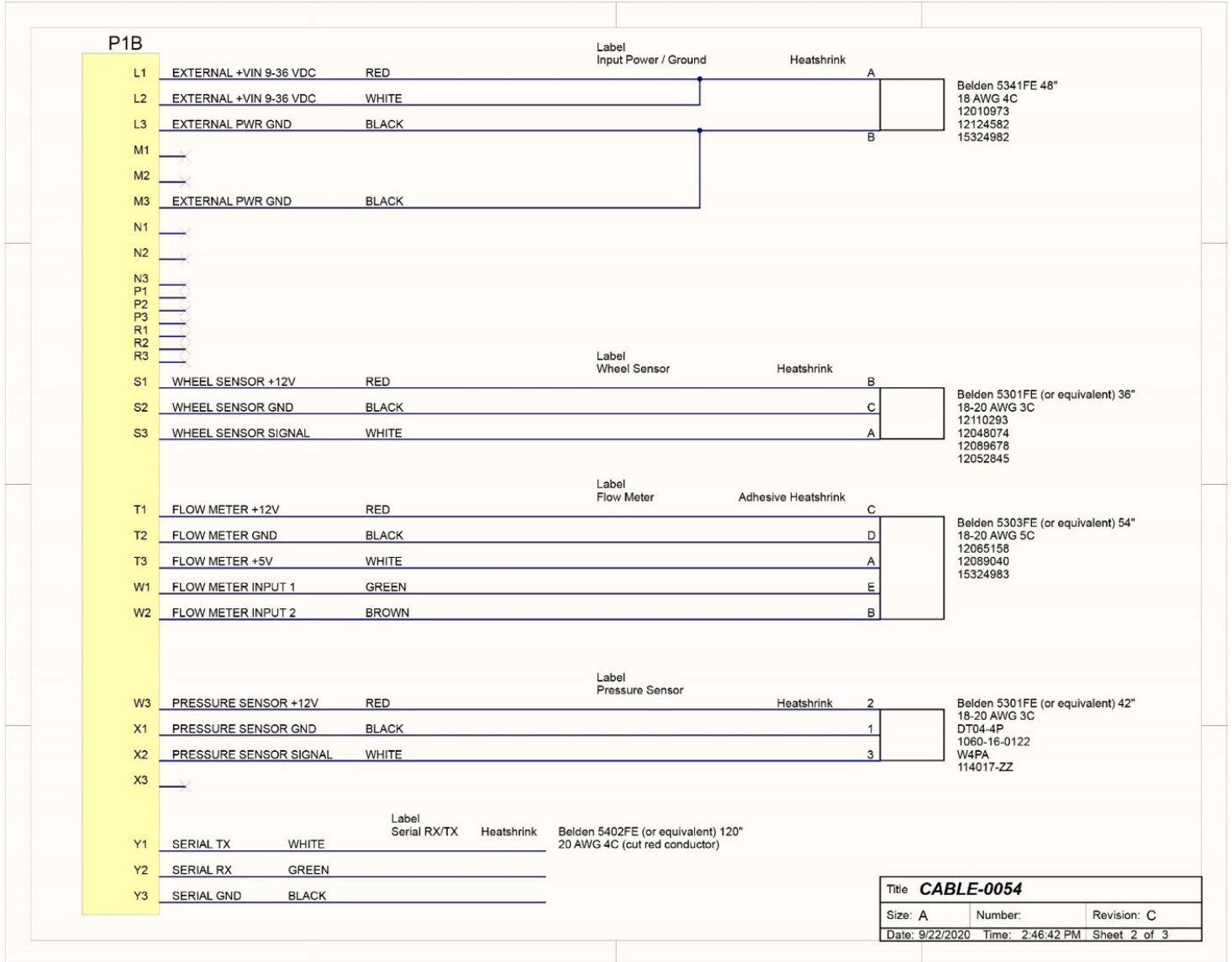
Serial connection will vary based on customer requirements.



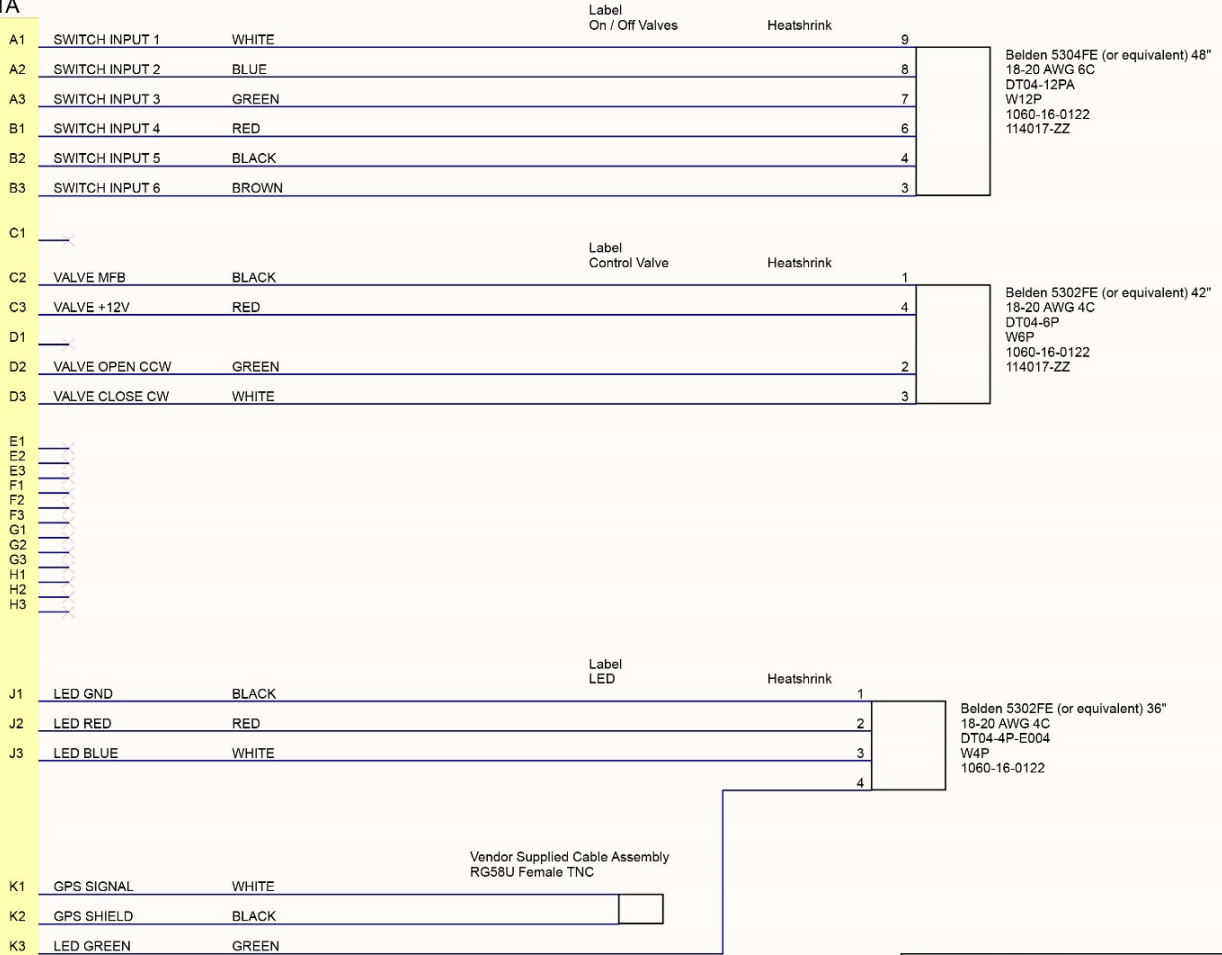
	NAME	DATE	 549 S 48TH ST #101 TEMPE, AZ 85281	
DRAWN	B. HEDGE			
CHECKED	R. WONG		TITLE: AgOtter 1.5 – Serial Transfer Connection	
ENG APPR.			REV A	DWG.NO AgOtter 1.5 Cable Interface
			SCALE: NONE	
			SHEET 5 OF 9	

Power Diagrams

POWER CABLE (RED) DIAGRAM



P1A



Title CABLE-0055		
Size: A	Number:	Revision: C
Date: 9/22/2020	Time: 2:46:42 PM	Sheet 3 of 3

Reference

Units Definitions and Conversions

Units of Measure Definitions

gpm = Gallons per Minute lit / min = Liters per Minute lit / ha = Liters per Hectare gpa = Gallons per Acre psi = Pounds per Square Inch kPa = KiloPascal	mm = Millimeters cm = Centimeters m = Meters km = Kilometers mph = Miles per Hour kph = Kilometers per Hour kg = kilogram lbs = pound
--	--

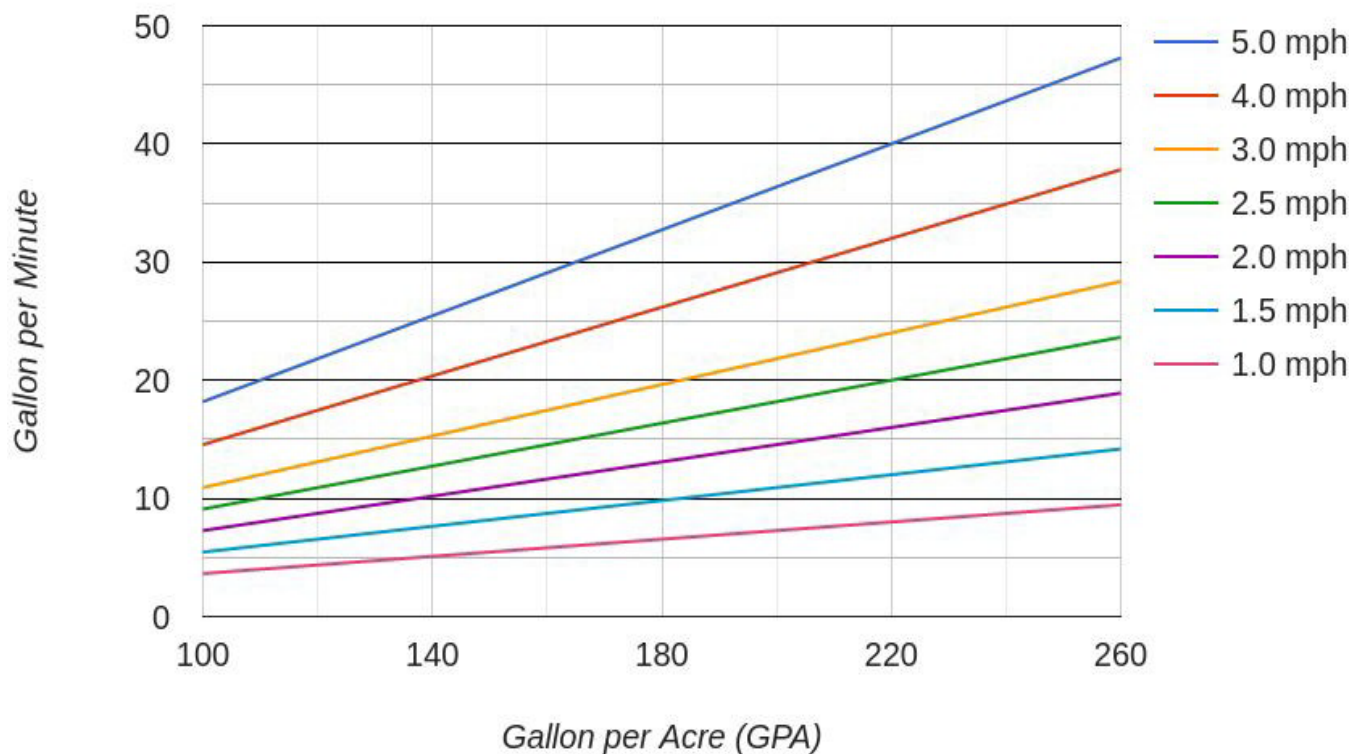
Units of Measure Conversions

<u>Pressure</u> 1 psi = 6.89 kPa 1 kPa = 0.145 psi 1 bar = 14.5038 psi 1 bar = 100 kPa <u>Liquid</u> 1 US gallon = 128 fluid ounces 1 US gallon = 0.83267 imperial gallons 1 US gallon water = 8.34 pounds of water 1 US gallon = 3.785 liters 1 liter = 0.2642 US gallon 1 liter water = 2.2034 pounds of water 1 liter water = 1.0 kilogram	<u>Area</u> 1 square meter = 10.764 square feet 1 hectare = 10,000 square meters 1 hectare = 2.471 acres 1 square foot = 0.0929 square meter 1 acre = 0.405 hectares 1 acre = 43,560 square feet 1 square mile = 640 acres <u>Length</u> 1 inch = 25.4 mm = 2.54 cm 1 foot = 12 inches = 0.3048 m = 30.48 cm 1 mile = 5280 feet = 1.609 km = 1609 m 1 cm = 10 mm = 0.3937 inches 1 m = 100 cm = 3.281 feet = 39.37 inches 1 km = 1000 m = 0.6215 miles = 3282 feet
--	---

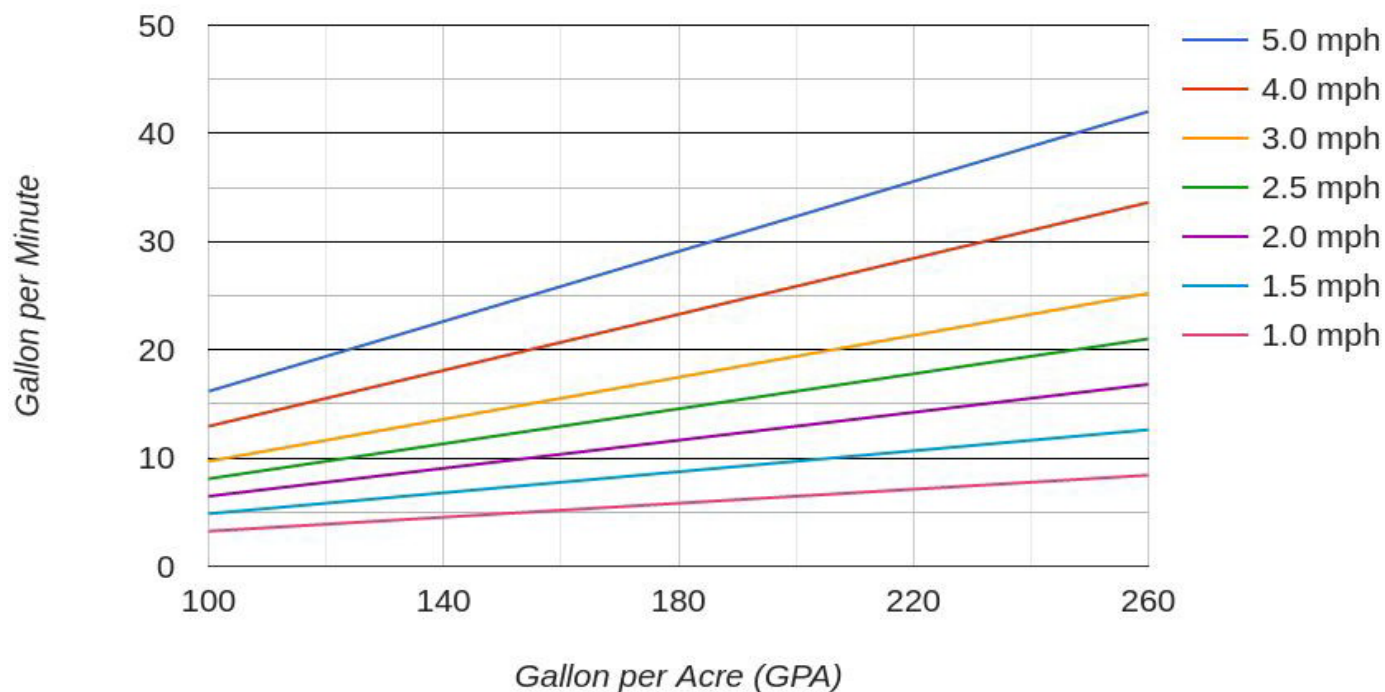
Flow Rate Conversions

$$\frac{\text{Gallon}}{\text{Minute}} (GPM) = \frac{\frac{\text{Gallons}}{\text{Acre}} \times \text{Speed (mph)} \times \text{Swath Width (feet)}}{495}$$

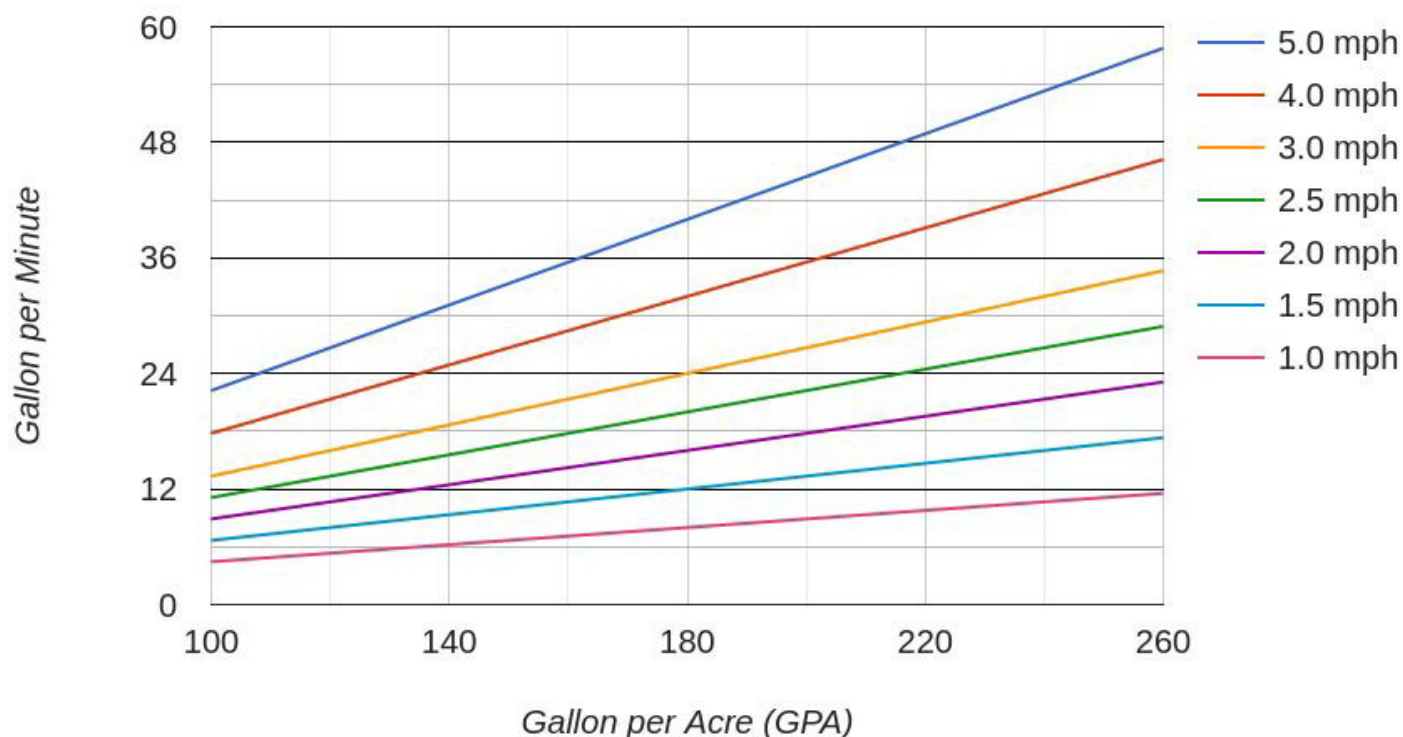
Flow Rate (gal/min) at 18 ft Swath Width



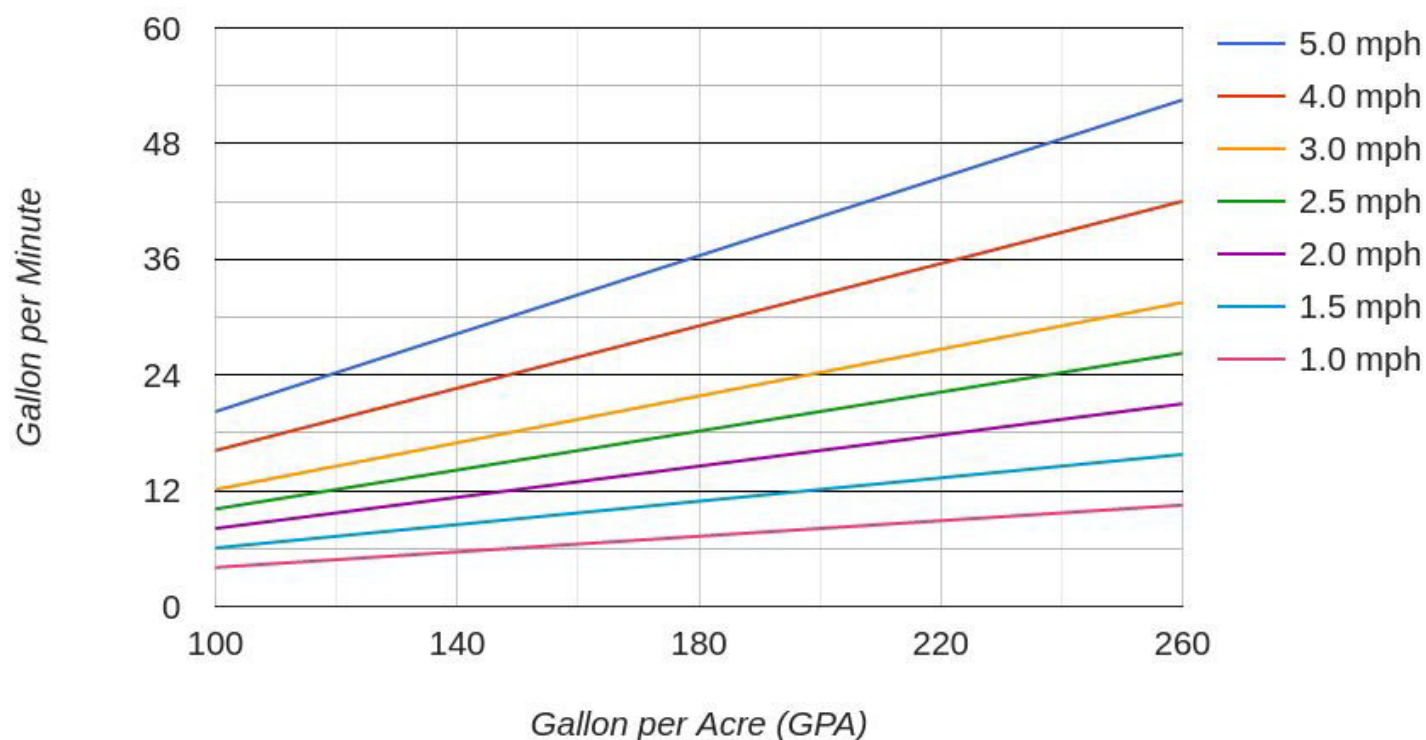
Flow Rate (gal/min) at 16 ft Swath Width



Flow Rate (gal/min) at 22 ft Swath Width



Flow Rate (gal/min) at 20 ft Swath Width





Setting up the AgOtter App to connect to AgHippo Live

**Before you begin, make sure your iPad has a cellular plan or a hot spot Wi-Fi connection before proceeding.

1. Connect the iPad to the AgOtter controller. The sprayer name should be detected by the AgOtter iPad and display on the "Devices" screen. Click on the sprayer name you are working with.



2. On the AgOtter App, press on the cloud "Track It" button.



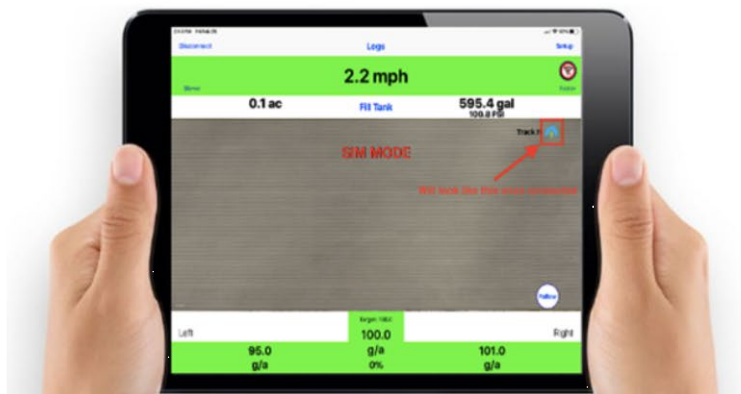
3. Log-in on the AgOtter iPad with the credentials Insero has provided for you.



4. Once connected, the screen should begin to show that your sprayer is actively being monitored and tell you are "Logged in".



5. Once the sprayer is logged onto AgHippo Live, the cloud icon should now have a green arrow to let you know it is actively connected to the AgHippo Live. From this point on, the iPad will remain logged into AgHippo Live every time the app is opened, and the data will be sent to the cloud.





AgOtter

For More Information Contact Us:

AgOtter



Email: sales@inerosolutions.com



Phone: +1 (559) 206-0733



Mailing Address: 549 S. 48th St. Suite 101
TEMPE, AZ 85281

Insero

Customer Service:

customerservice@inerosolutions.com