

Installation and Operation Manual Flo-Sense NH₃ Flow Indicator System

MANUFACTURED BY PARKER - PGI DIVISION

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Form FVC098 - Rev 02

WARNING: **DO NOT** use this product with chemical additives; it is designed to be used with Anhydrous Ammonia (NH₃) only.

IMPORTANT: **KEEP THIS DOCUMENT WITH THE PRODUCT UNTIL IT REACHES THE END USER.**

1. Contact with or inhalation of Liquid Anhydrous Ammonia (NH₃) can cause SERIOUS INJURY OR DEATH.
2. Before installation or removal of any sensor, the system must be purged of all product.
3. Personal Protective Equipment (PPE), safety gloves, goggles and clothing should be worn.
4. For proper handling and storage of NH₃, refer to ANSI Standard K61.1 and NFPA Pamphlet 58.
5. An abundant supply of fresh water should be available to provide immediate first aid treatment for exposure to NH₃.
6. To ensure long term safe operation, the manufacturer recommends that under normal service conditions this product should be inspected at least once every year and be repaired or replaced as required.

TOOLS REQUIRED: Safety Equipment (i.e. Gloves, Goggles, and Clothing), 5/8" Wrench or Socket, cable ties.

INSTALLATION INSTRUCTIONS

- Step 1:** If installing the Flo-Sense system on an existing toolbar, disconnect any previously installed knife hoses from the hose barbs on the manifold(s). Remove the hose barbs from the manifold(s). Wherever a hose barb was previously located, install a Sensor (See Fig. 1). Re-install the hose barbs and hoses (See Fig. 1).
If installing the Flo-Sense system on a new toolbar, install the Sensors on the manifold(s) in the configuration that you would normally use. Install the hose barbs and hoses (See Fig. 1).
- Step 2:** Mount the Junction Box to the toolbar using cable ties or other appropriate methods. See Fig. 2 for proper mounting orientation and clearances for the Junction Box. If the Junction Box is mounted improperly, water may enter the box and damage the system. Open the Junction Box. Select an appropriate length of Sensor Cable (available in 8 ft., 16 ft., and 20 ft. lengths) to connect the Sensor to the Junction Box. There should be enough length of cable such that there is no tension in the cable when connected.
- Step 3:** Connect the male weather-tight electrical connector from the Sensor to the female weather-tight connector on the Sensor Cable. Route the white male connector of the Sensor Cable through either of the grommet openings at the bottom of the Junction Box and connect it to the appropriate panel connector number. The grommet can accommodate up to 14 cables through each opening. Some stretching of the openings is expected. Note the channel number with which each knife is associated for ease of location once a plugged condition occurs. Secure any extra cable such that it will not interfere with the normal operation of the toolbar and does not pose a safety risk (e.g. being dragged along the ground). For ease of location once a plugged condition occurs, number each Sensor Cable and knife with the appropriate channel number using the numbered tags provided.
- Step 4:** Mount the In-Cab Panel at a convenient location in the tractor cab, preferably in a convenient line of sight for the tractor operator. Connect the Flo-Sense Monitor to a 12 volt power supply using the cigarette lighter adapter provided (see Fig. 3).
- Step 5:** Once the tractor and toolbar are connected, connect the Flo-Sense Monitor to the Junction Box via the In-Line Connector (See Fig. 3). Secure any extra cable such that it will not interfere with the normal operation of the toolbar or tractor and does not pose a safety risk.
- Step 6:** NOTE: An inline strainer with a 40 mesh screen and a magnet must be installed in the tool bar piping just prior to the distributor manifold(s) to ensure proper Sensor operation. Rust or bits of thread sealant may obstruct the precision guidance of the internal mechanisms in the Sensor and cause Sensor errors.

OPERATING INSTRUCTIONS

System Requirements

The Flo-Sense system has been designed to operate between 0.5 gpm and 2.5 gpm of anhydrous ammonia per knife. A minimum flow of 0.5 gpm per knife is required for proper operation. The Flo-Sense Monitor has space for 27 knives. Any indicator light not connected to a sensor will not light up under any circumstance.

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OPERATING INSTRUCTIONS (cont'd)

Begin Application of NH₃

Step 1: Switch the toggle on the Flo-Sense Monitor to the "ON" position. The green LED on the toggle will be lit if the monitor is correctly attached to a power supply. If NH₃ is not flowing, or is flowing at a rate of less than 0.5 gpm per knife, the indicator light for each attached Sensor will remain on.

Step 2: As the flow of NH₃ increases, each indicator light will turn off, indicating that there is sufficient flow through the knife to actuate the internal mechanism of the Sensor. If a knife becomes plugged or the flow rate through the knife becomes less than 0.5 gpm, its associated indicator light will turn on. Because all of the indicator lights (if connected to a Sensor) will turn on when flow to the toolbar is stopped, the tractor operator should take careful note of which knife or knives is plugged while NH₃ is flowing.

System Maintenance

- If the indicator panel or channel map (located on the inside of the cover of the junction box) become illegible due to dust build-up, clean with a damp cloth. Do not spray cleaner on the indicator panel directly.
- If debris or build-up affects sensor operation, remove the sensor from the system (**WARNING: Follow proper safety procedures when removing the sensor from the system to prevent serious injury or death**) and flush with water or a mild solvent. **DO NOT** take the sensor apart or attempt to remove debris by forceful means, as this may damage the sensor and render it inoperable. If a significant amount of metal debris is stuck to the embedded magnet in the sensor poppet, replace the sensor.
- Check the electrical connections for wear and damage each season before start-up to ensure proper operation. Replace the associated cable(s) if significant damage is noted.
- Check the sensors for exterior damage each season before start-up. Replace the sensor(s) if significant damage is noted.

Trouble-Shooting

1. No indicator light at zero flow (indicates full flow):

- Check electrical continuity from the indicator panel (make sure that all connections are secure and no wires are damaged)
- Check for large debris or obstructions in the sensor. There is a magnet in the sensor that will attract large rust or metallic debris and may prevent the sensor internals from returning to the "zero-flow" position
- Check for build-up from NH₃ additives. Some additives will produce a "sticky" build-up under certain conditions and may prevent the sensor internals from returning to the "zero-flow" position
- Check for exterior damage to the sensor

2. Indicator light never turns off (indicates no flow):

- Check for obstructions or large debris in the manifold or sensor
- Check for obstructions or pinches in the line connecting the sensor to the knife
- Check for exterior damage to the sensor
- Flow to the sensor is less than 1/2 gallon per minute NH₃

3. Indicator light flickers:

- Some intermittent flickering of the indicator lights is normal and may occur at especially low flow rates
- Check for obstructions or pinches in the line connecting the sensor to the knife
- Check for debris or obstructions in the knife manifold
- Flow to the sensor is less than 1/2 gallon per minute NH₃

4. No power to indicator panel:

- The fuse has been tripped due to a short in the system

Suggested Actions

1. No indicator light at zero flow (indicates full flow):

- Replace any damaged cables
- Replace the sensor
- Flush the sensors with an appropriate solvent, being careful not to get any on the outside of the sensor (sensor externals may be damaged by some solvents). If the build-up cannot be removed, replace the sensor
- Replace any sensors with significant external damage

2. Indicator light never turns off (indicates no flow):

- Clean out the manifold. If debris in the sensor cannot be easily removed without disassembling the sensor, replace the sensor
- Remove any obstructions or pinches in the line or replace the line
- Replace the sensor
- Check that flow to the sensor is greater than 1/2 gallon per minute NH₃

3. Indicator light flickers:

- No action required
- Remove any obstructions or pinches in the line or replace the line
- Remove any debris in the knife manifold
- Check that flow to the sensor is greater than 1/2 gallon per minute NH₃

4. No power to indicator panel:

- Check the 5 amp fuse in the cigarette lighter adapter by unscrewing the tip of the adapter. Check the system for any shorts or water and make any necessary repairs before plugging the system back in

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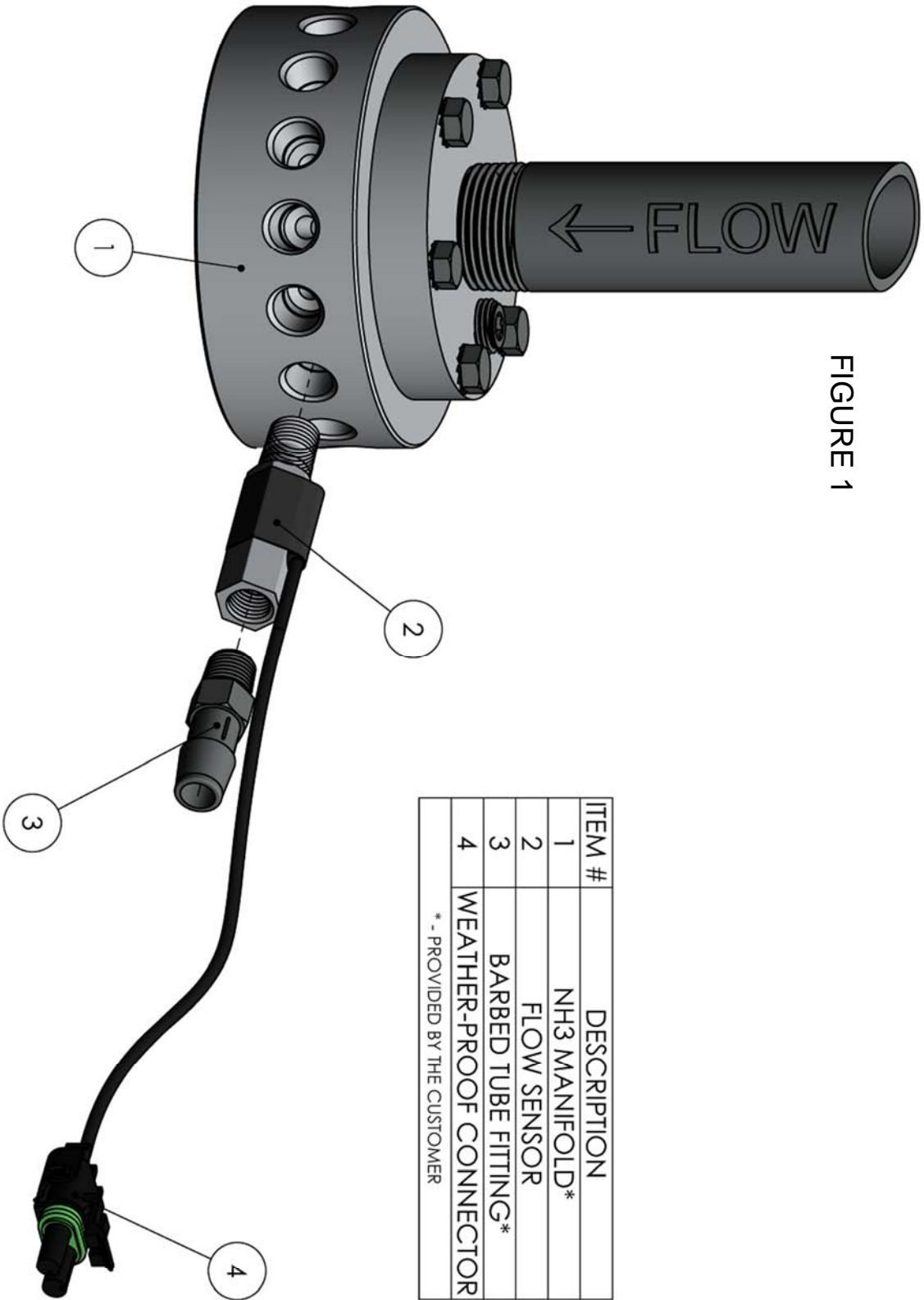
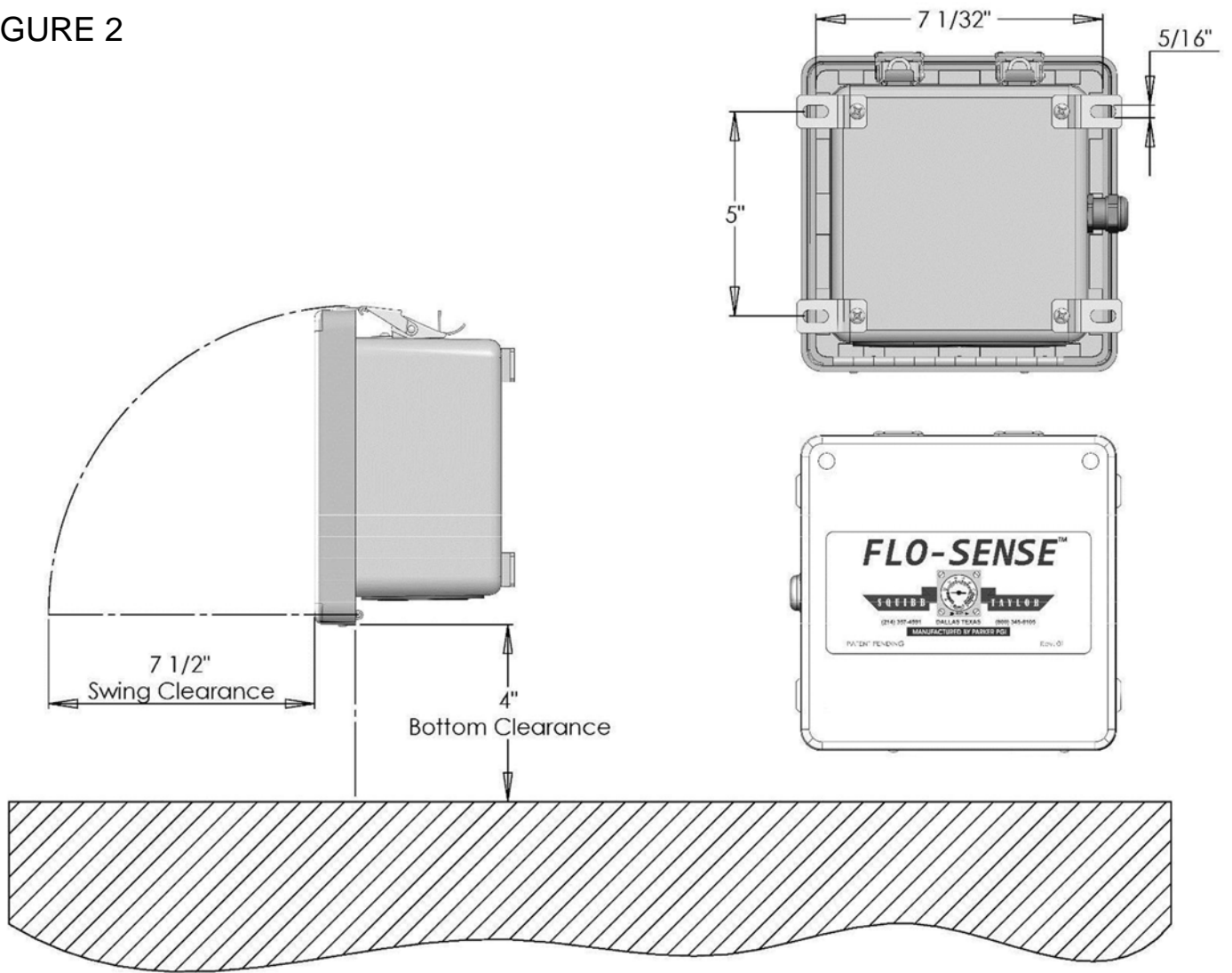


FIGURE 1

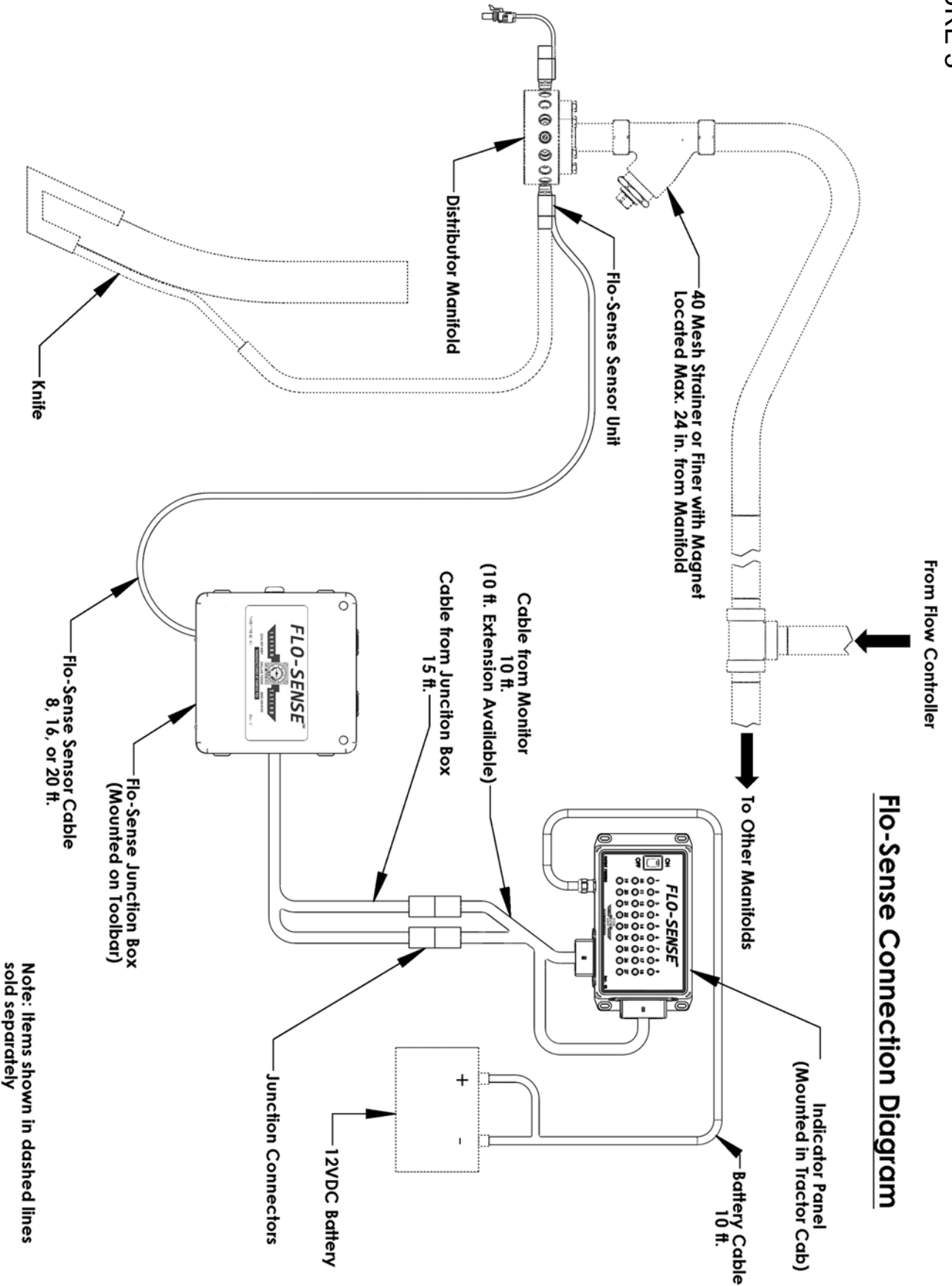
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FIGURE 2



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FIGURE 3



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