



## Smart IR Sensor

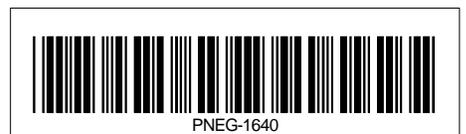
### Installation and Operation Manual

PNEG-1640

Date: 12-21-11



BY THE  
GSI GROUP



PNEG-1640



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## Contents

<b>Chapter 1 Safety</b> .....	<b>4</b>
Safety Guidelines .....	4
<b>Chapter 2 Application</b> .....	<b>6</b>
<b>Chapter 3 Installation</b> .....	<b>7</b>
<b>Chapter 4 Basic Operation</b> .....	<b>8</b>
<b>Chapter 5 Delay Time</b> .....	<b>9</b>
Check Delay Time Setting .....	9
Setting/Adjusting the Delay Time .....	10
Delay Time Operation .....	10
Delay Time By-Pass .....	10
<b>Chapter 6 Run Time</b> .....	<b>11</b>
Maximum Run Time .....	11
Check Maximum Run Time Setting .....	12
Setting/Adjusting the Maximum Run Time .....	12
Maximum Run Time Operation .....	13
Resetting the Maximum Run Timer .....	13
<b>Chapter 7 Sensitivity</b> .....	<b>14</b>
<b>Chapter 8 Replacement Parts</b> .....	<b>16</b>
Smart IR Sensor Assembly (FLX-4951) .....	16
<b>Chapter 9 Wiring Diagrams</b> .....	<b>18</b>
Alarm Wiring Diagram .....	18
AP Wiring Diagram .....	19
Choretime Wiring Diagram .....	21
Universal Wiring Diagram .....	22
<b>Chapter 10 Warranty</b> .....	<b>23</b>

### Safety Guidelines

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.



**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



**NOTICE** is used to address practices not related to personal injury.

**Install and Operate Electrical Equipment Properly**

Electrical controls should be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all local and state codes.

Disconnect and lock out all power sources before installing wires/cables or servicing equipment.



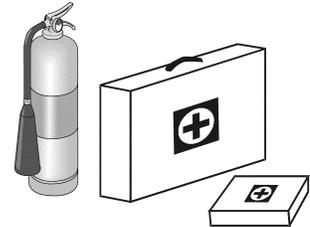
**Electric Shock Hazard**

**Prepare for Emergencies**

Be prepared if fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



**Keep Emergency Equipment Quickly Accessible**

**Wear Protective Clothing**

Wear close-fitting clothing and safety equipment appropriate to the job.

Remove all jewelry.

Tie long hair up and back.

Wear safety glasses at all times to protect eyes from debris.

Wear gloves to protect your hands from sharp edges on plastic or steel parts.

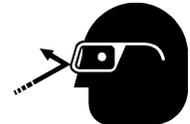
Wear steel-toed boots to help protect your feet from falling debris. Tuck in any loose or dangling shoestrings.

A respirator may be needed to prevent breathing potentially toxic fumes and dust.

Wear a hard hat to help protect your head.

Wear appropriate fall protection equipment when working at elevations greater than six feet (6').

**Eye Protection**



**Gloves**



**Steel-Toed Boots**



**Respirator**



**Hard Hat**



**Fall Protection**



## 2. Application

The Smart IR Sensor is used as the primary control for a Flex-Flo feed line. It uses “infrared” technology to detect the presence of all types of mash and pellet feeds. It is designed to be used in place of a proximity switch or drop tube switch and will operate with or without the aid of a power relay. The sensor is installed underneath a control unit between the powerhead drop (funnel) and the drop tube at the end of a Flex-Flo feed system.

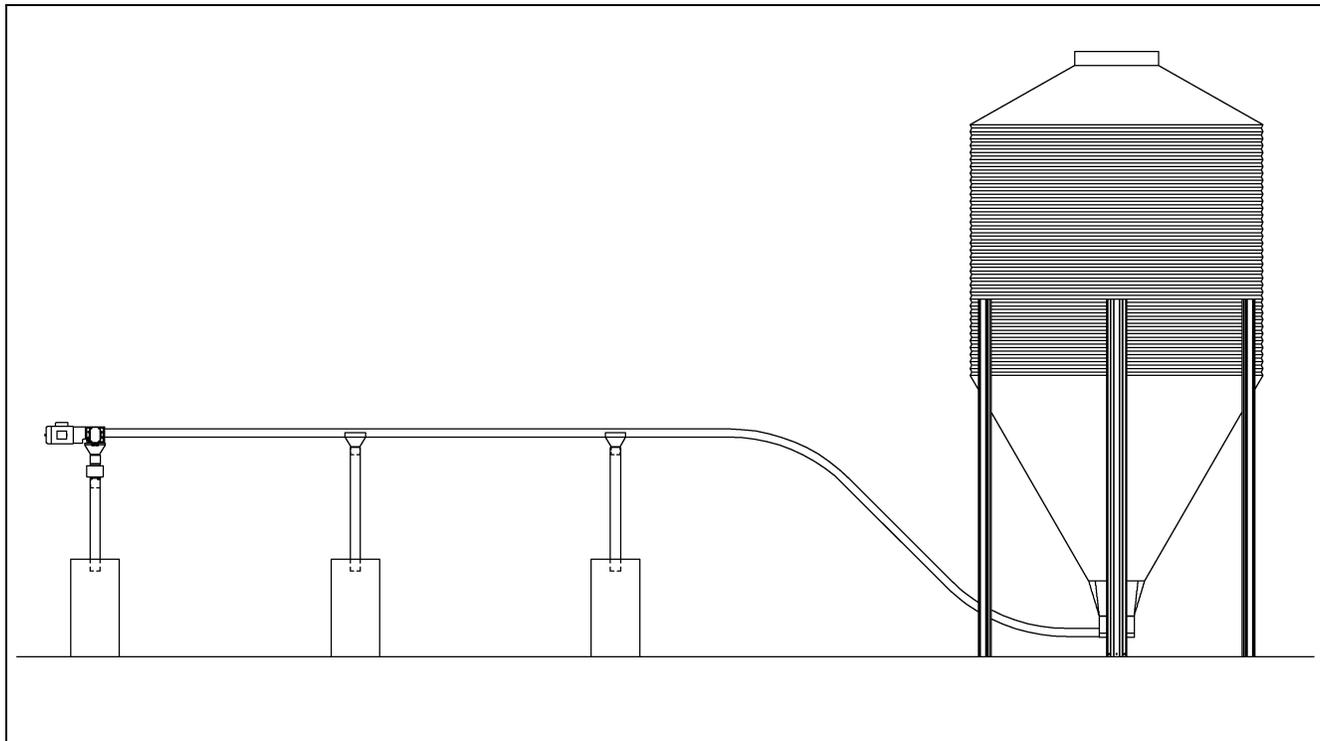
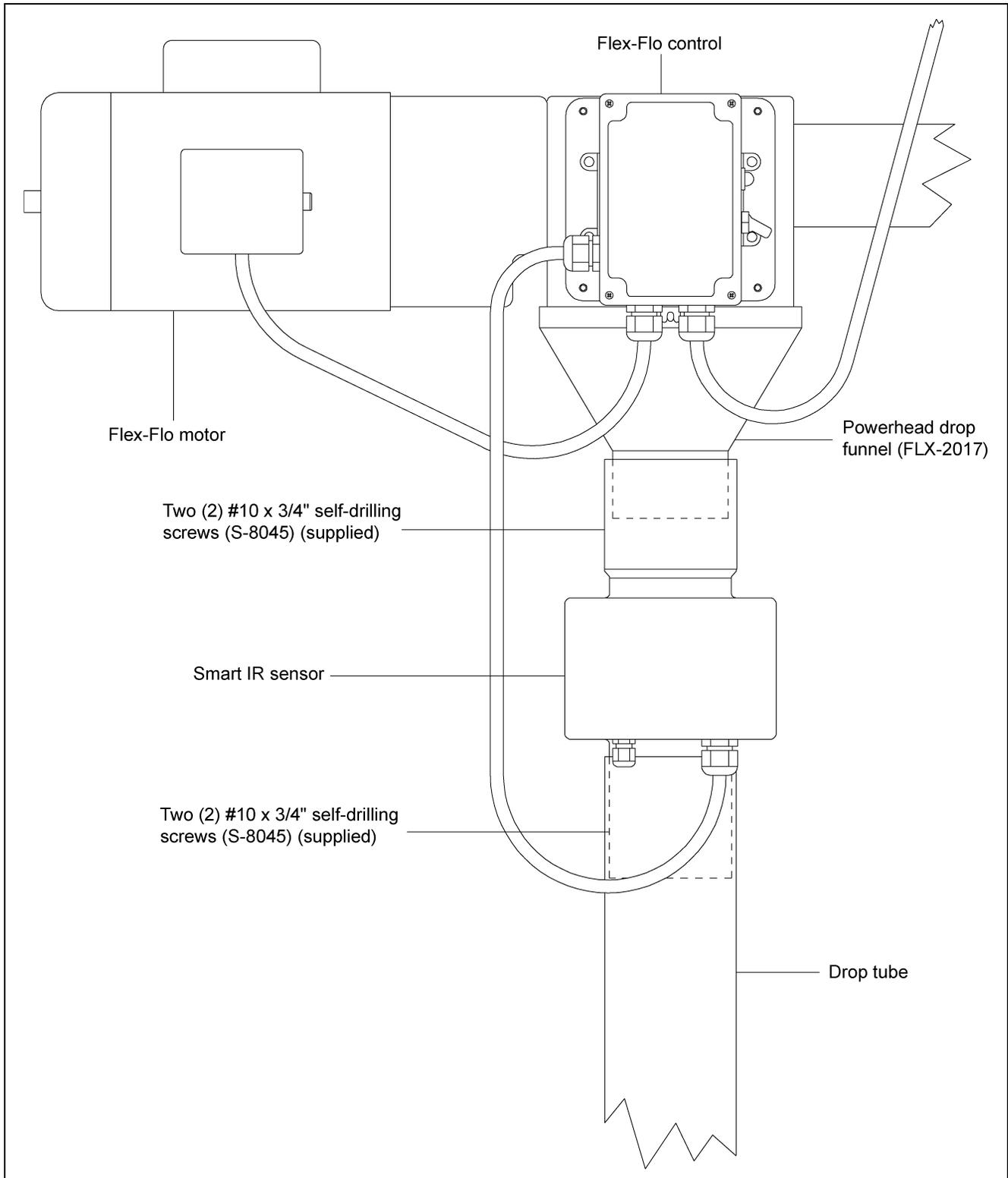


Figure 2A

The sensor is installed underneath a control unit between the powerhead drop (funnel) and the drop tube at the end of a Flex-Flo feed system. The control unit power head drop funnel must be an FLX-2017 or equivalent with an outlet measuring approximately 3-1/4" O.D. Use two (2) #10 x 3/4" self-drilling screws (S-8045) (supplied) to fasten the Smart IR Sensor to the powerhead drop funnel and drop tube as shown in *Figure 3A*.



**Figure 3A**

## 4. Basic Operation

The Smart IR Sensor will detect when the last feeder is full and immediately shut the Flex-Flo system off, the yellow “Product Detected” LED will be lit and the display will read “Full”. When the feed falls away from the sensor, it will count down a pre-determined delay time and then turn the Flex-Flo system back on. It also includes a maximum run timer that will shut the system down if the auger runs too long in case of an empty or bridged feed tank or a feed spill. Alarm contacts are available to provide remote notification of a maximum run situation.



Figure 4A Full



Figure 4B Maximum Run Time Alarm

Delay time is the length of time after the IR sensor no longer detects feed, before it turns the Flex-Flo system back on again. It is used to prevent short-cycling of the Flex-Flo system. Excessive short-cycling will reduce the life of the motor and/or Flex-Flo system. It can also result in the motor running hot and continually activating the thermal reset.

The required delay time setting depends on how quickly the animals can empty the feeders once the feed system is full. Large capacity feeders or younger, smaller animals will allow for longer delay time settings. For best results, use a slightly less delay time setting than the time it takes the animals to completely empty the feeder. Always check a pen where there are the most and largest animals and at the time of day when consumption is highest. As the animals get older and larger and consume more feed, decrease the delay time setting to prevent feeders from going empty.

The range of delay time setting for the Smart IR Sensor is from 0 hours and 0 minutes to 23 hours and 59 minutes.

### Check Delay Time Setting

To check the delay time setting, at any time, push and hold the “On Delay Time” button.



Figure 5A Checking Delay Time

## 5. Delay Time

### Setting/Adjusting the Delay Time

To adjust the delay time setting, at any time, while pushing and holding the “On Delay Time” button, push either the “arrow up” or “arrow down” button. Each time an “arrow” button is pushed, the time will change by 1 minute. To make the time scroll faster, continue to hold the “arrow” button down for several seconds.



Figure 5B Adjusting the Delay Time

### Delay Time Operation

Once the yellow “Product Detected” indicator light goes off, the delay time will begin to count down from its maximum setting. During this time, the green “Auger” indicator light will flash. After the delay time reaches 0.00, the “Auger” indicator light will turn on solid and the Flex-Flo system will start.

### Delay Time By-Pass

When the Smart IR Sensor is in delay time, the green “Auger” indicator light will be flashing. It is not necessary to wait for the delay time to expire before the auger will start-up. To make the auger start immediately, by-pass the delay time for one cycle only, by pressing and holding the “On Delay Time” button down for 5 second.

Once the Flex-Flo system starts, the display will count up showing the hours/minutes while keeping track of auger run time for the current cycle.



Figure 6A Auger Running

## Maximum Run Time

Maximum run time is the maximum time the Flex-Flo system will run each cycle. If this time expires, the Flex-Flo system will shut off and will not start again until the control is reset. The maximum run time is used to shut the Flex-Flo system off in case of an empty or bridged feed tank or a feed spill. In the case of an empty or bridged feed tank, it will prevent the Flex-Flo system from running empty for extended periods of time. In the case of a feed spill, it will prevent the Flex-Flo system from emptying the remaining contents of the feed tank on the floor.

To determine the optimum maximum run time, find the longest possible fill time by measuring the time required to completely fill all feeders when they are empty. Then add approximately 10 minutes to this time to account for variability.

The range of adjustment for the maximum run time is from 1 minute to 23 hours and 59 minutes.

## 6. Run Time

### Check Maximum Run Time Setting

To check the maximum run time setting, at any time, push and hold the “Maximum Run Time” button.



Figure 6B Checking Maximum Run Time Setting

### Setting/Adjusting the Maximum Run Time

To adjust the maximum run time setting, at any time, while pushing and holding the “Maximum Run Time” button, push either the “arrow up” or “arrow down” button. Each time an “arrow” button is pushed, the time will change by 1 minute. To make the time scroll faster, continue to hold the “arrow” button down for several seconds.



Figure 6C Adjusting the Maximum Run Time

If no maximum run time is desired, this feature can be disabled. To shut off the maximum run time, follow the adjustment procedure [on Page 12](#). Using the “arrow down” button, decrease the time to 1 minute. Press the “arrow down” button once more and the display will show “OFF”.

**IMPORTANT:** *Turning the maximum run timer OFF is not recommended.*



**Figure 6D** *Disabling the Maximum Run Time Feature (Not Recommended)*

## Maximum Run Time Operation

During normal operation, when the Flex-Flo system is running, the display will count up at 1 minute increments. If the displayed time reaches the maximum run time setting before the feed line is full, the Flex-Flo system will shut off. At that time, the display showing the maximum run time setting will begin to flash alternately with the red “Alarm” indicator light. The alarm contacts inside the Smart IR Sensor will now change state. If these contacts are being utilized, it will send a signal to a remotely connected alarm device (not provided). **IMPORTANT:** *The first cycle, after power loss or resetting of alarm, will have a maximum run time of twice the programmed value.*

## Resetting the Maximum Run Timer

The Flex-Flo system will not restart automatically once the maximum run time alarm has been activated. To reset the Smart IR Sensor to automatic mode and disable the alarm, re-cycle the power, in one of three (3) ways:

1. At the Smart IR Sensor, push and hold the “Maximum Run Time” button for 5 seconds.
2. At the Flex-Flo control unit, switch the toggle “off” then back “on” again.
3. At the main circuit board, switch the controlling circuit breaker “off” then back “on” again.

## 7. Sensitivity

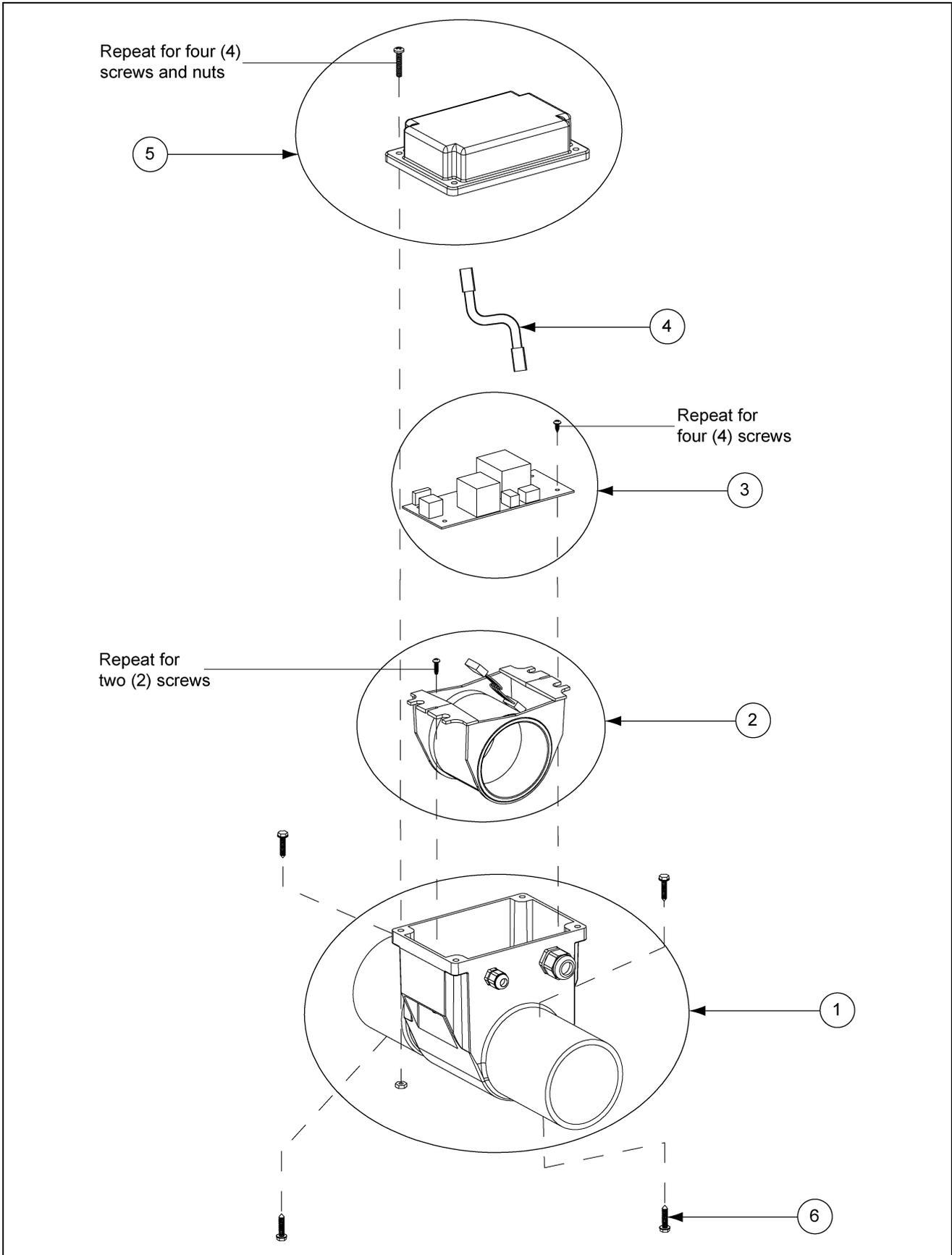
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No sensitivity setting is required. The infrared technology that is used in this sensor is not affected by temperature, humidity or type of feed. If the sensor fails to operate properly, disconnect the sensor from the powerhead drop above and use a soft cloth to clean the dust from inside. If it still does not operate properly, contact the nearest AP/Cumberland dealer to aid in troubleshooting.

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# NOTES

# Smart IR Sensor Assembly (FLX-4951)

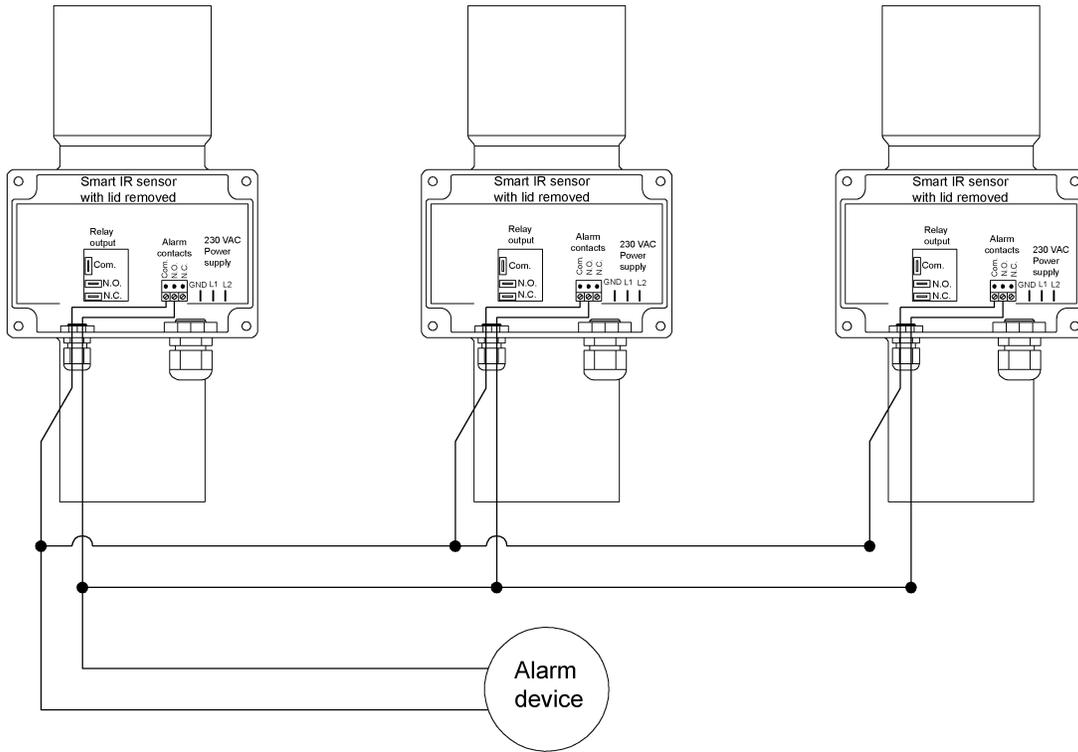


## Smart IR Sensor Assembly (FLX-4951) Parts List

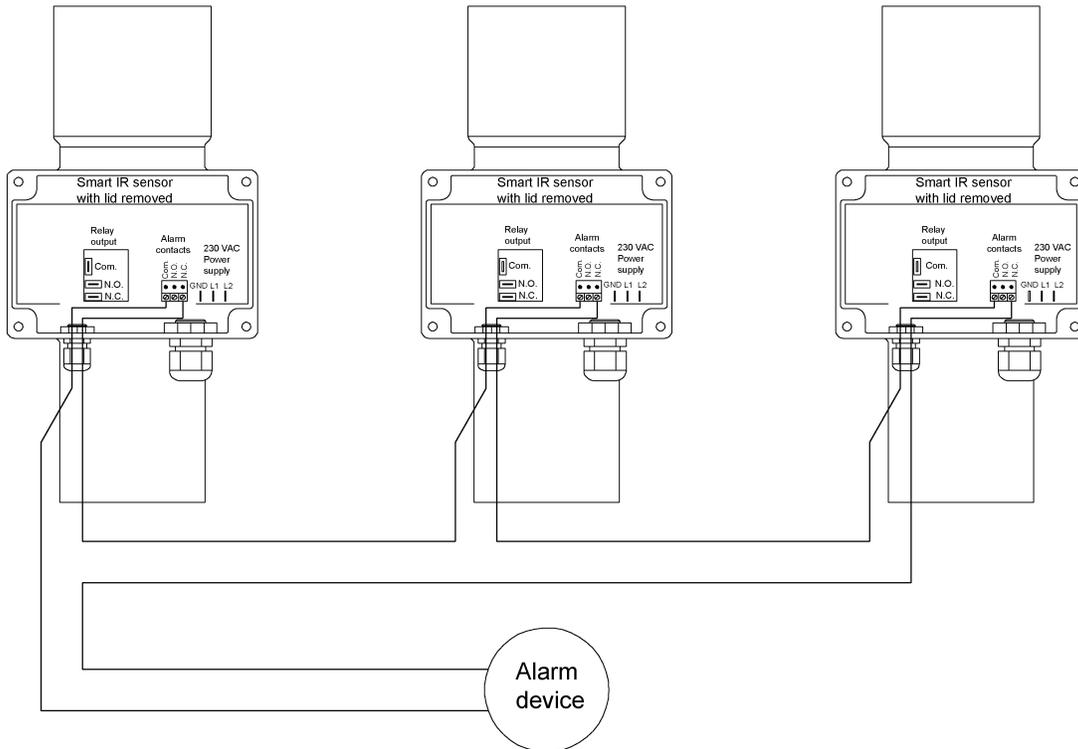
Ref #	Part #	Description	Qty
1	FLX-5000	Infrared Sensor Housing Assembly	1
2	FLX-5002	Infrared Sensor Insert Assembly	1
3	FLX-5003	Infrared Sensor Power Board Assembly	1
4	FLX-5001	Infrared Sensor Connector Cable	1
5	FLX-5004	Infrared Sensor Face Plate Assembly	1
6	S-8045	Screw, SDS #10 x 3/4" HWH SS 410	4

# Alarm Wiring Diagram

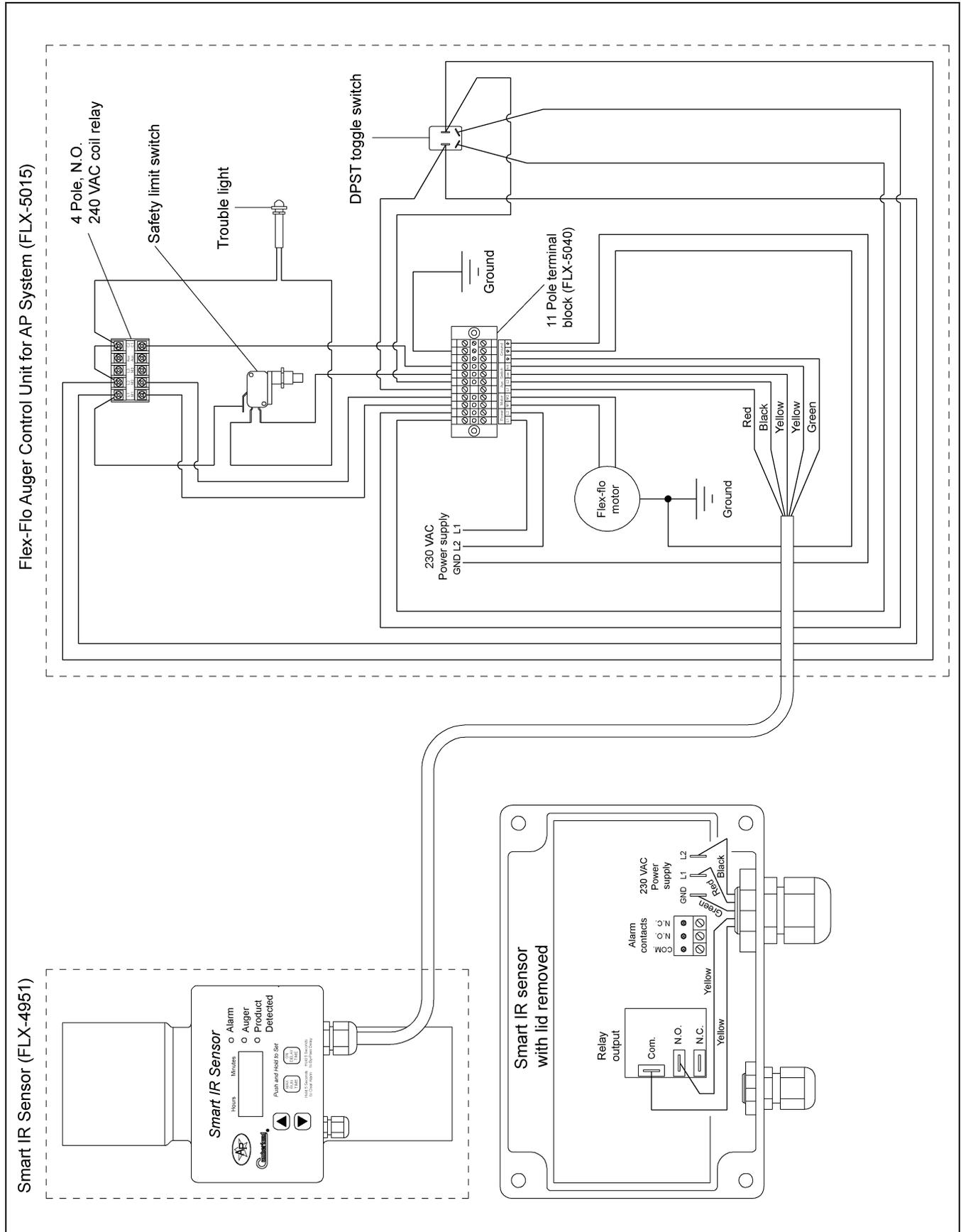
Alarm connections using normally open (N.O.) parallel circuit



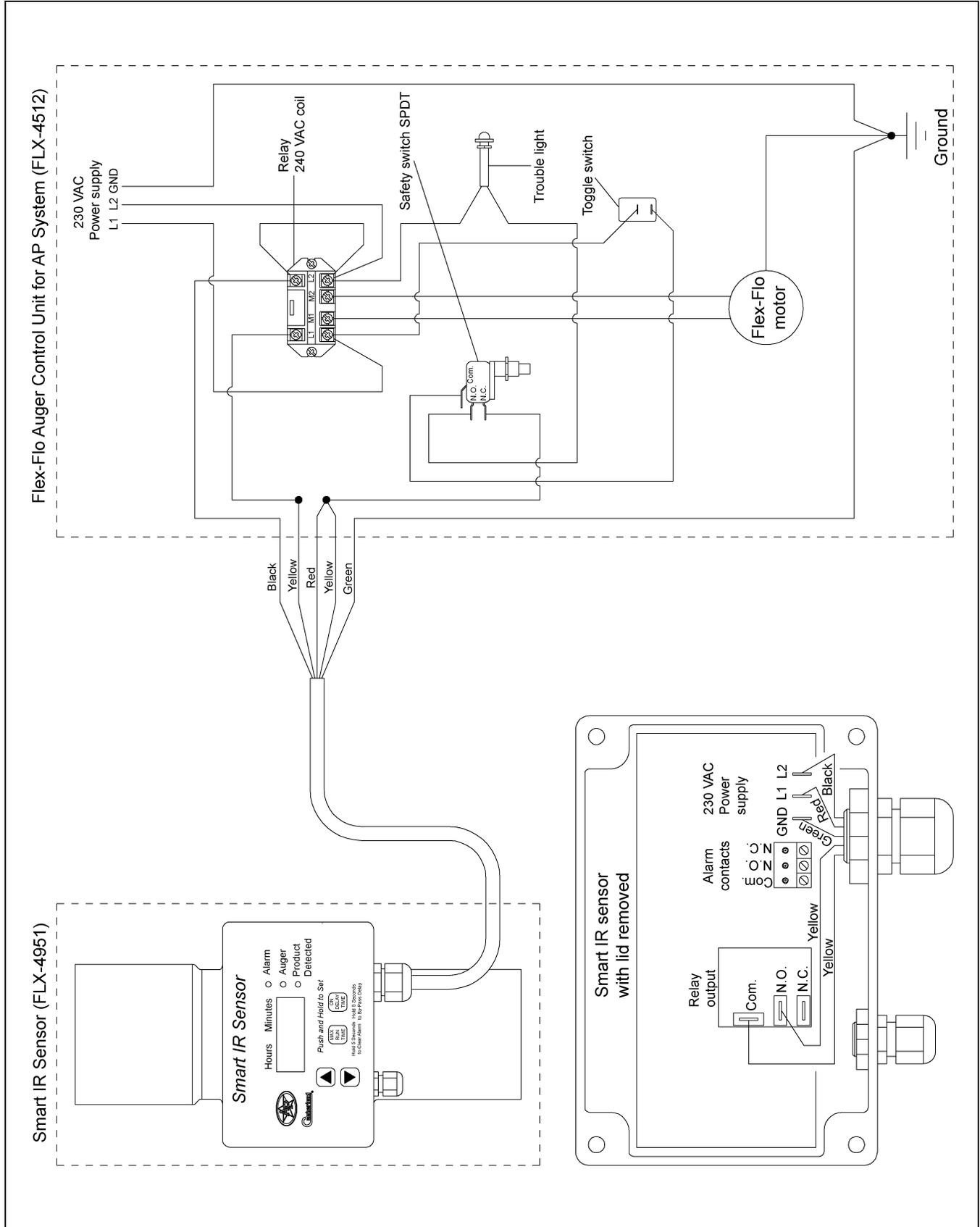
Alarm connections using normally closed (N.C.) series circuit



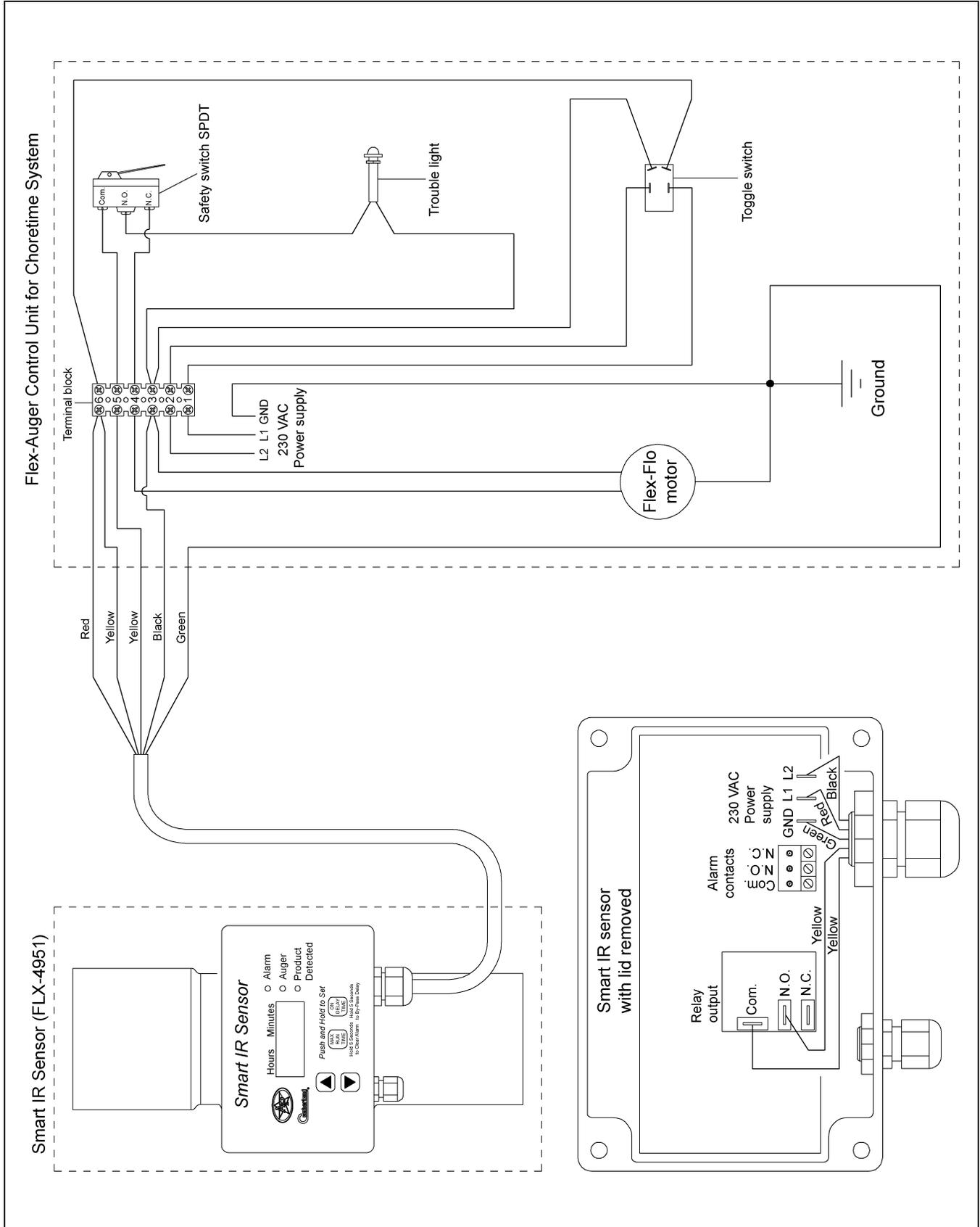
# AP Wiring Diagram



# AP Wiring Diagram (Continued)



# Choretime Wiring Diagram





## GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

### Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period
<b>AP Fans and Flooring</b>	Performer Series Direct Drive Fan Motor	3 Years
	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
<b>Cumberland Feeding/Watering Systems</b>	Feeder System Pan Assemblies	5 Years **
	Feed Tubes (1-3/4" and 2.00")	10 Years *
	Centerless Augers	10 Years *
	Watering Nipples	10 Years *
<b>Grain Systems</b>	Grain Bin Structural Design	5 Years
<b>Grain Systems Farm Fans Zimmerman</b>	Portable and Tower Dryers	2 Years
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years

\* Warranty prorated from list price:  
 0 to 3 years - no cost to end-user  
 3 to 5 years - end-user pays 25%  
 5 to 7 years - end-user pays 50%  
 7 to 10 years - end-user pays 75%

\*\* Warranty prorated from list price:  
 0 to 3 years - no cost to end-user  
 3 to 5 years - end-user pays 50%

† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12<sup>th</sup>) month from the date of purchase and continuing until the sixtieth (60<sup>th</sup>) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

### Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

**This product covered by U.S. Patent # 8,056,506.**



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