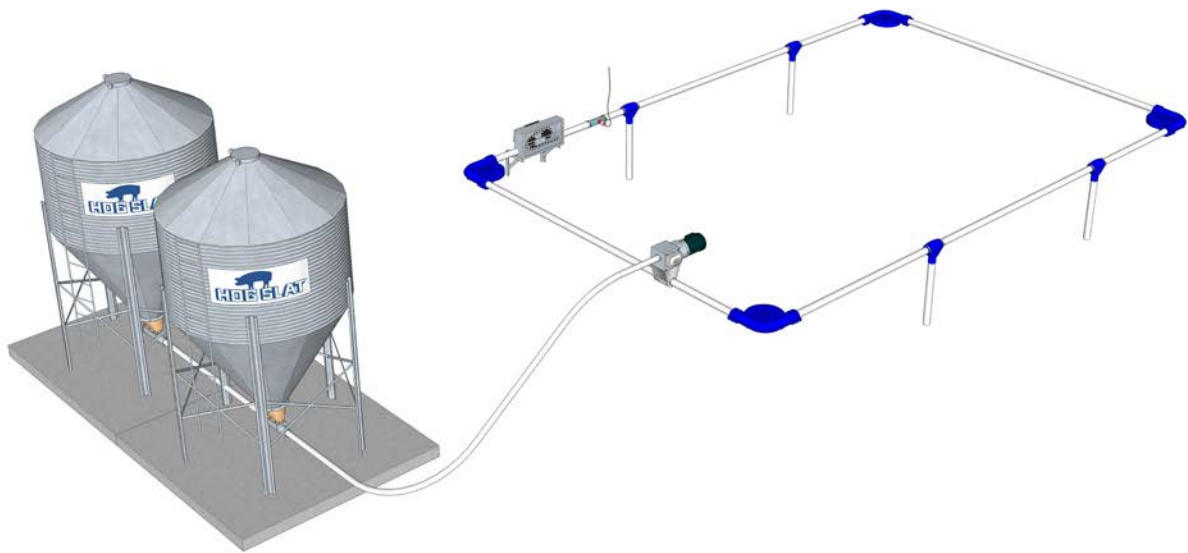


GrowerSELECT™ 
GROW-DISK™

CHAIN TUBE SYSTEM ASSEMBLY & OPERATING INSTRUCTIONS



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Safety Information

Caution, **Warning**, and **Danger** decals have been placed on the equipment to warn of potential dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety signs.

Safety – Alert Symbol



This is a safety-alert symbol. When you see this symbol on your equipment, be alert to the potential or personal injury. GrowerSelect equipment is designed to be installed and operated as safely as possible, however, hazards do exist.

Signal Words

Signal words are used in conjunction with the safety-alert symbol to identify the severity of the warning.

DANGER - identifies immediate hazards which WILL result in severe personal injury or death.

WARNING - identifies hazards or unsafe practices which COULD result in severe personal injury and death.

CAUTION – identifies hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

Warning – Moving Parts

Keep hands and clothing clear of moving parts. Chain Disk can cut and crush.

Severe personal injury will result if the electrical power is not disconnected prior to servicing the unit.

DANGER – ELECTROCUTION HAZARD



Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically states otherwise.

Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electrical codes.

Ground all non-current carrying metal parts to guard against electrical shock. With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.

General Safety Notes

The assembly, installation, and maintenance must be performed by qualified personnel.

- Safety notes and warnings in these instructions and on the system equipment must be followed. Failure to follow specified instructions may cause damage to equipment and/or personal injury or death.
- All components in the GROW-DISK™ chain system must be transported and assembled properly.
- System may only be operated if all the necessary emergency and alarm systems are connected and operational.
- System must be maintained at regular intervals.
- Only manufacturer-approved components and accessories may be operated in conjunction with the system.
- A lockable main switch must be installed between the controls and the main power capable of shutting the system down. It must be ensured that the system cannot be turned on by a third party.
- Before components in the feed system are opened, the chain must have come to a complete stop.
- Work on the feed system may only be carried out with the corresponding safety equipment (work gloves etc.).
- All system parts must be properly grounded to guard against electrical shock.
- The system may only be operated if all components are closed (driving unit, deflector corner pieces, and feed receiving station).
- The system must be switched off immediately if the conveyor chain is blocked.
- In systems with two or more feed bins in a row, only one bin may dispense feed into the feed system.
- The system can be started automatically using the controls. It must be ensured that no persons can reach into dangerous places with their hands.
- The safety equipment may not be switched to inactive.
- The feed system may only be repaired by persons who are authorized by the manufacturer.
- These instructions are to be submitted to the system operator following successful assembly.
- Always wear protective clothing and any applicable Personal Protective Equipment (Safety Glasses and/or Ear Plugs) when working with the equipment.
- Discarded materials, equipment, and boxes should be recycled in accordance with local and national codes.

Note: System is to be wired in accordance with all applicable local and national electrical wiring codes. All wiring sizes and fuse capacities are to be sized according to applicable electrical code specifications or other regulations.

Introduction

Prior to performing any work on Grow-Disk Feed System, read this entire manual. This assembly/operating instructions manual is intended to provide guidelines for the installation of system. Instructions should be considered as recommendations only. Actual installation may vary depending on specific conditions.

Wiring diagrams are included within this manual. Instructions should only be carried out by a qualified technician. This person must have a good understanding of technical issues and drawings in both mechanical and electrical areas.

The system is only suitable for operation in dry areas. System parts that are assembled outside the house must be adequately protected against moisture.

The surfaces on which the system parts are assembled must be able to withstand the static loads.

The feed system is intended for the transportation of feed. Maximum running time of the system may not exceed 4 hours per day.

Only dry feed may be transported in the feed conveyor system (maximum residual moisture = 14%, maximum filling level = 50%). The feed can be floury, crumbly, or in pellets.

Product Overview

The GROW-DISK™ Feed System consist of a drive unit which pulls a chain with nylon disks through tube that distributes feed from a storage bin to animals inside a containment house. The disks have approximately the same diameter as the inside of the tube, therefore is a very efficient conveying system with total clean-out of the tube. This system can be used with multiple configurations because of its capability to go through tight corners. Delivery of feed can be controlled manually or automatically using control units, proximity sensors, and drop kits.

Principle of Operation for the Feed Transportation System

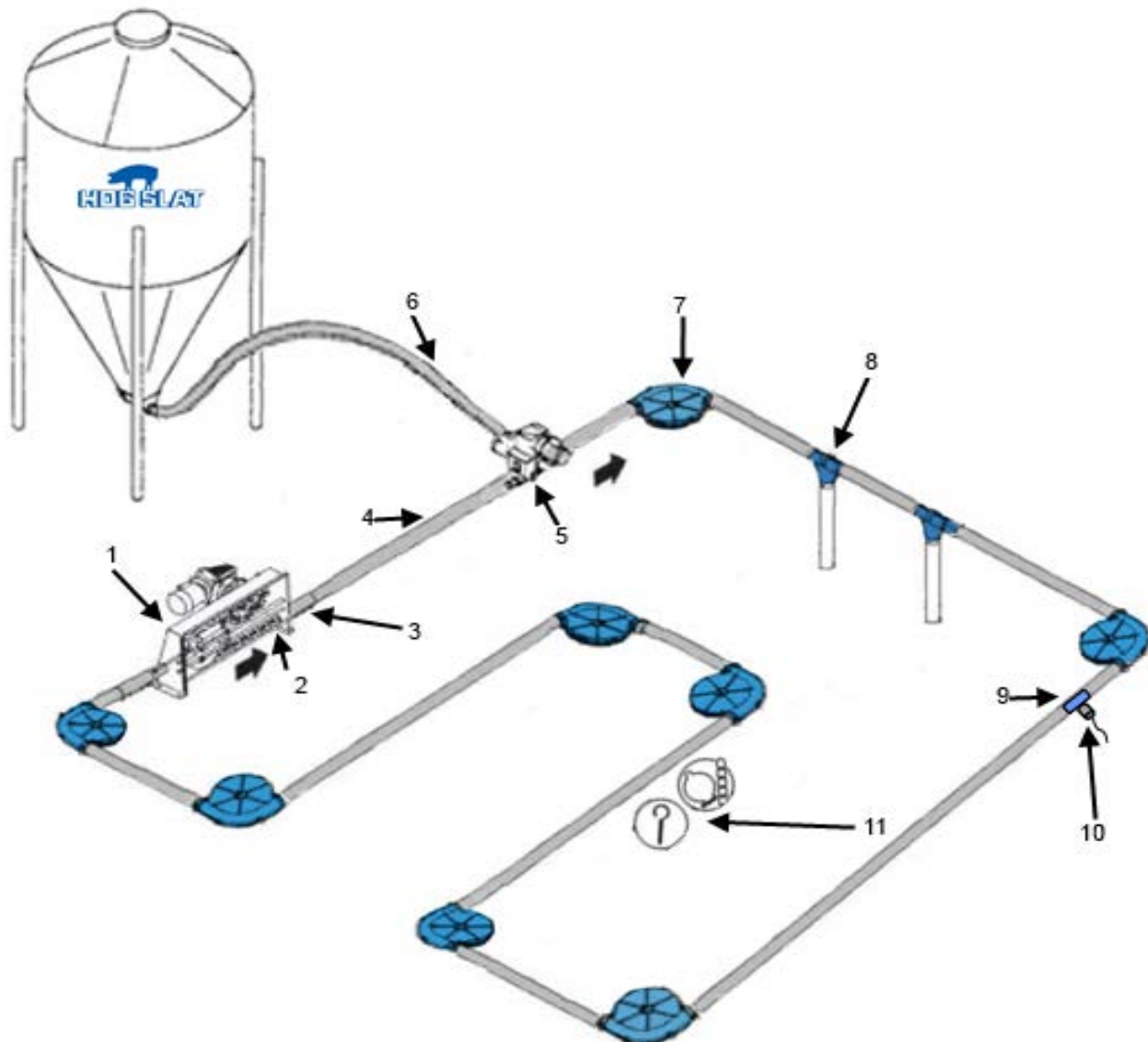


Figure 1.

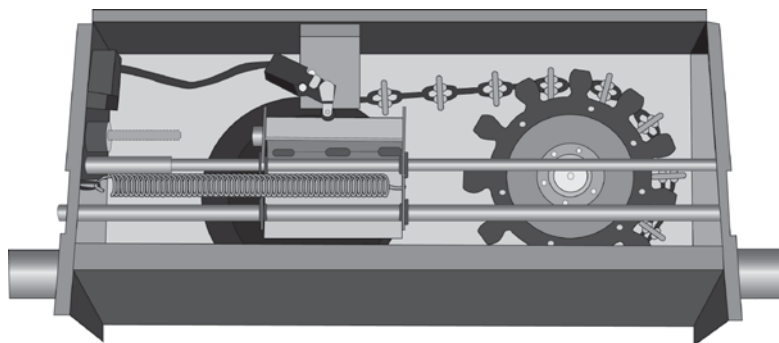
The structure of the system depends on the conditions at the site and must be designed individually. The delivered quantity of corner wheel assemblies (7) and the length of the conveyer tubes (4) are calculated by the seller. The manufacturer must be consulted before any extension of the feed conveyer system with deflector corner pieces (7) and conveyer tubes (4).

The feed transportation system is a closed loop made up of conveyer tubes (4) and deflector corner pieces (7). The feed is distributed to the feed transportation system via the fill hopper. The fill level can be monitored at the conveyer pipe with viewing window (clear tube) if provided. The drive unit (1) pulls a closed conveyer chain (2) through the conveyer tube system. The conveyor chain transports the feed to the feed dispensing stations with drop tubes (8). Depending on the position of the feed dispensers (open or closed), the feed is either let out of the feed transportation system or transported further. The shutdown sensing device located near the last feed dispenser station stops the drive unit so that no feed can be transported past the last feed dispenser station.

Principle of Operation for the Drive Unit

The drive unit is an enclosed stainless steel housing with a spring loaded idler tensioning wheel, a drive sprocket, and a safety shut off switch to shut down the system if it becomes obstructed by a foreign object. The drive unit wheel pulls the conveyer chain out of the conveyer tube system. The guide wheel takes the chain back to the conveyer tube system on the other side of drive unit. Correct chain tension is automatically adjusted by a spring loaded tensioning wheel.

Drive Unit is designed so that if feed enters the drive unit, it is able to carry it back out again. Because of this, the drive unit can be placed anywhere in the system as long as it is accessible and away from potential traffic areas. The best position to locate the drive unit is between the last feeder and the fill hopper. Ideally, the drive unit can be suspended from ceiling but can also be mounted to the floor. The entire drive unit weighs around 200 pounds. If it is suspended, make sure it is mounted properly to avoid structural damage and bodily injury.

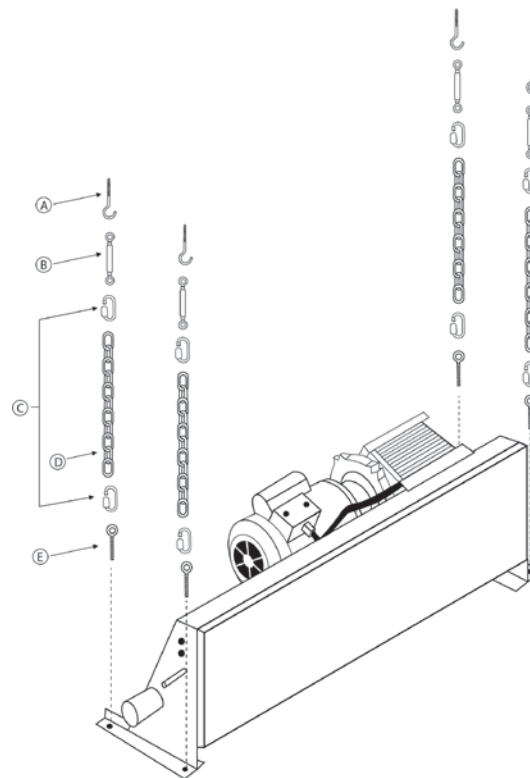


Drive Unit Assembly Requirements

The feed transportation system must be planned and assembled in such a way that it meets all the following conditions.

- Drive Unit must be mounted horizontally and securely. **MUST BE LEVEL WHEN INSTALLED!**
- Assemble Drive Unit so internal components are accessible.
- Conveyer tubes must be mounted horizontally and hung every 5 feet on wall brackets or supports.
- **Caution!** In order to avoid damage to the conveyer chain and contamination of the feed, all burrs and metal shavings created by cutting and drilling must be removed prior to use.
- The Fill Hopper Assembly must be placed on the output side of Drive Unit and mounted horizontally.
- All conveyer tubes must be assembled so the welded joint is at the top.
- Do not assemble any feed dispensers between the Drive Unit and Fill Hopper.
- The connections for the Drive Unit and the Fill Hopper must be aligned with one another.
- Recommended maximum of 24 corner pieces per feed system.
- Conveyer tubes can be laid at a maximum angle of 45°. Greater inclines should be avoided.
- Distance between the corner pieces must be at least 5 feet.
- The turns must be assembled so that the arrow on the guide wheel turns in the direction of transportation.
- Conveyer tubes must be inserted into the corner pieces as far as possible.
- Conveyer tubes must be uncoupled in front of and behind the corner pieces.
- Shutdown sensor must be installed either in or after the last feed dispenser.

Suspension of the Drive Unit



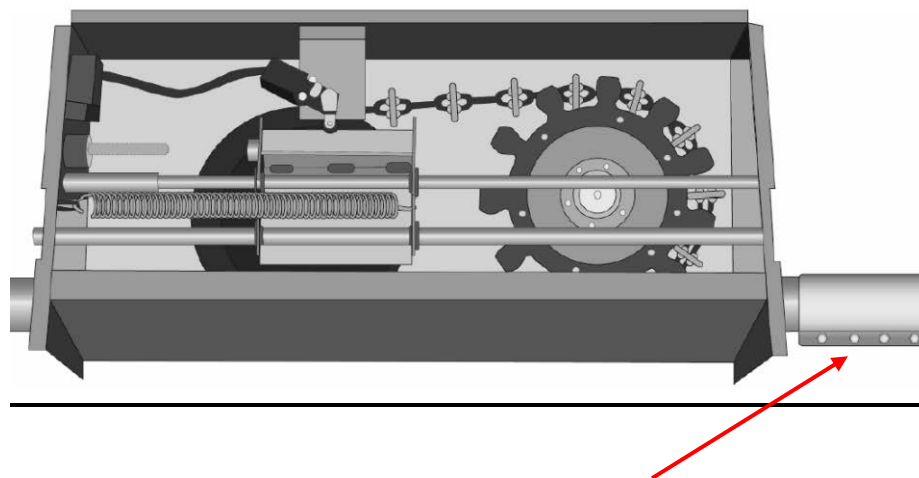
- Screw open eye lag bolts (A) securely into ceiling approximately 32" apart from one another to provide a stable suspension.
- Place turnbuckle (B) onto lag eye bolts in ceiling.
- Connect quick link (C) to turnbuckle and one end of chain (D).
- Place second quick link (C) to chain at approximately the desired height for drive unit.
- Attach eye bolt (E) to drive unit with washer and locknut.
- Connect the second quick link to the eyebolt.
- Level drive unit by re-hooking chain as necessary or by adjusting the turnbuckles in or out.

Drive Unit Installation Parts List

Item	Description	Quantity
A	Open Eye Lag Screws	4
B	Turnbuckle	4
C	Quick Link	8
D	Chain	16 feet
E	Eye Bolt (with nut)	4
	Lock Nuts	4
	Washers	8

Connecting Conveyor Tubes to Drive Unit

- Attach the welded steel tubing so that it butts up to the stainless steel tubing on both the inlet and outlet side of the drive unit.
- Place a steel compression coupler over the welded steel tubing and the inlet/outlet of the drive unit and tighten hardware securely. **Note: Make sure coupler is assembled facing downward as shown below to prevent water from entering during pressure washing.**



Position coupler facing downward

Assembly / Layout of Conveyer Tube

Layout of the tubing is one of the most important steps in the installation of the GROW-DISK™ Feed System. Tubes should be placed in the approximate location where they will be installed. System must be closed looped, sections of tubing can go in any direction, and the change in direction must be 90°. Overlap the tubes where there is to be a corner but do not cut the tubes until all other components are installed. Determine where the drop tubes will be placed. **Note: Make sure that the ends of the tubes do not connect where there is to be a drop kit or other feed dispenser.** If this occurs, one end of the tube must be cut off enough so the coupler will miss the drop kit.

Once the tubing has been laid out, the tubes should be connected in full lengths where possible. Assemble welded steel tubing using steel compression couplers. **Note: Make sure all couplers are facing downward as shown below.**



Installation of Corners

- Remove the top from the corner and remove the fastener kit. Hold the rest of corner in location required to mark the tubes for cutting.
- Cut the tubes so they fully extend into the corner up to the shoulder provided in corner housing.
- Secure the tubes to the corner with the blue clamp straps. Tighten with bolts and nuts at each side.
- All corners remain open until the assembly of the chain has been completed.
- Once the chain has been pulled through the tubes and corners, put washer (spacer) on top of the ball bearing.
- Place the cover on top of corner.
- Position the washers with offset hole into the socket of the covers.
- Place all bolts and nuts and tighten them by hand to hold the cover in position.
- Check the position of the tubes before tightening nuts crosswise with wrench. **Note: Do not over tighten.**



Assembled Corner

Drop Kit Installation

HS660S Model 60 Drop Adaptor – Straight Chain Disk

General Installation Notes:

Make sure that power is disconnected from system prior to servicing.

Installation of this equipment and related OEM equipment should be in accordance with these instructions, OEM's installation instructions and local codes (if applicable). Failure to follow specified instructions may cause damage to equipment and/or personal injury or death.

Take special note of any Warnings or Safety Decals on the equipment and in manuals.

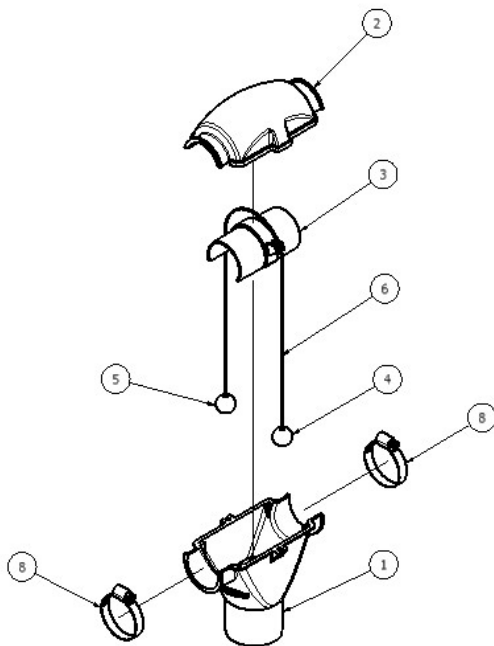
Always wear protective clothing and any applicable Personal Protective Equipment (Safety Glasses and/or Ear Plugs) when working with the equipment.

Discarded materials, equipment and boxes should be recycled in accordance with local and national codes.

Unless otherwise specified, all Feed Delivery Systems (Diameters) are installed similarly.

Overview:

The GrowerSELECT HS660S Feed Line Drop Adaptor is designed to allow the transfer of feed from a feed line or Feed Delivery System into a gravity Drop Tube at desired location along the Feed Delivery System. They are to be used only with 2.375" diameter chain disk tubes.

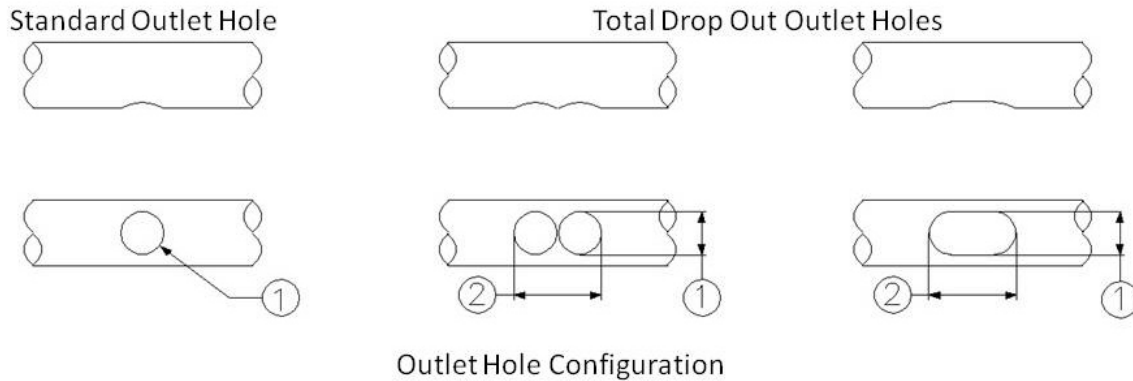


GrowerSELECT Part		
Item	Name	HS660S
1	Outlet Adaptor	*
2	Cover	*
3	Shutoff	*
4	Green Ball	HS655-5
5	Red Ball	HS655-6
6	Rope	----
8	Clamp	HSHC-36

* Not Sold Separately

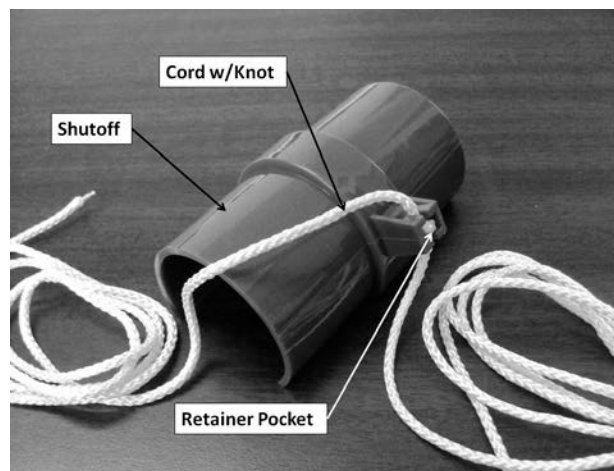
Installation

1. Determine the desired location for the Outlet Drop. Use a hole saw or uni-bit to drill outlet holes. All burrs should be removed after cutting so drop will perform properly. This is important on chain disk system as to not damage the chain disks or drop adapter. Reference Figures and Charts below.

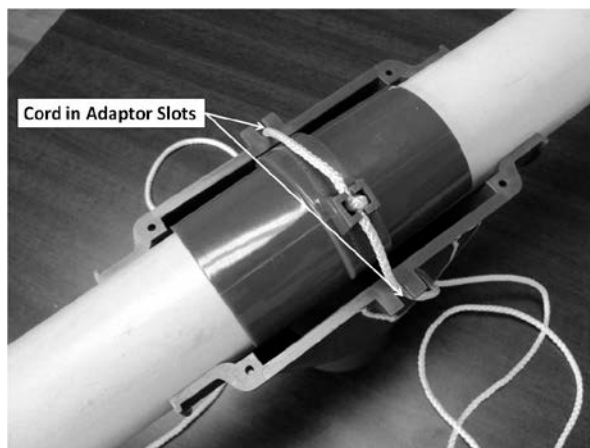


Model	Item 1	Item 2
60	1-3/8" Dia. (35 mm)	n/a

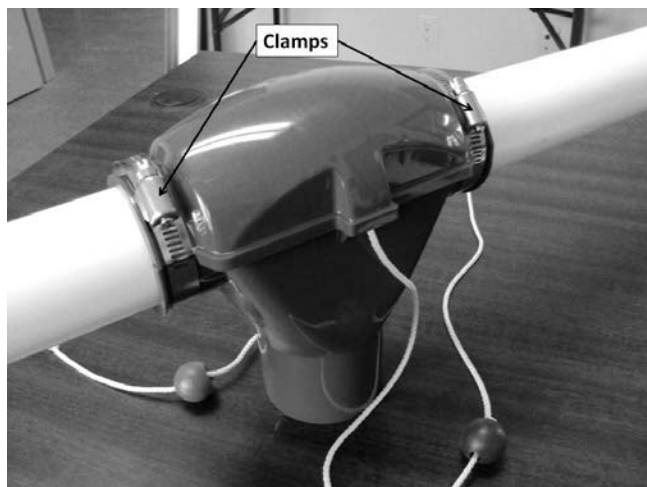
2. Tie an overhand knot in Cord provided located at center of Cord length. Assemble Cord with Knot into retainer pocket of the Shutoff making sure that cord is fully seated in slots.



3. Snap the Shutoff Assembly with Cord on the metal tubing of previously drilled or cut Outlet Hole.
4. Assemble (snap) the Outlet Adapter onto the metal tubing under the Shutoff Assembly over the Outlet Hole. Outlet Adapter should remain in place.
5. Tie a knot in center of cord and position knot into Shutoff Assembly as shown below. Place cord in slots of Outlet Adapter. Assemble Cover to top of Outlet Adapter over Shutoff Assy.



6. Assemble supplied Clamps on each end of Outlet Assembly as shown to prevent sliding and rotation. Make sure the entire Outlet Drop is centered over the Outlet Hole. Adjust Outlet drop for proper downward orientation and tighten Clamps to hold in place. **Note: Make sure that Cords are still in guide slots and move freely prior to tightening Clamps.**



7. Determine the appropriate length of Cord needed to ensure greatest ease of actuation. Assemble Indicator Balls on the Cord ends and knot each end of Cord so the Indicator Balls will not pull off. Green Indicator Ball should be assembled to end of Cord closest to retainer pocket of Shutoff or the "Open" position. Check by looking up through the Adapter opening. Check for proper function by using Indicator Balls to open and close Outlet Drop.

Grow-Flex Fill System Installation

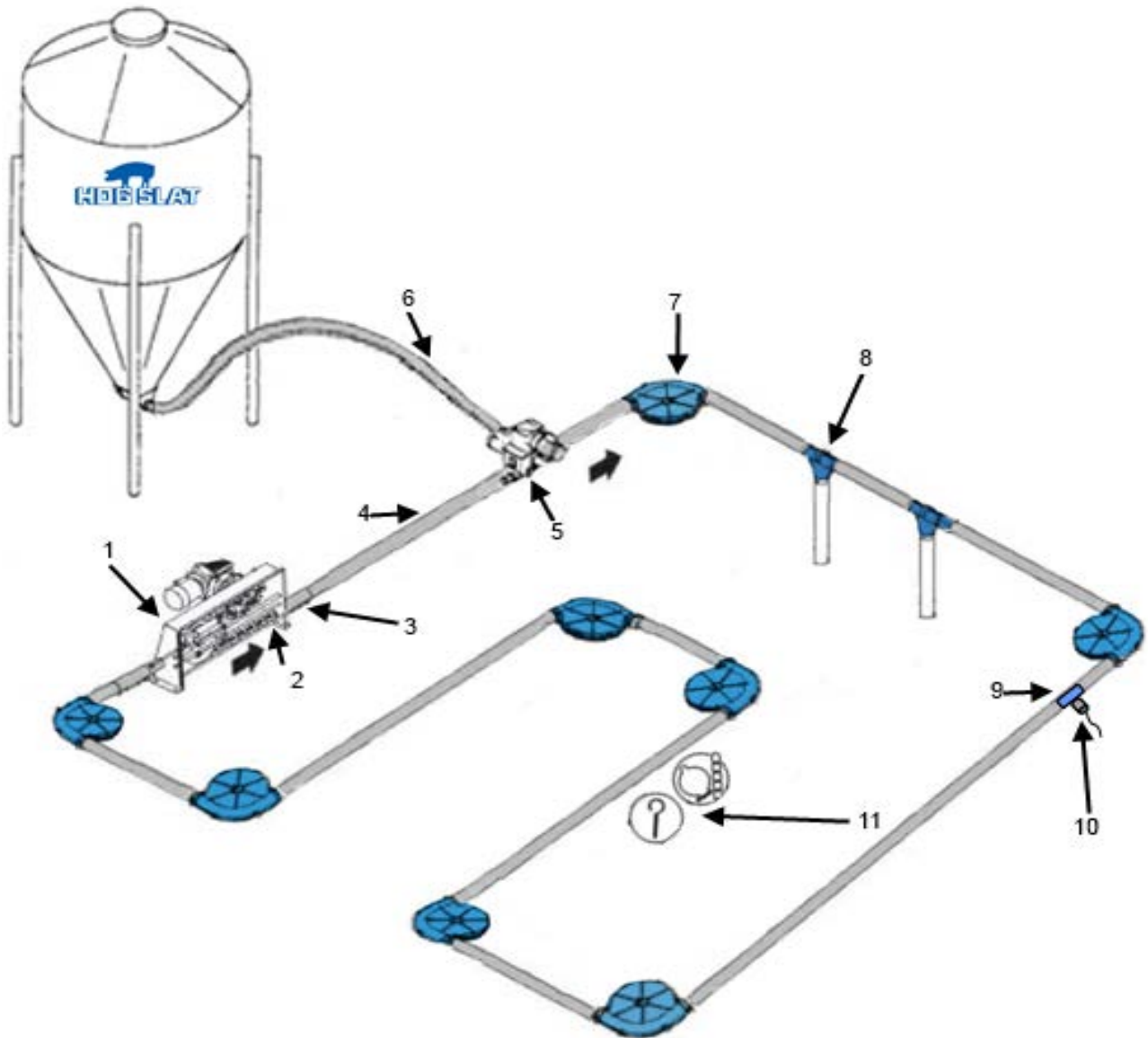


Diagram above shows an example of a Chain Disk system including a Grow-Flex feed auger system. The auger system must be used to transport feed from the bulk feed tank to the Grow-Disk system inside the containment house. In colder climates, the Grow-Disk system can possibly lock up when used outside due to freezing temperatures whereas the Grow-Flex auger system can break up loose frozen feed for delivery.

Design Specifications

Table below shows the maximum fill system rate for different chain disk system effective lengths and the corresponding Grow-Flex gearbox to deliver that rate. Refer to Grow-Flex Feed System Manual (Hog Slat part # HSMANUAL-020) for proper installation of the Grow-Flex Feed System. The Grow-Flex system can be installed either parallel or perpendicular to the Grow-Disk chain system.

Chain Disk Tube	Recommended Applications	System must not exceed any of these four (4) design criteria.				Grow-Flex Fill System	Effective Length (feet)	Effective Capacity (lbs/min)
		Max. Corners	Max. Chain (feet)	Max. Effective Length (Feet)	Max. Daily Run Time			
2.375" O.D. Welded Tube	Breeding & Gestation	24	1900	2000	4 Hours per day	Model 75 @ 256 RPM (35 lbs/min)	Up to 1500	35
							1500 - 1750	30
							1750 - 2000	25
	Finishing					Model 75 @ 352 RPM (50 lbs/min)	Up to 1000	50
							1000 - 1250	45
							1250 - 1500	40
							1500 - 1750	35
							1750 - 2000	30

Effective Length = Total feet of Grow-Disk chain + (number of corners X 25 feet)
 (Example: 1000 feet of tubing + (12 corners X 25 feet) = 1300 Effective Feet)

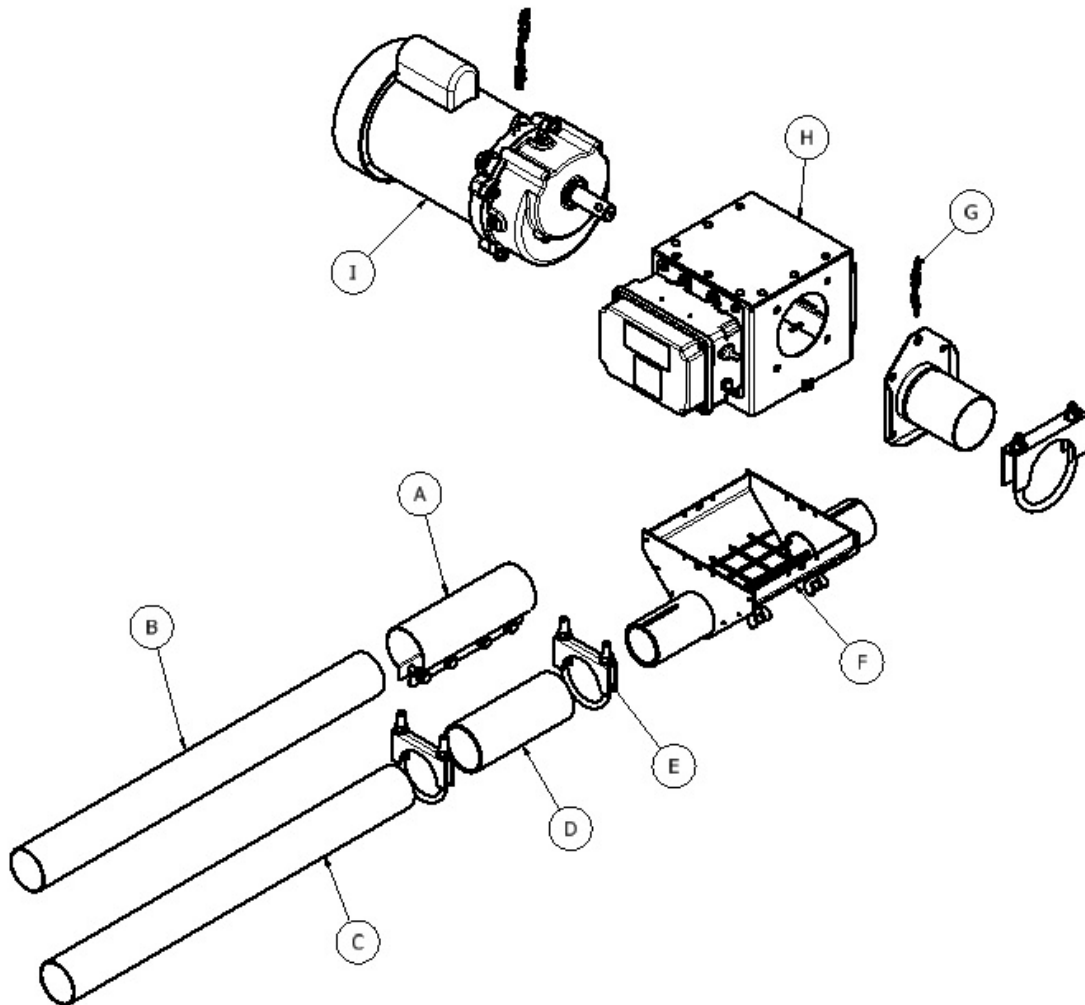
Daily Run Time = Maximum daily feed requirement divided by "Effective Capacity"

Effective Capacity is the estimated actual fill rate of the system when adjusted for the cycling of the Grow-Flex system by the Grow-Disk controller's current sensor to prevent system overload.

Pellet size maximum diameter is 1/8" and length cannot exceed 3/8".

Fill Hopper Installation

Attach fill hopper to the Grow-Flex™ control unit assembly. Adjust the suspension height of the control unit until fill hopper is in line with tubing.



Item #	Description
A	Steel Compression Coupling
B	Welded Steel Pipe
C	PVC Tube
D	PVC Coupler
E	Saddle Clamp
F	Chain Disk Fill Hopper
G	Suspension Chain
H	Grow-Flex Control Unit
I	Grow-Flex Power Unit

Wiring Instructions

HS693 Feed Line Control Unit – 230V Single Phase

General Installation Notes:

Make sure that power is disconnected from system prior to servicing.

Installation of this equipment and related OEM equipment should be in accordance with these instructions, OEM's installation instructions and local codes (if applicable). Failure to follow specified instructions may cause damage to equipment and/or personal injury or death.

Take special note of any Warnings or Safety Decals on the equipment and in manuals.

Always wear protective clothing and any applicable Personal Protective Equipment (Safety Glasses and/or Ear Plugs) when working with the equipment.

Discarded materials, equipment and boxes should be recycled in accordance with local and national codes.

Unless otherwise specified, all Feed Delivery Systems (Diameters) are installed similarly.

Note: Control Unit Switch Assembly is to be wired in accordance with all applicable local and national electrical wiring codes. All wiring sizes and fuse capacities are to be sized according to applicable electrical code specifications or other regulations.

Safety Instructions:

Read all safety messages in this manual and on equipment safety decals. Follow recommended precautions and safe operating practices.

Ground all electrical equipment for safety.

Ground all non-current carrying metal parts to guard against electrical shock.

Always keep safety decals in good condition and replace missing or damaged decals.

Overview:

The HS693 Control Unit is designed for use with a flexible auger feed system where control of an auger drive motor is required. Power to the auger drive motor is done through feed pressure being applied to a diaphragm coupled to an electrical switch internal to the control unit housing. This switch in conjunction with a multi pole relay is used to control the auger drive motor by turning off the power when feed is present and turning on the power when feed has been removed from the control unit housing. Auxiliary switch inputs provide a series circuit that allows the Control Unit Switch Assembly to be controlled by a variety of methods including hopper level, drop tube, proximity and various other control devices found in feed systems. **(Hopper is not used on when attaching to chain disk system. Use screws to attach to the fill hopper assembly).**

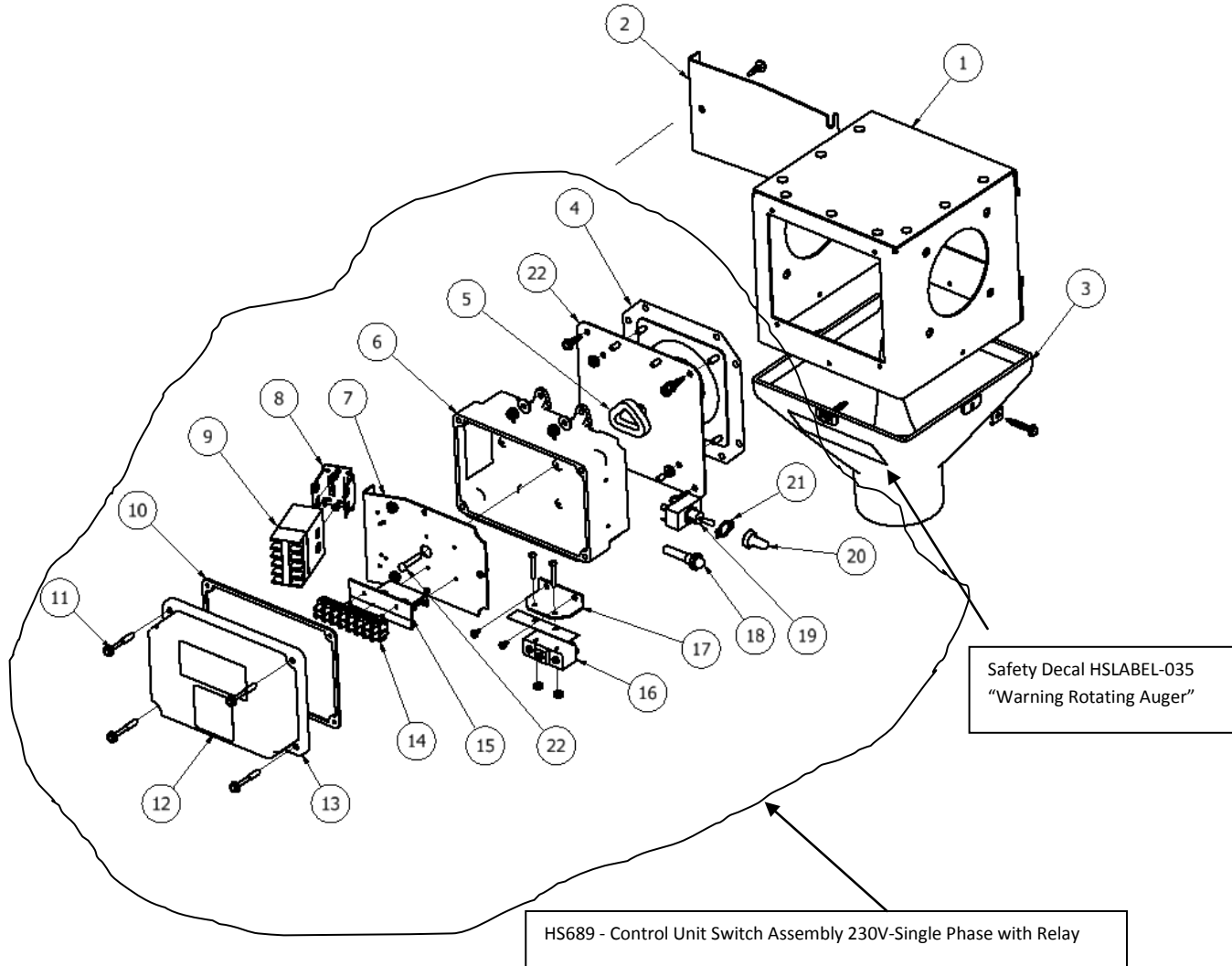
The sensitivity of the electrical switch is not adjustable.

ELECTRICAL RATING : 1 ½ HP @ 230VAC MAX, 1 PHASE

A red indicator light on the side of the switch housing will illuminate when the diaphragm has been pressed (MOTOR OFF) and the switch has been activated.

The ON/OFF switch is used to enable or disable the Control Unit. **DO NOT USE THIS SWITCH AS DISCONNECTING MEANS FOR SERVICING.**

HS693 Feed Line Control Unit



Parts List of serviceable components

REF #	PART #	DESCRIPTION	REF #	PART #	DESCRIPTION
1	HS590-1	ASSEMBLY HOPPER	12	HSLABEL-008	WARNING- SHOCK HAZARD DECAL
2	HS590-11	ACCESS GATE	13	HS589-2	COVER, SWITCH HOUSING
3	HS591	DROP CONE - CLARIFIED PLASTIC	14	EL1161	TERMINAL STRIP 8 POSITION 10 AWG MAX
4	HS582	DIAPHRAGM ASSEMBLY	15	HS689-6	BRACKET, TERMINAL MOUNT OFFSET
5	HS529-45	PLUNGER SEAL	16	EL1052M	SNAP ACTION 20A @ 250VAC SWITCH
6	HS589-1	BOX, SWITCH HOUSING	17	HS589-5	SWITCH MOUNT
7	HS589-4	COMPONENT MOUNT PLATE	18	EL1079	INDICATOR LAMP, RED, 250 VAC
8	EL1081	RELAY BRACKET	19	EL1011	SWITCH, TOGGLE DPST, 20A @ 250V, 1 ½ HP
9	EL1080	RELAY, MULTIPOLE, NO 208-240V, 25A	20	EL1083	TOGGLE SWITCH BOOT COVER
10	HS589-3	GASKET	21	EL1082	LEGEND PLATE
11	60932	SCREW #10-16 x 1-1/4" SS	22	HS589-6	SWITCH PIN

Installation:

1. (Figure 1) Illustrates a typical installation example of the HS693 Control Unit. **(The hopper will not be used.)**
 - a. Mount tube anchor to one side using (4) 5/16" x 3/4" bolts with (4) flat washers.
 - b. Mount auger power drive unit gear box secured with (4) 5/16" x 3/4" bolts and (4) flat washers.

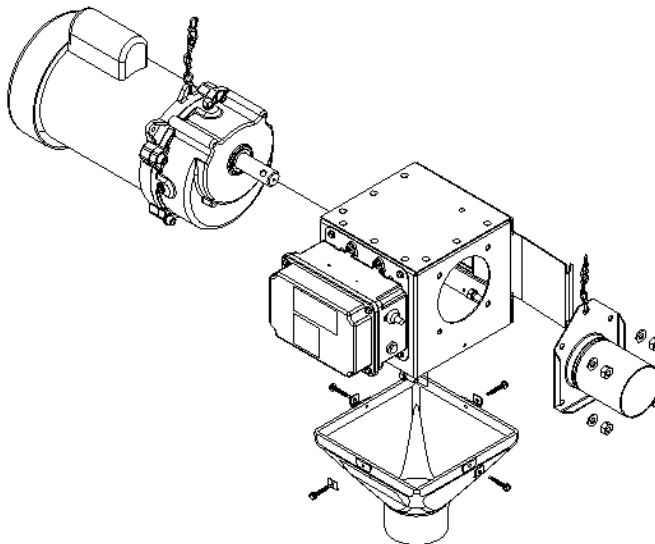
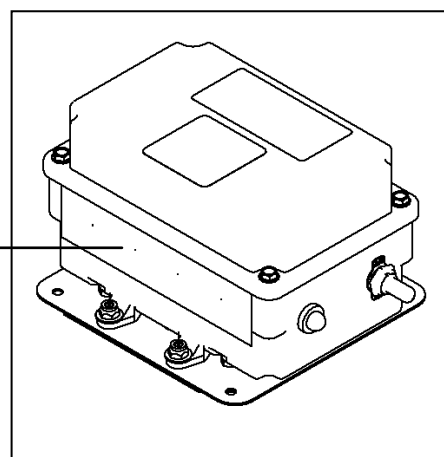
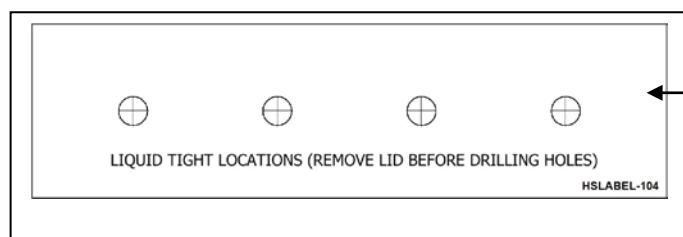
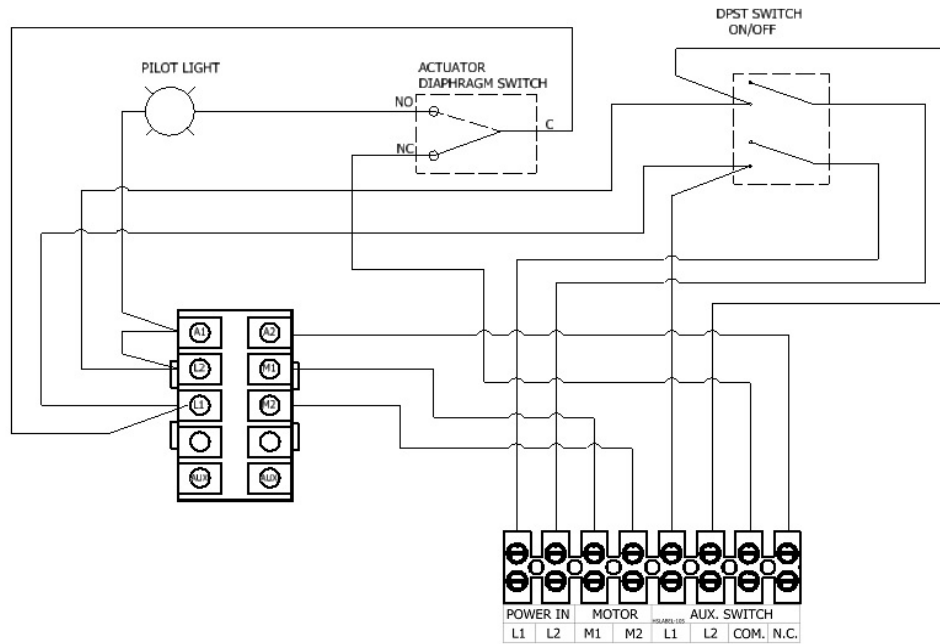


FIGURE 1

2. The HS693 Control Unit must be hardwired. See (Figure 2) for factory wiring diagram.
3. When using external control switches such as a **Hopper Level Control Switch**, switch should be wired as "Normally Closed" contact.
4. A jumper wire between "COM" and "N.C." at the AUX. SWITCH input terminal is provided. Leave in place if no external control switch is to be used.
5. A temporary drill template is affixed on the outside of the enclosure indicating where to install up to (4) 1/2" non-metallic liquid tight strain relief cord connectors. Location of template provides bottom entry into the enclosure and allowing sufficient clearance to internal components. Care should be taken (including removing enclosure lid /cover) when drilling holes to ensure no internal components are damaged during drilling. **DO NOT USE RIGID CONDUIT.**



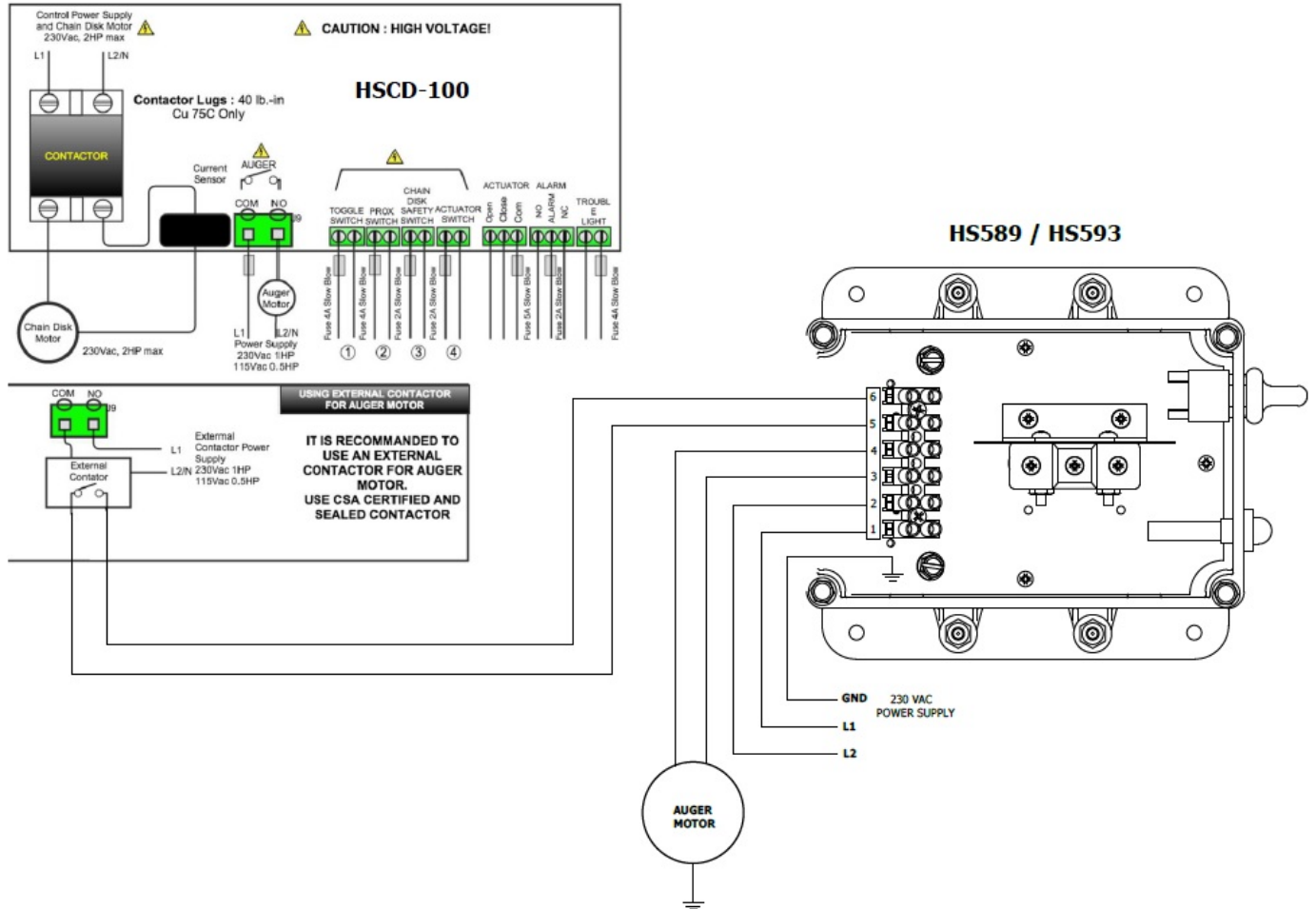
FACTORY WIRING DIAGRAM – FIGURE 2



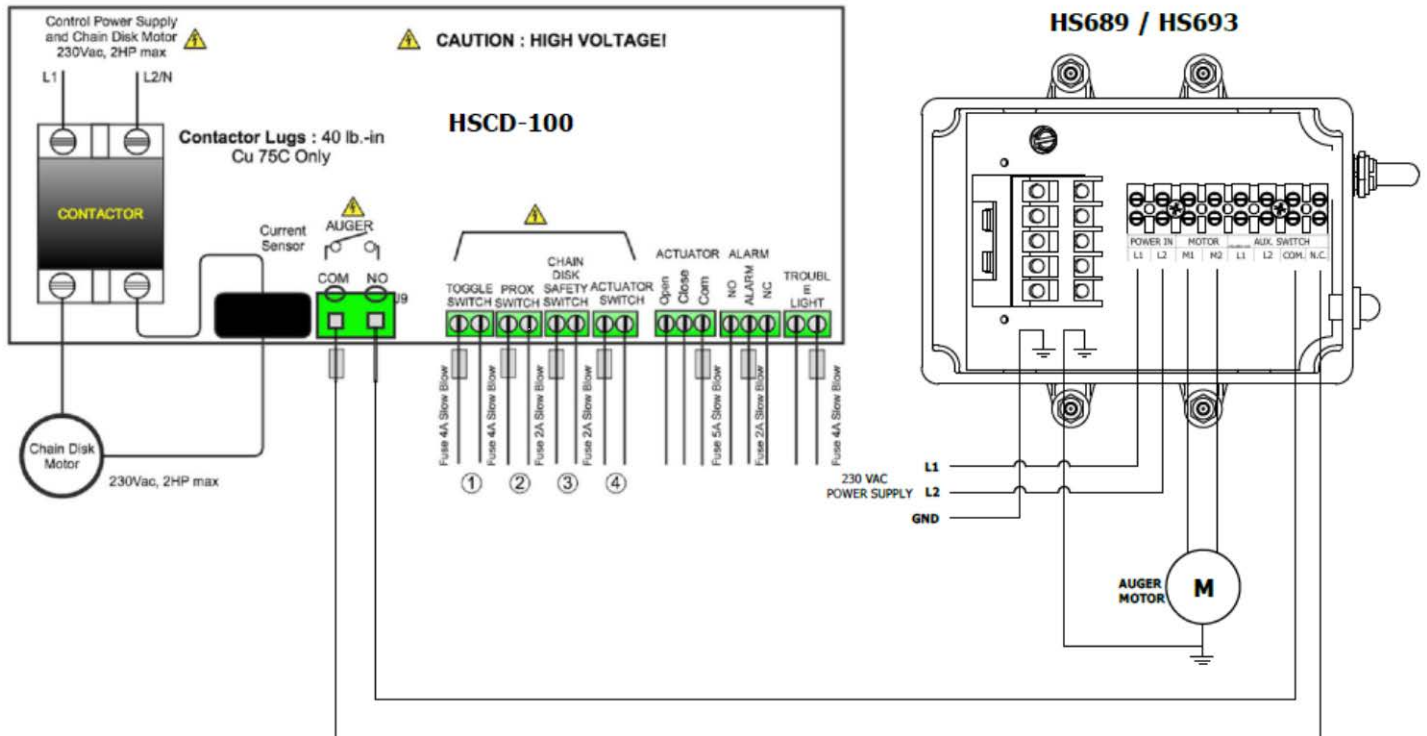
HSCD-100 System Controller

The HSCD-100 is a livestock feed system controller used to control a chain disk and auger motor with feed drop tubes. The user can define up to 12 feed cycle start and dump times over the course of a normal day. A proxy switch is used to detect feed in the last drop tube or at the end of the feed line. A toggle switch can be connected to manually stop the system without generating an alarm. The system features a current sensor input used for overload protection on the feeding system.

Wiring Diagram - HS593 to HSCD-100



Wiring Diagram - HS693 to HSCD-100

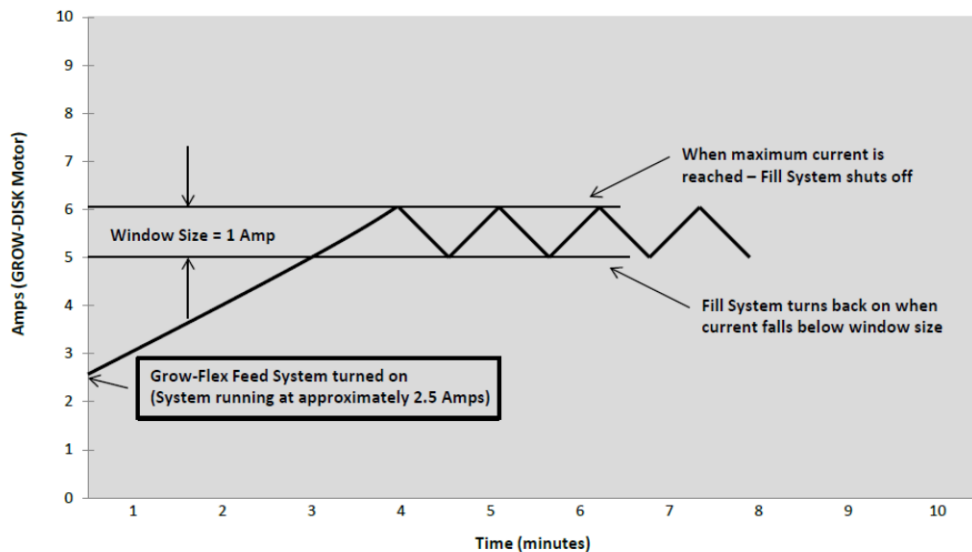


HSCD-100 Current Sensor

The Grow-Disk chain disk system can over fill if the Grow-Flex feed system’s capacity is greater than the capacity of the Grow-Disk system. Overfilling will overload the Grow-Disk motor causing the thermal overload switch to kick out and/or premature motor failure. To prevent this from occurring, a current sensor has been installed on the Grow-Disk HSCD-100 Controller circuit board. This current sensor monitors the amp draw of the Chain Disk motor and controls a relay which is wired to the fill system. If the amperage reaches the maximum point of a specified range, it will temporarily turn off the fill system. As the Chain Disk system continues to empty itself the amp draw will decrease steadily. If the amperage reaches the minimum point of a specific range the current sensor will turn the fill system back on. This ON/OFF cycling of the fill system will occur every few minutes until the Grow-Disk system is full. At this time, both the chain disk system and the fill system will shut off. **Critical amp setting on Controller should be 2 amps over maximum current sensor setting.** When this critical value is exceeded on the motor load, the system is shut down and the controller goes into alarm mode.

Grow-Disk Controller Current Sensor Settings

Grow-Disk Motor	Voltage	Recommended # of Loops through Current Sensor	Recommended Window Size	Recommended Maximum Current Sensor Setting
Single Phase, 60 Hz	208-230	1	1.0	6.0
Single Phase, 50 Hz	190-230	1	1.0	6.0
Three Phase, 60 Hz	208-230	2	1.5	8.0
	460	3	1.0	6.0
Three Phase, 50 Hz	190	2	1.5	9.0
	230	2	1.5	8.0
	380	3	1.0	7.0



Graphical Illustration of Current Sensor Operation for Typical Feed System

Drive Unit Safety Switch

The safety switch is located inside the Drive Unit as shown below. The switch can be activated in either direction by a bracket which is attached to the idler wheel. If either side of the bracket (caused by chain being too long or too short) comes in contact with the limit switch, it will shut the system down. It will also shut down if the chain or spring breaks or if a foreign object gets hung in system. Disconnect power and locate problem before attempting to reactivate the system. Once the problem has been corrected, pull the blue reset button on the safety switch and reset the HSCD-100 Controller.

Location of Safety Switch with Blue reset button



**Position of Safety Switch should be installed approximately
2" from left side of bracket as shown above.**

Chain Installation

Caution: To prevent damage, the chain disk must not be twisted when it is installed.

1. Remove chain from bag.
2. Lay the entire length of chain out straight. **Note: remove any kinks or knots.**
3. Place end of chain at one end of the drive unit.
4. At the end of the conveyer tube, push a cable/wire through the tube until it comes out into the drive unit.
5. Connect the end section of chain to the cable/wire.
6. Pull the section of chain disk through the tubing to the first corner piece. If the section of tubing is longer than the section of chain, use more than one section of chain and connect them together using a chain coupler. To easily identify the chain coupler for maintenance purposes, mark the coupler with color adhesive tape.
7. Go to the other end of the next section of tubing and start pushing the cable/wire through the tube until it comes out this end of tubing.
8. Connect one end of a new section of chain to the cable/wire and pull the chain through section of tubing.
9. Connect the 2 sections of chains together with the chain coupler and wrap tape around coupler as shown below for identification purposes.



Coupler



Chain sections attached with Coupler



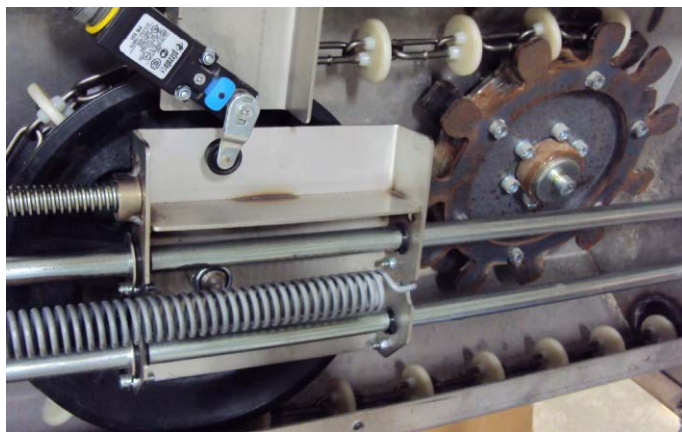
Tape wrapped on Coupler



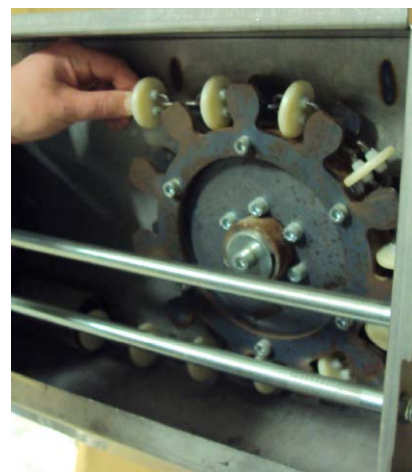
Incorrect way to connect chain to Coupler

10. Pull on the chain and disks until all the slack has been removed from both sections.
11. Connect the sections of tubing together.
12. Connections of chain and disk can be assembled at the corners also.

13. Repeat these steps until remaining sections and corners have been connected.
14. Adjust the tensioning bolt inward on drive unit as far as possible towards the drive sprocket. This will allow the idler tensioning wheel to get close to the drive sprocket for tightening chain after assembled.
15. Wrap one end of the chain around the idler wheel and the other end of chain onto the drive sprocket.

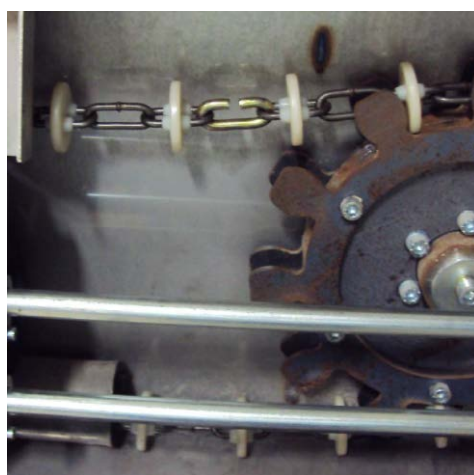


Idler Wheel



Drive Sprocket

16. Position the Safety Switch approximately 2 inches from the left side of bracket. This will prevent the initial startup movement from causing an erroneous activation of switch due to any slack in chain or stretching of chain.
17. Cut the ends of each chain so that the connection can be made in a convenient location.
18. Connect the ends with chain coupler and mark with color adhesive tape for easy identification.



Chain coupler attaching both ends of chain

19. Readjust the tensioning bolt all the way back out so the Safety Switch bracket is capable of floating freely.
20. Place cover on drive unit and secure.

Initial Operation/ Start Up



Only qualified and trained personnel are allowed to make the electrical connections. To prevent injuries, the feed transportation system must be isolated from the power system. The system must be safeguarded against accidental restart. **Caution: Drive wheel must come to a complete stop, before opening any drive units.**

- Run the system for 10 -15 seconds.
- Check to make sure drive sprocket is turning counterclockwise as viewed from inside the drive unit. If not, rewire the motor connections according to the wiring diagram on the motor.
- Disconnect all electrical power.
- Check the safety switch with reset button on the control system. Verify the switch is not contacting the limit switch tab. During the breaking-in period of the chain and disks, the chain will stretch causing the limit switch tab to move and eventually hitting the switch and shutting down the unit. Remove necessary links of chain to take out slack.
- Reconnect power to system.
- Conduct another test run and verify chain has not stretched. If not, system is now ready for operation.

HS11 Feed Sensor

Specifications:

Operating Voltage: 20-250 VAC/DC

Frequency: 50-60 Hz

Output Current max: 330 mA

Sensitivity: 3/32"-.3/4" [2...20mm]

Ambient Operating Temperature: -13°F-+158°F [-25...+70°C]

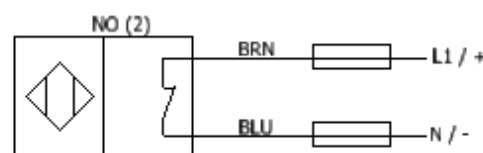
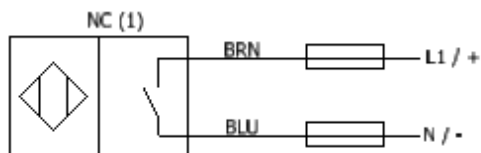
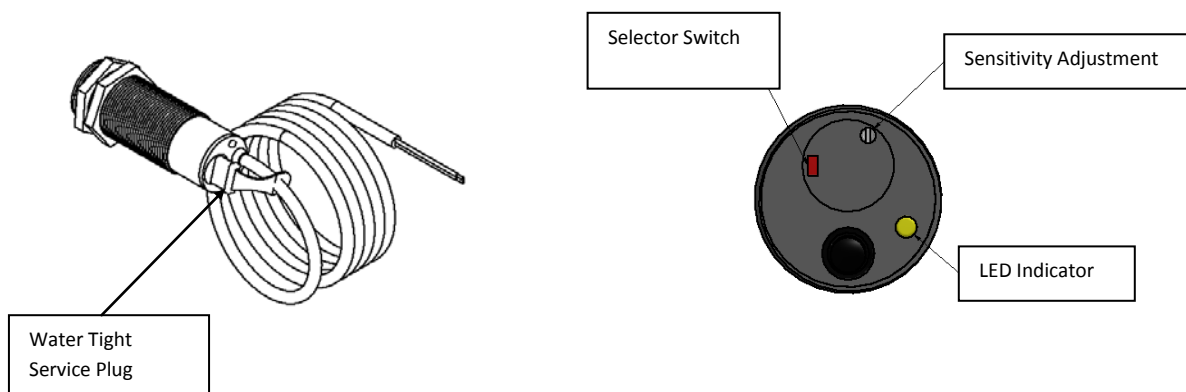
Cord: Length= 6' [2m] 2 x .75mm²

The HS11 Feed Sensor is used to signal the chain disk system controller when the feed system is full and to shut off the chain disk system drive unit. The HS11 is mounted in the chain disk feed tube after the last drop or mounted in the last drop tube depending upon application.

These instructions are a guideline for installation of the GrowerSelect Chain Disk System Feed Sensor (2) wire (Current Robbing) application for use with GrowerSelect Chain Disk Controllers and other Controllers utilizing (2) wire proximity switch inputs non-time delay. In all cases, the OEM (Original Equipment Manufacturer) wiring instructions should be followed if possible when connecting the HS11 to controller inputs.

It is in no way to be used to violate or supersede local, state and national wiring codes. All wiring sizes and fuse capacities are to be sized according to national electrical code specifications or other applicable regulations.

Feed sensor switch is switchable from Normally Open (NO) to Normally Closed (NC) depending upon application. Sensor is factory set to NO.



For the purpose of installation:

- **NO** (Normally Open) is defined as contacts open with power supply connected to Feed Sensor and no product in contact with sensor.
- **NC** (Normally Closed) defined as contacts closed with power supply connected to Feed Sensor and no product in contact with sensor.

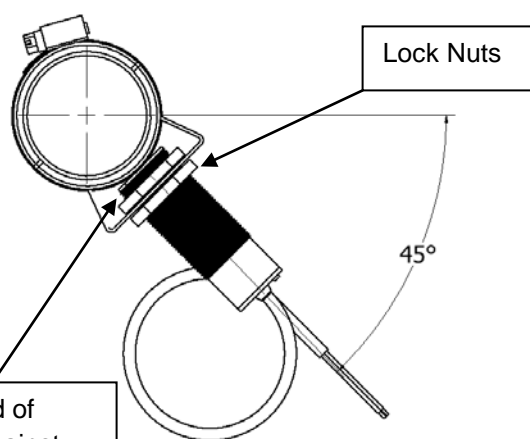
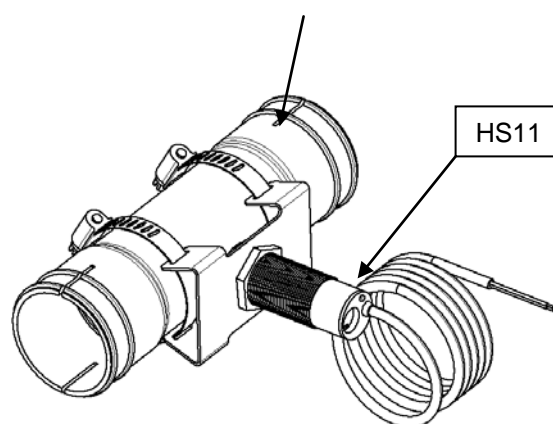
Mounting:

Sensor should be installed consistent with existing sensor mounting if used as replacement or other suitable mount using the supplied locking nuts.

For installation in a chain disk feed tube, mount sensor to tube bracket as illustrated in **Figure 1** and **Figure 2**. Sensor is supplied with (2) lock nuts. Thread one lock nut onto sensor about 1-2" from the end of the sensor. Place end of sensor through bracket and thread on second lock nut. Position sensor until end of sensors is touching the clear tube. Secure sensor by tightening the lock nuts on each side of the mounting bracket.

Position sensor bracket so that it is angled downward approximately 45 degrees to ensure feed detection.

Sensor location should be over clear section of chain disk tube

**FIGURE 1****FIGURE 2****Adjustment:**

Make sure there is no feed in the clear section of tube and there is not a disk section of the chain directly in front of the sensor.

For Normally Open (NO) Sensor Set-up:

1. Turn ON power to chain disk system controller so that Feed Sensor switch is powered.
2. Remove water tight service plug from back of sensor to reveal "sensitivity adjustment".
3. If LED indicator is *not illuminated*, turn sensitivity adjustment CLOCKWISE until the LED indicator comes ON. Then turn sensitivity adjustment COUNTERCLOCKWISE until LED indicator is fully OFF (not blinking).
4. To set sensitivity, place index finger on tubing 1/4" away from edge of sensor. **See Figure 3** Adjust sensitivity until LED indicator is ON.
5. With the chain disk running past the Feed Sensor and no feed in the chain disk tube, the LED indicator may blink as the disks pass by which is acceptable but should not be ON solid as this would indicate the sensitivity is too high and would send false detection signal to the controller. Turn sensitivity adjustment slowly COUNTERCLOCKWISE until the LED indicator is not ON solid while the disks pass by.
6. Further adjustment of the sensitivity may be required once system contains feed. If further adjustment is required, simply turn sensitivity adjustment CLOCKWISE to detect objects farther away from the sensor (more sensitive) or COUNTERCLOCKWISE to detect objects closer to the sensor (less sensitive).

Place index figure in this location. Keep fist together and only extend index finger to prevent false reading.

Keep area around sensor clear while performing this set up.

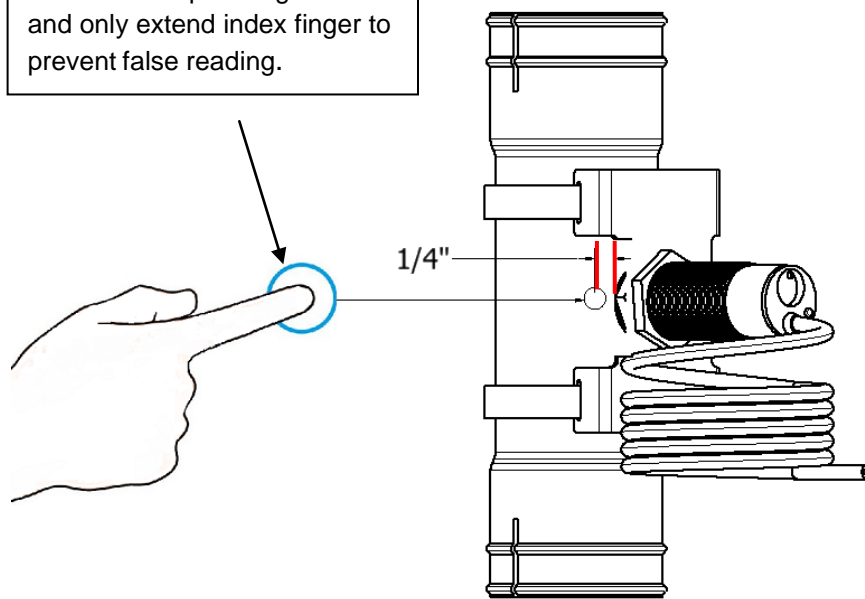


FIGURE 3

For Normally Closed (NC) Sensor Set-up:

1. Turn ON power to chain disk system controller so that the Feed Sensor switch is powered.
2. Remove water tight service plug from back of sensor to reveal "sensitivity adjustment".
3. If LED indicator is *illuminated*, turn sensitivity adjustment CLOCKWISE until the LED indicator goes OFF. Then turn sensitivity adjustment COUNTERCLOCKWISE until LED indicator is fully ON (not blinking).
4. To set sensitivity, place index finger on tubing 1/4" away from edge of sensor. **See Figure 3.** Adjust sensitivity until LED indicator is OFF.
5. With the chain disk running past the Feed Sensor and no feed in the chain disk tube, the LED indicator may blink as the disks pass by which is acceptable but should not be OFF solid as this would indicate the sensitivity is too high and would send false detection signal to the controller. Turn sensitivity adjustment slowly COUNTERCLOCKWISE until the LED indicator is not OFF solid while the disks pass by.
6. Further adjustment of the sensitivity may be required once system contains feed. If further adjustment is required, simply turn sensitivity adjustment CLOCKWISE to detect objects farther away from the sensor (more sensitive) or COUNTERCLOCKWISE to detect objects closer to the sensor (less sensitive).

Maintenance



Caution: Always disconnect power before performing maintenance on system.

- Remove feed residue from drive unit at least once a month.
- Check chain tension twice a month. If required, remove necessary chain links and readjust tensioning bolt.
- Check corner pieces every 6 months. Remove feed residue. Confirm that idler wheel can be turned easily. Verify tubes are inserted into corners as far as possible.
- Remove dust from the drive unit ventilator every 6 months.
- Check functioning of safety switch with the reset button every 6 months.
- Check functionality of proximity switch at feed dispensers every 6 months.
- Check any other safety devices or sensors connected to system every 6 months.
- Check to verify idler wheel and drive sprocket every 12 months for wear.
- Check system wiring every 12 months for damage.

Safety Switch Inspection

- Disconnect power and remove drive unit cover.
- Move safety switch roller in one direction so that safety switch is activated and blue reset button is tripped.





- Replace cover and turn power back on.
- Put the HSCD-100 Controller into the manual start position. If alarm indication is displayed, then safety switch is working properly. If not, disconnect power, inspect wiring and safety switch, and replace if necessary.
- Turn power back off, remove cover, and pull blue reset button out to normal position.
- Replace cover, power unit back on, turn the Controller to manual stop, and acknowledge alarm on Controller is off.
- System is ready for normal operation.

Troubleshooting

Problem	Possible Cause	Corrective Action
Drive unit motor will not run.	Motor will not run.	Check wiring, fuses, and switches on equipment.
	Safety switch activated in drive unit.	Refer to Safety switch section.
	Motor thermal overload switch activated	Check motor overload reset
Motor overloads after running briefly	Low voltage (motor runs slow & overheats)	Check line voltage at motor; confirm appropriate wire size
	Foreign object stuck in chain	Remove foreign object
	System too full with feed	Check fill system rate, check proximity switch
	Wet feed being transported or allowed to stand in system	Clean system; avoid transporting wet feed or empty line after each feeding
	Defective motor	Replace motor
Safety switch activated	Chain in system not tight enough	Remove sections of chain; reset limit switch
	Chain has broken in system	Repair broken section and reattach with chain coupler; reset Safety switch
	Foreign object in system	Remove foreign object; reset Safety switch
	System too full with feed	Check fill system rate; reset Safety switch
Drive unit motor does not shut off when full	Proximity switch sensitivity not adjusted properly (Not sensitive enough)	Adjust sensitivity
Drive unit motor always shuts off immediately after proximity by-pass time	Proximity switch sensitivity not adjusted properly (Too sensitive)	Adjust sensitivity

Grower Select Chain Feeding Components / Parts List

<p>WL10022012</p>	<p>Drive Unit SS AISI 304 For Chain Feeding Includes Gear Box (Does not include motor – BM996 required)</p>	
<p>HSCD-301</p>	<p>Gear Box for Drive Unit</p>	
<p>BM996</p>	<p>1.1 KW Motor for Chain Disk, 60 HZ, 1725 RPM</p>	
<p>WL10011001</p>	<p>Steel Wheel for Drive Unit</p>	
<p>WL10023047</p>	<p>Drive Shaft for Steel Sprocket</p>	
<p>WL10021001-1</p>	<p>Idler Guide Wheel Plastic For Drive Unit With Bearing</p>	
<p>WL601304-25</p>	<p>Axle for Idler Guide Wheel</p>	
<p>WL10011000</p>	<p>Switch Door Cover For Drive Unit</p>	
<p>WL601304-19</p>	<p>Safety Switch (Limit Switch) With Blue Reset Button</p>	

<p>WL10023008</p>	<p>Stainless Steel Door for Drive Unit</p>	
<p>WL70011028</p>	<p>Knob for Drive Unit Cover</p>	
<p>WL601304-17</p>	<p>Spring for Drive Unit</p>	
<p>WL601304-27</p>	<p>Bolt Clamping (Tension Rod)</p>	
<p>WL10023028</p>	<p>Guide Rod for Sliding Carriage</p>	
<p>WL10023002</p>	<p>Clamping Sliding Carriage</p>	
<p>WL10022012-HK</p>	<p>Hanging Kit for Chain Disk Drive Unit</p>	
<p>WL10211009</p>	<p>Grower Select Hardened Conveyor Chain, 44 MM</p>	
<p>WL10211019</p>	<p>Grower Select Hardened Chain Coupler, 71.5 MM Disc Distance</p>	

<p>HSCD-01</p>	<p>Grower Select Galvanized Coupler with Hardware</p>	
<p>HSFT2375</p>	<p>Grower Select Galvanized Tube for Chain Disk, 2.375" x 20'</p>	
<p>WL10121016 (HSCD-304)</p>	<p>Chain Disk Fill Hopper Assembly</p>	
<p>WL10121029</p>	<p>Fill Hopper Access Plate</p>	
<p>GROW-FLEX</p>	<p>Grower Select Grow-Flex System Model 75 with 256 RPM</p>	
<p>WL10222078</p>	<p>Grower Select 90 Degree Cast Iron Corner, Blue Wheel, 60 MM</p>	
<p>WL10222045</p>	<p>Wheel for Corner with Axle and 2 Bearings</p>	
<p>WL802108-08</p>	<p>Eccentric Washer for Corner</p>	
<p>HS660S</p>	<p>Grower Select Outlet Drop Model 60/236-CD</p>	
<p>HSSD55</p>	<p>Grower Select Feeder Sow Drop Dispenser M55</p>	

<p>HSCD-900</p>	<p>Grower Select Control Tube w/ Mount includes Proximity Switch</p>	
<p>HSCD-900-1</p>	<p>Bracket Chain Disk for Proximity Switch</p>	
<p>HSCD-900-2</p>	<p>Tube Clear Chain for Disk Proximity Switch</p>	
<p>HS11</p>	<p>Proximity Switch 220V Flush Mount Packaged Grower Select</p>	
<p>HSCD-100</p>	<p>Chain Feeding Controller</p>	

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Hog Slat Limited Warranty

Hog Slat warrants products to be free from defects in material or workmanship for a period of twenty-four (24) months from the date of **original purchase**. Hog Slat will credit, repair, or replace, at its option any product deemed defective within this time period. Labor costs associated with the replacement or repair of the product are not covered by the Seller/Manufacturer.

Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Seller/Manufacturer or Warranty will be void**.
2. Warranty is void if **all components** are not original equipment supplied by the **Seller/Manufacturer**.
3. This product must be purchased from and installed by an authorized retailer/distributor or certified representative thereof or the Warranty will be void.
4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.
5. This Warranty applies only to components/systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.
6. This Warranty applies only to the Original Purchaser of the product.

The **Seller/Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **“Consequential”** or **“Special Damages”** as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.

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This equipment must be installed in accordance with all State and Local Codes and applicable Regulations which should be followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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