

# Farrowing Drop Feeder

# Installation and Operation Manual

Owner's Manual Manual#PNEG-656 1/99







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# SAFETY FIRST General Safety Statements

The GSI Group Inc's Principal concern is your safety and the safety of others associated with grain handling equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist and inform all personnel associated with, or in the area of the Fill/Feed System. Safety precautions may be required from the personnel. Avoid any alteration to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.





DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury



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



CAUTION indicates a potentially hazardous situation which, ifnot avoided, may result in minor or moderate injury.

# CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



# BE ALERT! Danger!

Personnel operating or working around electrical equipment should read this manual.

This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

This product is intended for the use of feeding swine only. Any other use is a misuse of the product!

Danger! This product is connect to and works with rotating disk and or augers. Serious injury may occur, please take proper precausions when operation and/or working on this equipment.

The safety pages that follow are to show you where you can find the safety decals. The photographs show exactly where the decals should be. If a decal has been damaged or is missing contact The GSI Group, Inc. for a free replacement.

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# Introduction

### Applications

Typical Farrowing Drop Feeder applications are shown as follows:



Figure 1: Flex Flo Application.

In Flex Flo applications, a Farrowing Drop Feeder control unit with a proximity switch must be installed at the end of the line to turn the system on and off. The control unit is designed to allow total drop out of feed thus preventing the build up of feed at the end of the line.



Firgure 2: Chain Disk Application

In Chian Disk applications, a proximity switch is installed in the last farrowing drop feeder, to turn the system on and off.

# Using the Manual

Read the entire manual prior to any work being done. This installation/owner manual is to be used as a guideline for the installation of the Farrowing Drop Feeder. All instructions should be construed as recommendations only, as the actual installation may vary according to local conditions. Wiring diagrams can be found later in this manual. Instructions presented in this manual should only be carried out by a trained technician. It is essential that the technician has a sound understanding of technical matters and drawings in both mechanical and electrical areas.

# Background

The Farrowing Drop Feeder is specifically designed to hold and deliver feed to farrowing sows within a swine facility, although other applications are possible as well. There are two sizes available: 8.5 pound (3.9kg) or 12 pound (5.4 kg). Capacity is based on a feed density of 40 lbs/ft<sup>3</sup> (641 kg/m<sup>3</sup>). The delivery of feed can be accomplished by rotating a cup at the bottom of the feeder.

## Specification

Part #	AP-2259	AP-2260	AP-2263	AP-2264
Model	220 Flex-Flo or	300 Flex-Flo	220 Flex-Flo or	300 Flex-Flo
	236 Chain Disk		236 Chain Disk	
Capacity (Based on feed density	2 to 8.5 lbs.	2 to 8.5 lbs.	2 to 12 lbs.	2 to 12 lbs.
of 40lbs/ft3 (641kg/m3))	(.9 to 3.9 kg)	(.9 to 3.9 kg)	(.9 to 5.4 kg)	(.9 to 5.4 kg)
Tubing Outside Diameter	3.25 in (8.3 cm)	3.25 in (8.3 cm)	4.0 in (10.2 cm)	4.0 in (10.2 cm)
Overall Height	50.0 in (1.27 m)	50.0 in (1.27 m)	50.0 in (1.27 m)	50.0 in (1.27 m)
Materials	Transparent PVC tube, Polypropylene drop kit, & Stainless steel hardware.			
Feed Drop Method	To release feed from the farrowing drop feeder rotate the cup at at the bottom of the feeder.			

## **Optional Equipment**

Description	Part #
Farrowing Drop Feeder Control Unit 110V 8.5lb (Flex-Flo only)	AP-2261
Farrowing Drop Feeder Control Unit 220V 8.5lb (Flex-Flo only)	AP-2262
Farrowing Drop Feeder Control Unit 110V 12lb (Flex-Flo only)	AP-2265
Farrowing Drop Feeder Control Unit 220V 12lb (Flex-Flo only)	AP-2266
Proximity Switch 20V DC to 240 AC, N.C. (Chain Disk only)	FLXDF-1172
Tube Mounted Proximity Switch 220V (Chain Disk only)	APCD-137
Tube Mounted Proximity Switch 110V (Chain Disk only)	APCD-137A
1-1023 sec. Time Delay without Relay	FLX-4523
Timer - 24 Hour, Single Channel, Digital	TC4-T10
Timer - 24 Hour, 3 Channel, Digital	TC4-T30
Maximum Run Timer Assembly	E100-A1047

# Tubing Installation Determining Placement of Farrowing Drop Feeder.

The first step is to locate where the farrowing drop feeder is to be placed with respect to the sow feeder. The feeder can be swung, at the neck, 18 inches in any direction (see page 9 for photo of neck). The cup, however can only be moved in one direc-

tion to release the feed from the tube. For your convenience the cup can be rotated allowing it to move in a different direction for the release of feed.



#### Laying Out the Tubing

Once the location of the Farrowing Drop Feeder has been established the tubing needs to be layed out. Refer to the Chain Disk Feed System Manual or the Flex Flo Feed System manual on how to lay out the tubing for each respective system. These manuals also explain how to glue sections of tubing together.

#### **Cutting Outlet Holes**

With the sections of tubing still laid out and the placement of the Farrowing Drop Feeders already established, the next step is to mark on the top of the tube where each Farrowing Drop Feeder is to be. The reason for marking the tube is to make sure the holes stay aligned even if the tubes rotate as the holes

# Installation

are being cut. Once the tubes are marked, cut the holes for the feeder as shown in Figure 3 and Figure 4. When carry-over is acceptable drill one hole (Figure 3) using a holesaw. If total drop-out is necessary, cut a hole (Figure 4) in the tubing using a saber saw or hacksaw. In Flex Flo Systems, the last two or three feeders before the control unit should have holes cut out for total dropout. This is to ensure the control unit does not fill up before the system is full. Be sure to remove any burrs after cutting so the slide can perform properly.

#### Suspension of Tubing

Suspend the sections of tubing from the ceiling at least once every 4 feet. The Farrowing Drop Feeder measures 50.0 inches (1.27 m) in height. *Chain and eye bolts need to be ordered separately.* 

# **Farrowing Drop Feeder Installation**

# **Farrowing Drop Feeder Control Unit**

#### Chain Disk Feed System

The next step for a Chain Disk System is to install the chain and disks (see the Chain Disk Installation & Operation Manual) and finish connecting the sections together with couplers. The Chain Disk System does not require a farrowing drop feeder control unit. One method of turning the system on and off is to install a proximity switch in the last feeder of the system. Using this system requires that there be a sow in the pen with the last feeder. To install a proximity switch (FLXDF-1172) drill a 1-3/16 inch (30mm) hole in the side of the drop kit (Figure 5). Insert the proximity switch and secure it using two nuts, one on the inside and one on the outside.



1.5 in. (38mm) dia. (Model 220 & 236)
 2.5 in. (64mm) dia (Model 300)

#### Figure 3: Outlet Hole w/ Carry Over



Figure 4: Outlet Hole w/ Total Dropout







Figure 7: Control Unit with Model 220 Tubing.

Another method of turning the system on and off is to use a tube mounted proximity switch which has its own special control box. This switch is mounted on the clear PVC Chain Disk tubing just past the last feeder in the system. The proximity switch is attached to the bracket (Figure 6) using two nuts and the bracket is attached to the tube using two hose clamps. Using this switch doesn't require that there be a sow in the pen with the last feeder. Instead this switch detects whether there is feed in the feed system tube and turns the system on and off accordingly. The wiring diagram for this switch is located in the wiring instructions section later in this manual. Instructions on how to operate this switch is sent along with it.

# Flex-Flo Feed Systems

The installation of the control unit varies slightly depending on whether it is a Model 220 or a Model 300 system.

#### Model 220

1. Bolt the Farrowing Drop Feeder Control unit to the Model 220 tube anchor plate weldment using (4)  $5/16 \times 3/4$  inch bolts, 5/16 inch washers and 5/16 inch nuts (Fig. 7).

2. Slide end of straight section of Model 220 tubing over the tube anchor plate weldment and secure using  $5/16 \ge 1/4$  inch U-bolt with saddle.

3. Slide the anchor washer over the output shaft on the Flex-Flo power unit.

4. Install auger through the Flex-Flo tubing and fasten to the output shaft on the power unit using the auger lock and  $1/4 \times 11/4$  inch socket head cap screw.

5. Connect the power unit to the Farrowing Drop Feeder control unit using hardware provided with the power unit.

6. Support power unit and Farrowing Drop control unit with chain and lag screws provided.

# Installation

## Model 300

1. Bolt the Farrowing Drop Feeder Control Unit to the Model 300 tube anchor plate weldment using (4)  $5/16 \times 3/4$  inch bolts, 5/16 inch washers and 5/16 inch nuts (Fig. 8).

2. Slide tube spacer over end of the tube anchor plate weldment.

3. Glue coupler on end of straight section of Model 300 tubing.

4. Connect coupler and tubing to tube anchor plate weldment using  $3/8 \times 3$  inch U-bolt with saddle.

5. Slip clamp pin into hole on spindle and slide spindle over output shaft of power unit. Secure using  $5/16 \times 11/2$  inch socket head cap screw.

6. Install auger through the Flex-Flo tubing and fasten to the output shaft on the power unit using  $5/16 \times 1/2$  inch square head set screw.

7. Connect the power unit to the control unit using hardware provided with the power unit.

8. Support unit and control with chain and lag screws provided.



Figure 8: Control Unit with Model 300 Tubing

# **Standard Farrowing Drop**

1. If the drop kit is not rotated correctly with respect to the rest of the feeder simply take out the top two screws and loosen the top hose clamp. Rotate the drop kit to the desired location and then replace screws and tighten hose clamp.

2. Take apart each hose clamp, place it over the tubing, and put it back together loosely.

3. Hold the Farrowing Drop Feeder up next to the tubing making sure the hole in the tubing is in the center of the feeder. Slide the hose clamps into the groove on each side of the drop kit and tighten.

4. Snap the slide over the top of the tubing and make sure it can be rotated back and forth.



### Figure 9: Farrowing Drop Feeder Installation





#### Warning

1. Disconnect all electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

2. Keep hands and tools away from exposed chain disks and augers.

3. Do not operate equipment without covers and guards properly positioned. Failure to do so may cause personal injury or damage to the equipment.

#### Safety Regulations

 All wiring should be done by a qualified electrician in accordance with local and national electrical codes.
 Ground all electrical equipment for safety.

 Use proper sized wire according to the national electrical codes or other applicable regulations to wire all systems.



# 4.3 Wiring Diagrams

# FarrowingDrop Feeder Control Unit 110 Volt P\N AP-1753 220 Volt P\N AP-1752





# Farrowing Drop Feeder Unit With Unloader Proximity Switch

# Farrowing Drop Feeder Unit With Unloader Switch



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# Wiring Diagram for Chain Disk Feed System Using tube mounted proximity switch APCD-137 or APCD-137A to control Chain Disk System.



# **Initial Start-Up**

1. Test the toggle switch on the electrical box on the Farrowing Drop Feeder control unit. When the switch is turned to on, the motor should turn on. If the motor does not turn on, refer to the troubleshooting guide or the feed system manual.

2. Test the proximity switch by placing your hand in front of it while the motor is running. If the motor does not stop, refer to the troubleshooting guide or the instruction sheet for the proximity switch.

Problem	Possible Cause	Correct Action
Feed system motor will not	No power to system.	Check circuits, fuses, and on-
run.		off switches on equipment.
	Motor thermal overload switch activated.	Refer to motor overload problem later in this guide.
×	Proximity switch not adjusted properly.	Position the switch so that it extends into the farrowing drop feeder 0.25in (6.3mm).
	Proximity switch time delay not expired.	Refer to instructions sheet on proximity switch. Refer to Chain Disk Manual for adjustment of time delay switch inside of control unit.
	Feed stuck on end of proximity switch.	Clean off end of proximity switch.
	Sensitivity of proximity switch not set properly.	Refer to instruction sheet on proximity switch.
Motor overlande after rupping	ll av valtaga (matar runa alaw	Check line veltage at matery use
Motor overloads after running briefly.	Low voltage (motor runs slow and overheats).	Check line voltage at motor; use adequate wire size in circuits.
	Foreign object caught in system.	Check system for any foreign objects and remove them.
	Wet feed being conveyed or allowed to stand in system.	Clean the system; avoid conveying wet feed or empty line after each feeding.
	Defective motor.	Replace motor.

# Troubleshooting

# Farrowing Drop Feeder 8 1/2 lb. Capacity Part List



Key	Part #	Qty.	Description	
	AP-2259		Farrowing Drop Feeder Model 220/236 8.5lb	
	AP-2260		Farrowing Drop Feeder Model 300 8.5lb	
1	APCD-058	1	Slide, Manual Drop Kit Shut-off M220/236 8 1/2lb	
1	AP-1764	1	Slide, Manual Drop Kit Shut-off M300 8 1/2lb	
2	AP-0583	2	Clamp, 1 3/4" - 2 3/4" Stainless Hose (M220/236 only)	
2	AP-0584	2	Clamp 3" - 4" Stainless Hose (M300 only)	
3	APCD-059	1	Housing, Manual Drop Kit M220-236	
3	AP-1763	1	Housing, Manual Drop Kit M300	
4	S-8197	2	Clamp, 2" - 3" Stainless Hose	
5	S-8290	4	Screw #10-16 x 1/4 S.S. SMS	
6	AP-2248	1	Flexible Adapter Sock 8 1/2lb	
7	AP-2247D	1	Tube, Drilled Farrowing Drop w/Printed Scale 8 1/2lb	
8	S-7307	1	Nut, 1/4-20 Hex Leck Stainless	
9	AP-2257	1 .	Indicator Band, White PVC, 8 1/2lb	
10	AP-2256	· 1	Cup, S.S. Spring Style 8 1/2lb	
11	S-8130	1	Bolt, 1/4-20 x 4 1/2 Hex Stainless	
12	AP-2253	1	Torsion Spring, Cup Return	
13	S-8299	1	Bearing Sleeve 1/4 I.D. 1/2 O.D. 1/2 Long	

# Farrowing Drop Feeder 12lb Capacity Part/Price List



Key	Part #	Qty.	Description	
	AP-2263		Farowing Drop Feeder Model 220/236 12lb.	
	AP-2264		Farrowing Drop Feeder Model 300 12lb.	
1	APCD-058	1	Slide, Manual Drop Kit Shut-off M220/236 12lb	
1	AP-1764	1	Slide, Manual Drop Kit Shut-off M300 12lb	
2	APCD-059	1	Housing, Manual Drop Kit M220/236	
2	AP-1763	1	Housing, Manual Drop Kit M300	
3	AP-0583	2	Clamp 1 3/4" - 2 3/4" Stainless Hose (m220/236 only)	
3	AP-0584	2	Clamp 3" - 4" Stainless Hose (M300 only)	
4	S-8197	1	Clamp 2" - 3" Stainless Hose	
5	S-8290	4	Screw #10-16 x S.S. SMS	
6	AP-1768	1	Flexible Adapter Sock 12lb	
7	AP-0584	1	Clamp 3" - 4" Stainless Hose	
8	AP-1755	1	Tube, Drill Farrowing Drop w/Printed Scale 12lb	
9	S-7307	1	Nut, 1/4-20 Hex Lock Stainless	
10	AP-2251	1	Indicator Band, white PVC, 12lb	
11	AP-2250	1	Cup, S.S. Spring Style 12lb	
12	S-8282	1	Bolt, 1/4-20 x 5 Hex Stainless	
13	AP-2253	1	Torsion Spring, Cup Return	
14	S-8299	1	Bearing Sleeve 1/4 I.D. 1/2 O.D. 1/2 Long	

# Farrowing Drop Feeder Control Unit (8.5 lb & 12 lb) Part/Price List



Key	Part #	Qty.	Description	
	AP-2261		Farrowing Drop Feeder Control Unit 110V 8.5lb	
	AP-2262		Farrowing Drop Feeder Control Unit 220V 8.5lb	
	AP-2265		Farrowing Drop Feeder Control Unit 110V 12lb	
	AP-2266		Farrowing Drop Feeder Control Unit 220V 12lb	
1	S-7377	4	Screw, #10-24 x 1" Phil RD HD MS	
2	FLX-2689	1	Electrical Box Lid	
3	FLX-2690	1	Gasket, 4 x 4 x .090 PVC Lid	
4	E260-1020	1	REL 2PST 25A G7L-2A-BUB-CB-110	
4	E260-1021	1	REL 2PST 25A G7L-2A-BUB-CB-220	
5	S-7466	4	Screw, #10-16 x 3/4" HWHD Self Drill	
6	70-0129	1	Boot, Switch Weatherproof	
7	20-5060	1	Switch, SPST 15A on/off Toggle	
8	FLX-2688	1	Electrical Box Bottom	
9	S-849	4	Nut #10-24 Finished Hex	
10	AP-2268	1	Farrow DF M300 8 1/2lb w/o Hardware	
10	AP-2270	1	Farrow DF M300 12lb w/o Hardware	
. 11	AP-0584	2	Clamp, 3" - 4" S.S. Hose	
12	AP-1004	1	Grommet, 36.5 x 4MM Groove	
13	AP-1001	1	Switch, Prox 110V N.O. or N.C. 1 sec - 60 min Time Delay	
13	AP-1002	1	Switch, Prox 220V N.O. or N.C. 1 sec - 60 min Time Delay	
14	S-7906	1	Connector, 1/2" Cord	
15	AP-1258	1	Accu-Drop Feed Dispenser Adapter	

# **Proximity Feed Sensor for Tube**



Key	Part #	Qty	Description	
1	APCD-137		Prox Feed Sensor for Tube 220V	
1	APCD-137A		Prox Feed Sensor for Tube 110V	
2	AP-0583	2	Clamp 1 3/4" - 2 3/4" S.S. Hose	
3	APCD-136	1	Prox Switch Mounting Bracket	
4	FLXDF-1172	1	Proximity Switch N.C. 20-250 VAC	
5	FLX-4559	1	Electrical Box Bottom 4 x 6	
6	FLX-4569	1	Backplate, 4 x 6 Control Box	
NS	S-8183	4	Screw #6 x 3/8" PH Pan Head Small	
7	FLX-3914	1	Delay, Time D.O.M. 1-1023 Sec.	
NS	S-7667	1	Screw #8 x 1"PHL PN HD Type AB S.S.	
8	E260-1021	1	REL 2PST 25A G7L 2A BUB CB 220	
8	E260-1020	1	REL 2PST 25A G7L 2A BUB CB 110	
NS	S-7492	2	Screw #8 x 3/8 PH Pan HD AB SMS	
9	S-8170	1	Relay Power 240V NO/NC	
9	1593	1	Relay SPDT 120V Quick Connect	
NS	S-7492	2	Screw #8 x 3/8 PH Pan HD AB SMS	
10	FLX-4561	1	Electrical Box Gasket 4 x 6	
11	FLX-4650	1	Electrical box Lid 4 x 6	
NS	S-7377	4	Screw #10-24 x 1" Phil RD HD MS	
NS	S-849	4	Nut #10-24 Finished Hex Nut	
12	APCD-104		Clear PVC Tubing 2.00 in (51mm) I.D. x 2.36 in (60 mm) O.D. x 10ft (3m)	
13	TFC-0013	1	Switch 3 Position Toggle DPDT	

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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
AP Fans and	Performer Series Direct Drive Fan Motor	3 Years
Flooring	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
Cumberland	Feeder System Pan Assemblies	5 Years **
Feeding/Watering Systems	Feed Tubes (1.75" & 2.00")	10 Years *
	Centerless Augers	10 Years *
	Watering Nipples	10 Years *
Grain Systems	Grain Bin Structural Design	5 Years
Grain Systems	Portable & Tower Dryers	2 Years
Farm Fans Zimmerman	Portable & 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.

# THE GSIGROUP



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