Installation and Operation of Flex-Flo

Model 220, 300, 300P, 350, 500 and HR

Installation and Owner's Manual

PNEG-914

Version: 7.3

Date: 11-14-18

PNEG-914

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Contents

Chapter 1 Safety 5
Safety Guidelines 5
Cautionary Symbols Definitions 6
Safety Cautions 7
Safety Sign-Off Sheet 9
General Safety Statement 10

Chapter 2 Decals 11

Chapter 3 Introduction 13
Applications 13
Background 13
Building Safety 13
Installation Sequence 13

Chapter 4 Flex-Flo Specifications (English/Metric) 14
The Feed Tank Connections 14

Chapter 5 Installation 18
Boot and Transfer Plate Installation 18
Slide Gate Installation 19
Inspection/Clean-Out Plate Installation 20
Restrictor Adjustment 21
Straight-Through Tandem Installation 22
Auger Tubing Installation 23
Cementing Procedure 25
Outlet Holes 25
Pull Cord Style Drop Kit Installation 26
Kwik-Attach Drop Kit Installation 30
Power Unit and Control Unit 31
Auger 37
Auger Installation 37
Extension Hopper Installation 39
Operation Guidelines 42

Chapter 6 Parts List 45
Flex-Flo Feed Line Components 46
Direct Drive Power Unit Assemblies 47
Model 220 Unloader and Anchor Assembly 50
Model 300, 300P, 350 and HR Unloader and Anchor Assembly 51
Model 500 Unloader and Anchor Assembly 52
Direct Drive Driver and Plastic Tube Anchor Package 53
Belt Drive Driver and Plastic Anchor Package 54
Control Unit 55
Belt Drive Power Unit 56
Drop Kit/Kwik-Attach Drop Kit 57
Unloader Switch 58
Micro Drop Tube Switch/Proximity Switch 59

Table of Contents

Chapter 7 Wiring Diagrams 60
Flex-Flo Control Unit Used with 5 Wire Sensor 60
Flex-Flo Control Unit Extension System - Dependent 61
Flex-Flo Control Unit Extension System - Independent 64
Flex-Flo Control Unit Used with Hopper Level Controls 65
Flex-Flo Control Unit Used with IR Plus Feed Sensor 66
Flex-Flo Control Unit Used with IR Plus Feed Sensor as Hopper Level Controls 67
Flex-Flo Control Unit Used with Smart IR Sensor 68
Flex-Flo Control Unit Used with 3 Phase Power 69
Flex-Flo Control Unit Used with Universal Sensor 70

Chapter 8 Warranty 71

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

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

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must 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.

ST-0001-3

Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

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

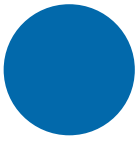
WARNING This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

CAUTION This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**

NOTICE This symbol is used to address practices not related to personal injury.

This symbol indicates a general hazard.

This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.

ST-0002-1

Operate Motor Properly

- All electrical connections must be made in accordance with applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe). Make sure equipment and bins are properly grounded.
- Lock-out power before resetting motor overloads.
- Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive in this manner can damage the equipment and drive components.

ST-0009-3

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.

ST-0003-1

Lifting Hazard

- Single person lift can cause injury.
- Use a mechanical lifting device to lift or move the equipment during installation.

ST-0021-2

Rotating Auger Hazard

- Keep clear of rotating augers and moving parts.
- Do not remove or modify guards or covers.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Failure to follow these precautions will result in serious injury or death.

ST-0037-1

Safety Sign-Off Sheet

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

Date	*Employee Name*	*Supervisor Name*

ST-0007

General Safety Statement

Electrical Safety

An adequate and safe power supply to the Flex-Flo System unit is essential for safety. A competent and qualified electrician must undertake all electrical wiring. All wiring is to be installed in accordance with all local and National Standards and Regulations relevant to your country and region.

Electrical safety devices, emergency stops and main isolators are recommended with the Flex-Flo System and are essential for safety. This should be installed as indicated in the enclosed installation instructions and in accordance with the relevant codes and directives.

Correct Uses of the Flex-Flo System

The Flex-Flo System is designed for the sole purpose of conveying granular or powdered agricultural animal feed. Use of the system in any other way is a misuse of the system and may endanger the health and safety.

Only genuine AP/Cumberland parts are to be used in the installation and use of the Flex-Flo System. Use of other non-genuine parts is a misuse of the system and may lead to dangerous situations imperilling the safety and health of you and others.

This system is not designed for use in atmospheres where there is a risk of explosion. Use in such an environment is prohibited. If in doubt contact your dealer or the GSI Group.

Safety in Maintenance

The Flex-Flo System is designed to keep maintenance to a minimum, however, some repairs will be necessary in the course of the life of the system. Do not attempt any repairs on the system unless you are competent to do so. Remember that the Flex-Flo operates under automatic control and will start without warning. ***Never attempt any work on the Flex-Flo System without first isolating the drive unit from the main power and locking the isolator so that only you can turn the power back ON***. Follow all guidelines given in the maintenance section of this manual.

Before restarting the Flex-Flo System, make sure that all electrical enclosures are locked closed, and all guards and other safety measures are correctly fitted. If in any doubt, contact your dealer or the GSI group for assistance.

Dust

Under normal working conditions little or no dust should be created by the Flex-Flo System. However, some dust may be created, which may be harmful to your health if inhaled. To prevent this, wear a suitable type dust mask.

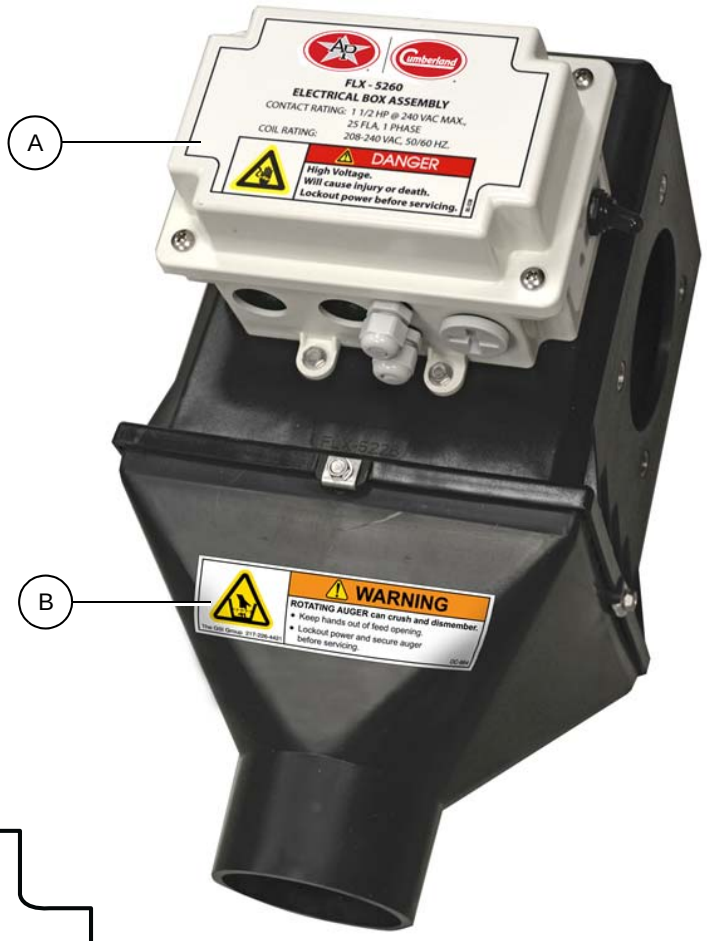
Noise

Noise is not generally a hazard associated with the Flex-Flo System. Excessive noise may indicate a problem with the machines. Tests on this machine indicate noise levels at a position one meter from the drive unit and 1.6 meters above the ground do not exceed 70 dBa, continuous “A” weighted sound pressure or 63 Pa, instantaneous “C” weighted sound pressure.

Sound Signs and Warnings

The following pages show you exactly where the safety and warning decals should be placed on the Flex-Flo System. If a decal is missing or unreadable, please contact your dealer or the GSI group, for a free replacement.

For guidance or assistance on any issues relating to the safe use of the Flex-Flo System, contact GSI.



FLX - 5260
ELECTRICAL BOX ASSEMBLY
CONTACT RATING: 1 1/2 HP @ 240 VAC MAX.,
25 FLA, 1 PHASE
COIL RATING: 208-240 VAC, 50/60 HZ.

DANGER

High Voltage.
Will cause injury or death.
Lockout power before servicing.

DC-1238

A

DC-1238

WARNING

ROTATING AUGER can crush and dismember.

- Keep hands out of feed opening.
- Lockout power and secure auger before servicing.

The GSI Group 217-226-4421

DC-884

B

DC-884

The GSI Group 217-226-4421

WARNING

ROTATING AUGER can crush and dismember.

- Keep hands out of feed opening.
- Lockout power and secure auger before servicing.

DC-884

B

DC-884

Applications

In poultry application, Flex-Flo Fill System conveys feed from bulk feed tank to hoppers inside the poultry building as shown in *Figure 3A*. Other feed systems (i.e. cycle plus, chain feeder etc.) take the feed from the hopper to the desired locations in the building. On this layout, hopper level switches may be placed in more than one hopper to assure that no hopper empties before the control unit hopper requires feed. (All switches must be wired in parallel so that any one switch can start the system.)

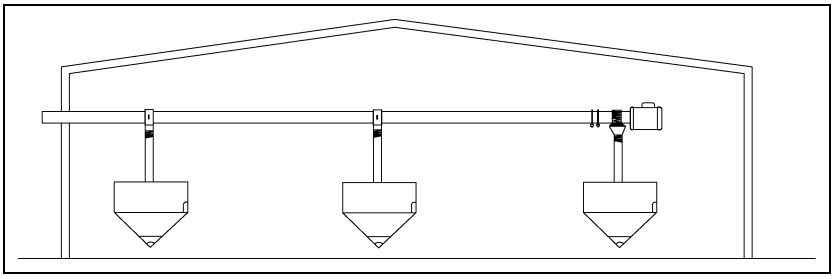


Figure 3A *Poultry Application Layout*

In swine applications, Flex-Flo Fill System conveys feed from bulk feed tanks to each individual feeder (i.e. S.S. hog feeder, drop feeder etc.) directly as shown in *Figure 3B*. It is at this location that feed is being consumed. A feed level control is installed at the end to shut off the system after all feeders are filled.

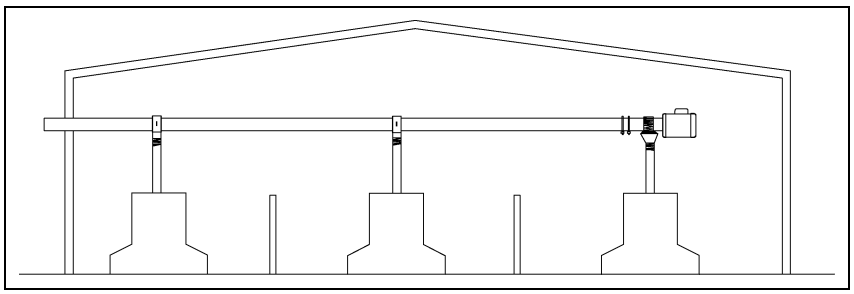


Figure 3B *Swine Application Layout*

Background

The Flex-Flo Fill System consists of a combination of PVC tubes and preformed PVC elbows. A special PVC cement is used to connect the tubes and elbows. The PVC tubes are available in four (4) different sizes. The PVC tube contains a rotating auger which conveys the feed to the different outlet holes. The auger is driven by a direct drive power unit or a belt drive power unit.

Building Safety

If you are intending to install the Flex-Flo System at high levels and/or suspended from a building structure, it is important that you check the structural integrity of the building to carry the additional load. For information on the imposed loads on the building by the Flex-Flo System, please contact the dealer or the GSI Group.

Installation Sequence

This manual outlines the recommended order for the installation of the Flex-Flo System. Following this guideline will provide the safest and easiest method of installation. Above all, connection of the system to the electrical mains should be the final stage of installation. Failure to observe this could lead to a fatal accident.

Flex-Flo Systems Specifications

	Model 220	Model 300	Model 300P	Model 350	Model 500	Model HR
Auger Tube Diameter	2.2" 55 mm	3" 75 mm	3" 75 mm	3.5" 90 mm	5" 125 mm	3.5" 90 mm
Carrying Capacity based on 40 lbs./cubic ft.	15 lbs/min 7 kg/min 900 lbs/hr 420 kg/hr	50 lbs/min 22 kg/min 3000 lbs/hr 1400 kg/hr	50 lbs/min 22 kg/min 3000 lbs/hr 1400 kg/hr	100 lbs/min 45 kg/min 6000 lbs/hr 2700 kg/hr	220 lbs/min 100 kg/min 13200 lbs/hr 6000 kg/hr	50 lbs/min 22 kg/min 3000 lbs/hr 1400 kg/hr
Maximum Particle Size and Feed Type	1/8" (3.175 mm) x 1/2" (12.7 mm) L max moisture content 18%	Crumble type feed mash	Crumble type feed, mash and pellets	Shelled corn or pellets 3/16" (4.76 mm) x 1/2" (12.7 mm) ground corn	Larger feed fragments like shelled corn or pellets 3/8" (9.52 mm) x 1" (25.4 mm) L	High moisture shelled corn (up to 27%) or ground feed. 3/8" (9.52 mm) dia. x 3/4" (19.05 mm) long

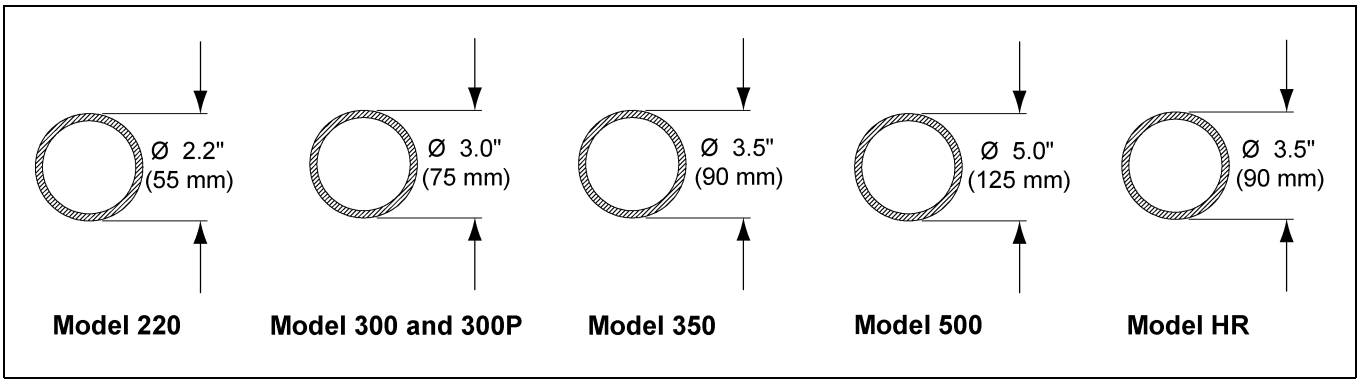


Figure 4A

The Feed Tank Connections

Feed Tank Orientation

Positioning the feed tank in line with the Flex-Flo System will provide the most trouble-free operation possible. Avoid unnecessary elbows and curves to ease system installation. A feed tank with a 30° unloader is generally required to be at least 10-1/2' (3.2 m) away from the building. With a straight unloader, the tank will be approximately 4' (1.22 m) farther away from the building in order to make auger tube connections. The reference points are based upon the height where the system enters the building. Different unloaders with various elbows and curves used provide different entrance opportunities. The distances are achieved by modifying and adjusting the elbows and tubing as needed. *See Table on Page 15* (English) or *See Table on Page 16* (Metric) for tank placement recommendations.

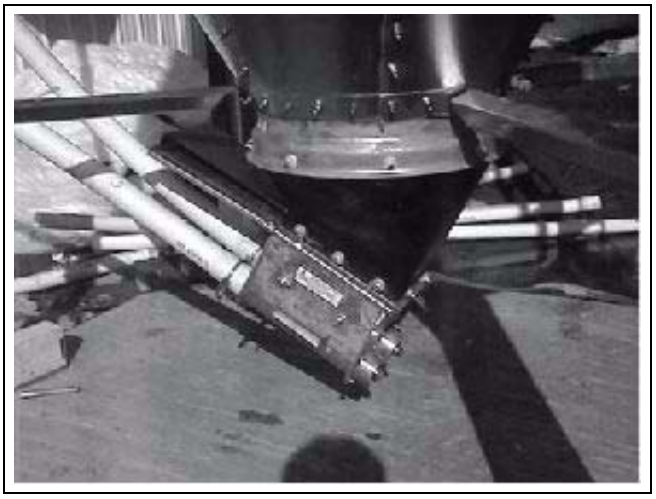


Figure 4B *30° Unloader*

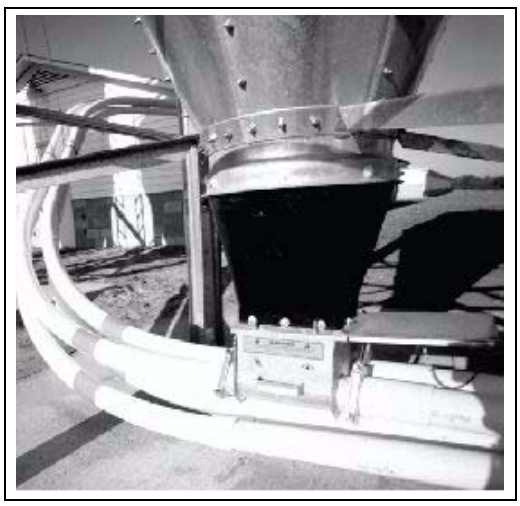


Figure 4C *Straight Unloader*

Tank Centerline to Building Entrance Distance “X” from Given Height “H” (English)

Model 220 with 10' Radius Elbows						
“H” (ft.)	“X” for 30° Boot (ft.)			“X” for Straight Boot (ft.)		
	30°	45°	60°	30°	45°	60°
5.0	10.5	-	-	15.0	-	-
6.0	12.5	11.0	-	17.0	-	-
7.0	14.0	12.0	-	18.5	17.0	-
8.0	16.0	13.0	-	20.0	18.0	-
9.0	17.5	14.0	-	22.0	19.0	-
10.0	19.5	15.0	-	23.5	20.0	-
11.0	21.0	16.0	14.5	25.5	21.0	19.5
12.0	23.0	17.0	15.0	27.0	22.0	20.0
13.0	24.5	18.0	16.0	29.0	23.0	21.0
14.0	26.5	19.0	16.5	30.5	24.0	21.5
15.0	28.0	20.0	17.0	32.5	25.0	22.0
16.0	30.0	21.0	17.5	34.0	26.0	22.5
17.0	31.5	22.0	18.0	36.0	27.0	23.0
18.0	33.5	23.0	18.5	37.5	28.0	23.5
19.0	35.0	24.0	19.5	39.5	29.0	24.0
20.0	37.0	25.0	20.0	41.0	30.0	25.0

Model 500 with 6' Radius Elbow						
“H” (ft.)	“X” for 30° Boot (ft.)			“X” for Straight Boot (ft.)		
	30°	45°	60°	30°	45°	60°
5.0	9.0	-	-	12.0	10.0	-
6.0	10.5	8.0	7.5	13.5	11.0	10.0
7.0	12.0	9.0	8.0	15.5	12.0	11.0
8.0	14.0	10.0	8.5	17.0	13.0	11.5
9.0	15.5	11.0	9.0	19.0	14.0	12.0
10.0	17.0	12.0	9.5	20.0	15.0	12.5
11.0	19.0	13.0	10.0	22.5	16.0	13.0
12.0	20.5	14.0	11.0	23.5	17.0	13.5
13.0	22.5	15.0	11.5	26.0	18.0	14.0
14.0	24.0	16.0	12.0	27.0	19.0	15.0
15.0	26.0	17.0	12.5	29.5	20.0	15.5
16.0	27.5	18.0	12.5	30.5	21.0	16.0
17.0	29.5	19.0	13.5	33.0	22.0	16.5
18.0	31.0	20.0	14.0	34.5	23.0	17.0
19.0	33.0	21.0	15.0	36.0	24.0	17.5
20.0	34.5	22.0	15.5	37.5	25.0	18.5

Model 220, 300, 300P, 350 and HR with 5' Radius Elbow						
“H” (ft.)	“X” for 30° Boot (ft.)			“X” for Straight Boot (ft.)		
	30°	45°	60°	30°	45°	60°
5.0	9.0	-	-	12.0	10.0	-
6.0	10.5	8.0	7.5	13.5	11.0	10.0
7.0	12.0	9.0	8.0	15.5	12.0	11.0
8.0	14.0	10.0	8.5	17.0	13.0	11.5
9.0	15.5	11.0	9.0	18.5	14.0	12.0
10.0	17.0	12.0	9.5	20.5	15.0	12.5
11.0	19.0	13.0	10.0	22.0	16.0	13.0
12.0	20.5	14.0	11.0	24.0	17.0	13.5
13.0	22.5	15.0	11.5	25.5	18.0	14.0
14.0	24.0	16.0	12.0	27.5	19.0	15.0
15.0	26.0	17.0	12.5	29.0	20.0	15.5
16.0	27.5	18.0	12.5	31.0	21.0	16.0
17.0	29.5	19.0	13.5	32.5	22.0	16.5
18.0	31.0	20.0	14.0	34.5	23.0	17.0
19.0	33.0	21.0	15.0	36.0	24.0	17.5
20.0	34.5	22.0	15.5	38.0	25.0	18.5

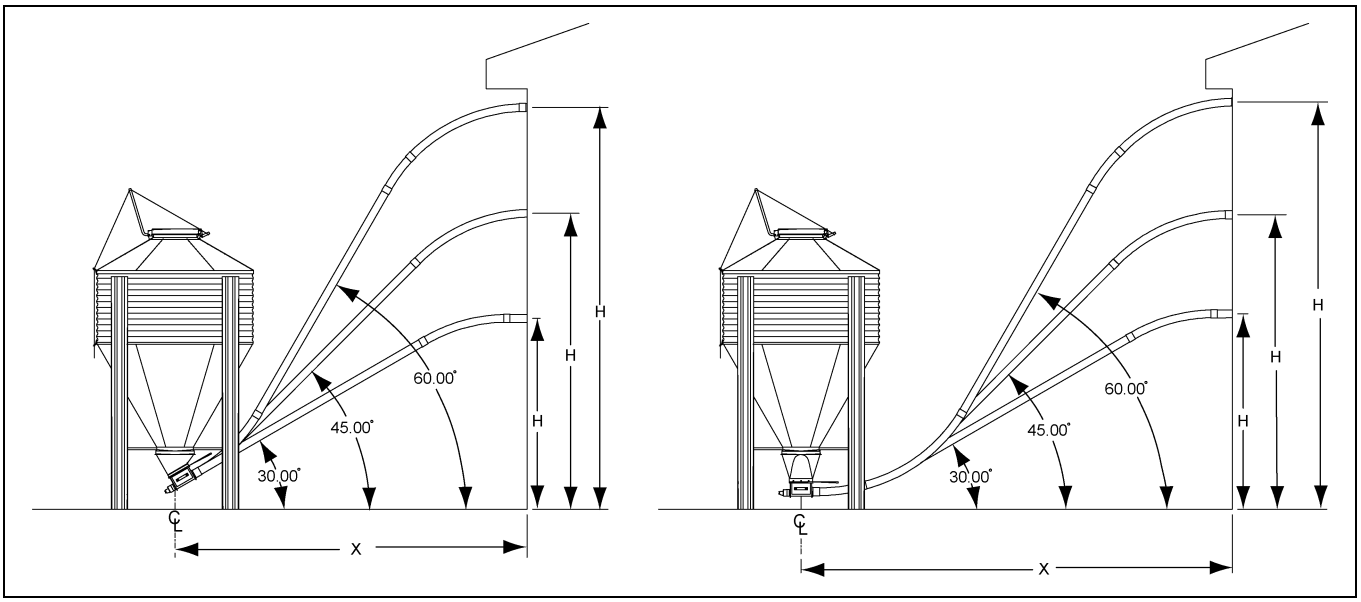


Figure 4D *Equipment Orientation Charts*

Tank Centerline to Building Entrance Distance "X" from Given Height "H" (Metric)

Model 220 with 10' Radius Elbows						
"H" (m)	"X" for 30° Boot (m)			"X" for Straight Boot (m)		
	30°	45°	60°	30°	45°	60°
1.52	3.20	-	-	4.57	-	-
1.83	3.81	3.35	-	5.18	-	-
2.13	4.27	3.66	-	5.64	5.18	-
2.44	4.88	3.96	-	6.10	5.49	-
2.74	5.33	4.27	-	6.71	5.79	-
3.05	5.94	4.57	-	7.16	6.10	-
3.35	6.40	4.88	4.42	7.77	6.40	5.94
3.66	7.01	5.18	4.57	8.23	6.71	6.10
3.96	7.47	5.49	4.88	8.84	7.01	6.40
4.27	8.08	5.79	5.03	9.30	7.32	6.55
4.57	8.53	6.10	5.18	9.91	7.62	6.71
4.88	9.14	6.40	5.33	10.36	7.92	6.86
5.18	9.60	6.71	5.49	10.97	8.23	7.01
5.49	10.21	7.01	5.64	11.43	8.53	7.16
5.79	10.67	7.32	5.94	12.04	8.84	7.32
6.10	11.28	7.62	6.10	12.50	9.14	7.62

Model 500 with 6' Radius Elbow						
"H" (m)	"X" for 30° Boot (m)			"X" for Straight Boot (m)		
	30°	45°	60°	30°	45°	60°
1.52	2.74	-	-	3.66	3.05	-
1.83	3.20	2.44	2.29	4.11	3.35	3.05
2.13	3.66	2.74	2.44	4.72	3.66	3.35
2.44	4.27	3.05	2.59	5.18	3.96	3.51
2.74	4.72	3.35	2.74	5.79	4.27	3.66
3.05	5.18	3.66	2.90	6.10	4.57	3.81
3.35	5.79	3.96	3.05	6.86	4.88	3.96
3.66	6.25	4.27	3.35	7.16	5.18	4.11
3.96	6.86	4.57	3.51	7.92	5.49	4.27
4.27	7.32	4.88	3.66	8.23	5.79	4.57
4.57	7.92	5.18	3.81	8.99	6.10	4.72
4.88	8.38	5.49	3.81	9.30	6.40	4.88
5.18	8.99	5.79	4.11	10.06	6.71	5.03
5.49	9.45	6.10	4.27	10.52	7.01	5.18
5.79	10.06	6.40	4.57	10.97	7.32	5.33
6.10	10.52	6.71	4.72	11.43	7.62	5.64

Model 220, 300, 300P, 350 and HR with 5' Radius Elbow						
"H" (m)	"X" for 30° Boot (m)			"X" for Straight Boot (m)		
	30°	45°	60°	30°	45°	60°
1.52	2.74	-	-	3.66	3.05	-
1.83	3.20	2.44	2.29	4.11	3.35	3.05
2.13	3.66	2.74	2.44	4.72	3.66	3.35
2.44	4.27	3.05	2.59	5.18	3.96	3.51
2.74	4.72	3.35	2.74	5.64	4.27	3.66
3.05	5.18	3.66	2.90	6.25	4.57	3.81
3.35	5.79	3.96	3.05	6.71	4.88	3.96
3.66	6.25	4.27	3.35	7.32	5.18	4.11
3.96	6.86	4.57	3.51	7.77	5.49	4.27
4.27	7.32	4.88	3.66	8.38	5.79	4.57
4.57	7.92	5.18	3.81	8.84	6.10	4.72
4.88	8.38	5.49	3.81	9.45	6.40	4.88
5.18	8.99	5.79	4.11	9.91	6.71	5.03
5.49	9.45	6.10	4.27	10.52	7.01	5.18
5.79	10.06	6.40	4.57	10.97	7.32	5.33
6.10	10.52	6.71	4.72	11.58	7.62	5.64

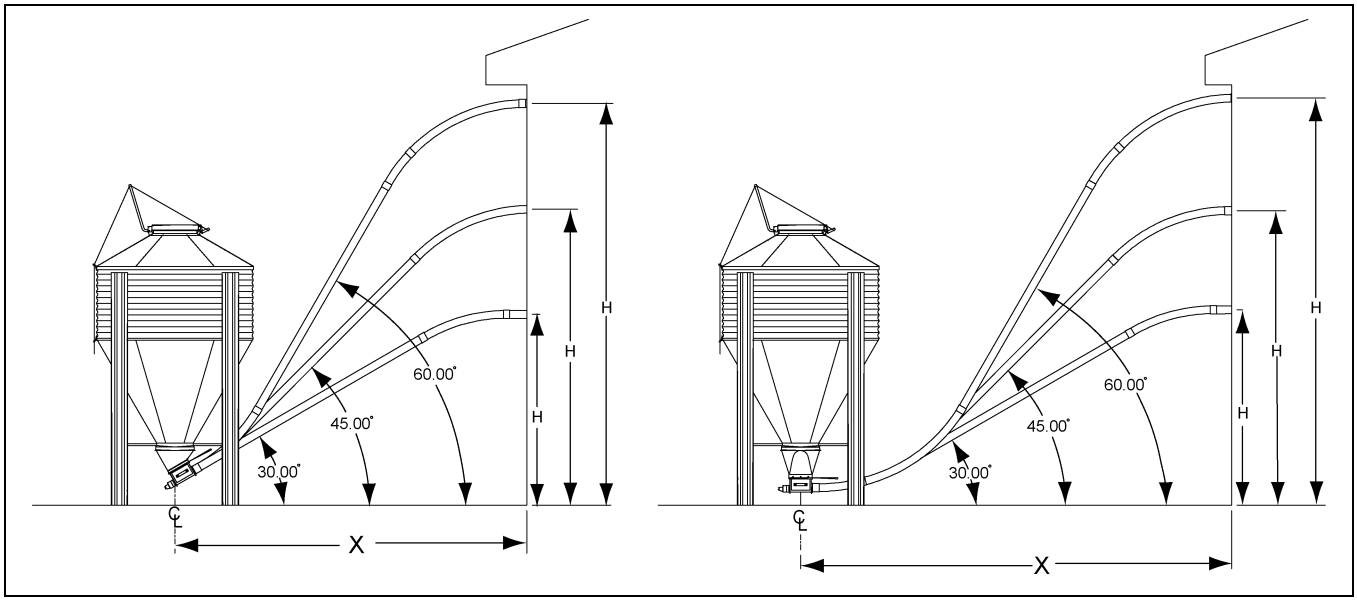


Figure 4E *Equipment Orientation Charts*

CAUTION ***Improper installation methods of the hardware may cause permanent damage and possible breakage of the boot.***

Boot and Transfer Plate Installation

NOTE: *Installation of the boot is the same whether the tank has the standard collar or the Sure-Flo Feed Flow Control.*

Slide the boot as far as possible into the tank collar or the Sure-Flo Feed Flow Control opening. *(See Figure 5A.)* Align the boot with the Flex-Flo System that will be installed. Using the holes in the collars for guides, drill eight (8) 11/32" holes into the boot rim. *(See Figure 5B.)*

Mount the boot to the collar with the hardware provided. Bolt the transfer plate and unloader braces to the boot as shown. *See Figure 5C* for proper usage and assembly direction of hardware for mounting the boot and the transfer plate. All connections should be tightened until they are “snug”.

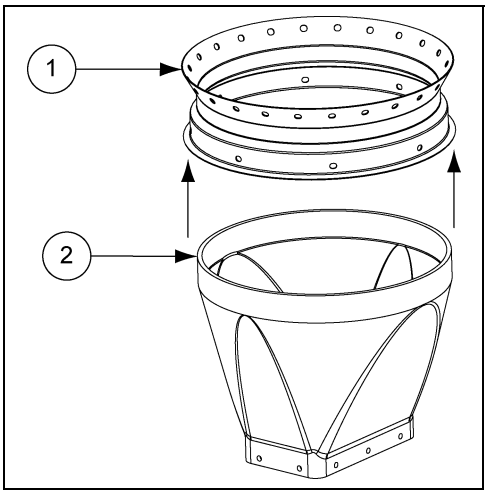


Figure 5A

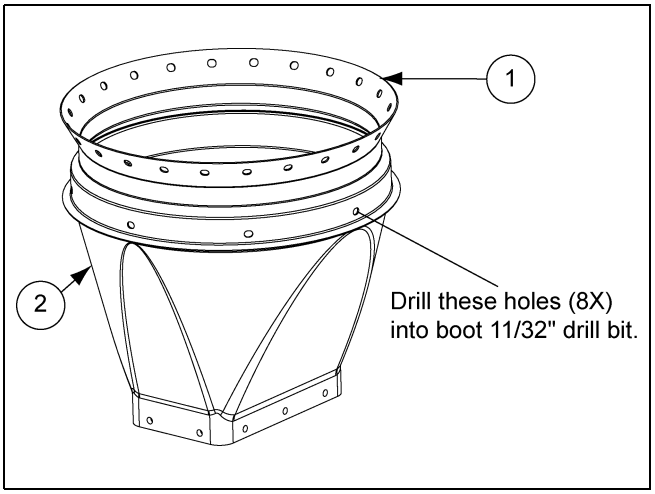


Figure 5B

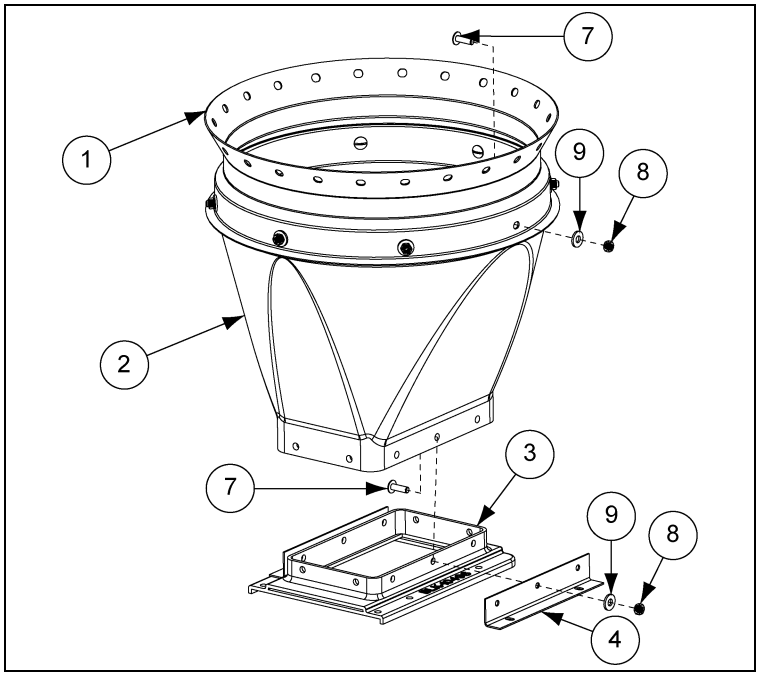


Figure 5C

Slide Gate Installation

Insert the slide into the transfer plate. The slide must be in its operating position prior to attaching the slide shield to the transfer plate. Use two (2) 5/16"-18 x 1" truss head tap bolts to mount the slide shield. *(See Figure 5D.)*

Bolt unloader to transfer plate/unloader brace assembly as shown in *Figure 5E*. Note orientation of these bolts. *(See Figure 5E.)*

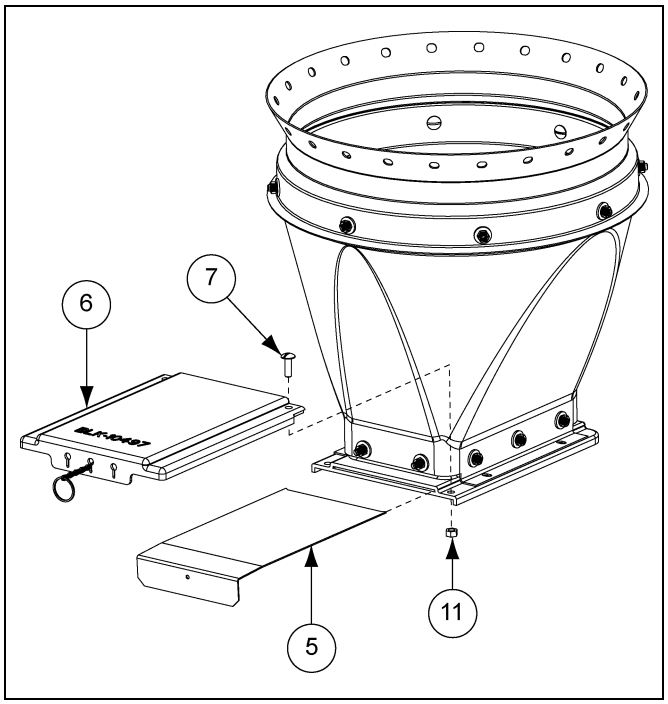


Figure 5D

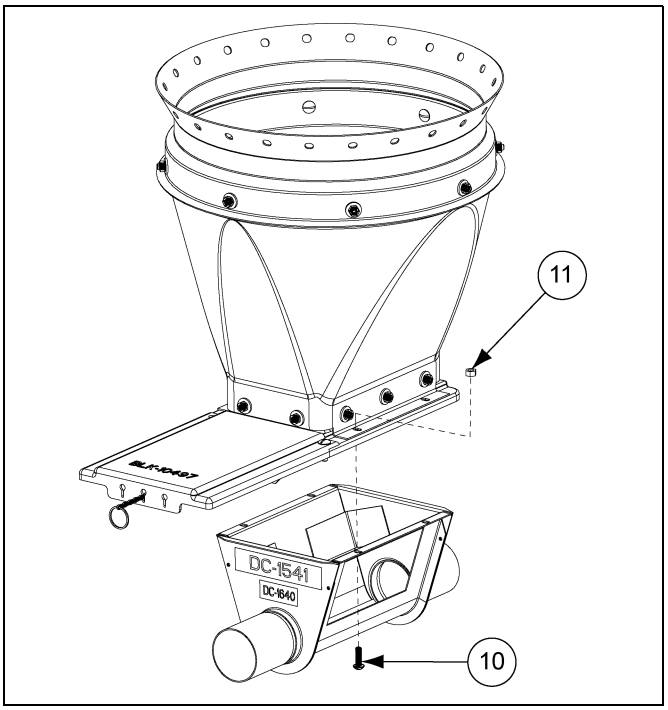


Figure 5E

Ref #	Part #	Description
1	BLK-10488	16" 67°, 16" Hopper Collar, (24 Holes)
1	BLK-10489	16" 60° Hopper Collar, (24 Holes)
1	BLK-11463	16" 60° Hopper Collar (27 Holes)
1	BLK-12342	16" 60° Hopper Collar (18 Holes)
2	FLX-2194	16" 30° Black Plastic Boot
2	FLX-2194C	16" 30° Clear Plastic Boot
2	FLX-2195	16" Straight Black Plastic Boot
2	FLX-2195C	16" Straight Clear Plastic Boot
2	FLX-4869	16" Double Straight Black Boot
3	BLK-10496	Transfer Plate
4	FLX-4819	Unloader Brace
5	FLX-4782	Slide Gate
6	BLK-10497	Slide Gate Shield
7	S-4336	5/16" x 1" Truss Head Machine Screw
8	S-4337	5/16"-18 Nylon Insert Nut
9	S-4338	5/16" Nylon Washer
10	S-8328	Screw, MS 5/16"-18 x 1" RHS ZN Grade 2
11	S-396	Hex Nut 5/16"-18 YDP Grade 2

Inspection/Clean-Out Plate Installation

Once the installation of the auger tubes and auger is complete, insert the inspection/clean-out plate or the optional unloader switch.

The inspection/clean-out plate is to be installed per the following instructions: *(See Figure 5F.)*

1. Back off both wing nuts to the stud ends.
2. Slide the plate onto the lower side of the unloader opening.
3. Move the plate first against the side of the unloader then upward toward the top of the unloader.
4. Tighten the wing nuts while holding the plate steady.

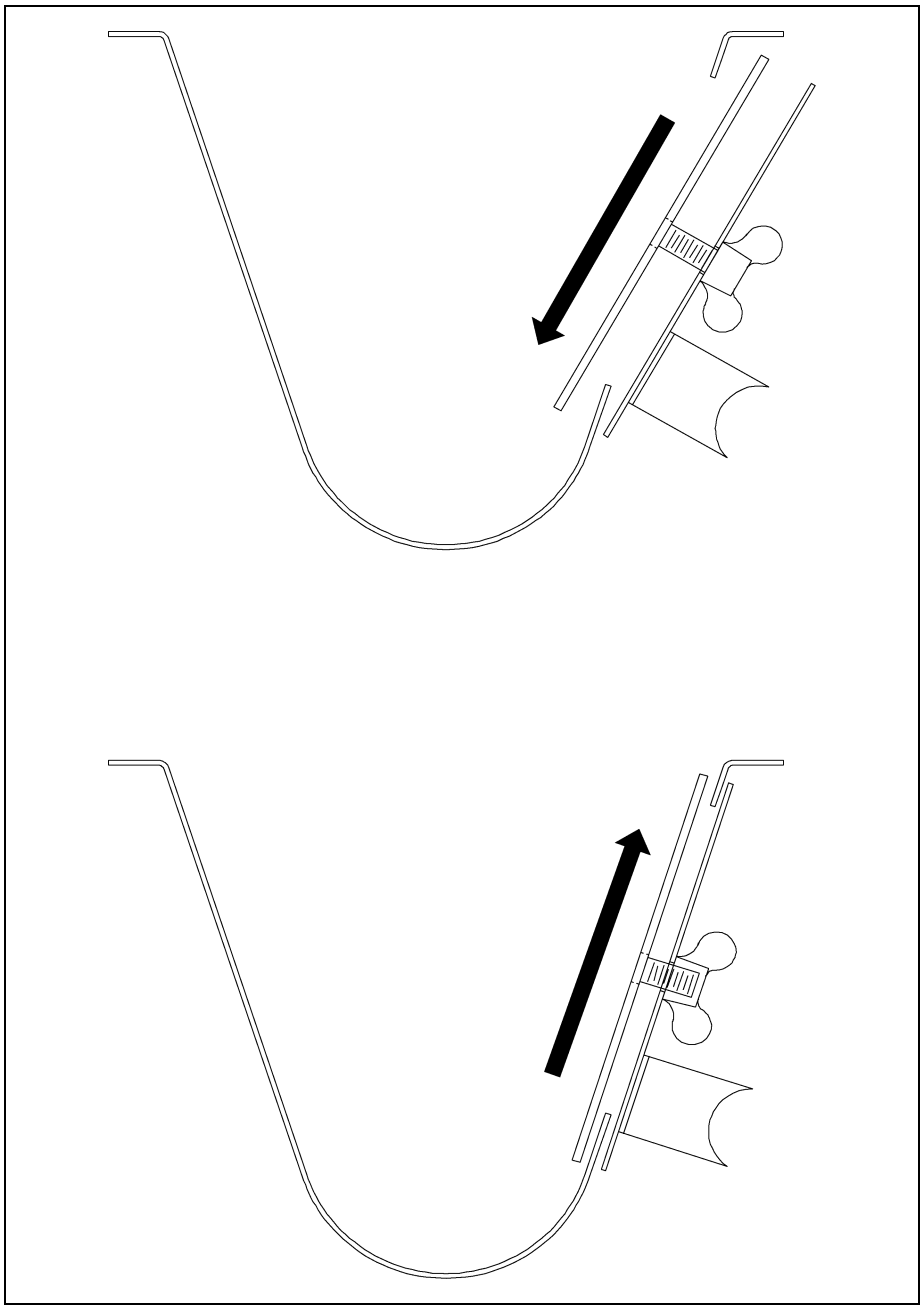


Figure 5F *Clean-Out Plate Installation*

Feed Tank Collar

The standard bulk feed tank is supplied with a 16" (40.64 cm) hopper opening. If needed, 22" (55.88 cm) hopper openings are also available. Consult the dealer for specific ordering instructions.

Restrictor Adjustment

The restrictor may be adjusted to allow more feed flow. Do not modify the restrictor until the system is completely operational and the auger has been polished by running feed through the system.

Instructions:

1. Remove the restrictor tube from the unloader.
2. Cut 1" (2.5 cm) from the restrictor. *(See Figure 5G.)*
3. Install the restrictor and the bearing assembly into the unloader.
4. Test the feed flow.
5. If the desired feed flow rate is not attained, repeat the above procedure until the desired rate is reached.

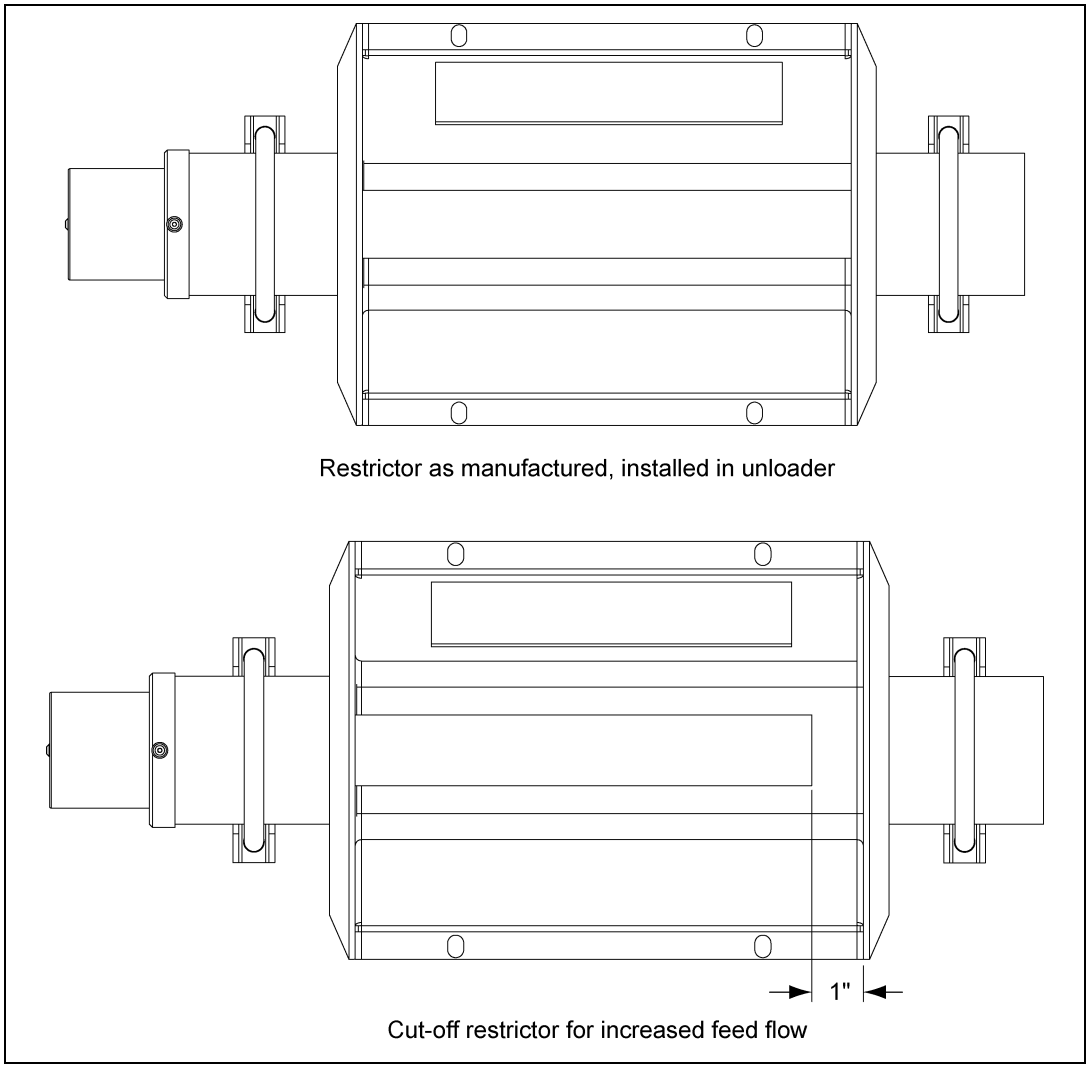


Figure 5G *Restrictor Adjustment*

Straight-Through Tandem Installation

The straight-through tandem system should be installed the same as a single tank system with the following exceptions:

1. Mount the boots on both tanks and the single or twin-out unloader as instructed.
2. Install baffle plate (FLX-4750) in the Model 350 single-through unloader as shown in *Figure 5H*. *The twin unloader baffle is factory installed as shown in Figure 5H*.

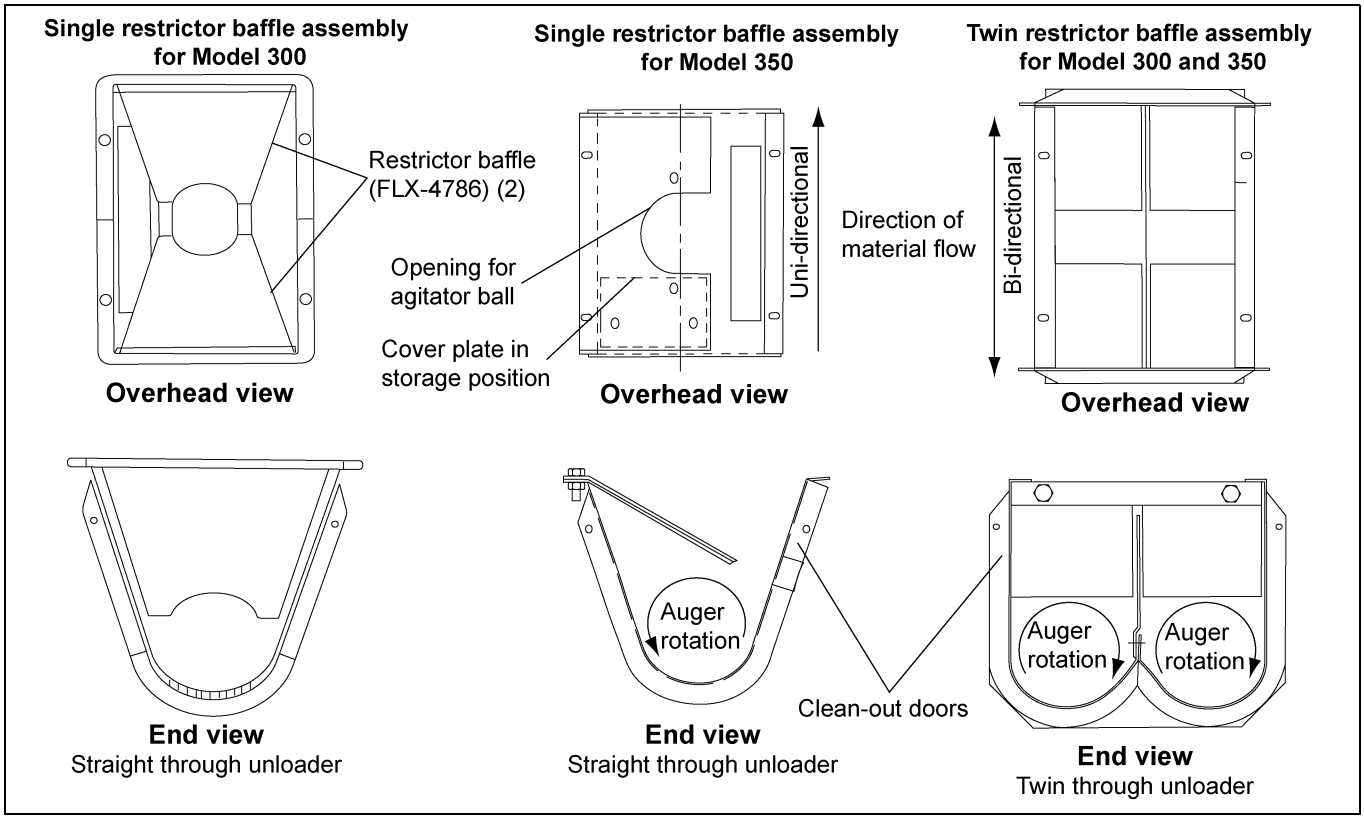


Figure 5H

3. Slide the belled end of a straight tube onto the unloader outlet on the first tank. Hold the straight tubing in the desired mounting position. Mark and cut the straight tube at the point where the tube and the inlet of the straight-through unloader inlet intersect.
4. Slip the appropriate tube coupler over the cut end of the straight tube. Position the straight tube in its operating location. Slide and clamp the tube coupler over the straight-through unloader inlet. *(See Figure 5I.)*

   NOTE: *The coupler should be equally distributed between the tubing and the unloader inlet.*

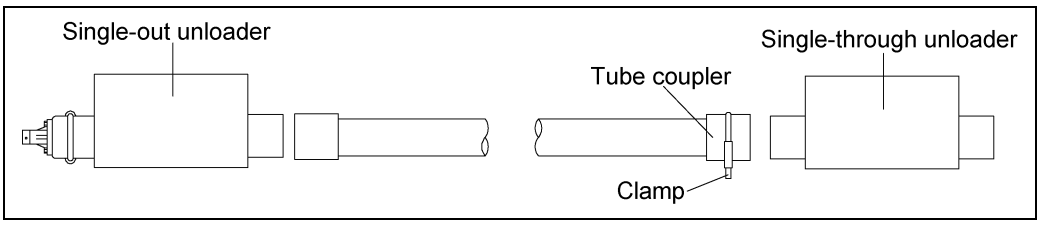


Figure 5I *Tandem System Installation*

5. Feed the auger through the single/twin-out unloader to the rest of the system and anchor as instructed.

Auger Tubing Installation

The auger tubing is one of the most important parts of the Flex-Flo Fill System. Proper installation is very important. Dry fit ALL parts before cementing or clamping. Once the complete system is fitting properly, cement or clamp the entire system.

The following steps are to be performed in the exact order shown:

1. Establish the entry point where the auger tube will enter the building. Once the entry point is determined, cut a hole large enough to accommodate the tubing. A seal ring and a neoprene seal are provided to seal the excess area between the tube and the hole in the building. The seal ring and the neoprene seal shall be installed as shown in *Figure 5J*.

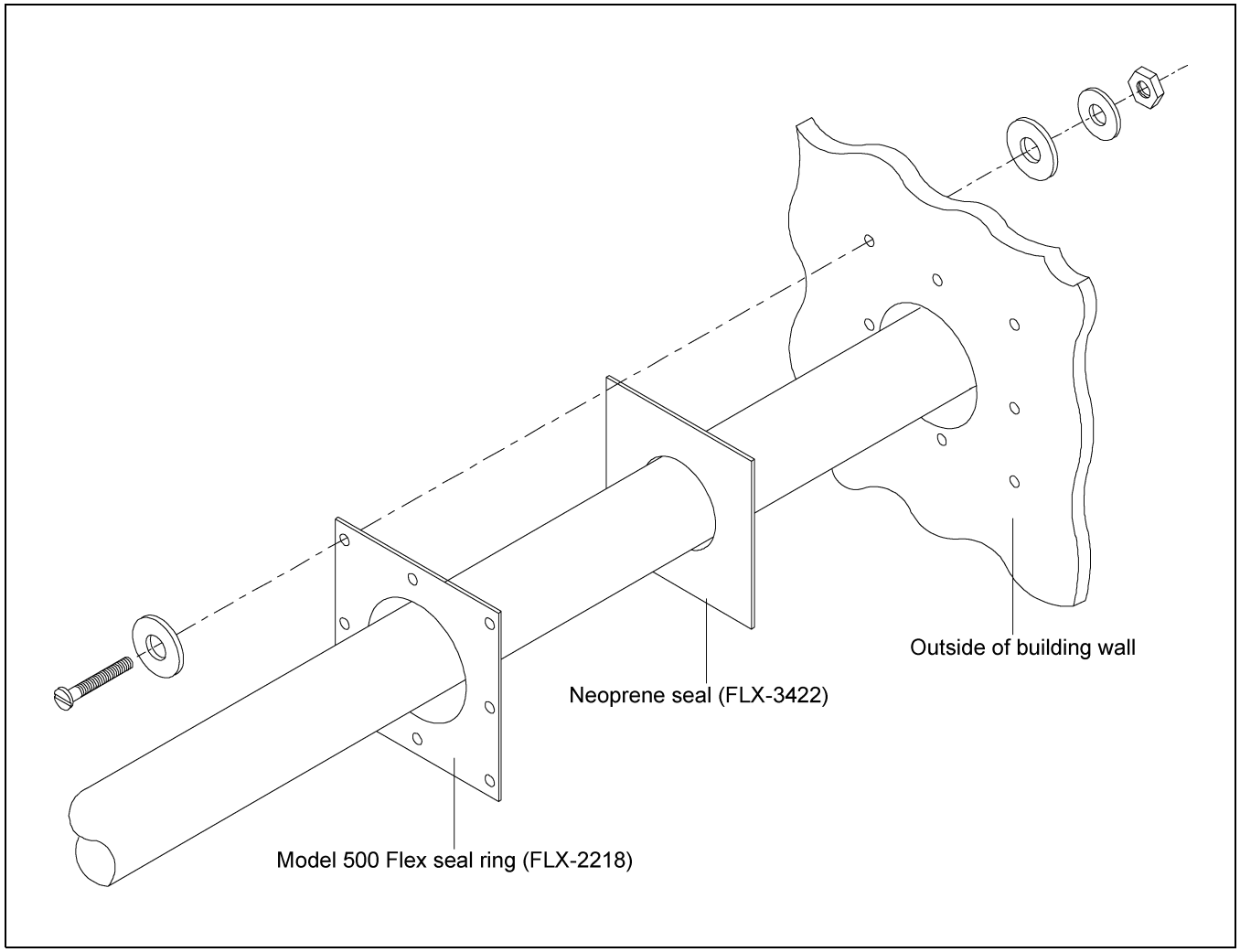


Figure 5J *Seal Ring and Neoprene Seal Installation*

2. Slide the elbow tubing through the hole in the building. Establish and cut (if necessary) the elbow at the desire length to ensure that the auger tubing will be horizontal. *See Figure 5K on Page 24* for proper cutting dimensions of the elbows at specific degree angles.
3. Fit and clamp a second elbow around the unloader outlet.
4. Slide the non-belled end of the straight tubing into the belled end of the “building” elbow. Hold the straight tubing in the desired mounting position. Mark and cut the “unloader” elbow at the point where it and the straight tubing intersect.

Auger Tubing Installation (Continued)

5. Remove the non-belled end of the straight tubing from the “building” elbow. Slide the belled end of the straight tubing over the freshly cut end of the “unloader” elbow. Mark and cut the straight tubing (as needed) so that it will fit inside the belled end of the “building” elbow.
6. Dry fit all of the outside tubing to ensure correct installation. Once satisfied, glue or clamp the tubing together as per the instructions in the section titled cementing procedure *on Page 25*.
7. When the auger tubing between the unloader and the building is 15' (4.57 m) or longer, the tubes should be supported.
8. Locate and cut the outlet holes needed in the remaining straight tubes. For the exact size of outlet holes, see section titled outlet holes *on Page 25*. Once ALL of the outlet holes are made and the tubing is dry fitted, glue or clamp the tubes together per the instructions in the section entitled cementing procedure *on Page 25*.
9. Suspend the auger tubes and elbows from the ceiling at least once every four feet (4'). If horizontal elbows are used, support them in at least two (2) places. Chain and lag screws are provided in each suspension kit. The tubes should be kept as straight and level as possible.

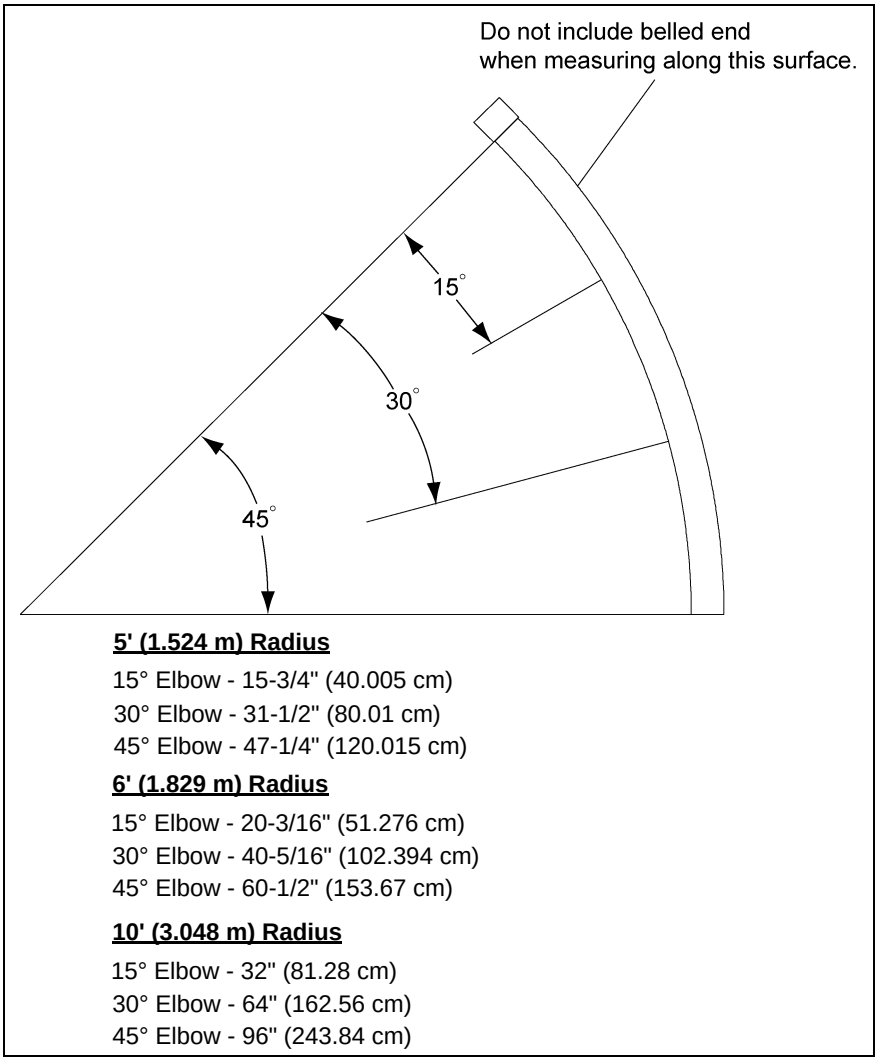


Figure 5K *Cutting Chart for 45° Elbow*

NOTE: *Align all outlet holes in proper functional positions prior to gluing the tube joints together.*

Cementing Procedure

Flex-Flo Systems have specially formulated PVC tubing. For strong tube connections, apply the PVC solvent cement per the instructions as follows:

1. Square tube ends and remove all burrs and dirt.
2. Check dry fit of tubes. The smaller end of the first tube should easily slide one-third of the way into the belled end of the second tube. The first tube end should be snug in the second tube once it is all the way in.
3. When the temperature is below 40°F (4°C) or above 85°F (29°C), consult PVC solvent cement container.
4. Apply a liberal coat of cement in the belled end. Avoid puddling inside.
5. Apply a liberal coat of cement on the smaller end, leaving no voids.
6. Assemble parts quickly. CEMENT MUST BE FLUID. If not fluid, re-coat both parts.
7. Push the smaller end into the belled end using a quarter turning motion until the small end bottoms.
8. Hold tubes together for 30 seconds, wipe off excess cement with cloth. Completed joints should not be disturbed until they have cured enough to withstand handling.

   Keep container closed when not in use.

Outlet Holes

Establish where the outlet drops are to be. Once this is done, cut holes for the outlet drops. *See Figure 5L* for hole size recommendations. If total drop-out is necessary, it is recommended that the holes are cut using a saber saw or hacksaw. When carry-over is desired, it is recommended that the outlet holes are cut with a holesaw.

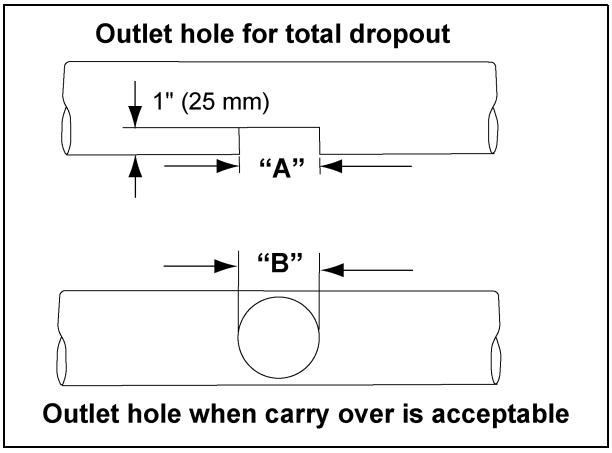


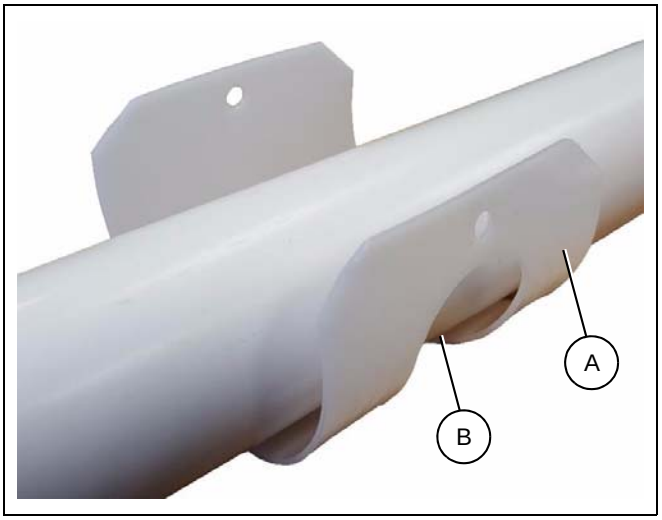
Figure 5L *Outlet Hole Cutting Chart*

Model	Full Drop	Carry-over
	Variable "A"	Variable "B"
220	1-1/2" (38 mm)	1-1/2" (38 mm)
300 and 300P	2-1/2" (63 mm)	2-1/2" (63 mm)
350	3" (76 mm)	3" (76 mm)
500	4" (102 mm)	4" (102 mm)
HR	3" (76 mm)	2-1/2" (63 mm)

Pull Cord Style Drop Kit Installation

1. Put a knot in the center of the cord.
2. Wrap a rotary slide (A) around the auger tube and align it with an outlet hole. *(See Figure 5M.)*

IMPORTANT: *Position the rotary slides (A) with the cutout (B) facing the same direction for all drops to ensure uniform operation.*



Ref #	Description
A	Rotary Slide
B	Cutout

Figure 5M

3. Thread one end of the cord through both holes in the top of the rotary slide (A). *(See Figure 5N.)*

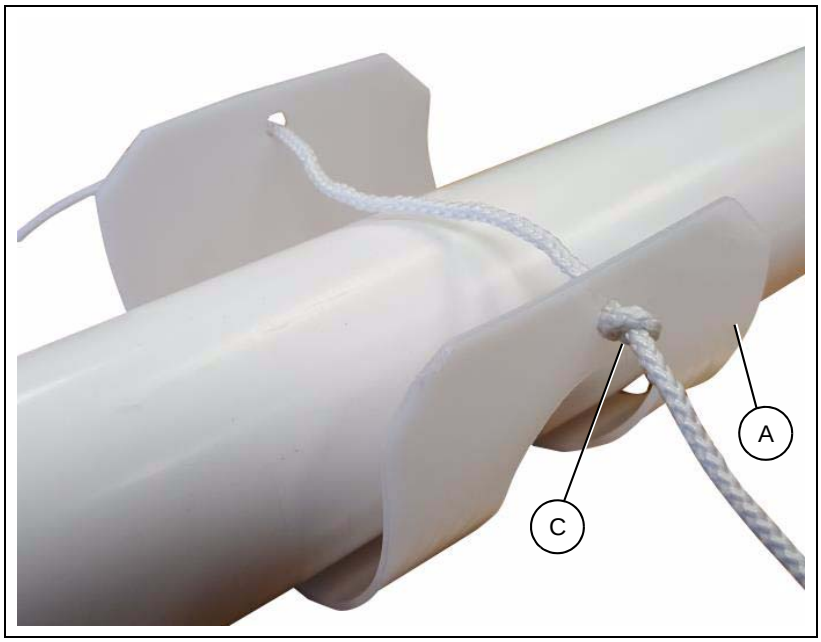


Figure 5N

Ref #	Description
A	Rotary Slide
C	Knot

4. Loop the cord over and back through both holes again. *(See Figure 5O.)*

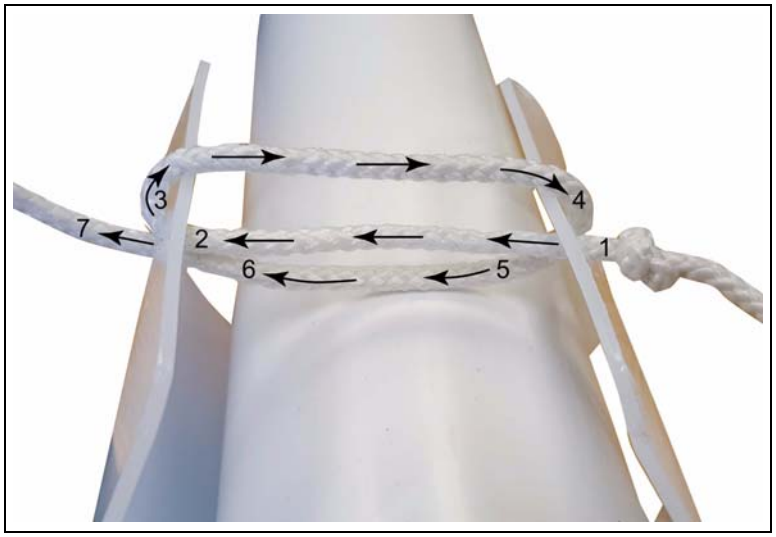


Figure 5O

5. Pull the cord tight until the first knot is firmly seated against the rotary slide (A) and the ends of the rotary slide touch each other evenly.

6. Tie a second knot (D) on the opposite side, making sure it is seated firmly against the rotary slide and there is no gap in the rotary slide (E). *(See Figure 5P.)*

   NOTE: *It is important that the ends of the rotary slide (E) touch evenly and the cord is flat against the seam so it does not catch on the drop halves. If needed, have someone hold the rotary slide (E) closed while tying the knot.*

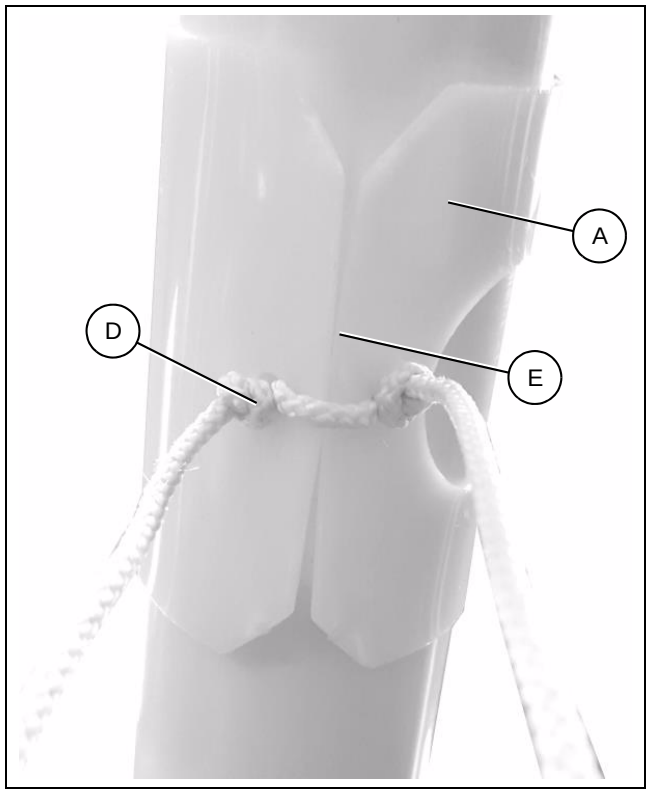


Figure 5P

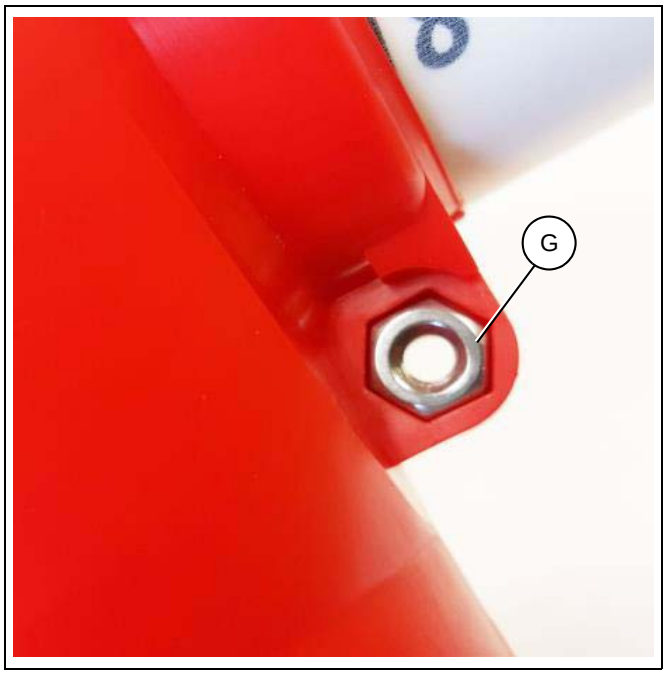
Ref #	Description
A	Rotary Slide
D	Second Knot
E	No Gap in Rotary Slide

7. Position the drop halves over the pipe and thread the cord through the guide holes (F). *(See Figure 5Q.)*

Ref #	Description
F	Cord through guide holes

Figure 5Q

8. Insert a hex nut (G) into each of the four hexagon shaped sockets on the drop halves and fasten the halves together using screws. *(See Figure 5R.)*



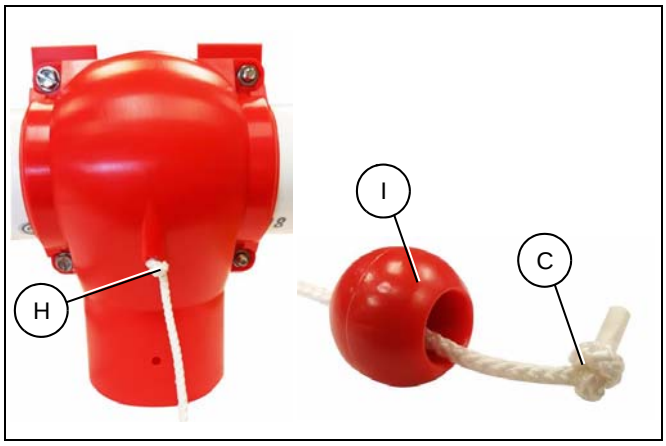
Ref #	Description
G	Hex Nut in Socket

Figure 5R

9. Pull on the cord until the rotary slide opening is centered over the hole in the auger tube.

   NOTE: *Check by looking up through the drop opening.*

10. Mark the cord on the opposite side where it enters the guide hole and tie a knot (C). Also, install the red indicator ball (I) at the end of this cord and tie a knot (C). *(See Figure 5S.)*



Ref #	Description
C	Knot
H	Stop Knot
I	Red Ball

Figure 5S

11. Pull on the red indicator ball (I) until the rotary slide is fully covering the opening in the auger tube.

    NOTE: *Check by looking up through the drop opening*.

12. Mark the cord on the opposite side where it enters the guide hole and tie a knot. Also, install the green indicator ball at the end of this cord and tie a knot.

13. Test that the outlet drop closes when pulling on the red ball and opens after pulling on the green ball. *(See Figures 5T and 5U.)*

Figure 5T *Closed Position*

Figure 5U *Open Position*

14. Dab PVC cement around the auger tube on both sides of the outlet drop to prevent it from shifting along the tube.

15. Use the supplied screws to attach an optional drop tube to the outlet drop kit.

Kwik-Attach Drop Kit Installation

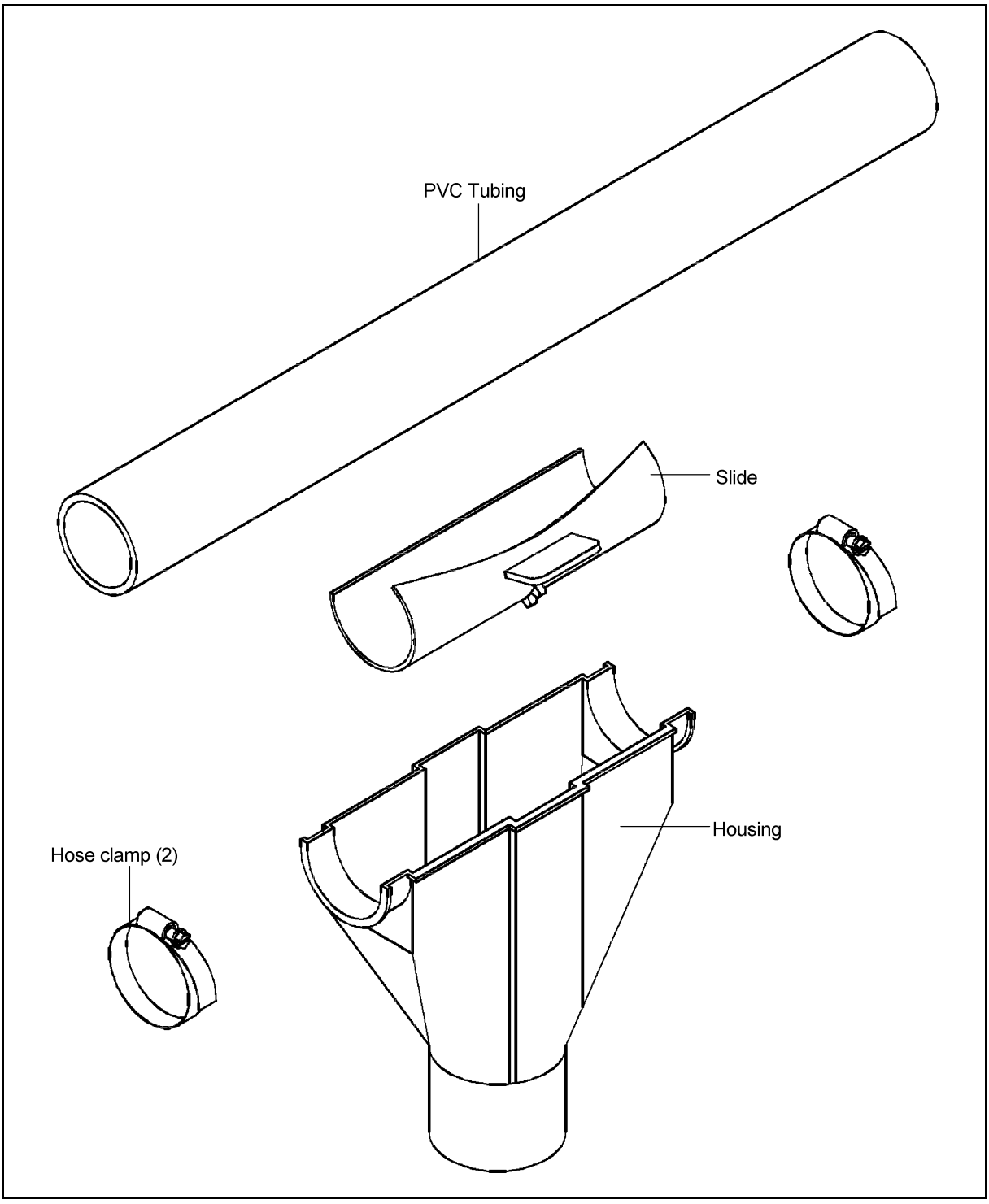


Figure 5V *Kwik-Attach Drop Kit Installation*

1. Snap the slide around the tube over the outlet hole. *(See Figure 5V.)*
2. Fasten the housing to the tube using two (2) hose clamps. Make sure the outlet hole is in the middle of the housing.
3. Slide can be rotated from side to side to open and close the drop kit.

Power Unit and Control Unit

CAUTION

The safety switch on the control unit is provided as a backup switch in case the hopper level or the drop tube switch does not operate properly. This switch is not intended to be used for controlling the Flex-Flo System, but as a safety backup switch only.

Flex-Flo offers two (2) different types of power units, direct drive unit and belt drive power unit, along with the control unit. Installation instructions are provided with each power unit.

Horsepower requirements are based on length, type of Flex-Flo System installed, number of turns, tandem systems etc. *Table below* shows maximum line lengths for Flex-Flo Systems plus maximum lengths for extensions hopper installing, using various power units.

Reduction of the maximum line lengths in the chart should be allowed for if the system's incline is greater than 45° and/or the rise of the system is higher than 8' (2.44 m). For each additional 90° (2 elbows) used beyond chart, reduce the maximum line length for each drive unit by 30' (9.14 m). For each straight-out to straight-through tandem system, decrease the maximum line length for each drive unit size by 50' (15.24 m).

Figure 5W

Maximum Line Length

Motor Size	Model 220			Model 300 and 300P		Model 350		Model 500				Model HR	
	Max. Length	Max. Extension	Model 220 Extended Pitch	Max. Length	Max. Extension	Max. Length	Max. Extension	Max. Length	Max. Extension	Max. Length	Max. Extension	Max. Length	Max. Extension
1/3 HP	150'	180'		-	-	-	-	Dry feed stuffs moisture levels below 18%		High-moisture systems moisture level from 18%-27%		-	-
0.246 kW	46 m	91 m		-	-	-	-					-	-
1/2 HP	250'	300'	300'	80'	80'	30'	65'					30'	50'
0.373 kW	24 m	38 m	38 m	24 m	38 m	9 m	20 m					7.6 m	12.7 m
3/4 HP	-	-	400'	150'	150'	90'	90'	50'	50'	25'	25'	90'	90'
0.559 kW	-	-		46 m	56 m	27 m	38 m					20.3 m	25.4 m
1 HP	-	-		200'	245'	150'	185'	100'	100'	50'	65'	150'	180'
0.746 kW	-	-		61 m	75 m	46 m	56 m					38.1 m	457 m
1-1/2 HP	-	-		-	-	-	-	150'	180'	75'	90'	-	-
	-	-		-	-	-	-					-	-

The maximum length is for a system with three (3) elbows.

Direct Drive Power Unit/Control Unit

1. Bolt the tube anchor to the control unit body with a flat washer on each of the four (4) 5/16" x 3/4" bolts. (*See Figure 5X* for more details.)
2. Slide the driver assembly onto the power unit drive shaft. Place the 5/16" hex socket bolt (supplied with the driver assembly) into the untapped hole of the driver through the drive shaft and tighten the bolt into threaded portion of the driver.
3. Mount the control unit to the gearbox unit with four (4) 5/16" x 3/4" bolts and four (4) flat washers, which are supplied with the power unit. *(See Figure 5Y on Page 33.)*

   NOTE: *Gearbox is shipped without oil. Fill with 15 oz. of 80W 90 gear lube part # FLX-4471.*

Figure 5X *Assembly of Tube Anchor to the Control Unit*

4. The control unit and power unit require hard wiring. The supply line wires into L1 and L2/N of the relay in the control unit. The motor leads wire into the M1 and M2 of the relay in the control unit. Auxiliary switch is wired into the male and female spade terminal of the control unit. *(See Wiring Diagram on Pages 60-70.)*
5. Slide and clamp a tube coupler on the tube anchor.
6. Attach the power/control unit to the Flex-Flo tubing.

7. Suspend power/control unit firmly from the ceiling as shown in *Figure 5Z*. Support holes are provided on the power unit and the control unit.

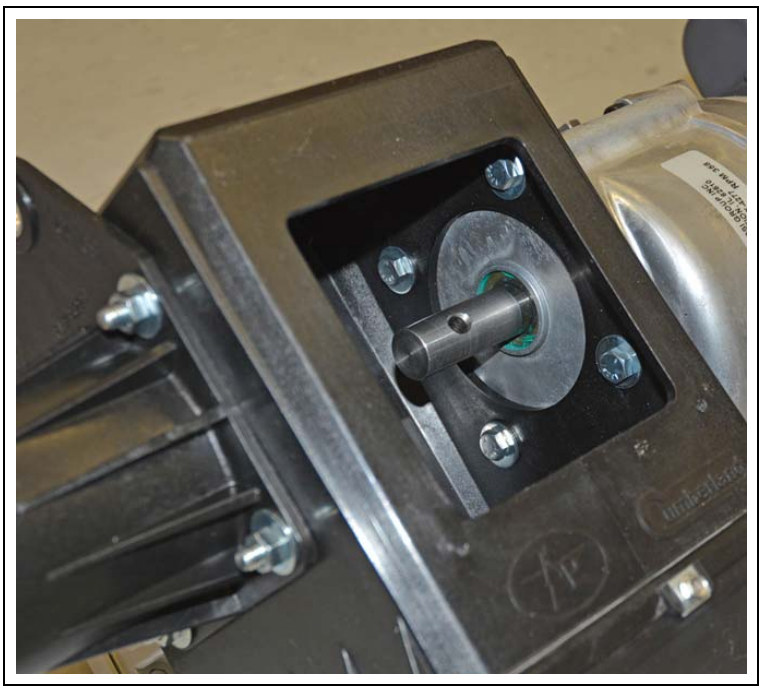


Figure 5Y *Assembly of the Control Unit to the Drive Unit*

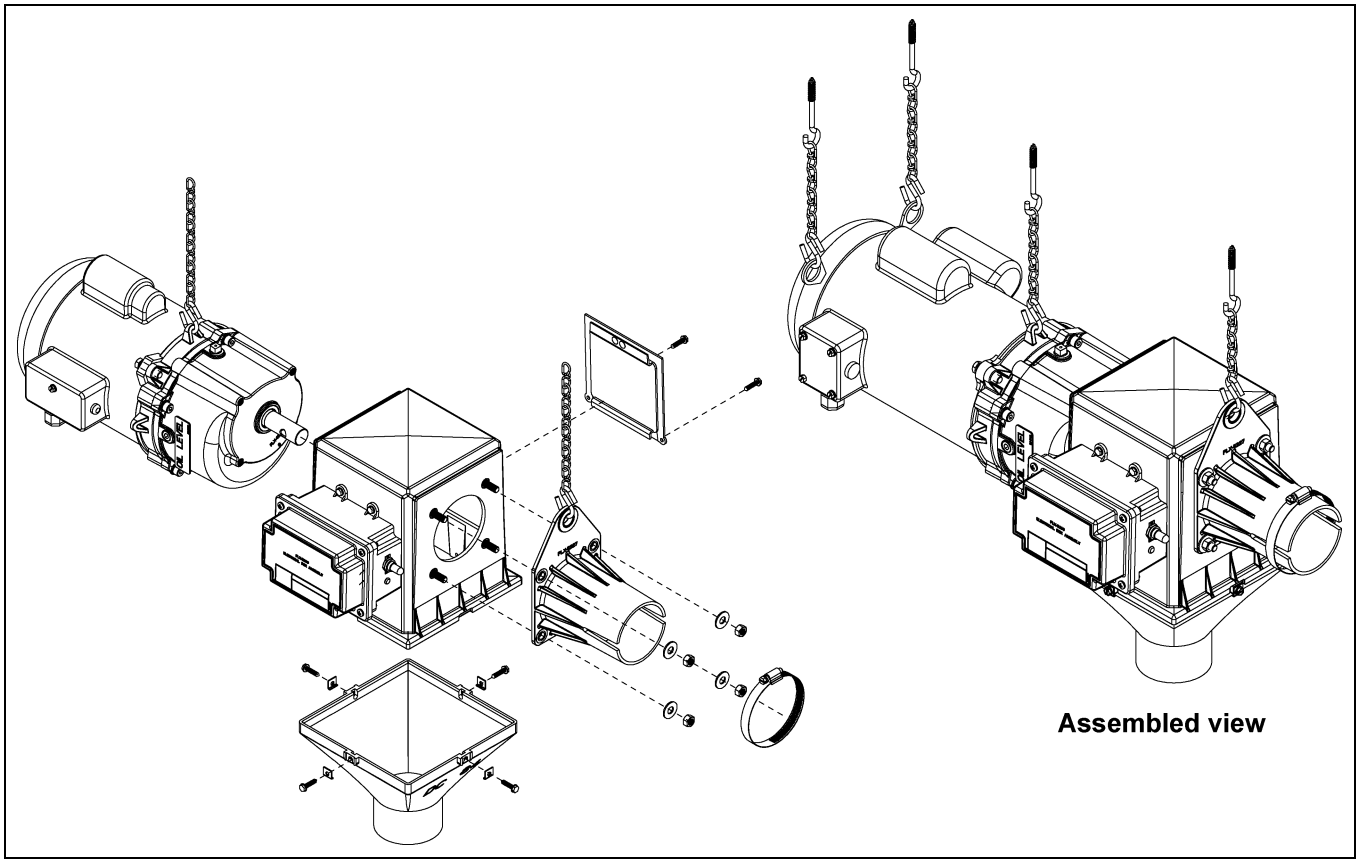


Figure 5Z *Direct Drive/Power Unit*

Installing and Un-Installing the Pinion

1. Un-install the gearbox (C) from the motor by removing the bolts (A) and washers (B). *(See Figure 5AA.)*

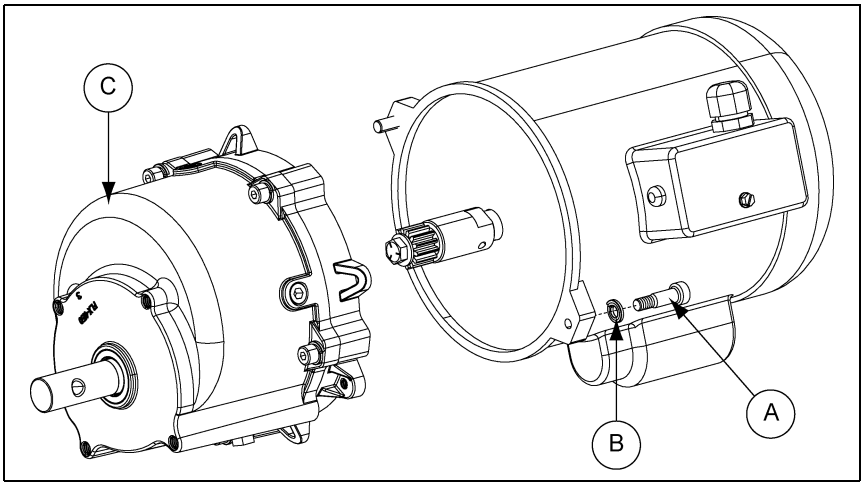


Figure 5AA

Ref #	Part #	Description
A	S-7225	Bolt, SHCS 5/16"-18 x 1-1/4"
B	S-1147	Split Lock Washer 5/16" ZN
C		Gearbox

2. Un-install the bolt (D) from the pinion shaft. Remove the washers (E and F) and the set screw (H) from the pinion shaft (G). *(See Figure 5AB.)*

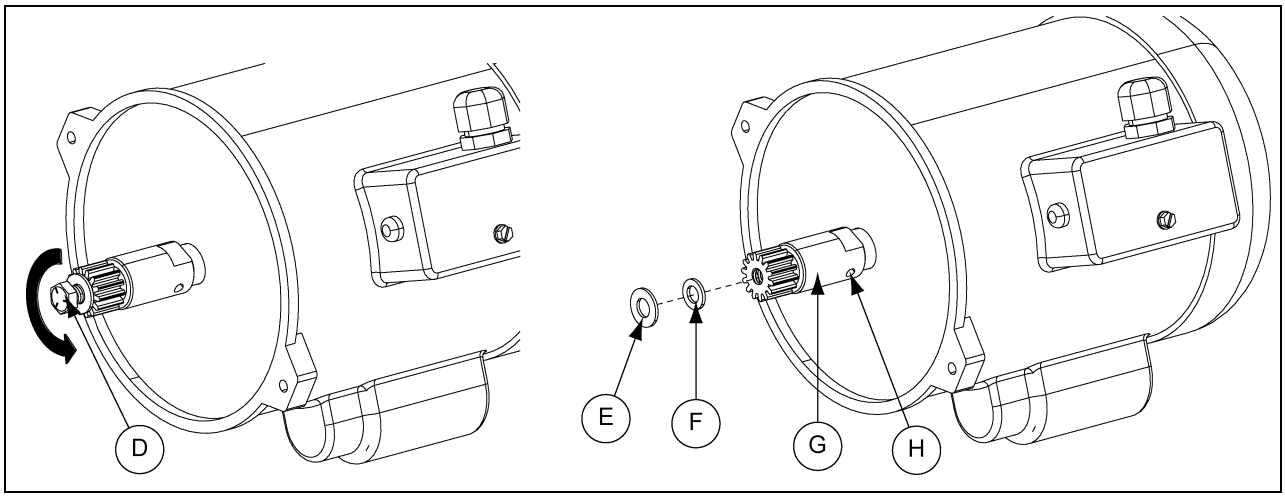


Figure 5AB

Ref #	Part #	Description
D	S-10293	Bolt, HHCS 3/8"-16 x 1/2" Grade 5 Zinc
E	S-7409	Flat Washer 3/8" SAE ZN Grade 2
F	FLX-5264	Gasket, for Bolt Blue Guard 3000

Ref #	Part #	Description
G	*See Chart on Page 35*	Gear Pinion Shaft
H		Set Screw

3. Hold the pinion with a wrench and install a 3/8"-16 x 2-1/2" or longer bolt (I) into the end of the pinion and turn until the pinion is released from the shaft. *(See Figure 5AC.)*

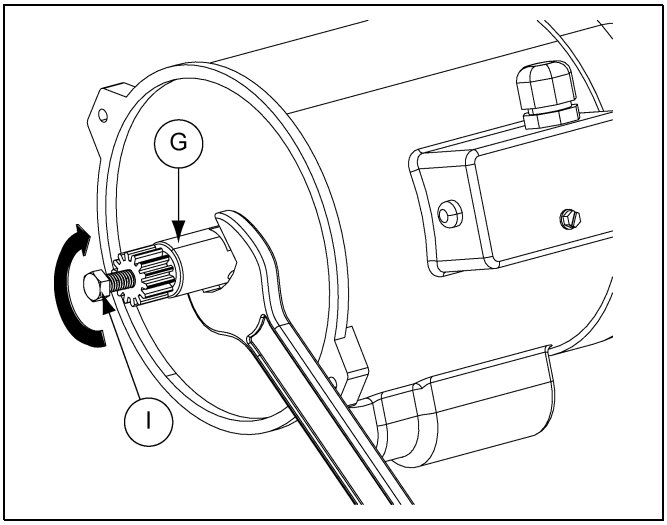


Figure 5AC

Ref #	Part #	Description
G	*See Chart below*	Gear Pinion Shaft
I	S-6762	Bolt, HHCS 3/8"-16 x 2-1/2" ZN Grade 5

Gear Pinion Shaft (G)	
Part #	**Description**
FLX-4275	Gear, Pinion, 14T, 1/2" Shaft Diameter, 1/3 HP and 1/2 HP
FLX-4276	Gear, Pinion, 14T, 5/8" Shaft Diameter, 3/4 HP, 1 HP and 1-1/2 HP Motors
FLX-4542	Gear, Pinion, 14T, 5/8" Shaft Diameter, 1 HP or 1-1/2 HP, 3.000" Long

4. Replace the pinion onto the shaft and install the set screw. Torque to 50 in-lbs.

5. Re-install the washers (E and F) and bolt (D) to the end of the pinion shaft (G). Torque to 50 in-lbs.

   NOTE: *Make sure the fiber washer is against the end of the pinion shaft (G).*

6. Re-install the gearbox (C) to the motor (J) using the bolt (A) and washer (B) previously removed. *(See Figure 5AD.)* Tighten bolt to 50 in-lbs.

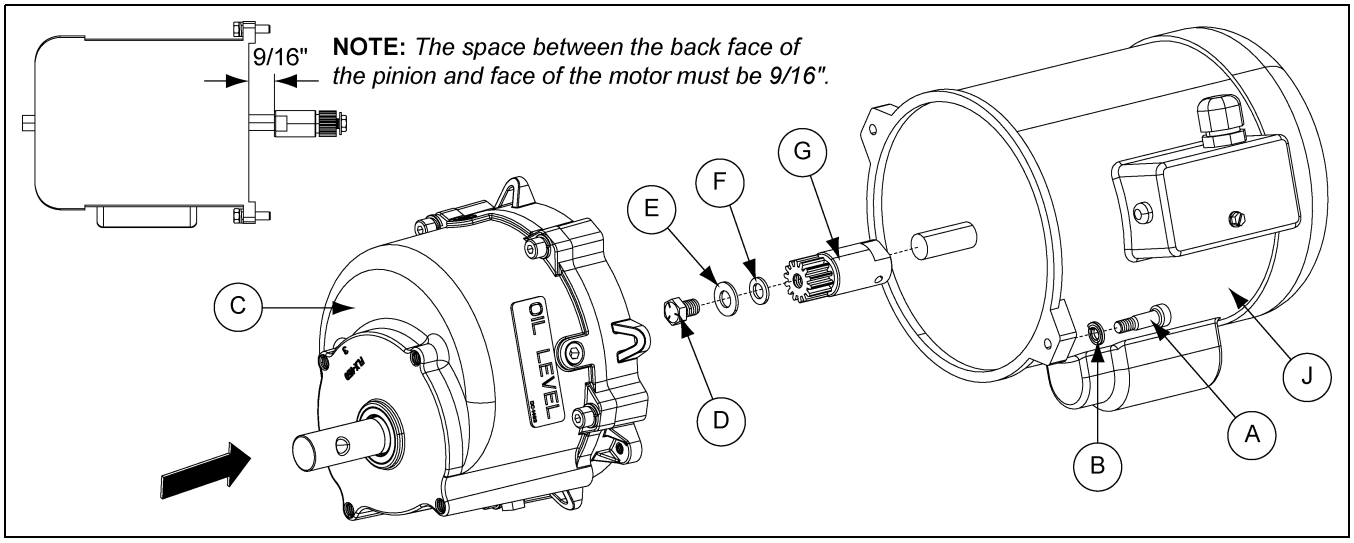


Figure 5AD

Ref #	Part #	Description
A	S-7225	Bolt, SHCS 5/16"-18 x 1-1/4"
B	S-1147	Split Lock Washer 5/16" ZN
C		Gearbox
D	S-10293	Bolt, HHCS 3/8"-16 x 1/2" Grade 5 Zinc

Ref #	Part #	Description
E	S-7409	Flat Washer 3/8" SAE ZN Grade 2
F	FLX-5264	Gasket, for Bolt Blue Guard 3000
G	*See Chart*	Gear Pinion Shaft
J		Motor

Belt Drive Power/Control Unit

1. Bolt the tube anchor to the control unit body with a flat washer on each of the four (4) 5/16" x 3/4" bolts. (*See Figure 5X on Page 32* for more details.)
2. Insert the driver shaft through the bearing assembly. The bearing mounting plate should be mounted in between. Tighten the set screw on the bearing down to the shaft.
3. Bolt the two (2) mounting brackets together with the four (4) bolts and washers provided.
4. Attach the motor support assembly to the control unit with the four (4) bolts already in the mounting bracket and belt guard. Secure with the four (4) lock washers and hex nuts provided. If necessary, motor orientation can be reversed by rotating the motor mount 180°.
5. Slide and clamp a tube coupler on the anchor.

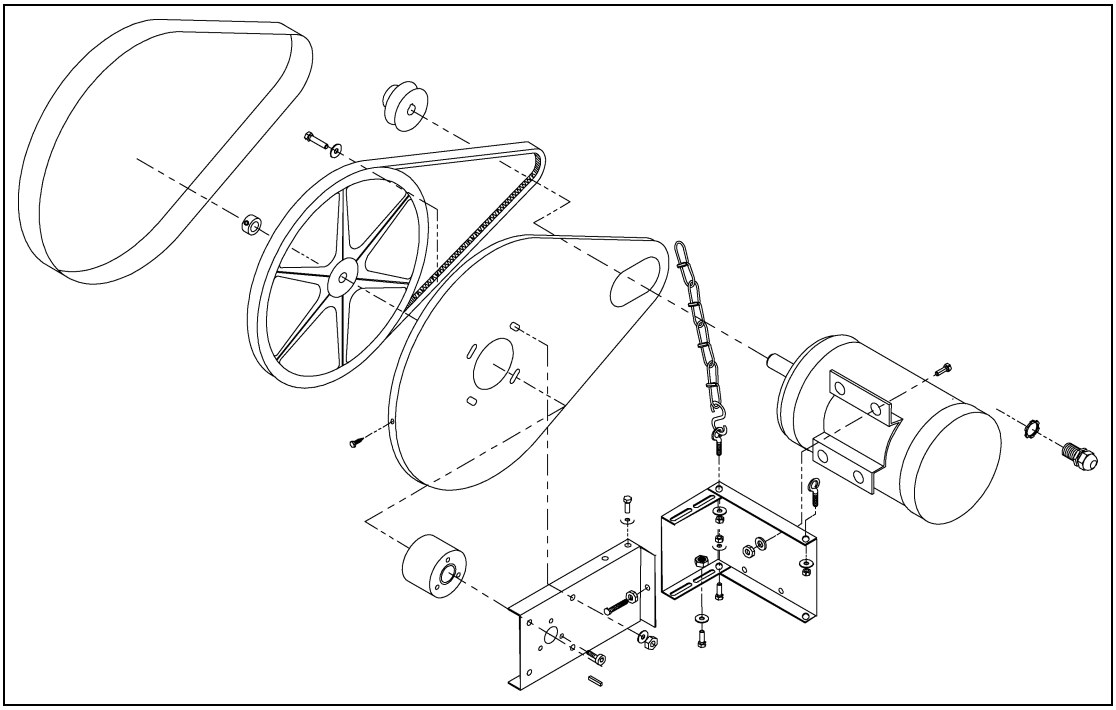


Figure 5AE *Belt Drive/Power Unit*

6. Mount the motor onto the motor mount base with four (4) bolts and washers.
7. Mount the belt pulleys. The two (2) pulleys must be positioned in line with each other to prevent from binding the belt.
8. Install the belt.
9. Adjust the belt tension by extending and retracing the two (2) mounting brackets. Resecure the bolts after adjustment.
10. Install belt guard cover.
11. Attach the power/control unit to the Flex-Flo tubing.
12. Suspend the power/control unit firmly from the ceiling using the chains provided.
13. The control unit and the power unit must be wired as shown in the *Wiring Diagram on Pages 60-70*.
14. Install the auger.

Auger

The auger should be handled with great care. Do not install the auger until the kinks have been removed. The kink may be removed by straightening the auger. A kink may cause extensive wear on the system and premature part replacement. In the event that the kink cannot be removed by straightening, the kink must be cut-out and the auger welded. (See brazing recommendations in *Figure 5AI on Page 38*.)

Figure 5AF

Auger Installation

Two (2) persons are required to install the auger. One person feeds the auger into the tubing while the other makes sure the auger is not damaged. Make sure no metal wires or loose ends enter the system.

1. The auger must be fed into the Flex-Flo System through the unloader. Remove the anchor from the unloader. Remove the control unit cover plate as well.
2. Feed the auger carefully into the Flex-Flo System through the unloader. Remove the anchor from the unloader and remove the control unit cover plate.
3. Push the auger in until it reaches the control unit at the other end. Fasten the end of the auger to the clamp pin or auger lock in the control unit driver assembly. Tighten the auger lock bolt according to the torque specifications from the “Auger Driver Connection” table as shown *on Page 40*. If the auger end is not in the appropriate orientation for connection, the driver assembly may be rotated by turning the motor drive shaft until the end of the auger makes contact with the welded washer on the driver.
4. Pull and release the free end of the auger gently a few times. This action should relax the auger into its natural position.
5. A certain mechanical stress must be applied when installing the auger; therefore stretching the auger is very important. This is performed by drawing the auger out of the tubing. An important factor is the total system length. The auger should be drawn out of the tubing 2" (5 cm) for every 50' (15 m) of length for single feed tanks. For tandem systems, stretch the auger 4" (10 cm) for every 50' (15 m) of length. *(See Figure 5AG.)*
6. While the auger is in the relaxed state, mark the auger at the unloader inlet.

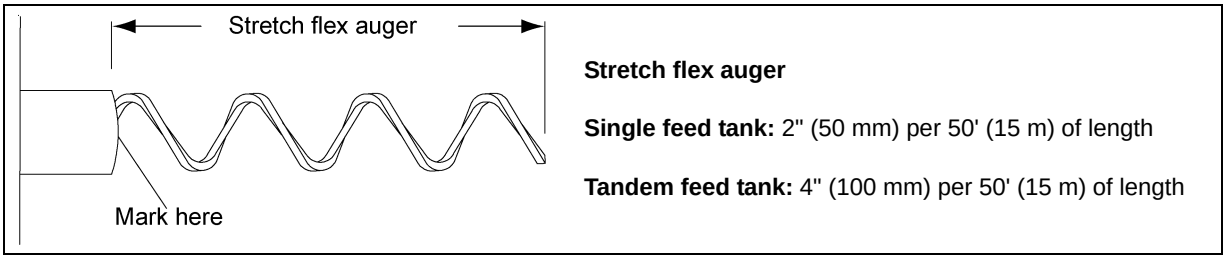


Figure 5AG *Stretching the Auger*

Auger Installation (Continued)

7. Draw the auger out of the tubing as far as required. Measure the length between the mark and the unloader inlet. Mark the auger again at the unloader inlet when properly stretched. *(See Figure 5AG on Page 37.)* Stretching the auger too far will cause premature wear at the inside bends of the PVC tubing. Stretching the auger not far enough will cause premature wear at the outside bends of the PVC tubing.
8. For ease of trimming the auger, pull the auger out an additional 8" (20 cm) past the mark and clamp it at the unloader. This clamping releases tension at the mark and thus eases cutting. *(See Figure 5AH.)*
9. Twist the unloader anchor into the auger and clasp the auger end in the clamp pin.
10. Mount the anchor in the unloader.
11. Place the cannonball inside the unloader.
12. Mount the cover on the control unit.
13. Place the inspection/clean-out plate in the unloader.

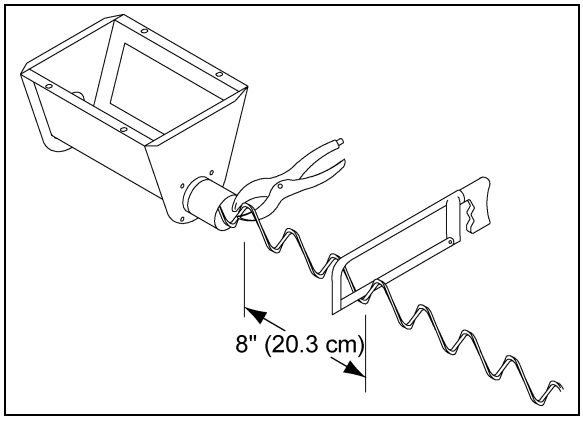


Figure 5AH *Cutting the Auger*

Brazing the Auger

1. Make sure both ends are cleaned.
2. Position the auger in an angle iron and clasp it securely to align it for brazing. *(See Figure 5AI.)*
3. Braze both ends together. Use a bronze flux-coated rod. Make sure the auger does not get too hot which might cause the auger to warp.
4. After the brazing is performed, the joint should be allowed to air cool.
5. Once the auger has cooled, install the auger with the brazed joint closer to the power unit.

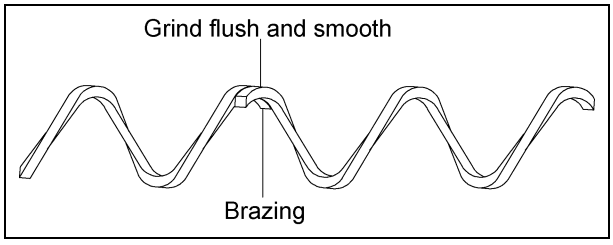


Figure 5AI *Brazing the Auger*

Extension Hopper Installation

1. To ease the installation, mount the extension hopper top section to the Flex-Flo tubing.

   NOTE: *A. Slide the tube clamp on the hopper tube anchor prior to attaching it to the tubing.*

   B. Make certain when mounting the power unit and the tubing that they are attached to the access slide side. When mounted in this orientation, the incoming auger is positioned as far away as possible to allow the upper control switch to operate properly.

2. Suspend the top section from the ceiling as shown in *Figure 5AJ*. Support holes are provided on the top section for mounting. When mounting, make allowance for future adjustments of the top section after the bottom section has been connected.

   NOTE: *Any additional support given to the extension hopper makes for a more solid system and is desirable. Take special care if or when the support is modified that the operation of the system and the ability to do a general maintenance are not hindered.*

3. Mount the unloader under the control unit. The control unit should be assembled together prior to mounting. This assembly includes the driver assembly. Suspend the control unit firmly from the ceiling. Support holes are provided on the tube anchor.

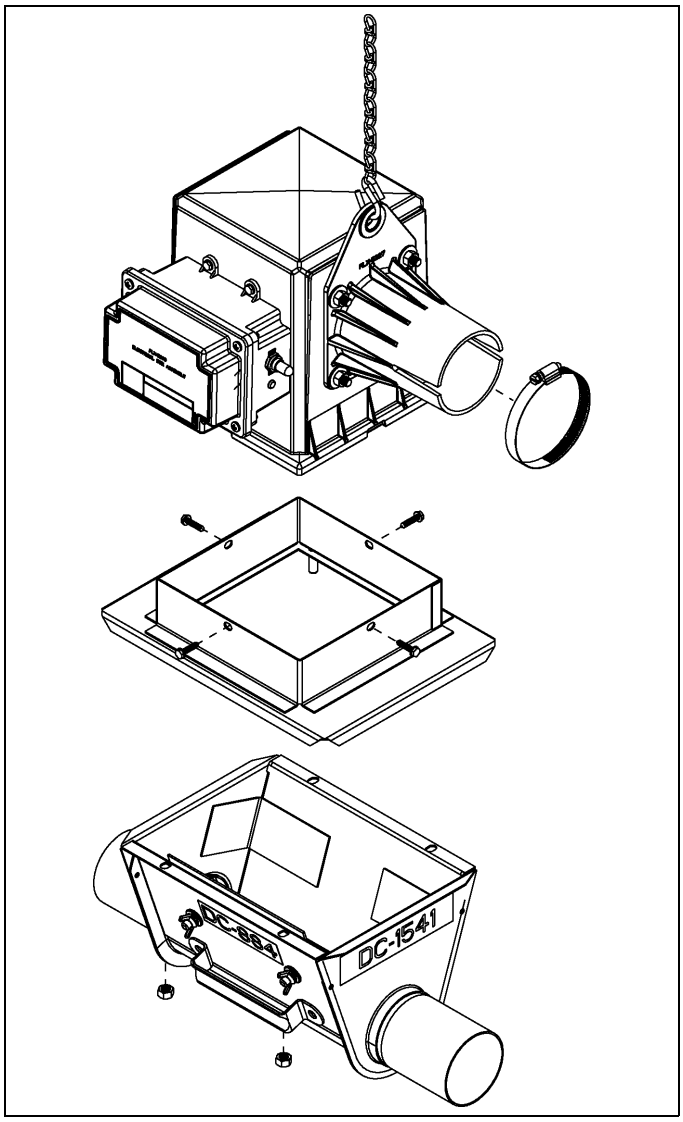


Figure 5AJ *Extension Hopper*

4. Push the auger in until it reaches the control unit at the other end. Fasten the end of the auger to the clamp pin or auger lock in the control unit driver assembly. Tighten the auger lock bolt according to the torque specifications from the “Auger Driver Connection” table as shown *below*. If the auger end is not in the appropriate orientation for connection, the driver assembly may be rotated by turning the motor drive shaft until the end of the auger makes contact with the welded washer on the driver.

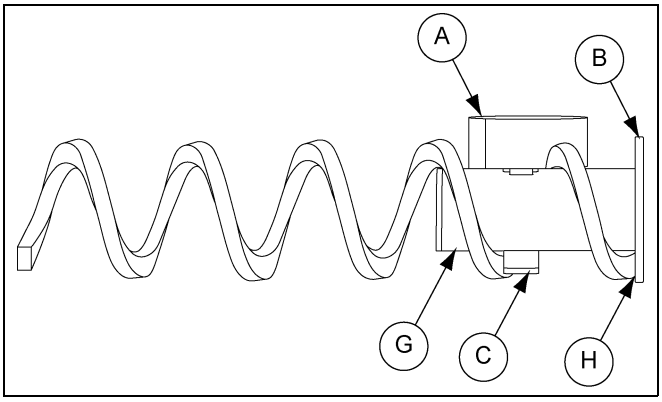


Figure 5AK *Model 220 Auger Driver Connection*

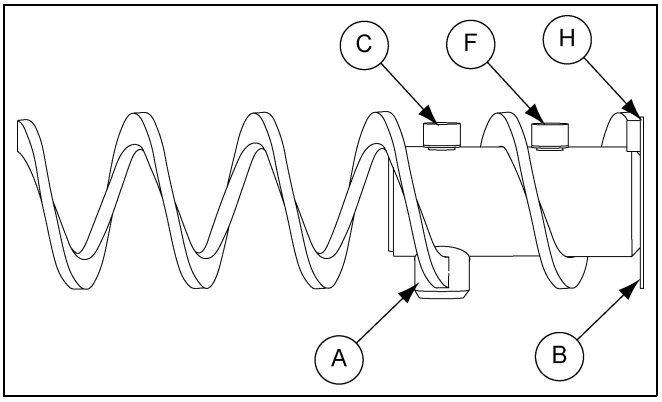


Figure 5AM *Model 300/Model 350 Auger Driver Connection*

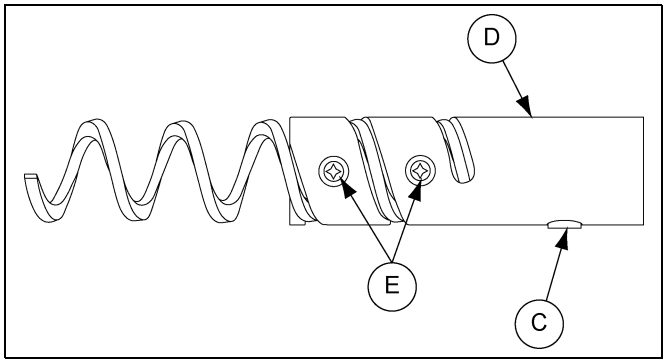


Figure 5AL *Model 220 Drop Feeder Auger Driver Connection*

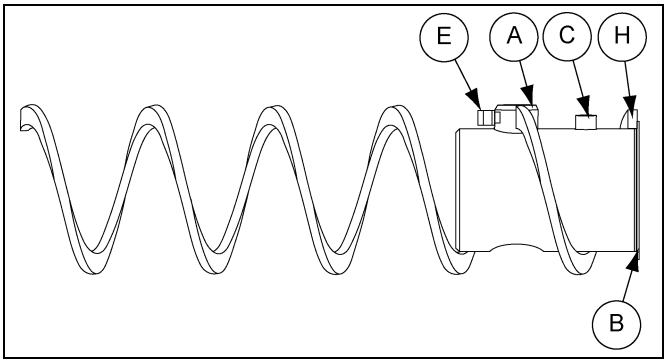


Figure 5AN *Model 500 Auger Driver Connection*

Auger Driver Connection Table

Ref #	Models	Part #	Description	Specifications
A	Model 220	FLX-4543	Auger Lock Clamp Pin	
	Model 300/Model 350	FLX-4571	Auger Lock Clamp Pin	
	Model 500	FLX-2974	Auger Lock Clamp Pin	
B	All Models		Anchor Washer	
C	Model 220	S-8039	Bolt, 1/4"-20 x 1-1/4" THD Lock Grade 8	Torque to 8ft.-lbs.
	Model 220 Drop Feeder	S-8660	Bolt, SHCS 5/16"-18 x 1-1/4" Cup Point	Torque to 20 ft.-lbs.
	Model 300	S-6481	Bolt, SHCS 5/16"-18 x 1-1/2" Type B Cup Point	Torque to 20 ft.-lbs.
	Model 350	S-8660	Bolt, SHCS 5/16"-18 x 1-1/4" Cup Point	Torque to 20 ft.-lbs.
	Model 500	S-6483	Bolt, SHCS 5/16"-18 x 2-1/2" Type B Cup Point	Torque to 20 ft.-lbs.
D	Model 220 Drop Feeder	FLXDF-1182	Drop Feeder Anchor	
E	Model 220 Drop Feeder	S-8895	Set Screw, 5/16"-18 x 3/8" SKT HD Cup Point	Torque to 15 ft.-lbs.
	Model 500	S-4312	Set Screw, 5/16"-18 x 1/2" SQ HD BK Cup Point	Torque to 15 ft.-lbs.
F	Model 300/Model 350	S-6481	Bolt, SHCS 5/16"-18 x 1-1/2" Type B Cup Point	Torque to 20 ft.-lbs.
G			Gearbox Output Shaft	
H	All Models		End of auger must make contact with welded washer.	

Extension Hopper Installation (Continued)

5. Remove the anchor assembly and the rear access panel from the bottom section of the extension hopper. Mount the bottom section to the top section with 1/4"-20 machine screws provided with the hopper. The bottom section may be mounted in three (3) various directions. *(See Figure 5AO.)*

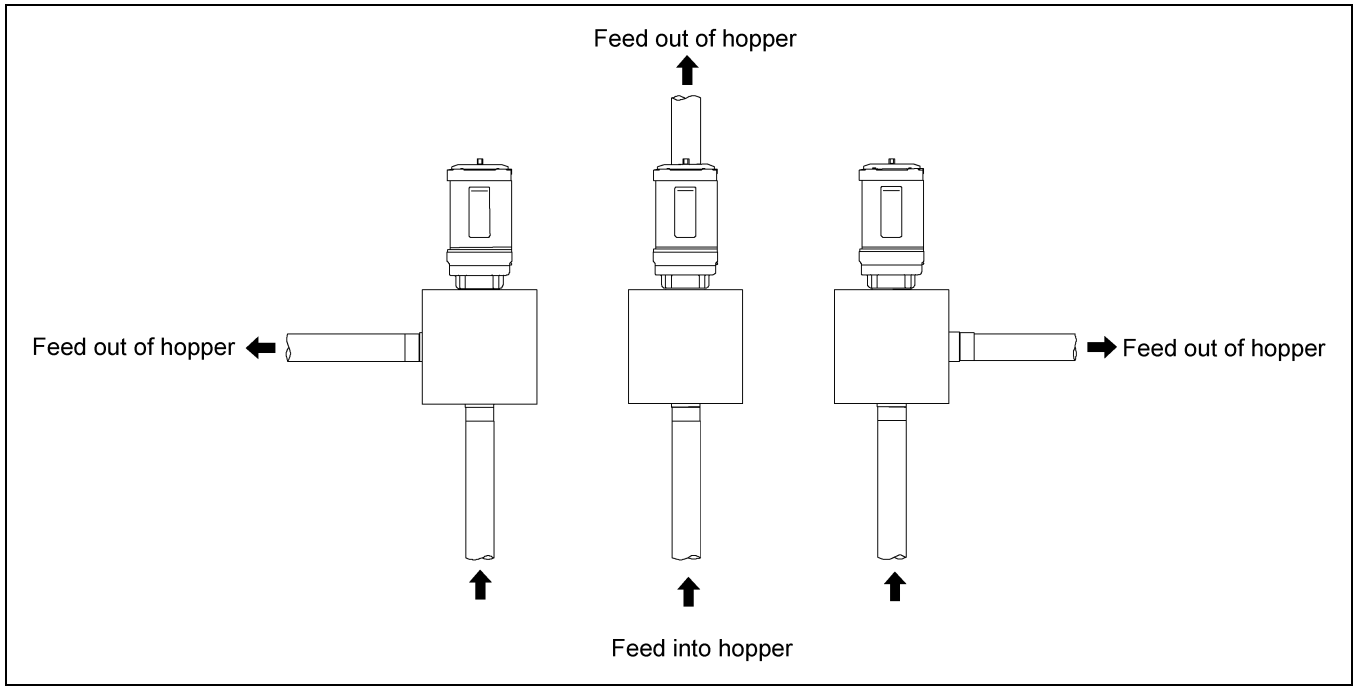


Figure 5AO *Extension Mounting Directions*

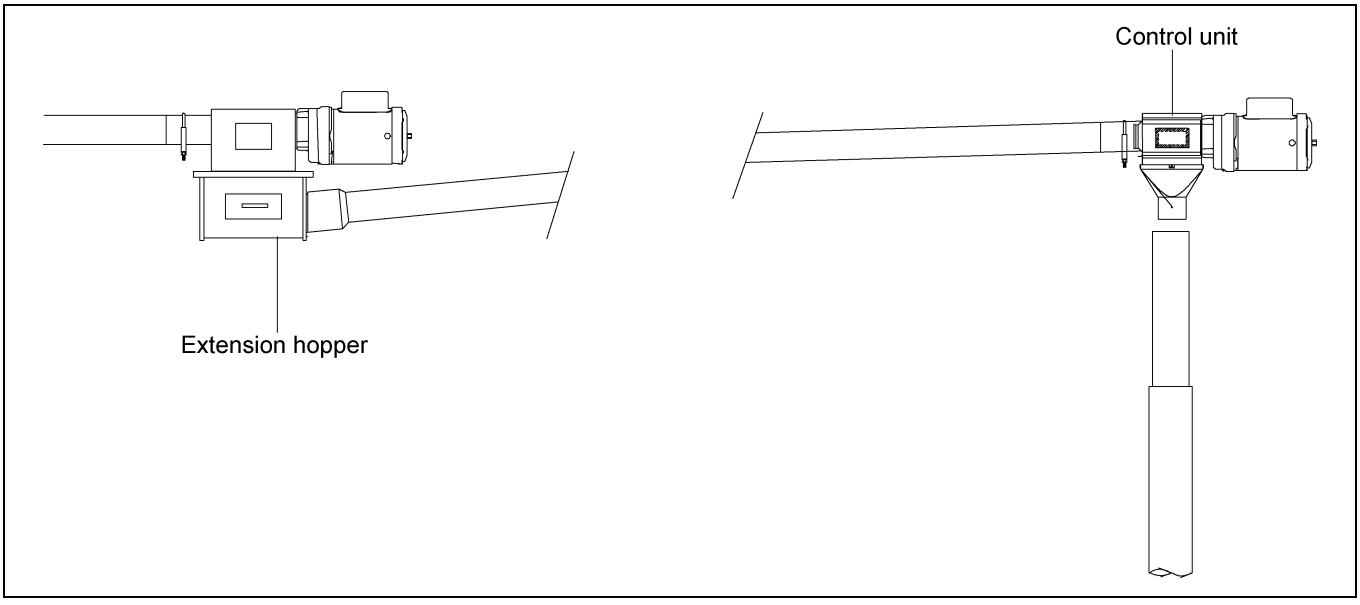


Figure 5AP *Extension System*

6. Install the auger for the system that is connected from the tank(s) to the extension hopper. Install as a standard system. The auger for the second part of the system should connect to the power/control unit at the other end.

7. Clamp the auger ends to their applicable anchors and mount the bearing assemblies in place.

Figure 5AQ

Operation Guidelines

1. Open the unloader slide completely for the delivery system operation except on tandem system.
2. Do not operate the Flex-Flo System empty. Utilize a time clock with the system whenever possible because:
   A. It lessens short cycling by operating on a set schedule versus on demand.
   B. It prohibits the system from running excessively when empty if the tank should go dry. When the optional unloader switch is used, it should be wired so that if the feed tank goes empty the power unit will stop.
3. The time clock should be programmed to start the Flex-Flo System often. By running the system often, long running periods are eliminated and the feeders are kept full. When the Flex-Flo System is used for filling poultry feeders, a time clock should be utilized to ensure that all feeders are filled at the same time. The Flex-Flo System will have a better opportunity to keep up. Position the hopper level control low in the last hopper.
4. A safety switch is provided on the control unit to trip out the motor in the event that feed is packed inside. If feed does get packed, dislodge the feed from the drop tube and clean-out the inside of the control unit which will allow the switch to close. The hopper level control needs to maintain vertical positioning to keep the paddle swinging freely. Check the adjustment regularly. The control unit safety switch does not replace the hopper level control.
5. When the Flex-Flo System is used to convey high-moisture feed, the auger line should be completely emptied after each running to prevent feed from jamming in the tubes.
6. Operate the manual outlets several times each week to free them of feed debris.
7. The restrictor on the unloader anchor controls the feed that is flowing into the auger. When starting a new system, the restrictor should be installed at full length and flush with the front of the unloader. Permit the system to polish out the inside of the tubing before modifying the feed flow. When the restrictor tube is in the unloader, maximum restriction is reached. When increased feed flow is desired, the length of the restrictor tube should be decreased.

8. When a multi-story building is supplied by one auger solely, obtain total drop-out at each outlet. A time clock MUST be utilized to ensure that all of the feeders are filled at the same time. In the last hopper on every level, install a hopper level control.
9. With the straight-through tandem system, open only one tank slide at a time when feeding. Operating the system with both unloader slides open is not recommended since horsepower consumption increases considerably.
10. Grease boot bearing grease fittings using automotive or industrial type grease. This should be done once a month as standard maintenance.

Wire Size by Type

Motor HP	Full Load Amps	Minimum Allowable Wire Size		
		In Cable, Conduit or Earth		Overhead in Air
		Type: R, T, W	Type: RH, RHW, THW	Bare and Covered Conductors
1/2	4.9	12	12	10
3/4	6.9	12	12	10
1	8.0	12	12	10
1-1/2	10.0	12	12	10

Copper conductors, 1 Phase 230V, 3% voltage drop.
In case of conductors supplying several motors on one (1) circuit, the wire size is determined by taking 125% of the full load current of the largest motor and 100% for all others.

Wire Size by Length of Run

	Length of run - Ft. (m)														
Motor	50	75	100	150	200	250	300	350	400	500	600	700	800	900	1000
Size	(15)	(22.5)	(30)	(45)	(60)	(75)	(90)	(105)	(120)	(150)	(180)	(210)	(240)	(270)	(300)
1/2 HP	12	12	12	12	12	12	12	12	12	10	10	8	8	8	8
3/4 HP	12	12	12	12	12	12	12	10	10	8	8	8	6	6	6
1 HP	12	12	12	12	12	10	10	8	8	8	6	6	6	6	6
1-1/2 HP	12	12	12	10	10	8	8	8	6	6	6	6	4	4	4

NEC Sec. 225-6/: Conductors in overhead spans must be at least #10 for spans up to 50' and #8 for longer.

NOTES

1. **Flex-Flo Feed Line Components -** *(See Page 46.)*

2. **Direct Drive Power Unit Assemblies -** *(See Pages 47-49.)*

3. **Model 220 Unloader and Anchor Assembly -** *(See Page 50.)*

4. **Model 300, 300P, 350 and HR Unloader and Anchor Assembly -** *(See Page 51.)*

5. **Model 500 Unloader and Anchor Assembly -** *(See Page 52.)*

6. **Direct Drive Driver and Plastic Tube Anchor Package -** *(See Page 53.)*

7. **Belt Drive Driver and Plastic Anchor Package -** *(See Page 54.)*

8. **Control Unit -** *(See Page 55.)*

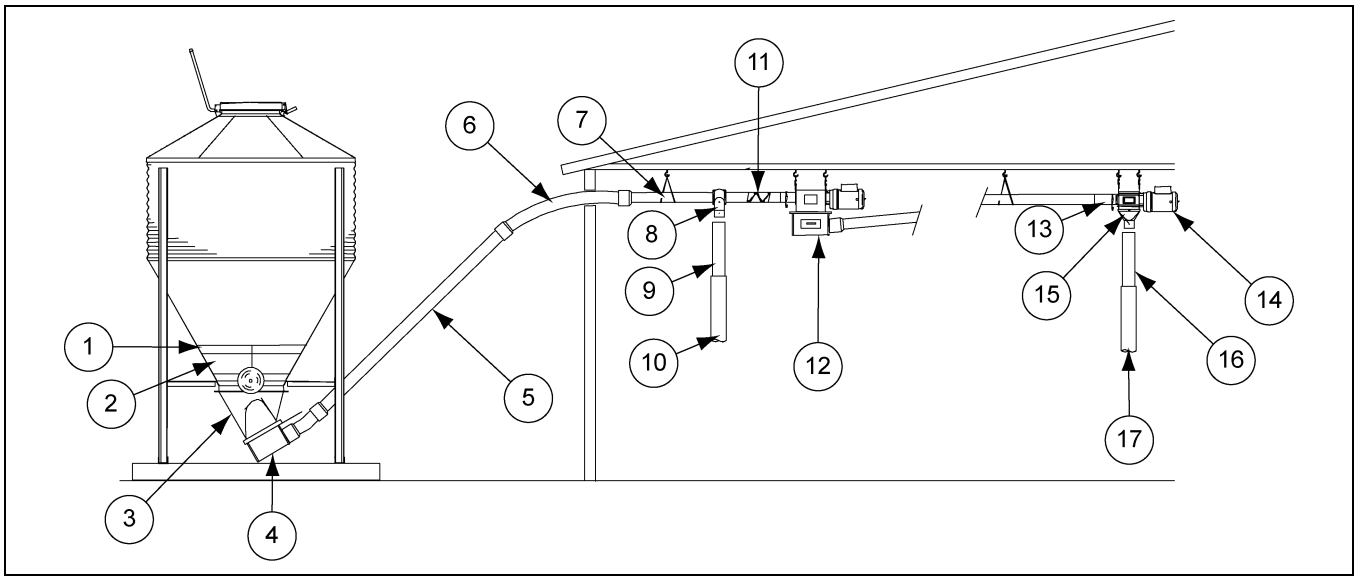
9. **Belt Drive Power Unit -** *(See Page 56.)*

10. **Drop Kit/Kwik-Attach Drop Kit -** *(See Page 57.)*

11. **Unloader Switch -** *(See Page 58.)*

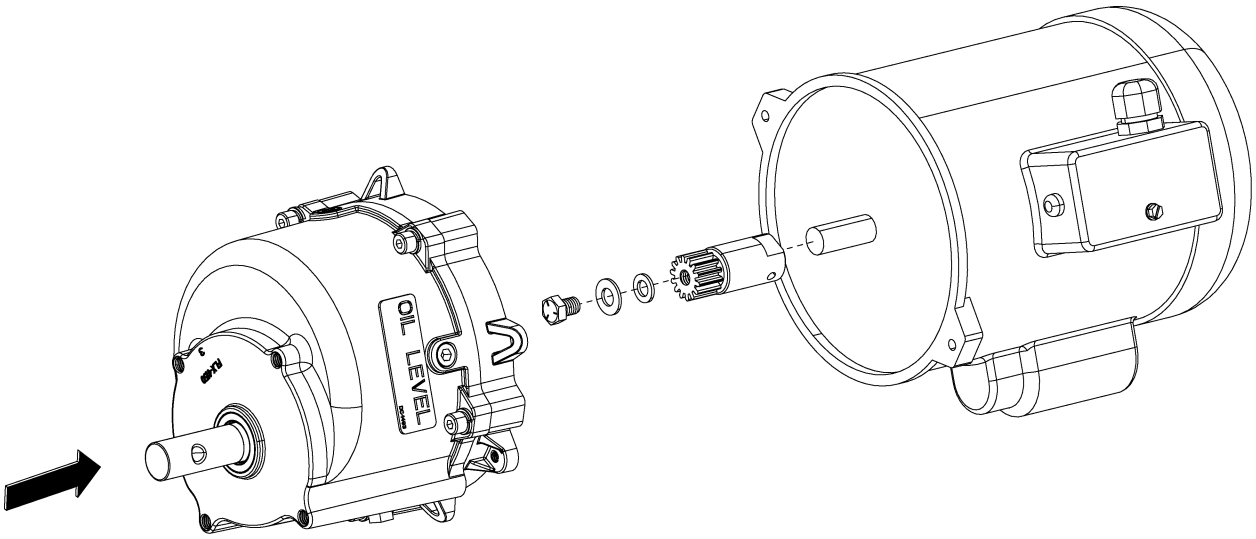
12. **Micro Drop Tube Switch/Proximity Switch -** *(See Page 59.)*

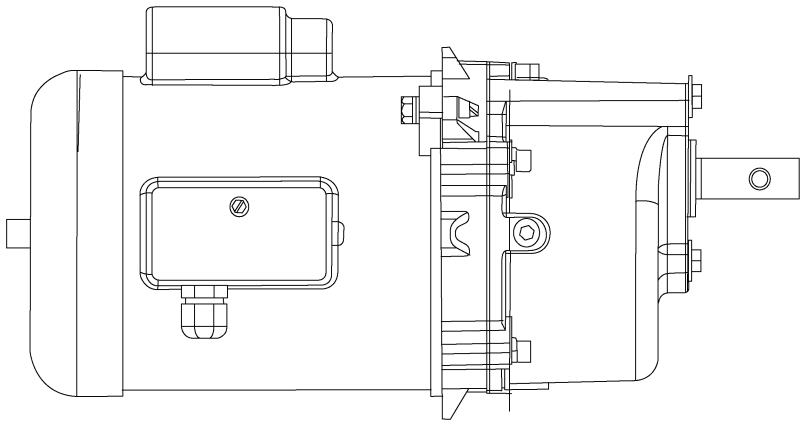
Flex-Flo Feed Line Components



Ref #	Model 220	Model 300	Model 300P	Model 350	Model 500	Model HR	Description
1	BLK-10847	BLK-10847	BLK-10847	BLK-10847	BLK-10847	BLK-10847	16" 45° Hopper Extension Kit w/ Collar
2	BLK-10587	BLK-10587	BLK-10587	BLK-10587	BLK-10587	BLK-10587	22"-16" 60° Hopper Extension Kit w/ Hopper Collar
2	BLK-10591	BLK-10591	BLK-10591	BLK-10591	BLK-10591	BLK-10591	22"-16" 67° Hopper Extension Kit w/ Hopper Collar
3	FLX-2194	FLX-2194	FLX-2194	FLX-2194	FLX-2194	FLX-2194	16" 30° Black Plastic Boot
3	FLX-2194C	FLX-2194C	FLX-2194C	FLX-2194C	FLX-2194C	FLX-2194C	16" 30° Clear Plastic Boot
N/S	FLX-2195	FLX-2195	FLX-2195	FLX-2195	FLX-2195	FLX-2195	16" Straight Black Plastic Boot
N/S	FLX-2195C	FLX-2195C	FLX-2195C	FLX-2195C	FLX-2195C	FLX-2195C	16" Straight Clear Plastic Boot
4	FLX-4682	FLX-4684	FLX-5212	FLX-4686	FLX-4743	FLX-4687	Single-Out Unloader (With Anchor and Bearing)
N/S	FLX-4694	FLX-4696	FLX-5214	FLX-4698	N/A	FLX-4699	Twin-Out Unloader (With Anchor and Bearing)
N/S	FLX-4408	FLX-2243	FLX-5213	FLX-2178	FLX-2943	FLX-4773	Single Through Unloader (Without Anchor and Bearing)
N/S	FLX-3937	FLX-2586	FLX-5215	FLX-2181	N/A	FLX-4772	Twin Through Unloader (Without Anchor and Bearing)
5	PVC-1004	PVC-1005	PVC-1005	PVC-1006	PVC-1007	PVC-1006	10' PVC Straight Tube
6	PVC-1101	PVC-1001	PVC-1001	PVC-1002	PVC-1003	PVC-1002	45° Elbow, 5' Radius (PVC-1003 is 6' Radius)
6	PVC-1000						45° Elbow, 10' Radius
7	S-4694	S-4694	S-4694	S-4694	S-4694	S-4694	#2 Weldless Chain
7	S-7313	S-7313	S-7313	S-7313	S-7313	S-7313	Screw, Eye 1/4"-20 x 3-1/2" ZN (Open Eye Screw)
8	FLX-2432	FLX-2433	FLX-2433	FLX-2434	FLX-2435	FLX-2434	Drop Kit
9	FLX-2425	FLX-2425	FLX-2425	FLX-2427	FLX-2429	FLX-2427	12' Drop Tube
10	FLX-2426	FLX-2426	FLX-2426	FLX-2428	FLX-2430	FLX-2428	6' Telescoping Drop Tube
11	FLXA-1520	FLXA-2390	FLXA-2206	FLXA-2710	FLXA-3800	FLXA-2390	Flex-Flo Auger
12	FLX-4682E	FLX-4684E	FLX-4684E	FLX-4686E	FLX-2542	FLX-4687E	Extension Unit
13	FLX-2537	FLX-2538	FLX-2538	FLX-2539	FLX-2540	FLX-2539	PVC Tube Coupler
14	See Direct Drive Power Unit Assembly Part Numbers on ***Pages 47-49***.						
N/S	012-1	012-1	012-1	012-1		012-1	1/2 HP Belt Drive Motor, 110/220V, 1 PH, 60 Hz, Farm Duty (5/8" Shaft)
N/S		034-1	034-1	034-1	034-1	034-1	3/4 HP Belt Drive Motor, 110/220V, 1 PH, 60 Hz, Farm Duty (5/8" Shaft)
N/S		100-1	100-1	100-1	100-1	100-1	1 HP Belt Drive Motor, 110/220V, 1 PH, 60 Hz, 1750 RPM (5/8" Shaft)
15	FLX-4496	FLX-4496	FLX-4496	FLX-4496	FLX-4497	FLX-4496	Direct Drive Control Unit, 220V
N/S	FLX-4179	FLX-4179	FLX-4179	FLX-4179	FLX-4179		Belt Drive Control Unit (No Motor)
16	FLX-2427	FLX-2427	FLX-2427	FLX-2427	FLX-2429	FLX-2427	12' Drop Tube
17	FLX-2428	FLX-2428	FLX-2428	FLX-2428	FLX-2430	FLX-2428	6' Telescoping Drop Tube

Direct Drive Power Unit Assemblies





Gearbox orientation

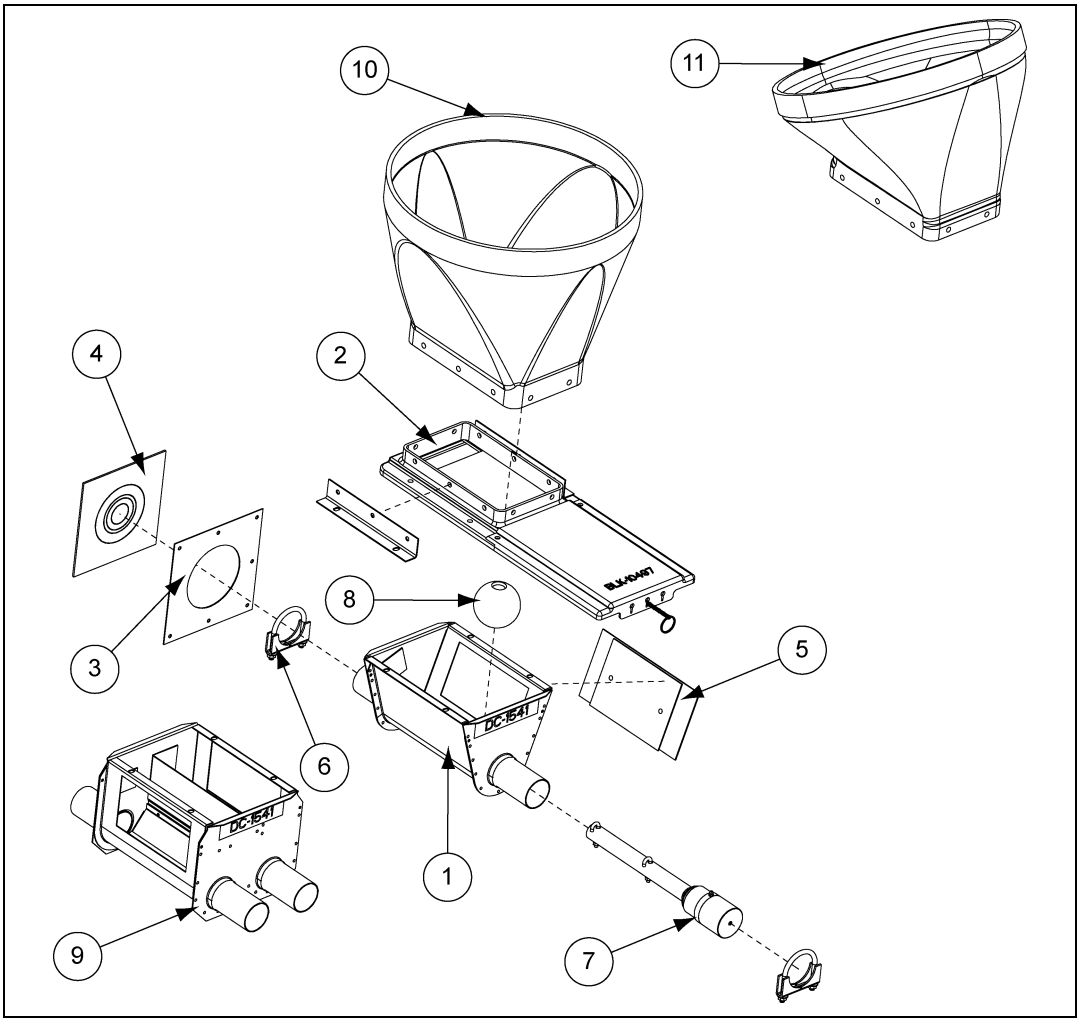
Direct Drive Power Unit Assemblies Parts List

Direct Drive Power Unit Gearbox Orientation						
Part #	Description	RPM		Part #		
		50 Hz	60 Hz	Motor	Gearbox	Pinion
FLX-2458	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 110/220V	298	358	FLX-5249	FLX-4277	FLX-4275
FLX-2459	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 110/220V	298	358	FLX-5250	FLX-4277	FLX-4275
FLX-2460	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 110/220V	298	358	FLX-5251	FLX-4277	FLX-4276
FLX-2461	DDPU, 1 HP, 1 PH, 50/60 Hz, 110/220V	298	358	FLX-5252	FLX-4277	FLX-4276
FLX-2462	DDPU, 1-1/2 HP, 1 PH, 50/60 Hz, 110/220V	298	358	FLX-5253	FLX-4277	FLX-4276
FLX-2672	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V	208	250	FLX-5249	FLX-4403	FLX-4275
FLX-2673	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V	208	250	FLX-5250	FLX-4403	FLX-4275
FLX-2674	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 115/230V	208	250	FLX-5251	FLX-4403	FLX-4276
FLX-2933	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V	53	64	FLX-5249	FLX-2931	FLX-3781
FLX-3535	DDPU, 1-1/2 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	297	358	FLX-5258	FLX-4277	FLX-4276
FLX-3543	DDPU, 3/4 HP, 3 PH, 50/60 Hz, 208-230/460V	297	358	FLX-5256	FLX-4277	FLX-4276
FLX-3546	DDPU, 1/3 HP, 3 PH, 50/60 Hz, 208-230/460V	297	358	FLX-5254	FLX-4277	FLX-4275
FLX-3549	DDPU, 1/2 HP, 3 PH, 50/60 Hz, 208-230/460V	297	358	FLX-3522	FLX-4277	FLX-4275
FLX-3552	DDPU, 1 HP, 3 PH, 50/60 Hz, 208-230/460V	297	358	FLX-5257	FLX-4277	FLX-4276
FLX-3555	DDPU, 1-1/2 HP, 3 PH, 50/60 Hz, 208-230/460V	297	358	FLX-5258	FLX-4277	FLX-4276
FLX-3582	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V	129	156	FLX-5250	FLX-4400	FLX-4275
FLX-3589	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V	368	441	FLX-5249	FLX-4405	FLX-4275
FLX-3590	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V	368	441	FLX-5250	FLX-4405	FLX-4275
FLX-3591	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 115/230V	368	441	FLX-5251	FLX-4405	FLX-4276
FLX-3593	DDPU, 1/2 HP, 3 PH, 50/60 Hz, 230/460V	130	156	FLX-3522	FLX-4400	FLX-4275
FLX-3629	DDPU, 1 HP, 1 PH, 50/60 Hz, 110/220V	208	250	FLX-5252	FLX-4403	FLX-4276
FLX-3632	DDPU, 1/2 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	368	441	FLX-3522	FLX-4405	FLX-4275
FLX-3633	DDPU, 3/4 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	368	441	FLX-5256	FLX-4405	FLX-4276
FLX-3634	DDPU, 1 HP, 1 PH, 50/60 Hz, 115/230V	130	156	FLX-5252	FLX-4400	FLX-4276
FLX-3637	DDPU, 1-1/2 HP, 1 PH, 50/60 Hz, 110/220V	208	250	FLX-5253	FLX-4403	FLX-4276
FLX-3640	DDPU, 1 HP, 1 PH, 50/60 Hz, 115/230V	368	441	FLX-5252	FLX-4405	FLX-4276
FLX-3644	DDPU, 1 HP, 3 PH, 50/60 Hz, 208-230/460V	130	156	FLX-5257	FLX-4400	FLX-4276

Direct Drive Power Unit Assemblies Parts List (Continued)

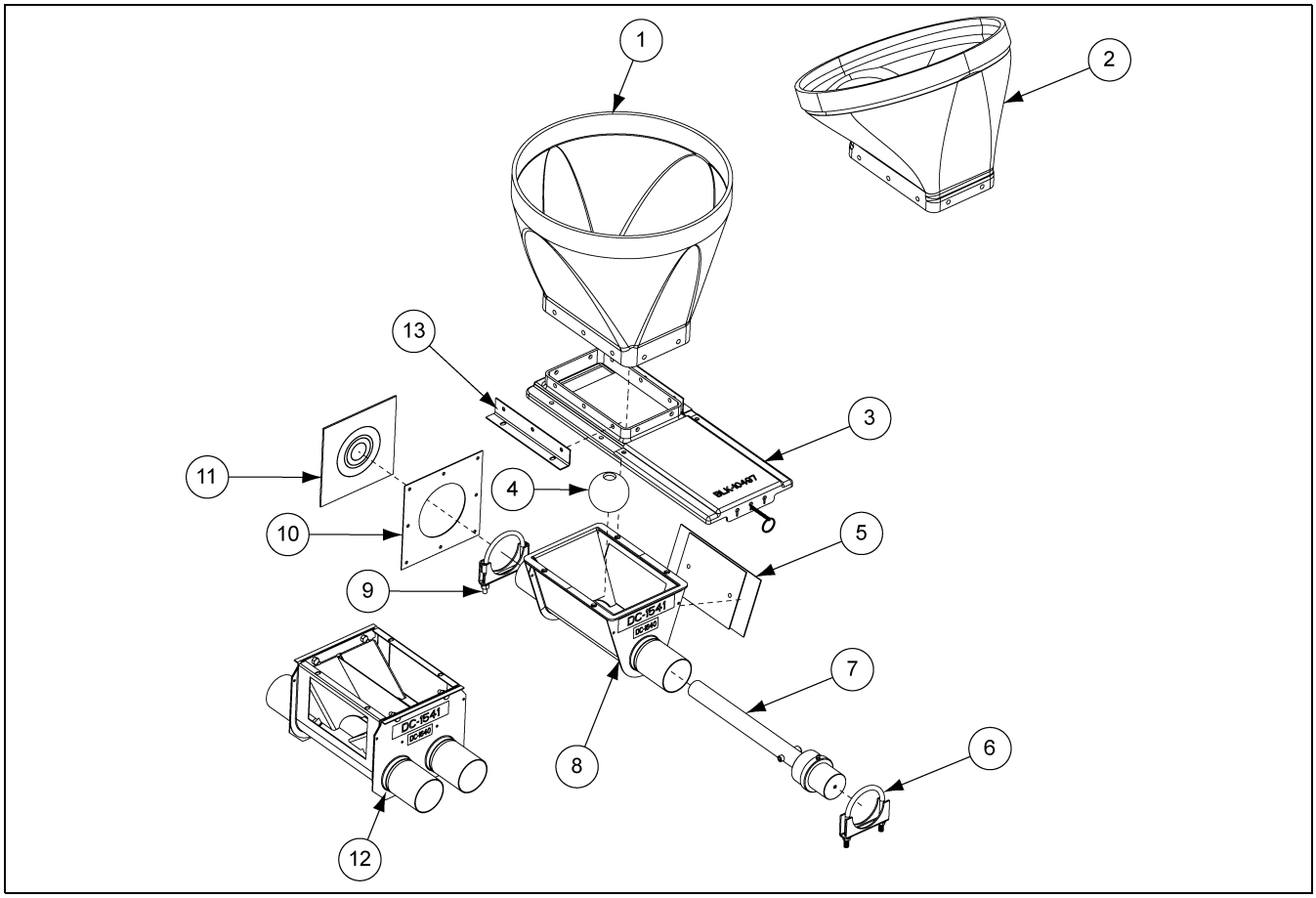
Direct Drive Power Unit Gearbox Orientation						
Part #	Description	RPM		Part #		
		50 Hz	60 Hz	Motor	Gearbox	Pinion
FLX-3661	DDPU, 1-1/2 HP, 1 PH, 50/60 Hz,110/220V	368	441	FLX-5253	FLX-4405	FLX-4276
FLX-3670	DDPU, 1 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	368	441	FLX-5257	FLX-4405	FLX-4276
FLX-3671	DDPU, 1-1/2 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	368	441	FLX-5258	FLX-4405	FLX-4276
FLX-3911	DDPU, 1 HP, 3 PH, 60 Hz, 600V	297	358	FLX-3901	FLX-4277	FLX-4542
FLX-3928	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 115/230V	130	156	FLX-5251	FLX-4400	FLX-4276
FLX-4355	DDPU, 1-1/2 HP, 3 PH, 60 Hz, 600V	297	358	FLX-4350	FLX-4277	FLX-4542
FLX-4632	DDPU, 1 HP, 3 PH, 50/60 Hz, 208-230/460V	219	250	FLX-5257	FLX-4403	FLX-4276
FLX-4645	DDPU, 1 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	219	250	FLX-5257	FLX-4403	FLX-4276
FLX-4873	DDPU, 1/2 HP, 3 PH, 60 Hz, 208-230/460V	219	250	FLX-3522	FLX-4403	FLX-4275
FLX-5044	DDPU, 3/4 HP, 3 PH, 50/60 Hz, 190/380 and 208-230/460V	219	250	FLX-5256	FLX-4403	FLX-4276
7101481	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V (CU)	208	250	FLX-5249	7101480	FLX-4275
7101557	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V (CU)	208	250	FLX-5250	7101480	FLX-4275
7097374	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V (CU)	298	358	FLX-5249	404048	FLX-4275
7097744	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V (CU)	298	358	FLX-5250	404048	FLX-4275
7098423	DDPU, 1/3 HP, 1 PH, 50/60 Hz, 115/230V (CU)	358	430	FLX-5249	7098809	FLX-4275
7098924	DDPU, 1/2 HP, 1 PH, 50/60 Hz, 115/230V (CU)	368	441	FLX-5250	7098809	FLX-4275
7099340	DDPU, 1/3 HP, 3 PH, 50/60 Hz, 190/230/380/440V (CU)	298	358	FLX-5254	404048	FLX-4275
7098422	DDPU, 1/3 HP, 3 PH, 50/60 Hz, 190/230/380/440V (CU)	368	441	FLX-5254	7098809	FLX-4275
7099341	DDPU, 1/2 HP, 3 PH, 50/60 Hz, 190/230/380/440V (CU)	298	358	FLX-3522	404048	FLX-4275
7099263	DDPU, 1/2 HP, 3 PH, 50/60 Hz, 190/230/380/440V (CU)	368	441	FLX-3522	7098809	FLX-4275
7098894	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 115/230V (CU)	597	716	7098893	404048	FLX-4276
7100693	DDPU, 3/4 HP, 3 PH, 60 Hz, 230/440V (CU)	613	735	7100692	404048	FLX-4542
7099247	DDPU, 3/4 HP, 3 PH, 50 Hz, 190/380V (CU)	735	882	7099248	7098809	FLX-4542
7099366	DDPU, 1/2 HP, 1PH, 50/60 Hz, 115/230V, Turkey (CU)	298	358	FLX-5250	404048	FLX-4275
7097965	DDPU, 3/4 HP, 1 PH, 50/60 Hz, 115/230V, Turkey (CU)	298	358	FLX-5251	404048	FLX-4276
7099342	DDPU, 3/4 HP, 3 PH, 50/60 Hz, 190/230/380/440V, Turkey (CU)	298	358	FLX-5256	404048	FLX-4276
7099298	DDPU, 3/4 HP, 3 PH, 50/60 Hz, 190/230/380/440V, Turkey (CU)	368	441	FLX-5256	7098809	FLX-4276

Model 220 Unloader and Anchor Assembly



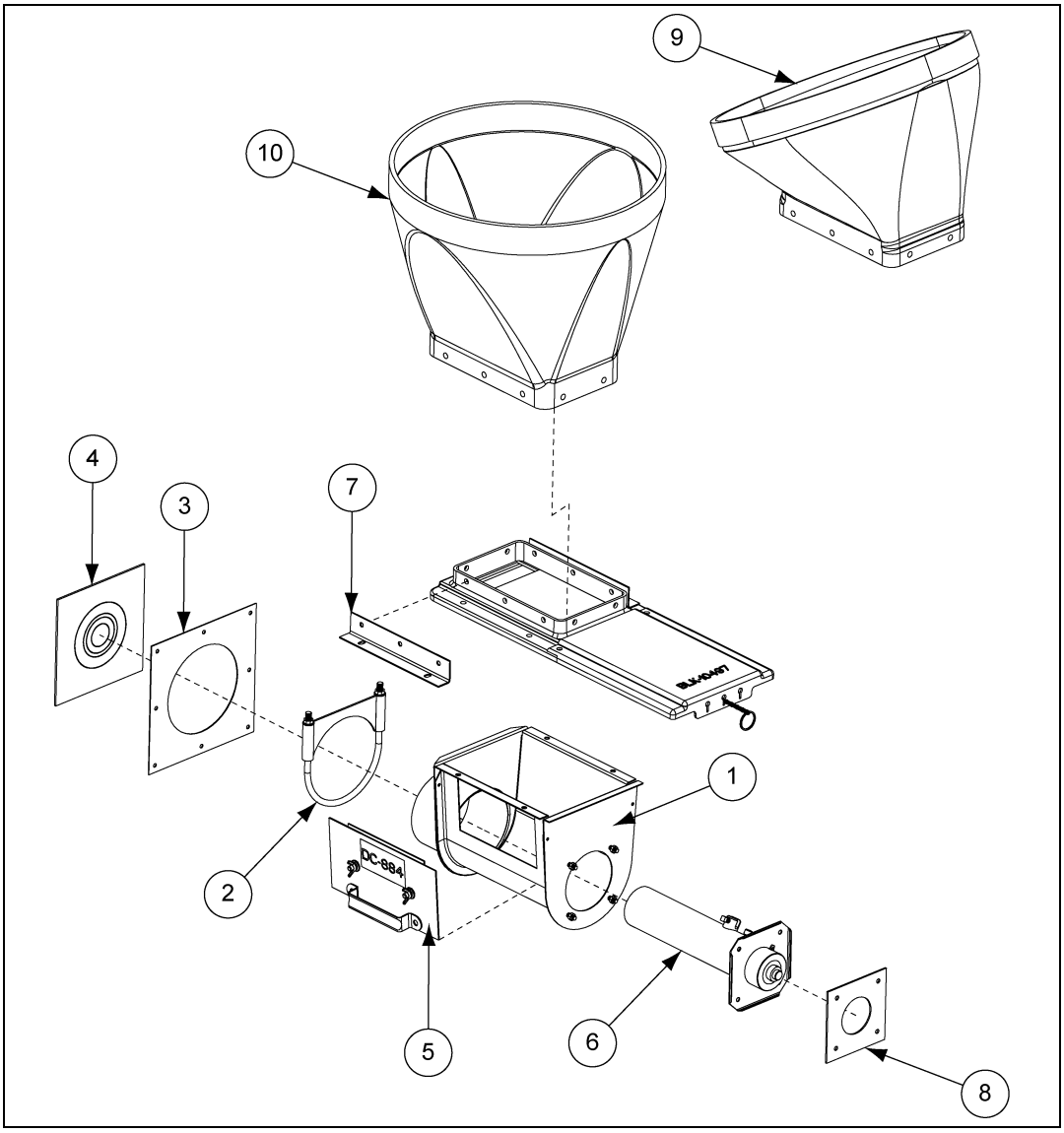
Ref #	Part #	Description	Qty
1	FLX-4331	Model 220 Flex-Flo Single through Unloader Body Assembly	1
2	BLK-11137A	Transfer and Slide Gate Kit	1
3	FLX-2217	Model 220, 300, 350 Flex Seal Ring	1
4	FLX-3422	Neoprene Seal	1
5	FLX-4239	Clean-Out Plate Assembly	1
6	S-4490	2-1/4" Tube Clamp Model 220	2
7	FLX-4646	M-220/EP Anchor and Bearing Assembly	1
8	00404238	Iron Ball 3" Hollow - 1-1/2 #	1
9	FLX-3938	Model 220 Flex-Flo Twin Unloader Body Assembly	1
10	FLX-2195	16" Straight Black Plastic Boot	1
10	FLX-2195C	16" Straight Clear Plastic Boot	1
11	FLX-2194	16" 30º Black Plastic Boot	1
11	FLX-2194C	16" 30º Clear Plastic Boot	1

Model 300, 300P, 350 and HR Unloader and Anchor Assembly



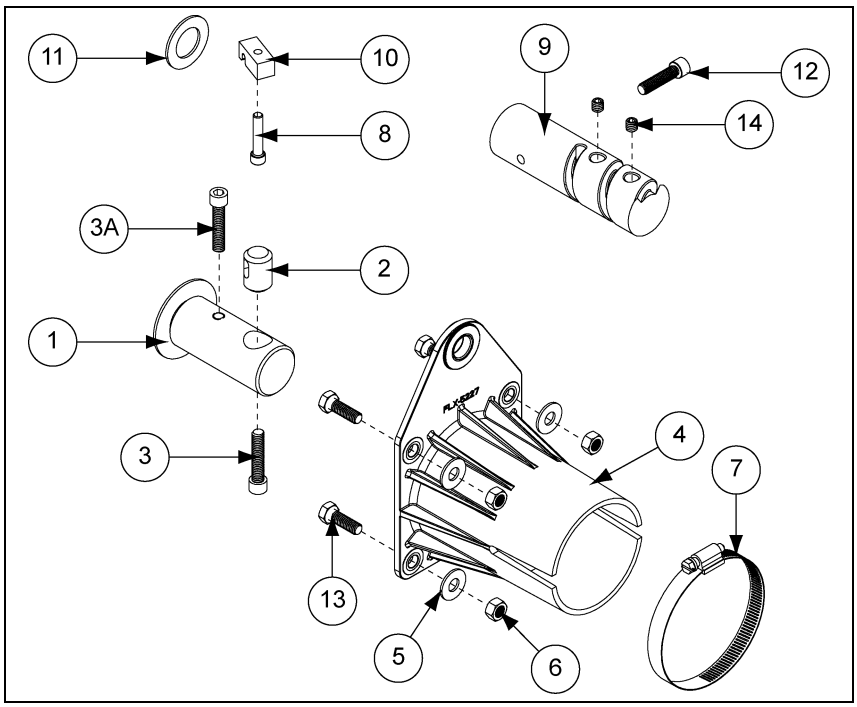
Ref #	Model 300		Model 300P		Model 350	
	Part #	Description	Part #	Description	Part #	Description
1	FLX-2195	16" Straight Black Plastic Boot	FLX-2195	16" Straight Black Plastic Boot	FLX-2195	16" Straight Black Plastic Boot
1	FLX-2195C	16" Straight Clear Plastic Boot	FLX-2195C	16" Straight Clear Plastic Boot	FLX-2195C	16" Straight Clear Plastic Boot
2	FLX-2194	16" 30° Black Plastic Boot	FLX-2194	16" 30° Black Plastic Boot	FLX-2194	16" 30° Black Plastic Boot
2	FLX-2194C	16" 30° Clear Plastic Boot	FLX-2194C	16" 30° Clear Plastic Boot	FLX-2194C	16" 30° Clear Plastic Boot
N/S	FLX-4869	16" Double Straight Black Boot	FLX-4869	16" Double Straight Black Boot	FLX-4869	16" Double Straight Black Boot
3	BLK-11137A	Transfer and Slide Gate Kit	BLK-11137A	Transfer and Slide Gate Kit	BLK-11137A	Transfer and Slide Gate Kit
4	00404238	Iron Ball 3" Hollow - 1-1/2 #	00404238	Iron Ball 3" Hollow - 1-1/2 #	00404238	Iron Ball 3" Hollow - 1-1/2 #
5	FLX-4239	Clean-Out Plate Assembly	FLX-4239	Clean-out Plate Assembly	FLX-4239	Clean-Out Plate Assembly
6	S-4320	3" Tube Clamp	S-4320	3" Tube Clamp	S-4319	3-1/2" Tube Clamp
7	FLX-4648	M-300 Anchor and Bearing Assembly	FLX-5211	M-300P Anchor and Bearing Assembly	FLX-4650	M-350 Anchor and Bearing Assembly
8	FLX-4669	Model 300 Flex-Flo Single through Unloader Body Assembly	FLX-4669	Model 300 Flex-Flo Single through Unloader Body Assembly	FLX-2053	Model 350 Flex-Flo Single through Unloader Body Assembly
9	S-9186	3-1/4" Tube Clamp Model 300	S-9186	3-1/4" Tube Clamp Model 300	S-4443	4" Tube Clamp Model 350
10	FLX-2217	Model 220, 300, 350 Flex Seal Ring	FLX-2217	Model 220, 300, 350 Flex Seal Ring	FLX-2217	Model 220, 300, 350 Flex Seal Ring
11	FLX-3422	Neoprene Seal	FLX-3422	Neoprene Seal	FLX-3422	Neoprene Seal
12	FLX-4671B	Model 300 Flex-Flo Twin through Unloader Body Assembly	FLX-4671B	Model 300 Flex-Flo Twin through Unlosader Body Assembly	FLX-2116B	Model 350 Flex-Flo Twin through Unloader Body Assembly
13	FLX-4819	Unloader Brace	FLX-4819	Unloader Brace	FLX-4819	Unloader Brace

Model 500 Unloader and Anchor Assembly



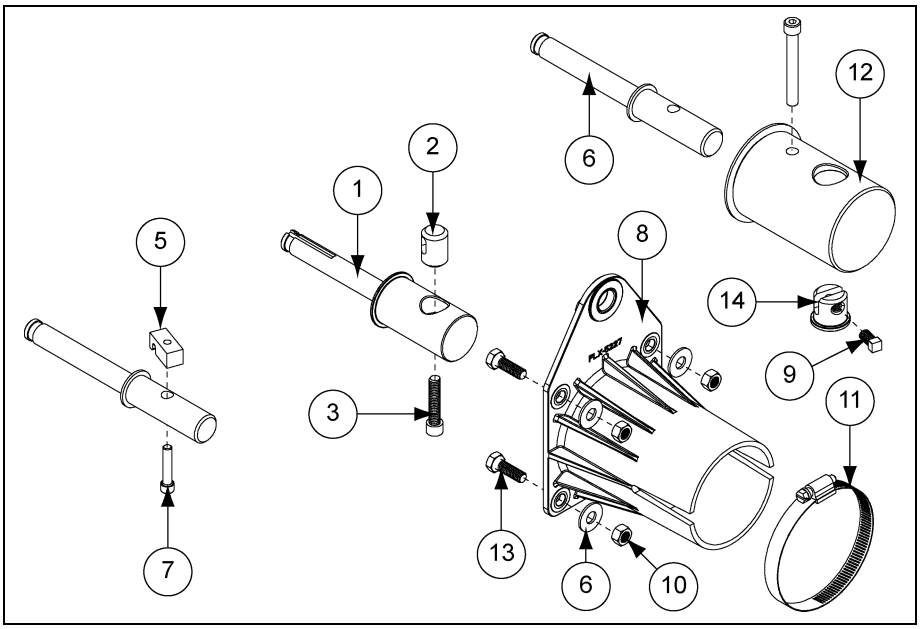
Ref #	Part #	Description	Qty
1	FLX-2065	Model 500 Flex-Flo Single through Unloader Body Assembly	1
2	S-4494	5-1/2" Tube Clamp Model 500	1
3	FLX-2218	Model 500 Flex Seal Ring	1
4	FLX-3422	Neoprene Seal	1
5	FLX-4239	Clean-Out Plate Assembly	1
6	FLX-2192	M-500 Anchor and Bearing Assembly	1
7	BLK-11137A	Transfer and Slide Gate Kit	1
8	FLX-2095	4-5" Control Unit Seal	1
9	FLX-2194	16" 30º Black Plastic Boot	1
9	FLX-2194C	16" 30º Clear Plastic Boot	1
10	FLX-2195	16" Straight Black Plastic Boot	1
10	FLX-2195C	16" Straight Clear Plastic Boot	1

Direct Drive Driver and Plastic Tube Anchor Package



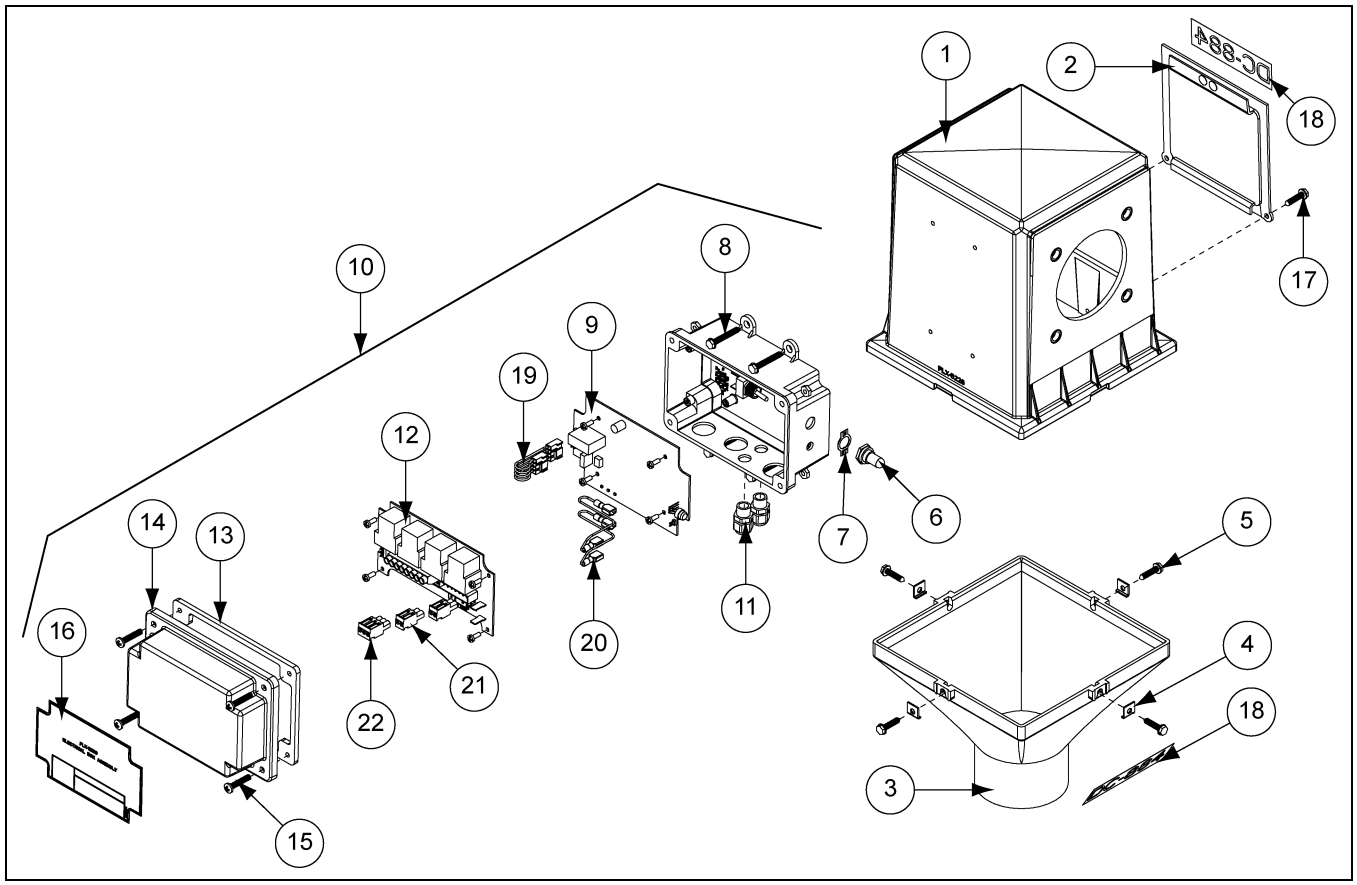
Ref #	Part #	Description	Qty
	FLXDF-1183	**Model 220 Drop Feed Control Anchor Package**	
	FLX-5275	**Model 220 Direct Drive Driver and Plastic Tube Anchor Package**	
	FLX-5279	**Model 300 Direct Drive Driver and Plastic Tube Anchor Package**	
	FLX-5282	**Model 300P Direct Drive Driver and Plastic Tube Anchor Package**	
	FLX-5286	**Model 350 Direct Drive Driver and Plastic Tube Anchor Package**	
	FLX-5293	**Model 500 Direct Drive Driver and Plastic Tube Anchor Package**	
1	FLX-4572	Model 300 Positive Lock Direct Drive Spindle	1
1	FLX-4572A	Model 300P Positive Lock Direct Drive Spindle	1
1	FLX-4575	Model 350 Positive Lock Direct Drive Spindle	1
1	FLX-2975	Model 500 Positive Lock Direct Drive Spindle	1
2	FLX-4571	Model 300, 300P and 350 Auger Lock Clamp Pin	1
2A	FLX-2974	Model 500 Auger Lock Clamp Pin	1
2B	S-4312	Set Screw 5/16"-18 x 1/2" SQ HD BK Cup Point (Model 500)	1
3	S-6481	Bolt, SHCS 5/16"-18 x 1-1/2" Type B Cup Point Grade 8 Alloy Steel (Model 300)	1
3	S-8660	Bolt, SHCS 5/16"-18 x 1-1/4" Cup Point (Model 350)	1
3A	S-6481	Bolt, SHCS 5/16"-18 x 1-1/2" Type B Cup Point Grade 8 Alloy Steel (Model 300 and 350)	1
3A	S-6483	5/16"-18 x 2-1/2" Hex Socket Cap Screw (Model 500)	1
4	FLX-5229	M220 Tube Anchor (Molded)	1
4	FLX-5227	M300 and M300P Tube Anchor (Molded)	1
4	FLX-5228	Model 350 Tube Anchor (Molded)	1
4	FLX-5239	Model 500 Tube Anchor (Molded)	1
5	S-845	Flat Washer 5/16" USS ZN (All Models)	4
6	S-7484	Hex Nut 5/16"-18 JS500 Grade 5 (All Models)	4
7	AP-0583	Clamp, Hose, Stainless Steel 1-13/16" - 2-3/4" (Model 220)	1
7	AP-0584	Clamp, Hose, Stainless Steel 3"-4" Model 300, 300P and 350	1
7	S-4282	Clamp, 5"-7" Geared Hose Model 500	1
8	S-8039	Bolt, SHCS 1/4"-20 x 1-1/4" THD Lock Grade 8 Alloy Steel (Model 220)	1
9	FLXDF-1182	Model 220 Drop Feed Control Anchor	1
10	FLX-4543	Auger Lock Model 220 Direct Drive	1
11	FLX-2685	Model 220 Direct Drive Anchor Washer	1
12	S-8660	Bolt, SHCS 5/16"-18 x 1-1/4" Cup Point (Model 220 Drop Feed)	1
13	S-1196	Bolt, HHCS 5/16"-18 x 1" ZN Grade 5 (All Models)	4
14	S-8895	Set Screw, 5/16"-18 x 3/8" ZN SKT HD (Model 220 Drop Feed)	2

Belt Drive Driver and Plastic Anchor Package



Ref #	Part #	Description	Qty
	FLX-5274	**Model 220 Belt Drive Driver and Plastic Tube Anchor**	
	FLX-5278	**Model 300 Belt Drive Driver and Plastic Tube Anchor**	
	FLX-5285	**Model 350 Belt Drive Driver and Plastic Tube Anchor**	
	FLX-5292	**Model 500 Belt Drive Driver and Plastic Tube Anchor**	
1	FLX-2979	Model 220 and 500 Positive Lock Belt Driver	1
1	FLX-4578	Model 300 Positive Lock Belt Driver	1
1	FLX-4579	Model 350 Positive Lock Belt Driver	1
2	FLX-4571	Model 300 and 350 Auger Lock Clamp Pin	1
3	S-6481	Bolt, SHCS 5/16"-18 x 1-1/2" Type B Cup Point Grade 8 Alloy Steel Model 300	1
3	S-6482	Bolt, SHCS 5/16"-18 x 1-3/4" Type B Cup Point Grade 8 Alloy Steel Model 350	1
3	S-6483	Bolt, SHCS 5/16"-18 x 2-1/2" Type B Cup Point Grade 8 Alloy Steel Model 500	1
4	FLX-2979	Model 220 and 500 Belt Driver	2
5	FLX-4543	Auger Lock 220 Belt Driver	1
6	S-845	Flat Washer 5/16" USS ZN	4
7	S-8039	Bolt, SHCS 1/4"-20 x 1-1/4" THD Lock Grade 8 Alloy Steel	1
8	FLX-5229	M220 Tube Anchor (Molded)	1
8	FLX-5227	M300 Tube Anchor (Molded)	1
8	FLX-5228	M350 Tube Anchor (Molded)	1
8	FLX-5239	M500 Tube Anchor (Molded)	1
9	S-4312	Set Screw 5/16"-18 x 1/2" SQ HD BK Cup Point	1
10	S-7484	Hex Nut 5/16"-18 JS500 Grade 5	4
11	AP-0583	Clamp, Hose, Stainless Steel 1-13/16" - 2-3/4" Model 220	1
11	AP-0584	Clamp, Hose, Stainless Steel 3"-4" Model 300 and 350	1
11	S-4282	Clamp, 5"-7" Geared Hose Model 500	1
12	FLX-2975	Model 500 Belt and Direct Drive Spindle	1
13	S-1196	Bolt, HHCS 5/16"-18 x 1" ZN Grade 5	4
14	FLX-2974	Model 500 Clamp Pin	1

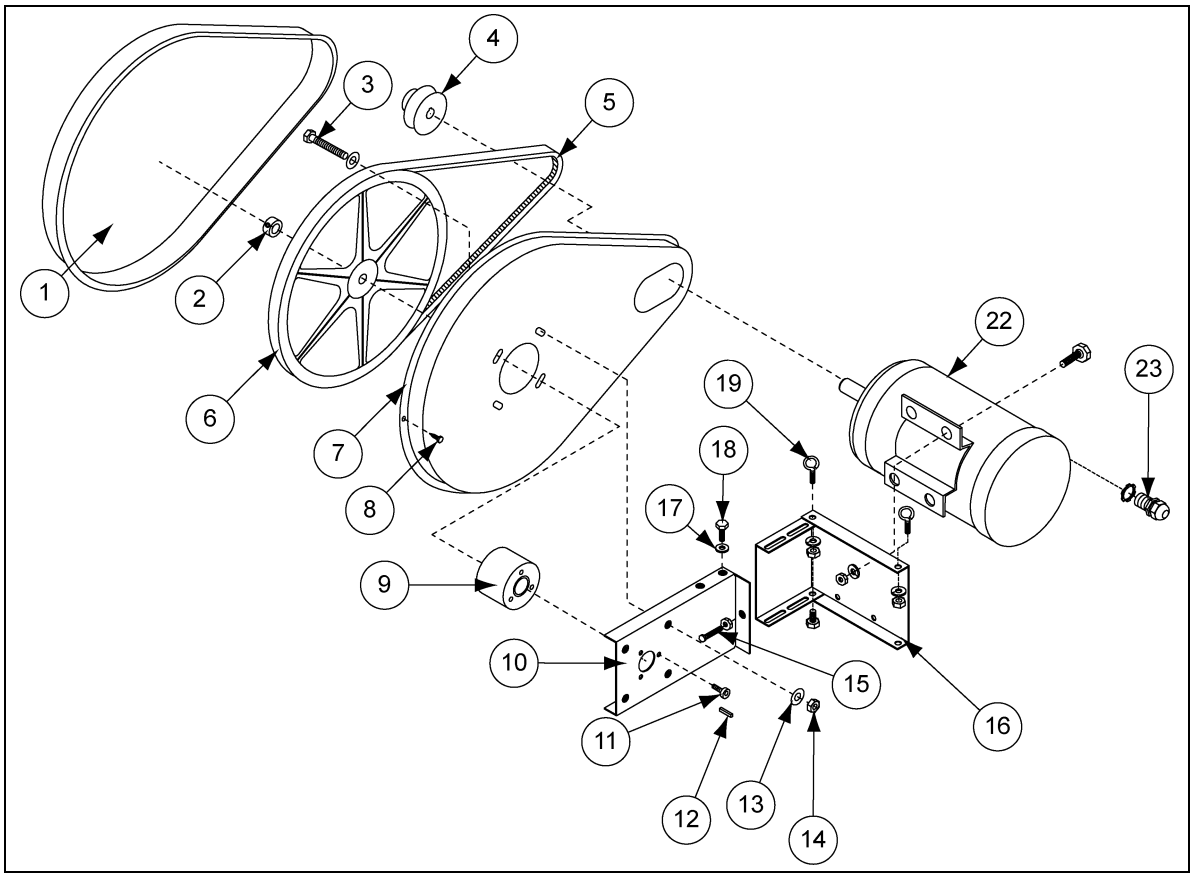
Control Unit



Ref #	Part #	Description
1	FLX-5226A	Control Unit Body M220, 300, 350 with Compression Limiters
1	FLX-5243A	Control Unit Body M500 with Compression Limiters
2	FLX-5230	Inspection Door (Molded)
3	FLX-2017	Drop, Model 220, 300, 350 Power Head w/o
3	FLX-2309	Drop, Model 500 Power Head - No Hardware Included
4	AP-2213	Power Head Drop Retaining Clip
5	S-7419	Screw, SDS #10-16 x 1-1/4" HWH SS410
6	70-0129	Switch, Boot Weatherproof
7	S-6622	Plate, On-Off Back
8	S-8045	Screw, SDS #10 x 3/4" HWH SS410
9	FLX-5260-B	Bottom Circuit Board with Enclosure for FLX-5260
10	FLX-5260	Control Unit Electrical Box - 220V, for Poly CU

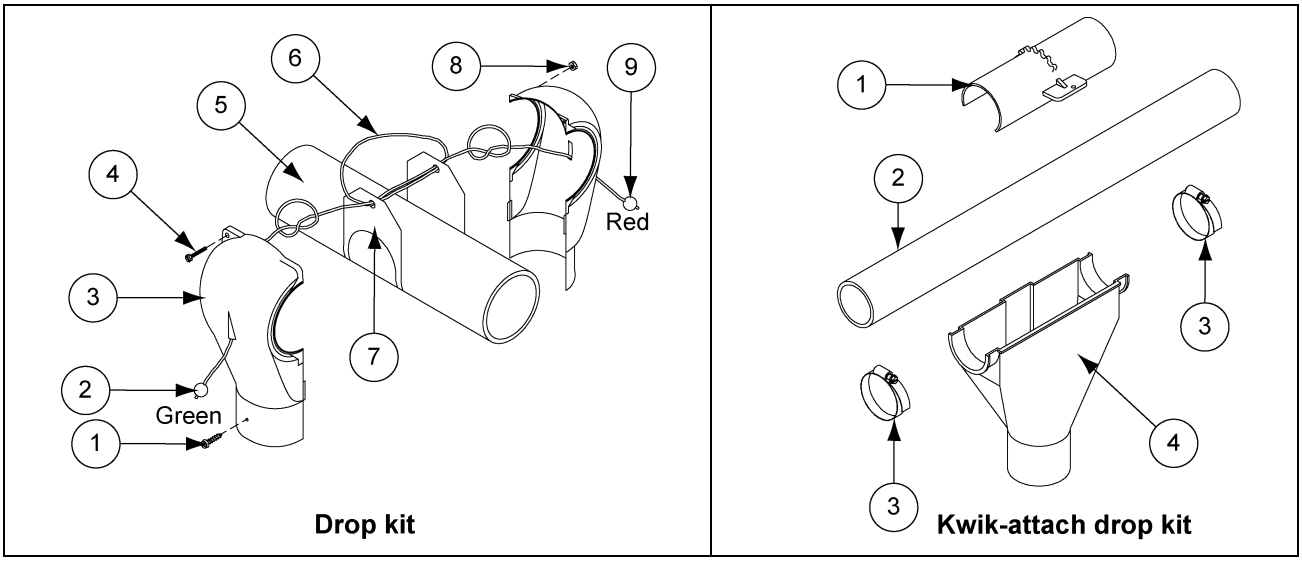
Ref #	Part #	Description
11	S-10292	Cable Gland, PG7 Size
12	FLX-5260-T	Top Circuit Board Assembly
13	FLX-4561	Gasket, Electrical Box 4 x 6
14	FLX-4560	Cover, Electrical Box Lid 4 x 6
15	S-995	Screw, MS #10-24 x 1" PHP SS
16	DC-2385	Decal, Flex-Flo Control Lid
17	S-8045	Screw, SDS #10 x 3/4" HWH SS410
18	DC-884	Decal, Rotating Auger Hazard
19	FLX-5308	Plug, 4 Wire
20	E105-1024	WR-KT,18 GA Black, Fem and Term 5" Long (1/4 Ins Fem Disc Term B)
21	FLX-5270-2	Terminal Block Plug, Two (2) Connector
22	FLX-5270-3	Terminal Block Plug, Three (3) Connector

Belt Drive Power Unit



Ref #	Part #	Description
	FLX-4179	**14" Belt Drive Power Unit (Less Motor)**
1	FLX-2986	Belt Guard Cover
2	S-4307	5/8" I.D. Locking Collar
3	S-7149	Bolt, HHTB 5/16"-18 x 1-3/4" ZN Grade 5
4	S-6242	2.7" A-Belt Single Groove Pulley (5/8" Bore)
5	BLK-11086	AX51 Gripnotch Belt
6	S-6240	14" A-Belt Single Groove Pulley
7	FLX-2987	Belt Guard Back
8	S-280	Screw, SDS #10-16 x 5/8" HWH ZN
9	FLX-2734S	Flex-Flo Anchor Bearing Assembly with Set Screw
10	FLX-5043	Inner Belt Drive Motor Bracket
11	S-4309	1/4"-20 x 5/8" Allen Head Bolt
12	S-8426	Key, SQ 3/16" x 1" Long
13	S-845	Flat Washer 5/16" USS SAE YDP Grade 2
14	S-396	Hex Nut 5/16"-18 YDP Grade 2
15	S-7299	Bolt, HHTB 5/16"-18 x 2-1/2" ZN Grade 2
16	FLX-5042	Outer Belt Drive Motor Bracket
17	S-1147	Lock Washer Split 5/16" ZN
18	S-4275	Bolt, HHTB 5/16"-18 x 3/4" ZN Grade 5
19	S-6236	Eye Bolt 5/16"-18 x 2-1/8" (w/ Nut)
22	013-1	Motor, 1/3 HP, 1 PH, 110/220V, 60 Hz, Farm Duty (5/8" Shaft)
22	012-1	Motor, 1/2 HP, 1 PH, 110/220V, 60 Hz, Farm Duty (5/8" Shaft)
22	034-1	Motor, 3/4 HP, 1 PH, 110/220V, 60 Hz, Farm Duty (5/8" Shaft)
22	100-1	Motor, 1 HP, 1 PH, 60 Hz, 110/220V, 1750 RPM (5/8" Shaft)
22	112-1	Motor, 1-1/2 HP, 1 PH, 60 Hz, 110/220V, 1750 RPM (5/8" Shaft)
23	S-6381	Black Strain Relief

Drop Kit/Kwik-Attach Drop Kit



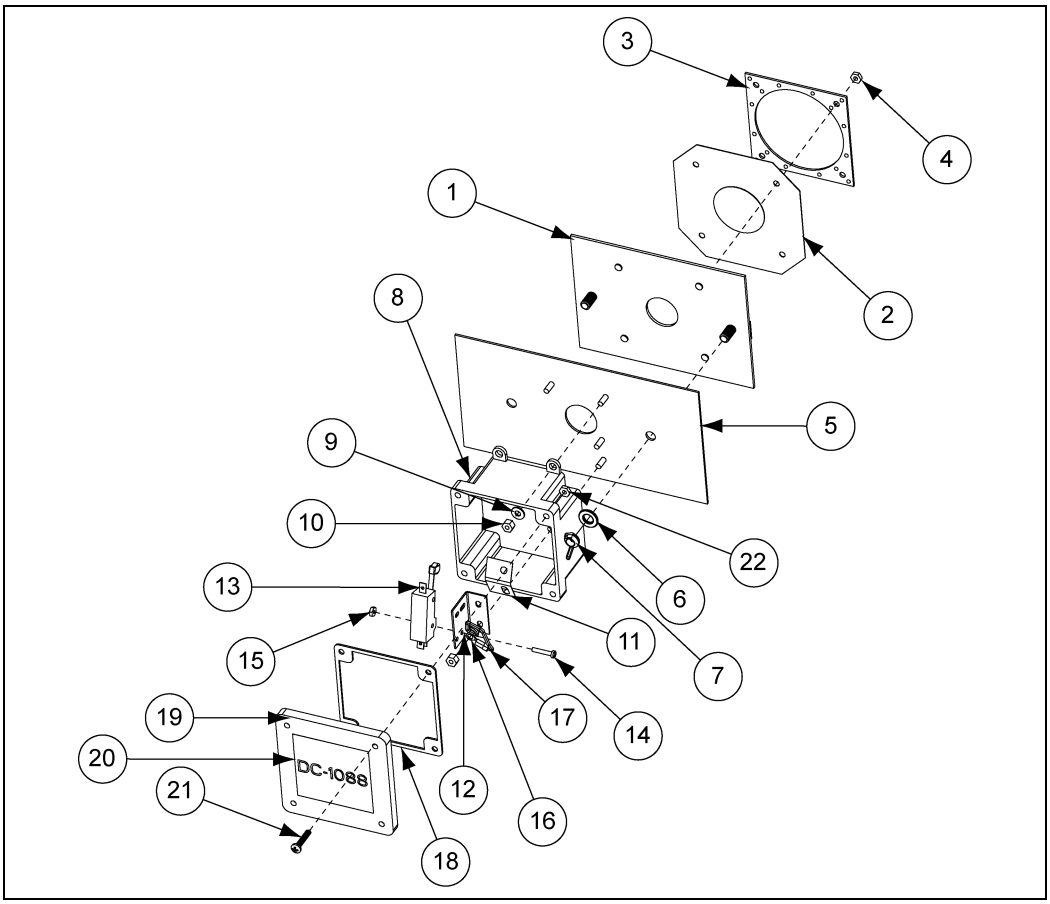
Drop Kit

Ref #	Part #	Description
	FLX-2432	**Model 220 Drop Kit (Nylon)**
	FLX-2433	**Model 300 and 300P Drop Kit (Nylon)**
	FLX-2434	**Model 350 Drop Kit (Nylon**
	FLX-2435	**Model 500 Drop Kit (Nylon)**
1	S-280	Screw, SDS #10-16 x 5/8" HWH ZN
2	FLX-2441	Green Indicator Ball
3	FLX-220	Model 220 Drop Half
3	FLX-300	Model 300 and 300P Drop Half
3	FLX-350	Model 350 Drop Half
3	FLX-500	Model 500 Drop Half
4	S-8174	Screw, MS #10-24 x 5/8" HWHS SS
5		Model 220, 300, 300P, 350, 500 10' Straight Tube
6	CW-2008	#4 Solid Braided Utility Cord
7	FLX-2437	Model 220 Nylon Slide
7	FLX-2438	Model 300 and 300P Nylon Slide
7	FLX-2439	Model 350 Nylon Slide
7	FLX-2440	Model 500 Nylon Slide
8	S-7931	Hex Nut #10-24 SS
9	FLX-2442	Red Indicator Ball

Kwik-Attach Drop Kit

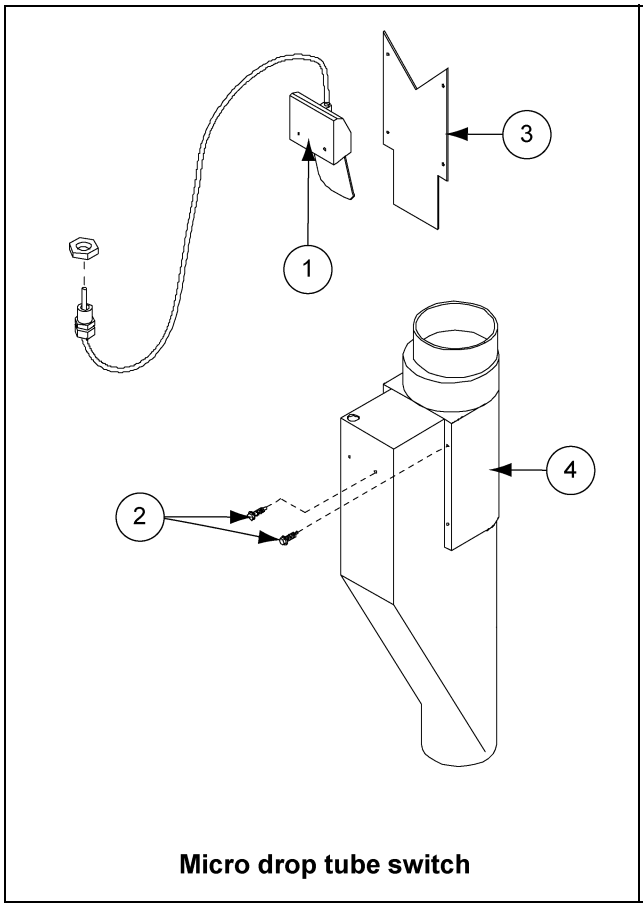
Ref #	Part #	Description
	APCD-109	**Kwik-Attach Drop Kit for Model 220/236 (Single)**
	AP-2276	**Kwik-Attach Drop Kit for Model 300 and 300P (Single)**
	APCD-110	**Kwik-Attach Drop Kit for Model 220/236 (Box of 10)**
	AP-2277	**Kwik-Attach Drop Kit for Model 300 and 300P (Box of 10)**
1	APCD-058	Shut Off Slide for Kwik-Attach Model 220
1	AP-1764	Kwik-Attach M300 and M300P Drop Kit Slide
2	PVC-1004	Model 220 PVC Flex-Flo Tube, 10' (3 Meters) w/ Belled End
2	PVC-1005	Model 300 and 300P PVC Flex-Flo Tube, 10' (3 Meters) w/ Belled End
3	AP-0583	Hose Clamp, Stainless Steel 1-3/4" - 2-3/4"
3	AP-0584	Hose Clamp, Stainless Steel 3"-4"
4	APCD-059	Main Housing for Kwik-Attach M220 Drop Kit
4	AP-1763	Main Housing for Kwik-Attach M300 and M300P Drop Kit

Unloader Switch

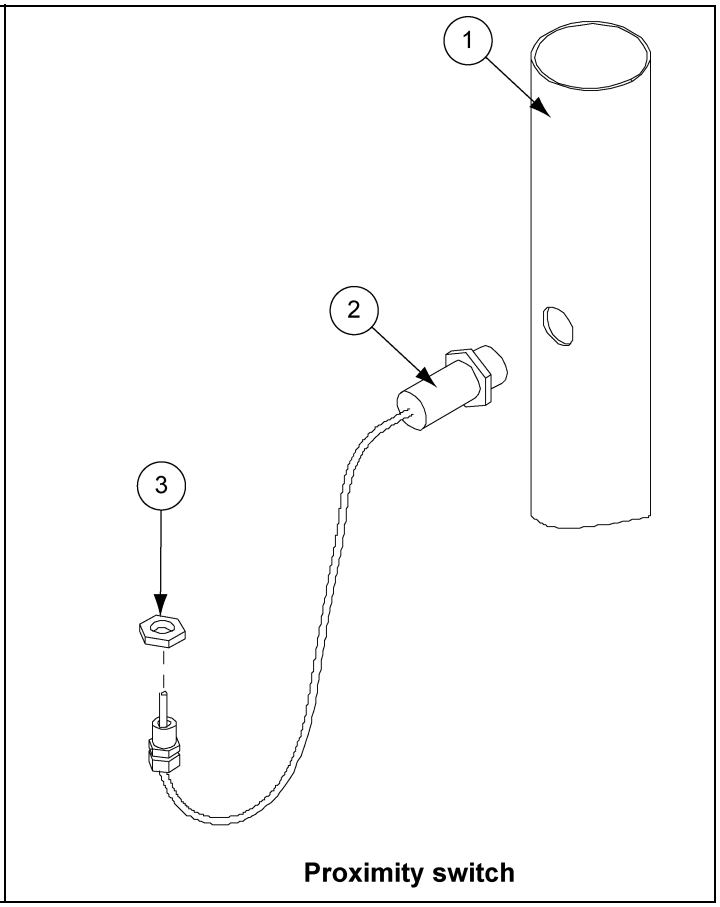


Ref #	Part #	Description	Qty
1	FLX-4157A	Back Plate, Unloader Switch Assembly	1
2	FLX-4410	Diaphragm Assembly	1
3	FLX-2380	Small Diaphragm Retainer	1
4	S-849	Hex Nut 10-24 Grade 2	1
5	FLX-4158A	Cover Plate Assembly for Switch	1
6	S-3558	3/8" Washer EPDM Steel Backed	1
7	S-4301	Wing Nut 5/16"-18 ZN Grade 2	1
8	FLX-4159	Unloader Switch Housing	1
9	S-3674	Flat Washer #10 x 7/32 I.D. x 1/2 O.D. x 18 Gauge TSAE ZN Grade 2	1
10	S-2010	Nylock Nut #10-24 ZN Grade 2	2
11	07097327	Micro Switch Spring Bracket	1
12	FLX-3493	Control Unit Switch Bracket	1
13	FLX-2128	Boot Switch	1
14	S-7319	Screw, MS #6-32 x 7/8" R.H. Side ZN Grade 2	1
15	S-6144	Hex Nut 6-32 Grade 2	1
16	E160-1074	Ring Terminal #10 Insulated	1
17	WR-16GRN-YLW	Wire 16 Gauge Green/Yellow Stranded 1'	1
18	FLX-2690	Electrical Box Gasket 4 x 4	1
19	FLX-2689	Electrical Box Lid	1
20	DC-1088	Decal, Flex-Flo Control Unit	1
21	S-995	Screw, MS #10-24 x 1" PHP SS	1
22	S-7931	Hex Nut #10-24 SS	1
23	BX-302	Box, 13-3/4" x 5-1/2" x 5-1/2" 200C FPF (Not Shown)	1

Micro Drop Tube Switch/Proximity Switch



Micro drop tube switch



Proximity switch

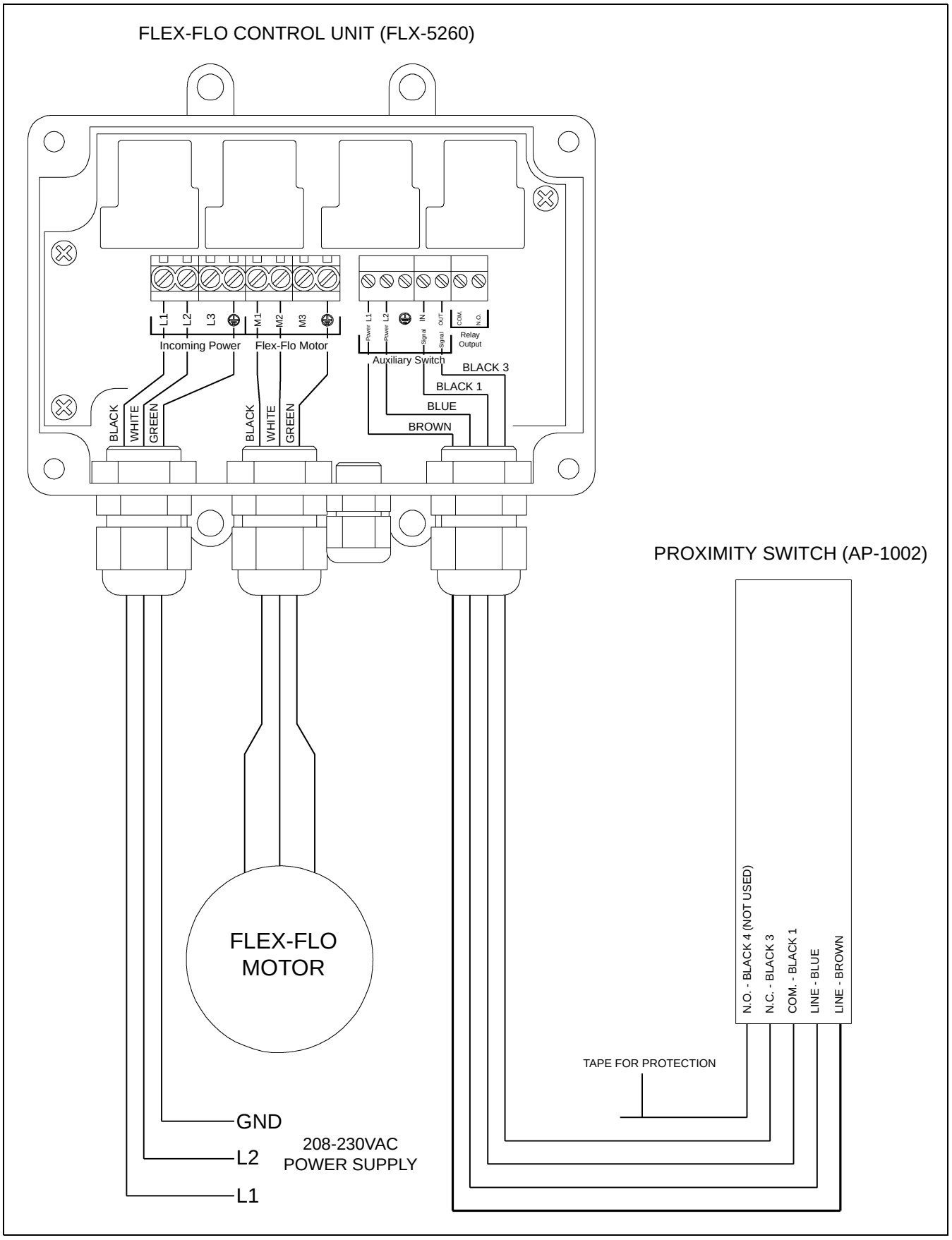
Micro Drop Tube Switch

Ref #	Part #	Description	Qty
	AP-0990	**Plastic Drop Tube Switch, 110/220V**	
1	FLX-3489	Micro Switch Box Assembly Wired NC	1
2	S-7621	Screw, SDS #10-16 x 1" HWH ZN Grade 2	6
3	FLX-3448	Drop Tube Switch Baffle Plate	1
4	FLX-3451	Drilled Drop Tube Housing	1

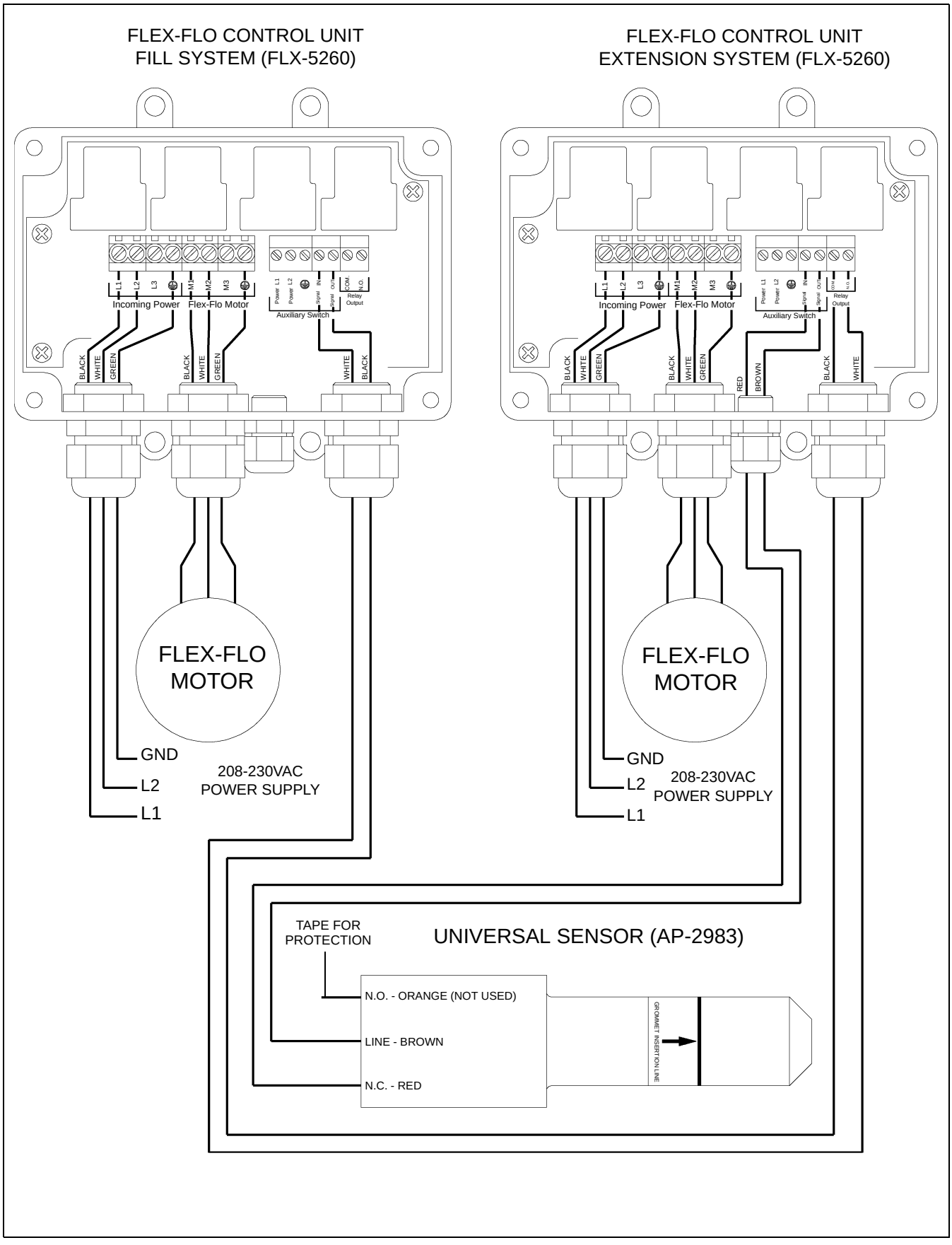
Proximity Switch

Ref #	Part #	Description	Qty
1	FLX-2425	Drop Tube, 3" I.D. x 12' (3.65 Meters)	1
2	FLXDF-1172	Capacitive Proximity Switch NC 20-250 VAC	1
3	S-7906	1/2" Cord Connector	1

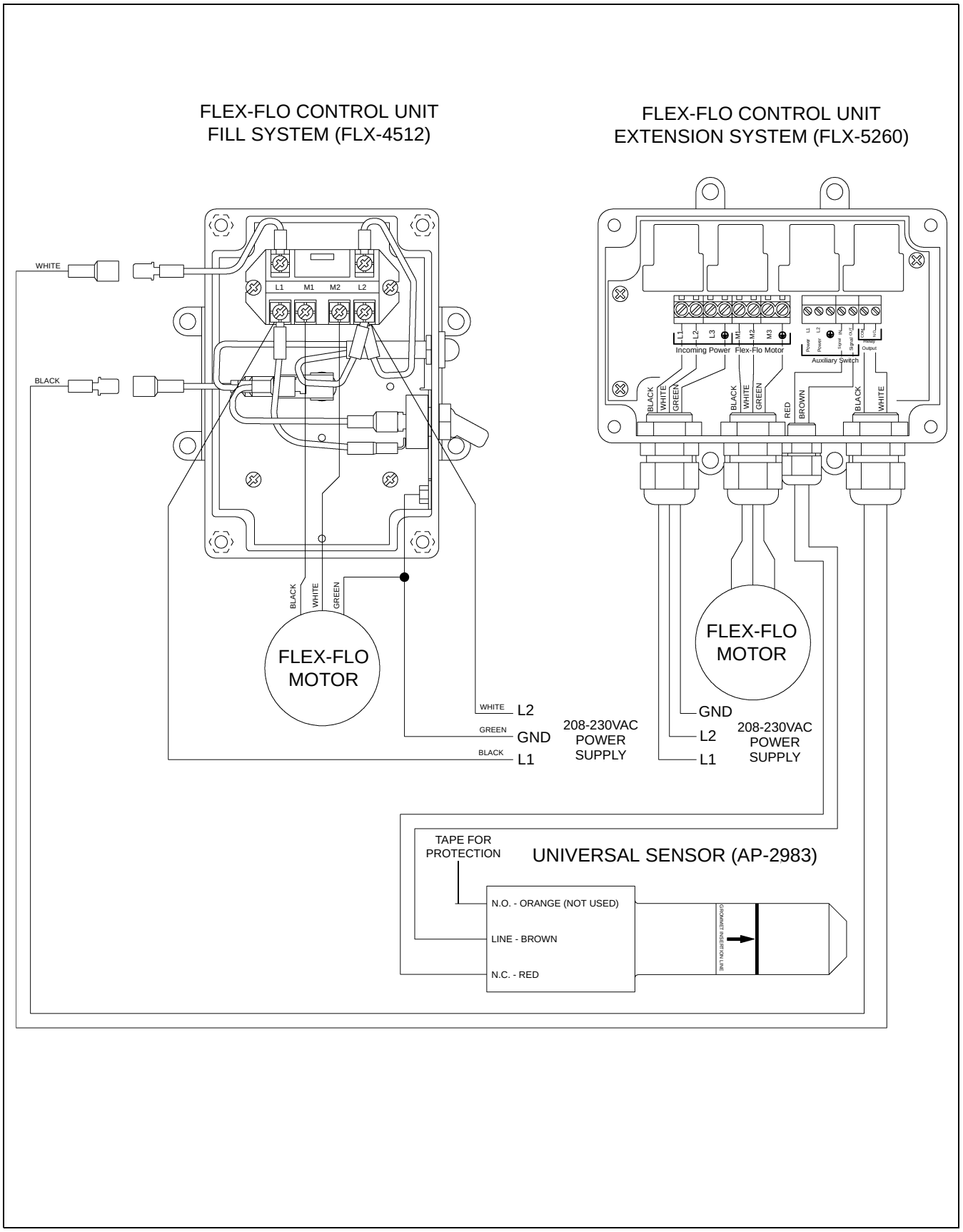
Flex-Flo Control Unit Used with 5 Wire Sensor



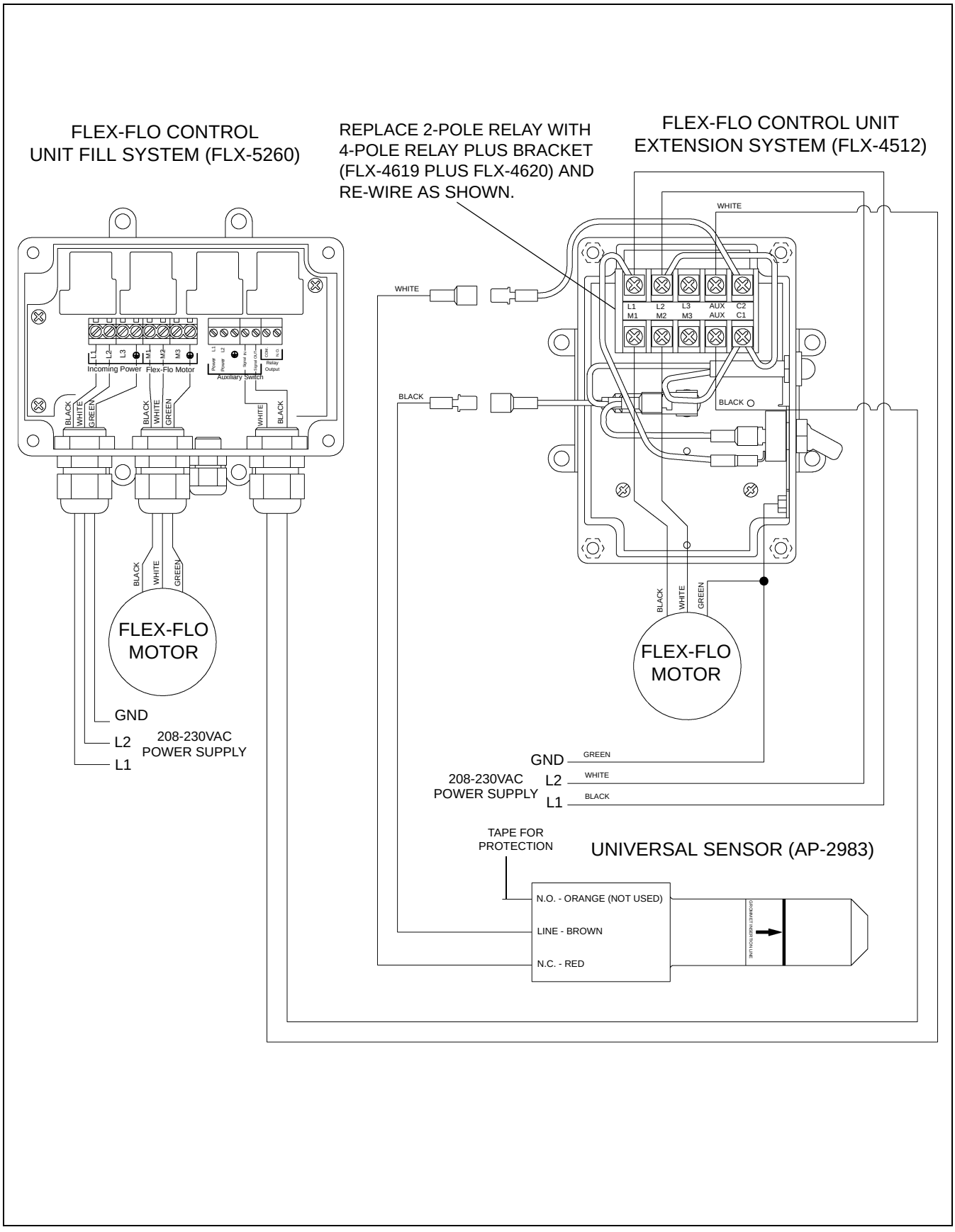
Flex-Flo Control Unit Extension System - Dependent



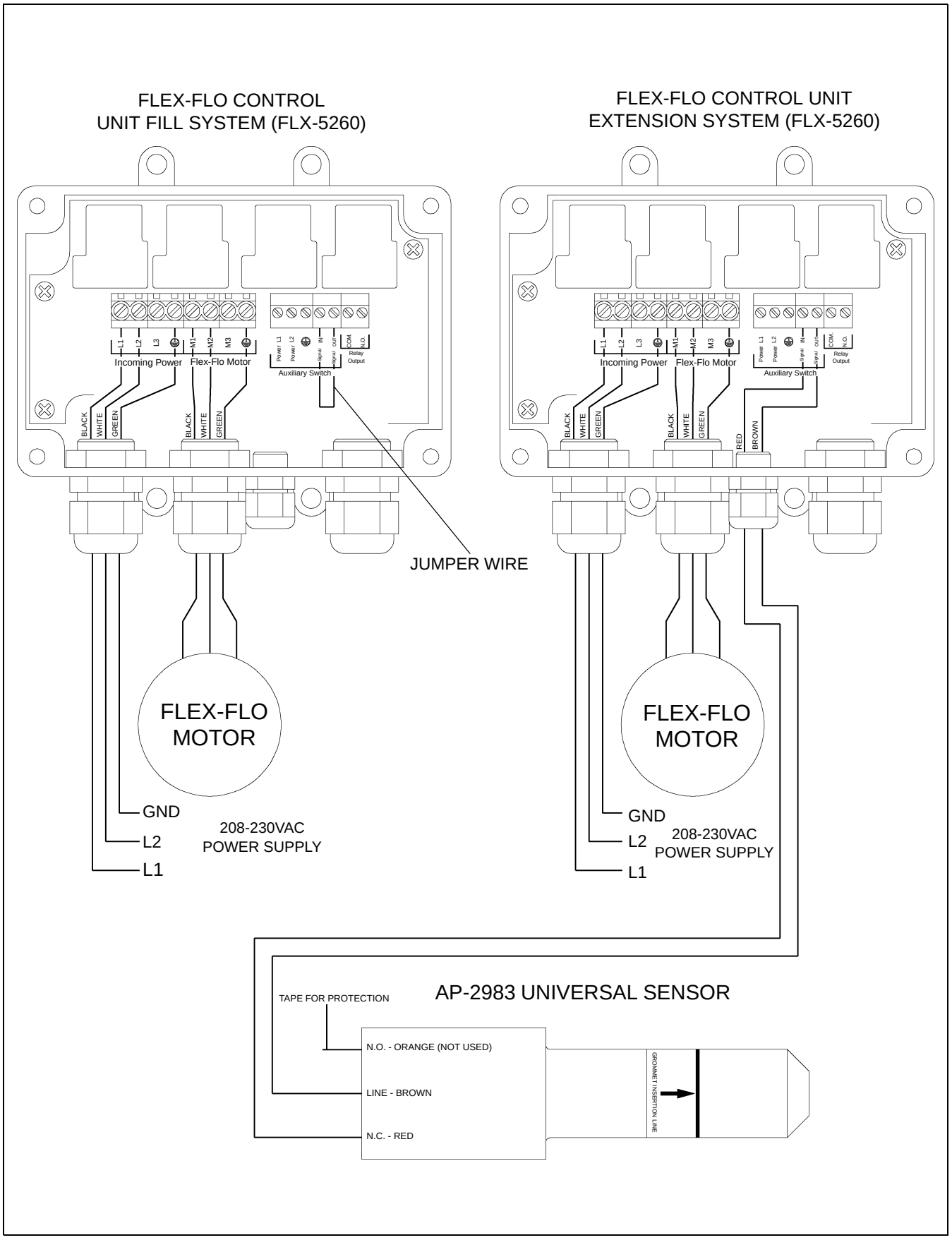
Flex-Flo Control Unit Extension System - Dependent (Continued)



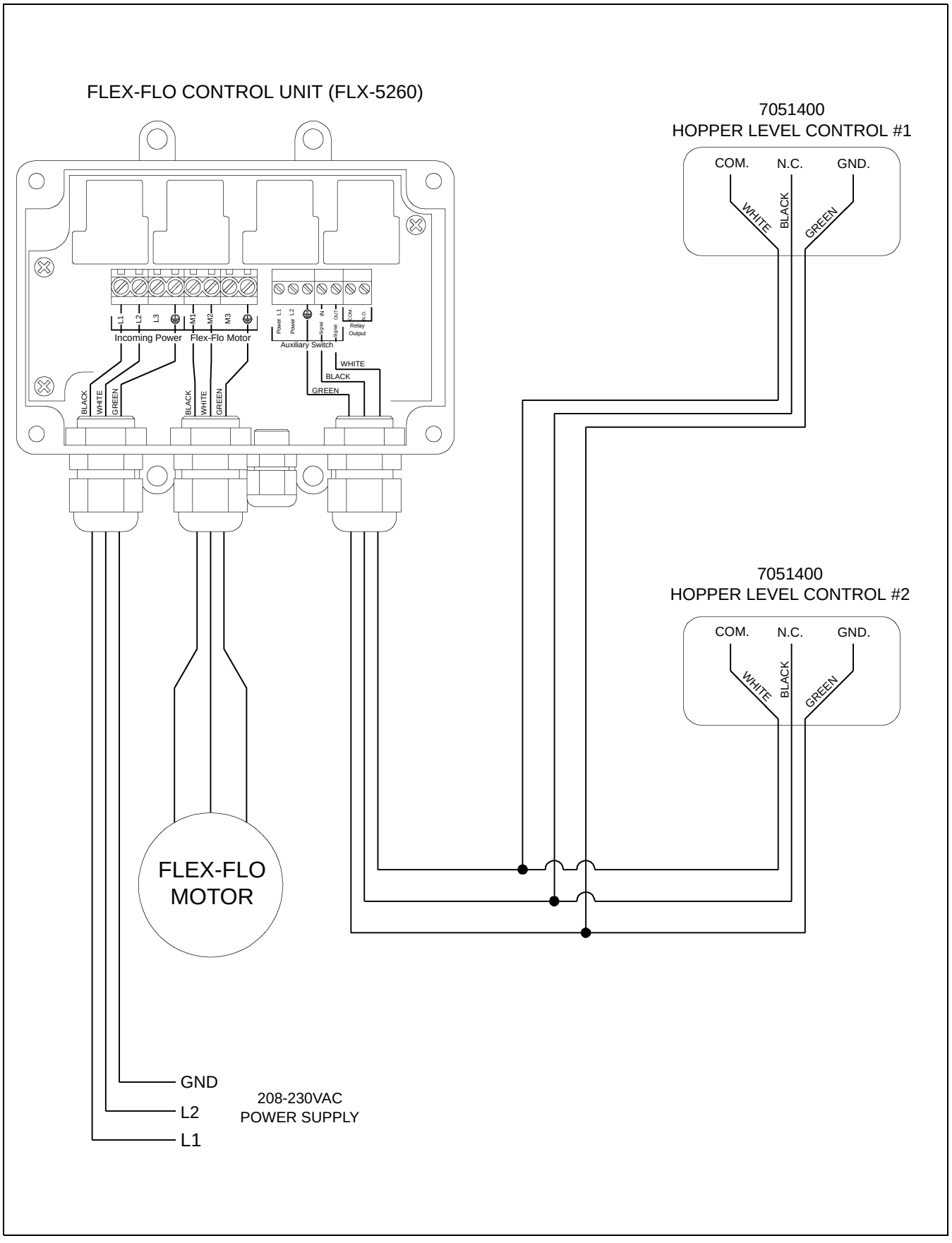
Flex-Flo Control Unit Extension System - Dependent (Continued)



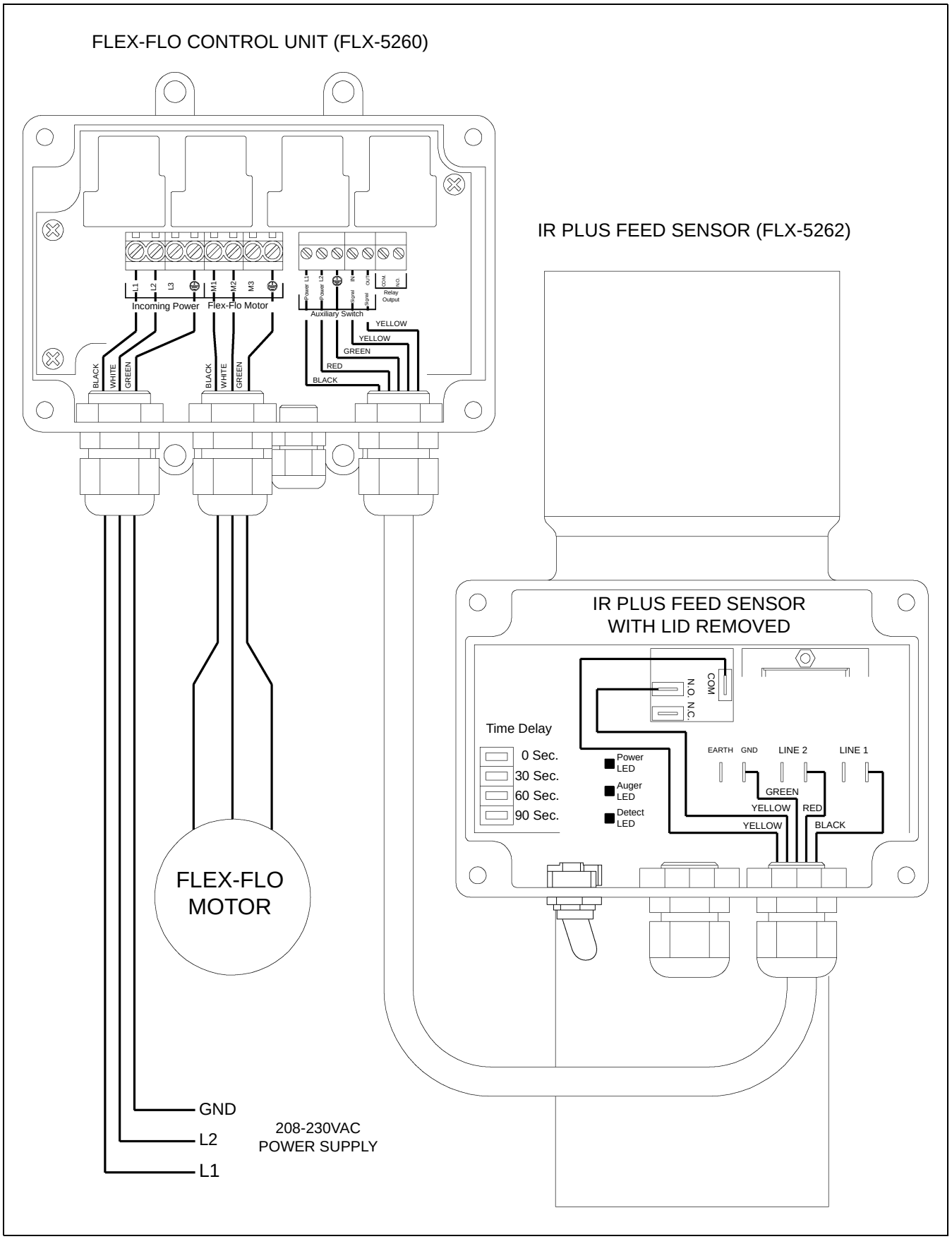
Flex-Flo Control Unit Extension System - Independent



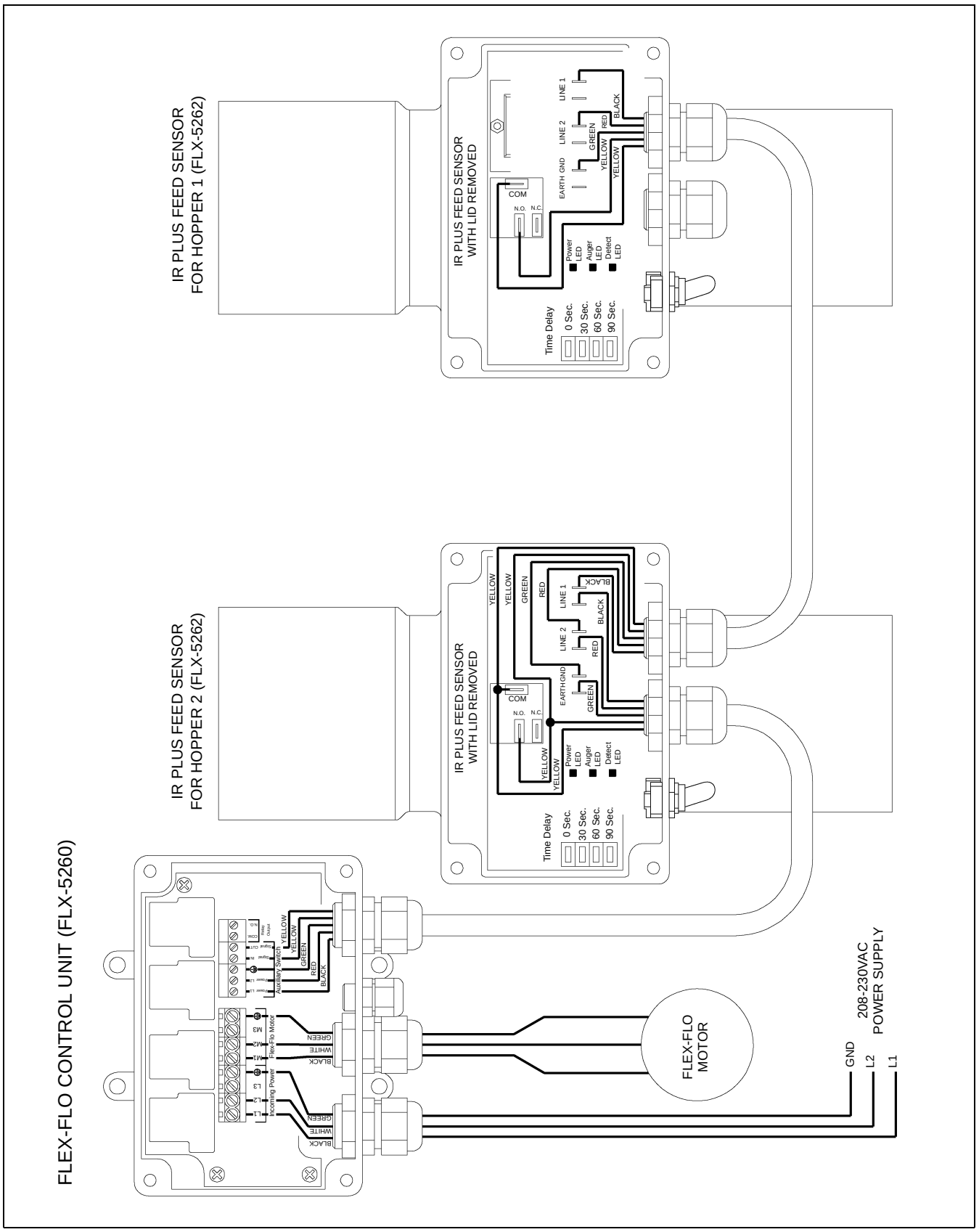
Flex-Flo Control Unit Used with Hopper Level Controls



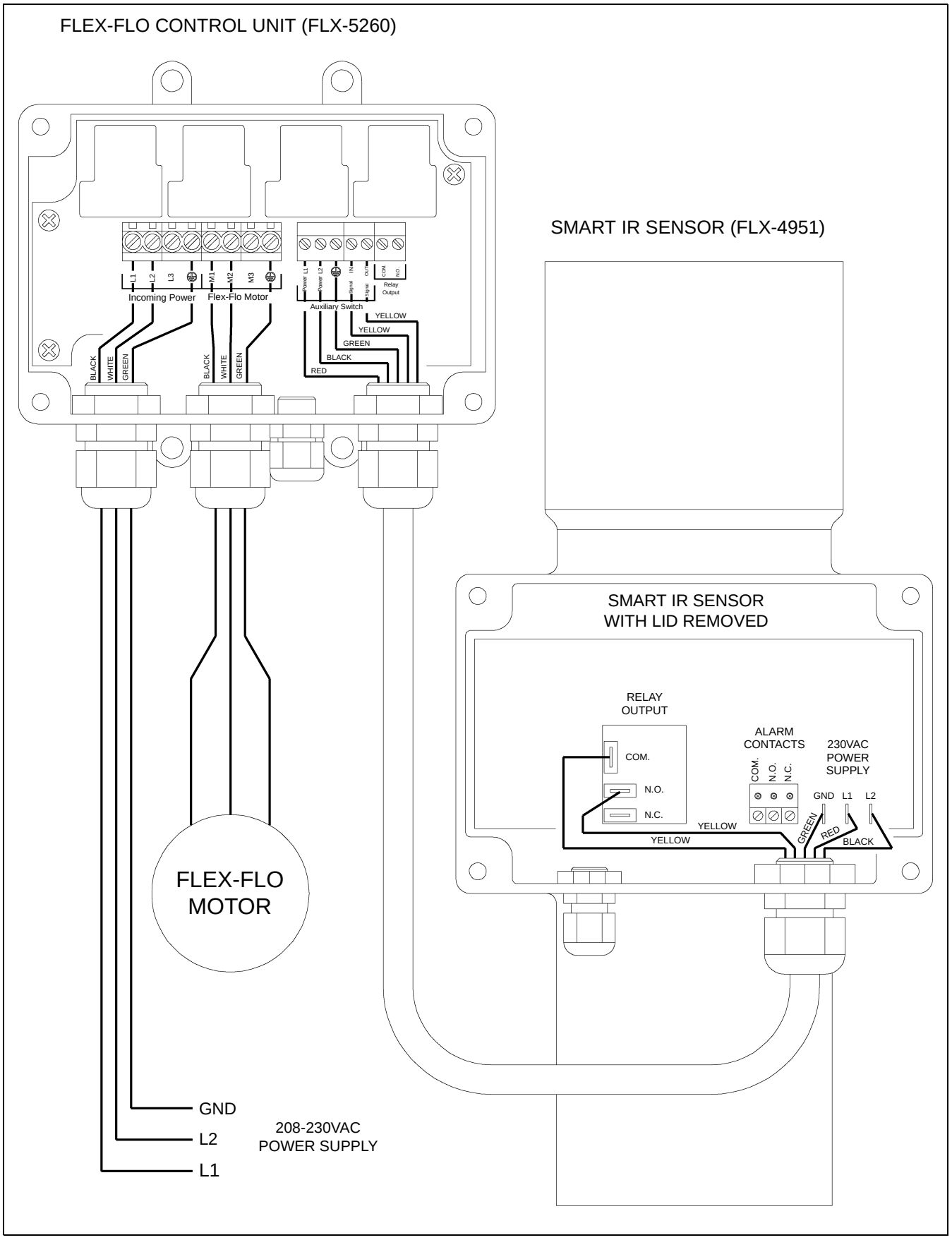
Flex-Flo Control Unit Used with IR Plus Feed Sensor



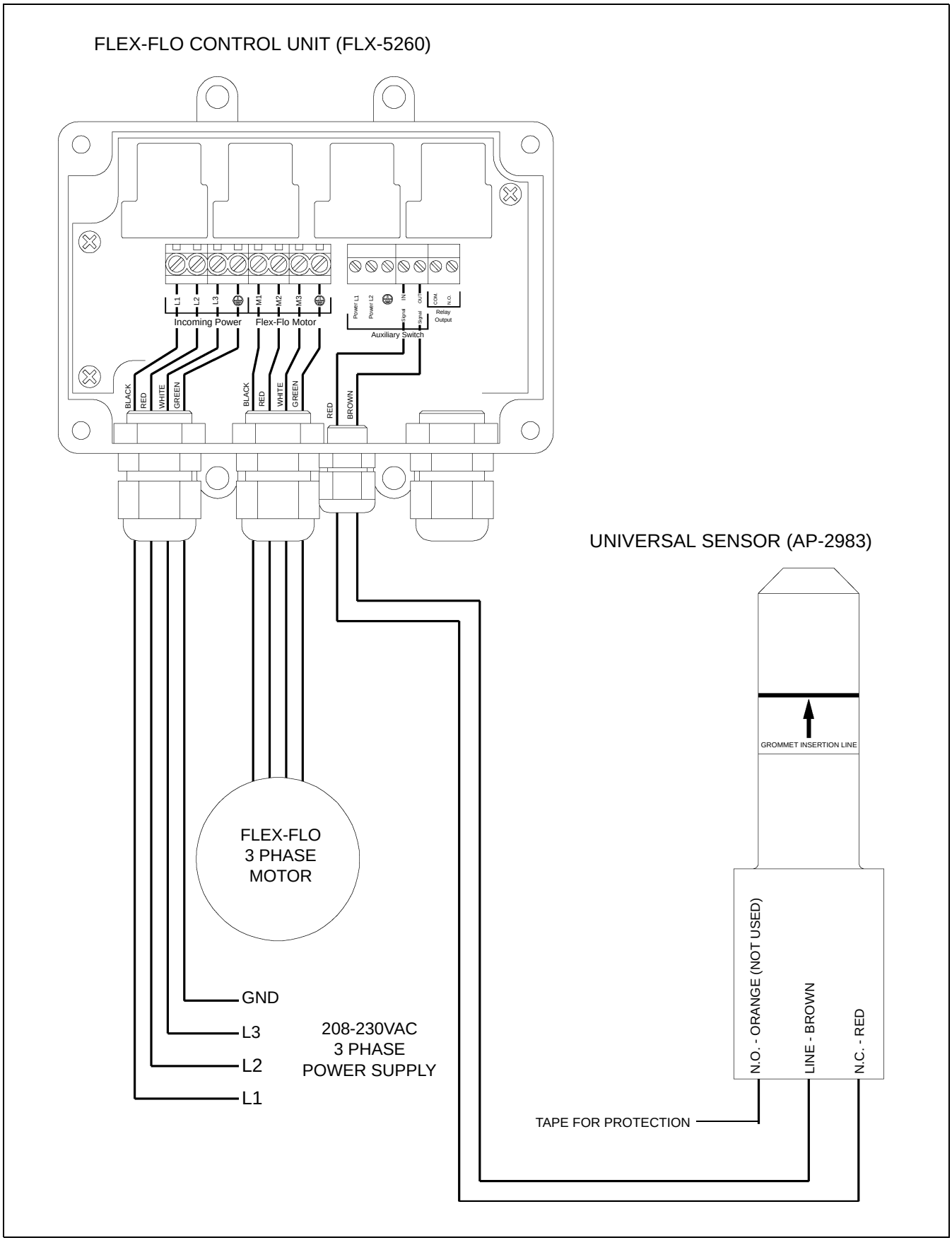
Flex-Flo Control Unit Used with IR Plus Feed Sensor as Hopper Level Controls



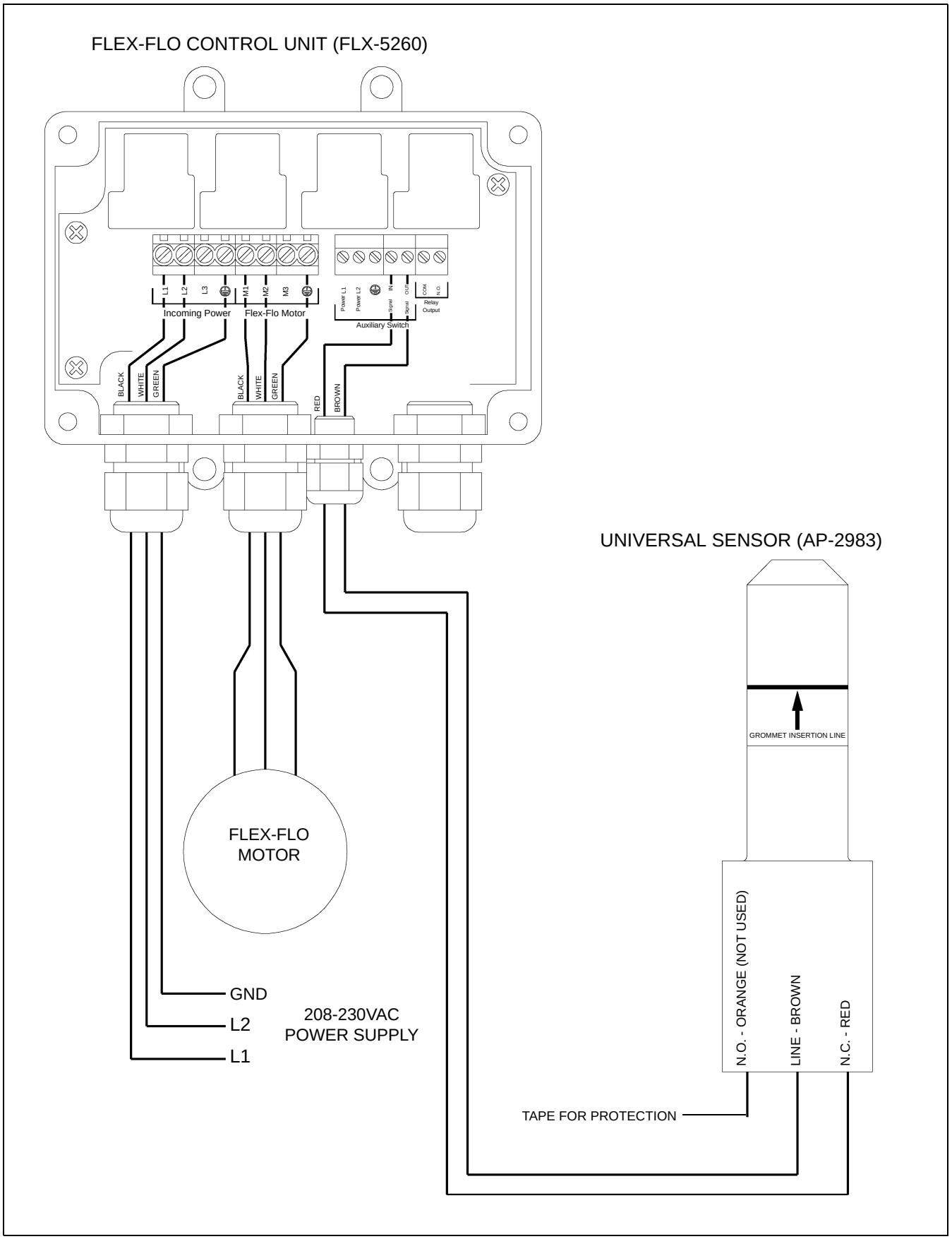
Flex-Flo Control Unit Used with Smart IR Sensor



Flex-Flo Control Unit Used with 3 Phase Power



Flex-Flo Control Unit Used with Universal Sensor



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
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years
	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
AP and Cumberland	Flex-Flo/Pan Feeding System Motors	2 Years
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **
	Feed Tubes (1-3/4" and 2.00")	10 Years *
	Centerless Augers	10 Years *
	Watering Nipples	10 Years *
Grain Systems	Grain Bin Structural Design	5 Years
Grain Systems Farm Fans Zimmerman	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^{th}) month from the date of purchase and continuing until the sixtieth (60^{th}) 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.

9101239_1_CR_rev8.DOC (revised January 2014)

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.

1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420
www.gsiag.com

AGCO
Your Agriculture Company

AP and Cumberland are a part of GSI, a worldwide brand of AGCO Corporation.

CN-339841