

# **Metric In-Line Mount and Cross-Cut Mount Flush Style Intermediate Discharge Gates**

Installation Manual

PNEG-2023

Version: 2.0

Date: 04-09-21





**Declaration of Conformity  
ATEX DIRECTIVE  
2014/34/EU**



AGCO Grain and Protein  
A/S Cimbria, Faartoftvej 22  
P.O. Box 40, 7700, Thisted  
DENMARK

The GSI Group declares that the machine, parts or equipment:

**RSG Slide Gates**

Models

Size	Model #	Voltage (V)	Power (kW)	Linear Speed (m/s) (MAX)	Rating
12 x 12	RSG1212GM-X21	220-440 AC	0.33	0.0626	Ex II2 D T4 (125°C); 'c'; 'b'
14 x 14	RSG1414GM-X21	220-440 AC	0.33	0.0626	
16 x 16	RSG1616GM-X21	220-440 AC	0.33	0.0626	
18 x 18	RSG1818GM-X21	220-440 AC	0.33	0.0626	
12 x 12	RSG1212GM-X22	220-440 AC	0.33	0.0626	Ex II3 D T4 (125°C); 'c'; 'b'
14 x 14	RSG1414GM-X22	220-440 AC	0.33	0.0626	
16 x 16	RSG1616GM-X22	220-440 AC	0.33	0.0626	
18 x 18	RSG1818GM-X22	220-440 AC	0.33	0.0626	

Meets the Essential Requirements of the ATEX Directive 2014/34/EU

- Equipment Group II
- Equipment Category 2/3 (see rating above)
- Combustible Material Grain Dust
- Minimum ignition temperature 380°C (maximum design surface temperature T4 = 135°C)

In accordance with the following standards:

- EN13463-1:2009
- EN13463-5:2011
- EN13463-6:2005

The equipment above must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of all relevant Directives or until these components have been assembled in the manner recommended in the manufacturers instructions.

Signed :

DocuSigned by:  
*Daniel Nemeth*  
ACBE46CACE554E3...

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### 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. Read and save these instructions.

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-0001-4**

## 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.



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



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



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



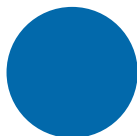
This symbol is used to address practices not related to personal injury.



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

### 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

**Toxic Fume and Dust Hazard**

- Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.
- Remove paint before welding or heating:
  - Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
  - If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
  - If you use solvent or paint-stripper, remove stripper with soap and water before welding.
  - Remove solvent or stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



ST-0043-2

**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

**Stay Clear of Slide Gate**

- Keep hands away from slide gate opening. Slide gates can crush and dismember. Motor can start at any time.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0049-1

**Stay Clear of Rotating Parts**

- Do not service equipment while the equipment is in operation.
- Entanglement in rotating shafts or exposed conveyor belts will cause serious injury or death.
- Keep all guards and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0092-1






Please remember, safety decals provide important safety information for people working near equipment that is in operation. If a safety sign cannot be easily read for any reason or has been painted over, replace it immediately. Additional safety signs may be obtained from your dealer, distributor or ordered from the factory free of charge.

**Contact:**

**GSI Group**

1004 E. Illinois St.  
 Assumption, IL. 62510  
 Phone: 1-217-226-4421

Location	Decal #	Decal	Description
<p>Located on the                      In-Line Mount and                      Cross-Cut Mount                      Discharge Gates</p>	<p>DC-1248</p>		<p>Decal, Warning                      Slide Gate</p>

### 3. Installation

## Overall Flush Gate Dimensions

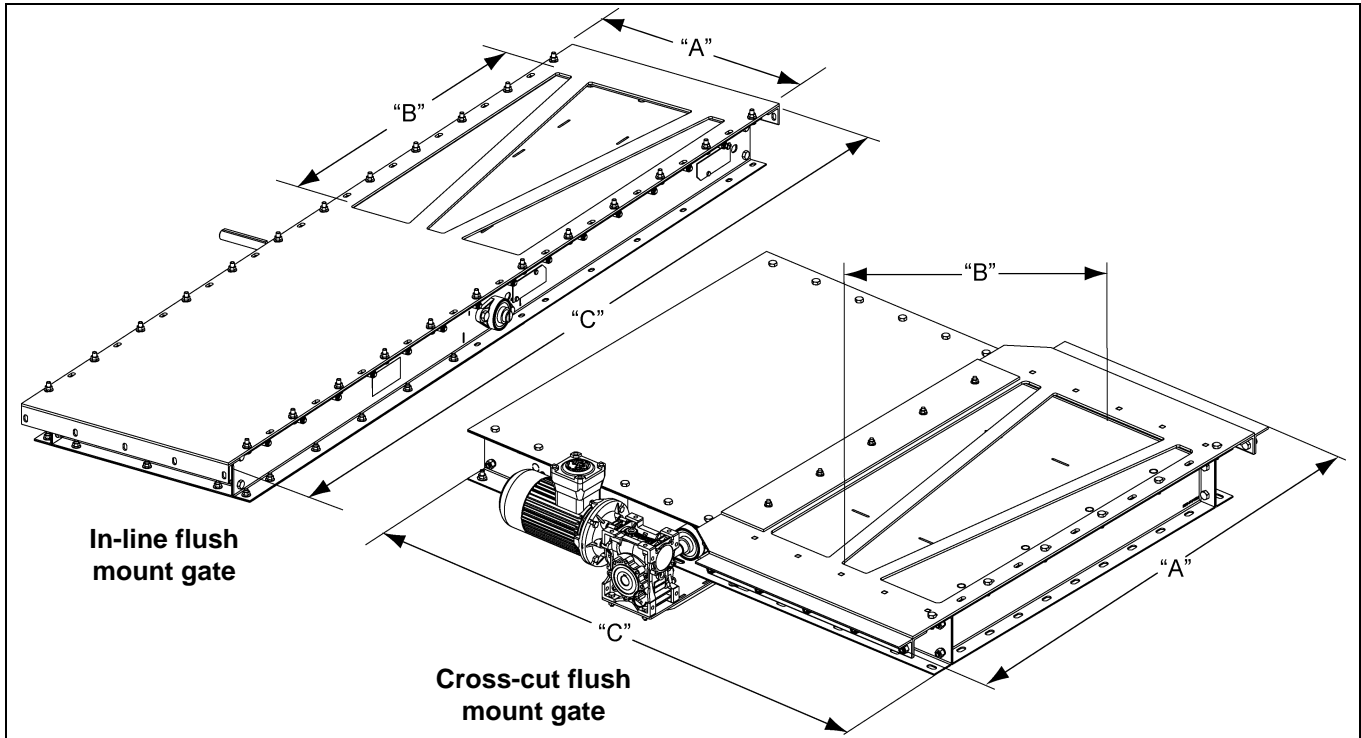


Figure 3A Overall Flush Gate Dimensions

Overall Flush Gate Dimensions

Gate Size (Conveyor Width)		"A" mm (in.)	"B" mm (in.)	"C" mm (in.)
09	In-Line	381 (15")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1022.35 (40-1/4")
12	In-Line	406.4 (16")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1123.95 (44-1/4")
14	In-Line	457.2 (18")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1225.55 (48-1/4")
16	In-Line	508 (20")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1327.15 (52-1/4")
20	In-Line	609.6 (24")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1530.35 (60-1/4")
21	In-Line	635 (25")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1581.15 (62-1/4")
26	In-Line	762 (30")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	1835.15 (72-1/4")
32	In-Line	914.4 (36")	914.4 (36")	2413 (95")
	Cross-Cut	1163.65 (45.813")	908.05 (35-3/4")	2139.95 (84-1/4")

## Cut Trough Bottom for Gate Placement

1. Start by locating the center of the proposed discharge location. Dimension "A" shown in [Figure 3B](#).
2. If holes cannot be aligned, new holes must be drilled in the trough side bottom flanges.
3. Dimension "B" would be 2413 mm (95") for in-line gates or 1163.65 mm (45.813") for cross-cut gates.
4. Center this dimension "B" around the point found with the "A" dimension and cut the bottom as straight as possible on either side of the center.
5. Weld the extra angle iron flanges (C) provided with the gate to each trough bottom cut, as shown in [Figure 3B](#), so that the gate can be bolted to each side. Stitch weld edges 51 mm (2") long with 38 mm (1-1/2") spacing.
6. Remove burrs on the inside edge of the trough bottom.
7. Apply paint to welds on outside of trough.

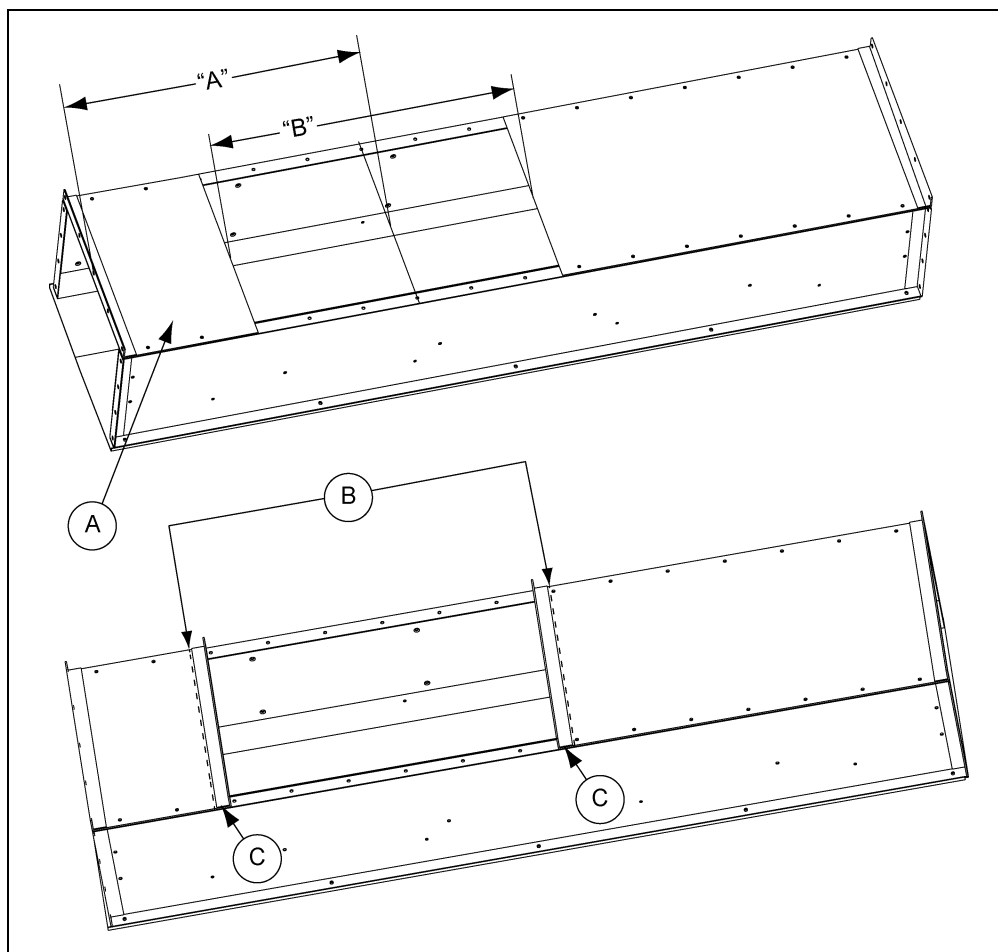


Figure 3B

Ref #	Description
A	Conveyor Bottom
B	Weld these two (2) edges stitch weld 50.8 mm (2") long 38.1 mm (1-1/2") spacing.
C	Angle Iron Flanges

### 3. Installation

## Manual Gate Installation

### Manually Operated Gate

1. Install the specified wheel to the shaft by aligning the key (C) and key way, then tighten the set screw. This gate can be operated by a chain, cable or hand wheel (D). (See Figure 3C.)
2. All flush mount style gates have a double gear rack for slide actuation.
3. The slide plate rides on 35 mm (1-3/8") double shielded radial bearings, as well as being guided and sealed by UHMW strips for smooth operation.

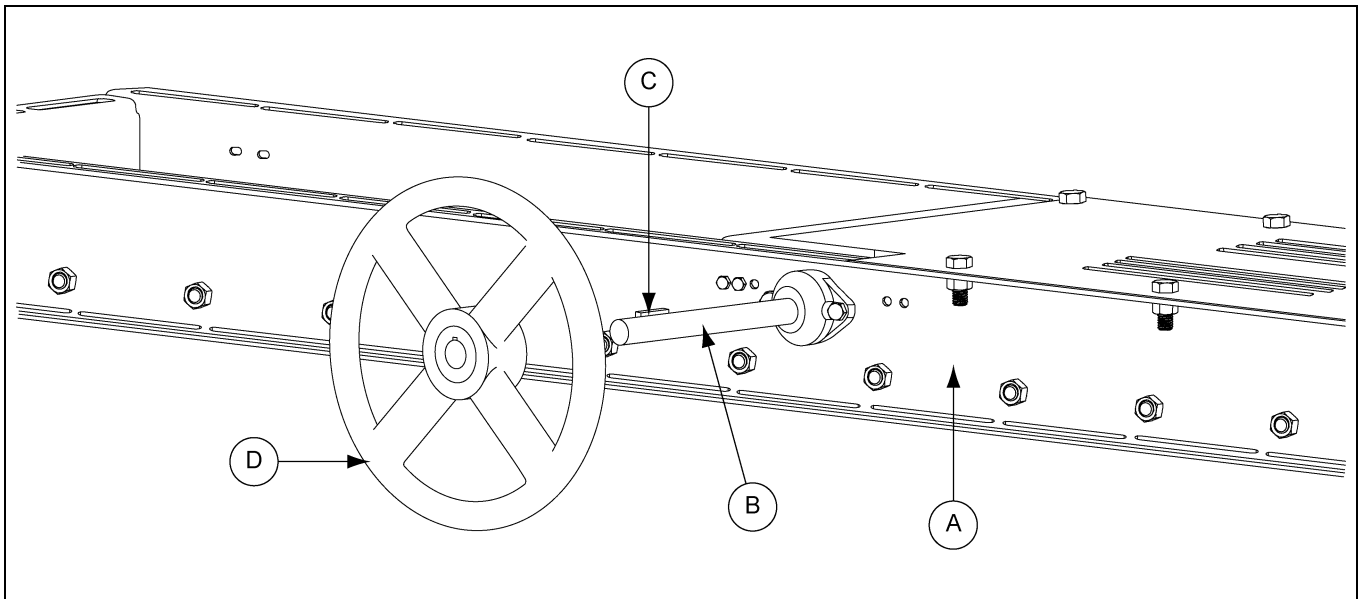


Figure 3C Manual Gate Installation

Ref #	Description
A	Gate Frame
B	Shaft
C	Key
D	Hand Wheel (Chain wheel and cable wheel optional.)

## Motor Driven Gate Installation for Cross-Cut Discharge Gate

### Install Motor Bracket

1. Install the motor bracket (B) to the gate. Then attach the motor (A) to the bracket (B) as shown in [Figure 3D](#), using the provided hardware.

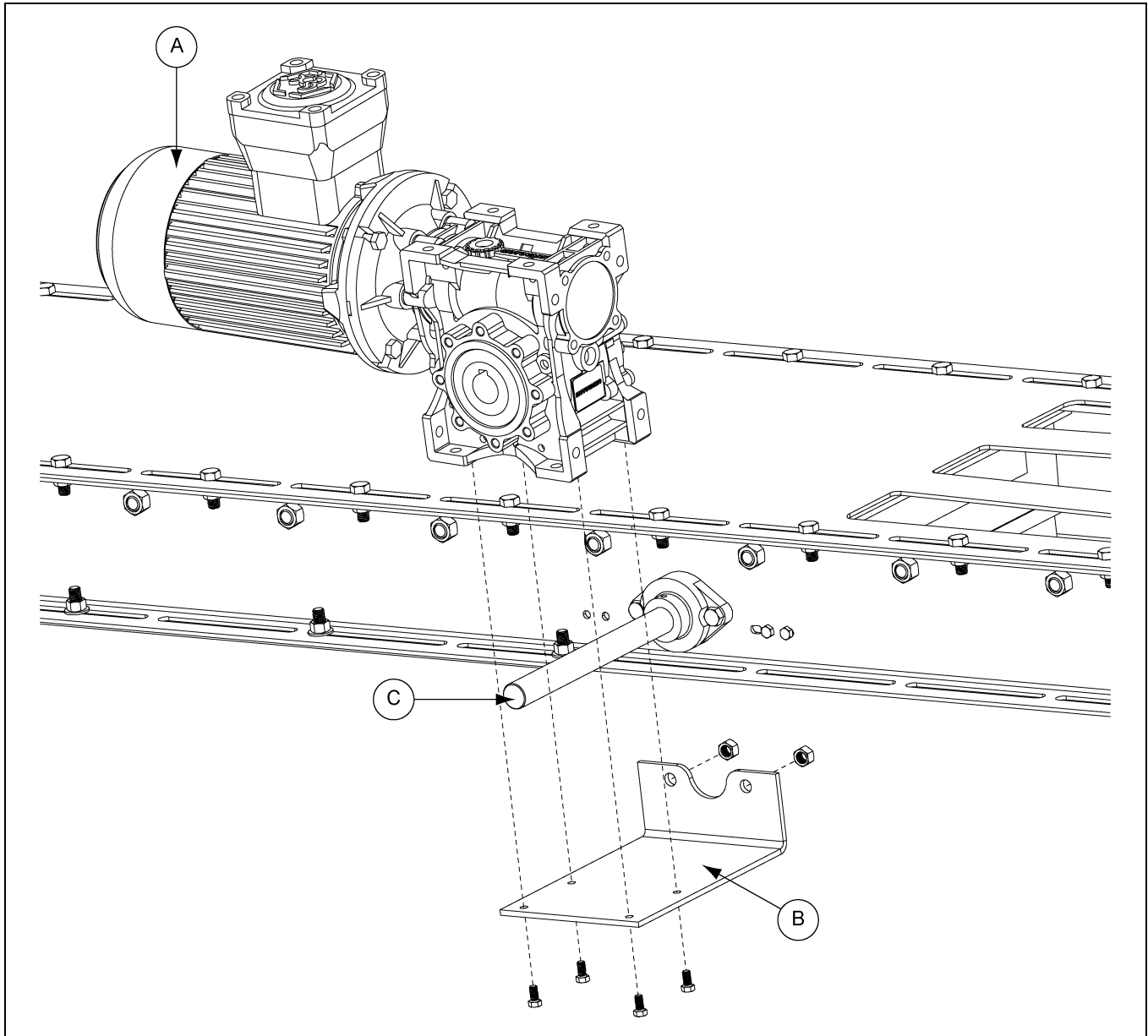


Figure 3D *Installing the Motor Bracket - Cross Cut*

Ref #	Description
A	Motor
B	Motor Bracket
C	Shaft

### 3. Installation

## Motor Driven Gate Installation for In-Line Mount Discharge Gate

### Install Motor Bracket

1. Install the motor bracket (D) to the gate. Then attach the motor (A) to the bracket (D) as shown in [Figure 3E](#), using the provided hardware.

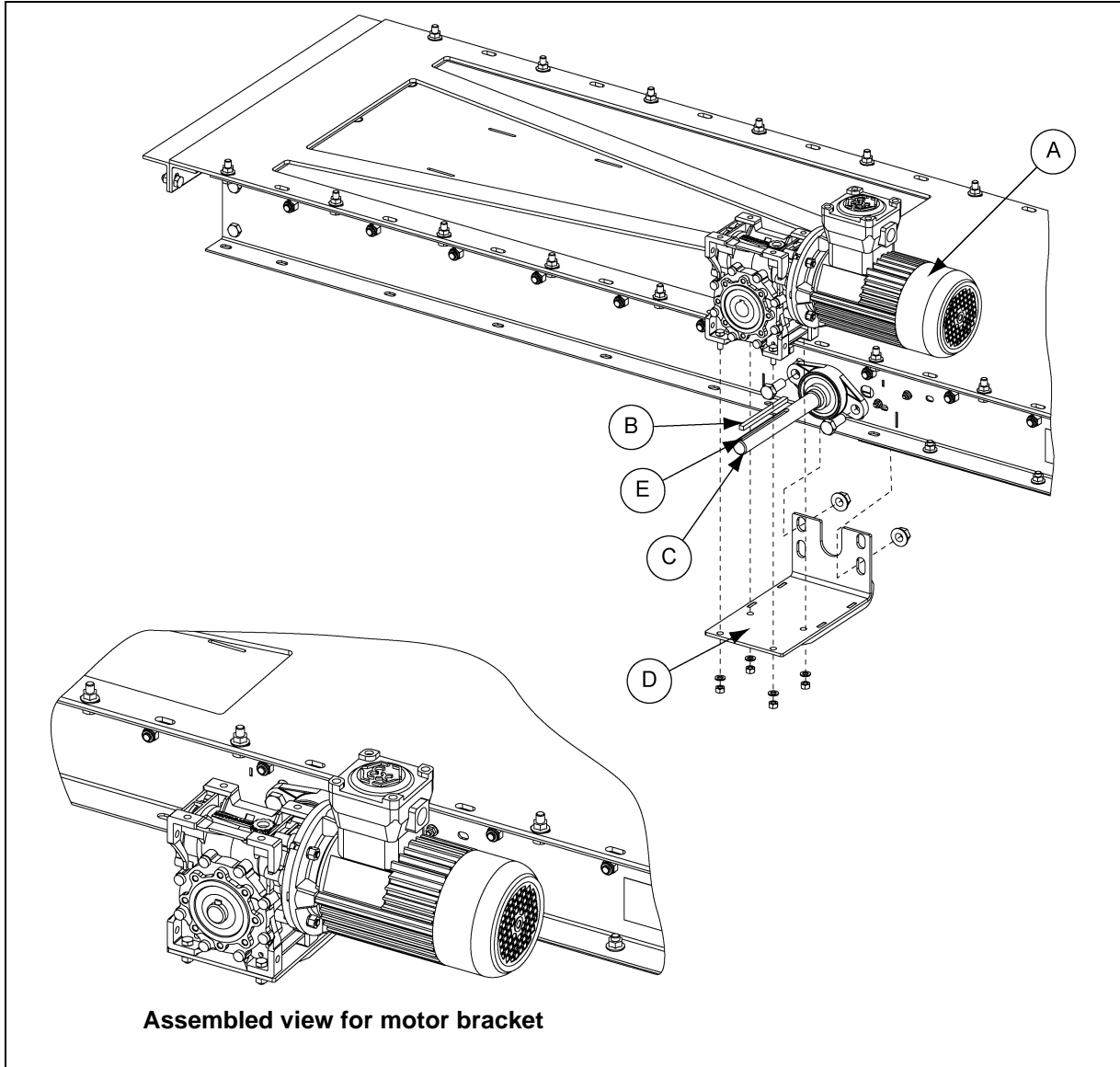


Figure 3E Installing the Motor Bracket - In-Line

Ref #	Description
A	Motor
B	Key
C	Shaft
D	Motor Bracket
E	Key Way

## Cross-Cut Discharge Gate Limit Switch Installation

1. Cross-cut switches are installed on opposite corners inside of gate frame. (See Figure 3F.)

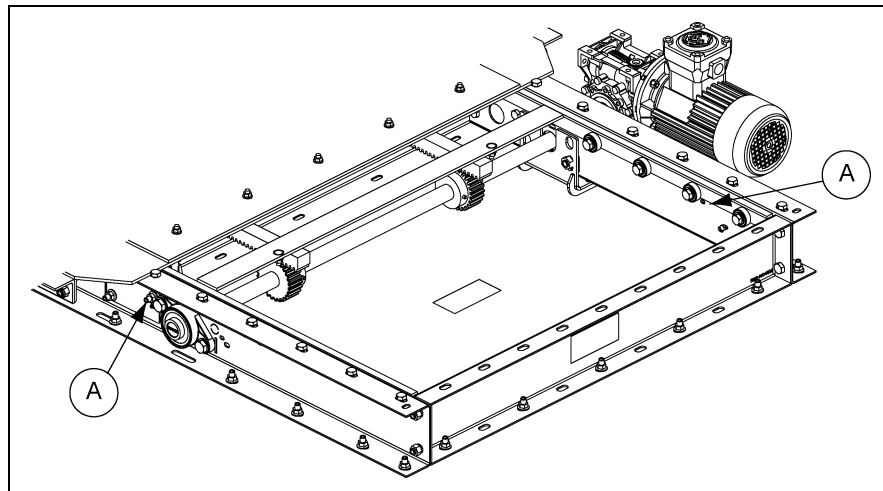


Figure 3F

Ref #	Description
A	Switch Location

2. Install limit switch (C) to the inside of the gate frame (D). Knock out the hole (B) where indicated to install switch through gate frame. (See Figure 3G.)

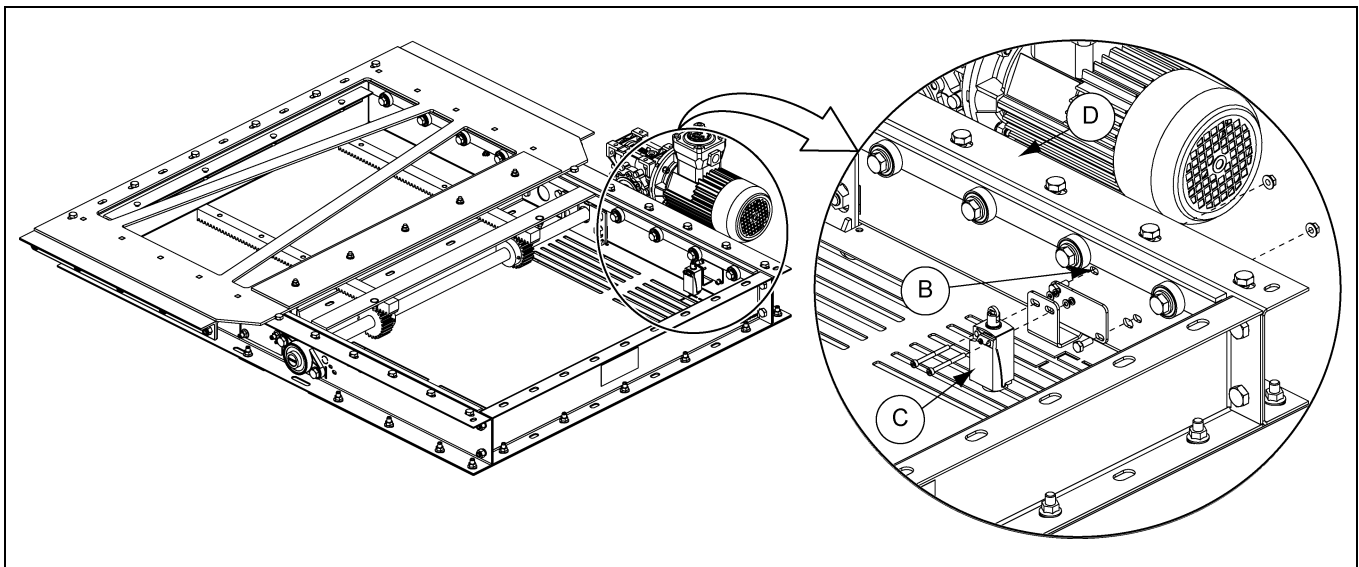


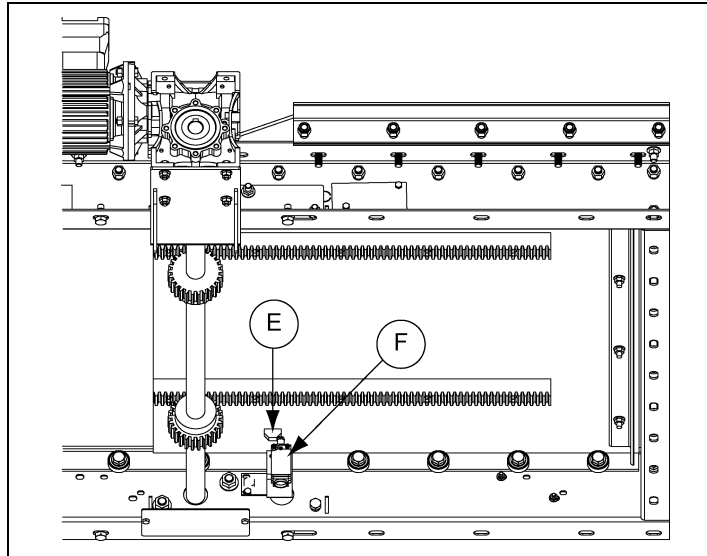
Figure 3G

Ref #	Description
B	Knock Out Hole
C	Limit Switch
D	Gate Frame

### 3. Installation

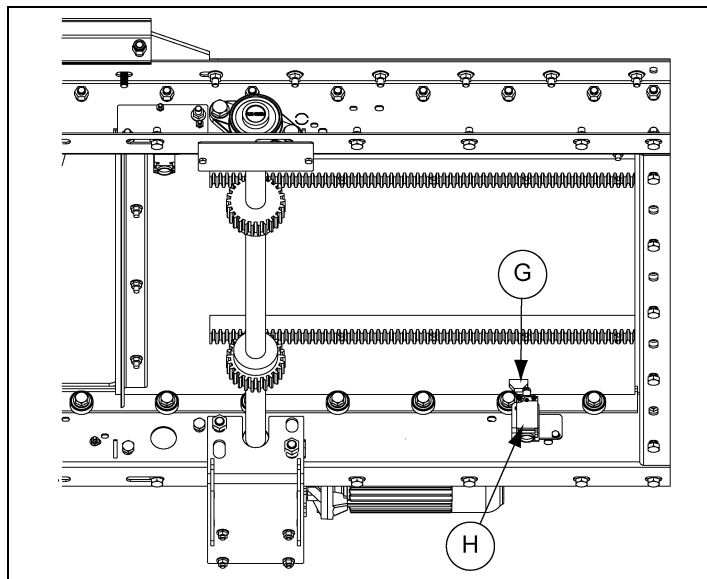
## Cross-Cut Discharge Gate Limit Switch Installation (Continued)

3. Install switch levers vertically. When the switch target on the gate push in the limit switch arm vertically, the motor will stop. (See [Figure 3H](#) and [Figure 3I](#).)



**Figure 3H** *Closed Position*

Ref #	Description
E	Switch Target Located on Gate
F	Closed Lever Position



**Figure 3I** *Open Position*

Ref #	Description
G	Switch Target on Gate
H	Open Lever Position



## In-Line Discharge Gate Limit Switch Installation

1. Using limit switches that are available in STD and ATEX or explosion proof standards, achieves accurate positioning of these gates. Limit switches (B) are located on both sides of the frame to detect when the gate is completely open or closed. (See Figure 3J.)
2. Attach the switch brackets (A) to the inside of the gate as shown using hardware provided. (See Figure 3J.) Attach limit switch (B) to the bracket as shown in Figure 3J.
3. After switches are securely fastened, adjust lever arms so they come in contact with tripper blocks on underneath side of slide plate.
4. Disconnect the power at the electrical panel and run the proper gauge electrical wire to the motors and limit switches. (See Wiring Diagram on Page 22.) **Be sure that the limit switches (B) are adjusted properly before operating the gate.** Turn the power back ON and CAUTIOUSLY operate the gate, opening and closing the gate slide, making the necessary adjustments to the limit switch arms to assure complete opening and closing of the gate.
5. Motor driven gates are available in both TEFC and explosion proof configurations.

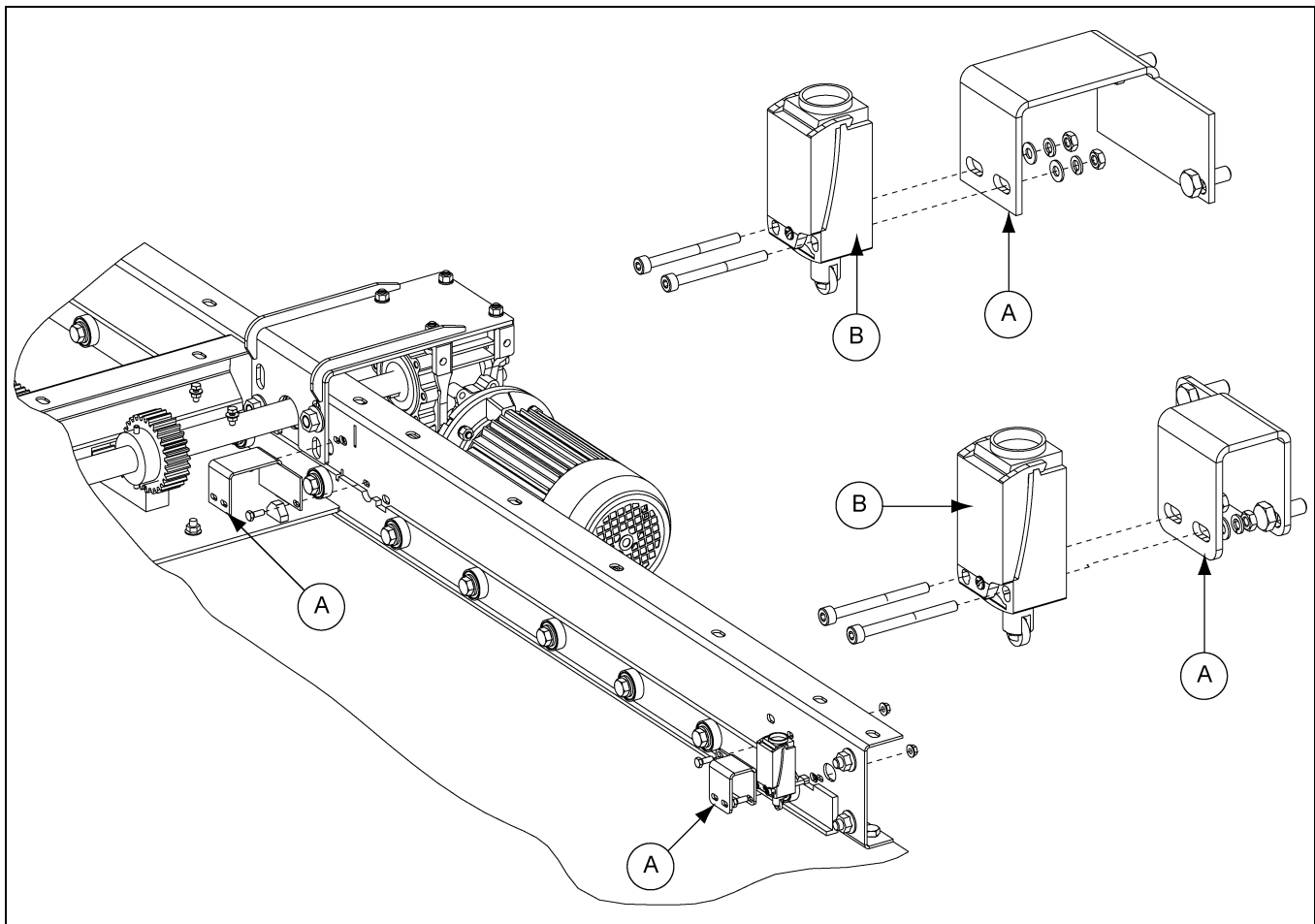


Figure 3J Installing the Limit Switch

Ref #	Description
A	Switch Brackets
B	Limit Switches

### 3. Installation

## In-Line Discharge Gate Limit Switch Installation (Continued)

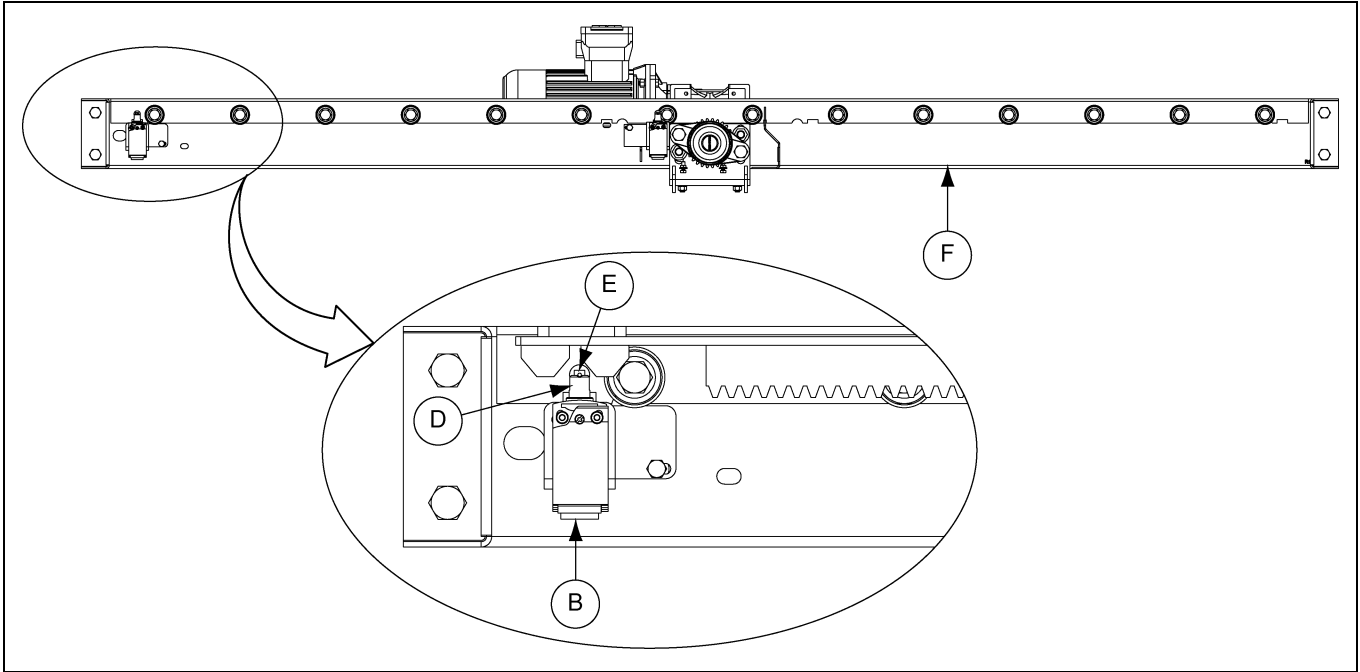


Figure 3K

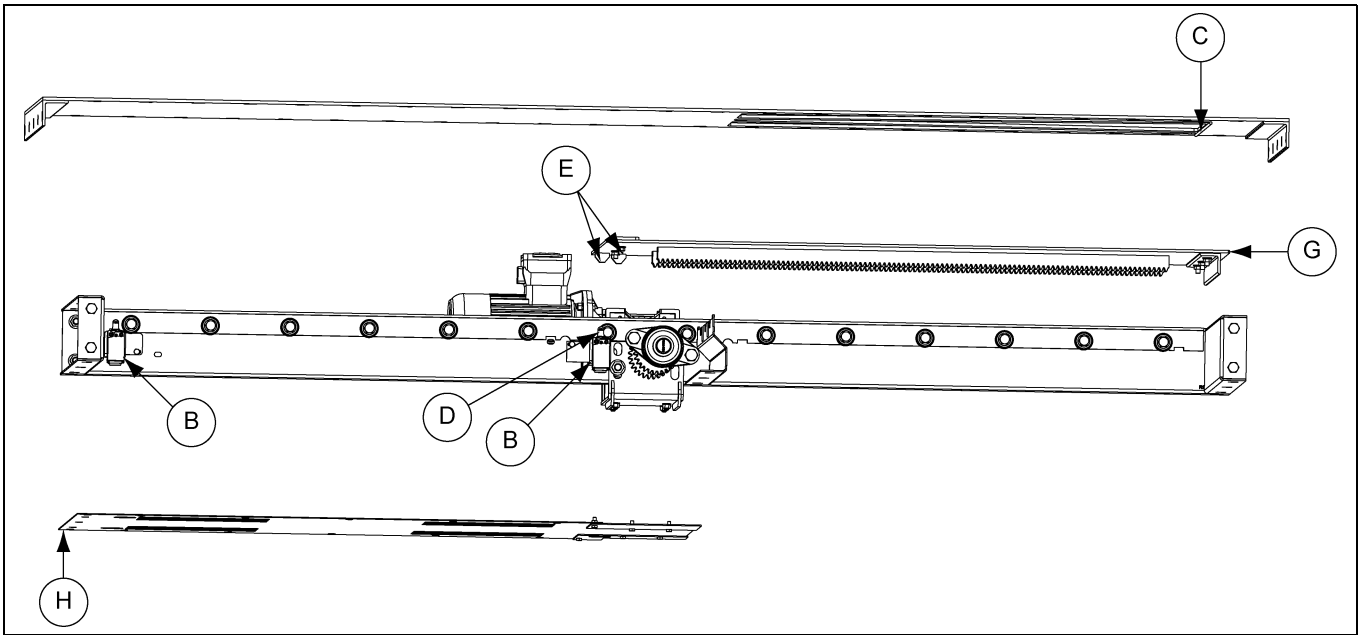


Figure 3L

Ref #	Description
B	Limit Switches
C	Weldment, AR Line
D	Actuator Arm
E	Tripper Block

Ref #	Description
F	Side view with side removed clarity.
G	Slide Gate
H	Cover

## In-Line Discharge Gate Limit Switch Installation (Continued)

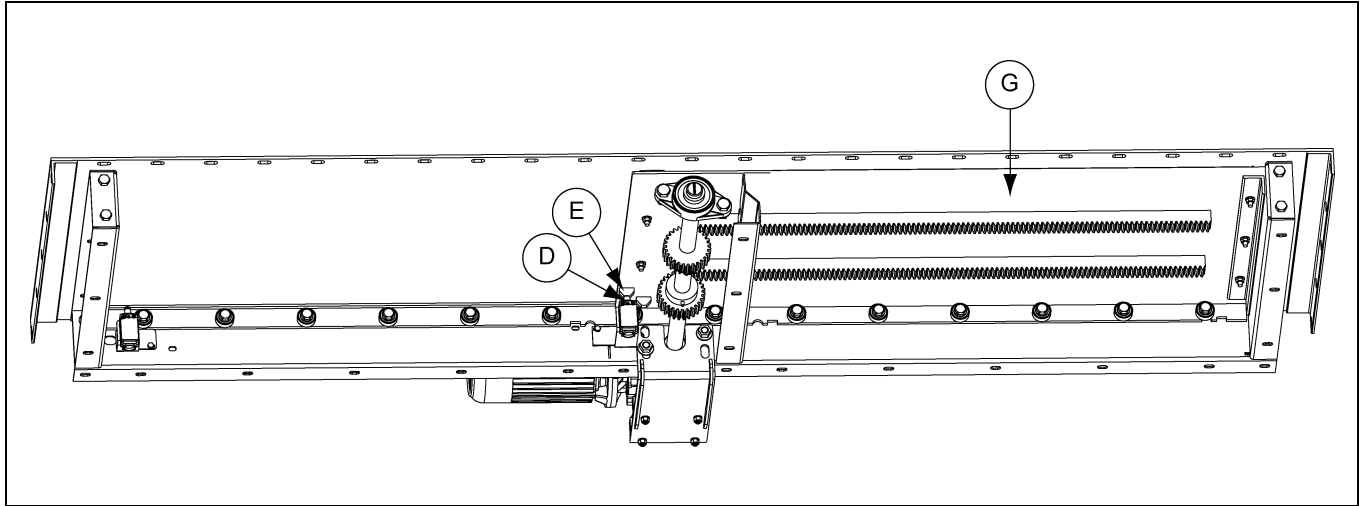


Figure 3M **GATE CLOSED POSITION** shown without side for clarity.

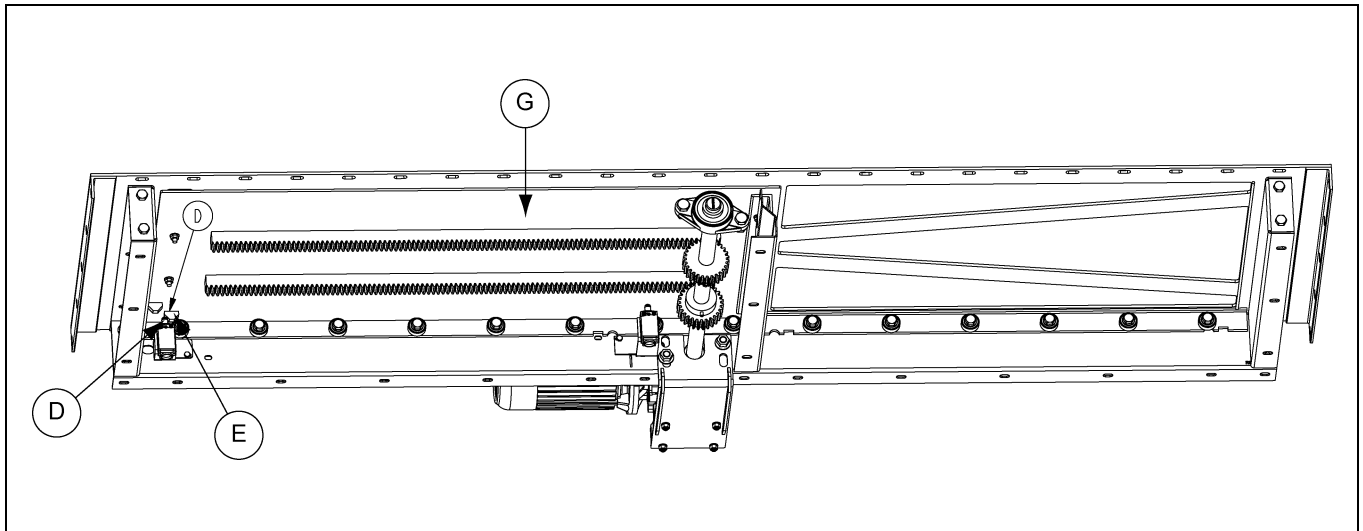


Figure 3N **GATE OPENED POSITION** shown without side for clarity.

Ref #	Description
D	Actuator Arm
E	Tripper Block
G	Slide Gate

### 3. Installation

## Install Gate to Trough Bottom

1. Attach the gate to the connection flanges and trough bottom using supplied hardware.
2. Seal all connections with a silicon based caulk to make weather-resistant.
3. It may be necessary to drill holes in the trough side flange. (See Figure 30.)
4. There are no carry-over bars to adjust, the carry-over feature is built into the gate.
5. On 305 mm (12") tall and 355.6 mm (14") tall conveyors, there will be some overhang 13 mm (1/2") of the gate frame past the edge of the trough bottom.

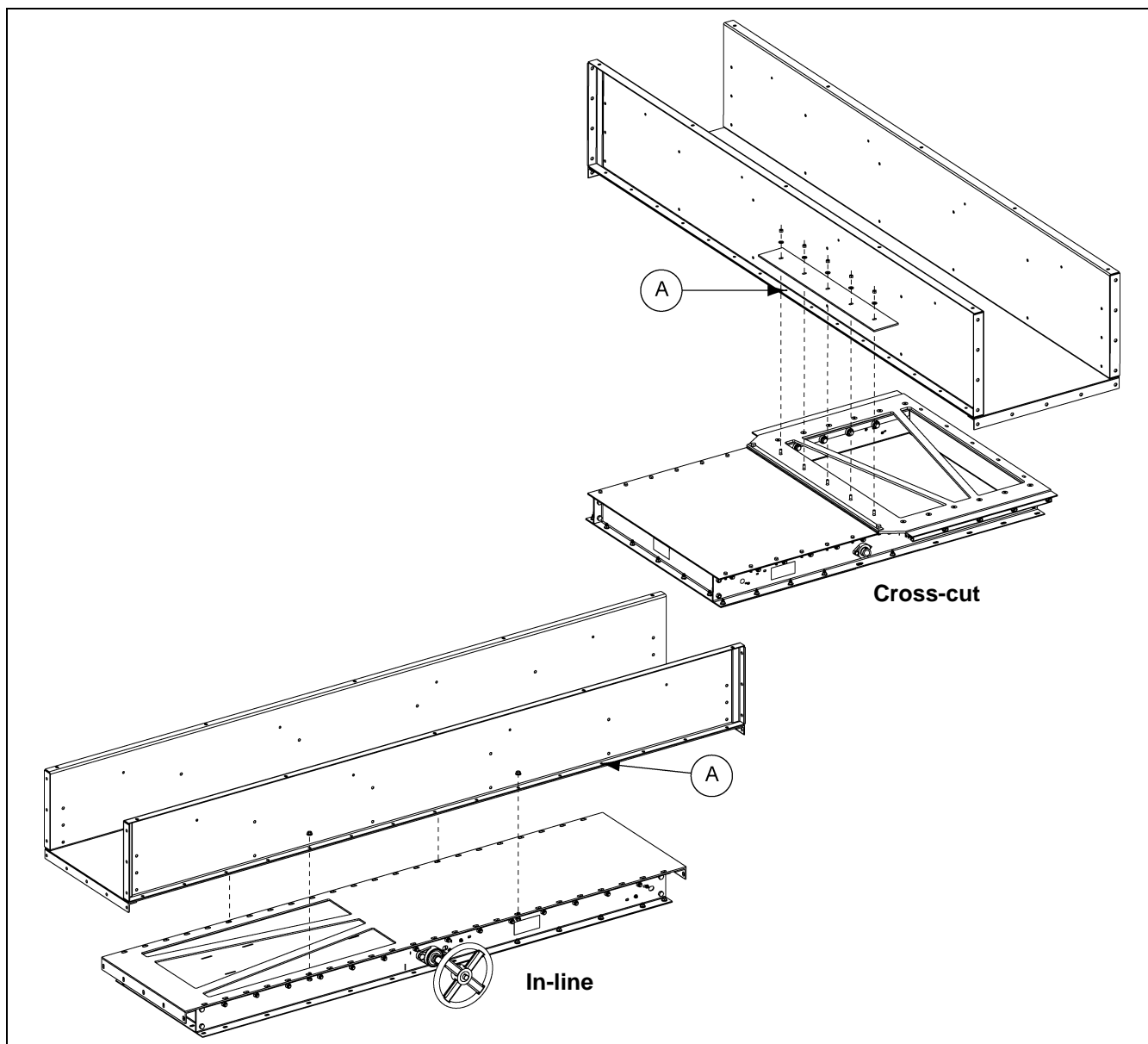


Figure 30

Ref #	Description
A	Field drill holes if necessary.

## Flipping the Shaft to Change Gate Drive Side

1. Loosen set screws (A) for shaft on both bearings. *(See Figure 3P.)*
2. Remove bearing on the long side of the shaft (B).
3. Flip shaft and re-install bearing.
4. Tighten set screws on shaft.
5. On guard move filler plate to opposite side if applicable.
6. If gate will be electronically operated, install motor mount on appropriate side for gearbox and motor.

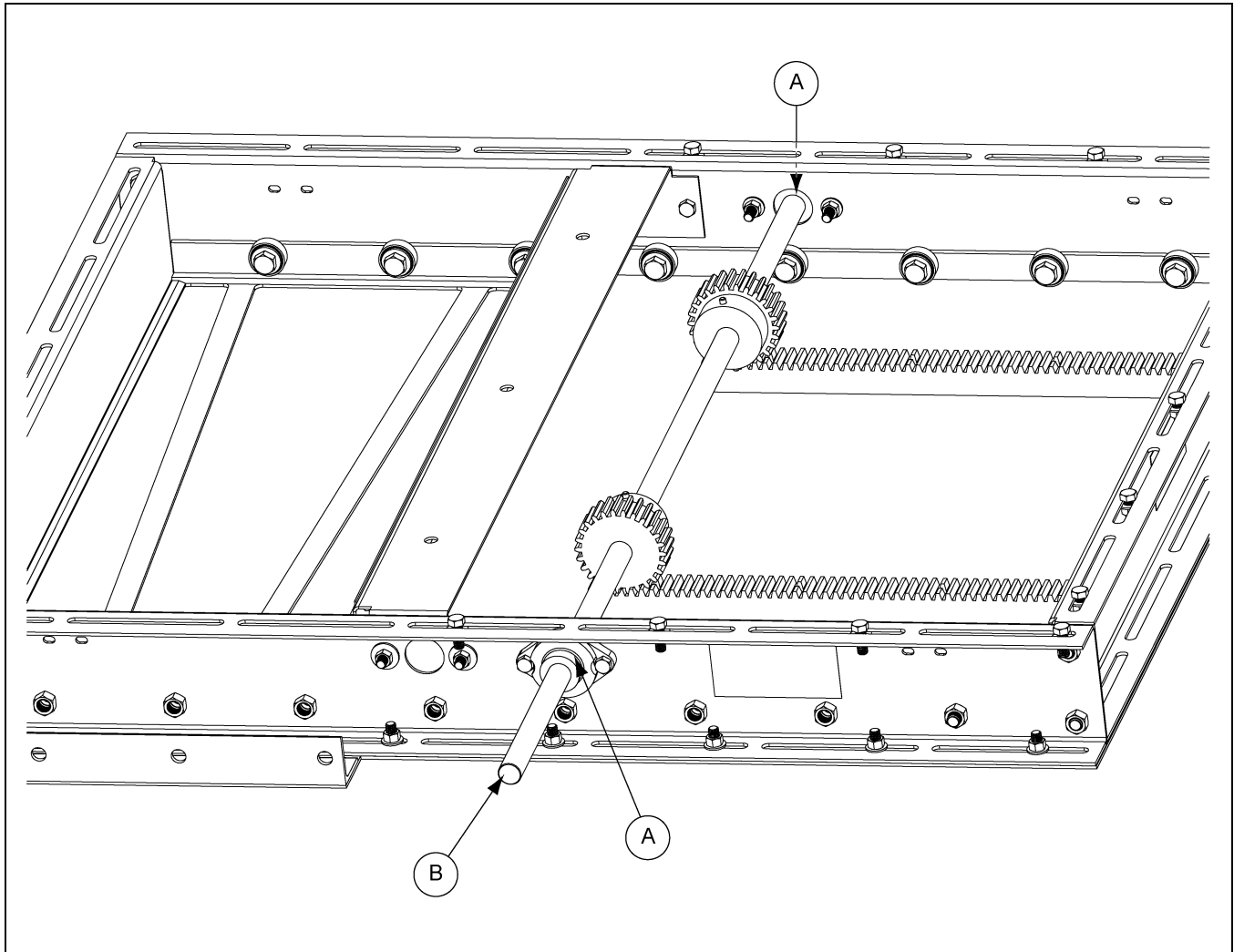
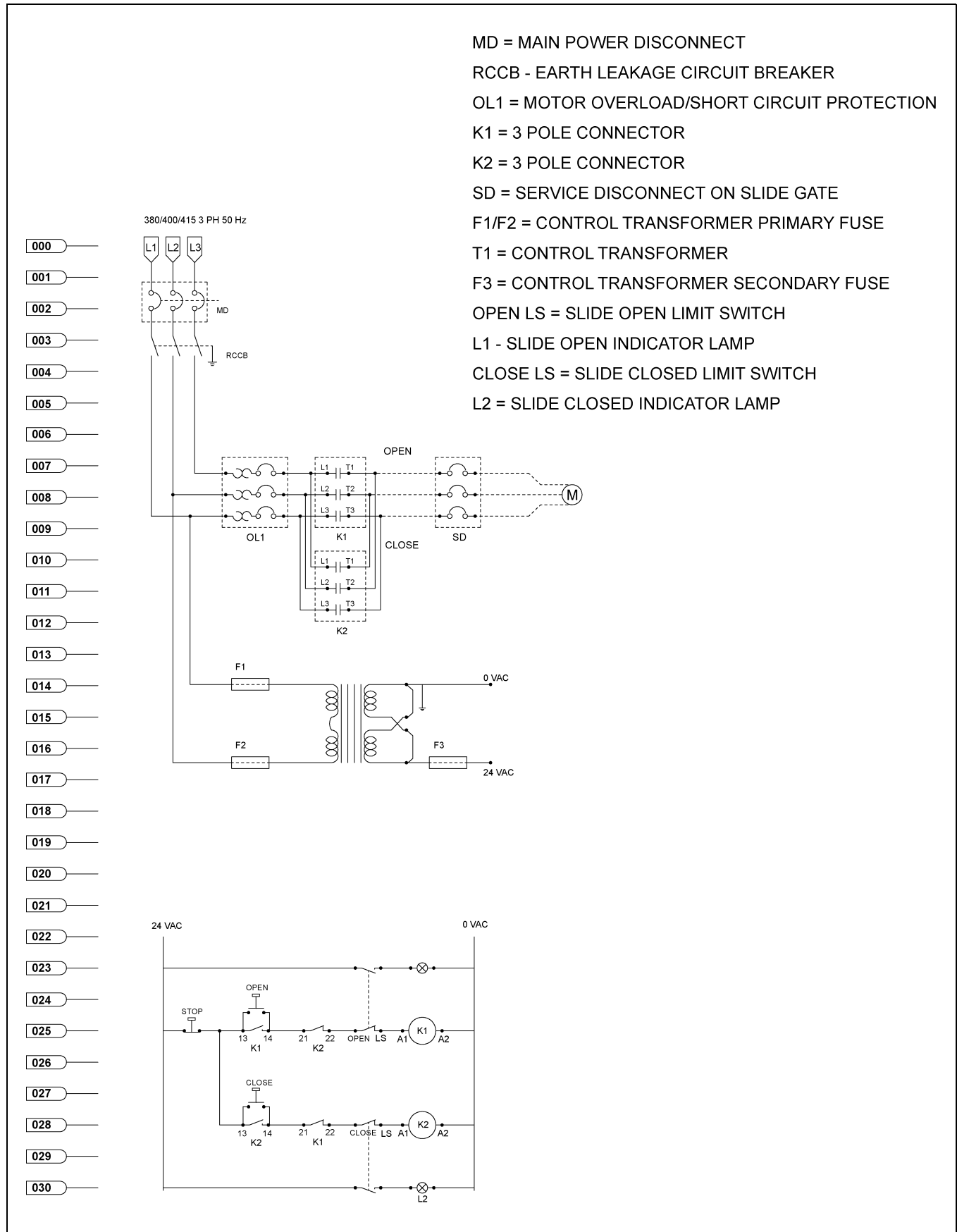


Figure 3P

Ref #	Description
A	Set Screws
B	Shaft

## 4. Wiring Diagram

### Slide Gate Manual Control Circuit



## Rating Plate

Each slide gate shall be fitted with a rating plate with Ex markings as follows:


<b>AGCO Grain and Protein</b> A/S Cimbria, Faartoftvej 22 P.O. Box 40, 7700, Thisted DENMARK	
<b>RSG SLIDE GATE</b>	
<b>RSG1818GM-X21</b>	
<b>Size</b>	18 x 18
<b>Max Chain Speed</b>	0.0626 m/s
<b>Ambient Temperature</b>	-20°C - +40°C
<b>SN</b>	-
<b>Date</b>	24 November 2015
<b>CE</b>	0.33 kw
	3 -
	380 V (AC)
 <b>II 2 D T4 (125°C); 'c'; 'b'</b>	0.6 A
	50 Hz

Figure 5A RSG Slide Gate - Name Plate

## Installation

General installation shall be in accordance with manual PNEG-2023, however for installation in hazardous locations, additional requirements shall be met.

All equipment connected to or fitted with these slide gates shall be compliant for use in hazardous, potentially explosive, locations to at least the same levels as the slide gates.

## Vibration

Where the equipment may be subject to vibration from other items of equipment, suitable measures shall be taken to isolate it, or the conveyor to which it is attached, by use of resilient mounts or other suitable means.

## 5. ATEX Compliant RSG Slide Gates

### Electrical Installation

All electrical components used when installing the slide gate and associated conveyor must be suited to the ATEX hazardous environment. Failure to do so will render the equipment rating invalid. This shall include:

- Cable glands
- Terminal boxes/electrical enclosures
- Conduit
- Switches

### Wiring for Motor Control Circuit

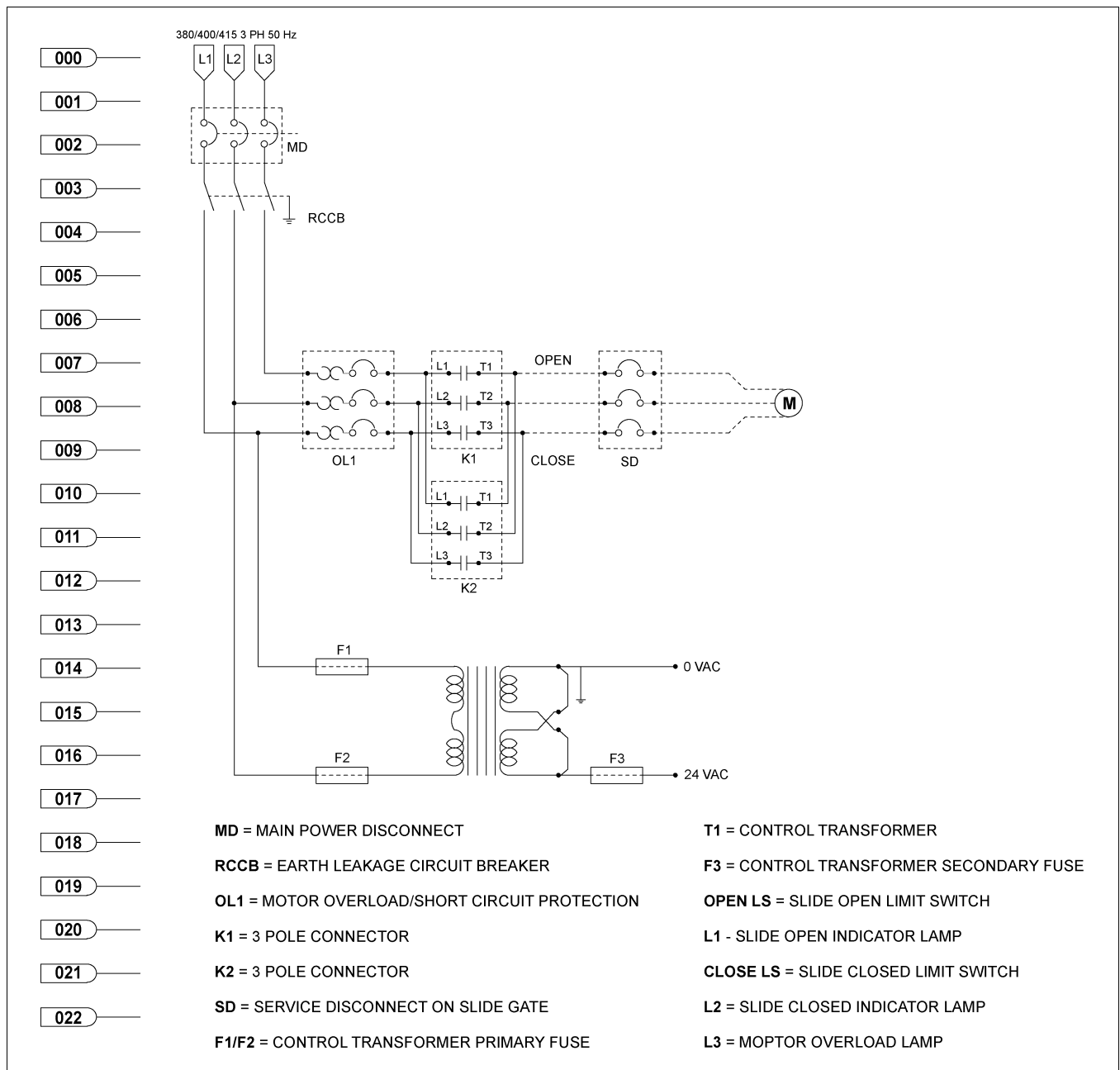


Figure 5B Example Motor Control Circuit



## Wiring for Safety Control Circuit

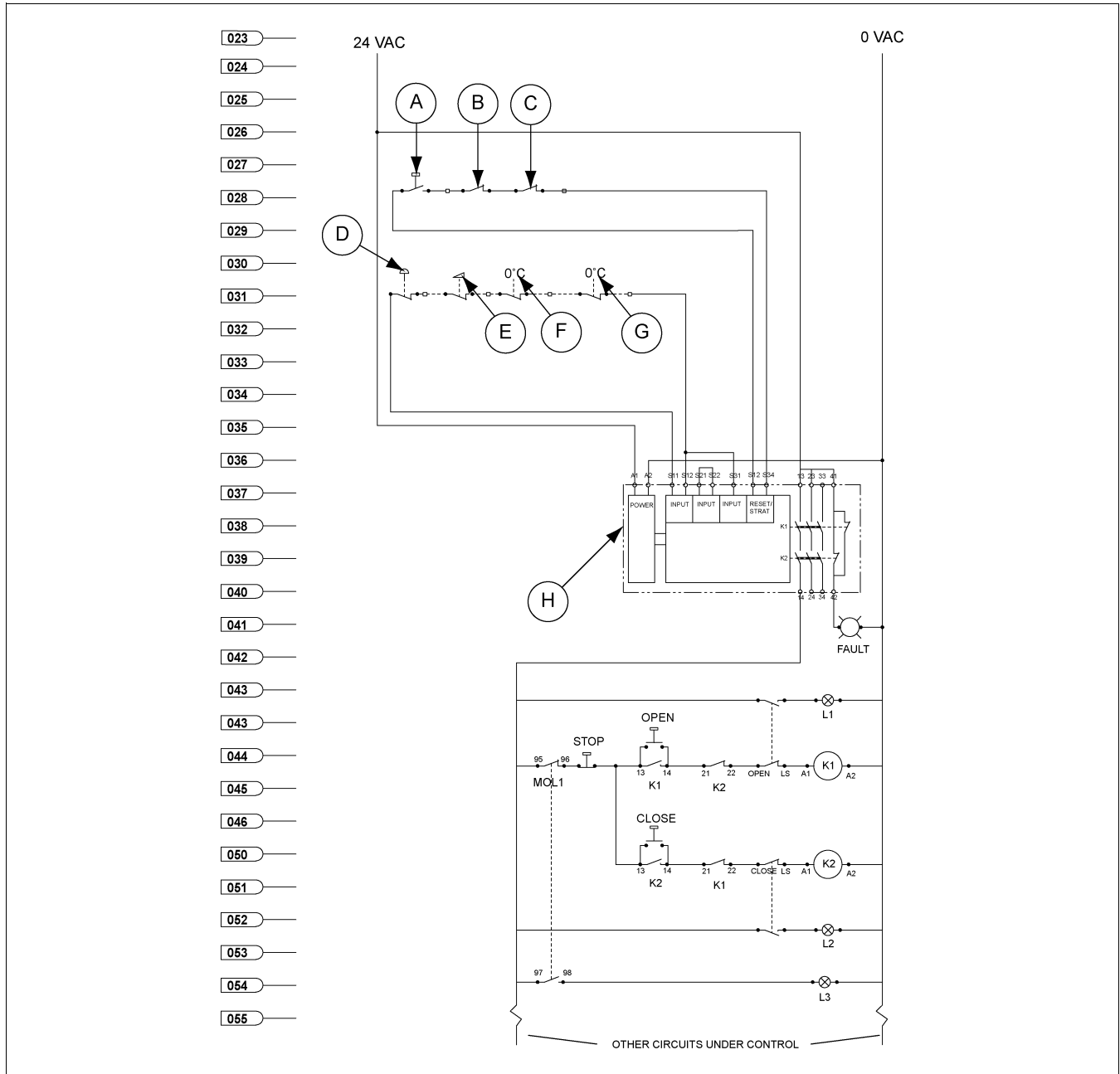


Figure 5C Example Safety Control Circuit

Ref #	Description
A	Safety Circuit Re-Set
B	Motor Contactor N.C.
C	Motor Contactor N.C. (Additional)
D	Emergency Stop

Ref #	Description
E	Safety Switch (If Required)
F	Motor Thermal Cut Out
G	Motor Thermal Cut Out (Additional)
H	Safety Relay Module (PLC 3)

### Maintenance

#### Routine Inspection

Slide gates operating in hazardous environments must be inspected on a regular basis for signs of wear which could give rise to ignition sources. Equipment shall be installed with suitable, safe access ladders/stairs/platforms and catwalks to allow ease of access for inspection.

At least every 150 hours of operation:

1. Visually inspect the bearings for signs of over-heating, loss of grease and wear.
2. Check cooling fans on motor and gear reducer are clean.
3. Check cooling fan and air inlets on motor and gear reducer - if fitted - are clear.
4. Check gate drive sprocket for signs or teeth wear.
5. Check for damage/loose connections of electrical cables into motors/switches.
6. Check limit switches for correct operation, freedom of movement and cleanliness.

All worn or damaged items must be replaced.

#### Repairs/Replacements

All repairs must be carried out in accordance with the product manual.

Replacement parts shall be matched like for like and be genuine GSI replacements. Failure to do so will render the conveyor rating invalid. The following ratings must be observed:

- |                       |                                     |
|-----------------------|-------------------------------------|
| 1. Gate Motor         | Ex tb IIIC T125C Db                 |
| 2. Gate Gear Reducer  | II 2GD c k T4                       |
| 3. Open Limit Switch  | Ex tD A21 IP67 T85°C                |
| 4. Close Limit Switch | Ex tD A21 IP67 T85°C                |
| 5. UHMW Lining        | Tivar 1000 Antistatic/Tivar 1000 EC |

## Limited Warranty - EME Grain Products

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 from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI's sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

### Warranty Enhancements:

The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
<b>Storage</b>	Grain Bin Structural Design <ul style="list-style-type: none"> <li>• Sidewall, roof, doors, platforms and walkarounds</li> <li>• Flooring (when installed using GSI specified floor support system for that floor)</li> <li>• Hopper tanks (BFT, GHT, NCHT, and FCHT)</li> </ul>	5 Years
	Dryer Structural Design - (Tower, Portable and TopDry) <ul style="list-style-type: none"> <li>• Includes (frame, portable dryer screens, ladders, access doors and platforms)</li> </ul>	5 Years
	All other Dryer parts including: <ul style="list-style-type: none"> <li>• Electrical (controls, sensors, switches and internal wiring)</li> </ul>	2 Years
<b>Conditioning</b>	All Non-PTO Driven Centrifugal and Axial Fans	3 Years
	Bullseye Controllers	2 Years
	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
<b>Material Handling</b>	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

### Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY 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.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. 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. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. 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.

#### Notice Procedure:

In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

#### Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - EME Grain Products\_ revised 01 October 2020)

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.



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