EAI

WHERE MATCHLESS SERVICE MEETS
PRACTICAL ENGINEERING FOR
EXCEPTIONAL SOLUTIONS.

# Tote / Minor Ingredient Scale Hopper

Parts & Installation Manual
Easy Automation, Inc.
Last Updated 2/26/2025

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# Section 1: Product Description & Overview

## Product Description

The tote scale weigh hopper will be fed with augers moving product from bulk bag or other smaller bulk ingredients. This hopper is intended to be used for the precise weighing of inclusions that are too high for a micro ingredient system. This entire unit will be constructed out of primed and painted mild steel. Standard operation is to fill the tote scale until the desired weight is reached utilizing automation, VFDs and free-fall compensation to reach a high degree of accuracy.

We currently have 16 different standard minor scale hopper configurations. All the sizes listed below can come with or without a flush hopper.

- 10 cuft
- 17.5 cuft
- 20 cuft
- 30 cuft
- 35 cuft
- 40 cuft
- 50 cuft
- 70 cuft

## Key Features & Benefits

- S-Style NTEP load cells.
- Heavy-duty frame.
- Pneumatic or electric discharge gates.
- Raised Lid for increased capacity.
- Hopper access doors for easy inspection, maintenance, and cleaning.
- 4 configuration options ranging from 1-4 tote design.
- Cubic foot capacity ranges from 10 to 70 (this is the standard capacity offering range for "minor scale hoppers") cubic feet or 450 to 3,100 lbs. (assuming 45 lb./cuft material density).
- Optional features:
    - Flush hopper
    - Stainless steel upgrade

## Technical Specifications

Appendix A has a table with the full technical specifications in a chart. This appendix can be found towards the end of this document. The slide gate is made in house with the following specifications:

- Standard 10” pneumatic ladder gate
- Recommended 100 PSI operating pressure
- Max 150 PSI operating pressure
- Air cylinder must be supplied with clean, dry air (filter and air dryer recommended)
- 2X explosion-proof limit switches, 720 VA-600 VAC MAX, can be wired for 24 VDC/120V AC
- 120 VAC double acting solenoid valve

## Compliance Standards

All our scale hoppers have NTEP Certified S-Style Load Cells.

## Section 2: Contact Information

Headquarters Office
102 Mill St.
Welcome, MN 56181

Mankato Office
1961 Premier Drive Ste. 404
Mankato, MN 56001

Twin Cities Office
8000 West 78th Street, Suite 180
Edina, MN 55439

Website: www.easy-automation.com
Email: info@easy-automation.com
Tel: 507-728-8214
Fax: 507-728-8215

# Section 3: Installation

1. Inspect the Scale Hopper after receiving it for any damage that could have occurred during shipment. Report any damage immediately to EAI and the freight carrier.

2. Remove all packaging. This may include, but is not limited to: plastic wrapping, metal banding, and lumber.

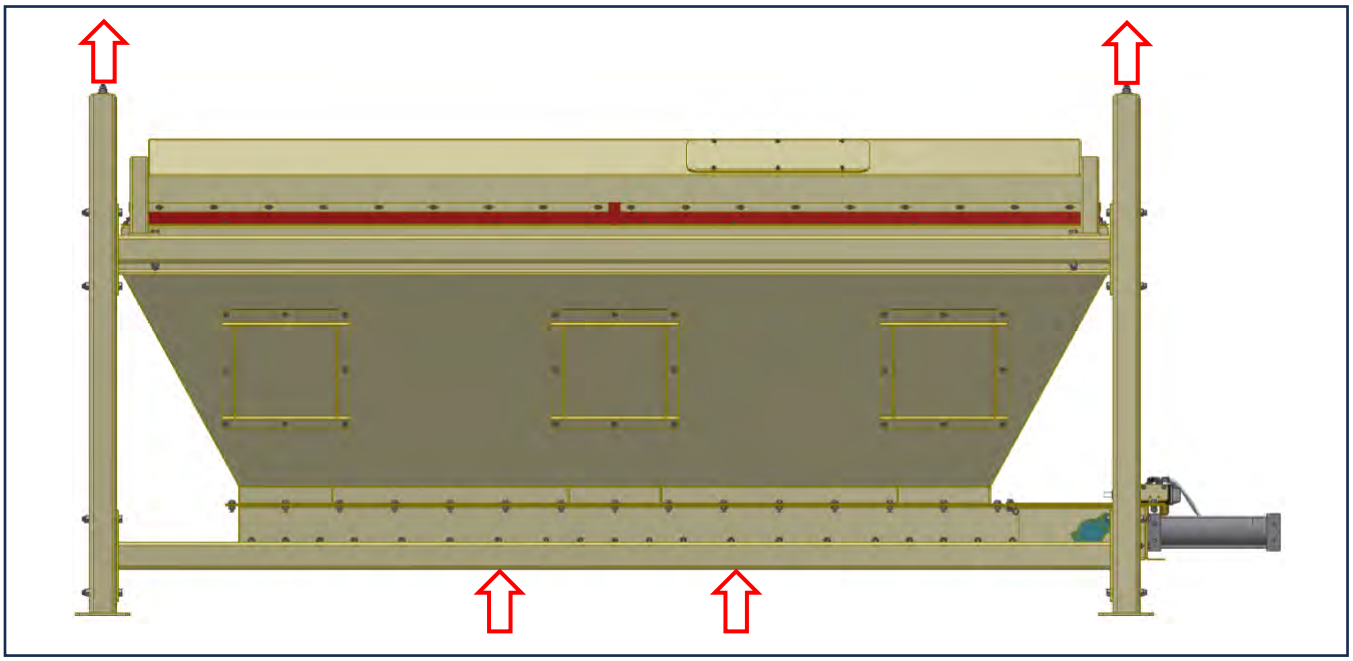


**FIGURE 1: Appropriate Lifting Locations on the Scale Hopper Frame**

3. Use care when unloading and locating the machine in your facility. Lifting on the lower frame stiffeners near the bottom of the Scale Hopper frame is acceptable if care is taken to avoid hitting the slide gate (Figure 1). Lifting from the end frames in combination with spreader bars is also acceptable if a forklift or similar machinery is unavailable. Avoid putting any loads on the hopper or lid. Avoid sudden jarring or dropping. The approximate dry weight of various size Scale Hoppers is listed in the table in Appendix A for reference to assist in determining the appropriate machinery to use when unloading the Scale Hopper.

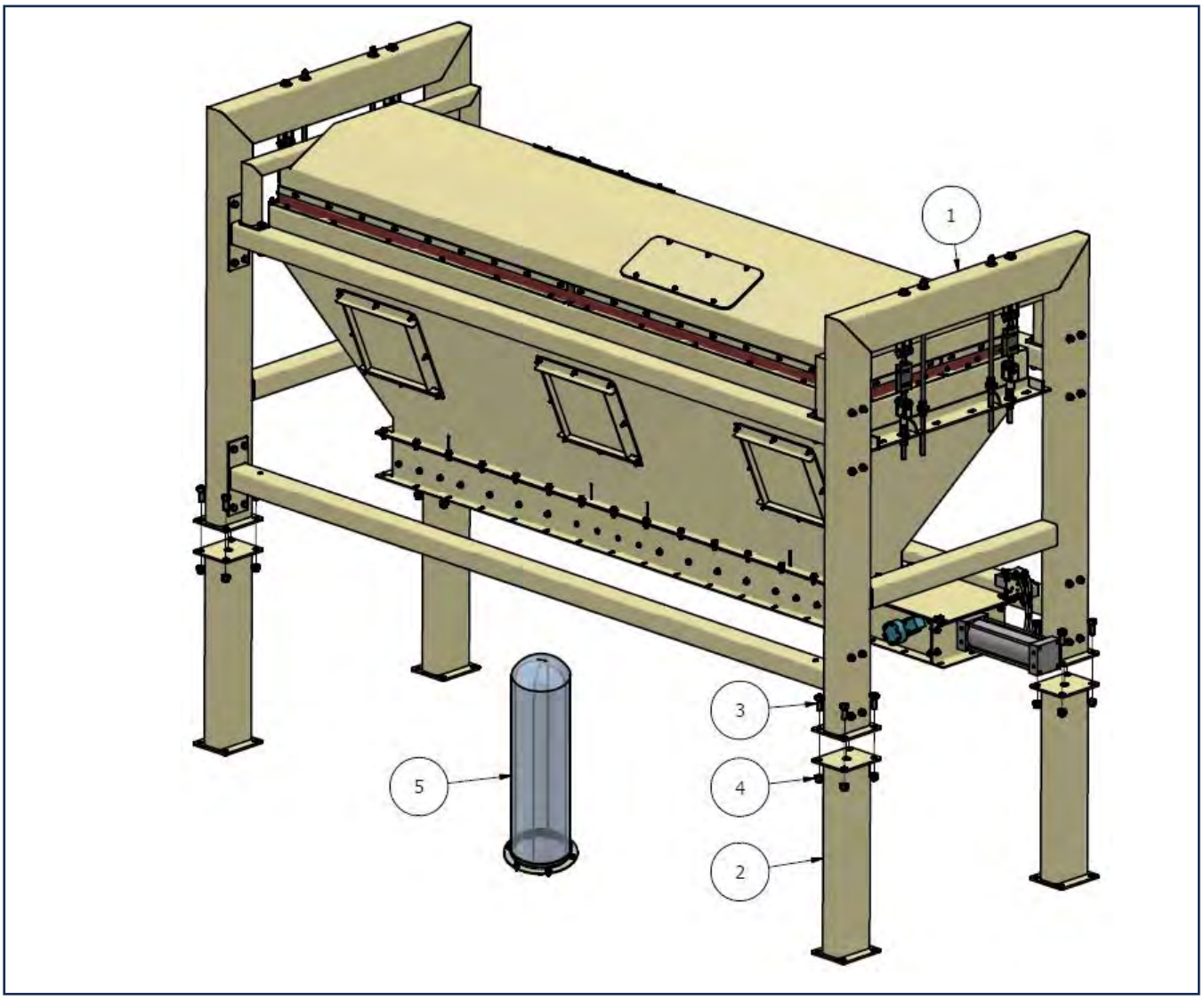



FIGURE 2: Shipped Components

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | EZ216987 | TOTE SCALE ASSEMBLY, TRIPLE, 30 CU FT, RAISED LID |
| 2 | 4 | EZ213516 | LEG EXTENSION, SS MICRO V2 (SPECIFY LENGTH) |
| 3 | 16 | EZ207662 | BOLT, HEX HEAD GR 8 ZINC PLATED 5/8-11 UNC X 1 1/2 |
| 4 | 16 | EZ207908 | NUT, NYLOCK 5/8-11 UNC ZINC |
| 5 | 1 | EZ209730 | VENTING SOCK 7" ID |

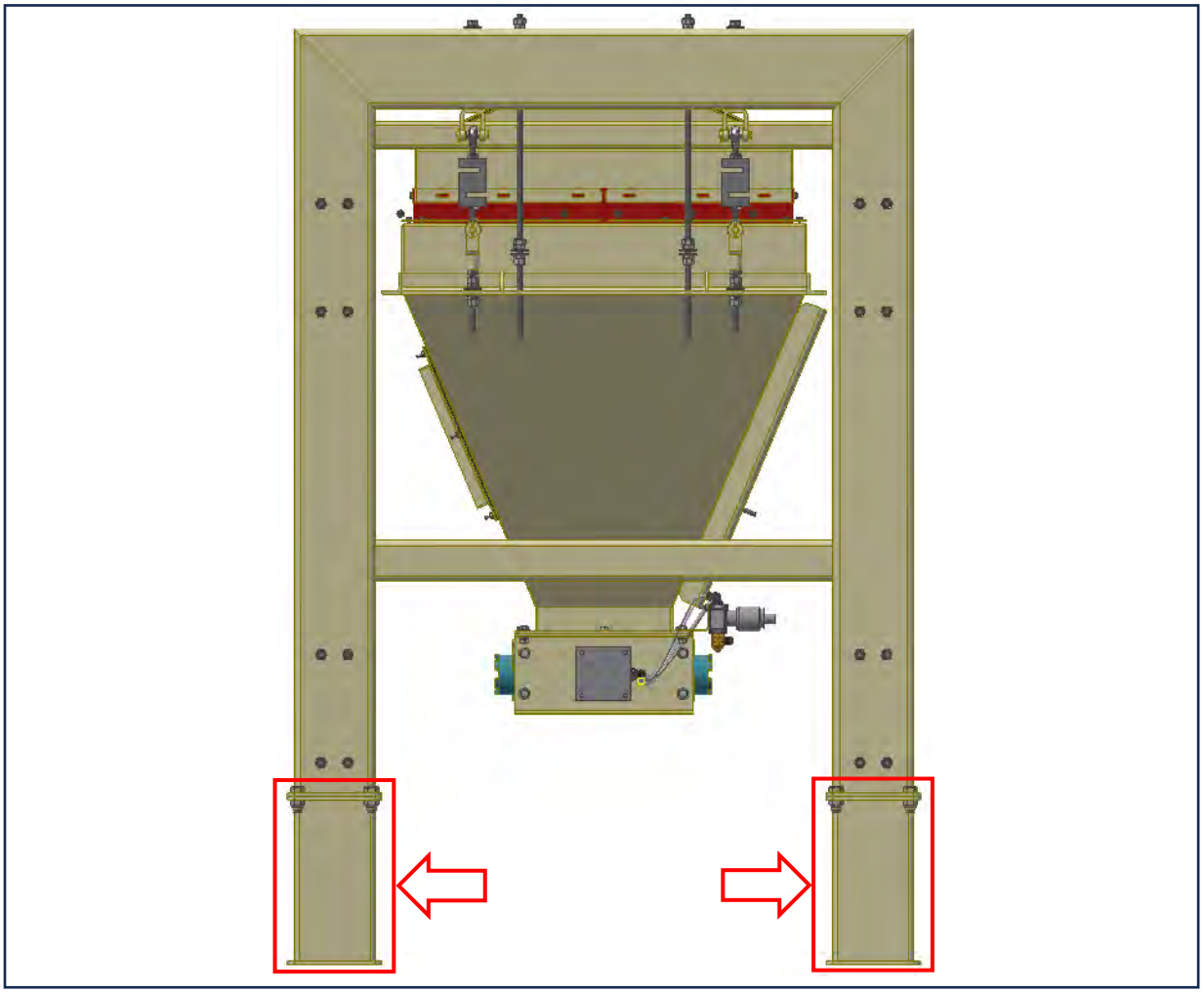


**FIGURE 3: Example of the Pedestals that Need to be Attached to the Scale Hopper Frame**

4. If shipped with additional leg pedestals, attach the pedestals to the Scale Hopper frame legs (Figure 3).

5. The Scale Hopper should be anchored on solid footings. Consult a local licensed professional to determine the requirements if you're not certain.

6. Parts may have come loose during shipping. Make sure all parts of the Scale Hopper are tightened and in working order.

7. Flexible transitions must be installed between the Scale Hopper and auxiliary equipment. If shipped with a transition, install this now. Fasteners or clamps are provided to attach the transition to the Scale Hopper.

8. Loosen the nuts on the threaded rod assembly near the load cells so that the load cells carry the weight of the hopper without binding or impacting free movement of the hopper (Figure 4). The threaded rod and nuts should remain in place to catch the hopper in case a load cell or the load cell mounting hardware fails. The threaded rod assemblies also come in handy if a load cell needs to be replaced.

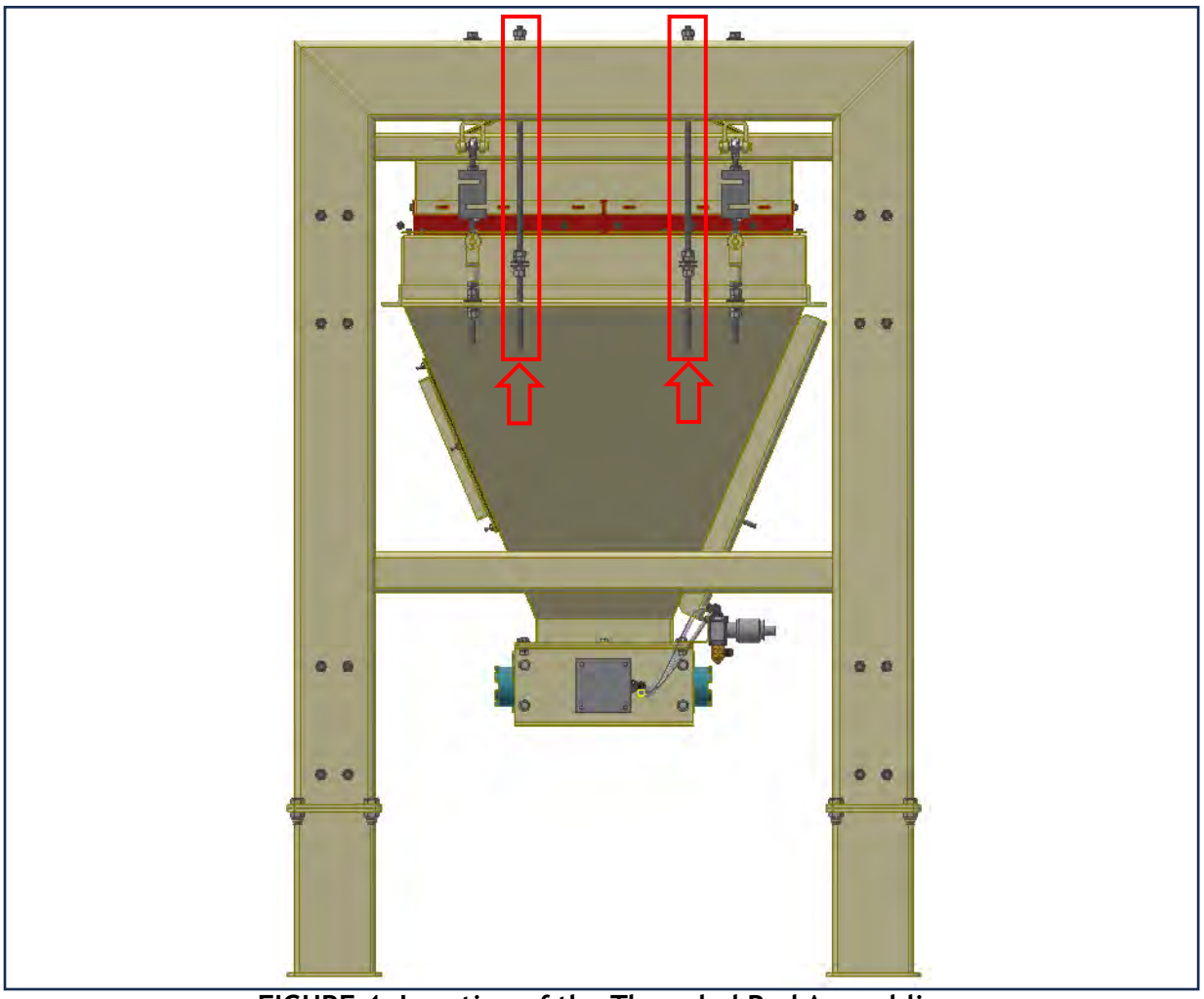


**FIGURE 4: Location of the Threaded Rod Assemblies**

9. Wire the Scale Hopper.
   - All wiring must be performed by a qualified electrician. If problems develop with electrical components, please contact the EAI service department.
   - Ensure the appropriate electrical components (wire, contactors, etc.) are being used for the volt and amp ratings of the equipment.
   - Wire the limit switch/slide gate and power them before adding product to ensure proper operation. The slide gate open/closed positions are set at the factory. These positions can be adjusted by rotating the lock collar that actuates the limit switch.
   - Wire the four (4) load cells to a summing junction box and use shielded cable to wire the summing junction box to the scale indicator. EAI ships every Scale Hopper with shielded cable (6-conductor 20 AWG). A table of the load cell wire color codes for various manufacturers can be found in Appendix B.

# INSTALLATION

10. Install the provided dust sock to allow airflow through the scale and prevent measurement errors due to air pressure fluctuations.

11. Run a small amount of inexpensive product (corn for example) through each hopper to clear any debris left behind from the factory (metal shavings, screws, nuts, silicone, etc.).

12. Contact a scale calibration company to calibrate the Scale Hopper. Test weights can be placed on the brackets hanging from the load cells.

13. Run test batches through the system while closely monitoring to ensure it is operating properly.

## Section 4: Start Up Checklist

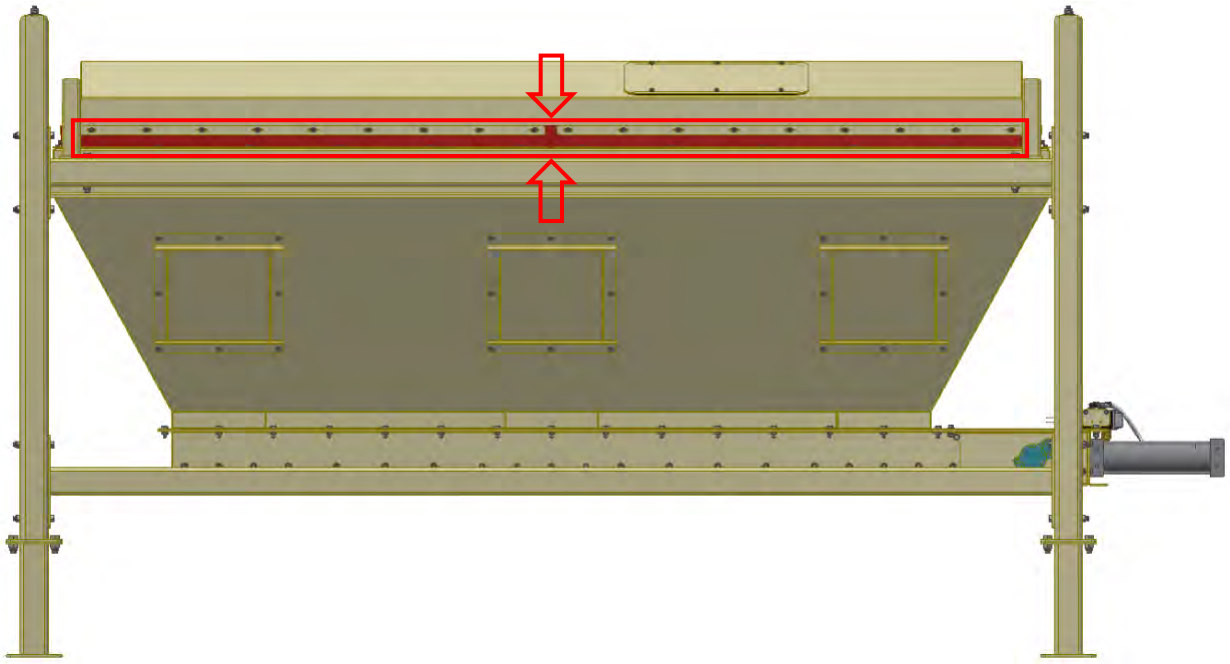


**Figure 5: Scale Hopper/Lid Possible Contact Point**

- Has a scale calibration company calibrated the scale hopper?
- Have you run a test batch to ensure everything is working properly?

## Section 5: Operation

- Be aware each hopper has a limited capacity. Typically, two augers can discharge into each hopper. To ensure maximum use of the scale's capacity, do not put multiple high inclusion ingredients in the same hopper, if possible.

## Section 6: Maintenance

- Daily – Ensure load cells are functioning properly by hanging test weights.

- Weekly – Inspect the interior of the hopper for material buildup by removing the inspection panels on the side of the system. Product may accumulate on the hopper and lid and should be removed to prevent excessive buildup.

- Monthly –
    - Verify smooth operation of the discharge gate and clean slides if necessary.
    - Verify proper air pressure on discharge gates.
    - Clean dust socks.
    - Ensure flexible connections are not leaking and do not interfere with the scale weight
    - Inspect flexible transitions for holes/tears.

- Periodically walk around the Scale Hopper and make note of any odd noises or excessive dust accumulation. Product accumulation may occur with sticky materials, during periods of higher humidity, and at other times.

- The Scale Hopper should be calibrated periodically by a properly licensed or accredited scale company.

- The limit switch on the slide gate should be positioned in a fashion to properly read the orientation of the gate. Ensure the gate is in the correct position when filling and that the limit switch is reading properly.

# Section 7: Safety

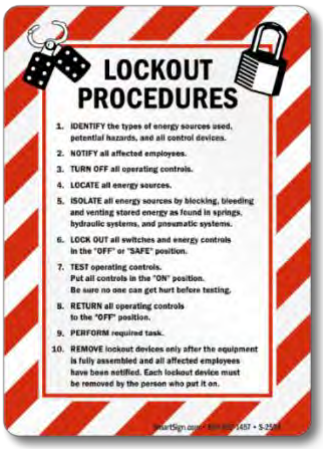
- Do not apply more load to the Scale Hopper than the combined rating of the hopper's load cells.
- Moving parts of the system automatically start/stop. Be sure to always disconnect and lockout the power before inspecting or working on the Scale Hopper system. Do not place your hands inside the hopper before performing the lockout/tagout procedure.

**⚠CAUTION**

There is no safety grating inside the Scale Hopper. Use caution when adding product to the hoppers and disconnect and lockout the power to the system before attempting to remove any foreign object that falls in (pieces of packaging, utility knives, etc.).

**⚠WARNING**

The Scale Hopper should only be operated or serviced by trained personnel.



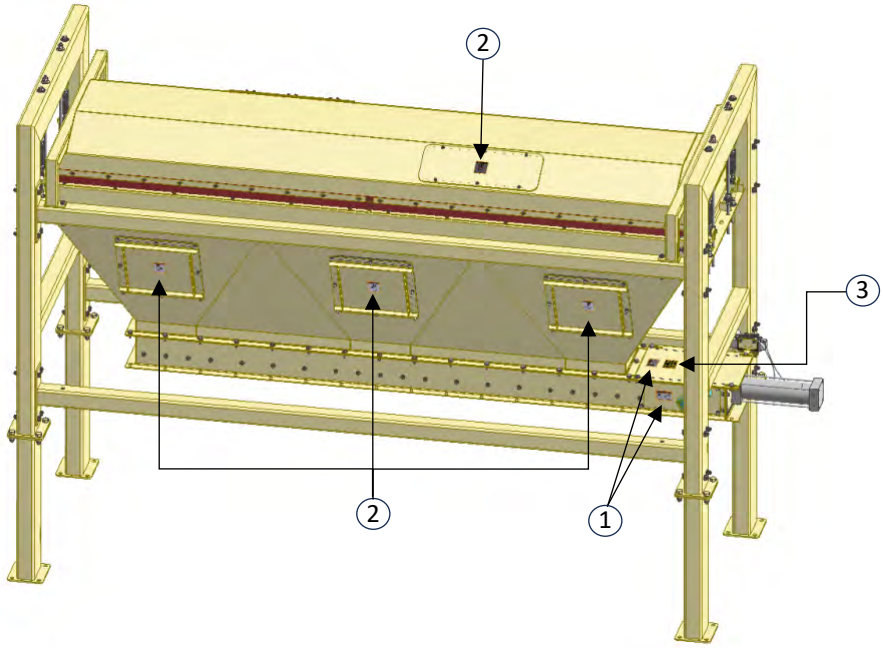

EZ215651


EZ100777

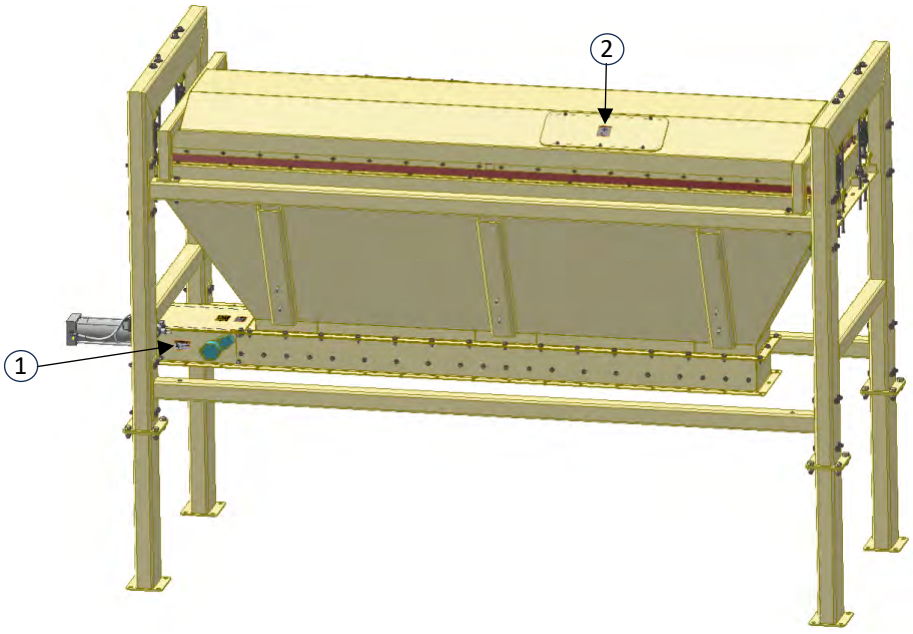

EZ100390


EZ100391

# SAFETY




FRONT




BACK

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | EZ100390 | WARNING, MOVING PARTS | 3 PER GATE |
| 2 | EZ100391 | WARNING, CONFINED SPACE | 1 PER DOOR |
| 3 | EZ100777 | CAUTION, KEEP GUARD IN PLACE | 1 PER GATE |

## Section 8: Pneumatic Slide Gate Specifications

- Stroke: 10” stroke for 10” wide gate; 12” stroke for 12” wide gate
- Recommended operating air pressure: 100 psi
- Maximum air pressure: 150 psi
- Air cylinder must be supplied with clean, dry air (filter and air dryer are recommended)
- 1/2” NPT ports (3/8” OD tubing)
- (2X) Explosion-proof limit switches, 720 VA – 600 VAC max, can be wired for 24 VDC/120 VAC
- 120 VAC solenoid valve, NEMA 9

# Section 9: Troubleshooting

1. Product can be seen flowing out of the hopper when the slide gate is closed:
   - Check that the slide gate still functions as intended. A damaged piston/motor or compromised wiring connection may have caused decreased/loss of slide gate functionality.
   - Check for gaps in the interface between the slide gate plate and rollers. Certain extremely free-flowing products could flow through the hopper when not in operation.
2. Product remains stuck to the hopper walls when the slide gate is opened:
   - Scale Hoppers are shipped with vibrator mounts to enhance hopper clean out when weighing material that is sticky or does not flow well.
   - The recommended vibrator is EZ201894 – VIBCO VS-130 (PNEUMATIC, 40 PSI SEALED, 10 MM BALL)
3. The system scale is not reading accurately, or inventories are incorrect:
   - The scale should be calibrated or checked by an accredited scale company periodically. This is recommended on a yearly basis.
   - Check the entire hopper scale as well as the load cells to be sure no components are binding or touching.
   - Check to ensure that all airlines and conduit are loose and not rigid enough to restrict the free motion of any components of the scale.
   - A scale company should check the tightness of scale wires in the junction box.
   - Load cells should be properly trimmed, and the entire scale calibrated.
   - Load cell yokes should be positioned correctly as indicated in this manual.
   - Air may be flowing up the discharge drag and creating pressure within the scale that can cause improper readings. Ensure that the supplied dust sock is properly installed and cleaned periodically to allow air to flow out of the scale.
   - If a scale is ever physically damaged by a forklift, electrical surge, or other external force, it should be immediately examined by a scale company for accuracy.

# Section 10: Warranty

EAI One-Year Limited Warranty

Easy Automation warrants that this Scale Hopper and all its mechanical and electrical components will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If the product proves defective during the warranty period, Easy Automation Inc., at its option, will:

- Replace the damaged or broken component with a comparable new component or,
- Repair the component.

Easy Automation must be notified prior to the expiration of the warranty period regarding the broken component. The component will only be replaced or repaired if it is determined that the product was not broken due to misuse, improper use, or inadequate maintenance and care.

This warranty covers the component(s) only. Easy Automation is not responsible for any costs associated with replacement of the component(s). Easy Automation may require that the damaged or broken components be returned to Easy Automation.

Easy Automation will cover any shipping and handling costs of the replacement component(s) as well as any return shipping costs for items that need to be sent back to Easy Automation.

Easy Automation will not reimburse any on-site repair costs without prior approval in writing by the Easy Automation Service Department.

To the extent allowed by local law, except for the obligations specifically set forth in this warranty, in no event shall Easy Automation Inc. be liable for any indirect, special, incidental, or consequential damages (including loss of revenue or profits).

# Section 11: Spare Parts

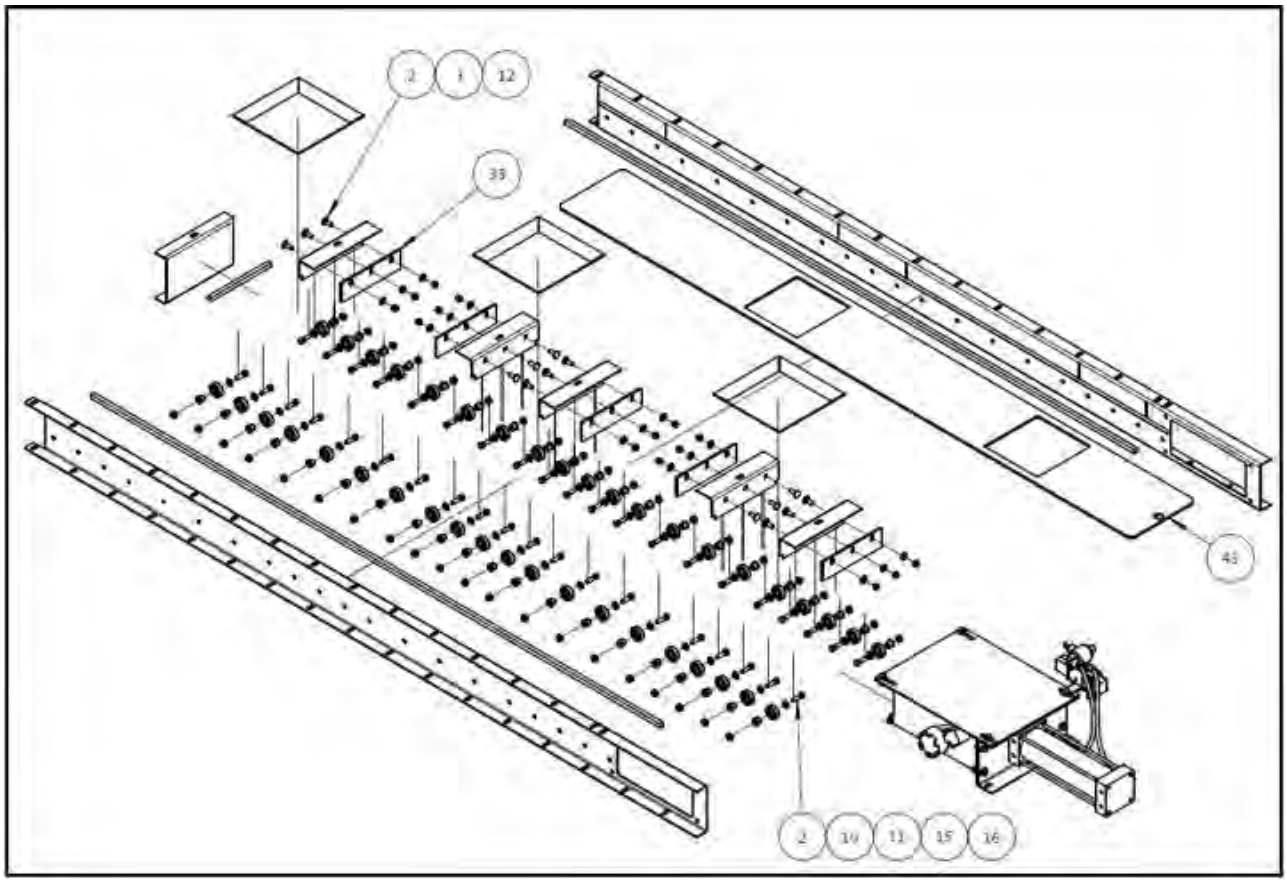



FIGURE 6: Pneumatic Slide Gate Body

| ITEM | PART NUMBER | DESCRIPTION | SINGLE DISCHARGE QTY | DOUBLE DISCHARGE QTY | TRIPLE DISCHARGE QTY |
|---|---|---|---|---|---|
| 2 | EZ101314 | WASHER, FLAT 3/8" ZINC | 21 | 41 | 63 |
| 3 | EZ101315 | NUT, NYLOCK 3/8-16 | 3 | 9 | 15 |
| 10 | EZ102328 | NUT, FLANGE, SERRATED EDGE 3/8-16 UNC ZINC | 18 | 32 | 48 |
| 11 | EZ102963 | BOLT, HEX HEAD GR 5 ZINC PLATED 3/8-16 UNC X 1 1/4 | 10 | 24 | 40 |
| 12 | EZ200978 | BOLT, CARRIAGE, 3/8-16 UNC X 1 | 3 | 9 | 15 |
| 15 | EZ212979 | BEARING, BALL, 17 MM ID 40 MM OD 12 MM WIDTH DOUBLE SEAL | 10 | 24 | 40 |
| 16 | EZ213013 | BUSHING, 17 MM OD X 3/8 BORE (SB0013) | 10 | 24 | 40 |
| 33 | EZ216006-0012 | WIPER, 1/4" UHMW PE, 10" GATE | 1 | 3 | 5 |
| | EZ213011-0013 | WIPER, 1/4" UHMW PE, 12" GATE | | | |
| 43 | MODEL DEPENDENT | SLIDE WELDMENT, 10" GATE | 1X EZ216005-0001 | 1X EZ216006-0001 | 1X EZ216007-0005 |
| | | SLIDE WELDMENT, 12" GATE | 1X EZ216004-0001 | 1X EZ215987-0001 | 1X EZ216003-0001 |

# SPARE PARTS

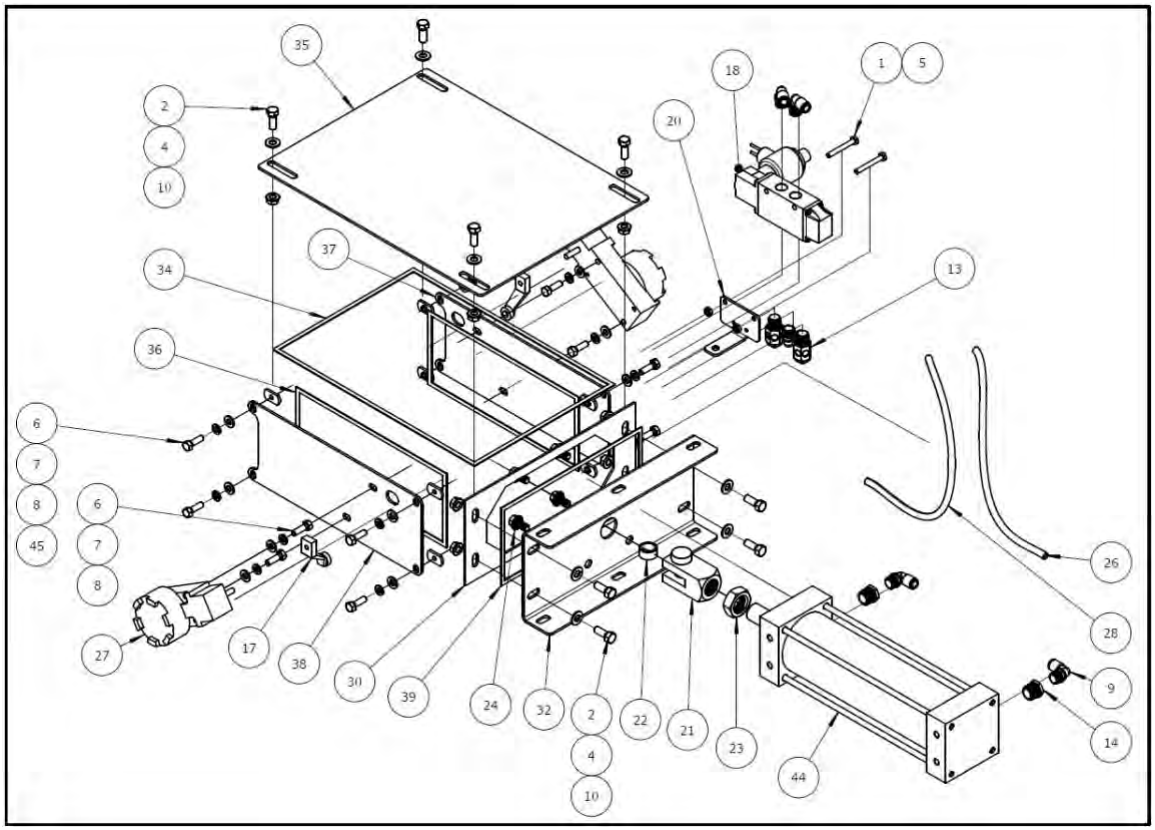



**FIGURE 7: Pneumatic Slide Gate Cylinder End**

| ITEM | PART NUMBER | DESCRIPTION | SINGLE DISCHARGE QTY | DOUBLE DISCHARGE QTY | TRIPLE DISCHARGE QTY |
|---|---|---|---|---|---|
| 1 | EZ101224 | BOLT, HEX, 1/4-20 X 2 GR 5 ZINC PLATED PARTIAL THREAD | 2 | | |
| 2 | EZ101314 | WASHER, FLAT 3/8" ZINC | 21 | 41 | 63 |
| 4 | EZ101317 | BOLT, HEX HEAD GR 5 ZINC PLATED 3/8-16 UNC X 1 | 8 | | |
| 5 | EZ101329 | NUT, NYLOCK JAM 1/4-20 GR 2, ZINC PLATED | 2 | | |
| 6 | EZ101361 | WASHER, LOCK 5/16" [ZINC] | 12 | | |
| 7 | EZ101363 | WASHER, FLAT 5/16" | 12 | | |
| 8 | EZ101385 | BOLT, HEX HEAD GR 5 ZINC PLATED 5/16-18 UNC X 1 | 12 | | |
| 9 | EZ101922 | FITTING, ELBOW 90 DEGREE 3/8 FEMALE PUSH-IN 3/8 MALE THREAD | 5 | | |
| 10 | EZ102328 | NUT, FLANGE, SERRATED EDGE 3/8-16 UNC ZINC | 18 | 32 | 48 |
| 13 | EZ202177 | MUFFLER, AIR, 3/8 NPT, ADJUSTABLE | 2 | | |
| 14 | EZ208268 | FITTING, BUSHING, 1/2 NPT X 3/8 NPT, ZINC PLATED STEEL | 2 | | |
| 17 | EZ213015 | LEVER, OFFSET, FRONT NYLON ROLLER (HONEYWELL SWITCH) | 2 | | |
| 18 | EZ213224 | SOLENOID, NORGREN, 120 VAC, NEMA 9, 3/8 IN PORTS, (K71EA00-KS6-KX1) | 1 | | |
| 20 | EZ215987-0020 | PLATE, AIR SOLENOID MOUNTING BRACKET | 1 | | |
| 21 | EZ215993 | YOKE END, FITS B960 AIR CYLINDER | 1 | | |
| 22 | EZ215994 | BUSHING, 1" O.D X 3/4" I.D X 1/2" THICK | 1 | | |
| 23 | EZ215997 | NUT, JAM, 1"-8 GRADE 5 | 1 | | |
| 24 | EZ216001 | BOLT, HEX FLANGE, 3/8-24 X 3/4 GR 5, FULL THREAD, ZINC PLATED | 4 | | |
| 26 | EZ216006-0002 | TUBING, AIR LINE, 3/8 OD X 1/4 ID, POLYETHYLENE - 15 IN | 1 | | |
| 27 | EZ216006-0003 | LIMIT SWITCH, EXPLOSION PROOF | 2 | | |
| 28 | EZ216006-0004 | TUBING, AIR LINE, 3/8 OD X 1/4 ID, POLYETHYLENE - 15 IN | 1 | | |
| 30 | EZ216006-0007 | SLIDE GATE FRAME END (A1011 CS, 10 GA) | 1 | | |
| 32 | EZ216006-0010 | SLIDE GATE FRAME, EXT CYL MNT | 1 | | |
| 34 | EZ216006-0019 | GASKET, FOAM, 1/4 X 1/8, BLACK - 54 IN | 1 | | |
| 35 | EZ216006-0020 | DUST COVER, 10X10 SLIDE GATE (A1011 CS, 10 GA) | 1 | | |
| 36 | EZ216006-0022 | GASKET, FOAM, 1/4 X 1/8, BLACK - 34 IN | 2 | | |
| 37 | EZ216006-0023 | SWITCH MOUNT PLATE, CLOSE (A1011 CS, 10 GA) | 1 | | |
| 38 | EZ216006-0024 | SWITCH MOUNT PLATE, OPEN (A1011 CS, 10 GA) | 1 | | |
| 39 | EZ216006-0026 | GASKET, FOAM, 1/4 X 1/8, BLACK - 33 IN | 1 | | |
| 44 | EZ216010 | AIR CYLINDER, 3.5" BORE, 10" STROKE | 1 | | |
| | EZ215992 | AIR CYLINDER, 3.5" BORE, 12" STROKE | | | |
| 45 | WT17953-0084 | NUT, WELD 5/16-18 UNC, 1006-1010 CARBON STEEL | 8 | | |

# SPARE PARTS

Replacement Load Cells
- 500-lb S-Type: EZ100823
- 750-lb S-Type: EZ202203
- 1000-lb S-Type: EZ202110

Replacement Nylon Skirting:
- Single Discharge: EZ213759
- Double Discharge: EZ213236
- Triple Discharge: EZ213493
- Quad Discharge: EZ216177

Replacement Summing Junction Box
- Standard: WT41428-0016
- Intrinsically Safe: EZ214060

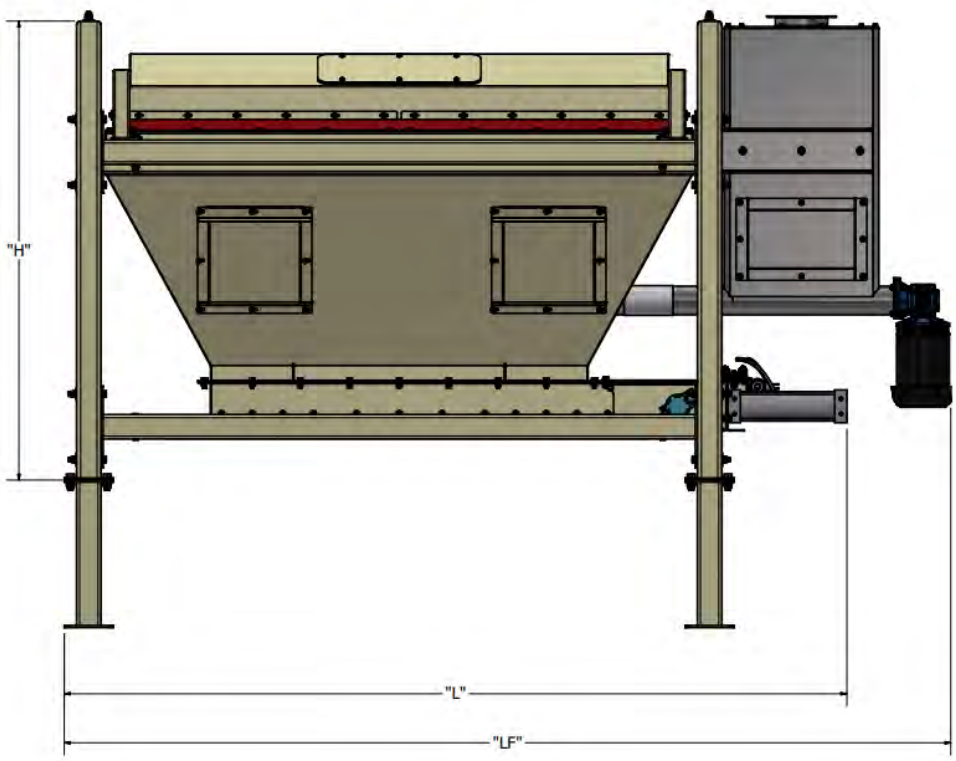
Shielded Scale Cable (6 conductor, 20 AWG) – EZ200593

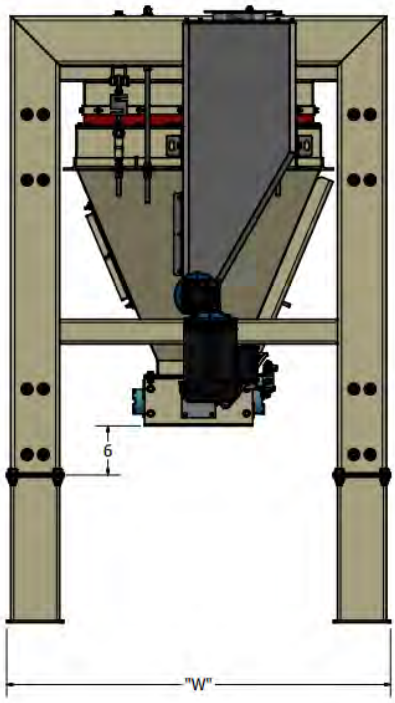
Paint, Spray Can, Off-White – EZ100889

# APPENDIX A – DIMENSIONS & APPROXIMATE DRY WEIGHT OF SCALE HOPPERS

## Section 12: Appendix A

| Scale Hopper Size | | Estimated Dry Shipping Weight (lbs.) | Maximum Capacity (lbs.) | Load Cell Size (Qty 4) | Length "L" (in.) | *Length w/ Optional Flush Hopper "LF" (in.) | Width "W" (in.) | Height "H" (in.) |
|---|---|---|---|---|---|---|---|---|
| Single Discharge | 10 $ft^3$ | 1,100 | 1,500 | 500 lb | 60 | 73 | 47" | 56 |
| | 17 ½ $ft^3$ | 1,200 | 1,500 | 500 lb | 60 | 73 | | 64 |
| Double Discharge | 20 $ft^3$ | 1,300 | 1,400 | 500 lb | 96 | 109 | | 56 |
| | 35 $ft^3$ | 1,500 | 2,300 | 750 lb | 96 | 109 | | 64 |
| Triple Discharge | 30 $ft^3$ | 1,500 | 2,300 | 750 lb | 132 | 145 | | 56 |
| | 50 $ft^3$ | 1,800 | 2,200 | 750 lb | 132 | 145 | | 64 |
| Quad Discharge | 40 $ft^3$ | 2,000 | 2,200 | 750 lb | 182 | 195 | | 56 |
| | 70 $ft^3$ | 2,400 | 3,000 | 1,000 lb | 182 | 195 | | 64 |



# Section 13: Appendix B

| Load Cell | Wire Color |
|---|---|
| Excitation + | Red |
| Excitation - | Black |
| Signal + | Green |
| Signal - | White |
| Shield | Bare |