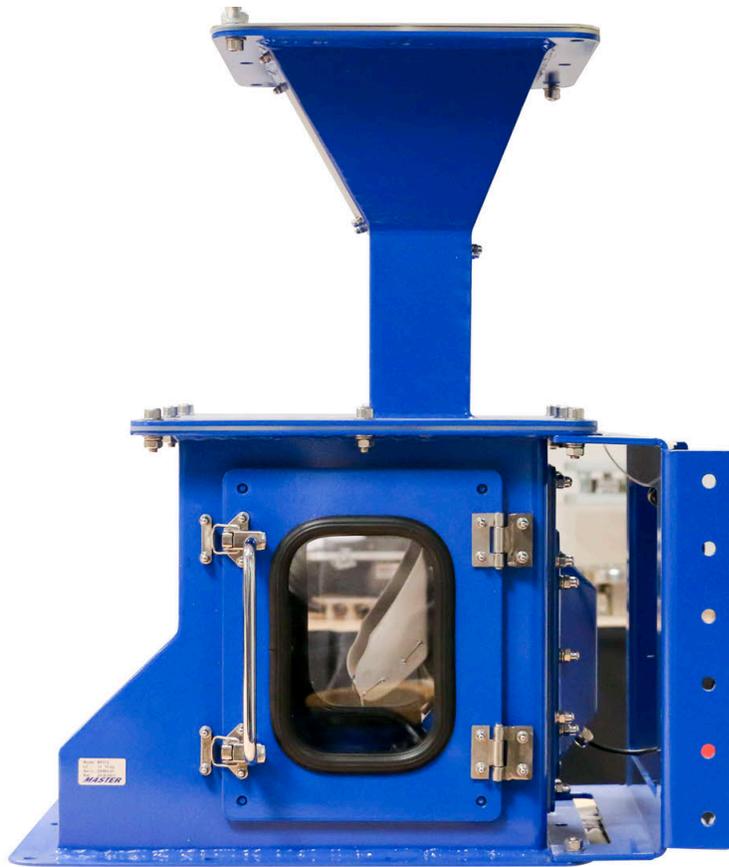


MASTER Bulkslide

Flow Measurement

Operation Manual



August 6, 2021

RICE LAKE[®]
WEIGHING SYSTEMS

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Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars

1.0 Introduction

The Bulkslide flow meter measures the flow rate of gravimetrically fed bulk solids and should only be used for free-flowing, non-adhesive bulk solids. The Bulkslide flow meter can be used for mixing, blending or ratio control applications in petrochemical, agricultural, aggregate, food and pharmaceutical industries.

This manual describes the safe and correct use in all phases of operation.



Manuals and additional resources are available from the Rice Lake Weighing Systems website at www.ricelake.com

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal Definitions:



DANGER Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.



WARNING Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.



CAUTION Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



IMPORTANT Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety



Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.



Failure to heed could result in serious injury or death.

Some procedures described in this manual require work inside the enclosure. These procedures are to be performed by qualified service personnel only.

Take all necessary safety precautions when installing the scale carriage including wearing safety shoes, protective eye wear and using the proper tools.

Keep hands, feet and loose clothing away from moving parts.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not jump on the scale.

Do not use for purposes other than weight taking.

Do not place fingers into slots or possible pinch points.

Do not use any load bearing component that is worn beyond 5 percent of the original dimension.

Do not use this product if any of the components are cracked.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Install and operate this product only if it is technically in serviceable condition and in the correct manner.

Read manual completely before use and keep this manual and all other relevant documents complete and accessible to personnel at all times.

2.0 Installation

Installation procedures generally should be a combination of the end user's best engineering practices in compliance with local codes and the manufacturer's recommendations. To achieve maximum performance, the following precautions should be observed.



WARNING

Failure to heed the following statements could result in severe injury or death.

Take all necessary safety precautions when installing the scale carriage including wearing safety shoes, protective eye wear and using the proper tools.

Always turn off the power supply before any connection is made or removed.

Before welding, the power supply must be off and the connectors removed.

IMPORTANT

Failure to heed the following statements could result equipment damage and void the warranty.

2.1 Unpacking

Immediately after unpacking, visually inspect the bulkslide to ensure all components are included and undamaged. The shipping crate should contain the unit and an installation manual. If any parts were damaged in shipments, notify Rice Lake Weighing Systems and the shipper immediately.

2.2 Lifting

Care must be taken when lifting the bulkslide to its location. Use the following tips to safely lift the unit.



DANGER

Death or crushed limbs caused by goods falling while being transported.

- Transport the Bulkslide at designated lifting points (Figure 2-1)
- Select the correct lifting gear for the weight being transported
- Do not stand under suspended loads
- Secure the transport route



WARNING

Improper transport can cause damage to the load cell.

- Transport the Bulkslide without vibration if possible
- Set down the Bulkslide as gently as possible

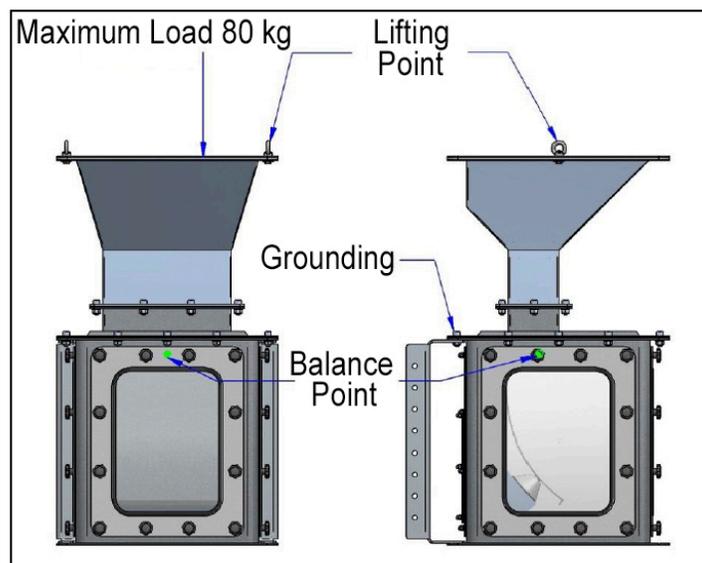


Figure 2-1. Lifting Points

2.3 Storage

When not in use, store the Bulkslide in its original packaging, making sure that the area where the unit is kept is;

- Dry
- Frost free
- Vibration free

2.4 Bulkslide Parts

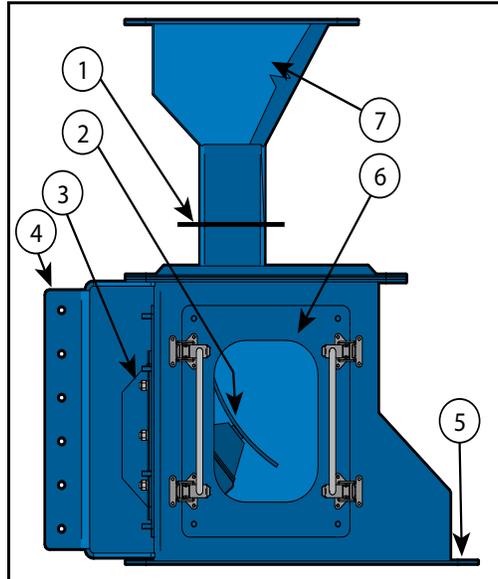


Figure 2-2. Bulkslide Component Parts

Item No.	Description
1	Inlet Flange
2	Measuring Slide
3	Sensor Cover
4	Holding Device
5	Discharge Flange
6	Housing Door
7	Feeder (optional)

Table 2-1. Bulkslide Parts

2.5 Checking the Operating Conditions

The following tips should be checked when operating the Bulkslide unit.

- The surface must be level within \pm degree
- Install option customer feeder if necessary
- Must be sufficient clearance to open the housing doors toward the inside of the meter
- Must be sufficient clearance to be able to open the rear sensor cover for maintenance

2.6 Installing the Bulkslide

Use the following steps to install the Bulkslide feeder.

1. Fix the discharge flange to the material feeder.
2. Establish the material supply using the Master feeder or the customer feeder.
3. Make sure that the support structure is free from vibration.



Note

Welding currents can damage the load cell so weld with extreme caution making sure that no welding current flows through the flow volume meter.

Strong vibrations can influence measured values so provide a sufficient mechanical support structure and secure the mounting structure if necessary.

2.7 Connecting Electronics

Several things must be done when wiring up the electronics.

- Use a shielded connecting line between the Bulkslide and the load cell, the power output 0 (4) - 20 mA and between relay contacts
- The shielding connection and the connector lines is connected to protective earth conductor connected to the terminal strip
- A proper, low impedance protective earth conductor is installed
- Lines in the clamp area should be laid as far as possible without any crossover

2.8 Compressed Air Cleaning System Connections (Optional)

If compressed air is present on site, it can also be hooked up. This is the customer's responsibility. Connect compressed air and solenoid valve in accordance to wiring diagrams (customer supplied).

3.0 Operation (Feeder Types)

There are various arrangements for planning the material supply to be fed to the feeder. The arrangement depends on the application that product is being used for. The following sections show different arrangements.

 **Note** *There must be optimum conditions for measuring product.*

- Bulk material must be dry and cannot solidify or stick
- Bulk material flows with steady throughput and at a low speed
- Bulk material flows in a purely vertical direction without impact
- No air flow must be present

3.1 Spiral Conveyor

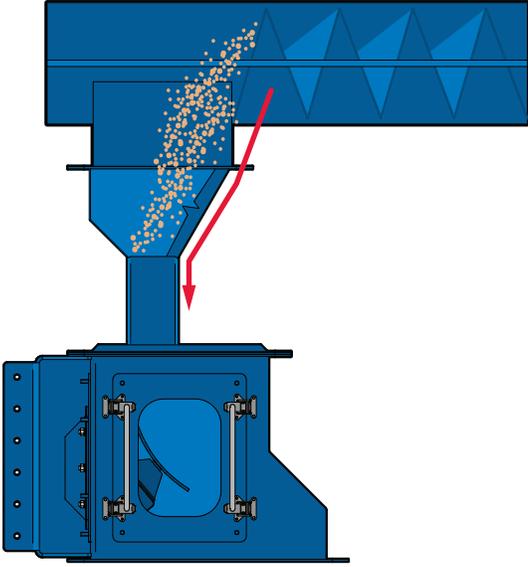
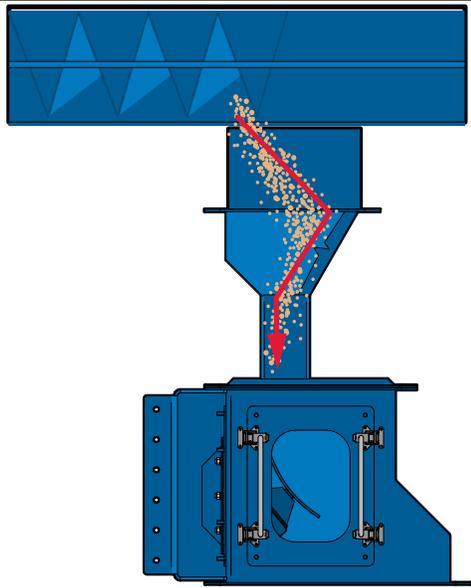
Conveying Speed	Arrangement
Low Speed < 40 rpm	
High Speed > 40 rpm	

Table 3-1. Spiral Conveyor Types

3.2 Rotary Valve

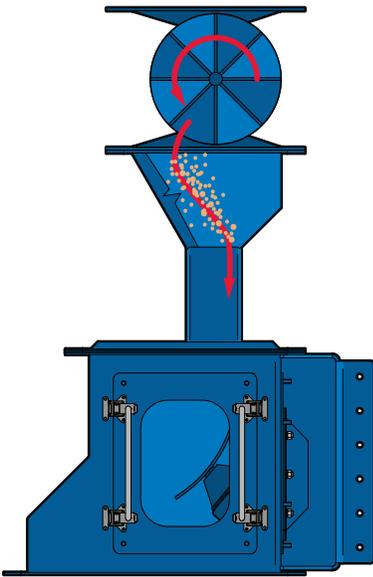
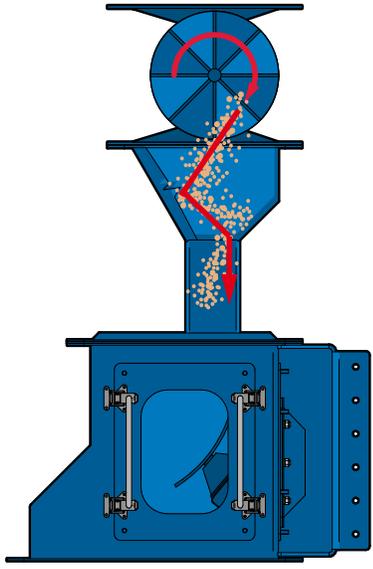
Conveying Speed	Arrangement
Low Speed <20 rpm	
High Speed > 20 rpm	

Table 3-2. Rotary Valve Types

3.3 Conveyor Belts

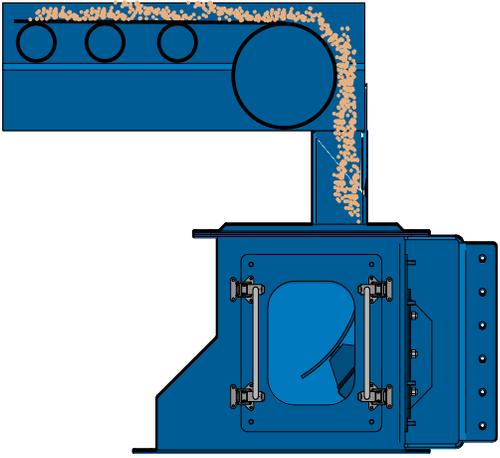
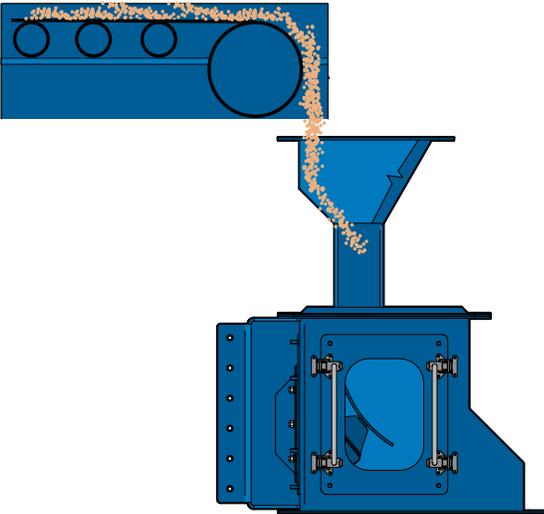
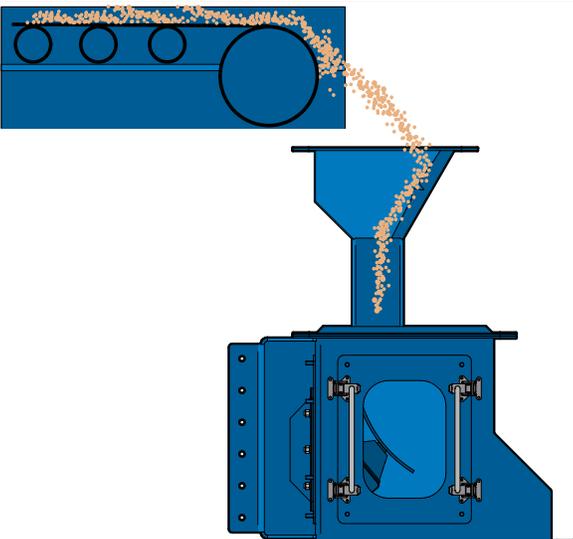
Conveying Speed	Arrangement
Slow, constant movement up to 1 m/s	
Slow, variable movement	
High speed from 1 to 4 m/s	

Table 3-3. Conveyor Belt Types

3.4 Direct Drop From a Silo/Container

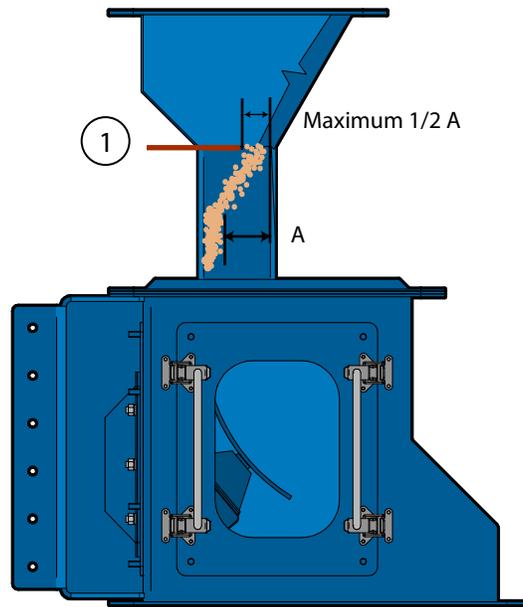


Figure 3-1. Direct Drop Type

The opening on the feeder gate must be no wider than half the straight unimpeded inflow section (Figure 3-1, #A) on a direct drop from a silo or container. A larger opening can result in overload and damage to the meter. Make sure that material does not hit the feeder slide and make sure that there is never a backlog as these forces can result in overload and damage to the meter.

3.5 Customer Feeders

The feeders shown in Figure 3-2 are also appropriate measure that can be used to feed the product stream evenly.

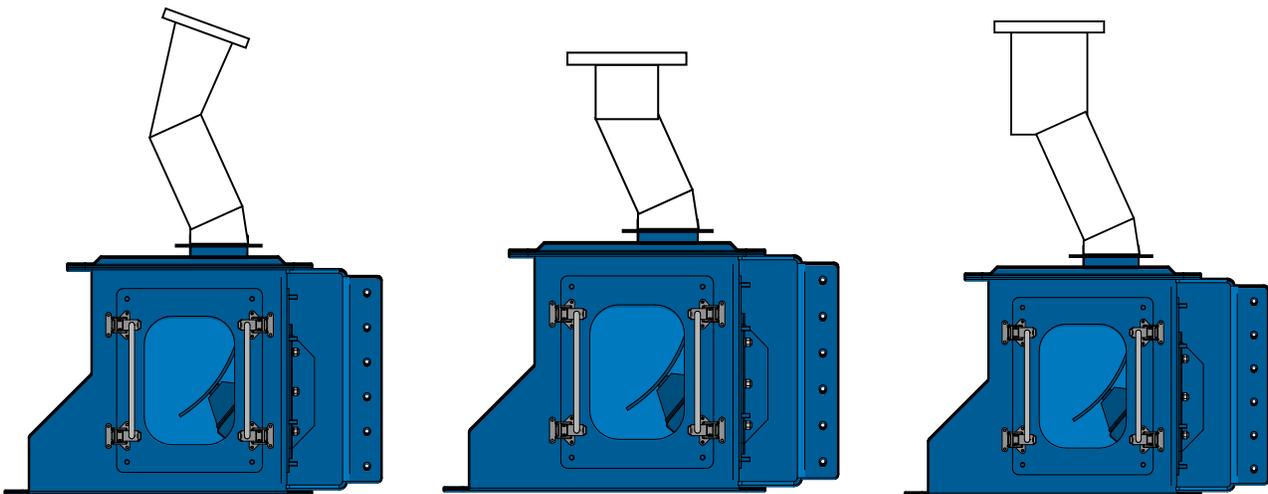


Figure 3-2. Custom Feeders

4.0 Maintenance

4.1 Inspection

Inspect the Bulkslide every six months for contamination and clean if necessary. Depending on the application, inspection might be sooner or later, depending on plant maintenance procedures.

Calibrate the unit every six months. Depending on the application, calibration might be sooner or later, depending on plant maintenance procedures.

4.2 Cleaning

Use the following recommendations when cleaning the Bulkslide unit.

- Clean the outer service using a dry brush
- Carefully clean the inside of the unit
- Remove all dust deposits with a vacuum cleaner if possible
- When cleaning with water, make sure that the measuring slide is completely dried after cleaning.



Note *Improper cleaning can cause damage.*

Table 4-1 shows recommended cleaning intervals for various Bulkslide parts.

Module	Component	Activity	Interval	Check it (X)/Clean it (O)
Inlet Funnel	Inlet Sheet Baffle Plate Friction Plate	In case of sticking material, clean the plate carefully with water	Yearly	X / O
Door	Door with Plexiglass	Check for cracks; if faulty, replace. In case of sticking material, carefully clean with water	Regularly	X
Sensors/Electronics	Slide	Check and replace as necessary	Regularly	X / O
	Sensor	Check sensor signal. Normal range should be 0-2 mV/V If >20 mV, contact RLWS	Regularly	X
	Sensor Cable	In case of an insulation fault, repair sensor cable or replace sensor	Regularly	X
	Connector	Check connector for solid connection (vibration cause)	Regularly	X

Table 4-1. Cleaning and Maintenance Plan

4.3 Dismantle and Transport

If the Bulkslide unit is to be moved to another location, use the following steps to dismantle the unit.

1. Disconnect all electronics.
2. Disconnect the secondary feeder material feeder.
3. Dismantle the material feeder.
4. Transport the Bulkslide without vibration is possible.

4.4 Disposal

Any excess materials should be disposed of in accordance to state and local regulations and if possible, recycle.

4.5 Technical Data

Type	Min. Throughput [m3/h]	MaxThroughput [m3/h]	Particle Size [mm]	Load Cell [kg]	Weight Including Intake Funnel [kg]
BF006	1	6	25	10	13
BF012	5	12	30	10	20
BF024	9	24	30	10	30
BF050	20	50	40	2 x 10	50
BF100	40	100	50	2 x 20	70
BF200	80	200	50	2 x 20	75
BF400	160	400	50	2 x 20	85
BF600	250	600	60	2 x 30	95

Table 4-2. Series Measurable Density: 0.3 to 2.5 kg/dm3

4.6 Specifications

	Description
Operating Temperature	-40 to +75C with the optional high temperature version up to 160C
Accuracy	0.5% for approved product feed, otherwise 2% of measuring range end value for tested application
Housing Material	Carbon steel ST52, powder-coated with RAL 1028 Stainless Steel 1.4301 (AISI 304) or 1.4401 (AISI 316) is optional
Gasket	Silicone rubber, standard, suitable for food processing application (EC) No. 1935/2004
Window	Plexiglass, optional safety glass or stainless steel plates for sanitary applications
Measuring Slide	Stainless Steel 1.4301, optional 1.4401, 1.4517 various anti-wear coatings; HARDOX 400, Ceramic
Approval	CE compliant

Table 4-3. Specifications

4.7 Load Cell

	Description
Design	Stainless Steel
Protection class of housing	IP 68
Excitation	5-15 VDC
Output	2 mV/V supply at the rated output of the load cell
Linearity	0.017% of the rated output power
Hysteresis	0.03% of the rated output power
Reproductability	0.01% of the rated output power
Capacity	Application dependant
Overload	Safe up to 150% of nominal capacity, up to a maximum of 300%
Temperature	-40 to +75 C operating range -18 to +65 C compensated Optional high temperature version for up to 160 C
Approval	Optional ATEX Zone 22, 21, 20 / FM/CSA on request

Table 4-4. Load Cell Specifications



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