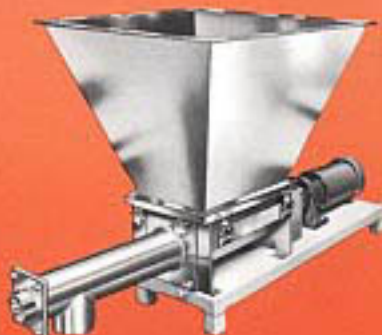


Metalfab, Inc.

Volumetric and Loss-of-Weight Feeders



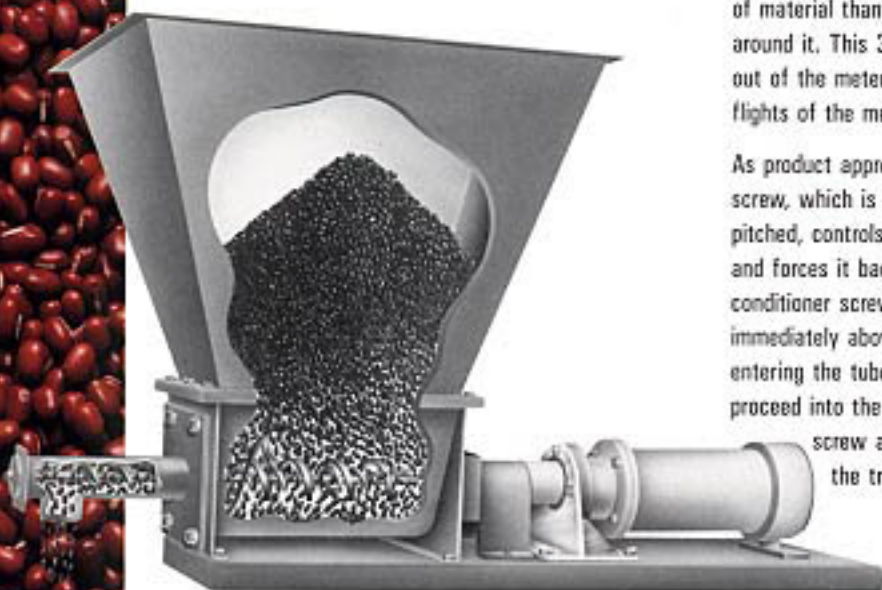


AGITATOR CONDITIONER SCREW CONCEPT

AGITATOR/CONDITIONER SCREW

Product metering is achieved by filling the flights of the metering screw to their maximum capacity with uniformly dense product. Particles are made mobile at the rear of the trough by both the agitator and the metering screw as they begin to convey the product forward. Due to the larger size and the wire configuration of the agitator screw, it carries greater capacity of material than the metering screw and allows material to flow through and around it. This 360° influence of the material forces entrained air up and out of the metering area and at the same time force feeds material into the flights of the metering screw.

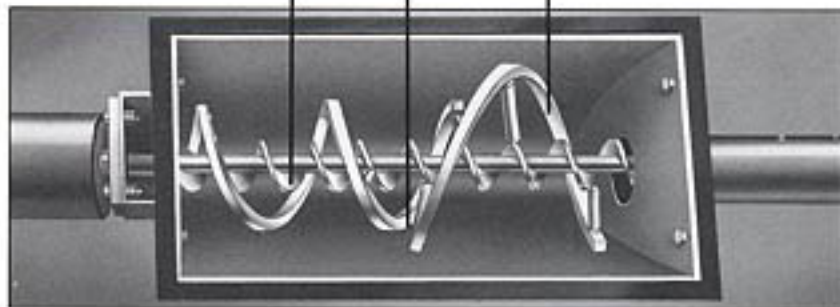
As product approaches the forward section of the trough, the conditioner screw, which is larger in diameter than the other two screws and reverse pitched, controls all the material on the outer edge of the agitator screw and forces it back. This creates a folding action where the agitator and conditioner screws meet allowing for the greatest mobility of material immediately above the final three pitches of the metering screw before entering the tube. Completely filled flights of uniformly dense material now proceed into the tube and continue on to the discharge point. The conditioner screw also prevents jamming of material in the forward section of the trough.



1. METERING SCREW

2. AGITATOR SCREW

3. CONDITIONER SCREW



**DB1**

VOLUMETRIC SCREW FEEDER

Metalfab DB1 is a simple, low-cost, ruggedly-built feeder that provides extremely accurate, dependable metering of a wide range of dry particulate materials.

Virtually maintenance-free, the Model DB1 has only 5 moving parts: drive, coupling, screw and two bearings. An agitator/conditioner screw, available in all but 6" units, fills the feed screw completely, resulting in feed accuracies of ± 1 to 1% (based on one minute samples).

All feed screws are made with through shafts to eliminate breakage. These shafts are supported by oversized ball bearings, which are sealed and provided with grease fittings.

All standard units (1" to 6" screw sizes) have feed rates from 0.3 to 550 cu. ft./hr. A 5 cu. ft. hopper, with 70° sloped sides and large rectangular outlet, provides capacity for most surge conditions. If desired, the hopper can be removed and replaced with up to a 10" diameter inlet trough cover. The unit can then be preceded by a Metalfab Bin Activator or Posibin.

Interchangeable screw and tube combinations permit feed rates beyond the 20:1 range of variable speed drive.

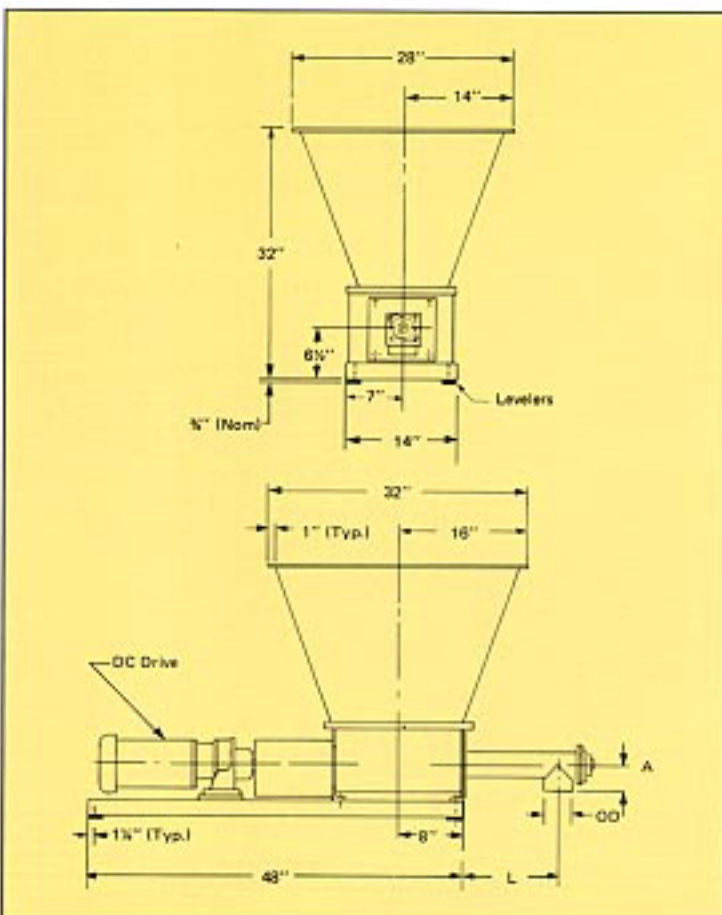


- Handles powders, pellets, flakes and agglomerates
- Interchangeable screw and tube combinations
- Ruggedly built for continuous operation

Specifications

Construction, mild steel, mild steel epoxy coated, 304 and 316 stainless or other specified materials. Sanitary construction is also available.

Drive, totally enclosed DC motor and inline gear (20:1 range). Controller rectifies single phase AC input into DC to vary motor speed. AC variable speed drive and explosion-proof motors also available.



MODEL	FEED RATE MAX. (cu. ft./hr.)	L	A	OD	HP
DB1-1	3	8"	2 1/4"	1 1/2"	1/4
DB1-1 1/2	8	8"	2 1/4"	2"	1/4
DB1-2	20	8"	2 1/4"	2 1/2"	1/4
DB1-3	60	12"	3 1/4"	3 1/2"	1
DB1-4	175	14"	3 3/4"	4 1/2"	1
DB1-6	550	21"	4 3/4"	6 1/2"	1



DB1C



SPACE SAVING DB1C SERIES VOLUMETRIC SCREW FEEDERS

DB1C series compact volumetric screw feeders offer the same high quality construction features and precision performance as Metalfab's standard-size feeders, plus a unique space saving benefit. Due to the positioning of their DC drive which has been placed alongside the feeder trough and parallel to it, the compact, new DB1C units require less than 3 1/2 sq. ft. of space, half the space of most conventional feeders.

Virtually maintenance-free, DB1C series compact volumetric feeders have only 5 moving parts: drive train, timing belt, screw, and front and rear bearings. The heavy duty timing belt transmits power from the DC drive to an agitator/conditioner screw which fills the feed screw completely, providing feed accuracies of ± 1 to 1 1/2% based on one minute samples.

A 5 cu. ft. hopper with 70° sloped sides and large rectangular outlet, provides capacity for most surge conditions. The hopper is removable and can be replaced with up to a 10" diameter inlet trough cover. The unit can then be preceded by a Metalfab bin activator or Posibin.

6 COMPACT HEAVY DUTY MODELS, 0.3 TO 550 CU. FT./HR. PROVIDE PRECISE FEEDING IN HALF THE SPACE

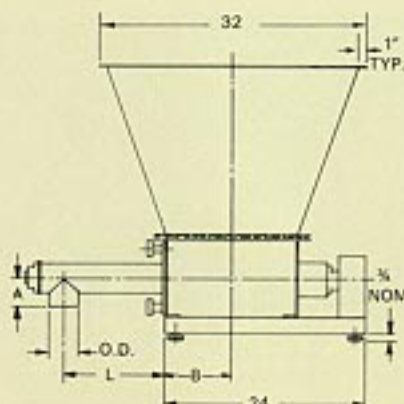
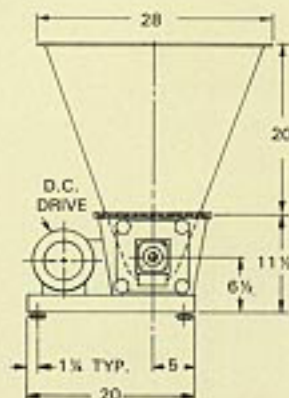
- Requires only 24" x 20" support
- ± 1 to 1 1/2% accuracy
- Handles flakes, powders, pellets, agglomerates
- Standard and sanitary models
- Rugged construction
- Interchangeable screws and tubes

Specifications

Construction, mild steel, mild steel epoxy coated, 304 or 316 stainless or other specified materials. Sanitary construction also available.

Drive, totally enclosed DC motor and inline gear (20:1 range). Controller rectifies single phase AC input into DC to vary motor speed. Explosion proof motor available.

MODEL	FEED RATE MAX. (CU.FT./HR.)	L	A	OD	HP
DB1C-1	3	8	2 3/4	1 3/4	3/4
DB1C-1 1/2	8	8	2 3/4	2	3/4
DB1C-2	20	8	2 3/4	2 1/4	3/4
DB1C-3	60	12	3 1/4	3 1/4	1
DB1C-4	175	14	3 3/4	4 1/4	1
DB1C-6	550	21	4 3/4	6 3/4	1



**DB1T**

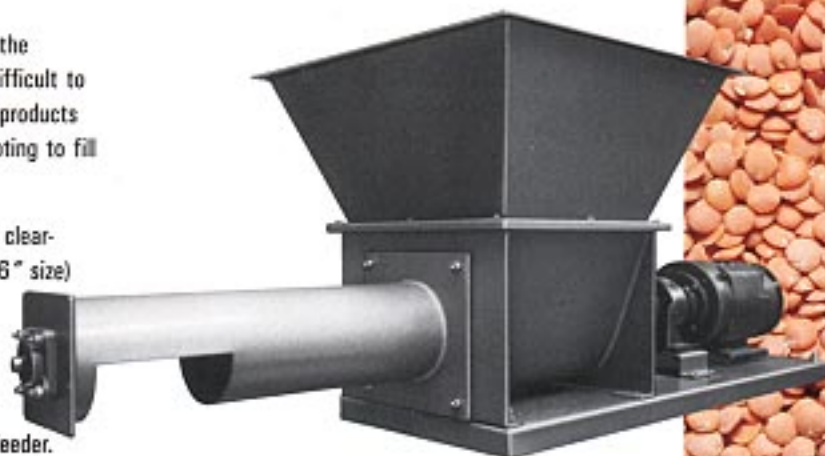
VOLUMETRIC SCREW FEEDER

The model DB1T feeder provides all of the features available with the standard Metalfab DB1, but is designed for the handling of more difficult to feed materials such as film scrap, wood chips, filter cake, fibrous products and many other materials which present vexing problems in attempting to fill the flights of the metering screw.

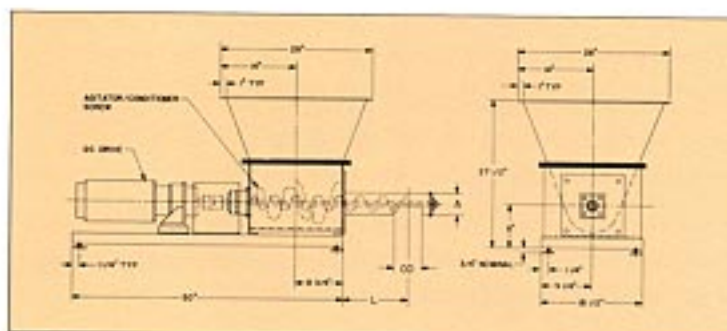
To solve these problems, the DB1T has been designed with greater clearances and larger agitator/conditioner screws (including one for the 6" size) and the downspout at the discharge end has been eliminated.

Standard metering screws are 3", 4", and 6". Agitator/conditioner screws are 8" and 10".

All other specifications are similar to those indicated for the DB1 feeder.



MODEL	FEED RATE MAX. (CU. FT./HR.)	SCREW DIA.	A/C DIA.	A	L	OD	HP
DB1T-3	80	3"	8"	5"	18"	4"	1
DB1T-4	175	4"	10"	6"	14"	5"	1
DB1T-6	550	6"	10"	8"	21"	7"	1



"MINI FEEDERS" DB1M VOLUMETRIC SCREW FEEDER

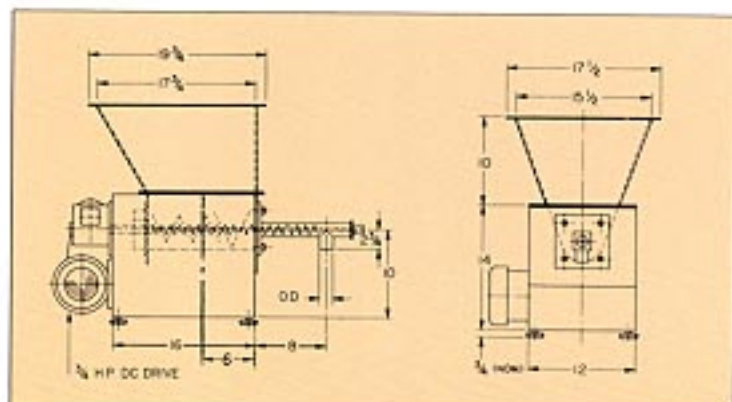
Designed for applications where space is critical, Metalfab model DB1M mini feeders provide dependable, highly accurate feeding of a wide variety of dry solid materials from an extremely small base of only 12" x 16".

A 1 cu. ft. hopper with sharply sloped sides and large rectangular outlet, provides capacity for most surge conditions. The hopper is removable and can be replaced with up to a 6" diameter inlet trough cover. The unit can then be preceded by a Metalfab bin activator or Posibin.



- ± 1 to 1 1/2% accuracy
- Only 3 moving parts
- Requires only 12" x 16" support
- Handles flakes, powders, pellets, agglomerates
- Standard and sanitary models
- Interchangeable screws and tubes

MODEL	FEED RATE MAX. (CU. FT./HR.)	O.D.
DB1M-3/4	1	1
DB1M-1	3	1 1/4
DB1M-1 1/4	8	2





DB1S

SANITARY VOLUMETRIC SCREW FEEDER

The Metalfab model DB1S sanitary feeder offers the simplicity of the standard DB1 unit, while satisfying the most stringent sanitary processing requirements necessary for the metering of such critical materials as pharmaceuticals and foodstuffs.

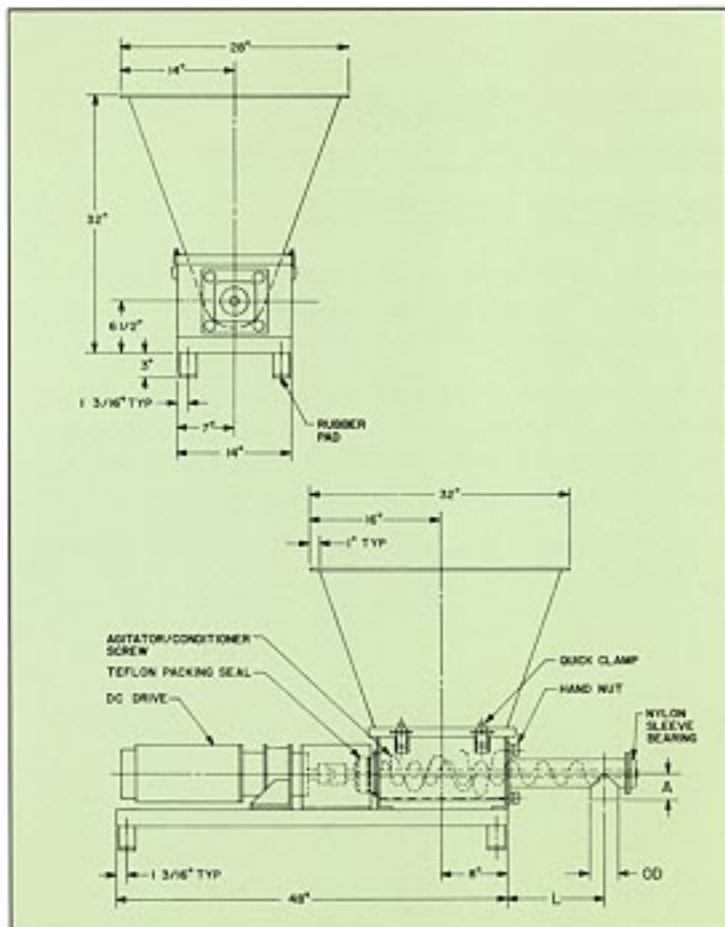
All contact surfaces are of 304 or 316 stainless steel and polished to a #4 finish. All welds are continuous and ground smooth to prevent product build-up and adherence. Gasketing is food grade white neoprene and a rear seal with teflon packing gland is standard. All external carbon steel parts are painted with white enamel.

Extra clearances are provided beneath the unit for ease of cleaning, but should it become necessary, the DB1S can be disassembled for cleaning without the use of tools.

Screw sizes range from 1" to 6", with agitator/conditioner screws on all but the 6" size. The D.C. motor is TENV (suitable for washdown). Can be made to comply with 3A dairy standards.



MODEL	FEED RATE MAX. (CU.FT./HR.)	SCREW DIA.	A/C DIA.	A	L	OD	HP
DB1S-1	3	1"	4"	2 3/4"	8"	1 1/2"	3/4
DB1S-1 1/2	8	1 1/2"	4"	2 3/4"	8"	2"	3/4
DB1S-2	20	2"	6"	2 3/4"	8"	2 1/2"	3/4
DB1S-3	60	3"	6"	3 1/4"	12"	3 1/2"	1
DB1S-4	175	4"	6"	3 3/4"	14"	4 1/2"	1
DB1S-6	550	6"	—	4 1/4"	21"	8 1/2"	1



COMBINATION SCREW FEEDER/CONVEYOR

A highly accurate, dependable volumetric screw feeder, Metalfab Model DB2 has only five moving parts—drive, coupling, 2 bearings and a screw. It is designed for the precision metering of dry materials in the chemical, food, plastics, pharmaceutical and foundry industries, but may also be used successfully as a short distance conveyor, with center of inlet to outlet dimensions of 3' to 12'.

The large diameter inlet to the V-shaped trough, which helps insure complete filling of screw flights provides feed accuracies of ± 1 to 1½%. When a Metalfab Posibin or bin activator is used to supply the feeder, even greater accuracies may be obtained.

A bin activator is recommended when feed rates are more than 1,000 cu. ft./hr. or non-free flowing materials are in process.

Flight-type screws with through shafts are standard. Oversize ball bearings which are sealed and provided with grease fittings support the shaft.

Operating noise levels are within OSHA requirements. All moving parts are guarded and the belt section is totally enclosed.

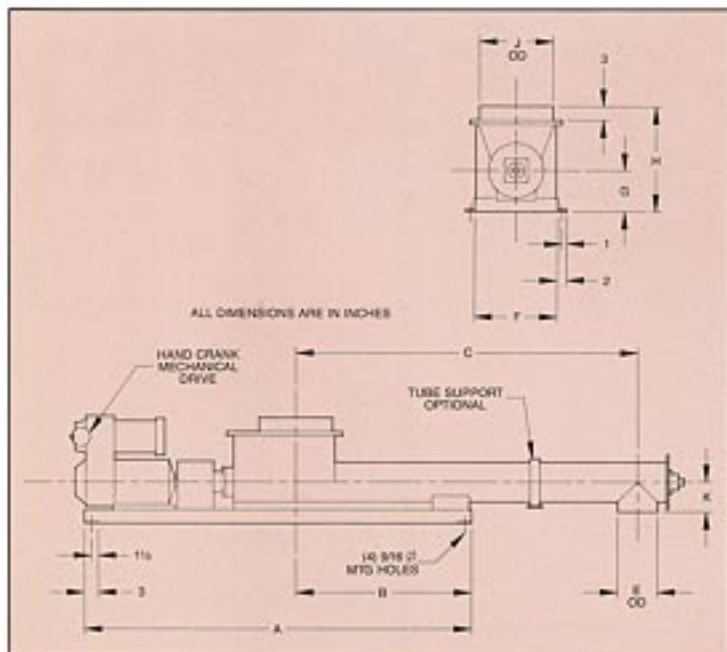


- Handles powders, pellets, flakes and other dry materials
- 6" to 20" screws provide feed rates, to 18,000 cu. ft./hr.
- May be used as a short distance conveyor
- Ruggedly built for continuous operation

Specifications

Construction, mild steel, mild steel epoxy coated, 304 and 316 stainless. Other materials available.

Drive, totally enclosed AC motor with variable speed transmission (10:1 turndown, min.) Drive directly coupled to screw by a flexible coupling, eliminating need for belt or chain drives.



MODEL	FEED RATE MAX (CU.FT./HR.)	A	B	C		D	E	F	G	H	J	K	HP
				MIN	MAX								
DB2-6	500	60	30	36	110	6 1/2	16	9	16 1/4	18	6 1/4	1-1 1/4	
DB2-8	1,100	84	38	48	120	6 1/2	16	9	23	16	6 1/4	2-3	
DB2-10	2,200	96	41	60	120	11 1/4	24	10	24	20	7 1/4	3-6	
DB2-12	3,800	96	43	84	144	14	28	11	25 1/4	22	9	3-8	
DB2-16	9,000	120	68	70	144	18	30	13	30	26	11	3-6	
DB2-20	18,000	120	48	90	144	22	36	15	36	35	13	5-7 1/4	



APB

VOLUMETRIC BELT FEEDER

The Metalfab model APB volumetric belt feeder is a ruggedly built slider bed assembly designed for the highly accurate metering of all types of powders, pellets and agglomerates. The unit is exceptionally well suited for the feeding of abrasive materials and those which have a tendency to smear or compress when being fed by a volumetric screw.

In addition, the APB feeder is ideal for the high volume requirements of the chemical and food industries. Normal metering accuracy is ± 1 to $1\frac{1}{2}\%$.

Standard APB feeders are available with belt widths of 12", 24", 36" and 48" and in belt lengths of 36", 72", 108" and 144" respectively.

The largest units are capable of achieving rates of up to 5,000 cu. ft./hr., simply by increasing the speed of the belt, which is driven by an S.C.R.-controlled DC motor.

Although neoprene belts are standard, other compounds, such as Hy-car, Nordel and Viton are also available, as are specially coated materials. Bearings are sealed and located outboard to prevent contamination, and all units are equipped with skirtboards and adjustable belt take-ups.

Belt scrapers, which help prevent build-up of material on the belt surface and insure complete discharge of material from the belt, are standard.

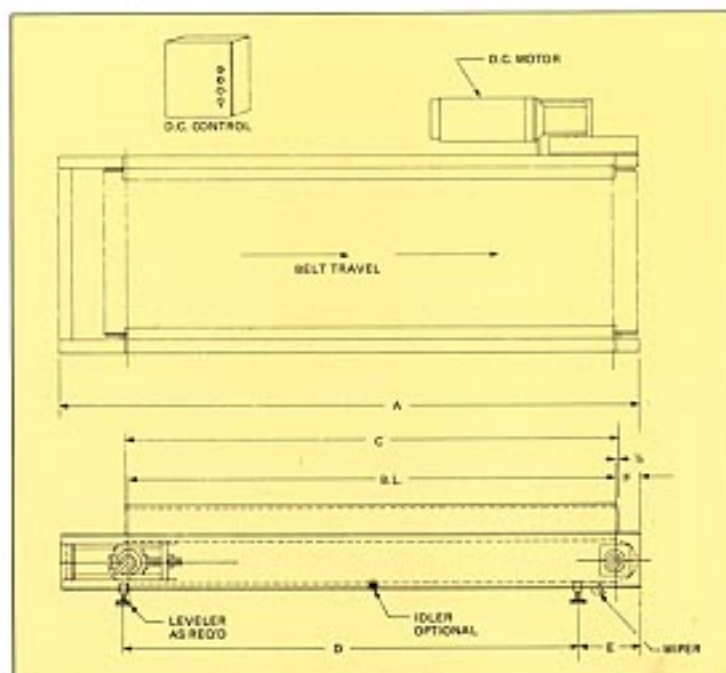
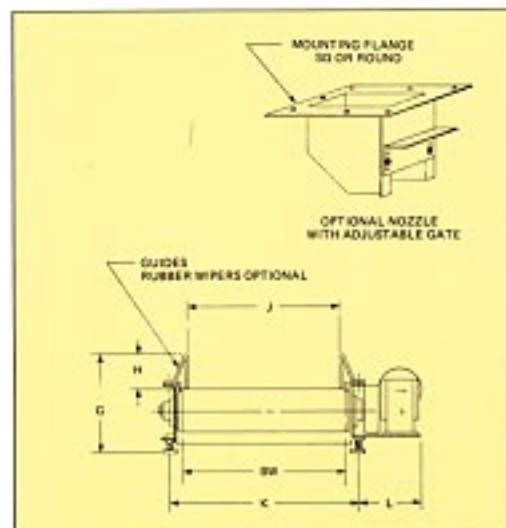
An optional, manually-adjusted nozzle which can regulate the depth and width of material on the belt in order to help maintain a continuing high degree of accuracy is also available. The nozzle may be attached to the outlet of the static bin when feeding free-flowing materials, or to the outlet of a Metalfab Bin Activator, for difficult materials.

Specifications

Construction, standard APB units are available in carbon steel, 304 or 316 stainless steel contacts.

Drive, options include constant speed and mechanical variable speed motors, explosion-proof motors, dust tight enclosures and extended belt lengths.

MODEL	MAXIMUM FEED RATE
APB1-3	400 CUBIC FEET PER HOUR
APB2-6	1200 CUBIC FEET PER HOUR
APB3-9	2400 CUBIC FEET PER HOUR
APB4-12	4800 CUBIC FEET PER HOUR



MODEL	B.W.	B.L.	A	C	D	E	F	G	H	J	K	L	HP
APB1-3	12	36	45	37	33	6	3	11	4	11	14	7	1/8
APB2-6	24	72	85	73	68	9	3 1/2	15	6	22 1/2	28	9 1/4	1
APB3-9	36	108	121 1/2	109	104	9	4 1/2	17	6	34 1/2	41 1/2	10 1/4	1 1/2
APB4-12	48	144	160	145	139	10	7	25	8	46	54	12	2



SCR-DC

SOLID STATE VARIABLE SPEED FEEDER DRIVES

The Metalfab SCR-DC Drives are specifically designed to provide highly accurate, dependable feeder speed in rugged and hostile environments in which its feeders excel.

OPERATION

A standard NEMA 4x enclosure and NEMA 4x operators protect the electrical components from contamination and assure a long, dependable service life for the control. The unit is available for in-plant environments with a 3 decade digital speed potentiometer to provide accurate, repeatable speed selection.

Input fusing is subcycle to protect the control integrity and anmotive, slow blow fusing is also provided to protect motors and power modules. All parts and equipment used in the control are conservatively service factored.



STANDARD SPECIFICATIONS

Motor:	Standard Shunt Wound DC, TEFC
Power Input Standard:	¾-¼ HP Control 115/60/50/1 Input 1½ HP Control 230/60/50/1 Input
Speed Range:	20:1 variation
Speed Regulation:	±1% maximum speed at 0-95% of load change
Linearity:	±1% of maximum speed at 0-95% of load change
Repeatability:	±0.5% of setting at 0-95% of load change
Line Voltage Compensation	
IR Compensation	
Full Wave Rectification	
Three Decade Digital Speed Selection	
Adjustable Internal Minimum and Maximum Speed Settings	
Torque boost for higher starting torque	
Enclosure:	NEMA 4x, fiberglass reinforced polyester
Pilot Lights and Switches:	NEMA 4x, heavy duty oil tight style
Remote Mounting Capability	up to 1,000 ft. from feeder

OPTIONAL AND ACCESSORY EQUIPMENT

1. Process signal input control (4-20 MA typical) auto-manual switch supplied. (Speed selector becomes ratio control in automatic mode)
 2. Process signal output linear to output speed (4-20 MA typical)
 3. Digital speed readout (calibratable in RPM, Pounds/Min., etc.)
 4. Digital Totalizer (calibratable in total pounds)
 5. Explosion proof enclosures
 6. Remote stations
 7. Process Signal Alarms: relay actuation on low or high process signal
 8. Chassis style controls for mounting in customer enclosures or main consoles
 9. Bulk and dribble speeds (for simple adaptation to scale control)
 10. Master speed control and multiple ratio control of more than one feeder
 11. Digital tach feedback for absolute speed control
- A.C. Variable Frequency Controllers are also available in NEMA 4x enclosure and NEMA 4x operators. Most of the above specifications and options would apply.



BW-P/L

THE METALFAB "BETTER-WEIGH"® FEEDER

When a process requires accuracies greater than 1 to 1 1/2% or it is necessary to determine actual feed rates, feeding by weight loss is the better method. Although material is fed in the same volumetric manner...the screw flights are filled to their maximum capacity with uniformly dense material...required rates are actually weighed by a scaling system in conjunction with either a batch or continuous controller. Weight of product being delivered is continuously monitored against weight required.

The "BETTER-WEIGH" feeders are available in a variety of screw sizes and two (2) types of scaling systems. Model BWP incorporates a platform scale, which consists of our unique screw feeder design with agitator/conditioner screws, a platform weigh scale and a controller. With the BWP, the total weight of the feeder and the weight of the product in the hopper are sensed by the load cell in the platform scale and the combined weight, which will vary based upon the bulk density of the material, determines the capacity of the load cell to be used.

Our "BETTER-WEIGH" feeder, model BWL, incorporates a lever balance scale system. With this method, the entire weight of the feeder is counter balanced so that only the contents of the hopper are weighed. This system allows for the minimal weightment of any product.

Open top hopper capacities of 2 to 5 cubic feet can be supplied with either model.

CONTROL FEATURES - "BETTER-WEIGH" BATCH LOSS-OF-WEIGHT FEEDER

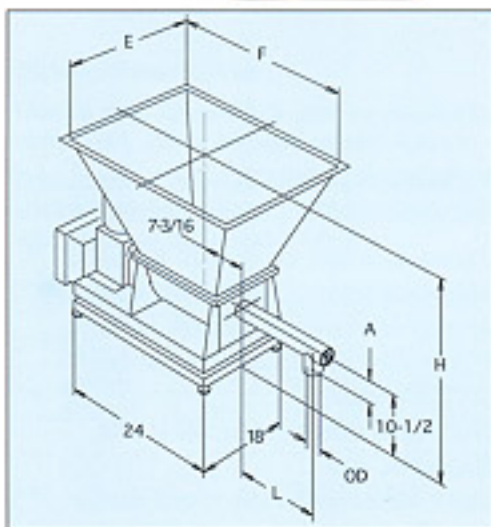
With the "BETTER-WEIGH" batch feeder model BWP, accuracies of $\pm 0.5\%$ can be achieved with 2 lb. batches and $\pm 0.25\%$ accuracy with 5 lb. or greater batches with time spans of 30 to 90 seconds. The BWL model can easily produce an accuracy of $\pm 0.5\%$ in 1 lb. batches.

The METALFAB batch controller is used to control the fast (bulk) and slow (dribble) speeds of our "BETTER-WEIGH" feeders.

1. The bulk dribble targets are entered through the front panel or down loaded to the indicator using RS-232 or optional RS-485 and Allen Bradley Blue Hose communications. The feeders fast and slow speeds are set manually and are initiated by the weigh indicator's twenty (20) programmable steps.
2. In addition to the fast and slow speed outputs, the indicator has two (2) additional outputs that can be configured for a refill, batch complete or general alarm conditions.
3. Formatting printing can be done and is activated by one of the programmable steps or by pushing the print button located on the front panel.
4. The indicator is also supplied with four accumulators and their values printed through the print functions.
5. Vibration elimination is used to remove motor and machine noise from the raw digital data used for weigh indication. It is also an added benefit when using vibration to assist with feeding.

6. Both the SCR DC drive and weigh indicator are mounted in the same NEMA 4 enclosure having a power on/off switch with light, Jog/Batch and Abort/Start selector switches.

7. Normally the control is supplied 230 VAC. As an option, 115 VAC can be supplied.



MODEL	FEED RATE	"OD" DIM	"L" DIM	"A" DIM
BW(P or L)-1	3	1-1/2	8	2-3/4
BW(P or L)-1 1/2	8	2	8	2-3/4
BW(P or L)-2	20	2-1/2	8	2-3/4
BW(P or L)-3	60	3-1/2	12	3-1/4

HOPPER SIZE	"E" DIM	"F" DIM	"H" DIM
2 CU FT	22	20	30
3 CU FT	26	22	34
5 CU FT	28	26	38

CONTROL FEATURES - "BETTER-WEIGH" CONTINUOUS LOSS-OF-WEIGHT FEEDER

Unlike the batch loss-of-weight feeders, the continuous weighers deliver an ongoing rate of material. The loss-of-weight of material per time is constantly monitored in order to maintain a continuous loss-of-weight with an accuracy of $\pm 0.25\%$ to 0.5% .

The METALFAB continuous controller is used to control the speed of our "BETTER-WEIGH" feeders based on the amount of material weight loss within a given time period.

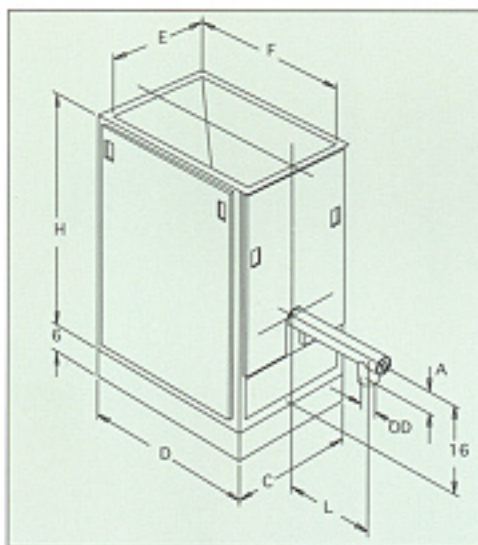
1. The rate targets are entered through the front panel or can be down loaded to the indicator using RS-232, optional RS-485 or Allen Bradley Blue Hose communications.
2. After our "BETTER-WEIGH" continuous controller has been installed, load cell and automatic rate calibrations are performed. The Proportion, Integral and Derivative factors are automatically calculated and stored in the indicator. This eliminates the trial and error methods used by other manufacturers.
3. Operation of the control can be manual, continuous or continuous batching. In all modes of operation, the indicator monitors material gross weight and initiates automatic refills with high and low level alarms.
4. The feed rate can be set for lbs./sec., lbs./hr. A rate tolerance input is used to provide a band for monitoring the indicator's performance. If the rate is operating out of tolerance for a set time, the indicator will output an alarm and can be programmed to automatically shut down the feeder.
5. The indicator uses vibration elimination to remove noise from the raw digital data used for weigh indication. The sensitivity can be preset to eliminate noise from machines, motors or vibrators.
6. As with our batch feeder control, both the SCR DC drive and weigh indicator are mounted in the same NEMA 4 enclosure having a power on/off switch with light and indicator keypad and display.
7. The control is supplied as 230 VAC. As an option, 115 VAC can be supplied.



BWM



"BETTER-WEIGH" MODULAR DESIGN



"BETTER-WEIGH" batch or continuous feeders are available in a modular design, which allows for quick removal of the hopper/trough assembly along with the screw and tube. Tools are not required for cleaning or replacement of a spare assembly. All that is required is the removal of two (2) side panels and the front panel (photos #1 & 2). The next step is to disconnect the hand clamps located adjacent to the rear coupling (photo #3). Simply pull the hopper/trough assembly with the screw and tube forward until they are removed from the unit (photo #4).

The modular design, model BWM, is available with either a platform scale or a lever balance system and can be supplied with a 5 or 2 cubic foot hopper. The modular design is also available as a volumetric screw feeder.

MODEL	FEED RATE	"OD" DIM	"L" DIM	"A" DIM
BWM-1	3	1-1/2	8	2-3/4
BWM-1 1/2	8	2	8	2-3/4
BWM-2	20	2-1/2	8	2-3/4
BWM-3	60	3-1/2	12	3-1/4

HOPPER SIZE	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"H" DIM
2 CU FT	20	28	18	22	34
5 CU FT	26	28	24	27	41





POSIBIN/FEEDER BATCH SCALING SYSTEM

When feed rates are very high and the storage capacity exceeds the standard BW-P and BW-L capabilities, a POSIBIN/FEEDER batch scaling system may be used. In this arrangement, any size Posibin can be combined with any of our standard volumetric screw or belt feeders. Units are then attached to a special mounting frame with appropriately sized load cells. Materials of construction are carbon steel or stainless steel along with all options shown for the Posibins and the volumetric screw and belt feeders.



Metalfab, Inc.

Dry Solids Processing Equipment

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