POWERFLOW™
RB CONVEYOR

Bulletin RB-18

ROUND BOTTOM CONVEYORS

The PowerFlow RB Conveyor is an addition to our highly popular and successful line of PowerFlow En-Masse Conveyors. The PowerFlow RB offers some features not available in other styles of conveyors. The reason most often given for choosing a round bottom style conveyor is cleanout. The close tolerance in the standard contour tail section and the fit of the flights in the trough ensure the minimum amount of material left in the housing between batches of material.

It is the intention of this bulletin to familiarize the reader with the system in general and highlight the various components available to match your installation requirements. A simplified engineering section is included to evaluate conveyor performance but is very limited in its scope. The wide variety of materials, capacities, wear factors and feeding arrangements can have a large effect on conveyor and drive selections. We ask that you discuss your system requirements with us so we may suggest an arrangement best suited to your needs.

THEORY OF OPERATION

Operation of a RB conveyor varies greatly from one application to another. Some conveyors are operated much like a standard En-Masse conveyor where the trough is full of material up to the EZ-Glide return rail and the entire mass moves along with the chain. Other applications, such as those going up a significant incline, may have the trough only partially filled and each paddle moves an individual pile of material along with it. Any given conveyor application will behave differently depending on the type of material handled so we strongly recommend that all but the most simple applications be referred to the factory for analysis.

The conveyor can be fed by one of two methods: **Controlled Feeding** or **Flood Feeding**.

A **Control Fed** conveyor has the capacity determined by a feeding device such as a bucket elevator, another conveyor or a process machine. The conveyor speed is set so that the trough conveying area is never more than 95% full. See Figure 1.

A **Flood Fed** conveyors capacity is determined entirely by the speed of the conveyor. There are three possible methods by which a RB conveyor may be flood fed. It is possible to flood the trough by dumping right into the top and passing through the top chain. This requires an extensive distance between the inlet and the tail however so this method is rarely used. More often the material is fed through a By-Pass Inlet or onto a Pan Feeder. Use of a By-Pass Inlet allows the conveyor to be fed right next to the tail section. See Figure 2 and Figure 3 for examples of these feeding methods.

Figure 1

STD. INLET CONTROL FEEDING

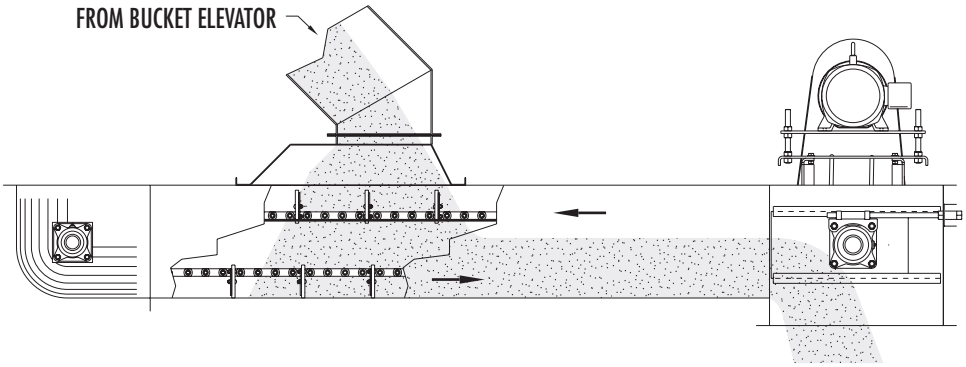


Figure 2

BY-PASS INLET FEEDING

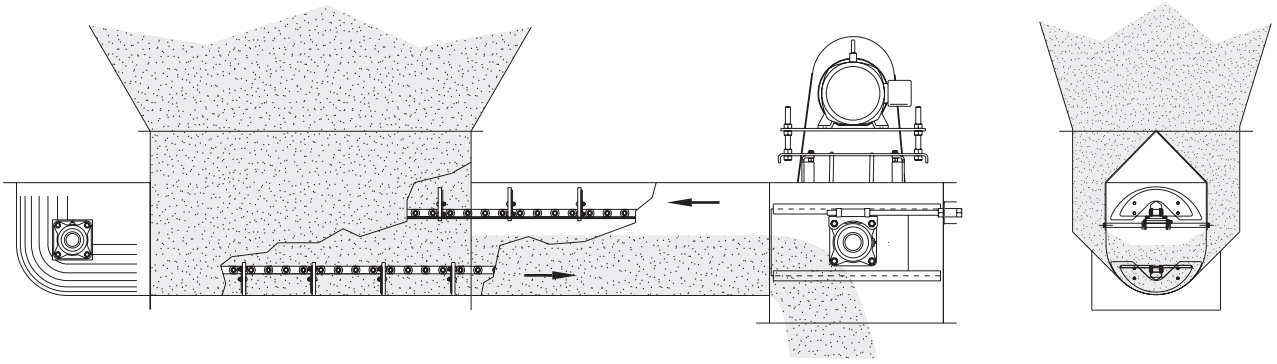
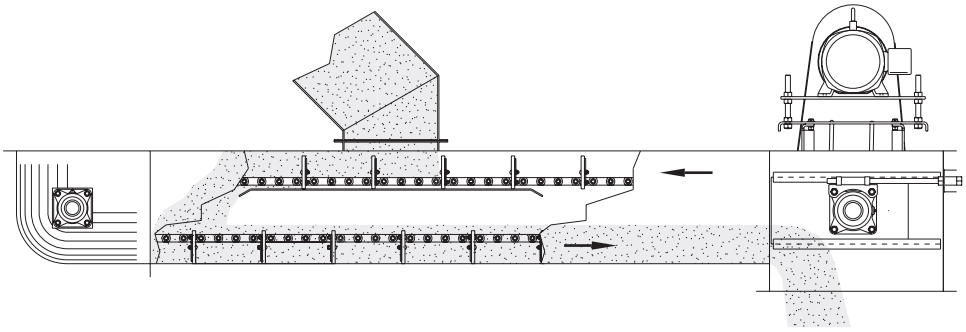


Figure 3

PAN FEEDER INLET



DESIGN ENGINEERING GUIDELINES

The following information is provided as a guide to assist the designer in evaluating the operating characteristics and drive requirements for various conveying applications. It is not intended to provide overall engineering for those not thoroughly familiar with the basic of en-masse conveying.

IMPORTANT

We recommend that all design criteria be presented to factory engineers for evaluation and recommendations.

CONVEYING SPEEDS

In general, the maximum recommended chain speed is 180 FPM. Total conveyor life increases rapidly as this speed is reduced. Severe duty service conveyors should be limited to 120 FPM or less.

CAPACITIES

When flood feeding, the capacity is exactly that of the design tables shown here. In this condition the conveyor is 100% full and capacity is adjusted by regulating the conveyor speed.

When the input is controlled, the conveyor should be run at least 5% faster than the speeds shown to ensure enough capacity within the conveyor housing to eliminate the possibility of material backup or plugging.

MAXIMUM LENGTHS

The maximum length of a PowerFlow RB Conveyor is limited by the pull required on the conveying chain. Since so many factors contribute to chain pull requirements and most applications for RB style conveyors are fairly short in length, no data is shown here for maximum possible lengths. If you have an application for a long RB Conveyor, consult the factory for recommendations.

HORSEPOWER REQUIREMENTS

There are many factors that must be considered when determining horsepower requirements. The formulas shown here represent a compromise of these factors to allow a close approximation. In most cases this will be more than the horsepower actually required. Starting a fully loaded conveyor may require additional horsepower as will long inlets such as found in receiving applications.

$$\mathbf{HP} = \frac{\mathbf{BPH \times Length}}{\mathbf{FF}}$$

HP = Horsepower

FF = Friction Factor for type of material handled

FF = 75,000 for Corn and most cereal grains

FF = 56,000 for soybeans

FF = 26,000 for Fertilizer and feed ingredients such as Salt, Dical, etc.

If inclines are involved additional horsepower must be added.

Calculate this per the following formula.

$$\mathbf{HE} = \frac{\mathbf{BPH \times E}}{\mathbf{30{,}000}}$$

E = Elevation in feet

HE = Additional HP required

Add this to the horsepower obtained above.

INCLINES

Material flowability determines the maximum incline at which a conveyor may be operated. This angle may be increased by modifications such as decreasing the spacing between flights or lowering the depth of material in the trough (only on conveyors that are control fed). Most conveying applications will work without any modifications at an incline of approximately 10 degrees (2-1/8" of rise per foot of run). Consult the factory for incline applications at any angle steeper than this.

INLETS

A number of possible inlet configurations can be used on a RB conveyor. Care must be taken to keep the inlet well in front of the tail sprocket. In some applications it is acceptable to simply cut a hole in the cover of the required spout size. Some applications will require an expanded relief box as shown in the dimension pages. Many flood fed applications will require a By-Pass Inlet or Pan Feeder. Long hoppered inlets from receiving pits or mixers will consume additional horsepower. Factory engineering is available to help with special inlet design and horsepower requirements.

DRIVES

Most applications use shaft mounted drives because of their reliability, efficiency and economy. Other types of drive packages are available such as direct connected reducers or In-Line types with chain drives but the cost is generally quite a bit higher and other obstacles such as how these are mounted must be considered. We can furnish drives of any configuration to suit your application.

EXAMPLE

REQUIREMENTS

A conveyor 50′ long to convey 6,000 BPH of corn is required. It is to be fed from a Bucket Elevator and it will be installed on an incline with the discharge end 3′ higher than the inlet. The application is in a processing facility and will run many hours per week so a conservative speed is desired.

Referring to the Model Selection Chart a 16" conveyor is selected because of its slower speed.

CHECK INCLINE

With the discharge elevated 3′ above the inlet it will be necessary to check the incline to see if it exceeds the 10 degree (or 2-1/8" rise to the foot of run) maximum angle. This can be accomplished by multiplying the elevation (3′) by 12 and dividing by the overall length (50′). The answer (.72" of rise per foot of run) is well below the maximum incline. If the angle had been greater than 10 degrees, a modification of some kind would have been required and factory engineers should be consulted.

COMPUTE HORSEPOWER

Since corn will be conveyed, the friction factor for the HP formula is 75,000. The result then is

$$\frac{\textbf{6,000 x 50′}}{\textbf{75,000}} = \textbf{4.0 HP}$$

The incline will require additional horsepower as described previously.

$$\frac{\textbf{6,000 x 3′}}{\textbf{30,000}} = \textbf{.60 HP}$$

The horsepower required is therefore

4.0 + .60 = **4.60 HP**

Select a 5 HP motor and drive.

CHAIN SPEED & RPM

Since this conveyor is control fed it is necessary to increase the speeds shown in the selection chart at least 5%. Actual operating speed is then:

126 FPM x 1.05 = **132.3 FPM**

53 RPM x 1.05 = **55.65 RPM**

ROUND BOTTOM CONVEYOR MODEL SELECTION CHART

	* CAPACITY IN BPH AT SPEEDS OF							
MODEL	180 FPM	160 FPM	150 FPM	140 FPM	120 FPM	100 FPM	1 FPM	** 1 RPM
RB06	1380	1227	1150	1073	920	767	7.67	8.33
RB09	2718	2416	2265	2114	1812	1510	15.1	19.7
RB12	4620	4107	3850	3593	3080	2567	25.67	50.22
RB14	6360	5653	5300	4947	4240	3533	35.33	69.13
RB16	8580	7627	7150	6673	5720	4767	47.67	113.94
RB18	11040	9813	9200	8587	7360	6133	61.33	186.8
RB20	13500	12000	11250	10500	9000	7500	75	228.43
RB24	20520	18240	17100	15960	13680	11400	114	470.64
RB09IC	2418	2149	2015	1881	1612	1343	13.43	17.52
RB12IC	4128	3669	3440	3211	2752	2293	22.93	44.87
RB14IC	5694	5061	4745	4429	3796	3163	31.63	61.89
RB16IC	7152	6357	5960	5563	4768	3973	39.73	94.98
RB18IC	9216	8192	7680	7168	6144	5120	51.2	155.94
RB20IC	11286	10032	9405	8778	7524	6270	62.7	190.96
RB24IC	16320	14507	13600	12693	10880	9067	90.67	374.31

* ALL THE ABOVE CAPACITIES ARE BASED ON FLOOD FEEDING (CHOKE FEEDING) THE CONVEYOR USING A BYPASS INLET AND AN UNLINED TROUGH. CONTROL FED CONVEYORS MUST OPERATE AT LEAST 5% FASTER.

** THE CAPACITY AT 1 RPM MAY CHANGE FOR OTHER THAN STANDARD PITCH CHAIN.

ROUND BOTTOM CONVEYOR SPECIFICATIONS

MODEL	6	9	12	14	16	18	20	24
STD. CHAIN	CA550	81X	81X	81X	81XHD	81XHD	81XHD	81XHD
STD. FLIGHT SPACING	6.52	10.436	10.436	10.436	10.436	15.654	15.654	15.654
UHMW FLIGHT THICKNESS	3/8	3/8	1/2	1/2	1/2	1/2	1/2	1/2
SPROCKETS	8 TOOTH	6 TOOTH	9 TOOTH	9 TOOTH	11 TOOTH	14 TOOTH	14 TOOTH	19 TOOTH
HEAD SHAFT DIA.	1-7/16	1-7/16	1-15/16	2-7/16	2-7/16	2-15/16	2-15/16	3-7/16
TAIL SHAFT DIA.	1	1-7/16	1-15/16	1-15/16	2-7/16	2-7/16	2-7/16	2-15/16
STD. TROUGH GAUGE	10	10	10	10	10	10	7	7
(OPTIONAL) RETURN SPROCKET	ROLLER	5 TOOTH	5 TOOTH	5 TOOTH	5 TOOTH	6 TOOTH	6 TOOTH	6 TOOTH
RETURN SPROCKET SHAFT	5/8 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.
STD EZ-GLIDE WIDTH	2-1/4	3	3	3	4	4	4	4
EZ-GLIDE SHAFT	5/8 DIA.	5/8 DIA.	5/8 DIA.	5/8 DIA.	5/8 DIA.	3/4 DIA.	3/4 DIA.	3/4 DIA.
# OF RETURNS / 10' TROUGH	3	3	3	3	3	4	4	5

DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

CONVEYOR FEATURES:

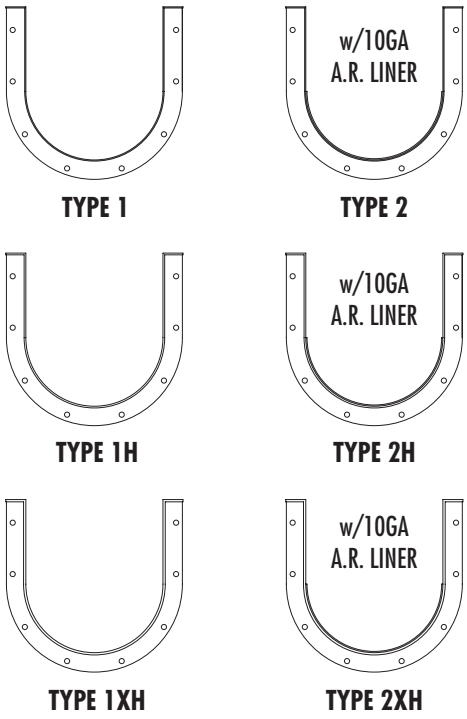
Our RB conveyor troughs are available in several designs to suit your application. See Figure 3. The standard Type 1 formed trough with no liners is carried in stock. Type 1H and 1XH are a heavier gauge. Types 2, 2H and 2XH have bolted 10 ga. A.R. Steel liners in the area shown. The shape of our chain paddles fits both lined and unlined troughs so liners can be retrofit into the conveyor at a later date if desired. See below for trough construction.

TROUGH TYPE	TROUGH MATERIAL THICKNESS
TYPE 1, TYPE 2	10GA FOR RB06-RB18 7GA FOR RB20 & RB24
TYPE 1H, TYPE 2H	7GA FOR RB06-RB18 1/4" THICK FOR RB20-RB24
TYPE 1XH, TYPE 2XH	1/4" THICK FOR RB9-RB18

The dimension tables starting on page 11 show both types of Heads & Tails that are available. Most common is the Take-Up Head and Contour Tail. Some applications may call for a Box Head and Take-Up Tail. The Take-Up Tail is also available with our patented "Detector" device.

Figure 3

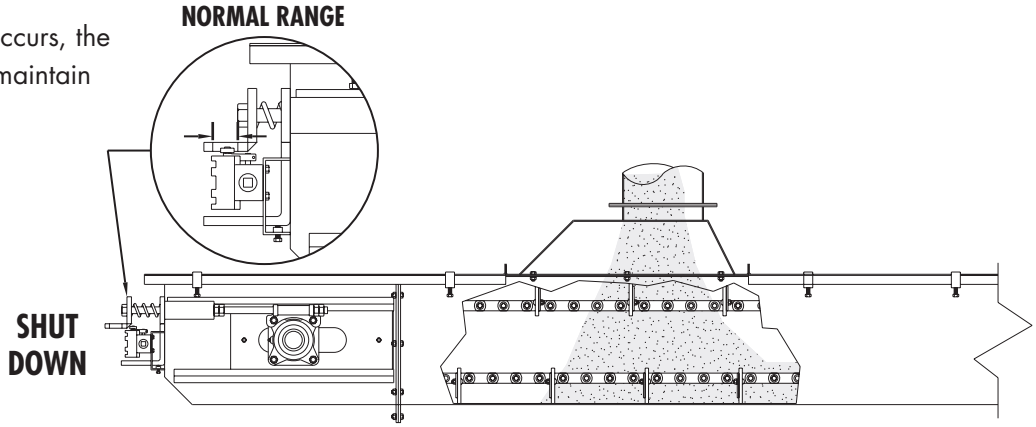
TROUGH CONSTRUCTION TYPES



DETECTOR TAIL

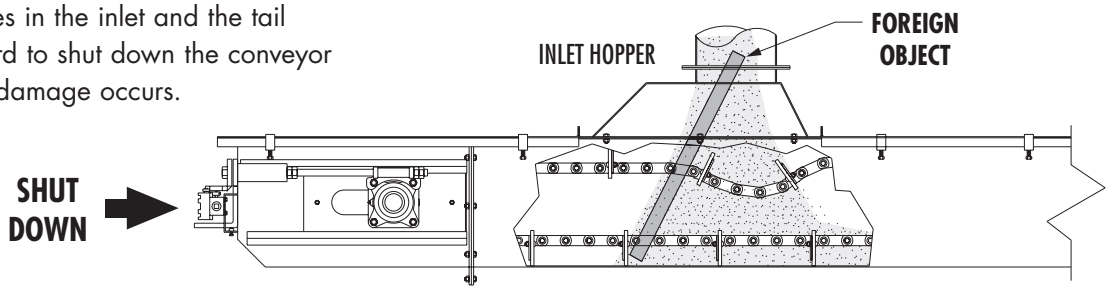
CASE A

As normal chain stretching occurs, the tail sprocket moves back to maintain the proper chain tension.



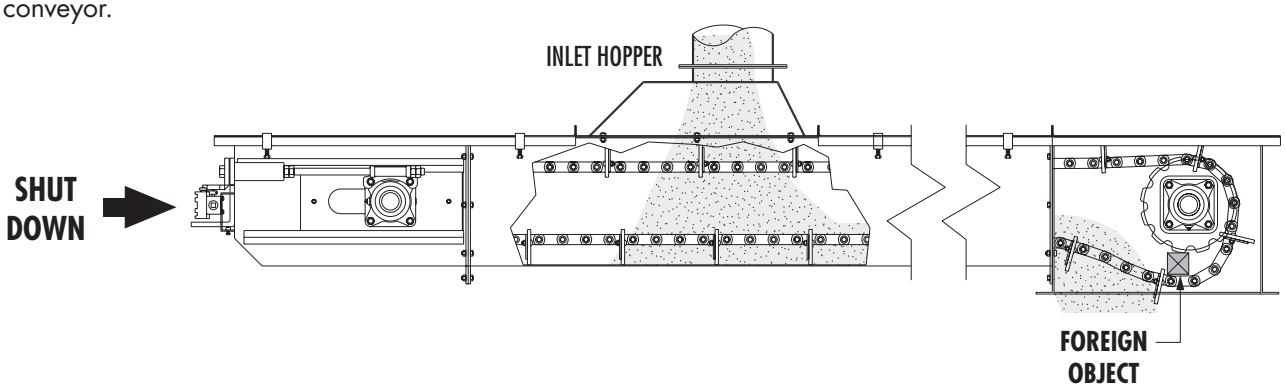
CASE B

A foreign object lodges in the inlet and the tail sprocket moves forward to shut down the conveyor before chain or wing damage occurs.



CASE C

A foreign object conveyed forward would normally break the chain when it entered the sprocket. In this case the tail sprocket moves forward shutting down the conveyor.



ROUND BOTTOM FLOATING TAIL SECTION

Chain and flight conveyors with fixed tail shaft bearings must provide some clearance, usually 1/4" or so, between the chain flight and the tail section floor to minimize the possibility of a jamming material between the flight and floor. This has the disadvantage of the flight leaving material in the tail section after the conveyor feed is shut off.

The floating tail section allows the UHMW flights to constantly scrape the area under the tail sprocket, generally leaving just dust for the wiper flights to clean. The shaft movement is field adjusted to allow for flight wear over time. An obstruction between the flight and floor will move the shaft upward to allow the flight to go over it and let the next flight deal with it.

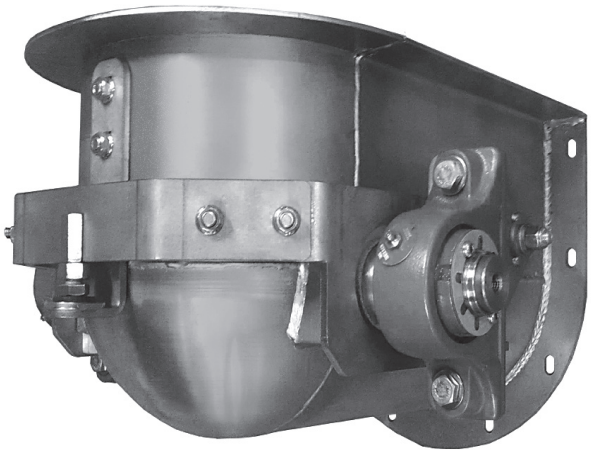
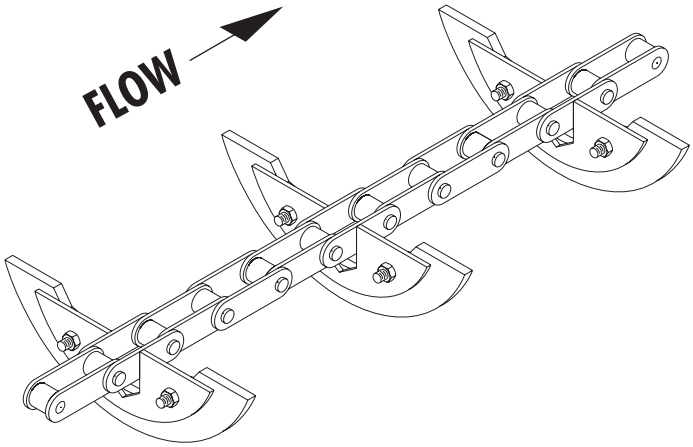


Figure 4

CHAIN

The standard conveyor chain used in most applications is a roller style chain. This type chain provides the longest life span of any type available when handling most materials. For corrosive or highly abrasive materials we recommend using our open barrel pintle style chain. All types of chain have a large metal backing plate welded to the chain as the UHMW paddle attachment (except on the 6" size). See Figure 4. This provides superior strength to other designs of paddle attachments.

81X CHAIN SINGLE FLIGHT

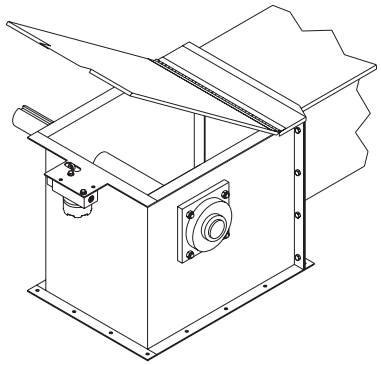


PLUG SWITCHES

It is always a good idea to have your conveyor system protected by a plug switch, whether or not it comes equipped with our Detector Tail. The best location for a plug switch is always as far down-stream as possible from the conveyor. This allows the maximum amount of reaction time to rectify the problem before the conveyor becomes plugged. Since many applications like a pit conveyor dumping into a leg have virtually no space until the next piece of equipment to put a plug switch, we offer several styles of switches mounted in the conveyor housing. Most types and suggested applications are shown below.

HINGED RELIEF COVER

Application notes:

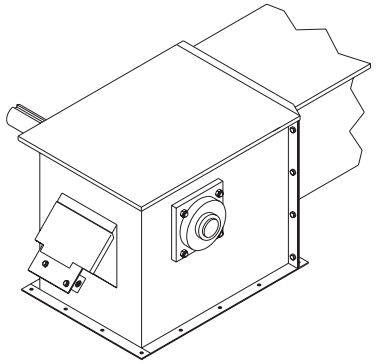


1. Works on both box head or take-up head.
2. Possible interference with motor mount on some sizes.
3. Top flange must be cleaned off after activation so cover will contact switch arm.

USES: LSXYAB4L MICRO-SWITCH

HINGED RELIEF END DOOR

Application notes:

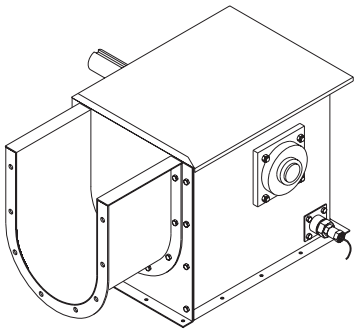


1. For use on all box heads and larger sizes of take-up heads.
2. Weld on take-up head versions may be available on request.

USES: LSXYAB4L MICRO-SWITCH

CAPACITANCE PROBE

Application notes:

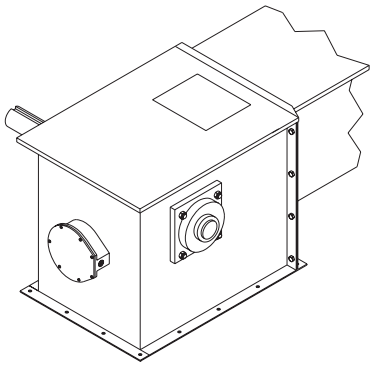


1. Do not use for fill conveyor that has head shut-off gate and reclaim cups.

USES: 4B #BP1V10F SWITCH

DIAPHRAGM SWITCH

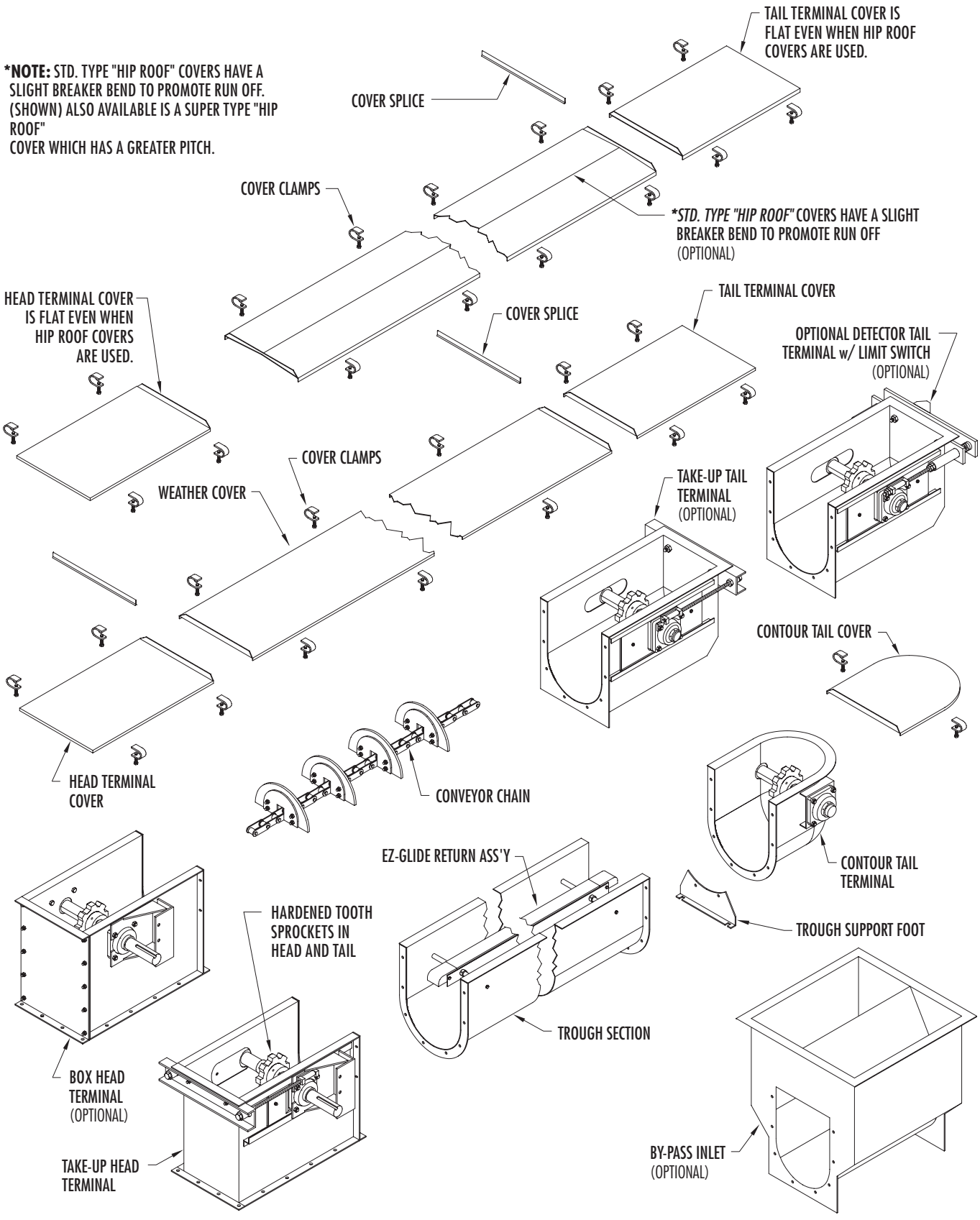
Application notes:



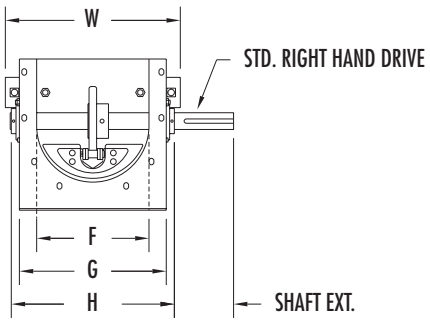
1. Do not use for fill conveyor that has head shut-off gate and reclaim cups.
2. For use on box head only, will not fit on take-up head.
3. Alternate location on top cover would work with reclaim cups but may interfere with some size motor mounts.

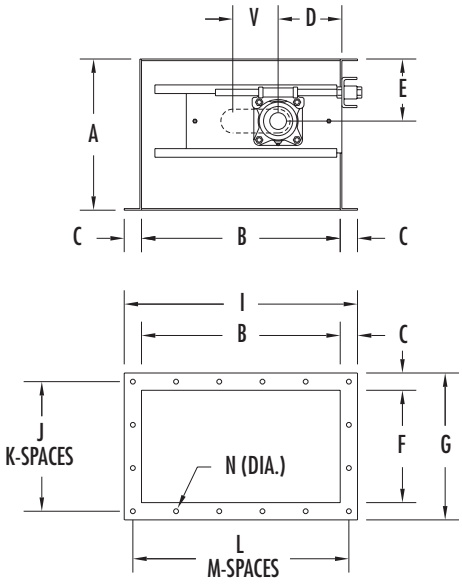
MULTIPLE OPTIONS AVAILABLE

ASSEMBLY OF BASIC COMPONENTS



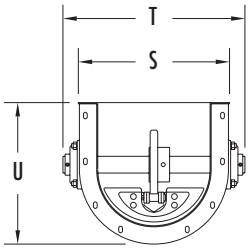
TAKE-UP HEAD - DIMENSIONS (STANDARD)

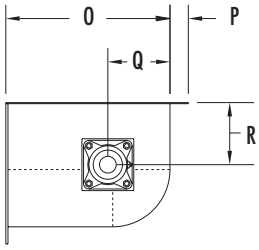




SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	V	W
6	10-1/2	15	1-1/2	4-3/8	4	7	10	12-3/4	18	8-1/2	2	16-1/2	3	7/16	3	14
9	14	20	2	5-5/8	5-7/8	10	14	15-5/8	24	12	2	22	4	7/16	4	16-11/16
12	17-1/2	23	2	7-3/8	7-3/16	13	17	18-7/8	27	15	3	25	5	9/16	5-1/4	20-1/4
14	21	26	2	8-7/16	8-15/16	15	19	21-5/8	30	17	3	28	5	9/16	5-1/4	23-1/8
16	23-1/2	29	2-1/2	9-11/16	10	17	22	23-5/8	34	19-1/2	3	31-1/2	5	9/16	5-1/4	25-1/8
18	26	32	2-1/2	10-15/16	11-1/16	19	24	27-1/2	37	21-1/2	4	34-1/2	6	9/16	5-1/4	28-5/16
20	28-1/2	35	2-1/2	12-1/8	12-7/16	21	26	29-1/2	40	23-1/2	4	37-1/2	6	9/16	5-1/4	30-5/16
24	34-1/2	40	2-1/2	14-3/4	14-3/4	25	30	34	45	27-1/2	5	42-1/2	8	9/16	5-1/4	34-9/16

CONTOUR TAIL - DIMENSIONS (STANDARD)

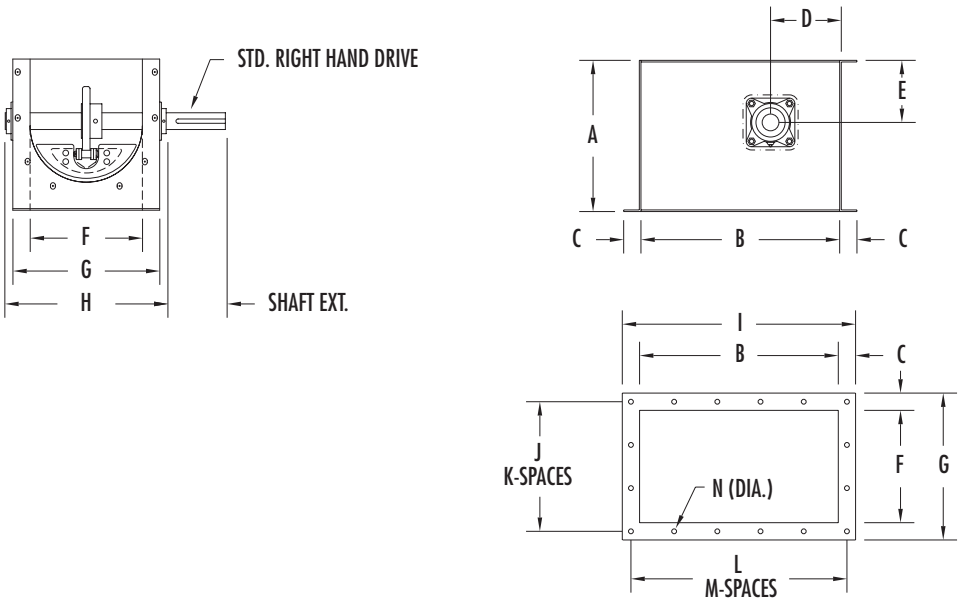




SIZE	O	P	Q	R	S	T	U
6	10	1-1/2	4-1/8	4	10-1/4	12-7/8	9-5/8
9	18	1-3/4	5-5/16	5-3/4	13-3/4	17-1/2	13
12	19	2	7-3/16	7-3/16	17-1/4	21	16-3/8
14	20	2	8-3/8	8-9/16	19-1/4	23-1/4	18-7/8
16	21	2	9-3/4	9-5/8	21-1/4	26-1/4	21-1/4
18	23	2-1/2	11	10-3/4	24-1/4	28-1/4	24-1/4
20	25	2-1/2	12	12-1/4	26-1/4	30-1/4	26-5/8
24	29	2-1/2	14-1/2	14-1/2	30-1/4	37-7/8	31-5/8

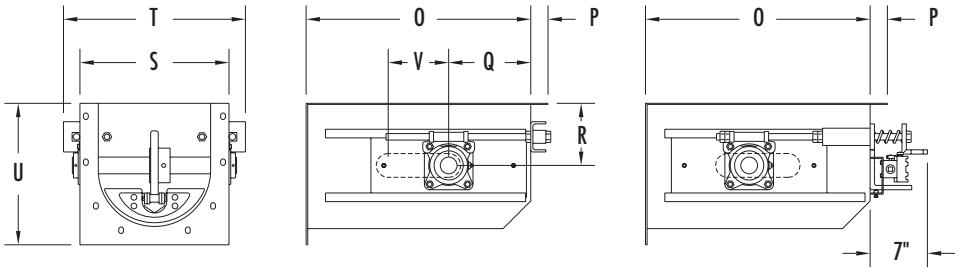
DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

BOX HEAD - DIMENSIONS



SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N
6	10-1/2	15	1-1/2	5	4	7	10	11-7/8	18	8-1/2	2	16-1/2	3	7/16
9	14	20	2	6-3/4	5-7/8	10	14	14-7/8	24	12	2	22	4	7/16
12	17-1/2	23	2	8-3/16	7-3/16	13	17	18-1/8	27	15	3	25	5	9/16
14	21	26	2	9-3/16	8-15/16	15	19	20-7/8	30	17	3	28	5	9/16
16	23-1/2	29	2-1/2	10-7/16	10	17	22	22-7/8	34	19-1/2	3	31-1/2	5	9/16
18	26	32	2-1/2	11-7/8	11-1/16	19	24	26-3/4	37	21-1/2	4	34-1/2	6	9/16
20	28-1/2	35	2-1/2	12-7/8	12-7/16	21	26	28-3/4	40	23-1/2	4	37-1/2	6	9/16
24	34-1/2	40	2-1/2	14-1/2	14-3/4	25	30	33-1/4	45	27-1/2	5	42-1/2	8	9/16

TAKE-UP TAIL - DIMENSIONS

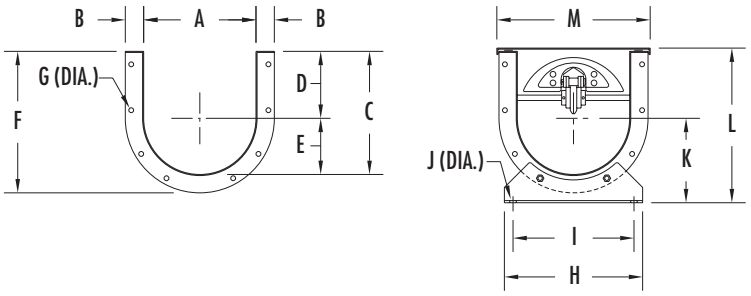


OPTIONAL DETECTOR TAIL

SIZE	O	P	Q	R	S	T	U	V
6	20	1-1/2	7-5/8	4	10-1/4	12-3/8	9-5/8	5
9	26	1-3/4	9-1/2	5-5/8	13-3/4	17-1/2	13	7
12	26	2	9-1/2	7-3/16	17-1/4	21-1/16	16-3/8	7
14	26	2	9-1/2	8-9/16	19-1/4	23-1/16	18-7/8	7
16	29	2	11	9-9/16	21-1/4	25-1/8	21-1/4	7-5/16
18	35	2-1/2	12-3/4	10-13/16	24-1/4	28-1/16	24-1/4	9-7/16
20	35	2-1/2	12-3/4	12-1/4	26-1/4	30-1/16	26-5/8	9-7/16
24	39	2-1/2	15-1/4	14-1/2	30-1/4	34-1/16	31-5/8	9-7/16

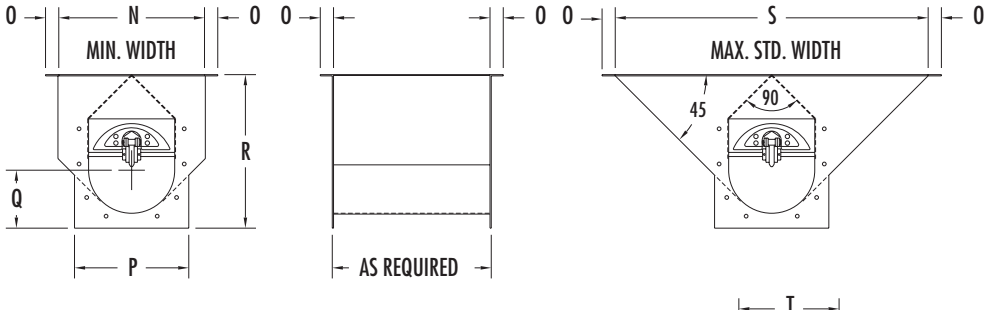
DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

U-TROUGH - DIMENSIONS

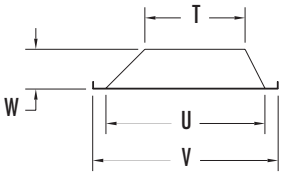


SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M
6	7	1-5/8	8	4-1/2	3-1/2	9-5/8	7/16	10	8-1/8	7/16	5-5/8	10-3/4	10-1/2
9	10	1-7/8	11-1/8	6-1/8	5	13	7/16	12	9-3/8	9/16	7-7/8	14-1/4	14-1/8
12	13	2-1/4	14-1/4	7-3/4	6-1/2	16-3/8	9/16	15	12-1/4	11/16	9-5/8	17-3/4	18-1/8
14	15	2-3/16	16-3/4	9-1/4	7-1/2	18-7/8	9/16	16-1/2	13-1/2	11/16	10-7/8	21-1/4	20-3/16
16	17	2-3/16	19-1/8	10-5/8	8-1/2	21-1/4	11/16	18	14-7/8	11/16	12	23-3/4	22-3/16
18	19	2-3/4	21-5/8	12-1/8	9-1/2	24-1/4	11/16	19-1/8	16	11/16	13-3/8	26-1/4	25-3/16
20	21	2-3/4	24	13-1/2	10-1/2	26-5/8	11/16	22-3/4	19-1/4	13/16	15	28-3/4	27-3/16
24	25	2-3/4	29	16-1/2	12-1/2	31-5/8	11/16	24	20	13/16	18-1/8	34-1/2	31-1/8

CONVEYOR INLET - DIMENSIONS



BY-PASS INLET



STD. INLET

SIZE	N	O	P	Q	R	S	T	U	V	W
6	12	1-1/2	10-1/4	5-1/4	13-1/2	26-3/8	15	24	28-3/8	6
9	18	2	13-3/4	6-7/8	18-1/4	36-7/8	15	24	28-3/8	6
12	22	2	17-1/4	8-3/4	23-3/16	49-1/16	15	24	28-3/8	6
14	25	2	19-1/4	9-13/16	26-3/4	55-1/16	21	30	34-3/8	6
16	28	2-1/2	21-1/4	11-3/16	30-1/2	62-5/8	21	30	34-3/8	6
18	31	2-1/2	24-1/4	12-11/16	34-1/2	70-1/2	21	30	34-3/8	6
20	34	2-1/2	26-1/4	13-5/16	37-1/2	78-1/16	27	36	40-3/8	6
24	40	2-1/2	30-1/4	15-5/16	44-1/2	93-11/16	27	36	40-3/8	6

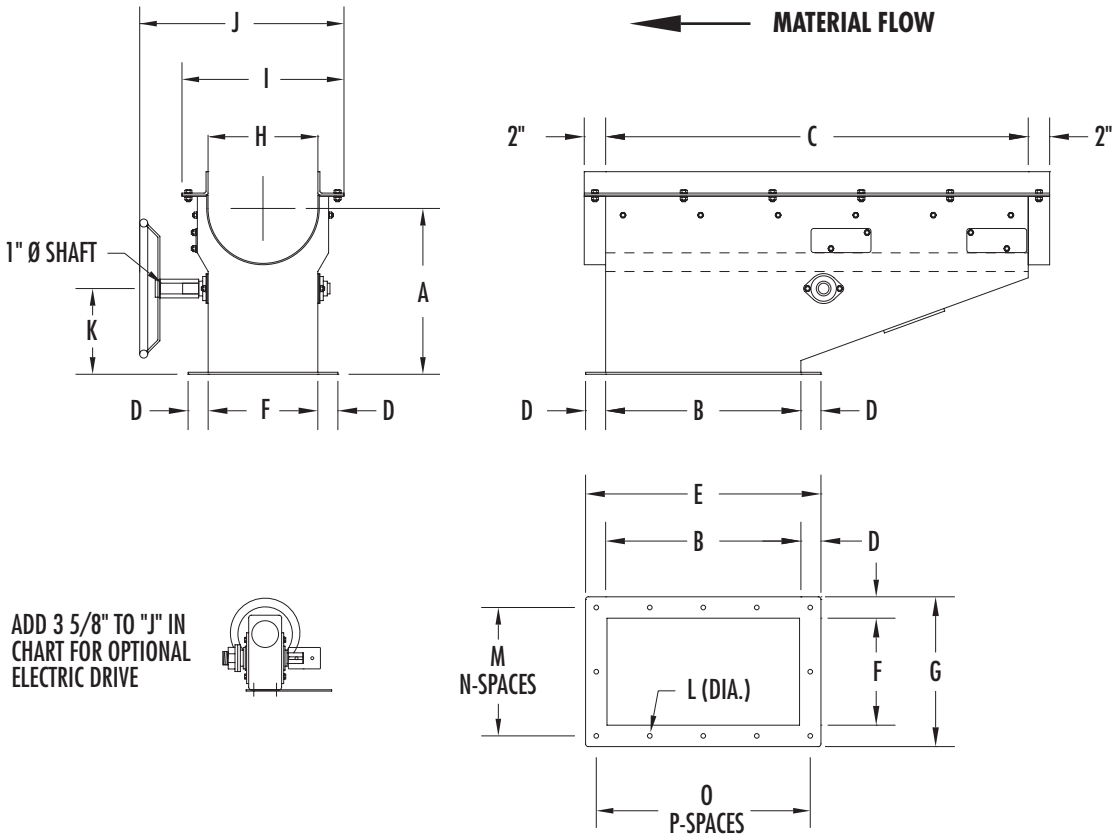
DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

For applications requiring the conveyor to discharge at more than one location we offer several types of Intermediate Discharge. Most popular is the enclosed curved slide style. It may be manually operated or run by Electric, Air or Hydraulic operators. Many modifications of this and other styles are available so contact the factory for details on any other type.

NOTE: USING INTERMEDIATE DISCHARGES ON A ROUND BOTTOM CONVEYOR CAN RESULT IN A SIGNIFICANT AMOUNT OF "CARRYOVER".

PLEASE CONSULT FACTORY ON ALL SUCH APPLICATIONS.

INTERMEDIATE DISCHARGE - DIMENSIONS

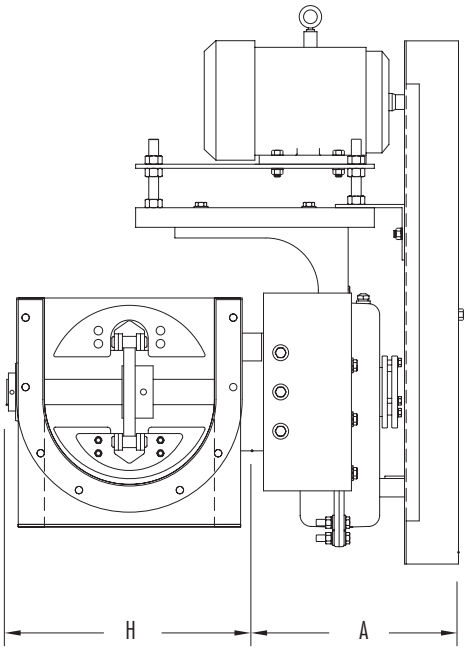


SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
6	11-13/16	12	27-1/2	1-1/2	15	7	10	7-1/4	11-1/4	15-5/8	5-13/16	7/16	8-1/2	2	13-1/2	3
9	15-1/2	18	39-1/2	2	22	10	14	10-1/4	15-1/8	19-1/8	8	7/16	12	2	20	4
12	17-3/4	20	43-1/2	2	24	13	17	13-1/4	18-1/8	22-1/8	8-3/4	9/16	15	3	22	4
14	19-1/2	22	47-1/2	2	26	15	19	15-1/4	20-1/8	24-1/8	9-1/2	9/16	17	3	24	4
16	21-3/16	24	51-1/2	2-1/2	29	17	22	17-1/4	22-1/8	26-1/8	10-3/16	9/16	19-1/2	3	26-1/2	5
18	23-5/8	28	59-1/2	2-1/2	33	19	24	19-1/4	24-1/8	28-1/8	11-5/8	9/16	21-1/2	3	30-1/2	5
20	25-3/8	30	63-1/2	2-1/2	35	21	26	21-3/8	26-1/8	30-1/8	12-3/8	9/16	23-1/2	4	32-1/2	6
24	29-9/16	36	75-1/2	2-1/2	41	25	30	25-3/8	30-1/8	34-1/8	14-9/16	9/16	27-1/2	4	38-1/2	6

DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

DRIVE CLEARANCE - DIMENSIONS

BASED ON DODGE TA SERIES SHAFT MOUNTED REDUCERS



REDUCER SIZE	#TA0	#TA1	#TA2	#TA3	#TA4	#TA5	#TA6
A	12-1/2	13-1/4	14-3/8	16-1/8	17-3/8	18-1/2	19-1/2

NOTE: USE DIMENSION "H" FROM PAGE 11 FOR TAKE-UP HEADS AND PAGE 12 FOR BOX HEADS.

SCHLAGEL

491 North Emerson Street • Cambridge MN 55008-1316 U.S.A.
Toll Free (800) 328-8002 FAX (763) 689-5310
Local / International (763) 689-5991 EMAIL sales@schlagel.com
www.schlagel.com