Twin Pole V-Plough

Installation, Operation and Maintenance Manual

FLEXCO

Twin Pole V-Plough

Purchase Date: _____

Purchased From: _____

Installation Date: _____

This information will be helpful for any future inquiries or questions about belt cleaner replacement parts, specifications or troubleshooting.

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Section 1 - Important Information

1.1 General Introduction

We at Flexco are very pleased that you have selected the Twin Pole V-Plough for your conveyor system.

This manual will help you to understand the operation of this product and assist you in making it work up to its maximum efficiency over its lifetime of service.

It is essential for safe and efficient operation that the information and guidelines presented be properly understood and implemented. This manual will provide safety precautions, installation instructions, maintenance procedures and troubleshooting tips.

If, however, you have any questions or problems that are not covered, please visit our web site or contact our Customer Service Department:

Customer Service: +27-11-608-4180

Visit www.flexco.com for other Flexco locations and products.

Please read this manual thoroughly and pass it on to any others who will be directly responsible for installation, operation and maintenance of this cleaner. While we have tried to make the installation and service tasks as easy and simple as possible, it does however require correct installation and regular inspections and adjustments to maintain top working condition.

1.2 User Benefits

Correct installation and regular maintenance will provide the following benefits for your operation:

- Reduced conveyor downtime
- Reduced man-hour labor
- Lower maintenance budget costs
- Increased service life for the plough and other conveyor components

1.3 Service Option

The Twin Pole V-Plough is designed to be easily installed and serviced by your on-site personnel. However, if you would prefer complete turn-key factory service, please contact your local Flexco Field Engineer or your Flexco Distributor.

Section 2 - Safety Considerations and Precautions

Before installing and operating the Twin Pole V-Plough, it is important to review and understand the following safety information.
There are set-up, maintenance and operational activities involving both ***stationary*** and ***operating*** conveyors. Each case has a safety protocol.

2.1 Stationary Conveyors

The following activities are performed on stationary conveyors:

- Installation
- Tension adjustments
- Blade replacement
- Cleaning
- Repairs

⚠ DANGER

It is imperative that Lockout/Tagout (LOTO) regulations be followed before undertaking the preceding activities. Failure to use LOTO exposes workers to uncontrolled behaviouer of the belt plough caused by movement of the conveyor belt. Severe injury or death can result.

Before working:

- Lockout/Tagout the conveyor power source
- Disengage any takeups
- Clear the conveyor belt or clamp securely in place

⚠ WARNING

Use Personal Protective Equipment (PPE):

- Safety eyewear
- Hardhats
- Safety footwear

Close quarters, springs and heavy components create a worksite that compromises a worker's eyes, feet and skull. PPE must be worn to control the foreseeable hazards associated with conveyor ploughs. Serious injuries can be avoided.

2.2 Operating Conveyors

There are two routine tasks that must be performed while the conveyor is running:

- Inspection of the cleaning performance
- Dynamic troubleshooting

⚠ DANGER

Every plough is an in-running nip hazard. Never touch or prod an operating plough. Plough hazards may cause instantaneous amputation and entrapment.

⚠ WARNING

Never adjust anything on an operating plough. Unforeseeable belt projections and tears can catch on ploughs and cause violent movements of the plough structure. Flailing hardware can cause serious injury or death.

⚠ WARNING

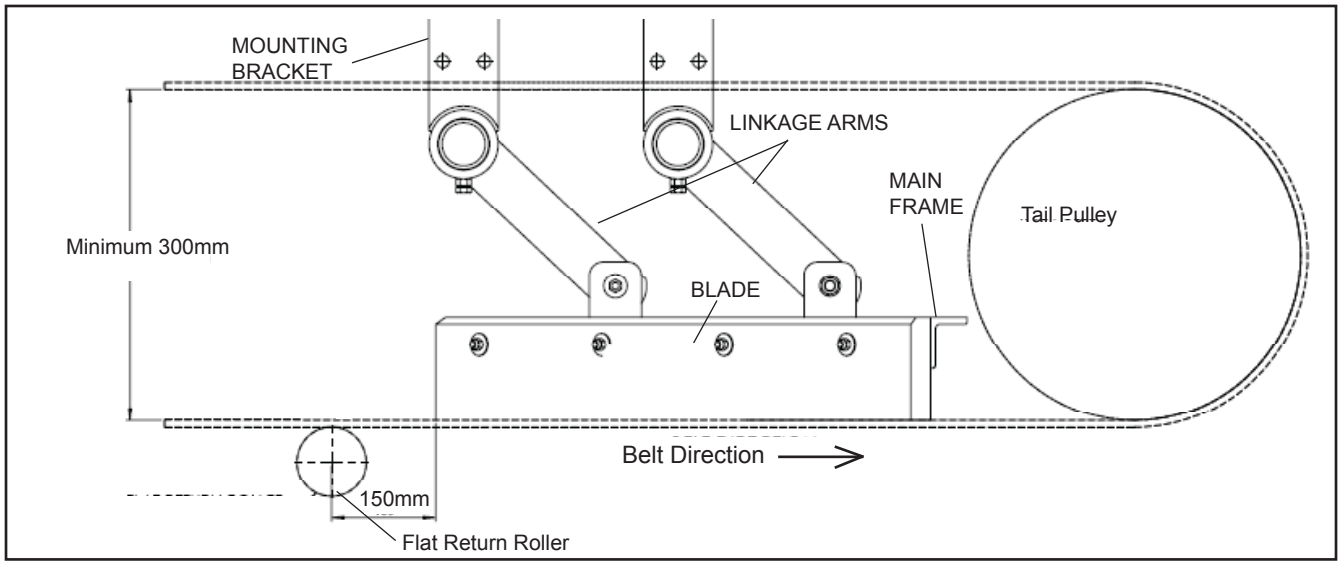
Ploughs can become projectile hazards. Stay as far from the plough as practical and use safety eyewear and headgear. Missiles can inflict serious injury.

Section 3 - Pre-installation Checks and Options

3.1 Checklist

- Check that the plough size is correct for the beltline width
- Check the product packaging and make sure all the parts are included
- Review the “Tools Needed” list on the top of the installation nstructions
- Check the conveyor site:
  - Are there obstructions that may require plough location adjustments
  - Ensure proper clearance is available between topside and returnside belts (350mm

Section 4 - Installation Instructions - Twin Pole V-Plough



Physically lock out and tag the conveyor at the power source before you begin installation.

Before Installation: Ideally the Twin Pole V-Plough should be positioned in a flat area on the inside of the belt close to the tail pulley. For optimum cleaning performance, the nose of the plough should be located about 150mm behind a return roller.

Tools Needed:
- 14mm spanner
- 13mm spanner
- 19mm spanner
- 24mm spanner

STEP 1. Measure the distance between the top side and return belts. A minimum of 350mm is required (Fig. 1). Place the Twin Pole V-Plough on the belt, positioned as specified above, to check for any clearance or obstruction problems.

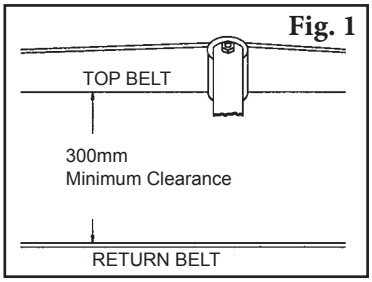


Fig. 1

STEP 2. Position the mounting brackets in either a horizontal or vertical position. The centre line of the poles must be within a range of 280mm to 440mm above the return belt to insure proper performance (Fig. 2a). **IMPORTANT:** The main linkage arms must be operated in a range between a minimum of 18° and a maximum of 59° (Fig. 2b). This allows the Twin Pole V-Plough to float on the belt.

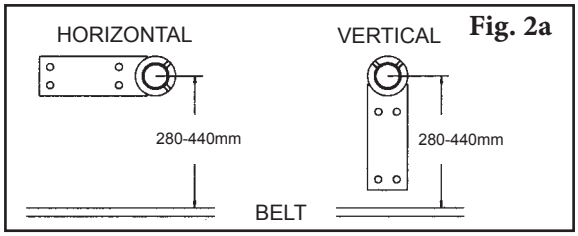


Fig. 2a

Tip: For very fast belts (over 3m per sec) it pays to kick the back end of the parallelogram up 10mm and for very fast belts and widths of 1200mm and over an extra 10mm for a max of 20mm. The surface area at the rear of the V has more friction area and hence with the speed of the belt, the nose or front section of the V tends to lose contact with the belt.

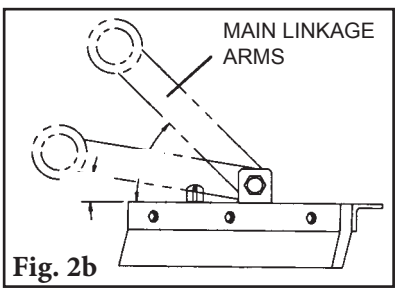
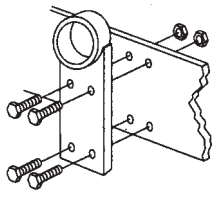


Fig. 2b

Section 4 – Installation Instructions (cont.)

STEP 3. Mark and drill holes for the mounting brackets.
Attach with 16 mm bolts, washers, and nuts provided (Fig. 3). Welding is optional.

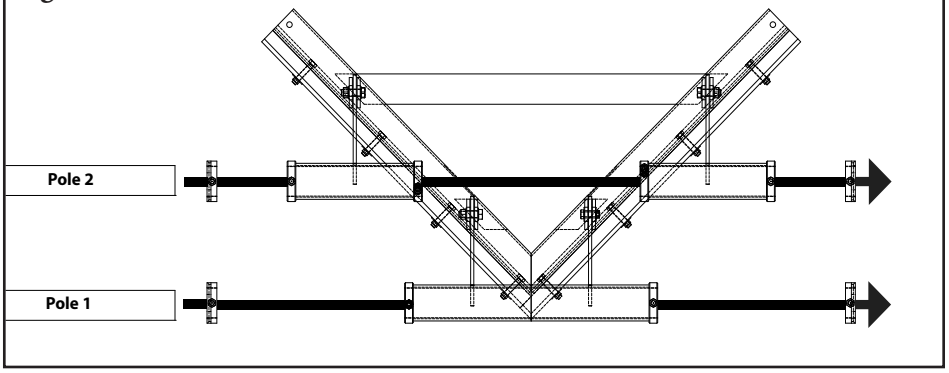
Fig. 3



STEP 4. Centre the Twin Pole V-Plough on the belt.
Slide the plow in the direction needed to centre it on the belt. Once centred, the front pole can then be mounted.

STEP 5. Install front pole.
Slide the front pole through the first / leading bracket. Before feeding pole through second bracket, slide the first collar followed by 2 linkage arms and finally the last collar onto the pole. Finish feeding the pole all the way through both brackets (Fig. 4). Tighten lock bolts and jam nuts once linkage arms are aligned with plough frame (plough is still centred on the belt). Attach the linkage arms to the main body of the plough with the bolts provided (finger tight only).

Fig. 4



STEP 6. Install second pole.
Repeat step 5 ensuring that the plough stays centred on the belt when aligning linkage arms, tightening lock bolts/ jam nuts, and while finger tightening linkage arms to main body.

STEP 7. Check position of plough to belt.
Make sure the unit is central to the stringers and sitting snug to the belt. Be very sure that both front and back linkage arm angles match each other. Once complete, tighten all bolts making sure that the linkage arms are free to move up and down with the belt.

STEP 8. Test run and inspect.
Run the belt and check that the Twin Pole V-Plough runs smoothly and has an effective cleaning action. If any vibration occurs, turn the adjuster to raise the nose slightly.

Section 5 - Pre-Operation Checklist and Testing

5.1 Pre-Op Checklist

- Recheck that all fasteners are tightened properly
- Check the blade location on the belt
- Be sure that all installation materials and tools have been removed from the belt and the conveyor area

5.2 Test Run the Conveyor

- Run the conveyor for at least 15 minutes and inspect the performance
- Make adjustments as necessary

NOTE: Observing the plough when it is running and performing properly will help to detect problems or when adjustments are needed later.

Section 6 - Maintenance

Flexco belt ploughs are designed to operate with minimum maintenance. However, to maintain superior performance some service is required. When the plough is installed a regular maintenance program should be set up. This program will ensure that the plough operates at optimal efficiency and problems can be identified and fixed before the plough stops working.

All safety procedures for inspection of equipment (stationary or operating) must be observed. The Twin Pole V-Plough operates near the tail pulley and is in direct contact with the moving belt. Only visual observations can be made while the belt is running. Service tasks can be done only with the conveyor stopped and by observing the correct lockout/tagout procedures.

6.1 New Installation Inspection

After the new plough has run for a few days a visual inspection should be made to ensure the cleaner is performing properly. Make adjustments as needed.

6.2 Routine Visual Inspection (every 2-4 weeks)

A visual inspection of the plough and belt can determine:

- If the belt looks clean or if there are areas that are dirty
- If the blade is worn out and needs to be replaced
- If there is damage to the blade or other belt plough components
- If fugitive material is built up on the plough or in the transfer area
- If there is cover damage to the belt
- If there is vibration or bouncing of the plough on the belt
- Check for buildup on the leading return roll

If any of the above conditions exist, a determination should be made on when the conveyor can be stopped for cleaner maintenance.

6.3 Routine Physical Inspection (every 6-8 weeks)

When the conveyor is not in operation and properly locked and tagged out a physical inspection of the belt plough to perform the following tasks:

- Clean material buildup off of the belt plough blade and frame
- Closely inspect the blade for wear and any damage. Replace if needed.
- Ensure full blade to belt frame contact (tip should have slight clearance)
- Inspect the belt plough pole for damage
- Inspect all fasteners for tightness and wear. Tighten or replace as needed.
- Replace any worn or damaged components
- When maintenance tasks are completed, test run the conveyor to ensure the belt plough is performing properly

6.4 Blade Replacement Inspection

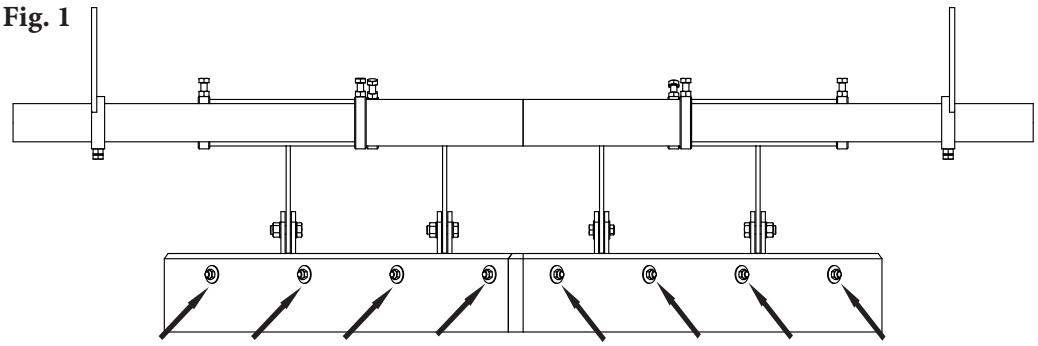
Physically lock out and tag the conveyor at the power source before you begin maintenance.

Tools Needed:
- 14mm spanner
- 13mm spanner
- 19mm spanner
- 24mm spanner

1. Remove bolts and washers indicated in Fig 1. Discard used blade and retain hardware.

2. Install new blade. Use current bolts to secure new blade to main frame (Fig. 1).

Fig. 1



3. Test run and inspect. Run the belt and check that the Twin Pole V-Plough runs smoothly and has an effective cleaning action. If any vibration occurs, turn the adjuster to raise the nose slightly.

Section 6 - Maintenance (cont.)

6.5 Maintenance Log

Conveyor Name/No. _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Section 6 - Maintenance (cont.)

6.5 Plough Maintenance Checklist

Site: _____ **Inspected by**: _____ **Date:** _____

Plough: _____ **Serial Number:** _____

Beltline Information:

Beltline Number: _____ Belt Condition: _____

Belt Width: ☐ 600mm (24") ☐ 750mm (30") ☐ 900mm (36") ☐ 1050mm (42") ☐ 1200mm (48") ☐ 1350mm (54") ☐ 1500mm (60") ☐ 1800mm (72") ☐ 2100mm (84") ☐ 2400mm (96")

Head Pulley Diameter *(Belt & Lagging):*_____ Belt Speed:_____ m/s Belt Thickness: _____

Belt Splice:_____ Condition of Splice:_____ Number of Splices:_____ ☐ Skived ☐ Unskived

Material conveyed: _____

Days per week run:_____ Hours per day run:_____

Blade Life:

Date blade installed:_____ Date blade inspected:_____ Estimated blade life:_____

Is blade making complete contact with belt? ☐ Yes ☐ No

Distance from wear line: Left _____ Middle _____ Right _____

Blade condition: ☐ Good ☐ Grooved ☐ Smiled ☐ Not contacting belt ☐ Damaged

Was Plough Adjusted: ☐ Yes ☐ No

Frame Condition: ☐ Good ☐ Bent ☐ Worn

Lagging: ☐ Side Lag ☐ Ceramic ☐ Rubber ☐ Other ☐ None

Condition of lagging: ☐ Good ☐ Bad ☐ Other_____

Plough's Overall Performance: (Rate the following 1 - 5, 1= very poor - 5 = very good)

Appearance: ☐ Comments:_____

Location: ☐ Comments:_____

Maintenance: ☐ Comments:_____

Performance: ☐ Comments:_____

Other comments: _____

_____

_____

_____

_____

_____

_____

Section 7 - Troubleshooting

Problem	Possible Cause	Possible Solutions
Poor cleaning performance	Plough not making proper contact with belt	Check location of plough to flat return roller
Attaining proper float function	Restriction in movement on linkage arms	Shaft/stop collars may be too tight
Material getting through	Too much space between belt and blade	Check Twin Pole V-Plough nose for proper clearance between nose and belt. Check adjuster arm angles.

Section 8 - Specs and CAD Drawings

8.1 Specs and Guidelines

Twin Pole V-Plough
Belt Width Specifications

BELT WIDTH (Min-Max)	
mm	in.
900	36
1050	42
1200	48
1400	56
1500	60
1600	64
1800	72
2000	80
2200	88
2400	96
2500	100

Use next larger size for belt widths between ranges.

Twin Pole V-Plough
Blade Specifications

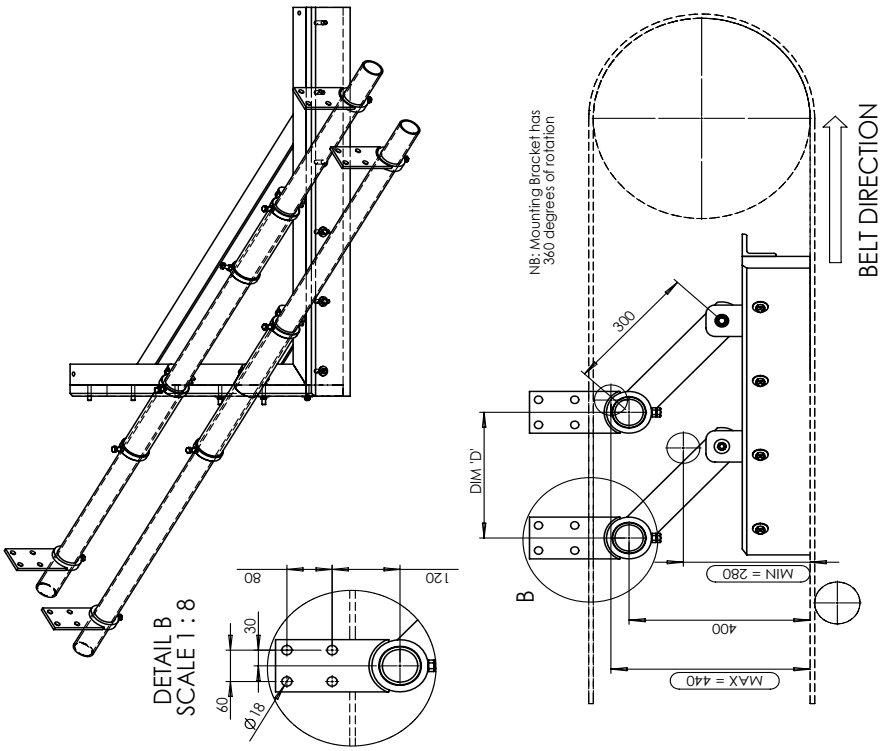
Material	UHMWPE
Durometer	67D
Working Temperature	
Degrees Celcius	-40 to 71
Degrees Farenheit	-40 to 160
Grease & Chemical Resistance	Excellent
Sticky Material Performance	Excellent

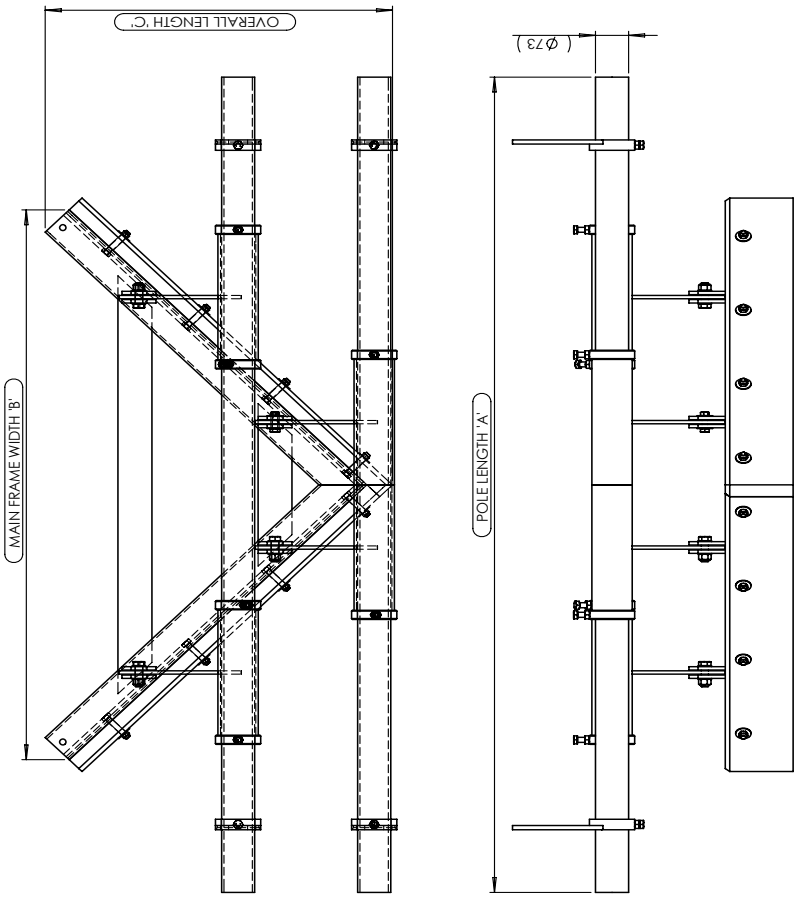
Application Guidelines

- Belt Speed.....6 m/s (1200 fpm)
- Belt Splice.....Mechanically Fastened/Vulcanised
- Belt Speed.....Refer to Flexco
- Belt Direction .....One Way

Section 8 - Specs and CAD Drawings

8.2 CAD Drawings





BELT WIDTH	POLE LENGTH	MAIN FRAME WIDTH	OVERALL LEGNTH	POLE CENTERS	MILD STEEL ORDERING NUMBER	MILD STEEL ITEM CODE	STAINLESS STEEL ORDERING NUMBER	STAINLESS STEEL ITEM CODE
	A	B	C	D				
900	1650	1000	600	300	HBP-TP-900	A2283	HBP-TP-900 S/S	A2474
1050	1800	1150	675	300	HBP-TP-1050	A2284	HBP-TP-1050 S/S	A2475
1200	1950	1300	750	300	HBP-TP-1200	A2285	HBP-TP-1200 S/S	A2476
1400	2200	1500	850	300	HBP-TP-1400	A2286	HBP-TP-1400 S/S	A2477
1500	2350	1600	900	300	HBP-TP-1500	A2287	HBP-TP-1500 S/S	A2478
1600	2450	1700	950	300	HBP-TP-1600	A2288	HBP-TP-1600 S/S	A2479
1800	2650	1900	1050	600	HBP-TP-1800	A2289	HBP-TP-1800 S/S	A2480
2000	2850	2100	1150	600	HBP-TP-2000	A2290	HBP-TP-2000 S/S	A2481
2200	3050	2300	1250	600	HBP-TP-2200	A2291	HBP-TP-2200 S/S	A2482
2400	3250	2500	1350	830	HBP-TP-2400	A2292	HBP-TP-2400 S/S	A2483
2500	3350	2600	1400	830	HBP-TP-2500	A2293	HBP-TP-2500 S/S	A2484
2600	3450	2700	1450	830	HBP-TP-2600	A2398	HBP-TP-2600 S/S	CONTACT FLEXCO
2800	3650	2900	1550	830	HBP-TP-2800	A2550	HBP-TP-2800 S/S	CONTACT FLEXCO
3000	3850	3100	1650	830	HBP-TP-3000	CONTACT FLEXCO	HBP-TP-3000 S/S	CONTACT FLEXCO
3200	4050	3300	1750	830	HBP-TP-3200	CONTACT FLEXCO	HBP-TP-3200 S/S	CONTACT FLEXCO

Section 9 - Replacement Parts

9.1 Replacement Parts List

Replacement Parts

		POWDER COATED			STAINLESS STEEL		
DESCRIPTION	BELT WIDTH mm	ORDERING NUMBER	ITEM CODE	WT. KGS.	ORDERING NUMBER	ITEM CODE	WT. KGS.
PL Pole	900	HBP900-PL-TP	A2294	14.0	HBP900-PL-TP-S/S	A2492	15.0
	1050	HBP1050-PL-TP	A2295	15.0	HBP1050-PL-TP-S/S	A2493	16.0
	1200	HBP1200-PL-TP	A2296	16.0	HBP1200-PL-TP-S/S	A2494	17.0
	1400	HBP1400-PL-TP	A2297	18.0	HBP1400-PL-TP-S/S	A2495	19.0
	1500	HBP1500-PL-TP	A2298	20.0	HBP1500-PL-TP-S/S	A2496	21.0
	1600	HBP1600-PL-TP	A2299	21.0	HBP1600-PL-TP-S/S	A2497	22.0
	1800	HBP1800-PL-TP	A2300	22.0	HBP1800-PL-TP-S/S	A2498	23.0
	2000	HBP2000-PL-TP	A2301	24.0	HBP2000-PL-TP-S/S	A2499	25.0
	2200	HBP2200-PL-TP	A2303	26.0	HBP2200-PL-TP-S/S	A2500	27.0
	2400	HBP2400-PL-TP	A2302	28.0	HBP2400-PL-TP-S/S	A2501	29.0
	2500	HBP2500-PL-TP	A2304	29.0	HBP2500-PL-TP-S/S	A2502	30.0
Frame	900	HBP900-MF-TP	A2305	26.0	HBP900-MF-TP-S/S	A2504	27.0
	1050	HBP1050-MF-TP	A2306	28.0	HBP1050-MF-TP-S/S	A2505	29.0
	1200	HBP1200-MF-TP	A2307	30.0	HBP1200-MF-TP-S/S	A2506	31.0
	1400	HBP1400-MF-TP	A2308	33.0	HBP1400-MF-TP-S/S	A2507	34.0
	1500	HBP1500-MF-TP	A2309	34.0	HBP1500-MF-TP-S/S	A2508	35.0
	1600	HBP1600-MF-TP	A2310	35.5	HBP1600-MF-TP-S/S	A2509	36.5
	1800	HBP1800-MF-TP	A2311	38.0	HBP1800-MF-TP-S/S	A2510	39.0
	2000	HBP2000-MF-TP	A2312	41.0	HBP2000-MF-TP-S/S	A2511	42.0
	2200	HBP2200-MF-TP	A2314	44.0	HBP2200-MF-TP-S/S	A2512	45.0
	2400	HBP2400-MF-TP	A2313	52.0	HBP2400-MF-TP-S/S	A2513	53.0
	2500	HBP2500-MF-TP	A2315	54.0	HBP2500-MF-TP-S/S	A2514	55.0
Blades	900	HBP900-B-TP	A2316	4.5			
	1050	HBP1050-B-TP	A2317	5.0			
	1200	HBP1200-B-TP	A2318	5.5			
	1400	HBP1400-B-TP	A2319	6.3			
	1500	HBP1500-B-TP	A2320	7.0			
	1600	HBP1600-B-TP	A2321	7.5			
	1800	HBP1800-B-TP	A2322	8.2			
	2000	HBP2000-B-TP	A2323	9.0			
	2200	HBP2200-B-TP	A2325	9.8			
	2400	HBP2400-B-TP	A2324	10.7			
	2500	HBP2500-B-TP	A2326	11.2			
Linkage Arm	900-2500	HBP-LA-TP	A2330	5.0	HBP-LA-TP-S/S	A2515	5.0
Mounting Bracket	900-2500	HBP-MB-TP	73922	2.1	HBP-MB-TP-S/S	A1155	2.1
Shaft Collar	900-2500	HBP-SC-TP	74490	0.7	HBP-SC-TP-S/S	A2189	0.7

Section 10 - Other Flexco Conveyor Products

Flexco provides many conveyor products that help your conveyors to run more efficiently and safely. These components solve typical conveyor problems and improve productivity. Here is a quick overview on just a few of them:

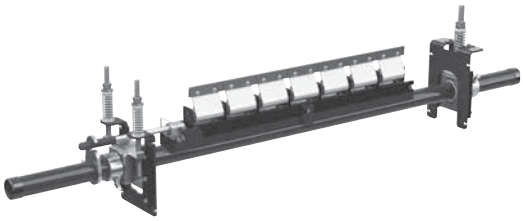
EZP1 Precleaner

- Patented ConShear™ blade renews its cleaning edge as it wears
- Visual Tension Check™ for optimal blade tensioning and simple retensioning
- Quick and easy one-pin blade replacement
- Material Path Option™ for optimal cleaning and reduced maintenance

Flexco Slider/Impact Beds

- Adjusting troughing angles for easy installation and adjustability
- Long-wearing UHMW for sealing the load zone
- Offered in both Light & Medium duty designs to affordably fit your application

MHS Secondary Cleaner



- Long-wearing tungsten carbide blades for superior cleaning efficiency
- Patented FormFlex™ cushions independently tension each blade to the belt for consistent, constant cleaning power
- Easy to install, simple to service
- Works with Flexco mechanical belt splices

PT Max™ Belt Trainer

- Patented "pivot & tilt" design for superior training action
- Dual sensor rollers on each side to minimise belt damage
- Pivot point guaranteed not or freeze up
- Available for topside and return side belts

Flexco Specialty Belt Cleaners

- "Limited space" cleaners for tight conveyor applications
- High Temp cleaners for severe, high heat applications
- A rubber fingered cleaner for chevron and raised rib belts
- Multiple cleaner styles in stainless steel for corrosive applications

The Flexco Vision

To become the leader in maximising
belt conveyor productivity for our customers worldwide
through superior service and innovation.

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Visit **www.flexco.com** for other Flexco locations and products.