

### ADVANTAGES:

- Available for belt widths 24” to 36” (610mm -914mm)
- Quick cycle times compatible with belt speeds ranging from 90 - 240 FPM (27.43 - 73.15 m/min)
- Two models available
- Effective and efficient sortation solution

### OVERVIEW:

The G&S Vertical Sortation Device (VSD) is a gentle, effective means of diverting or merging baggage in airport baggage handling systems. Typically preceded by one or more queue conveyors that control flow and optimize baggage spacing, the VSD redirects baggage in a vertical orientation, thus accommodating systems where space saving solutions are required.

Used as a vertical *sorter*, the VSD transfers baggage from one input conveyor to one of two adjacent vertically aligned outfeed conveyors that are positioned vertically one above another. For vertical *merging*, the VSD integrates the flow from two conveyors, which are aligned vertically one above the other, to a single outfeed conveyor.

Baggage is redirected by alternating the positions of two of three conveyors that are designed to pivot concurrently in opposing directions. When baggage is routed to or from the upper line, the two pivoting conveyors align together, providing a direct path between the two connecting conveyors. When baggage is redirected to or from the lower line, one conveyor aligns itself with a fixed conveyor, and the second is pivoted out of the way, providing a clear route between the two adjacent conveyors.

Each conveyor is capable of redirecting baggage of varying sizes as large as 120 pounds (54.43kg), including baggage tubs and golf clubs.



Quick cycle times are accomplished by counter-balancing one lightweight conveyor against the other, minimizing physical inertia, and producing a smooth and efficient actuating motion. As a result, this simple design is capable of cycle times of 0.6 seconds, translating to a capacity of 40 bags per minute (2260 bags per hour) running at 320 feet per minute (97.54 m/min) with 96” (2438mm”) front-to-front baggage gaps.

To better accommodate the varying needs of airport configurations and capacities, G&S Airport Conveyor offers the Vertical Sortation Device in two models:

- **VSD-1450** – standard design for use on systems requiring a baggage flow of 1480 bags per hour or less.
- **VSD-2200** – high-speed design capable of 2260 bags per hour.

### GENERAL

Consisting of a structural outer frame, one fixed and two pivoting paddle conveyors, power, transmission, and cycling components, and protective guarding to ensure safe operation, each unit is transported from the factory fully tested and assembled and ready to install.

Each conveyor belt is *driven* with a single synchronous belt and sprocket configuration that is powered by a dedicated drive coupled with a variable frequency drive (VFD). The result is individually powered queue conveyors that assist in baggage tracking and ensure baggage is transferred effectively.

The pivoting conveyors *cycle up and down* using a simple actuator / connecting arm mechanism that is controlled using inductive proximity switches that ensures the paddle extends and retracts for repeated and reliable operations. The cycling mechanism is powered by a dedicated gear motor and is combined with a variable frequency drive (VFD), providing full adjustment of acceleration, deceleration, and cycle rates on the actuating mechanism. This results in a simple and reliable system that eliminates the need for any clutch / brake modules.

#### **CONTROLS**

Each VSD is equipped with its own electrical control panel, functioning as a stand-alone subsystem with its own integrated controls. This approach simplifies overall system controls and requires only feed power supply and I/O signals from the Baggage Handling System to trigger each cycle.

Safeguards are built into the VSD through the use of strategically placed photo eyes that detect baggage at different stages along the unit. These photo eyes monitor baggage travel and ensure that baggage is not present when the pivoting conveyors are mid-cycle and detect any baggage jams immediately.

#### **FRAME**

- Robust rigid support structure
- Strategically placed attachment points for all components

Constructed using standard structural mild steel sections, the frame is welded in quality controlled jigs and fixtures to guarantee accurate component alignment.

The framework provides a perfect support structure for accurately locating bearings, drive and cycling components. Motor mounts are conveniently positioned in protected, yet accessible locations, while drive components and take-ups are within reach for regular maintenance and adjustments. The structure design also incorporates attachment points for the protective guarding measures, as well as a gantry system to accommodate maintenance on both the conveyors and the cycling mechanism.

All components of the framework structure are painted with a protective, rust-inhibiting grey finish.

#### **GUARDING**

- Lightweight, removable and see-through
- Protection from drive components and pinch-points

By providing removable mesh-covered guard panels on each side of the VSD frame, safety to operators and maintenance personnel is ensured, without limiting visibility of regular device operations. These panels include safety switches that halt system operations when the panels are dislodged or removed. Further guarding is provided over synchronous drive belts and pinch points between the pivoting and fixed conveyors.

#### **PADDLE CONVEYORS**

- Lightweight, minimal design
- 12 gauge side guards, 9" (229mm) high

Each conveyor unit comes complete with a 4" (102mm) diameter roller assembly that is located between precision, self-aligning ball bearings. Power is transmitted to the conveyor belting through the drive roller and oversized shaft assembly, which acts as both the bearing and conveyor pivot point on the frame. The simple, lightweight design of the paddle conveyors minimizes component quantities and is easy to maintain.

#### **CONVEYOR BELTING:**

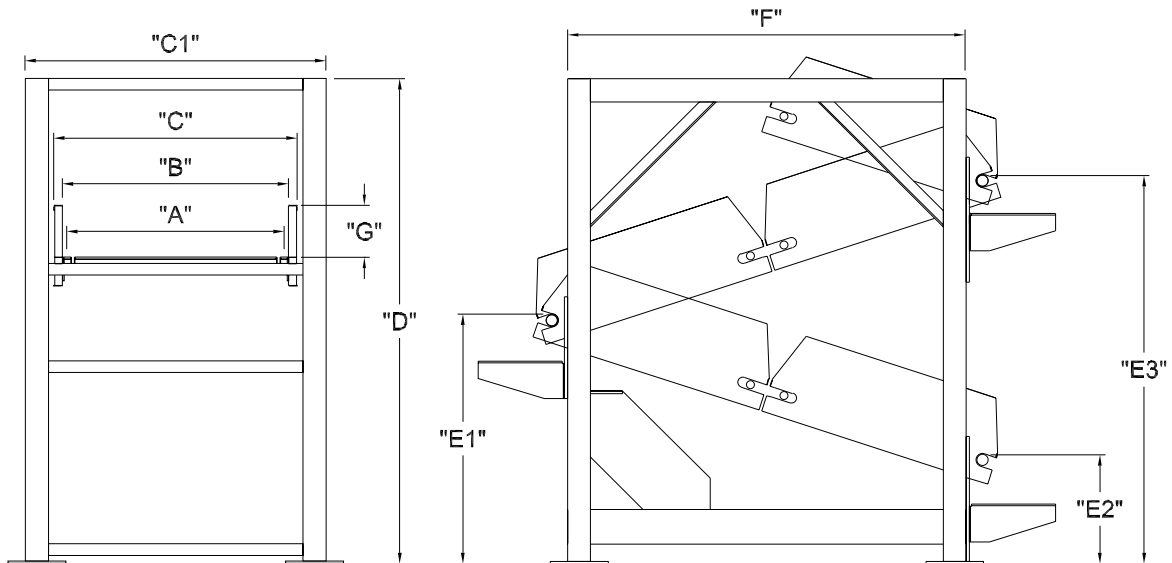
- Black, longitudinally ribbed, 2-ply woven polyester

Belting is joined to form a continuous loop using belt lacing and flexible, nylon-covered steel-cable joiner pins.

#### **MOTOR / REDUCER:**

- SEW Eurodrive constant speed gear motors
- Variable Frequency Drive

All systems are powered by a direct drive motor / gearbox assembly which is selected for reliability, low-noise characteristics, and ease of maintenance. Complimented with a variable frequency drive (VFD), this combination provides full adjustment of cycle rates and conveyor speed, acceleration, and deceleration. This eliminates the need for a clutch / brake module in any of the systems, resulting in simple, reliable operation.

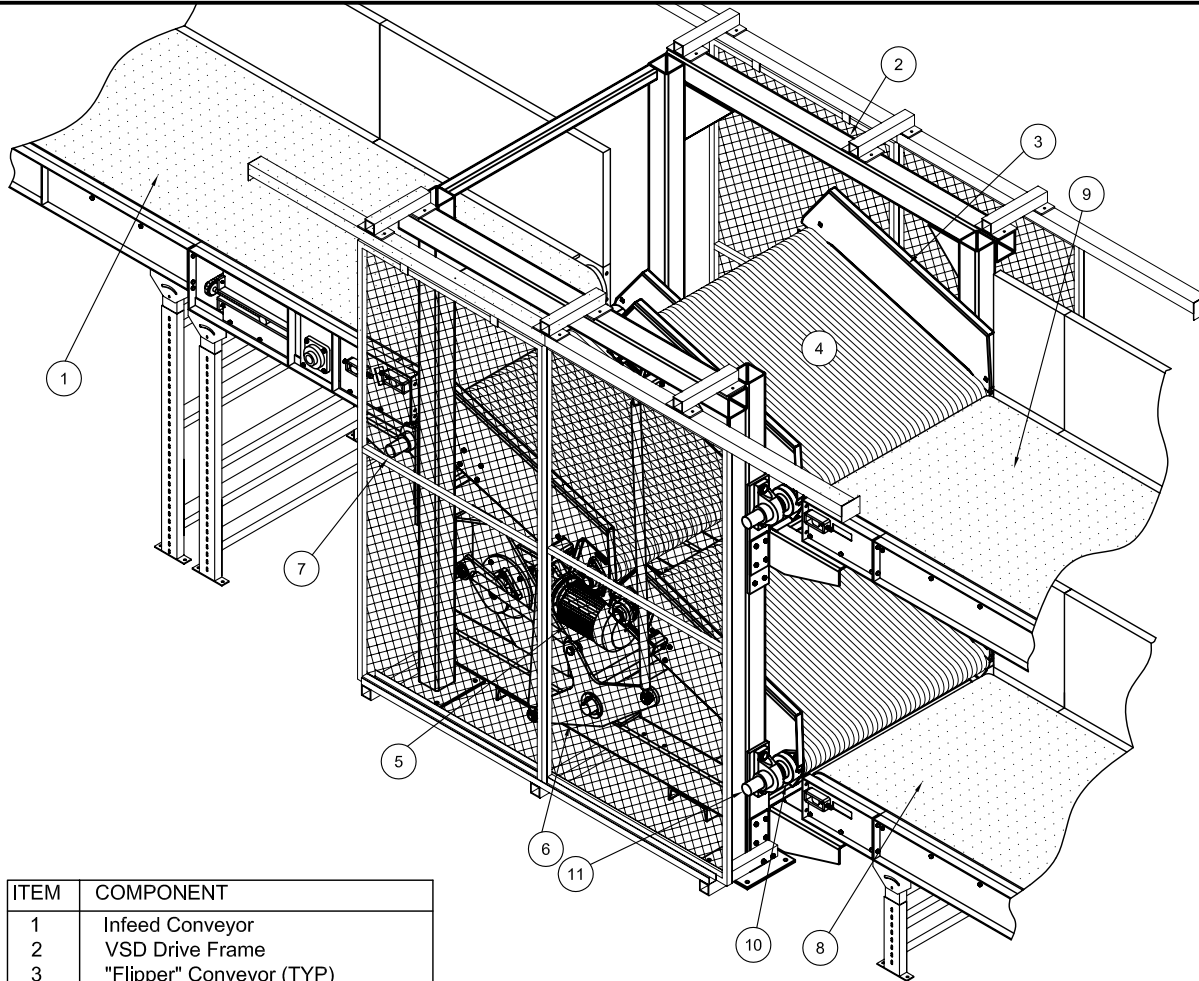


VERTICAL SORTATION DEVICE SPECIFICATIONS	
Description	G&S Standards
<b>Dimensions</b>	
Belt Width ("A")	38" (965mm)
Between Frame Width ("B")	39" (991mm)
Overall Frame Width ("C")	42" (1067mm)
Overall Steel Frame Width ("C1")	52" (1321mm)
Overall Steel Frame Height ("D")	83 <sup>3</sup> / <sub>8</sub> " (2130mm)
Infeed Paddle Height to Floor ("E1")	44 <sup>1</sup> / <sub>4</sub> " (1124mm)
Lower Out-feed Paddle Height to Floor ("E2")	20" (508mm)
Upper Out-feed Paddle Height to Floor ("E3")	68 <sup>3</sup> / <sub>8</sub> " (1737mm)
Conveyor Length ("F")	68 <sup>3</sup> / <sub>8</sub> " (1749mm)
Side Guard Height ("G")	9" (229mm)
<b>Rollers</b>	
Head Roller Dia	Ø4" (102mm)
Tail Roller Dia	Ø4" (102mm)
<b>Specifications</b>	
Speed (Main Belt)	90 ft/min (27.43 m/min) to 320 ft/min (97.54 m/min)
Speed (Paddle Belts)	Proportional to main belt
Load Capacity (Live Load)	40 lbs/ft (59.52 kg/m) maximum
Baggage Rate (bag / hr)	1450-2200

<b>Drive Options</b>		
Standard		
Application	Make	Model
90 Deg. Reducer	SEW Eurodrive	SA - Hollow Shaft ST - TorqLOC

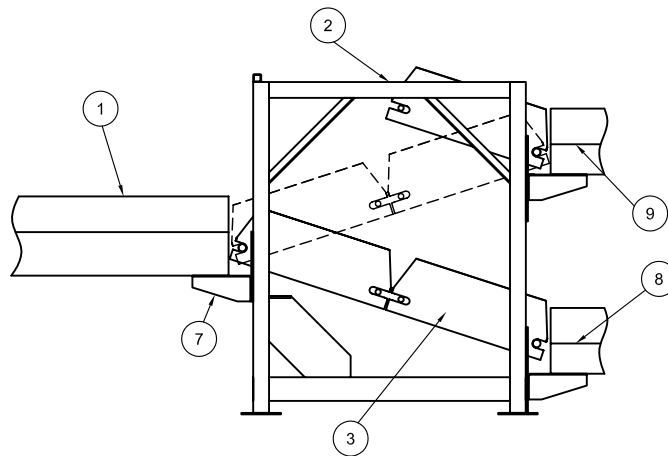
<b>Belting Options</b>				
Standard			Optional	
Application	Make	Model	Make	Model
Paddle Belt	Nitta	BLRB-16A	Ammeraal Beltech	EX 10/2 0+A32 Black AS FR
			Habasit	NSL-11ESBV
			Siegling America	E8/2 U0/V15 LG-FR

**VERTICAL SORTATION DEVICE (VSD)**



TYPICAL ISOMETRIC VIEW

ITEM	COMPONENT
1	Infeed Conveyor
2	VSD Drive Frame
3	"Flipper" Conveyor (TYP)
4	"Flipper" Belt c/w V-Guide (TYP)
5	Motor/Gearbox (TYP)
6	Drive Mechanism
7	Conveyor Mount Bracket
8	Lower Out-feed Conveyor
9	Upper Out-feed Conveyor
10	Bearing (TYP)
11	Flipper Belt Drive Shaft (Typical 3) (Can be Slave Driven or by Individual Drives)



TYPICAL ELEVATION VIEW