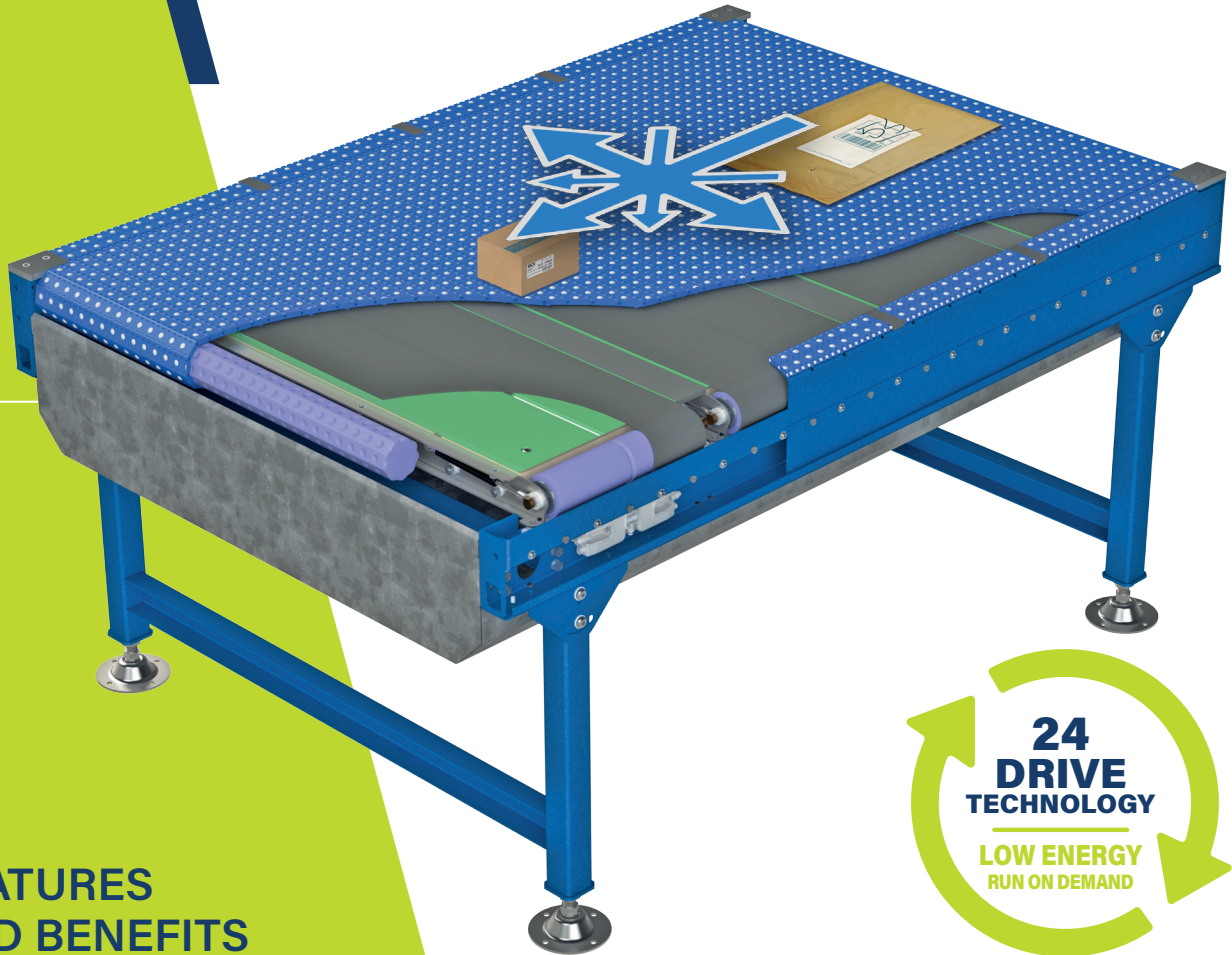


# CU SORT

ALL ANGLE TRANSFER AND DIVERT STATION



## FEATURES AND BENEFITS

- Small ball pitch (only 25mm)
  - this means small packages, jiffy bags, bagged product can be sorted with ease.
- High throughput with multiple belts
  - increasing your sort rates.
- Weight of product(s) up to 30kg.
- Truly versatile - being able to divert and merge in products from all angles up to 90 degrees.
- Can be introduced into existing systems.
- All 24V - meaning no pneumatics, easy controls integration and low energy consumption.
- Low noise ensuring user satisfaction.
- Patent pending NonaDRIVE technology - ensures that the modular ball belt moves truly synchronously with the drive for more accurate product positioning / tracking.

## Specifications

The versatile & scalable transfer & sortation module targeted at e-commerce business requirements.

It uses a unique multi-belt-system for sorting all your small e-commerce products at all angles and in all directions.

Network ready for:



**CONVEYOR UNITS**

QUALITY • PERFORMANCE • RELIABILITY



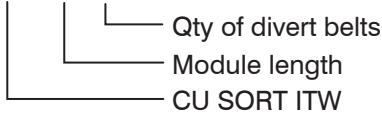
# Introduction

## Overview of Available Sizes

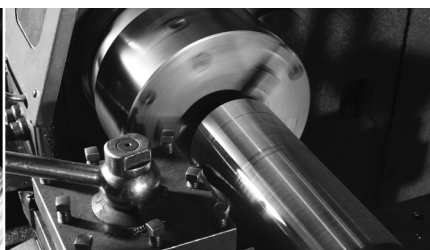
Closest CU Conveyor ITW Can also be used standalone	Divert Belt Configuration			
	Single Divert Belt	Double Divert Belts	Triple Divert Belts	Quad Divert Belts
<b>412</b> CU-SORT 406 ITW <i>Single Motor Nonadrive</i>	16" W x 30" L <i>2 x motors, 1 card</i>			
	CUSORT-0406-0914-1 16" W x 36" L <i>2 x motors, 1 card</i>			
<b>512</b> CU-SORT 559 ITW <i>Single Motor Nonadrive</i>	CUSORT-0559-0762-1 22" W x 30" L <i>2 x motors, 1 card</i>			
	CUSORT-0559-0914-1 22" W x 36" L <i>Dual motor divert belt 3 x motors, 2 cards</i>			
	CUSORT-0559-1067-1 22" W x 42" L <i>Dual motor divert belt 3 x motors, 2 cards</i>	CUSORT-0559-1067-2 22" W x 42" L <i>3 x motors, 2 cards</i>		
<b>612</b> CU-SORT 711 ITW <i>Dual Motor Nonadrive</i>	CUSORT-0711-0914-1 28" W x 36" L <i>Dual motor divert belt 4 x motors, 2 cards</i>			
	CUSORT-0711-1067-1 28" W x 42" L <i>Dual motor divert belt 4 x motors, 2 cards</i>	CUSORT-0711-1067-2 28" W x 42" L <i>4 x motors, 2 cards</i>	CUSORT-0711-1524-3 28" W x 60.7" L <i>5 x motors, 3 cards</i>	CUSORT-0711-1982-4 28" W x 78" L <i>6 x motors, 3 cards</i>
<b>762</b> CU-SORT 863 ITW <i>Dual Motor Nonadrive</i>	CUSORT-0863-1067-1 34" W x 42" L <i>Dual motor divert belt 4 x motors, 2 cards</i>	CUSORT-0863-1067-2 34" W x 42" L <i>4 x motors, 2 cards</i>	CUSORT-0863-1524-3 34" W x 60.7" L <i>5 x motors, 3 cards</i>	CUSORT-0863-1982-4 34" W x 78" L <i>6 x motors, 3 cards</i>
<b>912</b> CU-SORT 940 ITW <i>Dual Motor Nonadrive</i>			CUSORT-0940-1524-3 37" W x 60.7" L <i>5 x motors, 3 cards</i>	CUSORT-0940-1982-4 37" W x 78" L <i>6 x motors, 3 cards</i>
<b>1012</b> CU-SORT 1016 ITW <i>Dual Motor Nonadrive</i>				CUSORT-1016-1982-4 40" W x 78" L <i>6 x motors, 3 cards</i>

**Ref number example**

CUSORT-0406-0762-1



Models highlighted in blue are available on shorter lead times thanks to stocked components.



# Speed ranges & Transfer Capacity



Speed Ranges					
		Eco+ Mode		Boost 8 Mode	
		Min	Max	Min	Max
Modular Ball Belt	Belt Speed	5.0 m/min	50 m/min	5.0 m/min	36.3 m/min
	Product Speed	10.0 m/min	100 m/min	10.0 m/min	72.6 m/min
Divert Belt	Belt and Product Speed	8.1 m/min	82.25 m/min	8.1 m/min	60.0 m/min

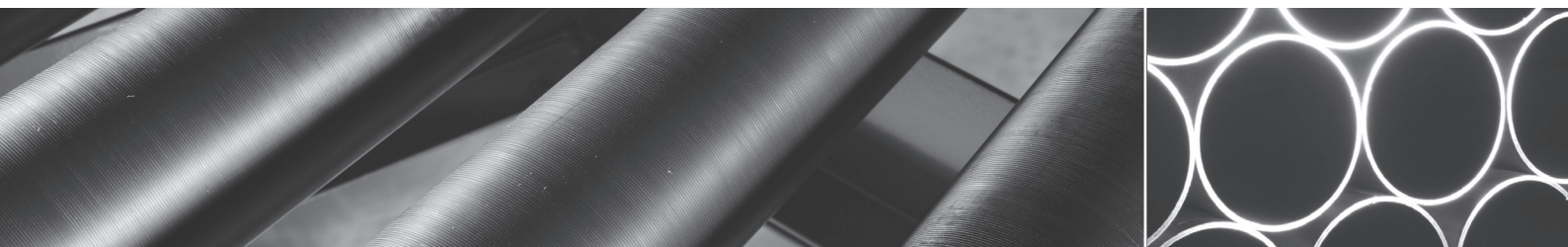
Transfer Capacity - Single Divert Belt Units				
Eco Mode: 3A start, 2.8A nom Boost 8: 8A start, 3.6A nom	Eco+ Mode (2.5A Ave per motor)		Boost 8 Mode (4A Ave per motor)	
	Vectored	90 deg	Vectored	90 deg
Modular Ball Belt (total load)	22Kg		22Kg	
Divert Belt	4Kg		22Kg	22Kg

Transfer Capacity - Multiple Divert Belt Units				
Eco Mode: 3A start, 2.8A nom Boost 8: 8A start, 3.6A nom	Eco+ Mode (2.5A Ave per motor)		Boost 8 Mode (4A Ave per motor)	
	Vectored	90 deg	Vectored	90 deg
Modular Ball Belt (total load)	30Kg*		60Kg**	
Divert Belt	4Kg		30Kg*	30Kg*

\*Loads over 22Kg must be longer than 500mm

\*\* This is the total load capacity for the Modular Ball Belt, NOTE that individual product load must not be greater than 30Kg each.

Load density - Product weight cannot exceed 90g per square inch.



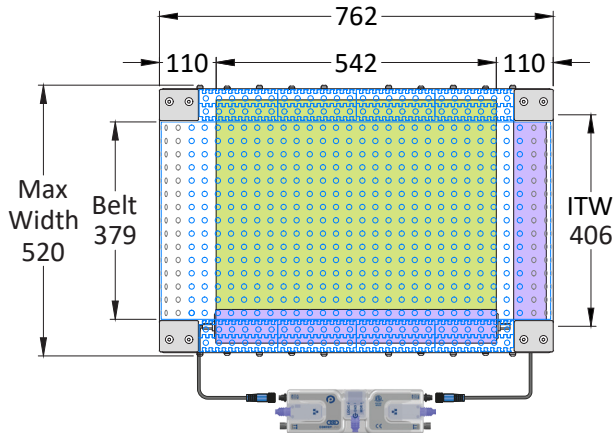


# Dimensions

Motor and control quantities

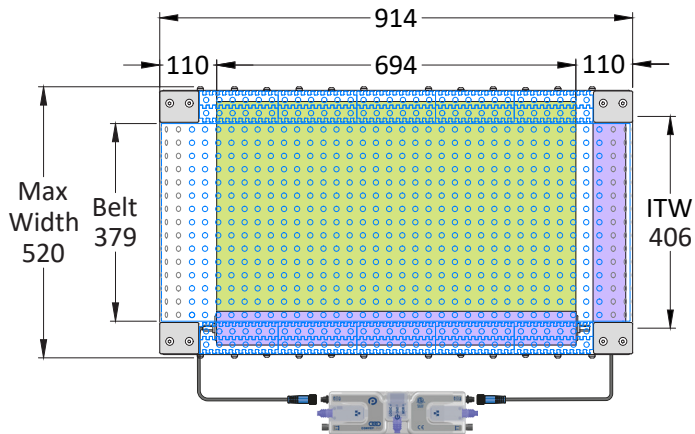
## CUSORT-0406-0762-1

(16" W x 30" L - 2 x motors, 1 x card)



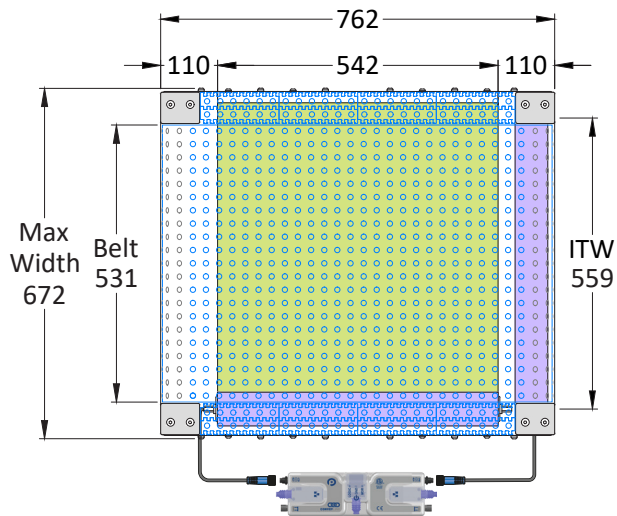
## CUSORT-0406-0914-1

(16" W x 36" L - 2 x motors, 1 x card)



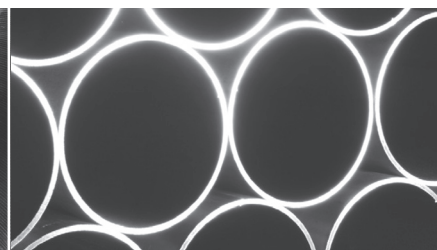
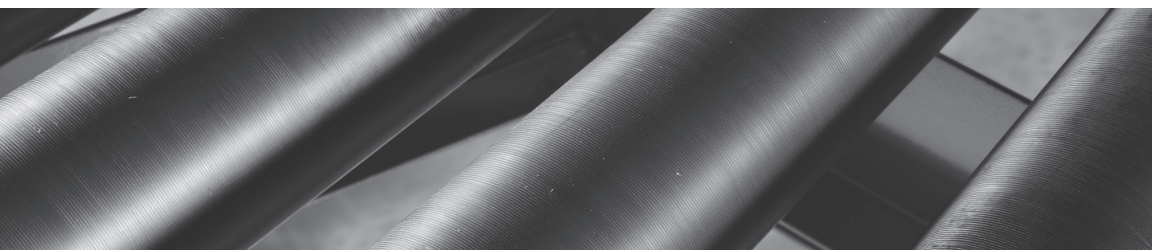
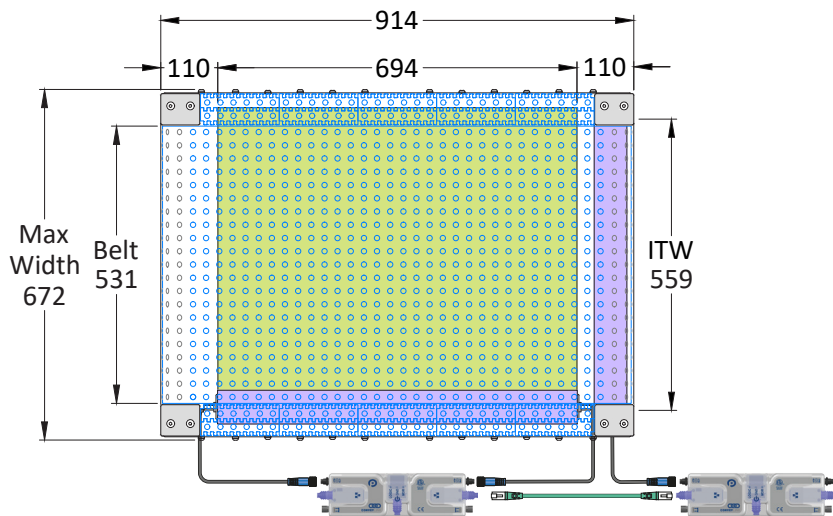
**CUSORT-0559-0762-1**

(22" W x 30" L - 2 x motors, 1 x card)



**CUSORT-0559-0914-1**

(22" W x 36" L - Dual motor divert belt 3 x motors, 2 x cards)



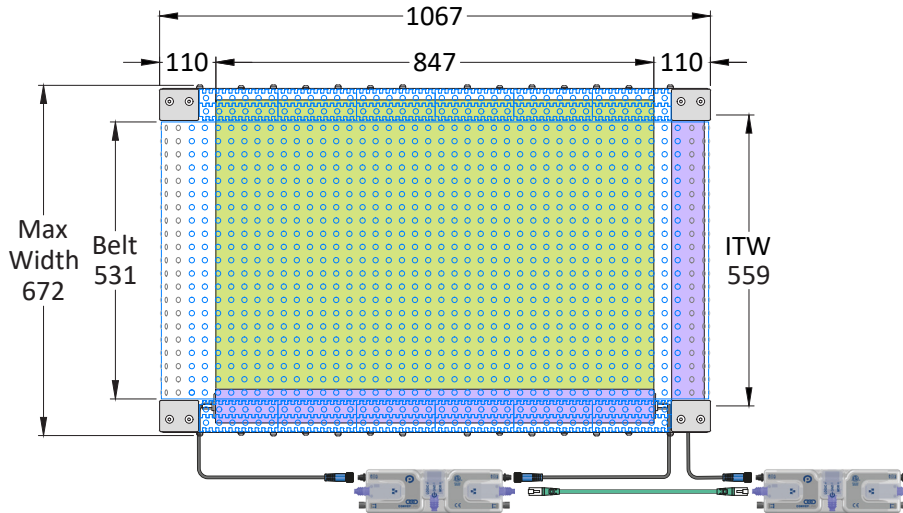


# Dimensions

Motor and control quantities

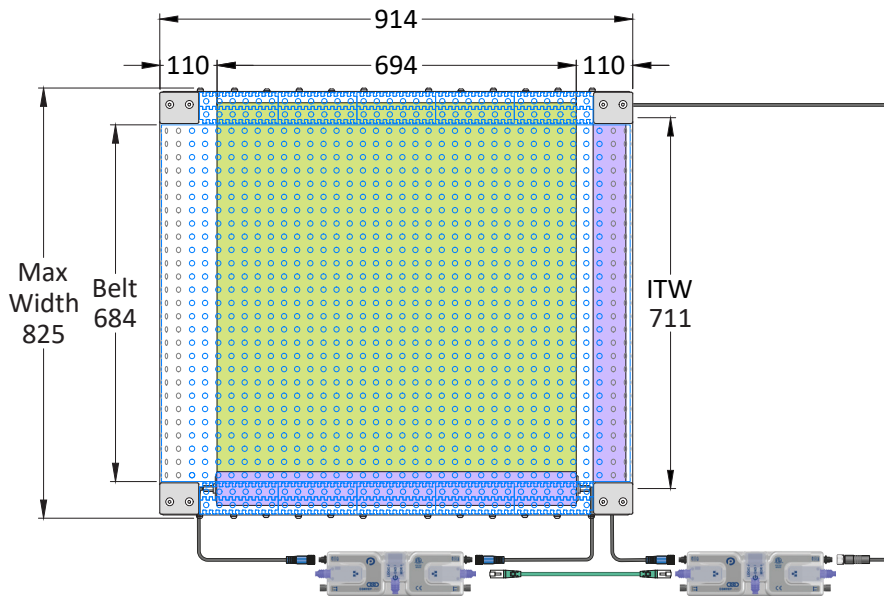
## CUSORT-0559-1067-1

(22" W x 42" L - Dual motor divert belt 3 x motors, 2 x cards)



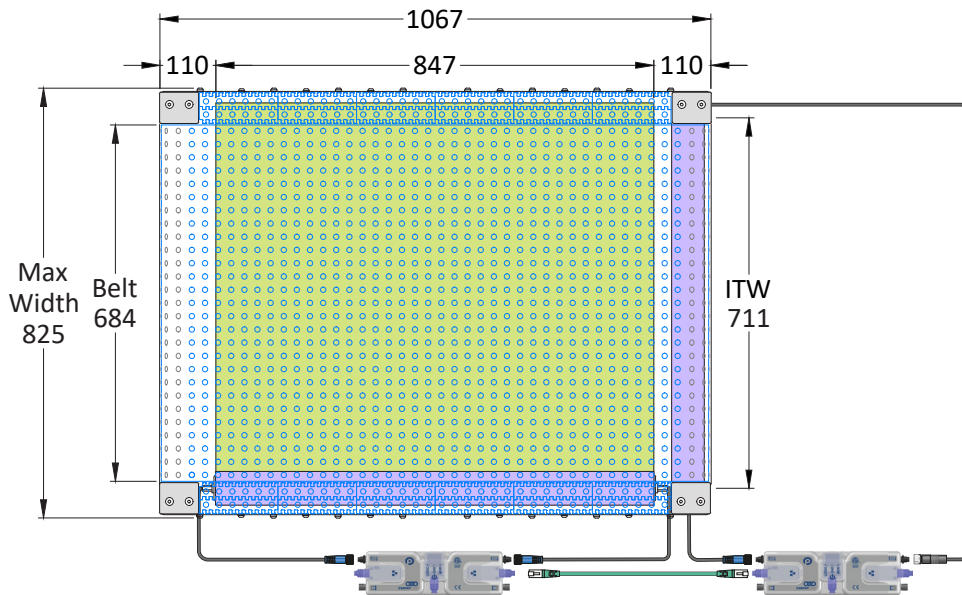
## CUSORT-0711-0914-1

(28" W x 36" L - Dual motor divert belt 4 x motors, 2 x cards)



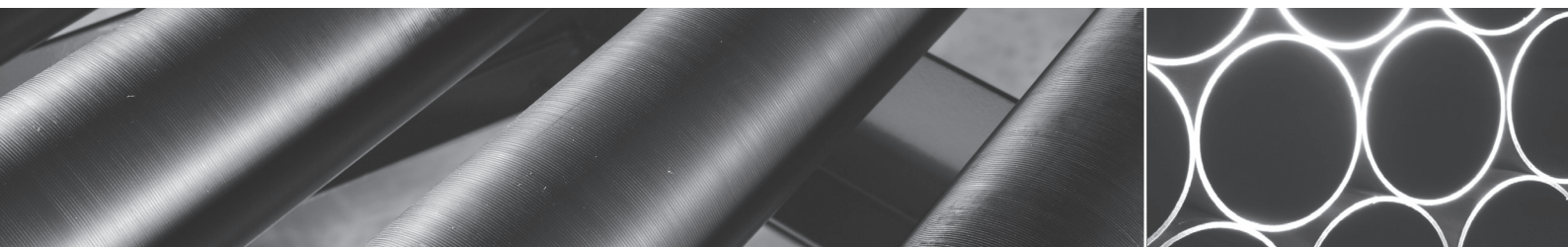
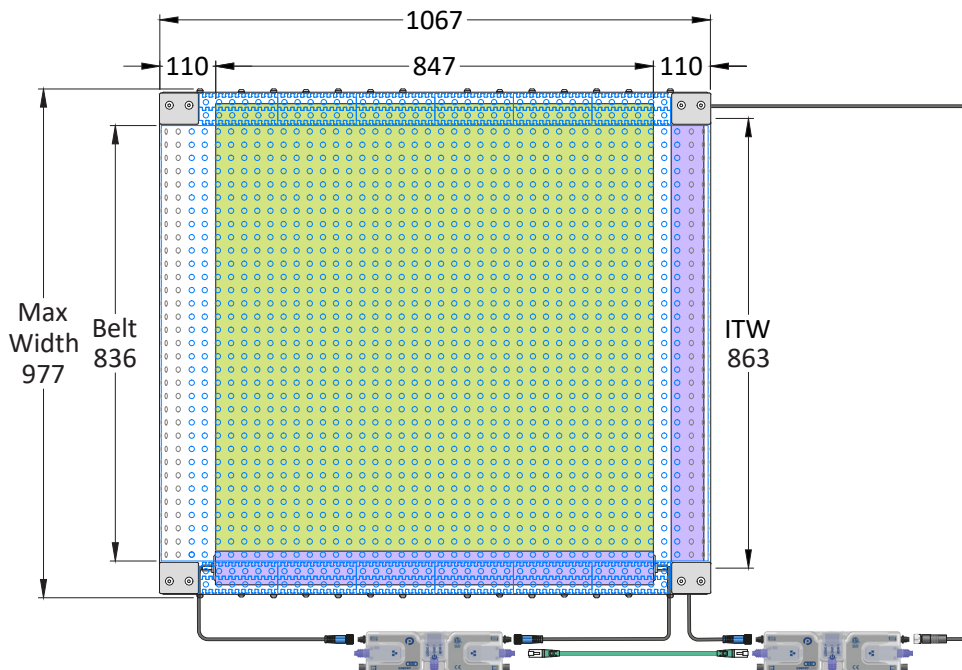
**CUSORT-0711-1067-1**

(28" W x 42" L - Dual motor divert belt 4 x motors, 2 x cards)



**CUSORT-0863-1067-1**

(34" W x 42" L - Dual motor divert belt 4 x motors, 2 x cards)

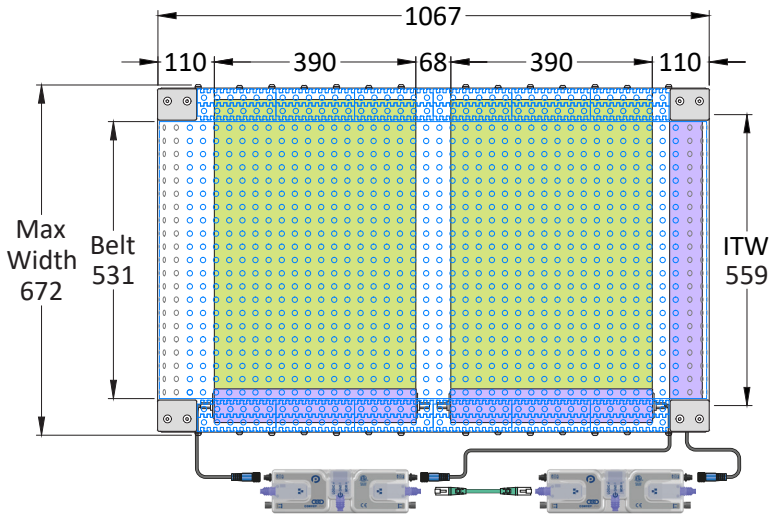




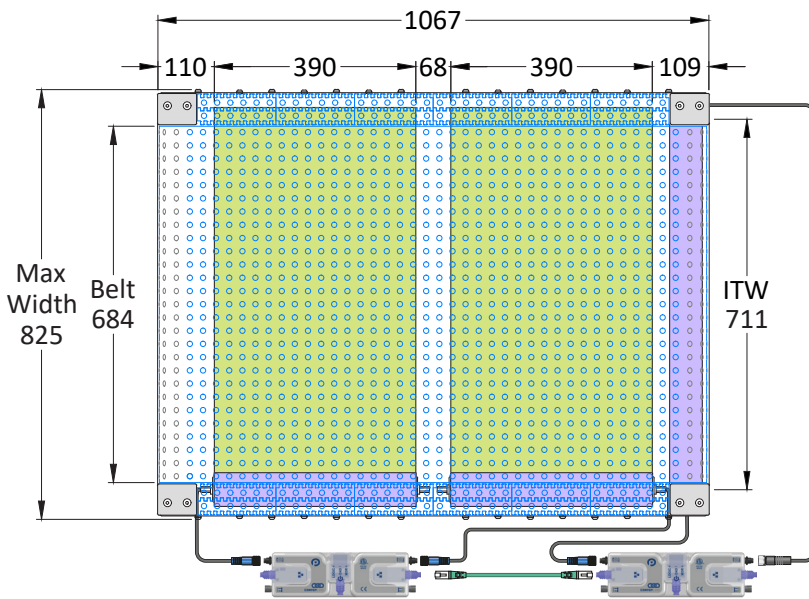
# Dimensions

Motor and control quantities

**CUSORT-0559-1067-2 (22" W x 42" L - 3 x motors, 2 x cards)**

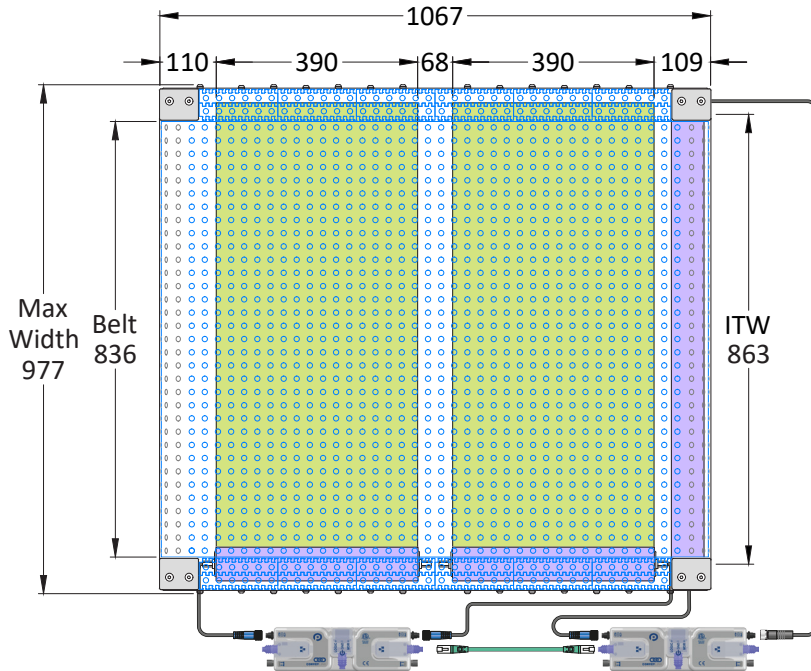


**CUSORT-0711-1067-2 (28" W x 42" L - 4 x motors, 2 x cards)**

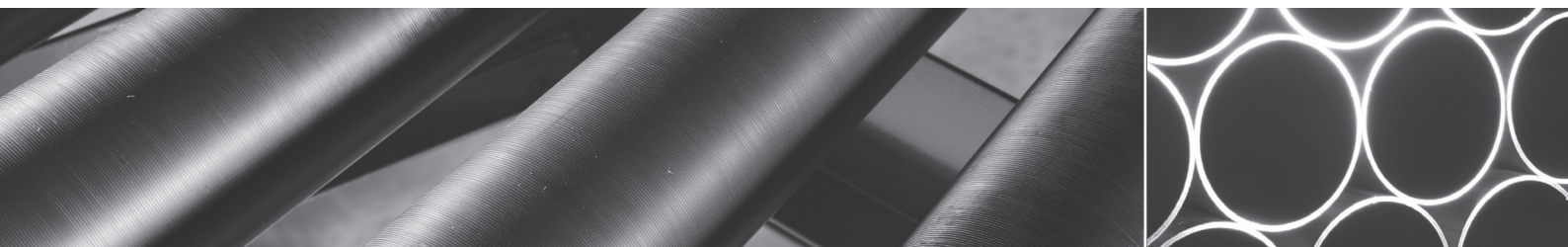
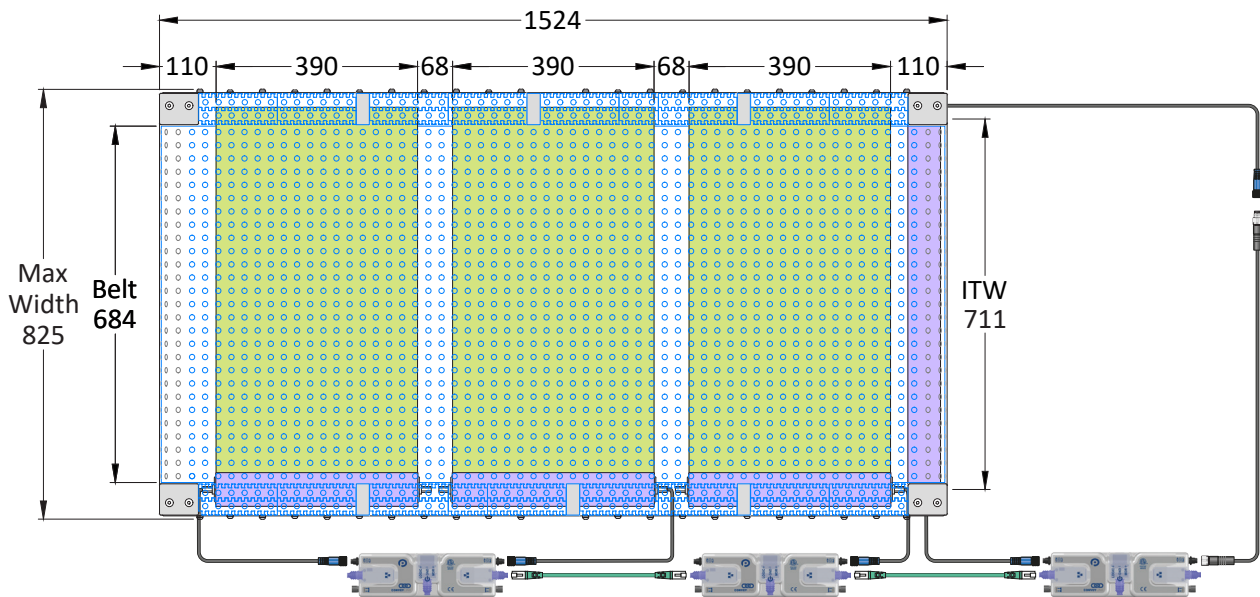




**CUSORT-0863-1067-2 (34" W x 42" L - 4 x motors, 2 x cards)**



**CUSORT-0711-1524-3 (28" W x 60.7" L - 5 x motors, 3 x cards)**

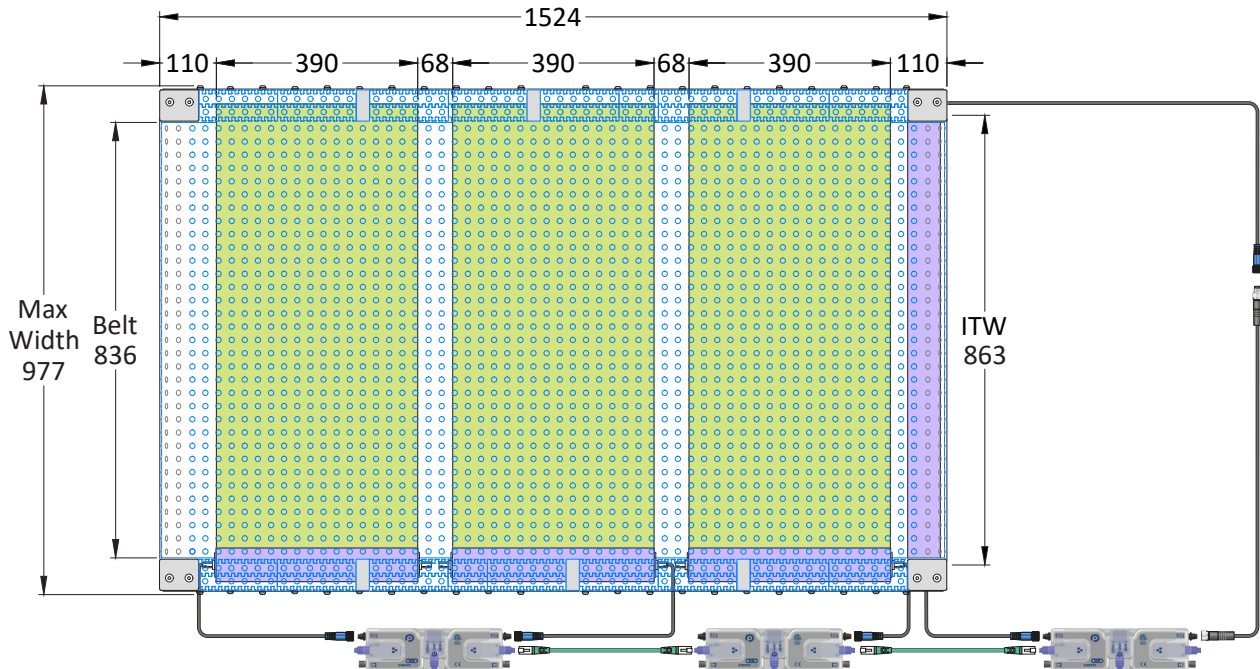




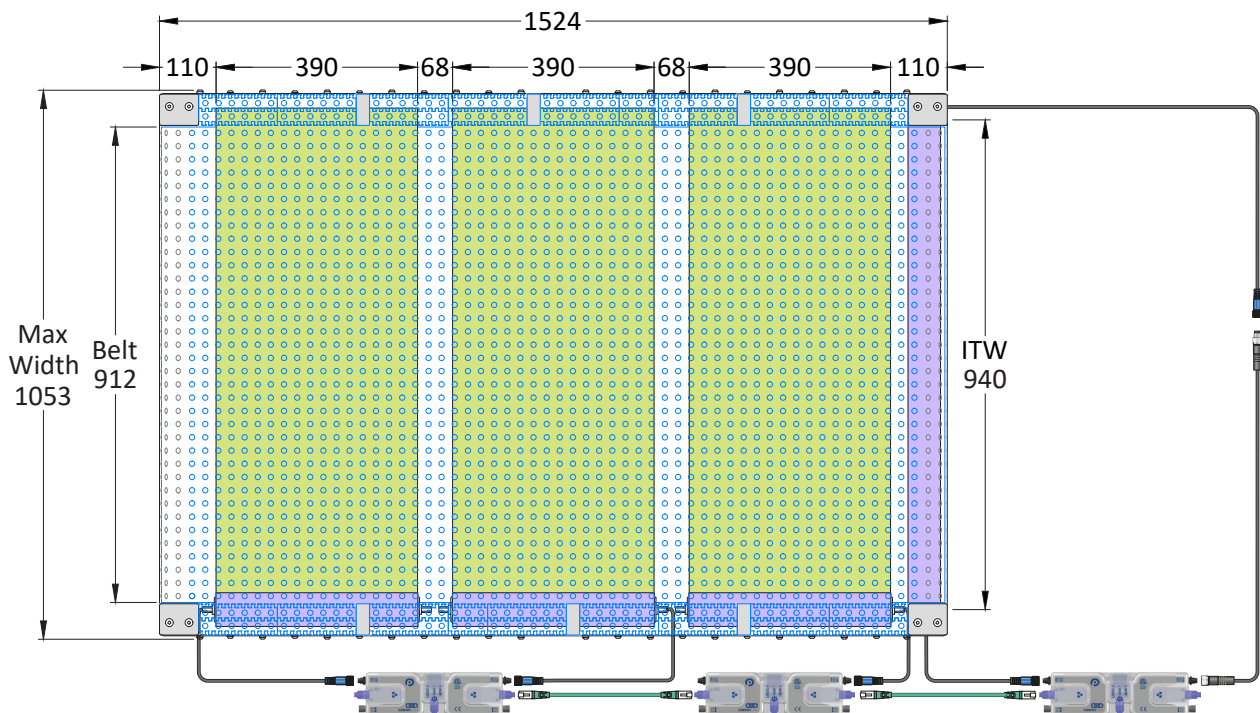
# Dimensions

Motor and control quantities

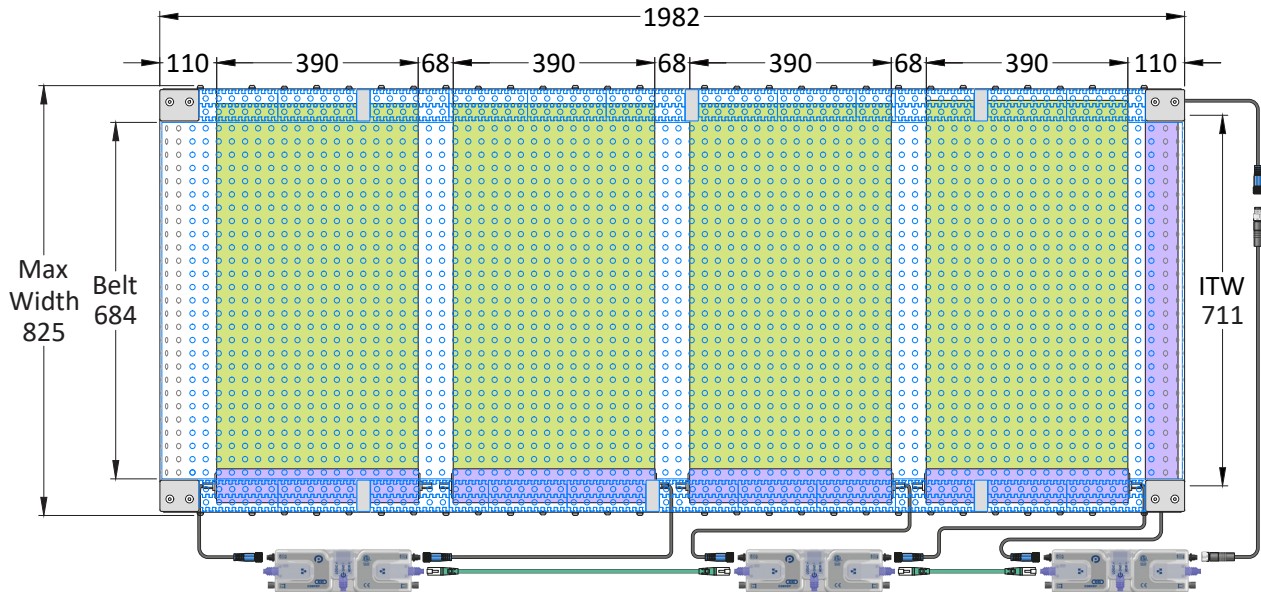
**CUSORT-0863-1524-3** (34" W x 60.7" L - 5 x motors, 3 x cards)



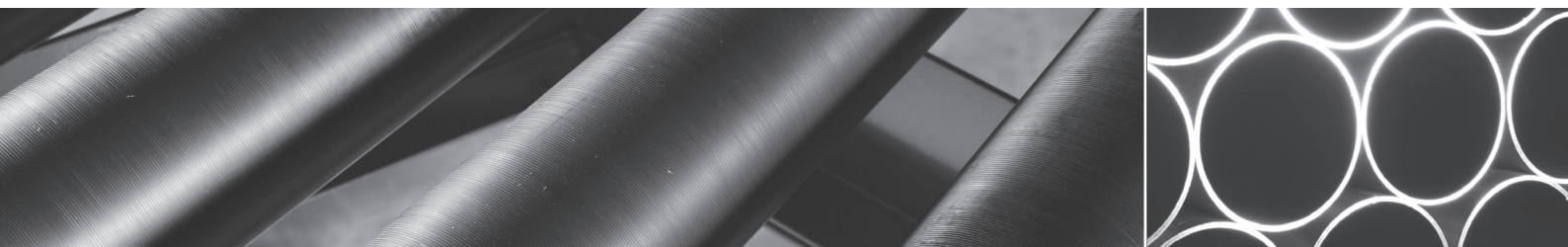
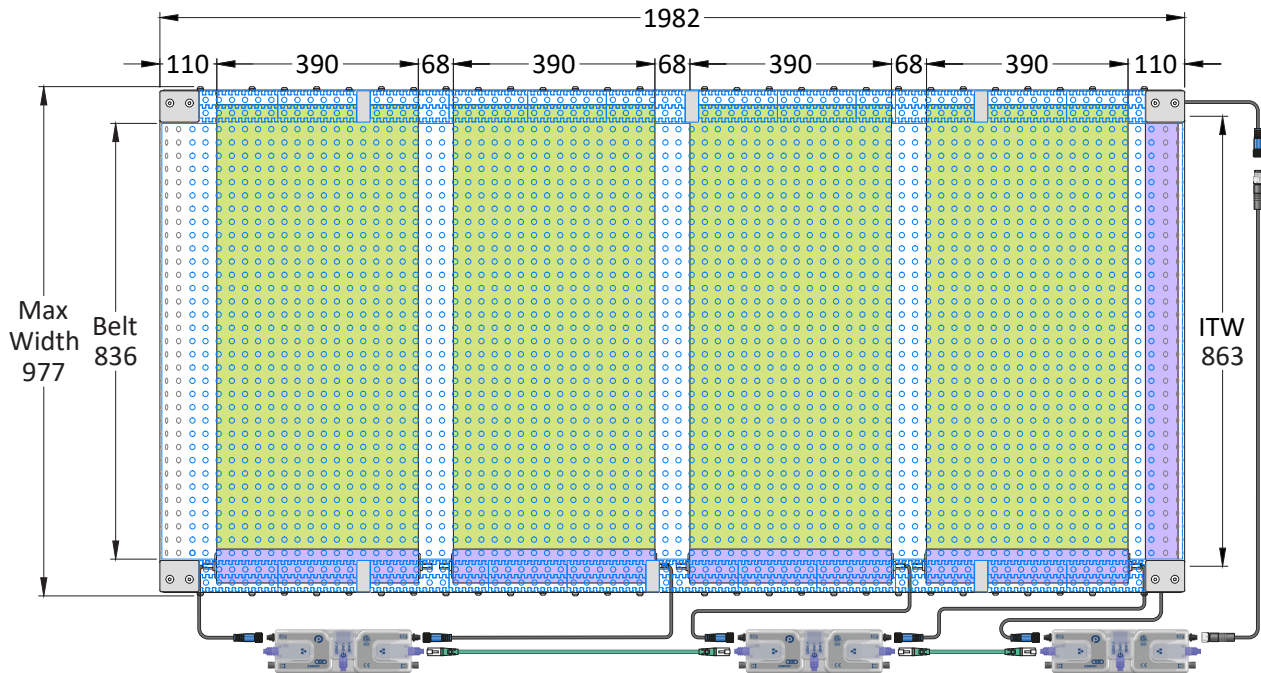
**CUSORT-0940-1524-3** (37" W x 60.7" L - 5 x motors, 3 x cards)



**CUSORT-0711-1982-4 (28" W x 78" L - 6 x motors, 3 x cards)**



**CUSORT-0863-1982-4 (34" W x 78" L - 6 x motors, 3 x cards)**

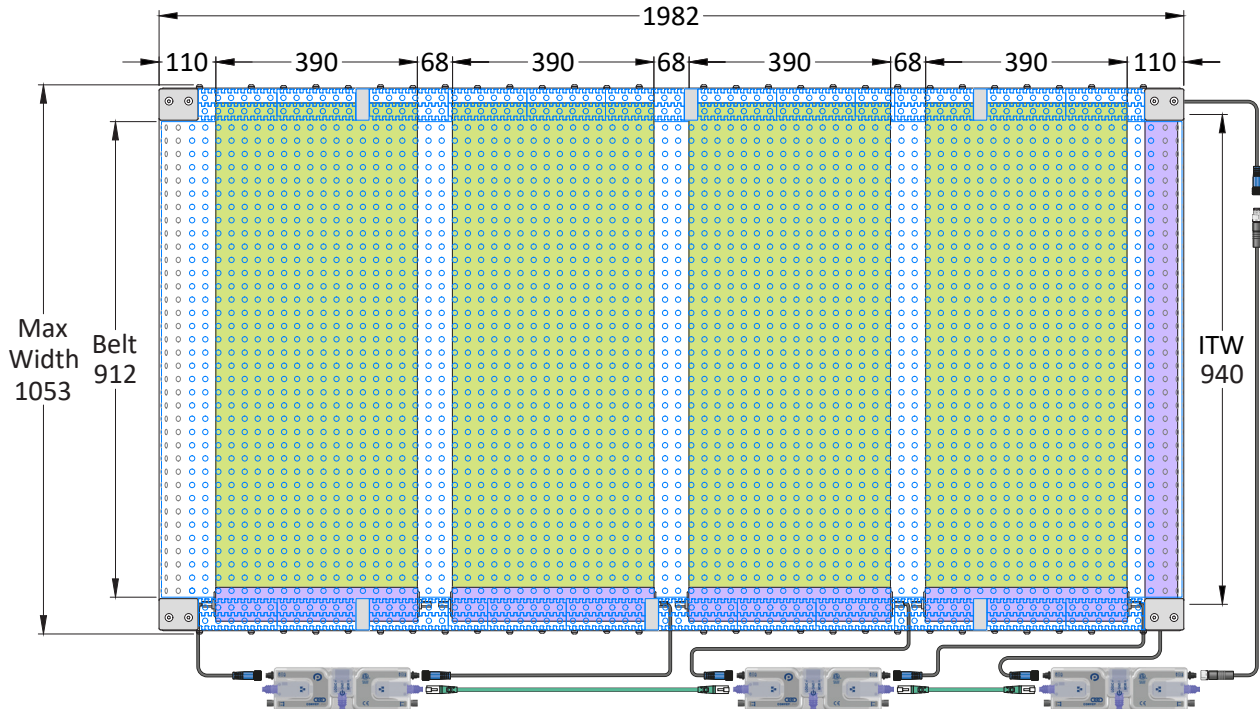




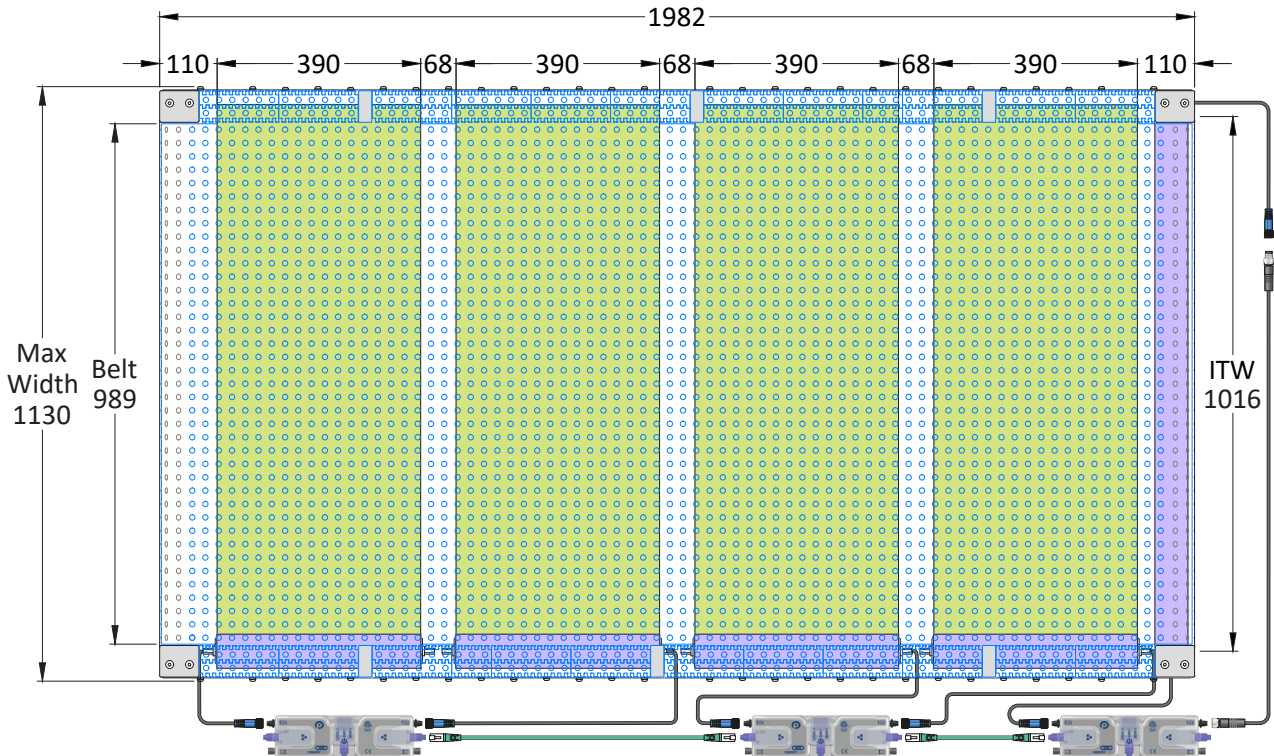
# Dimensions

Motor and control quantities

## CUSORT-0940-1982-4 (37" W x 78" L - 6 x motors, 3 x cards)



## CU SORT-1016-1982-4 (40" W x 78" L - 6 x motors, 3 x cards)

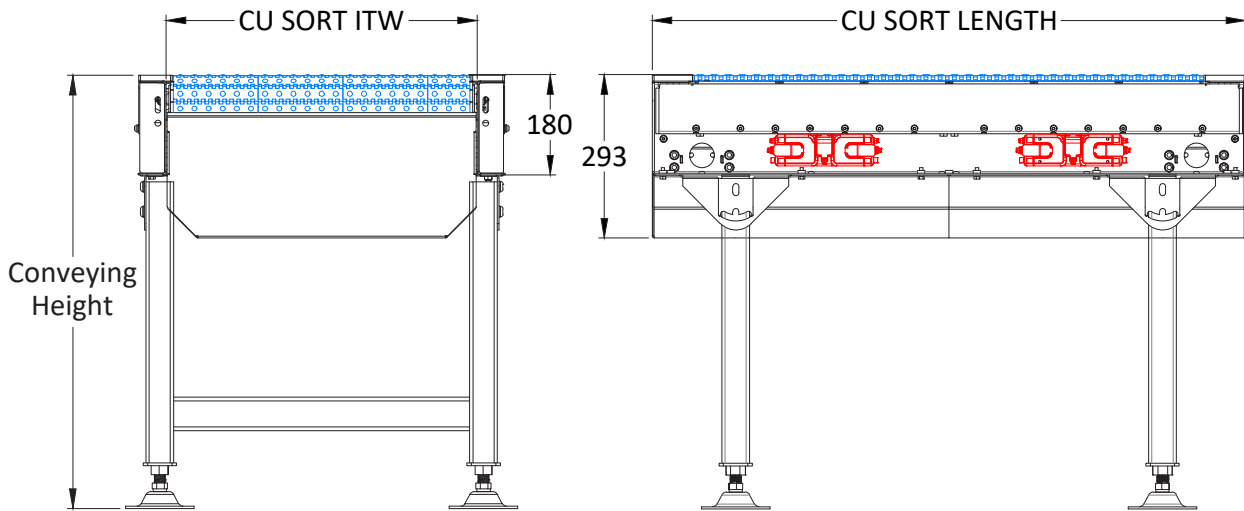


### 1.1 Side and End Elevation



# Dimensions

## Dims and Finger Guards



### 1.2 Finger Guards

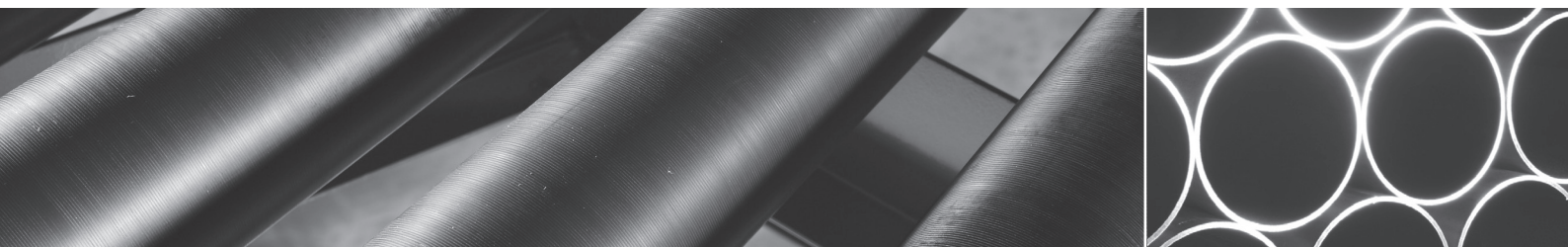
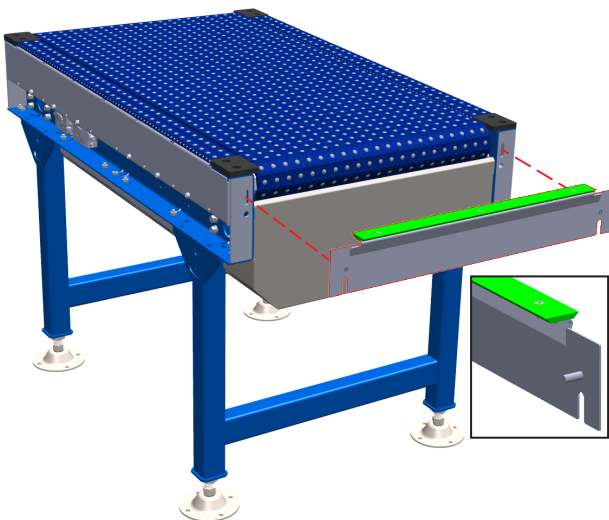
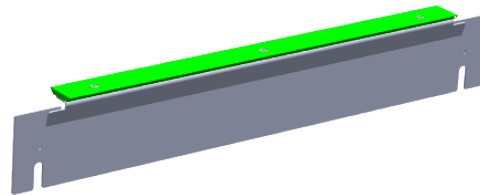
Finger guards are supplied separately to the CU SORT module and are used when joining sorter modules to adjacent conveyor or sorter modules.

They are fixed with the M8 x 20 threaded studs which go through the upper slot. Then an M8 nyloc nut secures the finger guard inside the CU SORT side frame on the other side of the upper slot.

Part ref CUS 0045-XXXX-xxxx

Where XXXX = sorter Inside Track Width

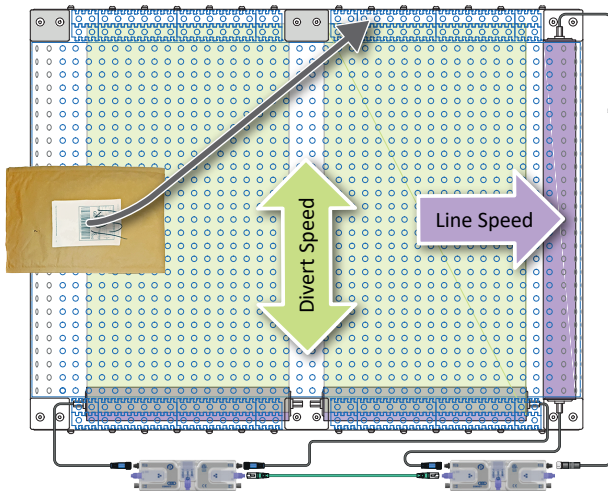
and xxxx = sorter length (can be left as xxxx)





# Control Methodology

## 1.1 Control Methodology

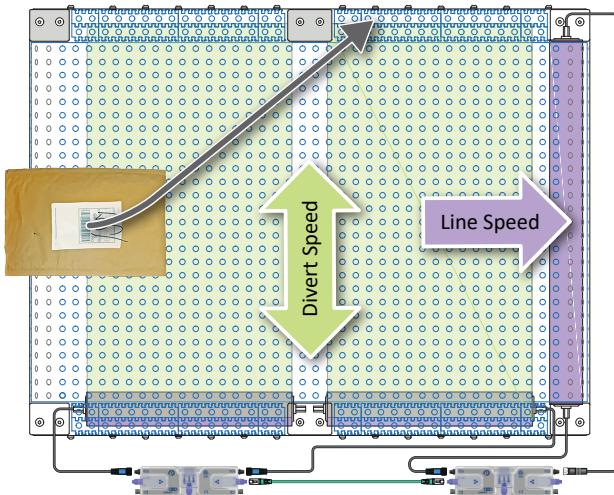


Line speed is managed by the NonaDrive and divert speed by each divert belt drive roller.

The angle of trajectory followed by packets and cartons can be controlled by coordinating the line speed of the modular ball belt and the speed of the divert belts.

The direction of divert is controlled by switching the direction of the relevant cross belt drive roller.

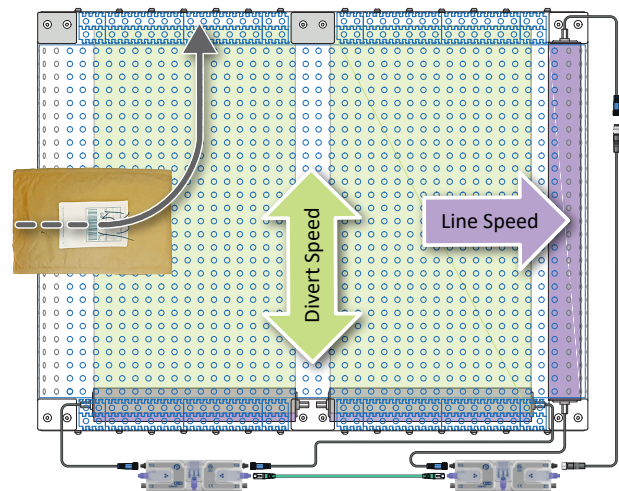
## 1.2 Vectored Divert



A vectored divert is when all belts are running, the modular ball belt and the divert belts. Throughput can be significantly optimised by pre-starting the divert belts before the product arrives on the sorter. Occasionally some turning of the product will occur depending on the product size and weight.

Product will start to divert when its centre of gravity crosses the the upstream edge of the first divert belt. Initially it will follow a curve as it accelerates laterally.

## 1.3 90 degree Divert



A 90 degree divert occurs when the modular ball belt is stopped as the product arrives on the designated divert belt. That divert belt is then started and the product will travel at 90 degrees off the conveyor.

Throughput can be optimised by pre-starting the cross belt before the modular ball belt has stopped, instead of waiting for the product to decelerate. The product will follow a curved trajectory as it decelerates before then exiting at 90 degrees.

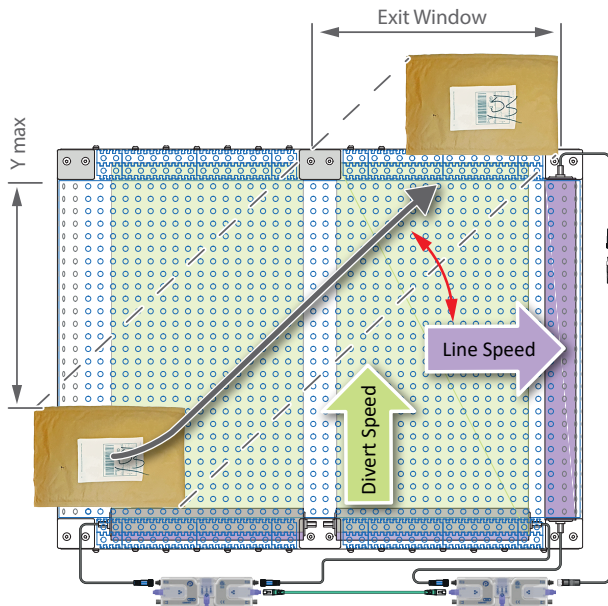
Some understanding of stopping distances for specific product types and weights will be required to coordinate the stopping point of the ball belt and the movement and exit position of the product.

## 1.4 Example Stopping Distances

Product	Size (W x L)	Weight (Kg)	Stopping Distance
Cardboard carton	260 x 290	0.225	250
Cardboard carton	100 x 150	2	230
Cardboard carton	200 x 200	5	238
Cardboard carton	260 x 290	10	271
Cardboard carton	260 x 290	15	263
Plastic tote	330 x 510	4	303
Plastic tote	330 x 510	9	314
Plastic tote	330 x 510	14	334
Plastic tote	330 x 510	29	371



### 1.5 Non-pre-sorted Product



Products are typically loaded on to conveyors randomly at any point across the width of the conveyor. In the case of a product arriving at the maximum distance from the exit side (Y max) then it will travel a greater distance along the sorter before reaching the exit side. This can impact the required sorter length AND throughput.

This also impacts the width and position of any mitre exit conveyor or bin.

In some cases, depending on sorter length, product size and conveyor width it may be necessary to reduce the line speed to allow the cross belts to increase the angle of the divert trajectory.

There is little or no advantage in trying to increase the speed of the divert belts beyond 60 m/min, by utilising ECO+ mode. This is because, beyond 60 m/min, product does not accelerate effectively compared with speeds below 60 m/min. So the exit speed is significantly less and the cycle time from induction to exit is typically the same or slightly longer at higher divert speeds, depending on load weight.

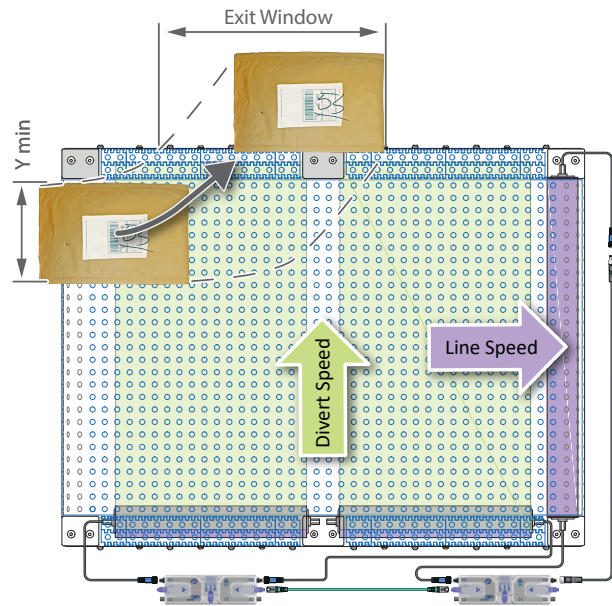
Typical speed settings in this case:

Divert Speed: 60 m/min

Line Speed: 50 or 40 m/min

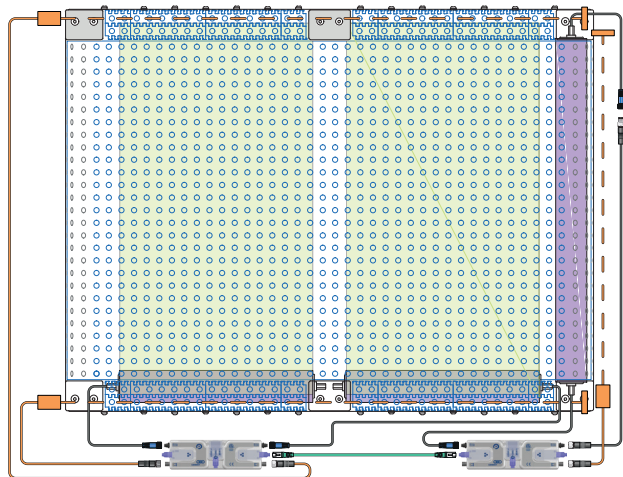
This is based on a wide variety of product sizes and weights and Y max of 900mm, in this case the sorter length needs to be a longer 4-belt model to accommodate the exit window.

### 1.6 Pre-sorted Product



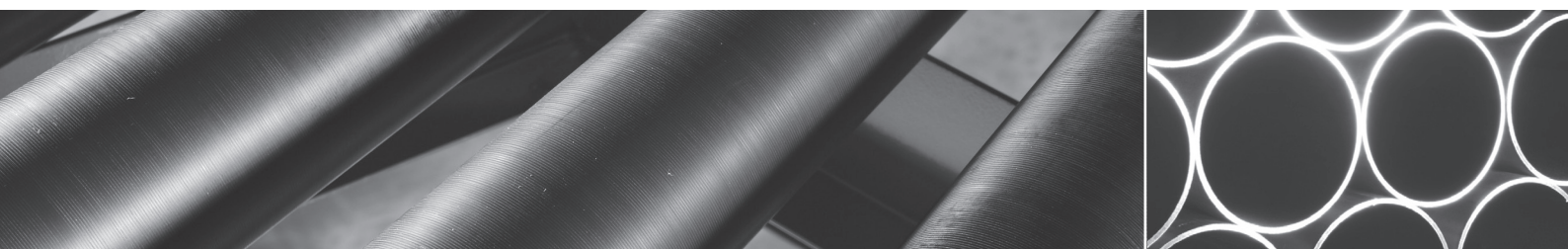
If products are pre-sorted, i.e. aligned to the exit side (Y min), the product will exit earlier so the ball belt can be run at a higher speeds. This can significantly increase throughput, reduce the required sorter length and the width of the mitre exit conveyor or bin.

### 1.7 Sensor Array



To optimise throughput and the control of stopping and starting the motors, a sensor array (not supplied) will provide the required feedback about when product has left the sorter. These sensors can be easily connected to the available sensor input ports on the Ai2 control card.

Furthermore a sensor at the downstream end of the sorter can help with PLC tracking of product along the system.

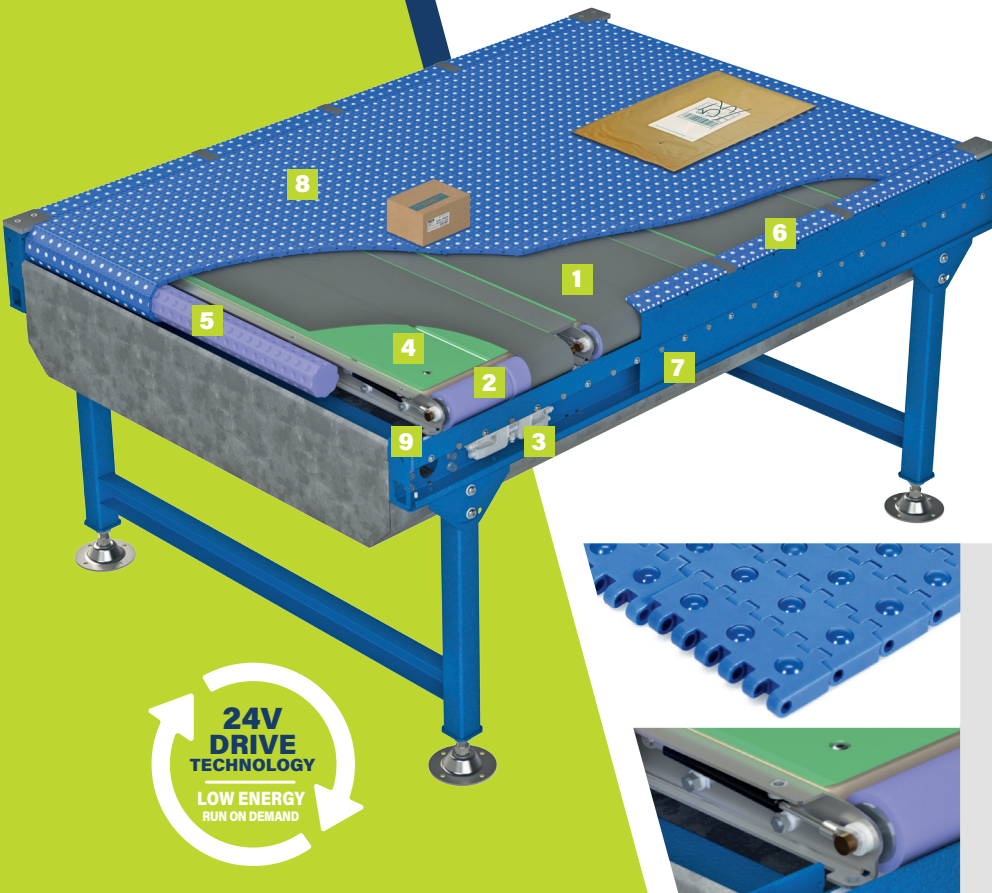




# CU SORT

ALL ANGLE TRANSFER AND DIVERT STATION

- 1 Divert Belt Conveyors**  
Robust dual ply textured cross belt drives sections of balls to move product left or right.
- 2 24V Divert Belt Drive Rollers**  
High transmission rubber lagged roller with tracking groove.
- 3 24V Network Control Modules**  
Each with 2 x M8 motor ports and 2 x M8 sensor ports (2 x inputs per sensor port).
- 4 Low Friction Bed**  
Supported by rigid marine ply deck under each divert belt.
- 5 24V NonaDrive**  
Unique nine sided 24V dual-drive ensures positive direct-drive of the modular belt.
- 6 Active Side Guide**  
Contain balls in contact with divert belt to ensure small or light product is fully diverted off the sorter.
- 7 Quick Release Fixings**  
Access to control cards and cable cavity is made easy with quarter-turn quick release fixings on the lower access cover.
- 8 Multi directional Ball Belt**  
Integral freely rotating balls allows product to be directed in any direction. Close ball pitch of 25mm allows small and flexible packages like jiffy bags as small as 100mm to be transported with ease. Fully integrated ball sockets ensures high tensile strength and resistance to dirt and contaminants.
- 9 Divert belt Tensioning**  
Tensioning is automatically maintained with gas springs.



## CU Sort - Transfer and Sortation Unit Specifications

Module Height	200mm (Frame bottom to top of balls)
Frame Construction	12 ga fabricated steel, bolted construction with welded butt couplings
Paint Finish	Electrostatically applied powder coating
Paint Colors	Standard in gloss black, custom colors available
Drive Technology	24V MDR (Motorised Drive Roller) from PulseRoller
Modular Ball Belt Drive	Unique 9-sided synchronous NonaDrive
Diverter Belt Drive	Lagged MDR, dual or single motor available
Diverter Belt Tensioning	Automatic, gas spring (no adjustments required)
Diverter Belt Construction	Ultra-flat Baltic Birch with SD-UHMW slider bed with ball chain transition guide, bolt-together, PVC or urethane belting
Controls Networks Supported	Ethernet I/P, Modbus TCP, Profinet I/O, CC-Link IE Field Basic
Supply Voltage	24V DC
Power Supply	600 Watt 24V switched mode, smoothed 10% ripple max
Power Cabling	Power cabling should sized to ensure 24V ± 10% @ each control module. Control modules can be supplied with either SINGLE or DUAL supplies for emergency stop switching of the motor power only
Diverting Modes	90 degree (stop and divert), or divert-on-the-fly (vector angle)
Side Cover	Bolt-on steel or polycarbonate
Network Cabling	Industry standard CAT5 ethernet cables
90 Degree Divert Sort Rate	Varies with unit size, approx. up to 2,400 cartons per hour (300mm x 300mm)
On-The-Fly Vector Angle Sort Rate	Varies with unit size, approx. up to 5,000 cartons per hour (300mm x 300mm - consult sales for throughput rate calculations)

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