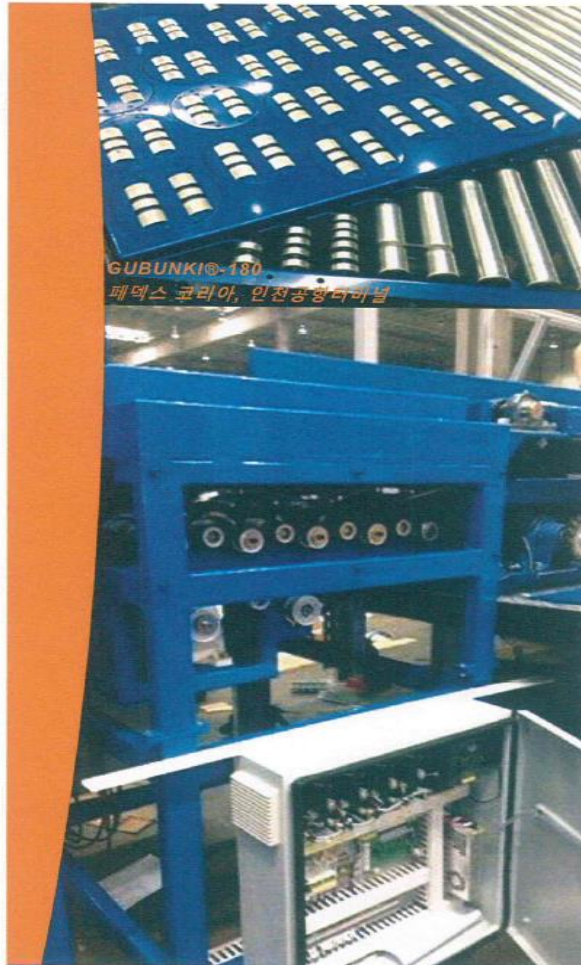


SORTER SYSTEM

Turn Roller SORTER

고성능 신개념 분류기 입니다.



구분기(GUBUNKI®), High-speed Diverter

GUBUNKI® - DIVIDING LINES RELIABLY IN THE HIGH-PERFORMANCE RANGE

고속 디버터인 구분기(GUBUNKI®)시리즈는 택배터미널, 물류창고 및 배송센터 등에서 고속으로 화물을 분류하는 장치로, 다양한 포장형태 및 사이즈의 상품을 자동 구분처리 할 수 있는 제품입니다.

고객의 배송센터, 물류창고 및 허브터미널에 적합한 매우 유연하고 경제적인 소팅솔루션입니다.

적용분야

- 사전구분을 위한 고속 분기라인
- Consolidation 및 방면별 구분
- 배송(물류)센터, 우편집중국, 택배터미널 등
- 처리화물의 종류: 박스, Poly-bag, etc
- 편방향 또는 양방향 구분처리

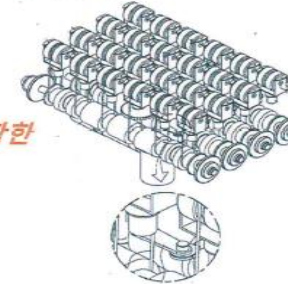
공급실적

(PROJECT REFERENCE)

- '16.04 월 페덱스 코리아 인천공항 터미널
- '16.10 월 TNT Express Country Depot, 싱가포르
- '16.11 월 TNT Express Regional Hub, 싱가포르

시스템 사양

구분처리 성능	Max. 7,000 개/시간
롤러 스피드	30 ~ 150 m/min
처리화물 중량	최소 500g ~ 최대 40 kg
최소화물(mm)	100 L x 100 W x 10 H
최대화물(mm)	1,200 L x 800 W x 800 H
배출각도	30 ~ 45°



MODULAR DESIGN

A modular device that mounts inside the special frame of the conveyor system



FLEXIBLE SOLUTIONS

It allows the sorter to be easily re-located along the conveyor path if divert locations change



QUICK INSTALLATION & COMMISSIONING

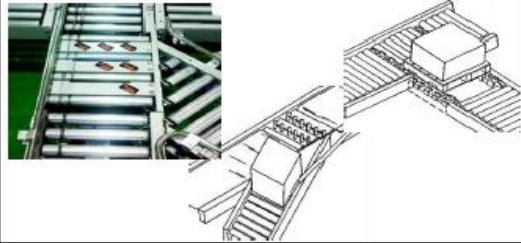
Pre-assembled mechanical module and proven control software accelerates the installation and commissioning on site

SORTER SYSTEM

Ball, Wheel, Pop up, SORTER

디버터 종류별 비교표

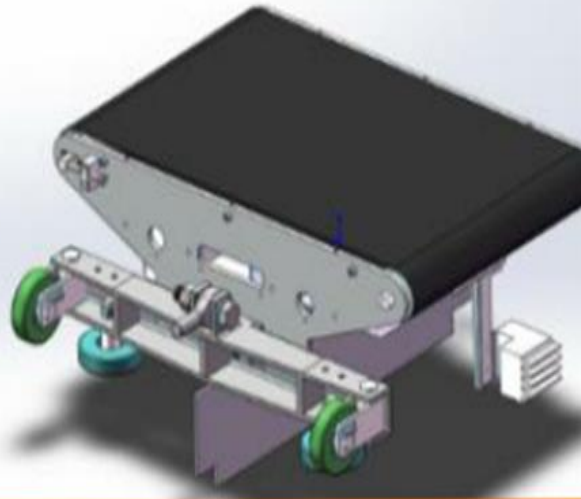
2017.05.26

순번	구 분	볼소터(ball sorter)	슬라이드 디버터 (sliding wheel diverter)	팝업 디버터 (pop up wheel diverter)
1	사진			
2	기계제원	본체크기 : 650L * 150W(x 열수) * 250H (1모듈) 본체중량 : 125kg (5열)	본체크기 : 650L * 600W * 400H 본체중량 : 154 kg	본체크기 : 500L * 500W * 500H 본체중량 : 85kg ~ 160kg
3	처리속도	50m/min ~ 140m/min	30m/min ~ 80m/min	30m/min ~ 60m/min
4	전원	DC24V - 40W	AC 0.37KW	AC 0.45KW ~ 1.2KW
5	디버터 제어	에어실린더	에어실린더	캠(모터사용) , 에어실린더
6	제품	최소 : 150mm * 150mm * 20mm (500g) 최대 : 1000mm * 600mm * 500hmm (50kg)	최소 : 200mm * 200mm * 50mm (1.0kg) 최대 : 1000mm * 600mm * 500hmm (50 kg)	최소 : 200mm * 200mm * 50mm (1.0kg) 최대 : 1000mm * 600mm * 500hmm (30kg)
7	길이 400mm	7000pc ~ 8000pc	3000pc ~ 4000pc	1500pc ~ 2500pc
8	제어방식	단위별 개별동작 방식	일체형 동작방식	일체형 동작방식
9	회전방향	단방향/양방향 30, 45'	단방향/양방향 30, 45'	단방향 30, 45'
10	소 음	70db 이하	70db 이하	70db 이하
11	수리시간	개별 교체 작업 : 30 분 이내(비전문가)	전체 교체 작업 : 3 시간 이내(전문가)	전체 교체 작업 : 3 시간 이내(전문가)
12	기계가격	높음	보통	조금낮음

SmartSort SS600

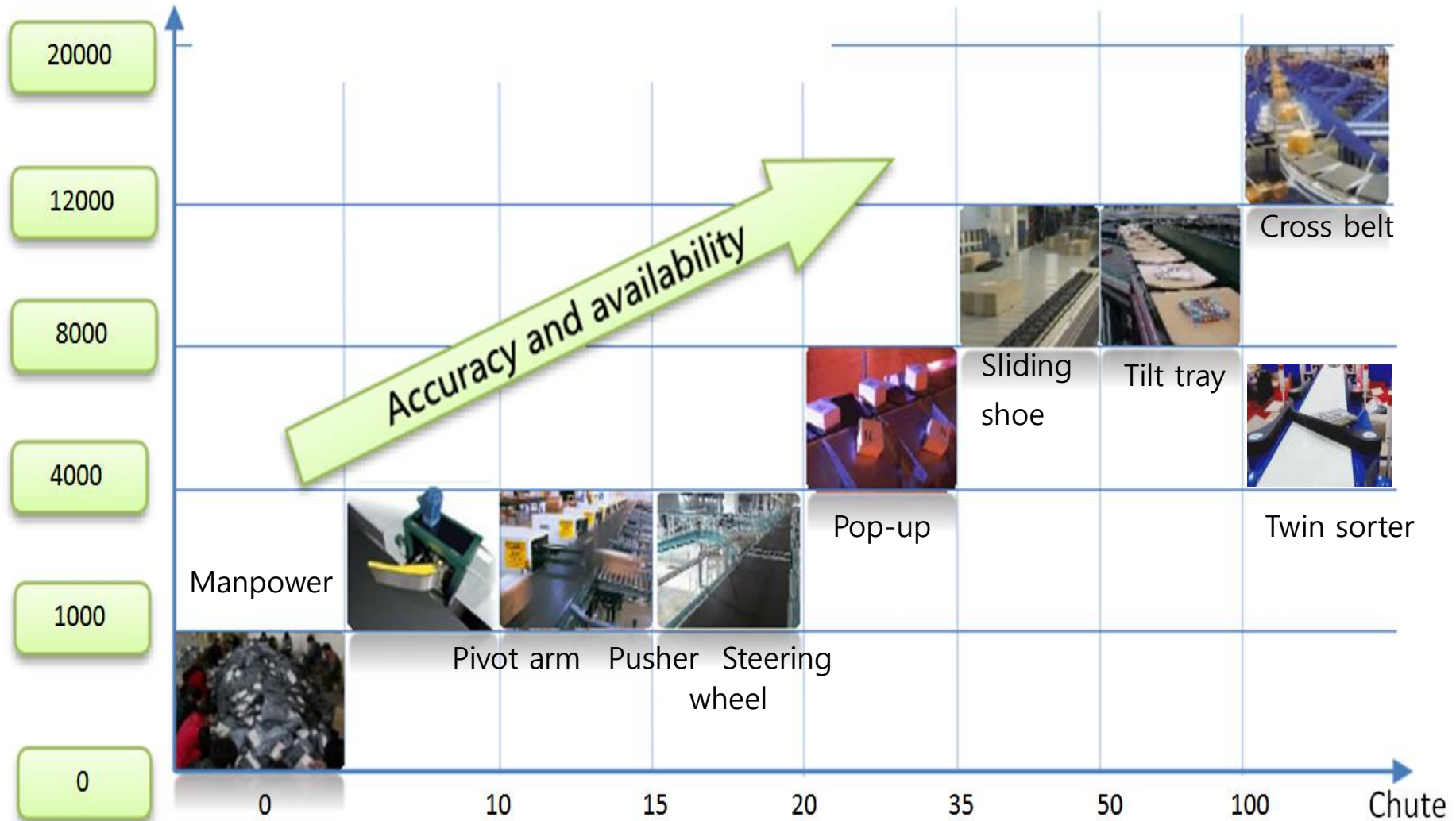
- Precise positioning and orientation. High efficiency sorting.
- Modularization design and High space availability.
- Energy saving and environment protection.
- High reliability and low noise level.
- Available for any size of cargo in double direction sorting.
- Abrasion resistant design and low life cycle cost.
- Ergonomic design to easy operation.

- Automatic sorting technology (AST)
- Real time communication (RTC)
- Charge Coupled Device (CCD)
- Radio frequency identification (RFID)
- Optical Character Recognition (OCR)
- Dimensioning Weighing Scanning (DWS)



Available solution for you

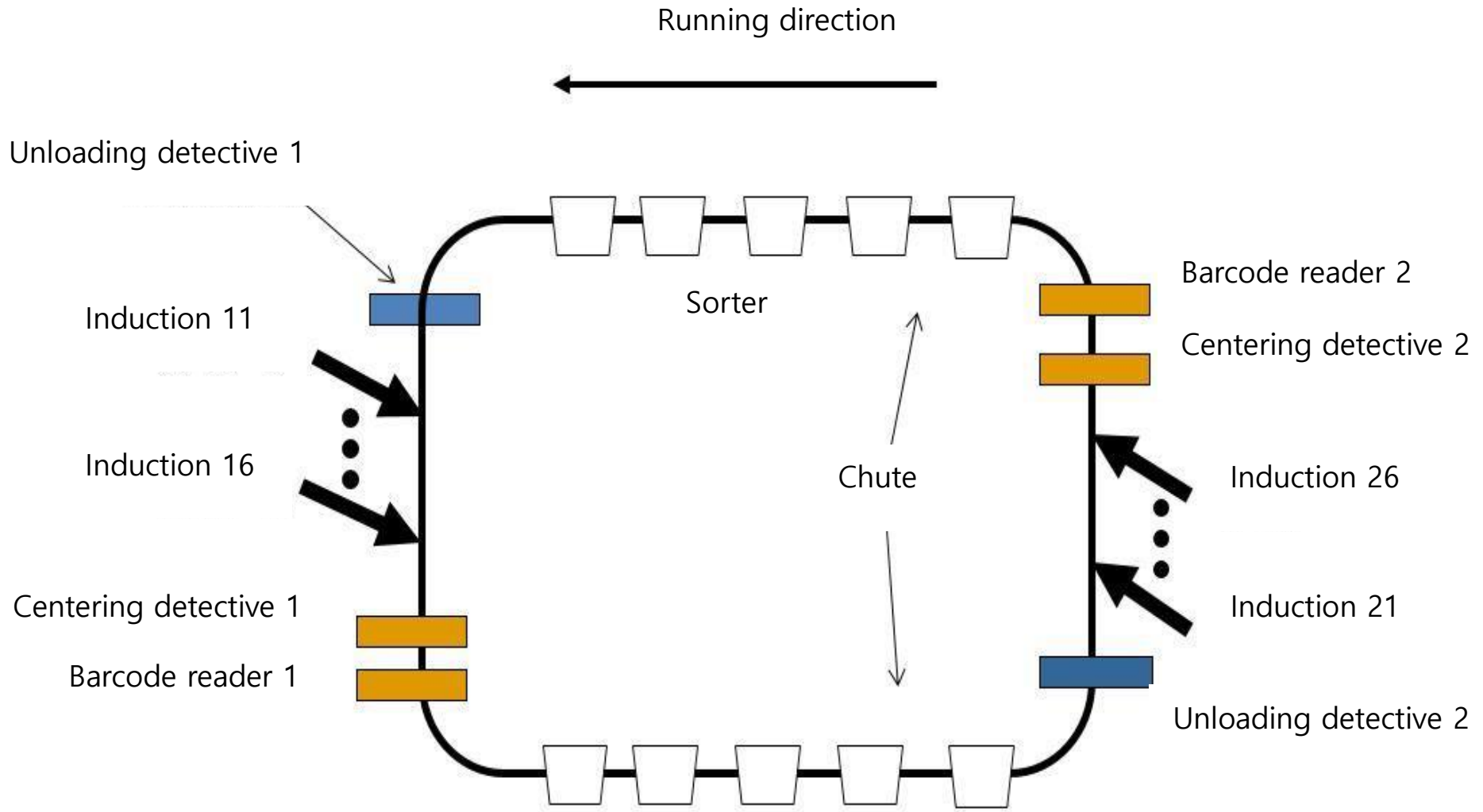
Sorting efficiency (Package/Hour)



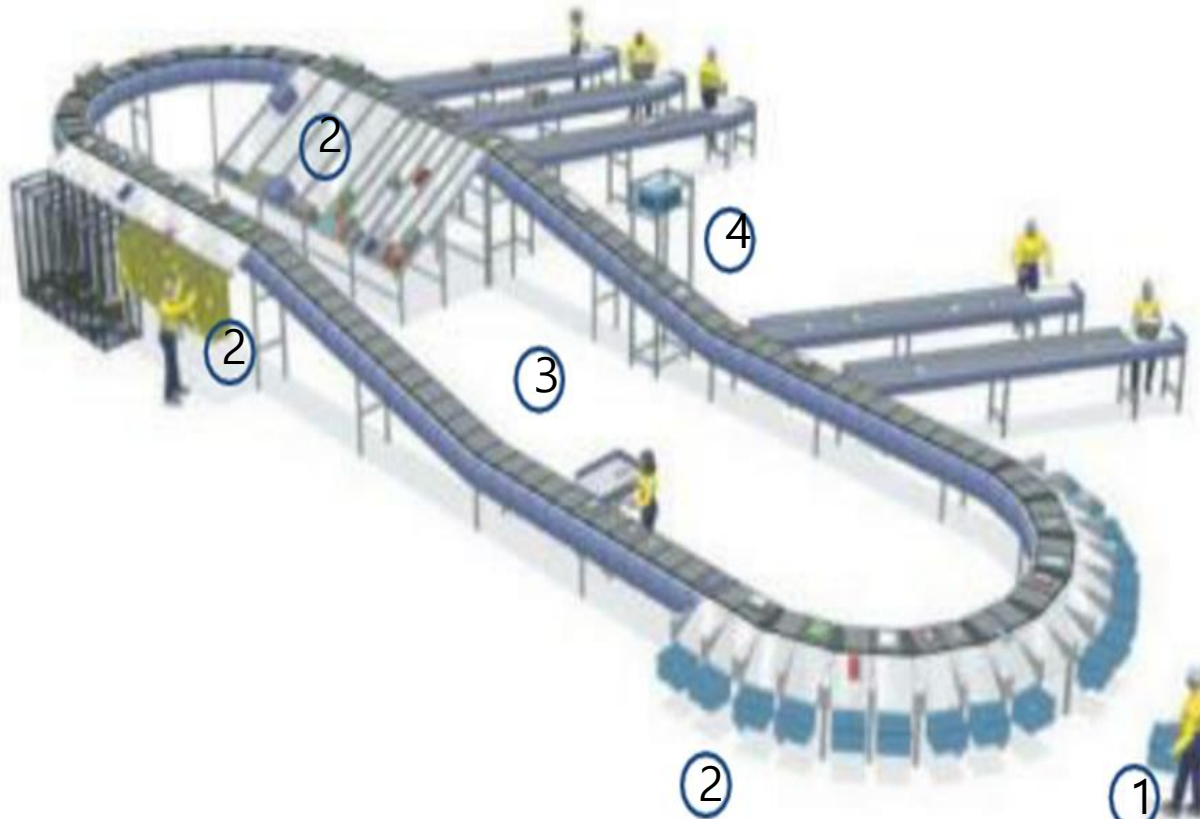
Available solution for you

Sorting type	Efficiency (Package /min.)	Conveyor type	Cost	Chute type	Flat package bottom	Bi- direction sorting
Manpower	15	Belt or roller	Low	All	No	No
Pusher	40	Powered belt or roller	Low- medium	All	No	No
Pivot arm	80	Belt conveyor	Medium	Gravity	No	No
Block arm	120	Belt conveyor	Medium	Powered	No	No
Pop-up	125	Belt conveyor	Medium	Powered/Chute	Yes	No
Steering wheel	125	Belt conveyor	Medium	Powered/Chute	Yes	Yes
Twin Sorter	60	Belt conveyor	Medium	ALL	Yes	Yes
Sliding shoe	150	Alum. Slat flight	High	All	No	Yes
Tilt tray	200	Tilt tray	High	Gravity/Chute	No	Yes
Cross belt	330	Belt conveyor	High	Gravity/Chute	No	Yes

Available solution for you



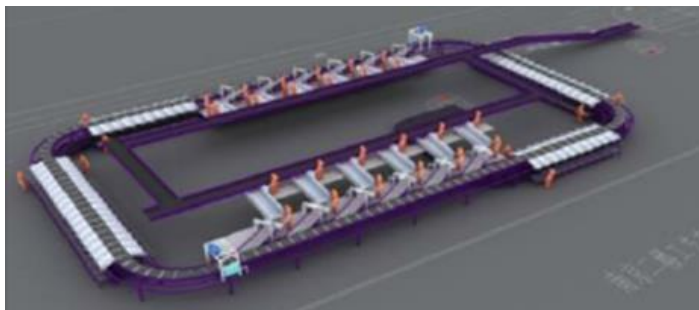
Available solution for you



- ① Cargo size, Max./Min. size/weight.
- ② Chute quantity.
- ③ Space size.
- ④ Cargo identification (Barcode or 2-dimension code).
- ⑤ Accuracy requirement.
- ⑥ Average/Peak value of sorting capacity.
- ⑦ Budget.

Available solution for you

① Horizontal(수평) Cross-Belt Sorter



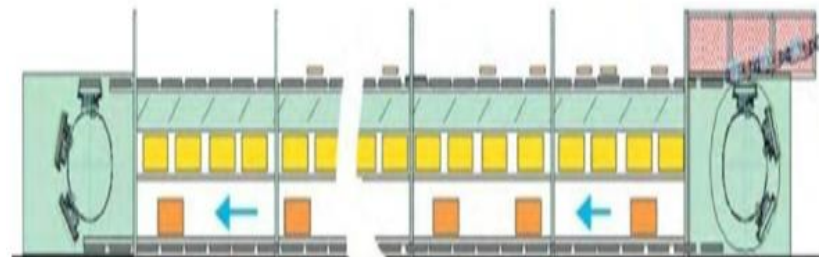
② Incline(경사) Cross-Belt Sorter



③ Double-Layer Cross-Belt Sorter



④ Vertical(수직) Cross-Belt Sorter



Cross belt sorter features



Item	Feature
Running speed	1.8m/s~2.5m/s
Sorting capacity	Single: 12,000 package/hr. ; Double: 25,000 package/hr. ;
Induction efficiency	>2500 package/hr.
Carrier size	660x400x600mm
Loading weight	0.05kg~35kg
Package size	150x150x1~500x450x250
Error rate	≤0.01%
Barcode reader	>99%
Noise level	<72 dB(A)
Others	Bi-direction sorting, No damage for package, Available for any size of package.

Cross belt sorter features

Advantages I

Ingenious
design

Fine machining
unitary carrier
frame, easy
installation and
high accuracy.

High
performance

High sorting
efficiency,
high barcode
reading rate,
low error rate.

Redundancy
system

Carrier max.
load 35kg,
linear motor
thrust 600N,
Double
redundancy.

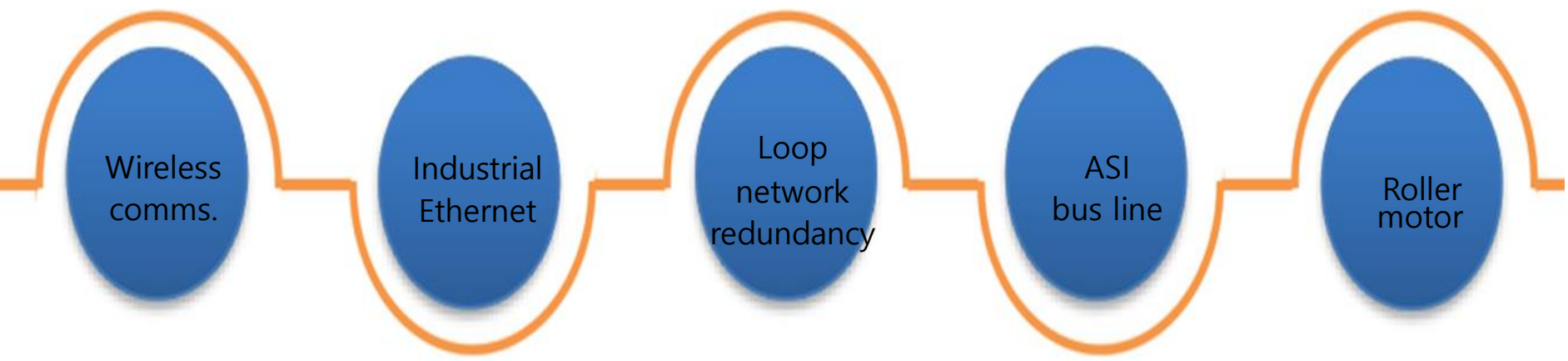
High
reliability

Continuous
operation
more than 6
months and
high stability.

Easy
maintenance

3 aviation
plugs and 8
connecting
bolts, easy
exchange of
carrier.

Advantages II



Wireless
comms.

Siemens leaky
wave cable
technology-
Rcoax, fast,
stable and
real time.

Industrial
Ethernet

High speed
communication
and real time. Easy
fault diagnosis,
debug and remote
maintenance.

Loop
network
redundancy

Reliable
communication.
Single broken
node can
recover in
200ms.

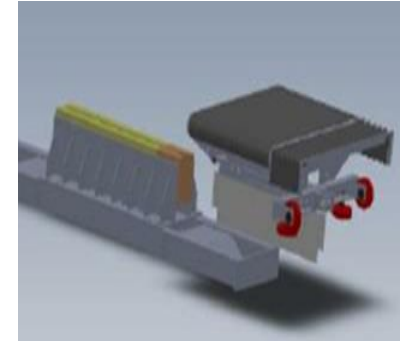
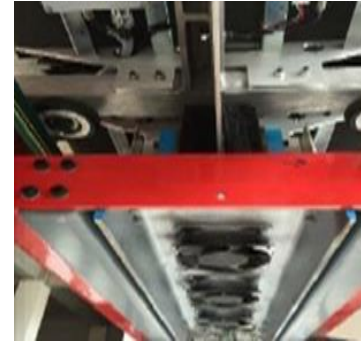
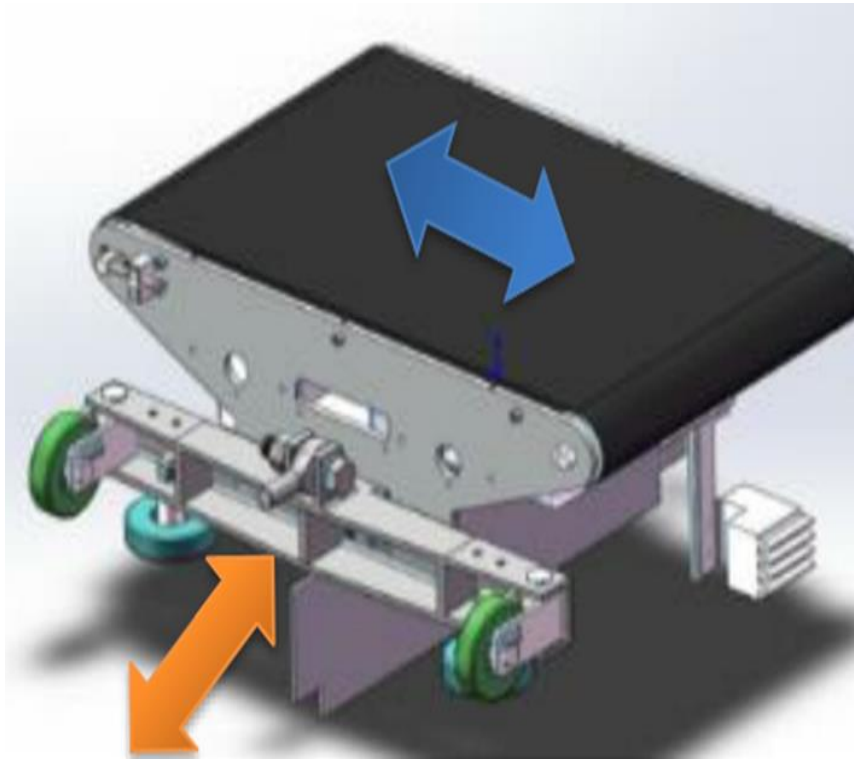
ASI
bus line

Easy
installation,
diagnosis and
expansion.
Protection
level IP65.

Roller
motor

Brushless DC
roller motor,
Belt drive, big
torque, low
noise and low
failure rate.

Cross belt sorter features



System is drove by linear asynchronous motor (5.5kw) .



Carrier is drove by brushless DC roller motor (48V) .

Cross belt sorter features

Carrier

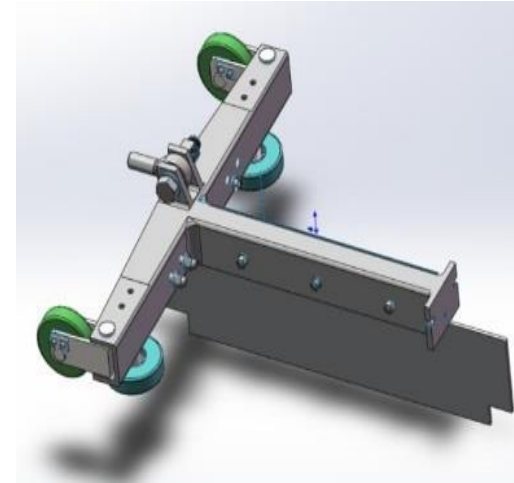


Power supply and communication of all carriers connect with industrial aviation plugs.

Frame rail is made of 3.5mm high quality steel plate.



Two carriers connect with the organ cover.

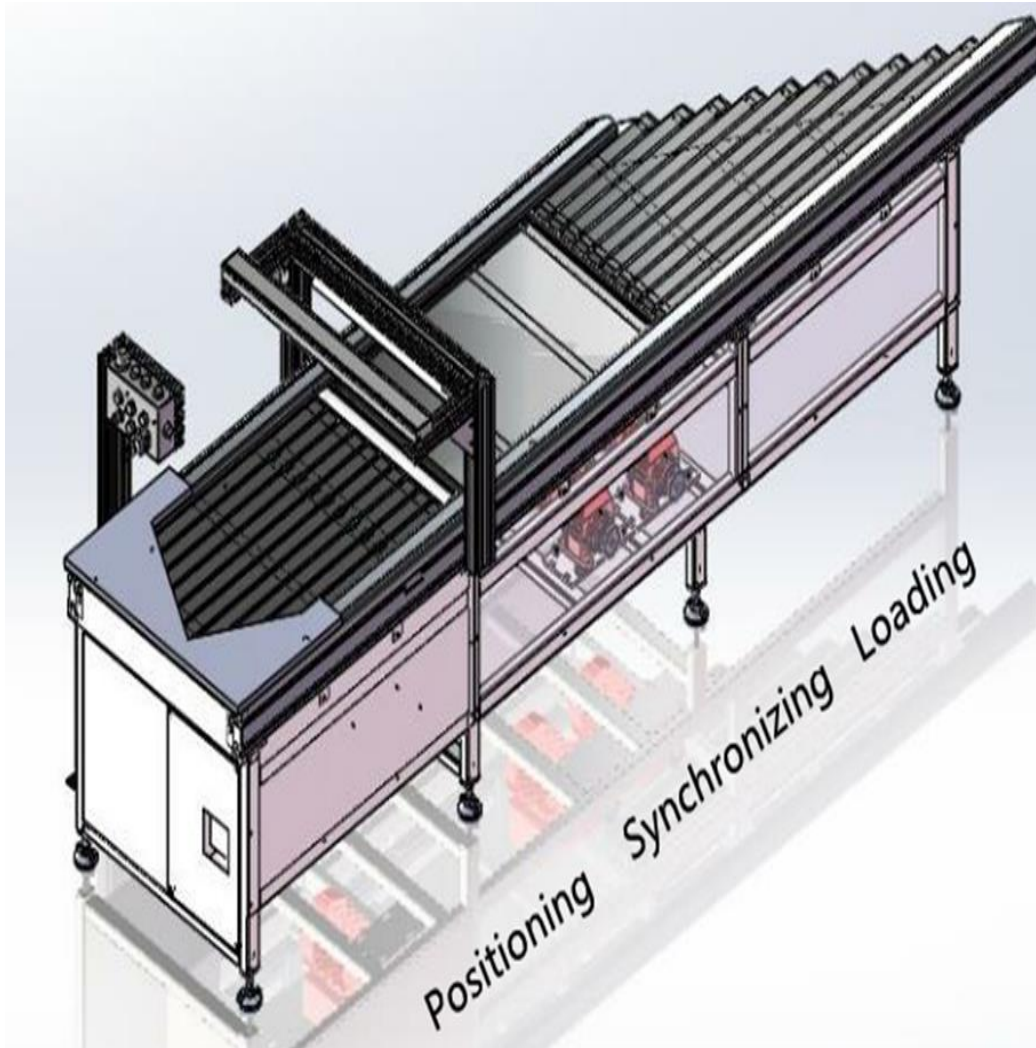


Fine machining unitary carrier frame.

Running wheel and guiding wheel is specified hardness and industrial level.

Cross belt sorter features

Induction



Cross belt sorter features

Available chute solutions

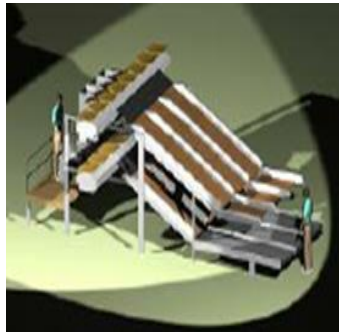


Double
straight layer

Single straight
layer



Double spiral
layer



Pallet



Container



Textile bag



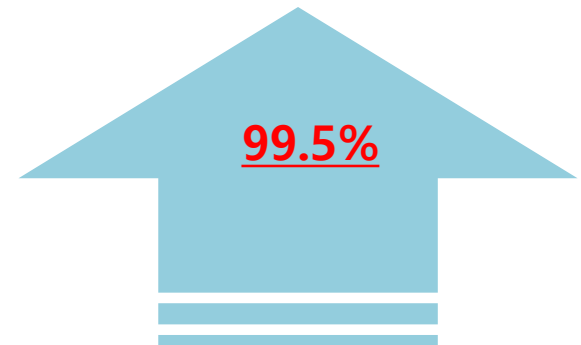
Double exit

Roller conveyor



Cross belt sorter features

Barcode reader

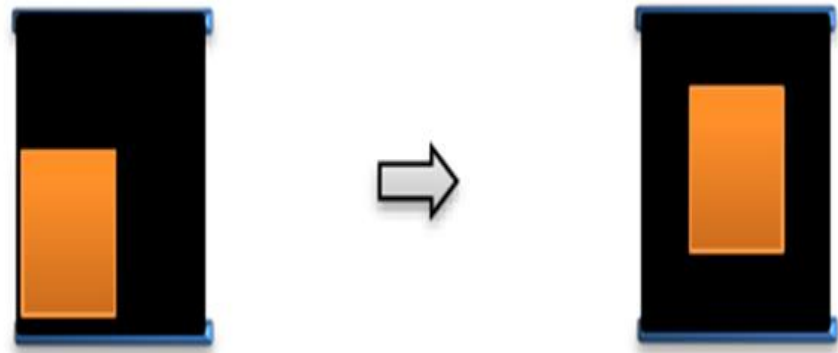


Cross belt sorter features

Grayscale detective



Centering detective



Unload detective



Cross belt sorter features

Encoder



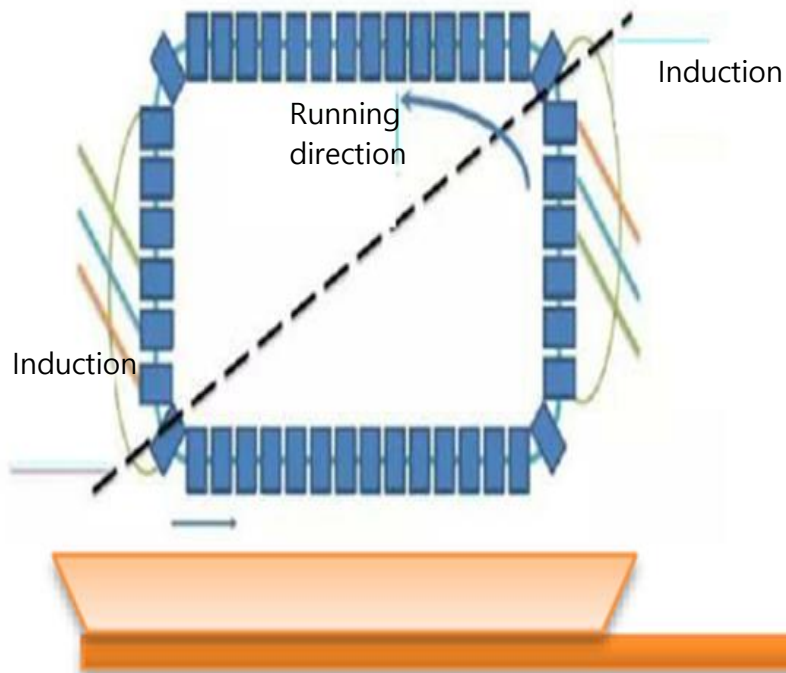
Speed measurement and sorter position control

Emergency stop switch

Stop the sorter at emergency situation



Human resources



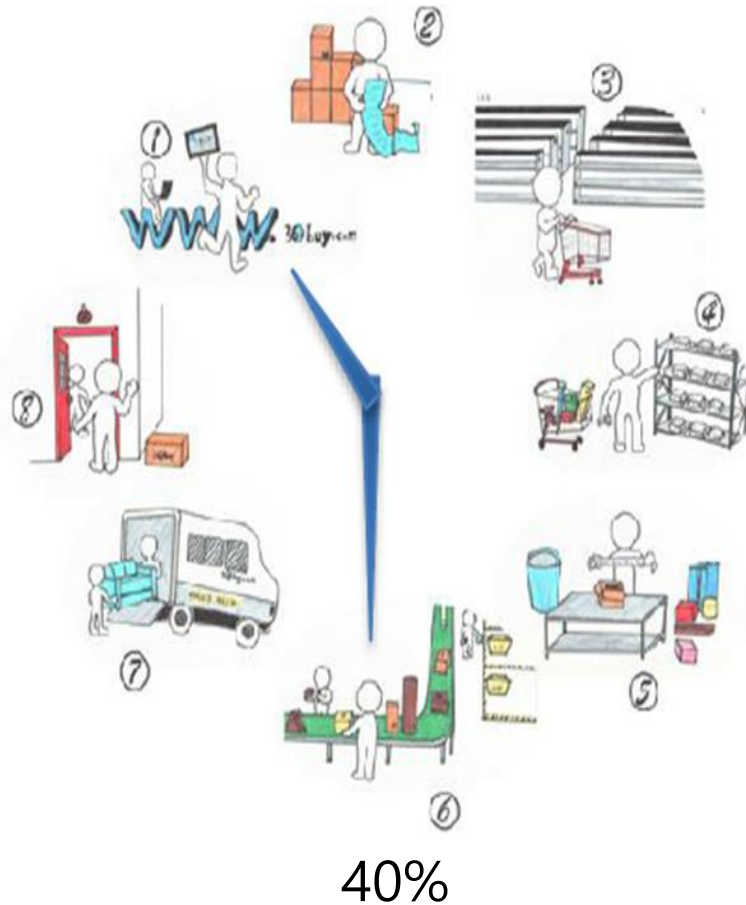
Double sorting capacity: 24000 packages/hr.
Package identification rate: >99%.
Sorting error rate: <0.01%.

$2 \times 12 = 24$ (Operators)



Manpower sorting capacity: 1000 packages/hr.
50% human resources of distribution center work for sorting normally.

Sorting efficiency



40% operation time of distribution center is sorting.

Total 250,000 packages can be sorted by one cross belt sorter in peak value.

Energy consumption



Normal motor : 50-60kw



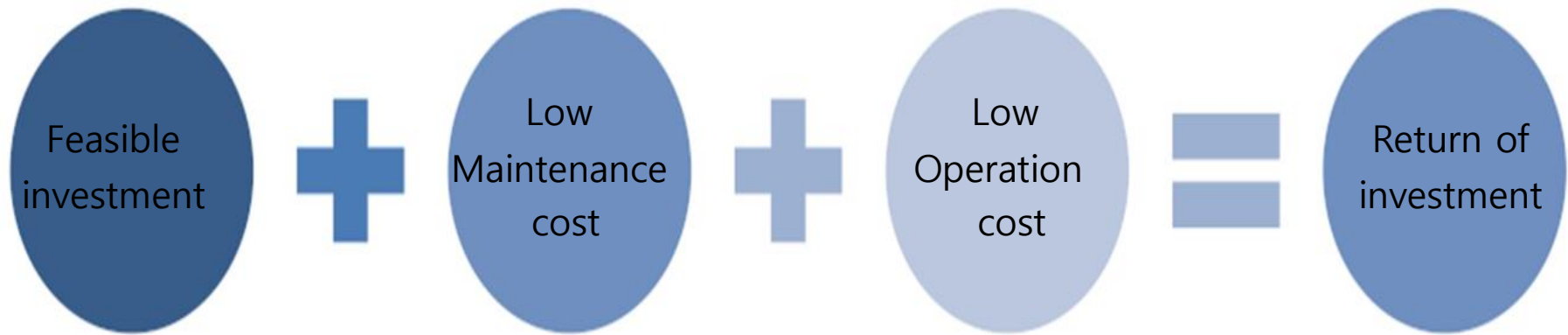
Linear motor : 5.5kw



If 2 linear motors of one sorter, 350 working days in one year, 10 hours one day,
1.5RMB per kwh. Then yearly saving electric expense :

$$350 \times 10 \times 2 \times (60 - 5.5) \times 1.5 = 572,250 \text{RMB}$$

Return of investment

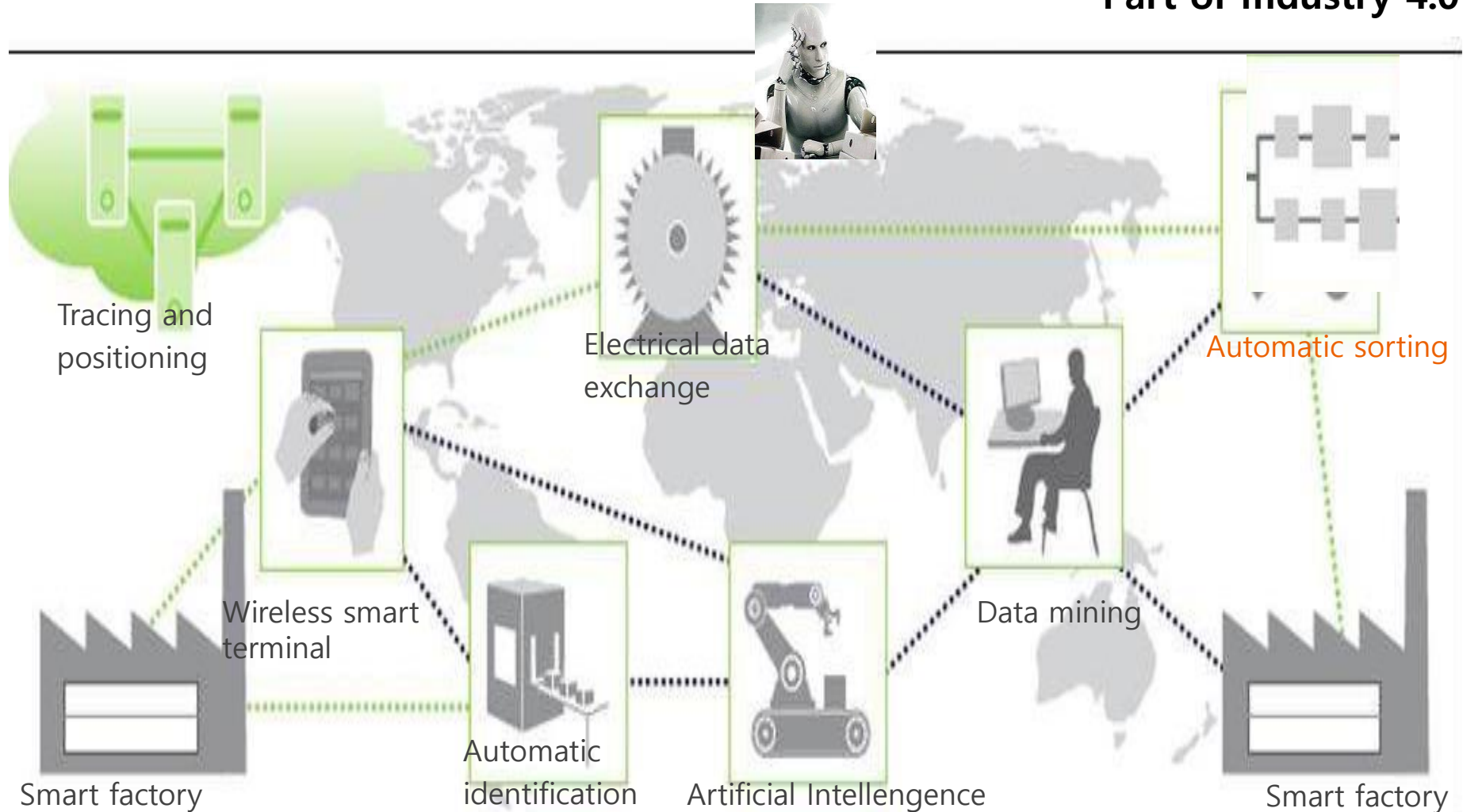


15%-20% of distribution center cost is sorting operation cost.
If calculating with 50% yearly profit rate, investment can be returned in 2 years and company can profit from the 3rd year.

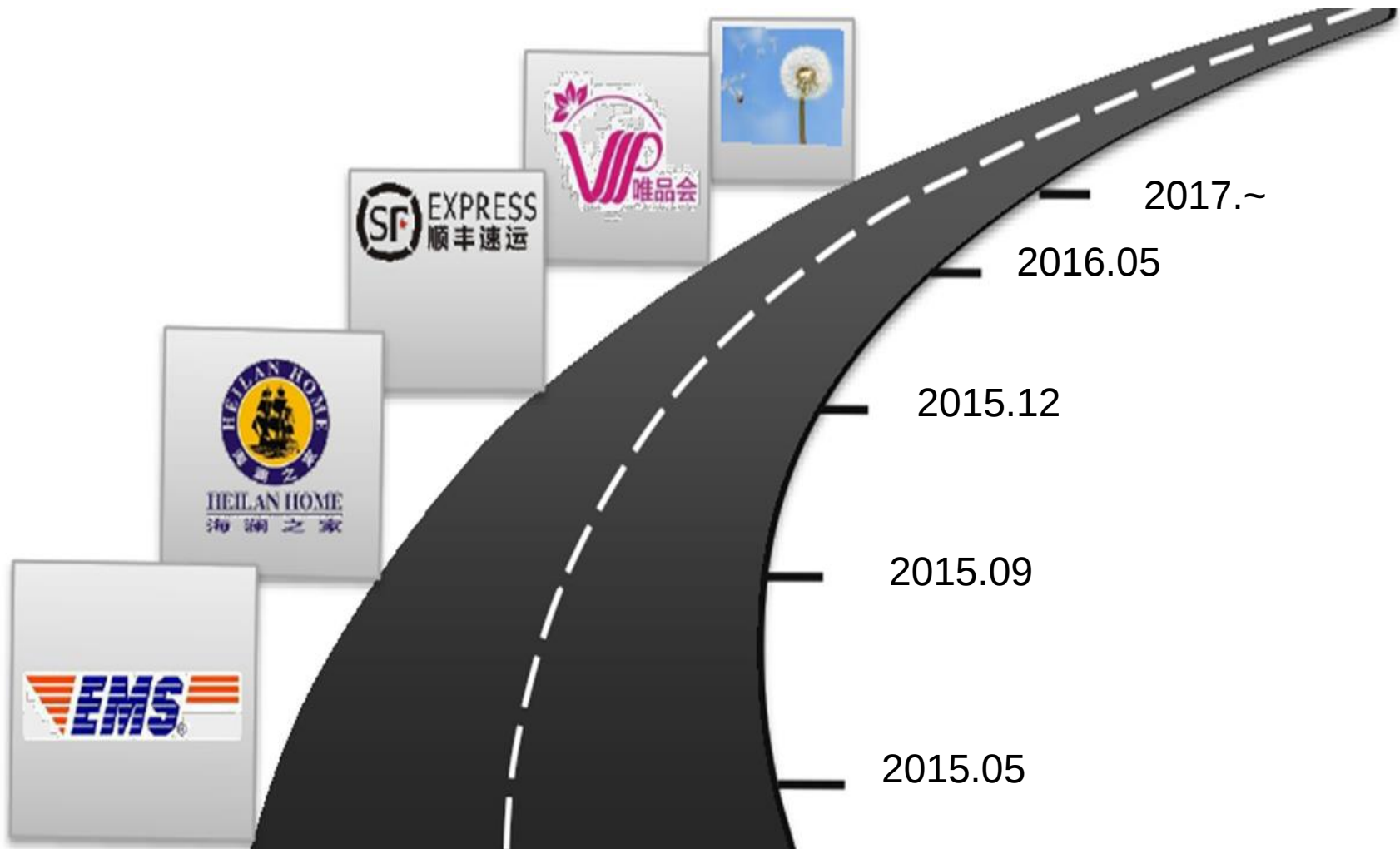


Smart logistics

Part of Industry 4.0

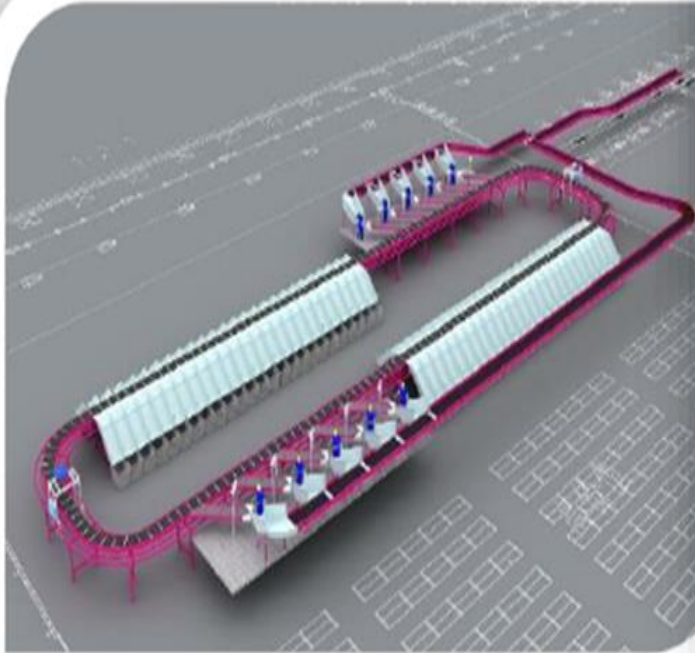


Successful case



Successful case

VIP (China Eastern) Sorting Center



- Project status: Commissioning
- Capacity: $\geq 15,000$ PPH

唯品会
vip.com

- Sorting accuracy: $\geq 99.99\%$
- System availability: 99.0%

Successful case

Online Shopping mall



重庆润威

Express



Twin Sorter

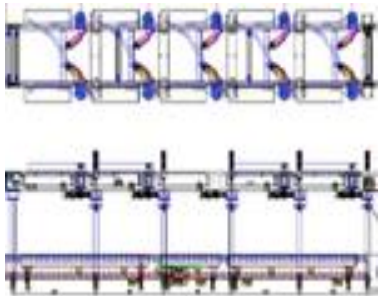
SORTER SYSTEM

TWIN ARM SWING SORTER

벨트 컨베이어를 이용한 고성능 신개념 분류기 입니다.



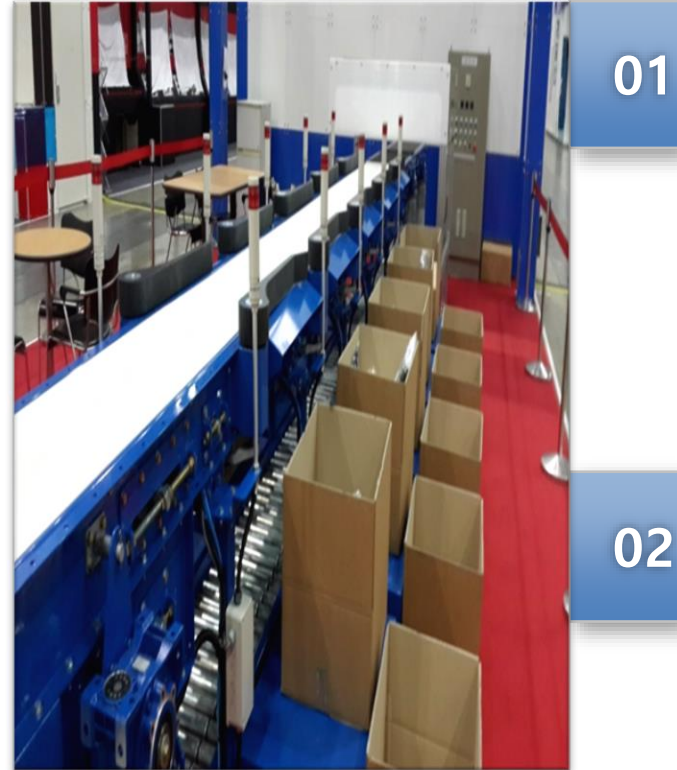
Twin Sorter은 양쪽의 Twin Bar가 좌,우로 움직이며, 제품을 끌어가는 분류방식 입니다.



SPECIFICATION

Item	Standard	Customized
Running speed	1.8m/s~2.0m/s (120m/m)	1.8m/s~2.0m/s
Sorting capacity	Single: 3,500 *Pkg/h Double: 7,000 *Pkg/h	Customized on request
Induction efficiency		
Emission angle	30° ~ 90°	30° ~ 90°
Loading weight	0.05kg~5kg	0.05kg~30kg
Package size (mm)	50x50x2 ~ 500x300x200	Customized on request
Error rate	≤0.01%	≤0.01%
Barcode reader	>99%	>99%
Noise level	<72 dB(A)	<72 dB(A)
Others	- 양방향 분류, - 상품 파손 줄어 듦, - 작은 크기의 상품 가능 - 최소 공간(최대 효율) - 쉬운 구조 변경 가능. - 유지보수 간편함.	- 대형 /중형 크기 가능

** Pkg : Package



01

Swing Arm Sorter

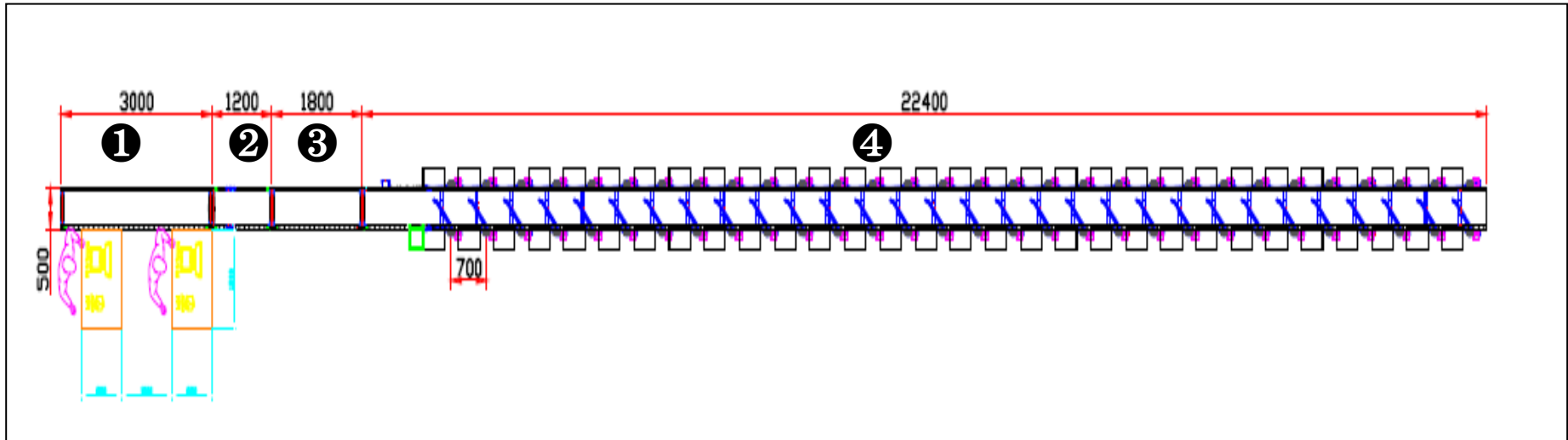
- The sorter system consists of an arm set, the parcels move along the track, and the arm is grouped into right and left Chute at the specified location.

02

Cost-effectiveness Best Sorter (Twin –Sorter)

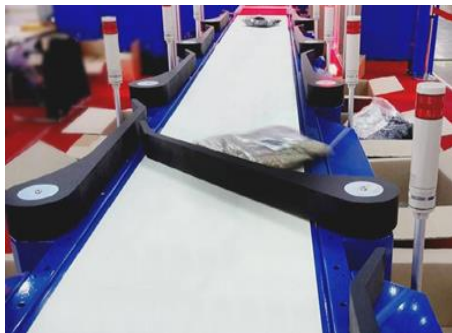
- Twin sorter is the best cost-effectiveness sorter among cross-belt sorter and tilt tray sorter.
- It is easy to install in small space and easy to change the structure.

Typical Configurations of Twin Sorter



- ❶ The parcels are put through induction.
- ❷ The inserted parcels are assigned to the corresponding chute via the barcode scanner
- ❸ Send parcels at regular intervals.
- ❹ Parcels When the chute arrives, Twin Sorter classifies it.

Specification of Twin Sorter



SPECIFICATION

Item	Standard	Customized
Running speed	1.8m/s~2.0m/s (120m/m)	1.8m/s~2.0m/s
Sorting capacity	Single: 3,500 *Pkg/h Double: 7,000 *Pkg/h	Customized on request
Induction efficiency		
Emission angle	30° ~ 90°	30° ~ 90°
Loading weight	0.05kg~5kg	0.05kg~30kg
Package size (mm)	50x50x2 ~ 500x300x200	Customized on request
Error rate	≤0.01%	≤0.01%
Barcode reader	>99%	>99%
Noise level	<72 dB(A)	<72 dB(A)

* Pkg : Package

Type of Sorters

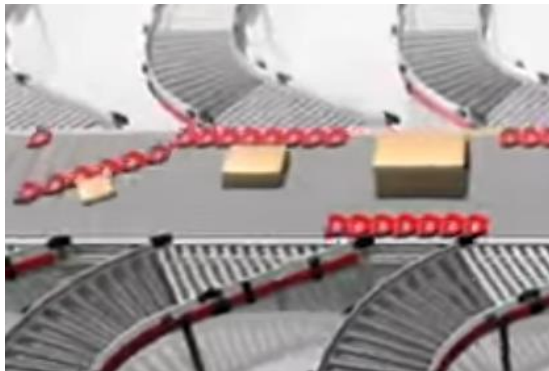
① Twin - Sorter



② Cross-Belt Sorter



③ Slide-Shoe Sorter



④ Tilt-Tray Sorter



Comparison Table of each Sorter

	Twin - Sorter	Cross-Belt Sorter	Slide-Shoe sorter	Tilt-Tray Sorter
Leveraging Installation Space	Maximization	Limited USE	Limited USE	Limited USE
Design Flexibility	Easy	Difficulty	Difficulty	Difficulty
Structural Change	Easy	Difficulty	Difficulty	Difficulty
Sorting Capacity	Low (High for double Layer)	High	High	Low
Manufacturer	Korea	Europe	Japan	Korea
Installation Cost	Low	High	High	Middle
Maintenance	Easy	Difficulty	Difficulty	Difficulty

Various Layer of Twin Sorter

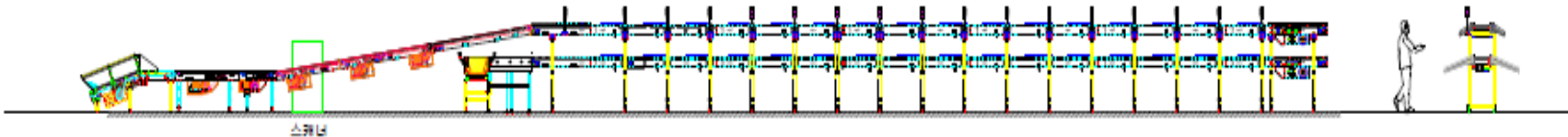
① Single-Layer



② Double - Layer

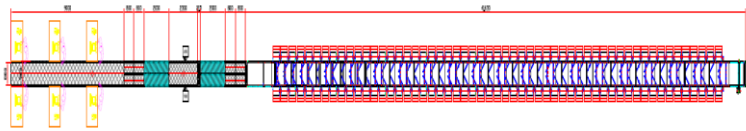


③ Triple – Layer , quadruple – Layer

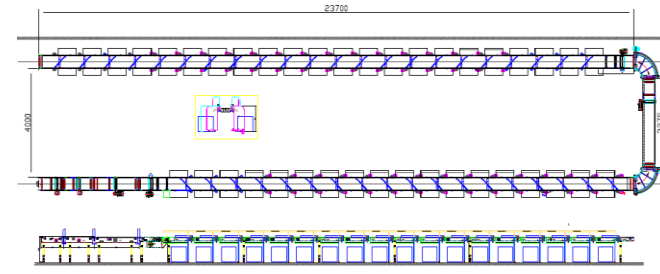


Various Layouts of Twin Sorter -drawing

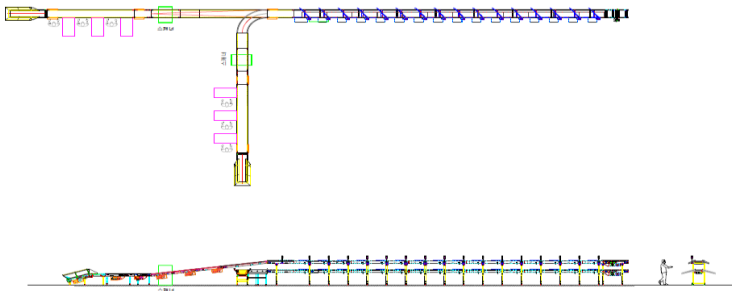
① Double-Lay out



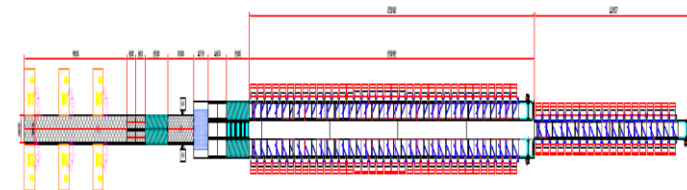
② Single Round – Lay out



③ 1F,2F – Lay out

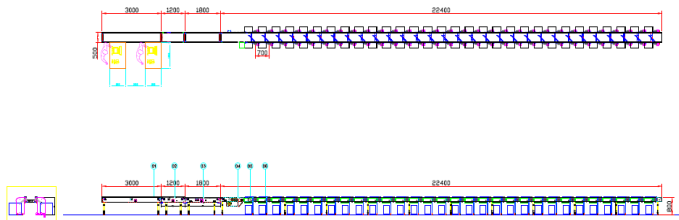


④ 3 way – Lay out

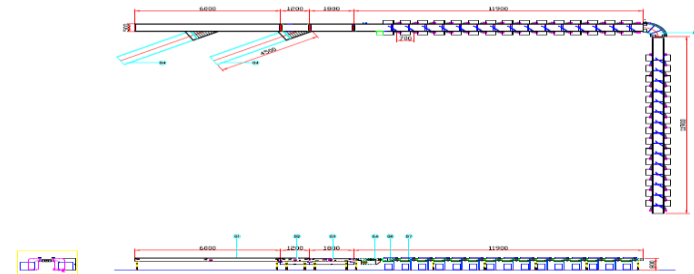


Types Layouts of Twin Sorter -drawing

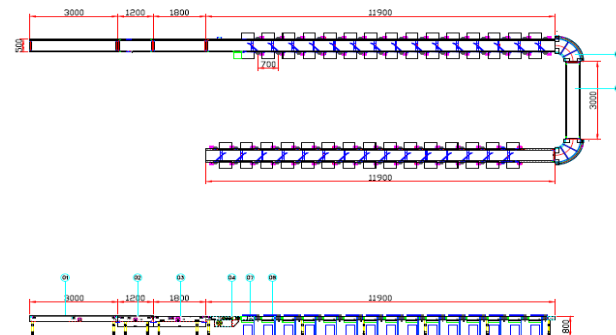
① A Type -Lay out



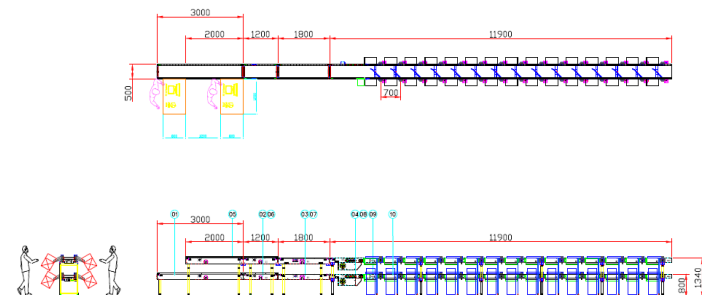
② B Type- Lay out



③ C Type – Lay out



④ D Type- Lay out



Advantage

Structural Change

- 물류터미널의 구조에 따라 설계 변경이 가능합니다.
- Chute의 증설과 변경이 쉽습니다.
- 설치 이전 및 기타 장비와의 연결이 쉽습니다.

Low Cost

- 순수 국산 개발로 최저 비용으로 제공합니다.
- (Cross-belt 60%, Tilt-tray 40% 절감 효과)

Various Classification

- 명함크기 제품, 책, 의류, 폴리백.
- 의류, 신발, 식품, 소스 류 등

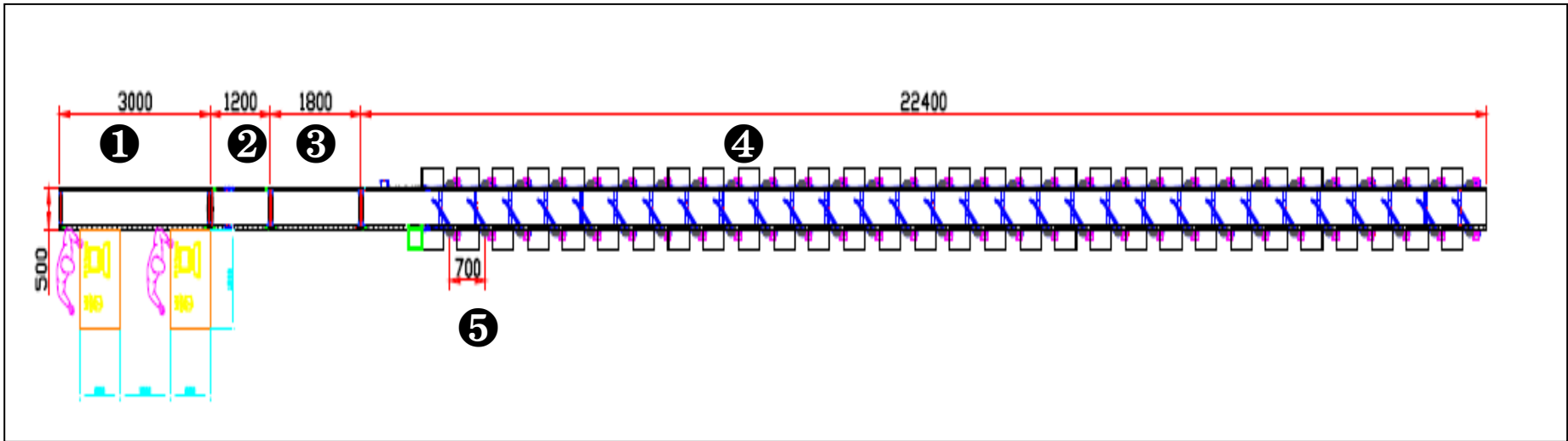
High Reliability

- 20년 이상의 기술 개발 경험
- 다양한 종류의 개발 경험
- 한국 특허 취득

Easy Maintenance

- 생산 일정의 단축 및 간소화로 납기 일정 단축됩니다.
- 자체 제작 부품 관리로 신속한 유지 관리 가능합니다.

Sorting System Components



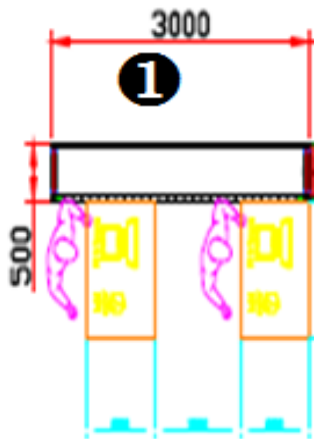
1 Induction

2 Bar-Code Scanner

3 Belt - Conveyor

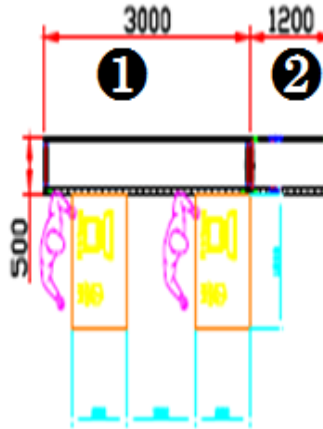
4 Swing Arm

5 Chute



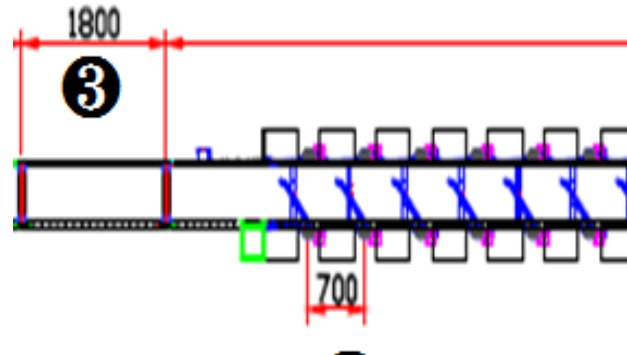
① Induction

1. Induction consists of belt conveyor
2. The parcel is checked through the barcode scanner and moved to the designated Chute.
3. There are automatic type and manual type.



② Bar-Code Scanner

- Fixed scanners and hand scanners are available.
- It can be easily applied according to customer's environment.

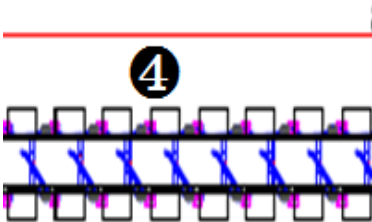


③ Belt - Conveyor

- Running Speed : 1.8m/s ~ 2.0m/s.
- Belt Size : W(500mm) x L(900~3300mm) x H (920mm).



④ Swing Arm



- Material: MC Nylon / Steel
- What is MC material?
사출 성형 또는 압출 성형은 엔지니어링 플라스틱의 일종이며 절연 특성을 가지고 있습니다.

Successful case

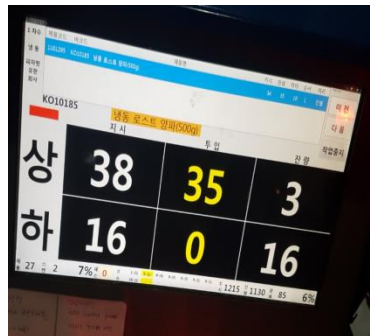
SORTER SYSTEM

식품 Industries

식품 및 식 자재 분류를 하고 있습니다.
2015년 5월 설치



1층,2층으로 이용하고 있습니다.



SPECIFICATION

Item	Double layer	Remark
Running speed	1.8m/s~2.0m/s (120m/m)	
Sorting capacity	Double: 7,000 *Pkg /h	
Induction efficiency	2500 Pkg/h (single induction)	1 person Work manually
Emission angle	30° ~ 90°	
Loading weight	0.05kg~5kg	
Package size (mm)	50x50x2 ~ 500x300x200	
Number of Chute	60ea	
Error rate	≤0.01%	
Barcode reader	>99%	
Noise level	<72 dB(A)	
취급 상품	- 식자재 - 소스류, - 음료수 - 폴리백 상품 등	

** Pkg : Package

Successful case

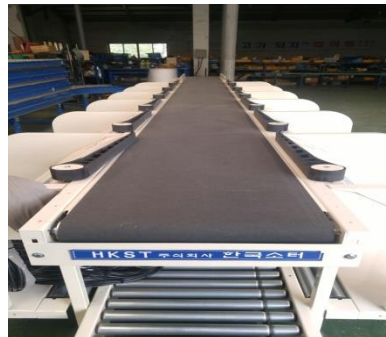
SORTER SYSTEM

Fashion Industries

의류 상품을 전국 대리점으로 분류하고 있습니다.
2015년 9월 설치



Single Layer 로 이용하고 있습니다.



SPECIFICATION

Item	Single layer	Remark
Running speed	1.8m/s~2.0m/s (120m/m)	
Sorting capacity	Single: 3,500 *Pkg/h	
Induction efficiency	3500 Pkg /h (single induction)	고정 스캐너 이용
Emission angle	30° ~ 90°	
Loading weight	0.05kg~5kg	
Package size (mm)	50x50x2 ~ 500x300x200	
Number of Chute	80ea	
Error rate	≤0.01%	
Barcode reader	>99%	
Noise level	<72 dB(A)	
취급상품	- 대리점(80개소) 분류 - 폴리백 상품 분류,	

** Pkg : Package

Successful case

HYUNDAI

LG CNS



FILA

WESTWOOD
You are the Mountain

LOOK
Optical

LF

Dongwon
동원산업



ILYANG
일양로차스

Hankook
driving innovation

E-MART
이마트

KAC
한국공항공사

김포세관
Gimpo Customs

A'REX
Airport Express

정수유통(주)

K2

LOEX
로엑스

KGB KGB택배주

생물자원센터
Bioscience Resource Center

한진택배

AMOREPACIFIC

정/사/학/병

YONEX

posco

HYUNDAI
현대그린푸드

CreaS Fashion

SORTER SYSTEM

WAVE SORTER

턴 롤러 방식의 고성능 신개념 분류기 입니다.



Wave Sorter는 복수의 롤러를 원반 위에 설치한 후, 원반을 회전시켜 화물을 배출시키는 분류장치 입니다.

SPECIFICATION

	Standard	Customized(small,middle)
Package size (mm)	L1000 x W600 x H600(50kg) Max.	L300 x W180 x H200(10kg) Max.
	L210 x W300 x H10(50g) Min.	L150 x W80 x H10(50g) Min.
Running speed	1.5m/s (90m/m)	1.5m/s (90m/m)
Sorting capacity	10,000 Package / hr	10,000 Package / hr
Emission angle	30° ~ 40°	30° ~ 40°

SORTER SYSTEM

SWING WHEEL SORTER

턴 롤러 방식의 고성능 신개념 분류기 입니다.



Swing Wheel은 휠 또는 롤러가 좌/우로 회전하여, 화물을 좌/우로 배출시키는 분류장치 입니다.

SPECIFICATION

	Standard	Remark
Package size (mm)	L1000 * W600 * H600 (30kg) Max.	
	L210 * W300 * H10 (50g) Min.	
Running speed	1.5m/s (90m/m)	
Sorting capacity	7,000~7500 Package / hr	
Emission angle	30° ~ 90°	

SORTER SYSTEM

WHEEL DIVERTER SORTER



Wheel Diverter Sorter는 다수의 휠을 좌우로 회전시켜 화물을 배출시키는 분류장치입니다.

SPECIFICATION

	Standard	Remark
Package size (mm)	L900 * W600 * H800 (50kg) Max.	
	L230 * W75 * H14 (0.2Kg) Min.	
Running speed	0.6m/s ~ 1.6m/s (36m/mi~ 96m/m)	
Sorting capacity	4,800 Package / hr	
Emission angle	30° ~ 90°	
Structural Change	Available	

POP-UP WHEEL SORTER



Pop-up Wheel Sorter은 휠이 up-down 되면서, 화물을 한쪽 방향으로 배출시키는 분류장치입니다.

SPECIFICATION

	Standard	Remark
Package size (mm)	L1000 * W600 * H600 (25kg) Max.	
	L210 * W300 * H10 (50g) Min.	
Running speed	1.3m / s (80m/m)	
Sorting capacity	3,000~3,500 Package / hr	
Emission angle	30° ~ 40°	
Structural Change	Available	