

MTA
innovation is our drive

MTA HIGH PERFORMANCE SORTER

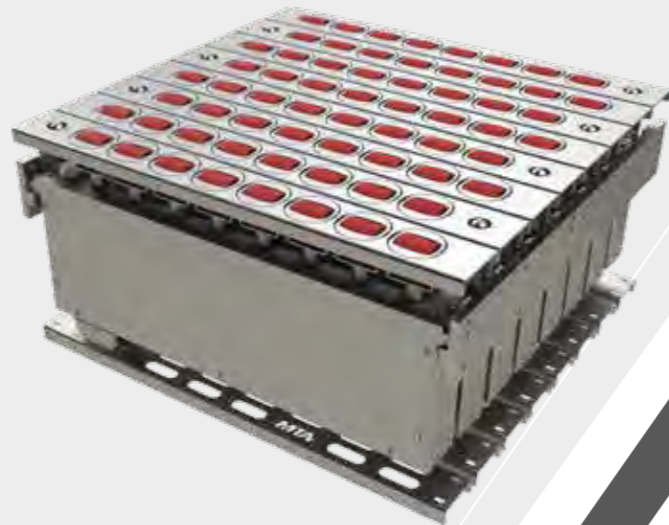
**Seperating, sorting,
diverting,...
The allrounder for parcel
and container conveyor
technology**



MTA-SORTER SYSTEM: flexible, modular, precise!

Our modular sorter concept can be used to assemble purely **electrically driven sorter systems** and **transfer elements**. The main applications are **sorting, redirecting, filtering and separation of mail and package streams**. Moreover, **in-feeds and out-feeds can be realised effortlessly for container conveying technology**.

The gearless sorter motors are extremely compact. This makes it possible to implement sorter systems with a very high roll density. In combination with the MTA motor controllers for multiple axes (4, 8 or 12-fold), unlimited possibilities are available for implementing flexible sorter cells for all conceivable application requirements. The individual control and diagnostics of each individual motor ensures smooth diverting and sorting operation.



- **Sorting, diverting, filtering, separation, corner transfer**
- **Up to 12,000 packages per hour**
- **Smooth transport**
- **Individual control of each motor**
- **Continuously adjustable swivel angle**

- **Low noise development**
- **Maintenance-free with a long service life**
- **Flexible assembly**
- **End-to-end digitalisation**
- **Simple system integration**
- **Predictive maintenance**

Areas of application of the MTA sorter system

MTA offers groundbreaking solutions for demanding challenges:



Our sorter was developed especially for highly dynamic **high-speed** applications in **package conveyor technology** and for reliable **diverting** in **container conveying technology**.



	Package conveying technology	Container conveying technology
Application	High-speed flow splitting	Storage, retrieval, diverting, 90° corner transfer units
Speed	up to 2.6 m/s	up to 1.2 m/s
Transported goods	Packages, boxes, small shipments, polybags, bags	Normed container sizes, small load carriers
Throughput	up to 12,000 pieces per hour	up to 1,800 pieces per hour
Weights	from 100 g to 60 kg	up to 50 kg
Final application	Package distribution centres	Central warehouse, logistics centres for inventory management

Single components or the full sorter system?




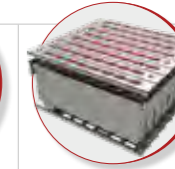
Maximum efficiency and reliability, tailor-made for your success.

Sorter component	Sorter system
	
With the open, flexible and scalable modular system for sorting applications, MTA offers customers the opportunity to implement innovative solutions for customised sorter systems . This enables versatile and customisable solutions for various applications in the field of automated sorting.	We also supply complete sorter systems for direct integration into conveyor technology. Furthermore, our systems can be adapted to individual requirements .

Maximum flexibility

The scope of delivery can be individually selected from single components through to a ready-to-install sorter system. When single components are ordered **the sorter system** will be assembled individually **by the customer in it's facility**. The engineering and production costs are reduced depending on the depth of manufacture.

When the entire sorter system is ordered you will receive a **pre-fabricated plug & play solution**. No matter which value-added component is selected from the modular system, **the End of Line test and quality assurance** will be carried out **100%** at MTA.

				
Production of the sorter motor and motor controller for multiple axes	✓	✓	✓	✓
Mechanical construction and installation of the sorter motors into the holding unit	—	✓	✓	✓
Production of the sorter line with swivel mechanism and electrical cabling	—	—	✓	✓
Production of the entire sorter system	—	—	—	✓
End of Line test / quality assurance	✓	✓	✓	✓

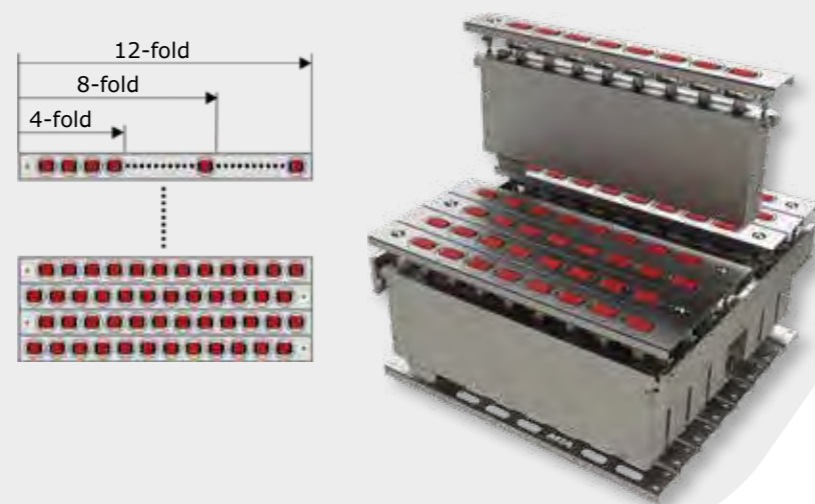
MODULAR CONCEPT for tailored solutions

With our **modular concept**, the structure of the entire sorter system can be customized.

Depending on the number of sorter motors per sorter line, scalable motor controllers for multiple axes are available.

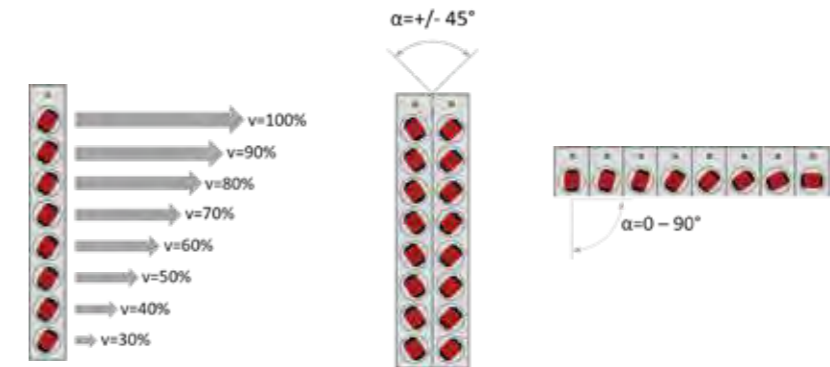
By stringing together several sorter rows, the **entire sorter system** is built up.

Simple installation from above allows fast assembly of the entire sorter or the exchange of individual sorter lines.



INDIVIDUAL CONTROL of each sorter motor

The **speed of each sorter motor** and therefore the conveying speed of the parcel **is controlled individually**. The **swivel angle** can also be set **individually for each sorter line**.



This means that packages can be diverted **as a curve** (e.g., long packages) **or parallel**.

The outer sorter motors are operated at a higher speed than the inner motors, particularly for curved diverting. This guarantees a **gentle** and **smooth diverting**.

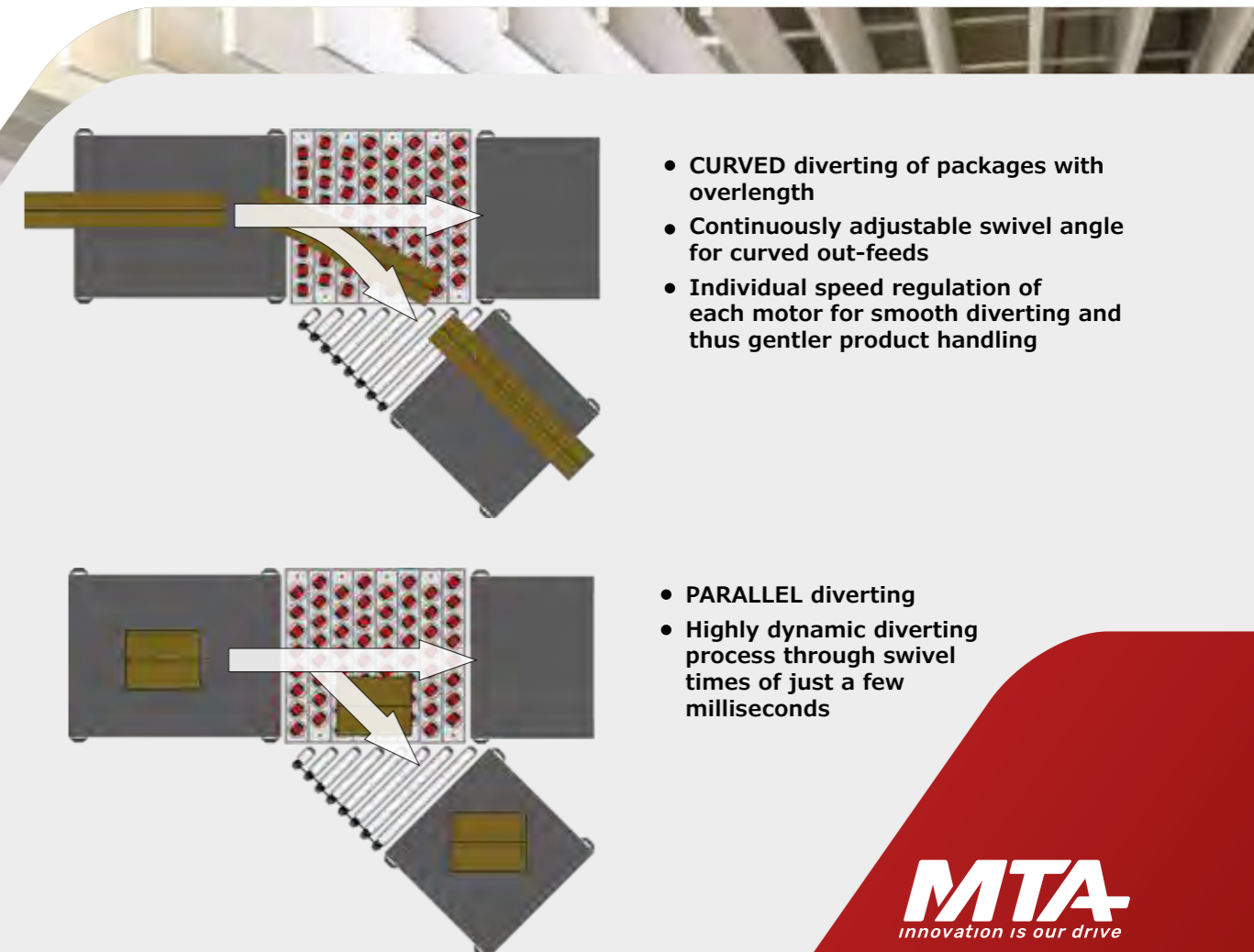
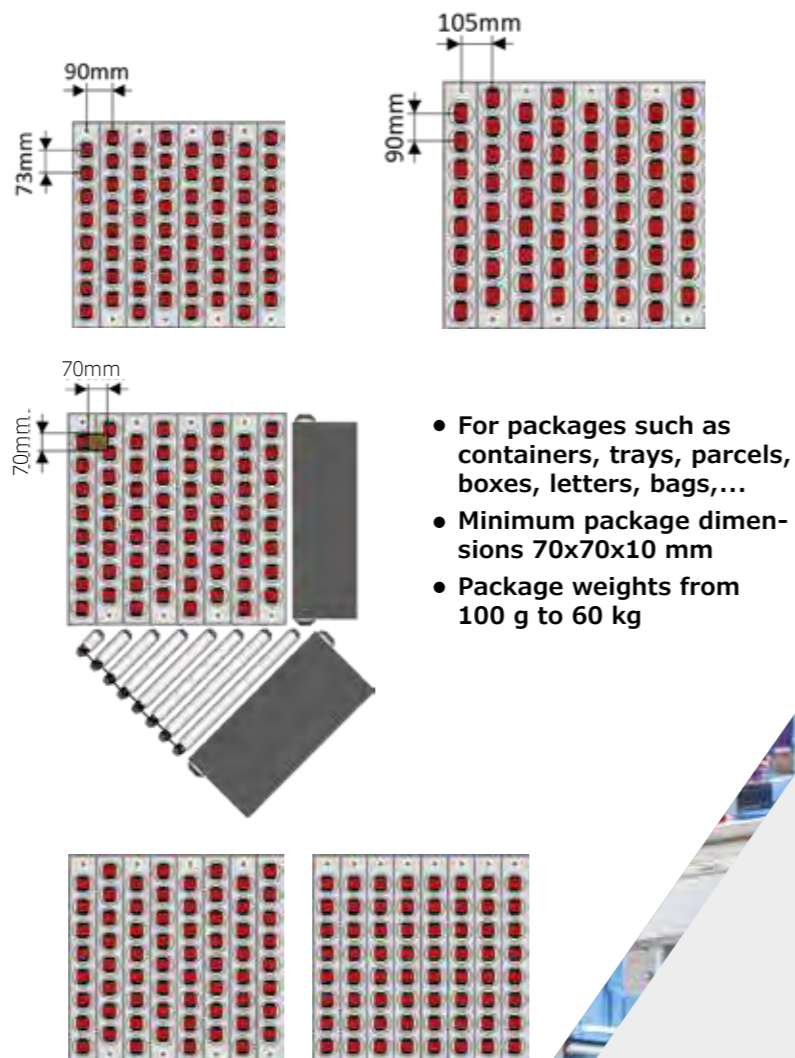
Two sizes, flexible layout

Depending on the application and the transported goods, the sorter system can be selected between **two sizes of sorter motors**. Therefore, the entire sorter system can be set up in a variety of ways.

Very compact sorter systems for small and light packages can be implemented with the small motor design. This makes it easy to transport small packages, polybags or bags.

Depending on the installation of the sorter lines, the motors **are either arranged** offset from one another **or straight**. The offset arrangement is typically used in parcel logistics centres and has the advantage that the minimum distance to the sorter motors is reduced compared to a straight arrangement. This prevents the **packages from "getting stuck"**.

The straight arrangement of the sorter motors is typically used in container conveyor technology for corner transfer units.



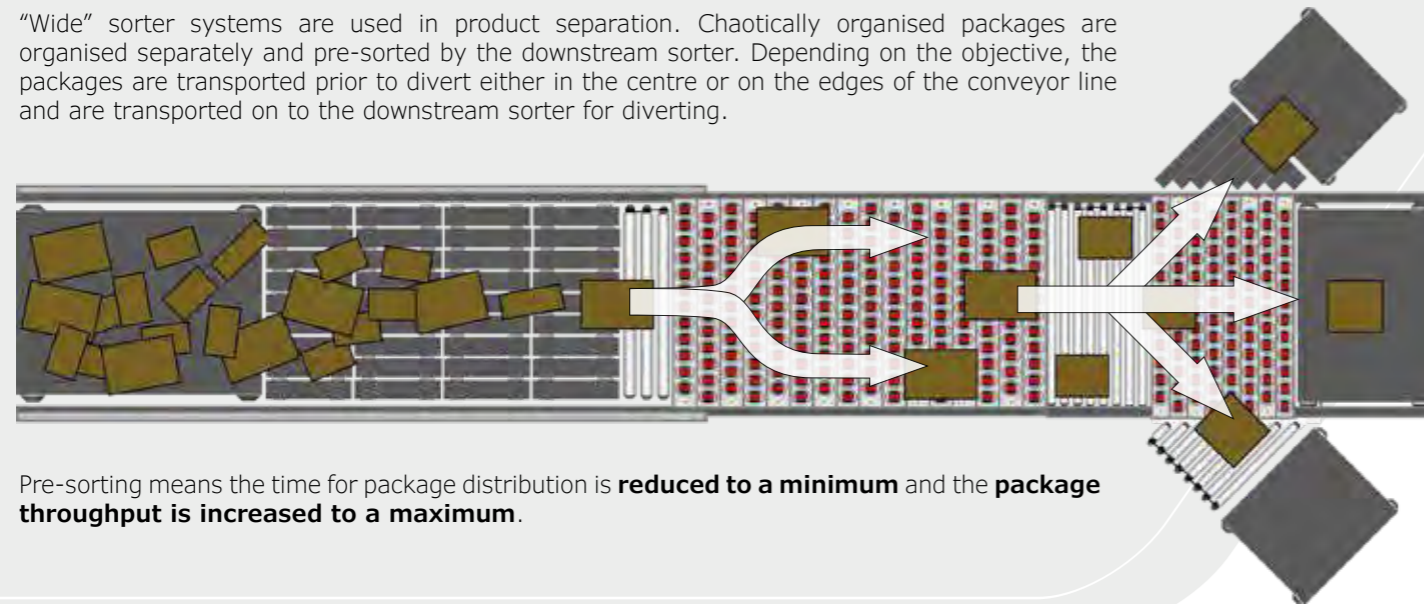
PACKAGE CONVEYING TECHNOLOGY

Fast throughput is the measure of all things in package conveying technology. Highly dynamic flow splitting is decisive for the productivity of the system.

The sorter system is used in the **ENTIRE package distribution centre**. Following **package delivery** the package flow is divided with wide sorter systems. During **transportation within the package distribution centre** the diverting is carried out via additional sorter systems. At the **package output** the package flows are sorted for delivery.

In the package delivery area

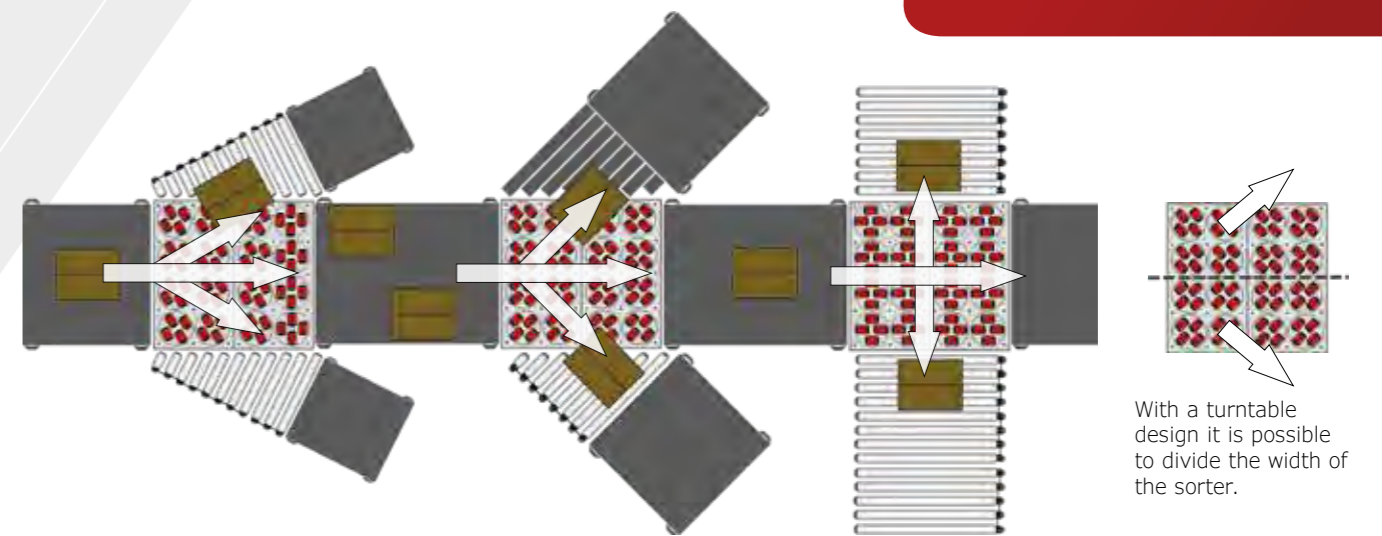
"Wide" sorter systems are used in product separation. Chaotically organised packages are organised separately and pre-sorted by the downstream sorter. Depending on the objective, the packages are transported prior to divert either in the centre or on the edges of the conveyor line and are transported on to the downstream sorter for diverting.



Pre-sorting means the time for package distribution is **reduced to a minimum** and the **package throughput is increased to a maximum**.

With the modular concept, sorter systems can also be implemented as turntables.

The rotating turntables also allow them to be arranged offset from one another. This means that very small parcels with a size of 80 x 80 mm can also be sorted in this version.

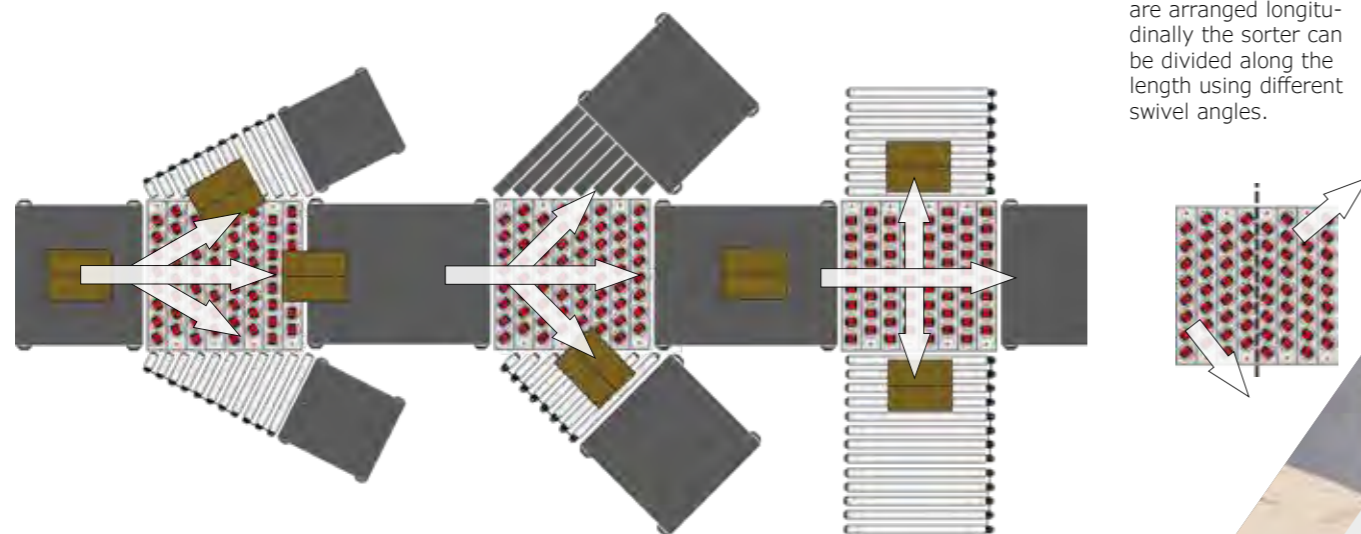


With a turntable design it is possible to divide the width of the sorter.

Inside the package distribution centre

In the package distribution centre packages are **filtered, sorted and diverted**. Swivel angles can be **continuously** set during operation. Typical diverting angles of $\pm 30^\circ$, $\pm 45^\circ$ or $\pm 90^\circ$ are easily possible.

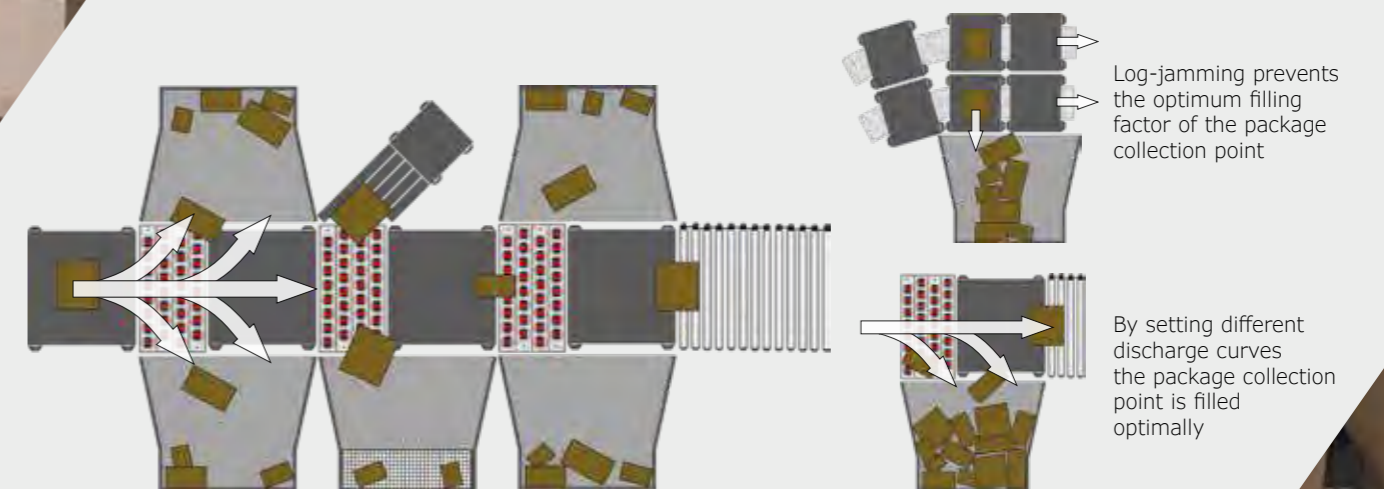
Where sorter motors are arranged longitudinally the sorter can be divided along the length using different swivel angles.



In the package delivery area

The **packages are "thrown"** by the sorter at the package output. Very short and exact swivel times are decisive in order to guarantee high throughput and fast bundling of packages for delivery. Reduction of the swivel times enables optimisation of workflows and increased efficiency. This allows the fast processing of orders and improved productivity.

The **individual setting of diverting curves** prevents so-called "log-jamming" and maximises the filling level of the end point (collection point).



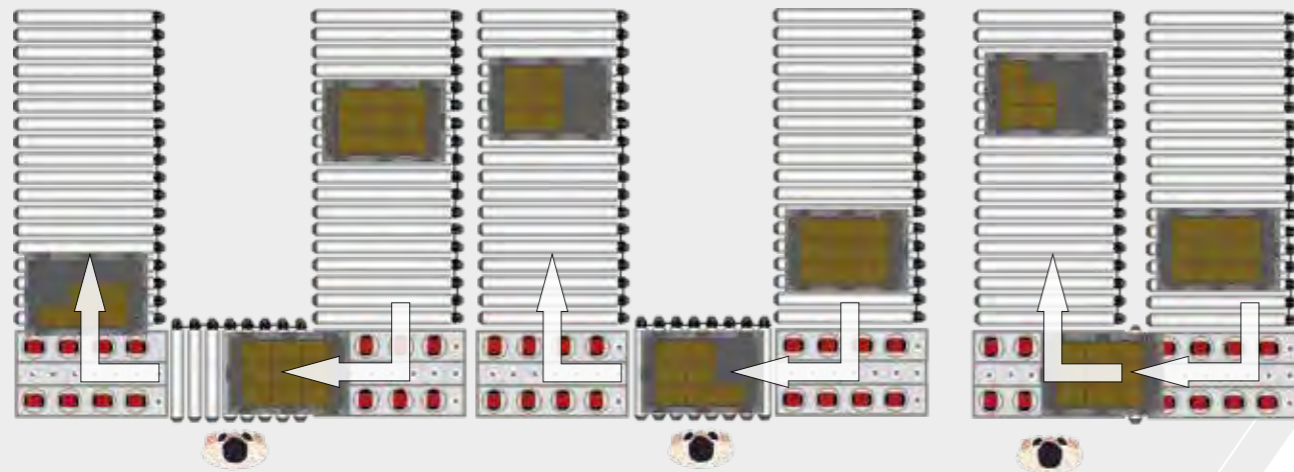
Log-jamming prevents the optimum filling factor of the package collection point

By setting different discharge curves the package collection point is filled optimally

CONTAINER CONVEYING TECHNOLOGY

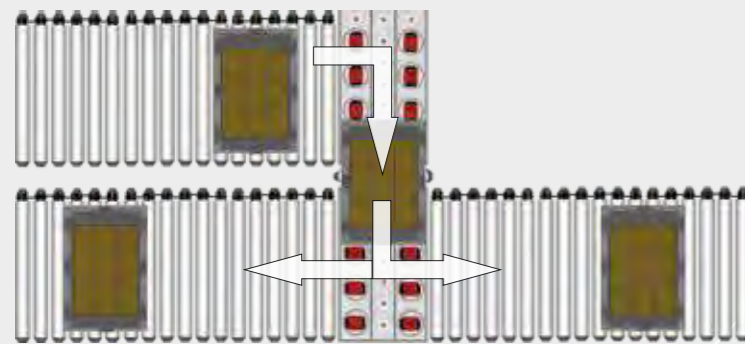
In container conveying technology for **normed small load carriers** our sorters are most often used for **90° implementation**. However **diverting at 45°** or other angles is also easily achievable.

The modular assembly means the sorter can be adjusted exactly to the container size. **Compared to package conveying technology fewer motors are used** in this case. The containers are neither lifted nor lowered in this case. No complex lifting mechanisms are required. One example of the area of application is picking stations, e.g. in automated small parts warehouses.



Reversing mode:

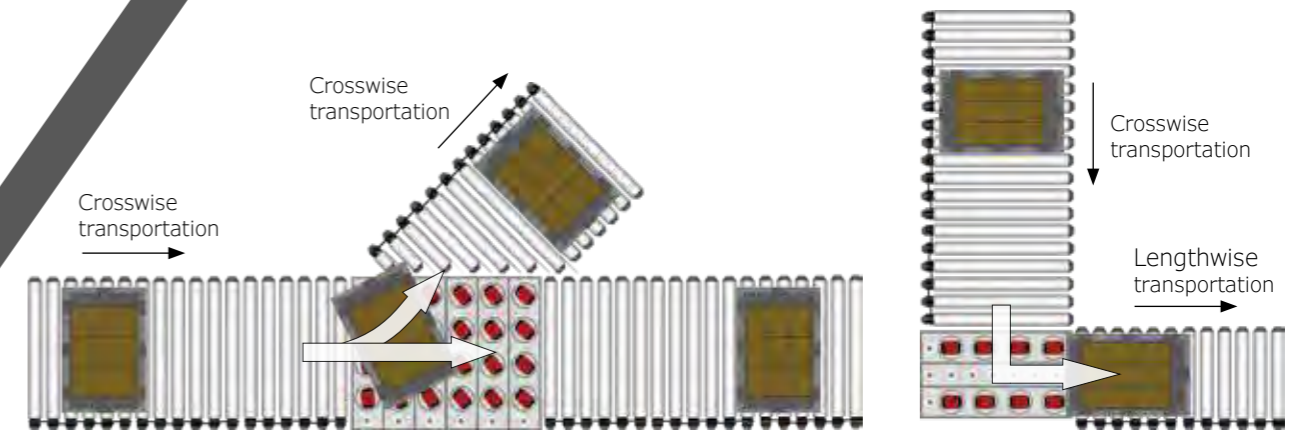
Within conveyor technology, the sorter system is used as an **out-feeder, in-feeder** or **corner transfer unit**. Thanks to the possibility of **reverse operation**, the direction of rotation is changed due to the individual control of each motor and the containers can be removed or conveyed in two directions. This replaces a complex reverse operation with motor rollers.



Length- and crosswise container transport:

With the sorter system, it is possible to change the type of container transport (crosswise transport to lengthwise transport or vice versa).

For curved routes the conveying mode of the container is retained. The sorter system offers the advantage that fragile goods, such as liquids, are diverted very gently and carefully.





SORTER COMPONENTS

Sorter motors

The core of the sorter system is the **sorter motor from MTA**, which has been proven and tested **for years**. The sorter motors are executed as **gearless direct drives** and therefore they **are extremely quiet**. This makes the entire sorter very **quiet** and is characterised by very smooth running and a long service life.

Executed in two different lengths and power ratings, optimised solutions for specific requirements can be implemented.

Sorter motors are available as single components in two sizes for own customer designs.

			
Power	W	15	22
Voltage	VDC	24/48	24/48
Speed	m/s	2.6	2.6
Noise level	dB	< 48	< 48
Length	mm	65.4	82.4
Diameter	mm	53	53
Coating		Polyurethane 80° Shore A	






Ready-to-install solutions (sorter motor in the holding unit) are also available. The sorter motor is installed, wired and tested in the holding unit.

Motor controller for multiple axes



The motor controllers allow **full digitalisation** of the sorter systems. The individual speed control of each motor is carried out via the **CANopen interface**. In addition, advanced software functions offer a high level of diagnostic capability for **predictive maintenance**. Alternatively, the control of all motors can be carried out via **I/O interface**.

Depending on the mechanical design and area of application, motor controllers with different numbers of motor outputs are available. The **flexibility, modularity** and **scalability** in the design of the entire sorter system continues consistently with the motor controller versions for multiple axes.

				
Number of motor outputs		4	8	12
Power supply	VDC	24/48	24/48	24/48
Control voltage	VDC	24	24	24
CANopen interface		✓	✓	✓
I/O interface		1 x analogue input for speed 1 x digital input for direction of rotation 1 x digital input for regulator enable 1 x digital output for error output		
Braking chopper		✓	✓	✓
Dimensions (L x W x H)	mm	188x81x37	244x81x37	300x81x37

Swivel drive

Moving to the swivel positions in the shortest possible time is essential for precise sorting at high conveying speeds.

A **highly dynamic synchronous motor with integrated motor controller** and high-resolution encoder system for precise positioning tasks is used in the swivel drive. Consequently, the CANopen interface for **full digitalisation** is also integrated into the whole drive unit.



Power	W	60
Motor controller		Integrated
Power supply	VDC	24/48
Control voltage	VDC	24
CANopen interface		✓
Swivel time ±45°	ms	150
Dimensions (L x W x H)	mm	45(hex)x218

The **integrated motor controller** reduces the cabling requirements to the power supply and CANopen communication.

Power supply and supply of the control section of the integrated motor controller can be supplied independently of each other. When the power is switched off, CANopen communication is maintained for diagnostics.

The high-resolution encoder system and the integrated positioning function mean that **all swivel angles, e.g. ±30°, ±45° or ±90°, can be approached continuously**. No limit switches or end switches are required. A reference run is carried out automatically when the sorter line is switched on. The swivel motor automatically measures the outer swivel positions and positions the the sorter highly dynamically and continuously between the two end positions as required.

- Separate supply for power section and control section
- Control via CANopen interface or I/Os
- Brake chopper onboard
- LEDs for diagnostics and display of error states, brake chopper and CANopen communication
- Dip switch for CANopen terminating resistor and Node ID
- Reverse polarity protection, overvoltage protection, overcurrent protection and temperature monitoring

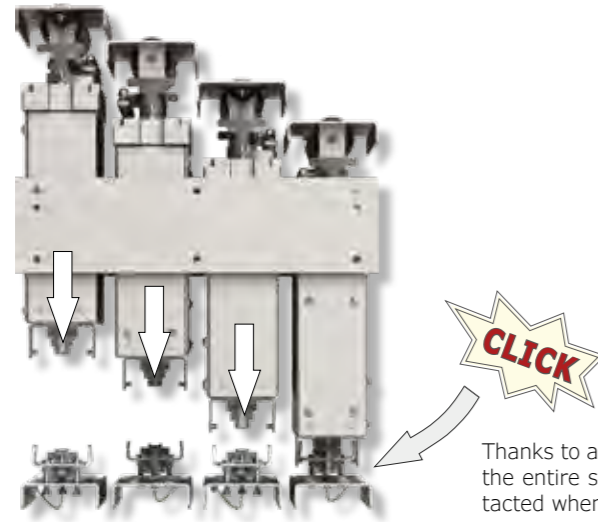


SORTER LINE

A sorter line is a **prefabricated, ready-to-install unit** in which the sorter motors, motor controllers for multiple axes and the swivel drive are fully integrated.

The sorter line contains the entire mechanical design including the swivel mechanism of an entire line of sorter motors.

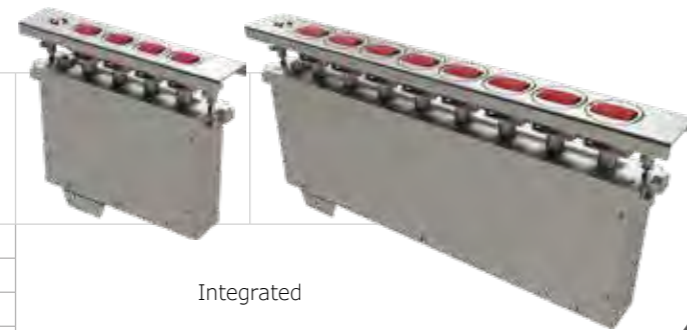
In addition, a power supply unit for the power supply is installed in each sorter line. The entire sorter line is already **pre-wired at MTA**.



Thanks to an ingenious contacting system, the entire sorter line is automatically contacted when installed.

The quality assurance measures are carried out during the **end-of-line test at the MTA factory**. Sorter motors and swivel mechanism are checked, limit values measured and recorded.

This means that a **prefabricated and 100% tested sorter line is available** for further installation.



Integrated

Sorter motors			
Motor controller for sorter motors			
Swivel motor			
Power supply 230 VAC/24 VDC			
Power per motor	W	15	22
Sorter line width	mm	92	105
Length of sorter line with 4 motors	mm	452	520
Length of sorter line with 12 motors	mm	1036	1240
Distance between sorter motors	mm	73	90
Connection technology / contacting		Plug & play contacting when the sorter line is installed in the sorter system	

SORTER SYSTEM

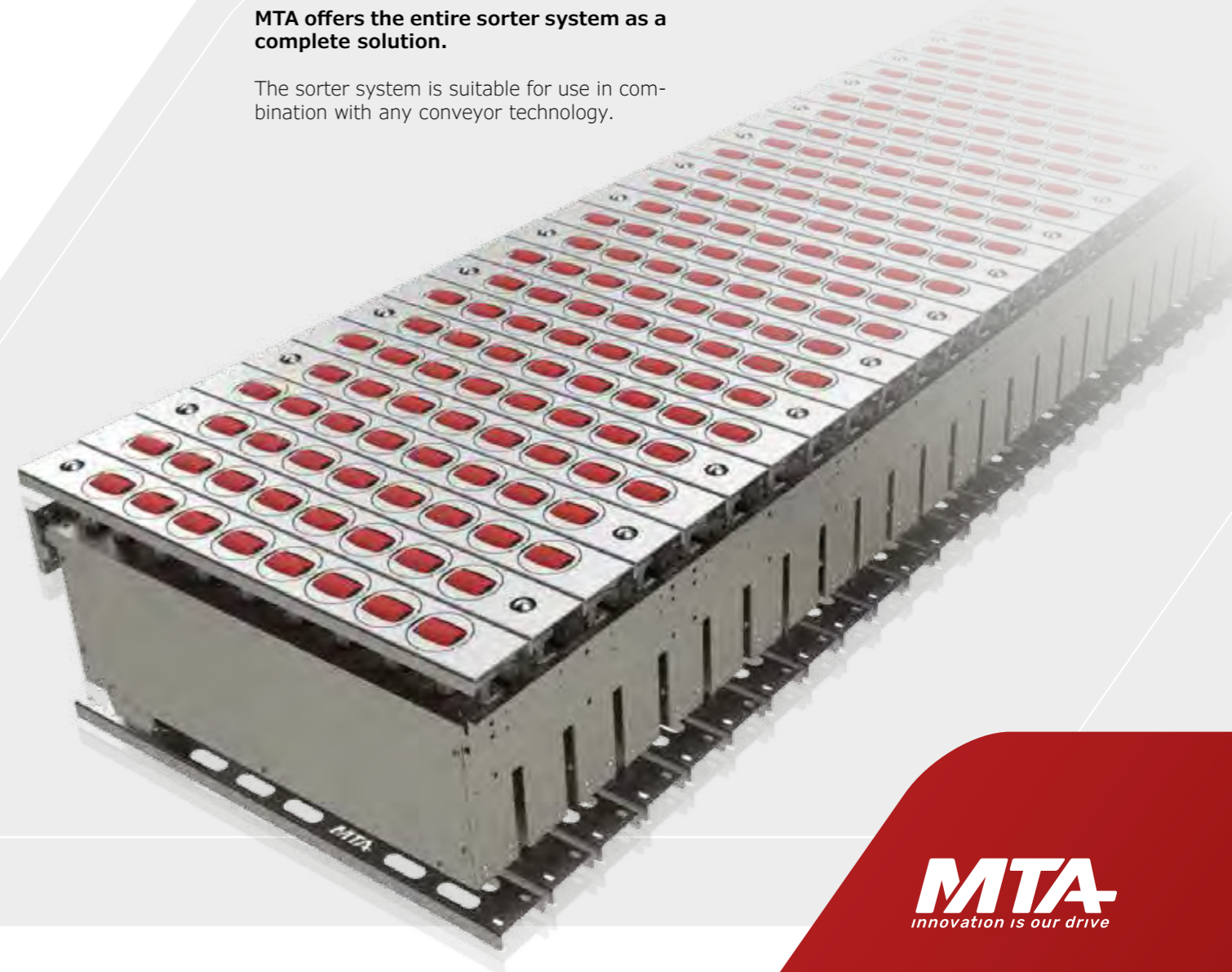
Several sorter lines in a row make up the entire sorter system. The sorter lines are slotted very easily into the sorter from above. Contacting is done automatically. This makes it possible to exchange the sorter line in only a few minutes.



Package throughput per hour		up to 12,000 pieces per hour	
Power per motor	W	15	22
Minimum package sizes	mm	70 x 70 x 10	90 x 90 x 10
Sorter length with 4 sorter lines	mm	368	420
Sorter length with 20 sorter lines	mm	1840	2100

MTA offers the entire sorter system as a complete solution.

The sorter system is suitable for use in combination with any conveyor technology.

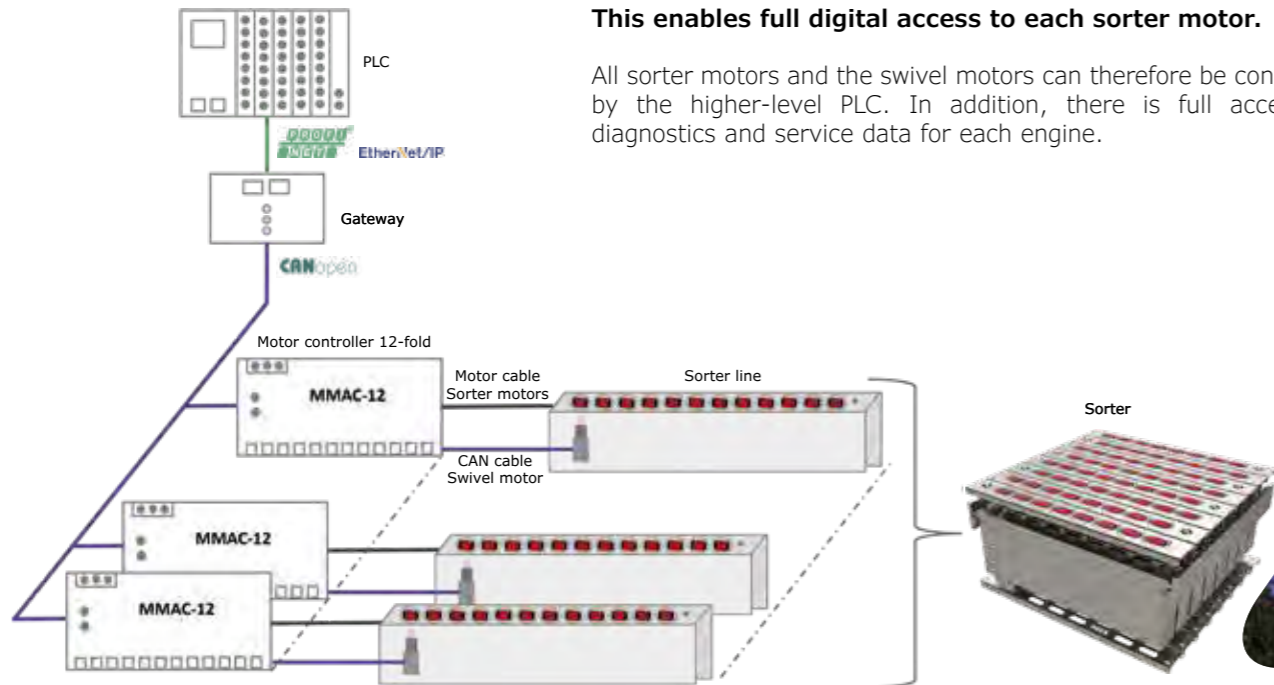


SYSTEM INTEGRATION

A cost-effective and industrially standardised fieldbus system is available with the full **CANopen communication interface in accordance with the DS402 drive protocol**. Integration via gateways means that the sorter can be easily integrated into common **industrial Ethernet standards**.

This enables full digital access to each sorter motor.

All sorter motors and the swivel motors can therefore be controlled by the higher-level PLC. In addition, there is full access to diagnostics and service data for each engine.



**OUR SORTERS
IN USE
SUCCESSFULLY
WORLDWIDE**

PREDICTIVE MAINTENANCE

The sorter is **maintenance-free**. The **gearless design** as a direct drive means that no wear parts are used in the sorter motors and the entire system is operated purely electrically.

Wear parts such as belts or other mechanical or pneumatic components, as found in outdated systems, are not used in this highly advanced sorter solution.

Abrasion of cardboard packaging during parcel transport can lead to contamination and subsequently to operational disruptions. Thanks to **full digitalisation, operating data can be read cyclically** from the motor controller firmware. In addition, warnings and error messages are reported to the higher-level PLC. Thanks to this ingenious early warning system, each individual sorter motor can report increasing soiling of the

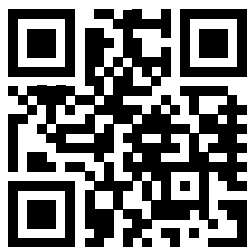
system to the control system without an immediate malfunction occurring. The system operator has the opportunity to clear the warning at a planned time or to plan system cleaning in advance before an operational disruption shuts the system down.

Accordingly, the production operation is not disrupted and this increases the availability of the system.



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