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I would like to take this opportunity to say thank you twice. Firstly, I would like to thank our customers for their cooperation that has been based on trust and openness - which in many cases has lasted over twenty years. And then I would also like to thank my employees for their level of commitment that often goes beyond their normal duties and for their eagerness to share responsibility. It is only due to this special commitment and exceptional trust that it has been possible to develop leading technology that has made the inspection process more refined and more reliable.

Michael Horst

Managing Director

Direct. Dynamic.

miho *Inspektionssysteme*
is a medium-sized company not just through its size but also through its profile and personality:
We are flexible and open.
We are a company that has its own personality and many personalities within it.

Founded in: 1977
Headquarter: in the middle of Germany,
in Ahnatal near Kassel.
Connected: to all our customers world-wide.

This connection is based on direct communication that is uncomplicated and reliable. And with a dynamic and flexible cooperation.

Today we are developing the best solutions together with you for different inspection requirements. Tomorrow and the day after tomorrow we will continue to offer you a service that you can rely on and provide updates that set the standards of the future.

The company miho or the big miho family.
Dedication world-wide that has character.

Be it near or far:
We are there: for you!

Examples of innovative miho inspection processes:
Full crate inspection using a line laser (subject to patent)

Sealing inspection using a sensor wheel (subject to patent).
See illustration of sensor wheel on page 5.

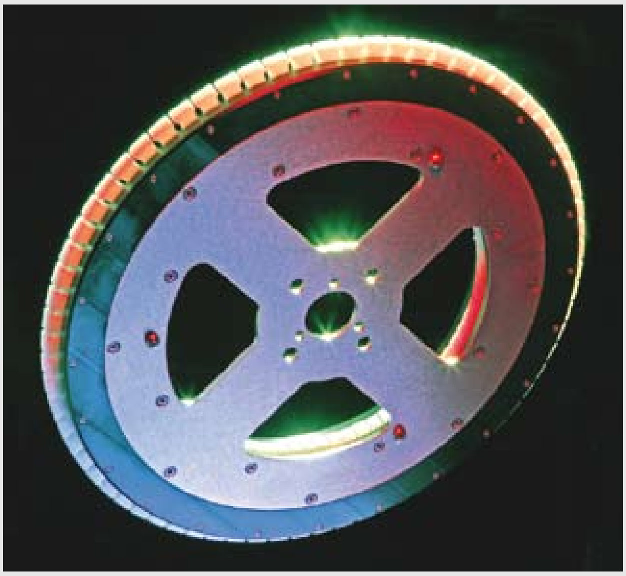
Direct Innovation.

miho inspection technology
reflects the constant upgrading process.

It is not just about the implementation of modern technology. The most important factor to use this technology effectively is the extensive and in part specialized knowledge of our engineers as well as the fine balance within specialized technological fields such as optics, image-processing and automatised mechanics. This is how miho inspection systems have always been able to increase their existing performance spectrum and have, as far as is technically possible, been able to set new standards.

There is also another reason for the performance capability of our machines: over 30 years of daily resonance in practice. This has had the most influence on our machines and this drives us forward.

miho innovation is direct innovation:
Innovation with a clear focus on functionality and efficiency.



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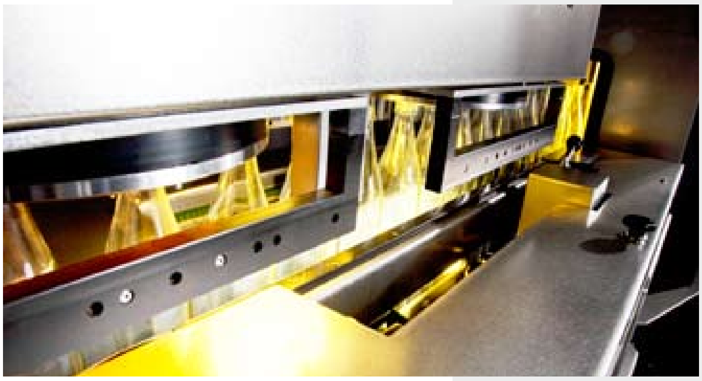

The flagship of the miho Inspection systems: The Empty Bottle Inspector miho David 2

Forward-looking.

miho machines, with their sophisticated and logical construction, are a real part of German engineering tradition. They are valued worldwide for their solid construction and easy maintenance. They have low follow-up costs and a long lifespan - aspects for future viability.

And: miho systems keep up with state of the art technology. They are consistently built with a radically modular construction and it is therefore possible to implement our constant new developments in older machines through updates which keeps them up and running.

The most important thing though is: we will also be there for you tomorrow.

The bottom line is that miho *Inspektionssysteme* has a team of highly qualified and dedicated employees. And you will find these people both at our headquarter in Germany and on location on various continents of the world. We are therefore always at hand - with our knowledge and service - quickly and directly at your side.

A good relationship sets the ground for the future. We look to the future together.

www.miho.de

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Obervellmarsche Str. 12 · 34292 Ahnatal · Germany · Tel: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de

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Maxx

Empty Bottle Crate Inspection Machine

miho **Maxx** is a **Crate Inspection Machine** that monitors and sorts empty crates in accordance with different criteria achieving a level of performance that exceeds any level reached up until now.
The main function of the miho **Maxx** is the **differentiated and extensive sorting system** of both **crates** and **bottles**. The **crates** are sorted in accordance with certain criteria defined by the user and are diverted to different conveyors. One of these conveyors is usually used for crates where the **bottles** are unpacked using a robot and they are controlled, sorted and distributed to the different conveyors by the miho **Maxx**.
The **technical core piece** of this very differentiated inspection system is the state of the art miho **Vario Optic System**, whose components, namely a camera, mirror and lighting system, operate on a **flexible** basis and in **coordination with the special object being inspected**. Up to **40 images** are created by the miho **Maxx** for each crate, by using **different perspectives and alternative lighting**. This leads to a higher level of detection accuracy for the different crate and bottle features. The **accuracy detection of bottle-material** (glass or plastic bottles) and the **bottle-type** (plastic returnable bottles, non-returnable bottles, PET cycle bottles) has been **increased to nearly 100%** through the development of an **innovative UV fluorescent inspection process**. Even the detection of the **shape of neck rings** for PET bottles is now possible.
The **radical and open modular construction** of the miho **Maxx** does not only make **maintenance and servicing of the machine easy** but also allows the machine to be **upgraded easily**. The miho **Maxx** is therefore a high performance sorting and monitoring system that has a **solid construction** and is a **secure investment for the future**.

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miho Maxx: Main Features

- Extensive and very differentiated inspection of both the crate and the bottle using several different criteria.
- Differentiated sorting, in accordance with the criteria set by the user: on the one hand, the diversion of crates to the different conveyors, on the other hand, control of the unpacking of the bottles by, for example, a robot to different conveyors.
- Complete monitoring and protocols for the quality of the incoming empty bottles.
- Technology: The state of the art miho-Vario-Optic-System. For example, special alternative lighting, which leads to the reliable detection of special crate and bottle features.
- Extensive network: Ethernet connection to Office programmes. Can be maintained by remote control. (Analogue / ISDN).
- User friendly, for example, by intuitive graphical user interface based on Windows XP. Connection to a remote workplace.
- Extremely easy maintenance and service through its very solid, radical, modular and open construction; wear resistant, for example by using LED lighting. Low investment costs.

Maxx

miho-Vario-Optic-System

For a differentiated inspection of the complex object, the crate, **many different inspection criteria** must be fulfilled. We have developed the miho **Vario Optic System** to meet these differentiated objectives. The **first** thing is that it has a **system of many cameras** that make images of each crate to be inspected and these images are made at **different moments and at many different angles**. This therefore takes into account the many different aspects of the crate and bottle to be inspected. **Secondly, and most importantly**, it has a **completely new flexible lighting system**. This lighting system can **create just the right lighting individually for each inspection process** and can therefore significantly improve the quality and amount of data. This special image data is used by high performance computers to make a detailed assessment of the status of the crate and the bottle. This improved and large amount of image data that is available and which is especially optimized for that particular inspection process results in a very **high level of secure inspection and a very low level of false rejections**.

The up until now unique, variable lighting system for the miho **Vario Optic System** is achieved by using **LED**'s. Here there are **three further advantages** of this method:

Disruptive external light from neighbouring lighting systems is no longer a problem, since the LED's are only activated for active cameras for some thousandths of a second.

The **life duration for the LED's is practically unlimited**, the lamps do not need to be replaced and this saves on costs.

The **intensity and light colour of the light system stays constant** and the inspection quality is not subject to any fluctuations (whereas light bulbs or fluorescent lamps change their intensity and light colour during their lifetime).

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Maxx

Operation and Network

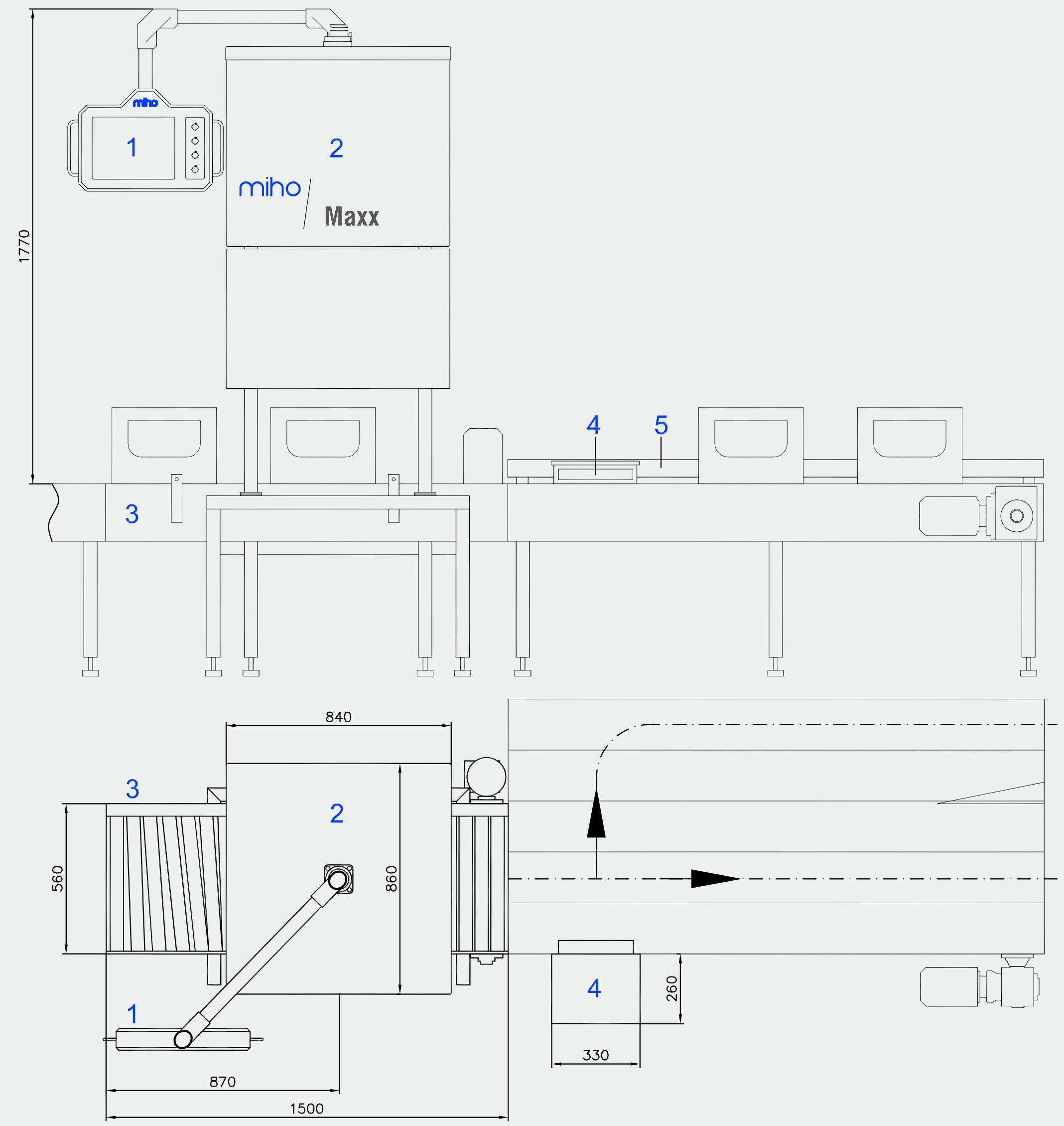
Operation and connection:
Intuitive user icons based on Windows XP.
Operation from a remote work place possible.
Connection to Office programmes through various data banks that can be configurated individually and in accordance with the requirements of the user.

Changing type:
No mechanical adjustment is required.

Interfaces:
Network interface: Industrial Ethernet, TCP/IP.
Interface for the control of different reject systems.
Profibus interface for, for example, the control of the unpacker.

Remote maintenance:
Completely by remote control (Analogue, ISDN, DSL).

Reject systems:
miho **HSP**, miho **Leonardo SK, Robot.**



1: Operating Panel 2: Inspection Unit 3: Roller Conveyor 4: miho HSP 5: Absorption Railing

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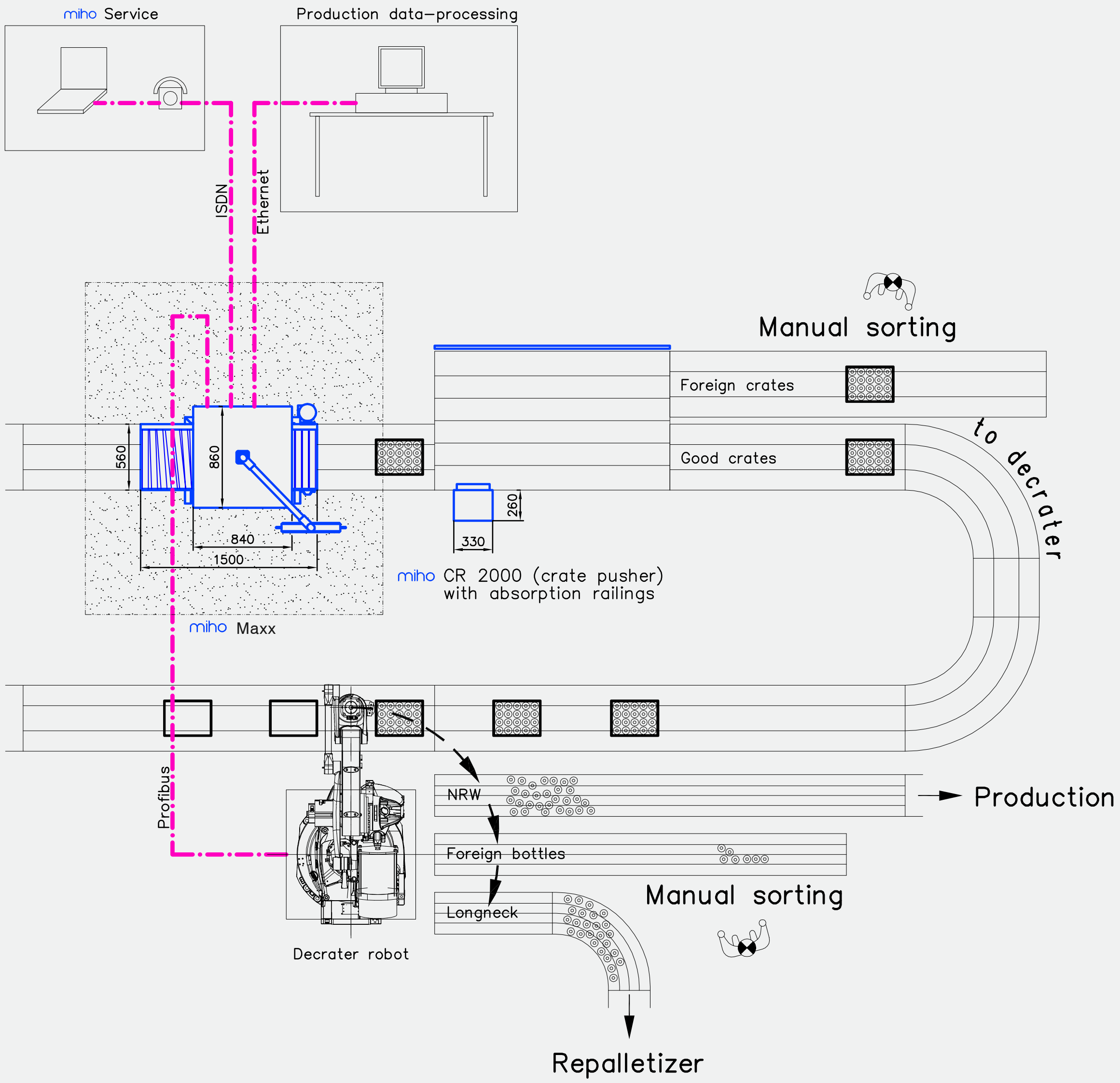
Maxx:
Example of a concept for a sorting line



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Multicon 3

Bottle Sorting System

The miho **Multicon 3** is an **accurate bottle sorting system** with a detection facility for **all optical features** of the bottle. Any differences in **bottle-shape, colour and size** can be detected and the system is able to make a **fine distinction**, so that only bottles of the required bottle-type enter the filling process. The miho **Multicon 3** can also sort the remaining bottles in accordance with the criteria set by the user and divert these bottles onto different conveyors.

One of the strong points of the miho **Multicon 3** is the **compensation of different „classic“ disruptive factors** which up until now have led to incorrect sorting. The miho **Multicon 3**, for example, allocates bottles with **loosely hanging labels** or **PET bottles** that are deformed by underpressure to the right bottle-type despite these deviations and ensures that they are forwarded or diverted accordingly.

The **technical basis** for this special performance is mainly a complex camera mirror system and a modern image-processing system with the new platform miho **VIDIOS**® (**V**ersatile **I**mproved **D**istributed **I**maging **O**peration **S**ystem / Real Time). miho **VIDIOS**® has been designed specifically by miho for inspection tasks.

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Multicon 3

List of features

Functions and performance

- Inspection of the bottle shape and height.
- Inspection of the bottle colour and brightness.
- Colour evaluation of the entire bottle and therefore no influence of residual liquids or labels.
- Compensation of disturbance variables such as loose labels, snap rings, or drinking straws.
- Simultaneous sorting according to different sorting criteria to different reject channels. Sorting of multiple types with one setting. No height adjustment of the inspection head is necessary.
- Optional: detection of glass with UV-filtering.
- Optional: distinction between glass and PET bottles.
- Optional: differentiation of different bottle finishes and cap shapes.
- Optional: compensation of PET bottles deformed by a vacuum.
- Sorting capacity up to 72 000 bottles / hour.

Technology

- **New platform** miho **VIDIOS**® (**V**ersatile **I**mproved **D**istributed **I**maging **O**peration **S**ystem / Real Time) for high quality image-processing. miho **VIDIOS**® is a registered trademark of miho for its own specially developed software program structure for image-processing. It is possible to carry out improvements to algorithm through the exact knowledge of source codes both better and faster in accordance with the requirements of inspection technology in the beverage industry. Thanks to miho **VIDIOS**®, miho is independent from external software manufacturers and can react more quickly to customer needs.
- Maintenance-free lighting systems with durable LEDs.

Operation

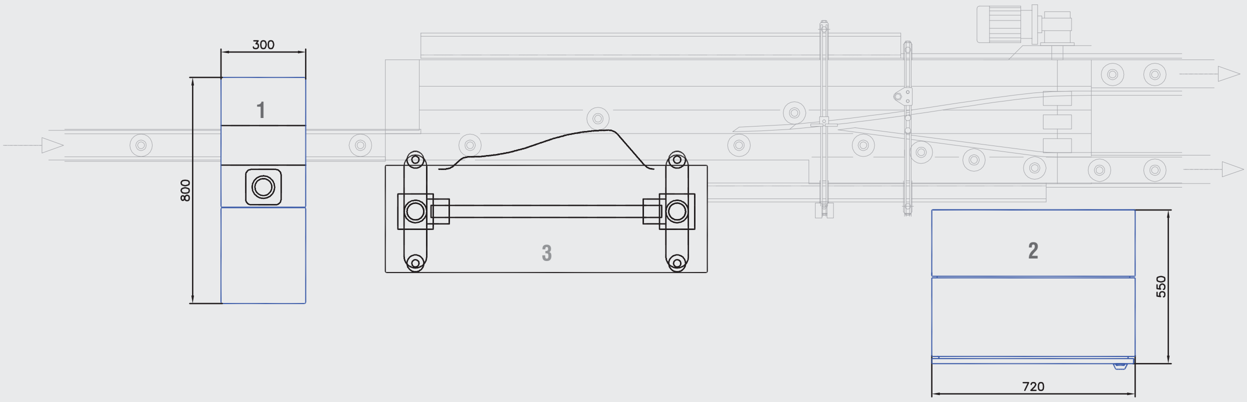
- Colour display with touch screen. Intuitively controllable user interface in local languages.
- High level of operational safety through individual password protection.
- Optional: Access protection by means of transponders.

Prepared for

- Remote maintenance via Internet.
- Operating data collection (for example, Weihenstephan standard version). Built-in network interface (Ethernet, TCP / IP).

Rejection

- Pneumatically operated standard Reject System miho **HSP.**
- Servo motor-driven eccentric Reject System miho **ESF 2.**
- Linear Reject System miho **Leonardo M**.
- Various reject signals for existing reject systems.



1: Inspection head **3: Reject system miho Leonardo M** **2: Control box**

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Unicon 3

Bottle Sorting System

miho **Unicon 3** is a bottle sorting system that uses the light barrier technology. It detects bottles with a different height and rejects them. The reject system detects **bottles with different heights and lying bottles and bottle-breakages** and initiates their rejection, even through different reject systems if required.
Area of use: the miho **Unicon 3** carries out an **accurate** inspection of the height of the bottles. The miho **Unicon 3** can therefore, for example, be used as an infeed inspection unit before the inspection machine, so as to avoid any interruptions in the filling process and any possible damage to the machines.
miho **Unicon 3** distinguishes itself through its high level of user comfort and an extensive and differentiated fault visualization system.

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Unicon 3

Additional functions

User comfort

The miho **Unicon 3** is operated by using a 5,7“ touch-screen and provides a comprehensive display of the parameters. The error messages are displayed in text form under the type of fault. Error accumulation can be displayed in accordance with certain criteria defined by the user. Different languages are available.

Introducing measures

The following measures can be introduced by the miho **Unicon 3**:

Rejection of the unacceptable bottles by up to two reject systems (for example, lying bottles can be diverted to a reject table and bottles with a different height can be diverted to a glass container)**.**

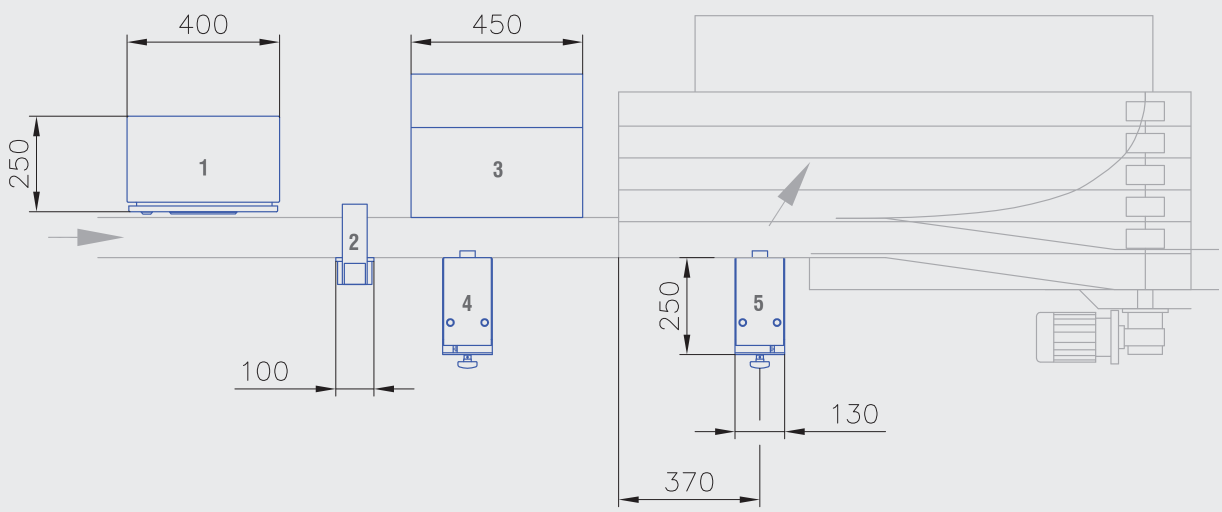
Conveyor stop and stopping a part of the conveyor

Optical and acoustical signal.

Changing the bottle-type

If the miho **Unicon 3** is used as an infeed inspection unit for the **Empty Bottle Inspector** miho **David 2**, then the bottle-type is changed automatically through a special connection to the miho **David 2**. This can also be carried out at the Bottle Sorting System itself.

Example for installation:



1: Control box 2: Light barrier 3: Safety cover for container for broken bottles 4 and 5: miho HSP

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David 2

Empty Bottle Inspection Machine

The miho **DAVID 2** is the newest version of the Empty Bottle Inspector miho **DAVID**. It is the result of new ideas that have arisen from studying the miho **DAVID** in practice. The exterior construction has extensively been redesigned and in detail but the successful basic construction has been maintained and all hygiene aspects have been taken into consideration. The level of detection and operational safety have significantly been increased through design modifications and state of the art components.

The basic features of the miho **DAVID 2** are:

Outstanding inspection performance.

State of the art calculation methods. New platform miho **VIDIOS**® (**V**ersatile **I**mproved **D**istributed **I**maging **O**peration **S**ystem / Real Time). miho **VIDIOS**® has been designed specifically by miho for inspection tasks and provides innovative image-processing.

Continuous **digitised and flexible camera concept** with modern **CCD camera technology**.

Optimised lighting conditions through **high performance LEDs** using the latest technology.

Optimal **safeguard against extraneous light** through pneumatic removeable light cover.

Hygienic construction: slanted surfaces. Integrated contamination-proof pipeline cooling system. Extensive access to the inspection components with no remote areas subject to possible contamination.

Consequent open modular construction: possible modification through new inspection modules and functions. Uncomplex maintenance.

Inspection Units

Base Inspection:

Detection and display of objects and contamination present at the bottle-base.

Detection of transparent faults (for example, cellophane) due to an integrated bright field system with polarisation filter (for glass bottles).

Optional: extension of visual angle for an improved inspection of bottles with long necks.

Residual Liquid Inspection:

Detection of residual liquid in the bottle, especially soda, by using the HF measuring process. With sensitivity adjustment control.

Optional: Residual liquid inspection by using an infrared inspection process for the improved detection of organic liquids (for example, oil).

Bottle-finish Inspection:

Detection and display of damage to the bottle-finish, in particular the sealing surfaces.

Detection not just of “usual“ external damage but also of internal damage (for example, cracks) by using a new lighting system

Optional: Underchip detection to detect damage on the side of the bottle mouth.

Thread Inspection (optional):

Detection and display of damaged and incorrectly manufactured threads. The complete thread is recorded in one single image.

Sidewall Inspection:

Detection and display of damage and contamination, even if it is very small, on the outer and inner bottlewall, whilst reducing the fault detection rate caused by a build up of steam or water drops.

Dual Sidewall Inspection (optional):

This has two camera systems facing one another at the bottle infeed and outfeed. This construction allows any dirt or damage, irrespective of which side of the bottle they are on, to be directly within the view of the camera and to easily be detected.

Inner Sidewall Inspection (optional):

Detection of three dimensional contamination on the inner wall of the bottle which cannot be detected from the outside because of, for example, ACL labels, relief printing.

David 2

System features

Radical and open modular construction:

Each separate function and sub-function of the machine does not only have its own technical component but is also independent and easily accessible. Component parts are also accessible.

Extensive possibilities of modernisation:

This consequent open modular construction allows uncomplex modifications with new inspection modules and future developments. The miho **David 2** is a machine that by upgrading can be kept state of the art technology even after years.

State of the art technology. For example:

State-of-the-art computer technology. New platform miho **VIDIOS®** (**V**ersatile **I**mproved **D**istributed **I**maging **O**peration **S**ystem / Real Time). miho **VIDIOS®** is a registered trademark of miho for its own specially developed software program structure for image-processing. It is possible to carry out improvements to algorithm through the exact knowledge of source codes both better and faster in accordance with the requirements of inspection technology in the beverage industry. Thanks to miho **VIDIOS®**, miho is independent from external software manufacturers and can react more quickly to customer needs.

Camera technology:

Thoroughly digitised and flexible camera concept with modern CCD camera technology.

Special lighting systems and light techniques:

Simultaneous implementation of different lighting processes. General use of LED lighting with a long lifetime.

Hygienic construction:

Slanting surfaces. No build-up of dripping water. Extensive access, therefore, no inaccessible corners and zones. Covered cable conduits. Closed pipeline cooling system: Secured against contamination.

Very solid mechanical components:

For example: Precision transport system for which all parts have been constructed to deal with the toughest of demands.

Maintenance- and service-friendly:

The clearly-arranged and open construction allows an uncomplex maintenance.

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David 2

Operation

TFT colour display:

With touch screen and intuitively controllable operator interface. Installed in a swivel arm.

User administration:

Multi-level user administration with password protection.
Optional: Registration by using a transponder.

Data processing (optional):

Extensive protocols and storing of all operating data. Compatible with the “Weihenstephan Standards“.

Remote maintenance (optional):

The miho **remote maintenance module** visualizes from a distance the current operation status (for example, counters and disruptions), the parameters and the images on an authorized computer. The remote distance module can be used to enter new parameters or to update them, to pre-set-up new bottle-types and to quickly and accurately analyze any faults.

The remote maintenance can be done using DSL or the company network and is secured by VPN technology.

Performance

72 000 bottles per hour

Periphery

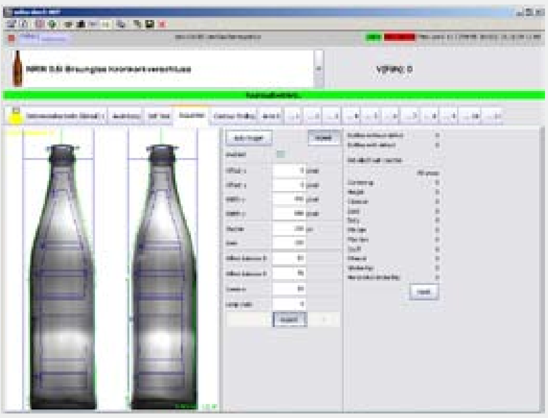
Infeed inspection:

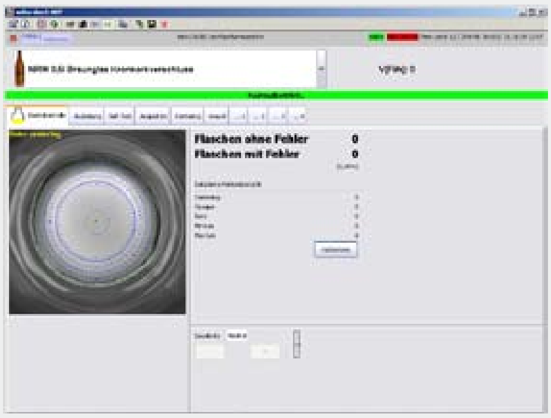
Sorting module miho **Unicon 3** (sensor technology). Halts the conveyor for bottles that are too low, too high and chipped. Option: An individual reject system that is installed before the infeed of the machine that rejects the foreign bottles without stopping the conveyor.

Alternative to the miho **Unicon 3**: the Sorting System miho **Multicon 3** (camera-based). Performs a differentiated detection in accordance with size, shape and colour. Rejection or diversion of different bottle-types takes place through a separate reject system without the conveyor being stopped.

Reject Systems:

Options:
Pneumatic Reject miho **HSP**
Eccentric Reject System miho **ESF 2**
Linear Reject System miho **Leonardo M**





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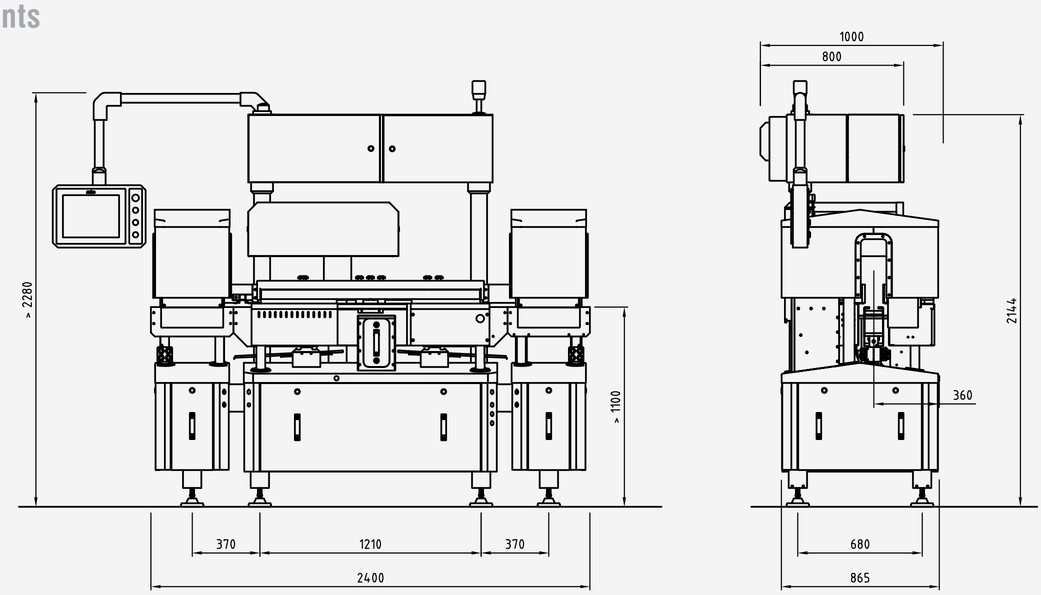
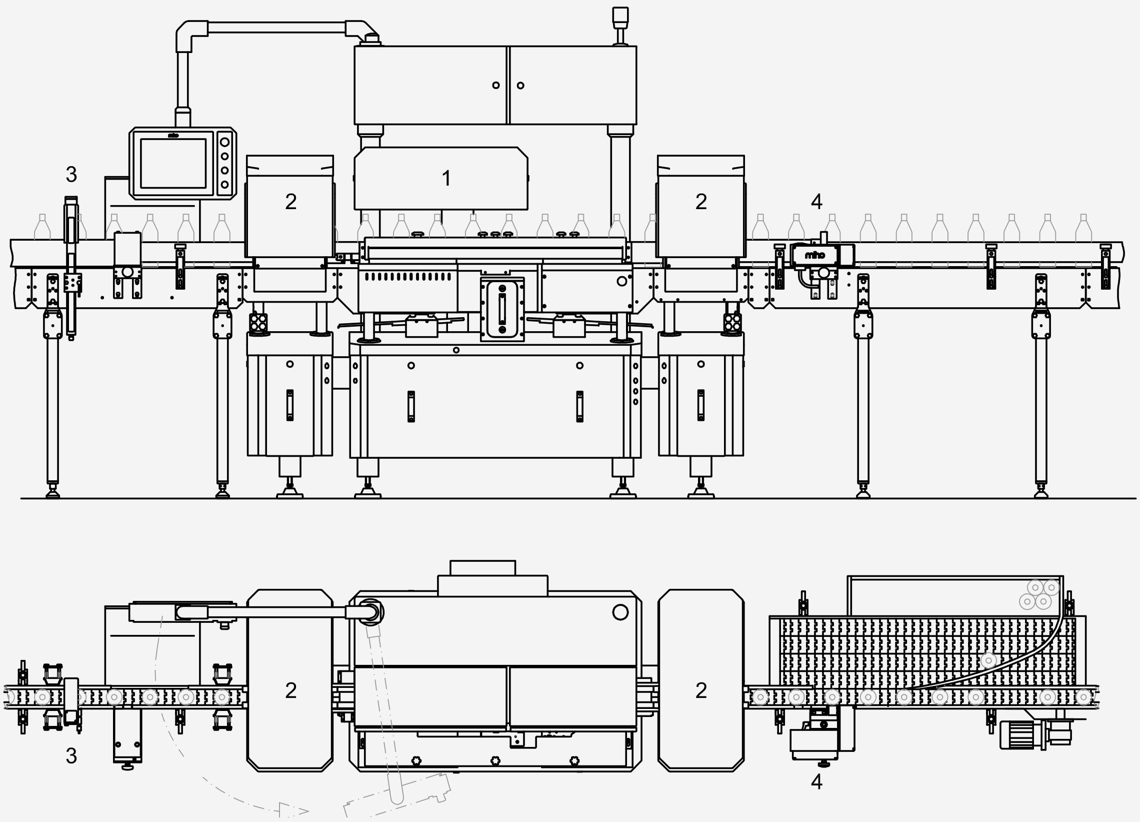
David 2

Measurements



Installation example



1 Inspection Head 2 Sidewall Inspection 3 Infeed inspection 4 Eccentric reject system miho ESF 2

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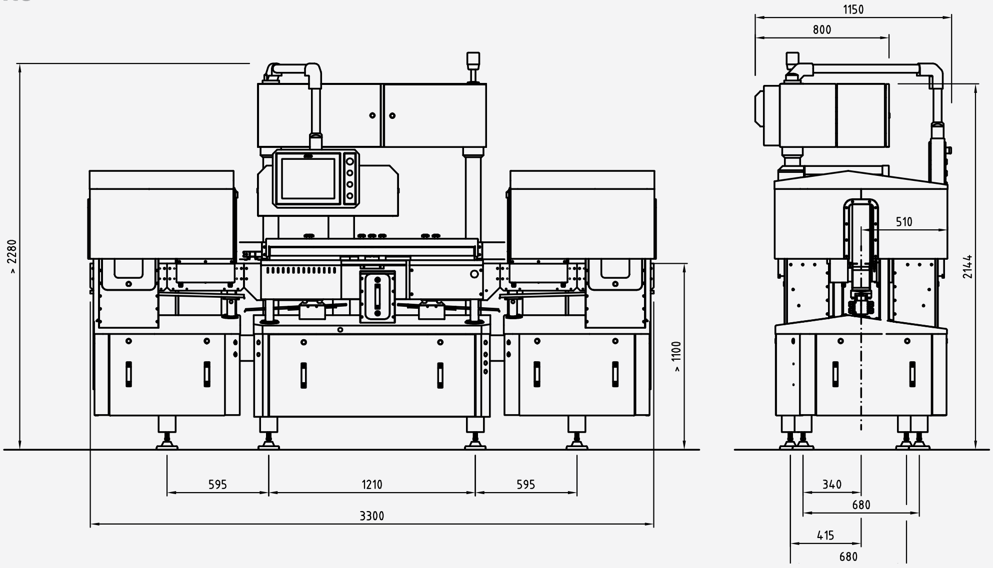
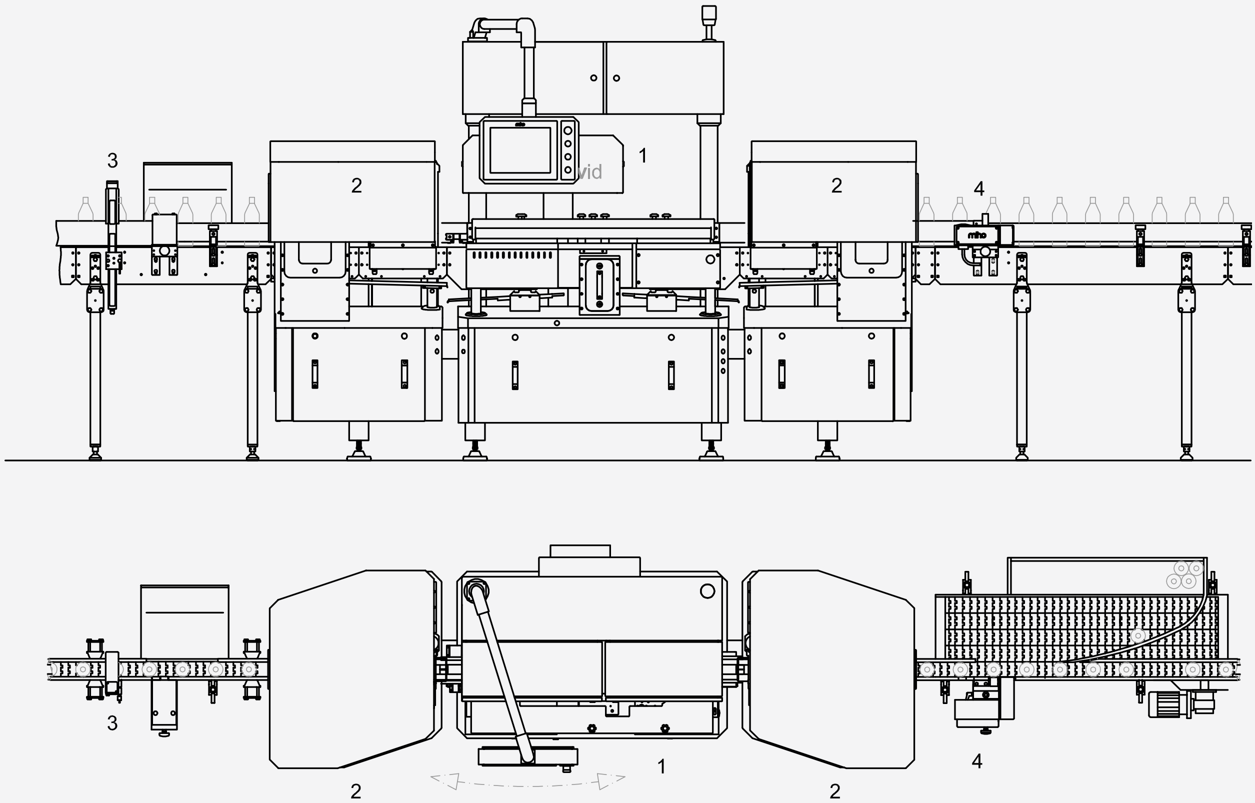
David 2 with Dual Sidewall Inspection

Measurements



Installation example



1 Inspection Head 2 Dual Sidewall Inspection 3 Infeed inspection 4 Eccentric reject system miho ESF 2

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LC

Residual Liquid Inspection

The miho **LC Residual Liquid Inspection Unit** is a standard feature of bottling plants today.
The miho **LC Residual Liquid Inspection Unit** detects liquids, water or left over drink with a high degree of accuracy and absolute safety. The miho **LC** can also be supplied with a metal detection facility.
These systems have been used for over 20 years in countless practical applications worldwide.

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LC

List of features

Functions and technology

- Inspection of residual water and caustic solution. High measurement accuracy and reliability.
- Metal detection (optional) for the detection of metal objects at the bottle-base and/or metal caps at the bottle-mouth.
- Can be used as a filling pipe inspection when installed after the filler (without caustic solution inspection).

Solidness

- Strong construction.
- Robust sensor technology that is insusceptible to external influences such as moisture and glass fragments.

Operation

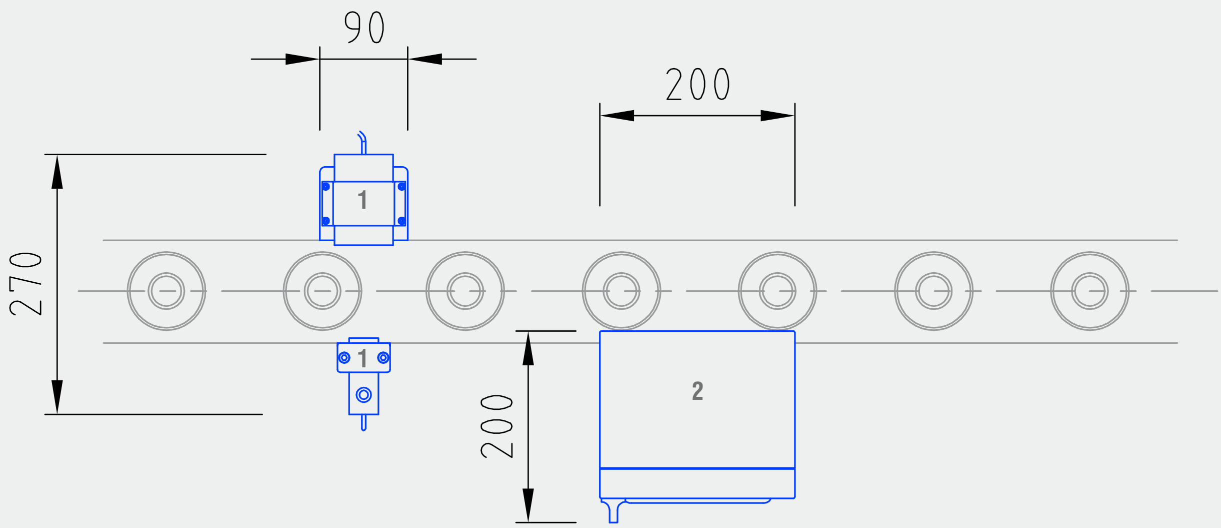
- Adjustment of sensitivity with potentiometer.

Initiation of measures

- Stopping the conveyor or activating the bottle-stopper. Optical or acoustic signal.

Construction size / Installation

- Installation is also possible in difficult areas due to the small construction.



1: Inspection Head

2: Electronic Cabinet

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LC 2

Residual Liquid Inspection

The miho **LC 2** is is the logical progression of the already highly successful miho **LC** (more than 3000 installations worldwide). A completely new construction using the most advanced electronic components that offer maximum ease of use. In addition, the new miho **LC 2** provides extensive documentation of inspection results with wide-ranging networking possibilities.
The core competence of the miho **LC 2** is the inspection of bottles for residual water and in particular caustic solution. This inspection process involves a high level of differentiation and precision. Even if bottles are just wetted with a caustic solution they are detected as being faulty but any amount of residual water within millimetre range will be tolerated, depending upon the parameter settings.
The miho **LC 2** also has other inspection facilities in addition to the caustic solution inspection, such as for example, a metal detection for the bottle-cap or base.

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LC 2

List of features

Functions and technology

- Inspection of residual water and caustic solution. High measurement accuracy and reliability.
- Metal detection (optional) for the detection of metal objects at the bottle-base and/or metal caps at the bottle-mouth.
- Can be used as a filling pipe inspection when installed after the filler (without caustic solution inspection).
- Evaluation unit with components of the standardized modular inspection unit system miho **Master**. High and diverse performance capability and easy maintenance.

Solidness

- Strong construction.
- Robust sensor technology that is insusceptible to external influences such as moisture and glass fragments.

Operation and documentation

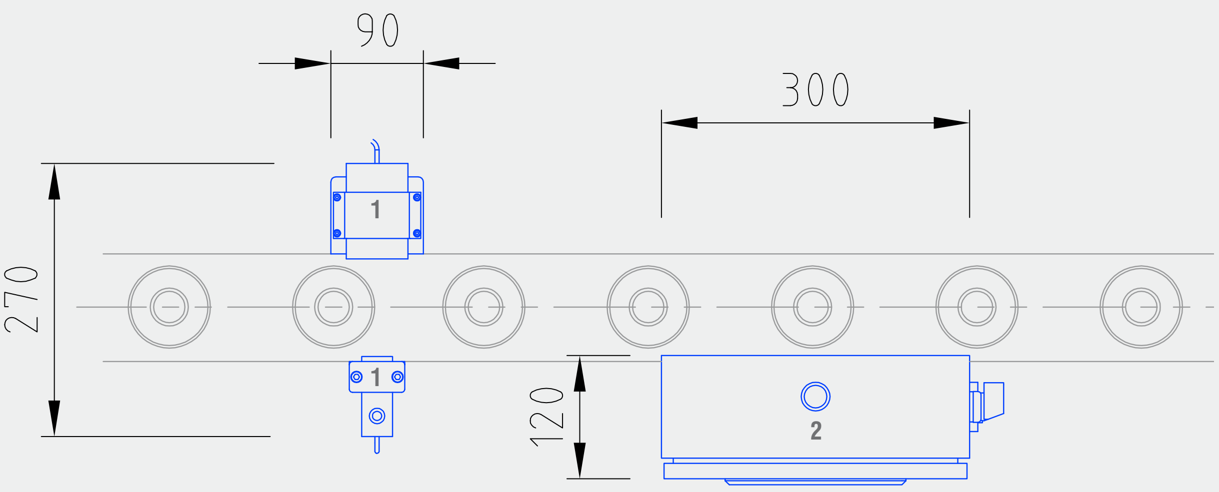
- High level of operating comfort.
- Comprehensive 5,7“ colour display with touchscreen.
- Language selection.
- User-defined passwords.
- Logging of inspection results, parameter values and user logins.
- Data transfer through optional interfaces via Ethernet.

Initiation of measures

- Stopping the conveyor or activating the bottle-stopper when installed behind the Empty Bottle Inspector. Optical or acoustic signal.
- Optional rejection of rejected bottles through own reject system.

Construction size / Installation

- Installation is also possible in difficult areas due to the small construction.



1: Inspection Head

2: Electronic Cabinet

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FM

Filler Monitor

miho **FM** is a **Filler Monitor that checks the Filler**. It carries out an additional control to the fill level inspection and the cap inspection. Whilst these inspection units detect incorrectly filled and capped bottles, the miho **FM** is responsible for **various diagnostic and safety procedures**: its main task is to **locate valves and capping elements** that lead to faults in the filling process and it activates any **safety procedures** that are necessary (for example, **Bottle-burst function**, separate descriptions for the different functions and modules - see overleaf). In addition, it also carries out **extensive statistical evaluations**.
miho **FM** is used as a control system within the framework of filler management. It is installed within the same electronic box as the **Fill Level Inspection Unit and Cap Control** miho **Newton HF**, as well as the **Label Detector** miho **EC**. It can also be combined with the **Fill Level and Closure Control** miho **Newton Optic 2**. The filler can be monitored from a location that is some distance away from the production line through the means of an external computer.

miho Inspektionssysteme

miho FM

The modules of the miho FM:

Valve locator:

Detects the valve and capping element responsible for the fault that has been detected by the fill level and cap inspection unit. A separate **statistical evaluation** as to the fault frequency is carried out for each individual valve. The production data is displayed on the LC display of the control box and also on an externally connected computer, if necessary.

Bottle Burst (optional):

Locates the valve at which the bottle has burst and **activates various measures** as a consequence of the burst:

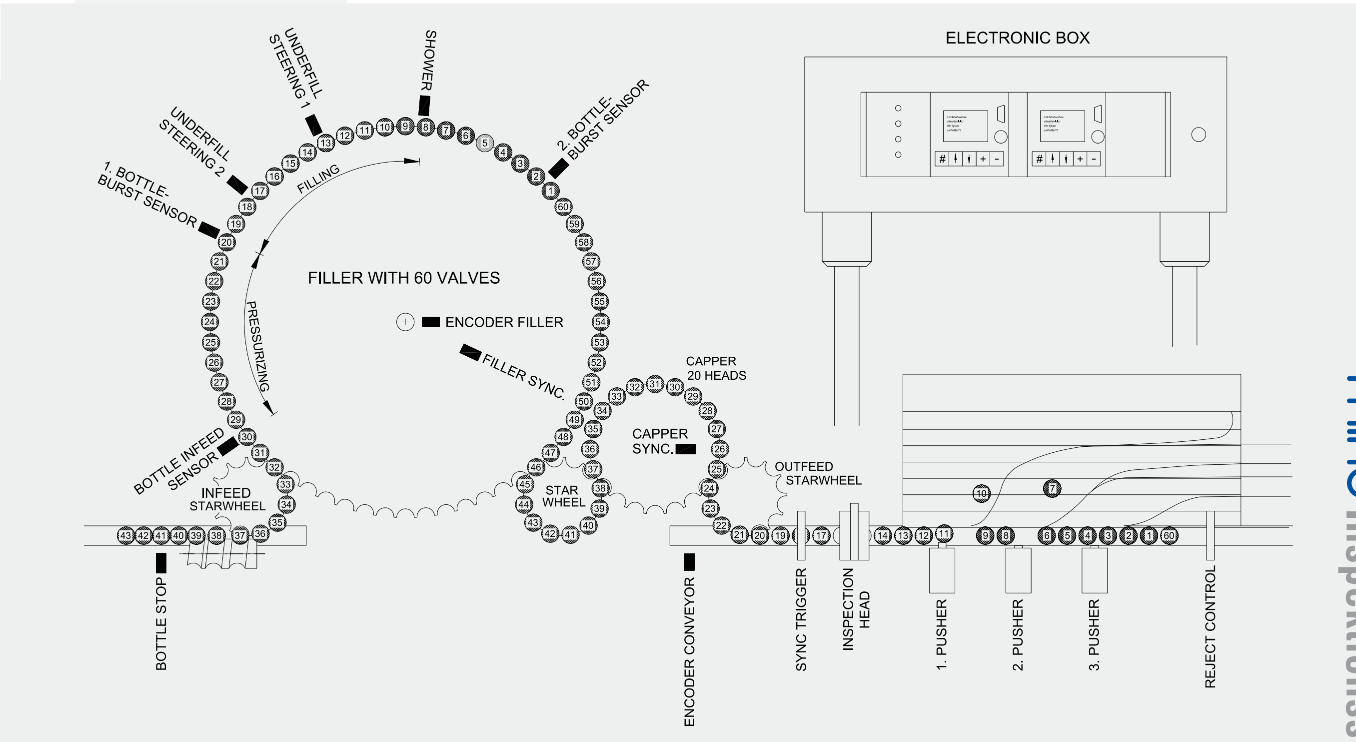
1. **Rejection** of bottles that have been filled by the valve contaminated by glass splitters. The user is free to choose the number of neighbouring valves and filling rounds for which the bottles should be rejected. (Rejection either takes place by the pusher for the fill level inspection or through a separate pusher).
2. **Activating a shower** that is installed at the filler, to clean the area surrounding the faulty valve. The area to be cleaned and the number of rounds can be programmed by the user. The filler can also be cleared automatically (optional) before the shower is activated.
3. **Forced underfilling** at the valves affected during the following filling rounds, so as to be able to visibly distinguish the bottles that are possibly contaminated (optional).

Sampling:

Organizes the targeted rejection of bottles so as to be able to **take samples** for quality control. The positions of the valve and capping elements and the number of filling rounds can be set by the user.

Signal lamp and accoustic signal:

A further visible signal **lamp** or a three-coloured lamp will **indicate the inspection result** which can be one of the following:
1. Normal production 2. Visible fault frequency
3. Production is stopped due to an excessive amount of faults.
Another possible option is for the **accoustic signal** to be activated where there is an accumulation of faults and a stop in production.



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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

Newton Optic 2

Fill level inspection
and cap inspection

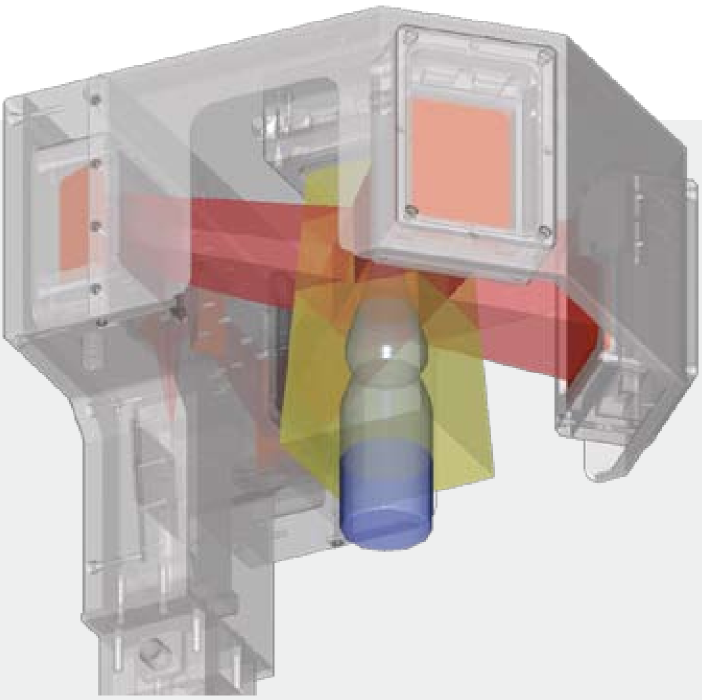
The miho **Newton Optic 2** is an optical inspection system for **precision level measurement**. It **inspects the cap** using different criteria and carries out a **date control** at the same time.
Fill level Inspection: the miho **Newton Optic 2** performs a **precision** fill level inspection that is hard to match. This precision level measurement is technically based on a **special camera light construction** (see p. 4). The images are evaluated by the image-processing system miho **Vidios**®, that has been designed specifically by miho ***Inspektionssysteme*** for inspection tasks.
Cap inspection: the miho **Newton Optic 2** checks that **the cap fits exactly**. Furthermore, the **colour** and **logo** can be checked by using an additional camera.
The miho **Newton Optic 2** is with all its technical ingenuity a **very robust** and **low-maintenance system**. Unlike for machines that use radiation or X-ray technology, no statutory requirements need to be observed.

miho Inspektionssysteme

miho

Inspection unit with lighting system

miho Newton Optic 2: Main Features



The different optical axes during the inspection

- **Fill level inspection:**
  1. Maximum precision 2. Extensive level of competence: fill level inspection for transparent, opaque and foaming liquids.
- Technology: Advanced Camera and lighting technology. Camera light construction that works with several optical axes and variable lighting. Up to 7 images are made per bottle.
- **Cap inspection:**
  Cap inspection for exact fitting.
  An additional camera checks the colour and logo.
- **Date control:**
  Checks the date on the top of the lid, the edge of the lid or on the bottle shoulder.
- Very solid construction. Low maintenance and service.

Newton Optic 2

Performance:

Fill level inspection

Precision

The miho **Newton Optic 2** determines the fill level in transparent containers with **the maximum level of accuracy**. An evaluation of underfilled or overfilled is made depending upon the inspection task.

Extensive level of competence

Filling contents

The bottle contents can be transparent, opaque and also foaming. Examples are: water, lemonade, beer, wine, spirits, oil, liquid and powder drugs, infusion solutions.

Types of bottles

Clear and coloured glass or plastic bottles (for example, PET) and containers are inspected. **Swing top bottles** can also be inspected.

Cap and date inspection

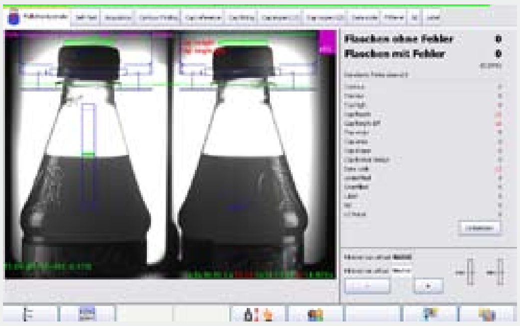
Cap inspection

The miho **Newton Optic 2** checks that **the cap fits properly**. Here, images are taken from two directions that are set at a 90° angle. Only then can a safe inspection be guaranteed for a cap that is tilted regardless of the rotational position of the bottle.

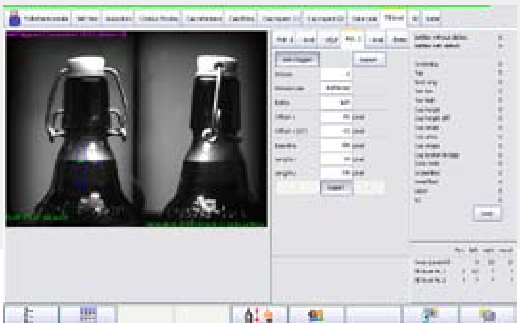
The **colour** and **logo** of the cap are also inspected by using a separate camera from above, as well as any deformities (**"skewed cap detection"**).

Date control

The miho **Newton Optic 2** checks the date codes on the top of the lid, at the side of the lid or on the bottle shoulder, if the print is on the side facing the camera. Here, more images are recorded using additional lighting.



Cap Inspection: tilted cap



Fill level inspection: Swing top bottles

Date control: date on the side of the cap

miho Inspektionssysteme

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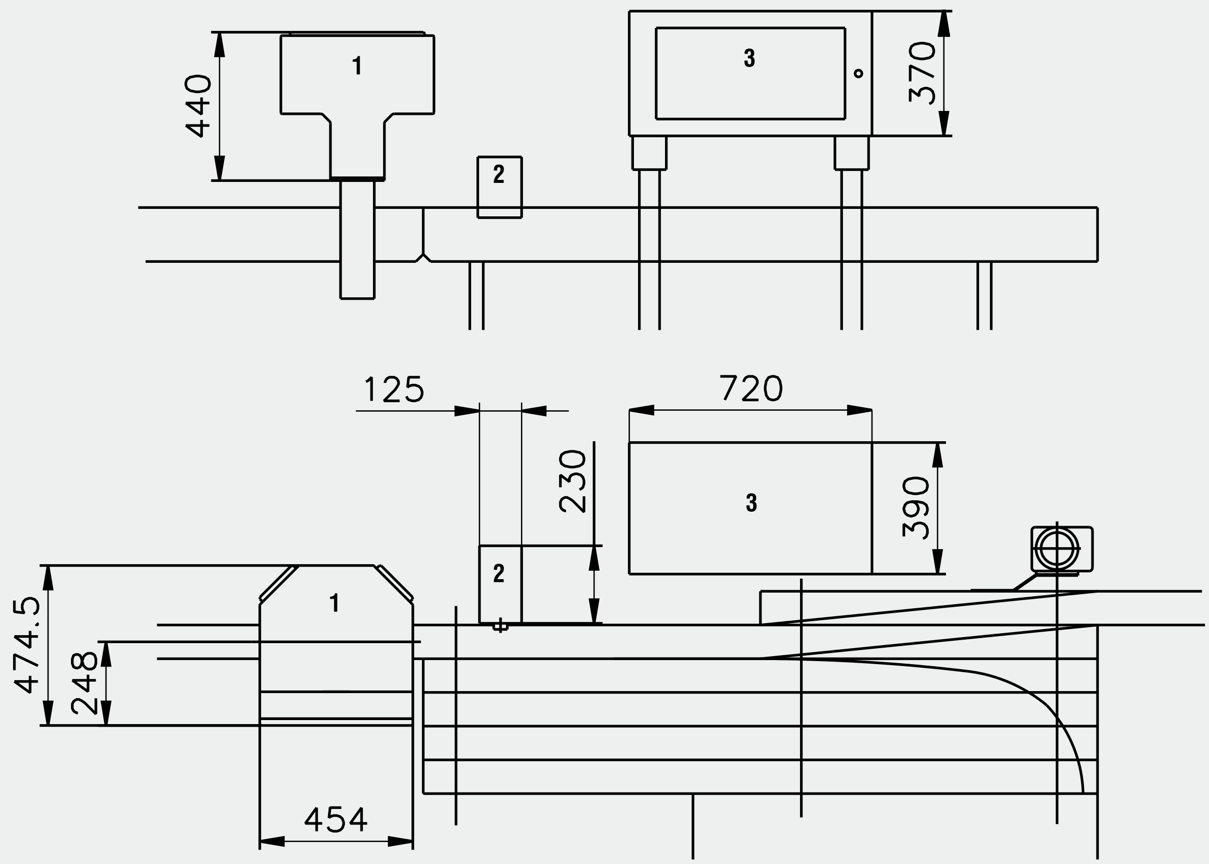
Newton Optic 2

Construction and Technology

The **technical centrepiece** of the miho **Newton Optic 2** is a **complex optical system** with the following main components:
CCD Cameras - variable lighting - mirror cabinet – image-processing system miho **Vidios**®. The bottle is therefore recorded on **several optical axes** and **with lighting that is adapted to the inspection task**. As a result, **7 images** per bottle taken from different perspectives are available through the evaluation by the electronic image-processing system.
Transmitted light is employed and there is also the option of reflective light. **LED panels** are used.
A wide range of **individual adaptations** is possible through **the 6 independent lighting units**.

Operation
It is operated via a **colour touchscreen** with plain text display. The test results appear **fully visualized** on the screen.

Rejection
The miho **Newton Optic 2** can be combined with the reject system miho **HSP**, the servo-motor driven eccentric reject system miho **ESF 2** or the linear reject system miho **Leonardo M**.
The installation of the reject head before the labeller with rejection behind the labeller is possible.



1: Inspection Head 2: Reject System miho HSP 3: Electronic Cabinet

miho Inspektionssysteme GmbH
Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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Newton HF

Fill Level Control

The miho **Newton HF** is the ***HF* Fill Level Control** in the miho **Newton** Fill Level Control Range. The fill level detection by means of high frequency technology is today the standard method, due to its **high level of reliability** and **economical price**.
The miho **Newton HF greatly improves** the **HF measurement process**. Without having to carry out any special precautionary measures the HF technology is very sensitive towards changes in temperature that lead to measuring drifts and can therefore lead to changes in the fill levels measured. miho **Newton HF** resolves these problems because it is a machine that permanently controls and calibrates itself.
miho **Newton HF** therefore represents **a level of accuracy and reliability that has not been known up until now** for the HF fill level control: with this machine the HF inspection process has reached **new heights**.
miho **Newton HF** is a detection module for the miho **Filling and Quality Management System**. It can be combined with the miho **EC** module for the **label detector** and with the miho **FM** module for the **filler monitoring**.

miho Inspektionssysteme

miho Newton HF

Areas of use and functions

miho **Newton HF** is a fill level control with a wide spectrum of use. It checks **glass and PET bottles,** in particular for liquids with little or no foam. For liquids that have alot of foam the inspection unit should be installed in a place in the filling line where the foam has reduced the most, for example, behind the labeller.
For the inspection of several specific bottle types, e.g. swing top bottles, we recommend using our Optical Fill Level and Closure Control System miho **Newton Optic**, for the inspection of cans our Fill Level Inspection miho **Newton X2P** or miho **Newton X2Z**.
In addition to being a fill level control, our miho **Newton HF** checks **the presence of caps**. This inspection takes place either inductively or optically (for plastic caps).

Additional functions (optional):

Detecting fallen bottles
To ensure that the rejection process is carried out accurately and safely, the centre of the fallen bottle is determined and then the rejector rejects the fallen bottle exactly at the middle of the bottle.

Detection of water
For **pasteurized juices** there is a special module that can detect **water that has seeped in,** with a high level of safety.

Filler stop
After a particular set number of consecutive faulty bottles either an accoustic warning signal will be activated or the filling process will be stopped automatically.

Control and Statistics:

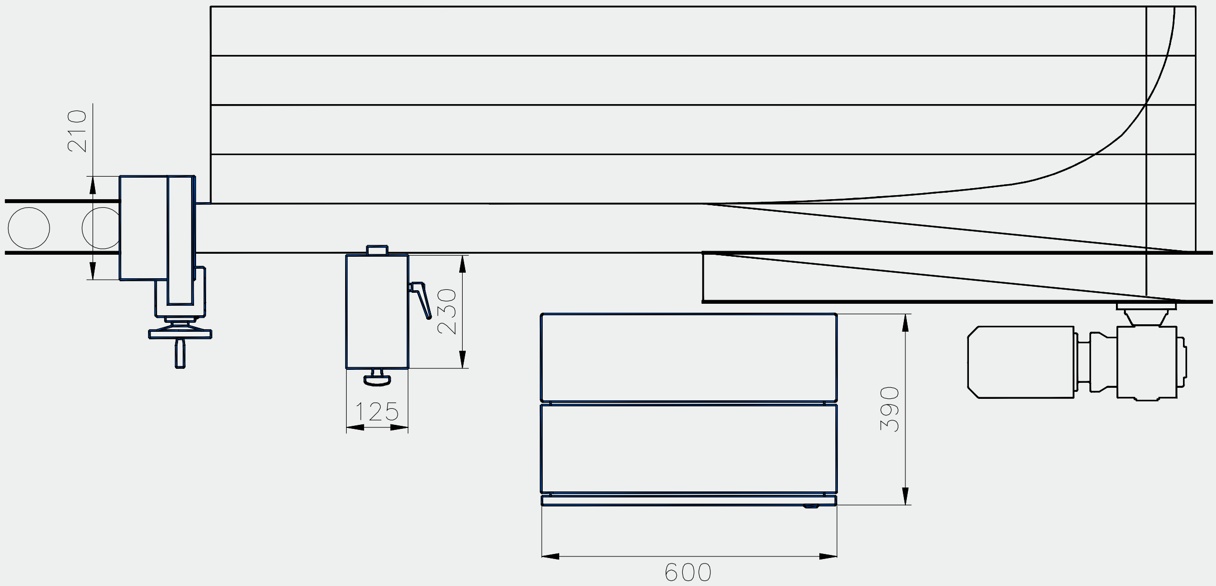
The machine can **easily be operated** by using the different displays on the monitor. An **extensive range of statistics**, which amongst other things differentiates between the different faults, is provided in clear text and in different languages.
Inputs for the processing of external fault signals, also for machines from other companies, are included in the standard version.

Reject monitoring (optional):

A **reject monitoring system** ensures that the faulty bottle is really rejected. The **reject table monitoring system** checks that the reject table is not too full and that there are no bottle-jams.

Installation possibilities:

The control unit and inspection head for the miho **Newton HF** are generally installed at the outfeed of the filler or the labeller.



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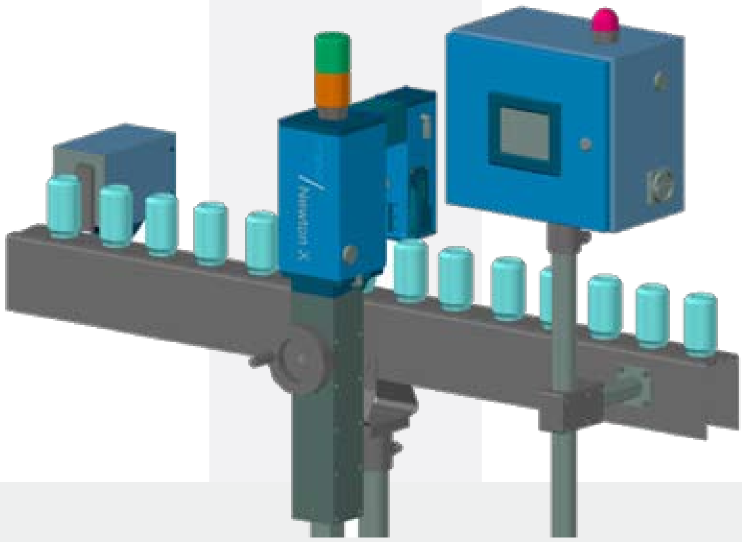
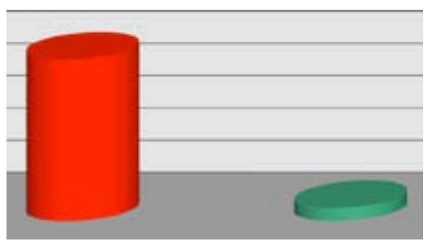
Newton X2P

Containers Fill Level Control





The miho **Newton X2P** is a X-ray fill level inspection unit that inspects cans, cartons lined with aluminium, foiled containers and bottles, and detects any underfilling and overfilling with the maximum level of reliability. It distinguishes itself by requiring less than a tenth of the average amount usually used for inspection by radiation for its measurement process. And thus the amount of radiation exposure is also reduced.

This reduction is due to X-ray technology developed for this purpose by miho *Inspektionssysteme*. Its core piece is a X-ray generator, which in contrast to traditional X-ray fill level inspection units only generates X-rays for a short moment during the measurement. The total radiation intensity is therefore only a fraction of what is the case with traditional X-ray fill level inspection units. The exact value depends upon the number of containers inspected. Another advantage of the X-ray generator being turned on only during the measurement is the considerable prolongation of the generator´s life span.

miho **Newton X2P** is able in particular to achieve the same level of performance as the gamma ray fill level inspection units. In contrast to the gamma ray fill level inspection units, it is free of the legal regulations concerning transport, storage, use and disposal. Since radiation can only be emitted during the production process it is only necessary to issue an obligatory notice under German Law.

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Newton X2P

List of features

Technology and functions

- X-ray generator: Circular emitter.
  Receiver: Circular detector.
- High level of measurement accuracy and reliability.
- The miho **Newton X2P** uses special algorithmic calculations irrespective of the type of container (can, carton, bottle), the dimensions of the container and the surrounding circumstances. For example, inaccurate calculations can be caused because the containers are not being transported smoothly and liquid surfaces that are uneven are therefore compensated for as much as possible.
- Evaluation unit with components of the standardized modular inspection unit system miho **Master**. High and diverse performance capability and easy maintenance.

Area of use

- Inspects the fill level in drink cans, carton packaging (even when aluminium coated), containers (even with foil) and glass bottles.

Operation

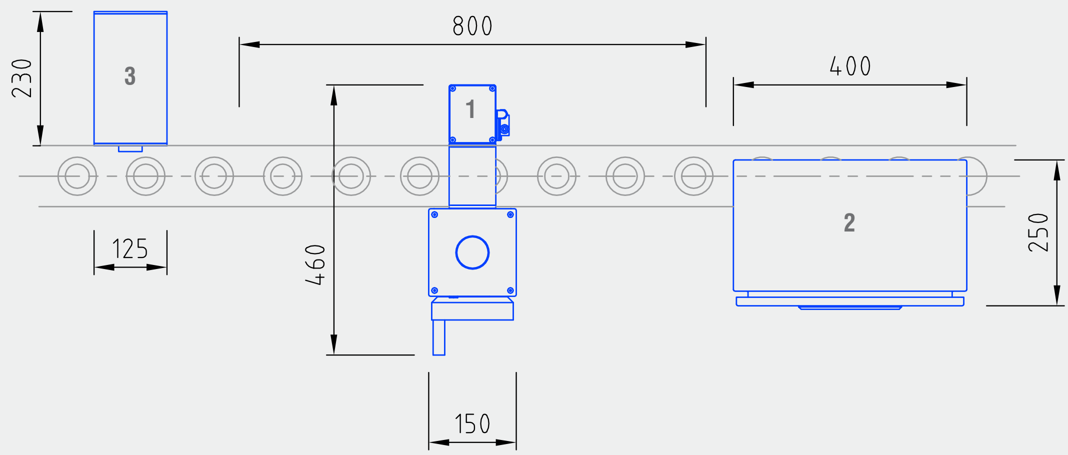
- High level of comfort through separation of the control cabinet and the inspection head.
- Comprehensive 5,7“ colour display with touchscreen.
- Language selection.
- Bottle-type with corresponding fill level, changeable and can be saved.
- Extensive statistics.
- Adjustment to different nominal fill levels through easy to operate manual adjustment device.

Prepared for

- Cap detection for metal or/and plastic caps.
- Label detection module.
- Filler monitoring system miho **FM**.
- Operational data-processing.
- Remote maintenance.

Rejection

- Standard reject system miho **HSP**.
- Standing rejection (especially for plastic bottles): Linear reject system miho **Leonardo M.**



3: Reject System miho HSP   1: Inspection Head   2: Electronic Cabinet

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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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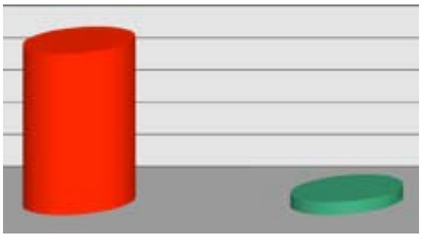
Newton X2Z

Containers Fill Level Inspection



The miho **Newton X2Z** is a X-ray fill level inspection unit that inspects cans, cartons lined with aluminium, foiled containers and bottles with the highest level of accuracy, with a refined determination of the exact fill level. It distinguishes itself by requiring less than a tenth of the average amount usually used for inspection by radiation for its measurement process. And thus the amount of radiation exposure is also reduced.

This reduction is due to X-ray technology developed for this purpose by miho *Inspektionssysteme*. Its core piece is a X-ray generator, which in contrast to traditional X-ray fill level inspection units only generates X-rays for a short moment during the measurement. The total radiation intensity is therefore only a fraction of what is the case with traditional X-ray fill level inspection units. The exact value depends upon the number of containers inspected. Another advantage of the X-ray generator being turned on only during the measurement is the considerable prolongation of the generator´s life span.

The high level of inspection accuracy of the miho **Newton X2Z** is also due to the use of a line detector. It measures the intensity values at different height positions and compensates for the different wall thickness of the containers in this way, which would otherwise influence the inspection result.

The miho **Newton X2Z** is therefore the X-ray fill level inspection unit that combines the maximum level of accuracy with the minimum level of radiation exposure.

miho Inspektionssysteme

miho

Newton X2Z

List of features

Technology and functions

- X-ray generator only emits radiation during the inspection time. Therefore, there is a considerably reduced average radiated power and considerable increase in lifespan of the X-ray tube.
- Highest level of measurement accuracy and reliability.
- Compensation for different glass thickness and quality due to the use of a line detector instead of a point detector.
- Container inspection for underfill and overfill with just one inspection head.
- Evaluation unit with components of the standardized modular inspection unit system miho **Master**. High and diverse performance capability and easy maintenance.

Area of use

- Inspects the fill level in drink cans, carton packaging (even when aluminium coated), containers (even with foil) and glass bottles.

Operation

- High level of comfort through separation of the control cabinet and the inspection head.
- Comprehensive 5,7“ colour display with touchscreen.
- Language selection.
- Bottle-type with corresponding fill level, changeable and can be saved.
- Extensive statistics.
- Adjustment to different nominal fill levels through easy to operate manual adjustment device.

Prepared for

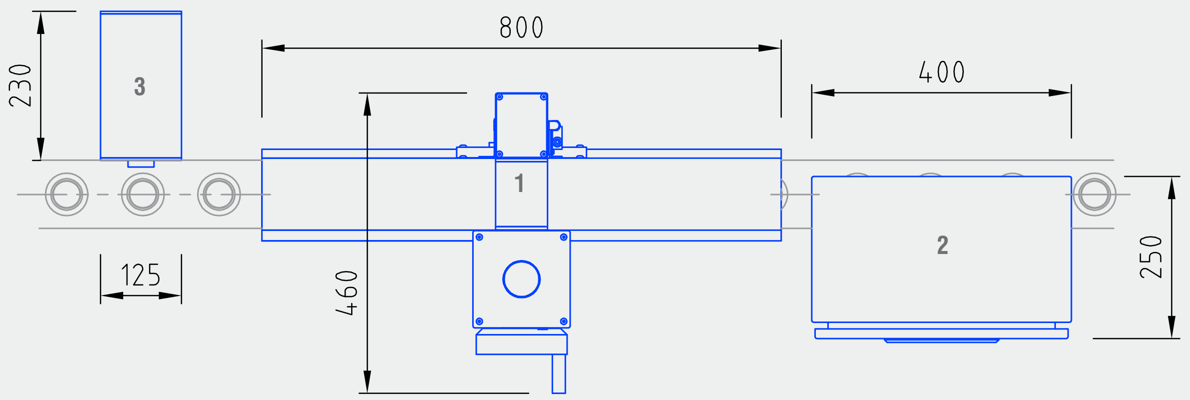
- Cap detection for metal or/and plastic caps.
- Filling pipe detection.
- Label detection module.
- Filler monitoring system miho **FM**.
- Operational data-processing.
- Remote maintenance.

Legal regulation

- In contrast to the gamma ray fill level inspection units, miho **Newton X2Z** is free of the legal regulations concerning transport, storage, use and disposal. Since radiation can only be emitted during the production process it is only necessary to issue an obligatory notice under German Law.

Rejection

- Standard reject system miho **HSP**.
- Standing rejection (especially for plastic bottles): Linear reject system miho **Leonardo M.**



3: Reject System miho HSP 1: Inspection Head 2: Electronic Cabinet

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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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EC

Label Control

The miho **EC** is a **Label Control System** that uses Light sensors. It detects the presence of the labels on bottles after the labelling process has taken place.

The miho **EC** is a detection module that can be installed as a stand alone system or together with the **Fill Level Control** miho **Newton HF** and the **Filler Monitoring System** miho **FM** in one single electronic cabinet.

Use and function: The miho **EC** checks the labels on all different types of bottles, regardless of the position and the type of label. It can be adjusted for label configurations for up to 26 bottles types. Depending on the individual project, up to 13 light sensors can be installed. The data from the sensors is evaluated electronically and in the case of faulty labelling the reject system is activated.

Upgrades: It is due to its modular construction that the Label Control can be upgraded with several functions and can be combined with other detection modules.

miho Inspektionssysteme

miho

EC

Optional Functions and Installation

Optional functions:

Machine stop

After a certain number of consecutive faulty bottles or a periodic fault (i.e. through faulty „glue plates“) an acoustic signal can be activated or the labeller can be stopped automatically.

Reject Control

The **Reject Control** makes sure that a faulty bottle is definitely rejected. The **Reject Table Control** checks the reject table for overfill and back jam.

Production data reports

The miho **EC** can be connected to the monitoring and data logging system miho **Awes**. The connection to third party data logging /SCADA systems is also possible.

Installation Possibilities:

The system can be installed inside the labeller or with additional sensors on the conveyor. If it is installed inside the labeller, the system requires very little space and is therefore also ideal for small labellers.

Additional Modules:

The **Label Control** miho **EC** is a detection module, that can be combined with the miho **Newton HF Fill Level Control** and the miho **FM** for the **Filler Monitoring**. All these modules can be installed in the same electronic cabinet and can also be added later on.

miho **EC** can also be combined with either the Fill Level Control miho **Newton Optic 2** or the Fill Level Control miho **Newton X2.**

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Feeler

Accurate Seal Inspection Unit

The miho **Feeler** inspects elastic plastic containers after they have been filled and capped to check that they are **sealed properly and this is carried out with a new level of precision and safety.** Incorrect sealing can arise either through some damage to the container or through a cap fault. Even the **smallest defects** such as, for example, rips at the neck of the bottle caused by tension or an incorrectly positioned sealing lid (inside the cap) can lead to the container being incorrectly sealed. The miho **Feeler** even detects these very small sealing faults and rejects the bottles in question.

Inspection process: the miho **Feeler** checks whether an elastic bottle containing pressure is sealed correctly by measuring this inner pressure through the use of a completely new measurement process that is protected by patent: the pressure inside the bottle is **felt** by **feelers** that are located in a **sensor wheel** and the pressure can therefore be measured in the most **direct and therefore safest** way. This is how the miho **Feeler** simulates and makes perfect the way that a person would recognise that an elastic plastic bottle is incorrectly sealed.

The miho **Feeler** is an inspection module within the miho **filling and quality management system** and this system also includes other inspection units such as **the Fill Level Inspection Units** miho **Newton HF**, the miho **Newton Optic 2** and the miho **Newton X2**, the **Filler Monitor** miho **FM** and the **Label Detector** miho **EC**.

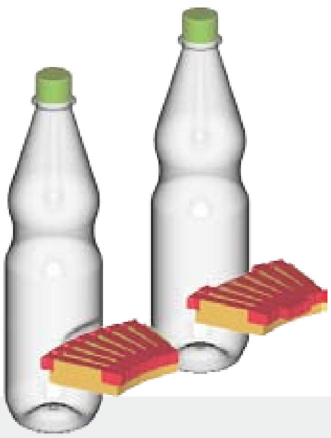
miho Inspektionssysteme

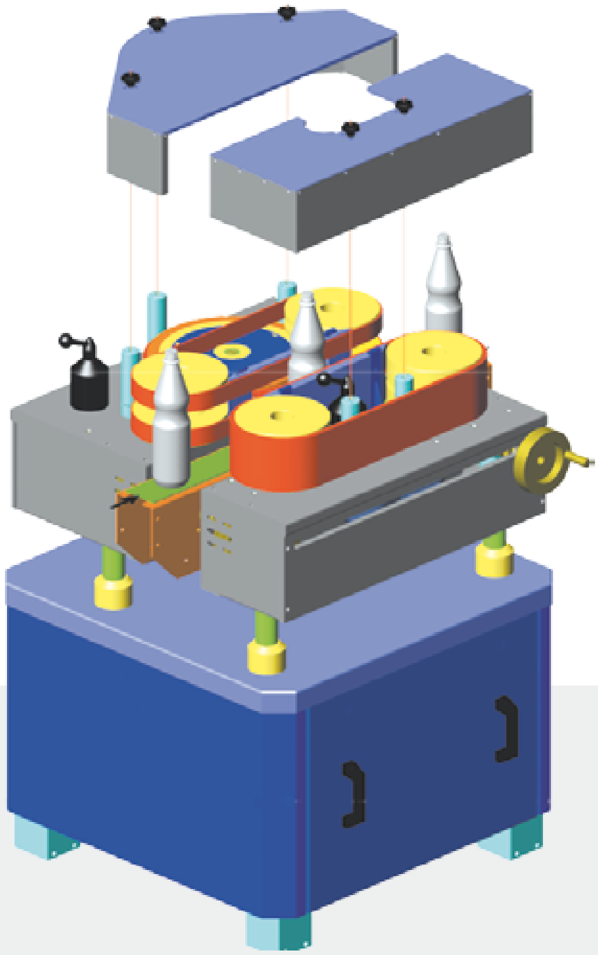
miho

miho Feeler: Main Features

- *Direct* measurement of inner pressure by feeling,
- leading to a *high level of measurement* accuracy and safety.
- Detects even *the most smallest sealing faults* (caused by, for example, hairline cracks or an incorrectly positioned inner sealing lid).
- Each bottle is inspected *individually* without being affected by a neighbouring bottle.
- A very high level of measurement accuracy even for *high speed lines*.
- *User-friendly*, for example, a change of bottle-type can easily be carried out.
- *Easy maintenance and service* due to its solid construction.

Feeler





Construction, Inspection Process

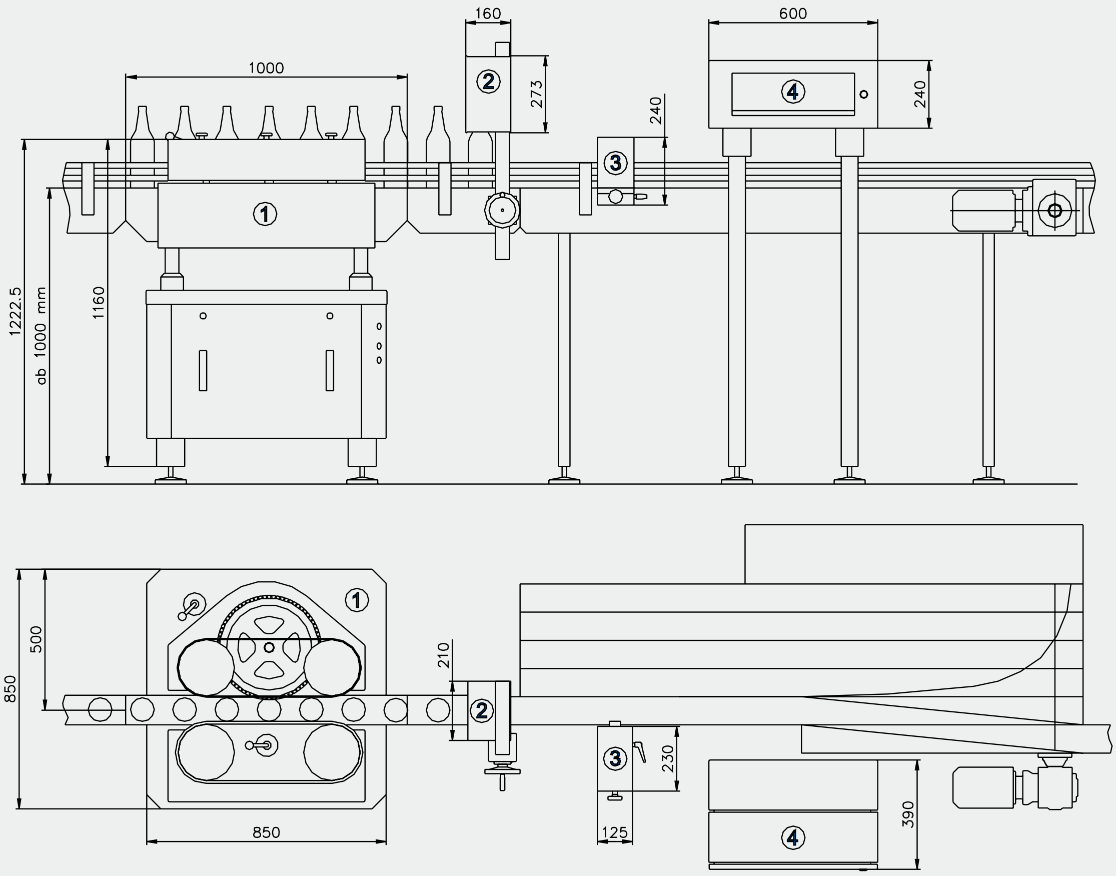
The miho **Feeler** has a **main cabinet** in which the control system for the drive motors and the safety electrics are located and it has a **belt system** which is located on top with a **sensor wheel.** Both these are operated in synchronisation with the conveyor speed.
The **sensor wheel** that is located between the belts is the core piece of this measuring device. This wheel has **feelers** that can be moved radially and they have a special form and mounting. These feelers apply a certain pressure to the bottle-wall when it passes them. The measuring principle is as follows: If the inner pressure is high the feelers are pushed backwards. If a bottle has a reduced inner pressure the feelers push into the bottle-wall or are pushed backwards to a lesser extent. This is how the inner pressure that is inside the bottle is felt directly and with a high level of accuracy and reliability.

Since the feelers are located on a rotating sensor wheel and occupy a little amount of space the bottles can be inspected **irrespective of the line speed** and without being affected by the test results of a neighbouring bottle. This system can therefore work with the same level of accuracy for **high speed lines.**
The miho **Feeler** is **easy** to operate through a **central control unit**, that also controls other units from the miho **filling and quality management system.** For example, the switching of bottle-types can be carried out easily.

miho Inspektionssysteme

miho

Feeler



1: miho Feeler
2: miho Newton HF (Inspection Head)
3: Reject System
4: Control Box

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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

Allround

360° Inspection System

The optical 360° inspection system miho **Allround** carries out an extensive last inspection of the filled, labelled and imprinted bottles and of cans or cartons. Every component is inspected by using many different criteria (see page 2). The fill level for bottles and cans can also be inspected by using the optional combination with a fill level inspection unit.

The miho **Allround** uses state-of-the-art technology. Very modern CCD cameras record images from 4 different sides of the product being inspected and these images are then sent to an image-processing computer to be analysed. The computer system uses the recently developed miho **Vidios**® platform.

The miho **Allround** has been designed to create maximum flexibility of the optical and electronical components. This enables the system to be equipped with additional cameras, lighting and special software, so that special inspection processes may be carried out. Due to its sophisticated, clear and service-friendly construction, the miho Allround is not just a system with advanced technology that achieves the maximum level of performance but it is also an inspection unit with a very solid construction that is built for the future.

miho Inspektionssysteme

Freely accessible mirror

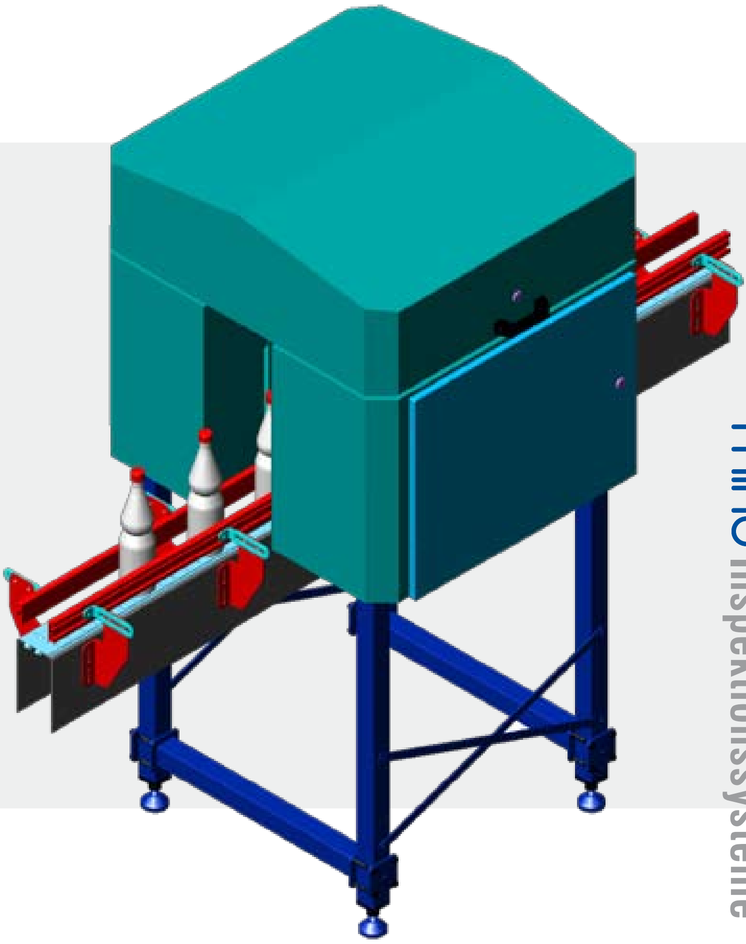
miho Allround: the performance

- *Comprehensive last inspection* of the components of bottles, cans and cartons. The following features are inspected:
- if the *labels* are present, in good condition, have the right position;
- the *texts on the label*: for example, the date the bottle was filled and the date of expiry;
- that the *cap* is present, its position, colour and cap imprint;
- optional: *fill level inspection* using a combination of fill level inspection units.
- *User-friendly:* 15“ touch screen; Choice of product directly on the screen (no need for any mechanical adjustments); User-defined passwords.
- *Documentation: logging of inspection* results, parameter values and user logins; optional interfaces for data transfer in Ethernet.

In line inspection of bottles

Height adjustable camera and lighting system

Construction and technology



The miho **Allround** is installed after the labeller in free-flow above the conveyor. The inspection unit and its optical components are installed in a stainless steel cabinet that protects against any water splashes. State-of-the-art CCD cameras record at least 4 sides of each bottle by using a mirror cabinet. High performance LED's are used for the lighting and are only switched on when recording images, which gives them a long life span. The high light intensity of the LED's provides good protection against external light influences.

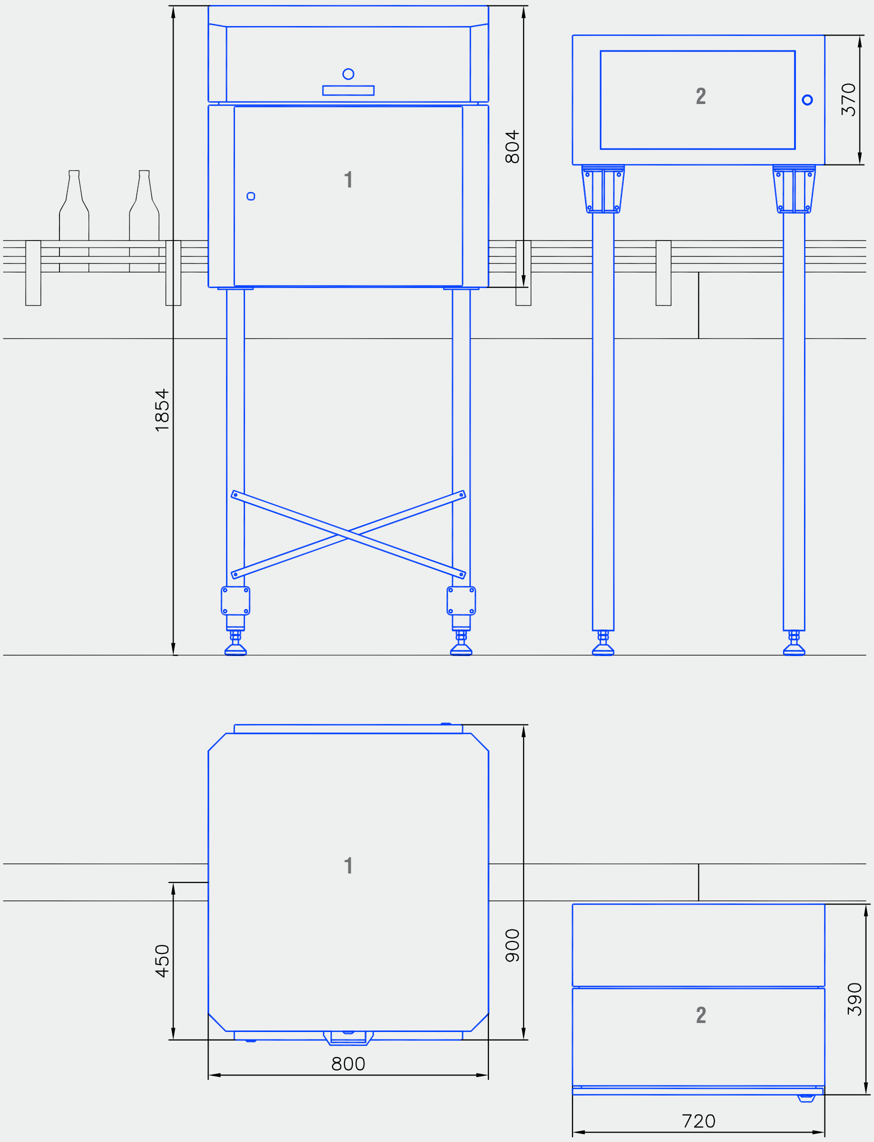
The images that are recorded are evaluated by the computer using the recently developed platform miho **Vidios**®.

Due to the flexible construction it is possible to integrate additional cameras and light sources for special inspection processes.

The system has a compact and space-saving construction. A clear and logical construction makes all components easily accessible for service. Faults can be diagnosed and rectified through remote maintenance.

miho

Allround



1: Inspection Unit

2: Control Box

miho Inspektionssysteme GmbH
Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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FZ 2

Bottle Counter

The miho **FZ 2** counts bottles or other containers after they have been filled. Through the use of state-of-the-art technology and double triggering the miho **FZ 2** counts with the highest level of reliability.
There is the option of installing a detection module that inspects the presence of caps.
The sensor system of the bottle counter miho **FZ 2** consists of either two ultrasonic barriers or of two light barriers. The ultrasonic barriers should be used where condensation from steam or fog can influence the trigger process of the light barriers. The barriers are logically linked (mutually locked). Through the double triggering any faulty counting results that are caused by small changes in direction during starting, stopping or vibrations from the conveyor will be avoided.
The miho **FZ 2** can also be used to monitor and control pre-selected production batches.

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FZ 2

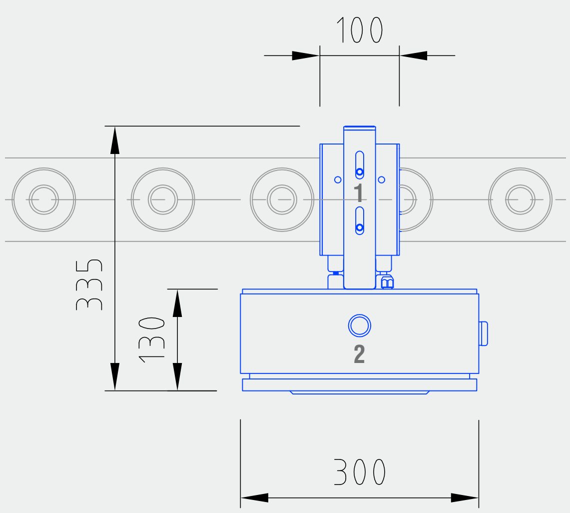
List of features

Technology and functions

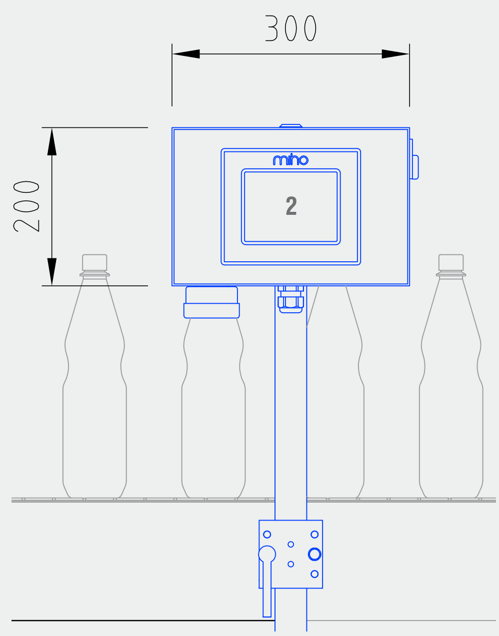
- Triggering through dual light or dual ultrasound barrier.
- Cap detection for metal caps by means of inductive proximity switch (optional).
- Cap detection for cork caps by means of a light switch (optional).
- Cap detection for plastic caps with laser light barriers (optional).
- Production batch monitoring. When a pre-programmed nominal number is reached the production can be stopped by a floating signal.
- Evaluation unit with components of the standardized modular inspection unit system miho **Master**. High and diverse performance capability and easy maintenance.

Operation

- Comprehensive 5,7“ colour display with touchscreen.
- Separate counter for good and unsealed bottles.
- Language selection.
- Counter can be reset using a password.
- Long acoustic signal for continual fault (reset by hand). Short acoustic signal for single fault.
- Ready for operational data-processing (optional).



1: Inspection Head



2: Electronic Cabinet

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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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VC 2

Crate inspection system

The crate inspection system miho **VC 2** inspects bottle crates after the packer to see if all bottles are present and that the trays are fully packed. It is especially distinguished by a performance spectrum not yet known concerning, for example, different crates and bottle-types.

The miho **VC 2** can achieve this maximum level of versatility and flexibility due to a completely newly-developed camera laser system (which is subject to patent). Further advantages are (compared to inspection systems that work with sensors or by using the traditional method with cameras): a further increase in the level of reliability and the maximum comfort concerning operation and maintenance.

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miho VC 2

Technology, operation, rejection:

Technology:

The patent-registered camera laser system for the miho **VC 2** offers many advantages in comparison to inspection systems that use cameras or sensors in the traditional way:

Reduced technology, increased efficiency

With the camera laser system there is generally a clear reduction in the number of electronical and mechanical components. This improves the overall reliability of the system and its inspection performance and it reduces the maintenance requirements.

Laser technology

The camera laser system does not need any extravagant lighting since just one laser (Laser class 2M) provides the necessary light. This provides a cost advantage in comparison to LED's and other additional advantages concerning reliability and durability when compared to incandescent or fluorescent lamps. In addition, a laser-based system is to a large extent resistant to external light.

User Comfort

With the camera laser system no mechanical or sensor adjustment is required when there is a change in crate dimension and compartment structure. The operator just has to select the crate type on the touchscreen.

The miho **VC 2** is operated by using a 5,7" touchscreen. User passwords define the areas of access. The display can be programmed in different languages.

Documentation

The miho **VC 2** records the inspection results, parameter values and user registrations. Data transfer via Ethernet is possible with optional interfaces.

Introducing measures

If a crate is rejected then the following measures can be introduced:

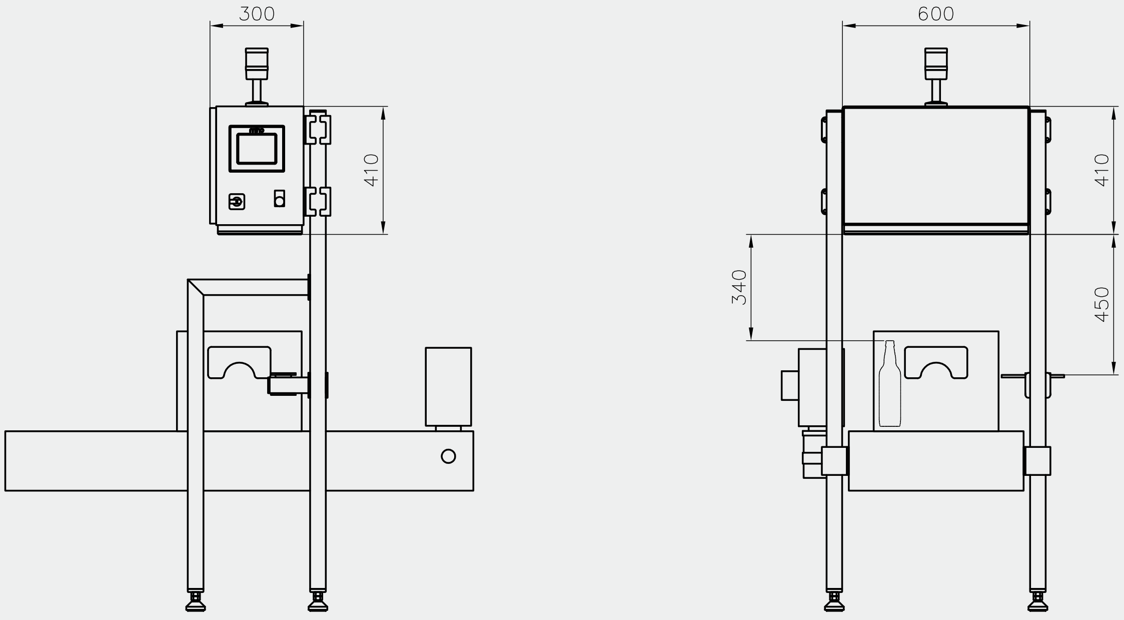
Rejecting the crate through a reject system;

Conveyor stop and stopping the packer/unpacker;

Optical and acoustic signal.

Remote maintenance module (optional)

Faults can be diagnosed and rectified through remote maintenance.



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Pascal

Conveyor Control

miho **Pascal** is a **conveyor control system** for the **complete** filling line between the unpacker and packer. It accomplishes **all the various conveyor control tasks** that modern filling lines, as complex as they may be, bring with them in their various sections.

This is how, for example, the miho **Pascal** controls the smooth bottle-transition from the buffer zone to the single conveyor by using a **pressureless combiner**, makes sure that there is a **defined gap** between the individual bottles before the inspection machine, and uses **pressure to close this gap** before the filler.

One further task of the miho **Pascal**, is to close gaps. Even big gaps are closed **quickly and smoothly**, even if only a short conveyor is present.

miho **Pascal** can also be adjusted to individual requirements to fit into complex conveyor systems.

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Pascal

Area of use and functions

Comprehensive performance spectrum

The control module miho **Pascal** is a conveyor control system for **the whole spectrum of conveyor control tasks** between the various machines in a filling line. However complex a filling line may always be, the miho **Pascal** is a conveyor control system for the complete filling line between the unpacker and packer.

Different types of bottle-rows must be achieved before they reach the various machines in a bottling line. Here, the inspection units often require a bottle-row with gaps but on the other hand, a closed bottle-row with pressure is needed before the infeed of many production machines. miho **Pascal** can carry out all these different control tasks.

Examples:

miho **Pascal** controls the **smooth bottle-transition** from the buffer zone to the single conveyor by using a pressureless combiner.

The miho **Pascal** ensures that there are **defined gaps** between the individual bottles before the Empty Bottle Inspection Machine.

The miho **Pascal** creates a closed row of bottles before the Filler. By precisely controlling the line speeds, there will always be enough bottles **under pressure** before the infeed of the machine.

Closes big gaps quickly and smoothly

Gaps always re-appear in the bottle-line, in particular through the rejection of bad empty and full bottles. When a gap is created, the miho **Pascal immediately** carries out all the necessary steps that lead to closing the gap straight away, if necessary through the evaluation of signals from various monitoring positions. Here, the conveyor control system differentiates between small gaps which can be closed smoothly during normal production and big gaps. To close the big gaps, the line speed is increased for a short period of time but is then reduced before the gaps are completely closed, so that the bottles come closer together smoothly. This complex gap-closing process can also be carried out **on a short conveyor.**

High adaptability to individual requirements

miho **Pascal** can also be adapted individually to fit into complex conveyor systems. Its software allows for many additional options to be added.

A series of special control functions have already been integrated into the standard version. For example, the miho **Pascal** can react to a bottle-stopper that has been activated with the introduction of various measures such as the reduction in line speed.

It is due to its high level of flexibility that the miho **Pascal** is able to fulfill the whole spectrum of conveyor control tasks that a modern complex filling line brings with it.

Everything in view

miho **Pascal** is operated by using an LC Display which is either installed directly at the conveyor or in the central control box for the conveyor system. It provides **all the information** concerning the status of the conveyors.

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Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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HSP

High Speed Pusher

The miho **HSP** is a reject system that pneumatically rejects containers from the production process. It can be used for the rejection of cans and glass or PET bottles. In each of these cases the pusher is used with exactly the right lift and has a specially designed reject block so as to ensure the maximum level of reject precision.
The simple, cost-efficient construction principle of the miho **HSP** has been optimized through intelligent details so that the different reject requirements are fulfilled on an optimum basis (see page 2). Several thousand installations worldwide fulfill their requirements every day: reliably, almost free of wear and tear and with a high level of continuity.

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HSP

Technology and area of use

Functional principle

The miho **HSP** is a pneumatic system where containers can be rejected by using a pneumatic cylinder. It has been possible to improve the precision of the reject process in comparison to traditional pneumatic reject systems through the use of many different constructional details:

Motion path of the reject block

The reject block of the miho **HSP** moves by sloping downwards. It therefore has in addition to the horizontal motion (C), that pushes the container out of the production line, a downwards vertical movement (B). This means that an additional force (B) is present at the bottom of the container being rejected whilst it is in contact with the reject block. This significantly improves the stability of the container during the reject process.

Defined contact surface of the reject block

The height (H) of the point of contact between the reject block and the container affects the stability during the reject process. The miho **HSP** enables the point of contact to match the height of the container as best as possible vertically. This means that in contrast to reject blocks with a large surface the height at which the reject force is transferred can be adjusted for slanting or irregular containers.

Horizontal adjustment of the reject block

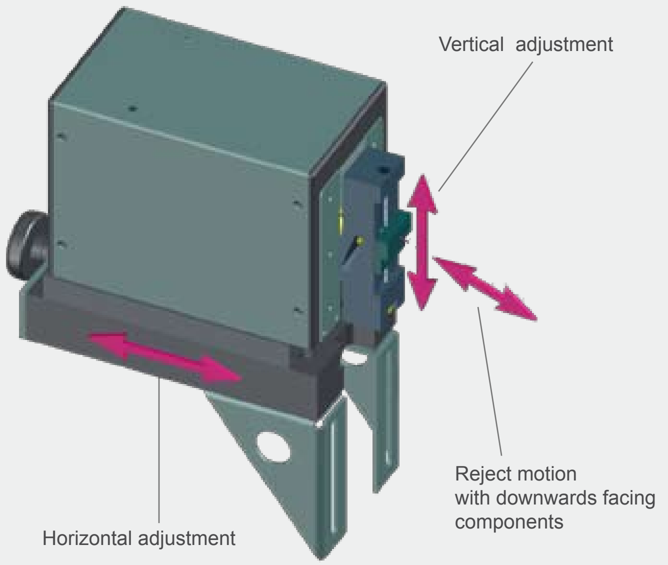
If several container types with different diameters are filled on one production line then it may be wise to adjust the main position of the reject block horizontally. The miho **HSP** therefore offers the option of a horizontal adjustment unit. One important detail here is that the conveyor railings are also automatically adjusted using an adapter.

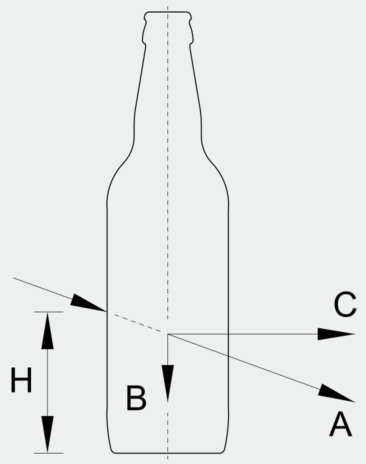
Area of use

The miho **HSP** can in addition to being used for the rejection of glass bottles also be used for the rejection of cans and PET bottles. It is equipped with specially designed reject blocks.

The output for production lines can be up to 120 000 containers/hour.

The miho **HSP** can be controlled from all miho machines and from external machines using a suitable interface.





Reject force components

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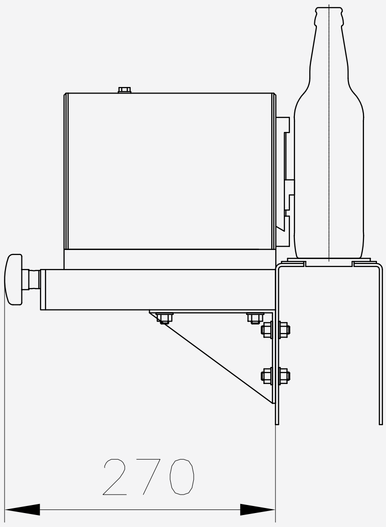
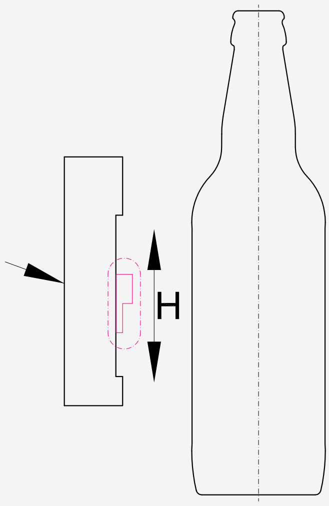
HSP:
Mechanical drawings

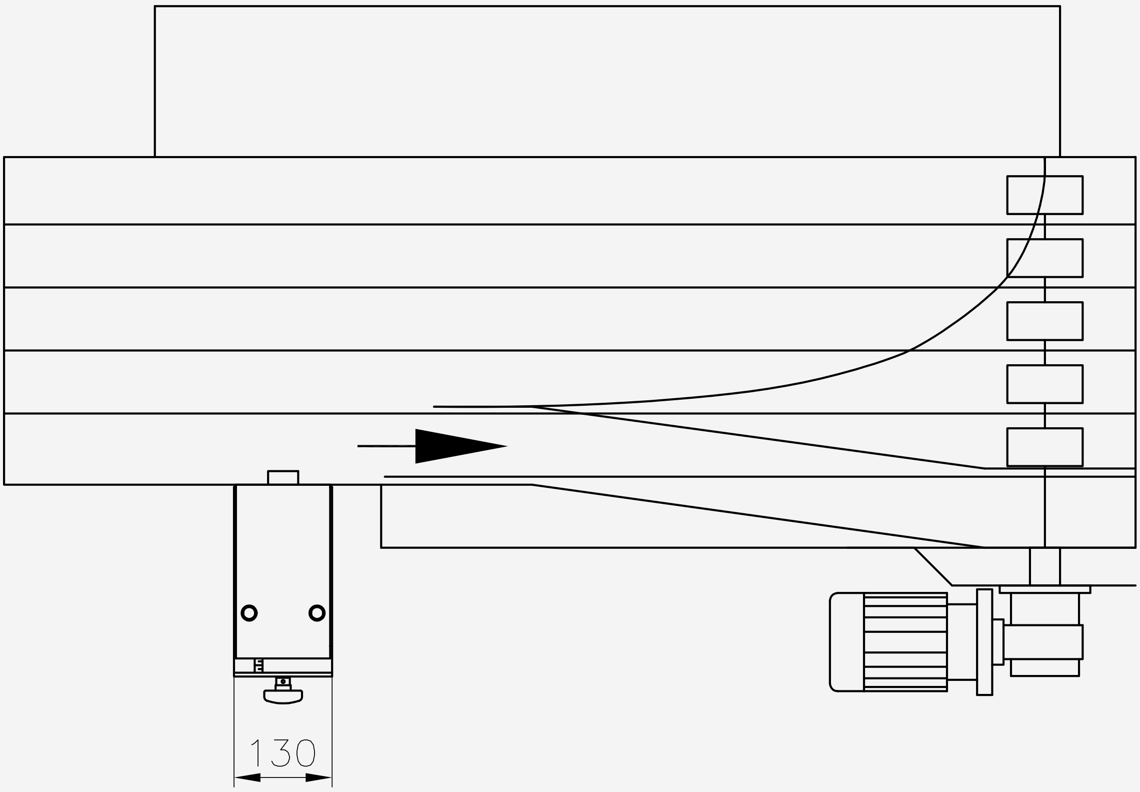


Side view



Detail: Vertical adjustment

Installation example:



ESF 2

Eccentric Reject System

The miho **ESF 2** is an ***eccentric*** reject system, i.e. it uses a **specially designed reject block** that pushes the bottle onto a parallel conveyor in a **revolving motion**. It is driven by a servo motor.
While the eccentric reject block pushes the bottle onto a parallel conveyor, the reject process is characterized by its **high precision** and its **long time reliability**. It is working **independently from the weight of the bottle** (see page 2).
When comparing the miho **ESF 2** with common pneumatic reject systems the reject process has been optimized considerably. Since the miho **ESF 2** also works with the **same precision at high speed**, it is the reject system for high speed lines.
The miho **ESF 2** can easily be adjusted to different bottle-types. In this way its precise function can also be guaranteed during a change of formats.

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miho **ESF 2** in combination with the Bottle Sorting System miho **Multicon**

miho ESF 2: Main Features

Reject Block

miho **ESF 2**: an extremely compact and solid construction

- Smooth precise rejection with *three main advantages:*
- *Completely independent of the weight involved*, so that the bottles are conducted with the same precise movement to a parallel conveyor, irrespective of their weight.
- *High level of stability* of the bottles during rejection, since a slight vertical pressure is applied downwards to the bottle during the reject process.
- *Long-term stability*, where the system is nearly free from wear and tear and therefore the precision motion used to push the bottle to the parallel conveyor is not altered for the entire life span.
- Easy adaptation to different bottle-types.
- High operational safety level with low maintenance requirements.

ESF 2


Vertical Adjustment

Horizontal Adjustment

Adjustment

The miho **ESF 2** can **easily be adjusted to different bottle-types**, so that an **optimal reject at the center** of the bottle can be guaranteed at all times. A change of formats can be done with a **horizontal** and a **vertical** adjustment. Both are **completely independent** from each other due to a special mechanism.

Horizontal Adjustment

The horizontal adjustment (in the direction of the center of the conveyor) helps to adjust the reject system to different bottle diameters. Its actual position can be seen on a scale. The adjustment is very easy, for the horizontal adjustment of the system **automatically changes the side railings of the conveyor**.

Vertical Adjustment

In order to cope with different bottle heights the system provides a vertical adjustment as well. It works independently from the horizontal adjustment. The vertical adjustment makes sure that the reject block touches the bottle at the right spot, thus providing a stable reject motion.

Technology and Reliability

The reject block of the miho **ESF 2** is driven by a **servo motor** that guarantees an **optimal reject motion**. **During a life time the reject motion does not change** when compared to pneumatic Pusher systems or any other reject system using a clutch. This stability is due to the **little wear** of the servo motor and all other technical components of the system. The **clear and well thought out inner construction** together with the robust and water resistant steel casing help make the system **reliable and solid**. In this way the miho **ESF 2** shows itself as a system with **high reliability but extremely little wear**.

The **small size** of the miho **ESF 2** also allows for an exchange with an existing Pusher.

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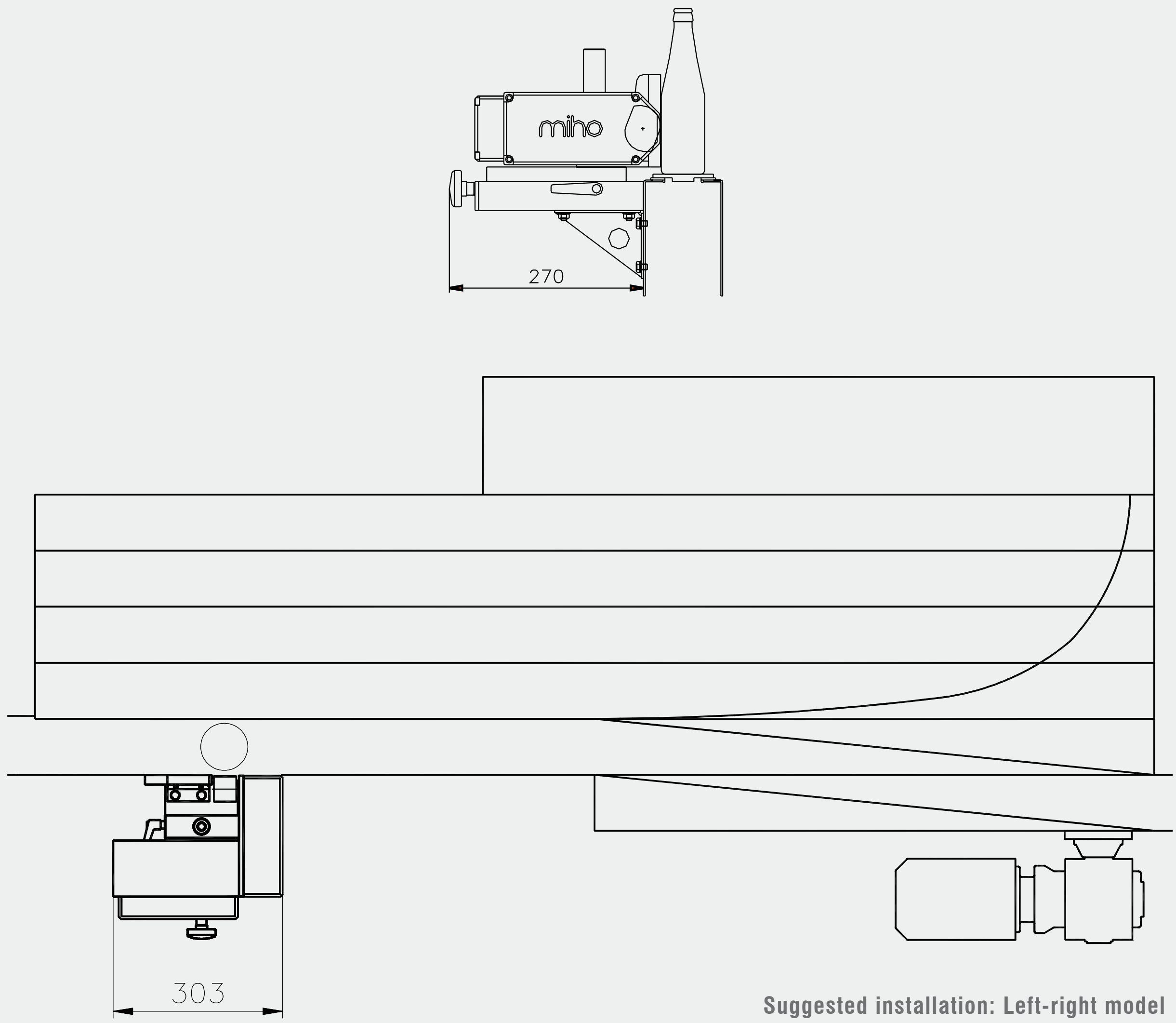
ESF 2



Suggested installation: Left-right model

miho Inspektionssysteme GmbH
Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

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Leonardo M

Linear Reject System

The miho **Leonardo M** is a magneto-mechanical linear reject system that securely rejects bottles, cans and carton packaging standing upright. The miho **Leonardo M** is especially recommended for lines with a high sorting performance, where many containers must be diverted smoothly at high speeds to another conveyor.
The technical core piece of the miho **Leonardo M** is a system using about 100 slide segments that are controlled in a special way and which are moved in synchronisation with and parallel to the conveyor when a container should be rejected. The rejection takes place with one or more slides where the slide, in addition to moving in the direction of flow, also slides crosswise towards the reject channel and thus diverts the container with a sliding movement to a parallel conveyor.
The traditional linear reject technology has been considerably updated for use in the miho **Leonardo M**. Due to this improvement of important constructional features the level of reliability has significantly increased in comparison to traditional linear reject systems (see back cover).

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Leonardo M

Above: miho **Leonardo M** together with the Seal Inspection miho **Feeler**.
Right: The slide segments of the miho **Leonardo M.**

The further developed linear reject technology of the miho Leonardo M

The miho **Leonardo M** uses linear technology that has been improved in the following crucial aspects:

Magnetic control of the reject slide

Each reject slide must selectively move parallel to the conveyor, or if a bottle should be rejected, then it must also move crosswise to the flow of direction. Here, a guide element is activated that steers the reject slide to the different paths. Only a few milliseconds are available for this changeover since the distance between reject segments is only a few millimetres. The electromagnetic, contact-free operation of the guide elements of the miho **Leonardo M** guarantees a low amount of scuffing and a high stability of „flash-like“ movements.

Non-gear transmission drive

Linear reject systems must be stopped immediately when overloaded, to prevent any damage from being caused. With the miho **Leonardo M** the connection between the motor and slide system is achieved through gear belts. The motor therefore has no gear with the important advantage that only a little mass is involved in the rotational movements that must be stopped in the case of an emergency. In addition to the monitoring of the torque of the servomotor, a safety clutch that restricts the torque is also installed.

Mathematically improved reject conveyor

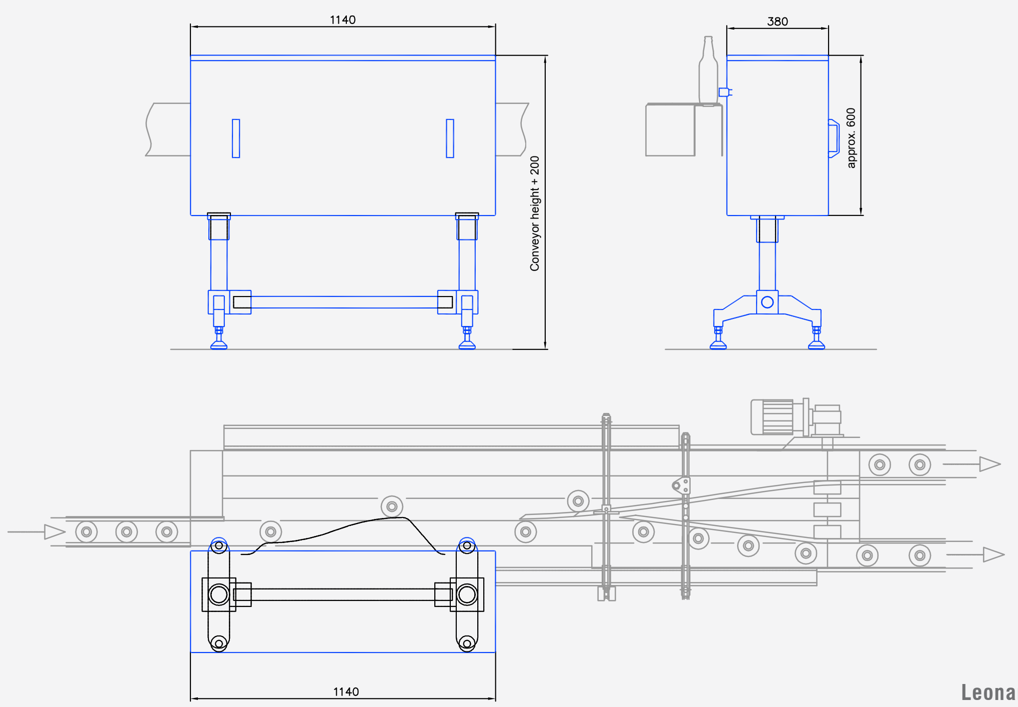
The miho **Leonardo M** leads the bottles to a neighbouring conveyor by using an optimal motion sequence. Here, the path of motion has been based on improved mathematical acceleration and braking procedures.

Easy and quick to change slide elements

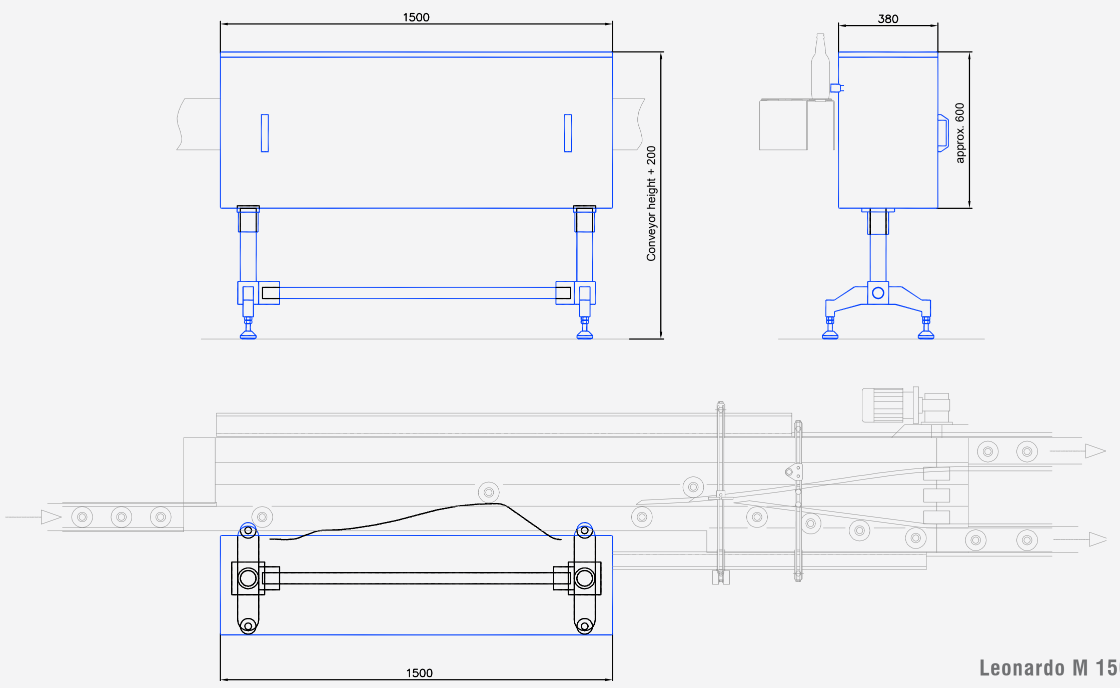
Each slide element can be changed quickly and easily.

miho **Inspektionssysteme GmbH**
Obervellmarsche Str. 12 · 34292 Ahnatal · Phone: +49/5609/8382-0 · Fax: +49/5609/6168 · E-Mail: info@miho.de · www.miho.de

Leonardo M: Mechanical drawings



Leonardo M



Leonardo M 1500

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Leonardo SK

Dynamic Segment Reject System for Crates

The miho **Leonardo SK** is a reject system that conducts drink crates and cartons from the main conveyor to one of possibly many parallel conveyors by using an activated segmented guide railing. The guide railing is installed **above** the main and side conveyors, diagonally to the direction of flow of the conveyors. If a crate is chosen for rejection by the crate inspection system then a segment is especially lowered for this crate and it diverts the crate to the corresponding side conveyor. If this is not activated then the crates carry on moving on the main conveyor under the guide railings.
A special feature of the miho **Leonardo SK** is that the crates being rejected are diverted to the side conveyor in a straight line. This also then guarantees a trouble-free rejection if several consecutive crates are rejected over several conveyors (see page 2).
The miho **Leonardo SK** can be employed with many different features for the rejection of crates (see page 2). Due to its solid construction the miho **Leonardo SK** is an extremely reliable and low-maintenance system.

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Leonardo SK

List of features

Technology and functions

- Rejection of crates by segments of a guide railing that is especially activated for each rejection.
- Pneumatic drive of reject segments.
- Special construction feature: rejection in a straight line. This ensures a constant gap is maintained between neighbouring crates that are being rejected over several conveyors at the same time. (If the line is not straight then the gap is reduced because an increase in angle reduces the speed).There is no danger of collision.
- Rejection to as many parallel conveyors as you wish. The side conveyors can be to the left or right of the main conveyor (see installation example „appendix“).

Robust construction

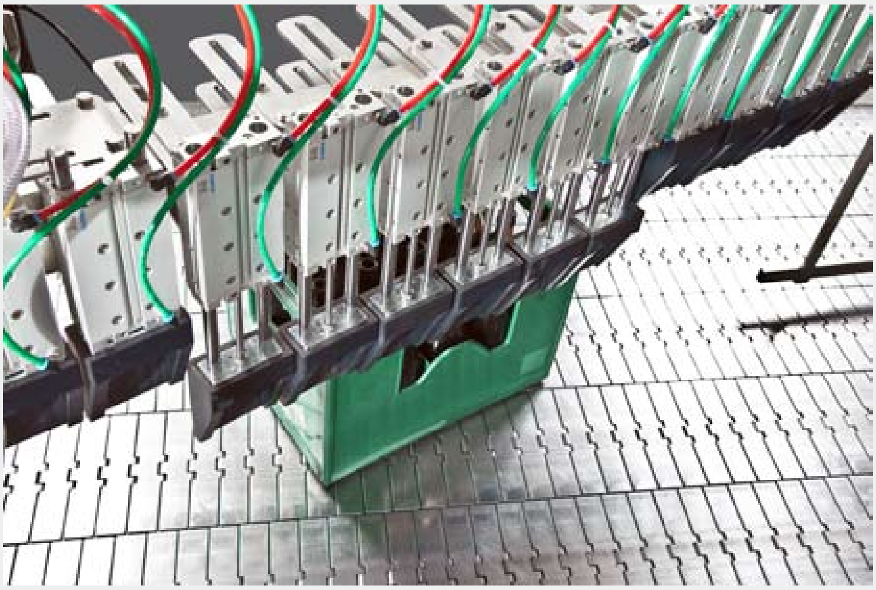
- Robust and reliable construction.
- Protected against dirt from the sides of the conveyor or the crate since the dynamic segmented guide railing is installed above the roller conveyor or conveyor chains.

Area of use

- Suitable for all drink crates, whether they contain plastic or glass bottles. The bottles can be filled or be empty because the reject process is hardly influenced by the weight of the crate.
- Crate lengthways or crosswise.
- Different crate heights are realised either through an increased lift or through the central pneumatic height adjustment of the reject segments.
- Rejection on chain or roller conveyors or even chain mat tables.

Installation variants

- Control through the crate inspection systems miho **Maxx** or miho **VC 2**.
- Installation of own control system possible.



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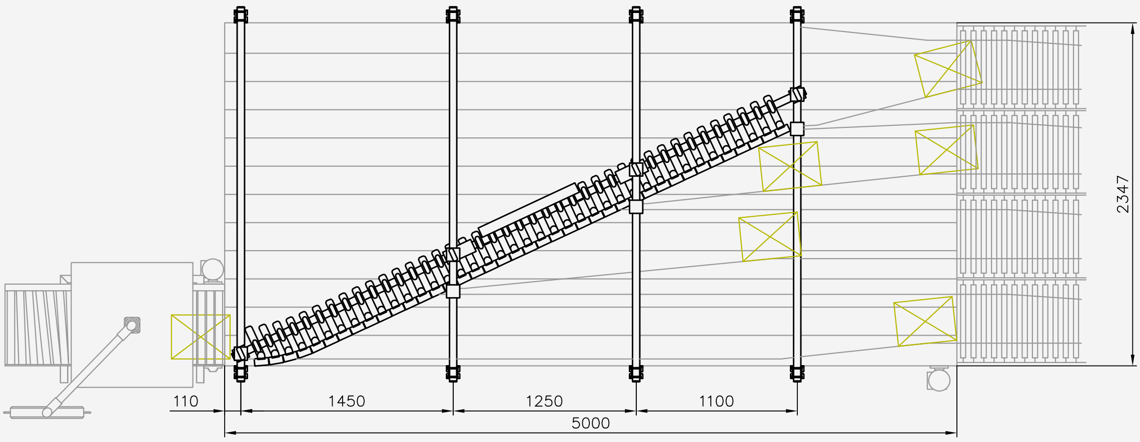
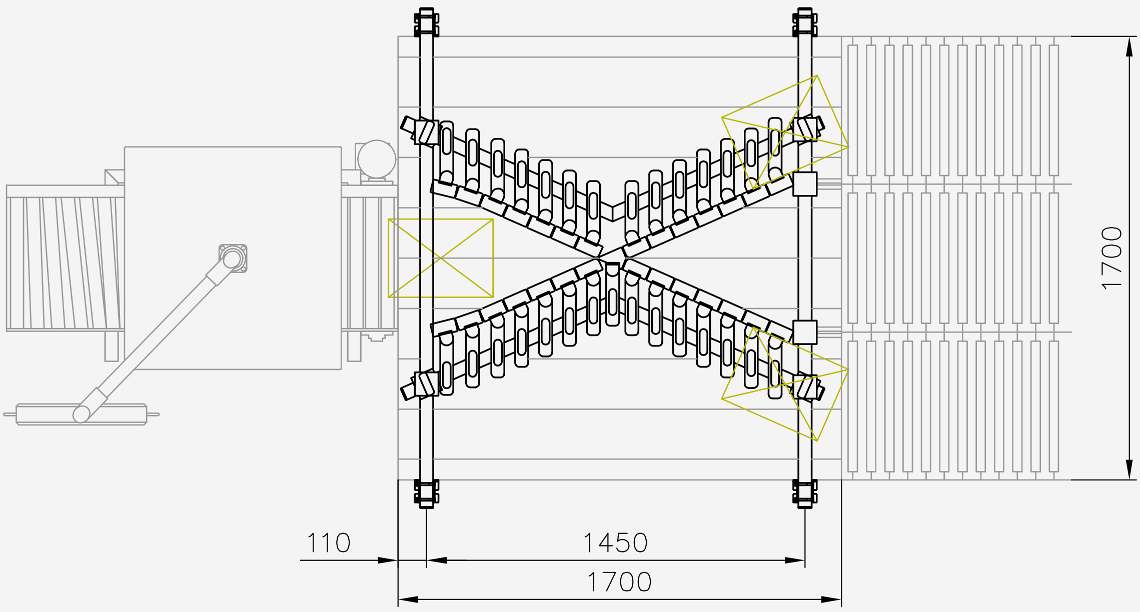
Leonardo SK
Installation examples



Installation example with reject possibility to three side conveyors on the left side of the main conveyor



Installation example with a reject possibility on both the left and right side of the main conveyor

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