Empty Bottle Inspector Miho David 2



Empty Bottle Inspector \min David 2

Complete inspection of the empty bottle between the washing machine and filler: base, finish, thread, sidewall, ...

- Individually configurable
- Latest computer technology on the platform \min O VIDIOS $^{ extsf{R}}$
- Up to 72 000 bottles per hour
- Installed more than 500 times worldwide
- Hygienic design
- Innovation: miho FSI, miho OpAL, miho AIM, Swing top seal inspection
- Optimized energy efficiency
- 24/7 hotline, remote maintenance, Spare parts supply for at least 15 years

made

Germany

in

Current innovations in this brochure are marked orange!



Table of contents Product overview 2 Empty Bottle Inspector miho David 2 2.1 **Basic machine Advanced** 2.2 **Basic machine Eco** 2.3 Sealing surfaces inspection 2.4 **Base inspection** Automatic self-monitoring of the base 3 **Sidewall inspection** 4 4.1 Dual sidewall inspection with miho Op Standard sidewall inspection 4.2 Dual sidewall inspection with finish side 4.3 4.4 Flange inspektion Blowing device for the finish area for gl 4.5 5 Integrated inspection of swing top bott 5.1 Dual sidewall inspection with miho FS 5.2 Swing top seal inspection 5.3 Bottling plant swing top bottles Integrated inspection of returnable PE1 6 miho Bottle Dryer 6.1 6.2 Bottling plant returnable PET bottles **Examples of bottling plants** 7 Network integration & production data 8 9 Upgrade modules 9.1 Inner sidewall inspection Standard thread inspection 9.2 Extension of visual angle for the base in 9.3 9.4 UV Filter detection of bottles Automatic adjustment when changing be 9.5 9.6 Undervoltage supply 9.7 Separate computer for production data 9.8 Separate AWeS viewer 9.9 Safety cabinet 10 miho infeed control systems 11 miho reject systems 12 miho conveyor control · miho contai 13 **Recommended installation / Technical** 14 miho Product program

	4
Basic machine	6
	6
	7
	9
	10
inspection miho AIM	12
	14
AL	16
	17
e inspection miho FSI	18
	19
ass bottles	19
les	20
l for swing top bottles	20
	21
	24
-Bollies	24
	20
	20
	20
acquisition	31
	34
	34
	34
ispection	35
ottle type	35
one type	36
acquisition miho AWeS	36
-	37
	37
	38
	40
ner transnort	42
data	
uala	44
	46
	0

miho David 2 and Periphery I Product Overview



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2

miho David 2 I Basic machine

2.1 Basic machine Advanced

Function -

- **Base inspection** with foil detection and variofocus: automatic adjustment of the focus for bottles with different heights
- Sealing surface inspection (RGB) with colour camera: detection of damage to the sealing surface
- **HF residual caustic soda** AIM: to detect liquid residues in the bottle, with continuous self-control
- IR residual liquid AIM: to detect organic liquid residues, with continuous self-control
- **Test bottle management:** automatic request of specially prepared test bottles to check that the machine is running smoothly. Allocation via transponder ring
- User administration: via transponder or password entry
- Production data acquisition miho AWeS with intermediate storing of production data if there is a network failure

Technology

- Real time image analysis software miho VIDIOS[®]
- Remote maintenance functionality with all the necessary software licences
- Software package miho AWeS for production data acquisition: Logging of all production data, counter readings, test bottle protocols and user access; Weihenstephan standard
- Mechanical construction: stainless steel, hygienic design
- TFT colour display with touch screen
- Pipeline cooling, closed system: no contamination through outside air or moisture, air conditioner based on Peltier
- Servo drive: automatic adjustment of the rotation angle (90°) for different bottle diameters
- Simple infeed protection system with line shutdown (too high, too low, lying bottles)
- Reject monitoring: line shutdown if a bottle is not rejected





Sealing surface inspection with RGB lighting





Touch operation through swivel arm

Touch operation through swivel arm



Test bottle with transponder ring attached

2.2 Basic machine Eco

As with the basic machine Advanced, but with the standard base inspection (without variofocus) and standard finish inspection (without RGB); without miho AWeS

2

miho David 2 I Basic machine

miho VIDIOS[®] - The proprietary real-time analysis software.

- Licence-free, because the proprietary software comes directly from miho
- Intuitive graphic user interface (GUI) in the local language
- Interactive help
- Machine diagnosis with clear display of machine status
- Operating system: Microsoft Windows 10

(((((((((((((((((((and the last of		The second se		
JANY MEC Pertomance		-				
Production	1					
Rejected	17	(94.44%)	-			
2 Bottle Sorting	Defect: 1	(5.56%)				
C Ease Inspection	Defect: 2	(11.11%)				
C Finish Inspection	Delect: 0	(0.00%)				
Sidevial Inspection (Infeed) 1	Defect: 1	(5.56%)				
Sidevial Inspection (Infeed) 2	Defect: 1	(5.56%)				
Sidewall Inspection (Outleed) 1	Defect: 2	(11.11%)				
Sidevial Inspection (Outfeed) 2	Defect: 1	(5.56%)				
Finish Side Inspection 1	Defect: 2	(11.11%)				
Finish Side Inspection 2	Defect: 1	(\$.56%)				
Finish Side Inspection 3	Defect: 1	(5.56%)				
5 Finish Side Inspection 4	Defect: 0	(0,00%)				
S HP RLD Inspection	Defect: 0	(0.00%)				
18 RLD Inspection	Defect: 0	(0.00%)				
E	100	1.1	81	- 36	P	

Detailed list of reasons for rejection



Help function in case of malfunction



Icon-based user guide when changing types

	and services reaction	AND REALLY AND ADDRESS OF ADDRESS OF
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E 201	EE	81 K P 10

Clear presentation of the test bottle run result

2.3 Sealing surface inspection RGB

Function

- for the improved detection of damage, especially at the outer edges of the sealing surface
- detects, for example, chips on the sealing surface / thread
- for both glass and PET

Technology -

- three lighting zones with three LED colour lighting rings RED / GREEN / BLUE at different illumination angles
- colour camera with spectral filter



Bottle finish recorded from above with ring-shaped RGB lighting for the improved detection of chips



Chip on the sealing surface



The LED colour lighting ring in operation



Glass: chip on the sealing surface



Glass: chip on the sealing surface

2

miho David 2 I Basic machine

2.4 Base inspection

Function

Detection of:

- Chipping, contamination, inclusions, damage
- Foreign objects
- Foil remains

Variofocus principle:

Technology

- LED lighting unit below, circular pole filter, camera above
- Variofocus: automatic focal tracking for change of bottle type



Shell-shaped chipping

Base inspection also for non-circular bottles

- Configure different base shapes and set up evaluation zones flexibly
- The analysis software miho VIDIOS® enow allows for a base inspection even for non-circular bottles without hidden zones
- Particularly interesting for foreign body detection in individual disposable containers



Left: small bottle with correct adjustment of the focus at the bottle base (orange) \rightarrow sharp image Centre: after changing to the big bottle, the focal point is above the bottle base, without having made any readjustment \rightarrow blurred image Right: miho Variofocus adjusts the focal point for the big bottle \rightarrow sharp image



Cigarette foil in PET bottle



PET bottle: stress cracks



Examples of different bottles inspected with base embossing

Base inspection also for base embossing

The embossing form is not recognized as an error but any contamination itself in the embossing area will be detected.





3

miho David 2 I Base inspection with miho AIM

Why self-control of the base inspection with miho AIM ?

- More frequent monitoring continuously
- Reduced false rejection
- Constant detection accuracy is ensured
- Logged inspection, irrespective of the operator

Base inspection self-monitoring module miho AIM



Construction of the base inspection with $\min o$ AIM



Without the AIM self-control system, contamination of the safety glass plate is not detected. In addition, another consequence is that foreign objects at the base of the bottle are shaded and not rejected.



-oreign object is shaded by contamination → bottle is NOT rejected

4

miho David 2 | Sidewall inspection in three versions

Standard sidewall inspection

- 2 cameras
- 360° inspection
- foil detection
- meets the basic requirement of a modern full inspection

Dual sidewall inspection with miho OpAL

- 4 cameras
- 360° inspection: fault at least once on the side facing the camera
- miho OpAL technology
- foil detection

Consider for:

- semi-transparent contaminants
- bottles with ACL labels
- bottles with relief or embossing
- swing top bottles

Dual sidewall inspection with finish side inspection miho FSI

- 8 cameras
- 360° inspection: fault at least once on the side facing the camera
- miho OpAL technology
- foil detection
- Additional miho FSI: unique transmitted light method

Consider for:

- bottles with finish side damage and contamination
- bottles with finish cracks without sealing sur face damage
- screw top bottles: inspection from beginning to end, from below and from above
- Damaged or dirty flanged edges







4

miho David 2 I Dual sidewall inspection with miho OpAL

Why dual sidewall inspection with miho-OpAL technology ?



Shell chipping in decorative area

Contamination in the bracket

miho OpAL (Optimized Area Localisation) is an innovative development of the image analysis software $\min O$ VIDIOS[®], used in the dual sidewall inspection. From now on, objects such as ACLs, embossing, shadows of bottle reliefs or parts of a swing top closure are recognized as such and no longer lead to false rejects. The entire sidewall of



4.2 Standard sidewall inspection

Two modules (infeed and outfeed of the empty bottle inspector) for the detection of contamination, foil residues and damage to the outer and inner sidewall of the bottle, using a total of **two** cameras

4

miho David 2 I Dual sidewall inspection with miho FSI

Why dual sidewall inspection with miho FSI-Technologie ?

miho FSI (Finish Side Inspection), an upgrade of the dual sidewall inspection, allows for the complete inspection of the finish and thread:

- dirt and damage
- rust ring detection
- cracks
- inspection regardless of the thread form
- · no false rejection of refunded new bottles

4.3 Dual sidewall inspection with miho FSI

Function

Functions identical to the dual sidewall inspection, and in addition:

- detection and visual display (360°) of damaged and incorrectly manufactured threads for screw cap bottles
- detection of contamination and damage in the area of the side finish (for example, glass defects, glass cracks, rust rings, underchip damage, chipping)
- inspection regardless of the thread form:
- segmented thread: twist off, vent slot
- fault at the thread start / end
- roughness of the thread is examined
- contamination of the thread dial
- no false rejection of refunded new bottles anymore
- full inspection of the thread dial: from beginning to end, from below and from above

Technology

- · as with the dual sidewall inspection
- an additional four cameras in the infeed module to ensure a full 360° view
- automatic adjustment of camera positions when changing bottle type (transmitted light process)

Contamination in the thread area

Stress cracks in vent slot thread of a PET bottle

Rough

thread



Vertical Split











Crown cork bottle with underchip defect

Chipping at the flanged edge

miho FSI schematic view: the cameras look down at an angle from above into the finish

4.4 FSI-Upgrade flanged edge inspection

Function -

As 4.3, additional detection of chipping at the flanged edge, for example with MCA threaded screw-top bottles. The following is detected:

- Chipping/bursts in the area of the flanged edge
- Friction rings below the flanged edge

4.5 Blowing device (glass bottles)

Function -

For the removal of adherent water or foam residues in the area of the thread dial, in order to ensure a proper inspection

Technology -

Blowing device before the empty bottle inspector, compressed air supply, optionally with sterile air filter, including control system and solenoid valve

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5

miho David 2 I Integrated inspection of the bracket area

The three modules for the comprehensive swing top bottle inspection in front of the filler in one machine.

- Dual sidewall inspection (DSW)
- Finish side inspection (FSI)
- Clapper inspection

5.1 Dualseitenwandinspektion mit miho FSI für Bügelflaschen

Function -

Detects amongst other things:

- Contamination
- Adhesive labels
- Missing bracket parts
- Missing clapper
- Vertical Splits



Swing top bottle with vertical split in the finish area



Swing top bottle with vertical split in the finish area



Bracket is the wrong way round

Bracket is missing









Bracket is lopsided





Domed sealing

sealing rubber



Mold at the

sealing rubber







Colour of the sealing rubber



5.2 Additional module clapper inspection

Function -

The additional module to inspect the rubber seal and the clapper of swing top bottles is an extension of the dual sidewall inspection.

The following is inspected:

- Presence of the rubber seal
- · Colour of the rubber seal: shade and fading
- Presence of the clapper
- Clapper: shade
- Bracket part present and properly attached? Inspection by the basic module Dual Sidewall Inspection (DSW)

Dependent upon the orientation of the clapper (the rubber seal must face outwards):

• Dirt of the rubber seal, for example mould • Damage to the rubber seal, for example missing material

Technology -

Additional module for the dual sidewall inspection with one module at the infeed and outfeed respectively of the empty bottle inspector.

- 2 cameras in the infeed module, 2 cameras in the outfeed module
- 2 images per camera through a mirror cabinet,
- reflected light process
- State-of-the-art colour cameras with downstream real-time image analysis software miho VIDIOS®









Damaged clapper

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Clapper: colour







5

miho David 2 I Integrated inspection of the bracket area

5.3 Bottling plant swing top bottles

Installed by miho

- Complete bottle transportation
- Intelligent conveyor control
- All control and inspection systems:

After the washing machine:

- 1 Infeed control miho Unicon 4 with rejection and additional residual liquid detector
- 2 Empty bottle inspector miho David 2

After the filler:

- **3** Fill Level inspection miho Newton HF
- 4 Ultrasonic bar for detecting leakage miho UIP

After the labeller:

5 360° inspection of a fully equipped bottle miho Allround with rejection

After the packer:

6 Full crate inspection miho Gauss F

Conveyor control:

7 Intelligent conveyor control system miho Pascal 2, central control cabinets





Correct / incorrect attachement of the bracket



Contorted sealing ring



Leaking bottle (frothing)



Examples of use for the inspection of swing top bottles:





miho David 2 I Integrated inspection of PET returnable bottles

Abrasion caused by faulty neck ring guide

Detection of typical faults in PET returnable bottles:

Scuffing

6

- Stress Cracks
- Damaged or dirty vent slots and segment threads
- Faulty support rings
- Deformed bottle bases



Chip on the sealing surface / thread







PET bottle: stress cracks, resulting in leakage



PET bottle: cigarette foil



6.1 miho Bottle Dryer

Function-

Fast and thorough drying of the threat or neck ring especially for PET bottles to guarantee a flawless inspection of these areas. The containers will be guided with two driven special belts, running synchronized with the conveyor speed. Adjustable nozzles and controlled airflow achieve an optimized drying result.

The belt system can be easily adjusted for different bottle diameters by using a handwheel. The regulated 4kW high performance ventilator with HEPA filter system generates the needed airflow.

Technology -

- Stainless steel housing
- Drive control unit
- Robust, long life time and easy cleaning substructure
- Guide belts with reduced abrasion and quick fastening
- High performance blower and HEPA-filter (class 7)

25

6

miho David 2 I Integrated inspection of PET returnable bottles

6.2 Bottling plant returnable PET bottles

Installed by miho

- Extremely accurate finish and thread inspection miho FSI, for example, to detect stress cracks
- Extremely effective thread blowing to avoid false rejects
- Secure standing rejection at 40,000 bottles / hour
- **1** High-performance thread blowing miho Bottle Dryer
- 2 Infeed protection with foreign bottle inspection and sorting of scuffed bottles miho Multicon 3
- 3 Empty bottle inspector miho David 2 with:
 - dual sidewall inspection
 - finish side inspection miho FSI
 - sealing surface inspection with RGB-Lighting
 - base inspection with stress crack detection
- 4 Linear segment rejector miho Leonardo M for standing rejection of empty and (partially) filled PET bottles
- 5 Reject table, optimized for PET bottles
- 6 Intelligent conveyor control system miho Pascal 2 / central control cabinets





Dirty vent slot



Stress cracks

Permanent marker



Examples of use for the inspection of PET returnable bottles:





7

Examples of bottling plants

7.1 High-speed bottling line 72 000 bottles / hour

Installed by miho:

- Up to 72,000 bottles / hour; **5** different bottle types
- Integration into the existing conveyor control
- **Connection to the existing PDAS** of the customer
- **1** Infeed protection with foreign bottle inspection miho Multicon 3
- 2 Empty bottle inspector miho David 2 with:
 - dual sidewall inspection
 - finish side inspection miho FSI
 - sealing surface inspection with RGB-Lighting
 - base inspection with miho AIM and Variofocus
- **3** High performance eccentric reject system miho ESF 2
- 4 Reject table, optimized for high speeds
- Α Good bottle, continues to the filler
- В Dirty bottle, goes back to the washing machine
- С Damaged bottle, goes to the container for broken glass





Damage in thread



Vertical Split



Crown cork rust ring

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Examples of use for the inspection of glass bottles:





Examples of bottling plants

7.2 Modernization of a bottling plant in confined spaces

Installed by miho:

- Cost-effective modernization: replacement of conveyor belts only where absolutely necessary
- Approximately 10,000 bottles/hour filling capacity in this example
- Intelligent conveyor control miho Pascal 2, 1 incl. buffer control
- **2** Conveyor construction $\min O$ Conveyance: The optimal solution of functional requirements in a given space
- **3** Infeed worm for creating a defined bottle division, ideal for swing top bottles
- 4 Camera based infeed control miho Multicon 3
- Reject table for infeed control set at 90° 5

- 6 Empty bottle inspector miho David 2 with:
 - dual sidewall inspection
 - finish side inspection miho FSI
 - sealing surface inspection with RGB-Lighting
 - base inspection with miho AIM and Variofocus
- 7 miho HSPM two-way rejection
- Removal of the bottles rejected at the 8 optimum location for the operator



SO 5000 Industry 4.0 ISO 14001 . ISO 9001 PDAS miho AWeS m m CCP CP

Why network integration?

- The empty bottle inspector is a prerequisite to
- monitor critical control points (CCP) in the filling process
- initiate quality assurance countermeasures, if necessary
- · verifiably log all production conditions
- · comply with the duty of care of producers in accordance with HACCP, IFS or other country-specific requirements for risk management
- Monitoring the filling process to control and improve efficiency, for example, in the control room, integration of the empty bottle inspector in a company-wide production data acquisition system (PDAS)
- Statistical evidence of minimum rejection, in accordance with the specifications of the operator of the bottle pool
- Remote diagnostics by miho for carrying out maintenance and optimization measures - quickly and inexpensively
- Basis for the requirements of Industry 4.0 and for modern certification standards: IFS Food, ISO 50001, FSSC 22000, ISO 9001, ISO 14001



miho AWeS Basis for the requirements of Industry 4.0

mino

8

Network integration & Production data acquisition

Pro

8.1 Production data acquisition system miho AWeS

Part of the scope of delivery for the basic machine Advanced

Function -

- Visualization and logging of:
 - counters
- operating status
- warning and error messages
- test bottle runs
- measures to correct faults after an unsuccessful test bottle run
- user registrations
- to monitor single or multiple miho machines, such as the empty bottle inspector miho David 2, the inspection of a fully equipped bottle by the miho Allround, the fill level inspection miho Newton Optics 2, ...
- export of data in pdf or xls format for further processing
- Backing up data in case of network failure no data is lost

Technology

- · polling the production data in accordance with the Weihenstephan standard, allowing easy integration into a PDAS
- either installation into the network on a virtual • machine or on a separate PDAS computer from miho

statistical.	- and the	And and a state	a second rule of		
r inspection unit			By impection unit		
Base (1)	336	(0.19 %) *	Base		
Base (2)			Finish		
Finah (1)	1032	(0.57 %) =	Side val		
Finish (2)			Thread		
Prish (3)			Frish ade well		
Sdewall m (1)	354	(0.09 %) *			
Side wall in (2)	158	(6.09 %) *	Sy fault		
Side well out (1)	212	(0.22 %) =	Verong bottle type	37	(0.02 %) *
Side mail out (2)	249	(0.24 %) *	Bottle too high		
Thread (1)			Bottle too low		
Thread (2)			Wrong coloured bettle		
PET-Souffing			Defective opening	2236	(1.24 %)
Sorting	39	(0.02 %) =	Defective bottom	336	包.29 %)*
High Frequency (HF)	.6	(0.00 %) *	Souffing		
Infrared (IR)	8	(0.00 %) =	Closed bottle		
Choped base			Poreign object		
Inner side wall			Side wall fault	485	(0.27 %)
Freish side wall (1)	285	(0.15 %) *	Residual liquid in the bottle	20	(0.01.%)
Frish side wal (2)	434	(0.23 %) *	Underchip fault	0	(0.00 %)*
Finah side wait (3)	311	(0.17 %) =	Other faults	75	(0.04 %) *
Finish side wall (4)	306	(0.17 %) *	Broken bottle	- 2	(0.00 %)
Sorting (HP)			Lying bottle	0	(0.00 %)
Sorting (IR)					

Screenshot miho AWeS user interface:

Statistical analysis of the inspection modules and causes of rejection



Screenshot miho AWeS user interface: Example of a successful test bottle run

miho AWeS as the central PDAS





8.2 miho Remote maintenance

Part of the scope of delivery for the basic machine Advanced / basic machine Eco

Function

Software package for remote visualization of the operating status, the parameters and images on an authorized computer of a miho service engineer: monitoring of counters and disruptions, checking and operating the inspection systems, new input and optimization of inspection parameters, accurate and quick analysis of faults.

Technology	
 Inter DSL Ope esta encr with cust 	net access with data transfer of at least standard nVPN , a globally recognized tool for blishing a v irtual p rivat n etzwork via an ypted TLS connection, or alternatively TeamViewer (licence supplied by the omer)

9

miho David 2 I Upgrade modules

9.1 Inner sidewall inspection

Function -

To detect three-dimensional dirt on the inner side wall, which is, for example, obscured by ACL labels or glass embossing. Restriction of the viewing angle is dependent on the bottle shape.

Technology

Lighting by a maintenance-free LED lighting unit from below, camera-based detection above the bottle.

9.2 Standard thread inspection

Function -

To detect damaged thread dials in screw cap bottles, with camera technology and maintenance-free LED lighting unit.

Technology -

Lighting unit and camera above the bottle finish, special mirror arrangement for inspecting from the side (incident light or reflection method).

9.3 Extension of visual angle of the base inspection

Function

Extension of visual angle of the base inspection for improved inspection of longneck and / or swing top bottles.

9.4 Additional UV filter detection

Function -

To detect clear glass bottles with or without UV filtering for subsequent sorting.

Technology -

Absorption measurement with a UVA detector, sensitive to a wavelength of 365 nm, including hardware and software kit.



A miho development engineer evaluating a prototype



9.5 Automatic adjustment when changing the bottle type

Function -

Automatic adjustment of inspection head height and the belt width when the operator changes the bottle type on the touch screen of the inspector.

Technology -

Adjustment via servomotors, all parameters of that setting are stored under $\min o \ \text{VIDIOS}^{(\mbox{ID})}$ according to type.

Circuit board test by a miho technician

9

miho David 2 | Upgrade modules

9.6 Undervoltage supply

Function

To ensure an electrical supply if there is a fault in the power supply $% \left({{{\bf{n}}_{\rm{s}}}} \right)$

Technology -

APC Smart-UPS 3000VA USB & Serial 230V, including housing

9.7 Separate computer for PDAS miho AWeS

Function

Separate PC system incl. monitor and printer for operation with the production data acquisition software miho AWeS. Also enables the integration of additional miho machines. Also available as an option to set up the remote maintenance connection.

Technology

Min. Intel Core i5, min. 4 GB RAM, min. 250GB HDD / SSD, min. 2x PCle slot, min. 2x Ethernet (RJ45), min. 1x VGA or DVI / HDMI, screen resolution min. 1280x1024 pixels, Operating System Windows 7 Professional / Windows 8.1 Professional (32 or 64bit)

9.8 Separate AWeS viewer

Function

Remote visualization of the operating status of the empty bottle inspector on a separate computer, for example, in the foreman's office

Technology

Installation of a separate viewer, for example, on a separate miho AWeS computer from miho; network connection is necessary. Requirements in accordance with miho IT-regulations



Mechanical installation of the miho David 2 basic machine



9.9 Safety cabinet

Function -

- improved access safety guard to the bottle conveyor belts
- operator protection against broken glass
- enhanced protection of bottles within the inspector from contamination by adjacent units or bottle conveyors
- improved soundproofing

Technology -

- 2 large-size safety doors on the front side
- monitoring through non-contact, tamperresistant security switches, integrated into the ASI bus safety system of the machine

Empty bottle inspector miho David 2 with safety cover

37

10

miho Infeed controls

General features of the infeed control:

- Machine protection for
- too high, too low or lying bottles;
- broken shards of glass Bottle sorting
 - shape, colour, height
 - · secondary characteristics such as embossing, ACL labels

10.1 Infeed control miho Unicon 4

Function -

Technology

- infeed control before the empty bottle inspector for broken bottles, lying bottles and bottle height
- rejection by the miho HSP (included)
- light barrier technology
- control and reject monitoring by the empty bottle inspector



Infeed control miho Unicon 4

10.2 Sorting miho Multicon 3

Function -

- camera-based infeed control (lying bottles, broken bottles) before the empty bottle inspector
- sorting in accordance with shape, colour and differences in size
- compensation of disruptive factors such as labels sticking out, drinking straws etc...
- · independent of the container material, even PET
- sorting of bottles based on secondary features such as embossing, permanent labels or degree of scuffing



Technology

- image processing system miho VIDIOS® and modern colour camera system, innovative lighting concept
- rejection in accordance with different sorting criteria to different reject channels is possible
- glass-PET distinction is a possible option
- rejection by the miho HSP (included)
- control and reject monitoring by the empty bottle inspector

miho Reject systems

 $\min o$ rejection - four systems for different requirements:

- the appropriate reject system, depending on the function and requirement
- all reject systems including reject monitoring
- central control system through the empty bottle inspector

11.1 Reject system miho HSP

Function

11

- to reject the faulty bottle via a pneumatic pusher
- including reject monitoring in the empty bottle inspector

11.2 Multi-reject system miho HSPM

Function

- Universal use in glass and plastic bottles, as well as in cans or carton packaging, empty or filled
- up to 60,000 containers per hour
- different container shapes and weights are compensated thanks to the servo-control of the linear drive and have no influence on the motion sequence of the reject block
- the reject process is individually configured for different container types and optimized for the respective container type

Technology

- the reject block of the miho HSPM is driven by an optimized high speed linear servomotor
- parameterization and operation integrated in upstream inspection unit
- low maintenance and durable •
- no compressed air supply necessary
- including reject monitoring in the empty bottle inspector

11.3 Eccentric reject system miho ESF 2

Function-

- for the rejection of cans, glass or plastic bottles with a specially shaped and rotating reject block
- for high conveyor speeds

Technology

- driving the reject block with a servomotor, independent of load and long-term stability
- high standing stability of the bottle by slight vertical downward pressure whilst rejecting
- horizontal and vertical adjustment of the reject block with rail guide
- including reject monitoring in the empty bottle inspector

11.4 Segment reject system miho Leonardo M

Function-

- secure standing rejection of bottles, cans and carton packaging, even of difficult bottles in terms of shape and centre of gravity
- suitable for sorting tasks

Technology

- magneto-mechanical reject system; containers to be rejected are transferred to a parallel conveyor by slide segments which run synchronously and parallel to the conveyor
- gearless drive via toothed belt, thus less mass movement and low-wear
- toraue monitoring of the servomotor through slip clutch
- · including reject monitoring in the empty bottle inspector

Reject principle:

The mechanical core piece of the **Leonardo M** is the approximately 100 reject slides (1), each one being connected to its own private guide element (2). They are all permanently driven parallel to the reject conveyor (green line) by a rotating chain and synchronously with the belt speed. If a bottle is to be rejected, the **central** switching unit (3) electromagnetically moves two or three of the guide elements in a mathematically calculated curve (red line) vertically to the running direction of the conveyor. Thus, by activating the reject slides in this way, the bottle to be rejected is pushed gently and securely standing onto the parallel reject conveyor (left reject conveyor, not pictured).



miho HSPM: multiple rejection (red arrows) depending on the type of bottle defect



miho Leonardo M, slide segments in action



12

miho conveyor control · miho container transport

Why conveyor control and container transport from a single source?

- Conveyor control

- \cdot contactless compensation of bottle gaps: reducing the noise and bottle abrasion
- one single control unit from the washing machine to the filler
- a modern conveyor control system brings efficiency, less disruption, less idle running at the filler

- Conveyor installation

- one integrated solution from a single source, without planning inter faces
- tailor-made concept
- \cdot project management from a single source saves time and nerves



Concept for conveyor control miho Pascal, from the washing machine to the filler

12.1 Intelligent conveyor control system miho Pascal 2

Function

- early detection of one of the nominal output deviating transportation capacities of the bottle line
- gaps created by rejected containers are compensated for without any container contact
- smooth and low noise gap closure for smooth bottle transport
- buffer control, isolation and single-lane blocking between two aggregates with only one control module miho Pascal 2
- reduction of aggregate interference from a lack of bottles at the infeed
- remote-controllable change of bottle type, no user intervention is necessary
- the operator is informed of the status of the system with messages in the local language
- alarm detectors can also inform on plant status on the spot
- user administration with individual access authorization of the operators

Technology

- microcontroller technology for quick responsive conveyor control in real time
- millimetre-precise detection of gap size
- no counting method: removing or adding bottles has no influence
- Allocation of the system section into up to 16 motor groups with different speed adjustments
- production data acquisition in accordance with Weihenstephan standard and remote visualization for example, in the foreman's office
- a graphical user interface with touchscreen makes operating for the user even easier
- Data backup of user-specific parameters on SD card
- no additional software necessary
- easy integration of the miho Pascal 2 into existing bottling plants.
- up to 18 gap sensors and up to 8 buffer sensors



12.2 Additional module conveyor control through the empty bottle inspector

Automatic adjustment of the conveyor control parameters to the empty bottle inspector when changing the bottle type.

12.3 Container transport system miho Conveyance

- modular container transport system for modern filling and sorting systems
- single and multi-lane conveyors, pressureles combiners, buffer systems and reject tables
- high quality reject tables from miho sare a requirement for secure standing rejection
- hygiene-friendly design details
- pre-assembled in the factory, thus short installation and commissioning times
- miho Conveyance und miho Pascal form a combined basis for smooth production and high plant efficiency

13

Recommended installation / Technical Data

13.1 miho David 2 with dual sidewall inspection and miho FSI as well as an additional reject table for the infeed control



13.2 miho David 2 with dual sidewall inspection and miho FSI



13.3 miho David 2 with standard sidewall inspection



13.4 miho David 2 with basic functions, for example base and finish inspection



Legend	
1	Optional finish blow-off system
2	Infeed control (e.g. Unicon 4 oder Multicon 3)
3	Reject system after infeed control (HSP)
4	Glass shards cover
5	Reject system for laid down and broken bottles (blow-o
6	Reject monitoring
7	Empty bottle inspector miho David 2
8	Trigger-Lichtschranke
9	Reject system after empty bottle inspector
	(HSP, HSPM, ESF 2, Leonardo M)
10	Reject control
11	Optional table monitoring

Operation -

- temperature $+10^{\circ}$ C to $+40^{\circ}$ C
- relative humidity: 30% bis 90%

Cleaning -

- out)
- cleaning plans in accordance with the instruction manual
- with standard industry cleaning agents

Supply -

- operating voltage 230 V +/- 10%,
- 1-phase AC
- frequency: 50 Hz bis 60 Hz
- power < 1.5 kW
- pneumatic, operating pressure: 5 bar 10 bar

14 miho Product program



miho Pascal 2

PRODUCTION DATA ACQUISITION miho AWeS

EMPTY CRATE INSPECTION

miho Gauss E

REJECTION

High Speed Pusher miho HSP Eccentric Reject System miho ESF 2 Multi-reject System miho HSPM Linear Reject System for bottles miho Leonardo M Linear Reject System for crates miho Leonardo SK

FILLER MONITORING

Filler Monitor miho FM 2 Filling Pipe Detection miho MX 2 / LC 2 Bottle Counter miho FZ 2

FILL LEVEL & CAP CONTROL

Optical: miho Newton Optics 2 X-Ray: miho Newton X 2 Infrared: miho Newton IR 2 High Frequency: miho Newton HF 2 U High Frequency: miho Newton HF 2 M (Especially for metallised labels)

The miho sales team

Thomas Mathusek Regional Director Asia / Pacific / Europe <u>/ MNC</u>

> +49 5609 8382-16 tmathusek@miho.de

Dr.-Ing. Markus Grumann Managing Director

+49 5609 8382-35 mgrumann@miho.de Luc Tricot Regional Director West<u>ern Europe</u>

+ 32 47 52 53 88 3 ltricot@miho.de Peter Schirmer Regional Director Africa / Latin America

+49 5609 8382-36 pschirmer@miho.de

Follow the QR code to find your local miho partner:



Oliver Kory Sales

+49 5609 8382-47 okory@miho.de Herbert Liebich Key account manager Germany

+49 5609 8382-23 hliebich@miho.de Philipp Wedel Area sales manager Germany, Austria, Switzerland

> +49 5609 8382-20 pwedel@miho.de

miho Inspektionssysteme GmbH · Obervellmarsche Str. 12 · 34292 Ahnatal · Deutschland +49 5609 8382-0 · info@miho.de · www.miho.de

miho Inspection System Nigeria Ltd. · 35A Furo Ezimora Street · Marwa Bus Stop · Lekki Phase 1 Lekki Expressway, Lagos · Nigeria · +234 0129 1693-0 · office.nigeria@miho.de · www.miho.de

Guangzhou miho Inspection Equipment Ltd. · Room 801 · No.1 Building · Jinke Ind. Park · No.136 Nanda Road Dashi Street · 51143 Panyu District, Guangzhou · China · +86 20 39936110 · office.china@miho.de · www.miho.de