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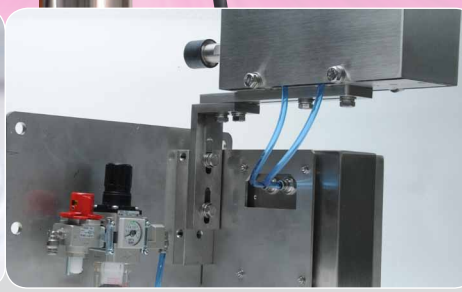
INDEC.
Vacuum Inspection



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INDEC.

In-line vacuum test systems

Ensuring that products meet the highest quality standards is absolutely essential in the manufacture of food, pharmaceutical and cosmetic products in particular.
Leak-tight product containers have a major role to play here. Leak-tight product containers have a major role to play here. Leakages allow the contents of a container to get out, but more importantly they also allow germs to get in, rendering the contents unusable.

INDEC vacuum test systems monitor containers for leak tightness fully automatically within the production process. A wide range of containers, including bottles, jars and cans as well as tubs and trays, are tested for leak tightness by means of a non-contact inspection.

The means to this end is a pre-existing vacuum or a vacuum created in the container expressly for the purpose of leakage testing. Containers which are not leak-tight are reliably identified and automatically rejected.

These processor-controlled test systems are highly reliable and extremely easy to use, qualities which have played no small part in making them the first choice already for many companies throughout the world.

Vacuum inspection with INDEC

The non-contact, 100% in-line vacuum inspection of jars, bottles, cans and similar containers is carried out within the production process. Containers which show insufficient vacuum, cocked/tilted caps or missing caps are reliably identified and automatically rejected.

A sensor measures the cap panel deflection which is dependent on the vacuum inside the container. The measurement values are evaluated by the testing software, leak tightness is assessed by comparing the data of each container with the data of a golden sample. The desired values are determined automatically by means of a simple, easy-to-use teach-in function. All container parameters are saved format-specifically and settings are made at the touch of a button. Manual adjustment of the vacuum sensor is only necessary if there are large differences in the dimensions of the containers, the parameters are saved format-specifically here too.

The systems are operated using a touch screen in combination with a membrane keypad. All system messages and information about the current test procedure are displayed clearly on the colour graphics display. System components are connected via plug-in connections in the connection unit. All housings and plug connectors can withstand high-pressure/steam cleaning in compliance with IP69K

INDEC VA turnkey test systems

INDEC VA turnkey test systems are pre-assembled before delivery and can be fitted to the conveyor system in just a few simple steps. The systems can be used as independent units or can be integrated within existing test systems. A range of different models are available to meet the requirements of specific applications.

INDEC VD vacuum test device

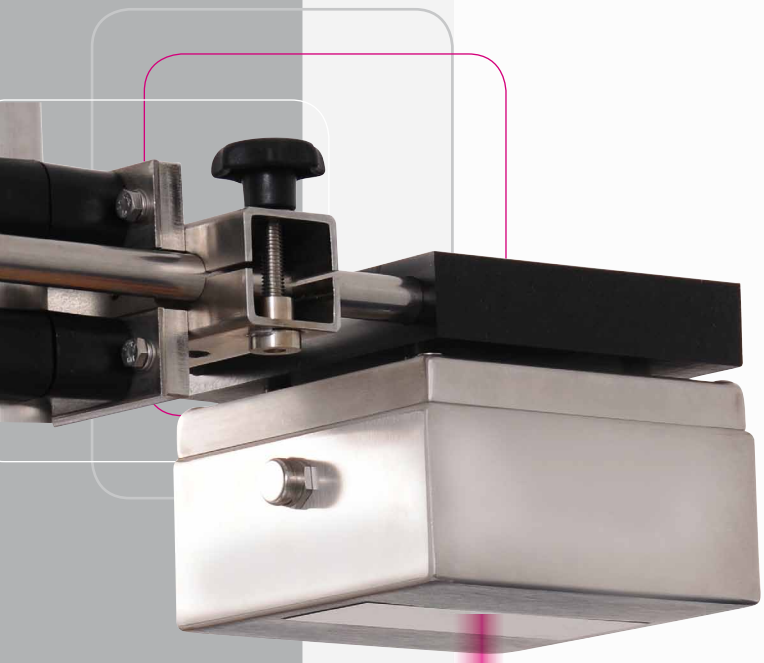
As an alternative to the turnkey systems, INDEC VD vacuum test devices are available in various configurations providing optimum solutions when the full functionality of the systems is not required or when certain components are already present.

Thanks to their modular design, INDEC VD devices can be extended as and when needed. It is easy to add to their functionality in response to changing requirements.

Equipment overview

INDEC	Central unit	Connection unit	Vacuum sensor	Light barrier	Sensor holding bracket	Stand	Ejector unit	Collection tray	System synchronisation	Data transfer/ remote maintenance	Industry 4.0 preparation
VD 100	●	●	●	●	●	⦿	⦿	⦿	⦿	○	○
VD 300	●	●	●	●	●	⦿	⦿	⦿	⦿	●	●
VA 300	●	●	●	●	●	●	●	⦿	⦿	●	●

Legend: ● included ⦿ optional ○ not available



The optical sensor

Multi-functional and versatile

Equipped with an optical sensor, INDEC can be used for closures made of any material, including composite or plastic lids, aluminium foils and twist-off lug closures made of metal.

All common closures can be measured with one and the same sensor head.

Even foil-sealed containers, such as tubs or trays with a vacuum, can be tested for leaky seams. For this reason it can make sense to create a vacuum in the container for the express purpose of leak testing.

Large working distance for a safe working environment

The large measuring distance of over 100 mm rules out collisions between the sensor head and containers.
Variations in the dimensions of the containers, misalignment of containers and vibrations of the conveyor are fully tolerated.

No problems with moisture

Unlike other optical measuring methods, the optical INDEC sensor head is unaffected by the presence of moisture or fully formed water droplets.
Furthermore, all housings are made of stainless steel and comply with IP69K in accordance with the principles of hygienic design. This ensures that there can be no ingress of moisture even when pressure washers are used.

Fast and easy format changeover

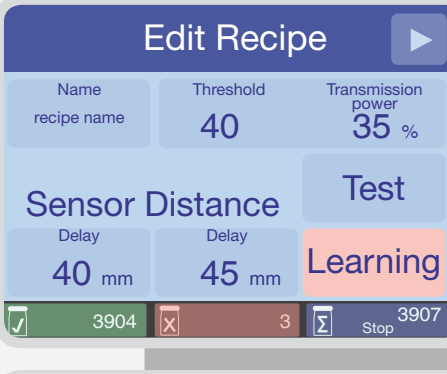
Not only does the optical sensor reach high test speeds, it also has the major advantage of providing easy handling, especially for frequent format changeovers.

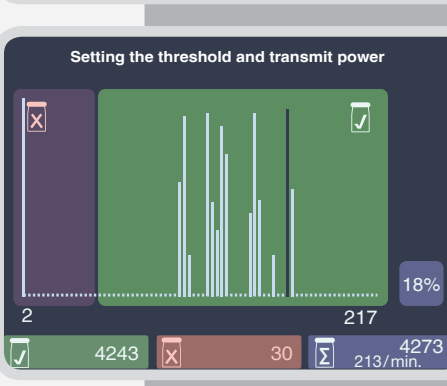
Because of the large measuring distance, it is not necessary to adjust the sensor head manually for format changeovers involving containers of varying heights. The system can be set up at just a touch of a button using saved parameters sets.

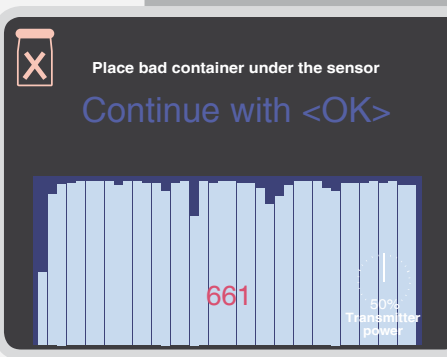
Automatic parameterisation with teach-in function

To be able to react quickly to process events, it must be possible to change parameters easily and reliably.

The optical sensor head features a user-friendly, time-saving teach-in function. The operator is guided step-by-step through the interactive teach-in process with graphical support. The container-specific test parameters and operating data are generated automatically. The operator prompting is so easy to follow that even inexperienced users can use the teach-in function.







Central unit

In the central unit, the data acquired by the vacuum sensor and the light barrier unit is processed by the vacuum testing software and the control signals are calculated for the ejector. A touch screen with a colour graphics display, multilingual user interface and membrane keypad is provided for data entry and display. The recipe parameters for the containers to be tested are generated and saved via programme routines (teach-in).
The central unit is equipped with a main switch. 1 ½" clamps are provided for mounting on the stand.

Connection unit

The stainless steel housing of the connection unit is fixed directly to the central unit. The supply voltage and all signal leads are assigned in the connection unit. All installations by users are also carried out via the connection unit.

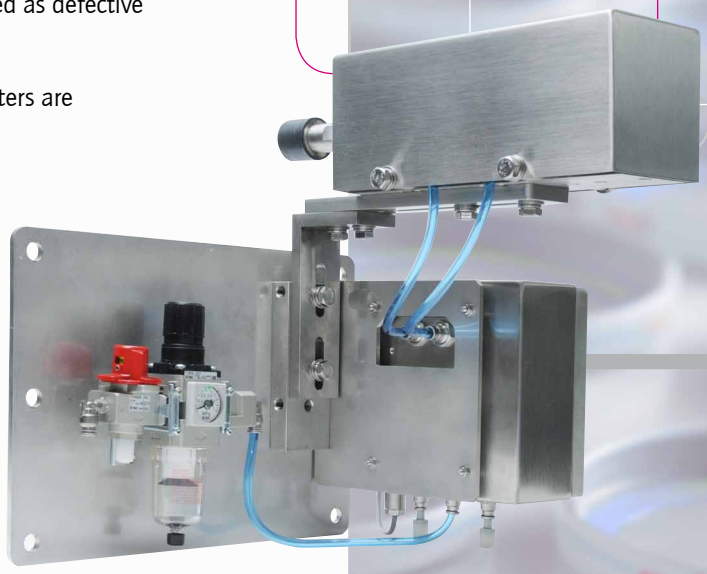
Ejector unit

With the ejector unit, containers which have been identified as defective by a test system are removed from the production flow.

Control and adjustment in line with the container parameters are performed with the central unit.

The ejector unit consists of a pneumatic valve and cylinder, a compressed air service unit with manual shut-off valve, a pressure regulator with filter and an adjustable holding fixture.

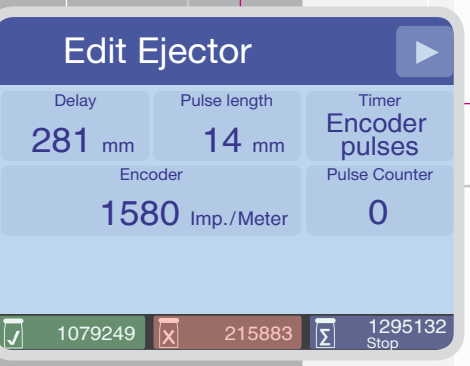
To make it easy to fix the ejector unit to the conveyor system, the entire unit is mounted on a base plate which can be screwed directly to the conveyor system. The pneumatic valve and cylinder are protected by a housing made of rust-resistant stainless steel.



Collection tray for defective containers

The large stainless steel tray is used to collect rejected containers. The rugged construction with crimped edges is made entirely of rust-resistant stainless steel.

The tray is provided with four drill holes and is fixed directly to the conveyor system opposite the ejector unit.

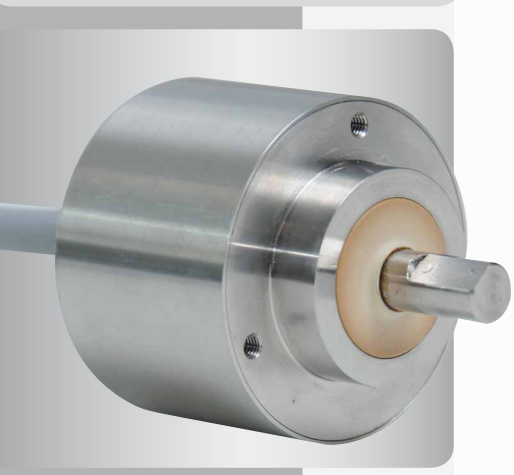


System synchronisation for variable conveyor speeds

The device option for system synchronisation contains a software extension and a rotary encoder which is ready for connection. With this option, INDEC systems can be synchronised with the speed of the conveyor system to accommodate variable conveyor speeds.

Real-time evaluation of the rotary encoder pulses by the INDEC central unit enables the position of the container to be determined exactly and the ejector to be controlled precisely.

The hygienic rotary encoder is detergent and disinfectant-proof and IP69K protection makes it able to withstand high-pressure/steam cleaning. It is connected to the connection unit by means of a 5 m long connection cable and can rotate in a clockwise or anti-clockwise direction.



Stand for central unit and connection unit

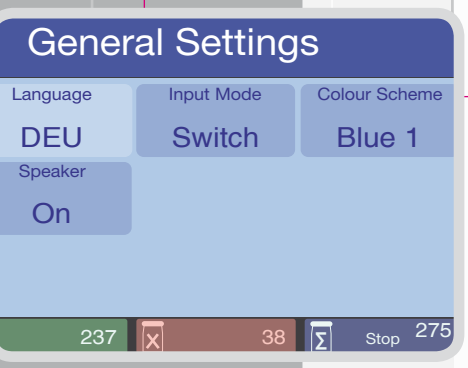
The robust, stable stand for the central unit and connection unit consists of a tripod base with levelling feet and a stand tube.
The central unit and the connection unit are mounted using clamps which provide height adjustability.
The levelling mechanism of the tripod base provides stability on uneven surfaces.
The base and stand tube are made of rust-resistant stainless steel. The base plates of the levelling feet are made of anti-bacterial plastic and can be fixed securely to the floor by means of three drill holes.

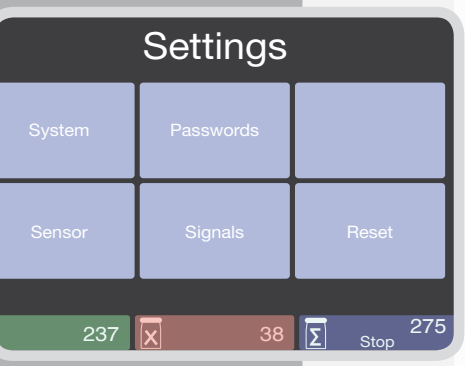
Light barrier unit for product detection

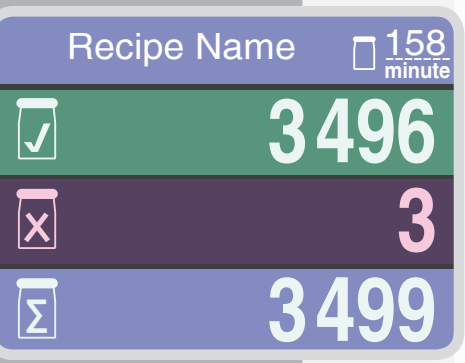
The reflective light barrier complete with reflector and adjustable holding fixtures is used for product detection to start the measurement.
High immunity to optical interference from the environment is a distinguishing feature of the light barrier as well as its rugged metal housing which is detergent and disinfectant-proof and able to withstand high-pressure cleaning. The light barrier features highly visible status LEDs. Precise switching and high detection quality guarantee reliable object detection.
The light barrier is equipped with an adjustable fixture for mounting on the sensor and light barrier holding bracket. The holding fixtures for the light barrier and reflector are made of rust-resistant stainless steel and can be adjusted in a vertical and horizontal direction.

Sensor and light barrier holding bracket, adjustable

The holding bracket with fixtures for the vacuum sensor and light barrier unit can be adjusted in a vertical and horizontal direction in accordance with the height and position of the container. Integrated scales make it possible to reproduce the settings at any time. The values of the settings can be managed in the testing software and can be shown on the graphics display.
The holding bracket is made of rust-resistant stainless steel and is mounted on a base plate which can be screwed directly to the conveyor system.







Operation and system integration

Intuitive operation

INDEC features a robust membrane keypad and a high-contrast colour graphics display. All user controls are located on the front panel of the test device for good access and easy operation with a clear view of the process environment.

Clear colour graphics

The colour graphics used for the display of measurement results and operational status guarantee optimum presentation and visual perception of all information. Specially selected colours contribute to the clear design of the user interface. Intuitive graphics and icons maximise clarity.

Simple PC and network connection

An Ethernet connection is provided for carrying out system maintenance and upgrades on site or via remote access.

As well as being used for remote maintenance, this interface can also be used for the central acquisition of production data. The analysis and archiving of this data facilitate effective quality management.

Evaluation of external control signals

The evaluation of external control signals makes INDEC test systems suitable for a wide range of different applications. The applications listed below serve as examples of the many possible uses of this option:

- Joint use of the ejector by external systems
- Integration of individual sensors, e.g. sensors for fill level monitoring
- Removal of containers for sampling at the touch of a key
- Ejection of entire series at production start or in test mode

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Technical data

Central unit

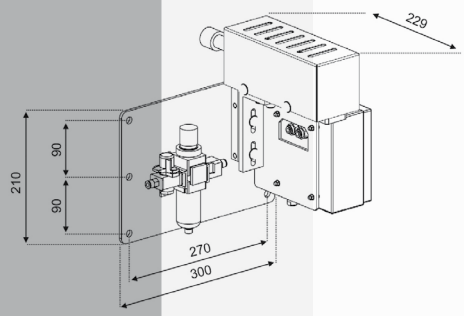
Operating voltage		88...264 VAC, 47...63 Hz		
Power consumption		max. 200 W		
		VD 100	VD 300	VA 300
Inputs	Semiconductor input channel 24 V DC	1	2	2
	Rotary encoder input 10...30 V DC	1	1	1
Outputs	Semiconductor output channel 24 VDC, 0.5 A	1	6	6
	Relay output channel	1	1	1
Ethernet		-	1	1
Colour graphics display / keys		3.5" / 4	5" / 8	5" / 8
Recipe memory		9	250	250
Housing material		Stainless steel (1.4301)		
Ambient temperature		0...50°C		
Dimensions (L x W x D) mm		300 x 200 x 120		

Vacuum sensor

Measurement principle	Optical, infrared sensor		
Field of application	Any kind of closure materials		
Closure diameter	30...120 mm		
Test speed max. units/minute	VD 100	VD 300	VA 300
	600	1200	1200
Working distance	> 100 mm		
Connection cable	5 m long		
Dimensions (L x W x D) mm	150 x 150 x 80		

Connection unit

Dimensions (L x W x D) mm	200 x 150 x 100

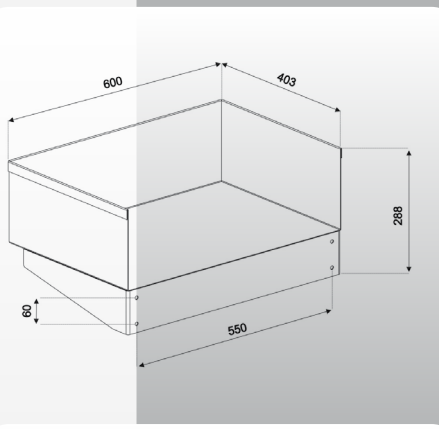


Ejector unit

Pneumatic connection	Plug-in coupling 6 mm
Operating pressure	6...10 bar
Compressed air quality	Cleaned and unoiled compressed air
Dimensions base plate	210 x 300 mm
Connection cable	2 m

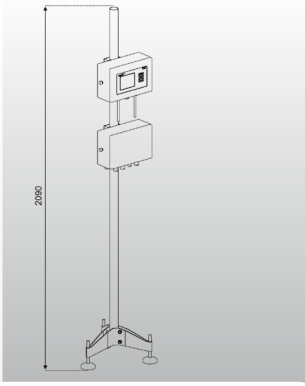
Collection tray

Dimensions (L x W x H) mm	605 x 403 x 185



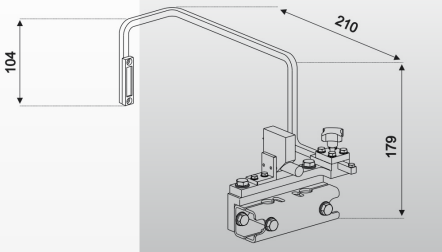
System synchronisation

Shaft parameters (D x L) mm	10 x 18
Operating speed	3.600 min^{-1}
Pulse frequency max.	200 kHz
Connection cable	5 m



Stand for central unit and connection unit

Diameter tripod base	496 mm
Diameter stand tube	1 ½" (nominal diameter 48.3 mm)
Length stand tube	2 m

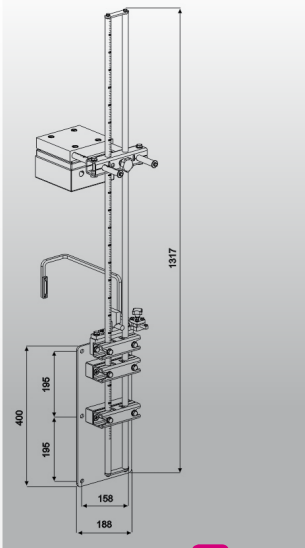


Light barrier unit for product detection

Range	Horizontal: 0...100 mm Vertical: 0...400 mm

Sensor and light barrier holding bracket

Range	Horizontal: 0...150 mm Vertical: 0...800 mm
Dimensions base plate	400 x 188 mm



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