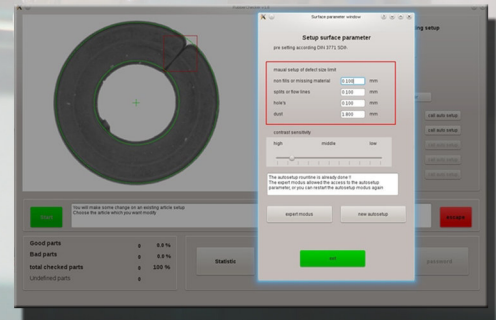
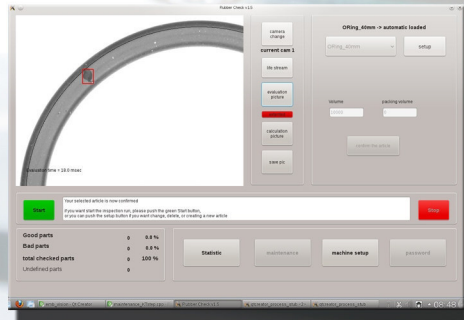


A yellow and silver industrial machine, likely a turntable or rotary work station, with a control panel and a large blue cable. The machine features a yellow frame and a silver turntable. A control panel with a digital display and buttons is visible. A large blue cable is connected to the machine. The background is a blurred industrial setting.



www.eep-maschinenbau.de

KTprime

Product Information

Modular single or double glass plate inspection system

Typically used for:

all kind of o-rings and similar round symmetrical sealing parts,
especially for rubber, plastic, ceramics or light metal materials

Details and Advantages

This system comes up with the best in class inspection software and unique precision sensors for secure quality assurance system with best price/performance ratio. Based on modular construction the system allows optimal adjustments/upgrades according to customer needs anytime.

All high quality optical camera sensors are equipped with a lighting system created for special surface requirements. This ensures a high contrast and a stable long-term inspection result.

The analysis software, especially the one for the surface analysis, is equipped with the latest innovative algorithms designed for stable results and a minimal amount of pseudo-rejects. The easy to use operator interface (HMI) with touchscreen control has a very special and comfortable feature in addition:

- **The active userguidance for easy setup -**

The entire inspection system is constructed on a solid frame and requires a minimum of space. Good accessibility and cleaning capability is assured.



Product features

- max. part size from 2 until 40 mm (50 mm KTprime²) OD (outside diameter) and max. 30 mm height
- throughput until 10 pieces per second (depends on part material and inspection volume)
- surface and geometric inspection
- modular construction, simple adaptable to the customers need
- single glass table (extendable to double glass table) inspection machine
- auto-setup function for easy approach to new products/seals
- HMI (Human Machine Interface) comfortable and easy adjustments by active user control and touchscreen
- surface analysis with pattern recognition to reduce the false scrap, and more statistic informations (Excel-compatible) with details about the imperfections

The basic machine can be extended with a second glass table including a turn over station

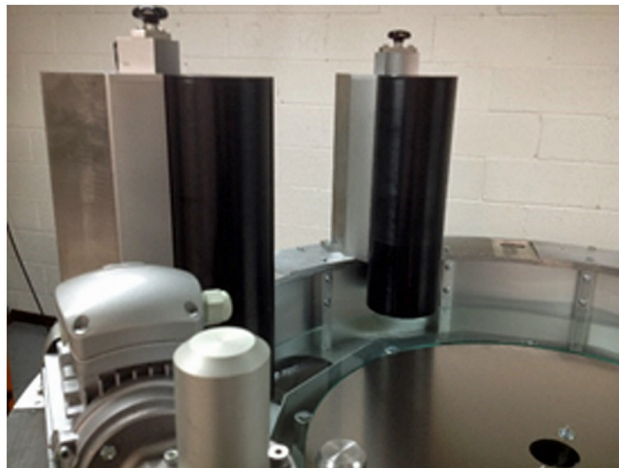
- KTprime-B1 Basic inspection machine with one glass table
- KTprime-B2 additional glass table including turn over station for the KTprime²

The feeding and separation unit will be available for two part sizes

- KTfeeder_1 Standard feeder for part size from 10 until 40 (50) mm
- KTfeeder_2 Microfeeder for small parts from 2 until 15 mm

The KTprime can be configured with several intelligent sensor units according to customer needs

- KTsensor_M Sensor unit for geometrical inspection (i.g. OD, ID and CS)
- KTsensor_O Sensor for surface inspection, view from the top or bottom
- KTsensor_A Sensor for outside and inside surface inspection
- KTsensor_H Height sensor for profile or height measurement

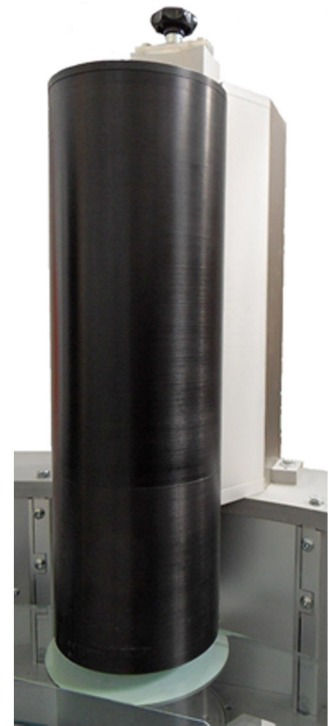


All sensor units are working as independent vision sensor including camera, lens, optic, flash controller, part tracing and triggering, as well as an own small PC (embedded board) with independent vision software. Each sensor is only connected with the operator PC via GigE network. Each sensor can be assembled on each position. This makes the KTprime full flexible for any customers requirement.

Geometric Sensor Type M

Sensor for geometric measurement i.g. for o-rings, outside, inside and radial cross section, as well as geometric values from frame seals or other.

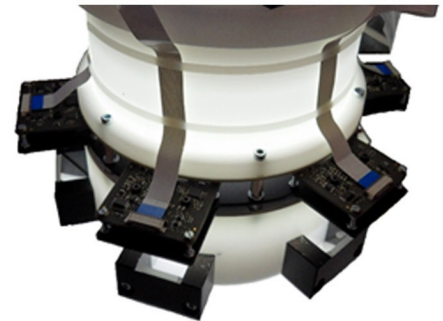
Camera type:	3 MPixel	5 MPixel
Resolution:	0,02 (0,025) mm	0,016 (0,02) mm
Field of view:	40 (50) mm	40 (50) mm
Measurable tolerance cpk 1,6:	+/- 0,15 (0,2) mm	+/- 0,12 (0,1) mm
Frames per second:	10 fps	7 fps
Illumination:	back light	back light
Objective:	telezentric	telezentric



Surface Sensor – top side Type O

Surface inspection sensor with top view. Surface defects reference by DIN 3771 N (S)

Camera:	3 MPixel
Pixelresolution:	0,02 mm
Limit of visible defect size:	0,15 x 0,15 mm
Min. gray scale (contrast):	20 gray steps
Min. defect depth (contrast):	0,08 mm
Illumination:	LED dom and dark light



Outside (inside) Sensor Type A

Outside and inside sensor for surface inspection with a view from the outside or inside.

Outside – inside with one sensor is possible up to an outside diameter of 25 mm. For bigger parts a separate outside and inside sensor is necessary.

Camera:	6 x 1,2 MPixel
Pixelresolution per sensor:	0,025 mm
Limit of visible defect size:	0,2 x 0,15 mm
Min. gray scale (contrast):	20 gray steps
Min. defect depth:	0,1 mm



General technical data sheet:

Power supply:	220 V 50 Hz
Power consumption:	1,2 KW
Compressed air:	min. 5 at
<u>HMI</u>	
Operating system:	Linux
Display:	14" Touchscreen
<u>Max. amount sensors</u>	
Single glass table machine:	up to 6
Double glass table machine:	up to 9
<u>Max. partsize (filmgate)</u>	
Single glass table machine:	max. 40 (45) mm
Double glass table machine:	max. 50 (55) mm
Dimensions (w/l /h:)	2,00 x 3,30 x 2,20 m
with opened cabinet	height 3,10 m
Externernal LAN network:	GigE Interface DHCP oder statisch

KT Software - KTvision

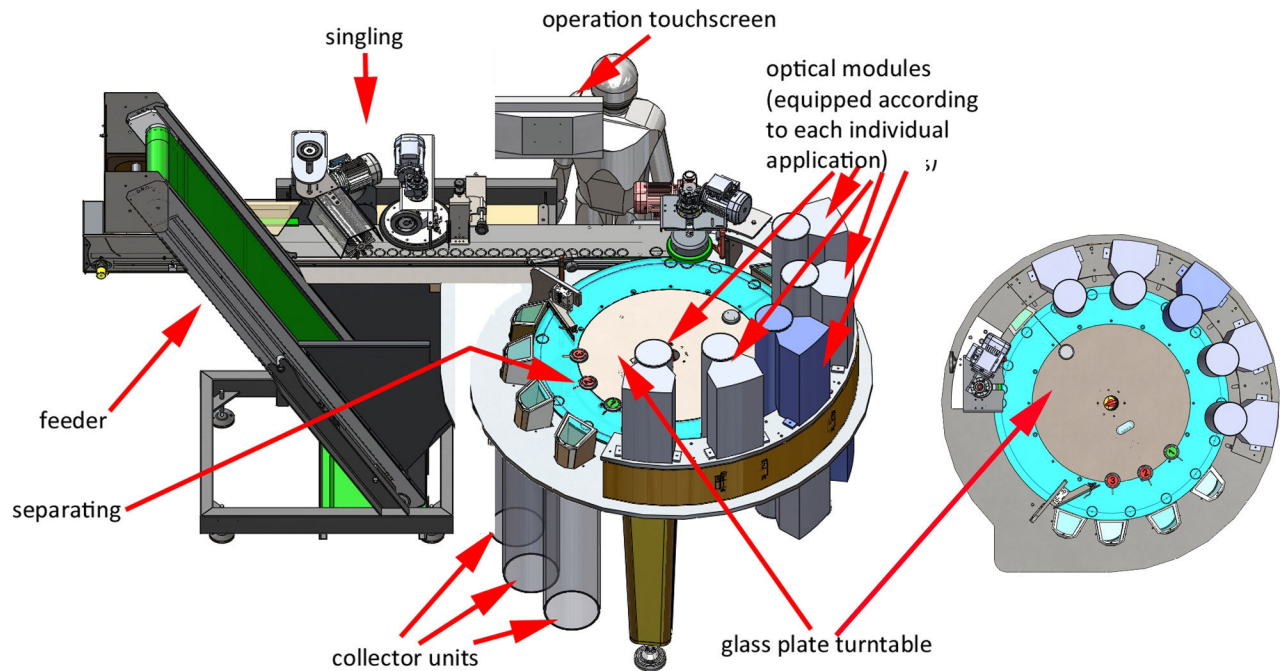
The KT Software is especially designed for rubber seals, but also useable for other materials. Rubber is called a living material and the surface condition of rubber seals has a wide varity of different looking. Therefore the rubber surface examination needs a special algorithm.

The KT software consists of all necessary tools for a vision inspection machine. Features are:

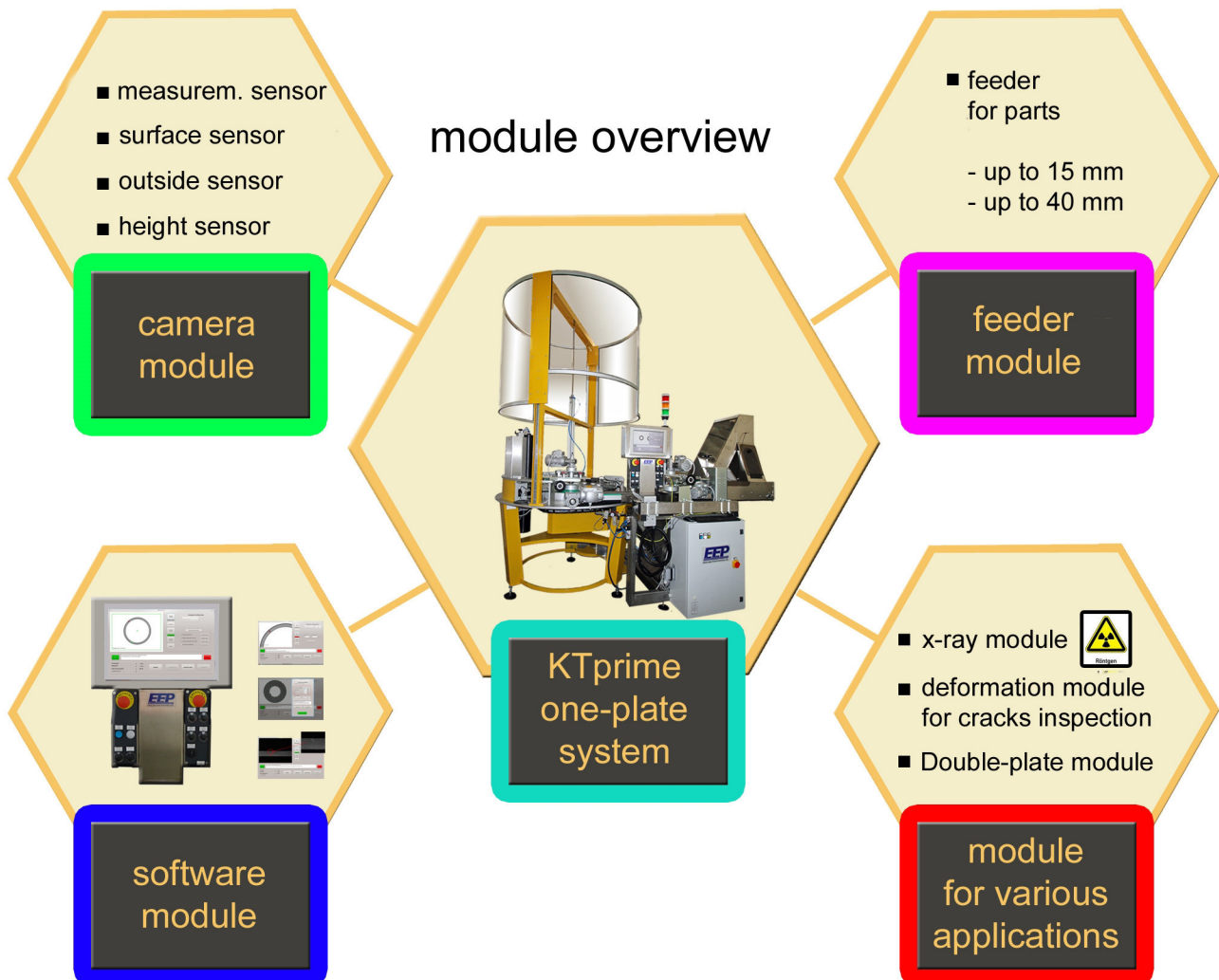
- modern designed GUI
- a special feature is the active user guidedance
- facilitation for the user: auto-setup modus for usual seals like o, v, or q-ring, break seals, frame seals and so on
- expert setup modus for complex seals and for general optimization after auto-setup
- pattern recognition: the software recognizes the general type of defect
- all size limits displayed and prompt in mm or inch
- informative statistic
- machine operation (PLC)

For more informative details, please see our brochure „Ktsoftware“

KTprime one-plate turntable system



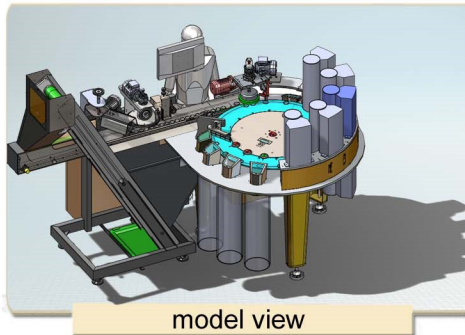
Thanks to the modular concept, the KTprime is upgradeable anytime and thus offers a high grade of flexibility and adaptation according to any user specific needs.



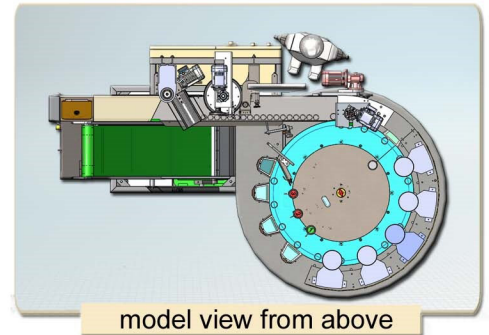
picture gallery KTprime



front view



model view



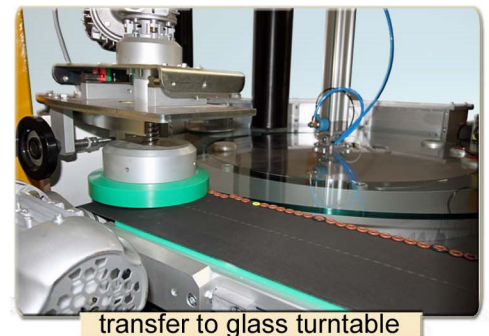
model view from above



feeder



singling



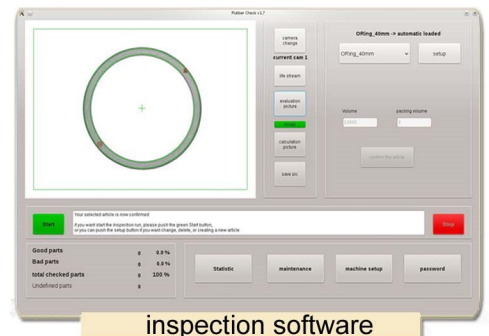
transfer to glass turntable



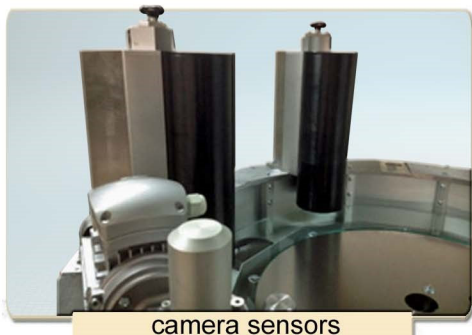
glass turntable



operating unit



inspection software



camera sensors



blow off separation



collector-box units

Highlights at a glance:

- ➡ ■ Upgradeable plug & play system
- ➡ ■ Modular construction with high grade of flexibility and adaptation according to any user specific needs
- ➡ ■ Intelligent high precision scanning-technology for safe surface analysis
- ➡ ■ Newest innovative algorithms for stable inspection results
- ➡ ■ Minimization of pseudo false output rate by identification of contamination
- ➡ ■ Informative statistics of various defect types (MS-Excel compatible file)
- ➡ ■ Comfortable touchscreen operation with clearly arranged and self-explanatory user interface (GUI)
- ➡ ■ USB Port and network-compatible
- ➡ ■ Active operator support with visual guidance
 - >> next-step-help, where the software expects the next input/setting (red frame > next step) and additional short-help-text during the operator usage
- ➡ ■ Innovative auto-setup function for fast read-in of articles during frequent product changes (>article library)
 - >> Preset selection of the basic shape of the parts, then scanning good part once with each sensor - ready

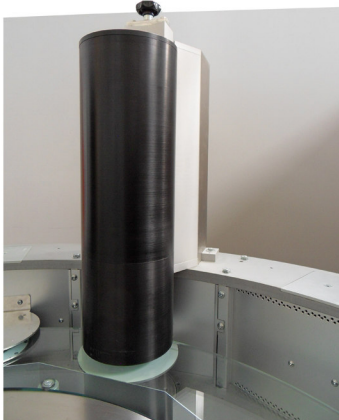
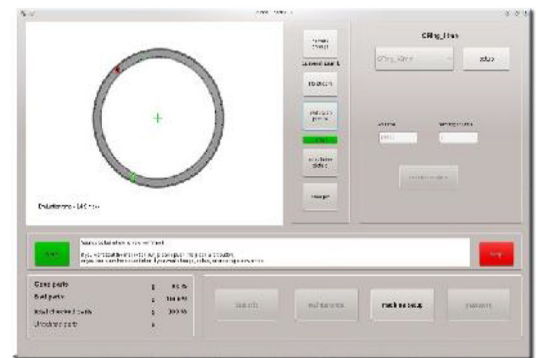
short info KTprime



KT Vision Systems aim to be as simple as possible needed with a modular design. This allows the user to concentrate on the product quality and to inspect small lots without efforts as well.

KT Vision Systems are unique in the picture analysis through consequent use of innovative sensor technologies. Combined with the very special software, this delivers highest quality and efficiency in the vision inspection.

KT Software, intelligent and easy to use! With KT auto-setup, the vision system applies a self-test on the master samples or even the first teach in parts. Generally, the operator sets only the severity and the minimum error limit. Lighting, flash, the test zones and the remaining parameters for the surface analysis are automatically determined and set optimally. The KT auto-setup works for standardized components and defects. For non-standard parts / seals, the expert mode is suitable to create your own receipts.

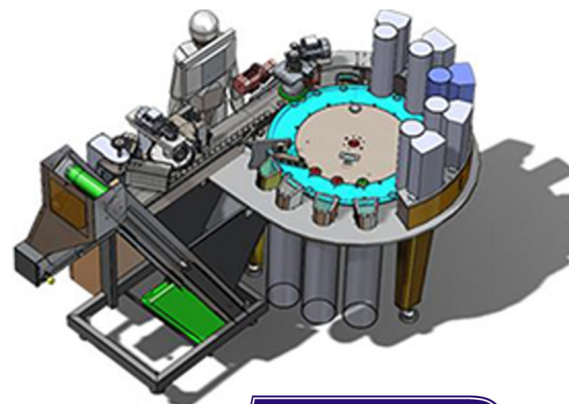


KT Sensors, the eyes of the inspection machine

Innovations in detail and highest optical precision generate detailed pictures of the parts. Multi-level lighting systems offer the highest possible contrast and thus a safe and reproducible surface analysis. All sensors are equipped with their own computing power and work autonomously. Only the instructions exchange via a network to the control computer. The pattern recognition collaborates together with an expert system generating the final decision if the detect area does not represent a defect or if the part has to be blown out as scrap. This very intelligent decision procedure reduces significantly the so-called pseudo scrap and makes the test system more efficient than most other systems on the market.

KT optimized mechanics

A stable engineering for optimized flow of parts form the backbone for sensor and actuator systems. Easy access allows rapid conversion to other parts and quick cleaning. The modular design allows for easy configuration and upgrades.





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