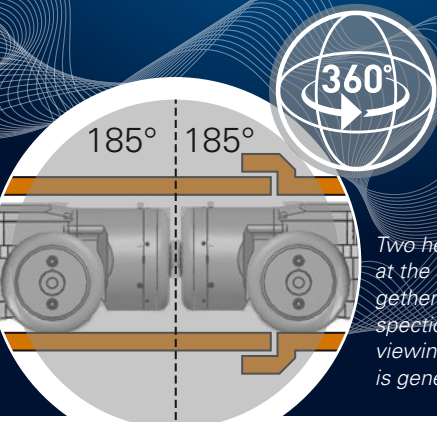


# PANORAMO 4K



Two hemispherical photos taken at the same location are put together to form an image. The inspection is performed from two viewing angles and a picture file is generated from this.

For more than 15 years now, IBAK has led the field of sewer inspection with worldwide unique 360° camera technology. So the PANORAMO principle is long proven and familiar to many people.

## Time-Tested Principle

Unlike conventional sewer inspection systems, the IBAK PANORAMO uses two high-resolution digital photo cameras with 185° fisheye lenses installed at front and rear of the camera tractor. The use of fisheye technology makes it possible to take pictures with extremely wide angle focal lengths. Photos are shot at 5 cm intervals and the photos from the front camera are combined with the corresponding photos from the rear camera. This generates what are called spherical images and these enable a true 3D interior view of the sewer to be created. The special feature is the use of two cameras that photograph the sewer from different perspectives. As a result, you can e.g. look into laterals with and against the flow during the analysis. The xenon flash lighting permits pin-sharp pictures to be generated even at maximum travelling speed (up to 35 cm per second) and prevents motion unsharpness.

With the image files generated in this way, the perspective from which you want to view an object or a defect is freely selectable and a virtual sewer inspection in the office is also possible. So the person who performs the analysis of the defects is not necessarily identical to the operator. Unlike inspection with conventional technology where you have to

## Complete Scan in 3D

Left mouse button: navigate in all directions (360°, continuously)



Right mouse button: move forward



stop the camera tractor, deliberately aim the camera at a defect and also document this, the IBAK PANORAMO scans a section without any stops. The condition of the pipe can be assessed in the office at a different time from the scan.

This makes it easier to plan time schedules for sewer inspections as scanning without having to stop and aim the camera always takes roughly the same amount of time, irrespective of the number of objects in the pipe. In addition, this offers the possibility of scanning considerably more sections in less time and implementing a different work structure as the system operator does not necessarily also have to perform the analysis.



PANORAMO unfolded view for a quick overview of the entire inspection

Defects, joints or laterals can be assessed efficiently and reliably on the basis of the 360° film. Alternatively, a two-dimensional unfolded view (vertical view from above of the unfolded inner surface of the pipe) enables the viewer to gain a rapid overview of the condition of the pipe and to access individual defects immediately. In addition, objects can be easily measured in this view using the software tools.

## Can Flowing Water Be Recognised?

Many people have been familiar with PANORAMO technology for many years. But not everyone who is interested is aware of all the details. Besides the unique possibilities that PANORAMO technology offers with its digital fisheye pictures, with the PANORAMO digital cameras, video mode can be selected at significant locations during the scan. So movement such as flowing water can also be optimally identified.



# IBAK

## PANORAMO 4K



www.ibak.de



Sharp. Sharper. 4K.

Over the past few years, the PANORAMO product line has been further improved on the basis of its well proven technology. The result is an even much more brilliant picture with 4K resolution. The abbreviation 4K stands for 4000 and means the approximate number of horizontal picture elements (3840 x 1920 pixels). So this means that the resolution is four times as high as full HD. To achieve such brilliance and to allow this high resolution to be displayed on the monitor and stored, the transmission path has been revolutionised. For the first time in the history of IBAK, a Gigabit Ethernet Standard is being used for the transmission of images and other data. With this technology, a data transmission rate of up to a billion bits (one gigabit) per second is possible.

As IBAK has very positive long-time experience in the implementation of fibre optic technology, with the Gigabit Ethernet Standard 2 fibre optic conductors have also been used in the cable.

In the new PANORAMO generation, as with most other IBAK cameras, there will be the option of integrating a 3D sensor for pipe run measurement.

Suitable Software Support

PANORAMO films can be optimally and reliably recorded with the efficient IKAS evolution sewer analysis software. The operator is offered modern, efficient user guidance. Thanks to intuitive operating procedures, after a short training period, the user is fully capable of handling the acquisition and analysis of sewer data in all complexity. IKAS evolution can be configured for all commonly used sets of rules and standards and client requirements for condition assessment – naturally also in accordance with EN 13508-2. With PANORAMO technology, the inspection workstation can be moved to the office. After the PANORAMO film has been scanned on site, all further steps can be performed in the office without any more on-site work – from condition assessment through classification to rehabilitation planning.

Is Automatic Pipe Condition Analysis Possible?

Over the past few months, IBAK has started on an innovation project called „PANORAMO ArtIST“ (Artificial Intelligence Software Tool). PANORAMO ArtIST is based on software that uses artificial intelligence techniques to automatically detect damage, connections, etc. and supports the operator in detecting and documenting damage more efficiently and, in some cases, automatically. The PANORAMO technology is the best basis for this, because 100% of the pipe is analyzed and not only parts of the pipe as with pan and tilt recordings. This supports a high quality and time-saving working method.

PANORAMO Advantages at a Glance:

- Brilliant 360° 4K resolution
- High travelling speed of 35 cm per second
- Inspection of the section(s) without any stops
- No motion unsharpness in spite of high speed (flash technology)
- Freely selectable perspective in the scanned 3D section film
- Virtual sewer inspection, also in the office
- Inspection tasks can be better planned
- Additional unfolded view for a better overview
- Video mode e.g. to identify flowing water
- 3D GeoSense optional

PANORAMO 4K

System Technical Data – PANORAMO 4K	
Range of application	From DN 200 upwards (PANORAMO 150: from DN 150 upwards)
Steerable	No
Speed	Continuously adjustable, max. 35 cm/sec.
Folding connector	Bends horizontally und vertically
Protection class	IP 68
Pressure monitoring	2 integrated pressure sensors <sup>1)</sup>
ATC <sup>2)</sup>	No
Ex protection	Optional (in preparation)
Height adjustment	Yes, electric (optional)
Viewing software	IBAK PANORAMO Viewer (Freeware)

Combinable with	
IBAK cable reels	KW 310 (4K), KW 505 (4K)
IBAK control systems	BS 5, BS 7

Accessories (optional)	
Tilt measurement	Yes
Additional weights	From DN 300 upwards
Ancillary lighting	No
Wheel sets	Wheels, tyres, pneumatic tyres, granulated wheels optimally adapted to the pipe diameter
Tractor attachments	Ovoid tractor attachment/overturn protection from 250/375 mm or DN 400 upwards
Height adjustment	Electric, from DN 250 upwards, adjustment range up to 210 mm
Software	IKAS PANORAMO Analysis, analysis support software

IBAK – Made in Germany

All IBAK products have one thing in common: They are „Made in Germany“. All system components are developed, produced, assembled and tested by IBAK. Thanks to their high quality standard, IBAK products have set the standard for investment security and profitability – for more than 75 years now.



PANORAMO 150

1) LCD indicator and acoustic alarm in the control unit  
2) ATC = Automatic Tilt Compensation

Änderungen vorbehalten | 200506\_PANORAMO\_4K-EN



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