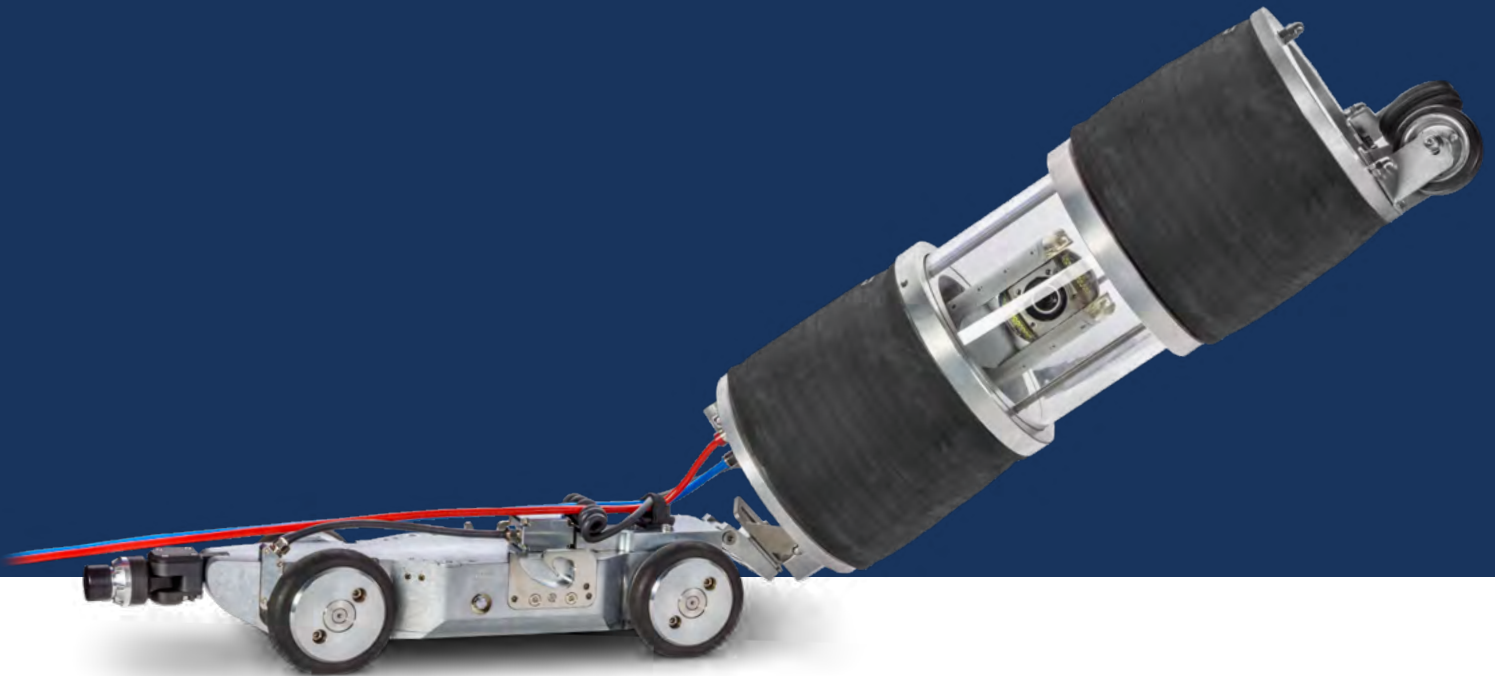
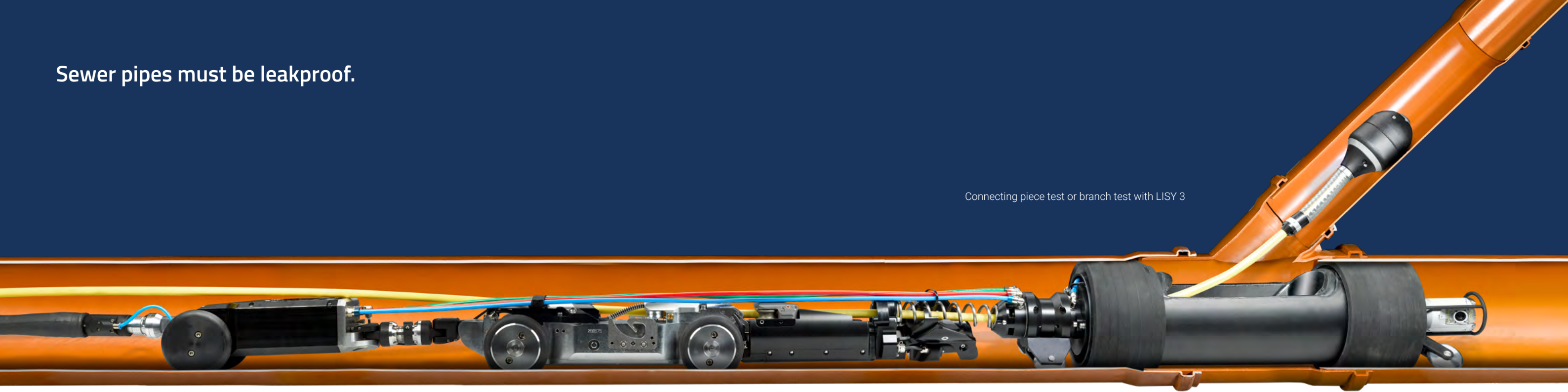


# IBAK

## Leak detection systems



# Sewer pipes must be leakproof.



Connecting piece test or branch test with LISY 3

## Protection of groundwater against leaky sewer pipes

This requirement is imposed by legislators to protect groundwater and soil from leaking sewer lines. Leak-tightness of all private and municipal house drain and laterals, through which sewage or combined wastewater flows, must be verified.

DIN EN 1610 "Construction and Testing of Drains and Sewers" and Worksheet DWA-A 139 are the basis for leak tests **for new buildings**. They specify binding standard methods for the test. Thus, in DIN EN 1610 the procedure for air pressure and water pressure tests, the test period, the test pressure, etc. are prescribed – as is the documentation of the test results.

In addition DIN 1986 Part 30 must be complied with for **existing sewer lines** for a water fill level test. It regulates the procedure and documentation of the leak test. However, in principle, these obligations correspond to the obligations stipulated in DIN EN 1610.

In addition, the relevant state water laws and the statutes of the municipality are relevant. For the leak test a distinction must be made between visual testing and pressure testing. In this regard the classic visual inspection with sewer television cameras is referred to as visual testing (described in the brochure "IBAK Sewer and Manhole Inspection Systems"). Pressure methods with which sewer lines are examined with positive air pressure, for example, are referred to as pressure testing.



## IBAK sewer leak testing with modular solutions

The TV inspection remains the indispensable basis for any sewer repair decisions that may become necessary. However, because frequently leaks also have causes that are not visible, the leak-tightness of a sewer cannot always be determined with certainty via a TV system.

The **IBAK DPS** leak detection system is designed for use in circular pipes DN 100 and up. Depending on the system configuration, the performance of positive air pressure tests, negative air pressure tests and water tests are possible. With the IBAK DPS components, a flexible system which covers the entire application spectrum of pressure tests is available: Sections, pipe joints, connecting pieces as well as house drains and building sewers can be tested for leaks.

The IBAK pressure test components can be integrated in the IBAK sewer TV systems. A common control system and a cable winch (KW 505) with a 250 meter combined camera and compressed air cable (hybrid cable) ensure a clear device arrangement. All components are easy to handle and have short set-up times; they are designed for one-man operation and ensure efficient work.

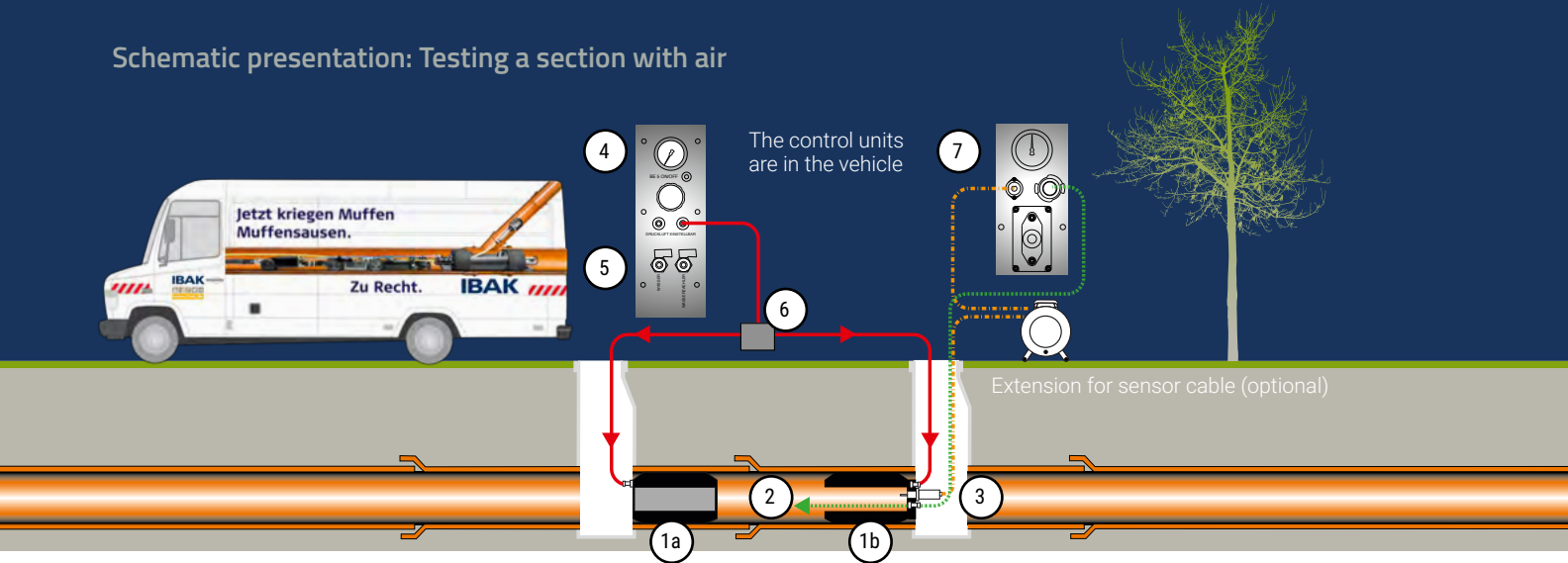
Regardless of the test method that is decided on: In all cases the user gets a test log in accordance with the applied standard.

## Advantages at a glance

- Checking of sections, pipe joints, connecting pieces, as well as house drains and building sewers for leaks
- Long service life of the hybrid cable thanks to a cable structure that is specially matched to the range of application
- Easy handling of all components; designed for one-man operation
- Low device weights
- Shore hardness: 35 Shore A; thus minimal collar pressures are possible with optimal sealing behaviour of the test collars
- Low collar pressures - thus pipes are not damaged
- Connecting piece test and branch test up to 40 m into the branch
- Satellite stopper which can move round bends with axial camera
- Modularly designed system component structure
- Connection of components for flushing of laterals (from the mainline sewer) is possible

# Section test

Schematic presentation: Testing a section with air



- 1a Bag stopper / bag plug
- 1b Test stopper / test plug
- 2 Test space, sealed section
- 3 Pressure sensor and temperature sensor
- 4 Delivery element for adjustable compressed air
- 5 Delivery element for water / water meter
- 6 Safety filling device
- 7 Delivery element for compressed air - section

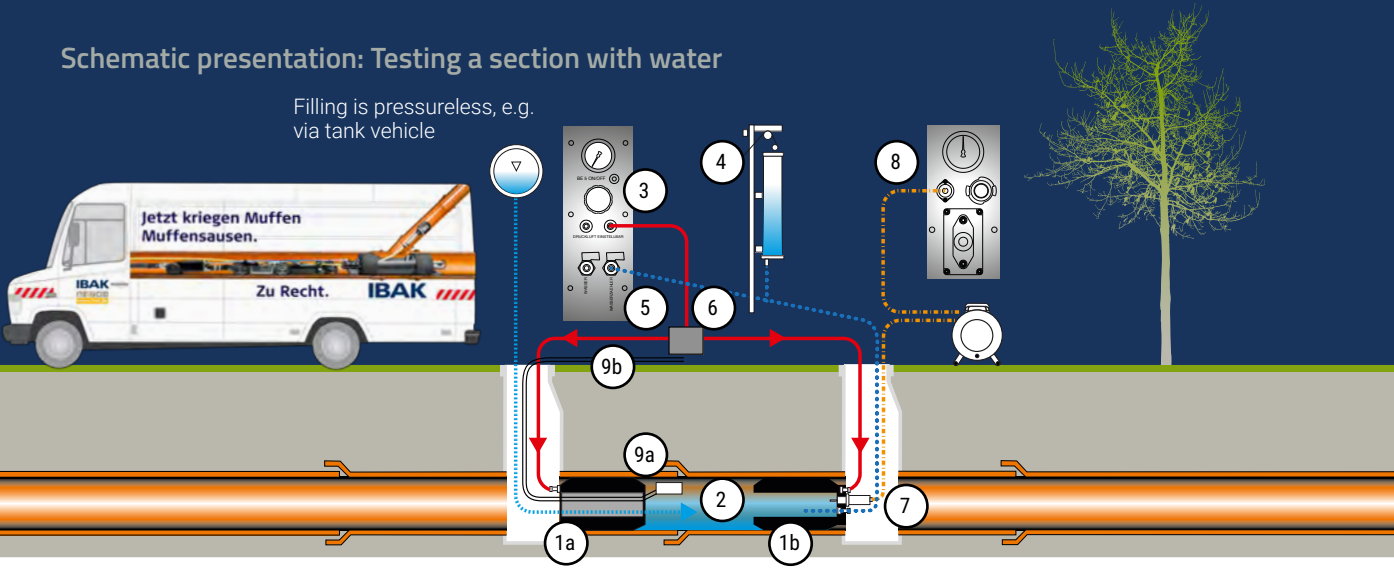
- ⋯ Sensor or control cable
- Compressed air hose
- ⋯ "Air" filler hose

## Section test with air

The section to be examined is sealed in the immediate vicinity of the manhole with a pipe seal stopper and a test stopper. Either a positive air pressure or negative air pressure is generated in the test space via a pressure vacuum pump (depending on the desired test method). A pressure sensor measures the pressure and relays it to the connected PC. The pressure curve is graphically displayed on the PC monitor, the measured data is saved and can be viewed and printed out as a test log at any time. If the values for the permissible pressure drop are exceeded, the pressure test has failed and the sewer line is designated as leaky. This is clearly shown on the test log, which is created with the IBAK "IDAS" software, as is all other required information.

- Automatic operation (filling and testing) possible
- Test control via PC
- Fill capacities of the section to 1 m³ air flow rate/ min. are possible
- Safety switch-off if there is an emergency stop
- Low-noise operation is possible
- Can be easily supplemented on IBAK-TV vehicle

Schematic presentation: Testing a section with water



- 1a Bag stopper / bag plug
- 1b Test stopper / test plug
- 2 Test space, sealed section
- 3 Delivery element for adjustable compressed air
- 4 Gravity tank
- 5 Delivery element for water / water meter
- 6 Safety filling device
- 7 Pressure sensor and temperature sensor
- 8 Delivery element for compressed air-section
- 9a Float fur ventilation
- 9b Vent hose

- ⋯ Sensor or control cable
- Compressed air hose
- ⋯ "Water" filler hose
- Vent hose
- ⋯ "Water" test hose

## Section test with water

For section testing with water, the water leak-tightness of the drainage object is confirmed. If an air test has not been passed, a water test can be executed subsequently. If, in this process, the defined threshold values are not exceeded, the line is considered leak-tight - even if the previous test had a negative result. In the same manner as for the leak test with air, the section is first sealed; the test space is filled with water, e.g. from a rinsing vehicle tank.

There is a pressure sensor which detects the water pressure in the test stopper. Water pressure should be kept constant during the test period.

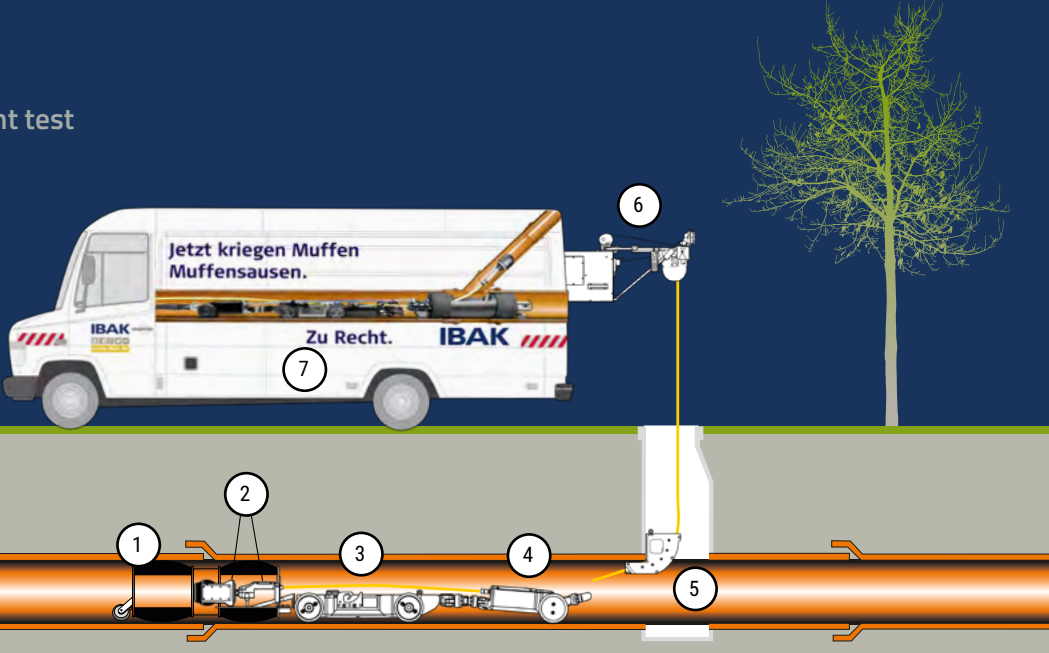
The water escaping from the test space is topped up via the gravity tank and the water meter. In this process, the topped-up quantity of water is clearly recorded in the IDAS software and stated in the test log. The following applies: If the escaped quantity of water does not exceed a defined threshold value within the specified test time, the section is considered leak-tight in accordance with DIN EN 1610 and DWA-A139.



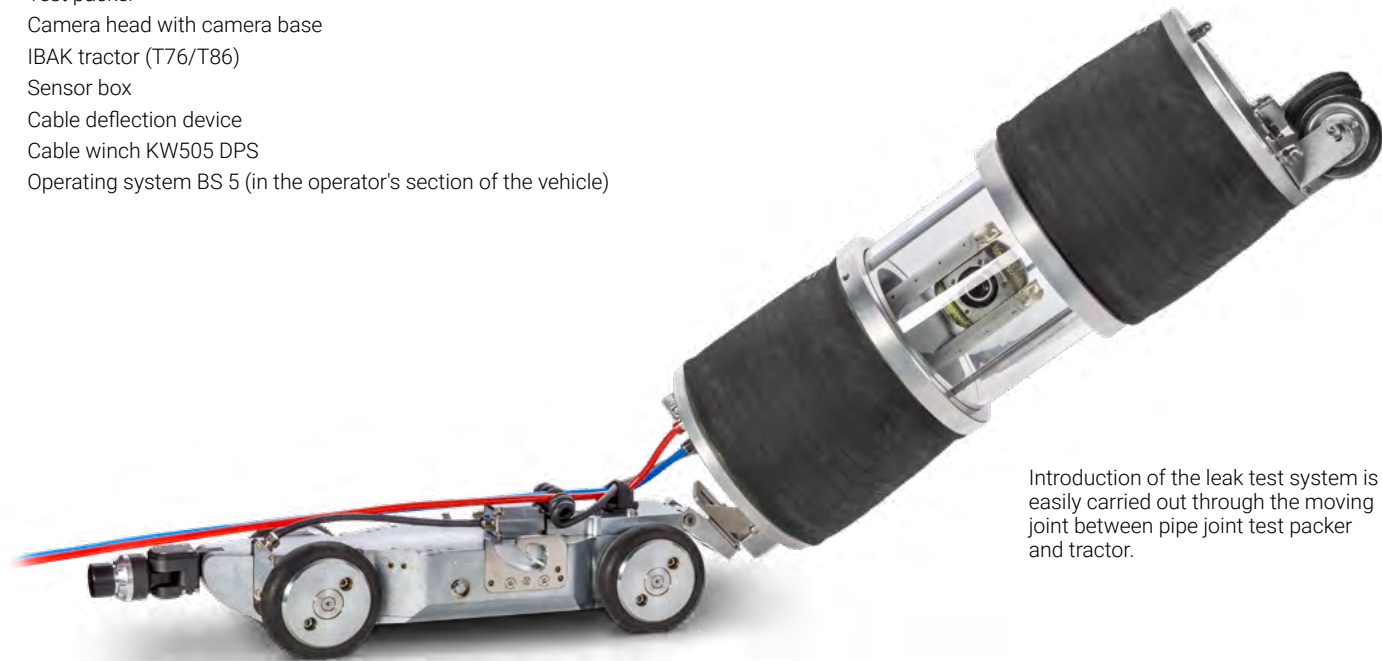
# Pipe joint test

## Schematic presentation: Pipe joint test

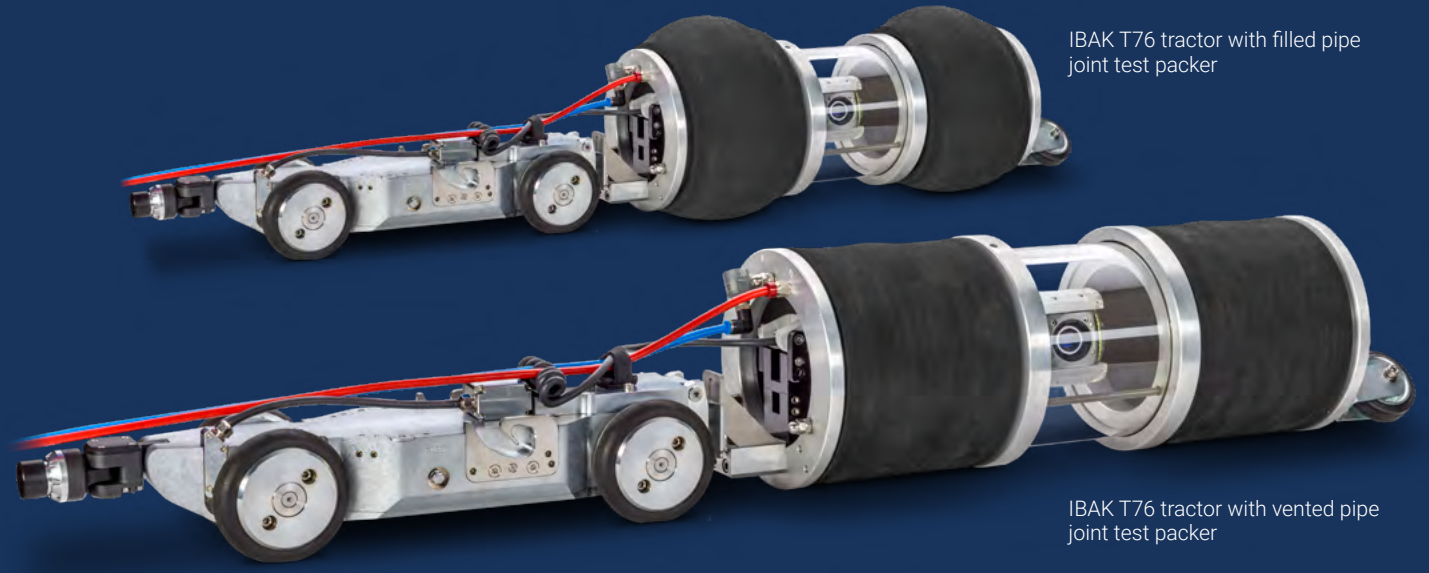
Schematic presentation without fuses / lining



- 1 Test packer
- 2 Camera head with camera base
- 3 IBAK tractor (T76/T86)
- 4 Sensor box
- 5 Cable deflection device
- 6 Cable winch KW505 DPS
- 7 Operating system BS 5 (in the operator's section of the vehicle)



Introduction of the leak test system is easily carried out through the moving joint between pipe joint test packer and tractor.



IBAK T76 tractor with filled pipe joint test packer

IBAK T76 tractor with vented pipe joint test packer

## Pipe joint test

The test packer mounted on the tractor (e.g. T 76) is introduced into the pipe to be examined via steel rope winch and is pushed by the tractor from pipe joint to pipe joint.

Correct positioning can be checked via the camera attached in the middle of the pipe joint test packer.

A compressed air line is integrated in the camera cable (hybrid cable) on the IBAK cable winch (KW 505 DPS). A box (sensor box) is connected in between the camera cable and tractor - this box handles the inflation, pressure holding, and air release from sleeves and test spaces; it is controlled by the user via the PC:

Pressure sensors in the sensor box measure all pressure values and relay them to the connected PC. The pressure curve is graphically displayed on the PC monitor, the measured data is saved and can be viewed and printed out as a test log at any time. An overlay of the measured pressure values in the video image is also provided.

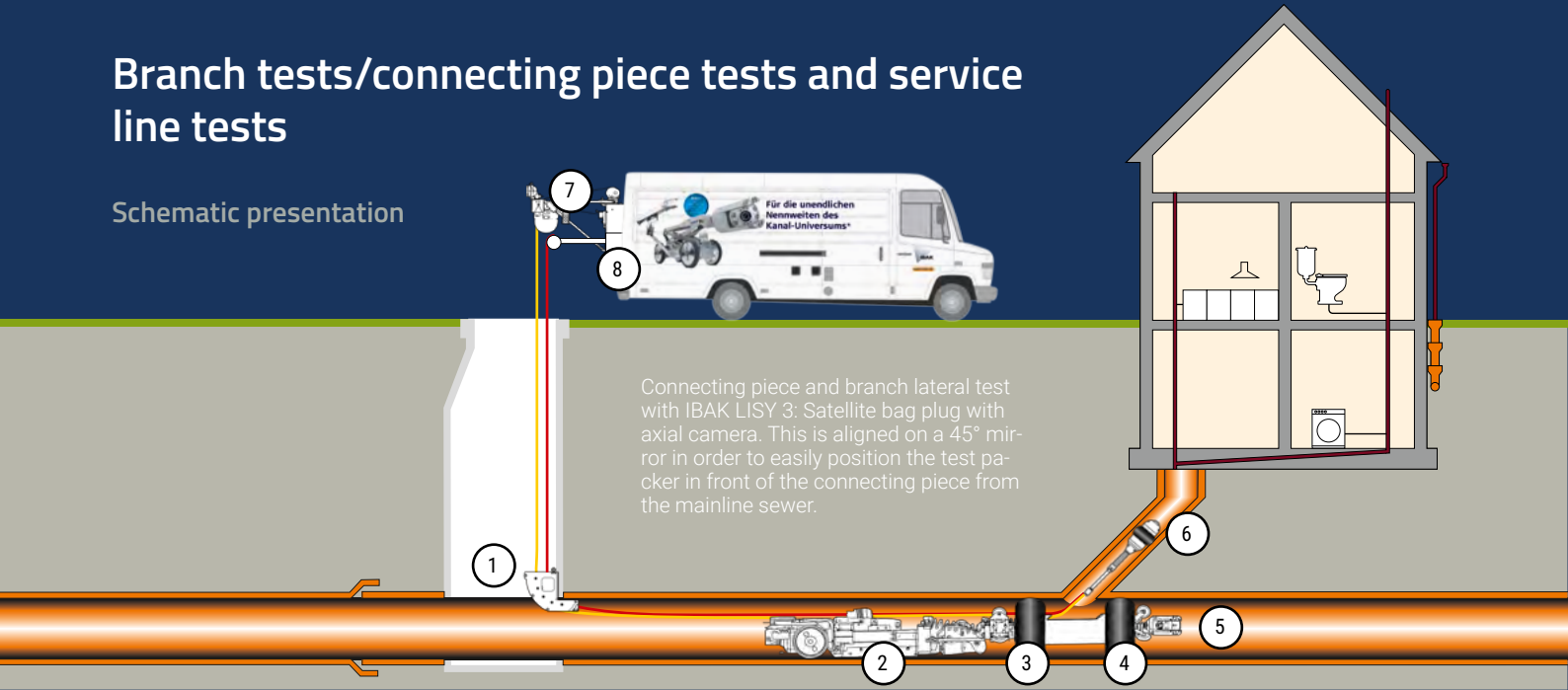
The system for the pipe joint test is designed for one-person operation; like an IBAK TV inspection system it is set up outside the manhole and can be controlled via the control system in the vehicle.

The drainage capability can be maintained during the entire inspection. This means: The sewer remains in operation during the inspection.

- No working in the manhole
- Test packer made of aluminium; thus particularly low self-weight
- Wide sealing sleeves
- Tests of several nominal diameters are possible with just one test packer (considerable advantage in repaired pipes)
- Test under TV observation through Plexiglas
- Quick venting of the sleeves
- Drainage capability is maintained during the leak test
- Only one cable is necessary

# Branch tests/connecting piece tests and service line tests

Schematic presentation



- 1 Cable deflection device
- 2 IBAK tractor (T76/T86), LISY inspection system
- 3 Feed-through sealing sleeve
- 4 Test packer sealing sleeve
- 5 Inspection camera - ORION
- 6 Bag plug with integrated inspection camera
- 7 KW505 DPS cable winch
- 8 LISY synchronous cable winch

## Connecting piece and branch lateral test from the mainline sewer

With the IBAK LISY inspection system, a special test packer with integrated satellite bag plug is pushed into the mainline sewer to the branch. The DPS LISY system makes it possible to push the bag plug a distance of 40 metres into the branch with the aid of the LISY "Magic Push Rod". The entire reach of the system is 130 metres. As soon as the bag plug is positioned at the desired point, the sealing sleeves in the test packer and the bag plug are inflated. The subsequent filling of the sealed test space with compressed air occurs via the hybrid cable of the IBAK cable winch KW 505 - a camera cable with integrated compressed air line. As described in the sections concerning the section test and pipe joint test, the pressure data is measured and further processed in the PC. In addition, the data can also be overlaid in the video screen. The drainage capability also remains intact during the leak test, so that decommissioning of the sewer is not necessary.

- No working in the manhole
- Connections DN 100 / 150 / 200, connection length up to 40 m
- Placement of the test plug under observation from up to three different cameras
- Mainline sewer DN 200 - DN 700
- Patented rotary push rod leadthrough
- Drainage capability is maintained during the leak test
- Only 2 cables are necessary (camera cable and Magic Push Rod)



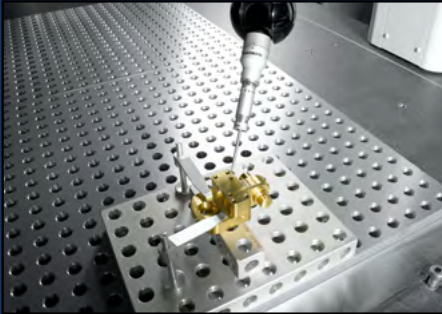


# IBAK – Made in Germany

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 standards, IBAK products have set the standard for investment security and economic efficiency – for more than 70 years.

# IBAK



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