The new modularly designed CRAB-ROBOT opens up new ways for the visual inspection of pipelines with diameters ranging from 50 mm to 600 mm.

The CRAB-ROBOT is modularly designed and can be retrofitted quickly and without any special tools for the specified tests and inspections. This new system embodies and reflects 28 years of practical experience in the fields of designing, developing and manufacturing video-endoscopic systems and testing them in close cooperation with our customers.

What are the benefits of this system?

* multi-functional use and easy handling,
* modularly designed controls,
* due to the modular design, customized and user-specific modifications can be carried out quickly and in a cost-effective way,
* light-intensive illumination system with powerful white-light LEDs (8000 K color temperature),
* Pan/Tilt camera-modules
* exchangeable camera heads with integrated lighting rings,
* manual or remotely-controlled focusing,
* negotiation of the smallest pipe bends of $\min$ by the system without any problems,
* minor obstacles, uneven surfaces and changes in the cross section will be automatically adjusted.

System description

Control unit:

A new compact and portable control-panel and a small cable reel with gold plated slip-rings guarantees a trouble-free signal assignment to the rear connection box. The new control-panel has a built-in control-unit and comes as a standard with installed 10" LCD monitor and optional digital DVR with 160 GB hard disk for the video recording.

Drive unit:

The CRAB-ROBOT consists largely of a drive unit and different video heads, the latter being either permanently fixed in the drive module or easily exchangeable by a plug-in coupling system. Each module is equipped with 6 spring-loaded drive units. Powerful miniature motors with combined planetary transmissions, 32 radial ball bearings and 12 wheels with a specific rubber coating will ensure maximum traction and thus the safe passage inside the pipelines, even if they have rough or smooth surfaces. The continuously variable speed can be controlled with the help of an electronic control unit right down to the absolute standstill. The six drive arms which are individually spring-loaded will ensure that the device is precisely located in the center of the pipe and that uneven surfaces as well as minor changes in the cross section can be automatically negotiated.

Depending on the actual application, the CRAB-ROBOT can also be equipped with different video heads for direct viewing or with Pan&Tilt camera modules. A high-resolution 1/3" CCD miniature color sensor (optionally with fixed or remote focus) will ensure the transmission of sharp video images in superior color fidelity.

Despite its small size, the CRAB-ROBOT is of a robust design and does not require any maintenance or operational skills. Variants and customized modifications can be implemented speedily and supplied at favorable prices on request.
The CRAB-ROBOT is suitable for pipelines with diameters ranging from about 50 mm to 600 mm and a length of up to approx. 100 m. The length of the cables depends on the diameter or the size of the robot, on the internal surfaces of the pipelines and on the number of pipe bends to be passed. Pipe bends of 1.5 x D, changes in the pipe’s cross section, slight deformations or sagging weld seams will be negotiated without any problems. Even pipelines branching off on the sides can be passed safely, without the spring-loaded drive arms getting off course or blocked.

A direct viewing video head with wide angle lenses and remote focus is recommended for the inspection of corroded or contaminated areas and of faults in the material. Depending on the type and size of the CRAB-ROBOT, different video heads can be used (see Table). Particularly cost-effective solutions are offered for customized applications. Pipelines with heavily oiled or greasy surfaces will have to be cleaned beforehand in any case, in order to ensure sufficient traction for the CRAB-ROBOT and its safety.
System-Chart

Cable-reel and control-unit

This new compact and portable cable reel is the latest development. A special slip ring with gold plated contacts guarantees a trouble-free signal assignment to the rear connection box.

The new control-unit comes as a standard with high resolution 10" Monitor, joysticks for drive and pan&tilt control. The new CUX-10 (for X-series) with additional touch-panel for focus and zoom functions.

All CRAB-ROBOT systems of the XS-Series are equipped, as a standard, with color camera modules and direct view optical systems. The S- M- and X-series can be further upgraded with different changeable camera systems, depending on the application.

The length of the cable only refers to the standard applications with 3-4 pipe bends. The distances may be shorter in piping systems with a higher number of pipe bends, while the distance may increase to twice the stated length, if there are no pipe bends at all. Please get in touch with the manufacturer for further details.
Pant/Tilt Camera-module for Crab-Robot S + M - Series (3rd Generation)

This new changeable Pan + Tilt cameramodule is the latest development for the small S- and M-Series. This camera is extremely shock resistant and easy to use.

Technical specifications ccd-cameras
- Image-sensor: 1/4" SONY Super HAD CCD
- TV lines: 450 TVL
- Pixels: 438,000
- Minimum illumination: 2,0 Lux/F2.2
- AES: 1/50s - 1/100,000s
- Lens: 2.7mm / F2.2
- Viewing angle: 80°
- Operating temperature: -10°C - +50°C

Technical specifications Pan+Tilt-module
- Dome diameter: 38mm
- Supply part diameter: 25mm
- Rotation: 360° endless
- Swivel: 200°
- Focus: Fixed focus
- Illumination: 18 high intensity LED’s

Technical specifications Pan+Tilt-module
- Dome diameter: 40mm
- Supply part diameter: 25mm
- Rotation: 360° endless
- Swivel: 200°
- Focus: Remote-focus
- Illumination: 24 high intensity LED’s

Vertical pipe crawler CR-100/.....

Changeable Camera modules
Two new camera-nodules for S- and M-series are available.

All camera modules are equipped with a new high resolution CCD-camera with 450 lines, automatic white balance and electronic light control.
### Technical specifications camera-module

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Diameter</td>
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<tr>
<td>Supply part diameter</td>
<td>40mm</td>
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<tr>
<td>Rotation</td>
<td>360° endless</td>
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<tr>
<td>Swivel</td>
<td>2x100°</td>
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<tr>
<td>Focus</td>
<td>Remote-Focus</td>
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<tr>
<td>Illumination</td>
<td>10x4 (40)high intensity LED</td>
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<tr>
<td>Lens</td>
<td>4.2-42 (10xZoom)</td>
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### Technical specifications:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Diam. camera-head</td>
<td>80mm</td>
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<tr>
<td>Image-sensor</td>
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<tr>
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<td>Pixels</td>
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<td>Focus</td>
<td>Remote-Focus</td>
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<tr>
<td>Lens</td>
<td>4.2-42 (10xZoom)</td>
</tr>
<tr>
<td>Lighting system</td>
<td>High intensity LED</td>
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</tbody>
</table>

### New Pan and Tilt Camera-module for Crab-Robot X-Series with Zoom

All camera modules are equipped with a new high resolution CCD-camera with 480 lines, automatic white balance and electronic light control.
Robot types for tube bends 1,5 x D

10.01.2013

The Crab-Robot-Systrm is a modular, long range internal pipe inspection system capable of operation within a variety of pipe sizes from a minimum internal diameter of 50mm/1". All Crab-Robot units are adjustable for a range of pipe diameters up to 500mm/20".
Optional video-equipment

Videoprinter

SONY-Notebook with integr.MEMORY-Stick and IEEE1394 FireWire

Digital Mini-DV-Recorder with MEMORY-Stick, analog Video-IN + OUT IEEE1394 FireWire and USB-Socket

Video-glasses

All control-units are optional with Digital (IEEE 1394 Firewire) A/D Converter available.

Digital Recorder with SD-Card and Monitor

SONY-Notebook with integr.MEMORY-Stick and IEEE1394 FireWire