




MADE  
IN  
GERMANY



THE WORLD'S SLIMMEST, MOST VERSATILE HEAT EXCHANGER/  
STEAM GENERATOR VIDEO INSPECTION SYSTEM



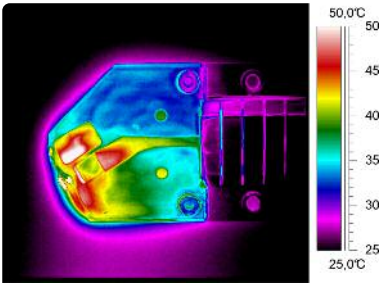
DE 2.4 / DE 4.0



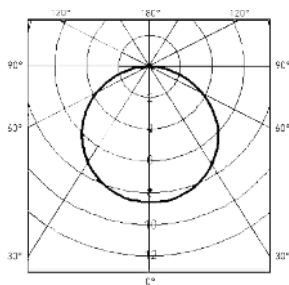
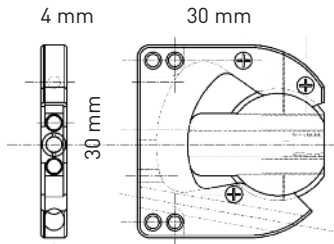
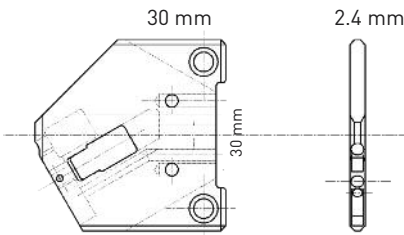
Employing only the latest LED illumination technology, breaking glass fibres are obsolete history for INVIZ® customers. 25 lumen + light turbo mode is enabling to illuminate even 4" / 100mm ID round pipes. Two optimized (light sensitive) optics (100° FOV and 60° FOV) will make your probe to the best possible inspection tool for your facility. Benefit from colorful and high contrast, forget about annoying noise in the image.

At only 2.4 mm thick, the INVIZ® DE 2.4 inspection camera can maneuver through the narrow tube lanes created by the space saving arrangement of the tubes in nuclear steam generators (incl. Siemens KWU style) and conventional heat exchangers. The world's slimmest INVIZ® DE 2.4 camera allows to make a wide range of special narrow (gap) inspections, in spaces which have never been reached by high resolution optics before.

Our engineering team has made a great effort to offer camera solutions which may be operated with delivery tools or operated by hand. Alternatively the even higher resolved INVIZ® DE 4.0 style can be adjusted in image sharpness and direction of view (+/-30°), while allowing custom made probes of up to 15 Meter – not forgetting the working channel preparation for foreign part retrieval tools.



Innovative heat management limiting emission from LED's



Optimized illumination for 60° and 100° FOV

# inVIZ **DE 2.4** | **DE 4.0**

## Control unit / Processor

<b>Power requirements</b>	96 - 256VAC, 50/60Hz
<b>Dimensions in mm (inch)</b>	Standard: [W] 260 x [L] 205 x [H] 45
<b>Operation</b>	Light adjustment, White balance setting (color adjustment)
<b>Output</b>	Composite VBS and S-VHS (Y/C) out, NTSC or PAL (depending on camera)
<b>Option</b>	Outlet for digital INVIZ LCD image and movie recorder
<b>Other</b>	19" housing available   CCU can only serve DE 2.4 or DE 4.0

## Camera head

<b>Video</b>	PAL 360 TV lines, 290.000 Pixel NTSC 330 TV lines, 250.000 Pixel	PAL 470 TV lines, 440.000 Pixel NTSC 460 TV lines, 380.000 Pixel
<b>Optical system</b>	100° FOV standard optic, 3 mm to 200 mm fix focus field of depth Option: 60° 'tele' lens system, fix-mounted, non interchangeable.	Focus adjustable 60° FOV, range 3mm to infinity, typical depth of field 8 mm to 100 mm. Direction of view adjustable +/- 30°.
<b>Magnification example</b>	Usage with 14" CRT monitor 100° FOV: 10x / 20 mm distance.	Usage with 14" CRT monitor 60° FOV: 18x / 20 mm distance.
<b>Illumination</b>	Two high power white LED's, individually dimnable, protected electric circuit, illumination distribution: view chart. Option: optical fibres (Fibre + LED) available to boost illumination range.	As INVIZ® DE 2.4, no fibre illumination option available.
<b>Dimensions</b>	Thickness 2.4 mm ( <sup>-0.03</sup> mm), other dimensions see chart, custom designed (down-) sizing is available (custom shape).	Thickness 4.0 mm ( <sup>+/-0.05</sup> mm), other dimensions view chart, custom designed (down-) sizing is available (custom shape).
<b>Water tightness</b>	1 bar / 15 psi	0.5 bar / 7.5 psi
<b>Other</b>	-	2.1 mm hole for attachment of non-included retrieval tools prepared.

## Video probe

<b>Working length</b>	Standard 2 m, extension option available. Max. 6.5 m probe.
<b>Umbilical cord</b>	2.5 m PU coated, protected cable, extension option available, max. up to 10 m (INVIZ® DE 2.4) or 15 m (INVIZ® DE 4.0) total combination length.
<b>Probe construction</b>	Open frame 2.4 mm insertion belt, stainless steel, high flexible design for (not included) delivery tool operation.   Option internal glass fibre push rods for manual operation available.

## Operating / storage environment

<b>Camera operation range</b>	-25°C to 65°C (-13°F to 150°F) LED operation   -25°C to 80°C (-13°F to 175°F) Non-LED operation
<b>CCU operation range</b>	-20°C to 45° C (-4°F to 115°F)
<b>Gamma / neutron dose rating</b>	Not specified due to wide, random lifetime deviations; within average of semiconductor specs.

All specifications are subject to change without notice due to technical progress.



# Cameras for steamgenerator inspection



## XPANDING YOUR VU®



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