

THE **#1** SOLUTION FOR YOUR
PWR STEAM GENERATOR INSPECTION

VUFLEX[®]

FLEXIBLE AND FOCUSED

STEAM GENERATOR INNER TUBE BUNDLE

THE VUFLEX VIDEOSCOPE - A COMPLETE SOLUTION.

Complex tasks require bespoke solutions. The VUFLEX from viZaar is just such a solution that has been developed specifically to perform steam generator inner tube bundle inspections.

Tried, tested and proven over the last two decades, the VUFLEX videoscope is now globally recognised as the leading product for this application and is available as a stock item or a customised version according to your needs.



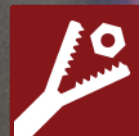
TWIN HIGH
INTENSITY LED



CUSTOMISABLE



THERMAL
MANAGEMENT



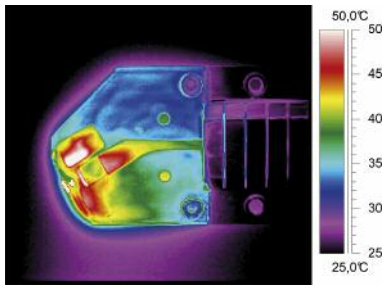
FOSAR
COMPATIBLE

INSPECTION AND FOREIGN OBJECT RETRIEVAL



All of the various types of steam generators are inherently complex structures with intensive inspection requirements that can be difficult to satisfy with conventional videoscopes without the risk of getting wedged within the structure.

The VUFLEX videoscope has been designed in consultation with industry specialists to allow for full, no risk inspection of these structures. With its unique structure allowing a superb combination of vertical rigidity and horizontal flexibility, the VUFLEX is further enhanced by class leading optics and imaging sensors as well as a double redundancy high intensity twin LED illumination system.



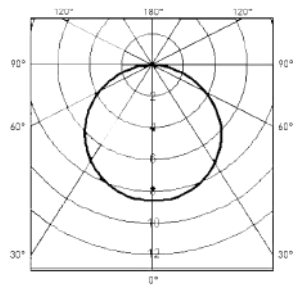
Innovative heat management limiting emission from LEDs

The VUFLEX videoscope is only 2.40 mm (2.4 mm to 6.5 mm thicknesses are available) thick and can manoeuvre with ease through the narrow tube lanes and the high intensity LED illumination system allows for illumination of 4" (100 mm) diameter pipework.

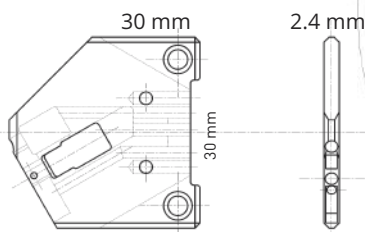
Specialist versions of the VUFLEX are available which feature an integrated working channel allowing for simple and accurate deployment of all FOSAR tools should the need arise.

The unique shape and operation of the product also allows for the possibility of power feeding via a manipulator or robotic handling device.

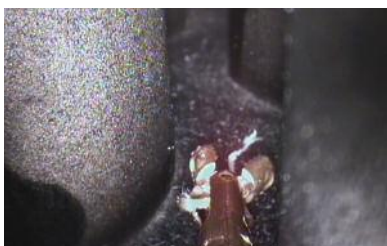
A wide variety of heads, accessories and specifications are available as well as a full customisation service ensuring that no matter how complex or difficult the inspection, you can easily, quickly and accurately complete your task.



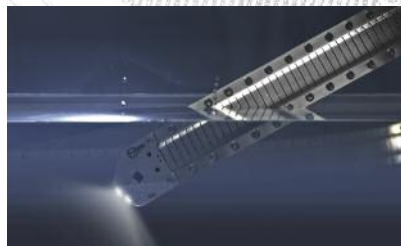
Optimized illumination for 100° and 120° FOV



Standard 2.4 mm head design



Accessories for retrieval



Tested for all environments



A new benchmark in image quality, clarity and depth of field



SEE BETWEEN THE LINES

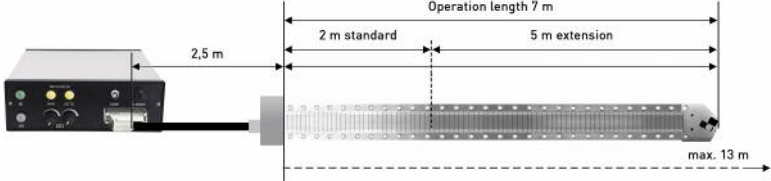




The VUFLEX is a proven specialist videoscope for in service tube bundle inspection.

Deploy the videoscope and you can quickly and efficiently check for flow induced vibration damage, pressure fatigue, thermal fatigue and footplate damage, foreign object contamination, corrosion, support bracket failures and more.

Given the increasing demand on our modern day power infrastructure and the driving need to reduce downtime, the VUFLEX is a fundamental tool for all power generation inspection departments.



VUFLEX STANDARD PRODUCTS

TECHNICAL SPECIFICATION	VUFLEX S	VUFLEX C
Probe length	2 m/6.6 ft to 7 m/23 ft	2 m/6.6 ft to 7 m/23 ft
		
Head width	2.4 mm/0.09 in to 6.5 mm/0.26 in	2.4 mm/0.09 in
Construction	Stainless steel	Stainless steel
Field of view (FOV)	120°	100°
Depth of field (DOF)	6 mm/0.24 in to ∞	11 mm/0.43 in to ∞
Direction of view (DOV)	Fixed 0° (straight) or up to -30°	Fixed 0° (straight) or up to -30°
Video Out	Analog, Composite, S-Video (420,000px)	Analog, Composite, (160,000px)
Water tightness	Splashproof	Splashproof
Illumination	Double Redundancy Twin High Power LED with variable control	Twin High Power LED with variable control
Brightness control	1/50 second to 6 seconds (long exp)	7 step control
Retrieval channel	1.8 mm/0.07 in working channel	1.8 mm/0.07 in working channel
CCU dimensions	265 mm/10.4 in (l), 235 mm/9.3 in (w), 135 mm/5.3 in (h)	250 mm/9.8 in (l), 255 mm/10 in (w), 90 mm/3.5 in (h)
Power requirements	Global standard 100 to 240VAC at 50/60Hz	Global standard 100 to 240VAC at 50/60Hz
Probe operating temperature	-25°C to +70°C -13°F to +158°F	-0°C to +55°C +32°F to +131°F
Probe bending radius	50 mm/1.97 in (storage: 800 mm)	50 mm/1.97 in (storage: 800 mm)
Image brightness	variable	fixed
Control unit		
Image size on screen		

FIVE REASONS TO CHOOSE VUFLEX

1

BUILT IN REDUNDANCY

Inspections of steam generators are often subject to severe time pressure. To ensure that once you have begun the inspection task that it can be completed regardless of any problems or complexities faced, the VUFLEX features a double redundancy illumination system. Using two independently powered and controlled high intensity LED systems ensures that in the unexpected event of a LED failure, the remaining LED has been designed to be powerful enough for you to finish your inspection task.



2

LONG EXPOSURE IMAGING & BRIGHTNESS CONTROL

If you need to visualise a defect or artefact inside a steam generator, it is not always possible to navigate directly to this area of interest. The VUFLEX has been designed with this in mind and offers an ability to increase the exposure time of the imaging sensor (can be adjusted from 1/50 second to **6 seconds**). This has been tried and tested and has been proven to allow for visualisation of defects up to 1 meter away in steam generator inner tubing environments.



3

FLEXIBLE SERVICE AND SUPPORT

viZaar fully recognise the need to offer comprehensive service and support alongside our high performance products. Full product training is available at our head office in Albstadt, and all of our servicing and repairs are performed entirely in-house by a team of dedicated and specialised engineers. In the unfortunate event that your VUFLEX videoscope is contaminated, viZaar are also KTA1401 approved and can provide repair services on-site in a contaminated area.



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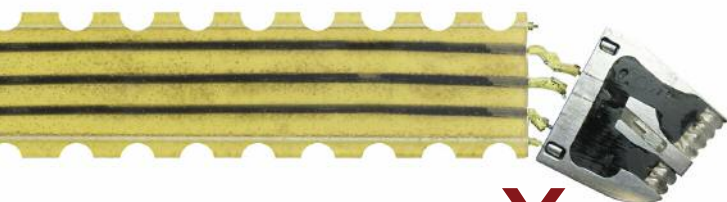
AVAILABLE AS A STOCK ITEM

In order to meet customer demand and timeframes, two standard models of the VUFLEX videoscope were developed and are available to order from stock, the VUFLEX-S and the VUFLEX-C. The VUFLEX-S is the high performance version and is intended specifically for condition inspection applications where visual performance is paramount. The VUFLEX-C is intended specifically to support FOSAR operations and has an optimised imaging system for this application. If neither of these products meet your exacting needs, a full customisation service is available (see opposite).

5

SINGLEPIECE CONSTRUCTION - 'NO RISK' INSPECTIONS

The VUFLEX videoscope is manufactured as a single piece item in stainless steel. This is expressly to completely negate the risk of head detachment or of any material debris being left inside the inspection area. The most important design aspect of the VUFLEX was that it must be robust and leave nothing behind.



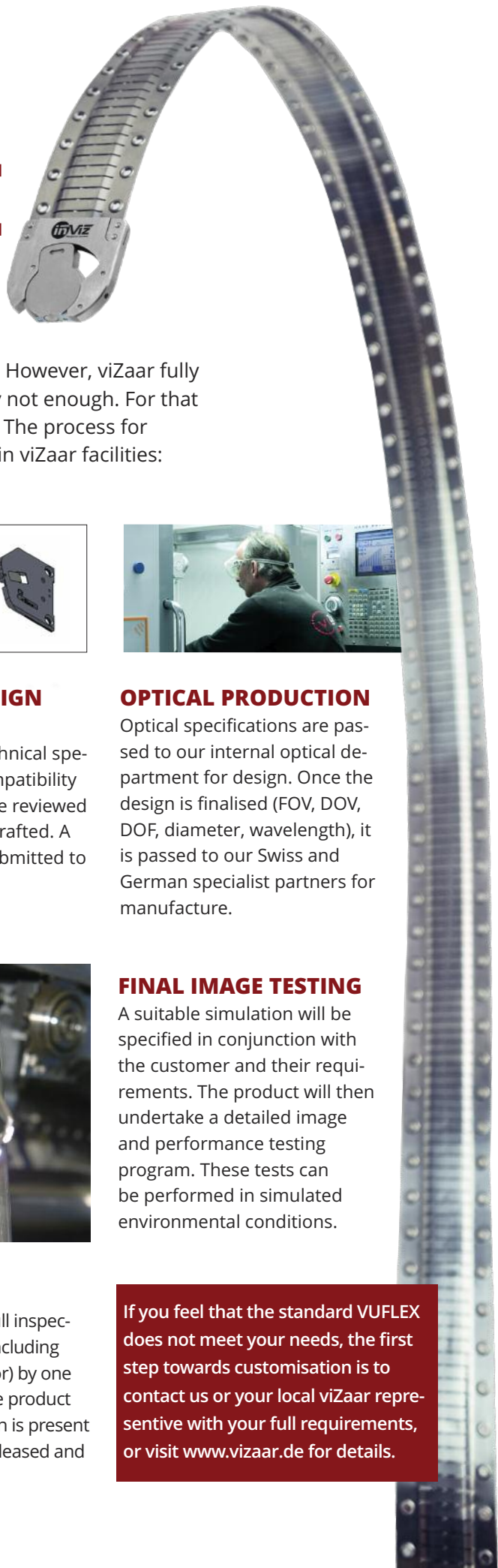
COMPETITOR PRODUCT WITH PARTIAL HEAD DETACHMENT DUE TO JOIN BETWEEN HEAD AND SHAFT



VUFLEX SINGLE PIECE CONSTRUCTION WITH NO JOIN BETWEEN HEAD AND SHAFT - NO RISK OF DETACHMENT



THE VUFLEX IS A FLEXIBLE SOLUTION...

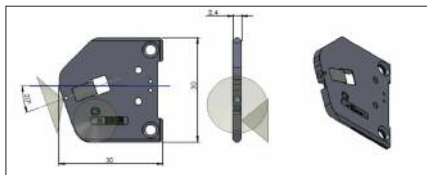


The standard VUFLEX videoscope is an incredibly versatile tool. However, viZaar fully recognise that for some applications, standard tools are simply not enough. For that reason, a full customisation service is available for the VUFLEX. The process for customisation is illustrated below and takes place entirely within viZaar facilities:



WORKING IN A PARTNERSHIP

After a request is made for a customised product, an agreement is made between viZaar Industrial Imaging AG and the customer. Desired technical specifications, timeframes and cost will all be agreed prior to the commencing of technical tasks.



FEASIBILITY AND DESIGN STUDY

The desired capabilities, technical specifications and required compatibility (i.e. remote manipulator) are reviewed and a technical solution is drafted. A detailed proposal is then submitted to the customer for approval.

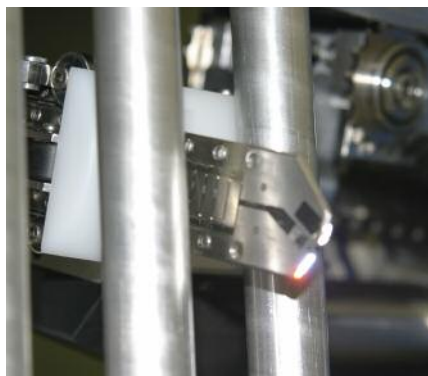


OPTICAL PRODUCTION

Optical specifications are passed to our internal optical department for design. Once the design is finalised (FOV, DOV, DOF, diameter, wavelength), it is passed to our Swiss and German specialist partners for manufacture.

MECHANICAL MACHINING

Once the prototype designs are approved, full AUTOCAD designs are produced. Our in-house machining specialists then use our submicron CNC machines to produce the required mechanical parts as per the customers' requirements.



FINAL IMAGE TESTING

A suitable simulation will be specified in conjunction with the customer and their requirements. The product will then undertake a detailed image and performance testing program. These tests can be performed in simulated environmental conditions.

ELECTRONIC PRODUCTION

The electronic requirements will be reviewed and specified by the design department as per the customers' requirements. The electronic department will then begin manufacture to the appropriate specifications and performance required.

PRODUCT RELEASE

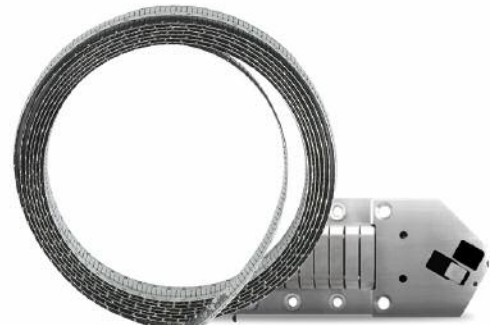
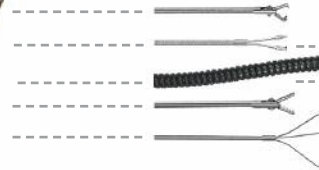
The product will be given a full inspection and performance test (including key ancillaries i.e. manipulator) by one of our senior engineers. If the product passes and all documentation is present and correct, the product is released and a full handover takes place.

If you feel that the standard VUFLEX does not meet your needs, the first step towards customisation is to contact us or your local viZaar representative with your full requirements, or visit www.vizaar.de for details.

INNOVATED IN FRANCE -
MANUFACTURED IN GERMANY



VUFLEX®

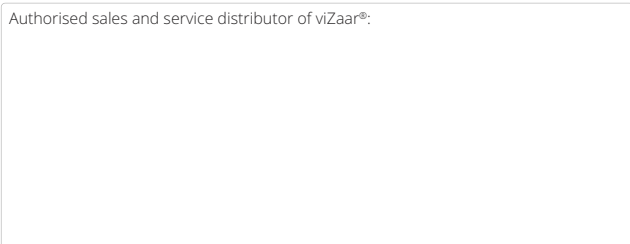


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