science, technology & innovation
Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

UViRCO TECHNOLOGIES

CSIR
Touching lives through innovation





GASCAM OPTICAL IMAGING GAS DETECTION SYSTEM

In partnership with the CSIR, UViRCO has developed a range of inspection camera systems that permit electrical field workers to inspect power pylons, substations and other electrical transmission and distribution infrastructure for faults.

Through this partnership, an industrial gas detection camera system, GASCAM, was developed to detect and locate Sulphur Hexafluoride (SF6) gas leaks on electrical switchgear and volatile organic compound (VOC) gas leaks in electrical power stations and petrochemical facilities. SF6 and VOC emissions can be detected using thermal differentiation imaging or IR absorption imaging techniques to help prevent environmental damage.



GASCAM (Gas detection camera)

The camera has a cooled infrared detector and cold band pass filter to image specific gas absorption onto the detector and illuminates small leaks to increase the signal-to-noise ratio. By changing the GASCAM detector, filters and algorithms, one can shift the product to sell into parallel markets. A longwave infrared detector is used to detect SF6 gas leaks in the electrical power industry, whereas a mid-wave infrared detector will be used to detect VOC gas leaks, such as methane, in the petrochemical industry.



SF6 gas detection

GASCAM offers numerous benefits to both the electrical and petrochemical industry markets. The camera provides early detection of gas leaks by visualising gas as it escapes from either the high-voltage electrical infrastructure or petrochemical infrastructure, allowing operators to identify and address leaks promptly before they escalate into more significant issues.



SF6 gas detection (grey-scale palette)

Detecting unwanted gas leaks early enables proactive maintenance and repair of equipment, reducing the risk of equipment failure and associated downtime. Regular inspection of infrastructures with GASCAM can help to ensure the integrity of critical infrastructure and extend its operational lifespan. GASCAM streamlines leak detection processes by providing real-time visualisation of unwanted gas emissions, allowing for swift identification and localisation of leaks. GASCAM plays a vital role in ensuring that your infrastructure is safe, reliable and sustainable and, most importantly, that it is compliant with the expected regulatory requirements.

Pre-release Brochure Version: 2024/1
Specifications subject to change without notice

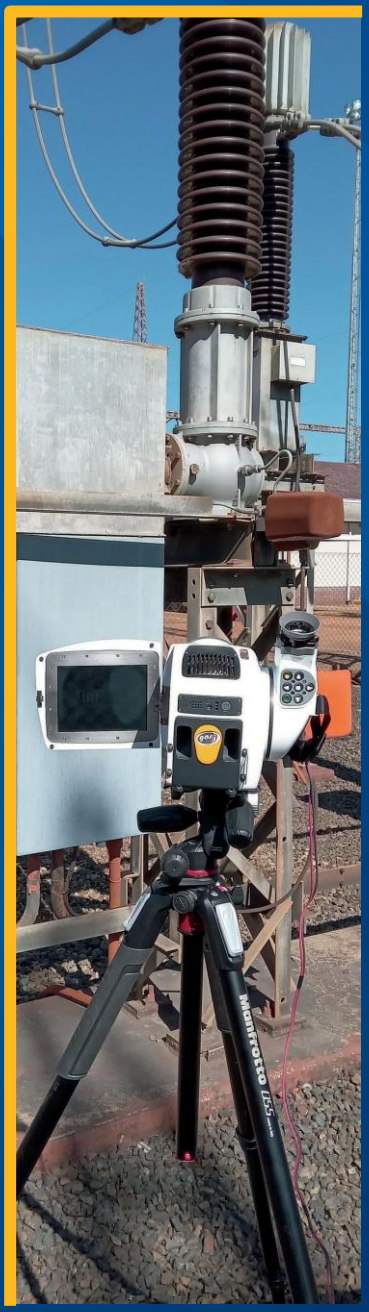
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SF6 SPECIFICATION SHEET

IMAGING AND OPTICAL	
LCD	Colour, 5.7", 640 X 480 pixel rotatable
Adjustable Viewfinder	Yes, 640 X 480 pixels
Camera f-number	1.4
Colour palettes	Black Hot, White Hot, Fusion, Rainbow, Glowbow, Ironbow01, Ironbow02, Sepia, Color01, Color02, Ice and Fire, Rain, Red Hot, Green Hot
Detector Pitch	30 um
Detector Type	Focal Plane Array (FPA), cooled QWIP
IR sensor dynamic range	16 bits
Field of View	15° X 12° (35mm), with an option to insert another lens
Focus	Manual
Image Modes	IR image, Visual image, IR overlay over IR image, merging of IR and visual images
IR Resolution	320 X 240 (76,800 pixels)
Sensor Cooling	Rotary Stirling Cooler
Dynamic range of the sensor	16 bits
Spectral Range	10.3 um to 10.7 um
Visual Image	1280 X 960 pixels
IR Zoom	Discrete (stepped) digital zoom
MEASUREMENT AND ANALYSIS	
Playback and Recording	SD Card
Thermal Sensitivity (temporal NETD)	25 mK
Thermal Sensitivity (spatial NETD)	10 mK
COMMUNICATION AND DATA STORAGE	
Communication Interfaces	USB2.0, Bluetooth, Wi-Fi, HDMI, Ethernet
Storage Media	Removable SD Card
Video Out	HDMI
GENERAL	
Remote control	Provision made for this in hardware, currently not implemented.
Compass	Yes
GPS	Location data added to the On-Screen Display (OSD)
Laser Pointer	Yes
Flashlight	Yes
Package Includes	Infra-red camera with lens, battery (2 pcs), battery charger, 220Vac to 12Vdc power adapter, harness, lens cap, SD card, HDMI-HDMI cable, USB cable, hard transport case
Packaging Size	515 mm X 415 mm X 260 mm
Camera Size	145 mm X 225 mm X 180mm (with LCD closed) 145 mm X 225 mm X 340 mm (with LCD open)
Weight	3.1 kg (without batteries) 3.7 kg (with 2 batteries)
POWER	
Battery Type	Rechargeable Li-ion battery; 7.2V, charged in camera or separate external charger
Start-up Time	7 min
ENVIRONMENTAL AND CERTIFICATIONS	
Certifications	EMC: testing to follow
Encapsulation	IP54
Operating Temperature Range	-20°C to +40°C
Operating Relative Humidity Range	Non-condensing up to 80% RH.
Shock and Vibration	Shock: peak acceleration of 30g Vibration: 2g RMS between 10 – 2000 Hz.
Storage Temperature Range	-50°C to +71°C (IR camera)



GASCAM on a tripod



SF6 field test

VOC SPECIFICATION SHEET

	VOC
Spectral range	3.2 – 3.4 um (LWIR)
Noise Equivalent Temperature Difference (NETD)	<10mK over the whole operating temperature of the camera.>
Image processing	IR background image as well as IR overlay where gas is present, superimposed on IR background image.
IR sensor dynamic range	16 bits
Visible image resolution	HD
Remote control	Provision made for this in hardware, currently not implemented.
Field of View (FOV)	14°, with an option to insert another lens.
IR zoom	Stepped
Storage temperature range	-50°C to +71°C
Operating relative humidity range	Non-condensing up to 80% RH.
Laser pointer	Yes
Flashlight	Yes
LCD	Yes
Viewfinder	Yes

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