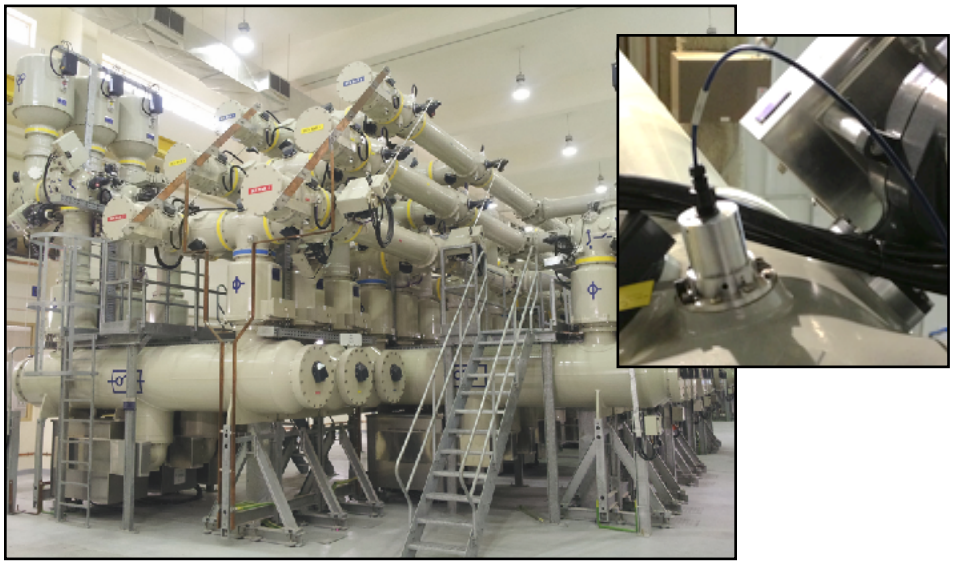
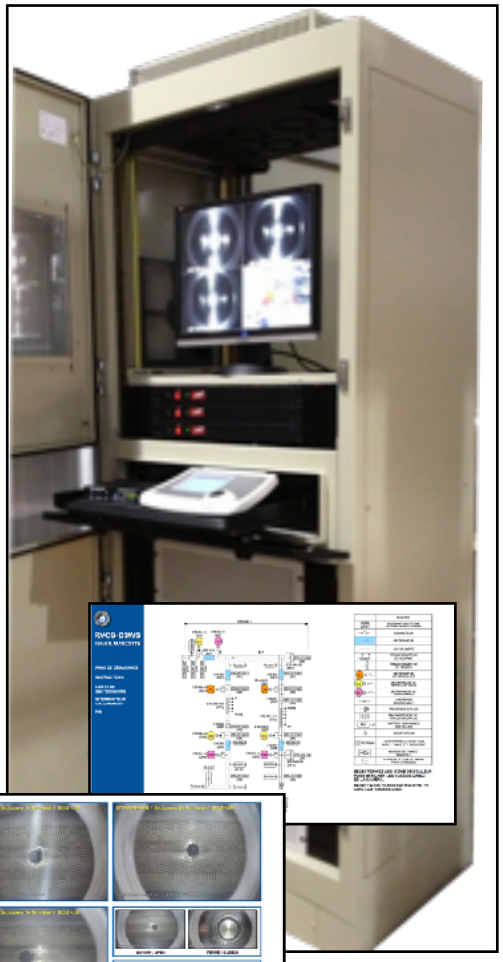
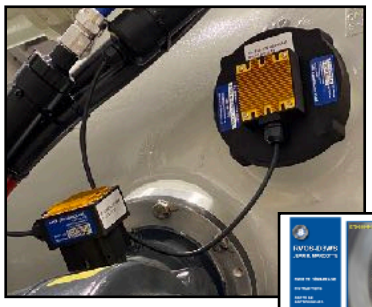
RVOS

REMOTE VIEWPORT OBSERVATION SYSTEM FOR GIS





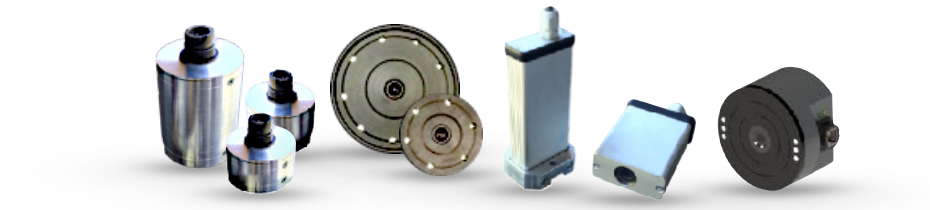


The Remote Viewport Observation System (RVOS) is a visual inspection and monitoring solution of GIS switchgear through viewports.

An operator friendly and efficient solution, RVOS eliminates the time consuming task of physically inspecting every switch position through small viewports. The need for awkward or hazardous operator climbing and positioning to manually look into a high voltage viewport is eliminated, resulting in a safer and more streamlined work flow. An operator can quickly and accurately inspect or monitor activity through the use of the strategically placed camera solution.

The RVOS is a network of viewport mounted cameras streaming live video to a matrix viewing solution. This allows for each switch to be viewed on demand from a single, centralized location. Portable "plug-in" viewing platform solutions are also available.

The RVOS utilizes a variety of camera designs which can be used with different sized viewports and spatially limited environments. Integrated illumination eliminates the need for secondary viewports and peripheral lighting solutions. Environmentally protected models are available for outdoor installations.

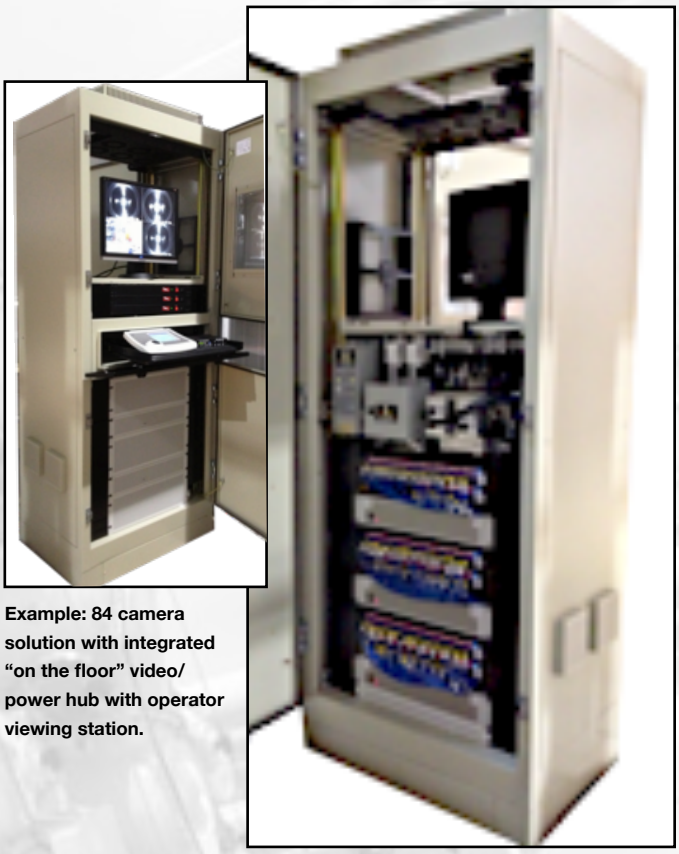


Examples of RVOS camera designs.

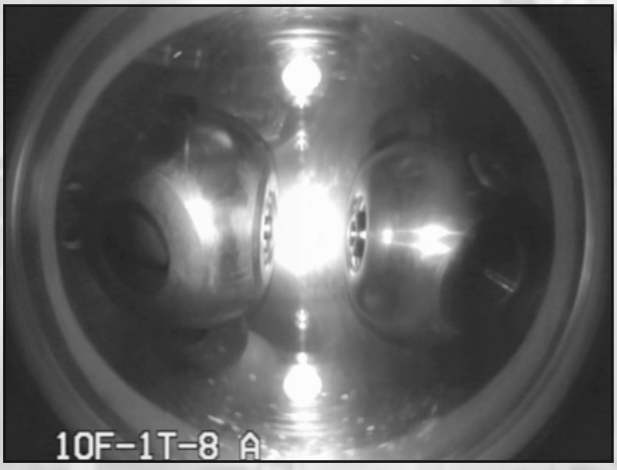
RVOS is available for use with various manufacturer's GIS solutions, including Hitachi/ABB, GE/Alstom, Mitsubishi Electric, and Siemens.

KEY FEATURES

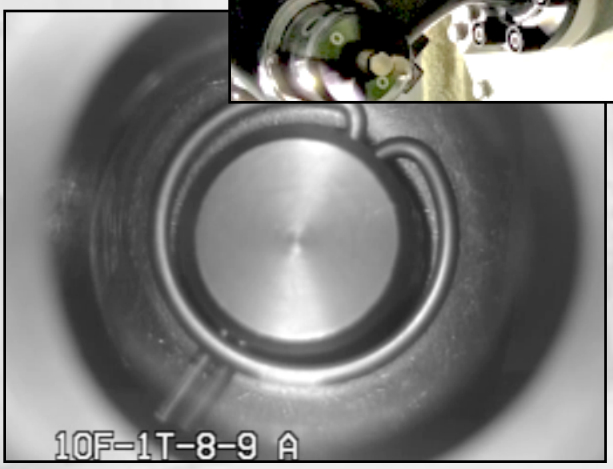
- IEC 61000-4-4 / IEC 61000-4-8 tested & certified
- Custom camera designs to accommodate a variety of viewport sizes and fields of view
- Camera designs for indoor and outdoor installations
- Integrated camera and illumination for single viewport chambers
- High quality image of switch contacts
- Single cable camera connectivity
- Camera to receiver distances up to 100m
- Centralized camera power distribution
- Real time imaging
- Fixed installation, workstation or portable options
- Simplified portable options (P-series)
- Capable of handling hundreds of cameras
- Easy operator interfaces
- Proven, in-field performance



Example: 84 camera solution with integrated "on the floor" video/ power hub with operator viewing station.



Example: Large chamber 120° ultra wide field of view. Ø 95mm viewport window.



Example: Small chamber close up, Ø19mm viewport window. "Closed" state. Camera mount above.

Due to the custom nature of RVOS designs and applications, specifications are subject to change without notice.

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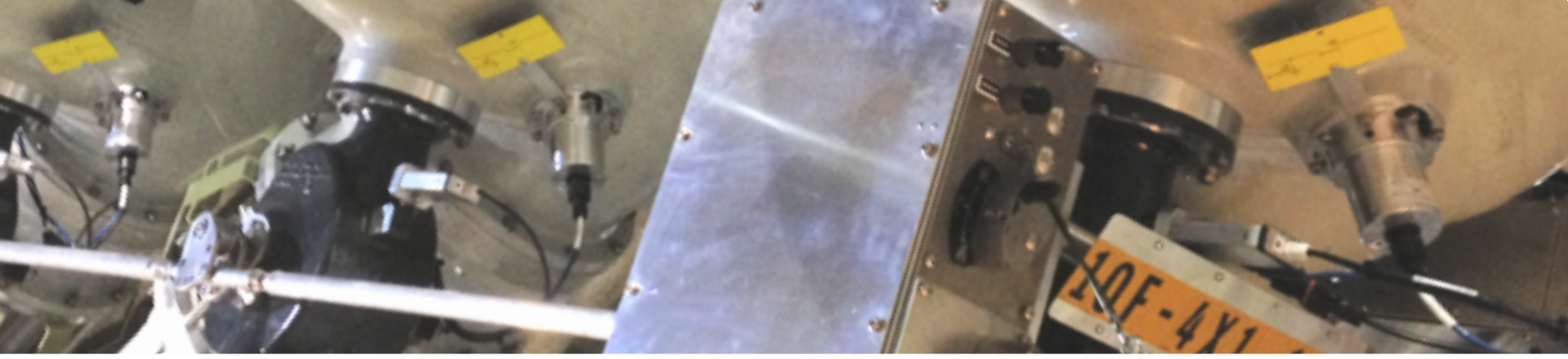

PRIMARY SYSTEM COMPONENTS

RVOS systems are preconfigured to minimize operator complexity, providing a simple and user friendly experience for monitoring each switchgear viewport. RVOS can be easily incorporated into small GIS substations whereby a single workstation or local "on-the-floor" access may be required. For larger centralized sites, multiple monitoring workstations are possible, allowing for greater flexibility for inspectors.

VIEWPORT CAMERA:
Designed and tested for high electrostatic and transient voltage environments, cameras sized to each viewport can be secured directly and easily for a permanent observation solution.

With integrated illumination and a high performance sensor package, the operator's view within the dark switchgear chamber of the switchgear position, allows for accurate positional assessment. Unique camera designs allow for the optimization of the image field of view and minimize second surface reflection from the viewport window.

Due to the varying nature of GIS viewport sizes, Bock Optronics offers a wide selection of camera designs and mounts to accommodate the needs of the environment.

VIDEO/POWER DISTRIBUTION SERVER SYSTEM (A-series / D-series):
Through a power distribution and video receiver station, each camera is centrally powered and the corresponding video received for distribution and viewing at one or more operator workstations.

Capable of powering cameras up to several hundred meters from the distribution station, RVOS can be used for both small and large GIS installations. This centralized power and video collection also eliminates the need for bulky cameras or external breakout boxes, minimizing system complexity and potential cable connection issues.

Video from the cameras is managed through a matrix solution, allowing for access and viewing of a large number of video input feeds and for the simultaneous output of any feed to one or more viewing stations.

Control and Monitoring Workstation:
RVOS can be controlled by an operator directly at a primary console or remotely within the facility by PC. Each video camera feed can be viewed locally via a simple push button interface or remotely through a PC as the site requires.

Portable Solutions (P-Series):
Portable viewing solutions are also available, allowing the operator to connect to a single camera at a time, to provide switch position validation.

For more information or to discuss what is possible for your GIS installation, please contact Bock Optronics.

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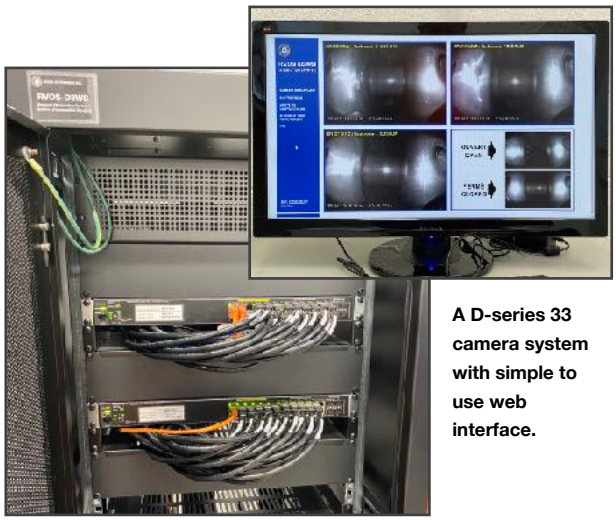
AVAILABLE SYSTEMS

D-SERIES:

D-Series systems are PC based solutions allowing for high volume switch viewing. Cameras can be viewed from a single or multiple viewing stations.

Using IP based communication, the RVOS D-series cameras are connected to an in-cabinet system for power and distribution. Cable lengths up to 100m are possible between the distribution hub and the cameras. Accessible through a PC, high quality camera video is displayed through a simple, easy to use web interface.



A D-series 33 camera system with simple to use web interface.

A-SERIES:

The RVOS A-series systems are specifically designed for on-site access and local viewing only, providing an "offline" solution to eliminate any potential cyber terrorist or other non-approved agent access.

The A-series system provides quick and easy viewing of switchgear from a rack cabinet based workstation. A simple push button interface provides on demand viewing of cameras. Without the use of a PC or other IP hardware, A-series reduce complexity and maintenance considerations.

An A-series 144 camera system with push button user interface.

P-SERIES:

P-series systems are designed to be a more cost effective solution where the operator uses a portable viewing monitor/recorder to connect to and power the specific viewport camera to be viewed. A plug-in point near the switch provides local interaction with a quick, easy to use solution.

A P-series portable viewing monitor/recorder for single camera/switch viewing.

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