

Switchgear Viewing Systems for Power Grids: Safe, Live Switch and Breaker Imaging

Unique product line from portable, ready-to-go solutions to comprehensive client-specific solutions for new substations and running systems

“Keeping the distance”: how our switchgear viewing systems improve occupational safety

Reliable switch device status is a safety requirement in power grids. However, hard-to-access viewports and sparks from switching processes make direct visual observation difficult and dangerous in power plants today. Live monitoring of switches using specialized cameras minimizes risks to human operators by monitoring switches from a safe distance, either locally using a portable video unit or remotely centralized from the control room.

What makes our line of switchgear viewing systems special?

Kappa provides a unique, comprehensive range of extremely robust switchgear cameras designed for safe, live monitoring of GIS, Hybrid Switchgear, GCB, and air-insulated applications in the typically harsh environments of medium- and high-voltage networks. All switchgear cameras can be adapted to any type of viewport/equipment and specific customer requirements. Scalable stationary or mobile solutions with a portable video unit are available for new substations or to upgrade running systems. This plant-focused concept assures quick, easy, and safe installation of the switchgear cameras. Reliable, user-friendly software is provided for easy and safe operation.

The latest (and smallest) member of our switchgear product line: our new PVU portable video unit for comfortable mobile switchgear monitoring – ready to go!



Quick, comfortable mobile viewport monitoring without “big” network-dependent solutions? That’s where our new battery-powered PVU comes into play: a smart mobile solution for viewport monitoring. 3 cameras can be connected for 3 phases. The image is directly displayed on the integrated monitor; it’s as easy as that. This solution is also ideal for service technicians.

Kappa optronics is an experienced partner for IEEE C.37.20.9-compliant switchgear camera systems (SGC). We work closely with major clients in the area of power grids/power technologies and thus can offer mature solutions that meet all specific requirements on site. Our switchgear camera systems are in use in plants worldwide, contributing to occupational safety.



Let's get into the details ...

Which solution fits where?



Analog Portable Solution

-  Field use at equipment where no cameras are installed
-  Battery-driven power independent solution




Analog Static Installation

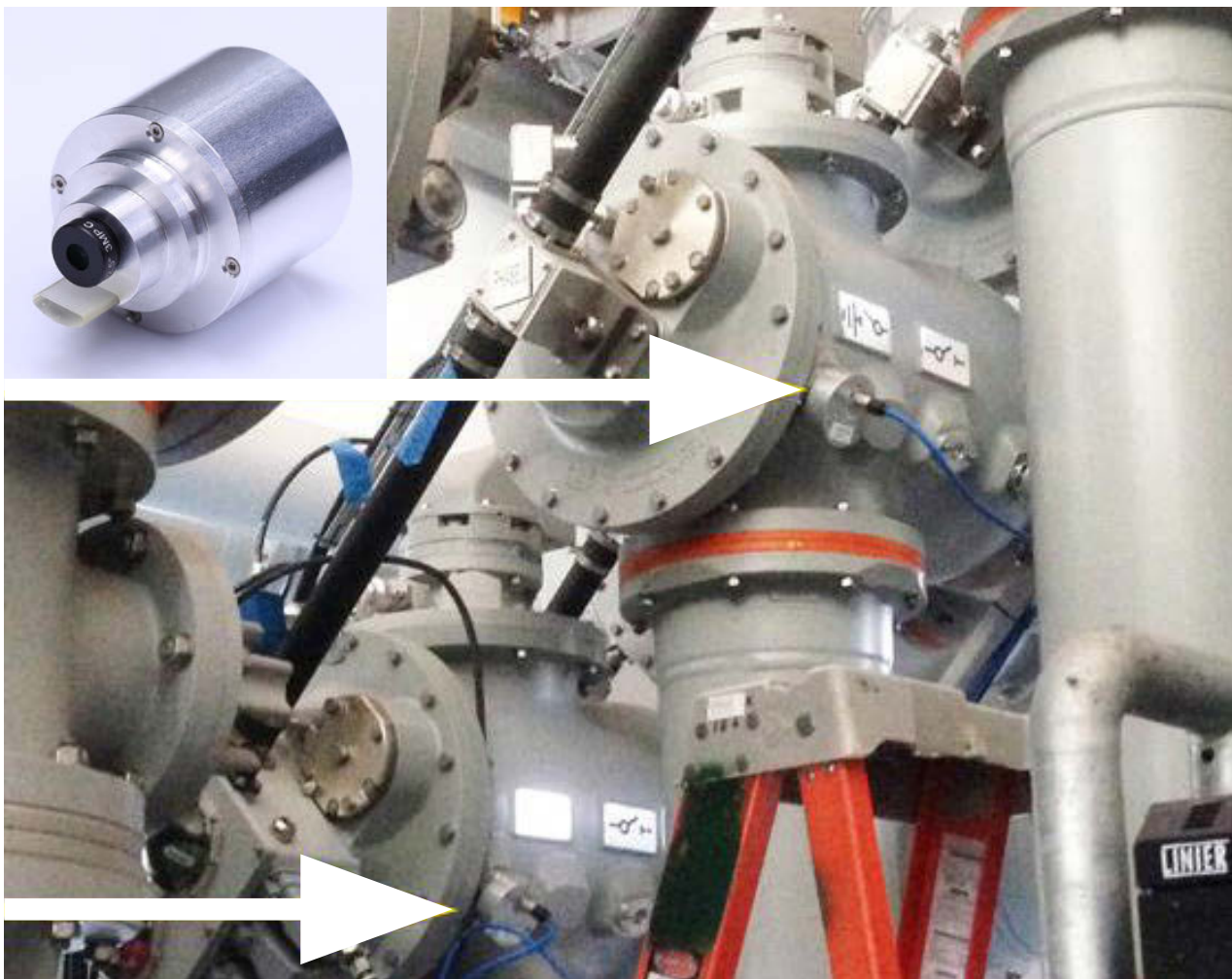
-  Small static installation with no AC/DC Power infrastructure where it is rational to operate the cameras next to the equipment
-  Operators who prefer an analog one-to-one video connection to the cameras

Digital Static Eco Installation

-  Small static installation with AC/DC Power infrastructure where it is rational to operate the cameras next to the equipment
-  Operators who want to use a PC or laptop instead of a portable video unit

Digital Static Premium Installation

-  Medium to large installations where several cameras must be operated from a remote workplace like an operator's room
-  Everywhere where comfort is important to the user
-  Guarantees highest functional safety and maximum process efficiency







Digital or Analog?





What you need to decide:
here are the pros and cons.

Analog Solutions

Advantages









-  Analog video signal – no bits and bytes
-  Hard-wired connection – no digital routing, no software manipulation possible
-  Robust technology – no operating System, no lost data packages etc.
-  Higher electromagnetic integrity against interferences

Disadvantages



-  Connection must be made by hand
-  System is operated usually directly next to the equipment, e.g., GIS
-  Limited cable length
-  Operation is limited to three connected cameras at the same time where only one image out of three can be displayed at the same time

Digital Solutions

Advantages

-  Digital compressed video stream – flexible routing.
-  Three video streams can be displayed at the same time (premium version)
-  Comfortable user interface with camera selection
-  Digital communication and controlling of system components (power on/off, restart, illumination on/off etc.)
-  System can perform self-tests and reporting (premium version)
-  Digital overlay with timestamp and user-defined name
-  Standard Ethernet installation cable can be used
-  System can be operated from long distances

Disadvantages

-  Theoretically the system could be hacked – so far, the system is a closed system with no access from any network
-  Installation must be carried out with great care, so that camera images are displayed on the correct position