

# XRC 049



The XRC 049 is a neutralizer based on X-ray ionization. It can be used the same way as the Kr-85-370 (for example, in SMPS systems), i.e., when the measurement task requires a reliable and defined aerosol charge distribution. The XRC 049 is especially suitable for mobile measurements performed at different locations, as there are no official transport requirements that must be considered in most countries.

## OPERATION PRINCIPLE

### DEFINED CHARGE DISTRIBUTION FOR SMPS MEASUREMENTS BY MEANS OF X-RAY IONIZATION

The XRC 049 is a bipolar neutralizer generating positive and negative ions through ionization. A defined equilibrium charge distribution is set if these ions are brought together with an aerosol. It is necessary for measuring systems such as a scanning mobility particle sizer (e.g., Palas® U-SMPS system).

Compared to unipolar neutralization, bipolar neutralization has a significant advantage: regardless of the initial state of charge of the particles, a reproducible equilibrium charge distribution is always set. This is why bipolar neutralization is mandatory for a traceable calibration of a condensation particle counter (e.g., ISO/CD 27891).

The soft X-rays ionize the carrier gas. As a first result of the ionization process, positively charged gas ions and free electrons are generated. Neutral gas molecules with a strong electron affinity (e.g.,  $O_2$ ) collect the free electrons to build negatively charged ions. When, at this point, aerosol particles are exposed to this mixture of ions during a determined period, the charge level of the aerosol particles is set at a defined equilibrium charge distribution.

The XRC 049 can be integrated into the U-SMPS / DEMC control unit. The entire performance is immediately available after switching on the device; no ionization occurs after switching off, and therefore, no further radiation.

## BENEFITS

- Reliable method for setting defined bipolar charge distributions
- Powerful alternative to radioactive neutralizers
- Flexibility in operation, no additional operating licence required\*\*
- Can be integrated into U-SMPS / DEMC control unit
- After switching on full performance available, after switching off no further ionization
- Suitable for concentrations up to  $10^7$  particles/cm<sup>3</sup>
- Reduces your operating costs

\*\* Regulations and requirements can vary depending on the state/country

## DATASHEET

Maximum particle number concentration	$10^7$ particles/cm <sup>3</sup>
Volume flow	Up to 5 l/min
Housing	Aluminium
Power supply	115 – 230 V, 50/60 Hz
Carrier/dispersion gas	Air, nitrogen
Aerosol outlet connection	$\varnothing_{\text{inside}} = 6 \text{ mm}, \varnothing_{\text{outside}} = 8 \text{ mm}$
Activity of the radiator	4.9 keV
Type of radiation	$\gamma$ radiation
Operation principle	Ionisation with X-rays
Mains fuse	F5A, 250 V
Aerosol inlet connection	$\varnothing_{\text{inside}} = 6 \text{ mm}, \varnothing_{\text{outside}} = 8 \text{ mm}$
Special features	Requires no certification in most countries

## APPLICATIONS

- Neutralization for SMPS systems
- Neutralization for filter test systems
- Neutralization for diverse measuring tasks and to avoid particle losses due to electrostatic deposition
- Aerosol research
- Laboratory and field measurements



Mehr Informationen:  
<https://www.palas.de/product/xrc049>