Atmospheric pressure plasmas are very promising tools for biomedical applications and are expected to bring new therapeutic options in surgery, dentistry and dermatology. Each scope of application requires specific, adapted plasma sources. In most cases, basic geometric criteria can be met by choosing a proper discharge type. Locally active plasmas are easily realized with single corona, jet or micro hollow cathode setups whereas large-area treatments may require arrays of these or the use of dielectric barrier discharges. Although physical modes of action like electric current and field, temperature or non-ionizing radiation may have a specific share in the desired biomedical effect, the plasma should not be irritating, if living tissue has to be treated, especially in veterinary and human medicine.

Within “Campus PlasmaMed” and “ZIK Plasmatis” different types of plasma sources are used to study their pharmacological, cell biological and biomedical effects. Before taking a new source into account for using it in this field, it has to pass through a set of basic physical diagnostics. In order to estimate its potential performance but also potential risks, related tests include electric characterization and determination of gas temperature and irradiance in the ultraviolet spectral range.

In this contribution the typical diagnostic procedure and the results for a locally active and a large-area plasma source are given. Additional aspects related to further development of a plasma source as medical device are discussed using the example of “kinpen MED”, a plasma jet intended to be employed in clinical trials.