



## Recommendation for the application of the neutral electrode in the veterinary medicine



A general discussed problem on using the HF surgery in the veterinary medicine is the application of the neutral electrode. The arising problems are partially preventing a successful application. The HF- current flows ,on using the monopolar mode, from a so-called small surface active electrode through a big tissue volume to a large neutral electrode.

Deliberately it comes to a current induced heating up of the tissue meanwhile the tissue under the neutral electrode keeps free from the thermal influence.

The advantage is that the energy can be transferred directly from “any” HF- electrode ( Needle-, ball,-knife or lancet electrode ) or indirectly from the HF- electrode through a conventional surgical instrument ( forceps, hemostatic forceps, scalpel,...)to the tissue

### Practisized and proven applications of neutral electrodes in the veterinary medicine are:

- Application on the tongue (figure 3)
- Use of conduct gel
- Saturated swab with NaCl between neutral electrode and shaven breast/abdomen
- Application of a special rectal neutral electrode (figure 4)

The necessary qualitative application of the neutral electrode is due to nature in the veterinary medicine and therefore very difficult to fix in the most cases. The high and non-definable crossing resistance between electrode and fell, hair or feathers prevents a good application.



A precondition for a save monopolar application is that the neutral electrode is covering a large surface.

The most important condition which a neutral electrode must fulfill is that the part of the application is not heating up improperly. If the contact surface is too small the tissue could be damaged through the thermal under the neutral electrode.

Burnings happen frequently because the skin was not shaved before the application of the neutral electrode. A non-shaved skin prevents a complete application of the neutral electrode, this leads to a high crossing resistance between electrode and skin.

The higher resistance prevents the needful energy flow which is necessary for the hemostasis. In order to this the user will raise the value of the HF- generator what leads to a higher tension- the worst case leads to burning.

### We recommend the following for the application of the neutral electrode

#### (Only for the monopolar HF-surgery)

1. Shave the animal for getting a hair,- and fat-free contact area
2. Spread the gel equally on the neutral electrode. The single use neutral electrode does not need gel in most cases.
3. If you don't have any gel to hand use a swab saturated with NaCl and put it on the neutral electrode ( figure 2 )
4. For fixing the neutral electrode we recommend a special elastic rubber band, which you can buy from us ( figure 1 )

**Many short-haired small animals do not need to be shaved. In most cases it is sufficient to moisten the fell with water for fixing the neutral electrode.**



**Figure 1:** Elastic rubber band for fixing, 100 cm (HF 9561)



**Figure 2:** Moistened swab on neutral electrode for improving the conductivity, patient should be shaved on the contact area



**Figure 3:** Application of a conventional neutral electrode under the tongue. A sensor of the Pulsoximeters is fixed additionally on the tongue. In principle the application on the tongue shows favorably impedance conditions for a neutral electrode but as the contact area is not defined, the fixing is very unsafe and the fixing – monitoring of the neutral electrode is missing-the application can lead to burnings on the tongue. (Single – Use electrodes which are divided in two are retired.)



**Figure 4:** Application of the rectal neutral electrode