



# Calibration Request for Electrometer in terms of DC current

## 1. General Information

|  |       |         |
|--|-------|---------|
| Customer<br><i>Name and full address</i>             |       |         |
| Contact person<br><i>Name, telephone, and e-mail</i> | Name: |         |
|  | Tel:  | E-mail: |

I would like to receive a quote.

## 2. Official Authorization

Name: ..... Date: ..... Signature:

Please fill in the entries and submit the form using the submit button or e-mail the file to service-emea@iba-group.com (subject: Calibration Request). Thank you for your request!

Comments:

The calibration certificate shall contain a recommendation on the calibration interval.

Note: According to DIN EN ISO/IEC 17025:2018 Chapter 7.8.4.3 a calibration certificate or calibration label shall not contain any recommendation on the calibration interval, except where this has been agreed with the customer. DIN EN ISO/IEC 17025:2018 is a German adoption of ISO/IEC 17025:2017.



## 3. Description of the Item to be Calibrated

**Dosemeter (electrometer, maximum 1):**

**No. of Channels:**

|              |  |
|--------------|--|
| Serial №     |  |
| Manufacturer |  |
| Model/Type   |  |

*If your electrometer's manufacturer is other than IBA Dosimetry (or Scanditronics-Wellhöfer), please consider that we are not authorized to perform any repair or internal adjustment of the device.*

*If you are sending more than one electrometer, please submit a separate request for each electrometer.*





Please select the calibration type and enter the necessary information.

### Basic Calibration – IBA electrometers only

Dose 1: Calibration points:  $\pm 1$  nA in the “0 – 10nA” range.

Dose 2: Calibration points (each channel):  $\pm 100$  pA in the “Low” range and  $\pm 1$  nA in the “High” range.

### Custom Calibration

| No. of Points | Electrometer Range<br><i>E.g., “High”, “Medium”, or “0 - 10nA”</i> | Calibration Points<br><i>Select points from the scope of <math>\pm 1</math> pA to <math>\pm 10</math> <math>\mu</math>A</i> |
|---------------|--|---|
| 1             |  | $\pm$   |
| 2             |  | $\pm$   |
| 3             |  | $\pm$   |
| 4             |  | $\pm$   |
| 5             |  | $\pm$   |
| 6             |  | $\pm$   |
| 7             |  | $\pm$   |
| 8             |  | $\pm$   |

### Standard Calibration

| Standard Calibration of Electrometer in terms of DC Current or Charge |  |
|---|--|
| No. 1   | 4 calibration points at $\pm 100$ pA and $\pm 1$ nA.             |
| No. 2   | 6 calibration points at $\pm 10$ pA, $\pm 100$ pA and $\pm 1$ nA |

### Calibration with Linearity Check

| Requested calibration extent      | Lowest value: $\pm$                                | Highest value <sup>§</sup> : $\pm$ |
|-----------------------------------|--|------------------------------------|
|                                   | <b>Calibration Points</b>                          |                                    |
| Linearity check calibration 1 *   | at 100 % of the decade <sup>1</sup>                |                                    |
| Linearity check calibration 2 **  | at 50 % and 100 % of the decade <sup>1</sup>       |                                    |
| Linearity check calibration 3 *** | at 20 %, 50 % and 100 % of the decade <sup>1</sup> |                                    |
| Linearity check calibration IEC   | Please refer to IEC 60731 chapter 6.2.3            |                                    |

<sup>§</sup> The calibrated extent will cover four decades starting from the given lowest value. The entire extent needs to be within the range of 1 pA up to 10  $\mu$ A.

Example: For a single channel dosimeter, if the requested extent is  $\pm 1$  pA to  $\pm 10$  nA, 2x4 decades will be calibrated: 8(\*), 16(\*\*), or 24(\*\*\*) calibration points.

<sup>1</sup> “Decade” to be understood as a factor of 10 difference between two numbers (an order of magnitude difference) on a logarithmic scale

e-mail the file to [service-emea@iba-group.com](mailto:service-emea@iba-group.com) (subject: Calibration Request)




|                              |  |
|------------------------------|--|
| <b>For Internal Use Only</b> |  |
| <b>DL No.</b>                |  |

## Electrometer Calibration Guide

Recommended electrometer calibration points with respect to beam type and chamber used for given beam types, points of typically used absolute dosimetry chambers are highlighted.



| Chamber Type | Chamber sensitivity<br>nC/Gy | Beam Type and Typical Dose Rate     |                                 |                   |                              |                            |                         |
|--------------|------------------------------|-------------------------------------|---------------------------------|-------------------|------------------------------|----------------------------|-------------------------|
|              |                              | Diagnostic<br>KV x-ray<br>4 mGy/min | Therapy<br>KV x-ray<br>1 Gy/min | Co-60<br>1 Gy/min | Linac: Electrons<br>6 Gy/min | Linac: Photons<br>6 Gy/min | Linac: FFF<br>20 Gy/min |
| CC01         | 0.4                          |                                     |                                 | ±10 pA            | ±10 pA                       | ±10 pA                     | ±100 pA                 |
| CC04         | 1.0                          |                                     |                                 | ±10 pA            | ±100 pA                      | ±100 pA                    | ±100 pA                 |
| CC08         | 1.9                          |                                     |                                 | ±10 pA            | ±100 pA                      | ±100 pA                    | ±1 nA                   |
| CC13         | 3.6                          |                                     |                                 | ±100 pA           | ±100 pA                      | ±100 pA                    | ±1 nA                   |
| CC25         | 7.5                          |                                     |                                 | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| FC23-C       | 7.2                          |                                     | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| FC65-G       | 21                           |                                     | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| FC65-P       | 21                           |                                     | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| PPC05        | 1.7                          |                                     |                                 | ±10 pA            | ±100 pA                      | ±100 pA                    | ±100 pA                 |
| PPC40        | 11                           |                                     | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| NACP-02      | 6.0                          |                                     | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| PS-033       | 16                           | ±1 pA                               | ±100 pA                         | ±100 pA           | ±1 nA                        | ±1 nA                      | ±1 nA                   |
| DC300        | 110                          | ±10 pA                              | ±1 nA                           | ±1 nA             | ±1 nA                        | ±1 nA                      | ±1 nA                   |



## Electrometer Current vs. Dose Rate

The electrometer current is a function of both chamber sensitivity and dose rate. Examples of recommended electrometer calibration points for selected ionization chambers and beam types.

