QUALITY CONTROL IN MEDICAL IMAGING

FULL MEDICAL IMAGING QA SOLUTIONS:
BEAM QA • IMAGE QA • DISPLAY QA • PATIENT DOSE QA
# TABLE OF CONTENTS

Quality Control for Diagnostic Imaging Modalities

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why IBA Dosimetry?</td>
<td>04</td>
</tr>
<tr>
<td>Complete QA Solutions for all modalities</td>
<td>08</td>
</tr>
<tr>
<td>Multifunctional Complete Solution</td>
<td>08</td>
</tr>
<tr>
<td>Complete Solution Kit for Rad / Flu / Mammo / CT</td>
<td>10</td>
</tr>
<tr>
<td>Radiography / Fluoroscopy</td>
<td>11</td>
</tr>
<tr>
<td>Complete Solutions</td>
<td>12</td>
</tr>
<tr>
<td>Multimeter</td>
<td>16</td>
</tr>
<tr>
<td>Dosimeters</td>
<td>17</td>
</tr>
<tr>
<td>kV-Meter</td>
<td>19</td>
</tr>
<tr>
<td>Detectors</td>
<td>19</td>
</tr>
<tr>
<td>Test Devices</td>
<td>21</td>
</tr>
<tr>
<td>Mammography</td>
<td>26</td>
</tr>
<tr>
<td>Complete Solutions</td>
<td>27</td>
</tr>
<tr>
<td>Multimeters</td>
<td>29</td>
</tr>
<tr>
<td>Dosimeters</td>
<td>30</td>
</tr>
<tr>
<td>kV-Meter</td>
<td>31</td>
</tr>
<tr>
<td>Detectors</td>
<td>32</td>
</tr>
<tr>
<td>Test Devices</td>
<td>33</td>
</tr>
<tr>
<td>Computed Tomography</td>
<td>38</td>
</tr>
<tr>
<td>Complete Solutions</td>
<td>39</td>
</tr>
<tr>
<td>Multimeter</td>
<td>41</td>
</tr>
<tr>
<td>Dosimeter</td>
<td>42</td>
</tr>
<tr>
<td>Ionization Chamber / Detectors</td>
<td>43</td>
</tr>
<tr>
<td>Software</td>
<td>43</td>
</tr>
<tr>
<td>Test Devices</td>
<td>44</td>
</tr>
<tr>
<td>Dental Radiography</td>
<td>46</td>
</tr>
<tr>
<td>Multimeter</td>
<td>47</td>
</tr>
<tr>
<td>Dosimeters</td>
<td>48</td>
</tr>
<tr>
<td>kV-Meter</td>
<td>49</td>
</tr>
<tr>
<td>Detectors</td>
<td>49</td>
</tr>
<tr>
<td>Test Devices</td>
<td>50</td>
</tr>
<tr>
<td>Accessories</td>
<td>51</td>
</tr>
<tr>
<td>Medical Display</td>
<td>52</td>
</tr>
<tr>
<td>Complete Solutions</td>
<td>53</td>
</tr>
<tr>
<td>Spot-Luminance-Meter</td>
<td>54</td>
</tr>
<tr>
<td>Software</td>
<td>55</td>
</tr>
<tr>
<td>Film Processing</td>
<td>56</td>
</tr>
<tr>
<td>Sensitometers</td>
<td>57</td>
</tr>
<tr>
<td>Densitometers</td>
<td>57</td>
</tr>
<tr>
<td>Combination Devices</td>
<td>58</td>
</tr>
<tr>
<td>Accessories</td>
<td>58</td>
</tr>
<tr>
<td>Software</td>
<td>58</td>
</tr>
<tr>
<td>Accessories for Radiology</td>
<td>59</td>
</tr>
<tr>
<td>Frames and Stands</td>
<td>60</td>
</tr>
<tr>
<td>Adapters</td>
<td>60</td>
</tr>
<tr>
<td>Filters</td>
<td>61</td>
</tr>
<tr>
<td>Carrying Cases</td>
<td>61</td>
</tr>
<tr>
<td>Resolution Tests – Line-Group Tests</td>
<td>62</td>
</tr>
<tr>
<td>Radiation Safety</td>
<td>64</td>
</tr>
<tr>
<td>Survey Radiation Meter</td>
<td>65</td>
</tr>
<tr>
<td>Dose Area Product Meters</td>
<td>69</td>
</tr>
<tr>
<td>KermaX plus Tin0</td>
<td>70</td>
</tr>
<tr>
<td>KermaX plus</td>
<td>71</td>
</tr>
<tr>
<td>Accessories</td>
<td>73</td>
</tr>
<tr>
<td>Product Overview Tables</td>
<td>74</td>
</tr>
<tr>
<td>Measuring Devices Overview</td>
<td>75</td>
</tr>
<tr>
<td>Measuring Devices Matrix</td>
<td>76</td>
</tr>
</tbody>
</table>
**WHY IBA DOSIMETRY?**

### Outstanding QA Solutions

IBA Dosimetry is your full QA solution partner, allowing you to provide quality control in medical imaging:
- Better image quality for improved diagnosis and therapy
- Advanced imaging dose control for patient safety

**Categories:**
- **BEAM QA**
- **IMAGE QA**
- **DISPLAY QA**
- **PATIENT DOSE QA**

### Outstanding Customer Care and Service

IBA Dosimetry is your partner long after the product sale. With your CAREprogram, IBA provides you with a wide range of expert services that enable you to maximize efficiency and usability of your medical imaging quality control.

- **Expert Service** by a dedicated team of qualified professionals determined to support more than 10,000 users around the world when needed:
  - Telephone and on-site support
  - Repair service

- **User Trainings** by expert trainers:
  - Learn the know how to perform your QA most competent and efficient
  - Dedicated high-end ICC training center

- **Calibration Services** at the IBA SSDL:
  - Ensure your measurement tools are calibrated with highest standards
  - Quality calibrations based on Secondary Standard Dose Lab
We are using the Multimeter MagicMaX from IBA Dosimetry GmbH for acceptance and constancy Tests with our EXAMION® x-ray systems as well as other systems that we maintain. We value the usability and high quality of the measurement device as well as the fast and competent service of IBA Dosimetry, especially regarding calibration and maintenance of our devices. During various trainings we could benefit from the extensive know-how of IBA which enabled us to offer our customers the legally required routine checks of the IBA Dose-Area-Product-Meters.

The trainings at the IBA International Competence Center (ICC) have further deepened our knowledge in the area of x-ray quality assurance and made our workflow more efficient.

Lars Olav Bromm
Project Manager
EXAMION GmbH, Munich, Germany

The most notable feature of the MagicMaX solution is its speed and simplicity of use. The system quickly and automatically records imaging doses and resets following each exposure for serial measurements. From setup to breakdown, my TrueBeam’s kV imaging system is evaluated in 5 minutes. It’s hard to argue against routine imaging QA when such an easy and affordable solution is available.

Jacob A. Gersh, PhD
Medical Physicist
Gibbs Cancer Center, Spartanburg, SC, USA
COMPLETE QA SOLUTIONS
IN DIGITAL RADIOLOGY

Image Quality & Dose Control

Complete Solution Kits, all-in-one, all modalities
Multimeter & Test Phantoms, Monitor QA

Over 30 years of innovations
Proven and certified by leading authorities
**MagicMax Universal**  
*Multifunctional Complete Solution*

**MagicMax Universal**  
The new flexible solution in beam QA.

Versatile through exchange of detectors and ionization chamber. Due to the modular design for all x-ray modalities:
- Radiography
- Fluoroscopy
- Mammography
- Computed Tomography
- Dental Radiography
- Luminance measurement

**Basic equipment**  
- **MagicMax Universal** [1]  
  USB powered system to be used with PC/Laptop.
- **MagicMax Software** [2]  
  Clear & structured design gives you a fast total overview as well as comprehensive expert level detail view. The various options of Excel®-exporting will grant fast and easy reporting.

**Modular equipment:**
- **Multidetector „XR“** [3]  
  For Radiography, Fluoroscopy & Dental Radiography.  
  (Parameters: Dose / dose rate, Dose per pulse, kVp / PPV, Time, Total filtration, Half Value Layer (HVL), Waveform)
- **Multidetektor „XM“** [4]  
  For Mammography.  
  (Parameters: Dose / dose rate, Dose per pulse, kVp / PPV, Time, Total filtration, Half value layer (HVL), Waveform)
- **Current Probe (mAs-Messsonde)** [5]  
  For invasive and non-invasive measurements of the tube current.
- **Illumance detector MM-LS** [6]  
  Light output measurements of image intensifiers and viewing boxes.
- **Ionisations chamber DCT10-MM** [7]  
  For DLP (in mGy*cm) and dose measurements and for CTDI calculations at CT Scanners.
Test devices:

- **Primus A VD0203650**
  [For detail information page 21.]

- **MAM-162 VD0203741**
  For image quality in Mammography according to DIN 6868-162.
  [For detail information page 34.]

- **2-pieces PMMA CT-Phantom VD1003110**
  For CTDI-measurements according to IEC60601-2-44, IEC 61223-3-5, IEC 61223-2-6.
  [For detail information page 44.]

- **DigiDent**
  For acceptance- and constancy tests in Dental Radiography according to IEC 61223-3-4 / 61223-2-7 and DIN 6868-5 / 6868-151.
  [For detail information page 50.]

Complete Sets

**MagicMaX Universal Full QA Kit**
- MagicMaX Universal
- Test phantoms for all X-ray modalities
- Multidetector radiography / fluoroscopy XR and mammography XM
- Ionization chamber DCT10-MM for CT
- MagicMaX Current Probe
- Illuminance detector MM-LS

**MagicMaX Universal rad/flu Case**
- MagicMaX Universal
- Multidetector radiography / fluoroscopy XR
- MagicMaX Current Probe
- Test phantom for radiography / fluoroscopy
- Illuminance detector MM-LS

**MagicMaX Universal mammo Case**
- MagicMaX Universal
- Multidetector mammography XM
- Test phantom MAM-162
- MagicMaX Current Probe
- Illuminance detector MM-LS

**MagicMaX Universal CT Case**
- MagicMaX Universal
- 3-part CT phantom for adults and pediatric
- Ionization chamber DCT10-MM for CT
- Illuminance detector MM-LS

**MagicMaX Universal Case**
- MagicMaX Universal
- Multidetector radiography / fluoroscopy XR and mammography XM
- Ionization chamber DCT10-MM for CT
- MagicMaX Current Probe
- Illuminance detector MM-LS
Complete Solution Kit for Rad/Flu/Mammo/CT

**MagicMaX Universal Full QA Kit**
Dose & Image QA for Rad / Flu / Mammo / CT
VD0250125

Your All-In-One Solution keeping you mobile.

Consisting of:
- **MagicMaX Universal** high-end Multimeter Solution for all needs in beam verification; Incl. advanced MagicMaX software for fast and complete dose measurement overview; Plug and Play system allows fast and seamless workflow within ONE minute setup time
- Test phantoms for Radiography, Fluoroscopy and Mammography
  - Primus A phantom for Digital & conventional Radiography and Fluoroscopy; Test device Mammo-14 for constancy tests / Quality Checks of Mammographic equipment according DIN 6868-162; incl. Primus PMMA attenuator
  - 2-part PMMA CT-Phantom
    - Adult Head & Body / Pediatric Body
  - Test device Mammo-14
    - Image Quality Phantom for digital mammography systems, according DIN 6868-14.
  - Multidetector XR for Radiography / Dental and Fluoroscopy and Multidetector XM for Mammography for attachment to the MagicMaX Universal;
    - Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form

**DCT10-MM**
- CT Ionization Chamber 10 cm

**DCT30-MM**

**MagicMaX Current Probe**
- Unique invasive and non-invasive measurements of the tube current

**Illuminance Detector MM-LS**
- Light output measurements of image intensifiers and viewing boxes

**Transportation Cases**
- 2 case solution with trolley

For more technical information, please see the MagicMaX family matrix at the end of the brochure!
Complete Solutions

**MagicMaX Universal Rad/Flu Case V0250122**
Your All-In-On Dose & Image QA Solution.

Consisting of:
- **MagicMaX Universal** high-end Multimeter Solution for all needs in beam verification; incl. advanced MagicMaX software for fast and complete dose measurement overview; Plug and Play system allows fast and seamless workflow within ONE minute setup time
- **Test Phantom for Radiography & Fluoroscopy**
  Primus A phantom for Digital & conventional Radiography & Fluoroscopy; incl. PMMA attenuator
- **Multidetector XR for Radiography & Fluoroscopy**
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form
- **MagicMaX Current Probe**: Unique invasive & non-invasive measurements of the tube current
- **Illuminance Detector MM-LS**: Light output measurements of image intensifiers and viewing boxes
- **Rad / Flu Carrying Case**

For more technical information, please see the MagicMaX family matrix at the end of the brochure!

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**MagicMaX Universal Multimeter Solution Rad/Flu Kit V0250122/L5**
Your All-In-On Dose QA Solution.

Consisting of:
- **MagicMaX Universal** high-end Multimeter Solution for all needs in beam verification; incl. advanced MagicMaX software for fast and complete dose measurement overview; Plug and Play system allows fast and seamless workflow within ONE minute setup time
- **Multidetector XR for Radiography & Fluoroscopy**
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form
- **MagicMaX Current Probe**: Unique invasive & non-invasive measurements of the tube current
- **Illuminance Detector MM-LS**: Light output measurements of image intensifiers and viewing boxes
- **Carrying Case**
Complete Solutions

Measuring Set IBArad/flu-L, incl. LXcan VD0250198
Complete measuring set for radiologists and hospitals with digital/conventional fluoroscopic/radiographic X-ray units.

Consisting of:
- **Test Device Primus A**
  Dimensions in mm: 300 x 300 x 18.5
- **Dosimeter DOSIMAX plus I**
  Single-channel dose meter for use in combination with Solid state detectors RQA / RQM or patient equivalent DEDX, for dose, dose rate and time measurement according IEC 61674.
- **Solid State Detector RQA**
  For use with MagicMaX and Dosimax plus series for dose measurements.
- **Detailed Check Instruction Fluoroscopy and Form according to DIN 6868-4, 2007**
on CD
- **Stand**
  For test device Primus A and solid state detector DEDX
- **QC Kit IBAcan**
- **Carrying Case**

Optional:
- **DSA Test Device** VD0203300
  (including manual and carrying case)

**Mounting Frame, Primus** VD0213104
For test devices DIGI-13 and Primus, highly recommended for use with a chest unit.

One Attenuation Body is necessary for Primus L:
- **Aluminum Pre-Attenuator, 25 mm**
  with supporting plate VD0503200
- or:
- **PMMA-Attenuation Body** VD0203521
  For test device Primus L.
  Dimensions in mm: 300 x 300 x 31.
  Consisting of: 30 mm PMMA and 1 mm Cu.

Optional Accessories:
- **Illuminance Detector LX-LS** VD0602960
  For measuring illuminance (lux) / ambient light of image display devices and at viewing boxes.
- **Tripod** VD0610200
  For measuring device LXcan, adjustable height 60 cm – 153 cm.
- **High Precision Mini Tripod** VD0610210
  For measuring device LXcan.
  (This tripod version fits into the carrying case of QC Kit IBAcan.)

**QC Kit IBArad/flu-L excl. LXcan** VD0250199
Same measuring devices as order number VD0250198 “Measuring Set IBArad/flu-L”, without QC Kit IBAcan.

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 52.
Complete Solutions

**QC Kit IBArad-digital incl. LXcan** VD0250202

Complete measuring kit for quality checks in digital radiology (CR/DR) acc. to DIN 6868-13 and at image display devices according to IEC 61223-2-5, DIN 6868-157, AAPM TG18.

Consisting of:
- Test Device DIGI-13
- Al-Pre-Attenuator, 25 mm
  With supporting plate
- **Dosimeter DOSIMAX plus I**
  Single-channel dose meter for use in combination with Solid state detectors RQA / RQM or patient equivalent DEDX, for dose, dose rate and time measurement according IEC 61674.
- **Solid State Detector RQA**
  For use with MagicMaX and Dosimax plus series for dose measurements.
- **Detailed Check Instruction**
  and Form R-F13 on CD
- **Spot-Luminance-Meter LXcan**
  Incl. mask for screen contact measurements
- **Power Supply with 4 Adapters**
  adapters for UK / US / AU / EU
- **USB-Cable**
  For automatic transfer of the measured data and for recharging batteries
- **Carrying Case**

*Alternatively to USB-Cable, but exclusively for Automatic Transfer of the Measured Data:*

**Interface Cable (2 m) RS 232** VD00101460

For automatic transfer of the measured data.

**Optional Accessories:**

**Illuminance Detector LX-LS** VD00102960

For measuring illuminance (lux) / ambient light of image display devices and at viewing boxes.

**Tripod** VD0010200

For measuring device LXcan, adjustable height 60 cm – 153 cm.

**High Precision Mini Tripod** VD0010210

For measuring device LXcan.

(This tripod version fits into the carrying case of QC Kit IBArad-digital.)

**Mounting Frame, Primus** VD00213104

For test devices DIGI-13 and Primus, highly recommended for use with a chest unit.

**QC Kit IBArad-digital excl. LXcan** VD0250203

Same measuring devices as order number VD0250202 "QC Kit IBArad “, without Spot-Luminance-Meter LXcan, USB-cable and power supply.

For luminance / illuminance measurements of your image display device, please see chapter "Quality Control at Medical Displays", page 52.
**Complete Solutions**

**QC Kit IBA rad/flu-analog VD0250305**
Complete measuring kit for QA tests at conventional radiographic and fluoroscopic X-ray units according to IEC 61223-2-1/-9/-11 and DIN 6868-2 and -3.

Consisting of:
- **Test Device ETR1**
  Including centering tube
  Dimensions in mm: 280 x 280 x 18.5
- **Dosimeter DOSIMAX plus I**
  Single-channel dose meter for use in combination with Solid state detectors RQA / RQM or patient equivalent DEDX, for dose, dose rate and time measurement according IEC 61674.
- **Solid State Detector RQA**
  For use with MagicMaX and Dosimax plus series for dose measurements.
- **Detailed Check instruction on CD**
- **Stand for Test Device ETR1**
  Stand for Al-filter or DEDX; height 38.5 cm
- **Sensitometer / Densitometer DUOLIGHT**
- **Power Supply**
  (for 110 V / 220 V DC)
  Absolutely necessary for Sensitometer/Densitometer DUOLIGHT.
- **Thermometer RT-1**
  (digital)
- **Carrying Case RK-1**

**Recommended as Attenuation Body (not included in the Set):**
**Aluminum Pre-Attenuator, 25 mm VD0503200**
With supporting plate.

**Optional:**
**Mounting Frame RW-1 VD0213100**
For test device Digi-13.

**Beam Alignment Test Tool – BATT VD0403850**
For measuring collimator beam alignment of the central beam.
Suitable for use in combination with test devices ETR1, Digi-13 and Primus.
Multimeter

**Multimeter MagicMaX-rad/flu/dent**

VD0201940

The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including fixed solid state Multidetector “XR”
- Ability to attach an additional solid state detector for dose measurements
- Including robust aluminum carrying case
- Multimeter is designed according to IEC 61674 and IEC 61676

**Measurement Parameters:**
- Dose / dose rate
- Dose per pulse
- kVp / PPV
- Time
- Total filtration
- Half value layer (HVL)
- Waveform

**Options / Additional Accessories for MagicMax “Logo” series:**

**HP Ultrabook 360** VD0201930

Instead of your own laptop.

**MagicMaX Current Probe** VD0201975

For use with MagicMaX for invasive and non-invasive measurements of the tube current.

**Illuminance Detector MM-LS** VD0201951

For use with MagicMaX.

**Solid State Detector RQA** VD0202850

For use with MagicMaX / Dosimax plus for dose measurements only (look page 20)

**Solid State Detector RQM** VD0202860

For use with MagicMaX / Dosimax plus for dose measurements only (look page 32)
Dosimeters

Dosimeter MagicMaX-rad/flu/dent V020201845
According to IEC 61674; the flexible solution for thorough dose measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including solid state Dose-Detector RQA
- Ability to attach an additional solid state detector for simultaneous measurements of exit and entrance dose
- Including aluminum carrying case

**Measurement Parameters:**
- Dose / dose rate
- Dose per pulse
- Time

Dosimeter MagicMaX-DEX V020201846
The flexible solution for smart dose measurements at X-ray units. Combines entrance dose measurement with a patient equivalent attenuator of 25mm Al.

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including integrated solid state detector & 25 mm Al patient equivalent Detector DEX
- Ability to attach an additional solid state detector for simultaneous measurements of exit and entrance dose
- Including aluminum carrying case

**Measurement Parameters with Detector DEX:**
- Dose: 20 µGy - 9999 mGy
- Dose rate: 20 µGy/s - 400 mGy/s
- Time: 1 ms - 19999 s

Options / Additional Accessories:
HP Ultrabook 360 V020201830
Instead of your own laptop.
Solid State Detector RQA V020202850
For use with MagicMaX for dose measurements only.
Solid State Detector RQM V020202860
For use with MagicMaX for dose measurement only. (look page 32 Mammography)

For more technical information, please see the MagicMaX family matrix at the end of the brochure!
Dosimeters

Dosimeter Dosimax plus A
(basic unit) VD0201747, Detector RQA VD0202850
PTB-approved single-channel dosimeter according to IEC 61674, designed for acceptance tests and for quality checks at radiographic, fluoroscopic, dental and mammographic X-ray units.
In Rad/Flu for use with solid state detector RQA.
Measurement Parameters with Detector RQA:
- Dose: 200 nGy - 9999 mGy
- Dose rate: 80 nGy/s - 70 mGy/s (50 - 150 kV)
- Time: 1 ms - 19999 s

Options / Additional Accessories:
Carrying Case VD0225720
For dosimeter DOSIMAX plus series; offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX).

Dosimeter DOSIMAX plus I,
(basic unit) VD0201748
Single-channel dose meter for use in combination with Solid state detectors RQA / RQM or patient equivalent DEDX, for dose, dose rate and time measurement according IEC 61674.

Measurement Parameters with Detector RQA:
- Dose: 200 nGy - 9999 mGy
- Dose rate: 80 nGy/s - 70 mGy/s (50 - 150 kV)
- Time: 1 ms - 19999 s

Measurement Parameters with Detector DEDX:
- Dose: 20 µGy - 9999 mGy
- Dose rate: 20 µGy/s - 400 mGy/s
- Time: 1 ms - 19999 s

Option / Additional Accessory:
Carrying Case VD0225720
For dosimeter DOSIMAX plus series; offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX).

The dosimeters DOSIMAX plus A and DOSIMAX plus I are medical devices (according to the directive 93/42/EWG) of class I m / 12.


**kV-Meter**

**kV-Meter MagicMaX-rad/flu/dent**

VD0201948

The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including solid state kV-detector
- Including aluminum carrying case

**Measurement Parameters:**
- PPV / kVp
- Time
- Total filtration
- Half value layer (HVL)

**Option / Additional Accessory:**
EeePC VD0201930 Instead of your own laptop.

For more information, please see the MagicMaX family matrix at the end of the brochure!

---

**Detectors**

**MagicMaX Universal Multi Detector XR**

VD0202030

Multidetektor is to be used with the MagicMaX Universal in kV a range of 40 - 150kV. The small footprint detector has 2 marked active areas, one for dose, dose rate, dose/puls and time and the other one for kVp, PPV, Half Value Layer, total filtration.

Size: 20 x 52 x 10
Detectors

**Solid State Detector RQA VD0202260**
For quality checks and acceptance tests at radiographic, fluoroscopic and dental X-ray units, 50 - 150 kV.

**Solid State Detector DEDX VD0202100**
Integrated in the patient equivalent attenuator, consisting of 25 mm Al, incl. one additional 1 mm Cu-filter for quality checks at radiographic and fluoroscopic X-ray units, 50 - 150 kV.
Size: 169 x 176 mm
Length of detector cables: 2 m.

**MagicMaX Current Probe VD0201975**
For invasive and non-invasive measurements of the tube current in combination with the MagicMaX and MagicMaX Universal Multimeters.

**Features:**
- Unique combination of invasive and non-invasive
- Comprehensive analysis with MagicMaX-Meter software
- Convenient selection of measurement range

**Benefits:**
- All in one device
- Cost efficient solution
- Workflow convenience

**MagicMaX Illuminance Detector MM-LS VD0201951**
For illuminance measurement in combination with MagicMaX. Measurement can be triggered at the detector for multiple measurements at viewing boxes. The Detector can also be used for continuous measurements for image intensifier light-output measurements.
Test Device Primus A [standard model] VD0203650
For quality checks at digital & conventional radiographic
and fluoroscopic X-ray units according to DIN 6868-150
and DIN 6868-4.

Test Parameters:
- Spatial resolution
- Contrast resolution
- Alignment of light and X-ray field
- Geometry symmetry
- Image scale dimensions in mm: 300 x 300 x 18.5

An Attenuation Body is necessary, if no Solid State Detector DEDX is available:
Aluminum Pre-Attenuator VD0503200
25 mm with supporting plate or
PMMA-Attenuation Body VD0203621
Consisting of 30 mm PMMA and 1 mm Copper.

Option / AdditionalAccessory:
- Stand for Test Device Primus / Digi 13 VD0212170
- Mounting Frame for Primus VD0212104

For more information see chapter "Accessories for Radiology".

Test Device DVT3D VD0203660
For quality checks in 3D digital volume tomography
according to DIN 6868-150 and DIN 6868-4.

Specifications:
- Quality check in 3D image quality with contrast/spatial resolution, iso center coincidence, noise
  and uniformity.
- Laser marks for easy positioning of the test device in the Isocenter
- Contrast/ Spatial resolution
  (1.3 – 1.0 – 0.8 – 0.7 – 0.6 – 0.5 mm)
- Dimension: 120x120x60 mm

Option / AdditionalAccessory:
- Stand for DVT Test Device VD0203684
Test Devices

Test Device Digi-13 vD0203560
For quality checks at all types of CR/DR radiographic systems.

Test Parameters:
- Homogeneity
- Spatial and contrast resolution
- Alignment of light and X-ray field
- Image scale
- Artifacts
- Geometry symmetry

An Attenuation Body is necessary, if no Solid State Detector DEDX is available:
Aluminum Pre-Attenuator vD0503200
25 mm with supporting plate (absolutely necessary in case of using the test device Digi-13).

Option / Additional Accessory:
Stand for Test Device Primus / Digi 13 vD0212170
For more information see chapter "Accessories for Radiology".

Test Device ETR1 incl. Centering Tube vD0203100
For quality checks in conventional (analog / film-based) radiography according to DIN 6868-3.

Test Parameters:
- Spatial resolution
- Alignment of light and X-ray field
- Geometry symmetry
- Contrast resolution
- Measuring areas for optional density

Option / Additional Accessory:
Stand for Test Device ETR1 vD0212160
For more information see chapter "Accessories for Radiology".

DSA Test Device incl. Carrying Case vD0203000
For quality tests in digital subtraction angiography (IEC 61223-3-3, DIN 6868-150 and DIN 6868-4).

Test Parameters:
- Dynamic range
- DSA contrast sensitivity
- Artifacts
- Logarythmic check

RADIOGRAPHY / FLUOROSCOPY
Test Devices

**Contrast-Detail-Phantom CDRAD** VD0203750
(including analyzer-software and carrying case)

For quality control in radiography.

**Test Parameters:**
- Contrast and spatial resolution
- Optimization, evaluation and comparison of different radiologic systems
- Determination of the optimum exposure technique
- Evaluation of the image quality versus dose relation

**Contrast-Detail-Phantom CD DISC 2.0** VD0203720
(including carrying case)

For quality control in radiology, considering the perception by the observer. Especially designed for evaluating fluoroscopic X-ray units.

**Test Parameters:**
- Contrast resolution
- Spacial resolution
- Optimization, evaluation and comparison of different fluoroscopic systems
- Determination of the optimum exposure technique and background density
- Evaluation of the image quality versus dose relation

**Test Device FFA 4090 R** VD0203291
For checking the film-screen contact at radiographic cassettes according to ISO 4090.

Internal dimensions without frame in cm: 42 x 49 x 0.7.

External dimensions including the frame in cm: 44 x 51 x 0.9.

**BATT – Beam Alignment Test Tool** VD0403850
Verifies that the angular alignment of the central beam is perpendicular to the image receptor. (Recommended in combination with test devices DIGI-13, ETR1 and Primus.)

Four different versions available. With aid of the accurate and easy to use analyser software quality reports can be generated.
Test Devices

**Test Device Set LiRa**
(Collimator / Beam Alignment Test Tool) VD0403865
- Verification of the proper alignment of the collimator light field with the X-ray field
- Verification of the central beam alignment (perpendicular to the image receptor)

**Consisting of:****
- Test device Primus A
  (Please see page 10 for more information)
- Beam Alignment Test Tool (Please see above)

**Test Set AEC-Systems for Radiography**
VD0203800
Set of PMMA-slabs for checking the Automatic Exposure Control. For X-ray units working in the range of 40 - 150 kV according to IEC 81223-3-1.

**Set consisting of:**
- 3 PMMA slabs, dimensions in mm: 240 x 240 x 50
- 2 PMMA slabs, dimensions in mm: 240 x 240 x 20
- 1 PMMA slab, dimensions in mm: 240 x 240 x 10
- 1 Al slab, dimensions in mm: 240 x 240 x 25

**HVL Aluminum Filter Set for Radiography**
VD0403320
Aluminum attenuator set for HVL measurements at radiographic X-ray units working in the range of 40 - 150 kV.
Dimensions: 100 mm x 100 mm each.
Purity of Al: 99.5 %.

**Set consisting of:**
- 5 filter plates of 0.1 mm Al
- 2 filter plates of 0.5 mm Al
- 5 filter plates of 1.0 mm Al
- 2 filter plates of 2.0 mm Al
Test Devices

**Tungsten Edge Test Device TX 5** V02203580
For determination of modular transfer function (MTF). According to IEC 62220-1.

**Consisting of:**
- 1 mm thick tungsten plate, edge ± 5µm, fixed on a 3 mm thick lead plate

Software

**IQ Analyzer Primus** V02203530
Software which performs quality checks on images taken with Primus in three simple steps:
Select  - Analyze  - Results.

The IQ Analyzer Primus can perform automatic, fast, quantitative and reproducible constancy measurement on multiple imaging modalities.

**Specifications:**
- Automated analyze of DICOM images from various modalities, including CR, DR, DX, XA and RF systems.
- Efficient selection of DICOM images through easy menu
- Automated analyze of Image Quality by determining: Positioning, SNR, dynamic, distortion and resolution (MTF)
- Generate reports and archive in both PDF and Microsoft® Excel® formats

**Technical Specifications / System requirements:**
- Processor : Intel® Core 2 Duo
- Memory : 1 Go DDRAM
- Minimum screen resolution : 1024*768
- Windows based system (XP, Vista, 7, 8)
QUALITY CONTROL IN
MAMMOGRAPHY
Complete Solutions

**MagicMaX Universal Mammo Kit VD0250123**
Your All-In-One Dose & Image QA Solution.
Consisting of:
- **MagicMaX Universal** high-end Multimeter Solution for all needs in beam verification:
  Incl. advanced MagicMaX software for fast and complete dose measurement overview; Plug and Play system allows fast and seamless workflow within ONE minute setup time
- **Multidetector XM for Mammography**
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form*
- **Test device MAM 162**
  Test phantom for image QA at digital Mammorapy systems
- **Illuminance Detector MM-LS**
  Light output measurements of image intensifiers and viewing boxes
- **Carrying Case** Mam

For more technical information, please see the MagicMaX family matrix at the end of the brochure!

*For the following Target-Filter-Combinations: Mo/Mo, Mo/Rh, Rh/Rh, W/Rh, W/Ag.*
Complete Solutions

**QC Kit IBA mam-analog v00250373**
Complete measuring kit for quality checks at conventional mammographic installations according to DIN 6868-7 / DIN 6868-152 / EPQC (EUREF).

**Consisting of:**
- Test Device Mammo-152
  Dimensions in mm: 180 x 240
- Dosimeter DOSIMAX plus I
  (basic unit)
- Detector RQM
  For mammographic installations
- Magnifying Glass
  For 8-fold magnification
- Foam Material Cuboid
  For checking the compression pressure
- Carrying Case

**Additional Accessory:**
Test Device FFA 4090 M v00203281
For checking the film-screen contact in mammography – ISO 4090.

**Option:**
MagicMax Universal with XM Detector (instead of Dosimax plus)

**Measuring Set IBA mam-digital according to PAS 1054 v00250155**
Complete measuring set for constancy tests at digital mammographic installations according to PAS 1054.

**Consisting of:**
- Test Device PASMAM 1054 C
  Incl. carrying case
- Dosimeter DOSIMAX plus I
  (basic unit)
- Detector RQM
  For mammographic installations
- Carrying Case for Dosimeter
  DOSIMAX plus Series
  Offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX)

**Optional:**
Contrast-Detail-Phantom CDMAM v00203701
With software, incl. carrying case

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 52.
Multimeter

**Multimeter MagicMaX-mam**

VD0201970

The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including fixed Multimeter detector XM
- Possibility to connect additional solid state detectors for dose measurements
- Including aluminum carrying case
- Multimeter is designed according to IEC 61674 and IEC 61676

**Measurement Parameters*:**
- Dose / Dose rate
- Dose per pulse
- kVp / PPV
- Time
- Total filtration
- Half value layer (HVL)
- Waveform

**Options / Additional Accessories:**

**EeePC** VD0201930

Instead of your own laptop.

**Current Probe** VD0201975

For use with MagicMaX for invasive and non-invasive measurements of the tube current.

**Illuminance Detector (lx)** VD0201951

For use with MagicMaX.

**Solid State Detector RQM** VD0202860

For use with MagicMaX.

**Solid State Detector RQA** VD0202850

For use with MagicMaX.

*Also available as:*

**MagicMaX-Universal** with XM Detector

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*For the following Target-Filter-Combinations: Mo/Mo, Mo/Rh, Rh/Rh, W/Rh, W/Ag.
Dosimeters

**Dosimeter MagicMaX-mam** VD0201955
According to IEC 61674; the flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including solid state Dose-Detector RQM
- Ability to attach an additional solid state detector for simultaneous measurements of exit and entrance dose
- Including aluminum carrying case

**Measurement Parameters:**
- Dose / Dose rate
- Dose per pulse
- Time

**Options / Additional Accessories:**
- **HP Ultrabook 360** VD0201930
  Instead of your own laptop.
- **Solid State Detector RQA** VD0202850
  For use with MagicMaX.

For more technical information, please see the MagicMaX family matrix at the end of the brochure!

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**Dosimeter Dosimax plus A**
(basic unit) VD0201747, Detector RQM VD0202860
PTB-approved single channel dosimeter according to IEC 61674, designed for acceptance tests and for quality checks at radiographic, fluoroscopic, dental and mammographic X-ray units.

In Mammo for use with solid state detector RQM.

**Measurement Parameters with Detector RQM:**
- Dose: 500 nGy - 9999 mGy
- Dose rate: 1.5 µGy/s - 300 mGy/s
- Time: 1 ms - 19999 s

**Options / Additional Accessories:**
- **Carrying Case** VD0225720
  For dosimeter DOSIMAX plus series; offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX).
Dosimeters

**Dosimeter DOSIMAX plus I,**
[basic unit] VD0201748, Detector RQM VD0202860

Single-channel dosimeter for QA tests at radiographic, fluoroscopic and mammographic X-ray units. In Mamm for use with the appropriate solid state detector (RQM).

**Measurement Parameters with Detector RQM:**
- Dose: 500 nGy - 9999 mGy
- Dose rate: 1.5 µGy/s - 300 mGy/s
- Time: 1 ms - 19999 s

**Options / Additional Accessories:**
**Carrying Case** VD0225720
For dosimeter DOSIMAX plus series; offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX).

kV-Meter

**kV-Meter MagicMaX-mam** VD0201958
The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMaX-Meter measurement software
- Including solid state kV-detector
- Including aluminum carrying case

**Measurement Parameters:**
- PPV / kVp
- Time
- Total filtration
- Half value layer (HVL)
- Waveform

**Option / Additional Accessorie:**
**EeePC** VD0201930
Instead of your own laptop.

For more technical information, please see the MagicMaX family matrix at the end of the brochure!
Detectors

**MagicMaX Universal Multi Detector XM**  
VD0202040  
Multidetektor is to be used with the MagicMaX Universal in kV a range of 21 - 49 kV and for following Target-Filter Combinations: Mo/Mo, Mo/Rh, Rh/Rh, W/Rh, W/Ag.

The small footprint detector has 2 marked active areas, one for dose, dose rate, dose/puls and time and the other one for kVp, PPV, Half Value Layer, total filtration.

Size: 20 x 52 x 10

**Solid State Detector RQM**  
VD02022860  
For quality checks and acceptance tests in mammography, 25 - 35 kV.

Length of detector cable: 2 m.

**MagicMaX-Current Probe**  
VD0201975  
For invasive and non-invasive measurements of the tube current in combination with the MagicMaX and MagicMaX Universal Multimeters.

**Features:**
- Unique combination of invasive and non-invasive
- Comprehensive analysis with MagicMaX-Meter software
- Convenient selection of measurement range

**Benefits:**
- All in one device
- Cost efficient solution
- Workflow convenience

**MagicMaX Illuminance Detector MM-LS**  
VD0201951  
For illuminance measurement in combination with MagicMaX.

Measurement can triggered at the detector for multiple measurements at viewing boxes. The Detector can also be used for continuous measurements for image intensifier light-output measurements.
Test Devices

**Test Device Mammo-152**  VD02034343
(including carrying case)

For acceptance and constancy tests
(DIN V 6868-152, DIN EN 61223-3-2 and
DIN 6868-7 / EPQC (EUREF) in conventional
mammography.

**Test Parameters:**
- Object thickness and tube voltage
  compensation resp. AEC reproducibility
- Attenuation factor
- Spacial resolution
- Contrast and image resolution
- Artifacts
- Geometry
- Check of missed tissue at chest wall

**Contrast-Detail-Phantom CDMAM 4.0**  VD0203701

- Optimized for European Guidelines for Quality Assurance
- Gold discs are placed in the area of interest of the
  psychometric curve
- Improved specifications based on highly accurate
  production processes
- Developed as a result of both customer feedback and
  customer requirements

**Consisting of:**
- 0,5 mm Polished Aluminum (99,5%) base plate with
  672 pure gold disc with 21 different diameters
  (0.08 ... 2.0 mm; +0.005 (Mean + 2SD)) and 16 different
  thickness (0.012 µm ... 2.8 µm; +3% (Mean + 2SD)).
  covered by a PMMA plate 240 * 162 * 3 mm
- 4 x 10 mm (± 0.1 mm) polished PMMA plates
- CDMAM 4.0 Analyser software based on
  EUREFs CDCOM for CDMAM 4.0.
- Carrying case

**Option / Additional Accessory:**

**PMMA Spacer Set**  VD0203782
10 pieces of spacers 180 x 15 mm, with the
following thicknesses 10, 8, 5 und 2 mm.

Also available as CDMAM 3.4
on request.
Test Devices

**Test device MAM-162 VD0203741**

For **acceptance tests** of digital mammography systems, according DIN 6868-162.

**Consisting of:**
- 40 mm base plate with integrated Al step wedge (14 steps from 0 - 5.2 mm) and 2 rows of steel balls for checking the image limitations towards the thorax side
- 6 mm structural plate for test inserts and 2 rows of steel balls with recess of 80 mm x 80 mm
- PMMA test insert with square marking
- Test insert SDNR (Signal Difference-to-Noise Ratio)
- Test insert HK (High contrast)
- 3 x 20 mm PMMA attenuator semi-circle 3x 20 mm, 1 x 10 mm, 1 x 4 mm
- 1 x 20 mm (+/- 0.3 mm) PMMA Attenuation Body (320 x 260 x 20 mm)
- Carrying case

**Test device MAM-14 VD0203823**

For **constancy check** of digital mammography systems, according DIN 6868-14.

**Consisting of:**
- 40 mm base plate with integrated Al step wedge
- 6 mm structural plate with recess for test insert and Al-Step wedge and 2x 5 steel balls for checking the image limitations towards the thorax side
- 6 mm PMMA with recess for test inserts
- PMMA attenuator semicircle 2 x 20 mm (+/-0.3mm); 2 x 10 mm (+/- 0.3mm)
- 2 x 20 mm (+/- 0.3 mm) PMMA attenuation plate (260 x 320 mm)
- Test insert PMMA
- Test insert SDNR (Signal Difference-to-Noise Ratio)
- Carrying case
Test Devices

Test device PASMAM 1054 C  VD0203715

For constancy tests / quality checks of mammographic equipment according PAS 1054.

Consisting of:
- 40 mm base plate with integrated Al step wedge with 14 steps from 0 to 5.2 mm and 2 rows of steel balls for checking the image limitations towards the thorax side
- 6 mm structural plate with recess for test inserts, 2 rows of steel balls with integrated turnable resolution test in line groups of 5, 6, 7, 8 and 10 lp/mm
- PMMA-test insert with square marking
- Test insert for constancy tests – ACR
- Test insert high contrast resolution
- Test insert contrast to noise ratio
- Attenuation body 2 x 20 mm
- Attenuation body 2 x 10 mm
- Carrying case

DIGIMAM Phantom  VD0203760
(including carrying case)

For assessment of digital mammography. The phantom complies with the European Guidelines for Quality Assurance in digital Mammography Screening.

Test Parameters:
- Contrast detail analysis
- Geometry
- Quick check of bad columns
- CNR measurement
- SNR measurement (reference point)
- Check of missed tissue at chest wall
- Check of dynamic range in three types of tissue

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 52.
Test Devices

**EU Test Set** VD0203785

Complete phantom test set for digital mammography.
For type testing and testing according to EUREF protocol.

**Consisting of:**
- Homogeneous Phantom
- PMMA plates, 8 pcs. (180 x 240 x 75)
- Stainless steel plate
- MTF tool of stainless steel and Al plate
- X-ray ruler set, 4 pcs.
- PMMA spacer set, 10 pcs.
- Geometric Distortion Phantom
- Al Foil Set
- Lead plate set, 4 pcs.
- PMMA plate set, 10 pcs. (40 x 20 x 20)
- Carrying case

**Test device FFA 4090 M** VD0203281

For checking the film-screen contact at mammographic cassettes according to ISO 4090.
Consisting of a fine metal wire grid, which is inserted in 2 plates of acryl.
For checking cassettes of a size up to 24 cm x 30 cm.

**Specifications:**
- Dimensions in cm: 31.5 x 25.5 x 0.7
  (internal dimensions without frame)
- Dimensions in cm: 33.5 x 27.5 x 0.9
  (external dimensions with frame)

**Mammographic Step Wedge** VD0203802

**Specifications:**
- 21 steps [Al]
- Dimensions in mm: 10 x 6.3 x 105

**Test Parameters:**
- Sensitometric curve shape
- Geometry
- Speed
- Mid-gradient
Test Devices

Breast Compression Test Device for Mammography VDO203480

For measurement of constancy and accuracy of the compression of mammography units, as described in the “European Guidelines for quality assurance...” for the annual test.

Specifications:
- Measuring range: 200 g - 25 kg
- Resolution of LCD: 10 g

Test set AEC-Systems for Mammography VDO203810

Set of PMMA-slabs for checking the Automatic Exposure Control.

Consisting of:
- 3 PMMA slabs, dimensions in mm: 180 x 240 x 20
- 1 PMMA slab, dimensions in mm: 180 x 240 x 10

HVL Aluminum Filter Set for Mammography VDO403310

For determination of half value layer in mammography.

Specifications:
- Dimensions in mm: 100 x 100 each
- Purity of Al: 99.9 %

Consisting of:
- 7 filter plates of 0.1 mm Al
QUALITY CONTROL IN COMPUTED TOMOGRAPHY
Complete Solution

**MagicMax Universal CT Case** VD0250124

Your complete solution for CTDI measurements.*

Consisting of:

- **MagicMax Universal** Multimeter
  with integrated high voltage module for Ionization Chambers
- **DCT10-MM**
  CT Ionization Chamber 10 cm
- **3-Part PMMA CT Phantom**
  for dose measurements
  (set for adults & pediatric)
- **Illuminance Detector**
  For use with MagicMax Universal;
  Measurement range 1 – 10,000 lx
- **Trolley Case** for convenient transportation

Optional devices:

- **DCT30-MM** VD020302
  CT Ionization Chamber 30cm for wide beam CT’s
- **Multidetector XR for CT in tomo mode**
  (non-rotational) VD0202030
  for PPV/kV measurements in CT

*MagicMax Universal Cases are preconfigured to meet all standard QC needs. Optional tools for additional applications are available.
Complete Solutions

**QC Kit IBA pediatric** VD1050103

**Adult Head & Body / Pediatric Head & Body**
Complete measuring kit for CTDI measurements at all types of CT scanners.

**Consisting of:**
- 3-part Modular PMMA CT-Phantom for Dose Measurements
  - Adult head & body / pediatric head & body
- Dosimeter Dosimax plus A HV
  - With internal high voltage supply for use with ionization chamber DCT10-RS
- Ionisation Chamber DCT10-RS / Lemo
- Extension Cable, 8 m
- Specialist Booklet “Radiation Exposure in Computed Tomography”
- Carrying Case
  - With removable trolley

**QC Kit IBA Standard** VD1050102

**Adult Head & Body**
Complete measuring kit for dose measurements in computed tomography according to IEC 60601-2-44, IEC 61223-2-6, -3-5.

**Consisting of:**
- 2-parted Modular CT-Phantom for Dose Measurements
  - Adult head & body
- Dosimeter Dosimax plus A HV
  - With internal high voltage supply for use with ionization chamber DCT10-RS
- Ionisation Chamber DCT10-RS / Lemo
- Extension Cable, 8 m
- Specialist Booklet “Radiation Exposure in Computed Tomography”
- Carrying Case
  - With removable trolley

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 52.
**Multimeter**

**MagicMax Universal Multimeter CT Kit**
VD0250126_US

*Your All-In-One Dose QA Solution.*

**Consisting of:**
- **High-end Multimeter Solution**
  for all needs in beam verification;
  incl. advanced MagicMaX software for fast and complete dose measurement overview;
  Plug and Play system allows fast and seamless workflow within ONE minute setup time
- **DCT10-MM**
  CT Ionization Chamber 10 cm
- **Multidetector XR for CT in tomo mode**
  [non-rotational], Radiography & Fluoroscopy
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form
- **Illuminance Detector**
  Light output measurements of image intensifiers and viewing boxes
- **Carrying Case**

**Optional devices:**
- **DCT30-MM**
  VD020302
  CT Ionization Chamber 30 cm for wide beam CT’s
- **Multidetector XR for CT in tomo mode**
  [non-rotational]
  for PPV/kV measurements in CT

*MagicMax Universal Cases are preconfigured to meet all standard QC needs.
Optional tools for additional applications are available.*
Dosimeter

Dosimeter Dosimax plus A HV
(basic unit) VD0201790

PTB-approved single channel dosimeter with internal high voltage supply according to IEC 61674 for use with ionization chamber DCT10-RS. Designed for measurements at CT.

Measurement Parameters:
- Dose length product:
  100 µGycm - 999 Gy.cm
- Dose length product rate:
  1 mGycm/s - 0.5 Gy.cm/s
- Time: 1 ms - 19999 s

Options / Additional Accessories:

Conformance statement VD0201965_KON
Conformance statement for German acceptance tests.

Carrying Case VD0225720
For dosimeter DOSIMAX plus series; Offers space for 1 DOSIMAX plus and 1 ionization chamber.
**Ionisation Chambers**

**Ionization Chamber DCT10**  
For DLP [in mGy*cm] and CTDI measurements at CT scanners, according to IEC 61223-2-6, -3-5, 100 - 150 kV.  
**For use with**  
- MagicMaX Universal → DCT10-MM: VD1020110  
- Dosimax plus A HV → DCT10-RS: VD1020100.  
**Specifications:**  
- Active length: 100 mm  
- Length of chamber cable: 2 m

**Ionization Chamber DCT30-MM**  
Ionization chamber to be used with MagicMaX Universal for DLP [mGycm] and dose [mGy] measurements for calculating CTDI at wide beam CT’s.  
**Specification:**  
- Active length: 300 mm  
- Length of chamber cable: 2 m

**MagicMaX Universal Multi Detector XR**  
Multidetektor is to be used with the MagicMaX Universal in kV a range of 40 - 150kV. The small footprint detector has 2 marked active areas, one for dose, dose rate, dose/puls and time and the other one for kVp, PPV, Half Value Layer, total filtration.  
Size: 20 x 52 x 10

**Software**

**Software CT QALite**  
- Fast, automated CT analysis for routine QA or extensive performance evaluation  
- User friendly Windows interface  
- Comprehensive image parameter trend analysis
Test devices

3-part PMMA CT-Phantom

Adult Head & Body / Pediatric Head & Body V01003105
Innovative 3-part nested PMMA phantom for CTDI measurements. Designed to image pediatric and adult head and body in accordance with FDA performance standard for diagnostic X-ray systems (21CFR 1020.33).

Consisting of:
- 1 pediatric head phantom, 10 cm diameter, 5 holes
- 1 adult head-/pediatric body phantom, 16 cm diameter, 4 holes
- 1 adult body annulus, 32 cm diameter, 4 holes
  *(The above-mentioned 3 phantoms fit into each other!)*
- 13 acrylic rods for plugging all the phantom holes

2-part PMMA CT-Phantom

Adult Head & Body V01003110
Phantom for CTDI measurements according to IEC 60601-2-44, IEC 61223-3-5, IEC 61223-2-6.

Consisting of:
- 1 adult head phantom, 16 cm diameter, 5 holes
- 1 adult body annulus, 32 cm diameter, 4 holes
- 9 acrylic rods for plugging all the phantom holes
Test devices

**Catphan 500 Phantom** V00403450
(including carrying case)

For evaluating the maximum obtainable performance potential of axial and spiral CT scanners.

**Test Parameters:**
- Slice width
- Sensitometry (Teflon, Acrylic, LDPE, Air)
- Pixel size
- Low contrast with supraslice and subslice contrast targets
- Image uniformity module

**Catphan 600 Phantom** V00403460
(including carrying case)

For evaluating the maximum obtainable performance potential of multi-slice CT scanners with enhanced sensitometry samples for radiation therapy planning.

**Test Parameters (additional to Catphan 500):**
- Sensitometry: Delrin Acrylic, Polystyrene, H2O, PMP
- Slice geometry and point source bead module

**Catphan 700 Phantom** V00403470

The Catphan® 700 Phantom has been designed to address the image performance measurement requirements for state of the art CT volume scanners

**Test Parameters:**
The phantom retains many of the tests and features offered in the other Catphan® models. Following test objects have been refined in this development.

- Higher resolution test patterns 1 to 30 LP/cm
- Smaller acrylic spheres in the sensitometry slice geometry module and additional bone and lung samples (for radiation therapy treatment planning).
- Innovative wave insert for measuring slice geometry and resolution across the scan area
- New rotation mount to be able to rotate the mounted phantom 360° with alignment detents at 45° intervals
Multimeter

**Multimeter MagicMax-rad/flu/dent**
VD0201940
The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMax-Meter measurement software
- Including fixed solid state Multi-Detector "XR"
- Ability to attach an additional solid state detector for dose measurements
- Including robust aluminum carrying case
- Multimeter is designed according to IEC 61674 and IEC 61676

**Measurement Parameters:**
- Dose / dose rate
- Dose per pulse
- kVp / PPV
- Time
- Total filtration
- Half value layer (HVL)
- Waveform

**Options / Additional Accessories**
for MagicMax “Logo” series:

- **HP Ultrabook 360** VD0201930
  Instead of your own laptop.
- **MagicMax Current Probe** VD0201975
  For use with MagicMax for invasive and non-invasive measurements of the tube current.
- **Illuminance Detector MM-LS** VD0201951
  For use with MagicMax.
- **Solid State Detector RQA** VD0202850
  For use with MagicMax for dose measurements only (look page 49)
- **Solid State Detector RQM** VD0202860
  For use with MagicMax for dose measurements only (look page 32)

**Also available as:**
**MagicMax-Universal** with XR Detector
Dosimeters

**Dosimeter MagicMaX-rad/flu/dent**  
VD0201945  
According to IEC 61674; the flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!  
**Features:**  
- USB based system to be used with PC/Laptop  
- MagicMaX-Meter measurement software  
- Including solid state Dose-Detector RQA  
- Ability to attach an additional solid state detector for simultaneous measurements of exit and entrance dose  
- Including aluminum carrying case  
**Measurement Parameters:**  
- Dose / Dose rate  
- Dose per pulse  
- Time  
**Options / Additional Accessories:**  
HP Ultrabook 360 VD0201930  
Instead of your own laptop.

**Dosimeter Dosimax plus A**  
(basic unit) VD0201747, Detector RQA VD0202850  
PTB-approved single channel dosimeter according to IEC 61674, designed for acceptance tests and for quality checks at radiographic, fluoroscopic, dental and mammographic X-ray units.  
For dental applications to be used with solid state detector RQA.  
**Measurement Parameters with Detector RQA:**  
- Dose: 200 nGy - 9999 mGy  
- Dose rate: 80 nGy/s - 70 mGy/s (50 - 150 kV)  
- Time: 1 ms - 19999 s  
**Option / Additional Accessory:**  
Carrying Case VD0225720  
For dosimeter DOSIMAX plus series; offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX).  

The dosimeter DOSIMAX plus A is a medical device  
(according to the directive 93/42/EWG) of class I m / 12.
**kV-Meter**

**kV-Meter MagicMax rad/flu/dent V0020194B**
The flexible solution for thorough measurements at X-ray units – a new generation of measuring devices!

**Features:**
- USB based system to be used with PC/Laptop
- MagicMax-Meter measurement software
- Including solid state kV-detector
- Including aluminum carrying case

**Measurement Parameters:**
- kV
- Time
- Total filtration
- Half value layer (HVL)
- Wave form

**Options / Additional Accessories:**
HP Ultrabook 360 V00201930
Instead of your own laptop.

---

**Detectors**

**MagicMax Universal Multi Detector XR V00202030**
Multidetektor is to be used with the MagicMax Universal in kV a range of 40 - 150 kV. The small footprint detector has 2 marked active areas, one for dose, dose rate, dose/puls and time and the other one for kVp, PPV, Half Value Layer, total filtration.

Size: 20 x 52 x 10

**Solid State Detector RQA V00202850**
For quality checks and acceptance tests at radiographic, fluoroscopic and dental X-ray units, 50 - 150 kV.

Length of detector cable: 2 m

For luminance/illuminance measurements of your image display device, please see chapter "Quality Control at Medical Displays", page 52.
Test Devices

Test Device DigiDent for Digital Dental Radiology
[Acceptance- and Constancy Tests]
Suitable for intra-oral and panoramic x-ray system.

Specifications:
- Upper slab with centering rings for different cone sizes and absorber of 6 mm Al
- Resolution test (different types in different models as well as additional resolution tests are available - see below)
- 0.5 mm Al plate with contrast determination bore holes
- Basic plate with gaps for dose detector and sensor of the X-ray

The following Versions of DigiDent are available:

Test Device DigiDent U  VD0903150
2.0 / 2.5 / 2.8 / 3.1 / 5.0 / 5.8 / 6.3 Lp/mm, diagonal arrangement

Test Device DigiDent I  VD0903153
4.0 / 4.5 / 5.0 / 6.0 / 7.0 / 8.0 Lp/mm, diagonal (IEC) arrangement

Test Device DigiDent P  VD0903154
1.6 / 1.9 / 2.2 / 2.5 / 3.0 Lp/mm, diagonal (IEC) arrangement

Test Device DigiDent G  VD0903151
2.5 and 5.0 Lp/mm horizontal and vertical arrangement

The following Additional Resolution Tests are available for the DigiDent:

Additional Resolution Test - U  VD0903158
2.0 / 2.5 / 2.8 / 3.1 / 5.0 / 5.8 / 6.3 Lp/mm, diagonal arrangement

Additional Resolution Test - I  VD0903156
4.0 / 4.5 / 5.0 / 6.0 / 7.0 / 8.0 Lp/mm, diagonal (IEC) arrangement

Additional Resolution Test - P  VD0903152
1.6 / 1.9 / 2.2 / 2.5 / 3.0 Lp/mm, diagonal (IEC) arrangement

Additional Resolution Test - G  VD0903157
2.5 and 5.0 Lp/mm, horizontal and vertical arrangement

Test Device Unident F  VD0903170
Phantom for dental radiology using films.

Phantom housing with centering rings for different cone sizes, a foil of 0.3 mm Cu and two PTFE steps (8 and 18 mm).
Test Devices

Contrast-Detail-Phantom CDDENT V0023719
(including analyzer-software and carrying case)

For quality control for dental X-ray systems. This Contrast-Detail-Phantom is an aid for improving image quality.

Monitoring of Image Information Content:
- Contrast-Detail curve/detectability
- Tests low contrast and spatial resolution

Specifications:
- 3 mm Al-tablet with 100 cylindrical holes:
- Depth: 0.04 .. 0.7 mm, ± 0.02 mm (10 exponential steps)
- Diameter: 0.1 .. 1.0 mm, ± 0.02 mm (10 exponential steps)
- Quality report generation, aided by the accurate and easy to use analyzer software.

Accessories

Secondary Attenuator V00903220

Additional Filter, 1 mm Cu V009032202
For use with Secondary attenuator at panoramic dental X-ray units.

Holder for Supporting Plate, Type GENDEX V00903210

Holder for Supporting Plate, Type SIRONA V00903230
QUALITY CONTROL AT
MEDICAL DISPLAYS
Complete Solutions

QC Kit IBAcan VD0601405

Complete measuring kit for luminance measurements at image display devices (grayscale) according to DIN 6868-157 (acceptance tests) and IEC 61223-2-5 (constancy tests), AAPM TG18.

Consisting of:

- **Spot-Luminance-Meter LXcan**
  Incl. mask for screen contact measurements
- **Power Supply**
  With 4 adapters (RoHs conform)
- **USB-Cable***
  For automatic transfer of the measured data and for recharging batteries
- **Carrying Case**

*Alternatively to USB-Cable, but exclusively for Automatic Transfer of the Measured Data:

**Interface Cable (2 m) RS 232** VD0601460
For automatic transfer of the measured data.

Optional Accessories:

**Illuminance Detector LX-LS** VD0602960
For measuring illuminance (lux) / ambient light of image display devices and at viewing boxes.

**Tripod** VD0610200
For measuring device LXcan, adjustable height 60 cm – 153 cm.

**High Precision Mini Tripod** VD0610210
For measuring device LXcan. (This tripod version fits into the carrying case of QC Kit IBAcan.)
Spot-Luminance-Meter

Quality Assurance solutions for imaging devices, like medical displays and viewing boxes, are needed to ensure best image quality for improved diagnosis in all x-ray modalities, like Radiology, Fluoroscopy, Mammography, CT and Dental Radiology.

Unique combination of distance and screen-contact measurements in one device:

**Spot-Luminance-Meter LXcan VD0601400**

For QC-tests at image display devices (grayscale) incl. photometric detector with achromatic optic, integrated scattered light tube and mask for screen contact measurements.

**Measurement Parameters:**
- Display: 1.2” TFT (65K color)
- Alignment sensor: user definable
- Distance sensor: ultrasonic
- Targeting: display finder
- F.O.V.: 1.6°
- Measuring range: 0.05 - 10,000 cd/m²
- f' uncertainty: ≤ 3%
- Interface: USB; RS232
- Stray-light-baffle: integrated
- Weight: 450 g

**Recommended Accessory for LXcan for additional Illuminance Measurements:**

**Illuminance Detector LX-LS VD0602960**

For measurements of illuminance in lux in the range of 0.1-10,000 lx.

- The ambient light of image display devices
- At viewing boxes
Software

DisplayQ Expert DICOM Curve  
Automated measurement of the DICOM Curve of image display devices according DIN 6868-157, IEC 62563-1.

With this DisplayQ Expert DICOM Curve, the calibration according the GSDF or DICOM Curve can be determined automatically reported. While the test images will be shown in the DICOM viewer of the operator.

System requirements:
Microsoft Windows Vista SP2, Windows 7/8/10

Measurement devices:
LXcan, LXchroma, LXplus
QUALITY CONTROL IN
FILM PROCESSING
Sensitometers

**Sensitometer Unilight S** VD0204110 # 001
Suitable for constancy tests.
For exposing an X-ray film with a standard 21-step wedge.

**Sensitometer Unilight AS** VD0204104 # 001
Suitable for acceptance tests.
For exposing an X-ray film with a high precision 21-step wedge, calibrated [DIN V 6868-55].

Densitometers

**Densitometer Unilight D** VD0204108 # 001
Suitable for constancy tests.
For a stepwise measurement of optical densities from a 21-step standard sensitometer wedge and for measurements of the optical density of X-rays (film size up to 35 x 35 cm).

**Densitometer Unilight AD** VD0204102 # 001
Suitable for acceptance and constancy tests.
Functionality as densitometer Unilight D, but including calculation of the processing parameters light sensitivity (LE) and light contrast [LK].

**Densitometer Unilight ADA** VD0204102 # 001
Suitable for acceptance and constancy tests.
Functionality as densitometer Unilight D, but alternatively suitable for auto-reading of optical densities (motorized measuring section) and auto-calculating of light sensitivity (LE) and light contrast (LK). Incl. RS 232 interface.

**Densitometer Unilight D / TR** VD0204109 # 001
Suitable for constancy tests.
Functionality as densitometer Unilight D, but especially also suitable for dry laser films.

**Densitometer Unilight D i** VD0204111 # 001
Suitable for constancy tests.
Functionality as Densitometer Unilight D, but including RS 232 interface.

A Power Supply is necessary for all Types of Densitometers:
**Power Supply** VD0214260
For 110 V / 220 V DC.

Optional Accessory:
**Interface Cable** VD0204112
For Densitometer Unilight D i.

Sensitometers and Densitometers are developed according to IEC 61223-2-1, German Standards DIN 6868-2 (Constancy Tests) resp. DIN V 6868-55 (Acceptance Tests).
Combination Devices

**Sensitometer and Densitometer in one Unit:**

**Sensitometer / Densitometer Duolight** V00204300 # 001
Suitable for constancy tests. Sensitometer Unilight S and densitometer Unilight D in one unit.

**Sensitometer / Densitometer Duolight A** V00204302 # 001
Suitable for constancy tests. Sensitometer Unilight S and densitometer Unilight D in one unit with motorized measuring section for auto-reading of densities and an RS 232-interface.

**Sensitometer / Densitometer Duolight AS** V00204304 # 001
Suitable for acceptance tests. Sensitometer Unilight AS and densitometer Unilight AD in one unit. Calibrated according to DIN V 6868-55.

**A Power Supply is necessary for all Types of Combination Devices:**

**Power Supply** V00214260
For 110 V / 220 V DC.

Accessories

**Thermometer RT-1 (Digital)**
VD0219250

Software

**Software for monitoring the X-ray Film Development Process:**

**Software Infosens Light** V00002404
For one processing unit.

**Software Infosens Light** V00002405
For two processing units.

**Software Infosens Light** V00002406
For three processing units.
ACCESSORIES FOR RADIOLoGY
Frames and Stands

Stand for Test Device Primus / DIGI-13  VD0212170
As well as for solid state detector DEDX and Aluminium Pre-Attenuator.
Specifications:
- Dimensions of the stand plate in mm: 300 x 300
- Height of the stand in mm: 435

Stand for Test Device ETR1  VD0212180
As well as for solid state detector DEDX and Aluminium Pre-Attenuator.
Specifications:
- Dimensions of the stand plate in mm: 280 x 280
- Height of the stand in mm: 385

Mounting Frame, Type RW-1  VD0213100
For test devices ETR1 and DIGI-13, highly recommended for use with a chest unit.

Mounting Frame, Primus  VD0213104
To mount test device Primus or Digi-13 at the chest wall stand.

Adapters

Adapter for Small Collimators  VD0212190
Distance of collimator rails: 98 mm – 174 mm.

Adapter for Mobilett E/B  VD0212220
To be used with Siemens systems.

Adapter for Mobilett Plus  VD0212210
To be used with Siemens systems.

Adapter for Mobilett Mira Handle  VD0212241
To be used with Siemens systems.

Adapter for Practix 2000  VD02122200
To be used with Siemens systems.

Adapter for Blue Handle Mobilett XP  VD0212240
To be used with Siemens systems.

More adapters are available on request.
Filters

Additional Filter, 1 mm Cu
VD0212110
For the patient equivalent attenuator 11.5 cm x 11.5 cm.
More Al & Cu Filters in different sizes and thicknesses are available on request.

Carrying Cases

Carrying Case “Dosimax plus” VD02259720
For 1 Dosimax plus and 2 solid state detectors (RQA/RQM) or 1 ionization chamber.

Carrying Case “QC Kit IBAflu-L” VD0225115
For equipment as listed on page 15.

Carrying Case “Universal”:
Without insert, suitable for the transport of smaller, special cases in one piece of luggage.

Carrying Case “Universal with Trolley” VD0230880
Internal dimensions in mm: 600 x 600 x 235.

Further cases on request.
# Resolution Tests – Line-Group Tests

## X-ray Test Pattern

Tests for Determination of the Visual Resolution

### Line-Group Tests

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Type</th>
<th>Range of Resolution in lp / mm</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD0219122</td>
<td>1 - 83</td>
<td>0.5...5.0</td>
<td>110 x 42</td>
</tr>
<tr>
<td>VD0219122</td>
<td>4 a</td>
<td>0.5...8.0</td>
<td>45 x 45</td>
</tr>
<tr>
<td>VD0219133</td>
<td>4 b</td>
<td>0.8...5.0</td>
<td>45 x 45</td>
</tr>
<tr>
<td>VD0219134</td>
<td>4 c</td>
<td>1.4...8.0</td>
<td>45 x 45</td>
</tr>
<tr>
<td>VD0219135</td>
<td>6 - 1.0</td>
<td>1.0...2.0</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219136</td>
<td>6 - 2.0</td>
<td>2.0...3.0</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219137</td>
<td>6 - 3.0</td>
<td>3.0...4.0</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219138</td>
<td>6 - 4.0</td>
<td>4.0...5.0</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219139</td>
<td>6 - 1.8</td>
<td>1.8...3.15</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219141</td>
<td>6 - 2.8</td>
<td>2.8...5.0</td>
<td>Ø 32</td>
</tr>
<tr>
<td>VD0219125</td>
<td>16</td>
<td>0.5...4.0</td>
<td>120 x 40</td>
</tr>
<tr>
<td>VD0219142</td>
<td>18</td>
<td>0.5...5.0</td>
<td>55 x 45</td>
</tr>
<tr>
<td>VD0219128</td>
<td>18 b</td>
<td>0.5...10.0</td>
<td>47.5 x 57.5</td>
</tr>
<tr>
<td>VD0219129</td>
<td>18 c</td>
<td>0.5...16.6</td>
<td>47.5 x 57.5</td>
</tr>
<tr>
<td>VD0219124</td>
<td>18 d</td>
<td>0.5...20.0</td>
<td>47.5 x 57.5</td>
</tr>
<tr>
<td>VD0219143</td>
<td>21</td>
<td>2.0...10</td>
<td>94 x 50</td>
</tr>
<tr>
<td>VD0219100</td>
<td>38</td>
<td>0.6...5.0</td>
<td>50 x 50</td>
</tr>
<tr>
<td>VD0219146</td>
<td>41</td>
<td>0.6...3.4</td>
<td>50 x 50</td>
</tr>
<tr>
<td>VD0219147</td>
<td>42</td>
<td>2.0...6.0</td>
<td>50 x 50</td>
</tr>
<tr>
<td>VD0219130</td>
<td>43</td>
<td>3.4...10.0</td>
<td>50 x 50</td>
</tr>
<tr>
<td>VD0219131</td>
<td>68</td>
<td>1.4...8.4</td>
<td>74 x 35</td>
</tr>
<tr>
<td>VD0219103</td>
<td>80</td>
<td>2.0...6.0</td>
<td>60 x 38</td>
</tr>
<tr>
<td>VD0219101</td>
<td>81</td>
<td>0.6...10.0</td>
<td>65 x 55</td>
</tr>
</tbody>
</table>

## Besom Tests

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Type</th>
<th>Range of Resolution in lp / mm</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD0219123</td>
<td>23</td>
<td>0.5...5.0</td>
<td>150 x 50</td>
</tr>
<tr>
<td>VD0219127</td>
<td>39</td>
<td>1.5...20.0</td>
<td>60 x 30</td>
</tr>
<tr>
<td>VD0219149</td>
<td>82</td>
<td>1.0...10.0</td>
<td>80 x 40</td>
</tr>
</tbody>
</table>
# Resolution Tests – Line-Group Tests

## Tests for Determination of the Focal Spot Size

### Sector-Star Tests

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Type</th>
<th>Angle of Single Line within a Sector</th>
<th>Number and Sizes of Patterned Sectors</th>
<th>Diameter in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD0219104</td>
<td>9 / 0.5</td>
<td>0.5°</td>
<td>4 - 45°</td>
<td>55</td>
</tr>
<tr>
<td>VD0219105</td>
<td>9 / 1.0</td>
<td>1.0°</td>
<td>4 - 45°</td>
<td>55</td>
</tr>
<tr>
<td>VD0219106</td>
<td>9 / 1.5</td>
<td>1.5°</td>
<td>4 - 45°</td>
<td>55</td>
</tr>
<tr>
<td>VD0219107</td>
<td>9 / 2.0</td>
<td>2.0°</td>
<td>4 - 45°</td>
<td>55</td>
</tr>
</tbody>
</table>

### Star Tests

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Type</th>
<th>Angle of Single Line within a Sector</th>
<th>Number and Sizes of Patterned Sectors</th>
<th>Diameter in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD0219108</td>
<td>9 / 1.5 / 360</td>
<td>1.5°</td>
<td>1 - 360°</td>
<td>55</td>
</tr>
<tr>
<td>VD0219109</td>
<td>9 / 2.0 / 360</td>
<td>2.0°</td>
<td>1 - 360°</td>
<td>55</td>
</tr>
</tbody>
</table>
RADIATION SAFETY
Survey Meter

Survey Meter SM 3 D VD0401170
Portable survey meter for the measurement of the ambient dose rate equivalent dH*(10)/dt

Areas of Application:
Portable survey meter for Measurement of Ambient dose equivalent rate in Medicine, Industry, Nuclear Power Plant, and Life-Sciences, research and development facilities.

Technical Specifications:
- M-Measuring value Ambient dose rate equivalent dH*(10)/dt
- Measuring range 0.01 µSv/h ... 999 µSv/h
  Dose rate averaging every 60 seconds
- Intrinsic Error < 25 % (referring to Co-60)
- Energy range
  Photon radiation 40 keV ... 1.3 MeV
- Radiation detector
  Type energy compensated halogen-quenched Geiger-Mueller-Tube
- Overload capacity 10 - times
- Display Digital on LCD
  Audible
  Background lightning
- Power Supply
  Batteries 2 x LR 6 Type AA 1.5 V
  Battery lifetime approx. 100 hrs [at background radiation level]
- Operating conditions
  Temperature - 20 °C ... + 50 °C
  Rel. Humidity max. 90 % [at 30 °C]
- Weight ≤ 250 g
- Dimensions 145 x 80 x 40 mm
Survey Meter

Survey Meter SM 5 D VD0401180

Portable, digital pocket radiometer for measurement of the dose rate equivalent of X-rays and gamma radiation and for the measurement of the area activity of alpha and beta radiation.

Areas of Application:
Measurement of the dose rate equivalent of X-rays and gamma radiation and for the measurement of the area activity of alpha and beta radiation in Medicine, Life-Sciences, Industry, research and development facilities.

Technical Specifications:
- M-Measuring value Dose rate equivalent [µSv/h]
  Area activity [Bq/cm²]
- Measuring range Local dose rate of photon radiation
  0.1 µSv/h ... 300 µSv/h (calibrated with Co-60)
  [Signal at overflow]
  Area activity (calibrated at Am-241 and Sr-90)
  0.1 .. 199.9 Bq/cm² · ka [ka = 6 for Am-241]
  0.1 .. 199.9 Bq/cm² · kb [kb = 2 for Sr-90]
- Intrinsic error < 25 % referring to Co-60
  < 25 % referring to Sr-90
  < 25 % referring to Am-241
- Energy range Photons: 20 keV bis 2 MeV
  Beta: qualitatively, energies > 35 keV
- Radiation detector End window Geiger-Muller tube
  (area mass < 2 mg/cm²), not energy-compensated
- Display Digital on LCD
  Audible
  Background lightning
- Power supply
  Batteries 2 x LR 6 Type AA 1.5 V
  Battery lifetime approx. 100 hrs [at background radiation level]
- Operating conditions
  Temperature 0 °C ... + 50 °C
  Rel. Humidity max. 75 % [at 30 °C]
- Weight ≤ 250 g
- Dimensions 145 x 80 x 40 mm
Survey Meter SM 7 D VD0401180

The SM 7D is a high sensitive pocket radiometer to detect low activity of alpha, beta, X-ray and gamma radiation. It includes an USB interface. Over an optional available PC- software the measured values can be displayed and analyzed.

Areas of Application:
Medicine, Life-Sciences, Industry, research and development facilities
Measurement of pulse rates in mixed alpha, beta and gamma radiation fields, Evaluation of workplaces. Because of the high sensitivity of the detector, the device is suited for school experiments with natural radioactivity.

Technical Specifications:
- Measuring range Pulse rate 0 .. 1999.9 cps
  (measurement range overflow indication)
- Timer / Impulse 1 .. 119940 counts
- Measuring time adjustable (10 sec, 30 sec, 60 sec)
- Sensitivity 6 cps / µSv/h [refering to Co-60]
- Energy range Photons: 10 keV bis 1.3 MeV
  Beta: qualitatively, energies > 160 keV
  Alpha: > 2 MeV
- Radiation detector End window Geiger-Mueller tube
  (area mass density < 2 mg/cm²), not energy-compensated, effective diameter 44.5 mm
- Display Digital on LCD with background lighting
  Audible pulse signalisation
- Outputs USB-port (optional)
  Evaluation software (optional)
- Power supply
  Batteries 2 x LR 6 Type AA 1.5 V
  Battery lifetime approx. 100 hrs [at background radiation level]
- Operating conditions
  Temperature 0 °C ... + 50 °C
  Rel. Humidity max. 75 % [at 30 °C]
- Weight ≤ 400 g
- Dimensions 152 x 83 x 35 mm

Option:
SM 7 D incl. Software VD0401190
Survey Meter

**Survey Meter OD-01**

For measurements of ambient and directional equivalent dose of pulsed radiation fields and dose rate of X-rays, gamma and beta radiation.

**Measurement Parameters:**
- Detector type: Air-opened ionization chamber
- Dose rate display: 0 ... 2000 µSv/h, 0 ... 2000 mSv/h
- Photon energy range: 6 keV - 7.5 MeV
  (15 MeV with optional PMMA-moderator lid)
- Beta energy range: 60 keV - 2 MeV

**Optional Accessories:**
- **Connecting Cable**
  VD0401111
  50 m for survey meter OD-01 nec.
- **PMMA-Moderator Lid**
  VD0401112
  For measurements up to 15 MeV.
- **Software**
  VD0401115
  For survey meter OD-01.

---

Personal Dosimeter

**Electronic Personal Dosemeter ED 150**

with alarm function and dose rate indication for the detection of the personal γ-dose when handling ionising radiation.

PTB-approved dosemeter for measuring gamma and X-rays for the measuring size Hp(10) (personal dose equivalent)
- Detector: energy compensated GM tube
- Radiation in front of the user’s body
  (detection of a solid angle of 180 °)
- 4 preset dose and dose rate alarm thresholds

**Measuring Areas:**
- Dose indication range:
  0.1 µSv ≤ Hp(10) ≤ 10 Sv
- Dose rate indication range:
  0.1 µSv/h – 1.5 Sv/h
- Dose rate measuring range:
  1 µSv/h - 1.5 Sv/h
DOSE AREA PRODUCT METERS
Dose Area Product Meters [DAP-meters]

The Convenient Solution for the Determination of Diagnostic Reference Levels and Individual Patient Dose Values and QA Measurements

Compliance with the following Standards:
- IEC 60580 “Medical Electrical Equipment - Dose area product meters”
- IEC 60601-1 "Medical Electrical Equipment - General requirements for basic safety and essential performance”.
- The light transparency of more than 75 % and the extended kV range starting from 40 kV underline the outstanding features of the system.
- Easy installation due to cost effective and flexible cabling system based on tele communication standard cable (no high voltage cable is used).

KermaX® plus TinO (Two in One)

DAP-meter and real-time dosimeter (time resolution: 500 µs) dedicated to measure simultaneously DAP/DAP rate as well as
- Cumulative air kerma (real time dosimeter)
- Air kerma rate
- Exposure time (KermaX® plus TinO DDP)
- Suitable for measurements in pediatric applications due to its digital resolution of 0.01 µGy•m²

KermaX® plus TinO IDP 120-TinO-IDP
Rectangular, transparent ionization chamber with integrated electronics, a 10-digit internal background lighting LC-Display, interface optionally.

KermaX® plus TinO DDP 120-TinO-DDP
Rectangular, transparent ionization chamber with integrated electronics and a “Dual Line Display” with two very bright LED display lines indicating either DAP / DAP-rate and exposure time or dose/dose rate; printer interface.
DAP-meters

**KermaX® plus IDP 120-IDP**
Ideal solution for a quick and convenient retrofit installation dedicated to measure DAP and DAP rate for patient dose monitoring.

- Rectangular, transparent ionization chamber with integrated electronics and a 10-digit internal background lighting LCD display; optional RS 232 / RS 485 for computer or printer interface
- Suitable for measurements in pediatric applications due to its digital resolution of 0.01 µGym²

**KermaX® plus SDP 120-SDP**
Easy to install standard dosimeter dedicated to measure DAP and DAP rate for patient dose monitoring.

- Rectangular, transparent ionization chamber with integrated electronics and a separate 10-digit background lighting LCD Single Line Display providing an RS 232 PC / Printer interface
- Suitable for measurements in pediatric applications due to its digital resolution of 0.01 µGym²
DAP-meters

**KermaX® plus DDP “Single”**

120-DDP S

Duo-channel multifunctional dosimeter dedicated to measure DAP or DAP rate or exposure time in patient dose monitoring.

- One rectangular, transparent ionization chamber with integrated electronics and “Dual Line Display D” with two very bright LED display lines indicating either the DAP / DAP rate or exposure time
- The system provides two RS 232 interfaces (RIS/HIS and printer connection)

The chambers can be delivered in the highly sensitive version on request.

**KermaX® plus DDP “Duo”**

120-DDP D

Duo-channel multifunctional dosimeter dedicated to measure DAP or DAP rate or exposure time in patient dose monitoring.

- Two rectangular, transparent ionization chambers with integrated electronics and “Dual Line Display D” with two very bright LED display lines indicating either the DAP / DAP rate or exposure time
- The system provides two RS 232 interfaces (RIS/HIS and printer connection)

The chambers can be delivered in the highly sensitive version on request.
DAP-meters

*KermaX® plus C* 120-C
Easy to install standard dosimeter dedicated to measure DAP and DAP rate for patient dose monitoring.

- Circular, nontransparent or transparent ionization chamber with separated electrometer box and a separate 10-digit background lighting LCD Single Line Display providing an RS 232 PC / Printer interface
- Standard resolution: 0.1 µGym²

Four standard sizes are available; customized solutions on request.

Accessories

**Printer Set “Star”** 120-Star

Consisting of:
- Robust matrix-printer, type Star
- Printer cable
- Power supply
- 1 set of labels (1,000 pcs.)

**Printer Set “Zebra S”** 120-Zebra_S

Consisting of:
- Robust thermo-printer, type Zebra LP2824
- Printer cable
- Power supply
- 1 set of labels (1,680 pcs.)

Adapters, Rails and Cables
There are multiple optional adapters, rails and cables which can be used with all KermaX plus and KermaX® plus TinO Systems.

More detailed information on request.
### Measuring Devices Overview

<table>
<thead>
<tr>
<th>Feature</th>
<th>Dosimax plus I</th>
<th>Dosimax plus A</th>
<th>MagicMax kV-MAM</th>
<th>MagicMax MAM</th>
<th>MagicMax Universal</th>
<th>MagicMax Universal</th>
<th>MultiMax R/Fu/Dent</th>
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- **Standard**: ●
- **Optional**: ○

**Legend**

- ● Standard
- ○ Optional
### Measuring Devices Matrix

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<th>Dose</th>
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<th>Dose per pulse</th>
<th>Time</th>
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**Radiography**

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**Digital**

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**CT**

| Luminance [cd/m²] | ● | ● | ● | ● | ● |
| Luminance [lx] | ● | ● | ● | ● | ● |

| Dosimax plus I | ● | ● | ● | ● | ● |
| Dosimax plus A | ● | ● | ● | ● | ● |
| Dosimax plus A - HV | ● | ● | ● | ● | ● |
| Dosimeter MagicMax Rad/Flu/Dent | ● | ● | ● | ● | ● |
| Dosimeter MagicMax Universal | ● | ● | ● | ● | ● |
| Dosimeter MagicMax MAM | ● | ● | ● | ● | ● |
| MagicMaX kV-meter | ● | ● | ● | ● | ● |
| MagicMaX Rad/Flu/Dent kV-meter | ● | ● | ● | ● | ● |
| MagicMaX MAM Multimeter | ● | ● | ● | ● | ● |
| MagicMaX Universal Multimeter | ● | ● | ● | ● | ● |
| MagicMaX Rad/Flu/Dent Multimeter | ● | ● | ● | ● | ● |
| MagicMax MAM LX | ● | ● | ● | ● | ● |

| Light measurement | ● | ● | ● | ● | ● |

| Dosimax plus I | ● | ● | ● | ● | ● |
| Dosimax plus A | ● | ● | ● | ● | ● |
| Dosimax plus A - HV | ● | ● | ● | ● | ● |
| Dosimeter MagicMax Rad/Flu/Dent | ● | ● | ● | ● | ● |
| Dosimeter MagicMax Universal | ● | ● | ● | ● | ● |
| Dosimeter MagicMax MAM | ● | ● | ● | ● | ● |
| MagicMaX kV-meter | ● | ● | ● | ● | ● |
| MagicMaX Rad/Flu/Dent kV-meter | ● | ● | ● | ● | ● |
| MagicMaX MAM Multimeter | ● | ● | ● | ● | ● |
| MagicMaX Universal Multimeter | ● | ● | ● | ● | ● |
| MagicMaX Rad/Flu/Dent Multimeter | ● | ● | ● | ● | ● |
| MagicMax MAM LX | ● | ● | ● | ● | ● |

**Light measurement**

| Luminance [cd/m²] | ● | ● | ● | ● | ● |
| Luminance [lx] | ● | ● | ● | ● | ● |

- ● Standard
- ● Optional Sensor

**Legend**

- Multimeter
- Dose meter
- Light Measurement Device
- kV - Meter

Dose meter only for constancy check
Radiography / Fluoroscopy
Artinis:
Contrast-Detail-Phantom CDRAD
Contrast-Detail-Phantom CD DISC 2.0

Mammography
Artinis:
Test Device PASMAM 1054 C
Test Device Mam-14
Test Device Mam-162
Contrast-Detail-Phantom CDMAM
PMMA Spacer Set
DIGIMAM Phantom
EU Test Set
Pehamed:
Mammographic Step Wedge
Test Device Breast Compression

Computed Tomography
IRIS:
Software CT QALite
The Phantom Lab:
Catphan 500 Phantom
Catphan 600 Phantom
Catphan 700 Phantom

Dental Radiography
Artinis:
Contrast-Detail Phantom CDDENT

Film Processing
Pehamed:
Software Infosens

Accessories for Radiology
Hüttner:
Line Pair Tests

Radiation Safety
Graetz:
Electronic Personal Dosemeter ED 150
STEP:
Survey Meter 3D
Survey Meter 5D
Survey Meter 7D
Survey Meter OD-01

Dose Area Product Meters
Seiko:
Printer Set “Star”
Zebra:
Printer Set “Zebra S”
IBA offers innovative high-quality solutions and services with a focus on patient safety in cancer diagnosis and therapy.

Medical Imaging:
Safer Imaging, Earlier Cancer Detection
- Innovative Quality Assurance (QA) devices for x-ray dose and image quality checks, as well as QA of diagnostic displays
- Patient dose monitoring solutions for x-ray imaging systems

Radiation Therapy:
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- Industry-leading dosimetry and QA solutions that maximize efficiency and minimize errors for better outcomes
- Flexible soft tissue imaging markers (VISICOIL™) enable precise tumor targeting and tracking for pinpoint RT, IGRT and SBRT treatment accuracy and patient safety
- Undisputed leader in Proton Therapy delivery systems: Providing highly precise and effective radiation therapy

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