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## Quality Control for Diagnostic Imaging Modalities

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**CARE** program 70
Complete QA Solutions in Digital Radiology
Image Quality & Dose Control

MagicMax Universal Multimeter

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

➤ Over 20 years of innovations
Proven and certified by leading authorities

NEW SALES & SERVICE OFFICE
IBA Dosimetry America
Bartlett, TN 38133, USA
Tel.: +1 901 386 2242
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 L phantom for Digital & conventional Radiography and Fluoroscopy; Test device PASMAM for constancy tests / Quality Checks of Mammographic equipment according PAS 1054; incl. PMMA attenuator.

➤ 2-part PMMA CT-Phantom VD1003110
Adult Head & Body / Pediatric Body.

➤ Test device PASMAM 1054
Test phantoms for Mammography image QA.

➤ Multidetector XR for Radiography 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 VD1020100
CT Ionization Chamber 10 cm.

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

➤ Illuminance Detector
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 Solution Kits Rad / Flu

**MagicMaX Universal Rad / Flu Case** VD0250122
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 L 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:** Light output measurements of image intensifiers and viewing boxes
➤ **Rad / Flu Carring Case**

**MagicMaX Universal Multimeter Solution Rad / Flu Kit** VD0250122_US
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:** Light output measurements of image intensifiers and viewing boxes
➤ **Carrying Case**

For more technical information, please see the MagicMaX family matrix at the end of the brochure!
**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 V 6868-57, AAPM TG18.

Consisting of:
- **Test Device DIGI-13** VD0203560
- **Al-Pre-Attenuator, 25 mm**
  With supporting plate VD0503200
- **Dosimeter DOSIMAX plus I**
  (basic unit) VD0201748
- **Solid State Detector RQA** VD0202850
- **Detailed Check Instruction**
  and Form R-F13 on CD VD0230204
- **Spot-Luminance-Meter LXcan**
  Incl. mask for screen contact measurements VD0601400
- **Power Supply with 4 Adapters**
  (RoHs conform) VD0601410
- **USB-Cable** VD0601450
  For automatic transfer of the measured data and for recharging batteries
- **Carrying Case** VD0225155

*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 IBArad-digital.)
- **Mounting Frame RW-1** VD0213100
  For test device DIGI-13.

**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 44.
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 L VD0203520
  Dimensions in mm: 300 x 300 x 18.5
➤ Dosimeter DOSIMAX plus I
  (basic unit) VD0201748
➤ Solid State Detector RQA
  VD0202850
➤ Detailed Check Instruction
  Fluoroscopy and Form according to DIN 6868-4, 2007
  on CD VD0230409
➤ Stand VD0212170
  For test device Primus L and solid state detector DEDX
➤ QC Kit IBAcan VD0601405
➤ Carrying Case VD0225115

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

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 44.
QC Kit IBArad/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/-3/-4.

Consisting of:

- **Test Device ETR1** VD0203100
  - Including centering tube
  - Dimensions in mm: 280 x 280 x 18.5
- **Dosimeter DOSIMAX plus I** (basic unit) VD0201748
- **Solid State Detector RQA** VD0202850
- **Detailed Check instruction on CD** VD0230201
- **Stand for Test Device ETR1** VD0212160
- **Sensitometer / Densitometer DUOLIGHT** VD0204300
- **Power Supply** (for 110 V / 220 V DC) VD0214260
  - Absolutely necessary for Sensitometer / Densitometer DUOLIGHT
- **Thermometer RT-1** (digital) VD0219250
- **Carrying Case RK-1** VD0225100

**Recommended as Attenuation Body (not included in the Set):**

- Aluminum Pre-Attenuator, 25 mm VD0503200
  - With supporting plate.

**Optional:**

- **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-radiflu/ident**
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 solid state micro footprint Multi-Detector "XR"
- Ability to attach an additional solid state detector for dose measurements
- Including robust aluminum carrying case
- Dosimeter part is designed according to IEC 61674

**Measurement Parameters:**
- Dose / dose rate
- Dose per pulse
- kVp
- 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 RQA** VD0202850
  For use with MagicMax.
- **Solid State Detector RQM** VD0202860
  For use with MagicMax.

For more technical information, please see the MagicMax family matrix at the end of the brochure!
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:**
- EeePC VD0201930
  Instead of your own laptop.
- Current Probe VD0201975
- Solid State Detector RQM VD0202860
  For use with MagicMaX.

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

**Dosimeter Dosimax plus A**
(basic unit) VD0201747, Detector RQA VD0202850
PTP-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:**
- Official Verification CF1E1003
  Of dosimeter DOSIMAX plus A
  by a German office of legal metrology.
- 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
According to IEC 61674; single-channel dosimeter for constancy tests at radiographic and fluoroscopic X-ray units.
In Rad/Flu for use with the appropriate solid state detector (RQA or DEDX).

**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).

**Dosimeter DOSIMAX plus Duo incl. Sandwich Detector DE2DX**
VD0201460
Dual-channel dosimeter especially for constancy tests at radiographic and fluoroscopic X-ray units with sandwich detector DE2DX. Entrance and exit dose / dose rate measurement with one single exposure.

**Measurement Parameters:**
- Dose: 20 μGy - 9.999 Gy
- Dose rate (entrance dose): 20 μGy/s - 1 Gy/s
- Dose rate (exit dose): 2 μGy/s - 400 mGy/s
- Time: 1 ms - 20 s
- kV-range combined with DE2DX: 50 - 150 kV

The dosimeters DOSIMAX plus A, DOSIMAX plus I and DOSIMAX plus duo 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:**
- 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**

**Solid State Detector RQA**  
VD0202850  
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.

Length of detector cables: 2 m.
Test Devices

**Test Device Primus L**  
(standard model)  
VD0203520  
For quality checks at digital & conventional radiographic and fluoroscopic X-ray units (according to DIN 6868-4, 2007).

**Test Parameters:**  
➤ Spatial resolution  
➤ Verification of used kV-range  
➤ 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**  
  VD0203521  
  Dimensions in mm: 300 x 300 x 31.  
  Consisting of 30 mm PMMA and 1 mm Copper.

**Option / Additional Accessory:**  
**Stand for Test Device Primus L / Digi 13**  
VD0212170

For more information see chapter "Accessories for Radiology".

**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

---

**IBA DOSIMETRY RADIOGRAPHY / FLUOROSCOPY**
**Test Device ETR1 incl. Centering Tube** VD0203100
For quality checks in conventional (analog / film-based) radiography and fluoroscopy (DIN 6868-3, -4 and IEC 61223-2-9 / -2-11).

**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".
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 L / Digi 13  VD0212170
For more information see chapter "Accessories for Radiology".

DSA Test Device incl. Carrying Case  VD0203300
For quality tests in digital subtraction angiography (IEC 61223-3-3 and DIN 6868-4, 2007).

Test Parameters:
➤ Dynamic range
➤ DSA contrast sensitivity
➤ Artifacts
➤ Logarythmic check
Contrast-Detail-Phantom CDRAD VD0203750
(including analyzer-software and carrying case)

For quality control in radiography.

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

**Test Parameters:**
- Contrast and spatial resolution
- Optimization, evaluation and comparison of different radiologic systems
- Determination of the optimum exposure technique and background density
- Comparison of image quality at various thicknesses of PMMA
- 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
- 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.)

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 L
  (Please see page 10 for more information)
➤ Beam Alignment Test Tool (Please see above)
Test Set AEC-Systems for Radiography  
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 61223-3-1.

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  
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

Tungsten Edge Test Device TX 5  
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
Quality Control in Mammography
Complete Mammography QA Solution Kits

**MagicMax Universal Mammo Case** 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
- **Test device PASMAM 1054**
  Test phantoms for Mammography image QA
- **Multidetector XM for Mammography**
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form*
- **MagicMax Current Probe**
  Unique invasive and non-invasive measurements of the tube current
- **Illuminance Detector**
  Light output measurements of image intensifiers and viewing boxes
- **Carrying Case Mam**

**MagicMax Universal Multimeter Solution Mammo Kit** VD0250123_US
Your All-In-One 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 XM for Mammography**
  Measuring values: kVp, PPV, HVL, dose, dose rate, dose per pulse, exposure time and wave form*
- **MagicMax Current Probe**
  Unique invasive and non-invasive measurements of the tube current
- **Illuminance Detector**
  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.
For luminance / illuminance measurements of your image display device, please see chapter "Quality Control at Medical Displays", page 44.

**QC Kit IBAmam-analog** VD0250373
Complete measuring kit for quality checks at conventional mammographic installations according to DIN 6868-7 / DIN V 6868-152 / EPQC (EUREF).

**Consisting of:**
- **Test Device Mammo-152** VD0203434
  Dimensions in mm: 180 x 240
- **Dosimeter DOSIMAX plus I** (basic unit) VD0201748
- **Detector RQM** VD0202860
  For mammographic installations
- **Magnifying Glass** VD02192001
  For 8-fold magnification
- **Foam Material Cuboid** VD0203450
  For checking the compression pressure
- **Carrying Case** VD0225300

**Additional Accessory:**
**Test Device FFA 4090 M** VD0203281
For checking the film-screen contact in mammography – ISO 4090.

**Measuring Set IBAmam-digital according to PAS 1054** VD0250155
Complete measuring set for constancy tests at digital mammographic installations according to PAS 1054.

**Consisting of:**
- **Test Device PASMAM 1054 C**
  Incl. carrying case VD0203715
- **Dosimeter DOSIMAX plus I** (basic unit) VD0202860
- **Detector RQM** VD0202860
  For mammographic installations
- **Carrying Case for Dosimeter DOSIMAX plus Series** VD0225720
  Offers space for 1 DOSIMAX plus and 2 solid state detectors (not DEDX/DE2DX)

**Optional:**
**Contrast-Detail-Phantom CDMAM** VD0203701
With software, incl. carrying case
Multimeters

Multimeter MagicMaX-rad/flu/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 2 base units, each with one fixed Multimeter detector (XR and XM)
➤ Possibility to connect additional solid state detectors for dose measurements
➤ Including aluminum carrying case
➤ Dosimeter part is constructed according to IEC 61674

Measurement Parameters:
➤ Dose / Dose rate
➤ Dose per pulse
➤ kVp
➤ 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:

Multimeter MagicMaX-mam VD0201950

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

**Dosimeter Dosimax plus A**
(basic unit) VD0201747, Detector RQM VD0202860
PTP-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:**
- Official Verification CF1E1003
  Of dosimeter DOSIMAX plus A
  by a German office of legal metrology.
- 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, Detector RQM VD0202860

Single-channel dosimeter for QA tests at radiographic, fluoroscopic and mammographic X-ray units. In Mammo 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).

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

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**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:**
- kV
- 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

**Solid State Detector RQM**  VD0202860
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.

➤ All in one device
➤ Cost efficient solution
➤ Workflow convenience
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
- Spatial resolution
- Contrast and image resolution
- Artifacts
- Geometry
- Check of missed tissue at chest wall

**Contrast-Detail-Phantom CDMAM** VD0203701

- Aid for optimization and evaluation of digital mammography systems
- For determination of the optimum exposure technique and background density
- Comparison of image quality at various thicknesses of PMMA and with various film-screen combinations
- Contrast detail curve test
- Low contrast and spatial resolution

Described in the “European Protocol for digital Mammography”.

**Consisting of:**
- 1 x 0.5 mm Aluminum (99.5 %) base with gold discs (99.99 % pure gold) with 16 different thicknesses (0.03 .. 2.00 μm) and 16 different diameters (0.06 .. 2.0 mm), covered by a 5.5 mm PMMA plate
- 4 x 10 mm PMMA plates
- 1 x 5 mm PMMA plate
- CDMAM Analyzer-Software
- Carrying case

**Option / Additional Accessorie:**

**PMMA Spacer Set** VD0203782

10 pieces of spacers 180 x 15 mm, with the following thicknesses 10, 8, 5 und 2 mm.
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

Test device PASMAM 1054 A/C  
VD0203710

For Acceptance- and Constancy Tests of Mammographic Equipment according PAS 1054

Consisting of:
➤ 40 mm basic body with integrated Al step wedge with 14 steps from 0 to 5.2 mm
➤ 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
➤ Attenuation body 3 x 20 mm PMMA
➤ Attenuation body 1 x 10 mm PMMA
➤ Attenuation body 1 x 6 mm PMMA (at some X-ray units necessary)
➤ Test insert for acceptance tests with golden discs – AP
➤ Test insert PMMA with square marking
➤ Test insert for constancy tests – ACR
➤ Test insert high contrast resolution
➤ Test insert contrast to noise ratio
➤ Carrying case

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 44.
**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

**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** VD0203602

**Specifications:**
- 21 steps (Al)
- Dimensions in mm: 10 x 6.3 x 105

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

**Breast Compression Test Device for Mammography** VD0403910

**Specifications:**
- Force range: 3 - 30 kg (6 - 66 lbs)
- Contact area: 8.5 cm diameter

**Test Parameter:**
- Compression force in automatic and manual models for assuring accuracy and reproducibility
**Test set AEC-Systems for Mammography**  
**VD0203810**  
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**  
**VD0403310**  
For determination of half value layer in mammography.

**Specification:**

- 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 CT QA Solution Kits

MagicMax Universal CT Case VD0250124
Your complete solution for CTDI measurements.*

Consisting of:
➤ MagicMax Universal Multimeter VD1003105
with integrated high voltage module for Ionization Chambers
➤ DCT10-MM VD1020110
CT Ionization Chamber 10 cm
➤ 3-Part PMMA CT Phantom VD1003105
for dose measurements (set for adults & pediatric)
➤ Illuminance Detector VD0201951
For use with MagicMax Universal;
Measurement range 1 – 10,000 lx
➤ Trolley Case for convenient transportation

Optional devices:
➤ MagicMax Current Probe VD0201975
➤ Multidetector XR for CT in tomo mode (non-rotational), Radiography, Fluoroscopy

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 VD1020110
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 VD0201951
Light output measurements of image intensifiers and viewing boxes
➤ Carrying Case

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

**QC Kit IBAct Advanced** 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 VD1003105
  Adult head & body / pediatric head & body
- Dosimeter Dosimax plus A HV VD0201790
  With internal high voltage supply for use with ionization chamber DCT10-RS
- Ionisation Chamber DCT10-RS / Lemo VD1020100
- Extension Cable, 8 m VD0211101
- Specialist Booklet “Radiation Exposure in Computed Tomography” VD1019101
- Carrying Case VD0225250
  With removable trolley

**QC Kit IBAct Standard** VD1050102
Adult Head & Body / Pediatric 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 VD1003110
  Adult head & body / pediatric body
- Dosimeter Dosimax plus A HV VD0201790
  With internal high voltage supply for use with ionization chamber DCT10-RS.
- Ionisation Chamber DCT10-RS / Lemo VD1020100
- Extension Cable, 8 m VD0211101
- Specialist Booklet “Radiation Exposure in Computed Tomography” VD1019101
- Carrying Case VD0225250
  With removable trolley

Optional:
**Official Verification** CF1E1003
Of dosimeter DOSIMAX plus A HV by a German office of legal metrology.

For luminance / illuminance measurements of your image display device, please see chapter “Quality Control at Medical Displays”, page 44.
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 μGy·cm - 999 Gy·cm
- Dose length product rate:
  - 1 mGy·cm/s - 0.5 Gy·cm/s
- Time: 1 ms - 19999 s

**Options / Additional Accessories:**
- **Official Verification** CF1E1003
  Of dosimeter DOSIMAX plus A HV by a German office of legal metrology.
- **Carrying Case** VD0225720
  For dosimeter DOSIMAX plus series; Offers space for 1 DOSIMAX plus and 1 ionization chamber.

Ionisation Chamber

**Ionization Chamber**

**DCT10-RS / Lemo** VD1020100

For DLP (in mGy·cm) and CTDI measurements at CT scanners, according to IEC 61223-2-6, -3-5, 100 - 150 kV.

**Specification:**
- Active length: 100 mm
- Length of chamber cable: 2 m
Software CT QALite VD0010140

- 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 VD1003105
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
- 1 adapter for ionization chamber DCT10-RS / Lemo

2-part PMMA CT-Phantom
Adult Head & Body / Pediatric Body VD1003110
Phantom for CTDI measurements according to IEC 60601-2-44, IEC 61223-3-5, IEC 61223-2-6.

Consisting of:
- 1 adult head-/pediatric body phantom, 16 cm diameter, 5 holes
- 1 adult body annulus, 32 cm diameter, 4 holes
- 9 acrylic rods for plugging all the phantom holes
- 1 adapter for ionization chamber DCT10-RS / Lemo
**Catphan 500 Phantom** VD0403450
(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** VD0403460
(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** VD0403470

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
Quality Control in Dental Radiography
Multimeter

**Multimeter MagicMaX-dent VD0201960**
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 Multi-Detector ”XR”
- Ability to attach an additional solid state detector for simultaneous measurements of exit and entrance dose
- Including aluminum carrying case
- Dosimeter part is constructed according to IEC 61674

**Measurement Parameters:**
- Dose / Dose rate
- Dose per pulse
- kVp
- 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 RQA VD0202850**
  For use with MagicMaX.

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

Dosimeter MagicMax-radflu/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:
EeePC 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

Options / Additional Accessories:
Official Verification CF1E1003
Of dosimeter DOSIMAX plus A by a German office of legal metrology.

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

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

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 MagicMaXradflu/ident 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:**
- kV
- Time
- Total filtration
- Half value layer (HVL)
- Wave form

**Options / Additional Accessories:**
- EeePC VD0201930
  Instead of your own laptop.

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

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**Detectors**

**Solid State Detector RQA VD0202850**

For quality checks and acceptance tests at radiographic, fluoroscopic and dental X-ray units, 50 - 150 kV.

Length of detector cable: 2 m

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**MagicMaX-Current Probe VD0201975**

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

- All in one device
- Cost efficient solution
- Workflow convenience

For luminance / illuminance measurements of your image display device, please see chapter "Quality Control at Medical Displays", page 44.

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41 IBA DOSIMETRY DENTAL RADIOGRAPHY
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 16 mm).
**Contrast-Detail-Phantom CDDENT** VD0203719
(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** VD0903220

**Additional Filter, 1 mm Cu** VD09032202
For use with Secondary attenuator at panoramic dental X-ray units.

**Holder for Supporting Plate,**
**Type GENDEX** VD0903210

**Holder for Supporting Plate,**
**Type SIRONA** VD0903230

**Universal Holder for Dental Test Devices** VD0903250
Including suction pad.
Quality Control at Medical Displays
Complete Medical Display
QA Solutions

**QC Kit IBAcan** VD0601405

Complete measuring kit for luminance measurements at image display devices (grayscale) according to DIN V 6868-57 (acceptance tests) and IEC 61223-2-5 (constancy tests), AAPM TG18.

**Consisting of:**
- **Spot-Luminance-Meter LXcan** VD0601400
  Incl. mask for screen contact measurements
- **Power Supply** VD0601410
  With 4 adapters (RoHs conform)
- **USB-Cable** VD0601450
  For automatic transfer of the measured data and for recharging batteries
- **Label BWG** green VD0601109 & red VD0601108
- **Carrying Case** VD0225905

**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.)

*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.
**QC Kit IBAchroma** VD0601505

Complete measuring kit for luminance and color measurements at image display devices (color and grayscale) according to DIN V 6868-57 (acceptance tests) and IEC 61223-2-5 (constancy tests), AAPM TG18.

Consisting of:

- **Spot-Luminance-Meter & Colorimeter LXchroma**, VD0601500
  BTS-256P Bi-Tech-Sensor for photometric and spectral colorimetric data, with internal scattered light tube and mask for screen contact measurements

- **Power Supply** VD0601410
  With 4 adapters (RoHs conform)

- **USB-Cable** VD0601450
  For automatic transfer of the measured data and for recharging batteries

- **Label BWG** green VD0601109 & red VD0601108

- **Carrying Case** VD0225905

*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 LXchroma, adjustable height 60 cm – 153 cm.

- **High Precision Mini Tripod** VD0610210
  For measuring device LXchroma.
  (This tripod version fits into the carrying case of QC Kit IBAchroma.)

---

46 IBA DOSIMETRY MEDICAL DISPLAYS
Spot-Luminance-Meter / Colorimeter

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
- f1’ uncertainty: ≤ 3%
- Interface: USB; RS232
- Stray-light-baffle: integrated
- Weight: 450 g

**Spot-Luminance-Meter & Colorimeter LXchroma VD0601500**

For QC-tests at image display devices (color and grayscale) incl. BTS-256P Bi-Tec-sensor for integral photometric and spectral colorimetric data, integrated scattered light tube and mask for screen contact measurements.

**Measurement Parameters:**

- Colorimetric measurement data: x, y, CCT
- Colorimetric measurement range: 1 to 10,000 cd/m²
- 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
- f1’ uncertainty: ≤ 3%
- Interface: USB; RS232
- Stray-light-baffle: integrated
- Weight: 500 g
- Measurement accuracy x, y: ± 0.005
Recommended Accessory for LXcan/LXchroma 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
Quality Control in Film Processing
**Sensitometers**

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

**Sensitometer Unilight AS**  VD0204104  
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  
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**  VD0204100  
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  
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  
Suitable for constancy tests.  
Functionality as densitometer Unilight D, but especially also suitable for dry laser films.

**Densitometer Unilight D i**  VD0204111  
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) and classified as Medical Devices according to EU Directive 93/42 (MDD).
Combination Devices

Sensitometer and Densitometer in one Unit:

**Sensitometer / Densitometer Duolight** VD0204300
Suitable for constancy tests. Sensitometer Unilight S and densitometer Unilight D in one unit.

**Sensitometer / Densitometer Duolight A** VD0204302
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** VD0204304
Suitable for acceptance tests. Sensitometer Unilight AS and densitometer Unilight AD in one unit. Calibrated according to DIN V 6868-55.

**Sensitometer / Densitometer Duolight AS A** VD0204306
Suitable for acceptance tests. Sensitometer Unilight AS and Densitometer Unilight ADA in one unit. Calibrated according to DIN V 6868-55.

A Power Supply is necessary for all Types of Combination Devices:
**Power Supply** VD0214260
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** VD0002404
For one processing unit.

**Software Infosens Light** VD0002405
For two processing units.

**Software Infosens Light** VD0002406
For three processing units.
Accessories for Radiology
Frames and Stands

**Stand for Test Device Primus L / 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** VD0212160
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.

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 Practix 2000** VD0212200
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, 1mm 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 IBArad-digital” VD0225155
For equipment as listed on page 14.

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

Carrying Case “QC Kit IBAradiflu-analog” VD0225100
For equipment as listed on page 16.

Carrying Case “QC Kit IBAmam-analog” VD0225300
For equipment as listed on page 27.

Carrying Case with Removable Trolley “QC Kit IBAct” VD0225250
For equipment as listed on page 32.

Carrying Case “QC Kit IBAcan”
VD0225905
For equipment as listed on page 42.

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

Carrying Case “Universal” VD0230850
Internal dimensions in mm: 459 x 319 x 110.

Carrying Case “Universal-Medium” VD0230860
Internal dimensions in mm: 459 x 319 x 160.

Carrying Case “Universal-Large” VD0230870
Internal dimensions in mm: 459 x 319 x 210.

Carrying Case “Universal with Trolley” VD0230880
Internal dimensions in mm: 600 x 600 x 235.
## 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>
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<tr>
<td>VD0219132</td>
<td>4 a</td>
<td>0.5...8.0</td>
<td>45 x 45</td>
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<tr>
<td>VD0219133</td>
<td>4 b</td>
<td>0.8...5.5</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>
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<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>
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<td>0.6...3.4</td>
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<td>VD0219147</td>
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<td>2.0...6.0</td>
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<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>
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<tr>
<td>VD0219103</td>
<td>80</td>
<td>2.0...6.0</td>
<td>60 x 38</td>
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<tr>
<td>VD0219101</td>
<td>81</td>
<td>0.6...10.0</td>
<td>65 x 55</td>
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### 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>
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<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>
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## Tests for measuring Modulation Transfer Function (MTF)

<table>
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<tr>
<th>Order No.</th>
<th>Type</th>
<th>Range of Resolution in lp / mm</th>
<th>Dimensions in mm</th>
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</thead>
<tbody>
<tr>
<td>VD0219110</td>
<td>52</td>
<td>0.05+0.1+0.25...3.4+3.7</td>
<td>95 x 50</td>
</tr>
<tr>
<td>VD0219126</td>
<td>53</td>
<td>0.25+0.5...10.0...6.0</td>
<td>71 x 44</td>
</tr>
<tr>
<td>VD0219150</td>
<td>54</td>
<td>0.5+0.1+0.25...3.55...2.8</td>
<td>80 x 44</td>
</tr>
<tr>
<td>VD0219151</td>
<td>56</td>
<td>0.25...10...5.2</td>
<td>62 x 44</td>
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</tbody>
</table>

## 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>
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</table>

### Star Tests

<table>
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<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>
Quality Control in Ultrasound
Ultrasound Phantoms

The Precision Multi-Purpose Grey Scale Phantom 403GS LE and Precision Small Parts Grey Scale Phantom 403 GS LE offer new advanced technology for measuring the image quality of high resolution ultrasound systems.

The 403GS LE and 404 GS LE phantoms incorporate the new Tissue Mimicking™ gel which provides a smoother background texture than conventional tissue mimicking gels. This gel reduces the backscatter that is inherent in other TM gels and is fully compatible with the latest in tissue harmonics equipment and technology.

**Gammex 403 GS LE VD0403350**

**Test Parameters:**
- Axial and lateral resolution targets at depths of 3, 8 and 14 cm for precise resolution measurements of any ultrasound system
- Anechoic cysts of 2, 4 and 6 mm diameter
- -6 dB, +6 dB and high scatter grey scale targets
- Convertible water dam for gel or water coupled scanning
- Integral cover to protect scanning surface
- Durable ergonomic design for ease of handling
- Available in 0.5 and 0.7 dB/cm/MHz attenuation

**Gammex 404 GS LE VD0403340**

**Test Parameters:**
- Measure to depths of up to 9 cm
- Varying sizes and depths of each type of target
- Resolution patterns and all vertical and horizontal targets are made of 0.1 mm nylon fibers
- Low scatter cysts of 1, 2, 4 and 7 mm diameters to better evaluate system noise and distortion
- Available in 0.5 and 0.7 dB/cm/MHz attenuation
Test Image Generator

**SonoTest – Test Image Generator for Ultrasound Systems** VD0404200

For generating technical test images (grey scale and color) for analog Ultrasound systems. Incl. power supply, cable set Cinch / BNC and integrated NiMh-rechargeable battery.

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Quality Control of Diagnostic Monitors & Displays

**QC Kit IBAcan** VD0601405

Complete measuring kit for luminance measurements at image display devices (black/white) according to DIN V 6868-57 (acceptance tests) and IEC 61223-2-5 (constancy tests), AAPM TG18.

For more details please refer to chapter “Quality Control of Medical Displays”.
Radiation Safety
Survey Meter

**Survey Meter OD-01** VD0401113

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.
Dose Area Product
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".
  ➤ Medical device, class IIb, according to "Council Directive 93/42/EEC of 14 June 1993 concerning Medical devices".
  ➤ 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.
KermaX® plus

**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 $\mu$Gym$^2$

**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 $\mu$Gym$^2$
**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.
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 is multiple optional adapters, rails and cables which can be used with all KermaX plus and KermaX® plus TinO Systems.

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

<table>
<thead>
<tr>
<th>Measuring Devices</th>
<th>kVp / PPV</th>
<th>waveform</th>
<th>mA</th>
<th>kV</th>
<th>PTB approved/can be officially gauged</th>
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</thead>
<tbody>
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<td>Dose rate in CT</td>
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<tr>
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### Measuring Devices
- Dosimax plus I
- Dosimax plus A
- Dosimax plus A - HV
- Dosimeter MagicMax
- Rad/Flu/Dent
- Dosimeter MagicMax MAM
- kV-meter MagicMax MAM
- kV-meter MagicMax
- Rad/Flu/Dent
- Multimeter MagicMax MAM
- Multimeter MagicMax
- Multimeter MagicMax Rad/Flu/MAM
## Measuring Devices Matrix

<table>
<thead>
<tr>
<th>Measuring Devices</th>
<th>Radiography</th>
<th>Flu / DSA</th>
<th>Mammography</th>
<th>Dental CT</th>
<th>Light measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV / kVp</td>
<td>● ● ● ● ● ●</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
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<td>● ● ● ● ●</td>
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<tr>
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</tbody>
</table>

### Standard and Optional Sensor

- **Standard**
- **Optional Sensor**

<table>
<thead>
<tr>
<th>Measuring Devices</th>
<th>Radiography</th>
<th>Flu / DSA</th>
<th>Mammography</th>
<th>Dental CT</th>
<th>Light measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV / kVp</td>
<td>● ● ● ● ● ●</td>
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<td>● ● ● ● ●</td>
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<td>● ● ● ● ● ● ●</td>
</tr>
</tbody>
</table>

### Measuring Devices and Sensors

- **Light Measurement**
  - **Light Measurement Device**
  - **Electronics**
  - **Dose meter only for constancy check**

### Measuring Devices and Sensors

- **Light Measurement**
  - **Light Measurement Device**
  - **Electronics**
  - **Dose meter only for constancy check**

69 IBA DOSIMETRY PRODUCT OVERVIEW TABLES
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➤ Treatment safety with best QA standards
Partners and External Manufacturers

Radiography / Fluoroscopy
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Contrast-Detail-Phantom CDRAD
Contrast-Detail-Phantom CD DISC 2.0

Mammography
Artinis:
Test Device PASMAM 1054 C
Test Device PASMAM 1054 A/C
Contrast-Detail-Phantom CD MAM
PMMA Spacer Set
DIGIMAM Phantom
EU Test Set
Pehamed:
Mammographic Step Wedge
Gammex:
Breast Compression Test Device

Computed Tomography
IRIS:
Software CT QALite
The Phantom Lab:
Catphan 500 Phantom
Catphan 600 Phantom
QRM:
Test Phantom "3D-Spatial Resolution"
Slice Sensitivity Test Phantom

Dental Radiography
Artinis:
Contrast-Detail Phantom CDDENT

Film Processing
Pehamed:
Software Infosens

Accessories for Radiology
Hüttner:
Line Pair Tests

Radiation Safety
Rados:
Personal Alarm Dosimeter DoseGUARD S 10
STEP:
Survey Meter OD-01

Dose Area Product Meters
Seiko:
Printer Set "Star"
Zebra:
Printer Set "Zebra S"
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Safer Imaging, Earlier Cancer Detection
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➤ Undisputed leader in Proton Therapy delivery systems: Providing highly precise and effective radiation therapy

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