True Precision.

X-ray Dosimetry
Dosimetry Solutions for Diagnostic Radiology
PTW – The leading provider of dosimetry and quality control equipment for radiation medicine

PTW designs, develops, manufactures and distributes high quality dosimetry and quality control equipment mainly for use in the medical field, especially in radiation therapy, diagnostic radiology and nuclear medicine.

Design and production of mechanical, electronic and software components are all done in house. We operate a well-equipped and modern workshop with ten CNC machines. Our products, especially the PTW ionization chambers and electrometers, are well known throughout the world and are recognized for their workmanship and high level of quality.

PTW is the market leader in its major product lines. The PTW distribution is organized internationally. A number of exclusive PTW representations are established in many countries around the world.
PTW-Freiburg operates Germany’s first Secondary Standard Dosimetry Laboratory for radiation quantities accredited by the DAkkS, under direct supervision of the National Laboratory. It is also a member of the international SSDL network, organized by the International Atomic Energy Agency IAEA.

We perform radiological calibrations for dosemeters used in radiation therapy, diagnostic radiology and health physics, which are directly traceable to the primary standard. Our calibration lab provides a complete range of radiological calibrations from low X-ray energies up to $^{60}$Co and from low to high dose rates and is one of the busiest calibration labs worldwide.

The Dosimetry School, founded in January 2014 by the dosimetry pioneer PTW, is a new global education initiative aiming to enhance the understanding and practice of clinical dosimetry through a series of seminars, workshops and trainings.

Benefiting from the knowledge and experience of the oldest dosimetry company, “The Dosimetry School” offers the medical physics community an up-to-date, well-rounded education program that provides a good mix of scientific theory and practice.
NOMEX® Multimeter

Multi-parameter measuring device for acceptance testing and routine quality control measurements on diagnostic X-ray units

Key Features
- All relevant QC parameters captured in one single shot
- NEW! Different models with or without mAs option available (all-in, R/F/MAM, R/F, MAM, DENT, CT, IGRT)
- Single exposure simultaneously captures: dose, dose rate, dose per pulse, pulses, frequency, irradiation time, tube voltage, total filtration, half value layer, together with waveforms for both kV and dose rate and mAs (optionally)
- kVpmax, kVpmean and practical peak voltage (PPV) calculation according to the algorithm of IEC 61676
- Medical device class IIb
High-performance dosimetry system for absolute dosimetry and quality control in X-ray diagnostic radiology

**Key Features**

- CE marked, class IIb certified diagnostic dosimetry system, fully compliant with IEC 61674 for acceptance testing and quality control measurements on RAD, FLU, DENT, CT and MAM X-ray units
- Field-class electrometer acc. IEC 60731 for air kerma measurements in radiotherapy and orthovoltage therapy
- Combined with the NOMEX Multimeter and/or NOMEX mAs allows all relevant QC parameters can be captured in one single shot
- Allows invasive and non-invasive mAs measurements combined with the NOMEX mAs meter
- Allows to connect either a semi-conductor detector (R/F/D or MAM), CT ionization chamber (100 mm or 300 mm long) or a shadow-free ionization chamber (6 cm³ or 75 cm³) for no interferences with the AEC
- Provides for automatic air density correction
- Stores the last measurements and allows data and waveform export as XLS, XML or CSV file via USB or Bluetooth®
- Multilanguage: Chinese, English, French, German, Italian, Japanese, Portuguese, Russian, Spanish
True Precision.
Quick and easy statistical data evaluation.

**Key Features**
- Modifiable parameter displaying (view all parameters at a glance or just selected ones)
- Statistic calculations (mean value, standard deviation, coefficient of variation) by simply marking the results of interest
- Adjustable timer functions (start or stop delays) and waveform sampling up to 60 seconds
- Data and waveform export direct to Excel®
- Make your own Excel® protocols and export the measurements automatically
- Software menu available in different languages (German, English, French, Spanish, Portuguese, Italian, Russian, Chinese, Japanese)

View waveforms of dose rate and tube voltage
Review all measurements
Use own Excel® templates to document measurements and calculate results

Key Features
- Track and manage all of your QA data efficiently on one single platform and share it within your organization
- Export analyzed QA data from your PTW QA device to Track-it with the click of a single button
- Easily access data from any network device simply by using a standard web browser

Efficiently manage all QA data on one single platform
Easily track changes over time to take action when needed
Customize Track-it to your specific needs
Radiography

Turnkey solution for stand-alone or combined use

- Angular independent for positioning within the beam
- Automatic HVL detection
- Modifiable parameter displaying (view all parameters at a glance or just selected ones)

NOMEX Dosemeter with NOMEX Multimeter

- Checks all relevant parameters of analogue and digital fluoroscopic and radiographic X-ray units
- For quality control and acceptance tests on radiography units
- For usage in combination with an attenuation absorber for patient simulation

NORMI RADIFLU for image quality control

- Combined with the SL Survey detector scatter and leakage measurements are possible with the NOMEX Dosemeter
- Measures the dose, dose rate, exposure time, and dose rate waveform
- Adjustable measuring quantities are air kerma in [Gy], exposure in [R], and ambient equivalent dose H*(10) in [Sv]
- Selectable time base in [1/s], [1/min], [1/h]
- Adjustable sampling with an appropriately sized log memory for several seconds

SL Survey Detector for measuring X-ray scatter and leakage
Fluoroscopy

For acceptance tests, QA and routine QC measurements

- Combined with the NOMEX Multimeter and NOMEX mAs, a single exposure simultaneously captures dose, dose rate, dose per pulse, pulses, frequency, irradiation time, tube voltage, total filtration, half value layer and waveforms for both kV and dose rate and additionally mAs.
- Dose and dose rate measurements at a total filtration up to 2.5 mm Cu possible.
- Allows to connect either a semi-conductor detector (R/F/D or a shadow-free ionization chamber (6 cm³ or 75 cm³) for no interferences with the AEC.

- Checks all relevant parameters of analogue and digital fluoroscopic X-ray units.
- Fully complies with DIN 6868-4 and 6868-150.
- For quality control and acceptance tests on fluroscopy units (over couch/under couch tubes) and on C arms.

- mAs meter for invasive and non-invasive measurements on diagnostic X-ray generators.
- Stand-alone mode or simultaneous usage with the NOMEX Multimeter or NOMEX Dosemeter.
- Allows non-invasive measurements by means of a current clamp.
- Measures current, mAs (current time product), mAs per pulse, measuring time, pulses, frequency and current waveform.

The NOMEX mAs is an invasive meter for measuring the current time product (mAs) on diagnostic X-ray generators. For invasive measurements the NOMEX mAs connects to the generator of the X-ray unit via banana plugs. Optionally, non-invasive mA and mAs measurements can be performed by means of connecting a current clamp directly to the NOMEX mAs.
Mammography

All parameters captured in one single exposure

- Modifiable parameter displaying (view all parameters at a glance or just selected ones)
- Measures all common anode/filter combinations*
- kVpmax, kVpmean and practical peak voltage (PPV) calculation according to the algorithm of IEC 61676
- Determines the total dose or single pulse doses as e.g. requested in tomosynthesis
- Detects the half value layer (HVL)

NOMEX Multimeter on mammography unit

- Checks all relevant parameters of digital mammographic X-ray installations
- Fully complies with DIN 6868-162 and DIN 6868-14
- Modularly composed CE marked class I certified test object incl. different absorbers and test elements

NORMI MAM digital for image control

*) Available anode/filter combinations: Mo/30µmMo, Mo/25µmRh, W/0.7mmAl, W/50µmRh, W/50µmAg, Rh/25µmRh, Rh/0.03mmAg, Rh/0.25mmCu, Mo/0.25mmCu, W/0.3mmCu, W/1.1mmTi
Measures the dose length product (DLP) in combination with the NOMEX Dosimeter and a 100 mm or 300 mm long CT ion chamber acc. to IEC 60601-2-44

Measures in CTDI Head/Body phantom with 100 mm CT chamber together with NOMEX Dosimeter

Data and waveform export to Excel via USB or Bluetooth®

Provides for automatic air density correction
**NOMEX® Dosemeter**

**Standard:**
IEC 61674, DIN EN 61010-1, IEC 61326-1, IEC 60731 (Kα only)

**Measuring ranges (for diagnostic only)**

- **Current:** 2 pA ... 23 µA, < 2%
- **Resolution:** ± 20 fA
- **Charge:** 2 pC ... 230 nC, < 2%
- **Resolution:** ± 10 fC
- **Irradiation time:** 1 ms ... 298 h, ± 1 ms
- **Pulse:** (0 ... 99999), ± 1 pulse
- **Frequency:** (0.2 ... 500) Hz
- **Temperature:** (10 ... 40) °C
- **Relative air humidity:** (10 ... 80) %
- **Air pressure:** (750 ... 1100) hPa

The respective measuring range depends on the detector connected, e.g. PTW R/F/D detector, MAM detector and CT ionization chamber.

**Air kerma rate R/F/D:**
40 nGy/s ... 460 mGy/s, ± 3.5 % (typically ± 1.5 %)

**Air kerma R/F/D:**
40 nGy ... 4.6 kGy, ± 3.5 % (typically ± 1.5 %)

**kV R/F/D:**
(40 ... 150) kV, ± 1.5 % or ± 1 kV (typically ± 0.75 % or ± 0.5 kV)

**Total filtration:**
(1.5 ... 40) mm Al, ± 10 % or ± 0.5 mm Al

**HVL R/F/D:**
(0.95 ... 13.5) mm Al, ± 10 % or ± 0.25 mm Al (typically ± 0.1 mm Al)

**Air kerma rate MAM**: 50 µGy/s ... 500 mGy/s, ± 2.5 %

**Air kerma MAM**: 0.5 µGy ... 500 Gy, ± 2.5 %

**kV MAM**: (20 ... 49) kV**, ± 0.5 kV

**HVL MAM**: (0.25 ... 0.75) mm Al, ± 0.01 mm Al

**Dose per pulse**: 50 nGy ... 500 Gy, ± 3.5 % (typically ± 1.5 %)

**Pulses**: 0 ... 99999

**Frequency:** 0.2 Hz ... 500 Hz

**Irradiation time**: 1 ms ... 298 h, ± 0.01 % or ± 0.5 ms

**PC interface:** USB V2.0 High-Speed, Bluetooth® 2.1 + EDR

**Outer dimensions:** 115 mm x 50 mm x 9 mm

**Weight:** 250 g

**Ordering information**

[L981815] NOMEX® Multimeter all-in for measurements in R/F/DENT, CT, MAM. Incl. NOMEX® Multimeter, software, 2 m USB and 5 m long active extension cable, user manual and transport cases. Requires connection to a PC.

**NEW!** Different NOMEX® Multimeter sets each with a specific NOMEX® Multimeter model and each with/without mAs option are available.

**Accessories**

[T20016] NOMEX® Multimeter holder

[T20017] NOMEX® cassette adapter

[E41700B,S,G] Service contract Bronze, Silver, Gold

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**NOMEX® Multimeter**

**Measuring ranges**

- **Air kerma rate R/F:** 5 µGy/s ... 500 mGy/s, ± 3.5 % (typically ± 1.5 %)
- **Sensitivity mode:** 0.1 µGy/s ... 500 mGy/s (typically ± 5 %)
- **Trigger level:** min. 10 nGy/s (typically)
- **Total filtration:** (1.5 ... 40) mm Al, ± 10 % or ± 0.5 mm Al
- **HVL R/F:** (0.95 ... 13.5) mm Al, ± 10 % or ± 0.25 mm Al (typically ± 0.1 mm Al)
- **Air kerma rate MAM**: 50 µGy/s ... 500 mGy/s, ± 2.5 %
- **Air kerma MAM**: 0.5 µGy ... 500 Gy, ± 2.5 %
- **kV MAM**: (20 ... 49) kV**, ± 0.5 kV
- **HVL MAM**: (0.25 ... 0.75) mm Al, ± 0.01 mm Al
- **Dose per pulse**: 50 nGy ... 500 Gy, ± 3.5 % (typically ± 1.5 %)
- **Pulses**: 0 ... 99999
- **Frequency:** 0.2 Hz ... 500 Hz
- **Irradiation time**: 1 ms ... 298 h, ± 0.01 % or ± 0.5 ms
- **PC interface:** USB V2.0 full speed
- **Outer dimensions:** 115 mm x 50 mm x 9 mm
- **Weight:** 250 g

**Ordering information**

[L981815] NOMEX® Multimeter all-in for measurements in R/F/DENT, CT, MAM. Incl. NOMEX® Multimeter, software, 2 m USB and 5 m long active extension cable, user manual and transport cases. Requires connection to a PC.

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[E41700B,S,G] Service contract Bronze, Silver, Gold

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**SL Survey Detector**

**Measurement quantities**

- **Air kerma**, **Air kerma rate (Gy, Gy/s)**
- **Ambient dose**, **Ambient dose rate H**°10 (Sv, Sv/s)

**Measuring ranges**

- **Dose**: 2 µGy ... 3 mGy,
- **Resolution**: 1.5 µGy,
- **Dose rate**: 2 µGy/h ... 1.1 mGy/h,
- **Resolution**: 10 nGy/h

**Useful range**

- **Radiation quality**: 33 keV ... 1.33 MeV

**Ordering information**

[T60021] SL Survey detector
NOMEX® mAs

Measuring ranges

Current: ± (0.1 ... 1100) mA, ± 1 % or ± 0.01 mA
Resolution: ± 0.01 mA

Charge: ± (0.01 ... 999.9) mAs, ± 1 % or ± 0.001 mAs
Resolution: ± 0.001 mAs

Measuring time: 1 ms ... 298 h, ± 1 ms
Pulses: 0 ... 99999, ± 0 pulses
Frequency: (0.2 ... 350) Hz

Reproducibility

Current: ± 1 %
Charge: ± 1 %
Pulses: ± 0
Measuring time: ± 1 ms

Cable length: 8 m
Outer dimensions: 94 mm x 46 mm x 12 mm
Weight: 140 g

Ordering information

[L981530] NOMEX® mAs
[L981529] Current clamp for NOMEX® mAs (optional)

NORMI® MAM digital

Dimensions

Basic phantom: (240 x 180 x 40) mm
Structure plate: (240 x 180 x 6) mm
Absorbers: (240 x 180 x 4/6/10/20) mm, (320 x 260 x 20) mm
Test elements: (80 x 80 x 6) mm
Weight: approx. 11.3 kg

Structures:

Basic Phantom: PMMA block with stops on the thoracic wall side, two rows of 5 steel balls each on the underside, cut-out for Al step wedge

Al step wedge: Removable aluminum step wedge with 14 steps
Structure plate: PMMA plate with a cut-out for test elements
Test element SDNR: PMMA insert, with two (20 x 20) mm markings, one covered with a 0.2 mm thick Al foil
Test element HK: PMMA insert, with a (20 x 20) mm marking, half covered with lead foil
Test element PMMA: PMMA insert, with (20 x 20) mm marking, when inserted in structure plate, the center is at a distance of 60 mm from the thoracic wall side

Ordering information

[T42039] NORMI® MAM digital 162
[T42040] NORMI® MAM digital 14

Accessories

[T42028.3.050] PMMA step substitute
[T42028.1.021] Test insert for dose detector
[T42028.1.008] Test element KP-ACR

CT Phantoms

Dimensions

CT body phantom: 32 cm Ø, 15 cm length
CT head Phantom: 16 cm Ø, 15 cm length

Weight

CT Head Phantom: 14.4 kg
CT Body Phantom: 3.6 kg

Ordering information

[T40016] CT body phantom
[T40017] CT head phantom
[T40027] CT head and body phantom

Accessories

[T40016.1.010] Carrying case for body phantom
[T400017.1.010] Carrying case for head phantom
[T40027.1.050] Carrying case for head and body phantom
[T77336/U20] CT chamber positioner
[L991397] Adapter for CT chamber
Dosimetry Pioneers since 1922.

It all started with a brilliant invention – the revolutionary Hammer dosemeter in 1922. Ingenuity coupled with German engineering know-how shaped the company’s history, leading to innovative dosimetry products that later became an industry standard. Over the years, PTW has maintained its pioneering spirit, growing into a global market leader of dosimetry and QA solutions well known for its unparalleled quality and precision. Today, PTW dosimetry is one of the first choices for healthcare professionals in radiation therapy, diagnostic radiology, nuclear medicine and health physics.

For more information on PTW Products visit www.ptw.de or contact your local PTW representative: