

Patient Dosimetry



DIAMENTOR® Systems

Dose area product meter,
Ionization chambers and Accessories

PTW

50 YEARS DIAMENTOR®

DIAMENTOR® – from the idea to innovation, from pioneer to premium product, from the first measurement device worldwide for measuring the dose area product to the diamond standard in patient dosimetry – developed by Herbert Pychlau more than 50 years ago and continually improved over time, it is unmatched on the market for performance today.



DIAMENTOR®. The Success Story...

1957
Herbert Pychlau developed an idea for a measurement device, which records the radiation dose a patient receives during an X-ray.

1959
Following two years of intensive development work, PTW launches the first DAP measurement device worldwide for medical diagnostic radiology.

1964
The study conducted by PTW on the "Measurement of Patient Doses in Diagnostic Radiology" convinces the experts and paves the way for binding radiation protection standards.

1987
The first German X-ray regulations were formulated and set down in law for protecting against excessive radiation load.

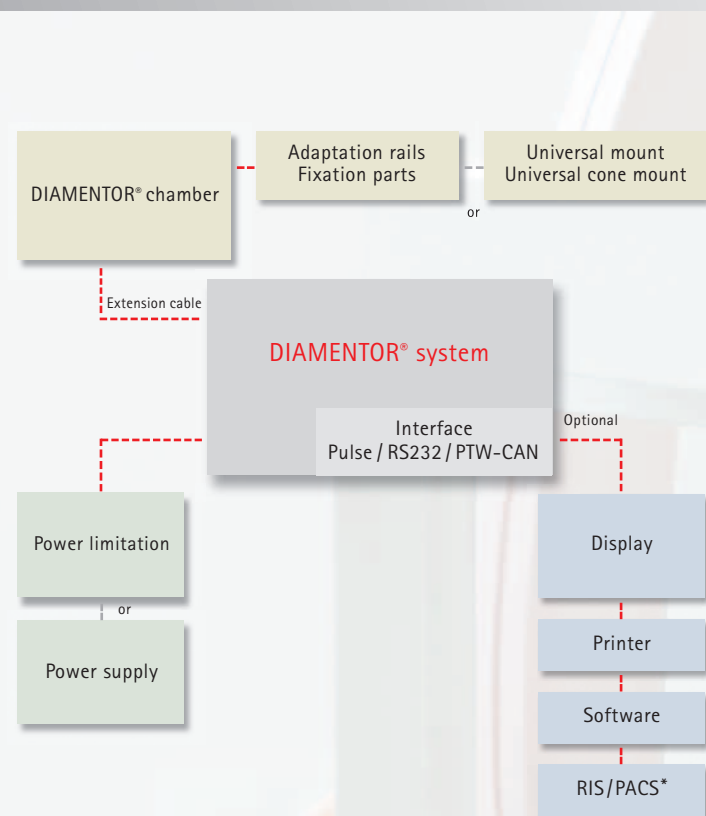
1997
The EU Directive 97/43/EURATOM obligates member countries to introduce legal, national norms for medical X-ray applications.

2002/2003
Germany implemented the EU directive in the 2nd version of the X-ray regulation; measure of patient doses became mandatory for many medical X-ray applications.

2006
The amendment of the "Federal performance standard for diagnostic x-ray systems and their major components" of the Food and Drug Administration (FDA) defines a new performance norm for the USA.

2009
Scientifically recognized, medically tried and tested, and technologically unsurpassed: DIAMENTOR® systems have become the international diamond standard 50 years after their introduction to the market.

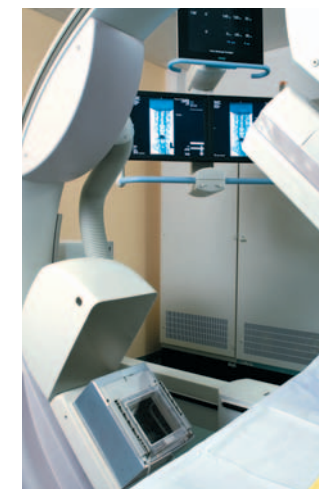
DIAMENTOR® SYSTEMS



* In collaboration with renowned manufacturers, the RIS link has been implemented successfully many times. The RIS manufacturers make the link to system. PTW-Freiburg provides the required interface manuals.

Why a DIAMENTOR® system from PTW?

Because it is a matter of protecting your patients and saving you time...



PTW has been contributing to continual improvement of safety and efficiency in diagnostic radiology with intensive research, interdisciplinary development work and international cooperative ventures for more than five decades. Our DIAMENTOR® systems for patient dosimetry support users in complying with legal requirements and others matters going far beyond them. Developed in the first generation as a unique pioneering achievement by Herbert Pychlau and launched on the market the first measurement equipment worldwide for detecting the dose area product in medical radiology, this in the meantime very varied product series has grown continually and remains unsurpassed in its performance until today. Measurement equipment and accessories have always been produced to comply with the highest quality standards, continually developed further and are still being using 100 % flawlessly even after 50 years of continual use.

APPLICATION AREAS

- ▶ Diagnostic radiology
- ▶ Fluoroscopy
- ▶ Angiography, DSA, cardiological series
- ▶ X-rays as well as combined imaging and fluoroscopy

THE USER GUARANTEE

- ▶ Optimally coordinated components
 - > **Simple and easy installation**
- ▶ Problem-free RIS link
 - > **Efficient and time-saving work routines**
- ▶ Easy equipment configuration by users
 - > **Convenient and intuitive handling**
- ▶ Internal test function
 - > **Fast checking of calibration with consistency check**
- ▶ Tried and tested, state-of-the-art technology
 - > **Fast and reliable measurement results**
- ▶ Unsurpassed reliability in continual operation
 - > **Proven operation and cost efficiency**

THE UNIVERSAL SYSTEM SERIES

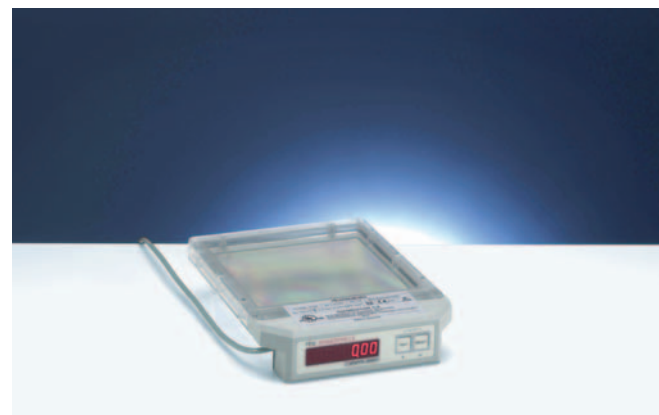
Why a whole device series?

Because the perfect solution is an individual choice...

There is a suitable DIAMENTOR® solution for every task, which supports your workflow and can be integrated optimally into a hospital environment. The system series provides you with precisely the flexibility, functions and design that you need for your application.

The guaranteed properties, which distinguish PTW's DAP measurement equipment:

- ▶ Transparent ionization chambers, which ensure perfect, unhindered function of the light localizer
- ▶ Chambers integrated into the collimator, which ensure smooth, routine hospital operation
- ▶ High resolution of $0.01 \mu\text{Gym}^2$, which enables use even in pediatrics
- ▶ Simple link to radiology information systems (RIS)
- ▶ An integrated test function for fast operation monitoring and checking calibration



DIAMENTOR® CX

- ▶ The compact all-in-one device, which links measurement electronics, chamber and display in one unit and is installed directly on the collimator



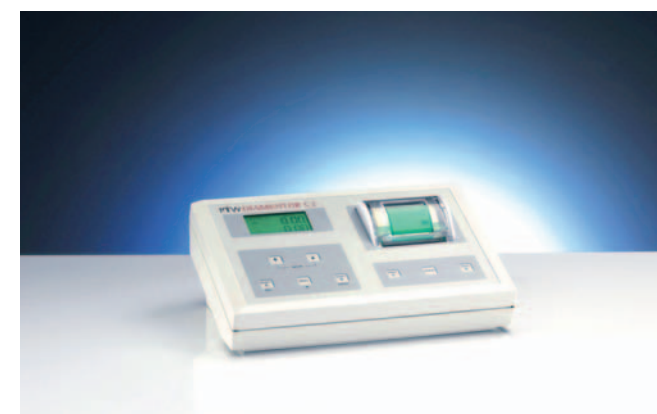
DIAMENTOR® CAN Systems

- ▶ DIAMENTOR® Set CI with integrated measurement electronics, chamber and display for flexible positioning as well as a 25 m extension cable
- ▶ DIAMENTOR® Set CM with small, separate measurement electronics, chamber and display for flexible positioning as well as a 25 m extension cable



DIAMENTOR® E2

- ▶ The classic device, which combines measurement electronics and display and enables connection with an external chamber



DIAMENTOR® C2

- ▶ The 2-channel solution as sturdy table console with separate channel operation for two ionization chambers
- ▶ Also available with integrated printer



DIAMENTOR® M4

- ▶ The 2-channel system, which enables connection of two chambers, two additional display devices and printer



DIAMENTOR® M4-KDK

- ▶ The 2-channel measurement device for optimum demands; designed for connection of a KDK chamber with two measurement fields for measuring dose area product, dose and time
- ▶ The perfect solution for use in stationary systems with additional secondary display

OVERVIEW OF PERFORMANCE PARAMETERS

How can I find the right DIAMENTOR® system for me?
Compare the performance with your requirements...



Product		CX	Set CI / Set CM	E2
Channels		1	1	1
Measuring unit	DAP	▼	▼	▼
	DAP rate	▼	▼	▼
	Dose			
	Dose rate			
	Irradiation time			
Measuring range	DAP	(0.1 ... 10 ⁶) µGym ²		
	DAP rate	(0.1 ... 15 000) µGym ² /s		
	Dose			
	Dose rate			
	Irradiation time			
Digital resolution	DAP	0.01 µGym ²		
	DAP rate	0.01 µGym ² /s		
	Dose			
	Dose rate			
	Irradiation time			
Interface	RS232	▼	▼	▼
	PTW-CAN	▼	▼	
Range of use	DAP rate	(0.01...15 000) µGym ² /s		
	Tube voltage	(40 ... 150) kV		
	Temperature	(10 ... 40) °C; (50 ... 104) °F		
	Air density	(10 ... 80) %, max. 20 g/m ³ (w/o condensation)		
Accreditations and standards	IEC 60580	▼	▼	▼
	IEC 60601-1	▼	▼	▼
	UL, VDE	▼	▼	▼
Power supply		24 V DC ± 10 %		
Dimensions	[H x W x D]	164 x 209 x 18 mm ³	CI: 164 x 220 x 18 mm ³ CM: 52 x 72 x 22 mm ³ CD: 24 x 138 x 40 mm ³	36 x 83 x 151 mm ³
Weight		325 g	CI: 330 g CM: 105 g CD: 65 g	250 g



	C2	M4	M4-KDK		Product
	2	2	2		Channels
▼	▼	▼	▼	DAP	Measuring unit
▼				DAP rate	
			▼	Dose	
			▼	Dose rate	
		▼	▼	Irradiation time	
		(0.1 ... 10 ⁶) µGym ²		DAP	Measuring range
(0.1 ... 15 000) µGym ² /s	(0.1 ... 30 000) µGym ² /s			DAP rate	
		(0,01 ... 10 000) mGy		Dose	
		(0,01 ... 10 ⁶) mGy/s		Dose rate	
	1 s ... 999 min			Irradiation time	
	0.01 µGym ²			DAP	Digital resolution
	0.01 µGym ² /s			DAP rate	
			0,001 mGy for (0,01...10 ⁶) mGy 1 mGy for (1000...10 000) mGy	Dose	
			0,001 mGy/s	Dose rate	
		> 0,04 µGym ² / 600 ms > 0,2 µGym ² / 60 ms	600 ms (Dose rate > 2,4 µGy/s) 60 ms (Dose rate > 12 µGy/s)	Irradiation time	
▼	▼	▼		RS232	Interface
				PTW-CAN	
(0.01...15 000) µGym ² /s	(0.005 ... 30 000) µGym ² /s			DAP rate	Range of use
	(40 ... 150) kV			Tube voltage	
	(10 ... 40) °C; (50 ... 104) °F			Temperature	
	(10 ... 80) %, max. 20 g/m ³ (w/o condensation)			Air density	
▼	▼	▼	▼	IEC 60580	Accreditations and standards
▼	▼	▼	▼	IEC 60601-1	
▼	▼	▼	▼	UL, VDE	
(100 ... 240) VAC (50 ... 60) Hz	230 V / 115 V AC voltage				Power supply
104 x 264 x 186 mm ³	71 x 225 x 198 mm ³			[H x W x D]	Dimensions
1180 g	2100 g				Weight

IONIZATION CHAMBERS AND ACCESSORIES

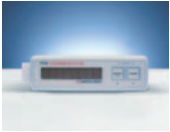
Many options – why?

Because optimum accessories prove their worth in daily routines...

DIAMENTOR® CHAMBERS

Rectangular, transparent			
	Chamber type	Outer Dimensions [mm²]	Measuring Area [mm²]
	34018	159 x 138	131 x 113
	34019	197 x 126	169 x 101
	34028	182 x 163	141 x 141
	34029	153 x 155	128 x 127
	34039	170 x 170	138 x 138
	34040	182 x 163	141 x 141
Rectangular, not transparent			
	Chamber type	Outer Dimensions [mm²]	Measuring Area [mm²]
	34054	113 x 110	85 x 85
Round, transparent			
	Chamber type	Outer Dimensions [mm]	Measuring Area [mm]
	34030	Ø 157	Ø 120
	34052	Ø 120	Ø 83
	34081	Ø 109	Ø 86
Round, not transparent			
	Chamber type	Outer Dimensions [mm]	Measuring Area [mm]
	34002	Ø 110	Ø 73
	34011	Ø 106	Ø 86
	34037	Ø 100	Ø 72
Chamber for simultaneous measurement of dose and dose area product for DIAMENTOR® M4-KDK			
	Chamber type	Outer Dimensions [mm²]	Measuring Area [mm²]
	34044	182 x 163	141 x 141 Central dose measurement field 13 x 13

ADDITIONAL ACCESSORIES



▶ DIAMENTOR® CD-R

- ▶ integrated RS232 interface
- ▶ 8-digit LED display
- ▶ for use with DIAMENTOR® CI or CM



▶ Pediatric filters

- ▶ reduction of entrance dose
- ▶ different filter sizes with different beam hardening values
- ▶ do not influence the light field



▶ Secondary Display

- ▶ flexible positioning
- ▶ bright LCD display
- ▶ for use with DIAMENTOR® M4 or M4-KDK



▶ Power supply

- ▶ voltage range: 110 ... 240 V / 24 V, 50 ... 60 Hz
- ▶ for use with DIAMENTOR® CX, CI, CM or E2
- ▶ UL and IEC certified



▶ External printers

- ▶ connection via RS232 interface
- ▶ prints the results on self-adhesive labels for time-saving documentation
- ▶ automatic printing process



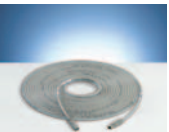
▶ Power limitation

- ▶ for mobile installations, which fulfill IEC 60601-1
- ▶ operation with 24 V
- ▶ for use with DIAMENTOR® CX, CI, CM or E2



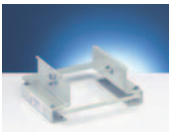
▶ DiaSoft

- ▶ calculates the effective dose and the organ doses
- ▶ presents results as function of time in a graph
- ▶ for use with DIAMENTOR® C2, M4 or M4-KDK



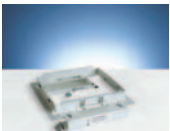
▶ Extension cable

- ▶ different types and lengths are available



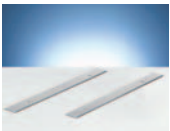
▶ Universal mount

- ▶ rail distances between 133 and 177 mm are possible
- ▶ allows the correct measurement arrangement of filters and chamber
- ▶ optional rails for use of filters available



▶ Universal cone mount

- ▶ rail distances between 133 and 177 mm are possible
- ▶ allows the correct measurement arrangement of filters and chamber
- ▶ for use with up to 3 kg heavy (max. 30 cm long) cone in 90° orientation



▶ (Distance) Adaptation rails

- ▶ various (distance) adaptation rails for different collimators

DO YOU HAVE ANY QUESTIONS OR WOULD LIKE TO LEARN MORE?

Simply give us a call: + 49 761 49055-0

Or write us an e-mail to: info@ptw.de

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The objective from the start was to be a trustworthy and competent partner for our customers throughout the world. This also includes maintaining quality standards and comprehensive service and support. We will continue to do everything possible in the future to manufacture high-quality dosimetry products, which users and patients can trust.

We know what responsibility means.

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