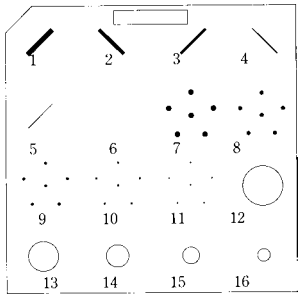
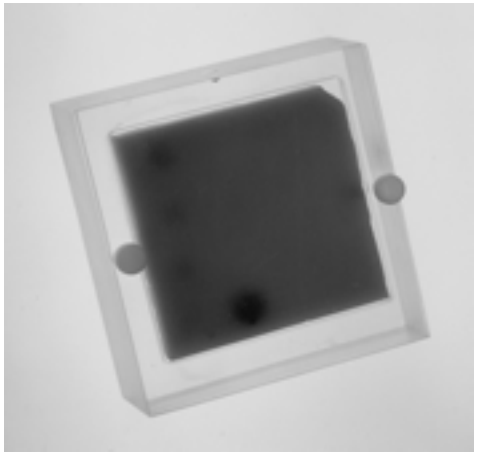
Mammographic Accreditation Phantom

Nuclear Associates Model 18-220

DI Diagnostic Imaging





- Helps ensure optimum image quality and peak performance of the mammographic system
- Essential for MQSA compliance

Introduction

The Mammographic Accreditation Phantom will assist you in complying with MQSA and the American College of Radiology (ACR) Quality Control Programs. This phantom is intended for use as an integral part of the Mammographic Quality Control Program, and when used to perform routine mammographic QC, it will help you quickly, easily, and accurately evaluate the overall imaging performance of your mammographic system. This phantom will detect imaging changes so you can make the necessary corrections in order to maintain your system at peak performance.

Applications

The Mammographic Accreditation Phantom was designed to test the performance of a mammographic system by a quantitative evaluation of the system's ability to image small structures similar to those found clinically. Objects within the phantom simulate calcifications, fibrous calcifications in ducts, and tumor masses.

The phantom is also designed to determine if a mammographic system can detect small structures that are important in the early detection of breast cancer. Test objects within the phantom range in size from those that should be visible on any system, to objects that will be difficult to see even on the best mammographic system.

Features

- Complies with ACR phantom specifications and QC requirements
- Contains test objects to simulate indications of breast cancer...punctuate calcifications, tissue fibrillar extensions in adipose tissue, and tumorlike masses
- Ideal for monitoring the overall performance of your mammographic imaging system, x-ray generator, film processor, and screen-film combination
- Equivalent in x-ray attenuation to a 4.5 cm compressed "average" breast

Specifications

Phantom body

Material Acrylic

Dimensions

Overall 10.15 (w) x 10.8 (d) x 4.4 cm (h)

Acrylic base 1.375 in thick (3.4 cm)

Cover 0.128 in thick (3 mm)

Acrylic contrast test disk 1 cm Ø x 4 mm

Weight 1.2 lb (0.55 kg)

NOTE: The 4.4 cm-thick phantom is made of a 7 mm wax block insert containing 16 sets of test objects, a 3.4 cm thick acrylic base, and a 3 mm thick cover. The phantom approximates a 4.5 cm compressed breast of average glandular/adipose composition. Included in the wax insert are aluminum-oxide (Al_2O_3) specks that simulate microcalcifications. Six different nylon fibers simulate fibrous structures and five different size lens-shaped masses simulate tumors

Each phantom includes a 4 mm x 1 cm diameter acrylic contrast test disk, faxitron x-ray image, and magnifying glass

Wax insert

Nylon fibers	Al_2O_3 Specks	Masses (thickness)
1) 1.56 mm	7) 0.54 mm	12) 2.00 mm
2) 1.12 mm	8) 0.40 mm	13) 1.00 mm
3) 0.89 mm	9) 0.32 mm	14) 0.75 mm
4) 0.75 mm	10) 0.24 mm	15) 0.50 mm
5) 0.54 mm	11) 0.16 mm	
6) 0.40 mm		

Optional accessories

Optional are two 2 cm acrylic plates to check the automatic exposure control of the mammography unit. The addition of these two plates, when combined with the overall 4.4 cm thickness of the phantom, will allow the system to be checked in varying thicknesses of 2 to 8.5 cm. Both of these items are recommended by ACR in their Mammography Quality Control Procedure

Acrylic Plates, 10 x 10 x 2 cm thick, set of 2 (Model 18-237)

Acrylic Contrast Test Disc, 1 cm Ø x 4 mm (Model 18-205)

Carrying Case (Model 89-220)

Available model(s)

18-220 Mammographic Accreditation Phantom, includes acrylic contrast test disk, faxitron x-ray image, and magnifying glass

For additional information, please contact M.D. McCauley Co., Inc. Customer Service at 800-544-4743 or (909) 390-9313 Fax (909) 390-9061

18-220-ds rev 1 10 mar 03

Wide-Range, Mammographic, & Dental Digital kVp Meters

Models 07-494, 07-492 & 07-479

DI Diagnostic Imaging

Introduction

Whether you choose the Wide-Range, Mammographic, or the Dental Digital kVp Meter, you will get quick and accurate measurements of your diagnostic x-ray generator tube potential. These instruments need no connection to the x-ray generator.

- **Choose from three kVp meters**
- **Easy read digital display**
- **Painless setup**

Applications

These lightweight, rugged units are extremely easy to use: simply place on the x-ray table, with the detector facing the x-ray source. With the beam's central ray centered on the detector, an exposure is made, and the reading appears immediately on the large, easy-to-read liquid crystal display.

Unique features are provided to ensure maximum efficiency and accuracy. Readings remain on display until the next exposure is made, at which time the reading is automatically updated. Automatic display indicators tell you when adjustment of exposure factors or battery replacement is necessary. Neither remote-control cables nor time-consuming manual re-zeroing are needed.

A BNC connector is provided for radiation waveform display on a storage oscilloscope.

Features

- Automatic display reset
- No remote control cables
- Scope output for waveform analysis
- Compact, lightweight and battery-operated

Specifications

Ranges
- **Wide-Range**
- *Low:* 50 to 90 kVp, 0.1 kVp resolution
- *High:* 80 to 150 kVp, 0.1 kVp resolution
- **Mammographic** 24 to 40 kVp, 0.1 kVp resolution
- **Dental** 45 to 90 kVp, 0.1 kVp resolution

Accuracy
- **Wide-Range** ± 3% or 3 kVp (whichever is greater)
- **Mammographic** ± 3% or 1.5 kVp **(whichever is greater)**
- **Dental** ± 3% or 3 kVp (whichever is greater)

mAs requirements
- **Wide-Range** (45.7 cm SDD) 18 mAs at 120 kVp; 50 mAs at 60 kVp, single phase. Minimum exposure time 1/20 (0.05) sec
- **Mammographic** (25 cm SDD) 100 mAs at 24 kVp. Minimum exposure time 1/20 (0.05) sec
- **Dental** 8.5 mAs at 45 kVp; 0.026 mAs at 90 kVp

Controls
- **Wide-Range** On/off, single/three-phase and range selection switch
- **Mammographic** On/off and Moly/Tungsten selector switches
- **Dental** On/off and single/three-phase selector switches

Operating temperature 50° to 104°F (10° to 40°C)

Relative humidity 0 to 90%, non-condensing

Power requirements 9 V alkaline battery, 150 hours operation

Display 3.50 x 0.50 inch LCD. Automatic indication of (a) low battery condition, (b) need to adjust exposure factors

Output signal BNC connector for waveform analysis

Dimensions 8 (w) x 6 (d) x 2.50 in (h) (20 x 15 x 6 cm)

Weight 2 lb (0.9 kg)

Optional accessories
- **Carrying Case** (Model 89-473)

Available model(s)
- **07-494** Wide-Range Digital kVp Meter
- **07-492** Mammographic Digital kVp Meter
- **07-479** Dental Digital kVp Meter

CE **Tested.** **Meets applicable standards.**

For more information, receive our full product catalog, or order online, contact **Radiation Management Services** business of **Fluke Biomedical**: or your authorized distributor M.D. McCauley Co. Tel (909 390-9061 www.xraymdm.com

Specifications are subject to change without notice.

07-494-ds rev 3 03 jun 05

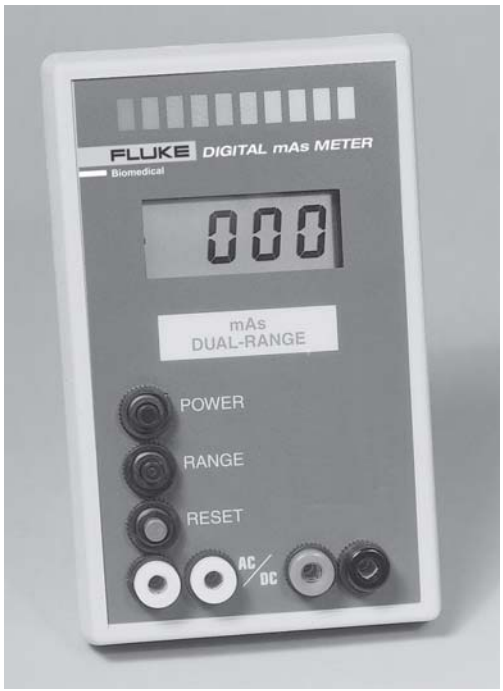
Authorized Distributor: *M.D. McCauley Co., Inc. Tel (909) 390-9313 Fax (909) 390-9061*

Diagnostic Imaging DI

Dual-Range Digital mAs Meter

Nuclear Associates Model 07-487

- **Accurately measure x-ray generator mAs values**
- **Meets today's QC needs for accuracy and dependability**
- **Used for calibration of high current and phototimer accuracy**
- **Calibrated directly in mAs; no calculations required**
- **Hand-held, battery operated, and lightweight**



Applications

The greatest use for the Nuclear Associates' Model 07-487 mAs meter is in calibrating the high-current, short-time station where a conventional mAs meter is precluded by tube ratings. The instrument can be used (after verifying the generator accuracy) to set all mA stations and check that phototiming error does not exceed the limits of good practice. To use, simply connect the cable to the x-ray generator and make the required exposure. The mAs reading appears instantaneously on the four-digit LCD. A display indicator warns of the need for battery replacement.

Introduction

The Nuclear Associates' Dual-Range Digital mAs Meter, Model 07-487, allows service personnel to check and adjust the mA settings of x-ray generators. This easy-to-use instrument is calibrated directly in mAs, thus eliminating the need for the calculations typically required with more complicated and expensive equipment.

The digital mAs meter is very sensitive. It can measure increments of 0.1 mAs. It has a low range of 0 to 199.9 mAs; push a button and the range expands to 0 to 1999 mAs.

Specifications

Range 0 to 199.9 mAs ("+" overrange indicator above 160 mAs). Also 0 to 1999 mAs ("+" overrange indicator above 1600 mAs)

Accuracy ± 2% of reading

Input 25 to 1000 mA

Drift Zero

Operating temp. 50º to 100ºF (15º to 30ºC)

Controls POWER (on/off), RANGE (high-low), and RESET

Power requirements Single 9 V alkaline battery; typical life 80 hours

Input jack Uses 2 banana jacks

Dimensions 3.50 (w) x 6.63 (d) x 1.38 in (h) (8.9 x 16.8 x 3.5 cm)

Weight 0.44 lb (0.2 kg)

Accessories supplied 24 inch cable with banana plugs and insulated alligator clips on opposite ends

Available model(s)

07-487 Dual-Range Digital mAs Meter

CE **Tested.** **Meets applicable standards.**

For more information, receive our full product catalog, or order online, contact **Radiation Management Services** business of **Fluke Biomedical**: or your authorized distributor M.D. McCauley Co Inc Tel (909) 390-9313 www.xraymdm.com

Specifications are subject to change without notice.

07-487-ds rev 2 13 jun 05

Hand-Held Dual-Color Sensitometer

Nuclear Associates Model 07-417

DI Diagnostic Imaging

Introduction

This compact, precision instrument is ideal for maintaining consistent, high-quality film processing. By evaluating control films on a daily basis, the technologist can identify processor variations before they affect clinical radiographs. Also, processing conditions in multiprocessor departments may be standardized. In the past, this was difficult in departments using varied film-screen combinations in different areas. With this sensitometer, proper exposure of either blue- or green-sensitive x-ray film is easily accomplished, with no need for internal adjustments.

Nuclear Associates' Hand-Held Dual-Color Sensitometer features a 21-step density wedge with 0.15 OD increments. The 21 density-gradient steps are numbered for convenience. An innovative, dual-color, electroluminescent light source provides precisely-controlled repeatable exposures. The desired color is selected with a front-panel switch.

- Helps maintain optimum film processing conditions
- Easy selection of blue or green light emission
- Lightweight, portable, battery-operated

Features

- Repeatability: ± 0.04 OD log exposure from unit-to-unit
- Stability: ± 0.02 OD log exposure per year at 10º to 45°C
- Numbered, 21-step density wedge

Applications

To make an exposure, the platen is raised and a sheet of film is inserted beneath it until the film stops are reached. The platen is lowered and the exposure switch is depressed. An audible buzzer is activated during the exposure. To prevent double-exposures, a two-second delay is engaged before the next exposure can be made. When battery replacement becomes necessary, the unit will not expose film. Battery life is approximately 10,000 exposures.

Processor variations are monitored by comparing the control film to previously processed films. Speed, contrast, and base-plus-fog values can be graphically plotted for easier comparison.

Specifications

Light source Dual-color electroluminescent

Blue 455 nm ± 10 nm; green 520 nm ± 10 nm

Repeatability ± 0.04 OD log exposure from unit to unit

Stability ± 0.02 OD log exposure per year at 10° to 45°C

Exposure area 21 steps, each 5 x 10 mm

Tablet densities 0.05 to 3.05 OD in 0.15 OD increments

Exposure time Adjustable, 50 to 500 ms typical

Exposure adjustment Separate external screwdriver adjustments ± 0.5 OD on each color

Controls Push-to-expose button with buzzer monitor and two-second delay to prevent double exposures

Blue/Green rocker switch

Power switch--none required. Unit draws no power on standby

Power requirements Two 9 V alkaline transistor batteries

Optional AC power converter

Approximate battery life 10,000 exposures

Dimensions 5.25 (w) x 7.625 (d) x 3.625 in (h) (13.34 x 19.37 x 9.21 cm)

Weight 2.5 lb (1.14 kg)

Optional accessories

Carrying Case (Model 89-417)

Available model(s)

07-417 Hand-Held Dual-Color Sensitometer

Available AC adapters (specify with order)

Model	Description	Typical geo. region
14-407	110 VAC 12 VDC 400 mA	USA, Japan
14-431	230 VAC 12 VDC 640 mA	Europe
14-432	230 VAC 12 VDC 640 mA	UK
14-432 and 14-416 adapter	230 VAC 12 VDC 640 mA	Australia

For additional information, please contact Fluke Biomedical or your Authorized Distributor: M.D. McCauley Co., Inc. 760-C S. Rochester Ave., Ontario, CA 91761 USA (909) 390-9313 Fax (909) 390-9061 www.xraymdm.com

CE **Tested.** **Meets applicable standards.**

Specifications are subject to change without notice.

07-417-ds rev 2 26 mar 03

Diagnostic Imaging DI

Hand-Held Deluxe Digital Clamshell Densitometer

Nuclear Associates Model 07-443

- **Features a self-contained light source**
- **Fast and accurate results**
- **Lightweight and portable**
- **Reads grayscale up to 4.00 OD**

Introduction

Get all the benefits of state-of-the-art features in a compact, hand-held unit. Become a "speed reader" with this accurate, rugged portable Clamshell Densitometer. It has today's most-wanted features for "go-anywhere" quality control testing...from darkroom to darkroom, and from lab to field.

Features

- Two aperture choices: 1 and 2 mm
- Easy touch pads
- Battery operated
- Easy read display

Applications

It's easy to use. Just lift the "shell" and insert the test film; close the "shell" and press the READ button. The measured optical density appears on the three-digit liquid crystal display. The self-contained light source makes it convenient to use...anywhere.

A carrying/storage case and a calibrated five-step density tablet are included.

Specifications

Range 0.0 to 4.0 OD

Accuracy ± 0.02 OD

Reproducibility ± 0.01 OD

Temperature range 50° to 104°F (10° to 40°C)

Apertures 1 and 2 mm

Measuring length *Throat:* 5.3 in (135 mm)

Zero range Auto zeros to density 0.0

Sensor High-efficiency silicon photodiode

Controls

Zero pushbutton: zeros unit

Power on/off switch

READ pushbutton: initiates READ sequence

Calibration control: screwdriver adjustable 20-turn potentiometer used to calibrate against a known step tablet

Display Three-digit, 0.5 in LCD with a low-battery indicator

Light source When turned on during measurement, provides extremely long life with minimum spectral and intensity degradation. Reduces heating to a minimum

Power requirements Four 1.5 V AA batteries (approx. 3,000 exposures)

Dimensions 3.2 (w) x 7.1 (d) x 2.4 in (h)

(8.1 x 18 cm x 6.1 cm)

Weight 1.81 lb (0.82 kg)

Optional accessories

Battery Charger (Model 87-443-1000)

Battery and Charger Kit (Model 87-443-2140), includes four AA NiCad batteries and one battery charger

Carrying Case (Model 89-443)

Available model(s)

07-443 Hand-Held Deluxe Digital Clamshell Densitometer, includes five-step density tablet and carrying case

CE **Tested.** **Meets applicable standards.**

For more information, receive our full product catalog contact **Radiation Management Services or an authorized distributor: M.D. McCauley Co., Inc. Tel (909) 390-9313 Fax (909) 390-9061**
760-C South Rochester Ave. Ontario, CA 91761 USA
www.xraymdm.com e-mail: info@xraymdm.com

7600-ds rev 3 13 jun 05 Specifications are subject to change without notice.

Diagnostic Imaging DI

Portable Digital Thermometer

Nuclear Associates Model 07-402

- **Affordably priced...includes a detachable probe**
- **Displays minimum/maximum readings**
- **Hold/freeze function**
- **Auto shut-off**
- **Battery eliminator jack for a 9 volt VDC converter**
- **Checks film processor solution temperatures quickly and accurately**
- **Large, easy-to-read, backlit digital display of temperature in Centigrade or Fahrenheit**
- **Accuracy: ± 0.5%**
- **State-of-the-art detachable immersion probe saves time and allows use of multiple probes with one display unit**

Introduction

This hand-held thermometer is a battery-powered unit with a detachable immersion probe. Temperature readings appear in Centigrade or Fahrenheit with ± 0.5% accuracy. The LED display eliminates problems that can result from the misreading of stem-type thermometers.

Applications

Detachable immersion probes are time-savers for x-ray departments that have several film processors. The use of multiple probes, each remaining in a specific tank, also eliminates the possible cross-contamination of chemicals. This improved version of the digital thermometer includes many convenient features and capabilities. You can quickly and easily display the lowest and highest temperatures measured by the probe since the unit was turned-on. Our digital thermometer also enables you to "freeze" the current temperature reading on the display. The thermometer display can be easily illuminated, making it perfect for use in the darkroom. You can also program the Portable Digital Thermometer for auto or manual shut-off.

The Portable Digital Thermometer (Model 07-402) is a shock resistant, solid-state unit that needs no adjustments to maintain accuracy. Calibration is traceable to the National Institute of Standards and Technology (NIST)*. The unit includes a high-impact plastic case with a recess for storing one probe, and is equipped with a power jack that will accept the optional AC power supply. The jack should be used when the unit will be in use for extended periods of time (in order to prevent battery failure).

Specifications

Temperature range - 40° to 300°F (- 40º to 150°C)

Resolution 0.1°F

Accuracy ± 0.5% over entire range

Display Four-digit LED, plus decimal point

Battery Standard 9 V alkaline or equivalent

Dimensions

Thermometer 3 (w) x 8 (d) x 1.125 in (t)

Display Area 2 x 0.94 in

Probe 6 in long

Weight 7.44 lb (3.38 kg)

Optional accessories

Immersion Probe (Model 07-403)

Waterproof Probe (Model 07-401), will not be damaged in chemistry or water

Available model(s)

07-402 Portable Digital Thermometer with one probe

** Factory re-calibration available.*

For more information, contact Radiation Management Services or your local distributor: M.D. McCauley Co., Inc.
M.D.McCauley Co., Inc. 760-C South Rochester Ave. Ontario, CA 91761USA
Tel (909)390-9313 Fax (909) 390-9061

Specifications are subject to change without notice.

07-402-ds rev 2 13 jun 05

Radiation Safety

RS

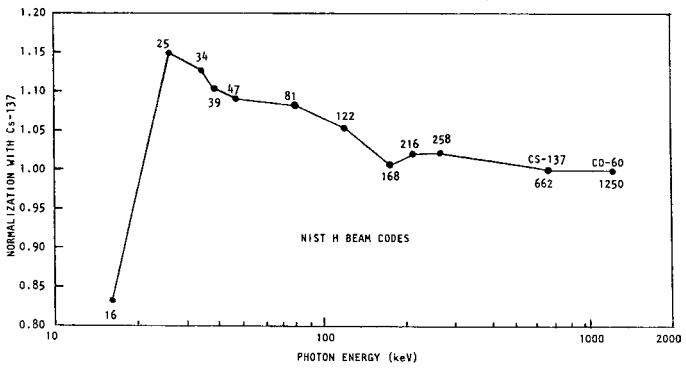
Direct Reading Pocket Dosimeters

Models 06-007 to 06-686

- Low leakage: measures background
- Superior energy response: 20 keV to 2 MeV
- Rugged: meets ANSI specifications N13.5 and N322
- Highly resistant to shock and vibration
- Available in a wide selection of ranges to meet all of your requirements

Introduction

Direct-Reading Pocket Dosimeters are rugged, precision instruments designed specifically for measuring accumulated quantities of gamma and x radiation. In use, the dosimeter is normally clipped to a pocket or to the outside of a lead apron. By checking the dosimeter reading periodically, the wearer is able to determine the exposure received during specific procedures. By knowing where and when greater-than-normal exposures occur, the wearer can identify the source and take quick, corrective action. We currently offers five dosimeters. Each dosimeter has a color-coded clip that signifies its range. This will help the user to identify the dosimeter (i.e. black clip = 0 to 200 mR, blue clip = 0 to 5 R, etc.), and ensure that the intended dosimeter is utilized.



Model 06-007

Applications

Direct-Reading Pocket Dosimeters are extremely easy-to-use. To read the integrated exposure, the user looks through the dosimeter eyepiece while pointing the unit toward any external light source. The exposure is determined by the position of a hairline fiber against a graduated scale. A Dosimeter Charger (Model 06-912) is used to re-zero the dosimeter.

The 0 to 200 mR Low-Energy Dosimeter is the most popular type for measuring personal radiation doses in hospital applications including fluoroscopy, portable radiography and angiography. Our dosimeters are ideal for nuclear medicine and health physics applications. All Direct-Reading Pocket Dosimeters are hermetically-sealed using state-of-the-art plastics and epoxy resins. These reliable, high-quality devices meet ANSI specifications N13.5 and N322, as well as military requirements.

Specifications

Radiation detected Gamma and x-radiation from 20 keV to 2 MeV

Ranges 0-200 mR to 600 R

Energy response See response curve:

160 keV to 2 MeV: ± 10%

40 keV to 160 keV: + 20%, - 10%

20 keV to 40 keV: + 20%, - 30%

Accuracy Within ± 10% of true exposure

Rate response Dose rate independent for gamma and x-radiation

Electrical leakage Less than 0.5% of full scale for 24 hours at 50°C

Relative humidity Up to 90%

Detector Fiber electrometer mounted in an electrically-conducting plastic ion chamber

Material

Detector housing Very low permeability plastics; hermetically-sealed

Clip Glass fiber-filled, high-strength plastic

Dimensions 0.6 in Ø x 4.5 (l) (1.5 x 12.4 cm)

Weight 0.06 lb (0.03 kg)

Available model(s)

06-007 Direct-Reading Pocket Dosimeter, 0 to 200 mR; Black Clip

06-007-2200 Direct-Reading Pocket Dosimeter, 0 to 2 mSv; Black Clip

06-611 Direct-Reading Pocket Dosimeter, 0 to 5 R; Blue Clip

Available model(s) *(continued)*

06-622 Direct-Reading Pocket Dosimeter, 0 to 20 R; Green Clip

06-638 Direct-Reading Pocket Dosimeter, 0 to 200 R; Yellow Clip

06-686 Direct-Reading Pocket Dosimeter, 0 to 600 R; Red Clip

For additional information, contact Cardinal Health
Authorized Distributor: M.D. McCauley Co., Inc.
Tel (909) 390-9313 Fax (909) 390-9061
Ontario, California USA

Specifications are subject to change without notice.

06-007-ds rev 1 11 mar 03

CardinalHealth

Dosimeter Accessories
Models 06-201 to 06-912

RS Radiation Safety

Multi-Dosimeter Checker

- Allows simultaneous testing of up to five or six direct-reading pocket dosimeters
- ^{137}Cs source requires no license. The Multi-Dosimeter Checkers consist of a plastic cylinder containing either five or six holes surrounding a central, hermetically-sealed, 9 µCi ^{137}Cs source

This device makes checking dosimeters easy. Properly charged and zeroed dosimeters are placed in the cylinder and exposed for the required period of time, depending on their range. Typically, a six-hour exposure of a properly-calibrated dosimeter will yield a reading from 25 to 35 mR.

Note: The hole diameter of Model 06-201 is larger than the hole diameter of Model 06-201-5000.

Specifications

Radioactive source 9 µCi ^{137}Cs source
Cylinder materials Cylinder material is PVC
Dimensions
Checker 2.5 in Ø x 2.5 (h)
Hole Model 06-201 0.6 in Ø x 2.5 in (d) (1.6 x 6.4 cm)
Hole Model 06-201-5000 0.807 in Ø x 2.5 (d) (2.1 x 6.4 cm)
Weight 0.5 lb (0.22 kg)
Available model(s)
06-201 Multi-Dosimeter Checker, six holes
06-201-5000 Multi-Dosimeter Checker, five holes

Dosimeter Charger and Storage Case Kit

- Convenient and cost-effective

Here you get the standard Dosimeter Charger (Model 06-912) in a rugged leatherette-covered case that holds up to 12 dosimeters. A chart conveniently affixed inside the case permits quick identification of each dosimeter and its user. The charger can be easily removed for battery change.

Specifications

Dimensions 5.25 (w) x 9.5 (d) x 5 in (h) (13.34 x 24.13 x 12.7 cm)
Weight 5 lb (2.3 kg)
Available model(s)
06-907 Dosimeter Charger and Storage Case Kit
06-907-1000 Dosimeter Storage Case without Charger

Dosimeter Charger

- For zeroing direct-reading dosimeters

This transistorized power supply zeroes all direct-reading dosimeters. A safety spring in the charging socket prevents damage from excessive pressure on the dosimeter. A protective cap keeps the socket free of dust and moisture when charger is not in use. One standard 1.5 V "D" cell battery (not included) permits thousands of chargings.

Specifications

Dimensions 4 (w) x 4 (d) x 3 in (h) (10 x 10 x 7.6 cm)
Weight 1 lb (0.45 kg)
Available model(s)
06-912 Dosimeter Charger

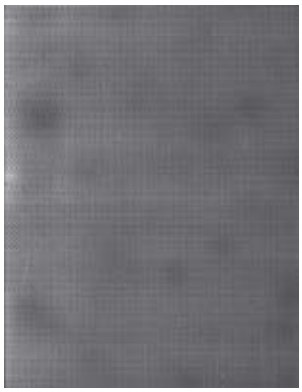
For additional information, please contact Cardinal Health Authorized Distributor: M.D. McCauley Co., Inc. 760 S. Rochester Ave. Unit C, Ontario, CA 91761 USA
Tel. (909) 390-9313 fax (909) 390-9061 www.xraymdm.com
 06-201-ds rev 1 11 mar 03

Diagnostic Imaging DI

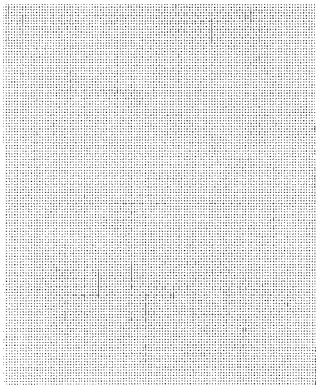
Mammography Screen-Film Contact Test Tool

Model 18-207

- **Identifies poor screen-film contact in cassettes**
- **Identifies problems that can affect image sharpness**



The dark areas in this image indicate poor screen-film contact



This image demonstrates good screen-film contact

Specifications

Dimensions 28.5 x 33.5 cm

Weight 1.05 lb (0.48 kg)

Available model(s)

18-207 Mammography Screen-Film Contact Test Tool

18-201 Mammography Screen-Film Contact Test Tool, 8.5 x 10 inch

For more information call your local authorized distributor:
M.D McCauley Co., Inc. 760-C South Rochester Ave. Ontario, California USA Tel 909-390-9313
Fax 909 390 9061 www.xraymdm.com

Specifications are subject to change without notice.

18-207-ds rev 2 26 feb 05

Introduction

Proper screen-film contact is essential for optimum image quality. The loss of contact and resolution is critical in areas of tiny calcifications or very subtle nodules. Contact testing should be performed on a routine basis to ensure the best possible image quality.

Because of the high resolution imaging capabilities of mammographic screen-film systems (16 to 20 cycles/mm vs. a conventional system with 4 to 8 cycles/mm), a fine mesh contact tool should be used to detect areas of poor contact. The Mammography Screen-Film Contact Test Tool consists of a copper screen with 40 wires per inch, laminated in white vinyl-covered plastic (with the equivalent density of 4 cm thickness of acrylic).

Just lay the contact tool over the cassette. Move the compression device as close as possible to the x-ray tube, and make an exposure. Process the film and look for screen-film clarity across the film. Dark areas indicate poor screen-film contact.

X-Ray Output Detector

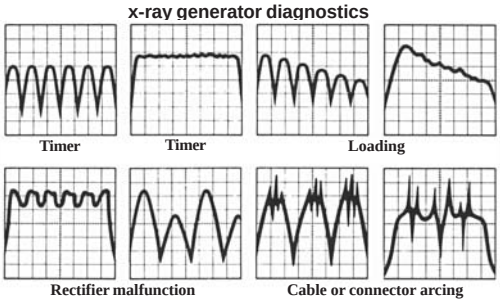
Model 07-451

- **Timer calibration (single-phase, three-phase or CP units)**
- **Loading characteristics**
- **Rectifier malfunctions**
- **Contactor problems**
- **Cable or connector arcing**
- **Shutter calibration, etc.**

This low-cost X-Ray Output Detector offers a dynamic means of demonstrating x-ray generator performance. It is used with a storage or camera oscilloscope to display the intensity-time relationship of an x-ray beam. To use, the detector is placed in the x-ray beam, and the output cable is connected to the oscilloscope input. The resulting waveshape patterns are used to calibrate and/or diagnose malfunctions in the x-ray generator.

The detector supplies a crisp 200 mV signal at standard diagnostic conditions (80 kVp, 100 mA). This extremely high output permits the simple interpretation of oscilloscope displays. Since the detector rise time is better than 1 microsecond, no alteration of the true x-ray output pulse shape is introduced.

Scope tracing examples of typical x-ray generator diagnostics



Specifications

Shock-resistant, solid-state diode detector. Power source: none required. Rise Time: Less than 1 µsec.

Dimensions 1.25 x 1.25 x 0.50 in (3.175 x 3.175 x 1.27 cm)

Weight 0.58 oz (16.6 g)

Optional accessories

Cable, 20 ft (6 m), BNC to BNC (Model 88-222)

Available model(s)

07-451 X-Ray Output Detector, includes BNC Output Connector

Screen/Film Contact Mesh

Model 07-608

The film/screen contact test tool determines the clarity of the focused image. This device allows problems to be identified so that image clarity can be restored. It consists of a 14 x 17 inch (35.6 x 43 cm) copper screen, with 0.125 inch (0.3 cm) mesh, embedded in durable plastic for long life use. To use, simply lay the unit over the cassette, radiograph, and develop the film. Look for screen image clarity across the film. Blurring or distortion indicates poor film/screen contact.

Specifications

Dimensions 15 x 18 x 0.125 in thick

Weight 1.5 lb (0.68 kg)

Available model(s)

07-608 Screen/Film Contact Mesh

Patient Phantom/Penetrometer System

Model 07-706

To check the tabletop output of image-intensified fluoroscopic equipment properly, a simulated body or phantom should be placed between the x-ray output meter and the input phosphor. The phantom protects the phosphor from the direct beam and provides the simulated attenuation needed to check the performance of image-intensifier systems. A penetrometer permits the determination of system contrast gradient under simulated operating conditions.

Consists of: **(a)** Two 7 x 7 x 0.75 inch blocks of high-purity aluminum, which represent the equivalent absorption of 26 cm of water and simulate a thick or heavy-set patient at 90 kVp. A single block is the equivalent of a child or adult chest. Aluminum simulates the scatter characteristics of the human body.

(b) One 7 x 7 x 0.125 inch lead beam-stop plate. When placed in the beam, this plate allows automatic brightness-control machines to deliver maximum output.

(c) One 7 x 7 x 0.03125 inch aluminum penetrometer plate with 0.25, 0.176, 0.125, 0.088, and 0.0625 inch holes. Place this plate between the two aluminum blocks and ascertain the contrast gradient of the penetrometer on image-amplified systems.

(d) Two sets of legs: one 1.25 inch long and one 10.375 inch long.

Specifications

Dimensions 7 x 7 x 1.656 in (h) (17.8 x 17.8 x 4.2 cm)

Weight 9.5 lb (4.3 kg)

Optional accessories

Aluminum Blocks, two Type-1100 Al 7.125 x 7.125 x 0.75 in thick (Model 07-629-1000)

Available model(s)

07-706 Patient Phantom/Penetrometer System

Authorized distributor: M.D. McCauley Co., Inc.
760 S. Rochester Ave., Ontario, CA 91761 USA
Tel (909) 390-9313 Fax (909) 390-9061
www.xraymdm.com

Specifications are subject to change without notice.

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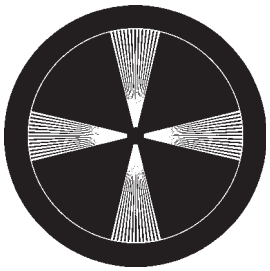
Diagnostic Imaging DI

Star Patterns

Models 07-503 to 07-551



Shown in Model 07-509-2000

Star X-Ray Test Patterns for Measuring Focal Spot Size

Focal spot size can be determined by observing the regions of blurring which occur when the pattern is radiographed by an x-ray source of finite dimensions. Radiation from different areas of the focal spot will cause a periodic blurring of the pattern due to penumbra effects. Knowledge of the geometric factors, and the distance from the center of the pattern to the region where blurring occurs, will permit the calculation of the focal spot size with the same accuracy as measurements made with a pinhole camera.

Available model(s)

07-503-2000 High-Precision Star X-Ray Test Pattern, 55 mm Ø. For measuring focal spots from 0.1 to 0.3 mm. Has four 15° patterned sectors with a 0.5° angle of a single line within a sector. Lead-foil thickness 0.03 mm

07-503-1000 Ultra-High Precision Star X-Ray Test Pattern. (Same specifications as Model 07-503-2000)

07-509-2000 High-Precision Star X-Ray Test Pattern, 55 mm Ø. For measuring focal spots from 1 mm and up. Has four 45° sectors with a 2° angle of a single line within a sector. Lead-foil thickness 0.05 mm

07-509-1000 Ultra-High Precision Star X-Ray Test Pattern. (Same specifications as Model 07-509-2000)

07-542-2000 Precision Star X-Ray Test Pattern, 55 mm Ø. For measuring focal spots from 0.3 to 0.6 mm. Has four 28 patterned sectors with a 1° angle of a single line within a sector. Lead-foil thickness 0.03 mm

07-542-1000 Ultra-High Precision Star X-Ray Test Pattern. (Same specifications as Model 07-542-2000)

07-543-2000 High-Precision Star X-Ray Test Pattern, 55 mm Ø. For measuring focal spots from 0.8 to 1.5 mm. Has four 35° patterned sections with a 1.5° angle of a single line within a sector. Lead-foil thickness 0.03 mm

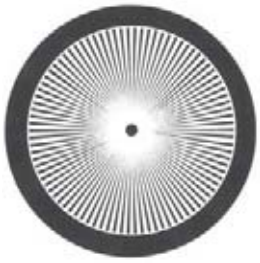
07-543-1000 Ultra-High Precision Star X-Ray Patterns. (Same specifications as Model 07-543-2000)

07-550 Ultra-High Precision Star X-Ray Patterns. (Same as Model 07-503-2000 except it has four 45° patterned sectors, for easier interpretation). Lead-foil thickness 0.03 mm

07-551 Ultra-High Precision Star X-Ray Pattern. (Same as Model 07-503-2000 except it has four 15° patterned sectors with a 0.25° angle). Lead-foil thickness 0.03 mm

07-510-2000 High-Precision Star X-Ray Test Pattern, 55 mm Ø. For measuring focal spots from 1 mm and up. Has one 360° pattern sector with a 2° angle of a single line within a sector. Lead-foil thickness 0.05 mm

07-510-1000 Ultra-High Precision Star X-Ray Test Pattern. (Same specifications as Model 07-510-2000)



Shown in Model 07-510

High-Purity Aluminum Step Wedges

Model 07-456

- **Built to US Federal Specification GG-X-635C**
- **Determines mAs linearity**
- **Determines contrast vs. kVp**
- **Used for:**
  - **Darkroom fog testing**
  - **Film and screen comparison**
  - **Technique chart development**

On these high-purity aluminum step wedges, even-numbered steps are identified with lead numerals.

11 steps

Dimensions

Step wedge 2.50 x 5.50 x 1.375 in

Each step 0.5 in surface; 3 mm rise

Weight 1.10 lb (0.50 kg)

21 steps

Dimensions

Step wedge 3 x 10.3 x 1.85 in

Each step 12 mm surface; 2.1 mm rise

Weight 3.20 lb (1.45 kg)

Available model(s)

07-456 11 Step Wedge, Type-2024 Aluminum

07-456-1100 11 Step Wedge, Type-1100 Aluminum

07-456-2100 21 Step Wedge, Type-2024 Aluminum

07-456-2111 21 Step Wedge, Type-1100 Aluminum

Authorized distributor: M.D. McCauley Co., Inc. 760 S. Rochester Ave., Ontario, CA 91761 USA
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