



# **OEM** **X-ray Components**



# Siemens Healthineers OEM Products

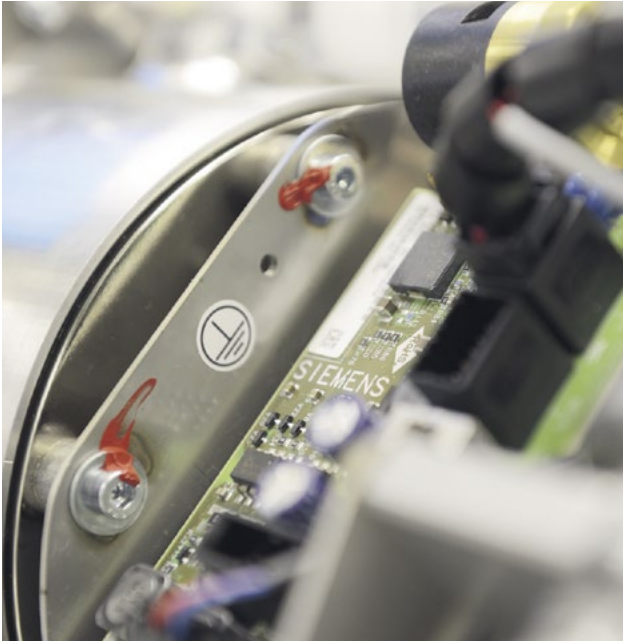
## Content

Introduction.....	04–07
Product Overview.....	08–09
Products .....	10–36
Contact us .....	37



OEM products for medical and industrial applications provided from a major global manufacturer of X-ray system components

## Creating values is our passion



Since the days of Prof. W. C. Röntgen, Siemens Healthineers has set standards in the development of X-ray products. Our solutions have found recognition among medical, industrial and scientific users throughout the world for many years. For countless customers the name Siemens Healthineers has become a synonym for quality, reliability and longevity.

We listen carefully to our customers and understand their need for outstanding quality at a reasonable price. And it's the passion of our engineers and that of our staff working at all stages of the value chain that enables us to create convincing customer values.

## Efficiency is our nature

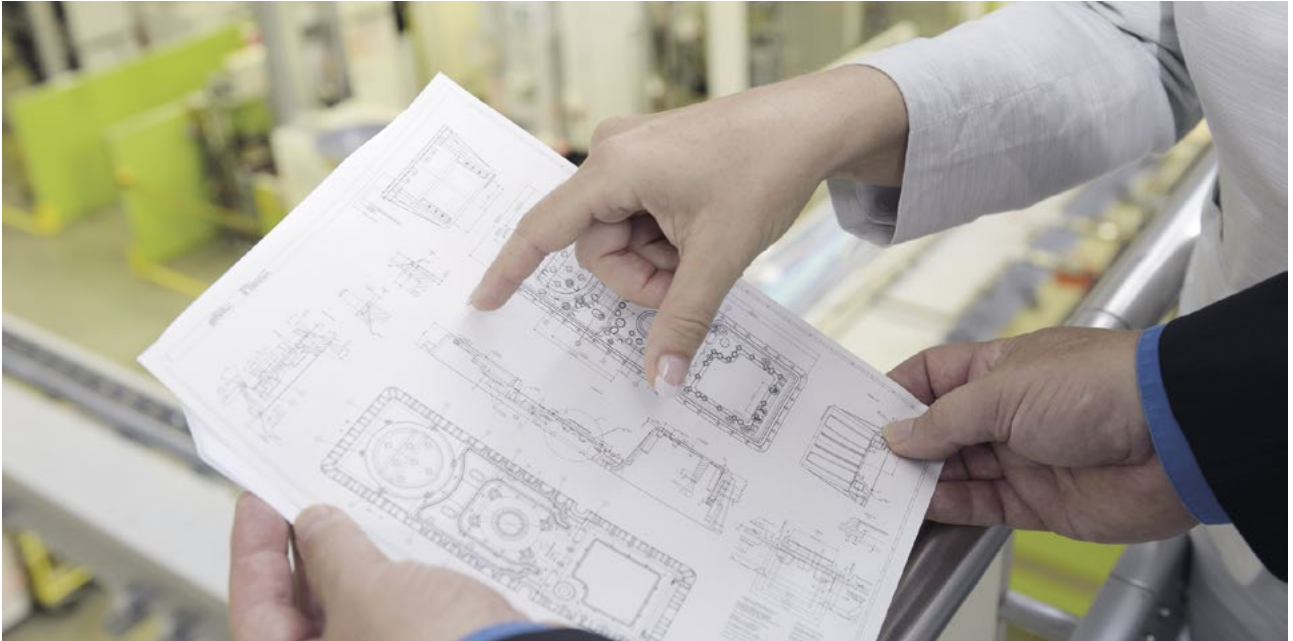


Being very focused and working very efficiently has become our second nature during the many years of manufacturing X-ray products. We apply innovative technologies, trigger synergies within Siemens Healthineers and benefit from global resources. Our consistent process orientation provides continuous learning and ideas for improvement.

This efficiency is a significant advantage not only in the field of production and logistics but also when it comes to information, consulting and after-sales services.

Last but not least, the efficient and conscious usage of natural resources has become an integral part of our company culture.

# Partnership is our way



We listen carefully to our customers and understand their specific requirements as well as the general economic environment. We offer solutions which can be beneficial for both sides. Our goal is to build a trustful long-term relationship.

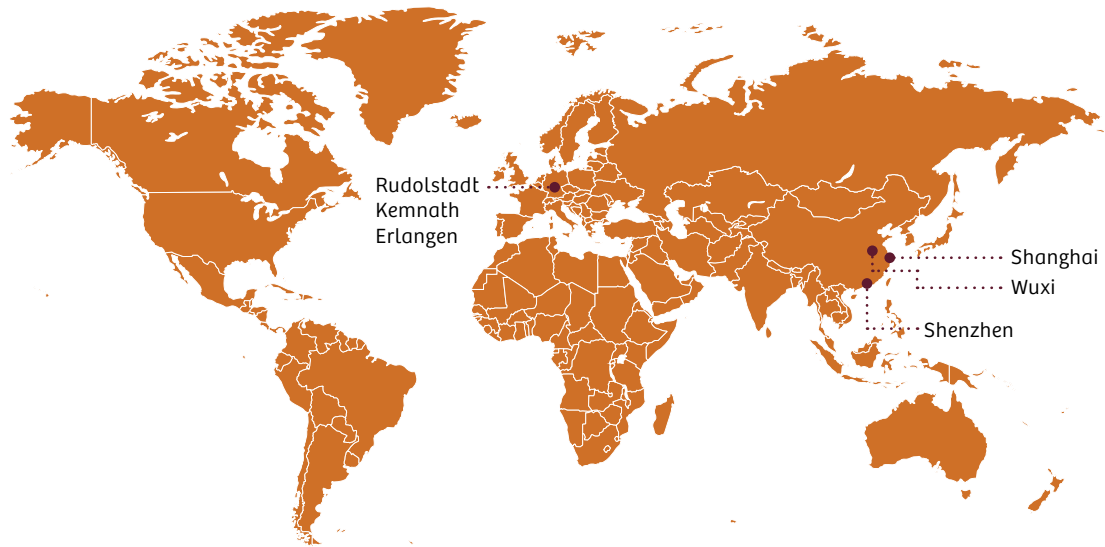
A good partnership proves its value in times of unforeseen events, where understanding, flexibility and reliability are essential.

We are always available for our partners and open to learn about potential for improvement, discuss new opportunities and enjoy our common success.

# About Us

## Our worldwide locations

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### Company Information

The Technology Centers of Siemens Healthcare GmbH have production sites located in Erlangen, Kemnath, Rudolstadt, Wuxi Shanghai and Shenzhen.

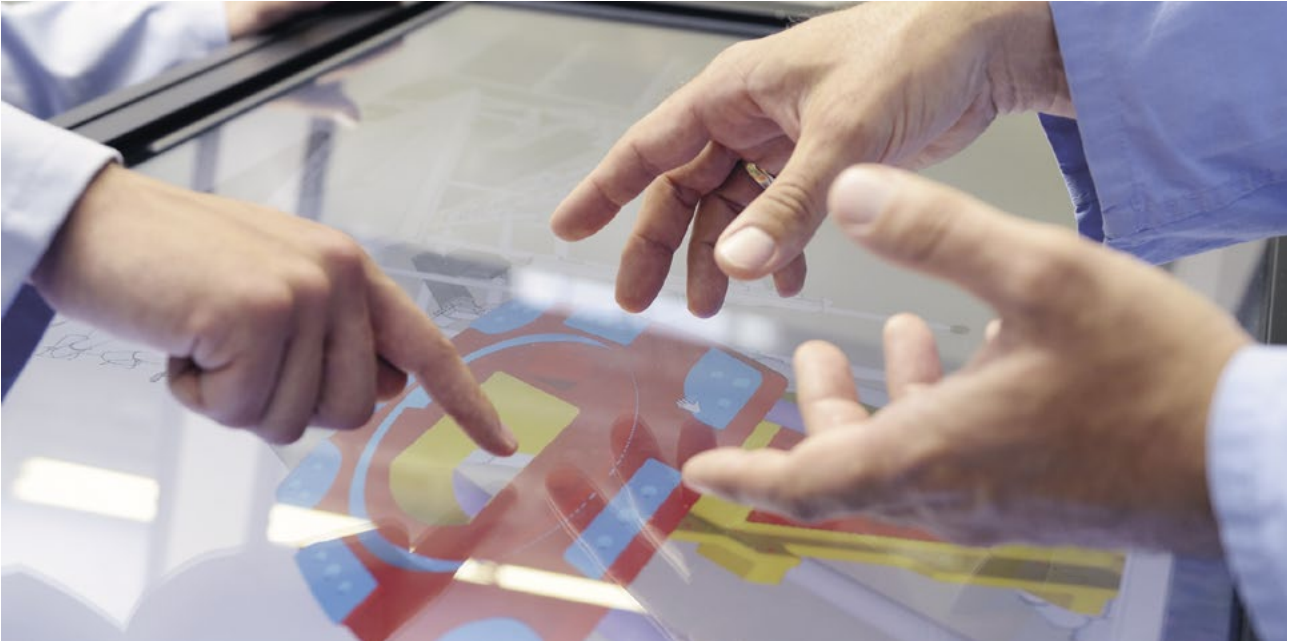
We are a major manufacturer of products for medical and industrial applications, supplying most divisions of Siemens Healthineers and a large number of OEM partners worldwide.

### Our Mission

Our goal is to continually grow our business together with OEM partners all over the world in the segments of Healthcare, Industry, Security and Science. We achieve this objective by offering you:

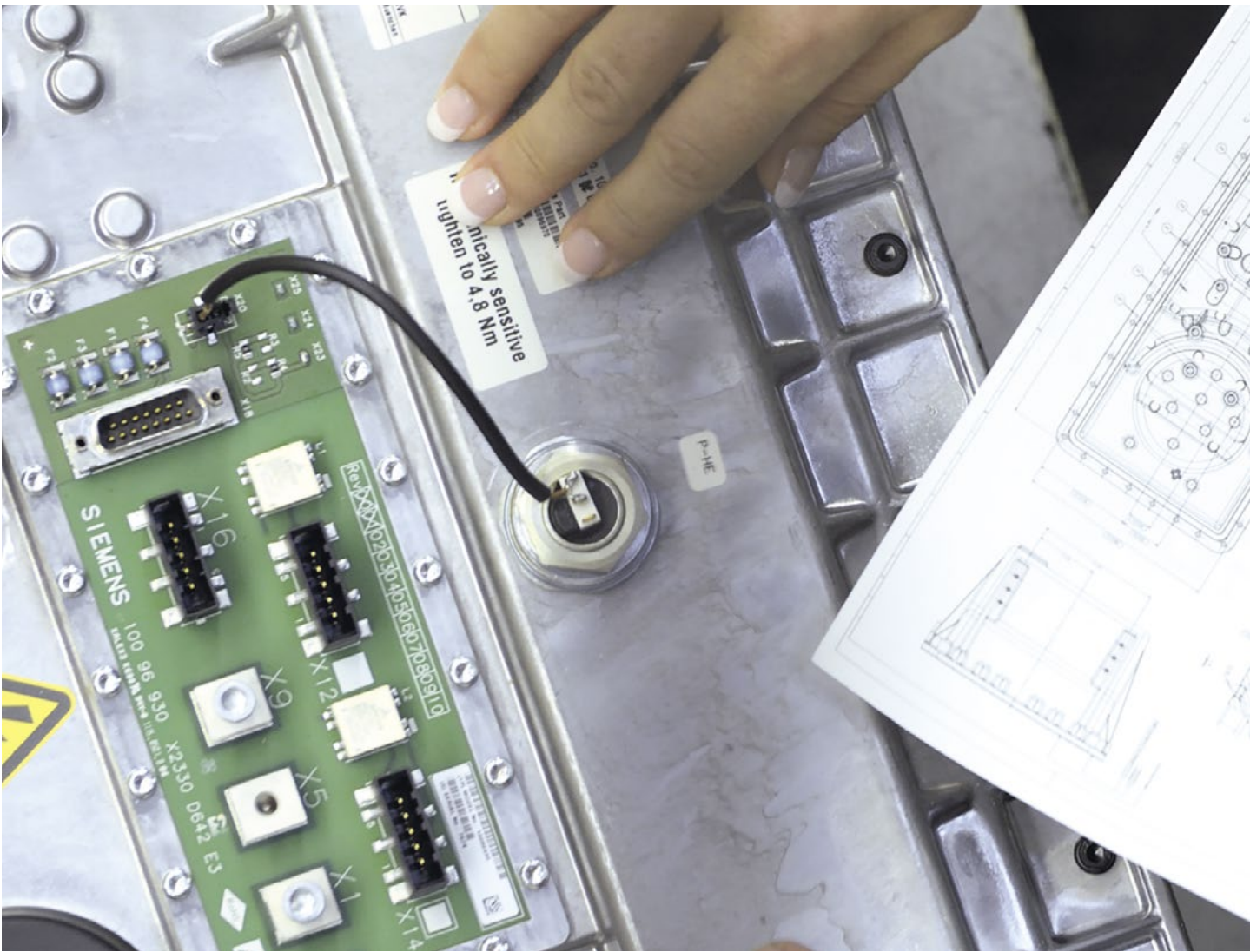
- Competitive and reliable high-quality products
- Customizing based on your specific requirements
- Cutting-edge technologies
- A well-trained, experienced and highly motivated team
- An efficient, reliable and trusting partnership

# Customized Solutions



We offer a broad spectrum of components. If none of our products meet your requirements, we are capable of customizing or creating something completely new for you.

Please feel free to contact us to discuss your specific needs. We are confident that we will find a competitive and convincing solution for you.



## Products and Solutions Overview

These components and configurations are not finished medical devices. Compliance with all laws and regulations that are applicable to finished medical devices is the responsibility of the assembler / manufacturer of the finished medical device.





<b>Ceiling Stands</b> .....	10	<b>X-ray Sources</b> .....	24
<b>Wall Stands</b> .....	12	<b>SILAC</b> .....	26
<b>Tables</b> .....	13	<b>Image Intensifiers</b> .....	30
<b>Ionization Chambers</b> .....	15	<b>Imaging Units</b> .....	32
<b>Collimators</b> .....	16	<b>X-ray Grids</b> .....	33
<b>Generators</b> .....	18	<b>Electronic and Mechatronic Solutions</b> ....	34
<b>X-ray Tube Assemblies</b> .....	20	<b>CERA – CT Imaging Software Components</b>	36
<b>X-ray Tubes</b> .....	23		

# Ceiling Stands

## Benefits

- Robust and reliable
- Smooth and accurate positioning
- Prepared for tilting technique for long legs and spine
- Integrated service functions for ease of service



The 3D V overhead supports feature a modular design so that you can tailor the configuration to your customer's diagnostic needs:

- Lungs, skeletal system, trauma
- Emergency room
- Orthopedic applications

### Technical data

Minimum focus-ceiling distance	830 mm	
Vertical telescope travel range	1800 mm	
Longitudinal travel range	3500 mm	(5645 mm) <sup>1</sup>
Detent positions	Configurable during installation	
Transverse travel range	2150 mm	(3500 mm) <sup>1</sup>
Detent positions	Configurable during installation	
Length of transverse track	3030 mm	(4380 mm) <sup>1</sup>
Tube rotation range, horizontal axis	-120° / +120° (-140° / +140°) <sup>2</sup>	
Detent positions at	-90°; 0°; +90°	
Tube rotation range, vertical axis	-154° / +182°	
Detent positions at	-90°; 0°; +90°; +180°	
Front touch user interface	SID	
	Horizontal tube rotation angle	
	Generator control <sup>3</sup>	



<sup>1</sup> Optional

<sup>2</sup> ACSS TT only

<sup>3</sup> With Polydoros RF

The versatile 3D V family has been designed with the objective of providing a cost-optimized product for radiography. The ergonomic product design is engineered to fulfill customer requirements for optimized handling that provides all radiographic features.

Together with a Bucky table and a Bucky wall stand, all relevant radiographic procedures are available.

Thanks to the 5-element telescope, a very small focus-to-ceiling-distance can be achieved, enabling installation in rooms with low ceiling heights.

Minimal force has to be exerted for positioning by hand. The support can still be moved manually in the case of a power failure to release the patient.

The very compact design enables low-cost installation. Together with ACSS (Automatic Cassette Size Sensing), motorized vertical movement is available, giving you system control at your fingertips.

#### Options and accessories

	Manual	ACSS T	ACSS TT
4.38 m long transverse track	x	x	x
Extension of longitudinal rails	x	x	x
Telescopic extension, 20 cm	x	x	x
Manual collimator ML03	x	–	–
Automatic collimator AL02 II eL	–	x	x
X-ray tube assembly	x	x	x



ACSS TT prepared for tilting technique for long-leg and full-spine stitching

#### Configurations

	Manual	ACSS T	ACSS TT
Prepared for tilting technique for long legs and spine	–	–	x
Automatic Cassette Size Sensing (ACSS)	–	x	x
Vertical motorized tracking of a wall or table Bucky	–	x	x
Electromagnetic brake for telescopic lift, transverse track	x	x	x
3 m long transverse track	x	x	x
Vertical SID acquisition	x	x	x
Integrated lock function, locks at any position along the ceiling track	x	x	x
Center-position catch for rotational axis		manual	motorized
Telescope carriage with automatic stop at SID 115 cm	x	x	x
Touch user interface for stand and generator control	x	x	x
CAN interface	x	x	x
24 m cable set for tube and collimator	x	x	x

# Wall Stands

## Benefits

- Fixed or tilting Bucky
- Buckies with stationary or moving grids
- Tracking for tube stand
- Spacer for examinations with trolley



WS P and WS T are radiographic wall stands for fast and simple routine X-ray exposures of a standing or sitting patient.

WS T provides a tiltable Bucky from +90° (horizontal position) to -20°. The wall stand allows optimal accessibility from left or right, and easy ergonomic one-hand operation of the entire system.

The counterbalance enables easy manual or motorized (WS T DS only) vertical movement. The wall stand is equipped with a Bucky for left or right loading (not for WS T DS). The large vertical travel range allows exposures of patients up to 190 cm (WS T) and 200 cm (WS P) in height.

Technical data	WS P	WS TL / TR	WS T DS
Vertical movement above floor (center to center)	38 cm to 180 cm (15.0" to 70.9")	34 cm to 173 cm (13.4" to 68.1")	26.5 cm to 175 cm (10.4" to 68.9")
Tilting Bucky	n.a.	Tiltable from -20° to +90° with 0° / 90° detent	
Front plate – detector plane distance	≤ 42 mm (1.7") <sup>1</sup>		≤ 45 mm (1.8") <sup>2</sup>
Radiation absorption front plate	≤ 0.45 mm Al		
Bucky cassette formats	All standard formats according to DIN 6832 Part 2-1992 ANSI / NAPM IT 1.49-1995 and from 13 x 18 cm to 35 x 43 cm (5" x 7" to 14" x 17")		n.a.



<sup>1</sup> Cassette

<sup>2</sup> Detector Pixium 4343RG

## Configurations

	PL CM	PR CM	TL CM	TR CM	TL CS	TR CS	T DS
Tilting Bucky	–	–	X	X	X	X	X
Left loading	X	–	X	–	X	–	–
Right loading	–	X	–	X	–	X	X
Moving grid	X	X	X	X	–	–	–
Stationary grid	–	–	–	–	X	X	X
Hand grips	X	X	X	X	X	X	X
Spacer option	–	–	–	–	X	X	X
Cassette	X	X	X	X	X	X	–
Mobile detector	X	X	X	X	X	X	–
Fixed detector	–	–	–	–	–	–	X
Motorized vertical movement	–	–	–	–	–	–	X
Babix holder (not with spacer)	X	X	X	X	X	X	X

## Tables

Siemens Healthineers offers Bucky tables with floating table tops and with height adjustment. All our tables are prepared for our 3D V ceiling stands.

Siemens Healthineers manufactures table tops that provide an outstanding degree of precision in height adjustment and during longitudinal movement of the table top.

The use of special materials helps to satisfy exacting requirements in terms of image quality and patient comfort during positioning.

### Technical data

Tabletop width	80 cm (31.5")
Tabletop length	241 cm (94.9")
Table height (motorized adjustment)	54 cm to 93 cm ± 1.5 cm (21.3" to 36.6" ± 0.6")
Radiation absorption	≤ 0.65 mm Al
Tabletop travel	Longitudinal: ± 48 cm (± 18.9");  Transverse: ± 14 cm (± 5.5")
Material	Compound tabletop
Table-film distance	≤ 55 mm (≤ 2,2")
Max. patient weight	280 kg (617 lbs) (200 kg/441 lbs otherwise)
Bucky cassette formats	All standard formats according to DIN 6832 Part 2-1992 ANSI/NAPM IT 1.49-1995 and from 13 x 18 cm to 35 x 43 cm (5" x 7" to 14" x 17")
Bucky travel along longitudinal table axis	≥ 60 cm (≥ 23,6")



# Tables

## Benefits

- Buckies with stationary or moving grids
- Manual and ACSS version
- Prepared for flat panel detector
- Small patient to active image area distance



The RAD TC series is an elevating table family developed for radiographic applications. These versatile radiographic tables offer motorized height adjustment and are designed for single hand operation. Children, people with injuries, and handicapped persons can be positioned with ease, and access to the patient is improved.

All tables are available with ACSS (Automated Cassette Size Sensing).

### Options and accessories

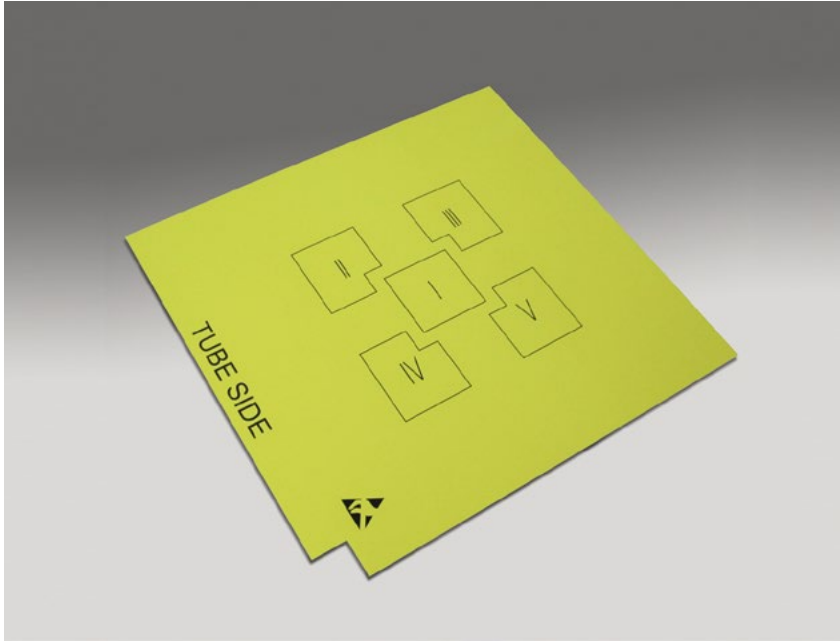
#### Options and accessories

- 2nd kick switch
- High transparency grid
- Compression belt
- Paper holder
- Table mattress
- Detector / cassette holders

### Configurations

	TC CM	TC CS	TC DST
Elevating patient table	x	x	x
Moving grid	x	–	–
Stationary grid	–	x	x
Cassette	x	x	–
Mobile detector	–	x	–
Fixed detector	–	–	x
Flat tabletop	x	x	x
Standard tabletop	x	x	x

# Ionization Chambers



## Benefits

- High flexibility thanks to 3 or 5 individually selectable measuring fields
- The virtually shadow-free design is ideally suited for use in digital X-ray imaging systems
- Environmentally friendly RoHS-compliant design
- High sensitivity for a wide range of applications
- Integrated preamplifier for improved signal-to-noise ratio

The 3-field and 5-field ionization chambers with pre-amplifier are used in X-ray diagnostics in automatic exposure control (AEC) systems as radiation-measuring devices.

The individually selectable measuring fields permit their universal use in digital and analog radiography systems. The flat chamber with a nominal thickness of 6 mm allows a minimum object-film distance for increased sharpness.

Type	5FA Iontomat Chamber XT	3FA Iontomat Chamber XT
Dimensions (L x W x H)	(486 ± 0.8) mm x (455 ± 0.8) mm x (6.4 ± 0.2) mm	
Weight	450 ± 20 g	
Imaging area, centered to central measuring field	430 mm x 430 mm	
Measuring field size central field / side fields	59.3 cm <sup>2</sup> / 59.6 cm <sup>2</sup>	64.0 cm <sup>2</sup> / 65.4 cm <sup>2</sup>
Sensitivity deviation between individual measuring fields (compared to central field)	≤ ±10%	
Reproducibility	≤ 3%	
Type of pre-amplifier, gain	Current to voltage converter, 3 x 10 <sup>7</sup> V / A	
Output signal proportional to dose rate	0.001–10 V	
Typical sensitivity at 100 kV	≥ 850 Vs / Gy	
Minimal dose / picture	0.85 μGy	
Measuring range	40–150 kV	
Dose rate range	0.85–10000 μGy / s	
Dose range	0.85–174 μGy	
Exposure time range	0.001–10 s	
Attenuation equivalent at 70 kV (RQR5, IEC 61267:2005)	< 0.7 mm Al	



These AEC chambers were designed for use in combination with a Siemens Healthineers X-ray generator.

# Collimators

## Benefits

- Precise collimation of X-ray field
- Versions for Radiography, Fluoroscopy and Surgery, Angiography, Cardiology
- Manual and automatic collimation



### For Radiography Systems

All our radiography collimators have an intuitive front panel and a state-of-the-art LED light field localizer for easy operation, as well as a manual rotary flange and accessory rails. Model ML03 offers several options for tailoring your collimator according to your specific needs.

- AL collimators with fanless design, that provides a superior silent operation.
- An integrated interface for CANopen DAP chambers reduces the cabling effort on the system side
- The 0° rotation detent detection is reported via CAN bus

	ML03	AL01 II eL	AL02 II eL	AL03 II eL
Collimation	Manual	Automatic		
Line laser	option	x	x	x
Measuring tape	option	x	x	x
Off focal blades	option	x	x	x
Manual prefilter	option	x	-	-
Motorized prefilter	-	-	x	-
Additional 1 mm Al filtration	option	-	-	-
Manual rotary flange	x	x	x	x
Prepared for integration of DAP chamber	only in accessory rails	x	x	x



**For Remote-controlled Fluoroscopy Systems**

- Designed for easy operation with an intuitive front panel, state-of-the-art LED light field localizer, with excellent brightness and contrast, line laser and measuring tape.
- Off-focal blades close to the focal spot for safety and excellent images.
- Motorized prefilter, manual rotary flange and foam-protected accessory rails.
- The AL 02 II eL with its ultrafast change of Cu-prefilter is ideally suited for Dual Energy (DE) radiography.

	AFL01 II eL	AFL DSA 01 II eL	AL02 II eL
Additional iris diaphragm	x	x	–
Off focal blades	x	x	x
Suited for Dual Energy	x	x	x
Semi-transparent wedge filters	–	x	–
Prepared for integration of DAP chamber	x	x	x

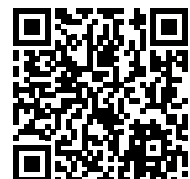
**For Patient-side controlled Fluoroscopy Systems**

- CAN control interface
- Off-focal blades close to the focal spot for safety and excellent images
- Interface for a CANopen DAP chamber available: reduced cabling efforts at system side
- Motorized prefilter with real position monitoring for advanced safety in fluoro mode

	A01 II	AF 01 II	AF DSA 01 II
Additional iris diaphragm	–	x	x
Off focal blades	x	x	x
Motorized prefilter	x	x	x
Semi-transparent wedge filters	–	–	x
Prepared for integration of DAP chamber	x	x	x

**For Angiography and Cardiology systems<sup>1</sup>**

	AFA DSA AMP	AF DSA AMP	AF C	MFD
Iris diaphragm	–	x	–	–
Rectangular collimator	asymmetrical	symmetrical	symmetrical	symmetrical
Motorized rotation	rotational unit optional	rotational unit optional	rotational unit optional	internal rotation of blades
Motorized prefilters	x	x	x	x
Semi-transparent filters	3 wedge filters	3 wedge filters	1 wedge filter	1 wedge filter
Prepared for integration of DAP chamber	x	x	x	x

<sup>1</sup> Work in progress

# Generators

## Benefits

- Flexible interfacing for DR systems
- Easy integration with 3rd party products
- Flexible positioning via compact design
- Operation with single phase line power possible with ESU



Siemens Healthineers offers Polydoros RF generators in the 30 kW to 80 kW output range, which are suitable for radiography and fluoroscopy X-ray applications. Available features include Automatic Exposure Control (AEC), high speed starter, conventional or pulsed fluoroscopy for dose reduction and tube overload protection. For use with single phase line power supply, we provide an Energy Storage Unit (ESU) for 30 kW and 55 kW versions. The X-ray generators are prepared for digital systems with CAN or RS 232 interfaces.

### Available console versions:

- Touch screen panel
- Key console with organ program option
- Mini console for use in DR environment

Our generators also support 3<sup>rd</sup> party tubes and AEC detectors from other manufacturers. Please contact us for details.



Generator	Polydoros RF Rad 80		
	55 kW	65 kW	80 kW
Power rating 60 kV	1 mA to 640 mA	1 mA to 1000 mA	1 mA to 1000 mA
100 kV	1 mA to 550 mA	1 mA to 650 mA	1 mA to 800 mA
125 kV	1 mA to 443 mA	1 mA to 524 mA	1 mA to 645 mA
150 kV	1 mA to 366 mA	1 mA to 433 mA	1 mA to 533 mA
Exposure voltage	from 40 kV to 150 kV		
Automatic exposure control	1-point technique with continuously falling load 2-point technique with constant load 3-point technique with constant load either mAs or mA (only with touch screen control console)		
mAs integrator	from 0.5 to 800 mAs graduated either in 33 fixed values of one or in 65 values of 1/2 Siemens Healthineers exposure point		
Exposure times	1-point technique: 1 ms to 5 s with mAs-post-indication (with AEC only) 2-point technique: 1 ms to 5 s depending on mAs and kV 3-point technique: 20 ms to 5 s depending on mAs and kV		
Tolerances	kV accuracy: $\pm 5\%$ ; mAs accuracy: $\pm 10\% + 0.2$ mAs, depending on which value is greater		
Power line	380 V $+15\%$ $-10\%$ , 50/60 Hz $\pm 3$ Hz, 3-phase, PE 400 V $+10\%$ $-15\%$ , 50/60 Hz $\pm 3$ Hz, 3-phase, PE 440 V / 480 V $\pm 10\%$ , 50/60 Hz $\pm 3$ Hz, 3-phase, PE, with optional line matching transformer		
Line impedance	according to IEC60601-2-7/IEC60601-2-54		
Dimensions	1020 mm (l) x 548 mm (w) x 542 mm (h)		

<sup>1</sup> Option<sup>2</sup> Available on request<sup>3</sup> High voltage pulse widths

Generator	Polydoros RF 80				Polydoros RF ESU	
	30 kW	55 kW	65 kW	80 kW	30 kW ESU	55 kW ESU
Power rating 60 kV	1mA to 500 mA	1mA to 640 mA	1mA to 1000 mA	1mA to 1000 mA	1mA to 500 mA	1mA to 640 mA
100 kV	1mA to 300 mA	1mA to 550 mA	1mA to 650 mA	1mA to 800 mA	1mA to 300 mA	1mA to 550 mA
125 kV	1mA to 241 mA	1mA to 443 mA	1mA to 524 mA	1mA to 645 mA	1mA to 240 mA	1mA to 324 mA
150 kV	1mA to 200 mA	1mA to 366 mA	1mA to 433 mA	1mA to 533 mA	1mA to 173 mA	1mA to 173 mA
Exposure voltage	from 40 kV to 150 kV					
Fluoroscopy values continuous <sup>1</sup>	0.2 mA to 11.3 mA @ 40 kV, 0.2 mA to 9.09 mA @ 110 kV, 680 W continuously, max. 1000 W (depending on duration), 40 kV to 110 kV				0.2 mA to 11.3 mA, 390 W continuously, 40 kV to 90 kV	
Fluoroscopy values pulsed <sup>2</sup>	4 mA to 80 mA, 400 W average, 40 kV to 110 kV, up to 30 frames/sec					
Automatic exposure control <sup>1</sup>	0-point technique with DR Mode supported by generator 1-point technique with continuously falling load 2-point technique with constant load 3-point technique with constant load either mAs or mA (only with touch screen control console)					
Tomography <sup>1</sup>	5 fixed time values				500 mAs: 31 fixed values 61 values	
mAs integrator	from 0.5 to 800 mAs graduated either in 33 fixed values of one or in 65 values of ½ exposure points				from 0.5 to 500 mAs graduated either in 33 fixed values of one or in 65 values of ½ exposure points	
Exposure times <sup>3</sup>	1-point technique: 1 ms to 5 s with mAs-post-indication (with AEC only) 2-point technique: 1 ms to 5 s depending on mAs and kV (for P ≥ 55 kW) 3-point technique: 20 ms to 5 s depending on mAs and kV					
Tolerances	kV accuracy: ± 5%; mAs accuracy: ± 10% or 0.2 mAs, depending on which value is greater					
Power Line	380 V / 400 V, 50 / 60 Hz, 3-phase, 440 V / 480 V, 50 / 60 Hz, 3-phase, PE with an optional line matching transformer				220 V / 230 V, 50 / 60 Hz, 1-phase 240 V, 50 / 60 Hz, 2-phase	
Line impedance	acc. to IEC 60601-2-7 / IEC60601-2-54				≤ 2 Ohm	
Dimensions	1020 mm (L) x 570 mm (W) x 542 mm (H)					

# X-ray Tube Assemblies

## Benefits

- Excellent quality and reliability
- Low life-cycle costs
- Outstanding image quality



With more than 100 years' experience in high-end X-ray technology, Siemens Healthineers offers various X-ray tubes and X-ray tube assemblies with stationary or rotating anodes, as well as X-ray sources for different applications.

Please contact us for further information.

12°	RAY-12 230 kHU	RAY-14 350 kHU  SDR 150 / 30 / 55 330 kHU	SV 150 / 40 / 80C-100(L)  600 kHU	SV 150 / 40 / 80HC-100(L)  800 kHU
16°	RAY-6 216 kHU	Optilix 154 / 30 / 50R-101S 340 kHU	SV 150 / 30 / 50C-100(L) 600 kHU	
17.5°	RAY-1 <sup>1</sup> 135 kHU			
Anode angle	Anode heat storage capacity			



<sup>1</sup> Not commercially available in all countries.



### X-ray tube assemblies for Radiography and Fluoroscopy<sup>1</sup>

	Nominal voltage	Anode angle	Focal spot size	Nominal power <sup>2</sup> 300 W 0 W	Anode heat storage capacity	Heat storage capacity of assembly	Maximum anode heat dissipation
RAY-1 <sup>3</sup>	125 kV	17.5°	1.0 / 2.0	- / - 23 / 54 kW	100 kJ (135 kHU)	1000 kJ (1350 kHU)	520 W
RAY-6	150 kV	16°	0.6 / 1.5	12 / 40 kW 24 / 69 kW	160 kJ (216 kHU)	1000 kJ (1350 kHU)	1125 W
RAY-12	150 kV	12°	0.6 / 1.2	22 / 54 kW 29 / 73 kW	170 kJ (230 kHU)	1000 kJ (1350 kHU)	1125 W
RAY-14	150 kV	12°	0.6 / 1.2	35 / 80 kW <sup>4</sup> 45 / 107 kW	260 kJ (350 kHU)	1000 kJ (1350 kHU)	1200 W
SDR 150 / 30 / 50	150 kV	12°	0.6 / 1.0	30 / 50 kW 40 / 69 kW	244 kJ (330 kHU)	1000 kJ (1350 kHU)	1567 W
SDR 150 / 30 / 55	150 kV	12°	0.6 / 1.0	30 / 55 kW 43 / 84 kW	244 kJ (330 kHU)	1000 kJ (1350 kHU)	1567 W
Optilix 154 / 30 / 50R-101S	150 kV	16°	0.6 / 1.0	30 / 50 kW 32 / 53 kW	250 kJ (340 kHU)	1200 kJ (1620 kHU)	2000 W
SV 150 / 30 / 50C-100	150 kV	16°	0.6 / 1.0	30 / 50 kW 40 / 69 kW	450 kJ (600 kHU)	1800 kJ (2430 kHU)	2000 W
SV 150 / 40 / 80C-100	150 kV	12°	0.6 / 1.0	40 / 80 kW 52 / 103 kW	450 kJ (600 kHU)	1800 kJ (2430 kHU)	2000 W
SV 150 / 40 / 80HC-100	150 kV	12°	0.6 / 1.0	40 / 80 kW 52 / 103 kW	580 kJ (800 kHU)	> 1800 kJ (> 2430kHU)	2000 W

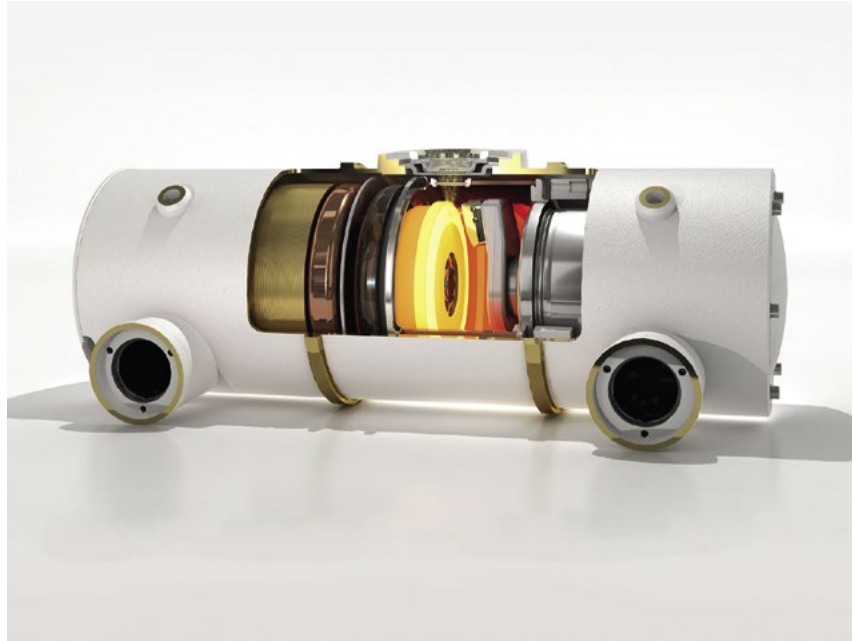
<sup>1</sup> Most tubes are available in single- or 3-phase if requested

<sup>2</sup> Thermal anode reference power 0 W resp. 300 W

<sup>3</sup> Not commercially available in all countries.

<sup>4</sup> Thermal anode reference power 130 W

# X-ray Tube Assemblies



## X-ray tube assemblies for Angiography and Cardiology

	Nominal voltage	Anode angle	Focal spot size	Nominal power 300 W <sup>1</sup>	Anode heat storage capacity	Heat storage capacity of assembly	Maximum heat dissipation
MEGALIX Cat 125 / 15 / 40 / 80 for Angiography	125 kV	12.5°	0.3 / 0.6 / 1.0	15 / 40 / 80 kW	2100kJ (3000kHU)	3600 kJ (4900 kHU)	5000 W
MEGALIX Cat 125 / 35 / 80 for Cardiology	125 kV	8.5°	0.4 / 0.8	35 / 80 kW	2100kJ (3000 kHU)	3600 kJ (4900 kHU)	5000 W

<sup>1</sup> Thermal anode reference power 300 W, IEC 60613 (1989)

# X-ray Tubes



Please contact us for further information

X-ray tubes for mobile C-arms, mobile X-ray systems and dental applications

Stationary anode tubes, operation in monoblocks

Tube Name	Appl.	Focal spot size	Nominal Voltage	Nominal power	Anode angle	Anode heat storage capacity	Maximum heat dissipation <sup>2</sup>
SR 90 series	dental	0.5	90 kV	1.65 kW	5.5°	26 kJ (35.1 kHU)	200 W
SR 120/15/60		0.5/1.5	120 kV	0.68/3.2 kW	16°	35.5 kJ (48 kHU)	600 W
SR 125/40/80 <sup>1</sup>	surgery, bone densitometry	0.6/1.0 <sup>3</sup>	125 kV	2.0/3.65 kW	9°	60 kJ (85 kHU)	680 W
SR 125/40/100 <sup>1</sup>		0.6/1.2 <sup>3</sup>	125 kV	2.0/4.8 kW	9°	60 kJ (85 kHU)	680 W

<sup>1</sup> Work in progress

<sup>2</sup> Depending on cooler

<sup>3</sup> Further focal spot sizes available on request

X-ray tubes for mobile C-arms, mobile X-ray systems

Rotating anode tubes, operation in monoblocks

Tube Name	Appl.	Focal spot size	Nominal Voltage	Nominal power	Anode angle	Anode heat storage capacity	Nominal continuous input power <sup>6</sup>
P 135/20	Mobile Rad	0.8	135 kV	20 kW <sup>2</sup> 24 kW <sup>3</sup>	15°	88 kJ (124 kHU)	450 W
P 135/30R	Mobile Rad	0.8	135 kV	28 kW <sup>2</sup> 34 kW <sup>3</sup>	15°	88 kJ (124 kHU)	450 W
Opti 125/4/8 <sup>1</sup>	Surgery	0.3/0.6	125 kV	4/8 kW <sup>4</sup>	10°	103 kJ (140 kHU)	600 W
Opti 150/10/30R	Surgery	0.3/0.5	150 kV	10/30 kW <sup>5</sup>	10°	200 kJ (270 kHU)	600 W

<sup>1</sup> Work in progress

<sup>2</sup> Thermal anode reference power 75 W

<sup>3</sup> Thermal anode reference power 0 W

<sup>4</sup> Thermal anode reference power 100 W

<sup>5</sup> Thermal anode reference power 150 W

<sup>6</sup> "Max Heat Dissipation" may yield higher values

# MonoSource S

## Benefits

- Excellent price-performance ratio
- For use with both X-ray image intensifiers and flat panel detectors



When both quality and costs matter, it can become a key component in your compact mobile X-ray system.

The package solution MonoSource S-4 comprises the monoblock and the generator unit. MonoSource S-5 additionally comprises an energy buffer.

### MonoSource S-4 / S-5

		S-4	S-5	IEC
Nominal voltage range		40 kV – 110 kV, ±5%		60613:2010
F1/Nominal anode input power		0.6 / 1.98 kW		60336
F2/Nominal anode input power		1.0 / 3.5 kW	1.2 / 4.8 kW	60336
F1/Pulse power		0.6 / 2.1kW (max. 60ms)		60336
F2/Pulse power		1.0 / 3.5 kW (max. 100ms)	1.2 / 5 kW (max. 70ms)	60336
Heat storage capacity single tank		1200 kHU = 840 kJ		60613:1989
Anode heat storage capacity		85 kHU = 60 kJ		60613:2010
Anode angle		9°		
Rad application	mAs	up to 100 mAs		
	Max. current	45 mA	65 mA	
Fluoro application	Continuous current	< 16 mA		
	Frame rates	up to 15 fps		
Mean power rating	Continuous	up to 120W*		
	10 min / 40 min	550 W / 330 W		60613:2010
Inherent filtration		permanent: ≤ 2.7 mm Al / 75 kV additional filter: 0.1 mm Cu, 1 mm Al		60522
Power supply		230V +10% -15%		
Interface		RS 232		

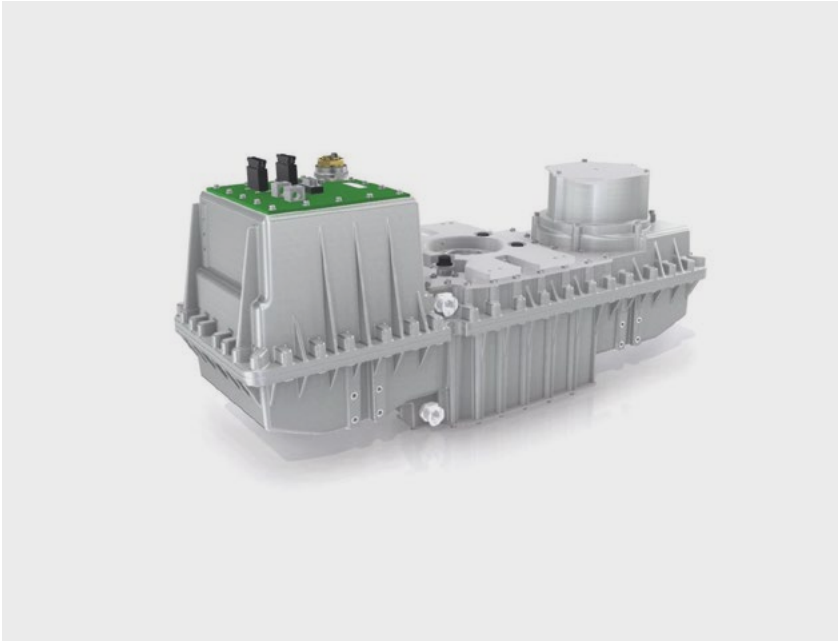
\* Depending on thermal conductivity of environment

Please note that the product MonoSource S is not commercially available in all countries. Due to regulatory and legal reasons the future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.





# MonoSource R



## Benefits

- Excellent image quality possible thanks to small focal spots and a high pulse power with up to 30 fps
- Ideally suited for use in combination with flat panel detectors
- Prepared for active cooling for an increased patient throughput
- High flexibility thanks to fast parameter switching capability

### MonoSource R-12 / R-25

High power monoblock / generator solutions with a rotating anode tube, designed for application in high end mobile C-arms. It can become one of the key building blocks in your versatile solution for surgical imaging and interventions.

The package solution MonoSource R comprises the monoblock, generator and one respectively two energy buffers.<sup>1</sup>

MonoSource		R-12	R-25	IEC
Nominal Voltage Range		40 kV – 125 kV, ±10%		60613: 2010
F1 Nominal Power		0.3 / 10 kW		
F2 Nominal Power		0.5 / 12 kW	0.5 / 25 kW	
Heat Storage Capacity Single Tank		2,565 KHU = 1.900 kJ		60613:1989
Anode Heat Storage Capacity		380 KHU = 270 kJ		60613:2010
Anode Angle		10.25°		
Rad Application	mAs	12 mAs	25 mAs	
	Max. Current	120 mA	250 mA	
	Anode Drive Frequencies	50 Hz / 120 Hz / 150 Hz		
Fluoro Application	Continuous Current	Available on request		
	Frame Rates	Up to 30 fps		
Mean Power Rating	Continuous	100 W		
	20 min / 40 min	- / 600 W		60613:2010
Inherent Filtration		Permanent: ≥3.0 mm Al / 75 kV Additional filter: 0.1 mm Cu		60522
Power Supply				
Interface		CAN, Ethernet on request		

*The products mentioned here are not commercially available yet. Due to regulatory reasons its future availability cannot be guaranteed.*

# SILAC



## Siemens Healthineers Industrial Linear Accelerator

The SILAC linear accelerator system is designed for non-destructive testing (NDT) and use in scanning devices for cargo and vehicles in the security sector.

It allows for stationary installation in bunkers or controlled areas as well as mobile setups on trucks. The movable X-ray head can be used in a versatile range of applications.

The SILAC system comprises all necessary components, including the linear accelerator itself, shielding, magnetron, modulator, power supplies and interfaces, as well as an external cooling unit for hot or cold environments. Collimators and shielding modifications are also available.<sup>1</sup>

## Possible applications

- Cargo inspection: trucks, ships, rolling stock
- Non-destructive testing
- Quality control in casting technology
- Metrology in complex assemblies
- Various research fields



<sup>1</sup> The product SILAC is not commercially available in all countries. Due to regulatory and legal reasons the future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

## Benefits

- Optimal mechanical degrees of freedom with movable X-ray head
- Compact design and optimized weight for easy installation
- Flexible and reliable operation thanks to full digital control
- Enhanced material detection capability in dual-energy operation mode
- Suitable for a wide range of applications thanks to continuously adjustable photon energy levels
- High flexibility with adjustable operation schemes

Technical Data		SILAC c
Dimensions (H x W x D) mm	X-ray head (rotatable)	1250 x 1010 x 1110
	control cabinet	1710 x 940 x 790
	cooling unit	710 x 1250 x 1060
Weight (kg)	X-ray head	1900
	control cabinet	600
	cooling unit	356
Maximum dose rates at specific energy (absorbed dose H <sub>2</sub> O, p = 1)	3 MeV	2.5 Gy/min
	4 MeV	4 Gy/min
	5 MeV	6.5 Gy/min
	6 MeV	9 Gy/min
	7 MeV	2 Gy/min
Leakage radiation <sup>1</sup>		≤ 2 x 10 <sup>-6</sup> from >60°
Photon spot size diameter(mm) <sup>2</sup>		1.2–2.0
Dose stability <sup>3</sup>		<1%
Energy stability <sup>3</sup>		<1%
Variable pulse adjustment	pulse repetition rate	20–600 Hz
	pulse length	1–4 μs
Interlaced dual energy	pulse to pulse switching	yes

Technical Data		SILAC c
Aperture (others on request) primary beam opening	vertical slit	70° x 1°
	cone	40° x 40°
Electrical power requirements		3 phase AC
	voltage / frequency	400 V / 50–60 Hz
	fuse	35 A
Communication	ethernet	yes
Status control	24V PLC	yes
External trigger control	RS-485	yes option internal detector synchronization
Human machine interface in 3 levels		system monitoring and system adjustment (energy/dose)
Cooling unit	external cooling medium	air
	maximum ambient temperature range	–40 to +60°C
Protection class	X-ray head	IP66
	control cabinet	IP66
	cooling unit	IP56

<sup>1</sup> Ratio of leakage radiation to primary radiation measured in 1m from housing at angles 60° and greater

<sup>2</sup> Penumbra of tungsten edge under high magnification (similar to EN 12543-5)

<sup>3</sup> <1% stability and drift are for max. 600Hz pulse repetition rate and single energy mode

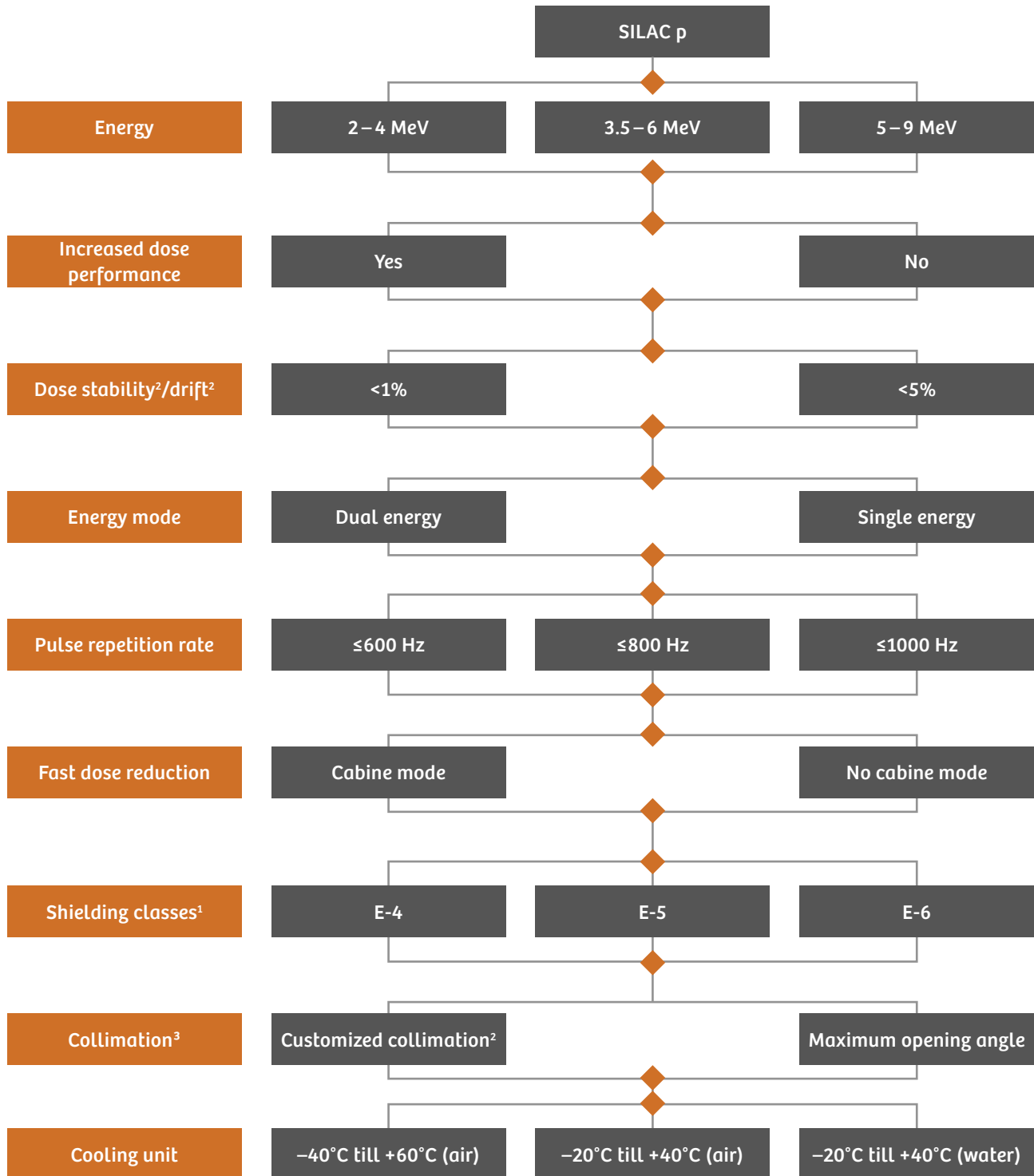
Technical Data		SILAC p 6 MeV	SILAC p 9 MeV
Dimensions (H x W x D) mm	X-ray head (rotatable)	1210 x 890 x 1180	1210 x 890 x 1684
	control cabinet	1710 x 940 x 790	
	cooling unit	710 x 1250 x 1060	
Weight (kg)	X-ray head	1720	2000
	control cabinet	600	
	cooling unit	356	
Maximum dose rates at (Gy/min) absorbed dose H <sub>2</sub> O (p = 1)	2 MeV (HVL = 2 cm)	1 Gy/min	-
	3 MeV (HVL = 2.3 cm)	2 Gy/min	-
	4 MeV (HVL = 2.5 cm)	5 Gy/min	-
	5 MeV (HVL = 2.6 cm)	8 Gy/min	2 Gy/min
	6 MeV (HVL = 2.7 cm)	10 Gy/min	12 Gy/min
	7 MeV (HVL = 2.8 cm)	3 Gy/min	18 Gy/min
	8 MeV (HVL = 2.9 cm)	-	32 Gy/min
	9 MeV (HVL = 3 cm)	-	24 Gy/min
Leakage radiation <sup>1</sup>		≤ 2 x 10 <sup>-6</sup> from >60°	
Photon spot size diameter <sup>2</sup>		1.2 – 2.0	1.5 – 2.5
Dose stability <sup>3</sup>		<1% or <5%	
Energy stability <sup>3</sup>		<1% or <5%	
Variable pulse adjustment	pulse repetition rate	20 – 600 Hz (option: 1000 Hz)	
	pulse length	1 – 4 μs	
Interlaced dual energy	pulse to pulse switching	optional	
Aperture (others on request) primary beam opening	vertical slit	70° x 1°	
	cone	40° x 40°	
Electrical power requirements		3 phase AC	
	voltage / frequency	400 V / 50 – 60 Hz	
	fuse	35 A	
Communication	ethernet	yes	
Status control	24V PLC	yes	
External trigger control	RS-485	yes option internal detector synchronization	
human machine interface in 3 levels		system monitoring and system adjustment (energy/dose)	
Cooling unit	external cooling medium	air	
	maximum ambient temperature range	-40 to +60°C	
Protection class	X-ray head	IP66	
	control cabinet	IP66	
	cooling unit	IP56	

<sup>1</sup> Ratio of leakage radiation to primary radiation measured in 1m from housing at angles 60° and greater

<sup>2</sup> Penumbra of tungsten edge under high magnification (similar to EN 12543-5)

<sup>3</sup> <1% stability and drift are for max. 600Hz pulse repetition rate and single energy mode

# Work in Progress: product diversity



<sup>1</sup> Ratio of leakage radiation to primary radiation measured in 1m from housing at angles 60° and greater

<sup>2</sup> <1% stability and drift are for max. 600Hz pulse repetition rate and single energy mode

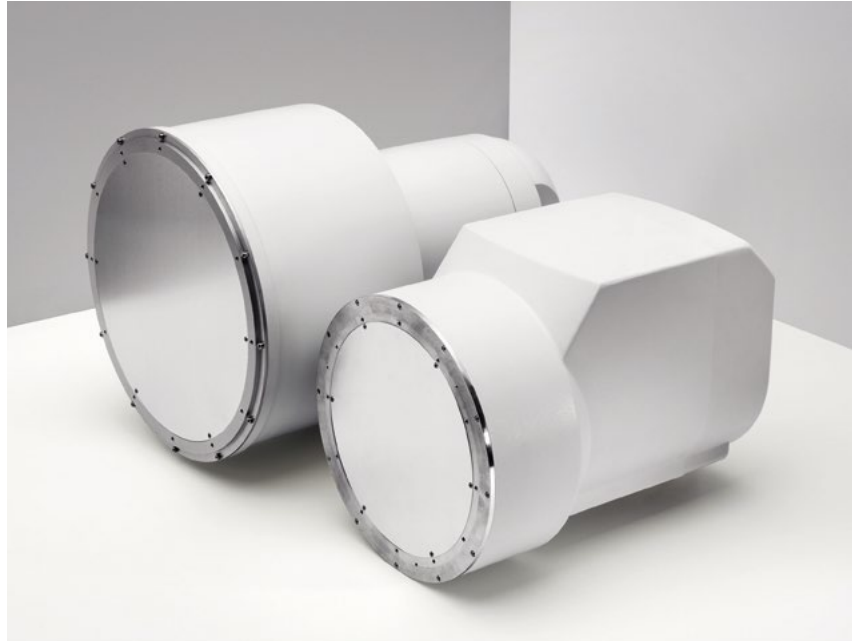
<sup>3</sup> Shape customized

# Image Intensifiers

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## Benefits

- High DQE, resolution, contrast and conversion factor
- Very low geometric distortion
- Outstandingly long-life cycle
- Environmentally friendly HR output phosphor



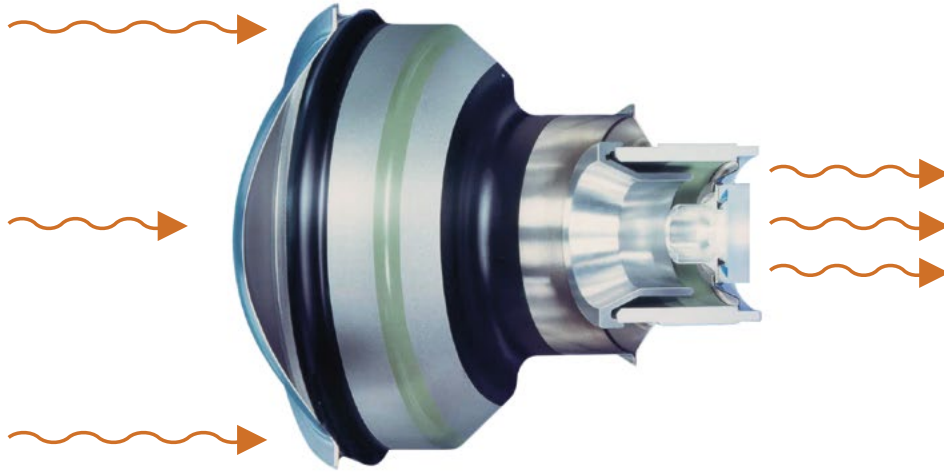
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Metal enamel technology provides high precision components with excellent X-ray transparency and negligible X-ray scatter. In keeping with established industry standards, all of our HIDEQ® image intensifiers are mechanically, electrically and optically compatible with competing products.

### Features and benefits

- HDQE cesium iodide input phosphor screen of very fine structure deposited on a highly transparent aluminium input window provides low quantum noise and excellent resolution and supports a significant reduction in X-ray dose
- Electron optical zooming for improved detail visibility and increased resolution properties
- HR output phosphor combined with a high contrast output window featuring an anti-glare screen and scattered light trap ensures high luminous efficiency and unsurpassed overall image definition with high contrast and high resolution
- Automatic dynamic ion-getter pump to help maintain the high vacuum throughout tube life
- Mu-metal encapsulated tube for very low geometric distortion





Type	Nominal entrance field size (in / cm)	Useful entrance field size (mm)	Diameter of output window (mm)	Thickness of output window (mm)	Resolution of image center ( $\frac{Lp}{mm}$ )	Conversion factor (cd*s / m2 * $\mu$ Gy)	Detective quantum efficiency (DQE) at 59.5 keV (%)	Contrast ratio (10%)	Contrast ratio (10 mm)
<b>Medical / Industrial / Scientific Application</b>									
HIDEQ	9 / 23	215	20	3.6	4.6	26	65	22:1	15:1
23-3		160			5.4	13		23:1	16:1
ISP		120			6.0	6		26:1	19:1
HIDEQ	9 / 23	215	25	14	5.2	27	65	33:1	22:1
23-3		160			6.0	14		42:1	24:1
ISX		120			6.5	8		61:1	30:1
HIDEQ	13 / 33	303	25	14	4.0	48	65	37:1	20:1
33-4		215			5.0	21		40:1	23:1
ISX		160			5.6	11		53:1	25:1
		120			6.0	7		75:1	32:1

# Imaging Units

## Benefits

- High DQE, resolution, contrast and conversion factor
- Very low geometric distortion
- Outstanding long-life cycle
- Configuration according to your specific needs



Our imaging units are equipped with HIDEQ® image intensifiers and 1024 x 1024 matrix CCD cameras. The imaging units feature a compact design which is achieved by optimizing the lens / camera system.

They are suitable for a wide range of applications in fluoroscopy-related procedures for medicine, science and industry.

### Medical / Industrial / Scientific Application

Type	Nominal entrance field size (in / cm)	Useful entrance field size (mm)	Resolution at image center ( $\frac{Lp}{mm}$ )	Matrix	Iris
HIDEQ Imaging Unit 23N Eco	9 / 23	215	2.2	1024 x 1024	manual
		160	2.8		
		120	3.1		
HIDEQ Imaging Unit 23N Pro	9 / 23	215	2.2	1024 x 1024	motor
		160	2.8		
		120	3.1		
HIDEQ Imaging Unit 33N Eco	13 / 33	303	1.6	1024 x 1024	manual
		215	2.1		
		160	2.8		
		120	3.1		
HIDEQ Imaging Unit 33N Pro	13 / 33	303	1.6	1024 x 1024	motor
		215	2.1		
		160	2.8		
		120	3.1		



# X-ray Grids



## Benefits

- High resolution up to 80 lines / cm for flat panel detectors
- Designed for a significant improvement of the dose yield compared to aluminum / lead
- Siemens Healthineers proprietary interspacing fiber material
- Customized versions available

An anti-scatter grid from Siemens Healthineers offers high image quality and a high degree of safety for the patient in all applications – from radiography and mammography to fluoroscopy.

A special Siemens Healthineers fiber material was designed to significantly reduce the dose compared to conventional aluminum grids. Superfine grids for different source-image distances are available in different sizes and grid ratios.

Type	5 / 31	17 / 70	17 / 70	15 / 80	15 / 80
Application	Mammography	Radiography, Fluoroscopy			
Cover Material	Carbon Fiber	Aluminum	Carbon Fiber	Aluminum	Carbon Fiber
Test Radiation Voltage	28 kV	80 kV	80 kV	80 kV	80 kV
Ratio	5	17	17	15	15
Frequency	31 lines / cm	70 lines / cm	70 lines / cm	80 lines / cm	80 lines / cm
Selectivity	4.17	9.12	9.27	5.38	5.49
Contrast improvement factor	1.48	3.75	3.78	3.01	3.06
Bucky Factor	1.96	5.63	5.53	4.13	4.01
Transmission Primary Radiation	0.75	0.66	0.68	0.73	0.76
Image Improvement Factor	1.12	2.49	2.58	2.20	2.33
Thickness	(2.8 ± 0.2) mm	(3.5 ± 0.2) mm		(3.3 ± 0.2) mm	
Rectangular Formats	7 x 9 inch <sup>2</sup> to 13 x 17 inch <sup>2</sup> (18 x 24 cm <sup>2</sup> to 33 x 43 cm <sup>2</sup> )	8 x 8 inch <sup>2</sup> to 17 x 17 inch <sup>2</sup> (20 x 20 cm <sup>2</sup> to 43 x 43 cm <sup>2</sup> )			
Circular Formats	–	for 7 inch to 16 inch X-ray image intensifiers (17 cm to 41 cm)			
Frame (Aluminum)	–	rectangular: 10 mm, circular: 5 mm			

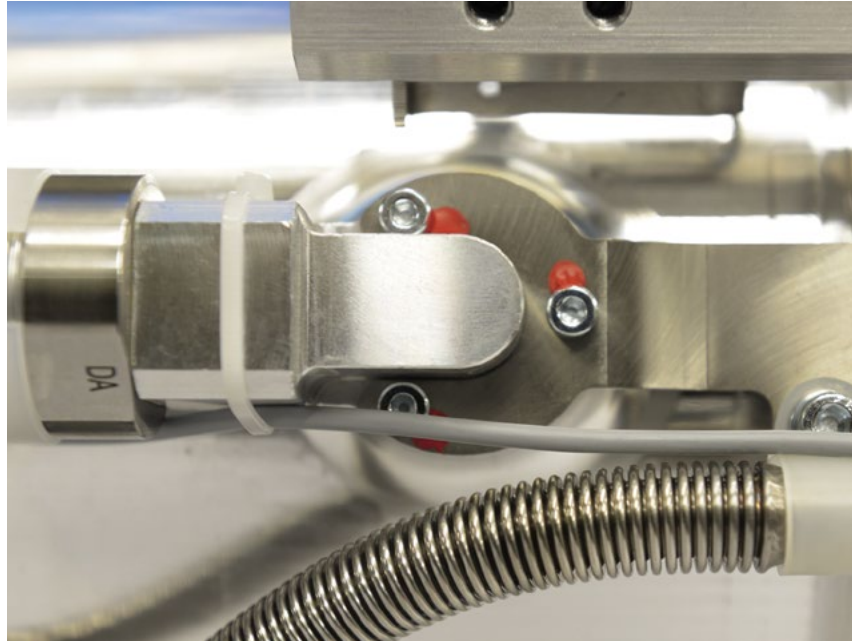


According to IEC 60627:2013

# Electronic and Mechatronic Solutions – from Concept to Final Product

## Benefits

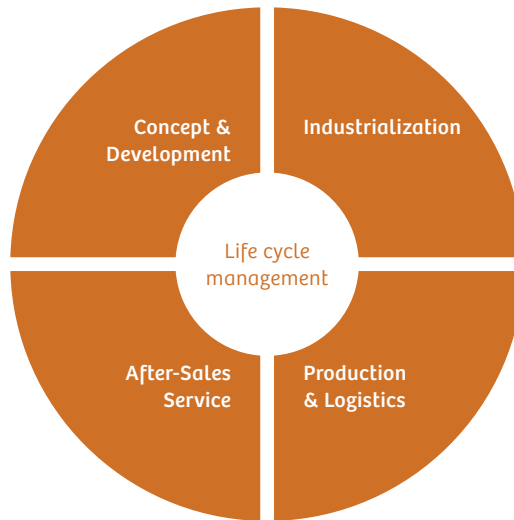
- You focus on your core business, we take care about the rest.
- Get world class support from a proven, strong and reliable partner.
- Benefit from our broad spectrum of expertise and experience.



Partnering with us can become a major asset in making sure your company continues to do what it does best.

We offer support from the Concept & Development phase through to After-Sales Service, as well as extensive knowledge in many areas of expertise.

Please contact us to find out how you can benefit best from our experience.

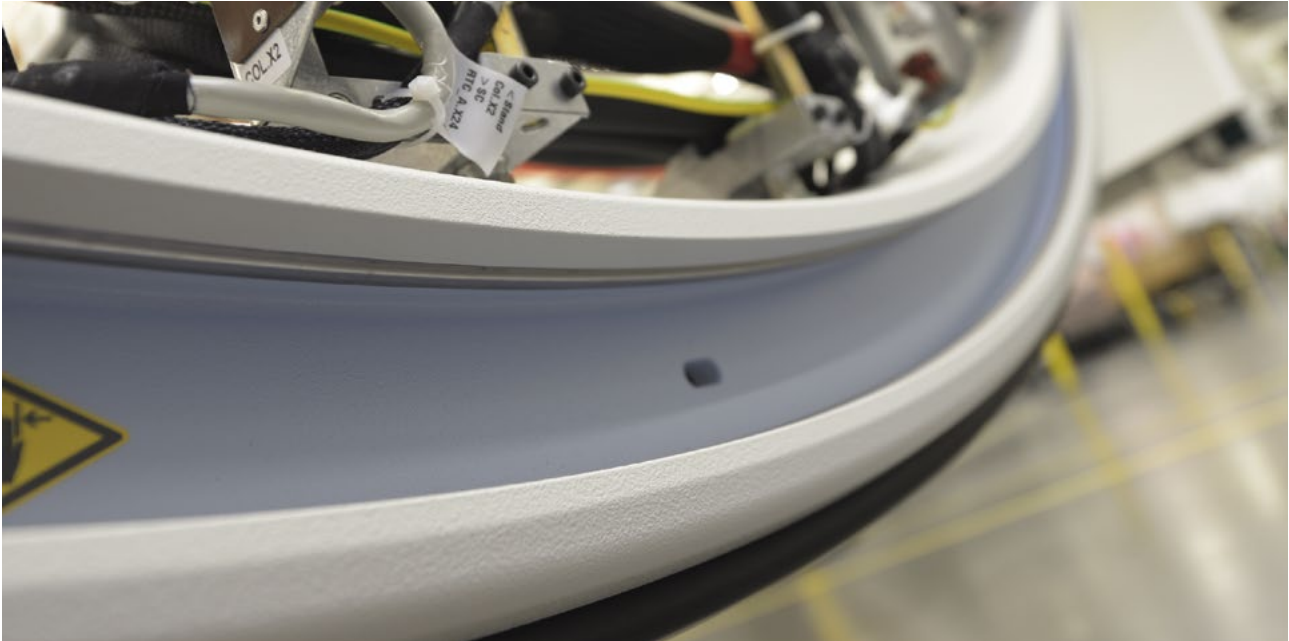


### Areas of expertise:

- Mechatronics
- System Control & Communication
- Human Machine Interfaces
- Technology Consulting & Engineering
- ... and more

We support the entire life cycle

# We support the entire product life cycle



## Concept & Development

- Solution concepts
- Technology engineering & consulting
- Mechatronic design

and more ...

## Industrialization

- Integrated manufacturing process planning
- Production & test equipment
- Prototyping

and more ...

## Production & Logistics

- Entire manufacturing chain
- Lean manufacturing
- Global supply chain management

and more ...

## After-Sales Services

- Service Tools
- Repair services
- Obsolescence & spare parts management

and more ...

Please contact us to find out how you can benefit best from our experience.

# CERA – CT Imaging Software Components

CT reconstruction and 3D volume visualization of a watch



Innovative solutions for geometry calibration, reconstruction, and 3D volume visualization in cone-beam CT.

We have successfully extended our expertise in software for reconstruction and 3D volume visualization beyond the medical field to include dental and industrial CT applications. CERA – Siemens Healthineers software components for cone-beam CT imaging – combines knowledge from all three fields of application, resulting in innovative and high-quality solutions for our customers. The modular CERA software easily integrates into customer software and does not compromise when it comes to high performance, excellent image quality, and application flexibility. Our focus on customer needs has made CERA a trusted component at the heart of several thousand cone-beam CT systems.

## Features and benefits

- System geometry alignment and patient motion compensation for precise CT imaging
- Fast, GPU-accelerated reconstruction combined with sophisticated CT image artifact and noise reduction
- Support of virtually any cone-beam CT geometry and acquisition setup
- 2D / 3D volume visualization in excellent quality showing fine image details
- Extensive feature set for image pre-processing and volume post-processing



# Contact us



If you would like any further information or to arrange a consultation, please feel free to contact us.

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These components and configurations are not finished medical devices. Compliance with all laws and regulations that are applicable to finished medical devices are the responsibility of the manufacturer of the finished medical device.

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

The components are labeled as "Manufactured by Siemens Healthineers". However, the buyer shall not market the components using the "Siemens Healthineers" brand name and/or trademark. The buyer may integrate these components into a system using its own brands and labels. The product names and/or brands referred to are the property of their respective trademark holders.

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