GE
Inspection Technologies

X-ray Products

Product Overview

GE imagination at work

ERESCO MF3 Portable X-ray Equipment

ERESCO MF3 Series

By using the latest technology and innovative circuitry, the weight of the ERESCO control was reduced by almost 40% compared to the MF2 series. This weight reduction combined with new carrying rings and an even more compact and robust tube design make on-site inspections an easy task in the true sense of the word.

The ergonomic digital control with its new graphical display is easy and safe to operate. The ease of use is further supported by clear text messages in many international languages, display of character sets (e.g. Cyrillic characters), an exposure calculator and many other features. High quality electronic components and robust design of control and tube heads make the ERESCO Series suitable for inspections even in hostile environments like rain (IP 65) or high temperatures (100% duty cycle at 30°C/86°F ambient temperature). Its low power consumption keeps not only the energy cost low but also makes operation with portable power supplies an easy thing to do. Due to its unique power mode the ERESCO MF3 Series can reduce exposure times up to 50% in comparison to other portables which impressively shows its position as the leading product for fast and economic on-site inspections.

ISOVOLT Mobile X-ray Equipment

ISOVOLT mobil

The ISOVOLT mobile has been designed to cope with even very complicated inspection tasks. It is very frequently used in container, pipe production and power plants where the objects are difficult to access.
Therefore the ISOVOLT mobile features a small X-ray tube and a cable of up to 20 m length, enabling high quality on-site inspections at hard-to-reach places.

The ISOVOLT mobile key features are:

- Medium frequency technology
- Constant potential output
- Suitable for continuous operation
- Light-weight, compact design
- Dual-focus operation
- Change-over to operate different tube types
- Fit for narrow-width access doors (> 650 mm)
- Horizontal transport possible

ISOVOLT Stationary X-ray Equipment

ISOVOLT HS

Continuous improvements of the ISOVOLT HS family plus the expertise gained in industry-specific power electronics and digital technology have resulted in a new generation of constant potential X-ray equipment, the ISOVOLT HS series. The very low ripple of the high-voltage generator results in high dose rates of the ISOVOLT HS X-ray equipment. Fast control systems lead to high stability of the operating data and high reproducibility of the inspection results. A real-time controlled automatic warm-up program provides long life-time of the X-ray tubes.

Different X-ray tubes and generators in 160 kV, 225 kV, 320 kV, 420 kV and 450 kV version cover nearly all possible applications. The ISOVOLT HS is ideally suited for dosimetric systems too.

Standard Radioscopic Inspection Systems

The programmable **X-CUBE compact** with its integrated Image Enhancement System VISTAPLUS III offers in the standard version everything required for a fast and easy high quality inspection. The new innovative swivel principle of the X-ray manipulator allows very exact positioning while being up to 5 times faster than other systems in the market. Short inspection cycles due to very fast movements, a programming mode with variable speed, and an excellent detail recognition by integrated image enhancement are key features of this system. The modular design enables easy transportation and fast installation. The form-fitting loading position and the ergonomically optimized operation desk rounds out the concept of this excellent multi-purpose system.

X-CUBE compact

Besides the X-CUBE compact GE Inspection Technologies offers three other Standard Radioscopic Inspection Systems (**DP 150**, **DP 419** and **DP 435 Vario**) to cover all applications and customer requirements from small, light-weight to big, heavy samples and from manual to programmable operation.

Wheel Inspection Systems

The programmable DP 500 wheel inspection systems with automated defect recognition (SABA) represent very economical systems with a high throughput at a very short idle time. The DP 500 is designed for inspection of light-alloy car wheels (13" to 20") whereas the DP 500 XL can cope with the larger diameters of truck wheels too (13" to 25").
Using a GE Inspection Technologies Wheel Identification Station the systems are capable of mixed-mode operation. The gripper principle allows unimpeded irradiation in all test positions. For shortest cycle times and reliable operation the DP 500 is equipped with a SIEMENS S7 PLC control.

DP 500

Customized Inspection Systems

GE Inspection Technologies designs and manufactures a wide range of specialized and customized Radioscopic Inspection Systems for various applications and industries. The two samples below represent only a very small selection of this applications. More information about the product range is available on our website at **www.GEInspectionTechnologies.com**.

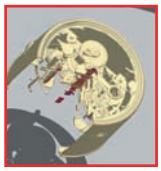
The DP 351 industrial X-ray system is dedicated to **fully automated serial inspection of suspension parts** with GE Inspection Technologies ADR software SABA. The system has been developed for radioscopic inspection of large batches and is characterized, above all, by a very fast cycle time. The twin manipulator enables the loading and unloading of a specimen outside the cabinet while at the same time the inspection of other parts is done inside. Loading and unloading can take place by a robot or manually by an operator.

DP 351

The DP 392 industrial X-ray system has been developed for **airbag inspection**. The measurement of both shell halves' wall thickness at the rolled seams and a good positive-fitting connection between initiator and the propulsion element of the airbag inflator are the inspection tasks of this application.

SABA is used for fully automated image evaluation which in this case is equipped with an additional pre warning stage for optimal production control.

DP 392



DP 424 / DP 425

3D Computed Tomography

As result of the rapid development of computer, software and detector technology, 3D-Computer Tomography is gaining more and more in importance - not only in research but also in industry.
By using cost efficient modern parallel computers for reconstruction and visualization of the measurement data and by using of recent flat panel detectors for acquiring the images, 3D-CT offers unique opportunities to map the structure of about any test sample three-dimensional in the computer.

Based on volumetric data, it's possible to find many defects in the test sample without destroying the sample itself. Furthermore dimensional measurements of the structure of the test samples can be performed and even copies of the test samples can be done by rapid prototyping technologies.

The latest GE Inspection Technologies developments are now allowing volumetric tomography in very short cycle times. Already within minutes internal structures of test samples can be displayed and measured three-dimensionally. Defects in the material can be exactly located, or deviations of the object structure from CAD data can be quickly acquired in a non-destructive way.

Image Enhancement System VISTAPLUS III

VISTAPLUS III is a PC-based digital image enhancement and archiving system that can be operated either with Windows 2000 or Windows XP.

It is superbly suited to enhance the detectability of minute structures and to perform fast evaluations and assessments of radioscopic images.

The VISTAPLUS III is set up for integration in radioscopic X-ray inspection systems and used in many of GE Inspection Technologies systems.
Existing customer systems can be upgraded too.

Automatic Image Evaluation System SABA

The universal analysis of complex radioscopic images in batch inspection of safety-relevant parts is a monotonous and strenuous task whose outcome depends on many subjective factors.

The state-of-the-art image evaluation system SABA automates this process and leads to an reproducible objective identification and evaluation of defects in cast parts. Built-in statistic programs enable the optimizations of the production process.

By its universal nature the PC-based SABA can be adapted to other inspection tasks as well, such as fully automatic completeness checks and measure-ments of various patterns (e.g. areas, sizes and distances).

GE
Sensing & Inspection Technologies

ERESCO MF4

Reliable, Lightweight, Portable X-Ray Generator

ERESCO MF4 – For the toughest of tasks

The ERESCO MF4 portable X-ray units are designed for reliability in some of the world's toughest conditions. With the ERESCO MF4 line, mobile X-ray inspection becomes lighter in the true sense of the word. By using the latest display technology, the new user interface to control and monitor the X-ray setup, has been fully utilized and features graphic visualization and menu driven operation to optimize productivity.

The robust construction of the control and the tube heads make them suitable for hostile environments. Due to its low power consumption, not only is energy cost reduced, but operation with portable power supplies are made easier. Special power electronics allow for an alternative operation in the field as well as integration in crawlers. Even with reduced weight, the new tube heads comply with the strict requirements of the European X-ray regulations.

Using modern compact electronics to minimize weight and provide a high power output with extremely low ripple, together with a sturdy metal ceramic X-ray tube, the ERESCO MF4 generates a high X-ray dose which allows the shortest exposure time, resulting in higher productivity.

A glance at the benefits

The **metal/ceramic technology** ensures both continuous operation and a long operating life.

The MF4 **cooling system** also assists in prolonging long trouble-free operation as its specially designed copper cooler optimises the air flow for maximum cooling effect.

The ERESCO MF technology allows the X-ray generator to be **operated in power mode,** because, unlike competitive generators, it can drive high tube currents. As a result, continuous power ratings of up to 900 W and high currents ensure that the ERESCO MF4 range of X-ray generators offer the best image definition in the 200 kV to 300 kV class.

Operation starts from 5 kV to enable **optimized exposure** of low-density materials, such as aluminum, composites and plastics resulting in **high-contrast images.**

The power electronics of ERESCO units provide extremely **low power consumption** between 1 to 2 kW/h.

Full graphic display and intuitive user interface for simple and guided operation.

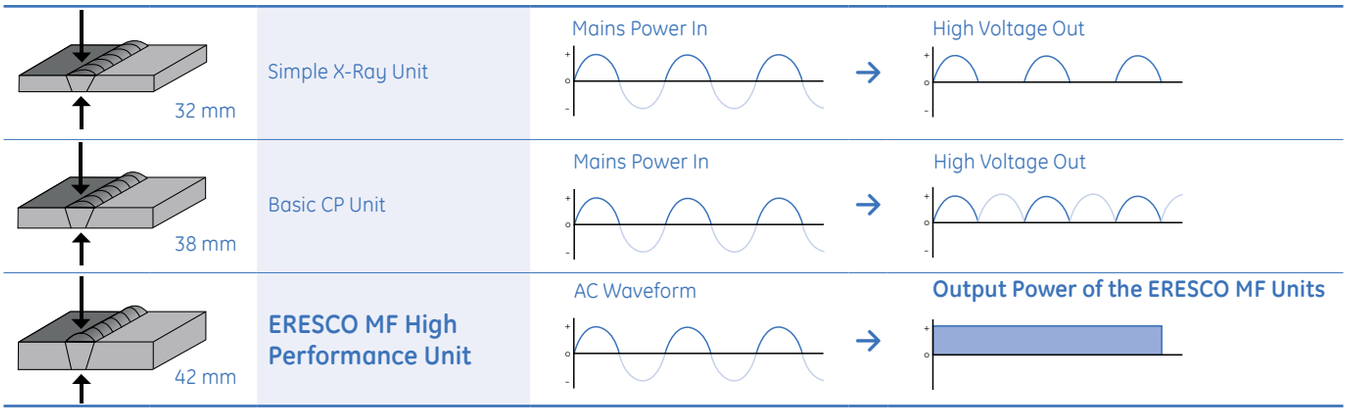
On-Board exposure calculator for determination of the optimum exposure settings and further exposure time reduction through unique ERESCO power mode.

Several programming and reporting features to shorten X-ray setup and evaluation times.

Microprocessor platform enables fast and safe unit control providing intelligent features, such as automatic tube head identification, autonomous operation with event recording, multi-lingual user interface and different exposure programs.

MF Technology for constant potential high dose output

A medium frequency output (around 20 kHz) can be used to produce a high power output with extremely low ripple.



Control Unit

The portable ERESCO X-ray digital control can operate any X-ray generator in the MF4 range. It features modern, power electronics and is ruggedly constructed to withstand heavy use in the field.

The MF4 Control faciliates a ergonomical interaction concept for safe and efficient operation unit operation. Several on-board features, such as Exposure Calculator, Parameter Monitoring or Programming / Reporting tools are simplyifing inspections.

A large, back-lit, full graphic, transreflective display allows easy viewing even in very strong sunlight and provides details of the system status in up to 19 languages supporting different character-sets. All operating and setup parameters can be entered by means of function keys, an alphanumeric keypad and cursor keys. Menu driven interfaces complete the ease of use. Alternatively setup parameters can be retrieved from a bank of 250, pre-entered exposure programmes, stored in a non-volatile memory. In addition, these programs can be uniquely named or commented and can be downloaded, modified, uploaded and archieved. In power operation, the maximum tube current is calculated and set, so minimising exposure times. Besides interfaces for warning lamps, interlocks and pumps, the MF4 control also offers a serial interface for external control or communication with PC based tools.

Applications

The ERESCO MF4 range of X-ray generators finds application throughout the industrial spectrum in the inspection of welds and in the examinations for structural integrity.

- Standard radiographic inspections, such as those carried out in fabrication yards in the oil and gas segment, in power plants, in the automotive sector and in general engineering.

- Oil and Gas segments require inspections in extreme conditions, such as pipeline inspections - both offshore and land-based applications - where equipment have to withstand hostile environment like very low or very high ambient temperature or permanent exposure to salt-water, sand or dirt.

- Structural integrity testing in the aerospace segment, where special materials, honeycomb sections and composites demand exceptional tube performance.

With direct emission and panoramic emission models and water- cooled and air-cooled versions, as well as small focal spot radioscopy units, the ERESCO MF4 range offers a comprehensive solution to meet virtually all customer portable X-ray generation needs.

Features Summary

ERESCO MF4 generators

- Highest power output, with best image definition in its class
- High X-ray dose permitting short exposure times with associated increases in productivity
- Operation with 100% Duty Cycle at 30°C
- Light weighted and compact design
- Robust construction of control and tube heads allowing operation in hostile environments (IP65)
- Lower power consumption meaning low energy costs, long battery endurance and providing flexible operation with portable power supplies or battery packs
- On-Board power electronics allow autonomous operation and integration within crawlers
- Range of designs, including air-cooled, water cooled, panoramic output and small focal spot, suitable for radioscopy
- Wide range of accessories, including stands and carriages to facilitate positioning during exposure set-up

ERESCO MF4 Control Unit

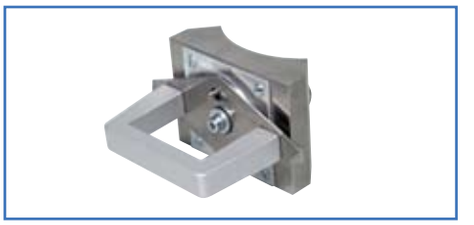
- Intuitive and menu driven user interface with multifunction-, numeric- and cursor keys input
- Transrefective, backlit, graphic display for contrast optimized indoor and outdoor operation
- Exposure Calculator
- Integrated, real time clock, enabling intelligent and automatic warm-up of the generating unit, taking past operational intervals into account
- Robust and ergonomic design for operation in different working position
- Automatic recognition of the type and serial number of the connected X-ray tube head
- Free configurable exposure programming mode
- Off-Line report generation and programming
- Multi-lingual graphical user interface
- Easily adapts to different mains supplies, including portable generators and batteries
- Built-in fail-safe warning lamp
- Emergency stop button, in compliance with international standards

Accessories

A wide range of accessories complements the ERESCO MF4 generators.

Four legged stands for tube heads to ensure stability

Laser centring device



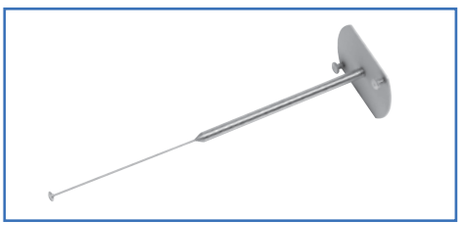
Lead plug for the tube window

Remote warning flash lamp

Exchangeable lead diaphragms

Aluminium transport boxes

Remote control



Telescope centering device

Adapter cables

Transport and Positioning Cart

Other available accessories

- Caster extensions for the pipe carriage
- Portable power generator
- Carrying cradle for the MF3 tube
- Door contact cable
- Bracing belts
- Interface cables
- Diaphragm caps for panoramic units
- 20 m extension cable
- PC based exposure calculator
- MF4 Administrator Kit (Serial Interface cable and SW CD-ROM)
- Crawler integration kit
- Pipe inspection carriage to facilitate transport and set-up

Technical Specifications

ERESCO MF4 – Series						
ERESCO Type	**160 MF4-R**	**160 MF4-RW**	**200 MF4-R**	**200 MF4-RW**	**32 MF4-C**	**42 MF4**
						
Description	A real time imaging device, with small focal Spot (EN12543), for applications requiring geometric enlargement	A water cooled real time Imaging device, with small focal Spot (EN12543), for applications requiring geometric enlargement	A real time imaging device, with small focal Spot (EN12543), for applications requiring geometric enlargement	A water cooled real time imaging device, with small focal spot (EN12543), for applications requiring geometric enlargement	Panoramic-Beam unit designed for pipeline and butt-weld inspection.	Air-Cooled unit, for a wide range of applications in weld inspection, Al casting and also composite materials
Emergent Beam	Direct Emission	Direct Emission	Direct Emission	Direct Emission	Panoramic Emission	Direct Emission
Penetration of Steel in 10 min	-	-	-	-	32 mm (1.26")	42 mm (1.65")
High Voltage Range	10 - 160 kV	10 - 160 kV	10 - 200 kV	10 - 200 kV	5 - 200 kV	5- 200 kV
Tube Current Range	0.5 – 10 mA	0.5 – 10 mA	0.5 - 10 mA	0.5 - 10 mA	0.5 - 10 mA	0.5 - 10 mA
Tube Current at U max	3.7 mA / 160 kV	3.7 mA / 160 kV	3.0 mA / 200 kV	3.0 mA / 200 kV	3.0 mA / 200 kV	4.5 mA / 200 kV
Continuous Rating	600 W	600 W	600 W	600 W	600 W	900 W
Nominal Focal Spot Value	1.0 mm (EN 12 543) 0.5 (IEC 336)	1.0 mm (EN 12 543) 0.5 (IEC 336)	1.0 mm (EN 12 543) 0.5 (IEC 336)	1.0 mm (EN 12 543) 0.5 (IEC 336)	0.4 x 4 mm (EN 12543)	3.0 mm (EN 12543) 1.5 (IEC 336)
Anode Material	Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)
Target Angle	20°	20°	20°	20°	22°	20°
Emergent Beam Range	Elliptical, 40° x 60°	Elliptical, 40° x 60°	Elliptical, 40° x 60°	Elliptical, 40° x 60°	40° x 360°	Elliptical, 40° x 60°
Inherent Filtration	0.8 mm ± 0.1 mm, Be	0.8 mm ± 0.1 mm, Be	0.8 ± 0.1mm, Be	0.8 ± 0.1mm, Be	0.4 mm Fe/Ni/Co + 2 mm Al	0.8 mm ± 0.1 mm, Be
Duty Cycle	100%					
Current and Voltage Stability	± 1 %					
Power Supply Requirements	160 V - 253 V AC, 80 V - 127 V AC, 50/60 Hz *					
Weight of Tube Head	26.8 kg (59.1 lbs)	26.8 kg (59.1 lbs)	26.8 kg (59.1 lbs)	26.8 kg (59.1 lbs)	31 kg (68.3 lbs)	26.8 kg (59.1 lbs)
Certifications	CE Conformity, NFC 74100 **, BfS Certification (PTB Approval) **					

* Operation with reduced output is possible at main voltages below 205 V and 108 V respectively
** Available for selected models

42 MF4-W	280 MF4-R	280 MF4-RW	52 MF4-CL	65 MF4	65 MF4-W
					
Water-Cooled unit, for a complete and flexible range of applications in weld inspection, Al casting and also composite materials	A real time limaging device, with small focal spot (EN12543), for applications requiring geometric enlargement	A water-cooled Real time imaging device, with small focal spot (EN12543), for applications requiring geometric enlargement	Panoramic unit designed for pipeline and butt-weld inspection where high penetration power is demanded	Air-Cooled unit for a wide range of applications in weld inspection, Al casting and composite materials, especially where high penetration power is demanded	Water-Cooled unit for a wide range of applications in weld inspection, Al casting and composite materials, especially where high penetration power is demanded
Direct Emission	Direct Emission	Direct Emission	Panoramic Emission	Direct Emission	Direct Emission
42 mm (1.65")	-	-	52 mm (2.04")	65 mm (2.55")	65 mm (2.55")
5 - 200 kV	10 - 280 kV	10 - 280 kV	5 - 300 kV	5 - 300 kV	5 - 300 kV
0.5 - 10 mA	0.5 - 4.5 mA	0.5 - 4.5 mA	0.5 - 6 mA	0.5 - 6 mA	0.5 - 6 mA
4.5 mA / 300 kV	1.2 mA /280 kV	1.2 mA /280 kV	2.0 mA / 300 kV	3.0 mA / 300 kV	3.0 mA / 300 kV
900 W	340 W	340 W	600 W	900 W	900 W
3.0 mm (EN 12543) 1.5 (IEC 336)	0.5 mm (EN 12543)	0.5 mm (EN 12543)	0.5 x 5.5 mm (EN 12543)	3.0 mm (EN 12543) 1.5 (IEC 336)	3.0 mm (EN 12543) 1.5 (IEC 336)
Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)	Tungsten (W)
20°	15°	15°	20°	20°	20°
Elliptical, 40° x 60°	Elliptical, 30° x 60°	Elliptical, 30° x 60°	38° x 360°	Elliptical, 40° x 60°	Elliptical, 40° x 60°
0.8 mm ± 0.1 mm, Be	0.8 mm ± 0.1 mm, Be	0.8 mm ± 0.1 mm, Be	0.4 mm Fe/Ni/Co + 3 mm Al	0.8 mm ± 0.1 mm, Be	0.8 mm ± 0.1 mm, Be
100%					
± 1 %					
160 V - 253 V AC, 80 V - 127 V AC, 50/60 Hz *					
25.8 kg (56.9 lbs)	40 kg (88.2 lbs)	40 kg (88.2 lbs)	36 kg (79 lbs)	40 kg (88.2 lbs)	40 kg (88.2 lbs)
CE Conformity, NFC 74100 **, BfS Certification (PTB Approval) **					

GE
Sensing & Inspection Technologies

ERESCO MF4 Control

Portable X-ray Unit Digital Control

Features

- Robust and ergonomic design for operation in different working positions
- Transflective, backlit, graphic display for contrast optimized indoor and outdoor operation
- intuitive and menu driven user interface with multifunction-, numeric- and cursor keys input
- Multiple on-board features:
  - Exposure Calculator
  - Customizable exposure programs (supports off-line administration with PC tool including download, upload, archiving, reporting)
  - System parameter monitoring
  - Intelligent fully automatic warm-up program
  - RS-232 interface
  - Power mode for shortest possible exposure time
  - Supports 250 exposure programs
  - Supports 256 event and warm-up records each with synchronization to different radiation units
  - Supports off-line analysis of event and warm-up records (for reporting and documentation purpose)
  - Automatic recognition of connected X-ray tube head
- Small size, low weight and water / dust resistant (IP 65)
- Protective front panel cover
- Modern power electronics
- Microprocessor-controlled
- Built-in fail-safe warning lamp
- Easily adapts to different mains supplies, including portable generators
- Emergency-Stop in compliance with international standards

Certifications

- CE compliant acc. to EMC and Low Voltage Directive
- French Standard NFC 74100
- BfS certification (PTB approval) *)
- Produced under ISO 9001 certified quality management system

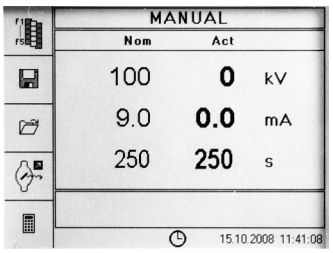
* in conjunction with radiation unit

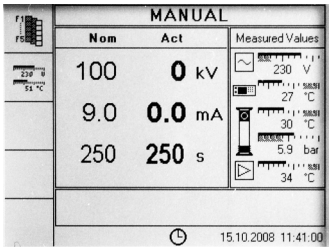
GE imagination at work

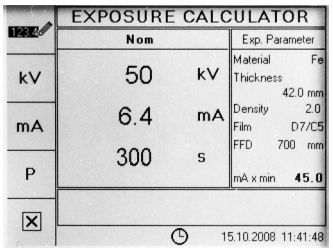
Technical Data

Voltage, settable in steps of 1 kV	5 - 300 kV (depending on the tube head)
Current, settable in steps of 0.1 mA	0.5 - 10 mA (depending on the tube head)
Exposure time in 1 sec steps or as min/sec value	1 to 5994 sec (optional display 99 min / 99 sec)
Pre programmable exposure programs	max. 250
Memory Size for event and warm-up records	256 for each
Display	transflective, backlit, graphic-display, 320 x 240 pixel
Supported languages	19
Character Sets	4, European (ISO), Japanese, Chinese, Cyrillic
Exposure Calculator	on-board, Fe, Ti, Al pre programmed / 3 materials free programmable
Warm-up	fully automatic, based on real time clock
Tube head identification	automatic
Parameter monitoring	continuous, on-line display of temperatures, pressure and line-voltage
Serial interface RS 232	1
Safety interlocks	2 (primary also available)
Emergency-Stop button	1
Three-position key switch	OFF, STANDBY, ON
Power supply requirements *)	1 PE N, 160 V - 253 V AC, max. 13 A single phase with grounded neutral,
	1 PE N, 80 V - 127 V AC, max. 20 A, 50/60 Hz
Dimensions	see drawing
Weight	8.6 kg (19 lbs)
Protection class	IP65
Operating Temperature	-20°C to +70°C
Storage Temperature	-30°C to +80°C

*) Operation with reduced output is possible at mains voltages below 205 V and 108 V respectively.



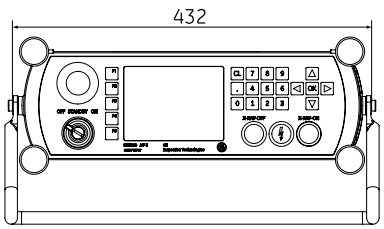


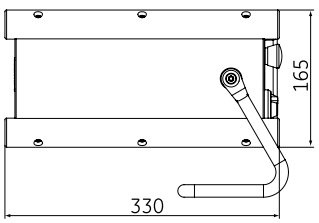


Exemplary screenshots of user Interface

Standard Delivery Scope of complete X-ray unit

- ERESCO MF4 tube head (see sep. product information)
- Digital Control "ERESCO MF4 Control"
- Canvas bag
- Connecting cable for ERESCO MF4, various length up to 60 m (193 ft)
- Power connecting cable 230 V or 115 V, 10 m (32 ft) long
- Set of accessories containing: spare fuses, spare bulbs and Allen key





Options

- External fail-safe flashing warning lamp
- Aluminium transport box
- MF4 Administrator Kit (CD-ROM and Interface Cable)
- Connecting cable for door contacts
- Extension cable ERESCO MF4,
  20 m / 10 m (64 ft / 32 ft)
- Portable electric power generator for ERESCO MF
- Exposure calculator (PC based)
- Primary interlock kit
- Adapter cable for ERESCO MF3 radiation unit,
  20 m / 0.5 m (64 ft / 1.6 ft) long

www.gesensinginspection.com

GEIT-30172EN (11/08)

Contact: GE Sensing & Inspection Technologies GmbH, Bogenstrasse 41, 22926 Ahrensburg, Germany, T +49 (0)4102 807 0

GE
Inspection Technologies

ISOVOLT mobil

Industrial X-ray Equipment

The ISOVOLT mobil is designed for operations where access to the inspection point is difficult.

It is ideal for site use in the energy, mineral and petro-chemical industries where pipelines and container tanks require X-ray inspection.

The ISOVOLT mobil is equipped with a small X-ray tube and high voltage cable up to 20 m (64 ft) in length to allow positioning in hard to reach places not accessible by other types of X-ray equipment.

GE imagination at work

Standard Delivery Scope

1 High voltage generator 160 kV	2510940
1 ISOVOLT mobil control unit	2522860
1 WL 2001 water cooling pump	2540390
1 ISOVOLT 160 M2 X-ray tubehousing	2530360
1 High voltage cable, length 10 m (32 ft)	2512465
1 PVC protective hose for high voltage cable and water hoses	9340110
1 Cart	2551340
1 Set cooling water hoses and accessories	7261020

Options

- Pipe inspection stand for tubehousing
- Extra-length high voltage cable (15 m (48 ft), 20 m (64 ft))
- Diaphragm and centering device
- External fail-safe warning flash lamp
- External fail-safe warning blinker lamp

Technical Equipment Data (not considering tube limit values)

Connected load:	230 V ±10%; 50/60 Hz; 3.0 kVA; max. 16 A
Tube voltage:	5 - 160 kV, (in 1 kV steps)
Tube current:	0.5 - 10 mA, (in 0.1 mA steps)
Exposure time to be set:	0.1 to 99.9 min in 0.1 or 1 second increments (optional display in min or sec)
Cooling output of WL 2001*:	1600 W at an ambient temperature of 25°C

*) For further details see product information WL2001.

Dimensions

High voltage generator:	870 x 300 mm (34.3” x 11.8”) (without clamp lever) 1020 x 300 mm (40.2” x 11.8”) (with clamp lever)
WL 2001 water cooling pump:	320 x 305 x 510 mm (12.6” x 12.0” x 20.1”) (WxDxH)
Control unit:	390 x 319 x 169 mm 15.4” x 12.6” x 6.7”) (WxDxH)
Cart:	Maximum width approximately 620 mm (24.4”)
High voltage cable:	10 m (option: 15 m (48 ft) / 20 m (64 ft))
Mains cable:	10 m (32 ft)

Total weight

With high voltage cable, 10 m:	approx. 151 kg (333 lbs)
With high voltage cable, 15 m:	approx. 158 kg (348 lbs)
With high voltage cable, 20 m:	approx. 165 kg (363 lbs)

Available X-ray Tubehousings:

X-ray Tubehousing ISOVOLT 160 M2 0.4 / 1.5

Direct radiating unit

Maximum tube voltage	160 kV	
	Small Focus	***Large Focus***
Maximum anode dissipation:	640 W	1600 W
Tube current (at U_{max}):	4 mA	10 mA
Focal spot size (EN 12 543):	1.00 mm (≈ 0.4 IEC 336)	3.0 mm (≈ 1.5 IEC 336)
Emergent beam angle:	40°	
Inherent filtration:	1 mm Be	
Weight:	approx.. 8.5 kg (19 lbs)	

For further details see separate Product Information.

X-ray Tubehousing ISOVOLT 160 MC 2

Panoramic radiating unit

Maximum tube voltage	160 kV
Maximum anode dissipation:	1000 W
Tube current (at U_{max}):	6 mA
Focal spot size (EN 12 543):	0.4 x 4.0 mm (at radiated angle of 0°)
Former focal spot designation:	0.3 x 3.0
Emergent beam angle:	40° x 360°, symmetrical
Inherent filtration:	0.5 mm Ti + 2 mm Al + 2 mm H_2O
Weight:	approx. 8 kg (17.7 lbs) (with optional cable quick-lock)

For further details see separate Product Information.

At present, the control unit comes in two versions with eight languages each.

Version A:	Western Europe	German, English, French, Spanish, Portuguese, Italian, Norwegian, Swedish
Version B:	Eastern Europe	German, English, Slovenian, Russian, Polish, Roumanian, Czech, Hungarian

High Voltage Generator

The high voltage generator is oil-insulated. It features power and monitoring electronics, a filament transformer, electro-magnetic focus change-over and a key switch to select the tube that is connected at the time.

High Voltage Cable

The high voltage cable, the cooling water hoses and the ground wire form a bundle that is sheathed in a plastic jacket for handling and protection.

Transport Cart

The ergonomic transport cart is light-weight and moves on air tires. An eyebolt allows easy lifting by a crane. The compact design enables access even through narrow doors. Horizontal transportation in a station wagon with adequate clearance is permissible.

Characteristics

- Low weight
- Simple compact design
- Access through narrow doors (> 650 mm)
- Short exposure times
- Dual-focus mode
- Change-over to operate different tube types
- Horizontal transportation possible
- Modern power electronics
- Microprocessor-controlled
- SMD technology
- Designed for continuous operation
- Fully automatic warm-up program with real-time clock
- Storage of 250 pre programmed exposure programs in a non-volatile memory
- Four-line LCD display with back light for clear text messages
- EMC-certified in compliance with EN 55011 / IEC 801 (electromagnetic compatibility)
- Produced under ISO 9001 certified quality management system

XR150

X-RAY SOURCE

XR150 X-RAY SOURCE

FEATURES AND SPECIFICATIONS

Size:	4.12" (104mm) high x 3.12" (80mm) wide x 10.75" (273mm) long
Weight:	4 lb. 6 oz. (2.0 kg.)
Power Supply:	7.2 volt removable, rechargeable, nickel cadmium battery pack. 2500 pulses per battery charge.
Battery Recharge Time:	1 hour with supplied battery charger.
Output Dose:	1.0 milliroentgens per pulse at 1 foot from source.
Pulse Rate:	10 pulses per second nominal.
Source Size:	2.2 mm.
Pulse Length:	60 nanoseconds.
Exposure Control:	Electronic counter can be set for 3-297 pulses.
Time Delay:	User has the option of 15 or 60 second time delay, allowing the user time to leave the area before the X-ray unit fires.

Specifications subject to change at manufacturers discretion.

CONVENIENT

The XR150 X-ray source is a complete, single package, pulsed device for use in exposing conventional or instant type X-ray film. Weighing under five pounds, the XR150 makes an ideal X-ray source for various portable applications. The entire system fits into one carrying case and weighs just 30 pounds.

EASY TO OPERATE

This compact X-ray unit is very simple to use. Operation requires attaching the battery, setting the desired number of pulses, and firing the X-ray using either the remote cable or the time delay button.

HIGH OUTPUT

Despite its small size the XR150 has 150 KVP output which will penetrate 1/2 inch steel. The only power supply is a custom battery pack that fully recharges in one hour.

DEPENDABILITY

Golden Engineering has been manufacturing portable X-ray systems since 1973. Golden Engineering produces THE INSPECTOR® X-ray source Model 200 which is in use worldwide for security and industrial applications.

DETEK

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

XR200
X-Ray Source

- Battery Powered
- Lightweight - 12 Pounds
- Entire System Fits into One Carrying Case (Including Instant Print Film System)
- Penetrates up to 1/2" of Steel
- Compatible With Film-Based and Digital Imaging Systems

Military - Law Enforcement - Corporate Security - Industrial

DETEK

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

XR200
X-Ray Source

The XR200 is a 150kV, single-package, pulsed X-ray source used by military, law enforcement, corporate security, and industrial personnel for radiographic examination of various items. The option of use with conventional radiographic film, instant radiographic film, or digital inspection systems provides users with the flexibility to develop a complete radiographic system best suited to their individual needs. The combination of battery power and minimal weight allows the user to obtain radiographs in even the most remote location.

To operate, attach a charged battery, set the number of pulses, and fire the unit. The user can view a high quality X-ray image immediately when using a video inspection system or within two minutes when using the Polaroid instant radiographic film system.

SPECIFICATIONS

Size (Including battery pack)	12.5 in. (31.75 cm) x 4.5 in. (11.5 cm) x 7.5 in. (19 cm)
Weight (Including battery pack)	12 lbs. (5.5 Kg)
Output dose	3.3 mR/pulse +/- 0.5 mR measured 12 inches from source
Pulse rate	25 pulse per second nominal
X-ray source size	1/8 in. (3 mm)
Maximum photon energy	150 KVP
X-ray pulse width	60 nanoseconds
Current draw	35 amps @ 13.4 volts
Power supply	DeWalt® 14.4 volt, removable, rechargeable, nickel-cadmium battery
Battery recharge time	1 hour with standard DeWalt® charger, 15 minute charger available
Number of pulses per battery charge	4000
Temperature range	-10 to 120 degrees F (-23 to 50 degrees C)
Maximum duty cycle	200 pulses every 4 minutes (3000 pulses per hr)
Warm-up	None required
X-ray leakage	3 mR per 100 pulses measured 2 inches behind the unit
Warranty	1 year limited warranty

XRS-3
X-Ray Source

- New Electronics Package Including Sealed Membrane Switch
- User Selectable Default Pulse Setting
- Backlit LCD
- Penetrates up to 1" of Steel
- Optional Thumbwheel Key
- Fully Battery Powered

Military - Law Enforcement - Industrial

DETEK

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

XRS-3
X-Ray Source

The XRS-3 is a light duty X-ray machine that requires little maintenance. The modular design makes component replacement easy and cost effective. The DeWalt® 14.4V battery and battery charger are commercially available in retail stores worldwide.

Lead shielding in the XRS-3 protects the user by minimizing radiation leakage outside of the X-ray beam while a time delay button and remote cable allow the operator to move a safe distance from the unit when it is in operation. Visual and audible indicators in the unit alert the operator when the XRS-3 is activated. Also, the XRS-3 contains no radioactive material. The unit produces radiation only when it is pulsing.

Specifications

Size (Including battery pack)	14" (35.6 cm) x 4.5" (11.5 cm) x 7.5" (19.0 cm)
Weight (Including battery pack)	12lbs (5.4kg)
Output dose	4.0 mR/pulse max, 2.6 mR/pulse min, measured 12 inches from source
Pulse rate	15 pulse per second nominal
X-ray source size	1/8 in. (3 mm)
Maximum photon energy	270 KVP
X-ray pulse width	50 nanoseconds
Current draw	20 amps @ 13.4 volts
Power supply	DeWalt® 14.4 volt, removable, rechargeable, nickel-cadmium battery
Battery recharge time	1 hour with standard DeWalt® charger, 15 minute charger available
Number of pulses per battery charge	4000
Temperature range	-10 to 120 degrees F (-23 to 50 degrees C)
Maximum duty cycle	200 pulses every 4 minutes (3000 pulses per hr)
Warm-up	None required
X-ray leakage	3 mR per 100 pulses measured 2 inches behind the unit
Warranty	1 year limited warranty

GE
Inspection Technologies

The ISOVOLT *Titan E* X-ray Generator

GE imagination at work

Robust, Reliable and Highly Accurate Stationary X-ray Generators for the Widest Range of Applications.

The Reference Class for X-ray generators is based on the proven ISOVOLT platform, which offers more than 25 years experience with thousands of installations across the world.

Designed for radiography, radioscopy, radiometry and life-science applications, which place the highest demands on reliability and exposure quality, the range of *Titan E* generators and accessories meets the different degrees of automation and customization, required throughout the industrial and scientific sectors.

A wide range of systems is provided. Generators and tubes can be 160 kV, 225 kV, 320 kV, 420 kV or 450 kV, and can be operated from as low as 5 kV or a current range exceeding up to 45 mA*.

Titan E control is a modern, state-of-the-art industrial control module for fail-safe and intuitive system operation.
A powerful range of suitable accessories complements the integration and application capabilities for all facets of industrial or scientific environments.

Unique Features at a Glance

Highest exposure quality

A reproducibility of ± 0.01 % for tube current (mA) and tube voltage (kV) provides highest possible stability of radiation dose rate with fluctuations < 0.05 %.

This excellent dose reproducibility fits both, *Titan E* applications that demand the highest accuracy, such as calibration of detectors or dosimeters, as well as radiography applications.

Extremely low ripple ensures outstandingly stable High Voltage for optimized material penetration with excellent efficiency factors.

The extended tube range of 5 kV to 450 kV in conjunction with the excellent maximum current of 45 mA, ensures optimized imaging contrast and very high penetration power. This results in short exposure times in various operation modes for different material.

Highest device performance

Rugged generator design with intelligent tube integration and permanent system monitoring, ensure highest performance, from peaked intermittent, up to permanent 24/7 operation. This results in consistent performance over various exposure modes and operation conditions.

Unmatched ramp-up times (< 1.5 sec) support applications requiring fast inspection cycles*.

100% duty cycle, for continuous operation in in-line systems.

Optimized equipment performance results in increased productivity and reduced total cost of ownership.

Highest device availability

Continuous improvements on critical system parameters to increase robustness and resistance against external influences, guarantee high system up-times that give the operator steady revenue streams and perfect time utilization.

Stackable and modular design allows easy field service.

Automatic event recording provide instant information for process control and system diagnosis either on site or via optional remote access.

Selected tubes feature maintenance-free High voltage connections, ensuring highest productivity, while minimizing operational risks.

Fully automated tube warm-up procedures safeguard tube operation and ensure maximum tube life.

Flexible usage

Built for a wide range of applications in different environmental conditions, *Titan E* generator solutions are for all NDT needs, life science applications and also measurement and calibration tasks.

Titan E is available in 3-phase, 400 V or single-phase, 230 V input power rating. As a result easy integration into different power environments without regional limitations is possible.

*) depending on permissable tube data

Smart user interaction

The stand-alone control module is available in both, a rugged and ergonomic desktop housing, and also as 19" adapter version, for easy control-desk integration.

The design permits intuitive and fatigue-proof operation through a large graphical display, rotary knob control, function keys and a keypad for fast and direct inputs.

The control interacts with the operator in clear text with four international character sets and 16 languages.

Intelligent and safe operation

Automatic tube configuration in conjunction with real time clock powered automated warm-up procedures enhance operational safety and maximize equipment lifetime.

On board electronics feature reserved memory for up to 250 programmable operation modes, records of the last 128 warm-up cycles and 512 operation event-logs and a structured setup menu for individual performance settings.

Built in safety features such as redundant interlock monitoring, cooling flow rate watchdog signals, operating temperature and other system status information are visible on the operation display.

This leads to instant recognition of system status and health.

Easy to integrate

The Titan E considers typical OEM needs, providing kits, interfaces and protocols for all kinds of industrial system integration (RS 232, Profibus).

It allows full external control of X-ray equipment and simplifies remote visualization – even without connecting the control module.

Extension of diagnosis capabilities by remote access via Internet or dial-up line is available as an option.

Titan E Control

A user-friendly, multi-language control features a clear full-graphical display, that allows simultaneous readings of set and actual operating parameters. Embedded in an ergonomic and rugged desktop or optional 19" rack mounting housing, full control for X-ray operation is established. Intuitive guidance through diverse menus as well as unmistakable messages for clear interventions are provided with this module.

The operating concept provides interaction with turning speed sensitive rotary knob, function keys, a numberic keypad and safety relevant buttons for X-ray operation as well as a key switch.

The multifunctional rotary knob can be used to set kV, mA, exposure time and several configuration settings.

By a progressive change of voltage and current via rotary knob the kV and mA settings can be accurately changed with different granulations of 0.1kV / 1 kV / 10 kV respectively 0.01 mA (if enabled) / 0.1 mA / 1 mA. This allows optimized one-hand operation for radioscopy and many other applications.

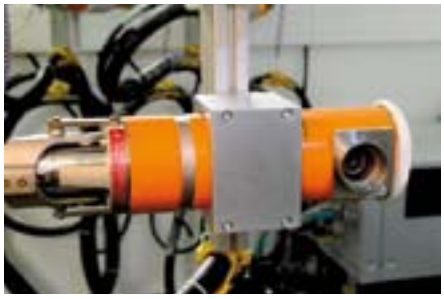
Features such as free configurable exposure programmes, or special programmes for constant power, constant current and manual operation cater for individual demands for radiographic or radioscopic inspections. The multi-lingual user display with 16 different languages and extended character sets for Japanese, Cyrillic and Chinese enables comprehensible and simple interaction. Optional, the entire system control with graphical visualization can be done via a stand-alone PC based platform.

Titan E provides automatic and manual warm-up modes for optimized tube conditioning. A special extended warm-up mode safeguards tube performance under severe conditions and setups.

Benefits

Proven platform serving broad range of applications

- Tube protection due to automatic warm-up procedures and extended warm-up modes to safeguard tube performance.
- Smart and intuitive user interaction, with several integration possibilities facilitating higher productivity.
- Excellent dose reproducability with extremely stable high voltage section for optimized exposures.
- Convenient integration into several external platforms, such as automated testing machines, leveraging different interface features for device control, monitoring and visualization.
- Excellent endurance and performance for permanent or intermittent operation.
- Less intensive maintenance combined with easier serviceability reduces total cost of ownership.
- Broad range of tubes, accessories and kits available.



Accessories

Safety devices
- Primary interlock switch
- Alarm box
- Switch box
- Flash- and warning lamps
- Country specific safety kits

HV cables
- In different standard lengths, with quick-lock or flange connections with rubbercone plugs or maintenance-free angle plugs.

Integration and solution kits
- Exposure Calculator (PC Software)
- *Titan E* PC (External PC based visualization)
- PROFIBUS Extension Kit

Dosimetry and calibration kits
- Voltage divider (incl. PTB certification)

Pumps and coolers
(See pictures below)

WL 3000 SE

OW 4002

OL 4503

OLK 50

Voltage Divider

ISOVOLT

Selection of unipolar Tubes*

	ISOVOLT 160 M2 0.4-1.5	ISOVOLT 160 M2 0.4-3.0	ISOVOLT 160 M2 0.4-0.4HP	ISOVOLT 160 MM2/ HP	ISOVOLT 160 MC2	ISOVOLT 160 M1	ISOVOLT 225 M2 0.4-3.0	ISOVOLT 225 M2 0.4-1.5	ISOVOLT 225 MM2/ HP
Max. Tube Voltage (kV)	160	160	160	160	160	160	225	225	225
Tube Current (mA) (at Max. Tube Voltage)	10	19	6	11	6	15,6	13	7.0	8
	4	4	6	5		5.6	3.0	3.0	3.5
Max. Anode Dissipation (W)	1600	3000	1000	1800	1000	2500	3000	1600	1800
	640	640	1000	800		900	640	640	800
Nom. Focal Spot Value IEC 336	1.5	3.0	0.4		0.3 x 3		3.0	1.5	
	0,4	0.4	0.4				0.4	0.4	
Focal Spot Size EN 12 543 (mm)	3.00	5.50	1.00	1.00	0.40 x 4.00	3.00	5.50	3.00	1.00
	1.00	1.00	1.00	0.40		1.00	1.00	1.00	0.40
Inherent Filtration (mm)	1.0 / Be	1.0 / Be	1.0 / Be	1.0 / Be	0.5 Ti + 2.0 H_2O + 2.0 Al	1.0 / Be	1.0 / Be	1.0 / Be	1.0 / Be
Emergent Beam Angle	40°	40°	40°	30° x 40° Asym.	40° x 360° Sym.	40°	40°	40°	30° x 40° Asym.
Weight (kg (lbs))	8.5 (18.7)	8.5 (18.7)	8.5 (18.7)	8.5 (18.7)	8.0 (17.6)	8.5 (18.7)	11.9 (26.2)	11.9 (26.2)	11.9 (26.2)

Selection of bipolar Tubes*

	ISOVOLT 320/7	ISOVOLT 320 M2 4.5 - 13	ISOVOLT 320/13	ISOVOLT 320 M2 0.4 - 1.0 HP	ISOVOLT 420/5	ISOVOLT 450/5	ISOVOLT 450/10	ISOVOLT 450 M2/10	ISOVOLT 450 M2 0.4 - 1.0 HP
Max. Tube Voltage (kV)	320	320	320	320	420	450	450	450	450
Tube Current (mA) (at Max. Tube Voltage)	7	13	13	5.6	5.3	5	10	10	3.3
	3	4.5	5	2.5	2.3	2.1	3.7	2	1.5
Max. Anode Dissipation (W)	2240	4200	4200	1800	2240	2240	4500	4500	1500
	960	1500	1680	800	960	960	1680	900	700
Nom. Focal Spot Value IEC 336	1.8	4.0	3.5		1.5	1.5	3.5	3.0	
	0.8	1.5	1.5		0.8	0.8	1.5	1.2	
Focal Spot Size EN 12 543 (mm)	3.60	5.50	6.30	1.00	3.60	3.6	6.30	5.50	1.00
	1.90	3.00	3.00	0.40	1.90	1.90	3.00	2.50	0.40
Inherent Filtration (mm)	7.0 / Be	3.0 / Be	7.0 / Be	3.0 / Be	7.0 / Be	7.0 / Be	7.0 / Be	5.0 / Be	5.0 / Be
Emergent Beam Angle	20° x 40°	40°	40°	30° x 40° Asym.	20° x 40°	20° x 40°	40°	40°	30° x 40° Asym.
Weight (kg (lbs))	35 (77)	35 (77)	35 (77)	36 (77)	75 (165)	75 (165)	75 (165)	75 (165)	75 (165)

* The ISOVOLT *Titan E* series can be equipped with various types of tube housing to suit your application. Ask your GE Inspection Technologies representative for an application specific consultation and a full list of tube housings

Maintenance free angle plug

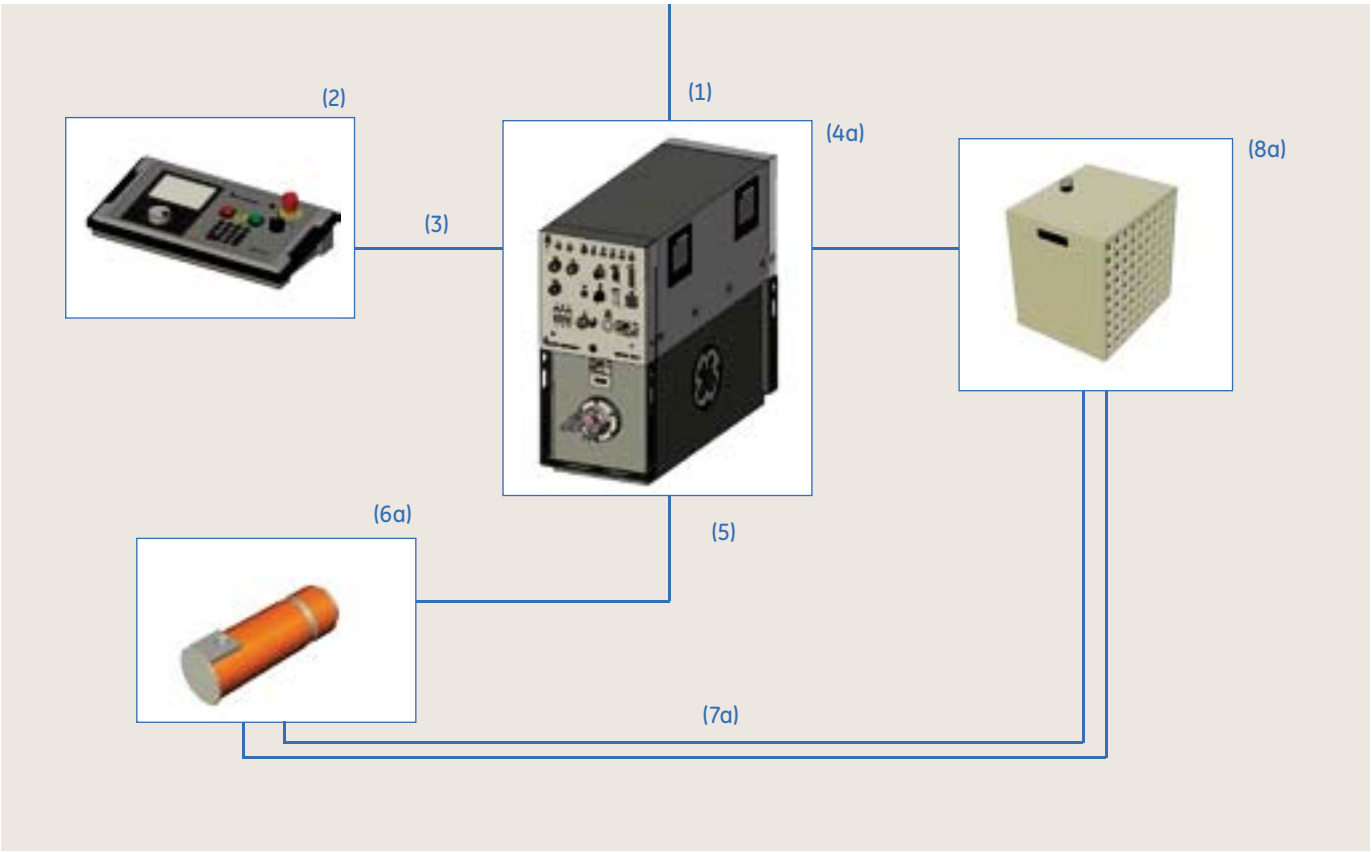
Junction Kits and Safety Devices

Diaphragms

Column Stand

System Layout for Exemplary Setups

Unipolar operation



Legend

(1) Mains connecting cable, standard length 10 m / 32 ft, with wire end ferrules

(2) Control Module ISOVOLT *Titan E* in desktop housing (optional 19" rack house)

(3) Connecting cable control/power stage, standard length 10 m (max. 100 m) / 32 ft. (max. approx 320 ft.)

(4a) High Voltage Generator, 160 kV or 225 kV, Cathode, with integrated power module *TITAN E*

(4b) High Voltage Generator, 160 kV or 225 kV, Anode incl. Connecting cable

(5) High Voltage Cables, 160 kV or 225 kV, standard length 5 m / 16 ft (max. 20 m / 64 ft for 160 kV - 320 kV; max. 10 m / 32 ft for 420 kV and 450 kV)

(6a) Unipolar Tube Housing (see tube overview or separate product information)

(6b) Bipolar Tube Housing (see tube overview or separate product information)

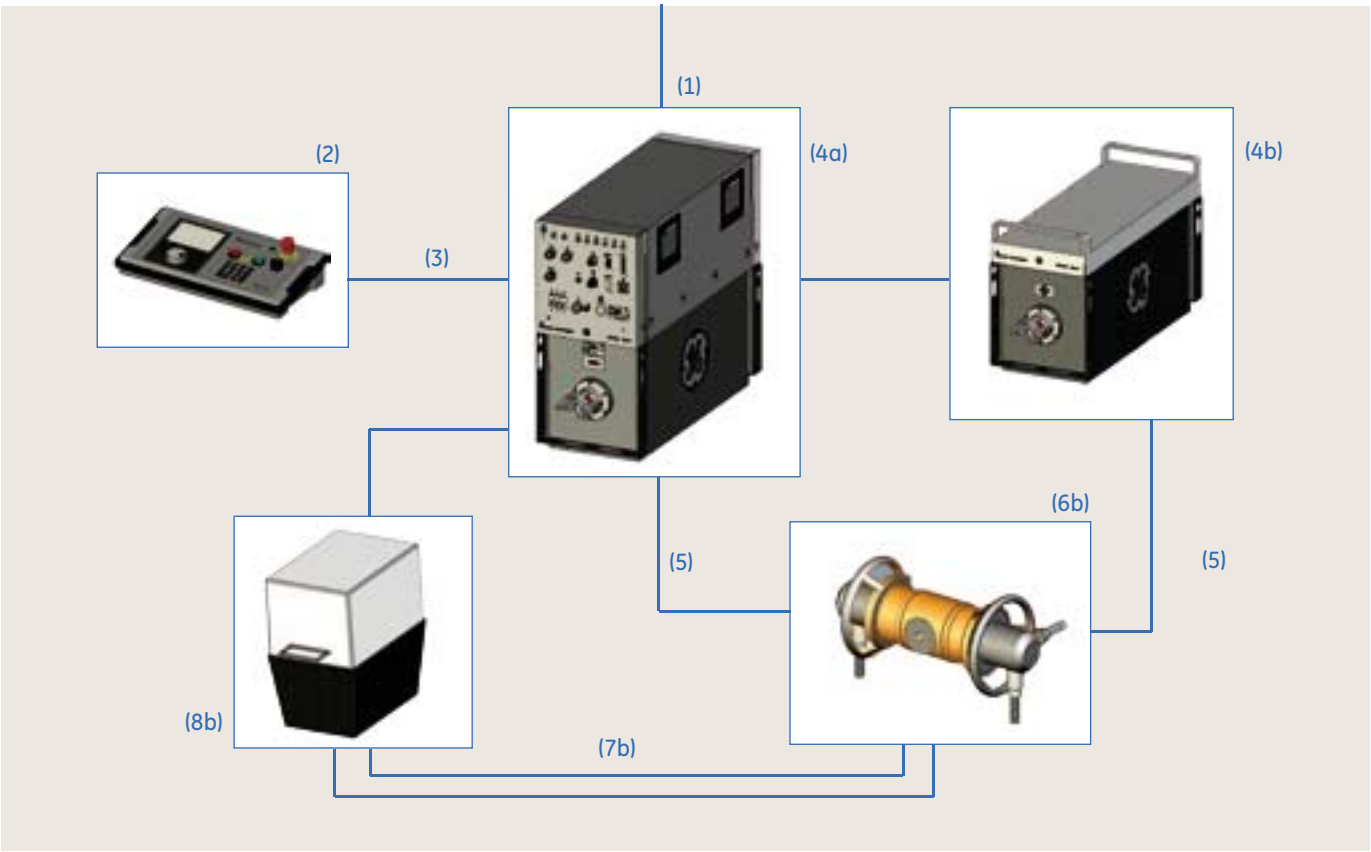
(7a) Water hoses, standard length 10 m (max. 20 m) / 16 ft (max. 32 ft)

(7b) Cooling Oil hoses, standard length 6m (max. 20 m) / 19 ft (max. 64 ft)

(8a) Water Cooling Pump with built in flow rate monitor, see separate specification

(8b) Oil Cooling Pump, see separate specification

Bipolar Operation



Input and output connections

- RS 232 interface for connection of machine controls
- Interlock as per DIN 54113.
- Interlock as per United States Radiation Control Act of 1968, § 1020.40.
- Additional warning output that is active during pre-warning time.
- External START/STOP.
- External EMERGENCY-STOP.
- Cooling system.
- External warning flash lamp (fail-safe).
- "Mains ON" (230V / 2A[2]).
- "High Voltage ON" (230V / 2A[2]).
- Potential-free contact, for "Mains ON" (60V AC / 75V DC / 2A[1]).
- Potential-free contact, for "Pre-warning Time ON" (30V AC/36V DC / 0.5A[1]).
- Potential-free contact, for "High Voltage ON" (60V AC / 75V DC / 2A[1]).

1) This voltage corresponds to the max. operating voltage (rating as per VDE 0110 Group B).

2) These 230 V contacts are collectively fused with 2.5 A.

Technical Specifications

Unipolar Systems		
High Voltage Generator		
Max. Output Voltage	160 kV	225 kV
Max. Output Current	45 mA	45 mA
Max. Output Power	4,5 kW, Limited by Tube Specification	4,5 kW, Limited by Tube Specification
High Voltage Ripple	5 V/mA (With High Voltage Cable 10 m), 40 kHz	5 V/mA (With High Voltage Cable 10 m), 40 kHz
Insulation	Oil	Oil
Housing Dimensions (Cathode) (W x D x H)	350 x 870 x 850 mm (13.8" x 34.3" x 33.5")	350 x 870 x 850 mm (13.8" x 34.3" x 33.5")
Weight (Cathode)	189 kg (417 lbs), Including Power Module	189 kg (417 lbs), Including Power Module
Tube Voltage		
Preselection and Setting	From 5 to 160 kV in 0.1 kV / 1 kV / 10 kV	From 5 to 225 kV in 0.1 kV / 1 kV / 10 kV
Digital Display of Set and Actual Values	Simultaneous 4 Digits Each	Simultaneous 4 Digits Each
Display Resolution	0.1 kV	0.1 kV
Accuracy	< ±1%	< ±1%
Reproducibility	±0.01% at Constant Temperature Level	±0.01% at Constant Temperature Level
Temperature Drift	< 65 ppm/°C	< 65 ppm/°C
Tube Current		
Preselection and Setting	From 0.1 to 45 mA in 0.01 mA / 0.1 mA / 1 mA	From 0.1 to 45 mA in in 0.01 mA / 0.1 mA / 1 mA
Digital Display of Set and Actual Values	Simultaneous 4 Digits Each	Simultaneous 4 Digits Each
Display Resolution	0.1 mA / 0.01 mA	0.1 mA / 0.01 mA
Accuracy	± 1%	±1%
Reproducibility	± 0.01% at Constant Temperature Level	± 0.01% at Constant Temperature Level
Temperature Drift	< 65 ppm/°C	< 65 ppm/°C
Exposure Time		
Programmable Timer	Non-Volatile Memory	Non-Volatile Memory
Preselection and Setting	From 0.1 to 99.9 Minutes in 0.1 Min. Increments or from 1 to 999 Sec. in 1 Sec. Increments or as direct Min./Sec. value (up to 99'59")	From 0.1 to 99.9 Minutes in 0.1 Min. Increments or from 1 to 999 Sec. in 1 Sec. Increments or as direct Min./Sec. value (up to 99'59")
Digital Display of Set and Actual Values	The Remaining Time Is Displayed, i.e. After a Mains Failure Exposure Can Be Continued Without any Time Error	The Remaining Time Is Displayed, i.e. After a Mains Failure Exposure Can Be Continued Without any Time Error
Prewarning Time		
Preselection and Setting	Digital Setting From 2 to 250 Seconds or de-activated	Digital Setting From 2 to 250 Seconds or de-activated
Programmed Mode		
Number of Storable Programs	250	250
Warm-Up	Automatic Intelligent Tube conditioning based on Real-time Clock Extended warm-up for special conditioning	Automatic Intelligent Tube conditioning based on Real-time Clock Extended warm-up for special conditioning
X-ray Tube Setup	8 Tube selectable from a database of > 40 pre-programmed tubes	8 Tube selectable from a database of > 40 pre-programmed tubes
Operation History	512 Events (256 On/Off Events)	512 Events (256 On/Off Events)
Warm-up History	128 Events	128 Events
Control Module		
Dimensions (W x D x H)	460 x 270 x 100 mm (18.1" x 10.6" x 3.9") Built into Desk Housing	460 x 270 x 100 mm (18.1" x 10.6" x 3.9") Built into Desk Housing
Weight	4.9 kg (10.8 lbs) Including Desk Housing	4.9 kg (10.8 lbs) Including Desk Housing
Connected Loads		
Power connection	1N PE 230 V ± 10% 50/60 Hz 3N PE 400/230 V ±10%, 50/60 Hz, 3-Phase, Grounded Neutral TN-S or TN-C-S Mains (Star Connected System, Optional 3-Phase Isolation Transformer)	1N PE 230 V ± 10% 50/60 Hz 3N PE 400/230 V ±10%, 50/60 Hz, 3-Phase, Grounded Neutral TN-S or TN-C-S Mains (Star Connected System, Optional 3-Phase Isolation Transformer)
Grounding	Separate Grounding for X-ray Tube and High Voltage Generator (Minimum 6 mm^2)	Separate Grounding for X-ray Tube and High Voltage Generator (Minimum 6 mm^2)
Mains Fuses	63 A (1N PE) or 16 A (3N PE) Time-Delay Fuses, Customer-Supplied	63 A (1N PE) or 16 A (3N PE) Time-Delay Fuses, Customer-Supplied
Operating Temperature Range	0°C to +40°C	0°C to +40°C
Storage Temperature Range	-30°C to +70°C	-30°C to +70°C

Bipolar Systems

High Voltage Generator		
Max. Output Voltage	-160 kV (Cathode), +160 kV (Anode)	-225 kV (Cathode), +225 kV (Anode)
Max. Output Current	45 mA	45 mA
Max. Output Power	4,5 kW (Cathode) 3 kW (Anode) Limited by Tube Specification	4,5 kW (Cathode) 3 kW (Anode) Limited by Tube Specification
High Voltage Ripple	10 V/mA (With High Voltage Cable 10 m), 40 kHz	10 V/mA (With High Voltage Cable 10 m), 40 kHz
Insulation	Oil	Oil
Operation History	512 Events (256 On / Off events)	512 Events (256 On / Off events)
Warm-up History	128 Events	128 Events
Housing Dimensions (Cathode) (W x D x H)	350 x 870 x 620 mm (13.8" x 34.3" x 24.4")	350 x 870 x 620 mm (13.8" x 34.3" x 24.4")
	350 x 870 x 850 mm (13.8" x 34.3" x 33.5")	350 x 870 x 850 mm (13.8" x 34.3" x 33.5")
Weight (Anode)	123 kg (272 lbs)	123 kg (272 lbs)
Weight (Cathode)	189 kg (417 lbs), Including Power Module	189 kg (417 lbs), Including Power Module
Tube Voltage (Anode)		
Preselection and Setting	From 5 to 320 kV in 0.1 kV / 1 kV / 10 kV	From 5 to 450 kV in 0.1 kV / 1 kV / 10 kV
Digital Display of Set and Actual Values	Simultaneous 4 Digits Each	Simultaneous 4 Digits Each
Display Resolution	0.1 kV	0.1 kV
Accuracy	< ±1%	< ±1%
Reproducibility	±0.01% at Constant Temperature Level	±0.01% at Constant Temperature Level
Temperature Drift	< 65 ppm/°C	< 65 ppm/°C
Tube Current		
Preselection and Setting	From 0.1 to 45 mA in 0.01 mA / 0.1 mA / 1 mA	From 0.1 to 45 mA in 0.01 mA / 0.1 mA / 1 mA
Digital Display of Set and Actual Values	Simultaneous 4 Digits Each	Simultaneous 4 Digits Each
Display Resolution	0.1 mA / 0.01 mA	0.1 mA / 0.01 mA
Accuracy	± 1%	±1%
Reproducibility	± 0.01% at Constant Temperature Level	± 0.01% at Constant Temperature Level
Temperature Drift	< 65 ppm/°C	< 65 ppm/°C
Exposure Time		
Programmable Timer	Non-Volatile Memory	Non-Volatile Memory
Preselection and Setting	From 0.1 to 99.9 Minutes in 0.1 Min. Increments or From 1 to 999 Sec. in 1 Sec. Increments or as direct Min./Sec. value (up to 99'59")	From 0.1 to 99.9 Minutes in 0.1 Min. Increments or From 1 to 999 Sec. in 1 Sec. Increments or as direct Min./Sec. value (up to 99'59")
Digital Display of Set and Actual Values	The Remaining Time Is Displayed, i.e. After a Mains Failure Exposure Can Be Continued Without any Time Error	The Remaining Time Is Displayed, i.e. After a Mains Failure Exposure Can Be Continued Without any Time Error
Prewarning Time		
Preselection and Setting	Digital Setting From 2 to 250 Seconds or de-activated	Digital Setting From 2 to 250 Seconds or de-activated
Programmed Mode		
Number of Storable Programs	250	250
Warm-Up	Automatic Intelligent Tube conditioning based on Real-time Clock Extended warm-up for special conditioning	Automatic Intelligent Tube conditioning based on Real-time Clock Extended warm-up for special conditioning
X-ray Tube Setup	8 Tube selectable from a database of > 40 pre-programmed tubes	8 Tube selectable from a database of > 40 pre-programmed tubes
Control Module		
Dimensions (W x D x H)	460 x 270 x 100 mm (18.1" x 10.6" x 3.9") Built into Desk Housing	460 x 270 x 100 mm (18.1" x 10.6" x 3.9") Built into Desk Housing
Weight	4.9 kg (10.8 lbs) Including Desk Housing	4.9 kg (10.8 lbs) Including Desk Housing
Connected Loads		
Power connection	1N PE 230 V ± 10% 50/60 Hz 3N PE 400/230 V ±10%, 50/60 Hz, 3-Phase, Grounded Neutral TN-S or TN-C-S Mains (Star Connected System, Optional 3-Phase Isolation Transformer)	1N PE 230 V ± 10% 50/60 Hz 3N PE 400/230 V ±10%, 50/60 Hz, 3-Phase, Grounded Neutral TN-S or TN-C-S Mains (Star Connected System, Optional 3-Phase Isolation Transformer)
Grounding	Separate Grounding for X-ray Tube and High Voltage Generator (Minimum 6 mm^2)	Separate Grounding for X-ray Tube and High Voltage Generator (Minimum 6 mm^2)
Mains Fuses	63 A (1N PE) or 16 A (3N PE) Time-Delay Fuses, Customer-Supplied	63 A (1N PE) or 16 A (3N PE) Time-Delay Fuses, Customer-Supplied
Operating Temperature Range	0°C to +40°C	0°C to +40°C
Storage Temperature Range	-30°C to +70°C	-30°C to +70°C

FAXITRON® CABINET X-RAY SYSTEMS
MODELS 43855C & 43855D

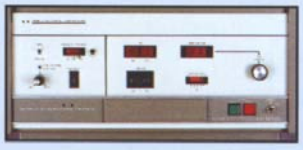
Faxitron X-Ray Systems Offer:

- Ease of operation
- High contrast, high resolution imaging
- Convenience and space savings
- Shielded, radiation safe enclosures

Faxitron Model 43855D

Faxitron Model 43855C

The Faxitron® Models 43855C and 43855D represent the latest evolution of the highly successful Faxitron product line. Over the last 30 years, Faxitrons have become the standard in small cabinet X-ray inspection systems. The Faxitron's size and radiation safe enclosure make it ideal for location almost anywhere. A modular design is utilized for easy service and upgrade. This unique design provides long life and safe, reliable operation to radiographic users needing an instrument they can depend on. Simple controls are utilized allowing operation by persons with no previous radiography training. These factors combined with a low purchase price make the Faxitron a great value and have resulted in the installation of over 5000 units worldwide. Faxitron X-ray Systems offer a variety of options which allow users to configure a unit meeting their specific needs. For example, three different X-ray sources are available on the Faxitron Models 43855 C/D including a microfocus X-ray source for radiographic magnification. Imaging is possible with X-ray film, radiographic paper or Polaroid® Film. The Model 43855C also has several real-time X-ray imaging options which provide a fluoroscopic video image. Both models have a cable access port for instrumentation and future real-time upgrade.



AO2, Automatic Exposure Control – Optionally available for the Model 43855C/D

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

System Specifications

Models 43855C & 43855D

X-ray Sources:

There are five X-ray sources offered with the Faxitron Models 43855C & 43855D. The system comes standard with a 110kVp maximum source.

Standard Source

- **Energy Range** – 10 - 110kVp
- **Tube Current** – 3.0 mA fixed*
- **Focal Spot** – 0.5mm, nominal
- **X-Ray Tube** – Stationary anode, glass tube with beryllium window (0.03″ thick)
- **Beam Angle** – 30 degrees divergence

Option A04

- **Energy Range** – 10 - 130kVp
- **Tube Current** – 3.0 mA fixed*
- **Focal Spot** – 0.5mm, nominal
- **X-Ray Tube** – Stationary anode, glass tube with beryllium window (0.03″ thick)
- **Beam Angle** – 30 degrees divergence

Option A05

- **Energy Range** – 10 - 150kVp
- **Tube Current** – 3.0 mA fixed*
- **Focal Spot** – 1.5mm, nominal
- **X-Ray Tube** – Stationary anode, glass tube with beryllium window (0.03″ thick)
- **Beam Angle** – 40 degrees divergence

Option M110

- **Energy Range** – 10 - 110kVp
- **Tube Current** – 300 µA fixed*
- **Focal Spot** – 50 µm, nominal
- **X-Ray Tube** – Stationary anode, glass tube with beryllium window (0.03″ thick)
- **Beam Angle** – 30 degrees divergence

Option M130

- **Energy Range** – 10 - 130kVp
- **Tube Current** – 300 µA fixed*
- **Focal Spot** – 50 µm, nominal
- **X-Ray Tube** – Stationary anode, glass tube with beryllium window (0.03″ thick)
- **Beam Angle** – 30 degrees divergence

* Tube current will be less than 3mA or 300µA for energies below 30 kVp.

Power Requirements:

110 - 120 VAC/60 Hz or optional 220 - 230 VAC/50 Hz (600 VA total)

Safety:

The Faxitron has a shielded cabinet and utilizes redundant safety interlocks. Certified to comply with standards set by the U.S. Food and Drug Administration, Center for Devices and Radiological Health, (21 CFR-1020.40). Most option configurations are classified by Underwriters Laboratories Inc. in the U.S. and Canada, with respect to electrical fire, shock, and mechanical hazards. Certified to comply with the European EMC Directive.

Model 43855C

A floor standing cabinet X-ray system providing a maximum 52″ film to source distance. The 43855C model can be ordered with all listed options and retrofitted for use with a microfocus X-ray source and/or real-time imaging components.

- **Exposure Timer** – 5 sec. to 60 min. (1 sec increments)
- **Film to Source Distance** – 14″ min to 52″max (35 cm to 132 cm)
- **Maximum Coverage** – 24″ diameter (61 cm) (fits a full 14″ x 17″ cassette)
- **External Dimensions** – 62″ H x 24″ W x 20″ L (157cm x 61 cm x 51 cm)
- **Internal Dimensions** – 41″ H x 18″ W x 16.5″ L (104 cm x 46 cm x 42 cm)
- **Weight** – 850 lb (386 kg)
- **Shipping Weight** – 960 lb (437 kg)

Model 43855D

A table top X-ray system providing a maximum 28″ film to source distance. The model "D" differs from the Model "C" only in its smaller beam coverage area and shorter film to source distance. The 43855D model can be ordered with all listed options and retrofitted for use with a microfocus X-ray source.

- **Exposure Timer** – 5 sec to 60 min (1 sec increments)
- **Film to Source Distance** – 12.0″ min to 28″max (30.5 cm to 71 cm)
- **Maximum Beam Coverage** – 15″ diameter (38 cm)
- **External Dimensions** – 40″ H x 24″ W x 20″ L (102 cm x 61 cm x 51 cm)
- **Internal Dimensions** – 17″ H x 18″ W x 16.5″ L (43 cm x 46 cm x 42 cm)
- **Weight** – 630 lb (286 kg)
- **Shipping Weight** – 740 lb (336 kg)

FAXITRON® CABINET X-RAY SYSTEM MODEL 43855E

The Faxitron Model 43855E X-Ray System Offers:

- HIGH RESOLUTION X-RAY IMAGING
- SPACIOUS CABINET DIMENSIONS FOR LARGER PARTS
- REALTIME OR FILM-BASED IMAGING OPTIONS
- SHIELDED, RADIATION SAFE ENCLOSURES
- EASE OF OPERATION
- CONVENIENCE AND SPACE SAVINGS
- OPTIONAL HORIZONTAL "SIDE-SHOOTING" CONFIGURATION

Typical Applications:

- PRINTED CIRCUIT BOARDS
- CASTINGS
- PLASTIC INJECTION MOULDING
- AUTOMOTIVE PARTS
- AEROSPACE COMPONENTS
- ELECTRICAL/MECHANICAL COMPONENTS
- MEDICAL DEVICES

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

X-Ray Sources:

There are four different X-ray sources offered with the Faxitron Model 43855E:

	Standard Source	Option A04	Option M110	Option A05
Energy Range	10-110kVp	10-130kVp	10-110kVp	10-150kVp
Tube Current	3.0 mA fixed	3.0 mA fixed	300 µA fixed	3.0 mA fixed
Focal Spot	0.5mm, nominal	0.5mm, nominal	50 µm (-0+20µm)	1.5mm, nominal

System Specifications

- Exposure Timer - 5 sec. to 60 min. (1 sec. increments)
- Maximum Film to Source Distance - 41"
- External Dimensions - 71"h x 51"w x 35"l
- Internal Dimensions - 30"h x 42"w 30"l
- Weight - 1,000 lbs.
- Shipping Weight - 1,300 lbs.
- Maximum PCB Inspection Size (Realtime with 6" Image Intensifier - 24" x 18")

Real-Time Imaging Options

- Image Intensifier - 4", 6", or 9"
- CCD Camera, 512 x 480 lines, fixed or auto zoom lens
- Motorized manipulator, 3 or 5 axis
- Thermal video printer, 4" x 5" format
- Digital image processing module
- 13" or 17" high resolution b/w video monitor

Power Requirements

110 - 120 VAC/60 Hz or optional
220 - 230 VAC/50 Hz (600 VA total)

Safety

The Faxitron has a shielded cabinet and utilizes redundant safety interlocks. Certified to comply with standards set by U.S. Food and Drug Administration Center for Devices and Radiology Health, (21 CFR-1020.40). UL Pending.

Specifications are subject to change without notice.

COMET

Industrial X-Ray

Bipolar Metal Ceramic Tubes

Overview

Bipolar Metal Ceramic Tubes

Overview and Configuration Information

About Bipolar Metal Ceramic X-Ray Tubes

The COMET Bipolar Metal Ceramic tubes are designed for use in demanding industrial applications like Security and Non-Destructive Testing.
The tube assembly consists of a Bipolar X-Ray tube and tube housing with two integrated high voltage receptacle sockets. The X-Ray proof housing has an integrated cooling system and is equipped with oil hose connections.
The main advantages are high power, small dimensions, low weight and rugged mechanical design.

"One Stop Shop" for Industrial X-Ray Sources: COMET's XRS Modules

COMET is pleased to offer all of the necessary components for a customized X-Ray Source: The new XRS modules each contain a COMET X-Ray tube, high voltage generator with cables and coolers designed for easy integration that will optimize system performance.
All XRS modules are factory prepared and tested for hassle free installation and operation.
This novel solution demonstrates COMET's continuous commitment and investment in delivering real added value to our worldwide customer base.

About the Business Unit Industrial X-Ray

COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed. Our product range features X-Ray tubes and sources with small focal spot resolution (< 1 µm) up to 6 kW in output for more power demanding requirements. From the smallest footprint for use in portable units to 450 kV fixed gantry systems that are suitable for cargo screening.

Bipolar Metal Ceramic Tubes – Configuration Information

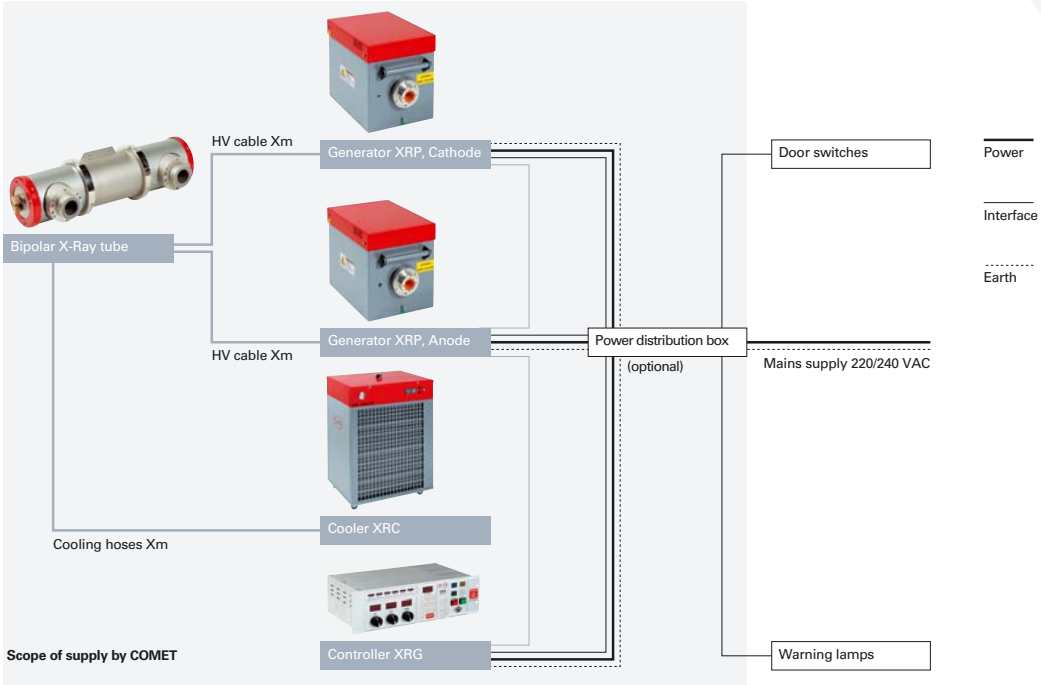
Overview of tubes and fitting module components; high voltage generator, high voltage cable and cooler.

Tube

Type	Ordering No.	Ordering No. with 90° housing	Nominal tube voltage	Continuous rating	Focal spot acc. EN 12543	Terminal type
MXR-320/23	915334.51	915334.56	320 kV	640 W / 1600 W	d = 1.9 mm / d = 3.6 mm	R24
MXR-320/26	915358.51	915358.56	320 kV	1500 W / 4200 W	d = 3.0 mm / d = 5.5 mm	R24
MXR-320HP/21	915362.51	915362.56	320 kV	900 W / 2000 W	d = 0.6 mm / d = 2.0 mm	R24
MXR-321	–	915341.51	320 kV	4000 W	d = 8 mm	R24
MXR-322	–	915337.61	320 kV	3200 W	d = 4.5 mm	R24
MXR-350/23	915334.61	915334.66	350 kV	640 W / 1600 W	d = 1.9 mm / d = 3.6 mm	R24
MXR-350/26	915358.61	915358.66	350 kV	1500 W / 4200 W	d = 3.0 mm / d = 5.5 mm	R24
MXR-420/25	915331.51	–	420 kV	1500 W / 4200 W	d = 3.0 mm / d = 7.0 mm	R24
MXR-451/26	915344.53	–	450 kV	900 W / 4500 W	d = 2.5 mm / d = 5.5 mm	R28
MXR-451HP/21	915364.53	–	450 kV	800 W / 1500 W	d = 0.6 mm / d = 1.0 mm	R28
MXR-452	915344.51	–	450 kV	900 W / 4500 W	d = 2.5 mm / d = 5.5 mm	R28

Bipolar X-Ray Source

Diagram of a Bipolar X-Ray Source XRS and its environment.



Generator		High Voltage Cable	Cooler	
Type	**Ordering No.**	**Type/Xm**	**Type**	**Ordering No.**
XRP-320/1600/2	**10002220**	N3/160-R24-R24-Xm	XRC-3000-OW / XRC-3000-OA	**10003804 / 10003803**
XRP-320/4200/2	**10002222**	N3/160-R24-R24-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-320/4200/2	**10002222**	N3/160-R24-R24-Xm	XRC-3000-OW / XRC-3000-OA	**10003804 / 10003803**
XRP-320/4000/1	**10002223**	N3/160-R24-R24-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-320/3200/1	**10002224**	N3/160-R24-R24-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-350/1600/2	**10003920**	P3/250-R24-R24-Xm	XRC-3000-OW / XRC-3000-OA	**10003804 / 10003803**
XRP-350/4200/2	**10003921**	P3/250-R24-R24-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-450/4500/2	**10002225**	P3/250-R30-R24-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-450/4500/2	**10002225**	P3/250-R30-R28-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**
XRP-450/4500/2	**10002225**	P3/250-R30-R28-Xm	XRC-3000-OW / XRC-3000-OA	**10003804 / 10003803**
XRP-450/4500/2	**10002225**	P3/250-R30-R28-Xm	XRC-4500-OW / XRC-4500-OA	**10003535 / 10002535**

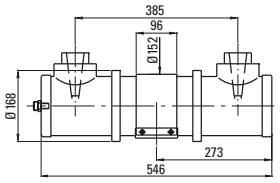
Bipolar Metal Ceramic Tubes

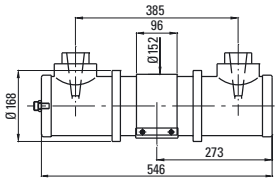
Technical Data

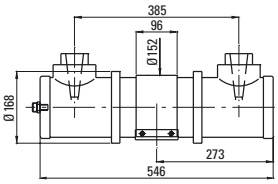
	MXR-320/23	MXR-320/26	MXR-320HP/21
Ordering No.	**915334.51**	**915358.51**	**915362.51**
Ordering No. with 90° housing	**915334.56**	**915358.56**	**915362.56**
Nominal tube voltage	320 kV	320 kV	320 kV
Continuous rating	640 W / 1600 W	1500 W / 4200 W	900 W / 2000 W
Focal spot acc. EN 12543	d = 1.9 mm / d = 3.6 mm	d = 3.0 mm / d = 5.5 mm	d = 0.6 mm / d = 2.0 mm
Former focal spot designation	0.8 / 1.8	1.5 / 4.0	–
Filament current, max.	4.9 A / 4.6 A	4.9 A / 4.6 A	4.1 A / 4.6 A
Filament voltage, typical	3.0 V / 6.8 V	2.6 V / 6.4 V	3.0 V / 6.8 V
Inherent filtration	3.0 mm Be	3.0 mm Be	3.0 mm Be
Target material	W	W	W
Target angle	20°	20°	10°
Radiation coverage	40°	40°	40° x 20°
Leakage radiation, max.	5 mSv/h	5 mSv/h	5 mSv/h
Cooling medium	Oil	Oil	Oil
Cooling medium flow, min.	14 l/min	14 l/min	14 l/min
Temperature at inlet, max.	50° C	50° C	50° C
Weight	40 kg	40 kg	40 kg
Terminal type	R24	R24	R24

Mounting flange	10001711	10001711	10001711
Locking device	940303	940303	940303

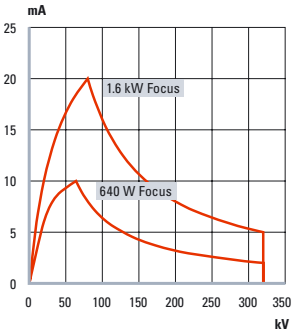
Outline drawing

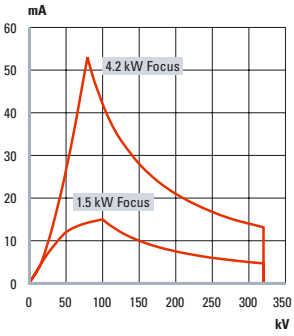


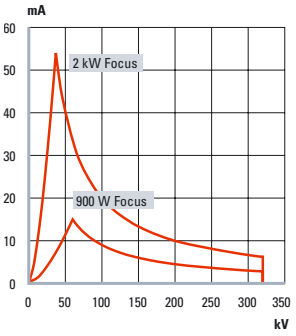




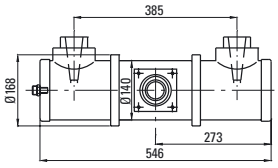
Tube diagram

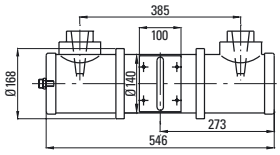


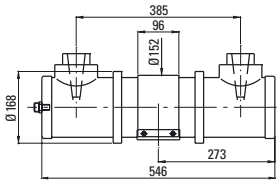


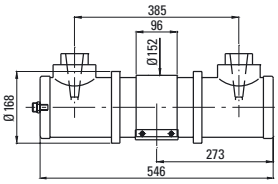


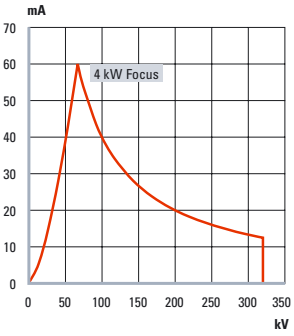
	MXR-321	MXR-322	MXR-350/23	MXR-350/26
	–	–	**915334.61**	**915358.61**
	915341.51	**915337.61**	**915334.66**	**915358.66**
	320 kV	320 kV	350 kV	350 kV
	4000 W	3200 W	640 W / 1600 W	1500 W / 4200 W
	d = 8 mm	d = 4.5 mm	d = 1.9 mm / d = 3.6 mm	d = 3.0 mm / d = 5.5 mm
	5	2.0 x 3.0	0.8 / 1.8	1.5 / 4.0
	4.6 A	4.6 A	4.9 A / 4.6 A	4.9 A / 4.6 A
	6.4 V	6.4 V	3.0 V / 6.8 V	2.6 V / 6.4 V
	3.0 mm Be	0.2 mm Cu + 0.4 mm Fe	3.0 mm Be	3.0 mm Be
	W	W	W	W
	30°	20°	20°	20°
	40°	80° x 8°	40°	40°
	10 mSv/h	10 mSv/h	5 mSv/h	5 mSv/h
	Oil	Oil	Oil	Oil
	14 l/min	14 l/min	14 l/min	14 l/min
	50° C	50° C	50° C	50° C
	40 kg	40 kg	40 kg	40 kg
	R24	R24	R24	R24
	10001711	10001711	10001711	10001711
	940303	940303	940303	940303

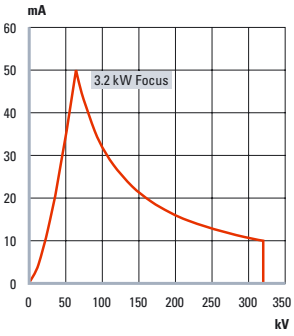


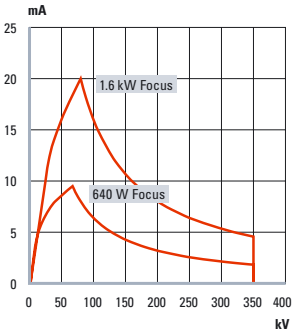


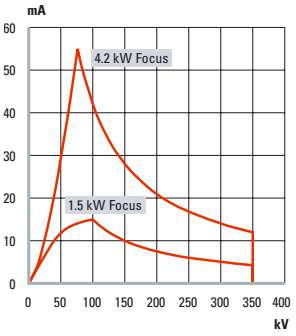






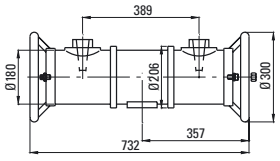


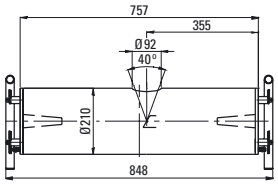


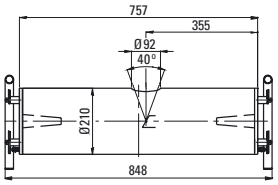


	MXR-420/25	MXR-451/26	MXR-451HP/21
Ordering No.	**915331.51**	**915344.53**	**915364.53**
Ordering No. with 90° housing	–	–	–
Nominal tube voltage	420 kV	450 kV	450 kV
Continuous rating	1500 W / 4200 W	900 W / 4500 W	800 W / 1500 W
Focal spot acc. EN 12543	d = 3.0 mm / d = 7.0 mm	d = 2.5 mm / d = 5.5 mm	d = 0.6 mm / d = 1.0 mm
Former focal spot designation	1.5 / 4.0	–	–
Filament current, max.	4.9 A / 4.6 A	4.9 A / 4.6 A	4.1 A / 4.6 A
Filament voltage, typical	2.6 V / 6.4 V	3.0 V / 6.8 V	3.0 V / 6.8 V
Inherent filtration	3.0 mm Be	3.0 mm + 2.0 mm Be	2.3 mm Fe + 1.0 mm Cu
Target material	W	W	W
Target angle	20°	30°	10°
Radiation coverage	38°	40°	20°
Leakage radiation, max.	10 mSv/h	10 mSv/h	10 mSv/h
Cooling medium	Oil	Oil	Oil
Cooling medium flow, min.	14 l/min	14 l/min	14 l/min
Temperature at inlet, max.	50° C	50° C	50° C
Weight	100 kg	95 kg	95 kg
Terminal type	R24	R28	R28
Mounting flange	10001711	10001710	10001710
Locking device	940303	–	–

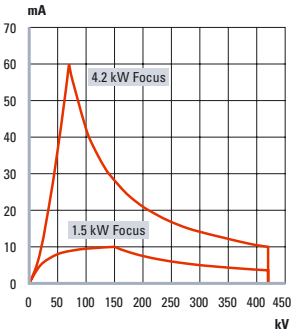
Outline drawing

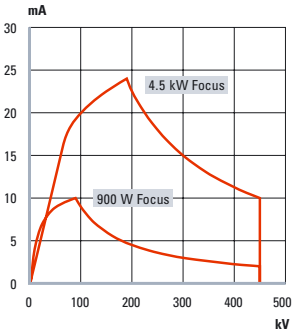


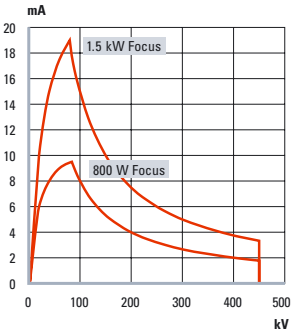




Tube diagram



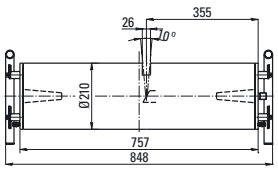


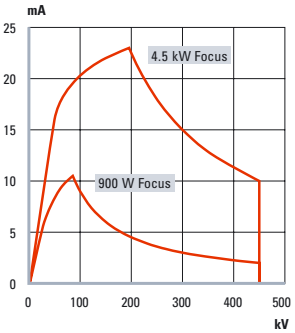


MXR-452

915344.51
–
450 kV
900 W / 4500 W
d = 2.5 mm / d = 5.5 mm
–
4.9 A / 4.6 A
3.0 V / 6.8 V
2.3 mm Fe + 1.0 mm Cu
W
30°
90° x 20°
10 mSv/h
Oil
14 l/min
50° C
95 kg
R28

10001710
–





COMET is a successful international technology company in the growth markets of security, inspection, electronics and communication. As an expert in the field of applied physics, COMET provides a complete and highly flexible portfolio of components, modules, systems and services from a single source.

COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed.

COMET – The X-perts for security, inspection, electronics and communication

June 2006
Specifications subject to change without notice

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

COMET

Industrial X-Ray

Unipolar Metal Ceramic Tubes

Overview

Unipolar Metal Ceramic Tubes

Overview and Configuration Information

About Unipolar Metal Ceramic X-Ray Tubes

The COMET Unipolar Metal Ceramic tubes are designed for use in demanding industrial applications like Non-Destructive Testing, Food Inspection and Thickness Gauging. The tube assembly consists of an Unipolar X-Ray tube with cooled anode at ground potential and a high voltage receptacle socket. The X-Ray proof tube housing has fittings for water hose connections. The main advantages are high power, small dimensions, low weight and rugged mechanical design.

"One Stop Shop" for Industrial X-Ray Sources: COMET's XRS Subsystems

COMET is pleased to offer all of the necessary components for a customized X-Ray Source: The new XRS Subsystems each contain a COMET X-Ray tube, high voltage generator with cables and coolers designed for easy integration that will optimize system performance. All XRS subsystems are factory prepared and tested for hassle free installation and operation.
This novel solution demonstrates COMET's continuous commitment and investment in delivering real added value to our worldwide customer base.

About the Business Unit Industrial X-Ray

COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed. Our product range features X-Ray tubes and sources with small focal spot resolution (< 1 µm) up to 6 kW in output for more power demanding requirements. From the smallest footprint for use in portable units to 450 kV fixed gantry systems that are suitable for cargo screening.

Unipolar Metal Ceramic Tubes – Configuration Information

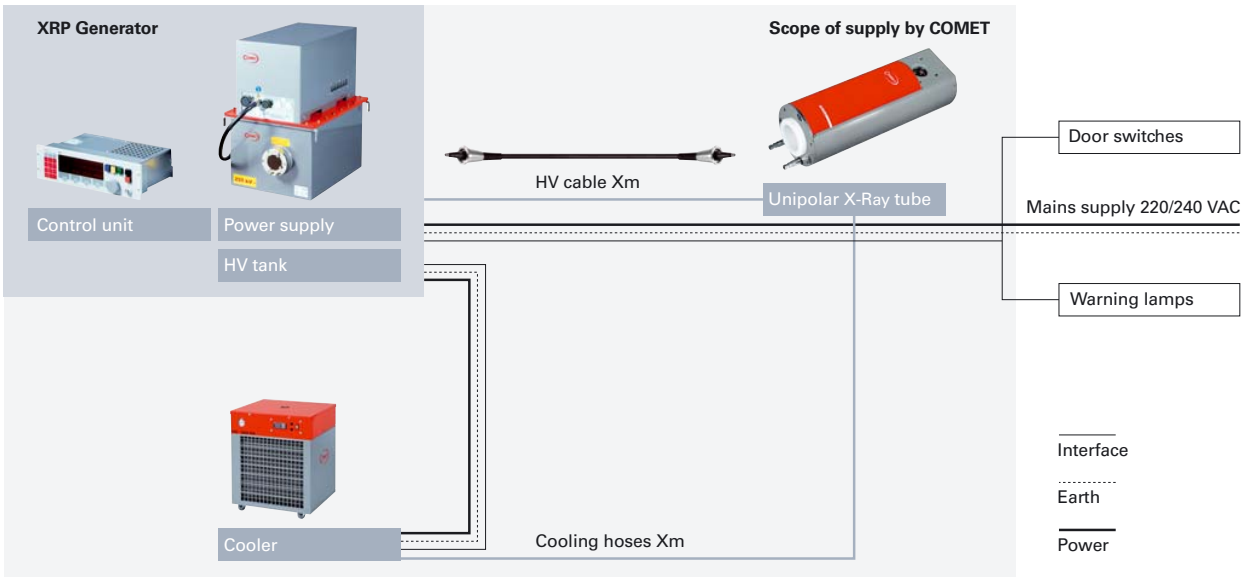
Overview of tubes and fitting system components; high voltage generator, high voltage cable and cooler.

Tube

Type	Ordering No.	Nominal tube voltage	Continuous rating	Focal spot acc. EN 12543	Terminal type
MXR-101	915343.51	100 kV	1000 W	d = 5.5 mm	R10
MXR-160HP/11	915370.51	160 kV	800 W / 1800 W	d = 0.4 mm / d = 1.0 mm	R24
MXR-160HP/20	915357.51	160 kV	1000 W / 1000 W	d = 1.0 mm / d = 1.0 mm	R24
MXR-160/01	915313.51	160 kV	320 W	d = 0.5 mm	R24
MXR-160/20	915317.51	160 kV	640 W / 640 W	d = 1.0 mm / d = 1.0 mm	R24
MXR-160/21	915302.51	160 kV	640 W / 1600 W	d = 1.0 mm / d = 3.0 mm	R24
MXR-160/22	915301.51	160 kV	640 W / 3000 W	d = 1.0 mm / d = 5.5 mm	R24
MXR-161	915305.51	160 kV	3000 W	d = 7.5 mm	R24
MXRP-160C	915311.51	160 kV	1000 W	l = 0.4 mm / w = 4.0 mm	R24
MXR-225HP/11	915371.51	225 kV	800 W / 1800 W	d = 0.4 mm / d = 1.0 mm	R24
MXR-225/21	915325.51	225 kV	640 W / 1600 W	d = 1.0 mm / d = 3.0 mm	R24
MXR-225/22	915326.51	225 kV	640 W / 3000 W	d = 1.0 mm / d = 5.5 mm	R24
MXR-226	915332.51	225 kV	3000 W	d = 7.5 mm	R24

Unipolar X-Ray Source

Diagram of a Unipolar X-Ray Source XRS and its environment.



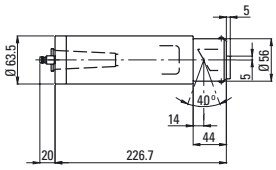
Generator		High Voltage Cable	Cooler			
Type	Ordering No.	Type/Xm	Type	Ordering No.	Type 2	Ordering No. 2
XRP-160/4500/2	**10006465**	U3/100-R24-R10-Xm	XRC-1000-WA	**10002533**	–	–
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-1000-WA	**10002533**	–	–
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-1000-WA	**10002533**	–	–
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-1000-WA	**10002533**	–	–
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-1000-WA	**10002533**	–	–
XRP-225/4500/2	**10006466**	P3/250-R28-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-225/4500/2	**10006466**	P3/250-R28-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-225/4500/2	**10006466**	P3/250-R28-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**
XRP-225/4500/2	**10006466**	P3/250-R28-R24-Xm	XRC-3000-WA	**10002534**	XRC-3000-WW	**10004730**

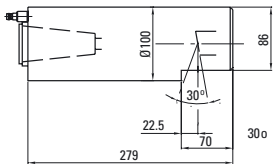
Unipolar Metal Ceramic Tubes

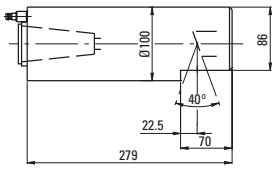
Technical Data

	MXR-101	MXR-160HP/11	MXR-160HP/20
Ordering No.	**915343.51**	**915370.51**	**915357.51**
Nominal tube voltage	100 kV	160 kV	160 kV
Continuous rating	1000 W	800 W / 1800 W	1000 W / 1000 W
Focal spot acc. EN 12543	d = 5.5 mm	d = 0.4 mm / d = 1.0 mm	d = 1.0 mm / d = 1.0 mm
Former focal spot designation	4	–	0.4 / 0.4
Filament current, max.	4.2 A	4.1 A / 4.1 A	4.1 A / 4.1 A
Filament voltage, typical	7.5 V	2.9 V / 7.3 V	4.2 V / 4.2 V
Inherent filtration	0.8 mm Be	0.8 mm Be	0.8 mm Be
Target material	W	W	W
Target angle	30°	11°	20°
Radiation coverage	40°	40° x 30°	40°
Leakage radiation, max.	–	2.5 mSv/h	2.5 mSv/h
Cooling medium	Water	Water	Water
Cooling medium flow, min.	4 l/min	4 l/min	4 l/min
Temperature at inlet, max.	40° C	35° C	35° C
Weight	3.5 kg	8 kg	8 kg
Terminal type	R10	R24	R24
Mounting flange	651142	10001756	10001756
Locking device	–	941002	941002

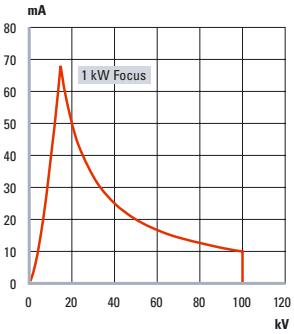
Outline drawing

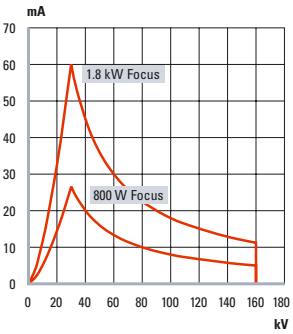


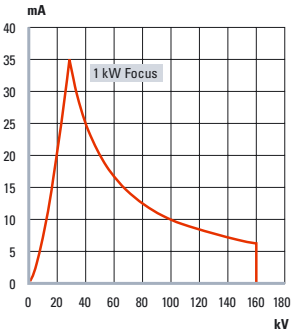




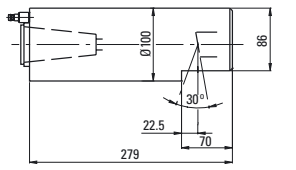
Tube diagram

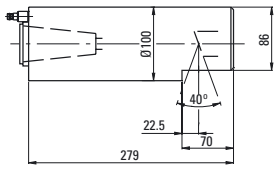


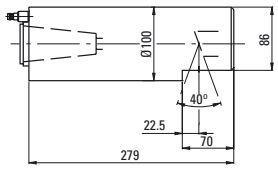


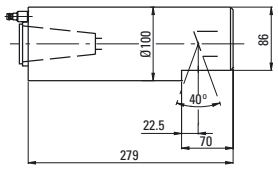


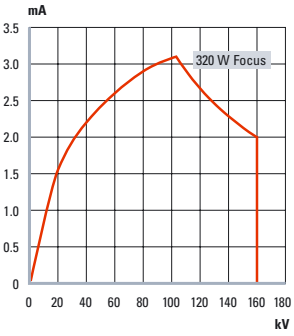
MXR-160/01	MXR-160/20	MXR-160/21	MXR-160/22
915313.51	**915317.51**	**915302.51**	**915301.51**
160 kV	160 kV	160 kV	160 kV
320 W	640 W / 640 W	640 W / 1600 W	640 W / 3000 W
d = 0.5 mm	d = 1.0 mm / d = 1.0 mm	d = 1.0 mm / d = 3.0 mm	d = 1.0 mm / d = 5.5 mm
0.2	0.4 / 0.4	0.4 / 1.5	0.4 / 3.0
3.3 A	4.1 A / 4.1 A	4.1 A / 4.2 A	4.1 A / 4.2 A
4.5 V	4.2 V / 4.2 V	4.2 V / 5.5 V	3.0 V / 5.5 V
0.8 mm Be	0.8 mm Be	0.8 mm Be	0.8 mm Be
W	W	W	W
10°	20°	20°	20°
40° x 30°	40°	40°	40°
2.5 mSv/h	2.5 mSv/h	2.5 mSv/h	2.5 mSv/h
Water	Water	Water	Water
4 l/min	4 l/min	4 l/min	4 l/min
35° C	35° C	35° C	35° C
8 kg	8 kg	8 kg	8 kg
R24	R24	R24	R24
10001756	10001756	10001756	10001756
941002	941002	941002	941002

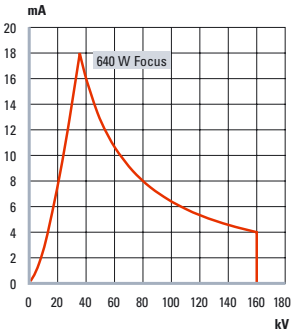


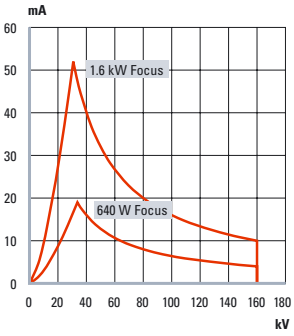


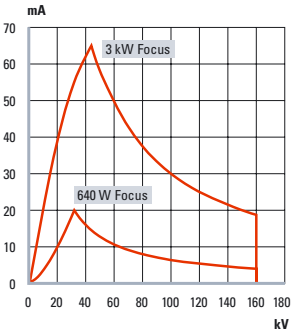






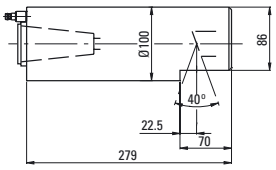


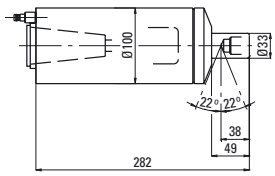


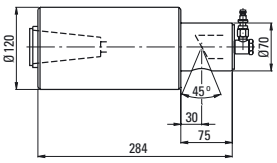


	MXR-161	MXRP-160C	MXR-165
Ordering No.	**915305.51**	**915311.51**	**915356.51**
Nominal tube voltage	160 kV	160 kV	160 kV
Continuous rating	3000 W	1000 W	6000 W
Focal spot acc. EN 12543	d = 7.5 mm	l = 0.4 mm / w = 4.0 mm	d = 5.5 mm
Former focal spot designation	3.0 x 6.0	0.3 x 3.0	–
Filament current, max.	4.2 A	4.2 A	4.2 A
Filament voltage, typical	5.5 V	2.7 V	5.5 V
Inherent filtration	0.8 mm Be	0.5 mm Ti + 2.0 mm H_2O + 2.0 mm Al	4 mm Be
Target material	W	W	W
Target angle	30°	22°	30°
Radiation coverage	40°	360° x 40°	45°
Leakage radiation, max.	1 mSv/h	2.5 mSv/h	2.5 mSv/h
Cooling medium	Water	Water	Water
Cooling medium flow, min.	4 l/min	4 l/min	5 l/min
Temperature at inlet, max.	35° C	35° C	30° C
Weight	8 kg	8 kg	9.4 kg
Terminal type	R24	R24	R24
Mounting flange	10001756	10001756	10001756
Locking device	941002	941002	940303

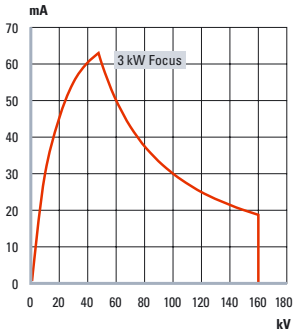
Outline drawing

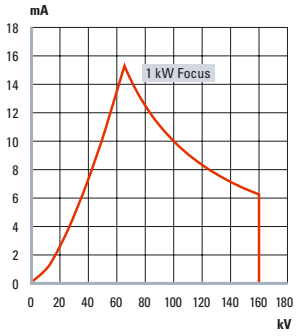


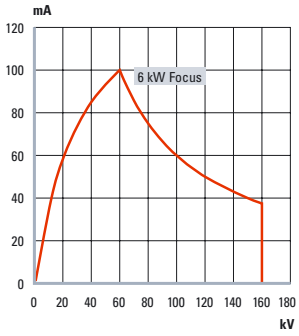




Tube diagram





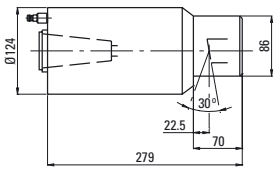


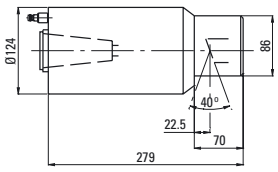
MXR-225HP/11
915371.51
225 kV
800 W / 1800 W
d = 0.4 mm / d = 1.0 mm
–
4.1 A / 4.1 A
2.9 V / 7.3 V
0.8 mm Be
W
11°
40° x 30°
5 mSv/h
Water
4 l/min
35° C
11 kg
R24
10001756
941002

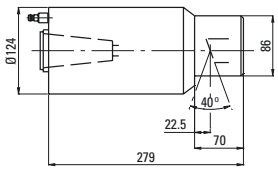
MXR-225/21
915325.51
225 kV
640 W / 1600 W
d = 1.0 mm / d = 3.0 mm
0.4 / 1.5
4.1 A / 4.2 A
4.2 V / 5.5 V
0.8 mm Be
W
20°
40°
10 mSv/h
Water
4 l/min
35° C
11 kg
R24
10001756
941002

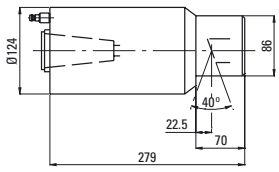
MXR-225/22
915326.51
225 kV
640 W / 3000 W
d = 1.0 mm / d = 5.5 mm
0.4 / 3.0
4.1 A / 4.2 A
3.0 V / 5.5 V
0.8 mm Be
W
20°
40°
10 mSv/h
Water
4 l/min
35° C
11 kg
R24
10001756
941002

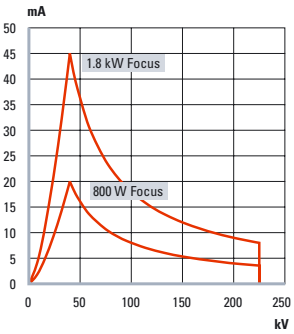
MXR-226
915332.51
225 kV
3000 W
d = 7.5 mm
3.0 x 6.0
4.2 A
5.5 V
0.8 mm Be
W
30°
40°
10 mSv/h
Water
4 l/min
35° C
11 kg
R24
10001756
941002

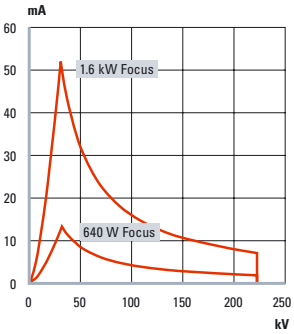


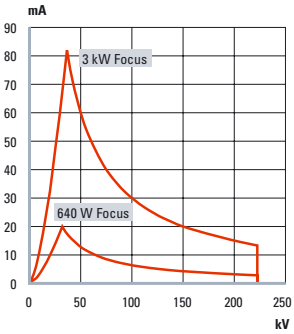


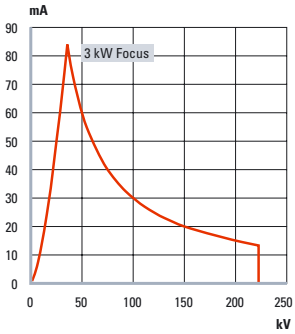












COMET is a successful international technology company in the growth markets of security, inspection, electronics and communication. As an expert in the field of applied physics, COMET provides a complete and highly flexible portfolio of components, modules, systems and services from a single source.

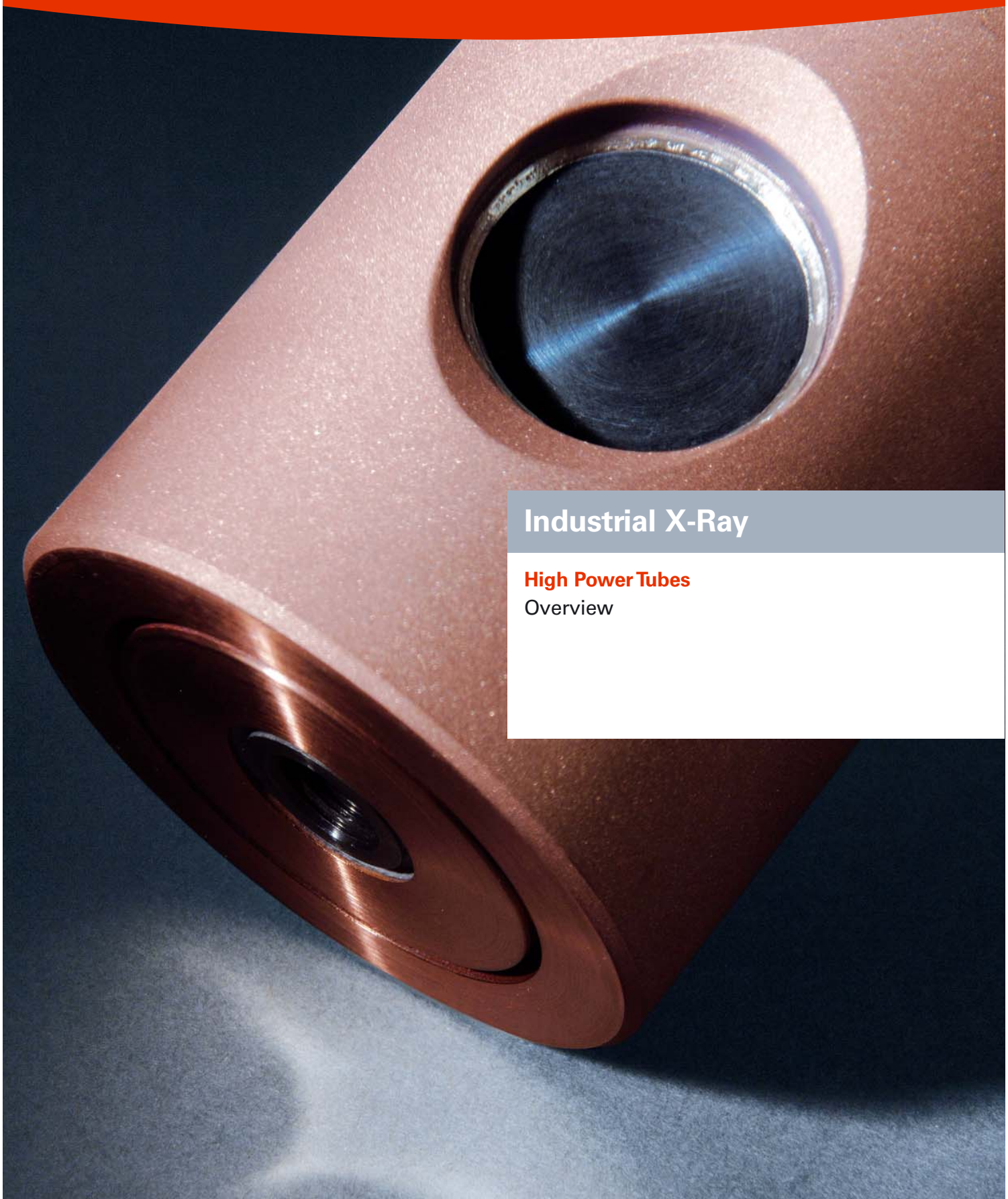
COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed.

COMET – The X-perts for security, inspection, electronics and communication

August 2007
Specifications subject to change without notice

DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

COMET



Industrial X-Ray

High Power Tubes

Overview

High Power Tubes

Overview

High Power HP Technology for X-Ray Tubes

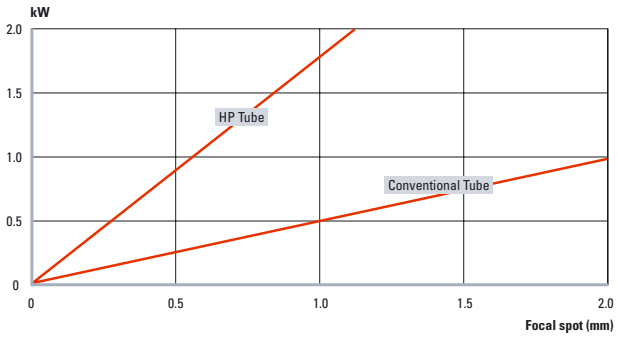
Since the invention of the X-Ray tube in 1895, the ratio between focal spot size and power has not improved significantly.

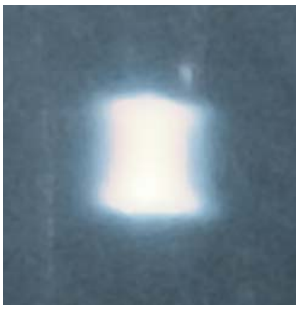
COMET AG has achieved a breakthrough in this historical relation with its new High Power (HP) technology. The HP family of X-Ray tubes has nearly doubled the power density of the conventional fixed-anode X-Ray tube.

The Benefit of the HP Innovation

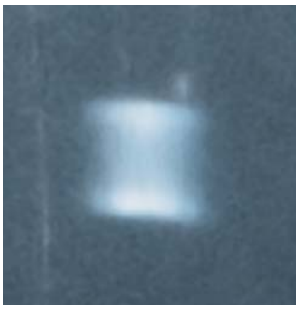
- Higher power with the same focal spot size. With higher power, shorter exposure times are necessary. The result is higher throughput through the inspection process.
- Smaller focal spot at the same power. Previously, when striving for finer resolution, the customer had to sacrifice power (and thus throughput) to achieve a smaller focal spot. You must no longer suffer this compromise.

Power/Focal Spot Ratio





1 mm focal spot of a conventional MXR-160/20. At 640 W (maximum power) the temperature reaches 1500° C.



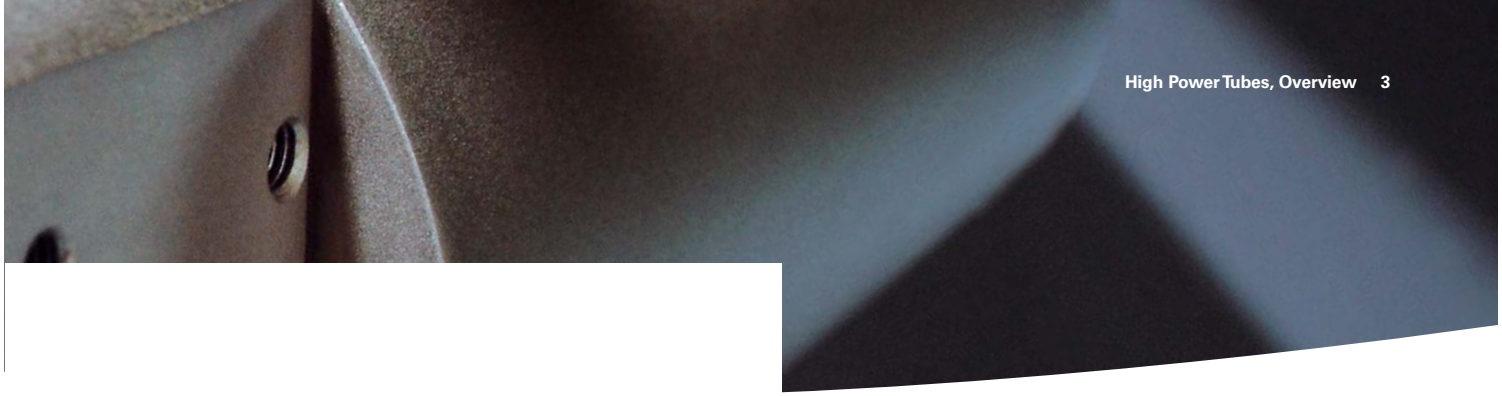
1 mm focal spot of the HP tube MXR-160HP/20, same focal spot size, same power, but with 900° C, a significantly lower temperature. The power can be increased to 1000 W before the temperature reaches 1500° C.

The Demanding Challenge to Increase the Power Density of an X-Ray Tube

X-Ray tubes operate in extreme conditions:

- Ultra high vacuum technology (10^{-9} mbar)
- Temperatures up to 1500° C
- Rough environment

To make an X-Ray tube more efficient, one must go to work on the focal spot, the very small place where the electron beam strikes the heavy-metal target and produces X-Rays. The power dissipation by a standard X-Ray tube is approx 300 W/mm². With our revolutionary new construction of the anode we can reach 600 W/mm². This success of COMET's development team was the result of the convergence of unconventional thinking, the use of the latest simulation techniques and more than 50 years of experience in the construction of X-Ray tubes.



What Are the Trends?

In the coming years, digital detectors will increasingly replace traditional X-Ray techniques such as film and image intensifiers. The consumer's demand for cost-effective products dictates that everything must be more efficient. Everything must move faster. Cycle times must be shorter. With digital detectors, already flux-starved imaging chains will be at their limits just to produce adequate pictures.
The public's increasing demand for safer products will push manufacturers to find ever smaller defects, thus increasing the need for high-resolution X-Ray inspection.

Our Response

To meet the challenges evoked by these trends, COMET invented the HP technology and thereby revolutionized the X-Ray industry.
Smaller focal spots with more power enable our customers to develop "best in class" solutions.
Today, COMET offers a broad portfolio of tubes based on HP technology in the range from 160 kV to 450 kV.

About the Business Unit Industrial X-Ray

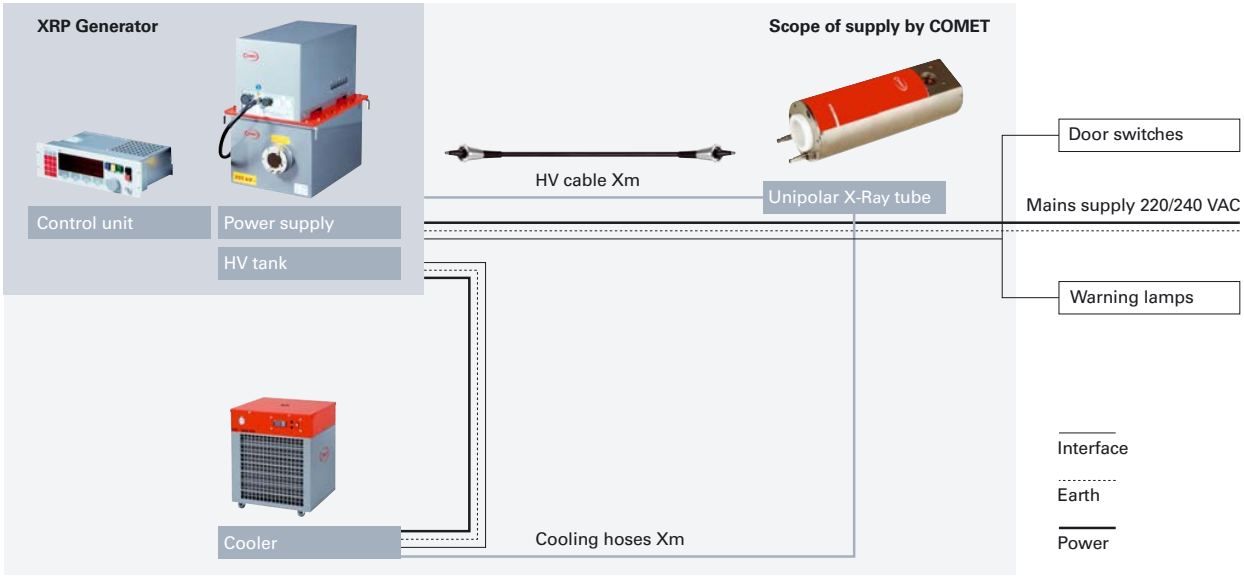
COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed. Our product range features X-Ray tubes and sources with small focal spot resolution (< 1 µm) up to 6 kW in output for more power demanding requirements. From the smallest footprint for use in portable units to 450 kV fixed gantry systems that are suitable for cargo screening.

High Power Tubes

Overview and Configuration Information

Unipolar X-Ray Source

Diagram of a Unipolar X-Ray Source XRS and its environment.



"One Stop Shop" for Industrial X-Ray Sources: COMET's XRS Modules

COMET is pleased to offer all of the necessary components for a customized X-Ray Source: The new XRS modules each contain a COMET X-Ray tube, high voltage generator with cables and coolers designed for easy integration that will optimize system performance.

All XRS modules are factory prepared and tested for hassle free installation and operation.
This novel solution demonstrates COMET's continuous commitment and investment in delivering real added value to our worldwide customer base.

High Power Tubes – Configuration Information

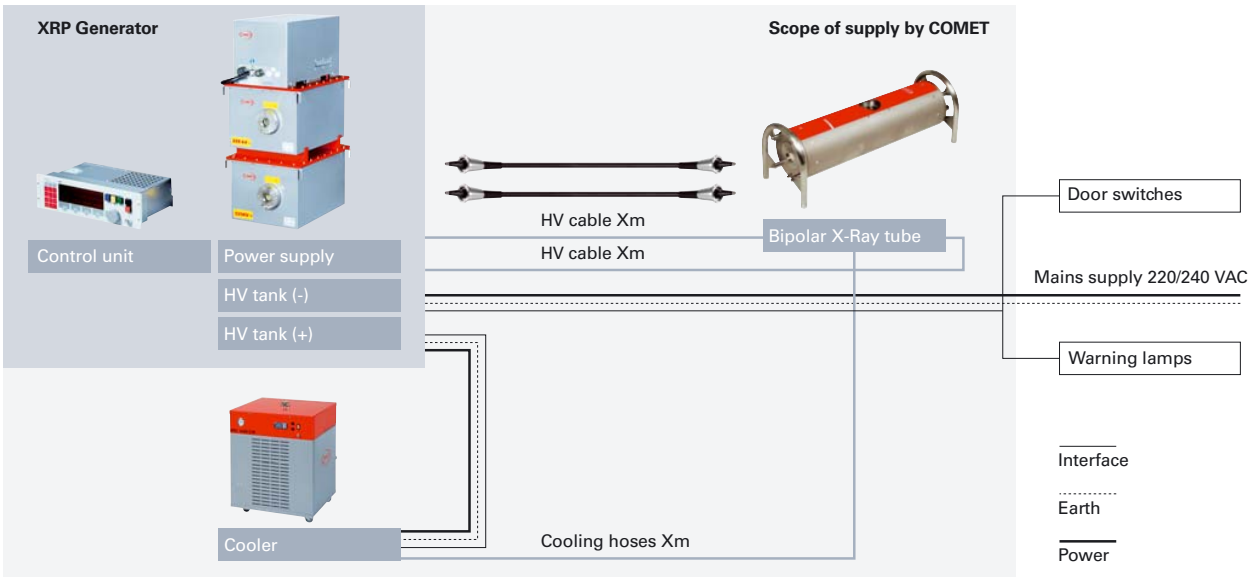
Overview of tubes and fitting module components; high voltage generator, high voltage cable and cooler.

Tube

Type	Ordering No.	Ordering No. with 90° housing	Nominal tube voltage	Continuous rating	Focal spot acc. EN 12543	Terminal type
MXR-160HP/11	915370.51	–	160 kV	800 W / 1800 W	d = 0.4 mm / d = 1.0 mm	R24
MXR-160HP/20	915357.51	–	160 kV	1000 W / 1000 W	d = 1.0 mm / d = 1.0 mm	R24
MXR-225HP/11	915371.51	–	225 kV	800 W / 1800 W	d = 0.4 mm / d = 1.0 mm	R24
MXR-320HP/11	915368.51	–	320 kV	800 W / 1800 W	d = 0.4 mm / d = 1.0 mm	R24
MXR-451HP/11	915369.51	–	450 kV	700 W / 1500 W	d = 0.4 mm / d = 1.0 mm	R28

Bipolar X-Ray Source

Diagram of a Bipolar X-Ray Source XRS and its environment.



Generator		High Voltage Cable	Cooler	
Type	**Ordering No.**	**Type/Xm**	**Type**	**Ordering No.**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-3000-WA	**10002534**
			XRC-3000-WW	**10004730**
XRP-160/4500/2	**10006465**	N3/160-R24-R24-Xm	XRC-1000-WA	**10002533**
XRP-225/4500/2	**10006466**	P3/250-R28-R24-Xm	XRC-3000-WA	**10002534**
			XRC-3000-WW	**10004730**
XRP-320/4500/2	**10006467**	N3/160-R24-R24-Xm	XRC-4500-OW	**10003535**
			XRC-4500-OA	**10002535**
XRP-450/4500/2	**10006468**	P3/250-R28-R28-Xm	XRC-4500-OW	**10003535**
			XRC-4500-OA	**10002535**

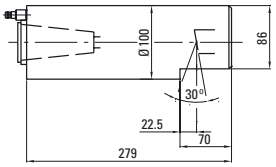
High Power Tubes

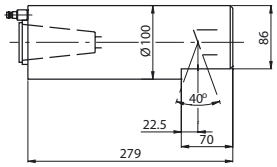
Technical Data

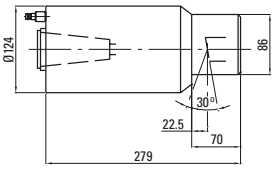


	MXR-160HP/11	MXR-160HP/20	MXR-225HP/11
Ordering No.	**915370.51**	**915357.51**	**915371.51**
Ordering No. with 90° housing	–	–	–
Nominal tube voltage	160 kV	160 kV	225 kV
Continuous rating	800 W / 1800 W	1000 W / 1000 W	800 W / 1800 W
Focal spot acc. EN 12543	d = 0.4 mm / d = 1.0 mm	d = 1.0 mm / d = 1.0 mm	d = 0.4 mm / d = 1.0 mm
Former focal spot designation	–	0.4 / 0.4	–
Filament current, max.	4.1 A / 4.1 A	4.1 A / 4.1 A	4.1 A / 4.1 A
Filament voltage, typical	2.9 V / 7.3 V	4.2 V / 4.2 V	2.9 V / 7.3 V
Inherent filtration	0.8 mm Be	0.8 mm Be	0.8 mm Be
Target material	W	W	W
Target angle	11°	20°	11°
Radiation coverage	40° x 30°	40°	40° x 30°
Leakage radiation, max.	2.5 mSv/h	2.5 mSv/h	5 mSv/h
Cooling medium	Water	Water	Water
Cooling medium flow, min	4 l/min	4 l/min	4 l/min
Anode temperature, max.	–	–	–
Temperature at inlet, max.	35° C	35° C	35° C
Weight	8 kg	8 kg	11 kg
Terminal type	R24	R24	R24
Mounting flange	10001756	10001756	10001756
Locking device	941002	941002	941002

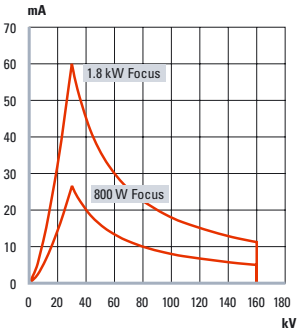
Outline drawing

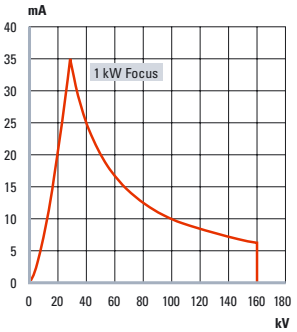


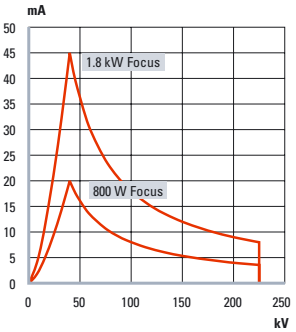




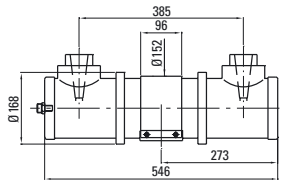
Tube diagram

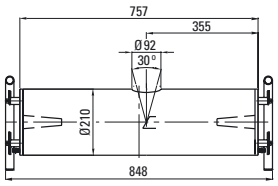


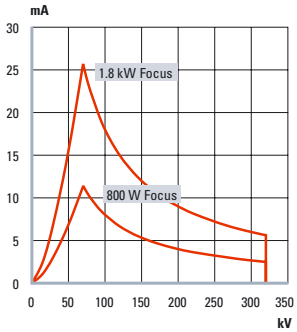


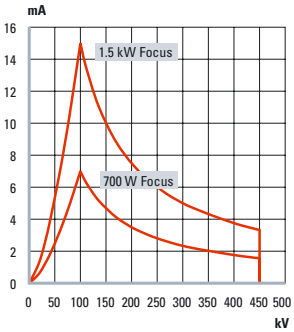


	MXR-320HP/11	MXR-451HP/11
	915368.51	**915369.51**
	–	–
	320 kV	450 kV
	800 W / 1800 W	700 W / 1500 W
	d = 0.4 mm / d = 1.0 mm	d = 0.4 mm / d = 1.0 mm
	–	–
	4.1 A / 4.6 A	4.1 A / 4.6 A
	2.3 V / 6.8 V	2.3 V / 6.8 V
	3 mm Be	5 mm Be
	W	W
	11°	11°
	40° x 30°	40° x 30°
	5 mSv/h	5 mSv/h
	Oil	Oil
	14 l/min	14 l/min
	–	–
	50° C	50° C
	40 kg	95 kg
	R24	R28
	10001711	10001710
	–	–









COMET is a successful international technology company in the growth markets of security, inspection, electronics and communication. As an expert in the field of applied physics, COMET provides a complete and highly flexible portfolio of components, modules, systems and services from a single source.

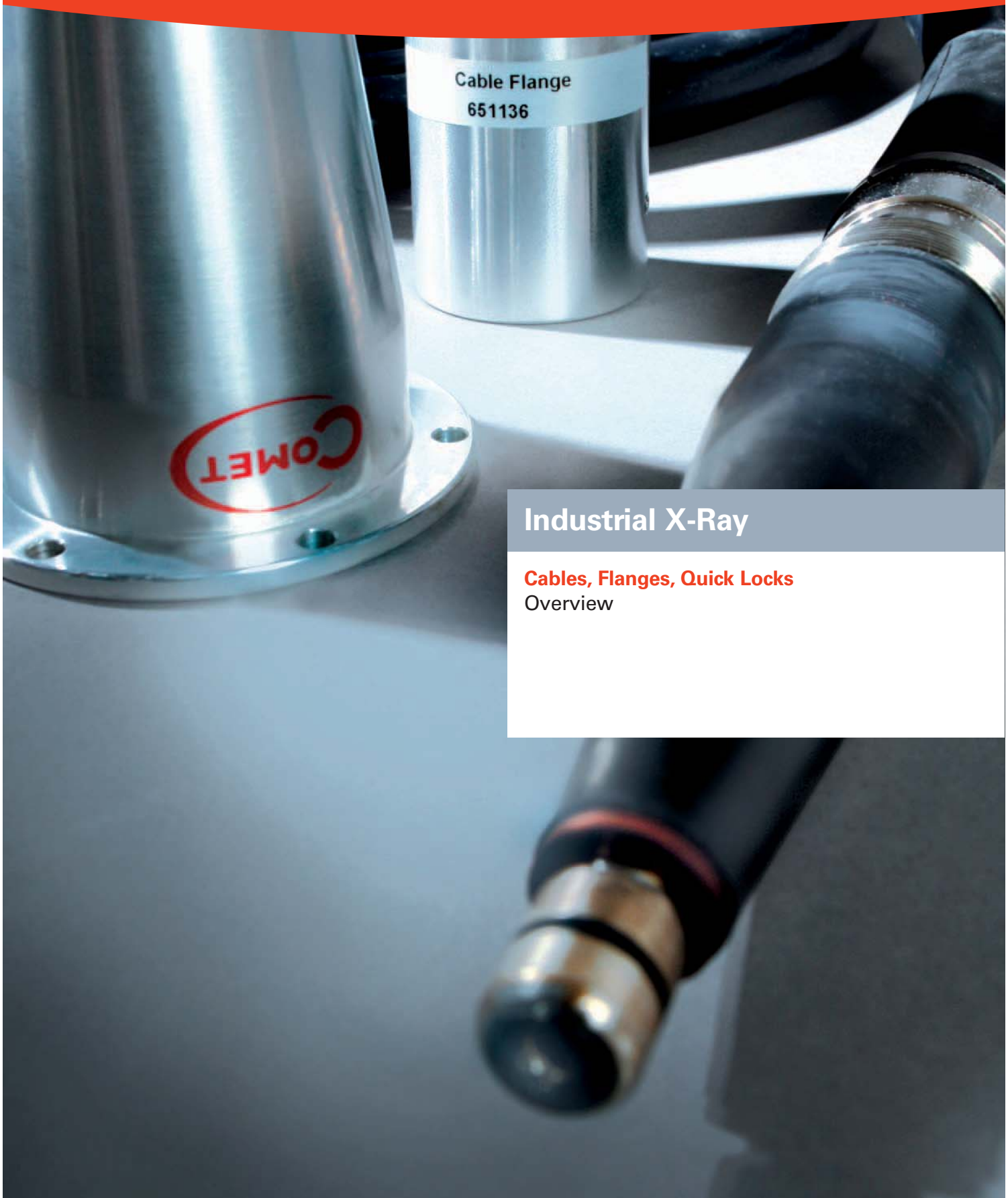
COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed.

COMET – The X-perts for security, inspection, electronics and communication

March 2007
Specifications subject to change without notice

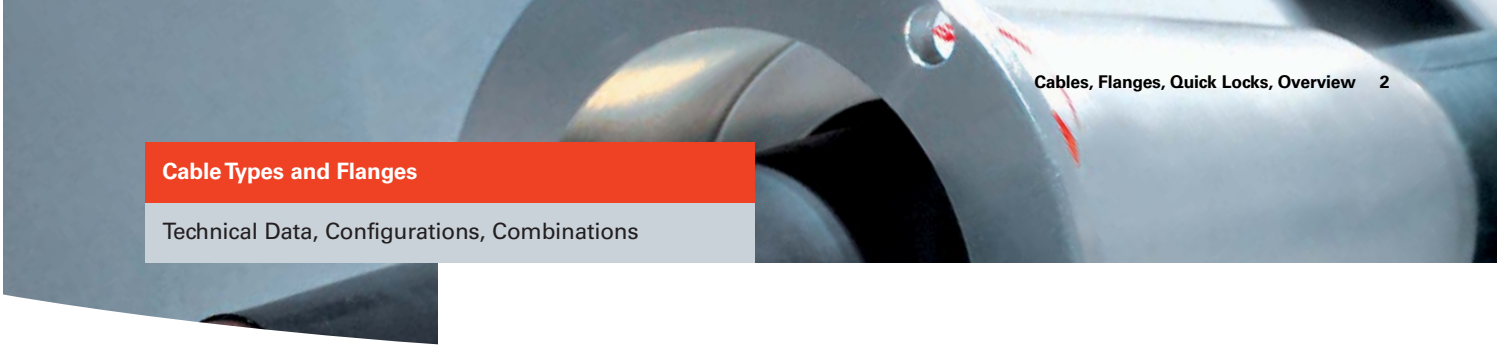
DETEK, Inc.
6805 Coolridge Drive
Temple Hills, MD 20748-6940
800-638-0554 **FAX 301-449-7011**
www.detek.com sales@detek.com

COMET



Industrial X-Ray

Cables, Flanges, Quick Locks
Overview



Cable Types and Flanges

Technical Data, Configurations, Combinations

Technical Data Cables

	U3/100	N3/160	P3/250
Rated voltage	100 kVDC	160 kVDC	250 kVDC
Nominal outside diameter	20mm	29mm	36mm
Coverage shielding braid	>95%	>95%	>80%
Conductor resistance Bare Conductor @ 20°C	6.6 mΩ/m	6.6 mΩ/m	6.6 mΩ/m
Conductor resistance Red & White Cond. @ 20°C	9.5 mΩ/m	11.4 mΩ/m	11.4 mΩ/m
Minimum bending radius (dynamic)	80 mm	120 mm	148 mm
Insulation resistance (wires to shield)	≥5x10^{12} Ω·m	≥1x10^{12} Ω·m	≥1x10^{12} Ω·m
Capacitance (wires to shield)	136 pF/m	126 pF/m	107 pF/m
Max. operating temperature	+70°C	+70°C	+70°C

Configurations with COMET Tubes

Cable	**MXR-101**	**CXR-10X**	**CXR-150**	**MXR-160**	**MXR-225**	**MXR-320**	**MXR-350**	**MXR-420**	**MXR-45X**	**Power Supply**	
U3/100	R10	R10									
N3/160			R24	R24		R24					
P3/250					R24		R24	R24	R28	R24	R30
Cable flange Ordering No.											
651142	■										
100001700		■									
100001710									■		
100001711			■			■	■	■			
100001756				■	■						
651136										■	
651138											■
Locking device Ordering No.											
941002				■	■						
940303			■			■	■	■			
651053			■	■	■	■	■	■			

Combinations

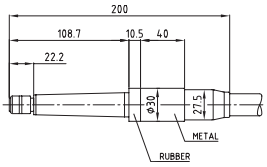
	R10	**R24**	**R24 RA**	**R28**	**R28 RA**	**R30**	**R30 RA**
U3/100 cable	100 kV	100 kV	100 kV	–	–	–	–
N3/160 cable	–	160 kV	160 kV	160 kV	160 kV	160 kV	160 kV
P3/250 cable	–	225 kV	225 kV	225 kV	225 kV	225 kV	225 kV

Within the high voltage system the part with the lowest specified high voltage rating defines the maximum allowed voltage.

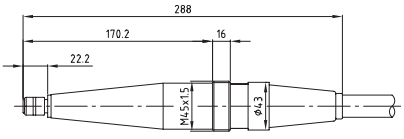
Special cables, terminals and flanges are available on request. Please contact us. xray@comet.ch

Plugs

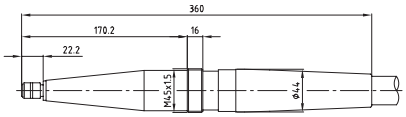
R10 with U3 cable



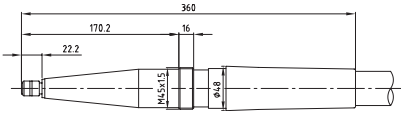
R24 with U3 cable



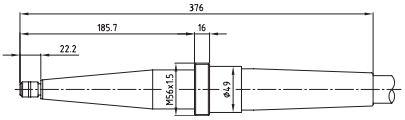
R24 with N3 cable



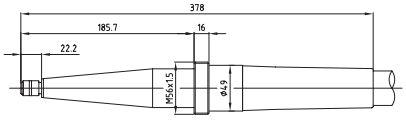
R24 with P3 cable



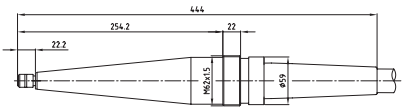
R28 with N3 cable



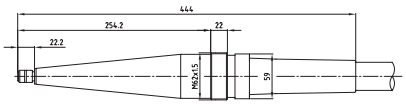
R28 with P3 cable



R30 with N3 cable



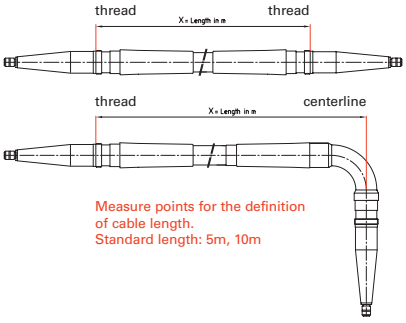
R30 with P3 cable



Ordering Example

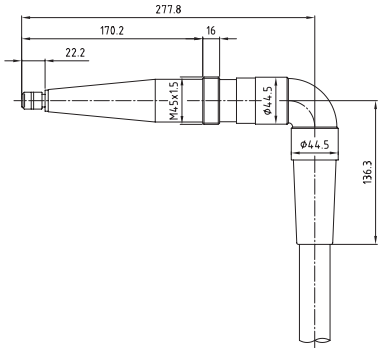
	cable	–	plug	–	plug	–	length
Cable	N3/160	–	R24	–	R24 RA	–	5m
Flange	10001756						

Example: 160 kV cable with straight and rectangular connector, length 5m with a flange for MXR-160.

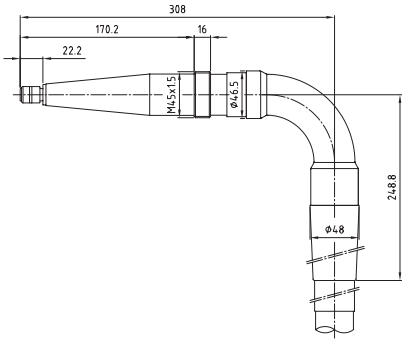


Measure points for the definition of cable length.
Standard length: 5m, 10m

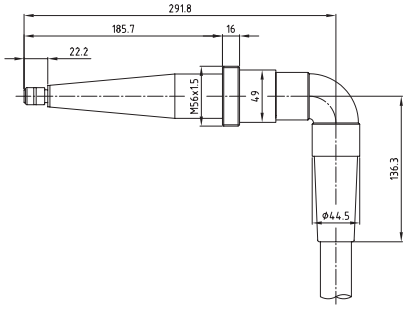
R24 RA with N3 cable



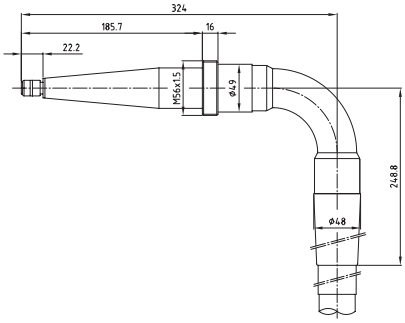
R24 RA with P3 cable



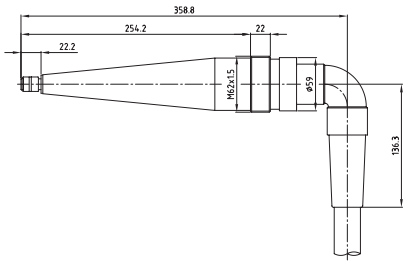
R28 RA with N3 cable



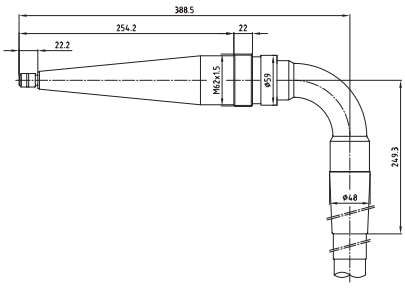
R28 RA with P3 cable

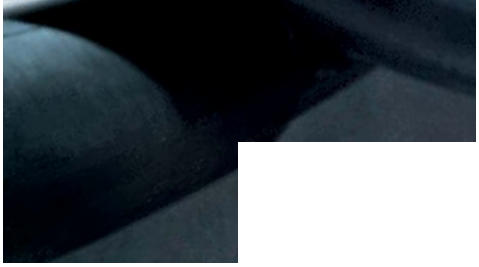


R30 RA with N3 cable



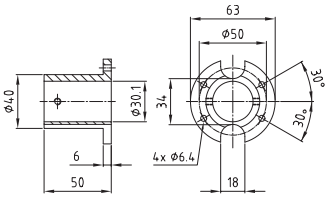
R30 RA with P3 cable



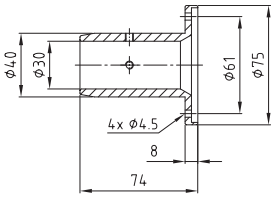


Flanges

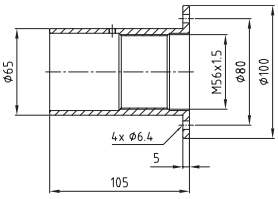
R10 cable flange 651142



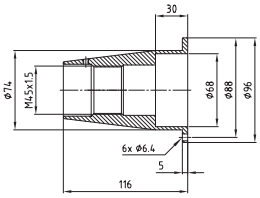
R10 cable flange 10001700



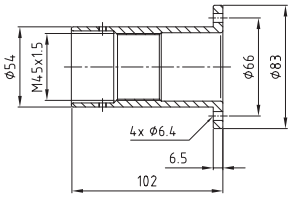
R28 cable flange 10001710



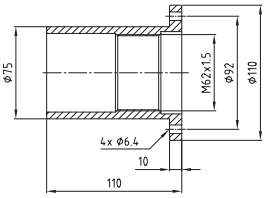
R24 cable flange 10001711



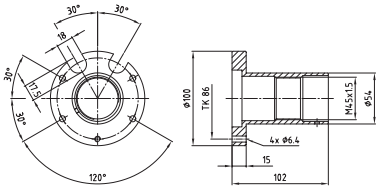
R24 cable flange 651136



R30 cable flange 651138

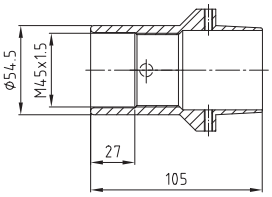


R24 cable flange 10001756

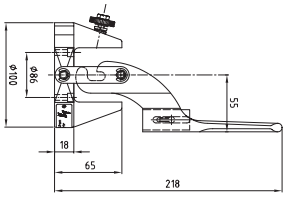


Locking Devices

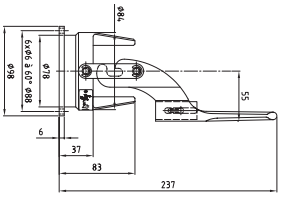
R24 clamping sleeve 651053



R24 locking device 941002



R24 locking device 940303



COMET is a successful technology company in the growth markets security, inspection and microelectronics. As an expert in the field of applied physics, COMET provides a complete and highly flexible offer of components, modules, systems and services from one source.

COMET Industrial X-Ray is an experienced supplier of components and modules for industrial X-Ray applications and is proud of its reputation as the preferred engineering partner in terms of innovation potential, know how, flexibility and speed.

The X-perts for security, inspection and microelectronics

August 2005

DETEK, Inc.

6805 Coolridge Drive
Temple Hills, MD 20748-6940

800-638-0554 **FAX 301-449-7011**

www.detek.com sales@detek.com