Industrial X-Ray

XRP Generators
Overview
**XRP Generators**

**COMET Industrial X-Ray generators and COMET Metal Ceramic X-Ray tubes are perfectly matched for high stable performance. The high frequency XRP Generator has been designed to meet the tough requirements of modern industrial X-Ray applications. The XRP Generator is the ideal workhorse for both radiographic and real-time applications. All generators are factory-configured and pre-tested.**

**COMET XRP Generators Offer**

- Voltages up to 450 kV
- Power up to 4.5 kW
- Unipolar and bipolar configurations
- Single or dual focal spot control

**XRP Generators Include the Following Components**

**Control unit**
- Microprocessor based controller for 19” rack mounting

**Power supply**
- Power supply for the high voltage section as well as the external cooler
- Integrated terminal blocks: controls for the safety circuits to the cooler, door switches, warning lamps and other remote devices

**High voltage tank(s)**
- Oil-insulated high voltage section

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**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, knowhow, flexibility and speed. Our product range features X-Ray tubes and modules with small focal spot resolution 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.

Specifications subject to change without notice
**Product Highlights**

**Ease of control**
- All COMET tubes are pre-programmed
- Constant current mode
- Constant power mode
- Language selection: English, German, French, Spanish
- Rotary-knob manual control of kV and mA
- Large LED display
- Serial interface
- Intelligent automatic tube warm up, optimized for COMET tubes
- Remote operation up to 100 m
- Easy installation with pre-manufactured interconnection cables
- RS232 C serial port for XRP controller

**Industry-proven construction, compact and service friendly**
- Outstanding reliability
- Rugged, oil-insulated, high voltage components
- Compact power supply for all module components including cooler, warning lamps and safety circuits
- Stackable components save floor space

**Highly stable, low-ripple kV level with**
- Precise and repeatable operation
- Very low high voltage ripple
- Very low temperature drift

**Safety provisions**
- Two separate, independently monitored safety-circuits (fail-safe, 24 V)
- Continuous system-function monitoring with fully automated system shut-down and failure indication
- Automated filament post-heating high voltage capacitor discharge upon termination
- “X-Ray on” warning lamp monitoring provided (fail-safe)
- External safety circuit for automated systems (24 V)
- High voltage primary circuit interruption for CDRH switch (US-standard)
- Monitored door lock feature
- External coolant monitoring

**Additional components**
- Optical interface kit

**Operational features**
- High HV reproducibility
- Exact HV and mA settings
- Discharge resistance allows high availability

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**XRP Generator Components – Bipolar**

- Power supply
- High voltage tank (-)
- High voltage tank (+)
- Control unit

**XRP Generator Components – Unipolar**

- Power supply
- High voltage tank
- Control unit
Unipolar X-Ray Source
Diagram of a Unipolar X-Ray Source XRS and its environment.

“One Stop Shop” for Industrial X-Ray: COMET’s XRS
COMET is pleased to offer all of the necessary components for a customized X-Ray module: The new XRS modules contain a COMET X-Ray tube, XRP Generator, HV-cables, cooler and interconnections designed for easy integration that will optimize system performance.

All XRS modules are factory pre-tested for hassle free installation and operation. This solution demonstrates COMET’s continuous commitment and investment in delivering real added value to our worldwide customer base.
**Bipolar X-Ray Source**

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

<table>
<thead>
<tr>
<th>Tube</th>
<th>Tube type example</th>
<th>Ordering No.</th>
<th>Focal spots (EN 12543 mm)</th>
<th>Terminal type</th>
<th>Ordering No. flange</th>
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<tbody>
<tr>
<td>MXR-101</td>
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<td>5.5</td>
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<tr>
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<th>Cool</th>
<th>Ordering No.</th>
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<tr>
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<td>Ordering No.</td>
<td>Cooler</td>
<td>Ordering No.</td>
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<td>XRC-3001-WA</td>
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<td>XRC-3001-WA</td>
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**Cooler**

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<th>Cyclotron</th>
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<th>Ordering No.</th>
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<tr>
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<td>XRC-4501-OW</td>
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</tbody>
</table>

**Tube type examples**

- **MXR-101**
- **MXR-160HP/11**
- **MXR-160/22**
- **MXR-225HP/11**
- **MXR-225/22**
- **MXR-320/26**
- **MXR-320HP/11**
- **MXR-451HP/11**
- **MXR-452**

**Focal spots**

- 5.5
- 0.4 / 1.0
- 1.0 / 5.5
- 0.4 / 1.0
- 1.0 / 5.5
- 3.0 / 5.5
- 0.4 / 1.0
- 0.4 / 1.0
- 2.5 / 5.5
- 0.4 / 1.0
## XRP Generators

### Technical Data

<table>
<thead>
<tr>
<th>Ordering No.</th>
<th>Voltage range</th>
<th>Adjustment increments (minimum step)</th>
<th>Accuracy</th>
<th>Reproducibility (at constant temperature)</th>
<th>High voltage ripple (with 10 m high voltage cable)</th>
<th>Temperature induced drift</th>
</tr>
</thead>
<tbody>
<tr>
<td>XRP100/2250/2</td>
<td>5 – 100 kV</td>
<td>0.1 kV/step</td>
<td>+/- 1% of output value +/- 0.1 kV</td>
<td>+/- 0.01% of maximum kV-value</td>
<td>5 V/mA, min. 20 V 80 ppm/°C based on output value</td>
<td>80 ppm/°C based on output value</td>
</tr>
<tr>
<td>XRP100/4500/2</td>
<td>5 – 100 kV</td>
<td>0.1 kV/step</td>
<td>+/- 1% of output value +/- 0.1 kV</td>
<td>+/- 0.01% of maximum kV-value</td>
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</table>

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<thead>
<tr>
<th>Current range</th>
<th>Adjustment standard range</th>
<th>High resolution range (recommended)</th>
<th>Accuracy (at constant temperature)</th>
<th>Reproducibility (at constant temperature)</th>
<th>Temperature induced drift</th>
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</thead>
<tbody>
<tr>
<td>XRP100/2250/2</td>
<td>0 – 22.5 mA</td>
<td>in 0.05 mA steps from 0.5 mA to maximum value</td>
<td>+/- 0.2% of output value +/- 0.01 mA</td>
<td>+/- 2 μA 50 ppm/°C of output value (on request 30 ppm/°C possible)</td>
<td>80 ppm/°C based on output value</td>
</tr>
<tr>
<td>XRP100/4500/2</td>
<td>0 – 45 mA</td>
<td>in 0.05 mA steps from 0.5 mA to maximum value</td>
<td>+/- 0.2% of output value +/- 0.01 mA</td>
<td>+/- 2 μA 50 ppm/°C of output value (on request 30 ppm/°C possible)</td>
<td>80 ppm/°C based on output value</td>
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<table>
<thead>
<tr>
<th>Maximum power</th>
<th>High voltage connector type</th>
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<td>XRP100/2250/2</td>
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<tr>
<td>XRP100/4500/2</td>
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<table>
<thead>
<tr>
<th>Control Unit</th>
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<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
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<tr>
<td>XRP100/2250/2</td>
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<tr>
<td>XRP100/4500/2</td>
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<table>
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<tr>
<th>Power Supply</th>
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<table>
<thead>
<tr>
<th>High Voltage Tank (Oil Insulated)</th>
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<td>Dimensions (W x H x D)</td>
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<tr>
<td>XRP100/2250/2</td>
</tr>
<tr>
<td>XRP100/4500/2</td>
</tr>
</tbody>
</table>
**XRP Generators, Overview**

**XRP160/2250/2**
- 10008863
- 7.5 – 160 kV
- 0.1 kV/step
- +/- 1% of output value +/- 0.1 kV
- +/- 0.01% of maximum kV-value
- 5 V/mA, min. 20 V
- 80 ppm/°C based on output value
- 0 – 22.5 mA
- in 0.05 mA steps from 0.5 mA to maximum value
- in 0.01 mA steps from 0.0 mA to maximum value
- +/- 0.2% of output value +/- 0.01 mA
- +/- 2 μA
- 50 ppm/°C of output value
  (on request 30 ppm/°C possible)

- 2250 W
- R24

**XRP160/4500/2**
- 10006465
- 7.5 – 160 kV
- 0.1 kV/step
- +/- 1% of output value +/- 0.1 kV
- +/- 0.01% of maximum kV-value
- 5 V/mA, min. 20 V
- 80 ppm/°C based on output value
- 0 – 45 mA
- in 0.05 mA steps from 0.5 mA to maximum value
- in 0.01 mA steps from 0.0 mA to maximum value
- +/- 0.2% of output value +/- 0.01 mA
- +/- 2 μA
- 50 ppm/°C of output value
  (on request 30 ppm/°C possible)

- 4500 W
- R24

**XRP225/2250/2**
- 10008864
- 10 – 225 kV
- 0.1 kV / step
- +/- 1% of output value +/- 0.1 kV
- +/- 0.01% of maximum kV-value
- 5 V/mA, min. 20 V
- 80 ppm/°C based on output value
- 0 – 15 mA
- in 0.05 mA steps from 0.5 mA to maximum value
- in 0.01 mA steps from 0.0 mA to maximum value
- +/- 0.2% of output value +/- 0.01 mA
- +/- 2 μA
- 50 ppm/°C of output value
  (on request 30 ppm/°C possible)

- 2250 W
- R28

**XRG**
- 483 mm x 133 mm x 300 mm
- 12.5 kg
  
**XRP-POWER-2250**
- 340 mm x 200 mm x 628 mm
- 26 kg

**XRP-POWER-4500**
- 340 mm x 350 mm x 628 mm
- 45 kg

**XRP-T160K**
- 375 mm x 335 mm x 625 mm
- 80 kg

**XRP-T225K**
- 514 mm x 364 mm x 624 mm
- 125 kg
### XRP225/4500/2

- **Model**: 10006466
- **Voltage Range**: 10 – 225 kV
- **Accuracy**: 0.1 kV/step
- **Output Accuracy**: ±1% of output value ±0.1 kV
- **Resolution**: 0.01% of maximum kV-value
- **Output**: 5 V/mA, min. 20 V
- **Temperature Coefficient**: 80 ppm/°C based on output value
- **Current Range**: 0 – 30 mA
  - 0.05 mA steps from 0.5 mA to maximum value
  - 0.01 mA steps from 0.0 mA to maximum value
  - ±0.2% of output value ±0.01 mA
  - ±2 μA
  - 50 ppm/°C of output value (on request 30 ppm/°C possible)
- **Power**: 4500 W
- **Dimensions**: 483 mm x 133 mm x 300 mm
- **Weight**: 12.5 kg

### XRP320/4500/2

- **Model**: 10006467
- **Voltage Range**: 15 – 320 kV
- **Accuracy**: 0.2 kV/step
- **Output Accuracy**: ±1% of output value ±0.2 kV
- **Resolution**: ±0.01% of maximum kV-value
- **Output**: 10 V/mA, min. 40 V
- **Temperature Coefficient**: 80 ppm/°C based on output value
- **Current Range**: 0 – 22.5 mA
  - 0.05 mA steps from 0.5 mA to maximum value
  - 0.01 mA steps from 0.0 mA to maximum value
  - ±0.2% of output value ±0.01 mA
  - ±2 μA
  - 50 ppm/°C of output value (on request 30 ppm/°C possible)
- **Power**: 4500 W
- **Dimensions**: 483 mm x 133 mm x 300 mm
- **Weight**: 12.5 kg

### XRP450/4500/2

- **Model**: 10006468
- **Voltage Range**: 20 – 450 kV
- **Accuracy**: 0.2 kV/step
- **Output Accuracy**: ±1% of output value ±0.2 kV
- **Resolution**: ±0.01% of maximum kV-value
- **Output**: 10 V/mA, min. 40 V
- **Temperature Coefficient**: 80 ppm/°C based on output value
- **Current Range**: 0 – 15 mA
  - 0.05 mA steps from 0.5 mA to maximum value
  - 0.01 mA steps from 0.0 mA to maximum value
  - ±0.2% of output value ±0.01 mA
  - ±2 μA
  - 50 ppm/°C of output value (on request 30 ppm/°C possible)
- **Power**: 4500 W
- **Dimensions**: 483 mm x 133 mm x 300 mm
- **Weight**: 12.5 kg
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.

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