

MEMORIAL DESCRITIVO

TUBO DE RAIOS X COMET MXR-451HP/11

LICENÇA DE IMPORTAÇÃO

1. Identificação do Bem

- **Descrição do bem:** Tubo de Raios X Industrial
- **Nome comercial:** MXR-451HP/11
- **Fabricante:** Comet AG
- **País de origem:** Suíça
- **Modelo/Referência:** MXR-451HP/11
- **Quantidade:** 01 Unidade
- **NCM:** 9022.30.00

2. Função do Bem

O MXR-451HP/11 é um tubo de raios X industrial utilizado em equipamentos de inspeção por radiografia para ensaios não destrutivos (END). Sua função é gerar radiação X de alta energia para inspeção interna de componentes metálicos e soldas, permitindo a identificação de defeitos, descontinuidades e imperfeições sem causar danos à peça inspecionada.

O equipamento é destinado à integração em sistemas industriais de inspeção radiográfica e possui proteção radiológica incorporada.

3. Características Técnicas

- **Tipo:** Tubo de Raios X bipolar refrigerado a óleo.
- **Aplicação:** Equipamentos industriais para ensaios não destrutivos (Radiografia Industrial).
- **Tensão nominal do tubo:** 450 kV.
- **Potência contínua:** 700 W / 1.500 W.
- **Potência máxima cíclica:** 700 W / 1.500 W.
- **Pontos focais:** 0,4 mm e 1,0 mm.
- **Material do alvo (ânodo):** Tungstênio (W).
- **Ângulo do alvo:** 11°.
- **Cobertura do feixe de radiação:** 40° × 30°.

- **Filtração inerente:** 3,0 mm + 2,0 mm de berílio (Be).
- **Peso aproximado:** 105 kg.
- **Tipo de terminal de alta tensão:** R28.
- **Meio de refrigeração:** Óleo isolante.
- **Vazão mínima do óleo de refrigeração:** 14 L/min.
- **Temperatura máxima do óleo na entrada:** 50 °C.
- **Pressão máxima do circuito de refrigeração:** 10 bar.
- **Tempo mínimo de pós-refrigeração após desligamento:** 2 minutos.

4. Matéria-Prima

O equipamento é fabricado predominantemente com os seguintes materiais:

- Carcaça metálica de alta resistência;
- Ânodo em tungstênio (W);
- Componentes internos metálicos de precisão;
- Isoladores cerâmicos para alta tensão;
- Blindagem radiológica integrada;
- Óleo dielétrico utilizado para isolamento elétrico e refrigeração.

5. Fotos

Conforme catálogo técnico do fabricante (anexo).



X-Ray Tubes

MXR-451HP/11

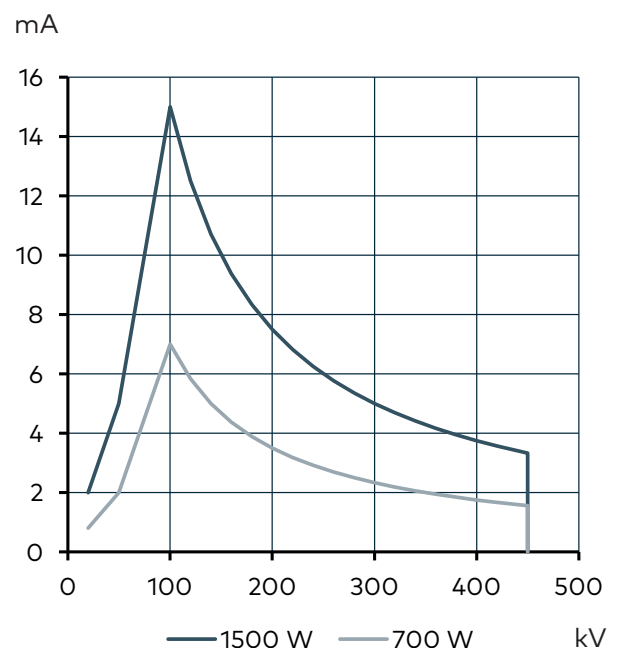


Product Description

The MXR-451HP/11 is a bipolar oil-cooled X-ray tube assembly with integrated radiation protection. It comprises a dual focal spot, a high power tungsten anode and a directional beam. The tube is specifically designed for non-destructive imaging applications.

Power rating chart

Power rating at a given filament current



Product Specifications

Nominal tube voltage	450 kV
Continuous rating (non-cyclic)	700 W 1500 W
Maximum cyclic rating*	700 W 1500 W
Focal spot acc. EN 12543	d = 0.4 mm** d = 1.0 mm
Filament current, max	4.1 A 4.2 A
Filament voltage, typical	2.3 V 6.2 V
Inherent filtration	3.0 mm + 2.0 mm Be
Target material	W
Target angle	11°
Radiation coverage	40° x 30°
Leakage radiation, max. ar loading factors in 1 m distance PTB Type Approval	5 mSv/h
Weight	105 kg
Terminal type	R28
Gapping spring-loaded HV-cable	2 rings visible (~ 7 mm)
Gapping non-spring-loaded HV-cable	5.5 - 6 mm
Grease quantity for HV-cable terminal	1.4 ml
Product No.	915369.51

Cooling

Cooling medium	Oil
Cooling medium flow, min.	14 l/min
Cooling medium temp. at inlet, max.	50° C
Pressure at cooling medium inlet, max.	10 bar
Level of dielectric strength of insulating oil	≥ 50kV/mm acc. DIN EN 60156
Insulating-/Cooling Oil used and recommended by Comet	Shell Diala S4 ZX-I
Post-cooling time after switchoff, min.	2 min

* Definition of cyclic rating: More than 15 ON/OFF cycles per day or more than 3000 cycles per year. Cycles include both ON/OFF and changes in set-points (kV and mA).

** Deviation from EN 12543-2: evaluation of the focal spot based on 25% threshold.

General Information

General

The control of high-voltage, tube current and filament current as well as the design of the cooling system and the radiation protection are within the responsibility of the integrator. Settings in the generator must assure that the X-ray tube will be protected against overcurrent, overvoltage and lack of cooling. Otherwise the tube and/or the radiation protection may be damaged and become a hazard. For detailed instructions always refer to the "X-Ray Tube Manual."

Radiation protection

When installing an X-ray tube assembly into an X-ray equipment and/or operating an X-ray equipment, the responsibility for radiation protection is with the integrator. Compliance with local regulatory requirements and limit values must be assured. After each tube exchange, repair, modification or upgrade of the unit, radiation protection integrity should be performed. Any modification of a Comet product will result in the warranty being invalidated.

Connection of the X-ray tube

High-voltage cables must be installed by trained personnel only. Please proceed with the installation as follows: Cleaning, greasing and gapping. Respect the cleanliness, the correct amount of grease and the correct pressure of the plug inside the high-voltage receptacle.

Cooling

The integrator is in charge that the cooling circuit is properly connected to the cooling system. Prior to operating the tube, the cooler must be turned on. Make sure that the coolant flow meets the required cooling conditions and is monitored. If any of the cooling conditions is not met, the high-voltage has to be switched off immediately. When the tube is switched off intentionally, the coolant flow must continue for at least two minutes in order to protect the anode and the lead protection from overheating.