






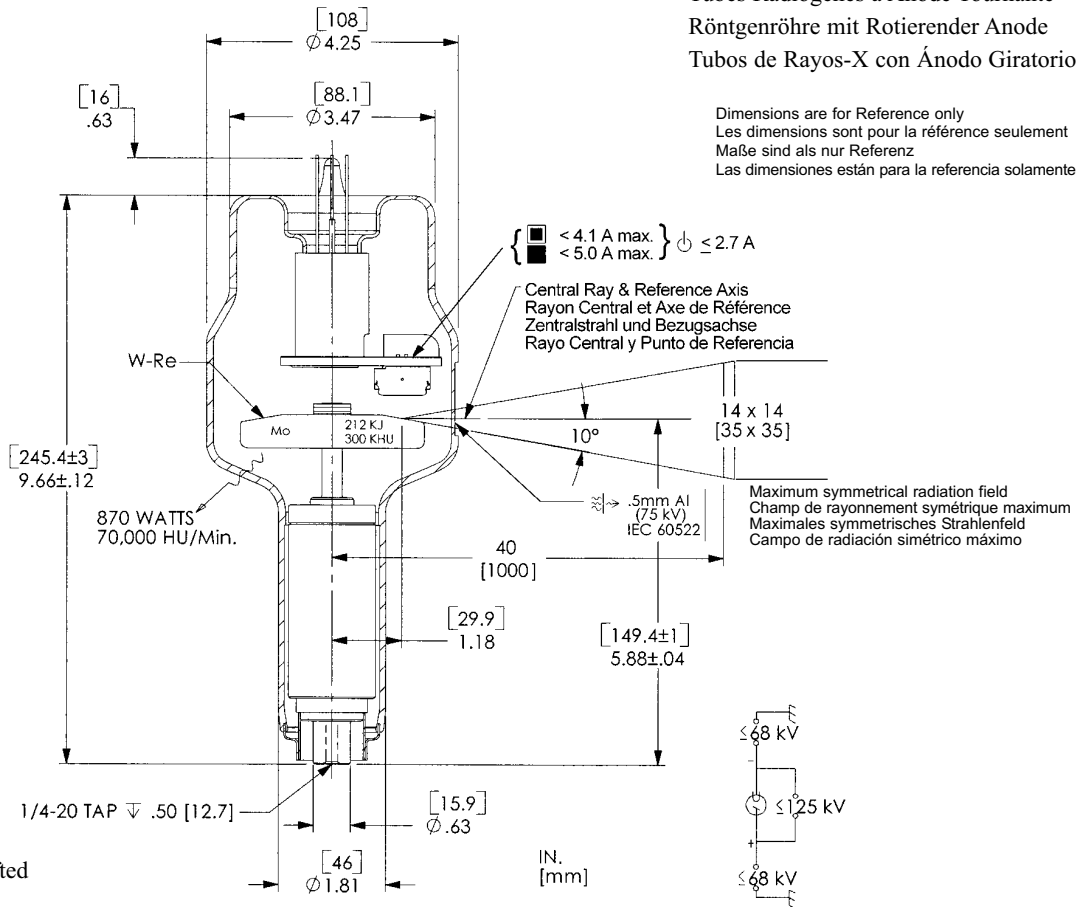


-  Common - Red  
Neutre - Rouge  
Neutral - Rot  
Común - Rojo
-  Large - Black  
Grand - Noir  
Gross - Schwarz  
Largo - Negro
-  Small - White  
Petit - Blanc  
Klein - Weiss  
Pequeño - Blanco
-  Stand - By  
Attente  
Bereitschaft  
En Espera
-  Frame or Chasis  
Masse  
Chassis  
Soporte o Chasis
-  X-Ray Tube  
Tube Radiogène  
Röntgenröhre  
Tubo de Rayos X
-  Radiation Filter or Filtration  
Filtre de rayonnement  
Filterung  
Filtración de Radiación



Note: Document originally drafted in the English language.

<b>Product Description</b>	<b>Description du Produit</b>	<b>Produktbeschreibung</b>	<b>Descripcion del Producto</b>
<p>The RAD-99 is a 125 kV, 212kJ (300 KHU) rotating anode insert specifically designed for mobile surgical C-Arm and electro-physiological applications. The insert features a 10°, 3" (80 mm), tungsten-rhenium molybdenum target and is available in the following focal spot combinations:</p> <p style="text-align: center;">0.3 - 0.6 IEC 60336</p> <p><b>Nominal Anode Input Power</b> Small - 8.3 kW IEC 60613 Large - 22.5 kW IEC 60613 For the equivalent anode power of 80 Watts</p>	<p>Le RAD-99 est un tube à anode tournante de 125 kV, 212 kJ (300 kUC) spécialement conçu pour les applications chirurgicales mobiles munies d'un support en forme de C et les applications électro-physiologistes. Il contient une anode composite en tungstène-rhénium et molybdène de 10° et de 80 mm, et est disponible dans les combinaisons focales suivantes:</p> <p style="text-align: center;">0.3 - 0.6 CEI 60336</p> <p><b>Puissance anodique nominale</b> Petit foyer - 8,3 kW CEI 60613 Grand foyer - 22,5 CEI 60613 Pour la puissance anodique de équilibre thermique de 80 Watts</p>	<p>Die RAD-99 ist eine Röntgenröhre mit rotierender Anode von 125 kV und 212 kJ (300 kWE). Sie ist besonders geeignet für mobile chirurgische C-Arm elektro-physiologische Anwendungen. Die Röntgenröhre ist charakterisiert durch eine 10°-ige, 3" (80 mm) Anode, zusammen-gesetzt aus Wolfram, Rhenium und Molybdän. Folgende Brennfleck sind möglich:</p> <p style="text-align: center;">0.3 - 0.6 IEC 60336</p> <p><b>Nominale Anodenbezugsleistung</b> Klein - 8,3 kW IEC 60613 Gross - 22,5 IEC 60613 Gilt bei einer Aquivalent - Anodenleistung von 80 Watts</p>	<p>El RAD-99 es un tubo de ánodo giratorio de 125 kV y 212 kJ (300 kUC), diseñado específicamente para uso en brazos móviles de cirugía (Brazos C) y en aplicaciones electrofisiológicas. El tubo presenta un objetivo compuesto de tungsteno - renio y molibdeno, fijado a un ángulo de 10° y 80 mm (3"). Es disponible en las siguientes combinaciones focales:</p> <p style="text-align: center;">0.3 - 0.6 IEC 60336</p> <p><b>Potencia nominal de entrada del ánodo</b> Foco Fine - 8.3 kW IEC 60613 Foco grueso - 22.5 kW IEC 60613 Para una potencia equivalente del ánodo de 80 Watts</p>

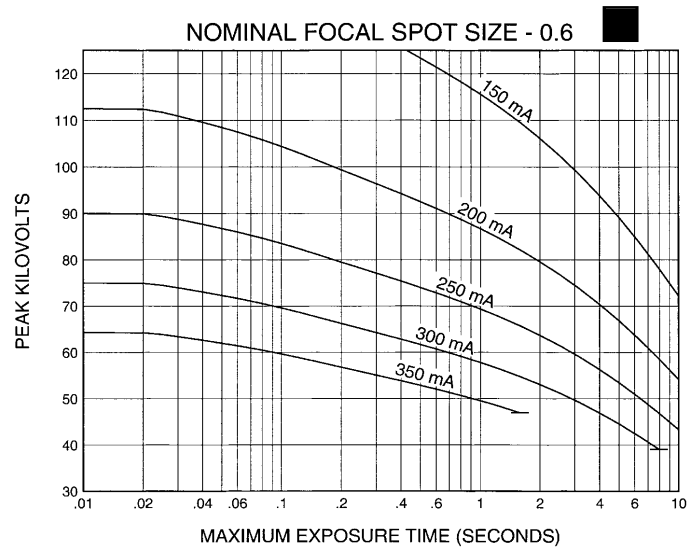
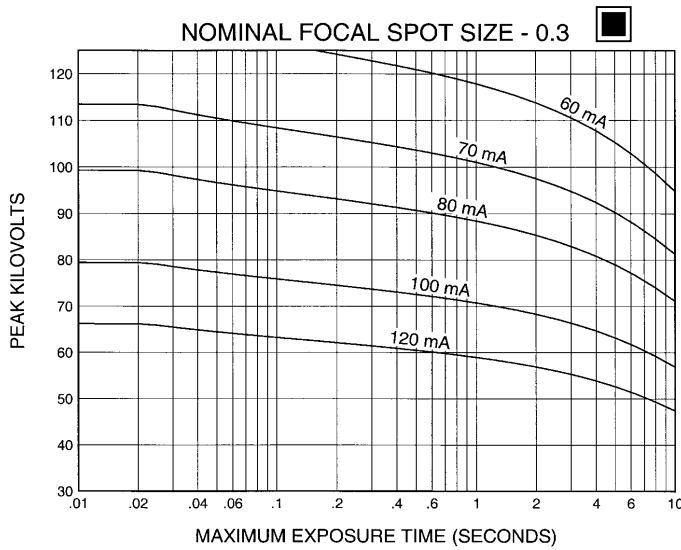
Manufactured by Varian Medical Systems  
Fabrique par Varian Medical Systems  
Hergestellt von Varian Medical Systems  
Fabricado por Varian Medical Systems

Specifications subject to change without notice.  
Spécifications susceptibles d'être modifiées sans préavis.  
Technische Daten ohne Gewähr.  
Especificaciones sujetas a cambio sin previo aviso.

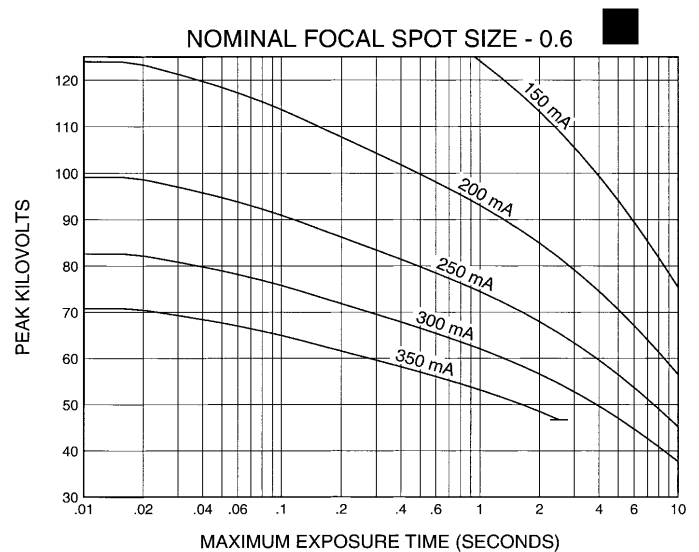
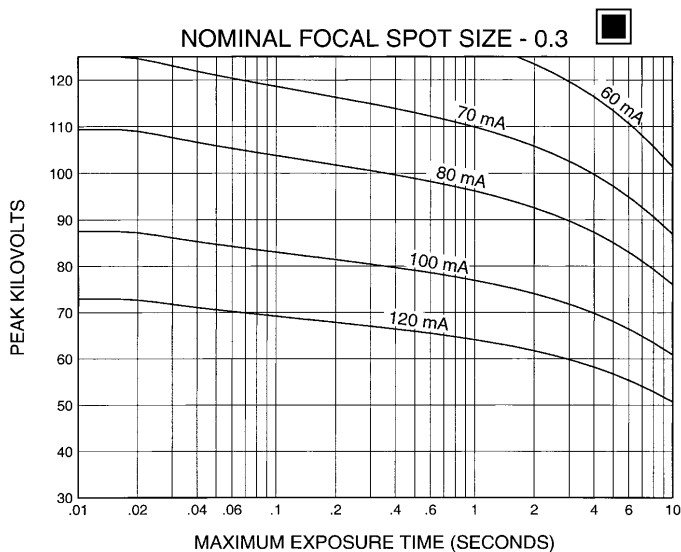
**3 Ø Constant Potential**

Abaques d'expositions Radiographiques CEI 60613  
Röntgenolische Belastungskurven IEC 60613  
Diagramas de Exposición Radiográfica IEC 60613

**50 HZ - 2,850 RPM**



**60 HZ - 3,450 RPM**



For 1Ø and other applications, please consult the manufacturer.

Pour 1Ø et autre applications, prière de consulter le Fabricant.

Für 1Ø und andere Anwendungen, konsultieren mit dem Fabrikant, bitte.

Para 1Ø y otras aplicaciones, por favor consulte a la Compañía.

Nominal anode input power for the anode heat content 40%. IEC 60613

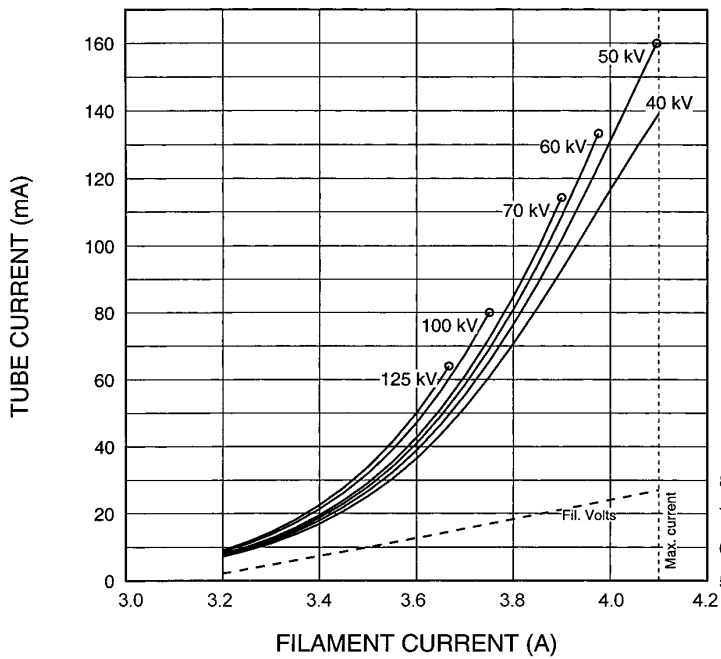
Puissance calorifique nominale de l'anode: 40%, CEI 60613


Thermische Anodenbezugsleistung bei einer Wärmespeicherung von 40%. IEC 60613

Aproximadamente el poder de penetración para obtener un almacenaje de calor del anodo de 40%. IEC 60613

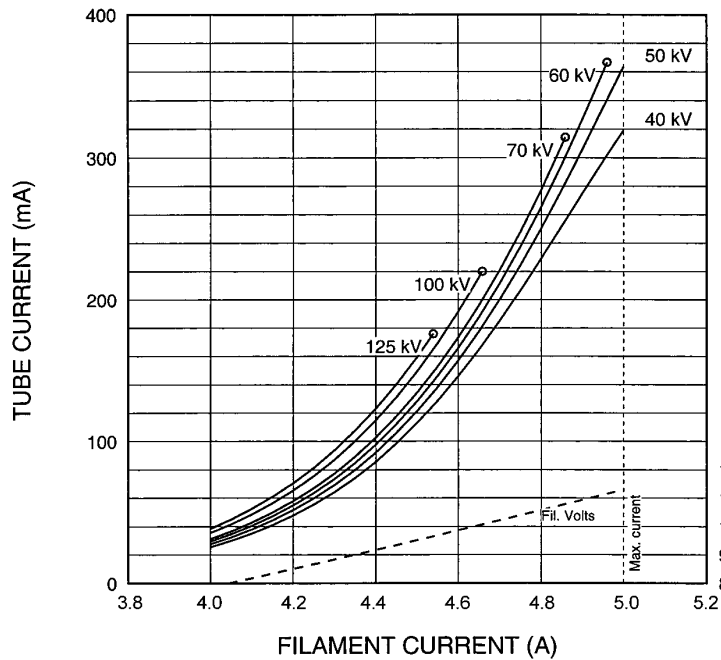
**3 Ø Constant Potential** 


Abaques d'Émissions des Filaments CEI 60613  
Glühfadenemissionsdiagramm IEC 60613  
Curvas de Emisión de los Filamentos IEC 60613



THREE PHASE EMISSION ( $\pm .15$  A)  
RAD-99 0.3 

FILAMENT VOLTAGE (V)



THREE PHASE EMISSION ( $\pm .15$  A)  
RAD-99 0.6 

FILAMENT VOLTAGE (V)

Note:	When using these emission curves for trial exposures, refer to the power rating curves shown for maximum kV, tube emission, filament current, exposure time, and target speed.
Remarque:	Lors de l'utilisation de ces abaques pour des expositions d'essai, référez-vous aux courbes maximales de kV, d'émission du filament, de temps d'exposition et de vitesse de rotation.
Anmerkung:	Wenn Sie diese Emissionskurven für Testaufnahmen verwenden, beziehen Sie sich hierbei auf die entsprechenden Nennleistungskurven für max. kV-Werte, Röhrenemission, Heizstrom, und Anodendrehzahl.
Nota:	Si utiliza estas curvas de emisión para exposiciones de prueba, refiérase a las curvas de gradación de potencia para el máximo de kV, tubo de emisión, corriente en los filamentos, tiempo de exposición, y a las curvas de velocidad del objetivo.

## CINERADIOGRAPHIC RATINGS

### HOW TO USE CINERADIOGRAPHIC CHARTS

**General:** With the Cineradiographic rating chart we can determine the maximum allowable kW of the Cine pulse, or with a given kW determine maximum time in seconds the Cine run can progress.

The Most common way of using the charts is to determine maximum time of any expected Cine run and maximum duty factor. With a known duty factor and Cine run time the kW can easily be determined.

#### Definition of Terms

**Time in seconds:** Total time of one Cine run, usually 5 to 12 seconds.

**Duty Factor in Percent (DF%):** Actual time during one second the x-ray tube is producing x-rays. If we select a 5 msec pulse width and 60 exposures per second the x-ray tube will be producing x-rays for a total of 300 msec each second or 30% of the time. The higher the DF number, the more load placed on the x-ray tube.

**Peak Pulse Power:** Peak energy in watts of any one Cine Pulse. Can be any combination of kV and mA allowed by Radiographic and Filament Emission curves.

Example: 80 kV at 400 mA equals

$$80,000 \text{ V} \times 0.4 \text{ A} = 32,000 \text{ W or } 32 \text{ kW}$$

#### USING THE CINE RATING CHARTS:

RAD-99 60 Hz 3 Phase 0.6 Focal Spot

**Example:** Determine maximum kW allowed with the following known factors:

Maximum Pulse Width ..... 5 msec

Exposures per Second ..... 60

Maximum Cine Run Time ... 10 seconds

**Calculate Duty Factor: (DF%)**

$$\text{DF\%} = \frac{\text{Pulse Width (msec)} \times \text{Frames per Second}}{10}$$

$$\text{DF\%} = \frac{5 \text{ msec} \times 60 \text{ exp/sec}}{10} = \frac{300}{10} = 30\%$$

Refer to Rating Chart RAD-99 60 Hz 3 Phase 0.6 Focal Spot:

At bottom of chart find 10 second line. Move vertically to intersection with 30% DF curve. Make a horizontal reference to left side of rating chart and note kW rating of 14.5 kW.

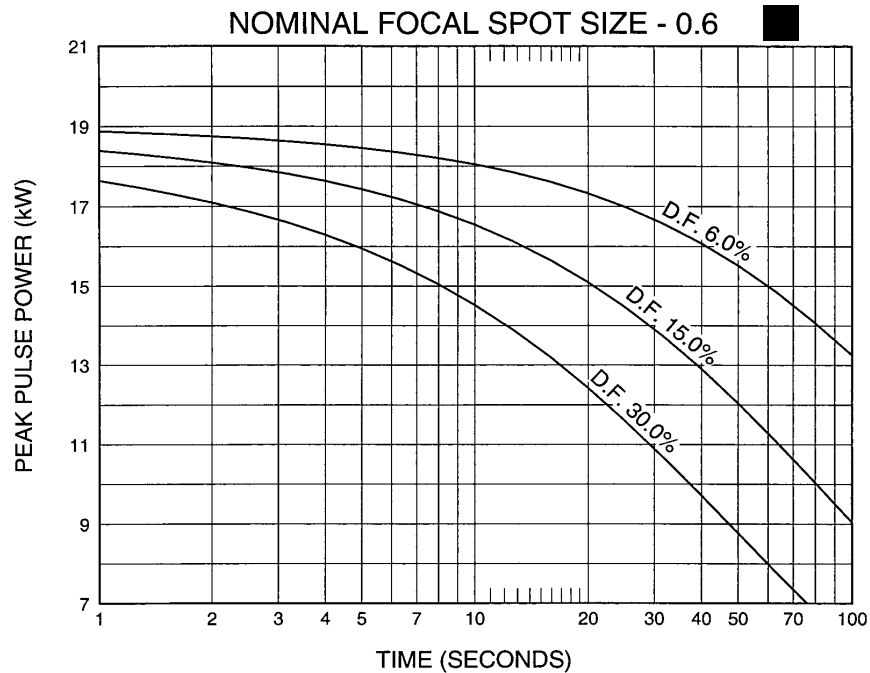
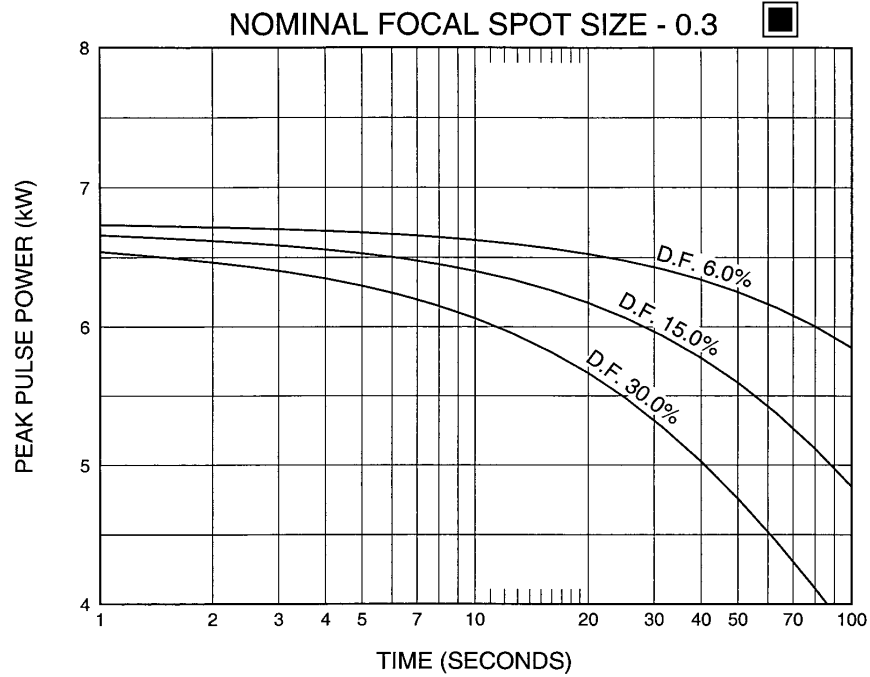
kW = kV x mA. The kW of the exposure can be any combination of mA and kV allowed by the Radiographic and Filament Emission Charts.

The Cine rating charts are usable to 100% anode heat storage. Exceeding 100% anode heat storage will cause anode track erosion with high risk of tube destruction.

# 3 Ø Constant Potential

Abaques de Cinèradiographie CEI 60613  
Belastungskurven für den Kinobetrieb IEC 60613  
Diagramas de Exposición Cineradiográfica IEC 60613

## 50/60 Hz



Nominal anode input power for the anode heat content 70%. IEC 60613

Puissance calorifique nominale de l'anode: 70%, CEI 60613

Thermische Anodenbezugsleistung bei einer Wärmespeicherung von 70%. IEC 60613

Aproximadamente el poder de penetracion para obtener un almacenaje de calor del anodo de 70%. IEC 60613

Abaques d'Échauffement et de Refroidissement de L'Anode  
Anodenerhitzungs und Kühlungsdiagramm  
Curvas de Calentamiento y Enfriamiento del Anodo

