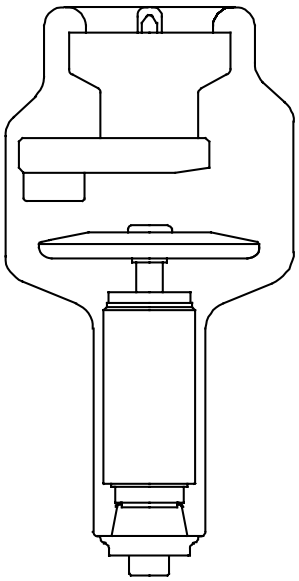
# Documentazione Tubo a raggi X
# Tube Documentation
# Documentation du Tube

# RTM 782 H 0.6/1.2



Nr. di matricola
Tube No.
Nr de série

Questa documentazione deve essere fornita all'utilizzatore del complesso tubo-guaina
The contents of this documentation must be transmitted to the user of the tube-assembly
Le contenu de cette documentation doit être transmis à l'utilisateur de la gaine équipée

| Documentazione N°<br>Documentation N°<br>N° de Documentation | Revisione<br>Edition<br>Version | Data di edizione<br>Date of release<br>Date de l'édition | Testo originale<br>Original text<br>Texte original |
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### Dichiarazione di conformità

Questo prodotto soddisfa i requisiti essenziali della direttiva 93/42/CEE in accordo alle norme IEC 60613, IEC 60336, IEC 60522, IEC 60601-1, IEC 60601-1-3, IEC 60601-2-28.

### Declaration of conformity

This tube fulfils the essential requirements of the directive 93/42/EEC according to standard IEC 60613, IEC 60336, IEC 60522, IEC 60601-1, IEC 60601-1-3, IEC 60601-2-28.

### Confirmation de conformité

Ce tube remplit les exigences essentielles de la directive 93/42/CEE en accord avec les normes IEC 60613, IEC 60336, IEC 60522, IEC 60601-1, IEC 60601-1-3, IEC 60601-2-28.

## Caratteristiche - Specifications - Spécifications

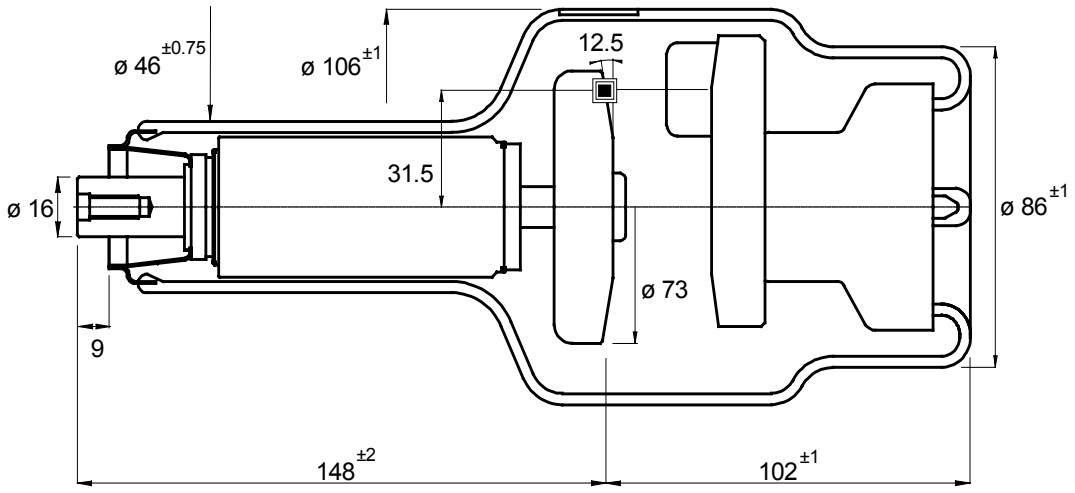
| | | |
|---|---|---|
| Macchie focali<br>Focal spot<br>Foyer | ▣ 0.6<br>■ 1.2 | IEC 60336 |
| Velocità di rotazione dell'anodo<br>Anode speed<br>Vitesse de l'anode | 50 / 60 Hz<br>2450 / 2850 $min^{-1}$ | |
| Potenza anodica nominale<br>Nominal anode input power<br>Puissance anodique nominale | ▣ 20 kW<br>■ 50 kW | IEC 60613 (1989) |
| Potenza anodica nominale in radiografia<br>Nominal radiographic anode input power<br>Puissance anodique radiographique nominale | ▣ 21 kW<br>■ 51 kW | IEC 60613 (2010) |
| Diametro anodico<br>Anode diameter<br>Diamètre de l'anode | 73 mm | |
| Materiale anodico<br>Anode material<br>Matériau de l'anode | RT-TZM * | |
| * RT = Tungsteno + Renio (5-10%) , TZM = Molibdeno + Titanio (0.40-0.55 %) + Zirconio (0.06-0.12 %)<br>RT = Tungsten + Rhenium (5-10%) , TZM = Molibdenum + Titanium (0.40-0.55 %) + Zirconium (0.06-0.12 %)<br>RT = Tungstène + Rhénium (5-10%) , TZM = Molybdène + Titane (0.40-0.55 %) + Zirconium (0.06-0.12 %) | | |
| Angolo anodico<br>Anode angle<br>Pente de l'anode | 12.5 ° | |
| Campo di radiazione<br>Radiation field<br>Champ de rayonnement | a 70 cm 30 cm<br>a 100 cm 43 cm | |
| Filtrazione permanente<br>Permanent filtration<br>Filtration permanent | 0.7 mm Al / 75 kV | IEC 60522 |
| Capacità termica anodica<br>Maximum anode heat content<br>Chaleur maximale accumulée dans l'anode | 225 kJ 300 kHU | IEC 60613 (1989) |
| Dissipazione termica continua<br>Continuous heat dissipation<br>Dissipation thermique continue | 750 W 60 000 HU/min | |
| Dissipazione termica massima<br>Maximum heat dissipation<br>Dissipation thermique maximale | 1300 W 104 000 HU/min | |
| Alta tensione nominale<br>Nominal X-ray tube voltage<br>Haute tension nominale | 150 kV | IEC 60613 (2010) |
| Massima corrente di filamento<br>Max. filament current<br>Courant dans le filament max. | 5.4 A | |

I dati forniti nella presente documentazione si intendono riferiti a:
The data indicated in this documentation refer to:
Les données indiquées dans cette documentation sont calculés pour:

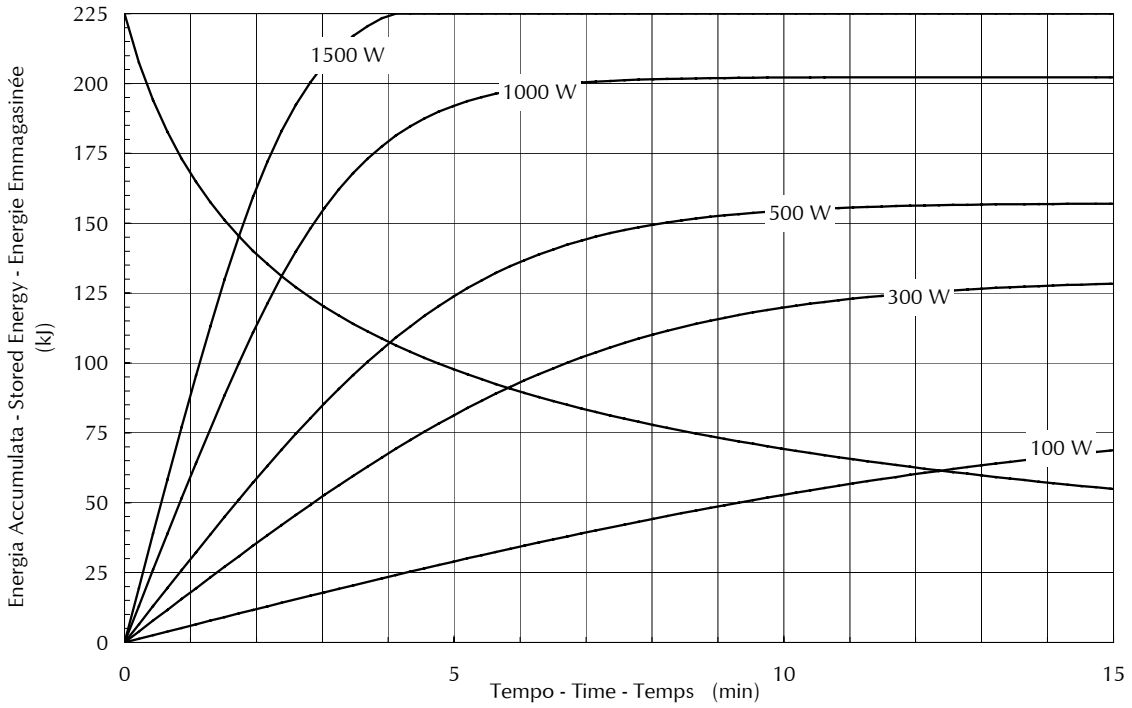
| | | | | |
|---|---|---|---|---|
| Potenza anodica di equilibrio termico<br>Equivalent anode input power<br>Puissance anodique d'équilibre thermique | 100 W | = | % della capacità termica anodica<br>% of maximum anode heat content<br>% de chaleur max. accumulée dans l'anode | 38% |

| | trasporto e stoccaggio<br>transportation and storage<br>transport et stockage | funzionamento<br>operation<br>opération | |
|---|---|---|---|
| Limiti di temperatura<br>Temperature limits<br>Limites de température | -10°C ÷ +80°C | +10°C ÷ +40°C | |
| Limiti di umidità<br>Humidity limits<br>Limites d'humidité | max. 80% | max. 75% | |
| Limiti di pressione<br>Pressure limits<br>Limites de pression | 500 ÷ 1060 hPa | 700 ÷ 1060 hPa | |

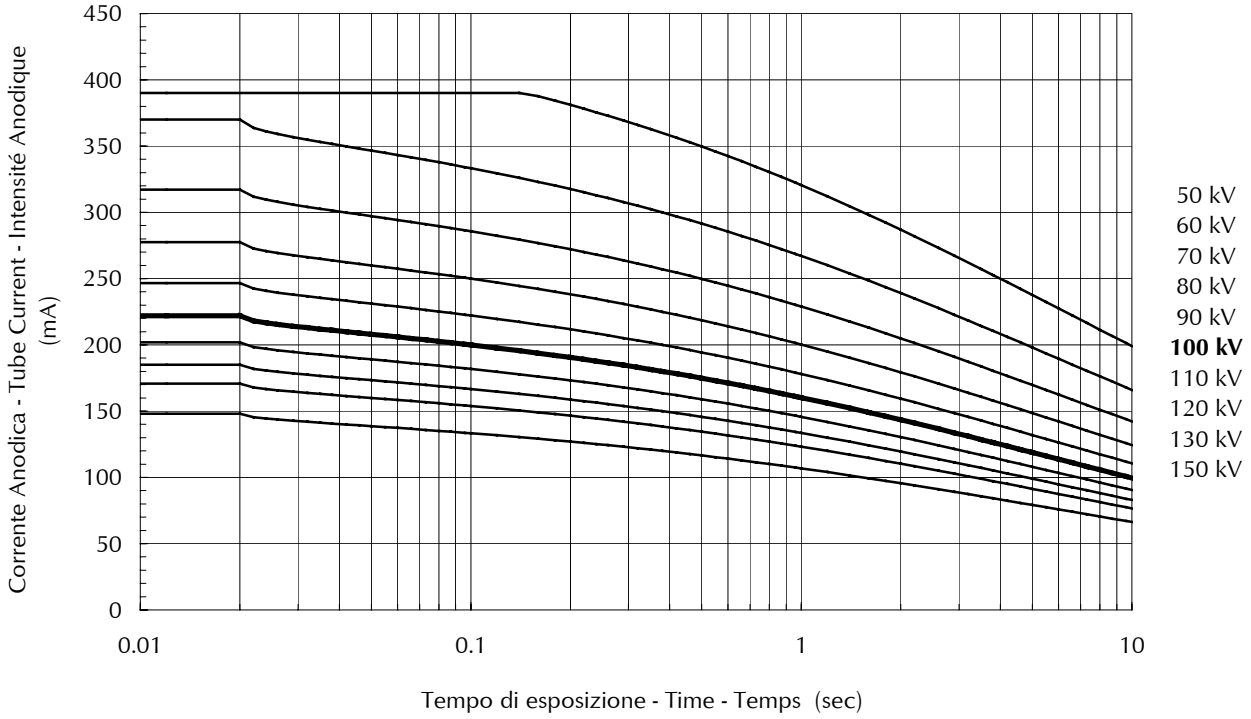
## Dimensioni - Dimension - Dimensions



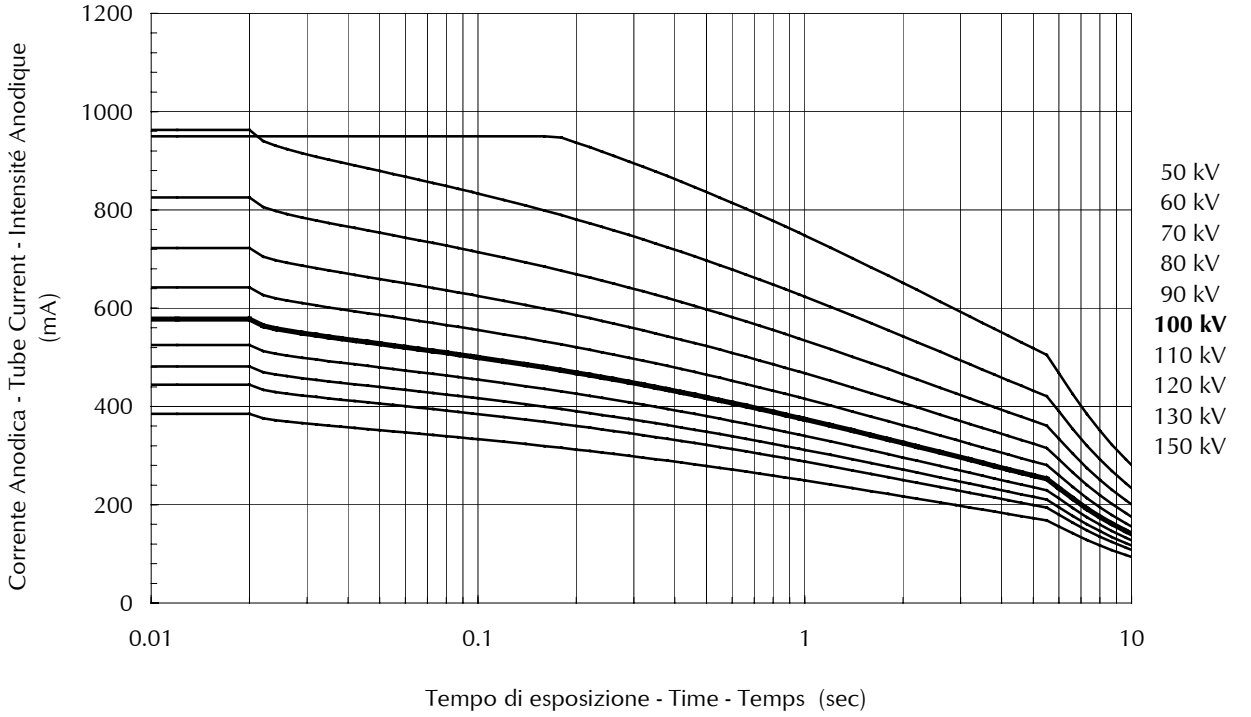

## Curve di riscaldamento e raffreddamento dell'anodo
## Anode heating and cooling curves
## Courbes d'échauffement et de refroidissement de l'anode
## IEC 60613 (1989)



## CURVE DI CARICO SINGOLO - SINGLE LOAD RATING - ABAQUE DE CHARGE UNIQUE
## ▣ 0.6 - 3 Ø - 50 / 60 Hz - IEC 60613 (1989) (2010)




## CURVE DI CARICO SINGOLO - SINGLE LOAD RATING - ABAQUE DE CHARGE UNIQUE
## ■ 1.2 - 3 Ø - 50 / 60 Hz - IEC 60613 (1989) (2010)



## Abaco per carichi in serie - Serial load rating - Abaque de charges successives

### ▣ 0.6 - 3 Ø - 50 / 60 Hz

**Potenza ammessa sul tubo in kW, per serie di n esposizioni, con frequenza z e durata di ogni esposizione in sec**
**Anode input power as a function of n (N° of exposures in series), z (exp. rate per sec), the exposure time (sec)**
**Puissance anodique en fonction de n (N° d'exp. de la séries), z (cadence d'exp. par sec), temps d'exposition (sec)**

| z | 0.010 | 0.020 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.120 | 0.140 | 0.160 | 0.180 | 0.200 | 0.220 | 0.250 | n |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17.5 | 17.5 | 17.1 | 16.8 | 16.6 | 16.5 | 16.2 | 16.0 | 15.8 | 15.7 | 15.5 | 15.4 | 15.1 | 14.9 | 14.6 | |
| 2 | 17.3 | 17.3 | 17.1 | 16.8 | 16.6 | 16.5 | 16.2 | 15.8 | 15.5 | 15.2 | 14.8 | 14.6 | 14.3 | 14.0 | 13.6 | |
| 3 | 17.2 | 17.2 | 17.0 | 16.8 | 16.5 | 16.3 | 15.9 | 15.4 | 15.1 | 14.7 | 14.3 | 14.0 | 13.7 | 13.4 | 12.9 | |
| 4 | 17.2 | 17.2 | 16.9 | 16.6 | 16.3 | 16.1 | 15.6 | 15.1 | 14.7 | 14.3 | 13.9 | 13.5 | 13.2 | 12.9 | 12.4 | 5 |
| 5 | 17.1 | 17.1 | 16.8 | 16.5 | 16.2 | 15.9 | 15.4 | 14.9 | 14.4 | 14.0 | 13.6 | 13.2 | 12.8 | - | - | |
| 10 | 17.1 | 16.9 | 16.4 | 16.0 | 15.7 | 15.3 | 14.6 | 14.0 | - | - | - | - | - | - | - | |
| 15 | 17.1 | 16.7 | 16.2 | 15.7 | 15.3 | 14.8 | - | - | - | - | - | - | - | - | - | |
| 30 | 17.0 | 16.3 | 15.7 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.3 | 17.3 | 17.1 | 16.8 | 16.6 | 16.5 | 16.2 | 15.8 | 15.5 | 15.2 | 14.8 | 14.5 | 14.3 | 14.0 | 13.6 | |
| 2 | 17.2 | 17.2 | 16.9 | 16.6 | 16.3 | 16.1 | 15.6 | 15.1 | 14.7 | 14.3 | 13.9 | 13.5 | 13.2 | 12.8 | 12.4 | |
| 3 | 17.1 | 17.0 | 16.7 | 16.4 | 16.1 | 15.8 | 15.2 | 14.6 | 14.2 | 13.7 | 13.3 | 12.8 | 12.5 | 12.1 | 11.6 | |
| 4 | 17.1 | 16.9 | 16.5 | 16.2 | 15.8 | 15.5 | 14.8 | 14.3 | 13.7 | 13.2 | 12.8 | 12.3 | 11.9 | 11.5 | 11.0 | 10 |
| 5 | 17.1 | 16.8 | 16.4 | 16.0 | 15.6 | 15.3 | 14.6 | 13.9 | 13.4 | 12.8 | 12.3 | 11.9 | 11.5 | - | - | |
| 10 | 17.1 | 16.5 | 15.9 | 15.4 | 14.9 | 14.4 | 13.6 | 12.8 | - | - | - | - | - | - | - | |
| 15 | 17.0 | 16.2 | 15.6 | 15.0 | 14.4 | 13.9 | - | - | - | - | - | - | - | - | - | |
| 30 | 16.7 | 15.7 | 14.8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.2 | 17.2 | 16.9 | 16.6 | 16.3 | 16.1 | 15.6 | 15.1 | 14.7 | 14.3 | 13.9 | 13.5 | 13.2 | 12.8 | 12.4 | |
| 2 | 17.1 | 16.9 | 16.5 | 16.2 | 15.8 | 15.5 | 14.8 | 14.3 | 13.7 | 13.2 | 12.7 | 12.3 | 11.9 | 11.5 | 11.0 | |
| 3 | 17.1 | 16.8 | 16.3 | 15.9 | 15.4 | 15.0 | 14.3 | 13.7 | 13.0 | 12.5 | 12.0 | 11.5 | 11.1 | 10.7 | 10.1 | |
| 4 | 17.1 | 16.6 | 16.1 | 15.6 | 15.1 | 14.7 | 13.9 | 13.2 | 12.5 | 11.9 | 11.4 | 10.9 | 10.5 | 10.1 | 9.5 | 20 |
| 5 | 17.1 | 16.5 | 15.9 | 15.4 | 14.9 | 14.4 | 13.6 | 12.8 | 12.1 | 11.5 | 11.0 | 10.5 | 10.0 | - | - | |
| 10 | 16.8 | 16.0 | 15.3 | 14.6 | 13.9 | 13.4 | 12.3 | 11.5 | - | - | - | - | - | - | - | |
| 15 | 16.6 | 15.7 | 14.8 | 14.0 | 13.3 | 12.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 16.2 | 15.0 | 13.9 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.1 | 16.9 | 16.5 | 16.2 | 15.8 | 15.5 | 14.8 | 14.3 | 13.7 | 13.2 | 12.7 | 12.3 | 11.9 | 11.5 | 11.0 | |
| 2 | 17.1 | 16.6 | 16.1 | 15.6 | 15.1 | 14.7 | 13.9 | 13.2 | 12.5 | 11.9 | 11.4 | 10.9 | 10.5 | 10.1 | 9.5 | |
| 3 | 17.0 | 16.4 | 15.7 | 15.2 | 14.6 | 14.1 | 13.2 | 12.5 | 11.8 | 11.1 | 10.6 | 10.1 | 9.6 | 9.2 | 8.6 | |
| 4 | 16.9 | 16.2 | 15.5 | 14.8 | 14.3 | 13.7 | 12.7 | 11.9 | 11.2 | 10.5 | 9.9 | 9.4 | 9.0 | 8.5 | 8.0 | 40 |
| 5 | 16.8 | 16.0 | 15.2 | 14.6 | 13.9 | 13.4 | 12.3 | 11.5 | 10.7 | 10.0 | 9.4 | 8.9 | 8.5 | - | - | |
| 10 | 16.5 | 15.4 | 14.4 | 13.6 | 12.8 | 12.1 | 11.0 | 10.0 | - | - | - | - | - | - | - | |
| 15 | 16.2 | 14.9 | 13.8 | 12.9 | 12.0 | 11.3 | - | - | - | - | - | - | - | - | - | |
| 30 | 15.7 | 14.0 | 12.7 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.1 | 16.8 | 16.3 | 15.9 | 15.4 | 15.0 | 14.3 | 13.6 | 13.0 | 12.5 | 12.0 | 11.5 | 11.1 | 10.5 | 9.2 | |
| 2 | 17.0 | 16.4 | 15.7 | 15.2 | 14.6 | 14.1 | 13.2 | 12.5 | 11.8 | 11.1 | 10.6 | 10.0 | 9.6 | 9.2 | 8.4 | |
| 3 | 16.9 | 16.1 | 15.4 | 14.7 | 14.1 | 13.5 | 12.5 | 11.7 | 10.9 | 10.3 | 9.7 | 9.2 | 8.7 | 8.3 | 7.7 | |
| 4 | 16.8 | 15.9 | 15.0 | 14.3 | 13.6 | 13.0 | 12.0 | 11.1 | 10.3 | 9.6 | 9.0 | 8.5 | 8.1 | 7.6 | 7.1 | 60 |
| 5 | 16.6 | 15.7 | 14.8 | 14.0 | 13.3 | 12.6 | 11.5 | 10.6 | 9.8 | 9.1 | 8.5 | 8.0 | 7.6 | - | - | |
| 10 | 16.2 | 14.9 | 13.8 | 12.9 | 12.0 | 11.3 | 10.1 | 9.1 | - | - | - | - | - | - | - | |
| 15 | 15.9 | 14.4 | 13.2 | 12.1 | 11.2 | 10.5 | - | - | - | - | - | - | - | - | - | |
| 30 | 15.3 | 13.4 | 11.9 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.1 | 16.6 | 16.1 | 15.6 | 15.1 | 14.7 | 13.9 | 13.2 | 12.5 | 11.9 | 11.4 | 10.2 | 9.2 | 8.4 | 7.4 | |
| 2 | 16.9 | 16.2 | 15.5 | 14.8 | 14.3 | 13.7 | 12.7 | 11.9 | 11.2 | 10.5 | 9.9 | 9.0 | 8.1 | 7.4 | 6.5 | |
| 3 | 16.8 | 15.9 | 15.0 | 14.3 | 13.6 | 13.0 | 12.0 | 11.1 | 10.3 | 9.6 | 9.0 | 8.5 | 7.7 | 7.0 | 6.2 | |
| 4 | 16.6 | 15.6 | 14.7 | 13.9 | 13.2 | 12.5 | 11.4 | 10.5 | 9.7 | 9.0 | 8.4 | 7.9 | 7.4 | 6.9 | 6.1 | 80 |
| 5 | 16.5 | 15.4 | 14.4 | 13.5 | 12.8 | 12.1 | 10.9 | 10.0 | 9.2 | 8.5 | 7.9 | 7.4 | 6.9 | - | - | |
| 10 | 16.0 | 14.6 | 13.4 | 12.3 | 11.5 | 10.7 | 9.4 | 8.5 | - | - | - | - | - | - | - | |
| 15 | 15.7 | 14.0 | 12.7 | 11.5 | 10.6 | 9.8 | - | - | - | - | - | - | - | - | - | |
| 30 | 14.9 | 12.9 | 11.3 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.1 | 16.5 | 15.9 | 15.4 | 14.9 | 14.4 | 13.5 | 12.8 | 12.1 | 11.1 | 9.7 | 8.7 | 7.8 | 7.1 | 6.2 | |
| 2 | 16.8 | 16.0 | 15.2 | 14.6 | 13.9 | 13.4 | 12.3 | 11.5 | 10.7 | 9.6 | 8.4 | 7.5 | 6.7 | 6.1 | 5.4 | |
| 3 | 16.6 | 15.7 | 14.8 | 14.0 | 13.3 | 12.6 | 11.5 | 10.6 | 9.8 | 9.1 | 7.9 | 7.0 | 6.3 | 5.8 | 5.1 | |
| 4 | 16.5 | 15.4 | 14.4 | 13.5 | 12.8 | 12.1 | 10.9 | 10.0 | 9.2 | 8.5 | 7.7 | 6.8 | 6.2 | 5.6 | 4.9 | 100 |
| 5 | 16.3 | 15.1 | 14.1 | 13.2 | 12.4 | 11.7 | 10.5 | 9.5 | 8.7 | 8.0 | 7.4 | 6.7 | 6.1 | - | - | |
| 10 | 15.8 | 14.3 | 13.0 | 11.9 | 11.0 | 10.2 | 9.0 | 8.0 | - | - | - | - | - | - | - | |
| 15 | 15.4 | 13.7 | 12.2 | 11.1 | 10.1 | 9.3 | - | - | - | - | - | - | - | - | - | |
| 30 | 14.6 | 12.5 | 10.8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 17.0 | 16.2 | 15.5 | 14.9 | 14.3 | 13.8 | 12.9 | 11.8 | 9.9 | 8.5 | 7.4 | 6.6 | 5.9 | 5.4 | 4.7 | |
| 2 | 16.6 | 15.7 | 14.8 | 14.0 | 13.3 | 12.6 | 11.5 | 9.7 | 8.1 | 6.9 | 6.0 | 5.4 | 4.8 | 4.4 | 3.9 | |
| 3 | 16.4 | 15.2 | 14.2 | 13.4 | 12.6 | 11.9 | 10.7 | 8.9 | 7.5 | 6.4 | 5.6 | 5.0 | 4.5 | 4.1 | 3.6 | |
| 4 | 16.2 | 14.9 | 13.8 | 12.9 | 12.0 | 11.3 | 10.1 | 8.6 | 7.1 | 6.1 | 5.4 | 4.8 | 4.3 | 3.9 | 3.4 | 150 |
| 5 | 16.1 | 14.6 | 13.5 | 12.5 | 11.6 | 10.8 | 9.6 | 8.4 | 7.0 | 6.0 | 5.2 | 4.6 | 4.2 | - | - | |
| 10 | 15.4 | 13.6 | 12.2 | 11.1 | 10.1 | 9.3 | 8.1 | 7.1 | - | - | - | - | - | - | - | |
| 15 | 15.0 | 13.0 | 11.4 | 10.2 | 9.2 | 8.4 | - | - | - | - | - | - | - | - | - | |
| 30 | 14.1 | 11.7 | 10.0 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 16.6 | 15.7 | 14.8 | 14.0 | 13.3 | 12.6 | 10.1 | 8.1 | 6.8 | 5.8 | 5.1 | 4.5 | 4.1 | 3.7 | 3.2 | |
| 2 | 16.2 | 14.9 | 13.8 | 12.9 | 11.8 | 9.9 | 7.4 | 5.9 | 4.9 | 4.2 | 3.7 | 3.3 | 3.0 | 2.7 | 2.4 | |
| 3 | 15.9 | 14.4 | 13.2 | 12.1 | 10.4 | 8.7 | 6.5 | 5.2 | 4.3 | 3.7 | 3.2 | 2.9 | 2.6 | 2.4 | 2.1 | |
| 4 | 15.7 | 14.0 | 12.6 | 11.5 | 9.7 | 8.1 | 6.0 | 4.8 | 4.0 | 3.5 | 3.0 | 2.7 | 2.4 | 2.2 | 1.9 | 300 |
| 5 | 15.4 | 13.6 | 12.2 | 11.1 | 9.2 | 7.7 | 5.8 | 4.6 | 3.8 | 3.3 | 2.9 | 2.6 | 2.3 | - | - | |
| 10 | 14.6 | 12.5 | 10.8 | 9.6 | 8.4 | 7.0 | 5.2 | 4.2 | - | - | - | - | - | - | - | |
| 15 | 14.1 | 11.7 | 10.0 | 8.7 | 7.7 | 6.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 13.0 | 10.2 | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - | |

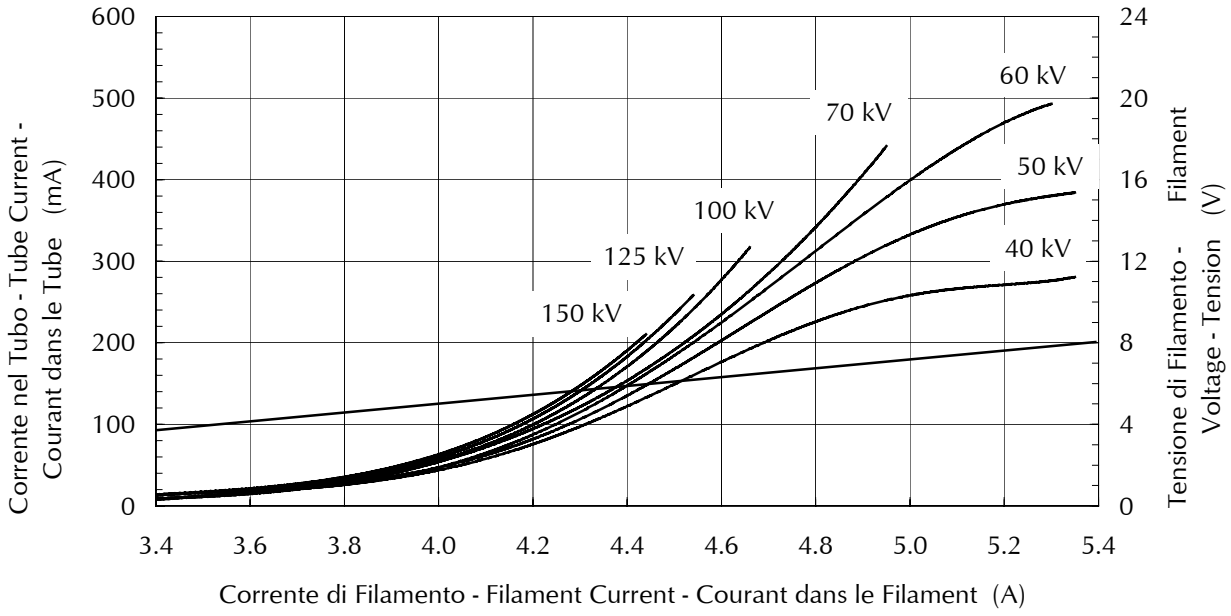
## Abaco per carichi in serie - Serial load rating - Abaque de charges successives

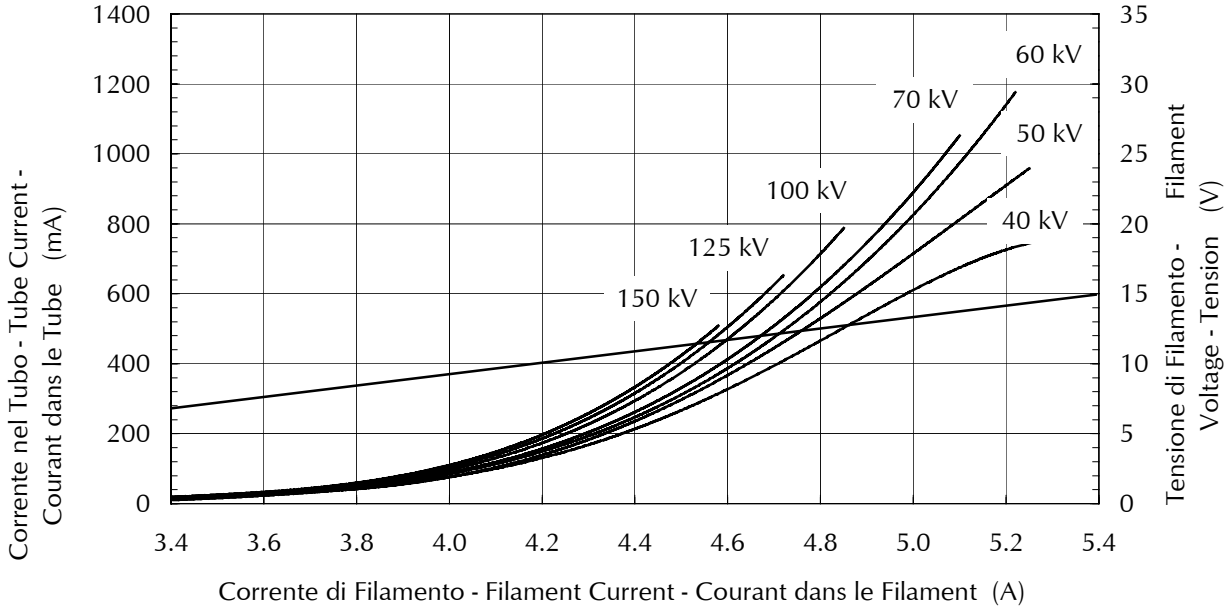
### ■ 1.2 - 3 Ø - 50 / 60 Hz

**Potenza ammessa sul tubo in kW, per serie di n esposizioni, con frequenza z e durata di ogni esposizione in sec**
**Anode input power as a function of n (N° of exposures in series), z (exp. rate per sec), the exposure time (sec)**
**Puissance anodique en fonction de n (N° d'exp. de la séries), z (cadence d'exp. par sec), temps d'exposition (sec)**

| z | 0.010 | 0.020 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 | 0.120 | 0.140 | 0.160 | 0.180 | 0.200 | 0.220 | 0.250 | n |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 45.1 | 45.1 | 43.8 | 42.9 | 42.2 | 41.6 | 40.7 | 40.0 | 39.4 | 38.8 | 38.3 | 37.9 | 37.1 | 36.4 | 35.4 | |
| 2 | 44.7 | 44.7 | 43.8 | 42.9 | 42.2 | 41.6 | 40.6 | 39.4 | 38.3 | 37.2 | 36.2 | 35.2 | 34.3 | 33.5 | 32.2 | |
| 3 | 44.3 | 44.3 | 43.5 | 42.6 | 41.8 | 41.0 | 39.5 | 38.1 | 36.9 | 35.7 | 34.5 | 33.5 | 32.5 | 31.5 | 30.2 | |
| 4 | 44.1 | 44.1 | 43.1 | 42.1 | 41.2 | 40.3 | 38.7 | 37.2 | 35.8 | 34.4 | 33.2 | 32.1 | 31.1 | 30.1 | 28.7 | 5 |
| 5 | 43.8 | 43.8 | 42.7 | 41.7 | 40.7 | 39.7 | 38.0 | 36.3 | 34.8 | 33.5 | 32.2 | 31.0 | 29.9 | - | - | |
| 10 | 43.8 | 43.0 | 41.5 | 40.1 | 38.8 | 37.6 | 35.4 | 33.5 | - | - | - | - | - | - | - | |
| 15 | 43.8 | 42.3 | 40.6 | 39.0 | 37.5 | 36.2 | - | - | - | - | - | - | - | - | - | |
| 30 | 43.5 | 41.0 | 38.9 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 44.7 | 44.7 | 43.8 | 42.9 | 42.2 | 41.6 | 40.6 | 39.4 | 38.2 | 37.2 | 36.2 | 35.2 | 34.3 | 33.4 | 32.2 | |
| 2 | 44.1 | 44.1 | 43.1 | 42.1 | 41.2 | 40.3 | 38.6 | 37.1 | 35.7 | 34.4 | 33.2 | 32.1 | 31.0 | 30.0 | 28.6 | |
| 3 | 43.8 | 43.6 | 42.4 | 41.3 | 40.2 | 39.2 | 37.3 | 35.5 | 34.0 | 32.5 | 31.2 | 30.0 | 28.9 | 27.8 | 26.4 | |
| 4 | 43.8 | 43.2 | 41.9 | 40.6 | 39.4 | 38.3 | 36.2 | 34.3 | 32.6 | 31.1 | 29.7 | 28.5 | 27.3 | 26.2 | 24.8 | 10 |
| 5 | 43.8 | 42.9 | 41.4 | 40.0 | 38.7 | 37.5 | 35.3 | 33.3 | 31.6 | 30.0 | 28.5 | 27.2 | 26.0 | - | - | |
| 10 | 43.8 | 41.7 | 39.7 | 38.0 | 36.3 | 34.8 | 32.2 | 29.9 | - | - | - | - | - | - | - | |
| 15 | 43.4 | 40.8 | 38.5 | 36.5 | 34.7 | 33.1 | - | - | - | - | - | - | - | - | - | |
| 30 | 42.3 | 39.0 | 36.2 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 44.1 | 44.1 | 43.1 | 42.1 | 41.2 | 40.3 | 38.6 | 37.1 | 35.7 | 34.4 | 33.2 | 32.0 | 30.3 | 27.5 | 24.2 | |
| 2 | 43.8 | 43.2 | 41.9 | 40.6 | 39.4 | 38.2 | 36.2 | 34.3 | 32.6 | 31.1 | 29.7 | 28.4 | 27.3 | 26.2 | 23.3 | |
| 3 | 43.8 | 42.6 | 41.0 | 39.5 | 38.1 | 36.8 | 34.5 | 32.4 | 30.6 | 29.0 | 27.5 | 26.2 | 25.0 | 23.9 | 22.4 | |
| 4 | 43.8 | 42.1 | 40.3 | 38.6 | 37.1 | 35.7 | 33.2 | 31.0 | 29.1 | 27.4 | 25.9 | 24.5 | 23.3 | 22.2 | 20.7 | 20 |
| 5 | 43.8 | 41.7 | 39.7 | 37.9 | 36.3 | 34.8 | 32.1 | 29.8 | 27.9 | 26.1 | 24.6 | 23.2 | 22.0 | - | - | |
| 10 | 42.9 | 40.0 | 37.5 | 35.3 | 33.3 | 31.6 | 28.5 | 26.0 | - | - | - | - | - | - | - | |
| 15 | 42.2 | 38.9 | 36.0 | 33.5 | 31.4 | 29.5 | - | - | - | - | - | - | - | - | - | |
| 30 | 40.8 | 36.5 | 33.1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 43.8 | 43.2 | 41.9 | 40.6 | 39.4 | 38.2 | 36.2 | 32.4 | 27.0 | 23.2 | 20.3 | 18.0 | 16.2 | 14.7 | 13.0 | |
| 2 | 43.8 | 42.1 | 40.3 | 38.6 | 37.1 | 35.7 | 33.2 | 30.3 | 25.2 | 21.6 | 18.9 | 16.8 | 15.1 | 13.8 | 12.1 | |
| 3 | 43.6 | 41.3 | 39.2 | 37.2 | 35.5 | 34.0 | 31.2 | 28.8 | 24.6 | 21.1 | 18.5 | 16.4 | 14.8 | 13.4 | 11.8 | |
| 4 | 43.2 | 40.6 | 38.2 | 36.2 | 34.3 | 32.6 | 29.7 | 27.3 | 24.3 | 20.8 | 18.2 | 16.2 | 14.6 | 13.3 | 11.7 | 40 |
| 5 | 42.9 | 40.0 | 37.5 | 35.3 | 33.3 | 31.5 | 28.5 | 26.0 | 23.9 | 20.7 | 18.1 | 16.1 | 14.5 | - | - | |
| 10 | 41.7 | 37.9 | 34.8 | 32.1 | 29.8 | 27.9 | 24.6 | 22.0 | - | - | - | - | - | - | - | |
| 15 | 40.8 | 36.4 | 32.9 | 30.1 | 27.7 | 25.6 | - | - | - | - | - | - | - | - | - | |
| 30 | 38.9 | 33.5 | 29.5 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 43.8 | 42.6 | 41.0 | 39.5 | 38.1 | 36.8 | 28.8 | 23.1 | 19.2 | 16.5 | 14.4 | 12.8 | 11.5 | 10.5 | 9.2 | |
| 2 | 43.6 | 41.3 | 39.1 | 37.2 | 35.5 | 33.9 | 26.1 | 20.9 | 17.4 | 14.9 | 13.1 | 11.6 | 10.5 | 9.5 | 8.4 | |
| 3 | 43.1 | 40.3 | 37.8 | 35.7 | 33.8 | 32.0 | 25.2 | 20.2 | 16.8 | 14.4 | 12.6 | 11.2 | 10.1 | 9.2 | 8.1 | |
| 4 | 42.6 | 39.5 | 36.8 | 34.5 | 32.4 | 30.6 | 24.8 | 19.8 | 16.5 | 14.2 | 12.4 | 11.0 | 9.9 | 9.0 | 7.9 | 60 |
| 5 | 42.2 | 38.8 | 36.0 | 33.5 | 31.3 | 29.4 | 24.5 | 19.6 | 16.3 | 14.0 | 12.2 | 10.9 | 9.8 | - | - | |
| 10 | 40.7 | 36.4 | 32.9 | 30.0 | 27.6 | 25.6 | 22.3 | 19.2 | - | - | - | - | - | - | - | |
| 15 | 39.7 | 34.8 | 30.9 | 27.9 | 25.3 | 23.2 | - | - | - | - | - | - | - | - | - | |
| 30 | 37.5 | 31.6 | 27.2 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 43.8 | 42.1 | 40.3 | 38.6 | 36.8 | 30.7 | 23.0 | 18.4 | 15.3 | 13.1 | 11.5 | 10.2 | 9.2 | 8.4 | 7.4 | |
| 2 | 43.2 | 40.6 | 38.2 | 36.2 | 32.4 | 27.0 | 20.3 | 16.2 | 13.5 | 11.6 | 10.1 | 9.0 | 8.1 | 7.4 | 6.5 | |
| 3 | 42.6 | 39.5 | 36.8 | 34.5 | 31.0 | 25.8 | 19.4 | 15.5 | 12.9 | 11.1 | 9.7 | 8.6 | 7.7 | 7.0 | 6.2 | |
| 4 | 42.1 | 38.6 | 35.7 | 33.2 | 30.3 | 25.2 | 18.9 | 15.1 | 12.6 | 10.8 | 9.5 | 8.4 | 7.6 | 6.9 | 6.1 | 80 |
| 5 | 41.6 | 37.9 | 34.8 | 32.1 | 29.8 | 24.9 | 18.6 | 14.9 | 12.4 | 10.7 | 9.3 | 8.3 | 7.5 | - | - | |
| 10 | 40.0 | 35.3 | 31.5 | 28.5 | 26.0 | 23.9 | 18.1 | 14.5 | - | - | - | - | - | - | - | |
| 15 | 38.8 | 33.5 | 29.4 | 26.2 | 23.7 | 21.6 | - | - | - | - | - | - | - | - | - | |
| 30 | 36.4 | 30.1 | 25.6 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 43.8 | 41.6 | 39.7 | 37.9 | 31.2 | 26.0 | 19.5 | 15.6 | 13.0 | 11.1 | 9.7 | 8.7 | 7.8 | 7.1 | 6.2 | |
| 2 | 42.9 | 40.0 | 37.5 | 33.5 | 26.8 | 22.4 | 16.8 | 13.4 | 11.2 | 9.6 | 8.4 | 7.5 | 6.7 | 6.1 | 5.4 | |
| 3 | 42.2 | 38.8 | 35.9 | 31.7 | 25.4 | 21.1 | 15.9 | 12.7 | 10.6 | 9.1 | 7.9 | 7.0 | 6.3 | 5.8 | 5.1 | |
| 4 | 41.6 | 37.9 | 34.8 | 30.8 | 24.6 | 20.5 | 15.4 | 12.3 | 10.3 | 8.8 | 7.7 | 6.8 | 6.2 | 5.6 | 4.9 | 100 |
| 5 | 41.2 | 37.1 | 33.8 | 30.3 | 24.2 | 20.2 | 15.1 | 12.1 | 10.1 | 8.6 | 7.6 | 6.7 | 6.1 | - | - | |
| 10 | 39.4 | 34.3 | 30.4 | 27.3 | 23.3 | 19.4 | 14.6 | 11.7 | - | - | - | - | - | - | - | |
| 15 | 38.1 | 32.4 | 28.2 | 25.0 | 22.4 | 19.2 | - | - | - | - | - | - | - | - | - | |
| 30 | 35.5 | 28.9 | 24.3 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 43.3 | 40.7 | 38.5 | 29.6 | 23.7 | 19.7 | 14.8 | 11.8 | 9.9 | 8.5 | 7.4 | 6.6 | 5.9 | 5.4 | 4.7 | |
| 2 | 42.2 | 38.8 | 32.2 | 24.2 | 19.3 | 16.1 | 12.1 | 9.7 | 8.1 | 6.9 | 6.0 | 5.4 | 4.8 | 4.4 | 3.9 | |
| 3 | 41.4 | 37.5 | 29.8 | 22.4 | 17.9 | 14.9 | 11.2 | 8.9 | 7.5 | 6.4 | 5.6 | 5.0 | 4.5 | 4.1 | 3.6 | |
| 4 | 40.7 | 36.4 | 28.6 | 21.4 | 17.2 | 14.3 | 10.7 | 8.6 | 7.1 | 6.1 | 5.4 | 4.8 | 4.3 | 3.9 | 3.4 | 150 |
| 5 | 40.2 | 35.5 | 27.9 | 20.9 | 16.7 | 13.9 | 10.5 | 8.4 | 7.0 | 6.0 | 5.2 | 4.6 | 4.2 | - | - | |
| 10 | 38.1 | 32.4 | 26.4 | 19.8 | 15.8 | 13.2 | 9.9 | 7.9 | - | - | - | - | - | - | - | |
| 15 | 36.7 | 30.4 | 25.9 | 19.4 | 15.6 | 13.0 | - | - | - | - | - | - | - | - | - | |
| 30 | 33.8 | 26.6 | 22.0 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 42.2 | 38.8 | 27.0 | 20.3 | 16.2 | 13.5 | 10.1 | 8.1 | 6.8 | 5.8 | 5.1 | 4.5 | 4.1 | 3.7 | 3.2 | |
| 2 | 40.7 | 29.6 | 19.7 | 14.8 | 11.8 | 9.9 | 7.4 | 5.9 | 4.9 | 4.2 | 3.7 | 3.3 | 3.0 | 2.7 | 2.4 | |
| 3 | 39.7 | 26.0 | 17.3 | 13.0 | 10.4 | 8.7 | 6.5 | 5.2 | 4.3 | 3.7 | 3.2 | 2.9 | 2.6 | 2.4 | 2.1 | |
| 4 | 38.8 | 24.2 | 16.1 | 12.1 | 9.7 | 8.1 | 6.0 | 4.8 | 4.0 | 3.5 | 3.0 | 2.7 | 2.4 | 2.2 | 1.9 | 300 |
| 5 | 38.1 | 23.1 | 15.4 | 11.5 | 9.2 | 7.7 | 5.8 | 4.6 | 3.8 | 3.3 | 2.9 | 2.6 | 2.3 | - | - | |
| 10 | 35.5 | 20.9 | 13.9 | 10.5 | 8.4 | 7.0 | 5.2 | 4.2 | - | - | - | - | - | - | - | |
| 15 | 33.8 | 20.2 | 13.4 | 10.1 | 8.1 | 6.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 30.4 | 19.4 | 13.0 | - | - | - | - | - | - | - | - | - | - | - | - | |

**Caratteristica di emissione del catodo**
**Cathode emission characteristic**
**Caractéristique d'émission de la cathode**
**▣ 0.6 - 3 Ø - (± 0.2 A) – IEC 60613 (1989) (2010)**




**Caratteristica di emissione del catodo**
**Cathode emission characteristic**
**Caractéristique d'émission de la cathode**
**■ 1.2 - 3 Ø - (± 0.2 A) – IEC 60613 (1989) (2010)**