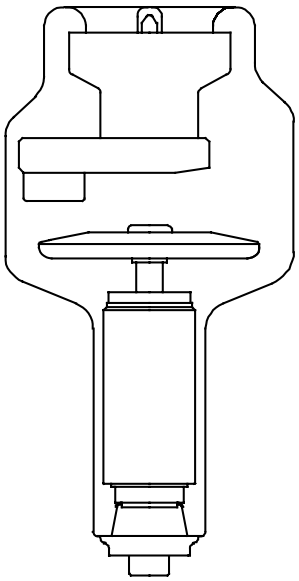
# Documentazione Tubo a raggi X
# Tube Documentation
# Documentation du Tube

# RTM 72 H 0.6/1.2



Nr. di matricola
Tube No.
Nr de série

CE 0051

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

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CSQ ISO 9001 IQNet CSQ ISO 13485

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### Dichiarazione di conformità

Questo prodotto soddisfa i requisiti essenziali del regolamento UE 2017/745 in accordo alle norme IEC 60613, IEC 60336, IEC 60522, IEC 60526, IEC 60601-1, IEC 60601-1-3, IEC 60601-2-28.

### Declaration of conformity

This tube fulfils the essential requirements of the regulation EU 2017/745 according to standard IEC 60613, IEC 60336, IEC 60522, IEC 60526, IEC 60601-1, IEC 60601-1-3, IEC 60601-2-28.

### Confirmation de conformité

Ce tube remplit les exigences essentielles de le règlement UE 2017/745 en accord avec les normes IEC 60613, IEC 60336, IEC 60522, IEC 60526, 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>2850 / 3450 $min^{-1}$ | | |
| Potenza anodica nominale<br>Nominal anode input power<br>Puissance anodique nominale | ▣ 17 kW<br>■ 43 kW | | IEC 60613 (1989) |
| Potenza anodica nominale in radiografia<br>Nominal radiographic anode input power<br>Puissance anodique radiographique nominale | ▣ 18.5 kW<br>■ 44.0 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 %)
RT = Tungsten + Rhenium (5-10%) , TZM = Molibdenum + Titanium (0.40-0.55 %) + Zirconium (0.06-0.12 %)
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 | 500 W | 40 000 HU/min | |
| Dissipazione termica massima<br>Maximum heat dissipation<br>Dissipation thermique maximale | 900 W | 72 000 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 | | |

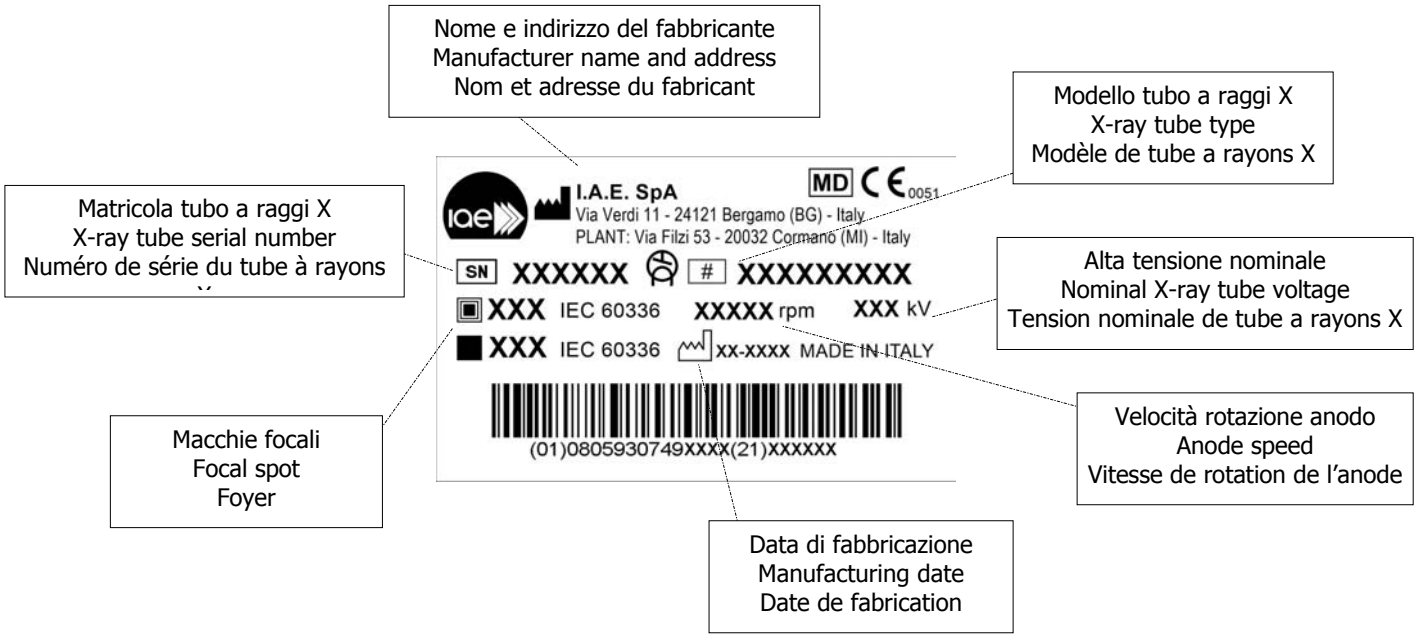
I dati forniti nella presente documentazione si intendono riferiti a:
The data indicated in this documentation refer to:
Les données indiquées dans cette documentation sont calculés pour:

| | | | | |
|---|---|---|---|---|
| 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 | 44% |

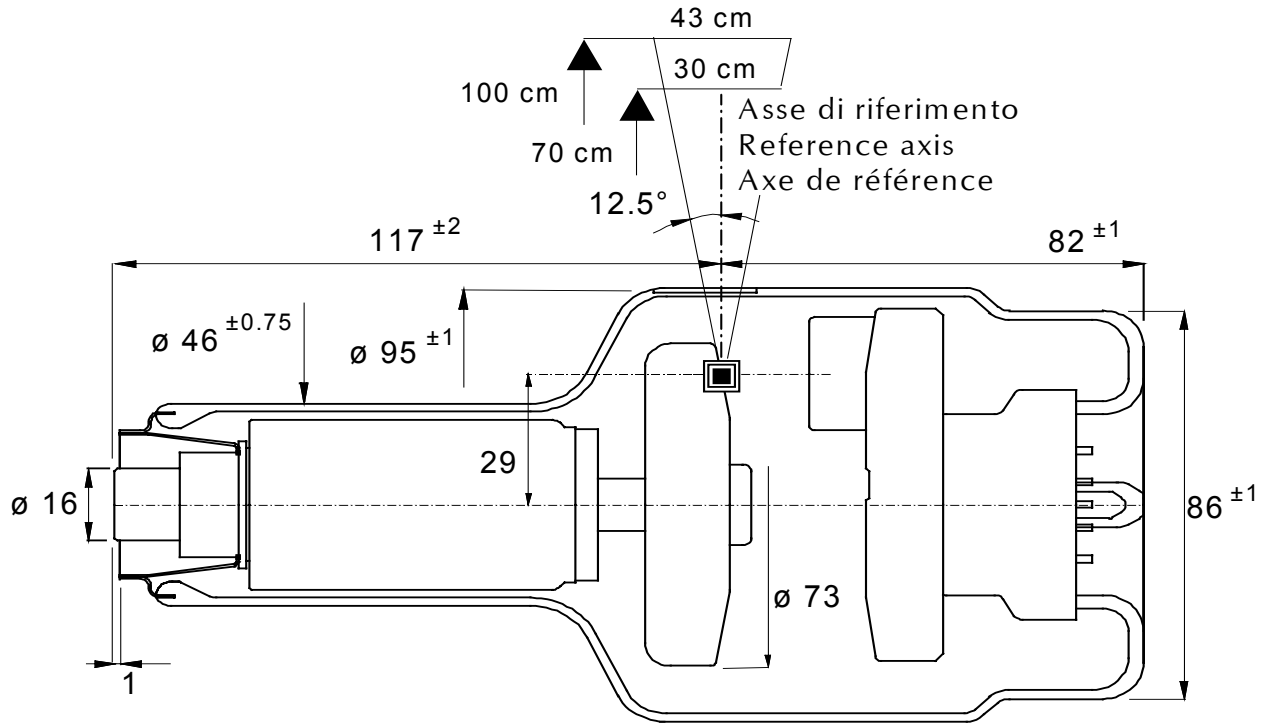
| | trasporto e stoccaggio<br>transportation and storage<br>transport et stockage | funzionamento<br>operation<br>opération | |
|---|---|---|---|
| Limiti di temperatura<br>Temperature limits<br>Limites de température | -10°C ÷ +80°C | +10°C ÷ +40°C | |
| Limiti di umidità<br>Humidity limits<br>Limites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

## Etichettatura - Labeling - Etiquetage

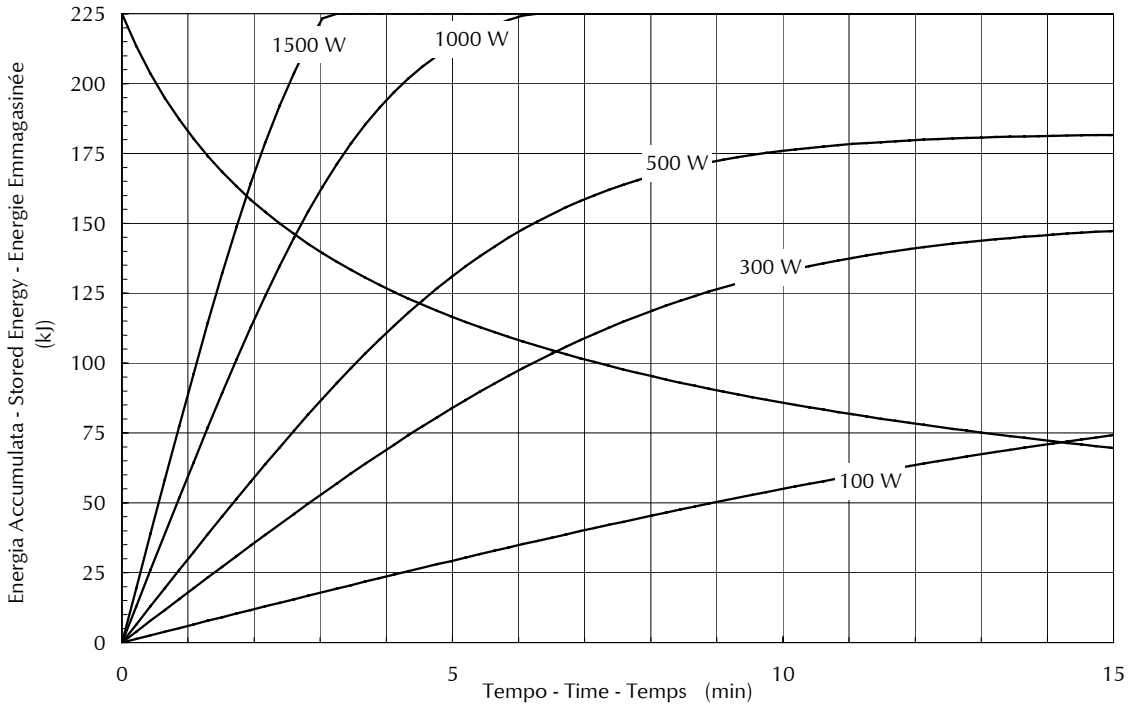
### Etichetta del tubo / Tube label / Etiquette de tube



## Dimensioni - Dimension - Dimensions

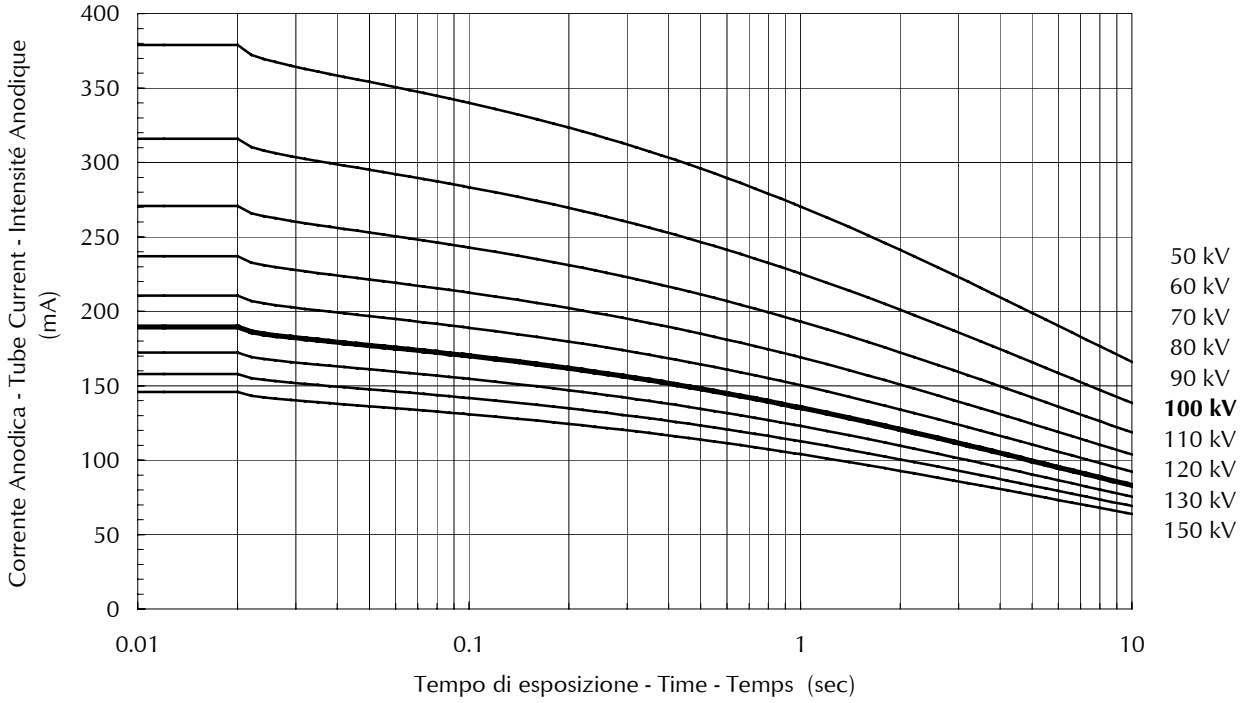



## Curve di riscaldamento e raffreddamento dell'anodo
## Anode heating and cooling curves
## Courbes d'échauffement et de refroidissement de l'anode
## IEC 60613 (1989)



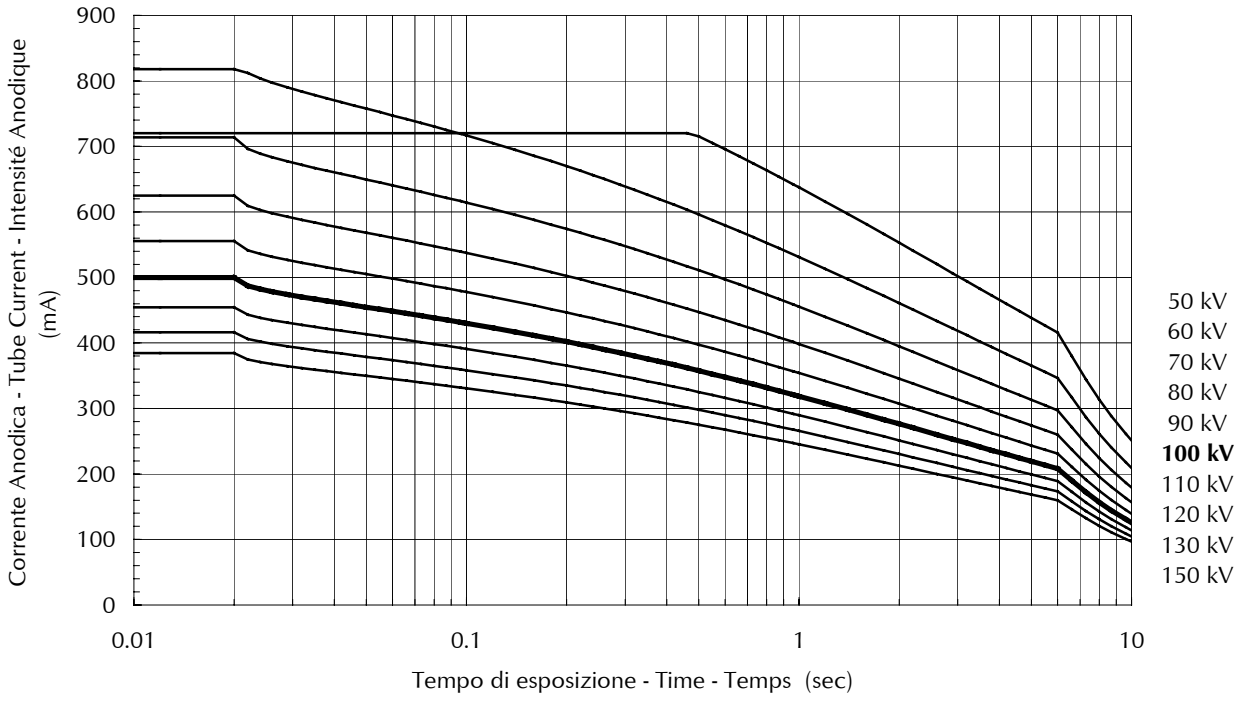
## CURVE DI CARICO SINGOLO - SINGLE LOAD RATING - ABAQUE DE CHARGE UNIQUE

**▣ 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 | 14.9 | 14.9 | 14.6 | 14.3 | 14.2 | 14.0 | 13.8 | 13.6 | 13.4 | 13.3 | 13.2 | 13.0 | 12.8 | 12.6 | 12.4 | |
| 2 | 14.8 | 14.8 | 14.6 | 14.3 | 14.2 | 14.0 | 13.8 | 13.4 | 13.1 | 12.9 | 12.6 | 12.3 | 12.1 | 11.8 | 11.5 | |
| 3 | 14.7 | 14.7 | 14.5 | 14.3 | 14.1 | 13.9 | 13.5 | 13.1 | 12.8 | 12.4 | 12.1 | 11.8 | 11.6 | 11.3 | 10.9 | |
| 4 | 14.6 | 14.6 | 14.4 | 14.1 | 13.9 | 13.7 | 13.3 | 12.8 | 12.5 | 12.1 | 11.8 | 11.5 | 11.1 | 10.9 | 10.5 | 5 |
| 5 | 14.6 | 14.6 | 14.3 | 14.0 | 13.8 | 13.5 | 13.1 | 12.6 | 12.2 | 11.8 | 11.5 | 11.1 | 10.8 | - | - | |
| 10 | 14.6 | 14.4 | 14.0 | 13.6 | 13.3 | 13.0 | 12.4 | 11.8 | - | - | - | - | - | - | - | |
| 15 | 14.6 | 14.2 | 13.8 | 13.3 | 13.0 | 12.6 | - | - | - | - | - | - | - | - | - | |
| 30 | 14.5 | 13.9 | 13.3 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.8 | 14.8 | 14.6 | 14.3 | 14.2 | 14.0 | 13.8 | 13.4 | 13.1 | 12.9 | 12.6 | 12.3 | 12.1 | 11.8 | 11.5 | |
| 2 | 14.6 | 14.6 | 14.4 | 14.1 | 13.9 | 13.7 | 13.2 | 12.8 | 12.5 | 12.1 | 11.8 | 11.4 | 11.1 | 10.8 | 10.4 | |
| 3 | 14.6 | 14.5 | 14.2 | 13.9 | 13.6 | 13.4 | 12.9 | 12.4 | 12.0 | 11.6 | 11.2 | 10.8 | 10.5 | 10.2 | 9.8 | |
| 4 | 14.6 | 14.4 | 14.1 | 13.8 | 13.4 | 13.1 | 12.6 | 12.1 | 11.6 | 11.2 | 10.8 | 10.4 | 10.0 | 9.7 | 9.3 | 10 |
| 5 | 14.6 | 14.3 | 14.0 | 13.6 | 13.3 | 12.9 | 12.3 | 11.8 | 11.3 | 10.8 | 10.4 | 10.0 | 9.7 | - | - | |
| 10 | 14.6 | 14.0 | 13.5 | 13.1 | 12.6 | 12.2 | 11.5 | 10.8 | - | - | - | - | - | - | - | |
| 15 | 14.5 | 13.8 | 13.2 | 12.7 | 12.2 | 11.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 14.2 | 13.3 | 12.6 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.6 | 14.6 | 14.4 | 14.1 | 13.9 | 13.7 | 13.2 | 12.8 | 12.5 | 12.1 | 11.8 | 11.4 | 11.1 | 10.8 | 10.4 | |
| 2 | 14.6 | 14.4 | 14.1 | 13.8 | 13.4 | 13.1 | 12.6 | 12.1 | 11.6 | 11.2 | 10.8 | 10.4 | 10.0 | 9.7 | 9.2 | |
| 3 | 14.6 | 14.3 | 13.9 | 13.5 | 13.1 | 12.8 | 12.1 | 11.5 | 11.0 | 10.5 | 10.1 | 9.7 | 9.3 | 9.0 | 8.5 | |
| 4 | 14.6 | 14.1 | 13.7 | 13.2 | 12.8 | 12.5 | 11.8 | 11.1 | 10.6 | 10.1 | 9.6 | 9.2 | 8.8 | 8.4 | 8.0 | 20 |
| 5 | 14.6 | 14.0 | 13.5 | 13.0 | 12.6 | 12.2 | 11.5 | 10.8 | 10.2 | 9.7 | 9.2 | 8.8 | 8.4 | - | - | |
| 10 | 14.3 | 13.6 | 12.9 | 12.3 | 11.8 | 11.3 | 10.4 | 9.7 | - | - | - | - | - | - | - | |
| 15 | 14.2 | 13.3 | 12.5 | 11.9 | 11.2 | 10.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 13.8 | 12.7 | 11.7 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.6 | 14.4 | 14.1 | 13.7 | 13.4 | 13.1 | 12.6 | 12.1 | 11.6 | 11.2 | 10.7 | 10.4 | 10.0 | 9.7 | 9.2 | |
| 2 | 14.6 | 14.1 | 13.7 | 13.2 | 12.8 | 12.5 | 11.8 | 11.1 | 10.6 | 10.1 | 9.6 | 9.2 | 8.8 | 8.4 | 8.0 | |
| 3 | 14.5 | 13.9 | 13.4 | 12.9 | 12.4 | 12.0 | 11.2 | 10.5 | 9.9 | 9.3 | 8.9 | 8.4 | 8.0 | 7.7 | 7.2 | |
| 4 | 14.4 | 13.8 | 13.1 | 12.6 | 12.1 | 11.6 | 10.8 | 10.0 | 9.4 | 8.8 | 8.3 | 7.9 | 7.5 | 7.1 | 6.6 | 40 |
| 5 | 14.3 | 13.6 | 12.9 | 12.3 | 11.8 | 11.3 | 10.4 | 9.6 | 9.0 | 8.4 | 7.9 | 7.5 | 7.1 | - | - | |
| 10 | 14.0 | 13.0 | 12.2 | 11.5 | 10.8 | 10.2 | 9.2 | 8.4 | - | - | - | - | - | - | - | |
| 15 | 13.8 | 12.7 | 11.7 | 10.9 | 10.1 | 9.5 | - | - | - | - | - | - | - | - | - | |
| 30 | 13.3 | 11.9 | 10.7 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.6 | 14.3 | 13.9 | 13.5 | 13.1 | 12.8 | 12.1 | 11.5 | 11.0 | 10.5 | 10.1 | 9.7 | 9.3 | 9.0 | 8.0 | |
| 2 | 14.5 | 13.9 | 13.4 | 12.9 | 12.4 | 12.0 | 11.2 | 10.5 | 9.9 | 9.3 | 8.9 | 8.4 | 8.0 | 7.7 | 7.2 | |
| 3 | 14.4 | 13.7 | 13.0 | 12.5 | 11.9 | 11.4 | 10.6 | 9.8 | 9.2 | 8.6 | 8.1 | 7.7 | 7.3 | 6.9 | 6.4 | |
| 4 | 14.3 | 13.5 | 12.8 | 12.1 | 11.5 | 11.0 | 10.1 | 9.3 | 8.6 | 8.1 | 7.6 | 7.1 | 6.7 | 6.4 | 5.9 | 60 |
| 5 | 14.2 | 13.3 | 12.5 | 11.8 | 11.2 | 10.7 | 9.7 | 8.9 | 8.2 | 7.6 | 7.1 | 6.7 | 6.3 | - | - | |
| 10 | 13.8 | 12.7 | 11.7 | 10.9 | 10.1 | 9.5 | 8.5 | 7.6 | - | - | - | - | - | - | - | |
| 15 | 13.5 | 12.2 | 11.1 | 10.2 | 9.4 | 8.8 | - | - | - | - | - | - | - | - | - | |
| 30 | 12.9 | 11.3 | 10.0 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.6 | 14.1 | 13.7 | 13.2 | 12.8 | 12.5 | 11.7 | 11.1 | 10.6 | 10.1 | 9.6 | 8.7 | 7.9 | 7.2 | 6.3 | |
| 2 | 14.4 | 13.7 | 13.1 | 12.6 | 12.1 | 11.6 | 10.7 | 10.0 | 9.4 | 8.8 | 8.3 | 7.9 | 7.1 | 6.4 | 5.7 | |
| 3 | 14.3 | 13.5 | 12.8 | 12.1 | 11.5 | 11.0 | 10.1 | 9.3 | 8.6 | 8.1 | 7.6 | 7.1 | 6.7 | 6.2 | 5.4 | |
| 4 | 14.1 | 13.2 | 12.5 | 11.8 | 11.1 | 10.6 | 9.6 | 8.8 | 8.1 | 7.5 | 7.0 | 6.6 | 6.2 | 5.8 | 5.3 | 80 |
| 5 | 14.0 | 13.0 | 12.2 | 11.4 | 10.8 | 10.2 | 9.2 | 8.4 | 7.7 | 7.1 | 6.6 | 6.2 | 5.8 | - | - | |
| 10 | 13.6 | 12.3 | 11.3 | 10.4 | 9.6 | 9.0 | 7.9 | 7.1 | - | - | - | - | - | - | - | |
| 15 | 13.3 | 11.8 | 10.7 | 9.7 | 8.9 | 8.2 | - | - | - | - | - | - | - | - | - | |
| 30 | 12.7 | 10.9 | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.6 | 14.0 | 13.5 | 13.0 | 12.6 | 12.2 | 11.4 | 10.8 | 10.2 | 9.5 | 8.3 | 7.4 | 6.6 | 6.0 | 5.3 | |
| 2 | 14.3 | 13.6 | 12.9 | 12.3 | 11.8 | 11.3 | 10.4 | 9.6 | 9.0 | 8.3 | 7.3 | 6.5 | 5.8 | 5.3 | 4.7 | |
| 3 | 14.2 | 13.3 | 12.5 | 11.8 | 11.2 | 10.7 | 9.7 | 8.9 | 8.2 | 7.6 | 6.9 | 6.2 | 5.6 | 5.0 | 4.4 | |
| 4 | 14.0 | 13.0 | 12.2 | 11.4 | 10.8 | 10.2 | 9.2 | 8.4 | 7.7 | 7.1 | 6.6 | 6.0 | 5.4 | 4.9 | 4.3 | 100 |
| 5 | 13.9 | 12.8 | 11.9 | 11.1 | 10.4 | 9.8 | 8.8 | 8.0 | 7.3 | 6.7 | 6.2 | 5.8 | 5.3 | - | - | |
| 10 | 13.4 | 12.1 | 10.9 | 10.0 | 9.2 | 8.6 | 7.5 | 6.6 | - | - | - | - | - | - | - | |
| 15 | 13.1 | 11.5 | 10.3 | 9.3 | 8.5 | 7.8 | - | - | - | - | - | - | - | - | - | |
| 30 | 12.4 | 10.5 | 9.1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.4 | 13.8 | 13.2 | 12.6 | 12.1 | 11.7 | 10.8 | 9.9 | 8.2 | 7.1 | 6.2 | 5.5 | 4.9 | 4.5 | 4.0 | |
| 2 | 14.2 | 13.3 | 12.5 | 11.8 | 11.2 | 10.7 | 9.7 | 8.3 | 6.9 | 5.9 | 5.2 | 4.6 | 4.1 | 3.8 | 3.3 | |
| 3 | 14.0 | 12.9 | 12.0 | 11.3 | 10.6 | 10.0 | 9.0 | 7.8 | 6.5 | 5.5 | 4.8 | 4.3 | 3.9 | 3.5 | 3.1 | |
| 4 | 13.8 | 12.6 | 11.7 | 10.8 | 10.1 | 9.5 | 8.4 | 7.5 | 6.2 | 5.4 | 4.7 | 4.2 | 3.7 | 3.4 | 3.0 | 150 |
| 5 | 13.6 | 12.4 | 11.4 | 10.5 | 9.7 | 9.1 | 8.0 | 7.2 | 6.1 | 5.2 | 4.6 | 4.1 | 3.7 | - | - | |
| 10 | 13.1 | 11.5 | 10.3 | 9.3 | 8.5 | 7.8 | 6.7 | 5.9 | - | - | - | - | - | - | - | |
| 15 | 12.7 | 10.9 | 9.6 | 8.6 | 7.7 | 7.0 | - | - | - | - | - | - | - | - | - | |
| 30 | 11.9 | 9.8 | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 14.2 | 13.3 | 12.5 | 11.8 | 11.2 | 10.7 | 8.2 | 6.5 | 5.5 | 4.7 | 4.1 | 3.6 | 3.3 | 3.0 | 2.6 | |
| 2 | 13.8 | 12.6 | 11.7 | 10.8 | 9.9 | 8.2 | 6.2 | 4.9 | 4.1 | 3.5 | 3.1 | 2.7 | 2.5 | 2.2 | 2.0 | |
| 3 | 13.5 | 12.2 | 11.1 | 10.2 | 8.8 | 7.4 | 5.5 | 4.4 | 3.7 | 3.2 | 2.8 | 2.5 | 2.2 | 2.0 | 1.8 | |
| 4 | 13.3 | 11.8 | 10.7 | 9.7 | 8.3 | 6.9 | 5.2 | 4.1 | 3.5 | 3.0 | 2.6 | 2.3 | 2.1 | 1.9 | 1.7 | 300 |
| 5 | 13.1 | 11.5 | 10.3 | 9.3 | 8.0 | 6.6 | 5.0 | 4.0 | 3.3 | 2.8 | 2.5 | 2.2 | 2.0 | - | - | |
| 10 | 12.4 | 10.5 | 9.1 | 8.0 | 7.2 | 6.1 | 4.6 | 3.7 | - | - | - | - | - | - | - | |
| 15 | 11.9 | 9.8 | 8.3 | 7.3 | 6.4 | 5.8 | - | - | - | - | - | - | - | - | - | |
| 30 | 10.9 | 8.6 | 7.0 | - | - | - | - | - | - | - | - | - | - | - | - | |

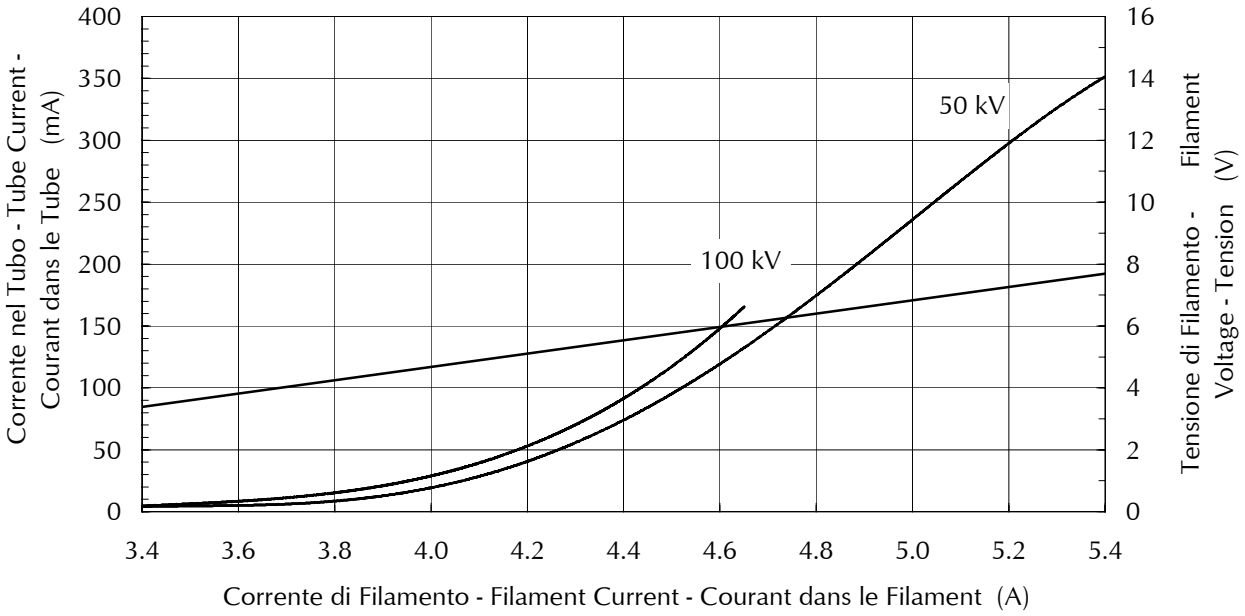
## Abaco per carichi in serie - Serial load rating - Abaque de charges successives

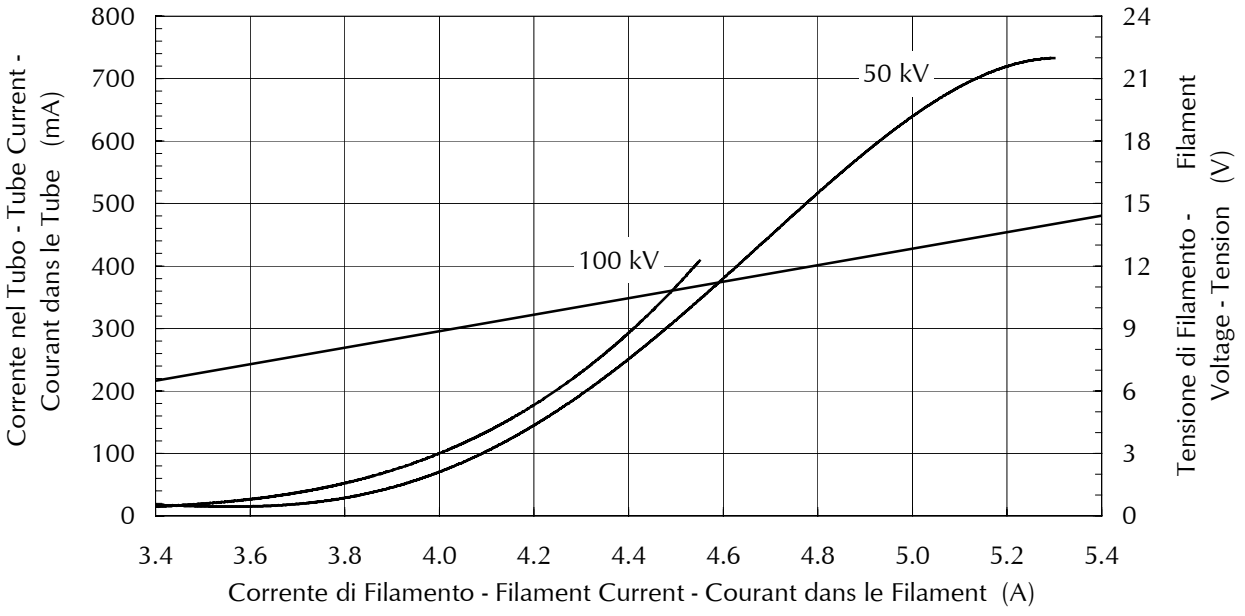
### ■ 1.2 - 3 Ø - 50 / 60 Hz

**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 | 39.0 | 39.0 | 37.8 | 37.0 | 36.4 | 35.9 | 35.1 | 34.4 | 33.8 | 33.4 | 32.9 | 32.5 | 31.8 | 31.2 | 30.3 | |
| 2 | 38.6 | 38.6 | 37.8 | 37.0 | 36.4 | 35.9 | 34.9 | 33.9 | 32.9 | 31.9 | 31.0 | 30.2 | 29.4 | 28.6 | 27.5 | |
| 3 | 38.3 | 38.3 | 37.5 | 36.7 | 36.0 | 35.3 | 34.0 | 32.7 | 31.6 | 30.5 | 29.5 | 28.6 | 27.7 | 26.9 | 25.8 | |
| 4 | 38.0 | 38.0 | 37.1 | 36.3 | 35.5 | 34.7 | 33.2 | 31.9 | 30.6 | 29.5 | 28.4 | 27.4 | 26.5 | 25.6 | 24.4 | 5 |
| 5 | 37.8 | 37.8 | 36.8 | 35.9 | 35.0 | 34.2 | 32.6 | 31.1 | 29.8 | 28.6 | 27.5 | 26.5 | 25.5 | - | - | |
| 10 | 37.8 | 37.0 | 35.7 | 34.5 | 33.4 | 32.3 | 30.3 | 28.6 | - | - | - | - | - | - | - | |
| 15 | 37.8 | 36.5 | 34.9 | 33.5 | 32.2 | 31.0 | - | - | - | - | - | - | - | - | - | |
| 30 | 37.5 | 35.3 | 33.4 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 38.6 | 38.6 | 37.8 | 37.0 | 36.4 | 35.9 | 34.9 | 33.8 | 32.8 | 31.9 | 31.0 | 30.1 | 29.3 | 28.6 | 27.5 | |
| 2 | 38.0 | 38.0 | 37.1 | 36.3 | 35.4 | 34.7 | 33.2 | 31.8 | 30.6 | 29.4 | 28.4 | 27.4 | 26.4 | 25.6 | 24.4 | |
| 3 | 37.8 | 37.6 | 36.5 | 35.5 | 34.6 | 33.7 | 32.0 | 30.4 | 29.1 | 27.8 | 26.6 | 25.6 | 24.6 | 23.7 | 22.4 | |
| 4 | 37.8 | 37.3 | 36.1 | 34.9 | 33.9 | 32.9 | 31.0 | 29.4 | 27.9 | 26.5 | 25.3 | 24.2 | 23.2 | 22.3 | 21.0 | 10 |
| 5 | 37.8 | 37.0 | 35.7 | 34.4 | 33.3 | 32.2 | 30.2 | 28.5 | 26.9 | 25.5 | 24.3 | 23.2 | 22.1 | - | - | |
| 10 | 37.8 | 35.9 | 34.2 | 32.6 | 31.1 | 29.8 | 27.5 | 25.5 | - | - | - | - | - | - | - | |
| 15 | 37.4 | 35.1 | 33.1 | 31.3 | 29.7 | 28.3 | - | - | - | - | - | - | - | - | - | |
| 30 | 36.5 | 33.5 | 31.0 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 38.0 | 38.0 | 37.1 | 36.3 | 35.4 | 34.7 | 33.2 | 31.8 | 30.6 | 29.4 | 28.3 | 27.4 | 26.4 | 24.3 | 21.4 | |
| 2 | 37.8 | 37.3 | 36.1 | 34.9 | 33.8 | 32.8 | 31.0 | 29.3 | 27.9 | 26.5 | 25.3 | 24.2 | 23.2 | 22.2 | 20.7 | |
| 3 | 37.8 | 36.7 | 35.3 | 34.0 | 32.7 | 31.6 | 29.5 | 27.7 | 26.1 | 24.7 | 23.4 | 22.2 | 21.2 | 20.2 | 19.0 | |
| 4 | 37.8 | 36.3 | 34.7 | 33.2 | 31.8 | 30.6 | 28.4 | 26.4 | 24.8 | 23.3 | 22.0 | 20.8 | 19.8 | 18.8 | 17.5 | 20 |
| 5 | 37.8 | 35.9 | 34.1 | 32.5 | 31.1 | 29.8 | 27.4 | 25.4 | 23.7 | 22.2 | 20.9 | 19.7 | 18.6 | - | - | |
| 10 | 37.0 | 34.4 | 32.2 | 30.2 | 28.5 | 26.9 | 24.3 | 22.1 | - | - | - | - | - | - | - | |
| 15 | 36.4 | 33.4 | 30.9 | 28.7 | 26.8 | 25.1 | - | - | - | - | - | - | - | - | - | |
| 30 | 35.1 | 31.3 | 28.3 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 37.8 | 37.3 | 36.1 | 34.9 | 33.8 | 32.8 | 31.0 | 28.3 | 23.6 | 20.2 | 17.7 | 15.7 | 14.1 | 12.9 | 11.3 | |
| 2 | 37.8 | 36.3 | 34.7 | 33.2 | 31.8 | 30.6 | 28.3 | 26.4 | 22.2 | 19.1 | 16.7 | 14.8 | 13.3 | 12.1 | 10.7 | |
| 3 | 37.6 | 35.5 | 33.6 | 32.0 | 30.4 | 29.0 | 26.6 | 24.6 | 21.8 | 18.7 | 16.4 | 14.5 | 13.1 | 11.9 | 10.5 | |
| 4 | 37.3 | 34.9 | 32.8 | 31.0 | 29.3 | 27.9 | 25.3 | 23.2 | 21.4 | 18.5 | 16.2 | 14.4 | 12.9 | 11.8 | 10.4 | 40 |
| 5 | 37.0 | 34.4 | 32.2 | 30.2 | 28.5 | 26.9 | 24.3 | 22.1 | 20.3 | 18.4 | 16.1 | 14.3 | 12.9 | - | - | |
| 10 | 35.9 | 32.5 | 29.8 | 27.4 | 25.4 | 23.7 | 20.9 | 18.6 | - | - | - | - | - | - | - | |
| 15 | 35.1 | 31.2 | 28.2 | 25.6 | 23.5 | 21.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 33.4 | 28.7 | 25.1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 37.8 | 36.7 | 35.3 | 33.9 | 32.7 | 31.6 | 24.9 | 19.9 | 16.6 | 14.2 | 12.5 | 11.1 | 10.0 | 9.1 | 8.0 | |
| 2 | 37.6 | 35.5 | 33.6 | 32.0 | 30.4 | 29.0 | 22.9 | 18.3 | 15.3 | 13.1 | 11.5 | 10.2 | 9.2 | 8.3 | 7.3 | |
| 3 | 37.1 | 34.7 | 32.5 | 30.6 | 28.9 | 27.4 | 22.2 | 17.8 | 14.8 | 12.7 | 11.1 | 9.9 | 8.9 | 8.1 | 7.1 | |
| 4 | 36.7 | 34.0 | 31.6 | 29.5 | 27.7 | 26.1 | 21.9 | 17.5 | 14.6 | 12.5 | 11.0 | 9.7 | 8.8 | 8.0 | 7.0 | 60 |
| 5 | 36.4 | 33.4 | 30.8 | 28.6 | 26.7 | 25.1 | 21.7 | 17.4 | 14.5 | 12.4 | 10.9 | 9.7 | 8.7 | - | - | |
| 10 | 35.1 | 31.2 | 28.1 | 25.6 | 23.5 | 21.7 | 18.8 | 16.6 | - | - | - | - | - | - | - | |
| 15 | 34.1 | 29.8 | 26.4 | 23.7 | 21.5 | 19.7 | - | - | - | - | - | - | - | - | - | |
| 30 | 32.2 | 26.9 | 23.2 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 37.8 | 36.3 | 34.6 | 33.2 | 31.5 | 26.2 | 19.7 | 15.7 | 13.1 | 11.2 | 9.8 | 8.7 | 7.9 | 7.2 | 6.3 | |
| 2 | 37.3 | 34.9 | 32.8 | 31.0 | 28.3 | 23.6 | 17.7 | 14.1 | 11.8 | 10.1 | 8.8 | 7.9 | 7.1 | 6.4 | 5.7 | |
| 3 | 36.7 | 33.9 | 31.6 | 29.5 | 27.2 | 22.7 | 17.0 | 13.6 | 11.3 | 9.7 | 8.5 | 7.6 | 6.8 | 6.2 | 5.4 | |
| 4 | 36.3 | 33.2 | 30.6 | 28.3 | 26.4 | 22.2 | 16.7 | 13.3 | 11.1 | 9.5 | 8.3 | 7.4 | 6.7 | 6.1 | 5.3 | 80 |
| 5 | 35.9 | 32.5 | 29.7 | 27.4 | 25.4 | 22.0 | 16.5 | 13.2 | 11.0 | 9.4 | 8.2 | 7.3 | 6.6 | - | - | |
| 10 | 34.4 | 30.2 | 26.9 | 24.3 | 22.1 | 20.3 | 16.1 | 12.9 | - | - | - | - | - | - | - | |
| 15 | 33.4 | 28.6 | 25.1 | 22.3 | 20.1 | 18.3 | - | - | - | - | - | - | - | - | - | |
| 30 | 31.2 | 25.6 | 21.7 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 37.8 | 35.9 | 34.1 | 32.5 | 26.5 | 22.1 | 16.5 | 13.2 | 11.0 | 9.5 | 8.3 | 7.4 | 6.6 | 6.0 | 5.3 | |
| 2 | 37.0 | 34.4 | 32.2 | 29.1 | 23.3 | 19.4 | 14.5 | 11.6 | 9.7 | 8.3 | 7.3 | 6.5 | 5.8 | 5.3 | 4.7 | |
| 3 | 36.4 | 33.4 | 30.8 | 27.8 | 22.2 | 18.5 | 13.9 | 11.1 | 9.3 | 7.9 | 6.9 | 6.2 | 5.6 | 5.0 | 4.4 | |
| 4 | 35.9 | 32.5 | 29.7 | 27.1 | 21.7 | 18.1 | 13.5 | 10.8 | 9.0 | 7.7 | 6.8 | 6.0 | 5.4 | 4.9 | 4.3 | 100 |
| 5 | 35.4 | 31.8 | 28.9 | 26.4 | 21.4 | 17.8 | 13.3 | 10.7 | 8.9 | 7.6 | 6.7 | 5.9 | 5.3 | - | - | |
| 10 | 33.8 | 29.3 | 25.9 | 23.2 | 20.7 | 17.3 | 12.9 | 10.4 | - | - | - | - | - | - | - | |
| 15 | 32.7 | 27.7 | 24.0 | 21.2 | 19.0 | 17.1 | - | - | - | - | - | - | - | - | - | |
| 30 | 30.4 | 24.6 | 20.6 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 37.4 | 35.1 | 33.0 | 24.7 | 19.8 | 16.5 | 12.4 | 9.9 | 8.2 | 7.1 | 6.2 | 5.5 | 4.9 | 4.5 | 4.0 | |
| 2 | 36.4 | 33.4 | 27.6 | 20.7 | 16.6 | 13.8 | 10.4 | 8.3 | 6.9 | 5.9 | 5.2 | 4.6 | 4.1 | 3.8 | 3.3 | |
| 3 | 35.6 | 32.2 | 25.9 | 19.4 | 15.5 | 12.9 | 9.7 | 7.8 | 6.5 | 5.5 | 4.8 | 4.3 | 3.9 | 3.5 | 3.1 | |
| 4 | 35.1 | 31.2 | 25.0 | 18.7 | 15.0 | 12.5 | 9.4 | 7.5 | 6.2 | 5.4 | 4.7 | 4.2 | 3.7 | 3.4 | 3.0 | 150 |
| 5 | 34.6 | 30.4 | 24.4 | 18.3 | 14.7 | 12.2 | 9.2 | 7.3 | 6.1 | 5.2 | 4.6 | 4.1 | 3.7 | - | - | |
| 10 | 32.7 | 27.7 | 23.4 | 17.5 | 14.0 | 11.7 | 8.8 | 7.0 | - | - | - | - | - | - | - | |
| 15 | 31.4 | 25.9 | 22.0 | 17.3 | 13.8 | 11.5 | - | - | - | - | - | - | - | - | - | |
| 30 | 28.9 | 22.6 | 18.6 | - | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | 36.4 | 32.7 | 21.8 | 16.4 | 13.1 | 10.9 | 8.2 | 6.5 | 5.5 | 4.7 | 4.1 | 3.6 | 3.3 | 3.0 | 2.6 | |
| 2 | 35.1 | 24.7 | 16.5 | 12.4 | 9.9 | 8.2 | 6.2 | 4.9 | 4.1 | 3.5 | 3.1 | 2.7 | 2.5 | 2.2 | 2.0 | |
| 3 | 34.1 | 22.1 | 14.7 | 11.0 | 8.8 | 7.4 | 5.5 | 4.4 | 3.7 | 3.2 | 2.8 | 2.5 | 2.2 | 2.0 | 1.8 | |
| 4 | 33.4 | 20.7 | 13.8 | 10.4 | 8.3 | 6.9 | 5.2 | 4.1 | 3.5 | 3.0 | 2.6 | 2.3 | 2.1 | 1.9 | 1.7 | 300 |
| 5 | 32.7 | 19.9 | 13.3 | 10.0 | 8.0 | 6.6 | 5.0 | 4.0 | 3.3 | 2.8 | 2.5 | 2.2 | 2.0 | - | - | |
| 10 | 30.4 | 18.3 | 12.2 | 9.2 | 7.3 | 6.1 | 4.6 | 3.7 | - | - | - | - | - | - | - | |
| 15 | 28.9 | 17.8 | 11.9 | 8.9 | 7.1 | 5.9 | - | - | - | - | - | - | - | - | - | |
| 30 | 25.9 | 17.3 | 11.5 | - | - | - | - | - | - | - | - | - | - | - | - | |

## 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)