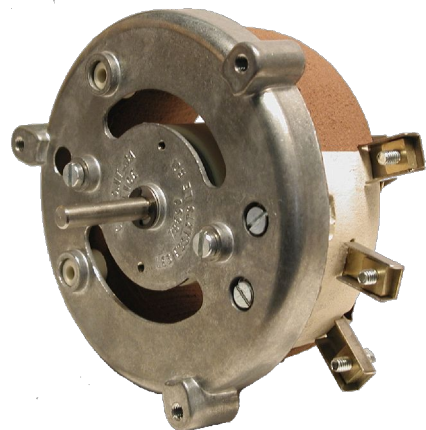
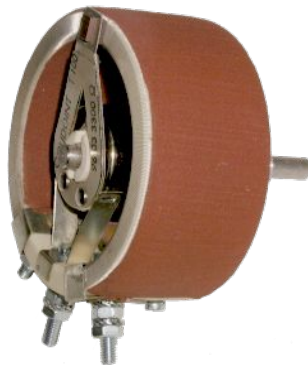
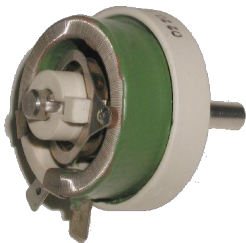




Rotary Rheostats



Hardware Reference

Document 1101066 - Edition June 2009

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1 Main Features

- ❖ **Series:** Rotary rheostats come in 6 standard models, each model with a different power rating : T16 (16 W), T25 (25 W), T50 (50 W), T100 (100 W), T150 (150 W), T300 (300 W).
Higher power ratings are achieved with **tandem mounted units**. These units may be used to replace the obsolete models T500 (500 W) and T1000 (1000 W).
- ❖ **Design:** Rotary rheostats are constructed with:
 - a ceramic core, specific to each model
 - a wirewound resistor:
 - with a nichrome or copper-nickel wire for a low TCR (Temperature Coefficient of electrical Resistance) guaranteeing very little variation of the ohmic value versus temperature
 - cement coated, silicon coated or vitreous enamelled to secure the winding and improve thermal exchanges
 - a rotating wiper (one by module, synchronized in gang assemblies) with an optimized mechanism providing a smooth rotation and a high resistance to wear (durability)
 - threaded terminal connectors
- ❖ **Ohmic values:**
 - **each rheostat is delivered at the required ohmic value**, in the range of feasible values for the model
- ❖ **Parameters and optional features** depending on each model :
 - type of coating on the winding: cement , silicon or vitreous enamel
 - optional mechanical stops
 - optional rotary knob and scale
 - optional intermediary taps
 - optional final disconnection
 - an optional **graded winding** may be achieved for covering a larger current range (*shown here before coating*):



This document presents the main technical characteristics of our different rotary rheostat models and some examples of special designs.

You can use the technical data to select a model, but you can also describe to us what you need : we would be pleased to help you choose or define the most appropriate solution to meet your requirements.

2 Product Selection Guide

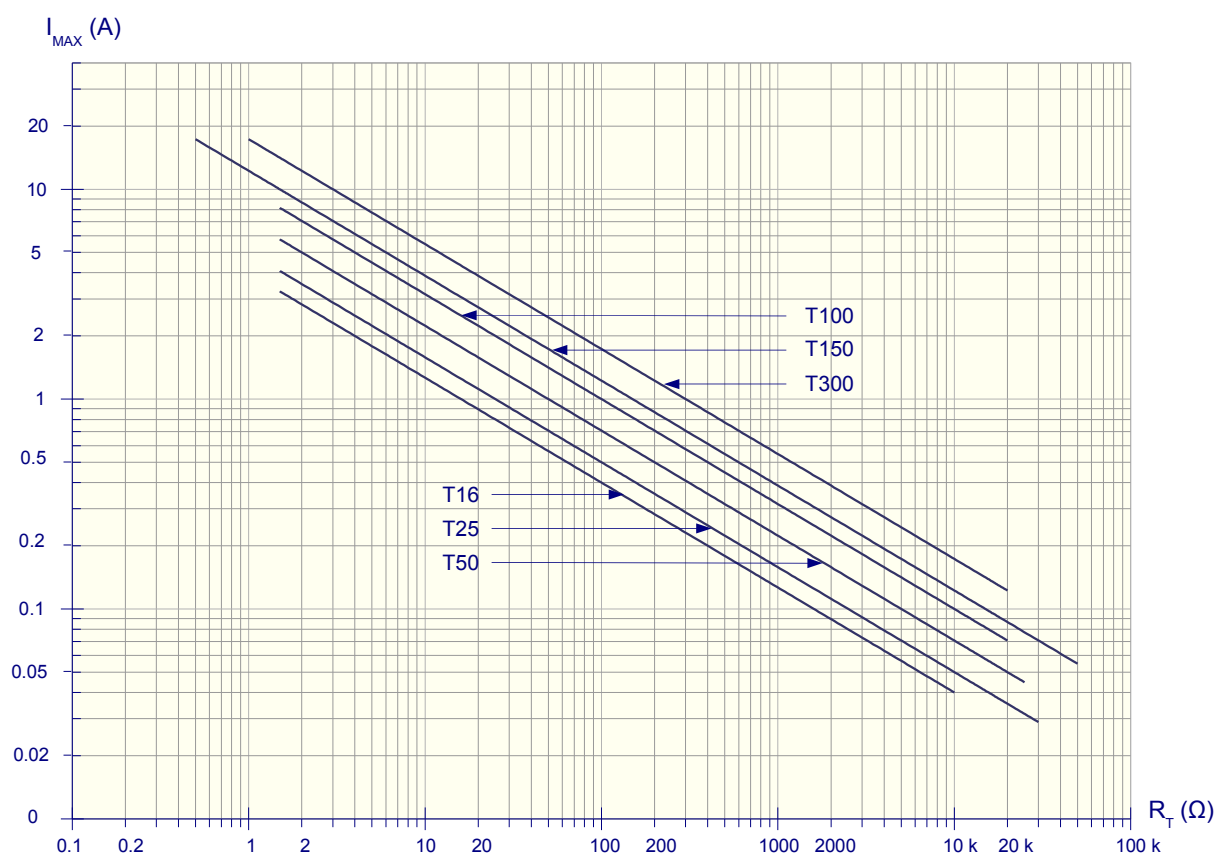
2.1 Product Selection Table

Maximum power rating	16 W	25 W	50 W	100 W	150 W	300 W
Model	T16	T25	T50	T100	T150	T300
<i>Feasible total ohmic values</i>	<i>1.5 Ω to 10 kΩ</i>	<i>1.5 Ω to 30 kΩ</i>	<i>1.5 Ω to 25 kΩ</i>	<i>1.8 Ω to 20 kΩ</i>	<i>0.5 Ω to 50 kΩ</i>	<i>1 Ω to 20 kΩ</i>

The product identification code takes into account its particular specifications (model, type of coating, number of modules, rotary button and / or scale, ohmic value, etc.) according to the description given on page 11.

2.2 Maximum Current

- Maximum current:** The current in each turn of the winding shall not exceed the I_{MAX} value at which the rheostat dissipates its maximum power level P_{MAX} , otherwise the rheostat could be damaged. I_{MAX} depends on the rheostat's total resistor capabilities according to the formula $P_{MAX} = R_T \times I_{MAX}^2$. The diagrams below show the curves of the maximum current versus the total ohmic value for each rotary rheostat model.



Precautions of use

Precautions must be taken so that the current does not exceed the maximum allowed value, particularly when the rheostat is used as a variable load: the low ohmic value at the end of the wiper travel may lead to high currents. This is usually done with a serial **current limiting resistor**, which can be either an external resistor or a part of the resistance winding which is kept out of the wiper travel by a mechanical stop.

3 Base Models

3.1 Model T16

» Feasible (total) ohmic values: 1.5 Ω to 10 kΩ

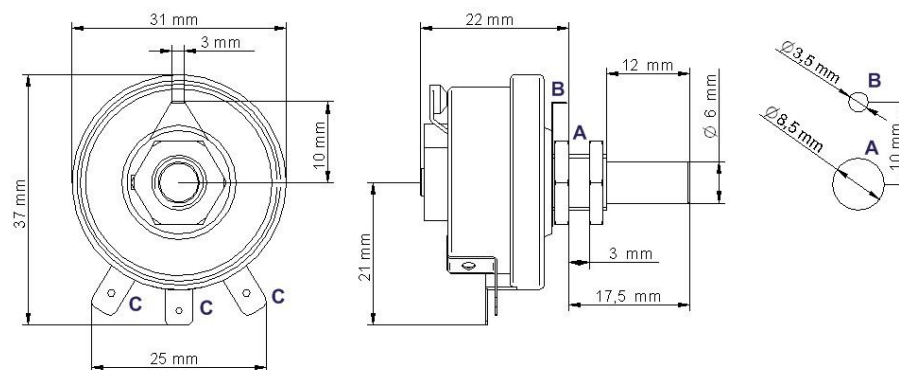
» Features:

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	16
Testing voltage	V	1,500
Maximum working voltage	V	500
Rotation torque	N.m	2.10^{-2} to 5.10^{-2}
Electrical travel	degree	280
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 10\%$
Average weight*	g	40



*: Weight value depends on the type of the wire and then on the ohmic value of the rheostat.

» Dimensions and panel mounting:



- A:** Mounting by 8 mm diameter threaded collar
- B:** Anti-rotation pin
- C:** Terminals: 3 stainless steel 4 mm wide Faston connectors

» Definition:

- Ohmic value
 - Coating: silicon or vitreous enamel
 - Rotary knob (with or without)
 - Scale (with or without)
- See identification code according to the product definition on page 11
(model shown above: silicon coated without rotary knob and scale – Reference T16S1XX100R)

» Optional features:

- Intermediary tap(s)
- Non-resistive winding bank

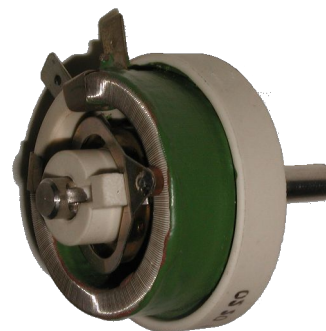
3.2 Model T25

» Feasible (total) ohmic values: 1.5 Ω to 30 k Ω

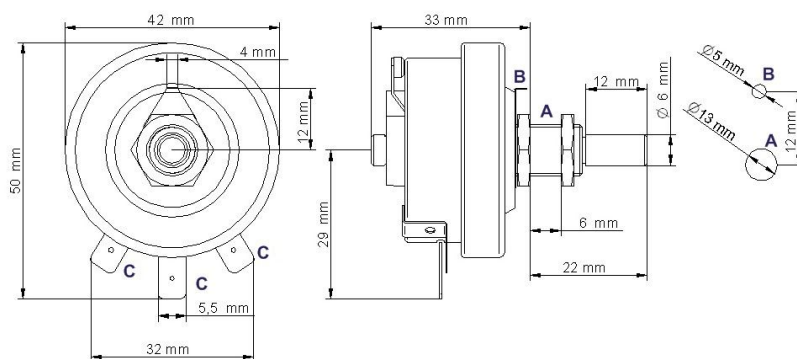
» Features:

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	25
Testing voltage	V	2,000
Maximum working voltage	V	500
Rotation torque	N.m	3.10^{-2} to 8.10^{-2}
Electrical travel	degree	280
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 10\%$
Average weight*	g	75

*: Weight value depends on the type of the wire and the ohmic value of the rheostat.



» Dimensions and panel mounting:



A: Mounting by 10 mm diameter threaded collar

B: Anti-rotation pin

C: Terminals : 3 stainless steel 5.5 mm wide Faston connectors

» Definition:

- Ohmic value
- Coating : silicon or vitreous enamel
- Rotary knob (with or without)
- Scale (with or without)

→ See identification code according to the product definition on page 11
(model shown above: vitreous enameled without rotary knob and scale – Reference T25V1XX220R)

» Optional features:

- Intermediary tap(s)
- Final disconnection
- Non-resistive winding bank

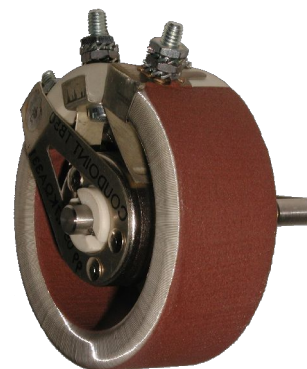
3.3 Model T50

» Feasible (total) ohmic values: 1.5 Ω to 25 kΩ

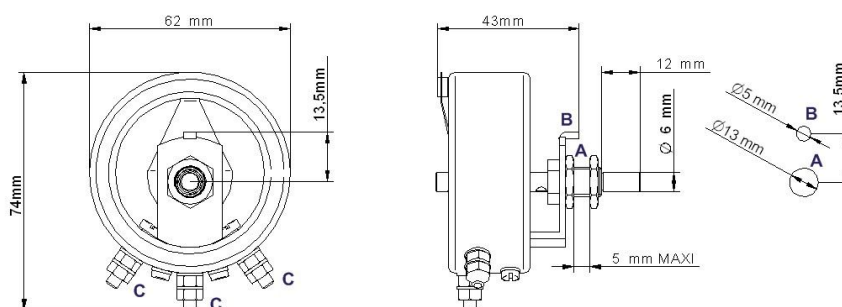
» Features:

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	50
Testing voltage	V	2,000
Maximum working voltage	V	500
Rotation torque	N.m	$5 \cdot 10^{-2}$ to $10 \cdot 10^{-2}$
Electrical travel	degree	275
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 10\%$
Average weight*	g	200

*: Weight value depends on the type of the wire and then on the ohmic value of the rheostat.



» Dimensions and panel mounting:



- A:** Mounting by 10 mm diameter threaded collar
- B:** Anti-rotation pin
- C:** Three 4 mm diameter threaded terminal pins

» Definition:

- Ohmic value
 - Coating : cement, silicon or vitreous enamel
 - Rotary knob (with or without)
 - Scale (with or without)
- See identification code according to the product definition page 11
(model shown above: cement coated without rotary knob and scale – Reference T50C1XX4700R)

» Optional features:

- Intermediary tap(s)
- Graded winding
- Final disconnection
- Non-resistive winding bank

3.4 Model T100

» Feasible (total) ohmic values : 1.8 Ω to 20 k Ω

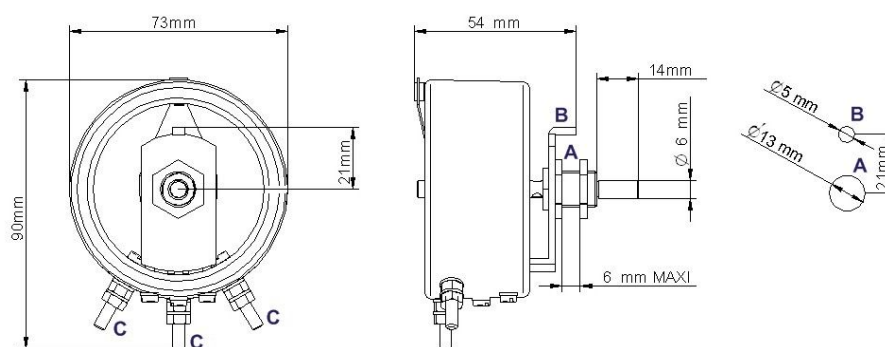
» Features :

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	100
Testing voltage	V	2,000
Maximum working voltage	V	500
Rotation torque	N.m	8.10^{-2} to 15.10^{-2}
Electrical travel	degree	280
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 10\%$
Average weight*	g	300

*: Weight value depends on the type of the wire and then on the ohmic value of the rheostat.



» Dimensions and panel mounting:



- A: Mounting by threaded collar \varnothing M10
- B: Anti rotation pin
- C: 3 threaded terminal pins \varnothing M4

» Definition:

- Ohmic value
 - Coating: cement, silicon or vitreous enamel
 - Rotary knob (with or without)
 - Scale (with or without)
- See identification code according to the product definition on page 11
(model shown above: cement coated without rotary knob and scale – Reference T100C1XX3300R)

» Optional features:

- Intermediary tap(s)
- Graded winding
- Final disconnection
- Non-resistive winding bank

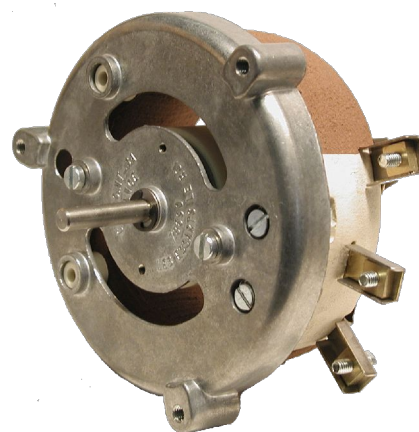
3.5 Model T150

» Feasible (total) ohmic values: **0.5 Ω to 50 kΩ**

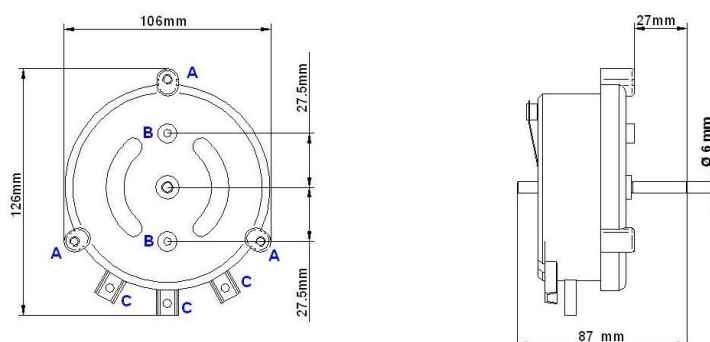
» Features:

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	150
Testing voltage	V	2,000
Maximum working voltage	V	500
Rotation torque	N.m	$10 \cdot 10^{-2}$ to $25 \cdot 10^{-2}$
Electrical travel	degree	280
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 5\%$
Average weight*	g	550

*: Weight value depends on the type of the wire and the ohmic value of the rheostat.



» Dimensions and panel mounting:



- A:** Rheostat mounting by three 6 mm screw holes spaced 120° apart on a $\varnothing 110$ mm circle
- B:** Scale mounting by two 4 mm diameter screw holes with an interaxial distance of 55 mm
- C:** Three 4.5 mm diameter threaded terminal pins

» Definition:

- Ohmic value
- Coating : cement, silicon or vitreous enamel
- Rotary knob (with or without)
- Scale (with or without)

→ See identification code according to the product definition on page 11

(model shown above: cement coated without rotary knob and scale – Reference T150C1XX60R)

» Optional features :

- Mechanical stop
- Intermediary tap(s)
- Graded winding
- Final disconnection
- Non-resistive winding bank

3.6 Model T300

» Feasible (total) ohmic values: 1 Ω to 20 kΩ

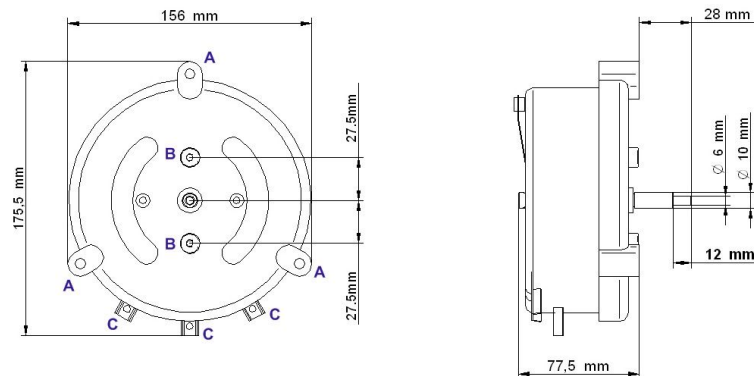
» Features:

Features	Units	Values
Power rating for $\Delta T = 300^{\circ}\text{C}$	W	300
Testing voltage	V	2,500
Maximum working voltage	V	750
Rotation torque	N.m	$15 \cdot 10^{-2}$ to $50 \cdot 10^{-2}$
Electrical travel	degree	285
Mechanical travel	degree	300
Tolerance on ohmic value	-	$\pm 5\%$
Average weight*	g	1,700

*: Weight value depends on the type of the wire and then on the ohmic value of the rheostat.



» Dimensions and panel mounting:



- A:** Rheostat mounting by three 6 mm screw holes spaced 120° apart on a $\varnothing 162$ mm circle
- B:** Scale mounting by two 4 mm diameter screw holes with an interaxial distance of 55 mm
- C:** Three 4.5 mm diameter threaded terminal pins

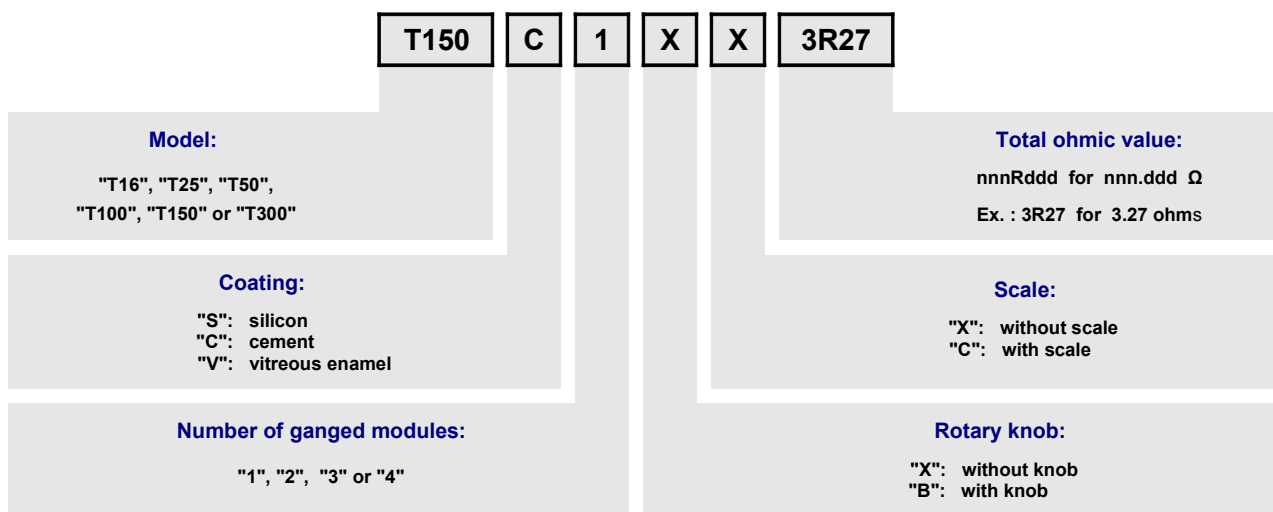
» Definition:

- Ohmic value
 - Coating: cement, silicon or vitreous enamel
 - Rotary knob (with or without)
 - Scale (with or without)
- See identification code according to the product definition on page 11
(model shown above: cement coated without rotary knob and scale – Reference *T300C1XX10R*)

» Optional features:

- Mechanical stop
- Intermediary tap(s)
- Graded winding
- Final disconnection
- Non-resistive winding bank

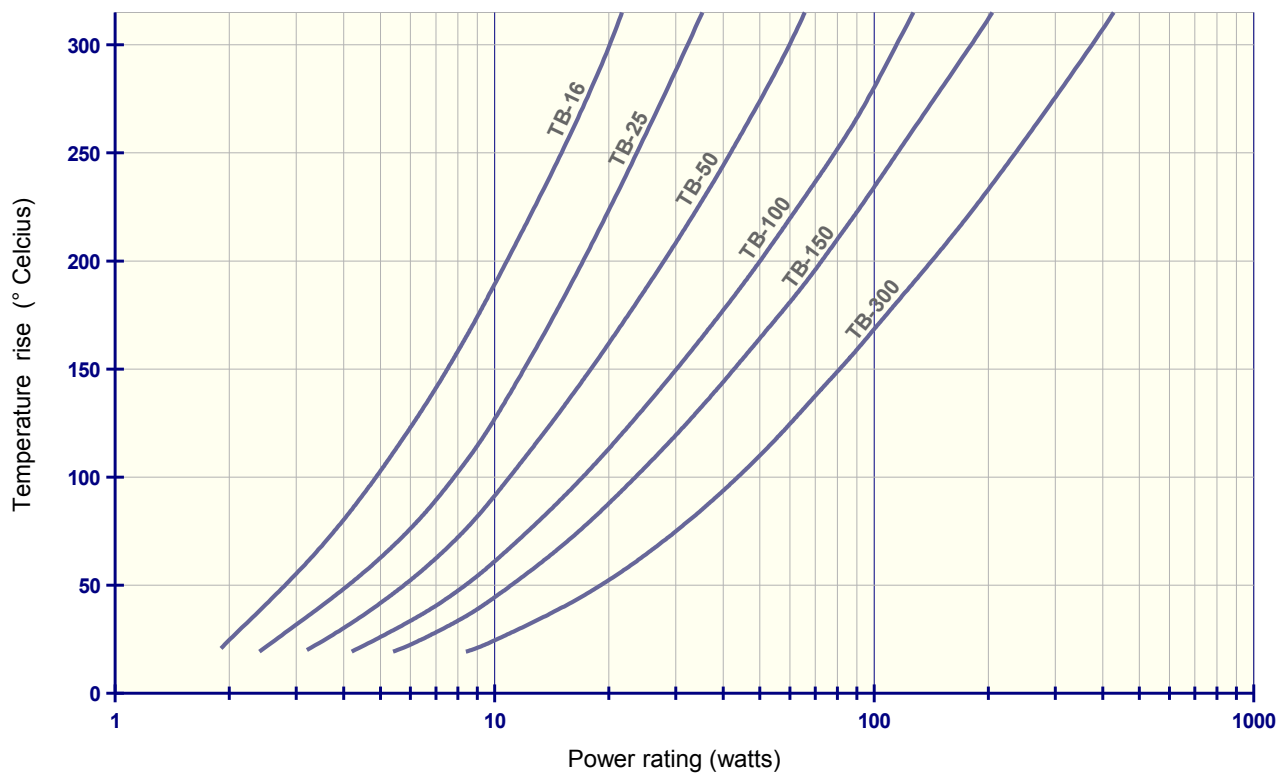
4 Product Identification Code



This identification code is followed:

- when ordering, from the list of the optional features which are not described in the code,
- internally, as a special code if the product cannot be considered as a standard model.

5 Temperature Rise Curves



6 Examples of Designs

6.1 900-watts Rotary Rheostat

Triple T300-rheostat.



Shown model : T300C3XX200R

6.2 600-watts Rotary Rheostat

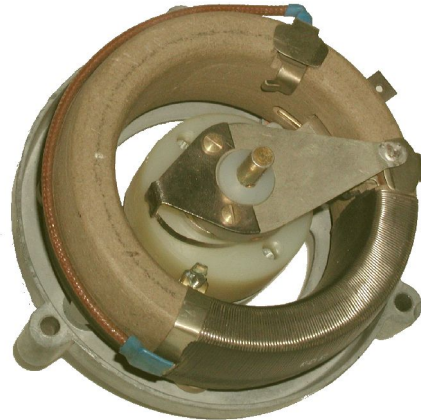
Dual T300-rheostat with rotary knob and scale.



Shown model : T300C2BC200R

6.3 Replacement Rheostat

Rotary T150-rheostat, with reduced electrical angle matching the definition of the part to be replaced.



Shown model : T150S1XX60RA453

6.4 Rheostat Box

T300 rotary rheostat in an IP20 housing .



Shown model : T300C1XX22RP2AA409

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