FOGLIO DATI
DATA SHEET

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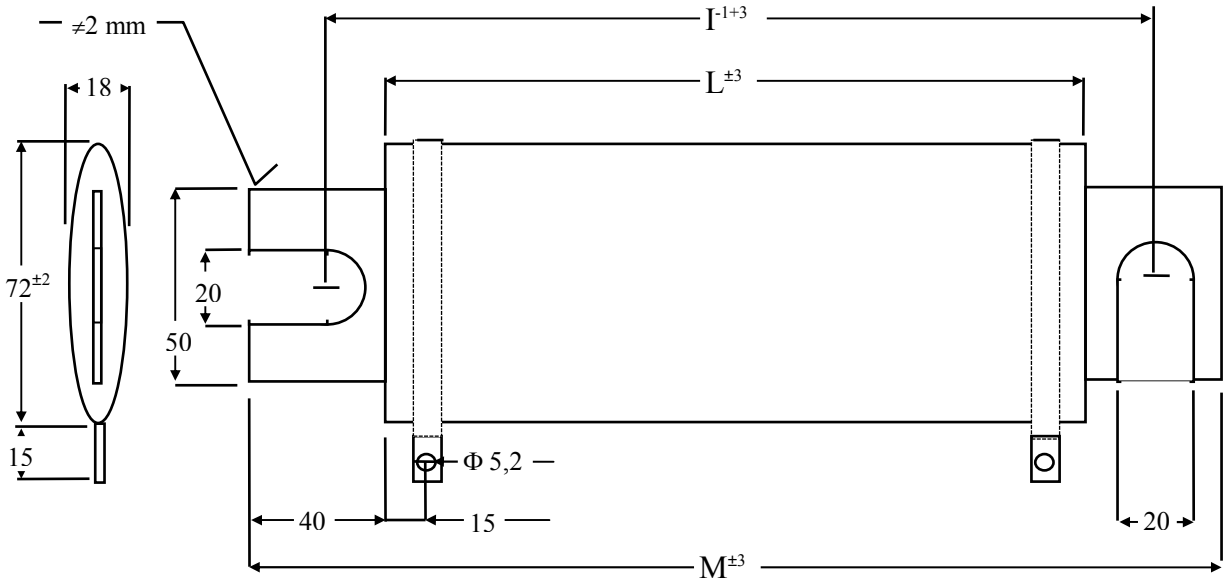
ELLIPTIC CEMENTED RESISTOR STYLE SCE



Dimensions	SCE 70.240	SCE 70.300	SCE 70.360	SCE 70.400	SCE 70.500
I mm	280	340	400	440	540
L mm	240	300	360	400	500
M mm	320	380	440	480	580
Weight≅ g	575	700	830	910	1120

1. FOREWORD

SCE resistors are cemented products designed for bank assembly in order to obtain high power resistance groups suitable to support strong overloads, heavy impulses duty cycle, and continuous load of tens kW.

Thanks to their special bracket system, these resistors can be assembled, by means of insulated spacers in groups fit to stand a dielectric strength higher then 12.000 Vrms without additional insulators (see drawings of § 5).

The protection coating is completely inorganic and don't shows characteristics changes within 800 °C.

Such characteristics make these resistors very valuable where high reliability is required also during heavy operating conditions as:

- braking resistors -snubber resistors -earthing resistors
- limiting resistors for capacity charge -inverter traction

The next paragraphs will show, besides the electrical characteristics, also the mounting possibility, which gives a great application versatility to these resistors.

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2. ELECTRICAL CHARACTERISTICS

Characteristics	SCE 70.240	SCE 70.300	SCE 70.360	SCE 70.400	SCE 70.500
Power rating (Pr) W	500	750	900	1050	1300
Temperature increase @ Pr	365°C	375°C	375°C	380°C	380°C
Absolute maximum rating W	700	850	1050	1250	1600
Absorbed energy @ ΔT=250°C J	40.000	50.000	60.000	70.000	90.000
Absorbed energy in 5" overload J	25.000	35.000	45.000	50.000	65.000
Absorbed energy in time ≤0,2" J	see graph				
Resistance range Ω	2 ÷10 k	2 ÷18 k	3 ÷27 k	4 ÷36 k	5 ÷47 k
Resistance tolerance	±5%				
Inductance @ 1.000 Hz μH	60÷600	70÷750	80÷900	90÷1000	100÷1200
Parasitic capacity (1÷100 kHz) pF	100	125	150	170	200
Limit element voltage V	2.500	3.000	3.500	4.000	5.000
Insulation resistance @ 1 kVDC	≥1000 MΩ(between termination and bracket)				
Dielectric strength @ 50 Hz for 1'	3.500Vrsm. (between termination and bracket)				

3. EXPLANATORY NOTES

3.1 Power rating. Power rating is referred to a cutting assembled resistor, with downwards terminal, in an environment where air can free circulate.
As per § 5.2 the assembled resistors shall be derated in order to compensate the temperature rise due to the adjacent resistors.

3.2 Temperature increase @ Pr. Temperature on resistor surface is not homogenous, and the central part is more hot. The central temperature is tat indicated.

3.3 Absolute maximum rating. It represents the maximum continuous load which can be applied without catastrophic damages.

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3.5 Absorbed energy @ ΔT=250°C It represents the quantity of energy stored in the resistor with a temperature rise of 250 °C and it points up a index of thermal capacity of resistor.

3.6 Absorbed energy in 5" overload It gives a behaviours index of resistor in the short term overload. For low values (< 10 Ω for SCE 70.240 and < 25 Ω for SCE 70.500) these data can be increased of 25%.

3.7 Absorbed energy in time ≤0,2" During a short impulse (from 0 to 0,2'') the energy tolerated by resistor is the one absorbed by thermal capacity of resistor wire. The phenomenon endurance is too short to transmit a significant quantity of heat from the wire to what surrounds it. Therefore the quantity of energy absorbed by resistor results from the simple expression

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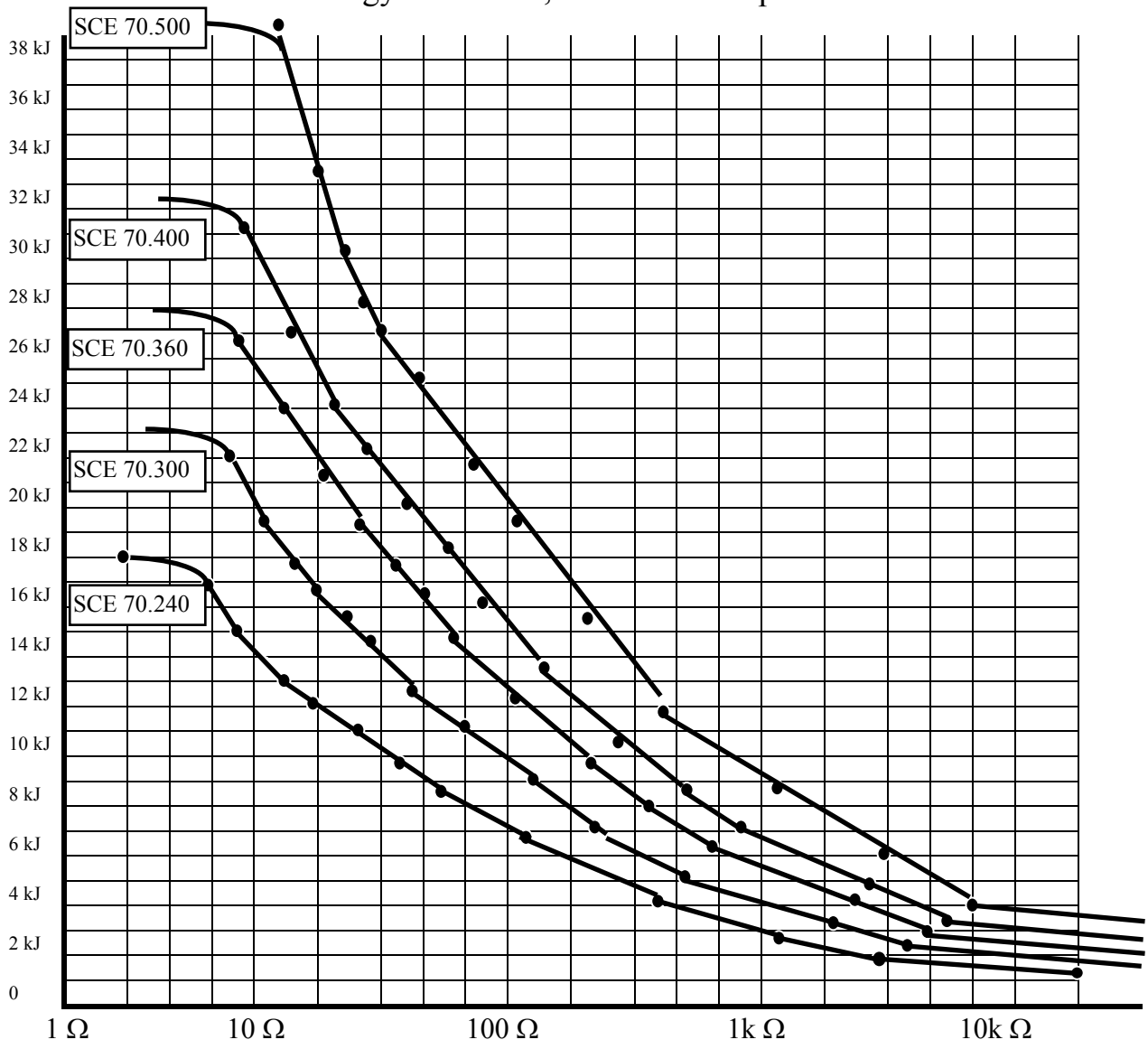
$$Q_J = Cs \bullet P \bullet T$$

where Q_J represents the quantity of energy expressed in joule, Cs the specific heat of resistor wire, expressed in $J \bullet g^{-1} \bullet °K^{-1}$, P the weight of the wire expressed in grams and T the temperature rise of wire during the phenomenon expressed in °K.

As the quantity and type of wire are distinctive for each model and resistance value, the limit of temperature rise accepted by resistor is determinant.
Such limits (@ 25°) are 500°C for normal operations, and 650°C for isolated situations.

GRAPH 1: Absorbed energy in time ≤0,2" for wire temperature of 500°C.



This graph shows the energy absorbed for a single impulse related to the resistance value. In case of isolated and exceptional interventions such value may be increased up to 25%.

Note. The necessity to adapt the commercial measures of wire to the resistance values scale can cause a reduction up 20% of the absorbed energy for some values. Please contact us for advice if your project is too close to the limits.

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In case of repeatable impulses or impulses applied on loaded resistors, due to thermal level of resistor, the impulse energy shall be lower than

$$E = E_D \bullet (1 - \tau/500)$$

where E_D is the energy shown in the graph and τ is temperature of resistor (°C).

3.8 Resistance value and tolerance. The values range cover the most of applications, but higher or lower values may be supplied on request. Closer tolerance values are also available**.**

3.9 Inductance. The inductance value change with resistance and it is not very influenced by frequency. Low self induction resistors (Ayrton-Perry system) can be supplied on request.
NOTE - Non inductive resistors can support lower energy impulses (less than the half) compared with standard resistors and the limit element voltage is about the third part. Please contact us for advice.

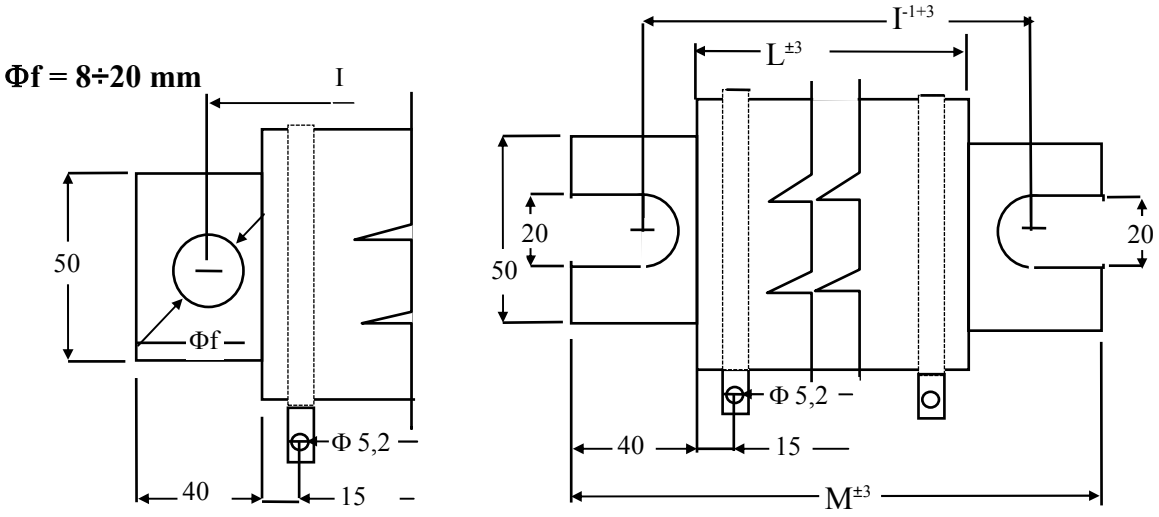
3.10 Resistor/bracket Capacity. Parasitic capacity don't change much with resistance value and with frequency.

3.11 Limit element voltage. It represent the working voltage which shall not be exceeded. On request it is possible to supply special execution with higher value.

3.12 Insulation resistance and dielectric strength. Both insulation resistance and dielectric strength keep high even after prolonged load because insulating materials of resistor do not present appreciable deterioration with the temperature. In order to increase these values it is possible the applications of insulators on brackets.

4. SPECIAL MECHANICAL EXECUTIONS

Standard executions can be modified to conform to various exigencies of use.
For instance the resistors may be supplied with the following mounting brackets



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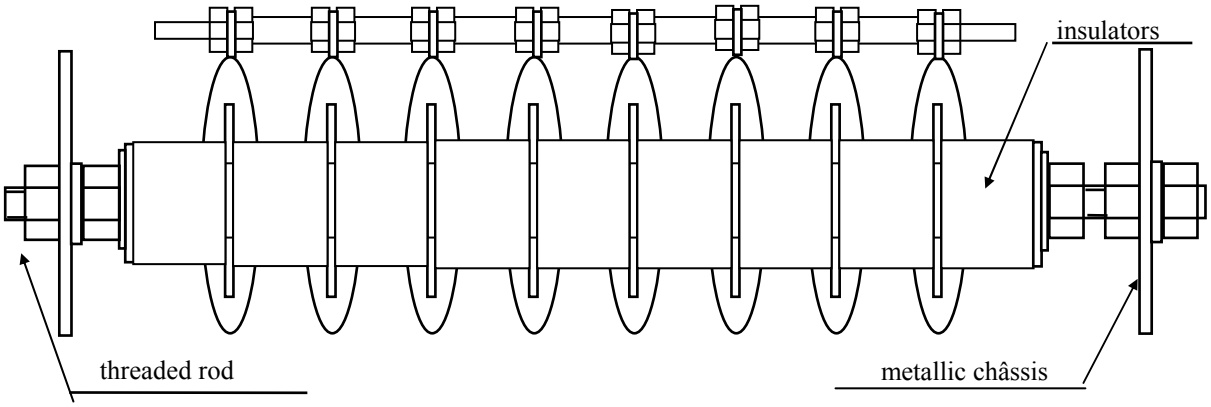
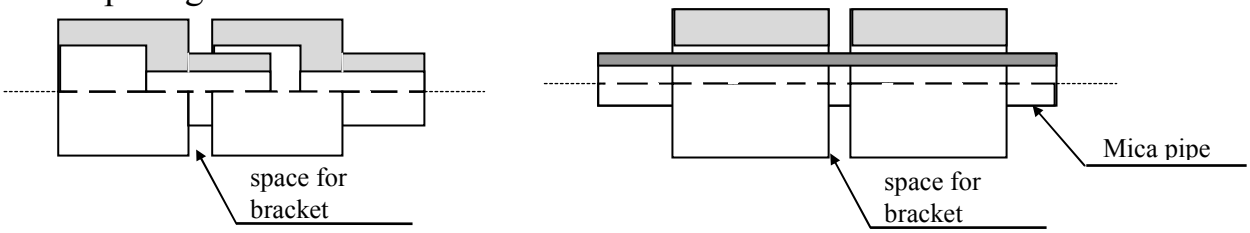
5. GROUPS OF RESISTORS

The following sketch gives a first idea of the mounting of a resistors group.



Resistors are spaced by means of ceramic insulator that provide insulation of brackets from the threaded rod and from the chassis. The types of insulators are two as per figure.



First type is cheaper and gives a dielectric strength to earth of 6 kVrms, while the second, more indicated for high voltage applications, permits to obtain .a dielectric strength of 12.000 Vrms

5.2 Limitation of rated characteristics of resistor mounted in groups.
The possibility of single resistor to dissipate the rated power in a resistors group is limited by the dissipation of the other resistors of group. For this reason it is suitable to apply a derating of 30%.

In case of forced ventilation, the rated power may be supported when the air speed is higher of 3,5 m/sec. If air speed is higher than 5 m/sec., the applied power can be increased.
No derating is necessary referring to the impulses behaviours.

6. CONTROLS

Before the shipping the following parameters will be checked:
6.1 Aspect and dimension
6.2 Resistance value
6.3 Insulation resistance
6.4 Dielectric strength

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