Semiconductor (AC) fuses

Other Protistor® Fuses
BS88-4 Fuses
17x49 gRB/URB - 690 VAC

EXTREMELY HIGH BREAKING CAPACITY FUSES:
PROTECTION OF SEMICONDUCTORS
AS PER IEC STANDARD 60269.1 AND 4
690 V VOLTAGE RATING AS PER IEC 33

- CLEARING ALL OVERLOADS
- IMPROVED SAFETY AND PROTECTION
- ENABLING SELECTIVE COORDINATION WITH ALL FUSES
 WITHIN DISTRIBUTION CIRCUIT

CONNECTION AS PER:
- GERMAN STANDARD DIN 43653/00C
- BRITISH STANDARD BS 88-4

These fuses are UL Recognized

Main Characteristics

<table>
<thead>
<tr>
<th>Voltage rating UN (V)</th>
<th>Class</th>
<th>Current rating IN (A)</th>
<th>pre-arcing I’t @ 1 ms I’tp [A^2s]</th>
<th>Total clearing I’t @ UN I’tt [A^2s]</th>
<th>Watts loss 0.8 IN IN</th>
<th>Tested Breaking capacity</th>
<th>Estimated Breaking capacity</th>
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<td>URB</td>
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<td>965</td>
<td>6150</td>
<td>13</td>
<td>23.5</td>
<td>300 kA @ 690 V</td>
</tr>
</tbody>
</table>

Minimum operating voltage for separate trip-indicator: 20 V
Other Protistor® Fuses
BS88-4 Fuses
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German standard without blown fuse indication

DIN 43623/00C

British standard without blown fuse indication

British standard with separate trip-indicator BS 88-4
**Other Protistor® Fuses**

**BS88-4 Fuses**

**17x49 gRB/URB - 690 VAC**

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**Total clearing I²t**

Above: Horizontal curves show for each rated current maximum values of total clearing $I^2t$ as a function of prospective current $I_p$ @ 690 V. $\cos \psi = 0.15$. Oblique lines indicate total clearing duration $T_t$ and associated pre-arcing duration in brackets.

**I²t corrective factor**

Left: Curve shows variation of total clearing time $I^2t$ and total clearing duration $T_t$ as a function of operating voltage $U$.

**Peak arc voltage**

Left: Curve shows peak value $U_m$ of arc voltage which appears across fuse-link as a function of operating voltage $U$ @ $\cos \psi = 0.15$

**Time vs current characteristics**

Above: Curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.

**Current limitation curves**

Above: Curves show, for each rating, value of peak let-through current $I_C$ as a function of available fault current $I_p$. Tolerance for mean pre-arcing current ± 9%.

Above: Curves indicate, for each rated current, pre-arcing time vs. R.M.S. pre-arcing current.
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### DC Application data

![Graph showing U/R (ms) vs. U (V) for L/R and Um (V) vs. U (V) for Um. The curve indicates permissible value of time constant L/R as a function of DC working voltage. Curve 1: Ip ≥ 1.6 IN only for fuses gRB (current rating from 12 to 50 A) Curve 2: Ip ≥ 8 IN for fuses gRB et URB.](image)

Above: Curves indicate permissible value of time constant L/R as a function of DC working voltage.

**NEW gR-CLASS**

**OPTIMAL PROTECTION OF POWER EQUIPMENT**

Thanks to recent technological developments, Ferraz Shawmut today markets gR-class PROTISTOR® fuses capable of clearing all types of overloads, from low multiples of current ratings up to very high short-circuit currents. Enhanced performance enables these fuses to provide solutions to many previously unsolved problems in power electronics: protection of cables without the use of additional components, protection of equipment from fire hazards, selective coordination of different fuses within a single power distribution installation...

### MICROSWITCH

![Microswitch diagram showing Designation, Ref. Num., Weight, Pack.](image)

Designation: MC 6,3 GR 2.5
Ref. Num.: Y 310015
Weight: 10 g
Pack.: 3 pieces

Electrical characteristics:
- $I_N = 3\ A - U_{N} = 250\ VAC$
- $I_N = 2\ A - U_{N} = 30\ VDC$

Certain minimum operating voltage/current:
- 20 V-100 mA

### SELECTIVE COORDINATION

gR-class semiconductor fuses can be utilized in association with gI and gG-class low voltage power distribution fuses of the same current rating, installed upstream. In a "selectively coordinated" distribution installation, melting is limited to the fuse associated with the faulted circuit, while upstream fuses remain intact. This prevents unnecessary down-time due to power blackouts in non-faulted branches.

### aR-CLASS vs. gR-CLASS

aR-class fuses feature a high minimum interrupting current as compared with their current rating. The primary time-current characteristic of aR-class fuses is the CC curve, above which another protection device must be associated. The gR-class fuse represents considerably improved performance in semiconductor protection.

### FERRAZ SHAWMUT EXPERTISE

gR-class fuses should be used in the design of low voltage equipment and in the protection of power electronics equipment. Designers can often substitute a gR-class fuse for an aR-class fuse (10x38, 14x51, 22x58, PSC 000 and 17x49 DIN80 or BS 88-4) but the reverse is not true: an aR fuse can never replace a gR fuse. Start protecting your new equipment with gR-class fuses today.

The application of gR class fuses, with current ratings less than 100 Amps, offers enhanced protection, safety and reliability, along with reduced risk of replacement errors and assembly costs.

Example:

- 100A aR vs. 100A gR
Semiconductor (AC) fuses

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BS88-4 Fuses
Microswitches for BS88-4 Protistor®

MICROSWITCH SYSTEMS ADAPTED TO THE FOLLOWING FUSES:
- BS88 - 4 separated trip-indicator
- BS88 - 4 built-in trip-indicator

Main Characteristics

<table>
<thead>
<tr>
<th>Code</th>
<th>AC Insulation voltage rating (***)</th>
<th>Positive operating voltage/current</th>
<th>Current</th>
<th>Interrupting rating</th>
<th>AC voltage withstand test (*)</th>
<th>Impulse voltage test Uimp 2/50 μs (**)</th>
<th>Fire class according to UL 94</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC 6,3 GR 2-5 N</td>
<td>1000 V</td>
<td>20 V 100 mA</td>
<td>5 A</td>
<td>50/60 Hz</td>
<td>- 5 A 0.3 A - 3 A 2 A</td>
<td>3.5 kV</td>
<td>-</td>
</tr>
<tr>
<td>MC 36 GR 2-5</td>
<td>1000 V</td>
<td>20 V 100 mA</td>
<td>5 A</td>
<td>50/60 Hz</td>
<td>- 5 A 5 A - 5 A 5 A</td>
<td>7.5 kV</td>
<td>-</td>
</tr>
</tbody>
</table>

* Between power circuit and microswitch terminals as per IEC 60 and 694 (50/60 Hz 1 min duration in dry air)
** Between power circuit and microswitch terminals Uimp: impulse voltage as per IEC 947-1
*** Between power circuit and microswitch terminals

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Ref. Number</th>
<th>Weight (g)</th>
<th>Pack.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC 6,3 GR 2-5 N (for separate trip-indicator)</td>
<td>Y 310015</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>MC 36 GR 2-5 (for built-in trip-indicator)</td>
<td>P 092496</td>
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