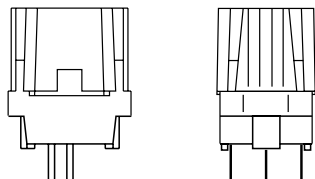
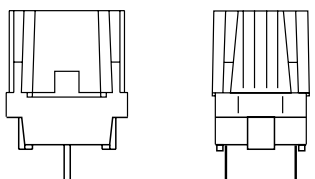


## PTC Thermistors For Degaussing, Dual, Mono And Double Mono Cased

a. Dual or double mono  
PTC degaussing.



b. Mono PTC  
degaussing.



### FEATURES

- Residual currents as low as 2 mA (p-p), ideal for high-resolution displays
- Long decay time
- Stable performance over a long time (>20000 operations)
- Self-extinguishing white plastic case ("UL 94. V.0")
- Design-in support available.

### APPLICATIONS

- Colour televisions
- Colour monitors.

### DESCRIPTION

For good picture definition, colour televisions and monitors must be degaussed by a strong alternating magnetic field which gradually and symmetrically decays to a small value of residual current. This can be achieved by connecting a PTC thermistor in the degaussing circuit.

The new generation of flat-screen, high-definition colour televisions and monitors require an excellent picture quality with high colour purity. This can only be achieved by a dual PTC device housing two PTC thermistors in intimate thermal contact, one being used to heat the other and so further reduce the residual current.

### QUICK REFERENCE DATA

| PARAMETER                                                             | VALUE                    | UNIT     |
|-----------------------------------------------------------------------|--------------------------|----------|
| Resistance of degaussing PTC ( $R_s$ ) at 25 °C                       | 3 to 30                  | $\Omega$ |
| Standard tolerance on resistance of degaussing PTC ( $R_s$ ) at 25 °C | 20 and 25                | %        |
| Resistance of heater PTC ( $R_p$ ) at 25 °C                           | 3000                     | $\Omega$ |
| Standard tolerance on resistance of heater PTC ( $R_p$ ) at 25 °C     | 75                       | %        |
| Maximum AC voltage (RMS value)                                        | 145 to 276               | V        |
| Minimum inrush current (peak-to-peak value)                           | 10 to 30                 | A        |
| Temperature range (at maximum voltage)                                | 0 to 60                  | °C       |
| Available pitch:                                                      |                          |          |
| 4e/1e                                                                 | 10.16 to 2.54            | mm       |
| 4e/2e                                                                 | 10.16 to 5.08            | mm       |
| Standard pin length                                                   | 4.2                      | mm       |
| Detailed specifications based on                                      | CECC 44000/<br>IEC 60738 |          |

**DUAL RANGE**

| ELECTRICAL DATA AND ORDERING INFORMATION                                                |                                                                    |               |                |                                       |       |                                            |      |                                         |                                     |                     |                                                 |             |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|----------------|---------------------------------------|-------|--------------------------------------------|------|-----------------------------------------|-------------------------------------|---------------------|-------------------------------------------------|-------------|
| MINIMUM<br>PEAK-TO-PEAK <sup>(2)(6)</sup><br>INRUSH CURRENT<br>(A)                      | MAXIMUM<br>PEAK-TO-PEAK <sup>(2)</sup><br>RESIDUAL CURRENT<br>(mA) |               |                | R <sub>25</sub> <sup>(3)</sup><br>(Ω) |       | R <sub>coil</sub> <sup>(4)(6)</sup><br>(Ω) |      | TYPICAL DECAY<br>PERFORMANCE            |                                     | TYPE <sup>(8)</sup> | CATALOG NUMBER <sup>(9)</sup><br>2322 662 ..... |             |
|                                                                                         | after<br>5 s                                                       | after<br>30 s | after<br>180 s | R <sub>s</sub>                        | ±%    | MIN.                                       | TYP. | DECAY<br>TIME <sup>(5)(6)</sup><br>(ms) | ALPHA<br>MAX. <sup>(6)</sup><br>(%) |                     | 4e/1e pitch                                     | 4e/2e pitch |
| U <sub>R</sub> = 220 to 240 V <sub>RMS</sub> (U <sub>max</sub> = 276 V <sub>RMS</sub> ) |                                                                    |               |                |                                       |       |                                            |      |                                         |                                     |                     |                                                 |             |
| 11                                                                                      | 50                                                                 | 5             | 2              | 30                                    | 25    | 17                                         | 25   | 60                                      | 36                                  | –                   | 96209                                           | 96309       |
| 14                                                                                      | 50                                                                 | 5             | 2              | 26                                    | 25    | 14                                         | 17   | 40                                      | 43                                  | –                   | 96211                                           | 96311       |
| 16                                                                                      | 80                                                                 | 8             | 4              | 22                                    | 25    | 14                                         | 17   | 40                                      | 44                                  | –                   | 96216                                           | 96316       |
| 16                                                                                      | 80                                                                 | 8             | 2              | 22                                    | 25    | 10                                         | 17   | 65                                      | 33                                  | LD                  | 96616                                           | 96716       |
| 20                                                                                      | 80                                                                 | 8             | 2              | 18                                    | 25    | 10                                         | 13   | 50                                      | 38                                  | –                   | 96624                                           | 96724       |
| 18                                                                                      | 80                                                                 | 15            | 2              | 18                                    | 25    | 10                                         | 17   | 75                                      | 29                                  | LD                  | 96626                                           | 96726       |
| 25                                                                                      | 80                                                                 | 10            | 4              | 14                                    | 25    | 10                                         | 10   | 40                                      | 45                                  | –                   | 96602                                           | 96702       |
| 25                                                                                      | 80                                                                 | 10            | 4              | 14                                    | 25    | 10                                         | 10   | 45                                      | 40                                  | LD                  | 96642                                           | 96742       |
| 21                                                                                      | 80                                                                 | 10            | 5              | 12                                    | 20    | 10                                         | 17   | 70                                      | 36                                  | LT                  | 96606                                           | 96706       |
| 21                                                                                      | 100                                                                | 20            | 5              | 12                                    | 20    | 10                                         | 17   | 80                                      | 30                                  | LD/LT               | 96646                                           | 96746       |
| 20                                                                                      | 100                                                                | 40            | 5              | 9                                     | 20    | 13                                         | 20   | 95                                      | 33                                  | LT                  | 96608                                           | 96708       |
| 20                                                                                      | 100                                                                | 25            | 10             | 9                                     | 20    | 13                                         | 20   | 115                                     | 26                                  | LD/LT               | 96648                                           | 96748       |
| 21                                                                                      | 100                                                                | 40            | 10             | 7                                     | 20    | 20                                         | 20   | 110                                     | 33                                  | LD/LT               | –                                               | 96709       |
| U <sub>R</sub> = 100 to 120 V <sub>RMS</sub> (U <sub>max</sub> = 145 V <sub>RMS</sub> ) |                                                                    |               |                |                                       |       |                                            |      |                                         |                                     |                     |                                                 |             |
| 19                                                                                      | 200                                                                | 20            | 10             | 7                                     | 20    | 5                                          | 7    | 80                                      | 31                                  | LT                  | 96213                                           | 96313       |
| 27                                                                                      | 200                                                                | 50            | 14             | 5                                     | 30/15 | 5                                          | 6    | 85                                      | 30                                  | –                   | 96605                                           | 96705       |
| 30                                                                                      | 200                                                                | 20            | 10             | 5                                     | 20    | 4                                          | 5    | 85                                      | 31                                  | LD/LT               | 96645                                           | 96745       |
| 30                                                                                      | 200                                                                | 20            | 10             | 3                                     | 30/15 | 4                                          | 6    | 115                                     | 29                                  | LD                  | 96643                                           | 96743       |

**MONO CASED RANGE**

| ELECTRICAL DATA AND ORDERING INFORMATION                                                |                                                                    |               |                |                                       |      |                                            |      |                                      |                                  |                     |                                                 |  |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|----------------|---------------------------------------|------|--------------------------------------------|------|--------------------------------------|----------------------------------|---------------------|-------------------------------------------------|--|
| MINIMUM<br>PEAK-TO-PEAK <sup>(2)</sup><br>INRUSH<br>CURRENT<br>(A)                      | MAXIMUM<br>PEAK-TO-PEAK <sup>(2)</sup><br>RESIDUAL CURRENT<br>(mA) |               |                | R <sub>25</sub> <sup>(3)</sup><br>(Ω) |      | R <sub>coil</sub> <sup>(4)(7)</sup><br>(Ω) |      | TYPICAL DECAY<br>PERFORMANCE         |                                  | TYPE <sup>(8)</sup> | CATALOG NUMBER <sup>(9)</sup><br>2322 662 ..... |  |
|                                                                                         | after<br>5 s                                                       | after<br>30 s | after<br>180 s | R <sub>s</sub>                        | ±%   | MIN.                                       | TYP. | DECAY<br>TIME <sup>(5)(7)</sup> (ms) | ALPHA<br>MAX. <sup>(6)</sup> (%) |                     | 4e pitch                                        |  |
| U <sub>R</sub> = 220 to 240 V <sub>RMS</sub> (U <sub>max</sub> = 276 V <sub>RMS</sub> ) |                                                                    |               |                |                                       |      |                                            |      |                                      |                                  |                     |                                                 |  |
| 11                                                                                      | 100                                                                | 40            | 20             | 30                                    | 25   | 17                                         | 25   | 75                                   | 30                               | –                   | 96281                                           |  |
| 12                                                                                      | 50                                                                 | 30            | 20             | 26                                    | 25   | 14                                         | 25   | 90                                   | 30                               | –                   | 96688                                           |  |
| 16                                                                                      | 80                                                                 | 40            | 20             | 22                                    | 25   | 14                                         | 17   | 40                                   | 44                               | –                   | 96286                                           |  |
| 20                                                                                      | 100                                                                | 50            | 25             | 18                                    | 25   | 10                                         | 13   | 50                                   | 38                               | –                   | 96682                                           |  |
| 25                                                                                      | 200                                                                | 50            | 30             | 14                                    | 25   | 10                                         | 10   | 40                                   | 45                               | –                   | 96683                                           |  |
| 25                                                                                      | 200                                                                | 80            | 30             | 14                                    | 25   | 10                                         | 10   | 45                                   | 40                               | LD                  | 96692                                           |  |
| 21                                                                                      | 200                                                                | 80            | 30             | 12                                    | 20   | 10                                         | 17   | 70                                   | 36                               | –                   | 96684                                           |  |
| 21                                                                                      | 200                                                                | 80            | 30             | 12                                    | 20   | 10                                         | 17   | 80                                   | 30                               | LD                  | 96696                                           |  |
| 20                                                                                      | 100                                                                | 50            | 30             | 9                                     | 20   | 13                                         | 20   | 95                                   | 33                               | LT                  | 96687                                           |  |
| 20                                                                                      | 200                                                                | 50            | 25             | 9                                     | 20   | 13                                         | 20   | 115                                  | 26                               | LD/LT               | 96698                                           |  |
| 21                                                                                      | 100                                                                | 50            | 30             | 7                                     | 20   | 20                                         | 20   | 110                                  | 33                               | LD/LT               | 96681                                           |  |
| U <sub>R</sub> = 100 to 120 V <sub>RMS</sub> (U <sub>max</sub> = 145 V <sub>RMS</sub> ) |                                                                    |               |                |                                       |      |                                            |      |                                      |                                  |                     |                                                 |  |
| 19                                                                                      | 200                                                                | 70            | 40             | 7                                     | 20   | 5                                          | 7    | 80                                   | 31                               | –                   | 96285                                           |  |
| 27                                                                                      | 200                                                                | 70            | 40             | 5                                     | 30/1 | 5                                          | 6    | 85                                   | 30                               | –                   | 96686                                           |  |
| 30                                                                                      | 200                                                                | 70            | 40             | 5                                     | 20   | 4                                          | 5    | 85                                   | 31                               | LD                  | 96695                                           |  |
| 30                                                                                      | 200                                                                | 70            | 40             | 3                                     | 30/1 | 4                                          | 6    | 115                                  | 29                               | LD                  | 96693                                           |  |

**Notes**

- Electrical data and catalog numbers. The shading indicates preferred types.
- All peak-to-peak currents are measured at typical resistance of the coil, at 50 Hz (AC), at 25°C and at 220 Vrms for the 276V types, and 110Vrms for the 145V types.
- Lower tolerances on resistance of degaussing PTC are available on request.
- Lower minimum coil resistance is available on request.
- Decay time is the time from the moment of maximum peak current until the half of the maximum peak inrush current.
- Alpha maximum is the maximum decrease in current expressed in percent between two successive peaks.
- Inrush currents and decay times at other voltage coil combinations can be derived from Figures 7 to 13, see section 'Introduction, PTC thermistors for degaussing'.
- LT = low tolerance; LD = long decay.
- Smallest packaging quantity (SPQ) = 600 units.

**DOUBLE MONO CASED RANGE**

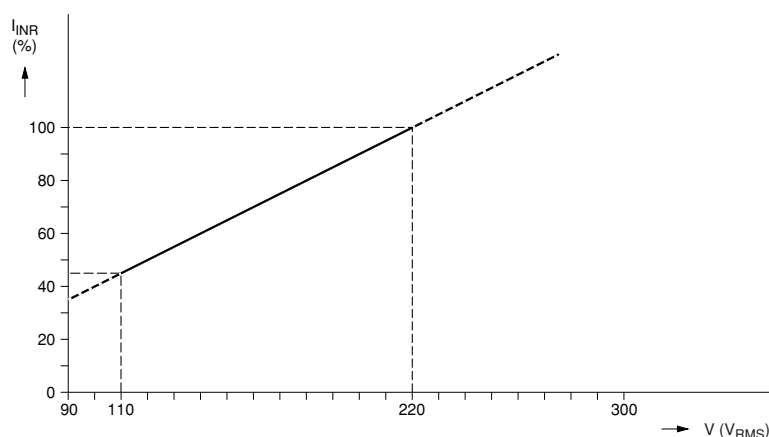
| ELECTRICAL DATA AND ORDERING INFORMATION                                                |                                                                    |               |                |                                       |    |                                            |      |                                         |                                     |                     |                                                 |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|----------------|---------------------------------------|----|--------------------------------------------|------|-----------------------------------------|-------------------------------------|---------------------|-------------------------------------------------|
| MINIMUM<br>PEAK-TO-PEAK <sup>(1)</sup><br>INRUSH<br>CURRENT<br>(A)                      | MAXIMUM<br>PEAK-TO-PEAK <sup>(1)</sup><br>RESIDUAL CURRENT<br>(mA) |               |                | R <sub>25</sub> <sup>(3)</sup><br>(Ω) |    | R <sub>coil</sub> <sup>(2)(6)</sup><br>(Ω) |      | TYPICAL DECAY<br>PERFORMANCE            |                                     | TYPE <sup>(7)</sup> | CATALOG NUMBER <sup>(8)</sup><br>2322 662 ..... |
|                                                                                         | after<br>5 s                                                       | after<br>30 s | after<br>180 s | R <sub>s</sub>                        | ±% | MIN.                                       | TYP. | DECAY<br>TIME <sup>(4)(6)</sup><br>(ms) | ALPHA<br>MAX. <sup>(5)</sup><br>(%) |                     | 4e/2e pitch                                     |
| U <sub>R</sub> = 220 to 240 V <sub>RMS</sub> (U <sub>max</sub> = 276 V <sub>rms</sub> ) |                                                                    |               |                |                                       |    |                                            |      |                                         |                                     |                     |                                                 |
| 33                                                                                      | 200                                                                | 35            | 25             | 9.0 (18 × 2)                          | 25 | 7                                          | 10   | 80                                      | 31                                  | LD                  | 96754                                           |
| 34                                                                                      | 200                                                                | 35            | 25             | 7.0 (14 × 2)                          | 25 | 7                                          | 10   | 80                                      | 31                                  | LD                  | 96752                                           |
| 36                                                                                      | 200                                                                | 40            | 30             | 6.0 (12 × 2)                          | 20 | 7                                          | 10   | 85                                      | 31                                  | LD/LT               | 96756                                           |
| 33                                                                                      | 200                                                                | 45            | 35             | 4.5 (9 × 2)                           | 20 | 10                                         | 13   | 130                                     | 27                                  | LD/LT               | 96758                                           |
| 35                                                                                      | 200                                                                | 50            | 40             | 3.5 (7 × 2)                           | 20 | 13                                         | 13   | 135                                     | 27                                  | LD/LT               | 96759                                           |
| U <sub>R</sub> = 100 to 120 V <sub>RMS</sub> (U <sub>max</sub> = 145 V <sub>rms</sub> ) |                                                                    |               |                |                                       |    |                                            |      |                                         |                                     |                     |                                                 |
| 27                                                                                      | 250                                                                | 80            | 45             | 3.5 (7 × 2)                           | 20 | 3                                          | 7    | 255                                     | 16                                  | LD/LT               | 96757                                           |
| 34                                                                                      | 250                                                                | 80            | 45             | 2.5 (5 × 2)                           | 20 | 3                                          | 6    | 200                                     | 19                                  | LD/LT               | 96755                                           |
| 39                                                                                      | 250                                                                | 80            | 45             | 1.5 (3 × 2)                           | 20 | 4                                          | 6    | 250                                     | 21                                  | LD/LT               | 96753                                           |

**Notes**

1. All peak-to-peak currents are measured at typical resistance of the coil, at 50 Hz (AC), at 25°C and at 220 Vrms for the 276V types, and 110Vrms for the 145V types.
2. Lower minimum coil resistance is available on request.
3. The indicated resistance value is the parallel combination of two degaussing PTCs.
4. Decay time is the time from the moment of maximum peak current until the half of the maximum peak inrush current.
5. Alpha maximum is the maximum decrease in current expressed in percent between two successive peaks.
6. Inrush currents and decay times at other voltage coil combinations can be derived from Figures 7 to 13 in the section, "Introduction, PTC thermistors for degaussing".
7. LT = low tolerance; LD = long decay.
8. Smallest packaging quantity (SPQ) = 600 units.

**INRUSH CURRENT**

Minimum inrush current as a percentage of mains voltage.

**APPLICATION SPECIFIC DATA**

The data shown in the above tables is obtained from measurements at reference parameters. If these parameters do not correspond to the application parameters required, refer to Figures 7 to 13 in the "Introduction, PTC thermistors for degaussing", datasheet.

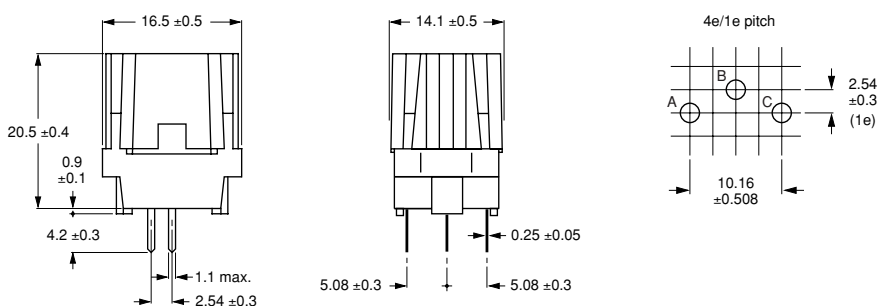
| DIMENSIONS AND PIN CONFIGURATION <sup>(1)</sup> |                |                |                |
|-------------------------------------------------|----------------|----------------|----------------|
| PRODUCT TYPE                                    |                |                |                |
| MONO                                            | DUAL           |                | DOUBLE MONO    |
| 4e                                              | 4e/1e          | 4e/2e          | 4e/2e          |
| 2322 662 9628.                                  | 2322 662 962.. | 2322 662 963.. | —              |
| 2322 662 9668.                                  | 2322 662 966.. | 2322 662 967.. | 2322 662 9675. |
| 2322 662 9669.                                  |                |                |                |

**Note**

1. See Mono, Dual and Dual and Double drawings below.

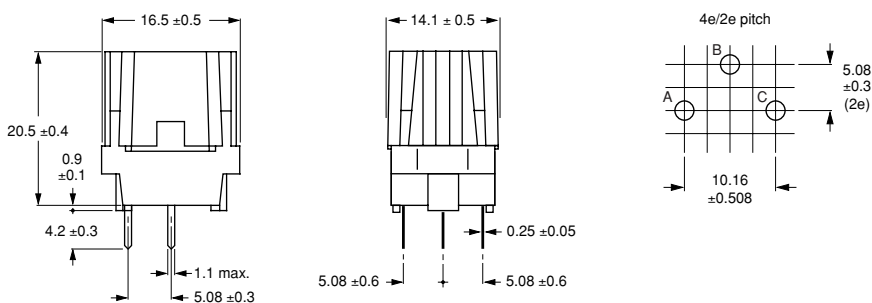
**DIMENSIONS** in millimeters

Dual PTC pin configuration 4e/1e pitch.



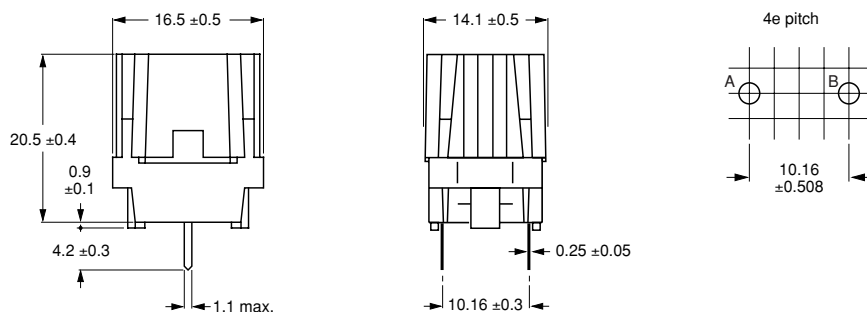
For electrical data and ordering information, see Dual Range table.

Dual and Double mono PTC pin configuration 4e/2e pitch.



For electrical data and ordering information, see Dual Range and Double Mono Range tables.

Mono PTC pin configuration 4e pitch.

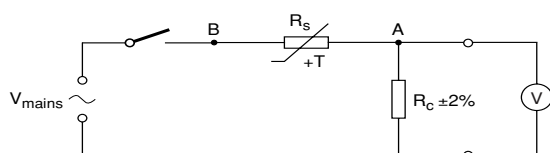


For electrical data and ordering information, see Mono Cased Range table.

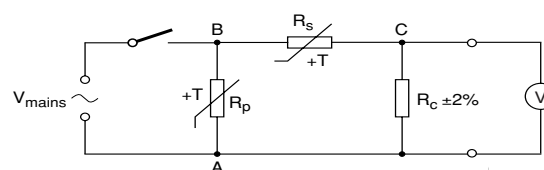
## PIN CONFIGURATIONS

| CONNECTION | PRODUCT TYPE |                |                |
|------------|--------------|----------------|----------------|
|            | MONO         | DUAL           | DOUBLE MONO    |
| Mains      | point A      | points A and B | point B        |
| Coil(s)    | point B      | points A and B | points A and C |

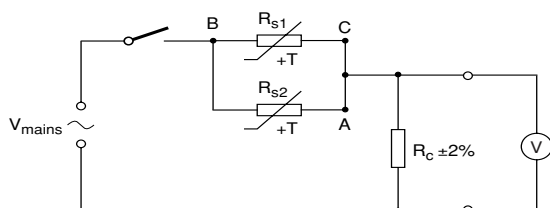
## MEASURING CIRCUITS



a. Mono cased PTC degaussing.



b. Dual cased PTC degaussing.



c. Double mono cased PTC degaussing.

V = A/D converter or oscilloscope.

$R_s$  = resistance of series PTC or degaussing PTC.

$R_p$  = resistance of parallel PTC or heater PTC.

$R_c$  = replaces the degaussing coil.

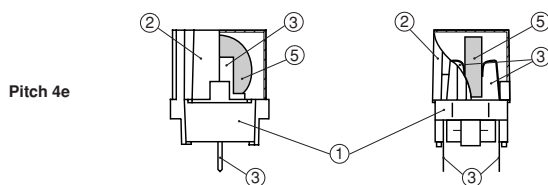
$V_{mains}$  = AC power source with high output current capability; frequency = 50 Hz  $\pm$  1%; total harmonic distortion < 2%.

For residual current measurement the  $R_c$  resistor can be increased to 100  $\Omega$  1%, 30 s after inrush.

## CONSTRUCTION

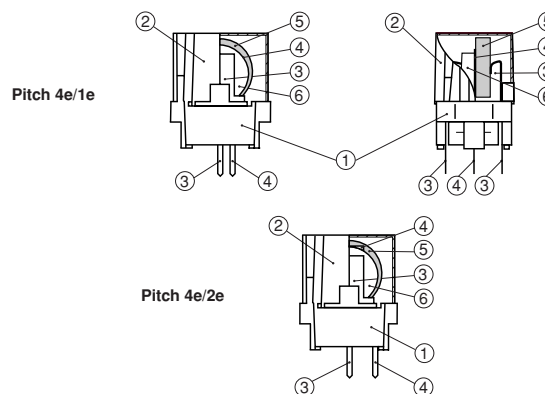
The dimensions of the ceramic are just for reference and might vary according to the PTC degaussing type.

## MONO CASED PTC DEGAUSSING



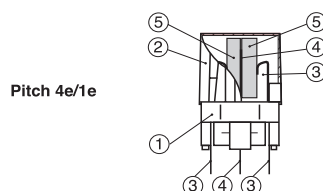
Mono cased PTC degaussing.

## DUAL CASED PTC DEGAUSSING

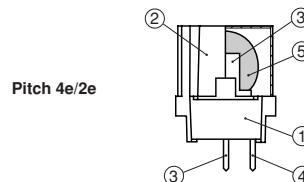


Dual cased PTC degaussing.

## DOUBLE MONO CASED PTC DEGAUSSING



Double mono cased PTC degaussing.





| MATERIAL INFORMATION <sup>(1)</sup> |                                     |                                                                                                                                               |
|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| NUMBER                              | DESCRIPTION                         | MATERIAL AND REMARKS                                                                                                                          |
| 1                                   | base                                | glass fibre reinforced polybutyleneterephthalate (PBTP);<br>self-extinguishing according to "UL 94 V-0",<br>UL number E69578(M) or equivalent |
| 2                                   | cap                                 |                                                                                                                                               |
| 3                                   | spring contact (outer)              | corrosion resisting steel with nickel/silver flash; pin termination in Sn60Pb40<br>coated                                                     |
| 4                                   | central contact                     |                                                                                                                                               |
| 5                                   | degaussing PTC thermistor ( $R_s$ ) | BaTiO <sub>3</sub> doped                                                                                                                      |
| 6                                   | heater PTC thermistor ( $R_p$ )     |                                                                                                                                               |

**Note**

1. See Mono, Dual and Double mono cased PTC Degaussing drawings.

| MASS                   |                 |                                 |
|------------------------|-----------------|---------------------------------|
| PTC DEGAUSSING         | MASS            |                                 |
|                        | PER UNIT<br>(g) | PER BOX OF<br>600 units<br>(kg) |
| DUAL OR DOUBLE<br>MONO | ≈5.0            | ≈3.6                            |
| MONO CASED             | ≈4.2            | ≈3.0                            |

**PACKAGE MARKING**

The package containing the thermistors marked as shown in the barcode label below.

BCcomponents

MADE IN BELGIUM

**MARKING****PRODUCT MARKING**

The thermistors are manufactured in Belgium and assembly is either in Belgium or Indonesia (Batam).

The products are marked on the top with the last five digits of the catalogue number, code of manufacturer and the date code (year, week, day and batch of manufacture).

| ASSEMBLED IN BELGIUM |                              |
|----------------------|------------------------------|
| MARKING              | DESCRIPTION                  |
| 96724                | last 5-digits of code number |
| BC                   | code of manufacturer         |
| 1141A                | manufacturing date (YWWDx)   |

**MARKING EXAMPLE**

96724

BC1141A



Barcode label.

| ASSEMBLED IN INDONESIA (BATAM) |                              |
|--------------------------------|------------------------------|
| MARKING                        | DESCRIPTION                  |
| BC                             | code of manufacturer         |
| 96724                          | last 5-digits of code number |
| SP                             | code of assembler            |
| 1141A                          | manufacturing date (YWWDx)   |

**MARKING EXAMPLE**

BC96724

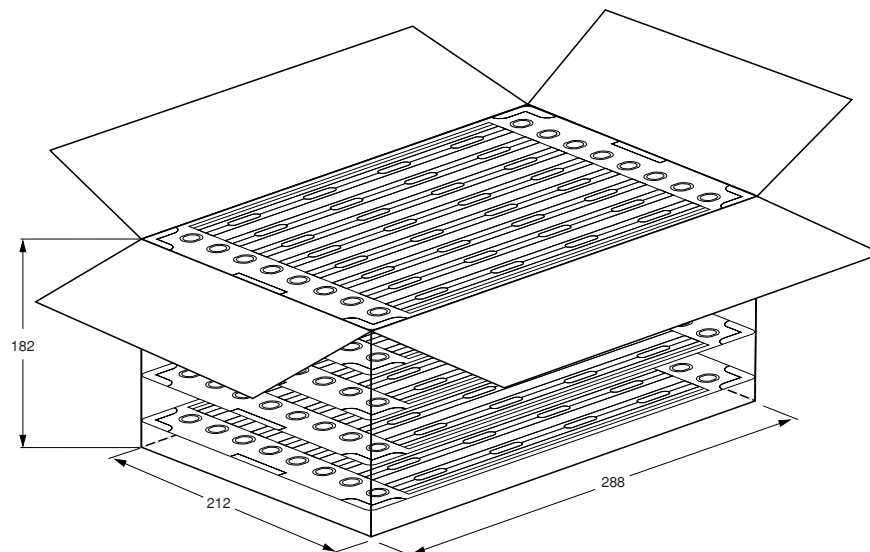
SP1141A

**BARCODE LABEL MARKING****LINE MARKING EXPLANATION**

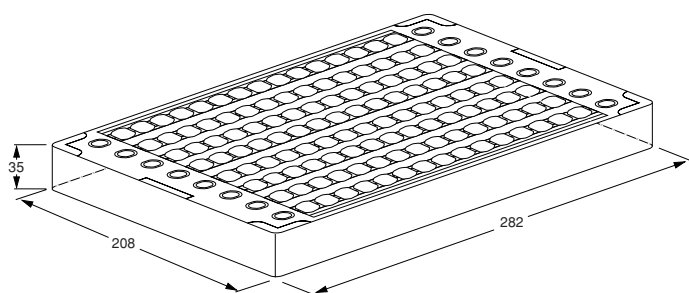
- |   |                                                                                                            |
|---|------------------------------------------------------------------------------------------------------------|
| 1 | Name of manufacturer; country of origin                                                                    |
| 2 | Batch number                                                                                               |
| 3 | Preference origin code: A<br>Country of origin in code: 170 (Belgium)<br>Responsible production centre: VS |
| 4 | Quantity and production period, year, week<br>day and batch code                                           |
| 5 | Product type description                                                                                   |
| 6 | Product code (12NC)                                                                                        |

**PACKAGING** in millimeters

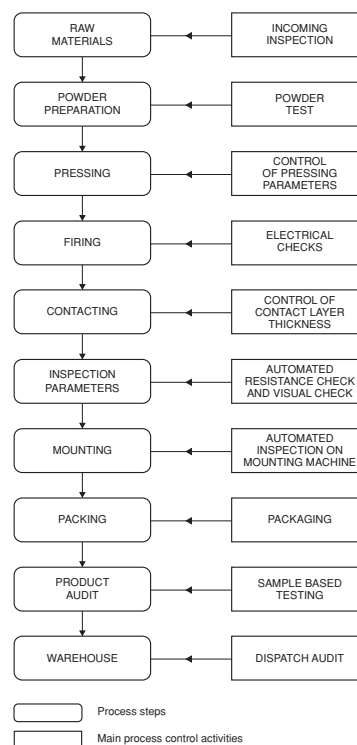
The thermistors are supplied in cardboard boxes containing 5 trays of 120 items per tray; each box containing 600 units.



Outer box dimensions.



Tray dimensions.

**GENERAL OVERVIEW OF PRODUCTION  
AND QUALITY CONTROL FLOWCHART**

**TEST AND REQUIREMENTS**

| <b>STANDARD TEST SCHEDULE</b>           |                                                                            |                |                                                |                                                            |
|-----------------------------------------|----------------------------------------------------------------------------|----------------|------------------------------------------------|------------------------------------------------------------|
| CECC<br>44003<br>CLAUSE                 | TEST                                                                       | D*<br>or<br>ND | CONDITIONS                                     | PERFORMANCE<br>REQUIREMENTS                                |
| <b>Outgoing inspection (lot-by-lot)</b> |                                                                            |                |                                                |                                                            |
| 4.3.1                                   | visual examination                                                         | ND             |                                                | no visible damage<br>legible<br>as detailed specifications |
| 4.3.2                                   | marking                                                                    |                |                                                |                                                            |
| 4.3.3                                   | dimensions (gauging)                                                       |                |                                                |                                                            |
| 4.4                                     | zero power resistance:<br>degaussing PTC ( $R_s$ )<br>heater PTC ( $R_p$ ) | ND             | at 25 °C                                       | as specified                                               |
| 4.27                                    | minimum peak to peak inrush current                                        | ND             | at 220/110 V <sub>RMS</sub> and reference coil | as specified                                               |
|                                         | maximum peak to peak current after:<br>5 s<br>30 s<br>180 s                | ND             | at 220/110 V <sub>RMS</sub> and reference coil |                                                            |
| 4.13.1                                  | solderability                                                              | D              | solder bath method: 235 ±5 °C                  | the terminations shall be evenly<br>tinned; 95% covered    |

\* D = Destructive, ND = Non-destructive.

| LIFE TESTS                                 |                                                            |                                                                                                                                                            |                                                                                                                                                                                                                                                                                          |
|--------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEC 60738<br>TEST<br>METHOD                | TEST                                                       | PROCEDURE                                                                                                                                                  | REQUIREMENTS                                                                                                                                                                                                                                                                             |
|                                            | endurance cycling: maximum voltage at low temperature      | maximum voltage with minimum coil:<br>see detailed specifications;<br>temperature: 0 ±5 °C; duration, 100 cycles                                           | no visible damage<br>$\Delta R_s/R_s$ (25 °C) max.: ±20%<br>$\Delta R_p/R_p$ (25 °C) max.: ±50%<br>inrush current at 25 °C:<br>$I_{inrush} > 95\%$ ; $I_{inrush}$ specified<br>final current at 25 °C:<br>$I_{final} < 105\%$ ; $I_{final}$ specified<br>$I_{final} = I$ after 3 minutes |
|                                            | endurance cycling: maximum voltage at 25 °C                | maximum voltage with minimum coil:<br>see detailed specifications;<br>temperature: 25 ±5 °C; duration, 40000 cycles                                        |                                                                                                                                                                                                                                                                                          |
|                                            | endurance at maximum rated temperature and maximum voltage | maximum voltage:<br>see detailed specifications;<br>temperature: 60 ±5 °C; duration, 2000 hours                                                            |                                                                                                                                                                                                                                                                                          |
|                                            | endurance cycling at maximum voltage in humidity           | maximum voltage with minimum coil:<br>see detailed specifications;<br>conditions: 40 °C, 95% RH;<br>cycle: 30 on 60 off; duration, 56 days<br>(900 cycles) |                                                                                                                                                                                                                                                                                          |
| Other tests in accordance with IEC 60068-2 |                                                            |                                                                                                                                                            |                                                                                                                                                                                                                                                                                          |
| 3 (Ca)                                     | damp heat (steady state)                                   | 56 days; 40 °C; 95% RH                                                                                                                                     |                                                                                                                                                                                                                                                                                          |
| 2 (Ba)                                     | dry heat                                                   | 1 000 hours; 125 °C                                                                                                                                        |                                                                                                                                                                                                                                                                                          |
| 6 (Fc)                                     | vibration (mounted state)                                  | frequency: 10 to 55 Hz;<br>displacement 0.75 mm or acceleration 10 g;<br>3 directions; total 6 hours                                                       |                                                                                                                                                                                                                                                                                          |
| 20 (Tb)                                    | resistance to soldering heat                               | 10 s; 260 ±5 °C                                                                                                                                            |                                                                                                                                                                                                                                                                                          |
| Other test in accordance with IEC 60695.2  |                                                            |                                                                                                                                                            |                                                                                                                                                                                                                                                                                          |
| 2                                          | flammability needle flame test                             | vertical severity; duration 10 s                                                                                                                           | flammability: flame 5 s max.                                                                                                                                                                                                                                                             |