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CECC 41 102-002  
Page 1 of 21



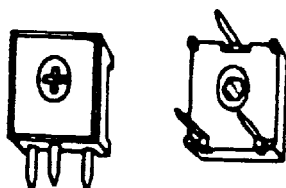
# **ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH**

CECC 41 000 or NBN C83-410  
CECC 41 100 or NBN C83-411  
CECC 41 102 or NBN C83-411-02

NBN C83-411-021 (Issue 1)

**DETAIL SPECIFICATION for**  
**Typical Construction :**

**ROTARY SINGLE TURN PRESET POTENTIOMETER**  
**NON-SEALED WITH DUST CAP**  
**RESISTIVE ELEMENT : CARBON COMPOSITION**



For individual details see appendix  
A to F

- ACTUATING DEVICE :
  - . NON INSULATED (HOT WIPER) CROSS SLOT
  - . INSULATED (COLD WIPER) CROSS OR HEXAGONAL SLOT
- END STOPS
- TERMINATIONS (SLIDE OR SNAP-IN)  
SUITABLE FOR MOUNTING ON PRINTED WIRING BOARDS
- HORIZONTAL AND VERTICAL VERSION
- BOTH SIDES SUITABLE FOR ACTUATING

**ASSESSMENT LEVEL M**

**TABLE 1**

| Rated<br>dissipation<br>at 70°C<br>(W) | Limiting<br>element<br>voltage<br>V d.c.<br>or a.c (eff) | Isolation voltage<br>V d.c. or a.c.<br>peak |
|----------------------------------------|----------------------------------------------------------|---------------------------------------------|
|                                        |                                                          | Normal<br>air pressure                      |
| 0,05                                   | 150                                                      | 220                                         |

## **1. RATINGS AND CHARACTERISTICS**

\*Resistance range : 100Ω to 2,2 MΩ

Standard selection tolerances :  $\pm 10$  and  $\pm 20 \%$

Temperature characteristic of resistance (20° to 70°C) :  $\Delta R/R/\Delta T : \leq \pm 500 \text{ ppm/}^\circ\text{C}$

Climatic category : 25/85/10

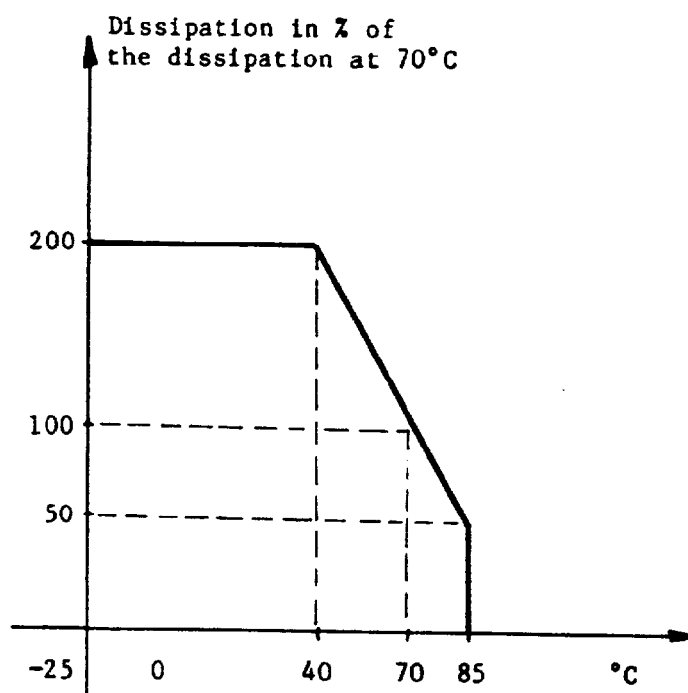
\* The preferred values are those of the E3 series of IEC 63. Where the use of intermediate values is essential, they should, wherever possible, be chosen from a series in that document.

See the relevant Qualified Products List for availability of components made to this specification.

|                                                                                                     |                                                                                      |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Vibration severity                                                                                  | : 10 Hz to 500 Hz ; 0,75 mm or 98 m/s <sup>2</sup><br>(whichever is the less severe) |
| Limits of resistance change<br>( <u>a</u> to <u>c</u> ) (after 1000 h<br>electrical endurance test) | : $\pm (10 \% R + 0,5 \Omega)$                                                       |
| Starting torque                                                                                     | : 1,5 mNm to 10 mNm                                                                  |
| Total mechanical travel                                                                             | : $300^\circ \pm 5^\circ$                                                            |
| Effective electrical travel                                                                         | : $285^\circ \pm 10^\circ$                                                           |
| Limiting slider current                                                                             | : see paragraph 7                                                                    |

### 1.1 Derating

Potentiometers covered by this specification are derated according to the curve :



## 2. MARKING

- 2.1 The following marking information, in the order of importance given below, is required :
- (1) Rated resistance
  - (2) Tolerance on rated resistance
  - (3) Resistance law (if other than linear)
  - (4) Detail specification and style
  - (5) Date of acceptance. A nationally approved code may be used.
  - (6) Manufacturer's name and trade mark
- 2.2 The potentiometers itself shall be clearly marked with (1) above using, where practicable, one of the coding methods specified in IEC 62, and with as many of the remaining items as is practicable.
- 2.3 The package containing the potentiometer shall be clearly marked with (1) to (6).
- 2.4 Any additional marking shall be so applied that no confusion can arise.

## 3. RELATED DOCUMENTS

- IEC 62 : Marking codes for resistors and capacitors.
- IEC 63 : Preferred number series for resistors and capacitors.
- IEC 68 : Basic environmental testing procedures for electronic components and electronic equipment.
- IEC 410 : Sampling procedures and tables for inspection by attributes for electronic components of assessed quality. (See CECC 00007 (1978) )
- CECC 00 007 (1978) - Basic specification : Sampling plans and procedures for inspection by attributes
- CECC 00 200 Qualified Products List
- CECC 41 000 (1976) - Generic specification for potentiometers and amendments 1 to 3
- CECC 41 100 (1978) - Sectional specification for lead-screw actuated and rotary preset potentiometers
- CECC 41 102 (1978) - Blank detail specification for preset potentiometers.

#### 4. ORDERING INFORMATION

Orders for potentiometers covered by this specification shall contain the following information :

- Resistance value and tolerance
- Number of the detail specification and style reference (see table 2 below)
- Bulk or rail packaging

Table 2 : STYLES

| mounting position | type of actuating device | shape of actuating slot | shape of terminations | STYLE | Dimensional pattern see appendix |
|-------------------|--------------------------|-------------------------|-----------------------|-------|----------------------------------|
| vertical          | non-insulated (hot)      | cross                   | slide                 | VH1   | A                                |
|                   | insulated (cold)         | cross                   | slide                 | VC1   | B                                |
|                   |                          |                         | snap-in               | VC2   | B                                |
|                   |                          | hexagonal               | slide                 | VC3   | C                                |
|                   |                          |                         | snap-in               | VC4   | C                                |
|                   |                          |                         |                       |       |                                  |
| horizontal        | non-insulated (hot)      | cross                   | slide                 | HH1   | D                                |
|                   | insulated (cold)         | cross                   | slide                 | HC1   | E                                |
|                   |                          |                         | snap-in               | HC2   | E                                |
|                   |                          | hexagonal               | slide                 | HC3   | F                                |
|                   |                          |                         | snap-in               | HC4   | F                                |
|                   |                          |                         |                       |       |                                  |

#### 5. CERTIFIED TEST RECORDS

non applicable

#### 6. DELAYED DELIVERY

The provisions of 3.6 of CECC 41000 shall apply, except that the Inspection Level shall be reduced to S-2.

## 7. ADDITIONAL INFORMATION (not for inspection purposes)

### 7.1. Limiting conditions

The limiting conditions for voltage and slider current as a function of the resistance for a linear law potentiometer at a temperature of 70°C are given in table 3 below.

Table 3

| Rated Resistance | Rated Voltage or Limiting Element Voltage (V) | Dissipation at 70°C (W) | Limiting Slider Current (mA) |
|------------------|-----------------------------------------------|-------------------------|------------------------------|
| 100 $\Omega$     | 2,2                                           | 0,05                    | 22                           |
| 220 $\Omega$     | 3,3                                           | 0,05                    | 15                           |
| 470 $\Omega$     | 4,8                                           | 0,05                    | 10                           |
| 1K $\Omega$      | 7                                             | 0,05                    | 7                            |
| 2,2K $\Omega$    | 10                                            | 0,05                    | 4,8                          |
| 4,7K $\Omega$    | 15                                            | 0,05                    | 3,2                          |
| 10K $\Omega$     | 22                                            | 0,05                    | 2,2                          |
| 22K $\Omega$     | 33                                            | 0,05                    | 1,5                          |
| 47K $\Omega$     | 48                                            | 0,05                    | 1,0                          |
| 100K $\Omega$    | 70                                            | 0,05                    | 0,7                          |
| 220K $\Omega$    | 105                                           | 0,05                    | 0,48                         |
| 470K $\Omega$    | 150                                           | 0,05                    | 0,32                         |
| 1M $\Omega$      | 150                                           | 0,02                    | 0,14                         |
| 2,2M $\Omega$    | 150                                           | 0,01                    | 0,07                         |

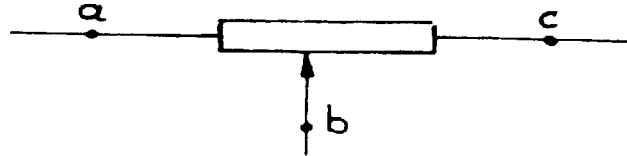
### 7.2. Resistance law

The resistance law of potentiometers covered by this detail specification approximates to that for a linear law as given in fig. 3 of CECC 41 000 clause 2.2.25

### 7.3. Packaging

Potentiometers covered by this detail specification can be delivered packed in bulk or in anti-static rails according drawing on appendix G.

### 7.4. Designation of terminations



see also appendix A to E

## 8. INSPECTION REQUIREMENTS

- 8.1 When drying is called for, Procedure I of 4.2 of CECC 41 000 shall be used.
- 8.2 When it is desired to obtain qualification approval by adopting the fixed sample size procedure, use shall be made of the test schedule given for that purpose in CECC 41 100.  
  
The conditions of test and the performance requirements shall be identical to those prescribed for quality conformance inspection in the detail specification.
- 8.3 In the quality conformance inspection the values representative of the whole approved range shall be tested within one year (Groups A, B and C only).

TABLE 4 : Test Schedule

| TEST<br>(See Note 1)                            | D<br>or<br>ND | Conditions of Test                                                                                  | IL<br>(See Note 2) | AQL  | Performance<br>Requirements<br>(See Note 1)                                                                                    |
|-------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------|--------------------|------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>GROUP A INSPECTION</b>                       |               |                                                                                                     |                    |      |                                                                                                                                |
| To be conducted on a sampling basis, lot-by-lot |               |                                                                                                     |                    |      |                                                                                                                                |
| <u>Sub-Group A1</u>                             | ND            |                                                                                                     | S-3                | 4,0% |                                                                                                                                |
| 4.3.1 Visual inspection                         |               |                                                                                                     |                    |      | As in 4.3.1                                                                                                                    |
| <u>Sub-Group A2</u>                             | ND            |                                                                                                     | S-3                | 1,5% |                                                                                                                                |
| 4.3.2 Marking                                   |               |                                                                                                     |                    |      | As in 4.3.2                                                                                                                    |
| 4.5 Element resistance                          |               |                                                                                                     |                    |      | As in 4.5.1                                                                                                                    |
| <u>Sub-Group A3</u>                             | ND            |                                                                                                     | S-3                | 2,5% |                                                                                                                                |
| 4.4 Continuity                                  |               |                                                                                                     |                    |      | As in 4.4                                                                                                                      |
| <b>GROUP B INSPECTION</b>                       |               |                                                                                                     |                    |      |                                                                                                                                |
| To be conducted on a sampling basis, lot-by-lot |               |                                                                                                     |                    |      |                                                                                                                                |
| <u>Sub-Group B1</u>                             | D             |                                                                                                     | S-2                | 1,5% |                                                                                                                                |
| 4.12 Voltage proof                              |               | Insulated styles only                                                                               |                    |      | As in 4.12.5                                                                                                                   |
|                                                 |               | Normal air pressure<br>See D1.1                                                                     |                    |      |                                                                                                                                |
| 4.23.1 Soldering - Solderability                |               | Solder bath method :<br>Temperature : $235 \pm 5^{\circ}\text{C}$<br>Duration : $2 \pm 0,5\text{s}$ |                    |      | The terminations shall be examined for good tinning as evidence by free flowing of the solder with wetting of the terminations |

Notes on page 14

-7-

CECC 41 102-002 Issue 1

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