

## Cradle P Relay V23003

- Highly reliable multi purpose relay
- Great variety of contact arrangements and materials to meet specific applications
- Contacts for signal loads and currents up to 5A
- Primarily intended for impulse operation
- Sockets for easy and quick mounting of relays (see datasheet Accessories)

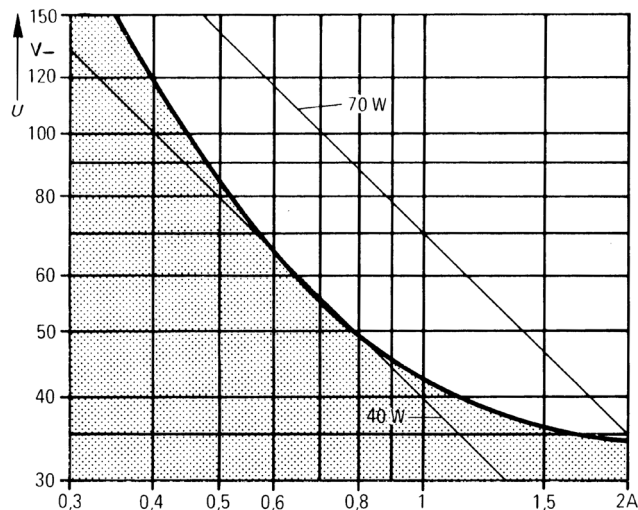


Typical applications  
applications where the switching status must be maintained, measuring systems

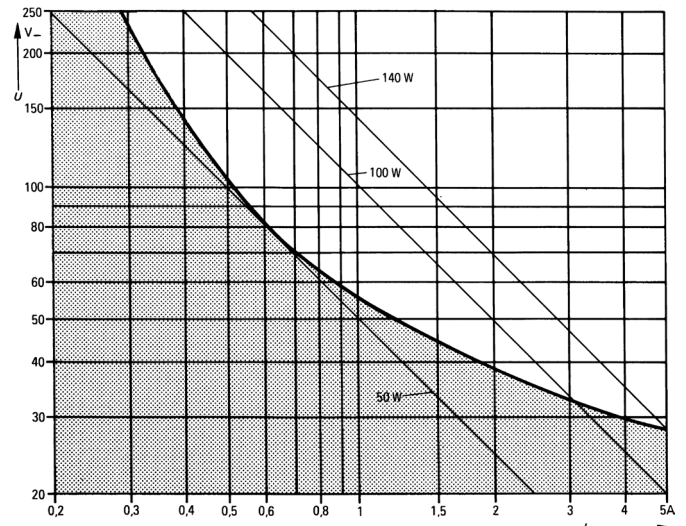
### Contact Data

| Product code block 3                                    | B104/B110                                                                                                            | B604/B610                 | C104/C110                 | C404/C410                 | F104 to F107              |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Contact arrangement                                     | max. 4 form C (4 CO) contacts, 2 form C (2 CO), 2 form A (2 NO) or 2 form B (2 NC) contacts (see product code table) |                           |                           |                           |                           |
| Max. switching voltage                                  | 150VDC<br>125VAC                                                                                                     | 36VDC<br>30VAC            | 150VDC<br>125VAC          | 36VDC<br>30VAC            | 250VDC<br>250VAC          |
| Rated current                                           | 2A                                                                                                                   | 0.2A                      | 2A                        | 0.2A                      | 5A                        |
| Limiting continuous current at max. ambient temperature | 2A                                                                                                                   | 2A                        | 2A                        | 2A                        | 5A                        |
| Breaking capacity                                       | 35 to 70W<br>see DC load breaking capacity curve below 50VA                                                          | 5W, 5VA<br>-              | 35 to 70W<br>50VA         | 5W, 5VA<br>-              | 50 to 140W<br>500VA       |
| Contact material                                        | silver, gold-flashed                                                                                                 | gold F                    | silver, gold-flashed      | gold F                    | silver, gold-flashed      |
| Contact style                                           | single contact                                                                                                       | single contact            | bifurcated contacts       | bifurcated contacts       | single contact            |
| Frequency of operation, without load, max.              | 20 ops./s                                                                                                            | 20 ops./s                 | 20 ops./s                 | 20 ops./s                 | 20 ops./s                 |
| Mechanical endurance                                    | app. 10 <sup>7</sup> ops.                                                                                            | app. 10 <sup>7</sup> ops. | app. 10 <sup>7</sup> ops. | app. 10 <sup>7</sup> ops. | app. 10 <sup>8</sup> ops. |

Max. DC breaking capacity, contact sets B1xx, C1xx



Max. DC breaking capacity, contact sets F1xx



**Cradle P Relay V23003** (Continued)

**Coil Data**

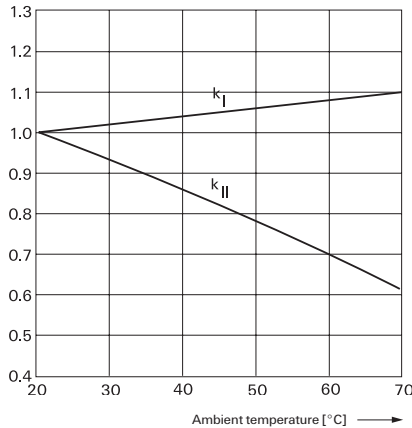
|                       |                                                |
|-----------------------|------------------------------------------------|
| Magnetic system       | polarized, bistable                            |
| Coil voltage range    | 6 to 60 VDC,<br>typ. 1500 mW power consumption |
| Max. coil temperature | 100°C                                          |
| Thermal resistance    | 50K/W                                          |

**Coil versions, bistable 2 coils**

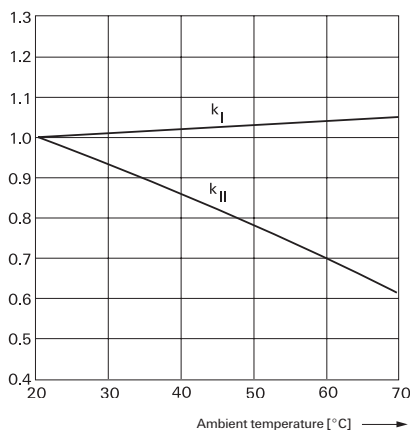
| Coil code | Rated voltage VDC | Set voltage VDC | Reset voltage VDC | Limiting Set/Reset VDC | Coil resistance $\Omega \pm 15\%$ | Rated coil power W (set) |
|-----------|-------------------|-----------------|-------------------|------------------------|-----------------------------------|--------------------------|
| 026       | 6                 | 4.0             | 4.0               | 6.7/6.7                | 24.5/24.5                         | 1.47                     |
| 025       | 12                | 8.0             | 8.0               | 13.5/13.5              | 100/100                           | 1.44                     |
| 037       | 24                | 16.5            | 16.5              | 26.5/25.0              | 400/340                           | 1.44                     |
| 044       | 60                | 44.0            | 44.0              | 65.0/65.0              | 2400/2400                         | 1.5                      |
| 064       | 48                | 33.5            | 33.5              | 49.0/49.0              | 1400/1400                         | 1.65                     |

All figures are given for coil without pre-energization, at ambient temperature +23°C.

Set - negative potential at start of winding



Reset - plus potential at start of winding



Terminals:

- coil with 2 windings:
- winding I: start 3, end 2
- winding II: start 4, end 1

**Coil Data** (continued)

Note: with continuous operation only one winding to be energized within the specified voltage range at a time!

The minimum voltage  $U_I$  and the maximum voltage  $U_{II}$  only depends on the ambient temperature.

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| $U_{I \text{ tamb}}$  | $U_I \cdot U_{20^\circ\text{C}} \cdot k_{I \text{ tamb}}$     |
| $U_{II \text{ tamb}}$ | $U_{II} \cdot U_{20^\circ\text{C}} \cdot k_{II \text{ tamb}}$ |
| tamb                  | Ambient temperature                                           |
| $U_{I \text{ tamb}}$  | Minimum voltage at ambient temperature, tamb                  |
| $U_{II \text{ tamb}}$ | Maximum voltage at ambient temperature, tamb                  |
| $k_I$ and $k_{II}$    | Factors                                                       |

**Insulation Data** B1xx,B6xx,C1xx,C4xx F1xx

|                                           |                        |                         |
|-------------------------------------------|------------------------|-------------------------|
| Initial dielectric strength               |                        |                         |
| between coil / frame                      | 500 VAC <sub>rms</sub> | 500 VAC <sub>rms</sub>  |
| between contact / contact                 | 500 VAC <sub>rms</sub> | 1000 VAC <sub>rms</sub> |
| between contact / frame                   | 500 VAC <sub>rms</sub> | 1000 VAC <sub>rms</sub> |
| Initial insulation resistance, at 500 VDC | > 106 $\Omega$         |                         |

**Other Data**

Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content refer to the Product Compliance Support Center at [www.te.com/customer-support/rohssupportcenter](http://www.te.com/customer-support/rohssupportcenter)

|                                                 |                                |
|-------------------------------------------------|--------------------------------|
| Ambient temperature                             | -40 to + 70°C                  |
| Category of environmental protection, IEC 61810 | RT I - dust-protected          |
| Degree of protection, IEC 60529                 | IP 30                          |
| Terminal type                                   | hand solder terminals, plug-in |
| Weight                                          |                                |
| V23003-A0xxx Size I                             | approx. 25g                    |
| V23003-B0xxx Size II                            | approx. 30g                    |
| Packaging unit                                  | 5 pcs.                         |

**Accessories**

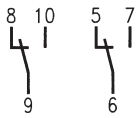
For details see datasheet Cradle Relay, Accessories and Mounting

## Cradle P Relay V23003 (Continued)

### Terminal assignment

#### Size I

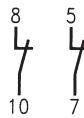
2 form C (2 CO)  
V23003-xxxx-Bx04  
V23003-xxxx-Cx04



2 form A (2 NO)  
V23003-xxxx-F105



2 form B (2 NC)  
V23003-xxxx-F107

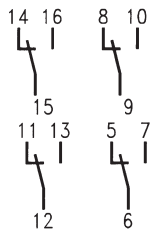


1 form A + 1 form B  
(1 NO + 1 NC)  
V23003-xxxx-F106

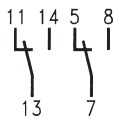


#### Size II

4 form C (4 CO)  
V23003-xxxx-Bx10

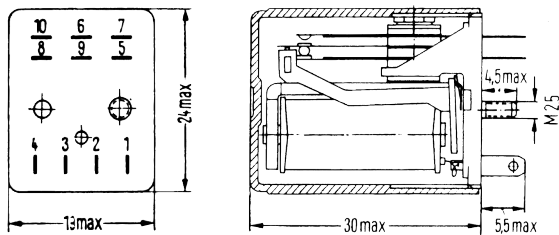


2 form C (2 CO)  
V23003-xxxx-F104

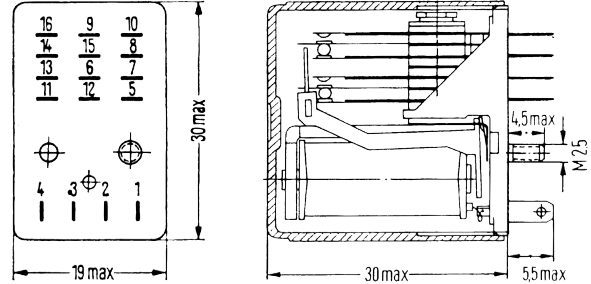


### Dimensions

#### V23003-A0xx, size I type



#### V23003-B0xx, size II type



## Cradle P Relay V23003 (Continued)

### Instructions for Impulse Operation

Cradle relay P is primarily intended for impulse operation. The maximum voltage stated in the coil table can be increased for impulse operation as follows:

$U_{II \text{ Impuls}}$   $U_{II \text{ tamb}} \times q$   
 $U_{II \text{ tamb}}$  Maximum continuous voltage at ambient temperature  $t_{\text{amb}}$   
 $q$  Factor

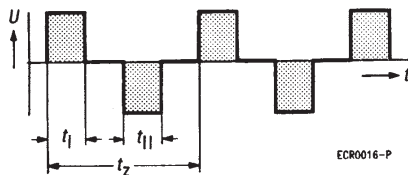
The impulse voltage must not exceed 80% of the test voltage (winding/frame or winding/winding) or 3.3 times at ambient temperature 20°C and 2.3 times at ambient temperature <20°C the value of the maximum voltage listed in the coil table.

If  $t_{ED} \leq 3s$  then  $q = \sqrt{\frac{t_z}{t_{ED}}}$ ; If  $t_{ED}$  = Pulse width,  $t_z$  = Cycle time.

If  $t_{ED} > 3s$  the value of  $q$  must be obtained from the nomograph.

Examples of various periodic pulse trains (energizing side)

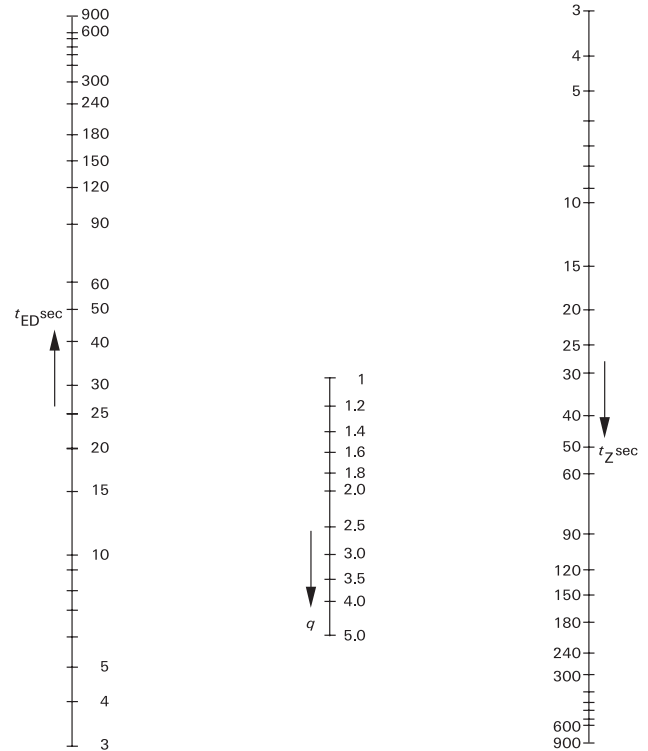
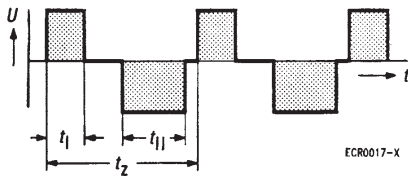
1. Periodic recurrence of one energizing pulse



$t_{ED} = t_l + t_{ll}$

$t_l$  = Pulse width of the positive pulse at the start of the winding  
 $t_{ll}$  = Pulse width of the negative pulse at the start of the winding  
 $t_l + t_{ll}$  = Pulse widths within one cycle

2. Periodic recurrence of two unequal energizing pulses



### Product code structure

Typical product code **V23003 -B0 037 -F1 04**

|                     |                                                                                                                          |  |  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------|--|--|
| Type                | V23003 Cradle P Relay, dust protected                                                                                    |  |  |
| Size                | A0 Size I, dust-protected<br>B0 Size II, dust-protected                                                                  |  |  |
| Coils               | Coil code: please refer to coil versions table                                                                           |  |  |
| Contact style       | B1 Single contacts      B6 Single contacts      F1 Single contacts<br>C1 Bifurcated contacts      C4 Bifurcated contacts |  |  |
| Contact arrangement | 04 2 form C, 2 CO      05 2 form A, 1 NO      06 1 form A+ 1 form B, 1 NO+ 1 NC<br>10 4 form C, 4 CO                     |  |  |

Other types on request

**Cradle P Relay V23003** (Continued)

| Product code                           | Version           | Coil  | Arrangement     | Contacts   | Enclosure      | Part number |
|----------------------------------------|-------------------|-------|-----------------|------------|----------------|-------------|
| <b>V23003-AXXXX, standard, size I</b>  |                   |       |                 |            |                |             |
| V23003-A0025-B104                      | Standard, size I  | 12VDC | 2 form C (2 CO) | Single     | Dust protected | 1393817-4   |
| V23003-A0025-C104                      | Standard, size I  | 12VDC | 2 form C (2 CO) | Bifurcated | Dust protected | 1393817-5   |
| V23003-A0037-B104                      | Standard, size I  | 24VDC | 2 form C (2 CO) | Single     | Dust protected | 1393817-7   |
| V23003-A0037-B604                      | Standard, size I  | 24VDC | 2 form C (2 CO) | Single     | Dust protected | 1393817-8   |
| V23003-A0037-C104                      | Standard, size I  | 24VDC | 2 form C (2 CO) | Bifurcated | Dust protected | 1393817-9   |
| V23003-A0044-B104                      | Standard, size I  | 60VDC | 2 form C (2 CO) | Single     | Dust protected | 1-1393817-8 |
| V23003-A0064-B104                      | Standard, size I  | 48VDC | 2 form C (2 CO) | Single     | Dust protected | 2-1393817-0 |
| V23003-A0064-B604                      | Standard, size I  | 48VDC | 2 form C (2 CO) | Single     | Dust protected | 2-1393817-1 |
| V23003-A0064-C104                      | 5A size I         | 48VDC | 2 form C (2 CO) | Single     | Dust protected | 2-1393817-2 |
| <b>V23003-AXXXX, 5A, size I</b>        |                   |       |                 |            |                |             |
| V23003-A0026-F106                      | 5A size I         | 6VDC  | 1A+1B (1NO+1NC) | Single     | Dust protected | 1393817-6   |
| V23003-A0037-F105                      | 5A size I         | 24VDC | 2 form A (2 NO) | Single     | Dust protected | 1-1393817-1 |
| V23003-A0037-F106                      | 5A size I         | 24VDC | 1A+1B (1NO+1NC) | Single     | Dust protected | 1-1393817-2 |
| <b>V23003-BXXXX, standard, size II</b> |                   |       |                 |            |                |             |
| V23003-B0025-B110                      | Standard, size II | 12VDC | 4 form C (4 CO) | Single     | Dust protected | 3-1393817-1 |
| V23003-B0025-C110                      | Standard, size II | 12VDC | 4 form C (4 CO) | Bifurcated | Dust protected | 3-1393817-2 |
| V23003-B0026-B110                      | Standard, size II | 6VDC  | 4 form C (4 CO) | Single     | Dust protected | 3-1393817-4 |
| V23003-B0026-C110                      | Standard, size II | 6VDC  | 4 form C (4 CO) | Bifurcated | Dust protected | 3-1393817-5 |
| V23003-B0037-B110                      | Standard, size II | 24VDC | 4 form C (4 CO) | Single     | Dust protected | 3-1393817-9 |
| V23003-B0037-B610                      | Standard, size II | 24VDC | 4 form C (4 CO) | Single     | Dust protected | 4-1393817-0 |
| V23003-B0037-C110                      | Standard, size II | 24VDC | 4 form C (4 CO) | Bifurcated | Dust protected | 4-1393817-1 |
| V23003-B0037-C410                      | Standard, size II | 24VDC | 4 form C (4 CO) | Bifurcated | Dust protected | 4-1393817-4 |
| V23003-B0044-B110                      | Standard, size II | 60VDC | 4 form C (4 CO) | Single     | Dust protected | 5-1393817-4 |
| V23003-B0044-B610                      | Standard, size II | 60VDC | 4 form C (4 CO) | Single     | Dust protected | 1413004-1   |
| V23003-B0044-B610                      | Standard, size II | 60VDC | 4 form C (4 CO) | Single     | Dust protected | 1-1419137-0 |
| V23003-B0044-C110                      | Standard, size II | 60VDC | 4 form C (4 CO) | Bifurcated | Dust protected | 5-1393817-6 |
| V23003-B0064-B110                      | Standard, size II | 48VDC | 4 form C (4 CO) | Single     | Dust protected | 6-1393817-3 |
| V23003-B0064-C110                      | Standard, size II | 48VDC | 4 form C (4 CO) | Bifurcated | Dust protected | 6-1393817-4 |
| <b>V23003-BXXXX, 5A, size II</b>       |                   |       |                 |            |                |             |
| V23003-B0025-F104                      | 5A size II        | 12VDC | 2 form C (2 CO) | Single     | Dust protected | 3-1393817-3 |
| V23003-B0026-F104                      | 5A size II        | 6VDC  | 2 form C (2 CO) | Single     | Dust protected | 3-1393817-6 |
| V23003-B0037-F104                      | 5A size II        | 24VDC | 2 form C (2 CO) | Single     | Dust protected | 4-1393817-5 |
| V23003-B0044-F104                      | 5A size II        | 60VDC | 2 form C (2 CO) | Single     | Dust protected | 5-1393817-7 |
| V23003-B0064-F104                      | 5A size II        | 48VDC | 2 form C (2 CO) | Single     | Dust protected | 6-1393817-5 |