

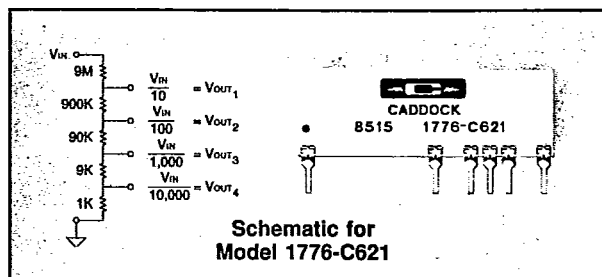
# Type 1776 Precision Decade Resistor Voltage Dividers

## Input Voltage Dividers for Digital Multimeters and Range-Switching Instruments

The exceptional performance of this extensive family of Type 1776 Precision Decade Resistor Voltage Dividers has been achieved through the special combination of advantages provided by Caddock's Tetrinox® resistance films. This advanced film resistor technology provides the performance characteristics required by the precision input signal circuits of both bench-type and laboratory digital instruments.

In addition to requiring less board space, these compact precision resistor networks deliver higher performance than selected discrete resistor sets and thin-film networks.

There are now 39 standard models in the expanded family of Type 1776 precision resistor networks that include -



- 3, 4 and 5 - decade voltage dividers with ratios from 10:1 to 10,000:1.
- 1,200 volts continuous ratings and overvoltage to 2,000 volts.
- Many combinations of Ratio and Absolute Tolerance, and Ratio and Absolute Temperature Coefficient.

For complete information on quantity price and delivery, call or write our Sales Office.

| Model No.  | Resistance Values |                |                |                |                | Fig. | Voltage Rating (7) | Absolute Tolerance % | Ratio Tolerance % (1) | Absolute TC ppm/°C | Ratio TC ppm/°C (2) | Voltage Coefficient of Ratio ppm/volt (3) | Ratio Stability % Change in Ratio |                |                  |
|------------|-------------------|----------------|----------------|----------------|----------------|------|--------------------|----------------------|-----------------------|--------------------|---------------------|-------------------------------------------|-----------------------------------|----------------|------------------|
|            | R <sub>1</sub>    | R <sub>2</sub> | R <sub>3</sub> | R <sub>4</sub> | R <sub>5</sub> |      |                    |                      |                       |                    |                     |                                           | Load Life (4)                     | Shelf Life (5) | Over-Voltage (6) |
| 1776-C61   | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 6    | 1200               | 0.1                  | 0.1                   | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C611  | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 6    | 1200               | 0.1                  | 0.05                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C6117 | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 6    | 1200               | 0.1                  | 0.02                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C62   | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 6    | 1200               | 0.1                  | 0.1                   | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C621  | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 6    | 1200               | 0.1                  | 0.05                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C6217 | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 6    | 1200               | 0.1                  | 0.02                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C732  | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 7    | 1200               | 0.25                 | 0.25                  | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-C73   | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 7    | 1200               | 0.1                  | 0.1                   | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-C742  | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 7    | 1200               | 0.25                 | 0.25                  | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-C74   | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 7    | 1200               | 0.1                  | 0.1                   | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-232   | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 3    | 1200               | 0.25                 | 0.25                  | 50                 | 50                  | 0.3                                       | 0.04                              | 0.02           | 0.04             |
| 1776-23    | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 3    | 1200               | 0.1                  | 0.1                   | 50                 | 50                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-231   | 9 Meg             | 900 K          | 90 K           | 9 K            | 900            | 3    | 1200               | 0.1                  | 0.05                  | 50                 | 50                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-242   | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 3    | 1200               | 0.25                 | 0.25                  | 50                 | 50                  | 0.3                                       | 0.04                              | 0.02           | 0.04             |
| 1776-24    | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 3    | 1200               | 0.25                 | 0.1                   | 50                 | 50                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-241   | 9 Meg             | 900 K          | 90 K           | 9 K            | 1 K            | 3    | 1200               | 0.25                 | 0.05                  | 50                 | 50                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-10    | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 4    | 1200               | +0, -0.5             | 0.1                   | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-105   | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 4    | 1200               | +0, -0.5             | 0.1                   | 30                 | 5                   | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-C10   | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 9    | 1200               | +0, -0.5             | 0.1                   | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-C105  | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 9    | 1200               | +0, -0.5             | 0.1                   | 30                 | 5                   | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-1     | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 2    | 1200               | 0.25                 | 0.05                  | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-14    | 9 Meg             | 900 K          | 90 K           | 10 K           | N/A            | 2    | 1200               | 0.25                 | 0.1                   | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-8     | 9.9 Meg           | 90 K           | 10 K           | N/A            | N/A            | 1    | 1200               | 0.25                 | 0.1                   | 30                 | 25                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-81    | 9.9 Meg           | 90 K           | 10 K           | N/A            | N/A            | 1    | 1200               | 0.25                 | 0.05                  | 30                 | 25                  | 0.2                                       | 0.02                              | 0.01           | 0.02             |
| 1776-9     | 9.9 Meg           | 90 K           | 10 K           | N/A            | N/A            | 1    | 1200               | 0.25                 | 0.1                   | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-91    | 9.9 Meg           | 90 K           | 10 K           | N/A            | N/A            | 1    | 1200               | 0.25                 | 0.05                  | 30                 | 10                  | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-912   | 9.9 Meg           | 90 K           | 10 K           | N/A            | N/A            | 1    | 1200               | 0.25                 | 0.02                  | 30                 | 5                   | 0.02                                      | 0.01                              | 0.005          | 0.01             |
| 1776-C4    | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.25                 | 0.25                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C44   | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.1                  | 0.1                   | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C441  | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.1                  | 0.05                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C4417 | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.1                  | 0.02                  | 30                 | 10                  | 0.1                                       | 0.01                              | 0.005          | 0.01             |
| 1776-C3    | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.5                  | 0.5                   | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-C34   | 10 Meg            | 1.111M         | 101.01K        | 10.01K         | 1.0001K        | 8    | 1200               | 0.25                 | 0.25                  | 50                 | 50                  | 0.5                                       | 0.04                              | 0.02           | 0.04             |
| 1776-C532  | 900 K             | 90 K           | 9 K            | 900            | N/A            | 5    | 750                | 0.25                 | 0.25                  | 25                 | 25                  | 0.4                                       | 0.02                              | 0.01           | 0.02             |
| 1776-C53   | 900 K             | 90 K           | 9 K            | 900            | N/A            | 5    | 750                | 0.1                  | 0.1                   | 25                 | 15                  | 0.3                                       | 0.02                              | 0.01           | 0.02             |
| 1776-C531  | 900 K             | 90 K           | 9 K            | 900            | N/A            | 5    | 750                | 0.1                  | 0.05                  | 25                 | 15                  | 0.3                                       | 0.02                              | 0.01           | 0.02             |
| 1776-C542  | 900 K             | 90 K           | 9 K            | 1 K            | N/A            | 5    | 750                | 0.25                 | 0.25                  | 25                 | 25                  | 0.4                                       | 0.02                              | 0.01           | 0.02             |
| 1776-C54   | 900 K             | 90 K           | 9 K            | 1 K            | N/A            | 5    | 750                | 0.1                  | 0.1                   | 25                 | 15                  | 0.3                                       | 0.02                              | 0.01           | 0.02             |
| 1776-C541  | 900 K             | 90 K           | 9 K            | 1 K            | N/A            | 5    | 750                | 0.1                  | 0.05                  | 25                 | 15                  | 0.3                                       | 0.02                              | 0.01           | 0.02             |

## Specifications:

(Numbers inside circles reference columns in Model No. table)

- ① **Ratio Tolerance:** Maximum ratio difference between two resistors in the network. (See the specific Figures for the Ratio Definition).
- ② **Ratio Temperature Coefficient:** Ratio track from 0°C to +70°C.
- ③ **Voltage Coefficient of Ratio (ppm/volt):** R<sub>1</sub> in series with any combination of R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub>. 100 volts to rated voltage.
- ④ **Load Life:** Ratio stability of resistance under full load, rated voltage applied to R<sub>1</sub> in series with any combination of R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub>.
- ⑤ **Shelf Stability of Ratio:** Six months at shelf conditions.
- ⑥ **Overvoltage:** Maximum voltage of 1.67 times rated DC voltage. Volts DC or peak AC applied to R<sub>1</sub> and any combination of R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> in series with R<sub>1</sub> for 10 seconds.
- ⑦ **Voltage Rating:** DC or RMS AC voltage applied to R<sub>1</sub> in series with any combination of R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub>.

**Storage Temperature:** -55°C to +85°C.

**CADDOCK**  
RIVERSIDE, CALIFORNIA, USA  
KERKRADE, THE NETHERLANDS

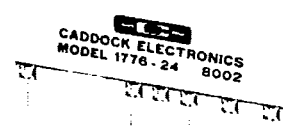
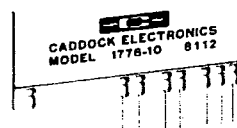
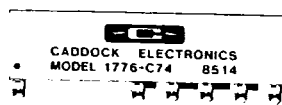
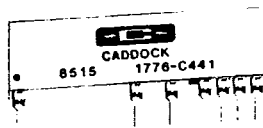
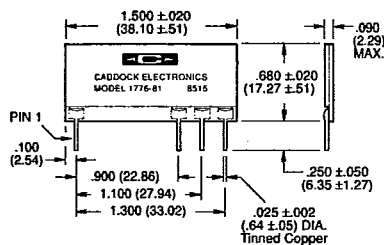


Figure 1



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

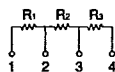
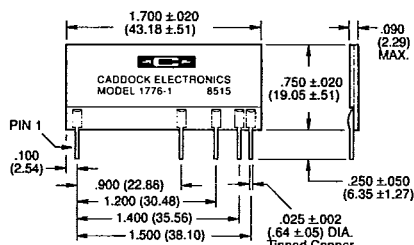


Figure 2



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

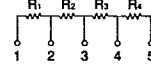
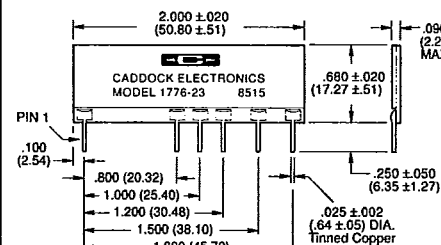


Figure 3



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

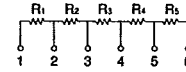
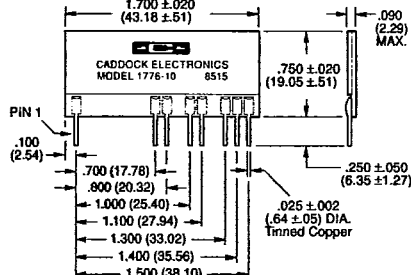


Figure 4



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

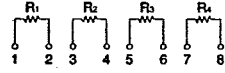
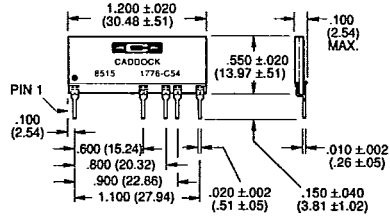


Figure 5



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

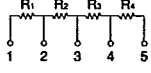
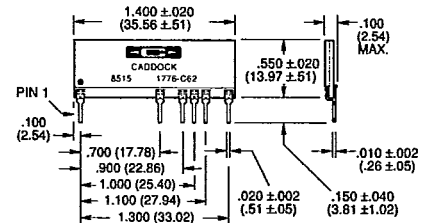


Figure 6



RATIO DEFINITION: Where  $R_T = R_1 + R_2 + R_3 + R_4 + R_5$   
RATIO 1  $(R_2 + R_3 + R_4 + R_5):R_T$   
RATIO 2  $(R_3 + R_4 + R_5):R_T$   
RATIO 3  $(R_4 + R_5):R_T$   
RATIO 4  $(R_5):R_T$

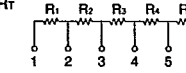
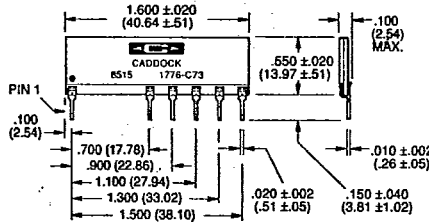


Figure 7



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

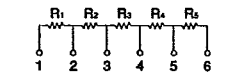
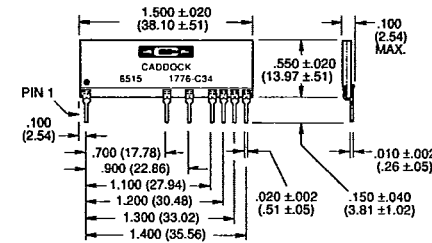


Figure 8



RATIO DEFINITION:  
RATIO 1  $R_1:R_2$   
RATIO 2  $R_1:R_3$   
RATIO 3  $R_1:R_4$   
RATIO 4  $R_1:R_5$

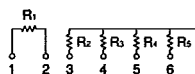
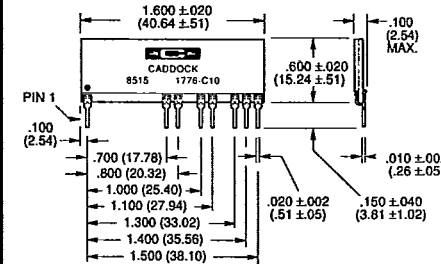


Figure 9



RATIO DEFINITION:  
ALL RESISTORS RATIO  
ONE ANOTHER

