

ELECTRONIC TUBE REFERENCE

ZM1081

Nixie electronic tube

CONSOLIDATED TECHNICAL DATA  
1 SECTION  
CONSTRUCTION  
NIXIE

Red-filtered gas-filled cold-cathode Nixie symbol indicator displaying plus, minus, and equals signs.

GENERAL CHARACTERISTICS

|                     |                        |                      |               |
|---------------------|------------------------|----------------------|---------------|
| BASE DESIGNATION    | Wire-leaded            | BASE PINS            | –             |
| NOMINAL HEATER      | – / –                  | PARALLEL HEATER      | – / –         |
| HEATING             | Indirect; cold cathode | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes      | SECTION CONSTRUCTION | Similar       |

SECTION RATINGS

|                                                                                                                          |       |
|--------------------------------------------------------------------------------------------------------------------------|-------|
| SECTION1 Nixie                                                                                                           |       |
| MAXIMUM CATHODE CURRENT                                                                                                  | 12 mA |
| MINIMUM REGULATOR CURRENT                                                                                                | 1.5 A |
| MAXIMUM REGULATOR CURRENT                                                                                                | 2.5 A |
| STARTING VOLTAGE                                                                                                         | 170 V |
| MAINTAINING VOLTAGE                                                                                                      | 140 V |
| Cold-cathode discharge/display section; explicit published limits and operating data are retained as section parameters. |       |

Gas-filled cold-cathode Nixie symbol indicator for direct optical display of +, – and = in measuring and counting instruments. ZM1081 is the red-filtered version.

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1967 Nixie La Radiotechnique

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1967 NIXIE LA RADIOTECHNIQUE

## Section 1 · Nixie

| CHARACTERISTIC              |                 |                                              |
|-----------------------------|-----------------|----------------------------------------------|
| PARAMETER                   | PUBLISHED VALUE | CONDITION / NOTE                             |
| Ignition/Starting Voltage   | 170 V           | Published ignition/start value               |
| Extinction Voltage          | 118 V           | Published extinction value                   |
| Maintaining Voltage         | 140 V           | Published maintaining/burning value          |
| Service Life Same Sign      | 5000 h          | Continuous operation on same sign            |
| Service Life With Switching | 30000 h         | Each sign switched at least once every 100 h |

| OTHER                              |                 |                                   |
|------------------------------------|-----------------|-----------------------------------|
| PARAMETER                          | PUBLISHED VALUE | CONDITION / NOTE                  |
| Recommended/Minimum Supply Voltage | 200 V           | Published operating condition     |
| Maximum Cathode Current            | 2.5 mA          | Published maximum/average maximum |
| Peak Cathode Current               | 12 mA           | Published peak value              |
| Off-Cathode Bias Voltage           | 60 V            | Relative to active cathode        |
| Preionization Bias Voltage         | 120 V           | Pulse operation                   |
| Pulse Width Minimum                | 100 us          | Pulse operation                   |
| Pulse Width Maximum                | 2 ms            | Pulse operation                   |

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1969 Nixie Mullard

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1969 NIXIE MULLARD

| OTHER                        |                 |                                   |
|------------------------------|-----------------|-----------------------------------|
| PARAMETER                    | PUBLISHED VALUE | CONDITION / NOTE                  |
| Numeral/Character Height     | 10.5 mm         | Published mechanical/display data |
| Maximum Peak Cathode Current | 12 mA           | Published peak limit              |

| CHARACTERISTIC           |                 |                                                         |
|--------------------------|-----------------|---------------------------------------------------------|
| PARAMETER                | PUBLISHED VALUE | CONDITION / NOTE                                        |
| Supply Voltage           | 170 V           | Published operating data                                |
| Minimum Ignition Voltage | 170 V           | Minimum anode-to-cathode voltage necessary for ignition |
| Cathode Current          | 2 mA            | Published average/normal value                          |

TUBE TINKER  
ELECTRON TUBE DATABASE

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

SOURCE PDF

# 1969 Nixie Valvo

Published test conditions and operating points. Values on this page are preserved as reported by this source.

| CHARACTERISTICS                            |                 |                                         |
|--------------------------------------------|-----------------|-----------------------------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE                        |
| Ignition voltage                           | 170 V           | Typical characteristic                  |
| Extinction voltage                         | 118 V           | Typical characteristic                  |
| Life with one digit continuously displayed | 5000 h          | Recommended conditions                  |
| Life with changing display                 | 30000 h         | Digit changed every 100 h or more often |
| Ignition delay                             | 400 ms          | Approximately at 180 V                  |
| Symbol set                                 | + - =           | 10 mm side-visible symbols              |

| OTHER              |                 |                     |
|--------------------|-----------------|---------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE    |
| DC supply voltage  | 200 V           | Biased DC operation |
| DC cathode current | 2 mA            | Biased DC operation |
|                    |                 |                     |

| PARAMETER                     | PUBLISHED VALUE | CONDITION / NOTE        |
|-------------------------------|-----------------|-------------------------|
| DC burning voltage            | 140 V           | Biased DC operation     |
| Recommended off-cathode bias  | 60 V            | Biased DC operation     |
| Continuous cathode current    | 1.5–2.5 mA      | Absolute range          |
| Envelope temperature          | -55–70 degC     | Absolute range          |
| Pulse cathode current         | 10 mA           | Typical pulse operation |
| Pulse burning voltage         | 185 V           | Typical pulse operation |
| Pulse duration                | 0.1 ms          | Typical pulse operation |
| Pulse frequency               | 1000 Hz         | Typical pulse operation |
| Maximum pulse cathode current | —12 mA          | Absolute maximum        |
| Pulse duration limits         | 0.1–2 ms        | Absolute range          |



SOURCE DATA APPENDIX

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 196X Nixie Random Datasheets

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 196X NIXIE RANDOM DATASHEETS

### Section 1 · Nixie

| CHARACTERISTICS                            |                 |                                         |
|--------------------------------------------|-----------------|-----------------------------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE                        |
| Ignition voltage                           | 170 V           | Typical characteristic                  |
| Extinction voltage                         | 118 V           | Typical characteristic                  |
| Life with one digit continuously displayed | 5000 h          | Recommended conditions                  |
| Life with changing display                 | 30000 h         | Digit changed every 100 h or more often |
| Ignition delay                             | 400 ms          | Approximately at 180 V                  |
| Symbol set                                 | + - =           | 10 mm side-visible symbols              |

| OTHER              |                 |                     |
|--------------------|-----------------|---------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE    |
| DC supply voltage  | 200 V           | Biased DC operation |
| DC cathode current | 2 mA            | Biased DC operation |

| PARAMETER                     | PUBLISHED VALUE | CONDITION / NOTE        |
|-------------------------------|-----------------|-------------------------|
| DC burning voltage            | 140 V           | Biased DC operation     |
| Recommended off-cathode bias  | 60 V            | Biased DC operation     |
| Continuous cathode current    | 1.5–2.5 mA      | Absolute range          |
| Envelope temperature          | -55–70 degC     | Absolute range          |
| Pulse cathode current         | 10 mA           | Typical pulse operation |
| Pulse burning voltage         | 185 V           | Typical pulse operation |
| Pulse duration                | 0.1 ms          | Typical pulse operation |
| Pulse frequency               | 1000 Hz         | Typical pulse operation |
| Maximum pulse cathode current | —12 mA          | Absolute maximum        |
| Pulse duration limits         | 0.1–2 ms        | Absolute range          |



SOURCE DATA APPENDIX

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1971 Nixie RFT

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1971 NIXIE RFT

### Section 1 · Nixie

| CHARACTERISTICS                            |                 |                                         |
|--------------------------------------------|-----------------|-----------------------------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE                        |
| Ignition voltage                           | 170 V           | Typical characteristic                  |
| Extinction voltage                         | 118 V           | Typical characteristic                  |
| Life with one digit continuously displayed | 5000 h          | Recommended conditions                  |
| Life with changing display                 | 30000 h         | Digit changed every 100 h or more often |
| Ignition delay                             | 400 ms          | Approximately at 180 V                  |
| Symbol set                                 | + - =           | 10 mm side-visible symbols              |

| OTHER              |                 |                     |
|--------------------|-----------------|---------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE    |
| DC supply voltage  | 200 V           | Biased DC operation |
| DC cathode current | 2 mA            | Biased DC operation |

| PARAMETER                     | PUBLISHED VALUE | CONDITION / NOTE        |
|-------------------------------|-----------------|-------------------------|
| DC burning voltage            | 140 V           | Biased DC operation     |
| Recommended off-cathode bias  | 60 V            | Biased DC operation     |
| Continuous cathode current    | 1.5–2.5 mA      | Absolute range          |
| Envelope temperature          | -55–70 degC     | Absolute range          |
| Pulse cathode current         | 10 mA           | Typical pulse operation |
| Pulse burning voltage         | 185 V           | Typical pulse operation |
| Pulse duration                | 0.1 ms          | Typical pulse operation |
| Pulse frequency               | 1000 Hz         | Typical pulse operation |
| Maximum pulse cathode current | —12 mA          | Absolute maximum        |
| Pulse duration limits         | 0.1–2 ms        | Absolute range          |



SOURCE DATA APPENDIX

#### SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1977 Nixie Tesla

Published test conditions and operating points. Values on this page are preserved as reported by this source.

#### 1977 NIXIE TESLA

### Section 1 · Nixie

| CHARACTERISTICS                            |                 |                                         |
|--------------------------------------------|-----------------|-----------------------------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE                        |
| Ignition voltage                           | 170 V           | Typical characteristic                  |
| Extinction voltage                         | 118 V           | Typical characteristic                  |
| Life with one digit continuously displayed | 5000 h          | Recommended conditions                  |
| Life with changing display                 | 30000 h         | Digit changed every 100 h or more often |
| Ignition delay                             | 400 ms          | Approximately at 180 V                  |
| Symbol set                                 | + - =           | 10 mm side-visible symbols              |

| OTHER              |                 |                     |
|--------------------|-----------------|---------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE    |
| DC supply voltage  | 200 V           | Biased DC operation |
| DC cathode current | 2 mA            | Biased DC operation |

| PARAMETER                     | PUBLISHED VALUE | CONDITION / NOTE        |
|-------------------------------|-----------------|-------------------------|
| DC burning voltage            | 140 V           | Biased DC operation     |
| Recommended off-cathode bias  | 60 V            | Biased DC operation     |
| Continuous cathode current    | 1.5–2.5 mA      | Absolute range          |
| Envelope temperature          | -55–70 degC     | Absolute range          |
| Pulse cathode current         | 10 mA           | Typical pulse operation |
| Pulse burning voltage         | 185 V           | Typical pulse operation |
| Pulse duration                | 0.1 ms          | Typical pulse operation |
| Pulse frequency               | 1000 Hz         | Typical pulse operation |
| Maximum pulse cathode current | —12 mA          | Absolute maximum        |
| Pulse duration limits         | 0.1–2 ms        | Absolute range          |



SOURCE DATA APPENDIX

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1999 Philips E-Z

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1999 PHILIPS E-Z

## Section 1 · Nixie

| CHARACTERISTIC                                                                |                 |                                                                               |
|-------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------|
| PARAMETER                                                                     | PUBLISHED VALUE | CONDITION / NOTE                                                              |
| Character height                                                              | 10.5 mm         | Character height 10.5 mm                                                      |
| Cathode current                                                               | 2 mA            | Cathode current I 2 mA                                                        |
| The tube contains 3 cathodes in the form of the characters -, + and ~ and one | 3               | The tube contains 3 cathodes in the form of the characters -, + and ~ and one |

| OTHER                                                          |                 |                                                                |
|----------------------------------------------------------------|-----------------|----------------------------------------------------------------|
| PARAMETER                                                      | PUBLISHED VALUE | CONDITION / NOTE                                               |
| Supply voltage                                                 | 170 V           | Supply voltage Vp min. 170 V                                   |
| at a solder temperature of 240 0C for a maximum of 10 seconds. | 10 a            | at a solder temperature of 240 0C for a maximum of 10 seconds. |