

ELECTRONIC TUBE REFERENCE

ZM1021

Nixie electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

NIXIE

Cold-cathode symbol indicator designed for direct glow-discharge character display. Multiple manufacturer sources document its operating and mechanical characteristics, identifying it as a specialized symbol companion to numerical instrumentation readouts.

GENERAL CHARACTERISTICS

BASE DESIGNATION	Special 13-pin	BASE PINS	13
NOMINAL HEATER	– / –	PARALLEL HEATER	– / –
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Nixie	
MAXIMUM PLATE VOLTAGE	170 V
MAXIMUM CATHODE CURRENT	10 mA
MINIMUM REGULATOR CURRENT	1 A
MAXIMUM REGULATOR CURRENT	2.5 A
STARTING VOLTAGE	160 V
MAINTAINING VOLTAGE	140 V
Single indicator/counting section. Nixie-specific electrical ratings and operating data are retained in TUBE_SECTION_PARAMETER.	

ZM1021 is a cold-cathode symbol indicator, classified as Nixie for this batch. The supplied datasheet provides cold-cathode display ratings, operating conditions, and mechanical/display information.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Nixie Valvo

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

1965 NIXIE VALVO

Section 1 · Nixie

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Typical characteristic
Burning voltage	140 V	Typical glow voltage
Extinction voltage	120 V	Typical characteristic
Life with one digit continuously displayed	5000— h	Recommended conditions
Life with changing display	30000 h	Digit changed at least every 100 h

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Continuous cathode current	1–2.5 mA	Absolute range
Pulse cathode current	4–10 mA	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	—120 V	Absolute maximum
Pulse rise time	80— us	Pulse operation
Pulse source internal resistance	—1 kOhm	Pulse operation
Envelope temperature	—70 degC	Absolute maximum
Recommended DC supply voltage	170 V	+/-3% example
Recommended DC operating voltage	140 V	At display electrodes
Recommended off-cathode bias	60— V	DC operation with bias

1966 Nixie Telefunken

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

1966 NIXIE TELEFUNKEN

Section 1 · Nixie

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Typical characteristic
Burning voltage	140 V	Typical glow voltage
Extinction voltage	120 V	Typical characteristic
Life with one digit continuously displayed	5000— h	Recommended conditions
Life with changing display	30000 h	Digit changed at least every 100 h

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Continuous cathode current	1–2.5 mA	Absolute range
Pulse cathode current	4–10 mA	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	—120 V	Absolute maximum
Pulse rise time	80— us	Pulse operation
Pulse source internal resistance	—1 kOhm	Pulse operation
Envelope temperature	—70 degC	Absolute maximum
Recommended DC supply voltage	170 V	+/-3% example
Recommended DC operating voltage	140 V	At display electrodes
Recommended off-cathode bias	60— V	DC operation with bias



1967 Nixie La Radiotechnique

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1967 NIXIE LA RADIOTECHNIQUE

Section 1 · Nixie

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition/Starting Voltage	160 V	Published ignition/start value
Extinction Voltage	120 V	Published extinction value
Maintaining Voltage	140 V	Published maintaining/burning value
Minimum Cathode Current	1 mA	Published minimum

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Recommended/Minimum Supply Voltage	170 V	Published operating condition
Maximum Cathode Current	2.5 mA	Published maximum/average maximum
Peak Cathode Current	10 mA	Published peak value



SOURCE DATA APPENDIX

1969 Nixie Mullard

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1969 NIXIE MULLARD

Section 1 · Nixie

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Numeral/Character Height	15.5 mm	Published mechanical/display data
Maximum Peak Cathode Current	10 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



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1969 Nixie Valvo

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1969 NIXIE VALVO

Section 1 · Nixie

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Typical characteristic
Burning voltage	140 V	Typical glow voltage
Extinction voltage	120 V	Typical characteristic
Life with one digit continuously displayed	5000— h	Recommended conditions
Life with changing display	30000 h	Digit changed at least every 100 h

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Continuous cathode current	1–2.5 mA	Absolute range
Pulse cathode current	4–10 mA	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	—120 V	Absolute maximum
Pulse rise time	80— us	Pulse operation
Pulse source internal resistance	—1 kOhm	Pulse operation
Envelope temperature	—70 degC	Absolute maximum
Recommended DC supply voltage	170 V	+/-3% example
Recommended DC operating voltage	140 V	At display electrodes

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Recommended off-cathode bias	60— V	DC operation with bias



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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196X Nixie Random Datasheets

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196X NIXIE RANDOM DATASHEETS

Section 1 · Nixie

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Supply Voltage Minimum	170 V	Published datasheet value
Extinguishing Voltage Minimum	120 V	Published datasheet value
Cathode/Anode Current Minimum	1 mA	Published datasheet value

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition Voltage Maximum	160 V	Published datasheet value
Cathode/Anode Current Maximum	2.5 mA	Published datasheet value



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1971 Nixie RFT

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1971 NIXIE RFT

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Maximum/typical threshold shown in source table
Operating glow voltage	140 V	Approximate service voltage
Extinction voltage	120 V	Source table value
Nominal cathode current	2 mA	Main symbol/digit
Ignition voltage	160 V	Typical characteristic
Burning voltage	140 V	Typical glow voltage
Extinction voltage	120 V	Typical characteristic
Life with one digit continuously displayed	5000— h	Recommended conditions
Life with changing display	30000 h	Digit changed at least every 100 h

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum supply voltage	160 V	Absolute limit table
Cathode current	1–2.5 mA	Main symbol/digit continuous range
Maximum peak cathode current	10 mA	Main symbol/digit
Envelope temperature minimum	-20 degC	Operating envelope temperature range
Envelope temperature maximum	70 degC	Operating envelope temperature range
Display characters	+, -, ~, A, V, ohm, %	Translated from French source
Display orientation	front	Viewing orientation
Character height	max 15.5 mm	Display geometry
Maximum tube height	26.5 mm	Mechanical dimension
Maximum tube width/diameter	30 mm	Mechanical dimension as printed
Continuous cathode current	1–2.5 mA	Absolute range
Pulse cathode current	4–10 mA	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	—120 V	Absolute maximum
Pulse rise time	80— us	Pulse operation
Pulse source internal resistance	—1 kOhm	Pulse operation
Envelope temperature	—70 degC	Absolute maximum

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Recommended DC supply voltage	170 V	+/-3% example
Recommended DC operating voltage	140 V	At display electrodes
Recommended off-cathode bias	60— V	DC operation with bias



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1973 Nixie Siemens

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

1973 NIXIE SIEMENS

Section 1 · Nixie

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Maximum/typical threshold shown in source table
Operating glow voltage	140 V	Approximate service voltage
Extinction voltage	120 V	Source table value
Nominal cathode current	2 mA	Main symbol/digit

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum supply voltage	160 V	Absolute limit table
Cathode current	1–2.5 mA	Main symbol/digit continuous range
Maximum peak cathode current	10 mA	Main symbol/digit
Envelope temperature minimum	-20 degC	Operating envelope temperature range
Envelope temperature maximum	70 degC	Operating envelope temperature range
Display characters	+, -, ~, A, V, ohm, %	Translated from French source
Display orientation	front	Viewing orientation
Character height	max 15.5 mm	Display geometry
Maximum tube height	26.5 mm	Mechanical dimension
Maximum tube width/diameter	30 mm	Mechanical dimension as printed