

# METRALINE DM 41

## Digital Multimeter

3-447-023-03  
1/2.19

- Voltage: DC / AC 100  $\mu$ V ... 600 V
- Current: DC / AC: 10  $\mu$ A ... 10.00 A
- Resistance: 100 m $\Omega$  ... 40.00 M $\Omega$
- Capacitance: 1 pF ... 200.0  $\mu$ F
- Frequency: 0.001 Hz ... 500.0 kHz
- Diode / Continuity
- Duty cycle (%) measurement
- Temperature TC with K-type: -50 ... +1300  $^{\circ}$ C
- Hold / Relative (Zero)
- Auto / Manual ranging
- Digital display with backlight
- ABS Automatic Blocking Sockets
- 3 year warranty



## Features

### Automatic Blocking Sockets (ABS) \*

Automatic blocking sockets prevent incorrect connection of measurement cables and inadvertent selection of the wrong measured quantity. This significantly reduces danger to the user, the instrument and the system under test, and eliminates it entirely in many cases.

### Automatic / Manual Measuring Range Selection

Measured quantities are selected with the rotary switch. The measuring range is automatically matched to measured values. The measuring range can be selected manually as well with the help of the AUTO/MAN key.

### Storage of Measured Values

By pressing the **HOLD** key, the currently displayed measurement value can be „frozen“ in the display.

### Relative measurement (REL)

By pressing the REL key, the zero correction is made and Relative Value is measured. All functions can measure Relative Value except Hz/Duty.

### Continuity Test

Allows for the detection of short-circuits and interrupted conductors. In addition to displaying test results, an acoustic signal can also be generated if desired.

### Power Saving Circuit

The device is switched off automatically if the measured value remains unchanged for a period of approximately 15 minutes, and if none of the controls are activated during this time. Automatic shutdown can be deactivated.

### Protective Cover for Harsh Conditions

The instrument is protected against damage in the event of impacts or dropping by means of a soft rubber cover with tilt stand. The rubber material also assures that the instrument does not wander if it is set up on a vibrating surface.

### Duty Cycle Measurement – Square-Wave Signals

This function makes it possible to test circuits and transmission cables by measuring the frequency and the duty cycle of pulses.

### Voluntary Manufacturer's Warranty

36 months for material and workmanship

\* Patented (patent no. EP 1801 598, US 7,439,725)

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### Characteristic Values

Meas. Function	Measuring Range	Resolution	Input Impedance V (AC) / V (DC)	Digital display inherent deviation at reference condition + (...% rdg. + ...digits)	Overload Capacity <sup>3)</sup>	
					Overload Values	Overload Duration
V $\equiv$	400.0 mV	100 $\mu$ V	> 20 M $\Omega$	0.75 + 2	1050 V (DC)	Continuous
	4.000 V	1 mV	11 M $\Omega$	0.5 + 2		
	40.00 V	10 mV	10 M $\Omega$			
	400.0 V	100 mV	10 M $\Omega$			
	600 V	1 V	10 M $\Omega$			
V $\sim$	400.0 mV	100 $\mu$ V	11 M $\Omega$	1.5 + 5	1050 V (AC) rms	Continuous
	4.000 V	1 mV	11 M $\Omega$	1 + 5		
	40.00 V	10 mV	10 M $\Omega$			
	400.0 V	100 mV	10 M $\Omega$			
	600 V	1 V	10 M $\Omega$			
			approx. voltage drop at max. meas. current			
A $\equiv$	40.00 mA	10 $\mu$ A	450 mV	0.8 + 2	480 mA	Continuous
	400.0 mA	100 $\mu$ A	4.2 V			
	10.00 A <sup>1)</sup>	10 mA	750 mV			
A $\sim$	40.00 mA	10 $\mu$ A	450 mV	1 + 5	480 mA	Continuous
	400.0 mA	100 $\mu$ A	4.2 V			
	10.00 A <sup>1)</sup>	10 mA	750 mV			
			Open-circuit volt.			
$\Omega$	400.0 $\Omega$	100 m $\Omega$	approx. 0.45 V	0.8 + 5	500 V DC/AC rms	10 min
	4.000 k $\Omega$	1 $\Omega$		0.8 + 2		
	40.00 k $\Omega$	10 $\Omega$				
	400.0 k $\Omega$	100 $\Omega$				
	4.000 M $\Omega$	1 k $\Omega$				
	40.00 M $\Omega$	10 k $\Omega$				
	400.0 $\Omega$	100 m $\Omega$	Acoustic signal for 0...< 75 $\Omega$ (approx)			
$\rightarrow$	1.000 V	1 mV	approx. 1 V	2 + 10		
F	5.000 nF	1 pF	—	3 + 40 <sup>4)</sup>	500 V DC/AC rms	10 min
	50.00 nF	10 pF		2 + 10 <sup>4)</sup>		
	500.0 nF	100 pF		0.5 + 3 <sup>4)</sup>		
	5.000 $\mu$ F	1 nF		1 + 2 <sup>4)</sup>		
	50.00 $\mu$ F	10 nF		1.5 + 2 <sup>4)</sup>		
	200.0 $\mu$ F	100 nF		5 + 10 <sup>5)</sup>		
			f min			
Hz <sup>2)</sup>	10.000 Hz	0.001 Hz	1 Hz	0.2 + 2	$\leq$ 1kHz : 1000 V $\leq$ 10 kHz : 400 V $\leq$ 500 kHz : 40 V except 400 mV	Continuous
	100.00 Hz	0.01 Hz				
	1.0000 kHz	0.1 Hz				
	10.000 kHz	1 Hz				
	100.00 kHz	10 Hz				
500.0 kHz	100 Hz					
%	2.0 ... 98.0%	0.1 %	—	10 Hz ... 1 kHz : $\pm$ 5D 1 kHz ... 10 kHz : $\pm$ 5D/kHz		
			Sensor			
$^{\circ}$ C	0 ... +1300 $^{\circ}$ C	1 $^{\circ}$ C	K-type NiCr-Ni	2 + 3	500 V DC/AC rms	10 min
	-50 ... 0 $^{\circ}$ C	1 $^{\circ}$ C		2,0 $\pm$ 10		

1) Limited by 10 A fuse

2) Indication for frequency measurement expanded to 9999 digits

3) At 0  $^{\circ}$ C... + 40  $^{\circ}$ C

4) With zero adjustment "REL".

5) Time required for measurement approximately 60 seconds.

### Influencing Quantities and Effects

Influencing Variable	Range of Influence	Measured Quantity/ Measuring Range	Influence Effect
Temperature	0 $^{\circ}$ C ... +21 $^{\circ}$ C and +25 $^{\circ}$ C ... +50 $^{\circ}$ C	V $\equiv$	0.1 x intrinsic error/K
		V $\sim$	
		mA/A $\equiv$	
		mA/A $\sim$	
		$\Omega$	
		F	
		Hz	
		Duty (%) $^{\circ}$ C	

Influence Variable	Range of Influence (max. resolution)	Frequency	Intrinsic Error at Ref. $\pm$ (... % of rdg + ... D)
Frequency V <sub>AC</sub>	4, 40, 400 V	20 Hz ... < 50 Hz > 50 Hz ... 1 kHz	2 + 3
	400 mV, 600 V	20 Hz ... < 50 Hz > 50 Hz ... 500 Hz	2 + 3

Influence Variable	Range of Influence	Measured Quantity/ Measuring Range	Influence Effect
Relative Humidity	55 ... 75 %	V AC/DC mA / A AC/DC $\Omega$ F Hz (%) $^{\circ}$ C	1 x intrinsic error

Influencing Variable	Interference Quantity	Measuring Range	Attenuation
Common Mode Interference Voltage	1000 V DC/AC 50 Hz sine	all V DC	> 100 dB
	1000 V DC	all V AC	> 100 dB
	1000 V AC 50 Hz sine	400 mV/4 V AC	> 55 dB
		40 V AC	> 55 dB
		400 V AC	> 43 dB
600 V AC	> 23 dB		
Series Mode Interference Voltage	max. 1000 V AC 50/60 Hz sine	V DC	> 43 dB
	max. 1000 V DC	V AC	> 55 dB

Auxiliary voltage influence:

(without display) – all ranges except cap.:  $\pm$ 8 D

cap. range:  $\pm$  20 D

### Display

LCD display field (58 mm x 31.4 mm) with digital display and display of unit of measure, current type and various special functions.

### Digital

Display/Char. Height 7 segment digits / 15 mm

Number of Places  $3\frac{3}{4}$  place equals 3999 steps

Overflow Display „OL“

Polarity Display „-“ sign is displayed when plus pole is at


„ $\perp$ “

Measuring Rate 3 measurements/s for V, A,  $\Omega$ , F and %

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### Power supply

Battery	2 x 1.5 V mignon cell (2x AA-Size) alkaline-manganese cell per IEC LR6.
Service life	with alkaline-manganese cell: approx. 600 hours
Battery test	Automatic display of „  “ symbol when battery voltage falls below approx. 2,4 V.

### Electromagnetic compatibility (EMC)

Emission	EN 61326: 2013 Class B
Immunity	IEC 61000-4-2: 8 kV atmospheric discharge 4 kV contact discharge IEC 61000-4-3: 3 V/m
Short-term measured value deviation may occur during electromagnetic interference thus reducing the specified operating quality.	

<b>Electrical Safety</b>	IEC 61010-1-2010
Installation category	600 V CAT III / 300 V CAT IV
High Voltage Test	3.5 kV ~ (IEC 61010-1-2010)

### Fuses

#### Fuse for up to 400 mA ranges

FF 1.6 A/1000 V; 6.3 mm x 32 mm; rating 10 kA with 600 VAC/DC and ohmic load; in conjunction with power diodes, protects all current measuring ranges up to 400 mA

#### Fuse for up to 10 A ranges

FF 10 A/600 V; 6.3 mm x 32 mm; rating 10 kA with 600 VAC/DC and ohmic load; protects the 10 A ranges up to 600 V AC/DC.

Defective fuses are not displayed.

### Reference Conditions

Ambient Temperature	+23 °C ±2 K
Relative Humidity	45% ... 55%
Measuring Magnitude	
Frequency	50 oder 60 Hz ±2%
Measuring Magnitude	
Waveform	Sine
Battery Voltage	3 V ±0.1 V

### Ambient Conditions

Working Temperature	
Range	
0 °C ... + 50 °C	
Storage Temperature	
Range	-25 °C ... + 70 °C (without batteries)
Relative Humidity	45 ... 75%
Elevation	up to 2000 m

### Mechanical Design

Protection	for multimeter: IP50 for terminals: IP20
Pollution degree	2
Dimensions	W x H x D: with holster: 86 mm x 188 mm x 53 mm without holster: 79 mm x 174 mm x 38 mm
Weight	approx. 480 g with battery and holster

### Applicable Regulations and Standards

IEC 61010-1 EN 61010-1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN EN 61326-2-1 VDE 0843-02-2-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-1: Particular requirements for sensitive test and measurement equipment
DIN EN 60529 DIN VDE 0470-1	Test Instruments and test procedures – Degree of protection provided by enclosures (IP code)

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### Standard Equipment

- 1 Multimeter
- 1 Rubber holster with carrying strap
- 1 Cable set
- 1 Battery set
- 1 Operating instructions
- 1 Test report

### Order Information

Description	Type	Article Number
Digital multimeter	METRALINE DM 41	M192A
Accessories		
AC clamp 1000:1	WZ1001	Z194A

For additional information on accessories, please refer to

- our „Measuring Instruments and Testers“ catalogue
- our website [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

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 **GOSSEN METRAWATT**

GMC-I Messtechnik GmbH  
Südwestpark 15  
90449 Nürnberg • Germany

Phone +49 911 8602-111  
Fax +49 911 8602-777  
E-Mail [info@gossenmetrawatt.com](mailto:info@gossenmetrawatt.com)  
[www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)