

Ziegler

Redefine Innovative Metering

Technical Datasheet

ZDM 1830

DIGITAL MULTIMETER

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Ziegler ZDM 1830 Multimeter is 5 ¼ digit high performance precision instruments for laboratory use, as well as for service and training. With a display range of 300,000 counts, as well as outstanding accuracy and long-term stability, it fulfills all requirements for use in calibration and R&D laboratories. The instrument can be utilized on-site for precision maintenance and calibration tasks.

Product Features

- Available with 5 ¼ digits 300000 counts for DC measured quantities & 4 ¾ 30000 counts for AC measured quantities
- Trms measurement
- Basic Accuracy of 0.02%
- Comes with Triple Digital Display
- Rugged, Reliable & Robust meters
- Automatic terminal blocking system (ABS) to avoid wrong connections & enhance safety
- Comes with protective holster for rough duty
- Auto Power OFF Facility
- Measurement of AC/DC voltage & current upto 1000V & 10A respectively
- High resolution and Precision



Fact Sheet

Applicable Standards	
IEC 1010-1 /EN61010-1	Safety regulations for electrical measurement, Control, regulating and laboratory devices
IEC 61326:2002 Class B	Electrical equipment for control technology and laboratory use – EMC requirements
IEC 61000-4-2	8kV atmosphere discharge. 4kV contact discharge
IEC 6100-4-3	3VT/m
DIN EN 60259 DIN VDE 0470 part 1	Test equipment & test procedures -Degrees of protection provided by enclosures (IP Code).
EMC	IEC 61326: Class B
Immunity	IEC 61000-4-2 : 8 KV atmosphere discharge, 4 KV contact discharge IEC 61000-4-3 : 3 V/m
Safety	
IP for water & dust	IEC 60529 : IP 50 for housing
Pollution degree	2
Installation category: Operating voltage	III, IV 1000V , 600V
High Voltage Test	6.7 kV (IEC 61010-1-2001)

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Technical Specifications

Meas. function	Meas. Range	Resolution at Measuring Range Upper Limit		Input impedance		Inherent Deviation at highest resolution under reference condition		Overload Capacity 4)		Meas. function
		300000 ¹⁾	30000 ¹⁾	DC	AC	DC Accuracy $\pm (... \% \text{ of rdg} + .. \% \text{rng} + ... \text{Digit})$	AC Accuracy ⁹⁾ $\pm (... \% \text{ of rdg} + ... \text{Digit})$	Overload Value	Overload Duration	
V	3.0V	100 μ V	100 μ V	11 M Ω	5 M Ω // < 50pF	0.02+0.008+20	0.2+30	DC AC RMS Sine 1000V	Continuous	V
	30.0V	1 mV	1 mV	10 M Ω	5 M Ω // < 50pF	0.02+0.008+20	0.2+30			
	300V	10mV	10 mV	10 M Ω	5 M Ω // < 50pF	0.02+0.008+20	0.2+30			
	1000V	100 mV	100 mV	10 M Ω	5 M Ω // < 50pF	0.02+0.008+20	0.2+30			
	300mV	10 μ V	10 μ V	>20M Ω	5 M Ω // < 50pF	0.02+0.015+30 ⁶⁾	0.5+30			
A	300 μ A	10nA	10nA	Voltage drop. approx. for upper range limit B		DC Accuracy $\pm (... \% \text{ of rdg} + .. \% \text{rng} + ... \text{Digit})$	AC Accuracy ⁹⁾ $\pm (... \% \text{ of rdg} + ... \text{Digit})$	0.36A	Continuous	A
	3 mA	100nA	100nA	300mV	300mV	0.05+0.02+20	0.5+30			
	30mA	1 μ A	1 μ A	300mV	300mV	0.02+0.01+20	0.5+30			
	300mA	10 μ A	10 μ A	300mV	300mV	0.02+0.01+20	0.5+30			
	10A	1mA	1mA	400mV	400mV	0.1+0.01+20	0.5+30			
Ω	300 Ω	10m Ω		Open-circuit voltage		$\pm (... \% \text{ of rdg} + ... \% \text{rng} + ... \text{Digit})$		1000V DC AC RMS Sine	10 Sec	Ω
	3.0 k Ω	100m Ω		1.3V	--	0.05+0.015+20 ⁶⁾				
	30 k Ω	1 Ω		0.5V	--	0.05+0.015+20				
	300 k Ω	10 Ω		0.5V	--	0.05+0.025+20				
	3.0 M Ω	100 Ω		0.5V	--	0.1+0.025+20				
	30 M Ω	1k Ω		0.3V	--	1+0.25+20				
	300 Ω	0.1 Ω		max. 1.3V	--	1.2+0+10		1000V DC AC RMS Sine	10 Sec	
	2.0 V	100 μ V		max. 2.5 V	--	0.2+0+10				
F	3.0 nF	1 pF		Discharge resistor	U ₀ max.	$\pm (... \% \text{ of rdg} + ... \% \text{rng})$		1000V DC AC RMS Sine	10 Sec	F
	30 nF	10pF		10 M Ω	3 V	2.5+0.2 ⁶⁾				
	300nF	100pF		10 M Ω	3 V	1.2+0.2				
	3.0 μ F	1 nF		1 M Ω	3 V	1.2+0.2				
	30 μ F	10nF		100 k Ω	3 V	1.2+0.2				
	300 μ F	100nF		11 k Ω	3 V	1.2+0.2				
	3000 μ F	100nF		2 k Ω	3 V	3.2+1				
	3000 μ F	1 μ F		2 k Ω	3 V	3.2+1				
	30000 μ F	10 μ F		2 k Ω	3 V	3.2+1				
Hz	300.00Hz	0.01Hz		f min ³⁾		$\pm (... \% \text{ of rdg.} + ... \text{Digit})$		< 3 KHz 1000V < 30 KHz 300V < 100 KHz 30V	Continuous	Hz
	3.0000kHz	0.1Hz		10 Hz		0.1+3 ⁷⁾				
	30.0000kHz	1Hz		100 Hz		0.1+3 ⁷⁾				
	300.000kHz	10Hz		100Hz		0.1+3 ⁷⁾				
	100 min ²⁾	10 ms				0.05+10 ⁷⁾		1000V		
°C	Pt100	-200.0... +100.0°C		0.1°C		$\pm (... \% \text{ of rdg.} + ... \text{Digit})$				
		+100.0... +850.0°C				1Kelvin +3 ⁸⁾				
	Pt1000	-100.0...+100.0°C				1% + 3 ⁸⁾				
		+100.0...+850.0°C				1 Kelvin + 3 ⁸⁾				

1) Display: 5 ¼ places for DC, 4 ¼ places for AC

2) Stopwatch : Format : mm : ss : hh

Where m = minute, s = second and h = hundredth second, max.: 99: 59: 59

3) Lowest measurable frequency with sinusoidal measurement signal symmetric to zero point

4) at 0 4°C

5) 12A – 5min, 16A – 30 s

6) With zero adjuster; Without zero adjuster

7) Vac > 1Veff/rms

8) Without sensor

9) Values less than 150 counts are suppressed

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Fuse	
Fuse for ranges up to 300 mA	FF1.6A /1000V/6.3mm x 32 mm. Rating 20 KA with 1000 V~ and ohmic load. In conjunction with diodes protects all current measuring ranges up to 300mA
Fuse for 10 A range	16 A / 1000V; 10 mm x 38 mm protects 10A upto 1000V
Mechanical design	
Protection	Instruments: IP 50, Connector sockets: IP 20
Dimensions	W x H x D 84 mm x 195 mm x 35 mm
Weight	Approx. 350 gm with battery
Reference conditions for accuracy	
Reference Temperature	23°C ± 2K
Relative Humidity	45%...55% RH
Waveform of measured quantity	Sinusoidal
Input frequency	50 or 60 Hz ±2%
Battery Voltage	3 V ± 0.1 V
Environmental conditions	
Operating temperature	-10 to +50°C
Storage temperature	- 25 to +70°C
Relative humidity	<75% non-condensing
Altitude	Up to 2000 m
Battery	
Battery Voltage	9 V flat cell battery
Battery type	Manganese Dioxide cell as per IEC 6F 22 Alkaline manganese cell according to IEC 6LR 61 suitable NiCd storage battery
Battery Life	Minimum 300 hrs. on VDC, ADC 150 hrs. on VAC, AAC

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Influence Quantities

Influence Quantity	Range of Influence	Measured Quantity/ Measuring Range	Variation ¹⁾ ± (... % of rdg. +....digits)
Temperature	-10°C...+21°C and +25°C...+40°C	VDC	0.05+3
		V ~	0.2+3
		300µA ... 300mA DC	0.2+3
		300µA ... 300mA AC	0.3+3
		10 A AC,10 A DC	0.5+3
		300 Ω ²⁾	0.1+5
		3 KΩ – 3 MΩ	0.1+3
		30 MΩ	0.6+3
		30 nF ²⁾ – 30 µF	0.5+3
		30 µF-30mF	2.0+3
		Hz	0.1+3
		-200...+200 °C	0.5 Kelvin+2 Digits
		+200...+850°C	0.5+2
Frequency of the measured quantity	25 Hz... < 45 Hz	300 mV ~	1.0+20
	> 65 Hz... 200 Hz		1.0+20
	25 Hz... < 45 Hz	3...300V ~	1.0+20
	> 65 Hz... 400 Hz		0.5+20
	>400 Hz...1 <KHz		0.5+20
	>1 KHz ...20 KHz		0.5+20
	25 Hz... < 30 Hz	1000V ~	1.0+20
	> 30 Hz... 45 Hz		0.5+20
	>65 Hz...1 <KHz		2.0+20
	25Hz ...< 45 Hz	A~	1.0+20
	>65 Hz... 1 kHz		1.0+20
Wave form of the measured quantity ³⁾	Crest factor CF	1...3	± 1 % of rdg
		3...5	± 3 % of rdg
Battery Voltage	⎓ ⁵⁾ ...< 7.5 V > 8.1 V ...10.0 V	V DC	±15 Digit
		V~	±30 Digit
		ADC	±20 Digit
		A AC	±40 Digit
		30Ω / 300 Ω/°C	±40 Digit
		3 kΩ – 30MΩ	±40 Digit
		Capacitance	±50 Digit
		Hz	±10 Digit
Relative humidity	75% 3Days Meter off		±1 Digit
DATA	-		± 1 digits
MIN/MAX	-	V ac/dc , A ac/dc	± 2 digits

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Influence Quantity	Range of Influence	Measuring Ranges	Attenuation
Common Mode interference Voltage	Noise quantity max. 1000 V	V dc	> 120 dB
	Noise quantity max. 1000 V ~ 50 Hz, 60 Hz sinusoidal	300 mV~ ... 30V~	> 80 dB
		300 V~	> 70 dB
		1000 V~	> 60 dB
Normal Mode interference voltage	Noise quantity V ~ Value of the measuring range at a time Max. 1000V~ ,50Hz, 60Hz Sinusoidal	V dc	> 50dB
	Noise quantity max. 1000 V-	V~	>110dB

Response time after manual range selection

Measured Quantity/ Measured range	Response time	Transient response for step function of the measured quantity
VDC,VAC,A AC+DC,A AC	1.5 s	From 0 to 80 % of upper range limit
30Ω...3 MΩ	2 s	From ∞ to 50 % of upper range limit
30 MΩ	5 s	
→	1.5s	
°C	3 s	From 0 to 50 % of upper range limit
3.0nF,300μF	Max. 1... 3 s	
3000 μF	Max. 7 s	
30000 μF	Max. 14 s	
300 Hz,3KHz	Max 2 s	
30 KHz,300 KHz	Max 0.7 s	

Standard Scope of Supply

- 1 Multimeter
- 1 Cable set
- 1 Copy Operating Instructions
- 1 Protective Case (Holster)
- 1 9V Battery

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