

Analog - Digital Multimeter

RISH Multi - 11

Data Sheet

RISH Multi - 11
Analog-Digital Multimeter



Test and Measurement Instruments C.C.

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MIN/MAX Value Storage :

In addition to the display of the actual measured value, the minimum or maximum value can constantly be updated and stored.

Indication of negative values on the analog scale :

When measuring DC quantities, also negative values are shown on the analog scale so that variations of the measured value can be observed at the zero point.

Automatic Data Hold :

The DATA HOLD function makes it possible to hold the digitally displayed measured value .
It is ensured that no freak value but the actual measured value is held in the case of rapid changes in measured quantities . The held measured value appears on the digital display. The actual measured value continues to be shown on the analog scale.

Autoranging / Manual Range Selection :

The measured values are selected with rotary switch.
The measuring range is automatically matched to the measured value. The measuring range can also be selected manually via the AUTO/MAN push button.

Continuity Test :

This permits testing for short circuit and open circuit. In addition to the display, a facility of sound signal is available.

Temperature measurement

It is possible to use RISH multi 11 in direct connection of temperature sensor Pt 100 / Pt 1000. The meter automatically detects the type of sensors connected to it & displays directly measured temperature .

Overload Warning :

A sound signal indication violation of the overload limits.

Power Economizing Circuit :

The meter is switched OFF automatically when the measured value remains unchanged for about 30 minutes and no operating control was operated during this time. The disconnection facility can be disabled.

Protective Holster for rough duty :

A holster of soft rubber with tilt stand protects the meter against damage in the case of shock and drop. The rubber material makes for the meter to stand firmly even on vibrating surface.



Calibration :

RISH multi is automatically calibrated with respect to Fluke 5500 / Wavetek 9100.

Every multimeter is provided with the Test Certificate which is traceable to National / International standards. All the meters can be recalibrated at the Rishabh Instruments.

Applicable Standards :

IEC 61010 - 1/ DIN EN 61010 part 1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN 43751 IS 13875 IEC 61326	Digital measuring instruments Electromagnetic Compatibility (EMC)
VDI/VDE 3540	Reliability of measuring and control equipment.
EIN EN 60529	Test equipment and test procedures -Degrees of protection provided by enclosures (IP Code).



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Meas. function	Measuring Range	Resolution	Input Impedance	Intrinsic error of the digital display \pm (.....% of rdg. + digits) at ref. conditions	Overload Capacity ¹⁾		Meas. function	
				Accuracy	Overload value	Overload duration		
V $\overline{\dots}$	30.00 mV	10 μ V	>10 G Ω // < 40 pF	0.5 + 3 ²⁾	1200 V	continuous	V $\overline{\dots}$	
	300.0 mV	100 μ V	>10 G Ω // < 40 pF	0.5 + 3				
	3.000 V	1 mV	11 M Ω // < 40 pF	0.25 + 1				
	30.00 V	10 mV	10 M Ω // < 40 pF	0.25 + 1				
	300.0 V	100 mV	10 M Ω // < 40 pF	0.25 + 1				
V \sim	1000 V	1 V	10 M Ω // < 40 pF	0.35 + 1	DC	continuous	V \sim	
	3.000 V	1 mV	11 M Ω // < 40 pF	0.75 + 2 (10...300 Digit)				Effective
	30.00 V	10 mV	10 M Ω // < 40 pF					
	300.0 V	100 mV	10 M Ω // < 40 pF					
1000 V	1 V	10 M Ω // < 40 pF						
Ω	No-load Voltage							
	30.00 Ω	10 m Ω	max. 3.2 V	0.5 + 3 ²⁾	500 V	10 min	Ω	
	300.0 Ω	100 m Ω	max. 3.2 V	0.5 + 3				
	3.000 k Ω	1 Ω	max. 1.25 V	0.4 + 1				
	30.00 k Ω	10 Ω	max. 1.25 V	0.4 + 1				
	300.0 k Ω	100 Ω	max. 1.25 V	0.4 + 1				
	3.000 M Ω	1 k Ω	max. 1.25 V	0.6 + 1				
30.00 M Ω	10 k Ω	max. 1.25 V	2.0 + 1					
DC				Effective	10 min	Ω		
AC								
$^{\circ}$ C	2.000 V	1 mV	max. 3.2 V	0.25 + 1	500 V	10 min	$^{\circ}$ C	
	- 200.0 ... + 200.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Pt 100	2 Kelvin + 5 Digit ³⁾				DC
	+ 200.0 ... + 850.0 $^{\circ}$ C	0.1 $^{\circ}$ C		1.0 + 5 ³⁾				
	- 100.0 ... + 200.0 $^{\circ}$ C	0.1 $^{\circ}$ C	Pt 1000	2 Kelvin + 2 Digit ³⁾				Effective
+ 200.0 ... + 850.0 $^{\circ}$ C	0.1 $^{\circ}$ C	1.0 + 2 ³⁾		Sinusoidal				

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

2) With Zero adjustment; without zero adjustment + 35 digits

3) Without sensor



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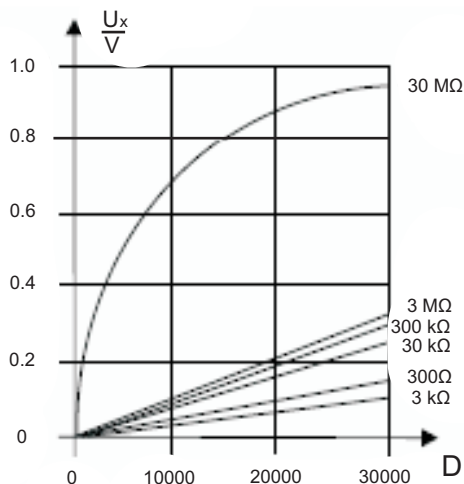
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Measuring voltage with resistance measurement :



Voltages U_x across the resistance R_x to be measured as a function of measuring range and display.

Display :

LCD field (65 mm x 30 mm) with analog indication and digital display and with annunciators for unit of measurement, function and various special functions.

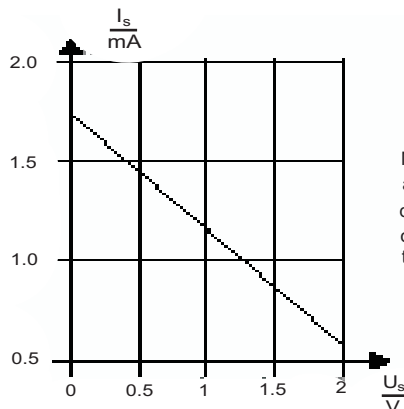
Analog :

Indication	: LCD scale with pointer
Scale length	: 55 mm on V_{Ω} 47 mm on all other ranges
Scaling	: $\pm 5 \dots 0 \dots \pm 30$ with 35 scale divisions on Ω 0...30 with 30 scale divisions on all other ranges
Polarity indication	: With automatic reversal
Overrange indication	: By triangle
Sampling rate	: 20 readings/s, On Ω : 10 readings/s

Digital :

Display / height of numerals	: 7-segment numerals / 15 mm
Number of counts	: 3 $\frac{3}{4}$ digit 3100 counts
Overrange display	: " OL " is shown
Polarity display	: "-" sign is shown, When positive pole to "1"
Sampling rate	: 2 readings/s, On Ω and $^{\circ}C$: 1 reading/s

Measuring current with diode test and / or continuity test :

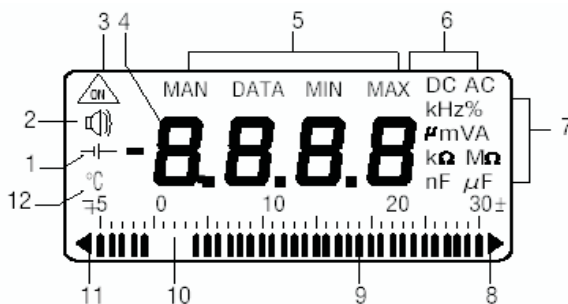


Measuring current I_s as a function of time displayed voltage U_s on the device under test.

Reference conditions :

Ambient temperature	: +23 $^{\circ}C$ + 2K
Relative humidity	: 45%... 55% RH
Frequency of the measured quantity	: 45 Hz... 65 Hz
Waveform of the measured quantity	: Sinusoidal
Battery voltage	: 8V \pm 0.1 V

Display RISH Multi -11 :



- 1) Display for Low battery voltage.
- 2) Display for sound signal on.
- 3) Symbol for "CONTINUOUSLY ON"
- 4) Digital Display with indication of decimal point and polarity.
- 5) Display with manual range selection as well as with data and MIN/MAX function.
- 6) Display of selected function.
- 7) Display of unit of measurement.
- 8) Display of over range.
- 9) Pointer for analog indication.
- 10) Scale for analog indication.
- 11) Indication that negative analog range is exceeded.
- 12) Display of the unit $^{\circ}C$ when measuring temperature.



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Influence quantities and variations :

Influence Quantity	Influence Range	Measured quantity / Measuring Range	Variations 1) + (...% of rdg. + ... digits)
Temperature	0°C...+21°C and +25°C...+40°C	30/300 mV $\overline{\text{---}}$	1.0 + 3
		3 ... 300 V $\overline{\text{---}}$	0.15 + 1
		1000 V $\overline{\text{---}}$	0.2 + 1
		V \sim	0.4 + 2
		30 Ω^2)	0.15 + 2
		300 Ω	0.25 + 2
		3 k Ω - 3 M Ω	0.15 + 1
		30 M Ω	1.0 + 1
Frequency Of the measured quantity	>65 Hz ... 400 Hz	3 ... 300 V \sim	2.0 + 3
	>400 Hz...1kHz		2.0 + 3
	>65Hz...1kHz	1000 V \sim	3.0 + 3

- 1) With Temperature : Error data is per 10 K change in temperature
With Frequency : Error data apply to display from 300 digits on wards
- 2) With zero adjustment
- 3) From the time the symbol " $\overline{\text{---}}$ " appears.

Influence Quantity	Influence Range	Measured quantity / Measuring range	Variations
Battery Voltage	" $\overline{\text{---}}$ " ³⁾ ... < 7.9V > 8.1V...10.0.V	V $\overline{\text{---}}$	\pm 2 D
		V \sim	\pm 4 D
		30 Ω / 300 Ω	\pm 4 D
		3 K Ω ... 30 M Ω	\pm 3 D
Relative Humidity	75 % 3 days Meter off	V $\overline{\text{---}}$, V \sim Ω $^{\circ}$ C	1 x intrinsic error
DATA	—		\pm 1 D
MIN / MAX	—	V $\overline{\text{---}}$, V \sim	\pm 1 D

Influence Quantity	Influence Range	Measuring Range	Attenuation
Common mode Voltage	Disturbance variable max. 1000 V \sim	V $\overline{\text{---}}$	> 120dB
		3 V \sim 30 V \sim	> 80 dB
		300 V \sim 1000 V \sim	> 70 dB > 60 dB
Normal mode Voltage	Disturbance variable V \sim , nom. value of meas. range at a time, max. 1000 V \sim 50 Hz, 60 Hz, sinusoidal	V $\overline{\text{---}}$	> 50 dB
		Disturbance variable max. 1000 V \sim	V \sim

Response time : (after manual range selection)

Measured quantity / Measuring Range	Response Time		Transient response For the step function of measured quantity
	of analog indication	of digital display	
V $\overline{\text{---}}$, V \sim	0.7 S	1.5 S	from 0 to 80% of the upper range limit
30 Ω ... 3M Ω	1.5 S	2 S	from 8 to 50% of the upper range limit
30M Ω	4 S	5 S	
$\overline{\text{---}}$	0.7 S	1.5 S	from 0 to 50% of the upper range limit
$^{\circ}$ C		max. 1 ... 3 S	



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Power Supply :

Battery 9V flat cell battery:
manganese-dioxide cell according to IEC 6 F 22.
alkaline Manganese cell according to IEC 6 LR 61
or corresponding NiCd storage battery

Operating time With alkaline -mangenease cell
approx. 750 hours on V $\overline{\text{---}}$
approx. 200 hours on V~

Battery test Automatic display of the " $\overline{\text{---}}$ " symbol,
when the battery voltage drops
below approximately 7 V.

Electrical Safety :

Protection class II according to IEC 348/DIN VDE 0411 and
IEC 1010-1/ EN61010-1 / VDE 0411-1

Overvoltage category II III

Nominal voltage 1000 V 600V

Degree of pollution 2 2

Nominal Insulation voltage 1000 V acc. To IEC 348/DIN VDE 0411

Test Voltage 6kV~ acc. To IEC 348/DIN VDE 0411

Electromagnetic Compatibility EMC :

Emission IEC 50081-1: 1992/
IEC 55022: 1987 Class B

Immunity IEC 50082-1: 1992
IEC 801-2: 1991 8 kV air discharg
IEC 801-3: 1984 3 V/m
IEC 801-4: 1988 0.5 kV

Environmental Conditions :

Working Temperature range : -10 °C... + 50 °C
Storage Temperature range : -25 °C... + 70 °C (excl. batteries)
Climatic class : 2z/ -10/50/70/75%
with reference to VDI/VDE 3540

Altitude above : up to 2000m
sea level

Mechanical Configuration :

Protection type : For meter - IP 50,
for connection sockets - IP 20

Dimensions : 84 mm x 195 mm x 35 mm

Weight : 0.35 kg, approx., incl. battery

Scope of delivery :

1 multimeter
1 Probe Set
1 copy of operating instructions
1 test certificate
1 rubber holster with tilt stand
and carrying strap
1 warranty card

Warranty :

3 year against defects in material & workmanship & calibration
From the date of purchase.



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