

Analog – Digital Multimeter

RISH Multi – 11



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.
DIN EN 60529	Test equipment and test procedures -Degrees of protection provided by enclosures (IP Code).

Specifications :

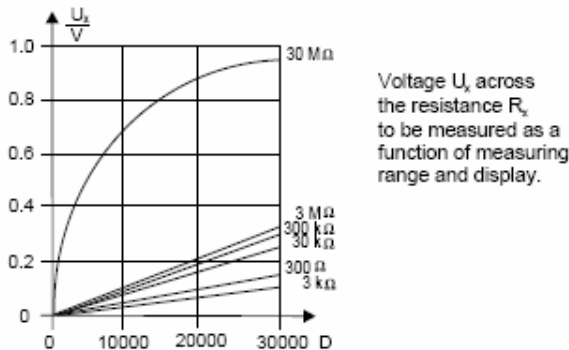
Meas. function	Measuring Range	Resoluti on	Input impedance	Intrinsic error of the digital display ± (.....% of rdg. + digits) at ref. conditions	Overload Capacity ¹⁾		Meas. function
				Accuracy	Overload Value	Overload duration	
V₌₌	30.00 mV	10 μV	>10 G? // < 40 pF	0.5 + 3 ²⁾	1200V	Continuous	V₌₌
	300.0 mV	100 μV	>10 G? // < 40 pF	0.5 + 3			
	3.000 V	1 mV	11 M? // < 40 pF	0.25 + 1			
	30.00 V	10 mV	10 M? // < 40 pF	0.25 + 1			
	300.0 V	100 mV	10 M? // < 40 pF	0.25 + 1			
	1000 V	1 V	10 M? // < 40 pF	0.35 + 1			
V_~	3.000 V	1 mV	11 M? // < 40 pF	0.75 + 2	Effective sinusoidal		V_~
	30.00 V	10 mV	10 M? // < 40 pF	(10...300 Digit)			
	300.0 V	100 mV	10 M? // < 40 pF	0.75 + 1			
	1000 V	1 V	10 M? // < 40 pF	(>300D igit)			
No-load Voltage							
?	30.00 ?	10 m?	max. 3.2 V	0.5 + 3 ²⁾	500V DC AC Effective sinusoidal	10 min	?
	300.0 ?	100 m?	max. 3.2 V	0.5 + 3			
	3.000 k?	1 ?	max. 1.25V	0.4 + 1			
	30.00 k?	10 ?	max. 1.25V	0.4 + 1			
	300.0 k?	100 ?	max. 1.25V	0.4 + 1			
	3.000 M?	1 k?	max. 1.25V	0.6 + 1			
	30.00 M?	10 k?	max. 1.25V	2.0 + 1			
→ 	2.000V	1 mV	max. 3.2V	0.25 + 1			→
°C	- 200.0 ... + 200.0 °C	0.1 °C	Pt 100	2 Kelvin + 5 Digit ³⁾	500 V DC AC effective sinusoidal	10 min	°C
	+ 200.0 ... + 850.0 °C	0.1 °C		1.0 + 5 ³⁾			
	- 100.0 ... + 200.0 °C	0.1 °C	Pt 1000	2 Kelvin + 2 Digit ³⁾			
	+ 200.0 ... + 850.0 °C	0.1 °C		1.0 + 2 ³⁾			

1) At 0 °C + 40 °C

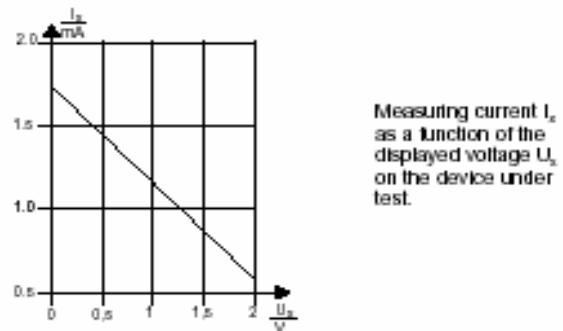
2) With Zero adjustment ; without zero adjustment + 35 digits

3) Without sensor

Measuring voltage with resistance measurement :



Measuring current with diode test and / or continuity test :



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...
 47 mm on all other ranges
 Scaling : $\pm 5 \dots 0 \dots \pm 30$ with 35 scale divisions on ...
 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 ? : 10 readings/s

Digital :

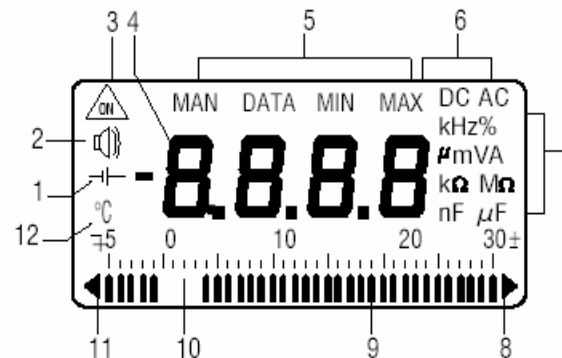
Display / height of numerals : 7-segment numerals / 15 mm
 Number of counts : $3 \frac{3}{4}$ digit \approx 3100 counts
 Overrange display : " OL " is shown
 Polarity display : "-" sign is shown,
 When positive pole to " ^ "

Sampling rate : 2 readings/s,
 On ? and $^{\circ}\text{C}$: 1 reading/s

Reference conditions :

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

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 $^{\circ}\text{C}$ 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 $\overline{\overline{=}}$	1.0 + 3
		3...300 V $\overline{\overline{=}}$	0.15 + 1
		1000 V $\overline{\overline{=}}$	0.2 + 1
		V \sim	0.4 + 2
		30 ? ²⁾	0.15 + 2
		300 ?	0.25 + 2
		3 k? - 3 M?	0.15+1
		30 M?	1.0 + 1
		-200...+200 °C	0.5 K + 2
		+ 200...+850 °C	0.5 + 2
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 $\overline{\overline{+}}$ appears.

Influence Quantity	Influence Range	Measured quantity / Measuring range	Variations
Battery Voltage	$\overline{\overline{+}}$ ³⁾ ...< 7.9V >8.1V...10.0V	V $\overline{\overline{=}}$	± 2 D
		V \sim	± 4 D
		30? / 300? / °C	± 4 D
		3 K? ...30 M?	± 3 D
Relative Humidity	75 % 3 days Meter off	V $\overline{\overline{=}}$, V \sim ? °C	1 x intrinsic error
Data	---		±1 D
MIN / MAX	---	V $\overline{\overline{=}}$, V \sim	±1 D

Influence Quantity	Influence Range	Measuring range	Attenuation
Common Mode Voltage	Disturbance variable max. 1000 V \sim	V $\overline{\overline{=}}$	> 120dB
		3 V \sim 30 V \sim	> 80dB
		300 V \sim 1000 V \sim	> 70dB > 60dB
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 $\overline{\overline{=}}$	> 50dB
		V \sim	> 110dB

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 $\overline{\overline{=}}$, V \sim	0.7 S	1.5 S	from 0 to 80% of the upper range limit
30? ...3M?	1.5 S	2 S	from ∞ to 50% of the upper range limit
30M?	4 S	5 S	
$\overline{\overline{+}}$	0.7 S	1.5 S	from 0 to 50% of the upper range limit
°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 $\overline{=}$ approx. 200 hours on V \sim
Battery test	Automatic display of the "+" symbol, when the battery voltage drops below approximately 7 V.

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 sea level	: up to 2000m

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 \sim acc. To IEC 348/DIN VDE 0411	

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

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

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 :

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