RISHABH

Data Sheet

RISHABH 410

Digital Multimeter

RoHS CE

Measure Control Record Analyze Optimize

Data Sheet

RISHABH 410

* Direct and alternating voltages from 100µV ... 1000V
* Direct and alternating currents from 10µA ... 10.00A
* Resistance from 1Ω ... 40.00MΩ with zero correction
* Capacitance from 1pF ... 200.00 µF with zero correction
* Frequencies from 10.00Hz ... 500kHz
* Diode measurement and continuity testing
* Hold measurement .
* Relative measurement
* Duty cycle (%) measurement
* Temperature measurement with K type Thermocouple
* Backlit Facility

Application

RISHABH 410 digital multimeter is suited for universal, general applications in the electrical and electronics fields, as well as in radio and television service, training and education.
It is of especially pocket size design, and thus fit into pocket. The protective cover, which is provided as standard equipment, can be opened at an angle for convenient reading from the workbench, and

Hold:
By pressing the HOLD key, the currently displayed measurement value can be held and “HOLD” is simultaneously displayed.

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.

Automatic/manual measuring range selection:
The measurement functions are chosen with the rotary selector switch. The measuring range is automatically adjusted to the measurement value. The measuring range can also be manually selected with the AUTO/MAN button.
Note : For Temperature (^{0}C) , Frequency (Hz) , Duty cycle (%), and Capacitance (F) measuring range is AUTO . No Manual range selection is possible.

Hz/Duty:
The instrument can measure frequency (Hz) and duty cycle (%) of the AC Voltage by pressing Hz/Duty key.

Temperature Measurement:
RISHABH 410 allows you to measure temperature with “ K ” type Thermocouple (Ni Cr-Ni) sensor in the range from 0^{0}C to +1300 ^{0}C.

Diode and continuity testing:
This provides for the testing of the polarity of diodes, as well as inspection for short-circuits and circuit interruptions. In addition to the display, resistance of less than approx 55 ± 2.5 Ω are indicated with an acoustic signal

Overload warning :
An acoustic signal occurs when measuring AC voltage>750V, DC Voltage>1000V, AC/DC mA current>400.0mA, AC/DC current>10.00A.

Energy saving circuit (Auto Power Off):
The instrument is switched off automatically, if none of the operating elements have been activated for about 15 minutes.

Protective cover for rough operating conditions:
A protective cover of Rubber Holster with a built-in stand protects the instrument against jolts and falls. It also secures the test probe for one-hand operation, and allows for winding of the measurement cable which provides protection during transport.

Automatic blocking socket(ABS):
The automatic terminal blocking system prevents incorrect connection of test lead and incorrect selection of measurement quantity, which provide safety to the user.

Backlit:
The RISHABH 410 multimeter provides facility of measurement in poor light condition by pressing backlit key.

Calibration:
RISHABH 410 multimeters are calibrated using precision calibrators having accuracy better than at least 5 to 10 times depends upon the functions and ranges. These sources are calibrated at regular intervals.

Others:
Separate compartment for batteries which makes battery replacement easy and faster. Also it has provision of mounting clip for hands free operation in awkward situation .

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Reference conditions for Accuracy

Reference Temperature	23°C ± 2K
Relative Humidity	45%...55% RH
Waveform of measured quantity	Sinusoidal
Input frequency	50 Hz
Battery Voltage	3 V ± 0.1 V

Applicable regulations and standards

EMC Immunity	IEC 61326-1:2012, Table A.1
Emission	IEC 61000-4-2 : 8 KV atmosphere discharge, 4 KV contact discharge
	IEC 61000-4-3 : 3 V/m
	Short-term measured value deviation may occur during electro-magnetic interference thus reducing the specified operating quality.
Safety	IEC 61010-1-2010
IP for water & dust	IEC 60529
Pollution degree:	2
Installation category:	600 V CATIII / 1000 V CATII
High Voltage Test	3.5 kV (IEC 61010-1-2010)

Environmental Conditions

Operating temperature	-10 to +50°C
Storage temperature	- 25 to +70°C (without battery)
Relative humidity	45%.....75%
Terminal Protection	IP 52 for instrument and IP20 for terminals.
Altitude	Up to 2000 m

Battery

Battery Voltage	2 X 1.5 V Cells
Battery type	Alkaline manganese Dioxide cells.
Battery Life	Alkaline manganese dry cell: approx. 600 hours.
Battery test	Automatic display of symbol when battery voltage drops below approx. 2.4V

Specifications

Meas. Function	Measuring Range	Resolution	Input Impedance	Digital display inherent deviation at reference conditions	Overload capacity[1]	
			V(AC) /V(DC)	±(...% of rdg + ...digits)	Overload Value	Overload Duration
V(DC)	400.0mV	100µV	>20MΩ	0.75+2	1050V(DC)	Continuous
	4.000V	1mV	11MΩ	0.5+2		
	40.00V	10mV	10MΩ			
	400.0V	100mV	10MΩ			
	1000V	1V	10MΩ			
V(AC)	400.0mV	100µV	11MΩ	1.5+5	1050V(AC) rms	Continuous
	4.000V	1mV	11MΩ	1+5		
	40.00V	10mV	10MΩ			
	400.0V	100mV	10MΩ			
	1000V	1V	10MΩ	1+10		
			Approx. voltage drop at max. meas. current			
A(DC)	40.00mA	10µA	450mV	0.8+2	480mA	Continuous
	400.0mA	100µA	4.2V			
	10.00A [4]	10mA	750mV	1.5+5	[4]	[4]
A(AC)	40.00mA	10µA	450mV	1+5	480mA	Continuous
	400.0mA	100µA	4.2V			
	10.00A [4]	10mA	750mV	2+5	[4]	[4]
			Open-circuit voltage			
Ω	400.0Ω	100mΩ	approx. 0.45V	0.8+5	500V DC/AC rms	10 min
	4.000kΩ	1Ω		0.8+2		
	40.00kΩ	10Ω				
	400.0kΩ	100Ω				
	4.000MΩ	1kΩ		1+5		
	40.00MΩ	10kΩ		2+5		
BUZZER	400.0Ω	100mΩ		Acoustic signal for 0...<75Ω (approx)		
DIODE	1.000V	1mV	approx. 1V	2+10		
F	5.000nF	1pF		3+40[2]	500V DC/AC rms	10 min
	50.00nF	10pF		2+10[2]		
	500.0nF	100pF		0.5+3[2]		
	5.000µF	1nF		1+2[2]		
	50.00µF	10nF		1.5+2[2]		
	200.0 µF	100nF		5+10[3]		
			f_{min}			
Hz [5]	10.000Hz	0.001Hz	1 Hz	0.2+2	≤1kHz : 1000V ≤10 kHz: 400V ≤500 kHz: 40V except 400mV	Continuous
	100.00Hz	0.01Hz	1 Hz			
	1.0000kHz	0.1Hz	1 Hz			
	10.000kHz	1Hz	1 Hz			
	100.00kHz	10Hz	10 Hz			
	500.0KHz	100Hz	100 Hz			
%	2.0...98.0%	0.1%	---	10Hz...1kHz: ±5D 1kHz...10kHz: ±5D/kHz		
			Sensor			
°C	0... +1300 °C	1°C	K Ni Cr-Ni	2+3	500V DC/AC rms	10 min

1) At 0 °C ... + 40 °C

2) With zero adjustment "REL"

3) Time required for measurement approximately 60 seconds.

4) 12 A/5 min , 16 A/30 s

5) Indication of the frequency measurement expanded to up to 9999 Digits.

Influence Quantities

Influence Quantity	Range of Influence	Measured Quantity/ Measuring Range	Variation [1] ± (….% of rdg. + ….digits)
Temperature	0 °C +21 °C and +25 °C…+50°C	VDC	1 X Intrinsic error / K
		VAC	
		ADC	
		AAC	
		Ω	
		Diode	
		F	
		Hz	
		%	
		°C	
Frequency of the Measured quantity	20 Hz....< 50 Hz	400mV~, 1000V~	2.0+3
	> 50Hz… 500 Hz		
	20 Hz....< 50 Hz	4V~, 40V~, 400V~	2.0+3
	> 50Hz… 1 kHz		
Relative Humidity	55.....75%	V~,VDC	1 x intrinsic error
		A~,ADC	
		Ω	
		F	
		Hz	
		°C	
		%	

Interfernce

Influence Quantity	Range of Influence	Measured Quantity/ Measuring Range	Attenuation
Common Mode interference voltage	Noise quantity max. 1000 V dc	VDC	> 100 dB
		V~	> 100 dB
	Noise quantity max. 1000 V ~ 50 Hz, 60 Hz sinusoidal	400mV~,4V~, 40V~	> 55 dB
		400V~	> 43 dB
		1000V~	> 23 dB
Normal Mode interference voltage	Noise quantity V ~ Value of the measuring range at a time Max. 1000V~ ,50Hz, 60Hz Sinusoidal	VDC	> 43 dB
	Noise quantity max. 1000 V dc	V~	> 55 dB

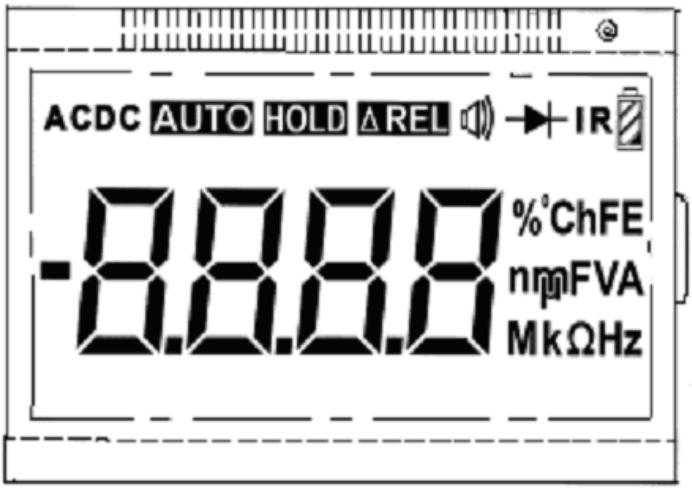
Display

LCD display field 58 mm X 31.4 mm with digital display ,alalog scale and with display of measurement unit, and Various special functions.

Digital

Display	7 segment
Character height	Main Display Character : 15mm
Number of digits/Counts	3¾ digits 3999 steps
Overrange display	"OL" is displayed.
Polarity display	"–" sign is displayed when positive pole at "⊥"
Sampling rate	3 measurements/s for V, I , Ω , Capacitance, Frequency and Duty cycle measurement

Analog



1. Digital display with dot and polarity.
2. Low Battery Indication.
3. Display for REL and HOLD.
4. Continuity test display:
   Buzzer symbol appears when acoustic signal is switched on.
5. Display for diode measurement.
6. Measurement unit display.
7. Display for automatic measuring range selection.
8. Display for selected type of Voltage/Current (AC or DC).
9. Display for overload value "OL".

Fuse

Fuse for ranges up to 400 mA	1.6 A / 600V; 6.3 mm x 32 mm
Fuse for 10 A range	16 A / 600V; 6.3 mm x 32 mm

Standard Scope Of Supply

1 Multimeter
1 Cable set
1 Copy Operating Instructions
1 Protective Case (Holster).

Mechanical Design

Protection	Instruments: IP 52 Connector sockets: IP 20
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. 0.480 Kg with battery

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RISHABH INSTRUMENTS LIMITED
Domestic (India): +91 253 2202099 | marketing@rishabh.co.in
International: +91 253 2202004/06/08/99 | global@rishabh.co.in
www.rishabh.co.in