RISHABH

Data Sheet

RISHABH 612...616

Digital Multimeter

RoHS CE

Measure Control Record Analyze

* Direct and alternating voltages from 100µV ... 1000V
* Direct and alternating currents from 10µA ... 10.00A
* Resistance from 100mΩ... 60.00MΩ
* Capacitance from 1pF ... 40.00 mF with zero correction.
* Frequencies from 10.00Hz ... 10MHz
* Diode measurement and continuity testing
* Hold measurement .
* Relative measurement
* Duty cycle (%) measurement
* Temperature measurement with K type Thermocouple
* Peak value measurement

Application

RISHABH digital multimeters are suited for universal, general applications in the electrical and electronics
radio and television service, training and education.

Root mean square value with distorted wave form(for 616 only).
Measuring principal employed permits the measurement of root mean square value (TRMS) of AC quantities regardless of wave form.

Dual Display
The dual display included a main display and a sub display. Main display always display current measurement value where as sub display shows some special measurements like maximum/ minimum value, reference value for relative value measurement. Also dual display is used to display at the same time Voltage/ Current with Frequency, Frequency with Duty cycle etc.

Peak Hold
Minimum and maximum Peak values are hold in VAC, mAAC, AAC.

MIN/MAX Function
By pressing min/max button instrument will start recording minimum and maximum readings.All functions can measure MIN/MAX except Hz/Duty functions.

Temperature measurement
Multimeters measures temperature with “K” type thermocouple (NiCr - Ni) sensor in the range from 0C to 1300°C.

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

Analog Scale
Analog scale that updates at the rate 28 times/sec to observe

Protection from dust and water:
Instrument: IP 50
For terminals: IP20 as per IEC60529.

Applicable International Safety standards
1000 V CAT III/600V CAT IV as per International Safety standard IEC 61010-1- 2010 and IEC 61557

Auto Power OFF (APO)
Multimeter has a default auto power off function. If the Meter is idle for more than the 15 minutes, the meter automatically turns the power off.

Hold
By pressing the HOLD/ON key, the currently displayed Measurement value can be held and “HOLD” is simultaneously displayed.

Relative measurement (REL)
By pressing and holding PEAK and then pressing AUTO/MAN key, the zero correction is made and relative Value is measured.
It is not active in Hz/Duty functions.

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

Auto and Manual ranging modes
In AUTO ranging mode the instrument automatically selects the range with best resolution depending on the applied input. In manual ranging mode range is user selectable using AUTO/MAN Key.
Note: For AAC, ADC, Temperature ,Continuity ,Diode and Duty cycle measuring range is manual. No AUTO range selection is possible.

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 30 Ω(approx.) Are Indicated with an acoustic signal.

Backlit
Large white LED backlit to work in poorly light area.

ContinuousON mode
In this mode, AUTO POWER OFF is disabled.

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

Applicable regulations and standards

EMC Immunity	IEC 61326-1:2012, Table A.1 *
Immunity	IEC 61000-4-2 : 8 KV atmosphere discharge, 4 KV contact discharge
	IEC 61000-4-3 : 3 V/m
Safety	IEC 61010-1-2010
IP for water & dust	IEC 60529
Pollution degree:	2
Installation category:	1000 V CATIII / 600 V CATIV (for 616,615,612) 1000 V CATII / 600 V CATIII (for 613)
High Voltage Test	6.7 kV (IEC 61010-1-2010) (for 616,615,612) 3.5 kV (IEC 61010-1-2010) (for 613)

* Short-term measured value deviation may occur during electro-magnetic interference thus reducing the specified operating quality.

Environmental Conditions

Operating temperature	0 to +50°C
Storage temperature	- 25 to +70°C
Relative humidity	<75% non condensing.
Terminal Protection	IP 50 for instrument and IP 20 for terminals.
Altitude	Up to 2000 m

Battery

Battery Voltage	2 X 1.5 V Cells
Battery type	Alkaline manganese Dioxide cells.
Battery Life	for 612, 613, 615: 600 hrs. for VDC, ADC 300 hrs. for VAC, AAC for 616: 400 hrs. for VDC, ADC 200 hrs. for VAC, AAC
Battery test	Automatic display of symbol when battery voltage drops below approx. 2.4V

Specifications

Meas. Function	Measuring Range	612	613	615	616 TRMS	Resolution	Input Impedance	Digital display Inherent deviation at reference condition +(...%rdg + ...digits)	Overload capacity [1]	
									Overload Values	Overload Duration
V(DC)	660.0mV	●	●	●	●	100µV	>100 MΩ // <40pF	0.7 + 5	1000 V DC AC eff / rms Sine wave	Cont.
	6.600V	●	●	●	●	1mV	11 MΩ // <40pF	0.4 + 5		
	66.00V	●	●	●	●	10mV	10 MΩ // <40pF	0.4 + 5		
	660.0V	●	●	●	●	100mV	10 MΩ // <40pF	0.4 + 5		
	1000.0V	●	●	●	●	1V	10 MΩ // <40pF	0.4 + 5		
V(AC)	660.0mV	●	●	●	●	100µV	>100 MΩ // <40pF	1.2 + 5		
	6.600V	●	●	●	●	1mV	11 MΩ // <40pF	1.0 + 3		
	66.00V	●	●	●	●	10mV	10 MΩ // <40pF			
	660.0V	●	●	●	●	100mV	10 MΩ // <40pF			
	1000V	●	●	●	●	1V	10 MΩ // <40pF			
							Voltage Drop			
A(DC)	66.00mA	●	●	●	●	10µA	66.00mV	0.8 + 5	0.7A	Cont.
	660.0mA	●	●	●	●	100µA	660.00mV	0.8 + 5		
	10.00A		16A	●	●	10mA	350mV	1.5 + 5	12A	
A(AC)	66.0mA	●	●	●	●	10µA	66.00mV	0.8 + 5	0.7A	Cont.
	660.0mA	●	●	●	●	100µA	660.00mV	0.8 + 5		
	10.00A		16A	●	●	10mA	350mV	1.5 + 5	12A	
⊁C(AC)	66.00A	●				10mA	66.00mV	0.8 + 5	0.7A	Cont.
	660.0A	●				100mA	660.00mV	0.8 + 5		
							No load Voltage			
Ω	660.0Ω	●	●	●	●	100mΩ	-3.3V	0.8 + 5	1000 V DC AC eff / rms Sine wave	10Sec.
	6.600KΩ	●	●	●	●	1Ω	-1.08V	0.8 + 5		
	66.00KΩ	●	●	●	●	10Ω	-1.08V	0.8 + 5		
	660.0KΩ	●	●	●	●	100Ω	-1.08V	0.8 + 5		
	6.600MΩ	●	●	●	●	1KΩ	-1.08V	1.0 + 5		
	66.00MΩ	●	●	●	●	10KΩ	-1.08V	2.0 + 5		
BUZZER	660.0Ω	●	●	●	●	100mΩ	-3.3V	0.8 + 5		
DIODE	2.000V	●	●	●	●	1mV	3.3V	2.0 + 10		
F	6.600nF			●	●	1pF	—	3.0+40		
	66.00nF			●	●	10pF		2.0+10		
	660.0nF			●	●	100pF		2.0+10		
	6.600µF			●	●	1nF		2.0+10		
	66.00µF			●	●	10nF		2.0+10		
	660.0µF			●	●	100nF		5.0+10		
	6.600mF			●	●	1µF		5.0+10		
	40.00mF			●	●	10µF		5.0+10		
Hz	66.00Hz			●	●	0.01Hz	10 Hz(Fmin)	0.2 + 2[2]		
	660.0Hz			●	●	0.1Hz				
	6.600KHz			●	●	1Hz				
	66.00KHz			●	●	10Hz	—			
	660.0KHz			●	●	100Hz				
	6.600MHz			●	●	1KHz				
	10.00MHz			●	●	10KHz				
%	1.0...98.90%			●	●	0.01%		10 Hz... 1kHz ± 5 Digit [3] 1 kHz ... 10 kHz; ± 5 Digit / kHz [3]		
C / F	0...1300°C	●	●	●	●	1°C	—	2.0+3[4]		
Peak (VAC /A AC)		●	●	●	●			3.0+300	-	-

1) At 0°C ... + 40 °C
2) At input ≥3.5Vrms ,Square wave, Bipolar inputs.
3) For <10 Khz ,Square wave, Bipolar inputs
4) Without sensor

Influence Quantities

Influence Quantity	Range of Influence		Measured Quantity/ Measuring Range	Variation [1] ± (….% of rdg. + ….digits)
Temperature	0 °C +21 °C and +25 °C…+40°C		VDC	1 X Intrinsic error / K
			VAC	
			ADC	
			AAC	
			Ω	
			Diode	
			F	
			Hz	
			%	
			°C	
Frequency of the Measured quantity	20 Hz....< 50 Hz		660mV~	1.0+3
	> 50Hz… 200 Hz			5.0+3
	20 Hz....< 50 Hz		6.6.....1000V~	1.0+3
	> 50Hz… 2 Khz			5.0+7
	20 Hz....< 50 Hz		A~	1.0+3
	> 50Hz… 2 KHz			5.0+7
Waveform of the Measured quantity [2]	Crest Factor CF	1….1.4	V~[3] ,A~[3]	± 1 % of rdg
		1.4….5		± 5 % of rdg
Battery Voltage	[4] **…< 2.49 V** **> 2.49 V …3 V**		VDC	5 Digit
			V~,ADC	10 Digit
			AAC	6 Digit
			600 Ω	4 Digit
			6.600 kΩ - 66 MΩ	3 Digit
			nF,µF,mF	5 Digit
			Hz	5 Digit
			%	5 Digit
Relative Humidity	75% 3 Days Meter off		V~,VDC	1 x intrinsic error
			A~,ADC	
			Ω	
			F	
			Hz	
			°C	
			%	

1) With temperature: Error data apply per 10 K change in temperature.
With frequency: Error data apply to a display from 300 digits onwards.

2) With unknown waveform (crest factor CF > 2), measure with manual range selection

3) With the exception of sinusoidal waveform.

4) After the " " symbol is displayed.

Influence quantities

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	VDC	>100 dB
		V~	> 50 dB
Normal Mode interference voltage	Noise quantity V ~ Value of the measuring range at a time Max. 1000V~ ,50Hz, 60Hz Sinusoidal	660mVDC, 6.6VDC, 660VDC,1000VDC	> 43 dB
		66 VDC	> 35 dB
	Noise quantity max. 1000 V dc	V~	> 45 dB

Response time (After manual range selection)

Measured Quantity/ Measured range	Response Time		Attenuation
	Of Analog indication	Of digital indication	
VDC ,VAC,ºC	0.1S	1.0S	From 0 to 80 % of upper range limit.
A~,ADC	0.1S	1.0S	From 0 to 50 % of upper range limit.
660Ω...6.6 MΩ	0.1S	1.0S	
66 MΩ	0.2S	2.0S	
Diode	0.1S	1.0S	From 0 to 80 % of upper range limit.
6.6nF... 66µF	0.7S	Max.1S	
660µF...6.6 mF	1.4S	Max.3S	
66 mF	7.0S	Max.15S	
660 Hz,6.6KHz	2.0S	Max.2S	
66 KHz,660 Khz,1MHz	0.5S	Max.1S	
% (10 Hz)	0.7S	Max.2.5S	

Fuse

Fuse for ranges up to 660 mA	1.6 A / 1000V; 6.3 mm x 32 mm
Fuse for 10 A range	16 A / 1000V; 10 mm x 38 mm

Mechanical Design

Protection	Instruments: IP 50 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

Ambient Conditions

Operating temperature range	0°C ... + 50°C
Storage temperature range	- 25°C ... + 70°C (without batteries)
Relative humidity	45 ... 75 %
Elevation	up to 2000 m

Standard Scope Of Supply

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

Subject to change without notice

Display

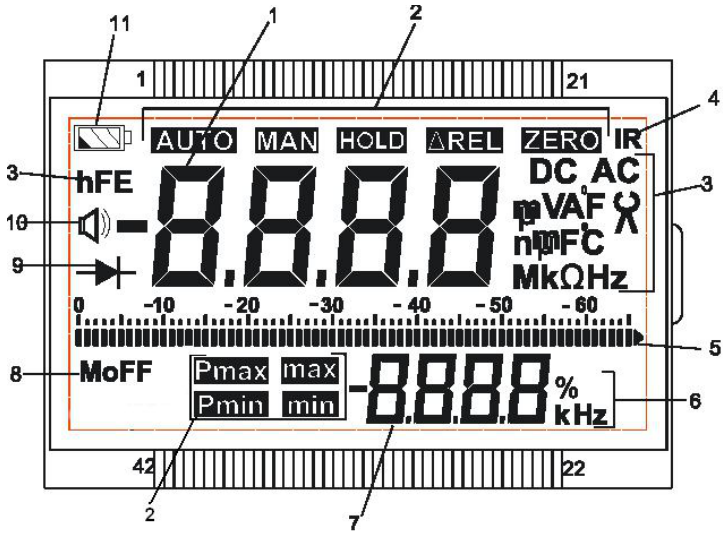
LCD display field 58 mm X 31.4 mm with digital display ,alalog scale and with display of measurement unit, and Various special functions.

Digital

Display	7 segment
Character height	Main Display Character : 12mm Sub Display Character : 7mm
Number of digits/Counts	4 digits 6600 steps
Overrange display	"OL" is displayed.
Polarity display	"–" sign is displayed when positive pole at "⊥"
Sampling rate	2.8 times /sec

Analog

Indication	LCD scale Analog Bar graph
Scale length	55 mm
Scaling	0 to 60 with 66 scale divisions
Polarity Indication	"-" sign on scale digits.
Over range indication	By triangle
Sampling rate	28 times/sec



Multimeter display :

1 Digital Main display with decimal point and polarity
2 Display for Automatic ,manual range Selection ,HOLD ,Relative ,Zero Peak ,Max ,Min.
3 Measurement unit of main display.
4 Display for IR mode indication.
5 Display for Analog scale.
6 Measurement unit of Sub display.
7 Digital Sub display with decimal point and polarity
8 Display for Auto off indication (After 15 Min meter will turn OFF)
9 Diode test Display.
10 Continuity test display.
Speaker symbol appears when acoustic signal is switched on
11 Low battery indication.

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