Technical Data Sheet

Gamma 10

Gamma 10 It is Analog Digital Multimeter which measures VAC, VDC, VAC+DC,Frequency, mA DC, mA (AC+DC), Resistance, continuity, Diode, Farad, AC current measurement.

Special Features

- Automatic terminal blocking system (ABS)
- Min/Max value storage
- Indication of negative values on the analog scale
- Overload warning

Application

Gamma 10 is Analog Digital Multimeter which measures VAC, VDC, VAC+DC, Frequency, mA DC, mA (AC+DC), Resistance, continuity, Diode, Farad, AC current measurement.

Product Features

Automatic Terminal Blocking System (ABS)	The automatic Terminal blocking system prevents incorrect connection of the test leads and incorrect selection of the measured quantity. This reduces danger to the user, the meter and the system to a remarkable extent.
Interface And Software	The multimeters are fitted with a serial RS-232 C interface via which the measured values can be transmitted to a PC. These values, electrically isolated, are transmitted to the attachable interface adaptor with infrared light through the case*
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.
Indication Of Negative Values On The Analog Scale	The measuring principle employed permits the measurement of the root-mean-square value (TRMS) of AC quantities and mixed quantities (AC and DC) regardless of the waveform.
Automatic Data Hold*	The DATA HOLD function makes it possible to hold the digitally displayed measured value. According to a patented method, 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 all models of Gamma 12, in direct connection of temperature sensor Pt 100 / Pt 1000. The meters automatically detects the type of sensors connected to it & displays directly measured temperature.
Signalling in the case of a blown fuse	The display FUSE points to a blown fuse.
Power economizing circuit	The meter disconnects automatically when the measured value remains unchanged for about 10 minutes and no operating control was operated during this time. The disconnection facility can be disabled.
Overload Warning	A sound signal indication violation of the overload limits.
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.
Top model Gamma 10	The top model Gamma 10 features a 4 3/4 digit display (31 000 digits)as well as the following additional functions : Event counter, measurement of the duration of the event, time counter (stop watch), data compare, dB measurement, wide-range capacitance measurement.
Calibration	Gamma multi is automatically calibrated with respect to Fluke 5500 / Wavetek 9100. Automatic calibration is done through a developed calibration software with RS232 connection to the multimeter. 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.

Technical Specifications

Analog

Indication	LCD scale with pointer
Scale length	55 mm on V ⎓ and A ⎓ ; 47 mm on all other ranges
Scaling	+ 5…0…± 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 Ω 10 readings/s

Environmental conditions

Temperature range	-20° C... + 50°C
Storage temperature range	-25°C ... +70°C (excl. batteries)
Climatic class	2z/-20/50/70/75% with reference to VDI/VDE 3540
Altitude above sea level	up to 2000m

Digital

Display/ height of numerals	7 segment numerals / 12mm
Number of counts	4 ¾ digit≙ 31000 counts
Overange display	"**OL**" is shown
Polarity display	"-" sign is shown, When positive pole to "⏊ "
Sampling rate	2 readings/s, On Ω and ℃:1 reading/s

Mechanical configuration

Protection type	For meters; IP 50, for connection sockets: IP 20
Dimensions	84 mm x 195 mm x 35 mm
Weight	0.35 kg, approx., incl. battery

Applied rules and standards

IEC 61010-1:2001 DIN EN 61010 part 1 VDE 0411 -1	Safety requirements for electrical equipment for measurement, control and laboratory use.
DIN 43751 IS 13875	Digital measuring instruments
EN 61326:2002	Generic emission standard; Residential, commercial and light industry
EN 61326:2002	Generic immunity standard; residential, commercial and light industry
VDI/VDE 3540	Reliability of measuring and control equipment.
DIN EN 60529 DIN VDE 0470 part 1	Test equipment and test procedures -Degrees of protection provided by enclosures (IP Code)

Warranty

3 year against defects in materials and workmanship & calibration from the date of purchase.

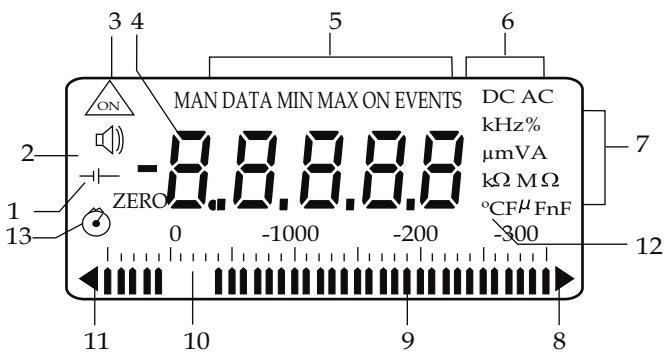
Scope of delivery

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

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.

1 Display with low battery voltage
2 Display with 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 hold
6 Display of the selected function
7 Display of the unit of measurement
8 Display with overrange
9 Pointer for analog indication
10 Scale for analog indication
11 Indication that negative analog range is exceeded
12 Display of the unit 0C when measuring temperature
13 Display with time counter switched on



Technical Specifications

Reference conditions Measuring current with diode test and / or continuity test		
Ambient temperature	+23Co + 2K	
Relative humidity	45%... 55%	
Frequency of the measured quantity	45 Hz... 65 Hz	
Waveform of the	Sinusoidal	
measured quantity Battery voltage	8V + 0.1 V	

Technical Specifications

Meas. function	Measuring range	Resolution	Input impedence		Inherent error of the digital display ± (...% of rdg.+... digits) at reference conditions		Overload capacity [2]		Meas. function
			⎓	~ [1] ≂ [1]	⎓	~ [1] ≂ [1]	Overload value	Overload duration	
V	300.00 mV	10 µV	>10 GΩ	5 MΩ // < 40 pF	0.05 + 3; 0.05 + 20 [3]	1.0 + 30 (> 600 Digit)	1000 V DC AC RMS sinusoidal	cont.	V
	3.0000 V	100 µV	11 MΩ	5 MΩ // < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	30.000 V	1 mV	10 MΩ	5 MΩ // < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	300.00 V	10 mV	10 MΩ	5 MΩ // < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	1000.0 V	100 mV	10 MΩ	5 MΩ // < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
dB	See table below		—	as at V~	—	± 0.5 dB [4]			dB
			Voltage drop. approx.						
			⎓	≂ [1]	⎓	≂ [1]			
mA	300.00 µA	10 nA	15 mV	15 mV	0.2 + 20	1.2 + 30 (> 300 Digit)	0.36 A	cont.	mA
	3.0000 mA	100 nA	150 mV	150 mV	0.2 + 10	1.2 + 30 (> 300 Digit)			
	30.000 mA	1 µA	30 mV	30 mV	0.05 + 10	1.2 + 50 (> 300 Digit)			
	300.00 mA	10 µA	300 mV	300 mV	0.2 + 10	1.2 + 30 (> 300 Digit)			
A	3.0000 A	100 µA	150 mV	150 mV	0.5 + 10	1.2 + 50 (> 300 Digit)	12A [5]	5 min	A
	10.000 A	1 mA	400 mV	400 mV	0.5 + 10	1.2 + 30 (> 300 Digit)			
			No-load voltage	Short circuit current					
Ω	300.00 Ω	10 m Ω	max. 4.00 V	max. 1 mA	0.1 + 6; 0.1 + 30 [3]		1000 V DC AC RMS sinusoidal	1 min	Ω
	3.0000 k Ω	100 m Ω	max. 1.25 V	max. 100 µA	0.1 + 6				
	30.000 k Ω	1 Ω	max. 1.25 V	max. 10 µA	0.1 + 6				
	300.00 k Ω	10 Ω	max. 1.25 V	max. 1 µA	0.1 + 6				
	3.0000 M Ω	100 Ω	max. 1.25 V	max. 0.1 µA	0.1 + 6				
	30.000 M Ω	1k Ω	max. 1.25 V	max. 0.1 µA	1.0 + 6				
→|←	3.0000 V-	1mV	max. 4.00 V	---	0.2 + 3				→|←
			Discharge resist.	U_{0max}					
F	3.000 nF	1 pF	1.5 MΩ	4 V	1.0 + 8; 1.0 + 60 [3]		1000 V DC AC RMS sinusoidal	1 min	F
	30.00 nF	10 pF	1.5 MΩ	4 V	1.0 + 8; 1.0 + 30 [3]				
	300.0 nF	100 pF	150 k Ω	4 V	1.0 + 3				
	3.000 µF	1 nF	150 k Ω	4 V	1.0 + 3				
	30.00 µF	10 nF	15 k Ω	2 V	1.0 + 3				
	300.0 µF	100 nF	1.5 k Ω	2 V	5.0 + 6				
	3000 µF	1 µF	1.5 k Ω	2 V	5.0 + 6				
	10000 µF	10 µF	1.5 k Ω	2 V	5.0 + 6				

Technical Specifications

Meas. function	Measuring range		Resolution	Input impedence		Inherent error of the digital display ± (...% of rdg +... digits) at reference conditions		Overload capacity [2]		Meas. function
				⎓	~ [1] ≂ [1]	⎓	~ [1] ≂ [1]	Overload value	Overload duration	
				f_{min} [6]						
Hz	300.00 Hz		0.01 Hz	10 Hz		0.1 + 3 [7]		≤ 3 kHz; 1000 V ≤ 30 kHz; 300 V ≤ 100 kHz 30 V	cont.	Hz
	3.0000 kHz		0.1 Hz	10 Hz						
	30.000 kHz		1 Hz	10 Hz						
	100.00 kHz		10 Hz	100 Hz						
°C	Pt 100	- 200.0... + 100.0 °C	0.1 °C	–	–	0.5 Kelvin + 3 [8]		1000 V DC AC rms sine	1 min.	°C
		+ 100.0... + 850.0 °C	0.1 °C	–	–	0.5 + 3 [8]				
	Pt 1000	- 100.0... + 100.0 °C	0.1 °C	–	–	0.5 Kelvin + 3 [8]				
		+ 100.0... + 850.0 °C	0.1 °C	–	–	0.5 + 3 [8]				

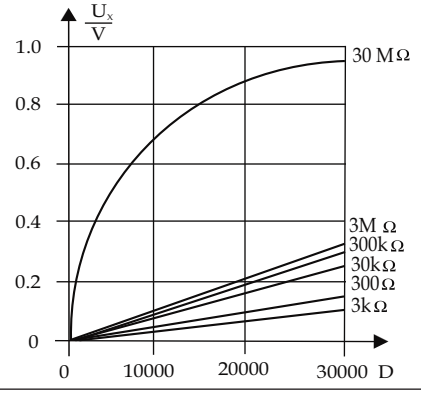
dB ranges

Measuring ranges	Display span at reference voltage U = 0.775 V	Display span at reference voltage Uref (V)
300 mV ~	- 48 dB... - 8 dB	- 40 dB... + 110 dB
3 V~	- 38 dB... + 12 dB	-60 dB... + 100 dB
30 V~	- 18 dB... + 32 dB	- 80 dB... + 80 dB
300 V~	+ 2dB... + 52 dB	- 100 dB... + 60 dB
1000 V~	+ 22 dB... + 63 dB	- 110 dB... + 40 dB
	Display (dB) = 20 lg U_x(V) / 0.775 V	Display (dB) = 20 lg U_x(V) / U_{ref}(V)

1) TRMS measurement
values < 100 digit (<500 digit for measuring range 300mV) will be supressed
2) At - 10 °C... + 40 °C
3) With zero adjuster; without zero adjuster
4) At a resolution of 0.01 dB
5) 16 A for 30s
6) Lowest measurable frequency with a sinusoidal measuring signal which is symmetrical to zero
7) Range 3 V ≂: Ue = 1V eff/rms 10 V eff/rms
30 V ≂: Ue = 10V eff/rms 100 V eff/rms
300 V ≂: Ue = 100V eff/rms 1000 V eff/rms
8) Without sensor

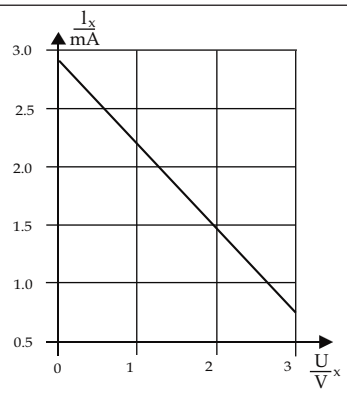
Measuring voltage with resistance measurement

Voltage Ux across the resistance Rx to be measured as a function of measuring range and display.

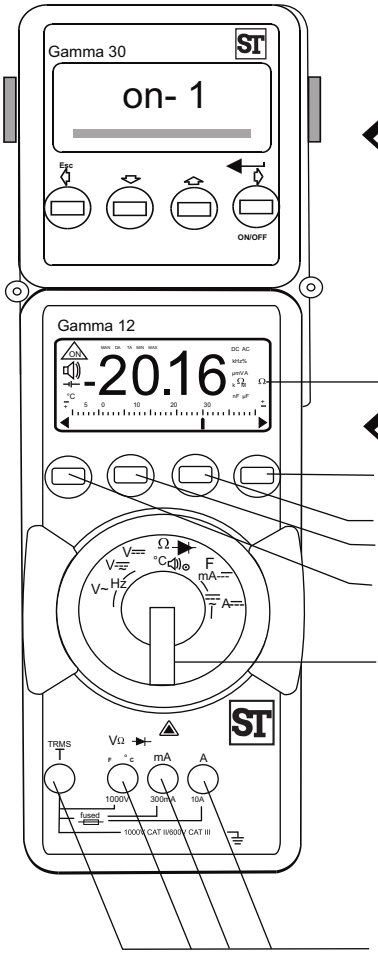


Measuring current with diode test and / or continuity test

Measuring current Ix as a function of the displayed voltage Ux on the device undertest.



Operating controls



Option storage adapter

Analog-to-digital multimeter

1 LC display
2 ON/OFF push-button
3 Push-button for data hold and MIN/MAX storage
4 Push-button for manual range selection
5 Multi-function push-button
6 Switch for measurement functions
7 Connection sockets with automatic blocking system

Ordering Information

Product Code	GM 20-	X	X	X	X	X	X	0000000
Type	Gamma 10	7						
Probe Set	Normal		N					
	Fine Tip		F					
Backlit	With Backlit			B				
	Without Backlit			Z				
CE Marking	CAT IV				4			
	CAT III				3			
Carrying Case	Without Carrying Case					0		
	With Carrying Case					1		
Gamma 30	Without Gamma 30						0	
	With Gamma 30						1	

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