

*Cost-effective combination of versatile,
easy-to-use functions*

FREQUENCY COUNTER

VF-4301 5Hz to 120MHz

- Low-Pass Filter
- Three Steps Gate Time Control

VF-4305 5Hz to 550MHz

- Low-Pass Filter
- Three Steps Gate Time Control

VF-4310 DC to 1.3GHz

- Low-Pass Filter
- Continuous Gate Time Control
- Variable Trigger Level
- Priod
- RPM

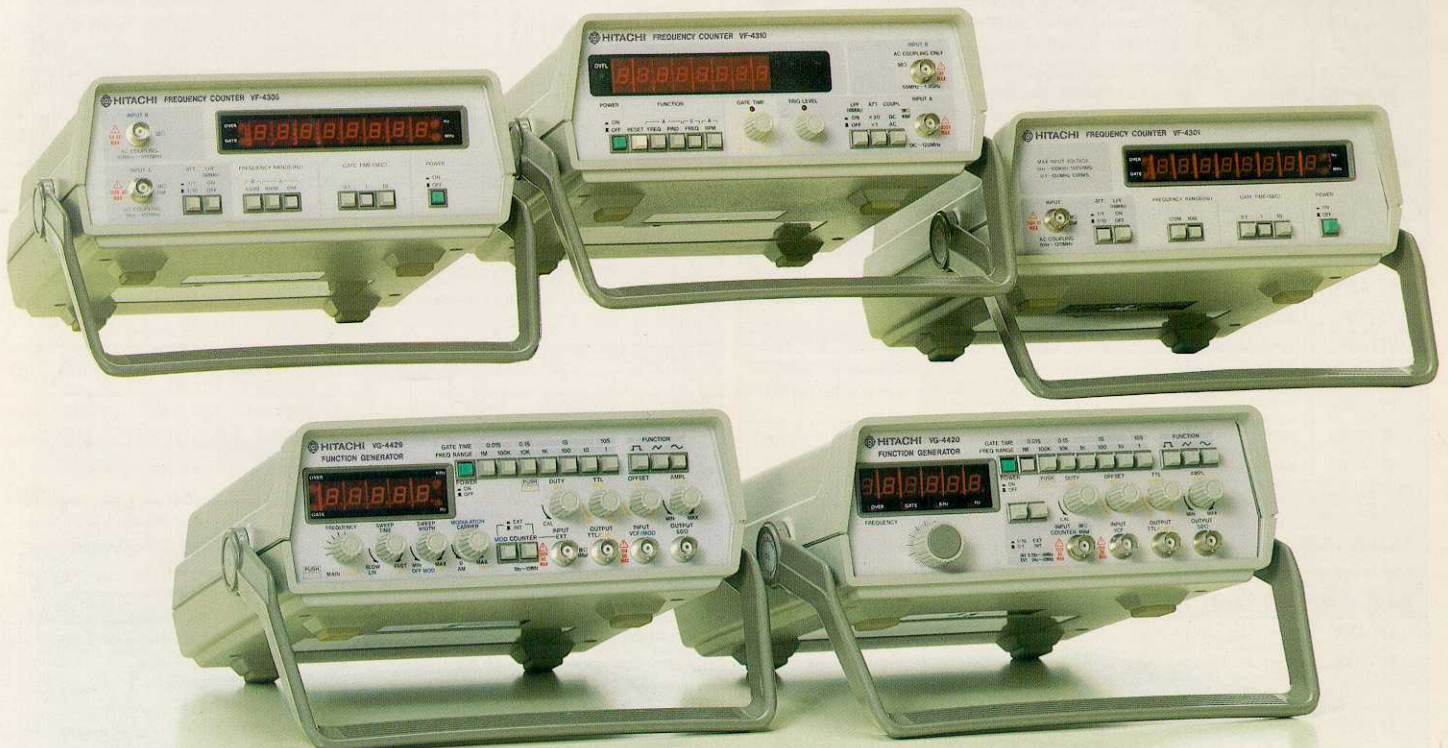
FUNCTION GENERATOR

VG-4420 0.2Hz to 2MHz

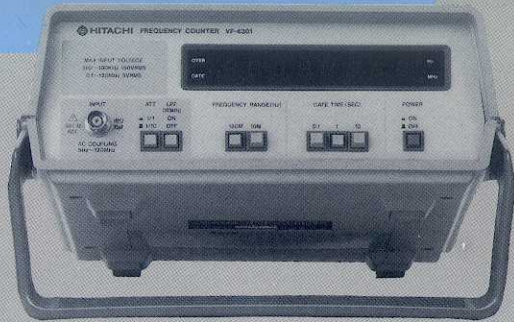
- Sine
- Triangle
- Square
- TTL Pulse
- CMOS Output
- Built-in Frequency Counter
- VCF Input

VG-4429 0.2Hz to 2MHz

- Sine
- Triangle
- Square
- TTL Pulse
- CMOS Output
- Built-in Frequency Counter
- VCF Input
- Sweep Operation
- AM/FM Modulation



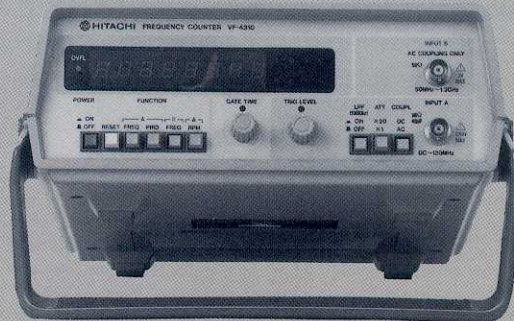
FREQUENCY COUNTER



VF-4301



VF-4305



VF-4310

- High-sensitivity and high-stability design
- Built-in lowpass filter
- Controllable gate time
(VF-4301/4305: 3 steps, VF-4310: continuously variable)
- Continuously variable trigger level (VF-4310 only)
- Period and rpm measurements (VF-4310 only)

SPECIFICATIONS

FREQUENCY RANGE			
VF-4301	5Hz to 120MHz in 2 ranges of 10MHz and 120MHz		
VF-4305	Input A	5Hz to 100MHz in 2 ranges of 10MHz and 100MHz	
	Input B	50MHz to 550MHz	
VF-4310	Input A	AC coupling	30Hz to 120MHz
		DC coupling	0.01Hz to 120MHz
	Input B	50MHz to 1.3GHz	
SENSITIVITY			
VF-4301	5Hz to 60MHz: 15mVrms 60MHz to 100MHz: 20mVrms 100MHz to 120MHz: 30mVrms		
VF-4305	Input A	5Hz to 60MHz: 15mVrms 60MHz to 100MHz: 20mVrms	
	Input B	50MHz to 100MHz: 20mVrms 100MHz to 350MHz: 50mVrms 350MHz to 450MHz: 100mVrms 450MHz to 550MHz: 200mVrms	
VF-4310	Input A	less than 10kHz: 20mVrms (TYP.), 50mVrms (MAX) less than 80MHz: 10mVrms (TYP.), 25mVrms (MAX) less than 120MHz: 25mVrms (TYP.), 40mVrms (MAX)	
	Input B	less than 80MHz: 15mVrms (TYP.), 25mVrms (MAX) less than 700MHz: 10mVrms (TYP.), 15mVrms (MAX) less than 1GHz: 15mVrms (TYP.), 25mVrms (MAX) less than 1.3GHz: 25mVrms (TYP.), 40mVrms (MAX)	
INPUT IMPEDANCE			
VF-4301	Approx. 1MΩ//35pF		
VF-4305	Input A	Approx. 1MΩ//35pF	Input B: 50Ω
VF-4310	Input A	Approx. 1MΩ//40pF	Input B: 50Ω
INPUT COUPLING			
VF-4301	AC		
VF-4305	Input A	AC	Input B AC
VF-4310	Input A	AC/DC switchable	Input B AC
ATTENUATOR (Input A only)	VF-4301/VF-4305 1/1 and 1/10 switchable		
	VF-4310 1/1 and 1/20 switchable		
TRIGGER LEVEL (only VF-4310 Input A)	Continuous variable control from +2.5V to -2.5V		
LOW-PASS FILTER (Input A only)	100kHz (-3dB)		
MAX. INPUT VOLTAGE			
VF-4301	150mVrms max.		
VF-4305	Input A	150Vrms max.	
	Input B	5Vrms max. (sinewave)	
VF-4310	Input A	1/1	DC to 10kHz: 150Vrms max., 10kHz to 120MHz: 5Vrms max.
		1/20	DC to 30MHz: 300Vrms max., 30MHz to 120MHz: 100Vrms max.
	Input B	3Vrms max. (sinewave)	

RESOLUTION			
VF-4301	10MHz range:	0.1Hz with 10s gate time	
	100MHz range:	1Hz with 10s gate time	
VF-4305	10MHz range:	0.1Hz with 10s gate time	
	100MHz range:	1Hz with 10s gate time	
	550MHz range:	10Hz with 10s gate time	
VF-4310	1s gate time:	7 digits display	
	100ms gate time:	6 digits display	
	60ms gate time:	5 digits display	
	(1Hz range):	10nHz, 100MHz range: 1Hz to 10Hz	
TIME BASE			
Oscillation Frequency		10MHz	
Aging Rate		± 1ppm/month	
Temperature Stability	VF-4301/VF-4305	25°C ± 5°C: ± 5ppm 0°C ~ 40°C: ± 20ppm	
	VF-4310	25°C ± 5°C: ± 5ppm	
Line Variation (Specified only for VF-4310)		0.005ppm with ± 10% change	
ACCURACY		± (1Hz + 1count + time base error)	
COUNTING CAPACITY		8 digits decimal LED display	
GATE TIME	VF-4301/VF-4305	Switchable 0, 1s, 1s and 10s	
	VF-4310	Continuous variable control from 60ms to 10s	
PERIOD MEASUREMENT (only VF-4310 input A)		AC coupling: 8ns to 30ms DC coupling: 8ns to 100s	
RPM MEASUREMENT (only VF-4310 input A)		AC coupling: 1800rpm to 7200 × 10 ⁶ rpm DC coupling: 0, 6rpm to 7200 × 10 ⁶ rpm	
ENVIRONMENTAL CAPABILITY			
Temperature Operation Mode		0 to 40°C	
Temperature Rated Range of Use		15°C to 35°C	
Temperature Non-Operation Mode		-10°C to 70°C	
Operation Humidity		10% to 80%RH	
OTHERS			
Power Supply		AC100/120/220/240V ± 10% (switchable internal) 50/60Hz	
Power Consumption (at 100V operation)		VF-4301: Approx. 5.7VA VF-4305: Approx. 5.6VA VF-4310: Approx. 10.6VA	
Dimensions (except handle)		Approx. 230(W) × 95(H) × 280(D)mm, 9.1 × 3.7 × 11.0 ins.	
Weight		VF-4301/VF-4305: Approx. 1.7Kg, 3.7lbs. VF-4310: Approx. 2.1Kg, 4.6lbs.	
STANDARD ACCESSORIES			
Operation Manual		1	
Power Cord		1	
Test Leads		1 (2 for VF-4310)	
Fuse		1	

※1) The head of 3 digits are effectively for less than 10kHz

FUNCTION GENERATOR



- TTL pulse-waveform and CMOS outputs are provided, in addition to the normal sine wave, triangle wave, and square wave outputs, making a useful signal source for digital equipment as well.
- A built-in frequency counter provides not only digital readout of the output signal frequency, but also the ability to count external signals check the operation

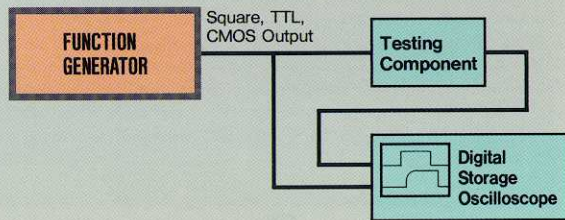
- of frequency-dividing circuits.
- The VG-4429 has a sweep function (switchable linear and log), making it ideal for use in frequency response measurements.
- The VG-4429 has an AM/FM modulated output, enabling use in receiver performance testing.

SPECIFICATIONS

MAIN OUTPUT	
Waveforms	Sine, Triangle, Square TTL Pulse, CMOS Output
Frequency Range	0.2Hz to 2MHz, 7 range *Effective variable frequency range is 0.2 to 2.0 times
Setting Error	± 5% + 1Hz (×0.2 and 2.0 position)
Amplitude	20Vp-p or more (open circuit) 10Vp-p or more (into 50Ω load)
Attenuation	-20dB ± 1dB (at 1kHz)
Output Impedance	50Ω ± 6% (except TTL pulse and CMOS output)
DC Offset Variable Range	+10V to -10V (open circuit) +5V to -5V (into 50Ω load)
Duty Control	1:1 to 10:1 continuous rating
SINEWAVE	
Distortion	1% or less for 0.2Hz to 200kHz at 100kHz range
Frequency Response	0.1dB or less for 0.2Hz to 100kHz 0.5dB or less for 100kHz to 2MHz
SQUAREWAVE	
Rise / Fall time	120ns or less
Symmetry	2% or less for 0.2Hz to 100kHz
TRIANGLE	
Linearity	98% or more for 0.2Hz to 100kHz 95% or more for 100kHz to 2MHz
TTL PULSE	
Rise / Fall Time	25ns or less
Level	3Vp-p or more
Fan-out	VG-4420: Max. 5 TTL inputs VG-4429: Max. 20 TTL inputs
CMOS OUTPUT	
Rise / Fall Time	120ns or less
Level	Adjustable 4V ± 1V to 14.5V ± 0.5V
V. C. F. (Voltage for Frequency Control)	
Input Voltage	Approx. 0 to 10V ± 1V input for 1000:1 frequency ratio
Input Impedance	10kΩ or more
FREQUENCY COUNTER	
Mode	Selectable Internal and External
Rnage	Internal: 0.2Hz to 2MHz External: 5Hz to 10MHz
Accuracy	± (time base accuracy + 1 count)
Time Base	± 10ppm (23°C ± 5°C) Oscillation Frequency: 10MHz
Display	VG-4420: 6 digit LED display VG-4429: 5 digit LED display
Resolution	0.1Hz, 1Hz, 10Hz, 100Hz
Sensitivity	VG-4420: 20mVrms or less VG-4429: 25mVrms or less
Input Impedance	VG-4420: Approx. 1MΩ // 600pF VG-4429: Approx. 1MΩ // 150pF

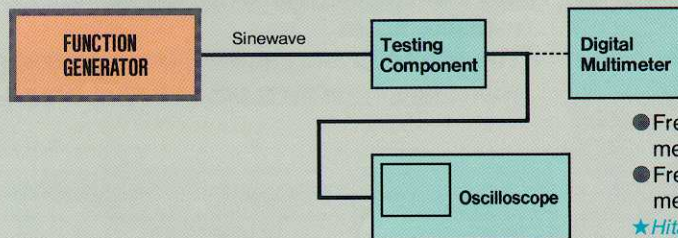
SWEEP OPERATION (VG-4429 only)	
Mode	Linear or logarithmic
Sweep Width	Adjustable 1:1 to 1000:1
Sweep Rate	Adjustable 0.5s to 30s
AM MODULATION (VG-4429 only)	
Modulation Depth	0 to 100%
Modulation Frequency	Internal: 400Hz External: DC to 1MHz
Carrier Bandwidth	100Hz to 2MHz (-3dB)
External Sensitivity	10Vp-p or less for 100% modulation
FM MODULATION (VG-4429 only)	
Deviation	0 to ± 5%
Modulation Frequency	Internal: 400Hz External: DC to 20kHz
External Sensitivity	10Vp-p or less for ± 10% modulation
ENVIRONMENTAL CAPABILITY	
Temperature	
Operation Mode	0 to 40°C
Reted Range of Use	18°C to 28°C
Non-Operation Mode	-10°C to 70°C
Operation Humidity	10% to 80%RH
OTHERS	
Power Supply	AC100/120/220/240V ± 10% (switchable internal) 50/60Hz
Power Consumption (at 100V operation)	VG-4420: Approx. 11.2VA VG-4429: Approx. 18.1VA
Dimensions	Approx. 230(W) × 95(H) × 280(D)mm, 9.1 × 3.7 × 11.0 ins.
Weight	VG-4420: Approx. 2.1kg, 4.6 lbs. VG-4429: Approx. 2.2kg, 4.9 lbs.
STANDARD ACCESSORIES	
Operation Manual	1
Test Leads	2
Power Cord	1
Fuse	1

● Digital Component Test



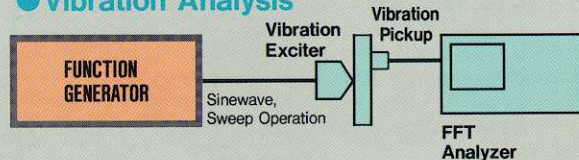
- Delay Time Measurement
 - Pulse Response Measurement
 - Rise/Fall Time Measurement
 - Setup Time Measurement
 - Hold Time Measurement
- ★ Hitachi function generators have TTL/CMOS outputs, enabling easy testing of digital ICs.

● Analog Component Frequency Response Measurement



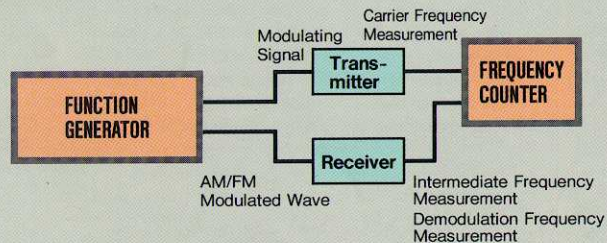
- Frequency Response Measurement for Amplifier and Attenuator
 - Frequency Response Measurement for Filters
- ★ Hitachi function generators have a built-in frequency counter for frequency readings at a glance, thereby greatly simplifying measurements.

● Vibration Analysis



- Frequency of Normal Mode of Vibration Measurement
 - Vibration Transfer Characteristic Measurement
 - Data Acquisition for Modal Analysis
- ★ The VF-4429 function generator from Hitachi has a sweep output, ideal for use as a vibration stimulus signal source.

● Radio Communication Equipments Test



- ★ The VF-4429 function generator from Hitachi has AM/FM modulated output, enabling testing of communications equipment.
- ★ Hitachi frequency counters are available in versions that count up to 120 MHz, 550MHz, and 1.3GHz, enabling use in a wide range of applications.



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