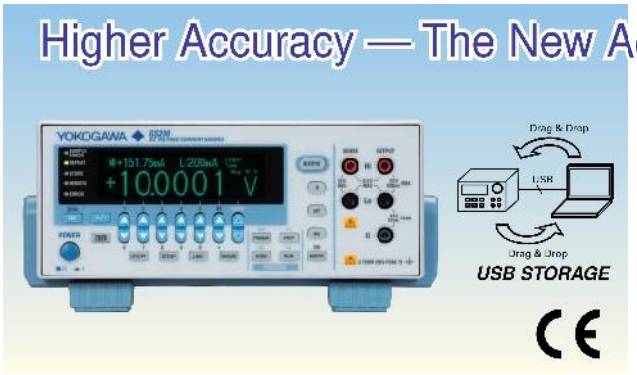
Generators, Sources

DC Voltage/ Current Source **GS200**

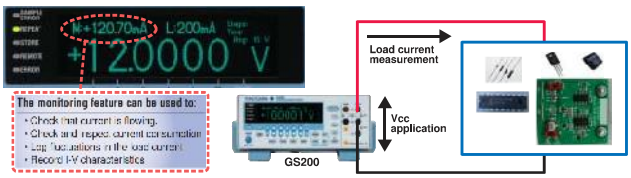
Higher Accuracy — The New Advanced DC Voltage/Current



Functions

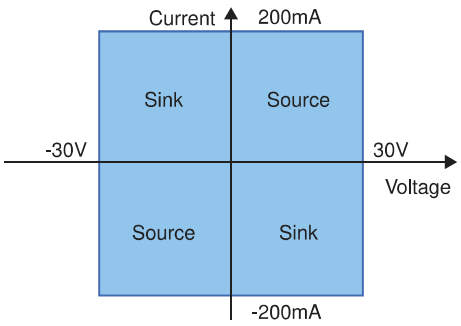
The GS200 generates high accuracy, high stability, high resolution, and extremely low-noise DC voltage and current signals that are required for many applications.

•V oltage source up to ±32 V and current source up to ±200 mA
•5 1/2-digit, ±120,000-count output resolution
•V oltage and current simple monitoring feature (optional)
• Programmable output up to 10,000 points
• Built-in USB mass storage device
• Channel expansion through synchronous operation



Voltage and Current Source Range

The GS200 can perform four-quadrant operation by operating as a current source or a current sink in the range of ±30 V and ±200 mA. When the GS200 is sinking current, it can operate over the exact same range as when it is operating as a current source. You can use the GS200 not just as a highly accurate voltage source but also as a highly accurate constant-current electronic load.



Functions and Specifications

■ Source

•Voltage source

Range	:	10 mV, 100 mV, 1 V, 10 V, 30 V (Use a highly accurate voltage divider at 10 mV and 100 mV ranges)
Maximum output	:	±200 mA (at 1 V, 10 V, and 30 V ranges)

•Current source

Range	:	1 mA, 10 mA, 100 mA, 200 mA
Maximum output	:	±30 V

■ Monitoring (option)

Function	:	Voltage (during current generation), Current (during voltage generation)
Integration time	:	1 to 25 PLC (Power Line Cycle)
Trigger source	:	Internal timer (0.1 s resolution), READY, Communication and Immediate
Delay	:	0 to 999,999 ms (1 ms resolution)
Maximum storage	:	10,000 points

■ External Input and Output

Input signal	:	TRIG IN, OUTPUT IN
Output signal	:	TRIG OUT, OUTPUT OUT, READY OUT
Connector	:	BNC connector (Select any one of the signals for both the input and output)
Input and output level	:	TTL
Minimum pulse width	:	10 µs

■ Interface

•GP-IB interface
•USB interface
•Ethernet interface (option) 100BASE-TX/10BASE-T

■ General Specifications

•Display	:	256 × 64 dot vacuum fluorescent display
•External dimensions	:	Approx. 213 (W) × 88 (H) × 350 (D) mm (excluding protrusions)
•Weight	:	Approx. 5 kg

GS200 Model and Suffix Codes

Model	Suffix Code	Description
GS210		DC voltage/current source (front panel output terminals)
GS211		DC voltage/current source (rear panel output terminals)
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
Options	/MON	Monitoring function
	/C10	Ethernet interface function

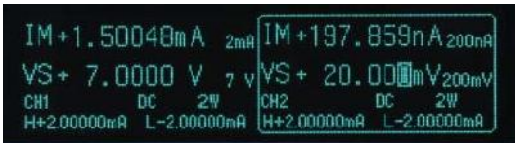
Multi Channel Source Measure Unit **GS820**

Highly Accurate 2-Channel Voltage/Current Source Measure Unit

Features

The GS820 is a highly accurate and highly functional 2-channel programmable DC voltage/current source that incorporates voltage/current generation and measurement functions.

- Isolated 2-channel source and measurement function
- Source and measurement ranges: 7 V and 3.2 A or 18 V and 1.2 A
- Minute current ranges with 200-nA or 1-pA resolution
- Generate arbitrary waveforms consisting of up to 100,000 points at 100-µs intervals
- Channel expansion through master-slave synchronization link
- F ast test speeds
- 16-bit digital I/O (model 765602)

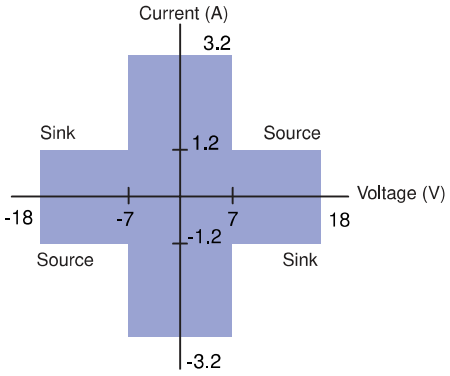


2-channel display example (256 x 64 dot matrix display)

Source and Measurement Range

Four-quadrant operation consisting of source operation (current source) and sink operation (current sink) is available with ranges up to 7 V and 3.2 A or 18 V and 1.2 A.

The output and measurement resolutions are 5.5 digits.



Functions

Source

Function:	Voltage or current
Mode:	DC or pulse (pulse width: 50 µs to 3,600 s)
Sweep mode:	Linear, logarithmic or program (up to 100,000 steps)
Trigger source:	External or internal timers 1 and 2 (period: 100 µs to 3,600 s)
Sweep start source:	External or internal timers 1 and 2 (period: 100 µs to 3,600 s)
Source delay:	15 µ to 3,600 s
Response characteristics:	Normal or stable

Measurement

Function:	Voltage, current, auto, voltmeter mode, ammeter mode or resistance meter mode
Integration time:	0.001 to 25 PLC (Power Line Cycle)
Trigger source:	External or internal timers 1 and 2 (period: 100 µs to 3,600 s)
Measure delay:	0 µs to 3,600 s
Measurement data storage:	Up to 100,000 data points
Average:	Moving average (average count: 2 to 256)
Voltage sense:	Two-wire system or four-wire system
Auto zero:	Measure the internal zero reference every measurement and correct the measured value
NULL computation:	Computes the difference with respect to the current measuredvalue or user-defined value
User-defined computation:	Computes user-defined equations in real-time
Operators:	+[addition], -[subtraction], *[multiplication], /[division], ^ [exponentiation], % [mod], | [logic OR], & [logic AND], ! [negation], < <= > >= == != [comparison], = [substitution],
Functions:	ABS() [absolute value], SQRT() [square root], LN(), LOG() [logarithm], SIN(), COS(), TAN() [trigonometric functions], ASIN(), ACOS(), ATAN() [inverse trigonometric functions], SINH(), COSH(), TANH() [hyperbolic functions], RAND() (random number generation), EDGE() [logic change extraction], TRUNC(), FLOOR() [rounding to an integer], ISINF() [infinity judgment], ISNAN [not-a-number judgment]
Conditional statement:	IF-THEN-ELSE

Communication Interface

GPIB

Electrical and mechanical specifications:	Conforms to IEEE St'd 488-1978
Functional specifications:	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Protocol:	Conforms to IEEE St'd 488.2-1992
Address:	0 to 30

RS232

Electrical specifications:	Conforms to EIA RS232
Connection format:	Point-to-point
Transmission mode:	Full-duplex
Synchronization mode:	Start-stop synchronization
Baud rate:	9600, 14400, 19200, 38400, 57600, 115200 bps

USB

Number of ports:	1
Connector type:	Type B connector (receptacle)
Electrical and mechanical specifications:	Conforms to USB Rev. 2.0
Protocol:	Mass storage class, USB-TMC

Ethernet

Number of Ethernet ports:	1
Connector type:	RJ-45 connector
Electrical and mechanical specifications:	Conforms to IEEE 802.3
Transmission system:	100BASE-TX/10BASE-T
Data rate:	100 Mbps or 10 Mbps
Protocol:	VXI-11 server, HTTP server, FTP server, DHCP client, and command socket

Model and Suffix code

Model	Suffix Code	Notes
765601		GS820 Multi Channel Source Measure Unit Standard Model
765602		GS820 Multi Channel Source Measure Unit Digital I/O Installed Model
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard

Generators, Sources

Source Measure Unit **GS610**

Combines High Accuracy and High Speed in a Single Unit

Features

The GS610 is a highly accurate and highly functional programmable voltage/current source that incorporates voltage/current generation and measurement functions. The maximum output voltage and current are 110 V and 3.2 A, respectively. Evaluation of over a wide range of basic electrical characteristics is possible, because the GS610 can operate as a current source or a current sink.

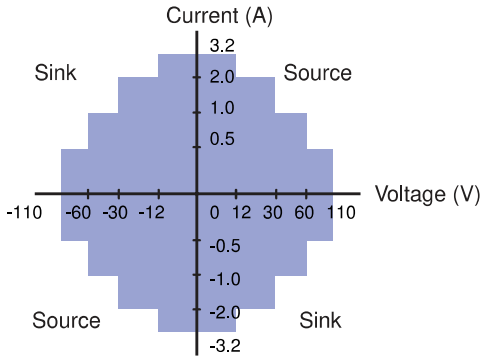
- Source and sink operation up to 110 V/3.2 A (four-quadrant operation)
- Basic accuracy: ±0.02% *1
- Sweep output at up to 100 µs intervals
- Comes with abundant sweep patterns (linear, logarithmic, and arbitrary)
- Stores up to 65,535 points of source measure data in the internal memory
- Easy file operation with the USB storage function
- Remote control and FTP using Web server function (Optional)

*1: DC voltage generation

Voltage/Current Generation and Measurement Range

Four-dimensional operation with source operation (current source) and sink operation (current sink) is possible at up to 110 V, 3.2 A, and 60 W. The output and measurement resolutions are 5.5 digits.

Voltage generation/measurement range: 200mV to 110 V
Current generation/measurement range: 20 µA to 3.2 A
Maximum output current:
±3.2 A (at an output voltage of ±12 V or less)
±2 A (at an output voltage of ±30 V or less)
±1 A (at an output voltage of ±60 V or less)
±0.5 A (at an output voltage of ±110 V or less)



Functions

■ Function

•Generation
Generation function : Voltage or current
Generation mode : DC or pulse
Sweep mode : Linear, logarithmic or program (up to 65,535 steps)

•Measurement
Measurement function : DC voltage, DC current and resistance
Measurement data storage : Up to 65,535 data points
Average : Block average or moving average (Specified count: 2 to 256)

•Trigger
Trigger mode : Internal, external and immediate

•Time setting
Pulse width : 100 µs to 3,600 s, 1 µs resolution
Period time : 1 ms to 3,600 s, 1 µs resolution (during source and measure operation)
100 µs to 3,600 s, 1 µs resolution (during source-only operation)
Source delay : 1 µs to 3,600 s, 1 µs resolution
Measurement delay : 1 µs to 3,600 s, 1µs resolution
Integration time : 250 µs, 1 ms, 4 ms, 16.6 ms/20 ms,100 ms, 200 ms
(auto detect from the power supply frequency when the power is turned ON for 16.6 ms/20 ms)

•Computation function
Operators: +[addition], -[subtraction], *[multiplication], /[division] and ^ [exponentiation]
Functions: ABS(), EXP(), LN(), LOG(), SQRT(), SIN(), COS(), TAN(), ASIN(), ACOS(), ATAN(), SINH(), COSH(), TANH(), RAND()

■ External Input/Output

•Synchronization signal input/output (TRIG, SWEEP, CTRL IN and OUT) (BNC)
•External input/output (D-Sub 15-pin)
•GP-IB interface
•RS-232 interface
•USB interface
•Ethernet interface (option) 100BASE-TX/10BASE-T

■ Internal memory

ROM : 4 MB Area for storing setup and output pattern files
RAM : 4 MB Area for storing the measured results (cleared when the power is turned OFF)

■ Display : 256 × 64 dot vacuum fluorescent display

■ External dimensions : Approx. 213 (W) × 132 (H) × 400 (D) mm (excluding protrusions)

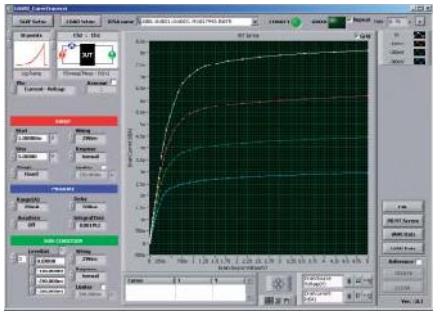
■ Weight : Approx. 7 kg

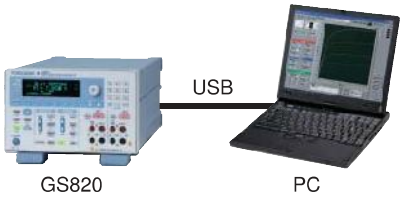
Model and Suffix code

Model	Suffix Codes	Description
765501		GS610 Source Measure Unit
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
Option	/C10	Ethernet interface

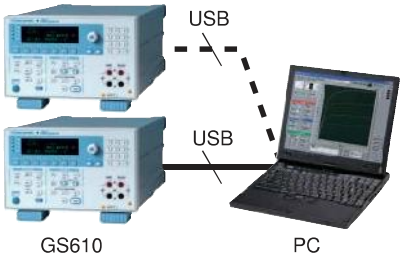
GS Series Accessory Software

765670 Curve Tracer Software for the GS series





System configuration illustration



Product Overview

This product is a high-speed, high-accuracy real-time I-V curve tracer that consists of the GS series Source Measure Unit and the 765670 Curve Tracer Software. It is particularly well-suited to DC parametric tests of minute signals.

Features

■ Simple system configuration, easy connection, compact and light

This system is configured by connecting the GS series Source Measure Unit to a PC that contains the 765670 Curve Tracer Software via USB.
You can perform high speed, high-accuracy curve tracing despite its compact size, light weight, and simple system configuration.

■ Real-time, High-Speed Drawing

The GS series is high-speed communication and sweep features allow high-speed graph update rate up to 25 pages/s(GS820).
You can use the real-time curve tracer with comfort.

■ Field of Applications

- Discrete semiconductors such as transistors and diodes
- Analog ICs such as voltage regulators and op- amps
- MOS logic and other digital ICs
- LEDs and other optical devices
- Solar battery cells

Drawing Speed (times/s; reference values)

Plot Points	Model Number	
	GS610	GS820
20	20	25
50	10	16
100	5	11
200	3	6

Measurement conditions: Using Core2Duo CPU, 1.5 GHz, USB 2.0, and LabVIEW
Measurement integration time: 0.001 PLC for GS820 / 250 µs for GS610

http://tmi.yokogawa.com/products/generators-sources/source-measure-units/765670-curve-tracer-software/

Specifications

- Graph drawing:
  Voltage vs. current, voltage vs. voltage, gain vs. voltage, voltage vs. timestamp, current vs. voltage, current vs. current, gain vs. current, current vs. timestamp

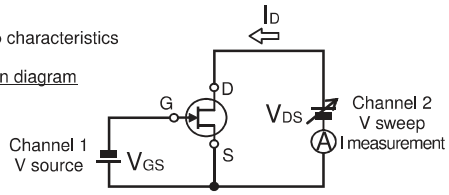
Sweep axis:	Voltage source or current source
Measurement axis:	Voltage measurement or current measurement
Parameter:	Voltage source or current source
Sweep shape:	Ramp (linear or log), triangle (linear or log), rectangle
Sweep points:	5, 10, 20, 50, 100, 200, 1000
Scaling:	Auto scale or fixed scale
Averaging count:	2 to 100

- Analysis feature:
  Cursor, zoom & scroll, reference curve designation
- File operations:
  CSV data storage and loading, graphic image storage, panel image storage, setup storage and recall

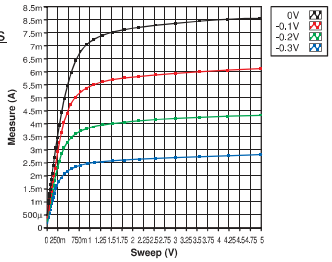
Examples of Measurements of Characteristics

● FET V_{DS}-I_D characteristics

Connection diagram



Measurement results



AC Voltage Current Standard **2558A**

AC Standard Source with Improved Performance and Usability

Features

The wide output ranges of 1.00mV to 1200.0 V AC and 1.00 mA to 60.00 A AC mean that the 2558A is the instrument of choice for the cost effective calibration of AC analog meters.

- Wide output range — AC voltage : 1.00 mV to 1200.0V; AC current : 1.00 mA to 60.00 V
- High accuracy — AC voltage : 0.04%; AC current : 0.05%
- High output stability : ±50 ppm/h
- Wide frequency range Accuracy : ±50 ppm
- Intuitive operation with dials for setting each digit
- Sweep function : 16/32/64 sec. (selectable)
- Output divider function (Divided output of the main setting)
- Direct readout of the deviation (Displays the deviation from the main setting)

Functions and Specification

Output

Range	Output Range	Guaranteed Accuracy Range
100 mV	0 to 144.00 mV	1 to 120.00 mV
1 V	0 to 1.4400 V	0.01 to 1.2000 V
10 V	0 to 14.400 V	0.1 to 12.000 V
100 V	0 to 144.00 V	1 to 120.00 V
300 V	0 to 432.0 V	3 to 360.0 V
1000 V	0 to 1440.0 V	10 to 1200.0 V
100 mA	0 to 144.00 mA	1 to 120.00 mA
1 A	0 to 1.4400 A	0.01 to 1.2000 A
10 A	0 to 14.400 A	0.1 to 12.000 A
50 A	0 to 72.00 A	0.5 to 60.00 A

Accuracy (180 days)

1 to 10% output of range ±(% of range)

Voltage	50/60 Hz	: 0.013
	40 to 400 Hz	: 0.015
	400 to 1000 Hz	: 0.030
Current	50/60 Hz	: 0.014
	40 to 400 Hz	: 0.016
	400 to 1000 Hz	: 0.032

10 to 120% output of range ±(% of setting + % of range)

Voltage	50/60 Hz	: 0.03 + 0.01
	40 to 40 0Hz	: 0.05 + 0.01
	400 to 1000 Hz	: 0.10 + 0.02
Current	50/60 Hz	: 0.04 + 0.01
	40 to 400 Hz	: 0.06 + 0.01
	400 to 1000 Hz	: 0.12 + 0.02

Functions and Specifications

Stability : ±(20 ppm of setting + 30 ppm of range)/h

Distortion factor — Voltage : 0.07% or less; Current : 0.18% or less

Frequency range

- Internal : 50 / 60 / 400 Hz / VAR
  VAR: 40 to 1000 Hz (0.001 Hz resolution)
- External : EXT1/EXT2
  (Use the terminals for synchronized operations)
- FREQUENCY METER : MIN/MAX
  20 to 1000 Hz (0.001 Hz resolution)
  Sweep, output divider and deviation functions are used for the frequency.

Sweep — Target : Voltage / Current / Frequency; Speed : Approx. 16/32/64 sec. selectable

Output divider — Target : Voltage / Current / Frequency; Denominator range : m4 to 15; Numerator range : n0 to 15 (n ≤ m)

Deviation — Target : Voltage / Current / Frequency; Variable range: ±20.00%; Operation : Two dials
Resolution of the first dial: 0.2% of the main setting
Resolution of the second dial: 0.01% of the main setting
Deviation preset: OFF / 0 / 2% / 5%

Output terminal

Type — Voltage : Plug-in terminal (safety terminal); Current : Binding post
Selectable LO terminal to earth or floating
Max. floating voltage to earth: 12 Vpk

Interface : USB interface (for PC connection)
: Ethernet
: GP-IB interface (optional)

Warm-up time : Approx. 30 minutes

Operating environment — Temperature : 5 to 40ºC; Humidity: 20 to 80%RH (no condensation)

Rated power supply voltage : 100 to 120 VAC / 200 to 240 VAC

Rated power supply frequency : 50/60 Hz

Max. power consumption : 200 VA

Weight : Approx. 20 kg

Dimensions : 426(W) x 132(H) x 400(D) mm

2558A Model and Suffix Codes

Model	Suffix Code	Description
2558A		AC Voltage Current Standard
Power cord	-D	UL/CSA standard, PSE
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
	-N	NBR standard
Option	/C1	GP-IB interface

Digital Multimeters 7561/7562

6.5 Digits Digital Multimeter

7561/7562

Digital Multimeters

- High accuracy (DC voltage-based accuracy) ±0.0045% of reading ± 15 digits
- Fast sampling at 333 times/s
- Large capacity buffer memory: up to 8000 data items IC memory card usable
- GP-IB interface (standard)

7561/7562 Specifications

- DC voltage (DCV)
  Range: 200 mV to 1000 V
- DC current (DCA)
  Range: 2 mA to 2000 mA
- A C voltage (ACV)(7562 only)
  Range: 200 mV to 700 V
- A C current (ACA)(7562 only)
  Range: 2 mA to 2000 mA
- Resistance measurement (OHM, 2 W/4 W)
  Range: 200 Ω to 200 MΩ
- Maximum indication: 1999999
- External dimensions:
  approx. 213 (W) × 88 (H) × 330 (D) mm
- Weight: approx. 3 kg

Digital Resistance Meter 7556

High-Speed Digital Resistance Meter for Production Line of Fixed Chip Resistors

The 7556 is designed to be mounted on a taping machine.
* When you use the 7556 for any purpose other than a production line, you need to be careful. Please read the specifications carefully.

7556

- High-speed measurement (2.8 ms)
- High accuracy: ±(0.006% of reading + 3 digits)
- High resolution: 5.5 digits
- Wide range: 1 Ω range to 100 MΩ range
- Full remote control through serial (RS-232) or GP-IB interface
- Software-based calibration function
- Advanced contact check function

7556 Specifications

Range: 1 Ω, 10 Ω, 100 Ω, 1 kΩ, 10 kΩ, 100 kΩ,
1 MΩ, 10 MΩ, 100 MΩ
Resolution: Deviation display
755601: -99.99% to 19.99% or -99.9% to 199.9% (selectable)
755611: -99.999% to 19.999% or -99.99 to 199.99% (selectable)
Absolute value display
755601: 100 μΩ (at 1 Ω range)
755611: 10 μΩ (at 1 Ω range)
Measurement time:
Normal mode: 60 Hz power supply: 19.9 ms
50 Hz power supply: 23.2 ms
Fast mode: 5.7 ms
High-speed mode: 2.8 ms
Accuracy (at 1 kΩ range, 23±5°C in normal mode)
755601: ±(0.015% of reading + 1 digit)
755611: ±(0.006% of reading + 3 digits)
Contact check function
Check level: 1 Ω to 30 Ω (Selectable)
Execute checks before or after measurement (selectable)
Check current: 50 mA
Contact check error message with display panel and handler interface
Measured current abnormality detection function (Detect measured current abnormality caused by a contact error)
Comparator function (both Hi and Lo)
Deviation setting range
755601: -9.99% to 9.99% or -99.9% to 99.9% (selectable)
755611: -9.999% to 9.999% or -99.99% to 99.99% (selectable)
Absolute value setting range
755601: 0.0000 Ω to 1.2000 Ω
755611: 0.00000 Ω to 1.20000 Ω

Temperature Measuring Instrument 7563

Precision Digital Thermometer

7563

Digital Thermometer, 6.5 Digits

- Thermometer has a 6.5-digits display
  Twelve types of TC's and four types of RTD's
- Basic accuracy in temperature measurement: 0.006% (TC)
- Basic accuracy in DCV measurement: 0.0045% (2000 mV range)
- Basic accuracy in resistance measurement: 0.006% (2000 Ω range)
- Number of sampling times: up to 100 times/s (4.5 digits)

7563 Specifications

Maximum display: ±1999999

Resolution:	Voltage	100 nV
	Resistance	100 μΩ
	Thermocouple	0.1°C
	RTD	0.01°C

Reference junction compensation accuracy: ±0.2°C
Various computation functions
Software calibration function
Memory function
- Internal memory up to 1000 data items
- IC memory up to 8000 data items

Communication function: GP-IB
Analog output (optional): code /DA specified
Power consumption: 20 VA
External dimensions: 213 (W) × 88 (H) × 350 (D) mm
Weight: approx. 3 kg

Arbitrary/Function Generator **FG400 Series**

Easily Generate Basic, Application Specific and Arbitrary Waveform

FG400

Features

The FG400 Arbitrary/Function Generator provides a wide variety of waveforms as standard and generates signals simply and easily. There are one channel (FG410) and two channel (FG420) models. As the output channels are isolated, an FG400 can also be used in the development of floating circuits. (up to 42 V)

- 0.01 µHz to 30 MHz output (sine wave)
- 20 Vp-p output/open, 10 Vp-p output/50
- Arbitrary waveform generation function
- 3.5-inch color display
- Up to 6 units (12 channels) can be synchronized.
- A variety of sweeps, modulations and functions
- Parameter-variable waveforms

Functions and Specifications

• Number of channels	FG410: 1 channel FG420: 2 channels
• Output waveforms	Sine, square, pulse, ramp, DC, parameter-variable waveform (25 types), noise (Gaussian distribution), arbitrary waveform
• Oscillation modes	Continuous, modulation, sweep, burst, sequence
• Frequency	Sine 0.01 µHz to 30 MHz Square/pulse 0.01 µHz to 15 MHz Ramp/parameter-variable waveform 0.01 µHz to 5 MHz
• Arbitrary waveform	Waveform length 4 K to 512 K words or 2 to 10,000 control points
• Modulation type	FM, FSK, PM, PSK, AM, DC offset, PWM
• Sweep type	Frequency, phase, amplitude, DC offset, duty
• Synchronization of multiple units	Sync operation is possible. Up to 6 units can be connected with BNC cables in the form of master/slave connections, using the frequency reference output and external 10 MHz frequency reference input.
• Power supply	AC 100 V to 230 V ± 10% (250 V max.) 50 Hz/60 Hz ± 2 Hz
• Power consumption	FG410 50 VA or less FG420 75 VA or less
• Weight	Approx. 2.1 kg
• Dimensions	216 (W) × 88 (H) × 332 (D) mm

FG410/FG420 Models and Suffix Codes

Model	Suffix code	Description
FG410		Arbitrary /Function Generator, 1-Channel Model
FG420		Arbitrary /Function Generator. 2-Channel Model
Power cord	-D	UL/CSA standard, PSE
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard
	-N	NBR standard

Related Software

XviewerLITE

This software allows you to display the waveforms and measurement results on a PC for the data measured with Yokogawa's DLM/DL/SL series. It allows you to clip part of a waveform and generate an arbitrary waveform with the FG400.

Arbitrary Waveform Editor

This software supports the arbitrary waveform function of the FG400. It allows you to edit waveforms and transfer data to the FG400. It also makes it easy to work on a pre-installed waveform to generate an arbitrary waveform.

Sequence Editor

This software supports the sequence function of the FG400 that outputs different waveforms sequentially. It controls the edit, transfer, and execution of sequence data. Complex programs can also be created easily.

Pressure Standard MC100

Pneumatic Pressure Standard

MC100

Pneumatic Pressure Standard

- High accuracy: ±0.05% of full scale
- Output ranges and resolution
  0 to 200 kPa (resolution 0.01 kPa)
  0 to 25 kPa (resolution 0.001 kPa)
- Functions useful for instrument calibration
  Divider output, auto-step output, and sweep output
- Excellent temperature coefficient
  Zero point: ±0.003% of full scale/°C
  Span: ±0.002% of full scale/°C

MC100 Series Specifications

- Supply pressure
  0 to 200 kPa range model:
  280 kPa ±20 kPa
  0 to 25 kPa range model: 50 kPa ±10 kPa
- Accuracy
  ±0.05% of full scale (at 23°C ±3°C)
- Output noise: ±0.02% of full scale
- Effect of mounting orientation
  Forward/backward incline of 90°
  0 to 200 kPa range model: ±0.01% of full scale
  0 to 25 kPa range model: ±0.1% of full scale
  Sideways incline of 30°
  0 to 200 kPa range model: ±0.2% of full scale
  0 to 25 kPa range model: ±2.5% of full scale
- Pressure display units (selectable):
  kPa, kgf/cm^2, mmH$_2$O, mmHg
  kPa, psi, inH$_2$O, inHg
- External dimensions:
  213 (W) × 132 (H) × 400 (D) mm
- Weight: approx. 9.5 kg

Manometers MT210/MT210F/MT220/MT10

Precision Digital Manometer

MT210

Digital Manometer

- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range gauge model)
- A wide range pressures, from a low differential pressure of 1 kPa to a high gauge pressure of 3000 kPa, and absolute pressure of 130 kPa
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210 Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Measuring range (differential pressure)
  0 to 1 kPa, 10 kPa, 130 kPa and 700 kPa
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Resolution
  0 to 1 kPa range model: 0.00001 kPa
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH$_2$O, inHg, kPa, kgf/cm^2, mmH$_2$O, mmHg
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 6.5 kg (0 to 130 kPa range model)

Fast Response Digital Manometer

MT210F

Digital Manometer

- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range gauge model)
- Select from three measurement modes: normal speed, medium speed, and high speed
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210F Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Response time (0 to 130 kPa range model, at high speed mode)
  50 msec max.
- Readout update interval (at medium and high speed mode)
  100 msec
- Resolution
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH$_2$O, inHg, kPa, kgf/cm^2, mmH$_2$O, mmHg
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 6.5 kg (0 to 130 kPa range model)

Digital Manometer For Efficient Field Calibration

MT220

Digital Manometer

- The de facto standard of field celibrators for pressure and ditferential pressure transmitters
- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range gauge model)
- DCV/DCA measurement function (DMM function)
- 24 VDC power supply for driving the transmitter
- % display, error display, and measured data memory
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT220 Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Resolution
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH$_2$O, inHg, kPa, kgf/cm^2, mmH$_2$O, mmHg
- Measurement range of DCV/DCA measurement function
  0 to ±5.25 V
  0 to ±21 mA
- Accuracy of DCV/DCA measurement function (6 months after calibration)
  ±(0.05% of reading + 3 digits)
- 24 VDC output
  24 ± 1 VDC, 30 mA max.
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 7.0 kg (0 to 130 kPa range model)

Handheld Digital Manometer

MT10

Mini-Manometer

- Compact and lightweight (approx. 700 g), battery-operated
- High reliability (silicon resonant sensor adopted)
- Accuracy: ±(0.04% of rdg + 0.03% of FS) for 130 kPa model
- Three models for 130 kPa, 700 kPa, and 3000 kPa (gauge pressure)
- Data hold function
- RS-232-C interface
- Comes with carrying case

MT10 Series Specifications

- Type of pressure: gauge
- Three measuring ranges
  0 to 130 kPa, 0 to 700 kPa, and 0 to 3000 kPa
- Measurement display range:
  -2.5 to 110% of FS
- Accuracy:
  0 to 130 kPa range model
  ±(0.04% of rdg + 0.03% of FS)
  0 to 700 kPa and 0 to 3000 kPa range models
  ±0.1% of FS
- Resolution
  0 to 130 kPa range model: 0.01 kPa
  0 to 700 kPa range model: 0.1 kPa
  0 to 3000 kPa range model: 1 kPa
- Maximum allowable input
  0 to 130 kPa range model: 500 kPa
  0 to 700 kPa range model: 1000 kPa
  0 to 3000 kPa range model: 4500 kPa
- Effect of temperature
  Zero: ±0.02% of FS/10°C or less
  Span: ±0.02% of FS/10°C or less
- Pressure display units (specified at shipment)
  kPa, kgf/cm^2, mmH^{2}O, mmHg, Psi, inH^{2}O, inHg
- External dimensions:
  Approx. 72 (W) × 174 (H) × 60 (D) mm (excluding input connections)
- Weight: Approx. 700 g (including battery)