

F2251 VOLTAGE AND CURRENT SOURCES

Source 1	Source 2
Voltage Power	Current Ranges
50/60/Hz & DC	(Resolution)

Source 1 AC Voltage

Continuous Power ..150 VA-rms 75, 150, 300 V-rms (0.01V)

Source 1 DC Voltage

Continuous Power ..150 watts 106, 212, 424 V-dc (0.01V)

Source 2 AC Current

1.5 second Transient 225 VA-rms 15, 30, 60 A- rms (0.01A)

Continuous Power ..150 VA-rms 7.5, 15, 30 A-rms (0.001A)

Source 2 DC Current

1.5 second Transient 225 watts 15, 30, 60 A-d.c. (0.01A)

Continuous Power ..150 watts 5, 10, 20 A-d.c. (0.001A)

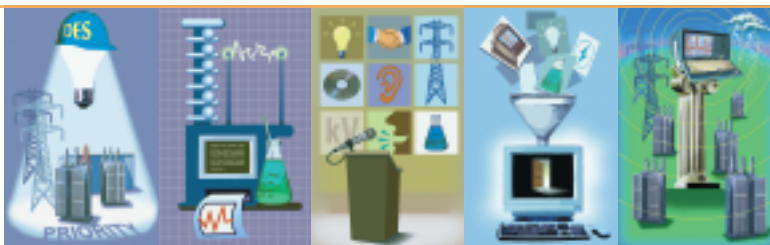


Doble is certified ISO 9001:2000



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The World Leader in Diagnostic Test Instruments and Knowledge Services for Electric Power



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Specifications are subject to change without notice.

MKT-SL-F2250TS-03/05

F2250 Power System Simulators Technical Specifications



Improves the
productivity
of your
protection
maintenance
systems



GENERAL SPECIFICATIONS

Source Operation:

Accuracy specifications include all errors contributed by variations in power line voltage, load regulation, stability, and temperature, up to full output power. Stable source operation in four quadrants: load power factor from 1 to 0, leading or lagging. The F2250 Family is supplied with Certificate of Calibration traceable to the National Institute of Standards and Technology.

Source Power:

May be lower than the maximum rating at frequencies other than 50/60Hz or DC.

Electrostatic Discharge Immunity:

IEC 801-2: I.E.C. performance level 1 @ 10KV: normal performance within specifications. I.E.C. performance level 2 @ 20KV: no permanent damage.

Surge Withstand Capability:

ANSI/IEEE C37.90. The F2250 functions as a source during surge withstand capability tests, when the specified isolating circuit is interposed between the F2250 and the test relay.

AC Amplitude Accuracy:

From 20° to 30° C, $\pm 0.4\%$ of reading maximum at 50/60 Hz
From 0° to 50° C, $\pm 0.5\%$ of reading absolute maximum
Typically 0.2% of reading

Distortion:

Low distortion sine waves; total harmonic distortion: 0.2% typical; 2% maximum at 50/60 Hz

Noise:

-80 dB of range

Phase Angle:

Range: 0 to + 359.9° (Lead) / 0 to -359.9° (Lag)
Accuracy: $\pm 0.25^\circ$ at 50/60 Hz
Resolution: $\pm 0.1^\circ$ at 50/60 Hz

Frequency:

Range: dc; ac from 0.1 Hz to 10 kHz

Base Frequency: 50 or 60 Hz; crystal, line, or satellite synchronized

Manual Ranges: 2nd through 20th harmonic at harmonic intervals and 100th harmonic

F2010 Minicontroller/Automation Ranges and Resolutions:

Range: 0.1 to 9999.9 Hz

Range is dependent on the frequency selection on the simulator. When the frequency selection on the simulator is 60 (50)Hz, range is 0.1Hz to 99.999 Hz with 0.001 Hz resolution. When a higher level of harmonic is selected on the simulator, then the range is the base range (0.1 - 99.999 Hz) multiplied by the selected level of harmonic, and the resolution is equal to the order of the harmonic times (0.001 Hz).

Example 1: If the base frequency selection is 120 (or 100) Hz, which is the second harmonic, then the range is 0.2 Hz to 199.99 Hz with a resolution of 0.002 Hz.

General Specifications — continued

Example 2: If the base frequency selection is 300 (or 250) Hz, which is the fifth harmonic, then the range is 0.5 to 499.99 Hz with a resolution of 0.005Hz.

RAMP/Set:

Ramp: Continuously increments/decrements voltage, current, and phase angle at different ramp rates. Insures smooth, linear changes in value carried to next significant digit, by changing the least significant digit.

Ramp Rates: » Least Significant Digits per Second (L.S.D./s).

Amplitude: 1,5,10, 100 and 1000 L.S.D./s

Phase Angle: 1,2,5, 360 L.S.D./s.

SET: Individually sets each digit, with next significant digit carry over.

Logic Outputs:

Two sets of galvanically isolated Logic Outputs, each set has a normally open (Form A) terminal, shared common terminal, and a normally closed (Form B) terminal.

Switching Power: 10 watts maximum

Input Voltage: 300 V dc and (or) ac peak maximum

Switching Current: 0.2 A make or break maximum

Carry Current: 0.3 A maximum

Operate Time: 1 millisecond maximum

Logic/Signal Inputs:

Two sets of galvanically isolated Logic/Signal Inputs, each set has a voltage sensing terminal for ac or dc voltage, a shared common terminal, and a dry contact sensing terminal.

Contact Sense Mode, for dry contacts:

Open Circuit Test Voltage: 30 volts nominal

Short Circuit Test Current: 90 mA nominal

Threshold: 460 ohms nominal

Voltage Sense Mode, for ac and dc voltages:

Input Voltage: 420 volts dc and (or) peak ac maximum

Input Impedance: 100K ohms nominal

Threshold: 1.5 volts nominal

Multi-Mode Digital Timer:

Accuracy: $\pm 0.0005\%$ of reading, \pm one least significant digit, ± 50 microSeconds.

Resolution: 10 microSeconds. (1 least significant digit).

Ranges: 0 - 9999.99 milliseconds; resolution: 10 microSeconds

0 - 999999 seconds; resolution: 1 second

0 - 999999 cycles; resolution: 1 cycle

GPS time of day may be displayed when using the F2895 GPS Option

Line Power Supply:

105 - 132 V or 210 - 264 V (field selectable) at 47-63 Hz

Operating Temperature:

0° to 50° C:

Storage Temperature:

-25° to +70° C

Humidity:

Up to 95% relative humidity, non-condensing.

Displays:

0.3" High Intensity filtered LED

Interfaces:

RS232 remote control to PC

IEEE 488 instrument inter-communications network

D232 for F2010 Minicontroller

External Signal inputs for voltage and current conditioning amplifier

DC Slave for F2410 Battery Simulator control

Enclosure:

High impact, molded, flame retardant ABS - Meets National Safe Transit Association testing specification

No. 1A for immunity to severe shock and vibration

Dimensions:

9.5 x 19.75 x 22 inches or 24 x 50 x 55.8 cm

Weight:

50 lbs./22.7 kg

Audible Noise:

Measured at 2 meters; ANSI Type 2

Typically: Front: 52.5 dBA Rear: 55 dBA

L.H.: 54 dBA R.H.: 52.5 dBA

NOTE:

All specifications are subject to change without notice.



F2253 VOLTAGE AND CURRENT SOURCES

	Source 1	Source 2
	Voltage Power	Current Ranges
	50/60/Hz & DC	(Resolution)
Source 1 AC Voltage		
Continuous Power	..150 VA-rms	..... 75,150,300 V-rms (0.01V)
Source 1 DC Voltage		
Continuous Power	..150 watts	..... 106, 212, 424 V-dc (0.01V)
Source 2 AC Current		
1.5 second Transient	675 VA-rms	..... 15, 30, 45, 60, 90 A-rms (0.01A), 180 A-rms (0.1A)
Continuous Power	..450 VA-rms	..... 7.5, 15, 22.5, 30, 45 A-rms (0.001A), 90 A-rms (0.01A)
Source 2 DC Current		
1.5 second Transient	675 watts	..... 15,30, 45, 60, 90 A-rms (0.01A), 180 A-d.c. (0.1A)
Continuous Power	..450 watts	..... 5, 10, 15, 20, 30 A-rms (0.001A), 60 A-d.c. (0.01A)

	Source 1	Source 2
	Voltage Power	Current Ranges
	50/60/Hz & DC	(Resolution)
Source 1 AC Current		
1.5 second Transient	225 VA-rms	..... 15, 30, 60 A-rms (0.01A)
Continuous Power	..150 VA-rms	..... 7.5, 15, 30 A-rms (0.001A)
Source 1 DC Current		
1.5 second Transient	225 watts	..... 15, 30, 60 A-d.c. (0.01A)
Continuous Power	..150 watts	..... 5, 10, 20 A-d.c. (0.001A)
Source 2 AC Current		
1.5 second Transient	450 VA-rms	..... 15, 30, 60 A-rms (0.01A), 120 A-rms (0.1A)
Continuous Power	..300 VA-rms	..... 7.5, 15, 30, 60 A-rms (0.001A)
Source 2 DC Current		
1.5 second Transient	450 watts	..... 15, 30, 60 A-d.c. (0.01A), 120 A-d.c. (0.1A)
Continuous Power	..300 watts	..... 5, 10, 20, 40 A-d.c. (0.001A)

F2252 VOLTAGE AND CURRENT SOURCES

	Source 1	Source 2
	Voltage Power	Current Ranges
	50/60/Hz & DC	(Resolution)
Source 1 AC Voltage		
Continuous Power	..150 VA-rms	..... 75, 150, 300 V-rms (0.01V)
Source 1 DC Voltage		
Continuous Power	..150 watts	..... 106, 212, 424 V-dc (0.01V)
Source 2 AC Current		
1.5 second Transient	450 VA-rms	..... 15, 30, 60 A-rms (0.01A), 120 A-rms (0.1A)
Continuous Power	..300 VA-rms	..... 7.5, 15, 30, 60 A-rms (0.001A)
Source 2 DC Current		
1.5 second Transient	450 watts	..... 15, 30, 60 A-d.c. (0.01A), 120 A-d.c. (0.1A)
Continuous	.....300 watts	..... 5, 10, 20, 40 A-d.c. (0.001A)

	Source 1	Source 2
	Voltage Power	Current Ranges
	50/60/Hz & DC	(Resolution)
Source 1 AC Current		
1.5 second Transient	225 VA-rms	..... 15, 30, 60 A-rms (0.01A)
Continuous Power	..150 VA-rms	..... 7.5, 15, 30 A-rms (0.001A)
Source 1 DC Current		
1.5 second Transient	225 watts	..... 15, 30, 60 A-d.c. (0.01A)
Continuous Power	..150 watts	..... 5, 10, 20 A-d.c. (0.001A)
Source 2 AC Current		
1.5 second Transient	225 VA-rms	..... 15, 30, 60 A-rms (0.01A)
Continuous Power	..150 VA-rms	..... 7.5, 15, 30 A-rms (0.001A)
Source 2 DC Current		
1.5 second Transient	225 watts	..... 15, 30, 60 A-d.c. (0.01A)
Continuous Power	..150 watts	..... 5, 10, 20 A-d.c. (0.001A)