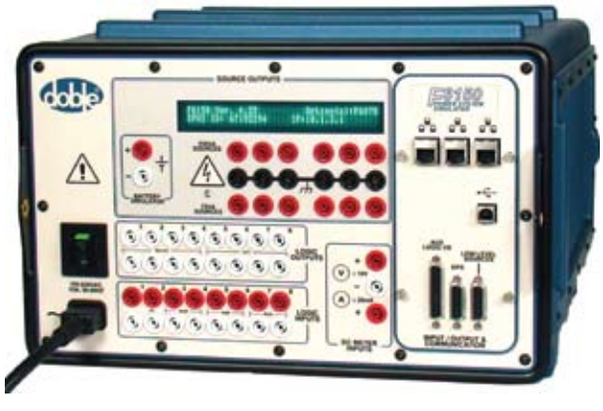
F6150

doble®

TECHNICAL SPECIFICATIONS

Over 10,000 Doble® protection test instruments are currently used by test engineers around the world, to ensure the reliability of electric power systems.

TOGETHER WE POWER THE WORLD®



Total Sources

The F6150 can provide up to twelve simultaneous user configurable AC/DC sources including: six convertible sources and six current sources.

Convertible Sources

Each 150 VA Convertible Source can be used as a voltage source or optionally as a high-power, low range current source. The F6150 has up to six Convertible Sources.

Source Configurations

	Output Power	
Continuous	**Transient for 1.5 Seconds**	**Number of Sources**
75 VA	97.5 VA	6
150 VA	195 VA	3
300 VA	390 VA	2x150 VA or 1x150 VA+2x75 VA
450 VA	585 VA	1

Each 150 VA convertible source can be split into two 75 VA sources.
Two 150 VA convertible sources can be combined in parallel into one 300 VA current source.
Three 150 VA convertible sources can be combined in parallel into one 450 VA current source.

Ranges and Resolution

75 VA Source	**F6150 Ranges (Resolution)**
AC Voltage	75, 150 V rms (0.01V)
DC Voltage	106, 212 V dc (0.01V)
AC Current	
Transient	0.75, 1.5 A rms (0.0001 A)
Continuous	0.5, 1.0 A rms (0.0001 A)
DC Current	
Transient	0.53, 1.06 A dc (0.0001 A)
Continuous	0.354, 0.707 A dc (0.0001 A)

150 VA Source	**F6150 Ranges (Resolution)**
AC Voltage	75, 150, 300 V rms (0.01 V)
DC Voltage	106, 212 V (0.01 V), 300 VDC (0.1 V)
AC Current	
Transient	0.75, 1.5, 3.0 A rms (0.0001 A)
Continuous	0.5, 1.0, 2.0 A rms (0.0001 A)
DC Current	
Transient	0.53, 1.06 (0.0001 A), 2.12 A dc (0.001 A)
Continuous	0.354, 0.707 (0.0001 A), 1.41 A dc (0.001 A)

300 VA Source	**F6150 Ranges (Resolution)**
AC Current	
Transient	1.5, 3.0, 6.0 A rms (0.001 A)
Continuous	1.0, 2.0, 4.0 A rms (0.001 A)
DC Current	
Transient	1.06 A (.0.0001 A), 2.12, 4.24 A dc (0.001 A)
Continuous	0.707 A (0.0001 A), 1.41 A, 2.83 A dc (0.001 A)

450 VA Source	**F6150 Ranges (Resolution)**
AC Current	
Transient	2.25, 4.5, 9.0 A rms (0.001 A)
Continuous	1.5, 3.0, 6.0 A rms (0.001 A)
DC Current	
Transient	1.59 (0.0001 A), 3.18, 6.36 A dc (0.001 A)
Continuous	1.06, 2.12, 4.24 A dc (0.001 A)

Current Sources

The F6150 has up to twelve current sources available including: six current sources and six high-power, low-range convertible sources.

Source Configurations

Output Power		
Continuous	**Transient for 1.5 Seconds**	**Number of Sources**
75 VA	112.5 VA	6
150 VA	225 VA	3
300 VA	450 VA	2x150 VA or 1x150 VA+2x75 VA
450 VA	675 VA	1

Each 150 VA current source can be split into two 75 VA current sources.
Two 150 VA current sources can be combined in series or in parallel into one 300 VA current source. Three 150 VA current sources can be combined in parallel into one 450 VA current source.

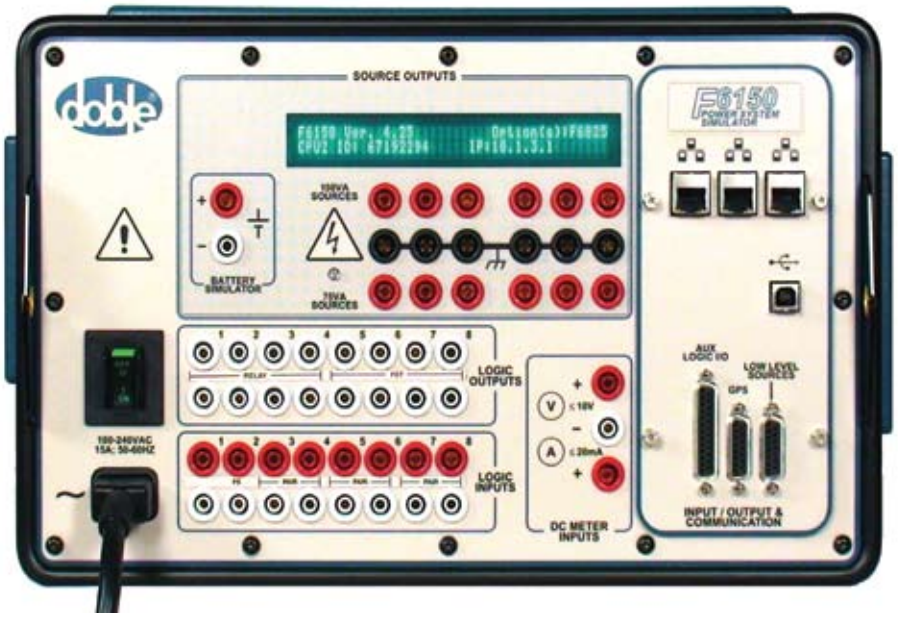
Ranges and Resolution:

75 VA Source	**F6150 Ranges (Resolution)**
AC Current	
Transient	15, 30 A rms (0.001 A)
Continuous	7.5, 15 A rms (0.001 A)
DC Current	
Transient	10, 20 A dc (0.01 A)
Continuous	5 A (0.001 A), 10 A dc (0.01 A)

150 VA Source	**F6150 Ranges (Resolution)**
AC Current	
Transient	15, 30 A (0.001 A), 60 A rms (0.01 A)
Continuous	7.5, 15 A (0.001 A), 30 A rms (0.01 A)
DC Current	
Transient	10, 20, 40 A dc (0.01 A)
Continuous	5 A (0.001 A), 10, 20 A dc (0.01 A)

300 VA Source	**F6150 Ranges (Resolution)**
AC Current	
Transient	15, 30 A (0.001 A), 60, 120 A rms (0.01 A)
Continuous	7.5, 15 A (0.001 A), 30, 60 A rms (0.01 A)
DC Current	
Transient	0 A (0.001 A), 20, 40, 80 A dc (0.01 A)
Continuous	5 A (0.001 A), 10, 20, 40 A dc (0.01 A)

450 VA Source:	**F6150 Ranges (Resolution)**
AC Current	
Transient	15, 30 A (0.001 A), 45, 90, 180 A rms (0.01 A)
Continuous	7.5, 15, 22.5 (0.001 A), 45 A, 90 A rms (0.01 A)
DC Current	
Transient	10 A (0.001 A), 20, 30, 60, 120 A dc (0.01 A)
Continuous	5 A (0.001 A), 10, 15, 30, 60 A dc (0.01 A)



F6150 Technical Specifications

AC Amplitude Accuracy at 50/60 Hz Voltage and Current Sources

From 20° to 30° C: <0.02% typical, 0.09% guaranteed

Typically 0.02% of reading

Convertible Source in Current Mode

From 20° to 30°C: <0.5% guaranteed

Distortion at 50/60 Hz Voltage and Current Sources

Total Harmonic Distortion (THD) < 0.02% typical < 0.1% guaranteed

Phase Angle

Range: 0 to +359.9° (Lead) / 0 to –359.9° (Lag)

Accuracy: ±0.25° at 50/60 Hz

Resolution: ±0.1° at 50/60 Hz

Frequency

Bandwidth: dc to 3 kHz at full power for transient playback

Range: dc; ac from 0.1 Hz to 2 kHz at full power continuous load

Resolution: 0.001 Hz

Accuracy:

0.5 ppm	Typical
1.5 ppm	20° to 30° C
10 ppm	0° to 50° C

Ramp/Set

Ramp: increments/decrements voltage, current, phase angle, and frequency at user defined ramp rates. Ensures smooth, linear changes in value.

Metering Functions

DC Meter Inputs

Input Range: 0 to ±10V dc or 0 to ±20mA dc

Accuracy: <0.003% typical <+0.05% guaranteed

AC Sources

Accuracy: <0.02% for typical meter loads

Logic Inputs as Counters

Frequency: 10 kHz

Pulsewidth: >175 microseconds.

Timers and Triggers

Timers
Number: 8

Max Recording Time: <24 Hours
Accuracy: ±0.0005% of reading, ±50 microseconds

Resolution: 100 microseconds

Time can be displayed as milliseconds, seconds, or cycles

Triggers
Number: 8
Boolean combination of logic inputs can be used to define triggers

Logic Inputs

Number:
logic inputs : 8 total

Isolated inputs:

Number: 2

Configurable as Voltage Sense or Contact Sense

Voltage Sense: Up to 250 V ac or dc

Open Circuit Test Voltage: 12 V dc nominal

Short Circuit Test Current: 20 mA dc nominal

Response Time: 0.1 millisecond max pickup and dropout

Isolation: ±500 V peak

Paired Logic Inputs:

Number: 3 pairs (6 total)

Configurable as Voltage Sense or Contact Sense

Voltage Sense: Up to 250 V ac or dc

Open Circuit Test Voltage: 4 V dc nominal

Short Circuit Test Current: >50 mA dc nominal

Response Time: 0.1 millisecond max pickup and dropout

Isolation: ±500 V peak

Logic Outputs

Number: 8
Configurable as Normally Open (NO) or Normally Closed (NC) switches.

High-Speed Electronic Switches

Number: 4

Input Voltage: 250 V dc or ac

Switching Current: 0.5 A make or break, maximum

Response Time: 0.1 millisecond maximum pickup and dropout

Isolation: ±500 V peak

Outputs: Relays.

Relays: 4

Breaking Capacity AC: 2000 VA with Vmax 250 V, Imax 8 A

Breaking Capacity DC: 50 W with Vmax 300 V, Imax 8 A

Response Time: <10 millisecond max pickup and dropout

Isolation between pairs: ±500 V peak

Variable Output Battery Simulator

Range: Adjustable 6 to 300 V dc

Resolution: 0.3 V

Power: 90 W, 1.5 A max

50/60 Hz Ripple: <0.2% of range

Accuracy < +/- 5%

Analog Input Measurement (F6820 Option)

Recording: 8 external analog and digital channels

Source Recording: 12 internal sources

Ranges: 250 mV rms, 2.5 V rms, 25 V rms, 250 mV rms

Accuracy: ±0.06% typical, ±0.15% maximum

Bandwidth: dc to 5 kHz

Input Impedance: 150 kΩ

Max. Input Voltage: 250 V rms/ dc

Isolation: ±500 V peak channel-to-channel

General Specifications

Quality Assurance Management System
Third-party certification to ISO 9001:2000

Calibration
Certification traceable to N.I.S.T. standards

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

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

GPS Accuracy
With F6895 (Antenna and Receiver):
+/-50 nanoseconds
With F6050:
+/-10 microseconds

Enclosure
High-impact, molded, flame-retardant ABS – meets National Safe Transit Association testing specification No. 1A for immunity to severe shock and vibration

Dimensions
15 x 9.5 x 18 inches
38 x 24 x 45.7 cm

Weight
37.5 lb 17.05 kg
(with front cover and carrying strap)

Interfaces
Ethernet or USB control to PC

Line Power Supply
105–132 V or 210–264 V, 47–63 Hz

EMC Emissions
FCC 47 CFR Part 15 Class A (USA)
EN55011:1998/A1:1999/A2:2002 Group1 Class A ISM(EU)
AS/NZS CISPR 11:2004 Class A ISM (Australia)
ICES-001 Issue 3 ISM (Canada)

EMC Immunity
EN 61000-6-2:2005; IEC 61000-4-2/3/4/5/6/11

Safety
EN 61010-1; UL 61010-1; CSA 27.2 # 61010-1

Environmental
IEC 60068-2-2 Dry Heat (+ 85°C storage; + 50°C Operating)
IEC 60068-2-1 Cold (- 50°C storage; 0°C operating)
IEC 60068-2-30 Damp Heat (+55°C, 6 cycles, 95% humidity)
NEMA Enclosure Rating Type 1
IEC Enclosure Rating IP20

Mechanical
IEC 60068-2-27 Shock (15g/11ms, half sine)
IEC 60068-2-6 Vibration (10-150 Hz, 20 m/s^2)
IEC 60068-2-6 Drop test

IEC61850 Communication
Certified by KEMA as being compliant with IEC61850 protocol (IEC 61850-7-2 and 8-1)

Humidity
Up to 95% relative humidity non-condensing

Specifications are subject to change without notice.

Additional external F6150 options described in other Doble product brochures:

F6010 Controller


F6080 Field Calibration Unit


F6050 Universal Time Synchronizer


F6300 High-Power Current Amplifier


F6816 External Input/Output Unit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Doble is certified ISO 9001:2000
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