

DOBLE F6150sv TECHNICAL SPECIFICATIONS

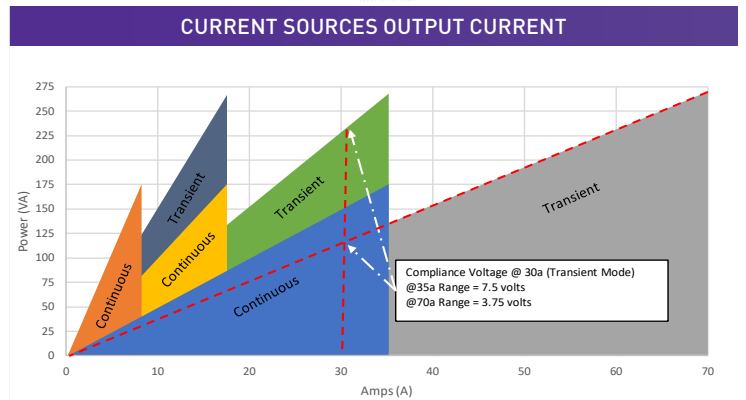
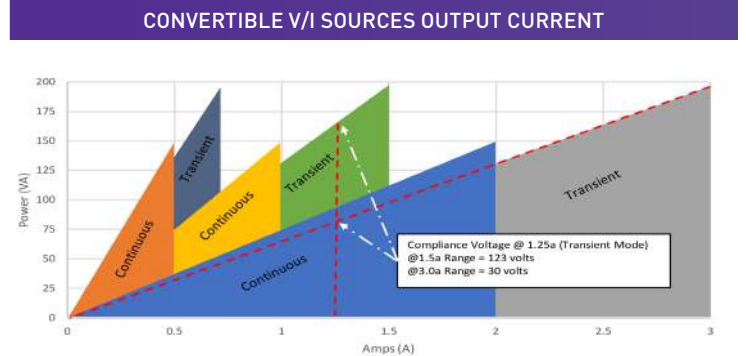
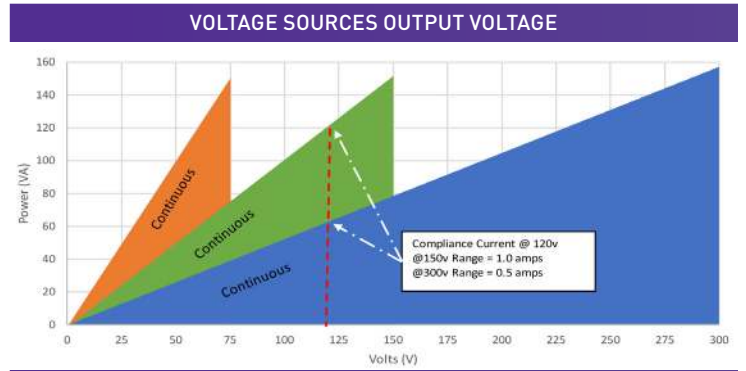
The F6150sv line of Power System Simulators is designed for simulation tests on relay and protection schemes.

VOLTAGE SOURCES (6 TOTAL)	
Source Configuration	Power
6-phase AC (L-N)	6 x 150 V @ 75 VA
3-phase AC (L-N)	3 x 300 V @ 150 VA
1-phase AC (LL-LN)	1 x 600 V @ 300 VA
DC (LL-LN)	3 x 424 V @ 150 W
Available Range	75 V, 150 V, 300 V

CONVERTIBLE V/I SOURCES	
Source Configuration	Power
6-phase AC (L-N)	6 x 1.5 A @ 97.5 VA** 6 x 1 A @ 75 VA***
3-phase AC (L-N)	3 x 3 A @ 195 VA** 3 x 2 A @ 150 VA***
1-phase AC (LL-LN)	1 x 9 A @ 585 VA** 1 x 6 A @ 450 VA***
DC (LL-LN)	1 x 6.36 A @ 585 W** 1 x 4.24 A @ 450 W***
Available Range	0.5 A, 1 A, 1.5 A, 3 A, 9 A

CURRENT SOURCES	
Source Configuration	Power
6-phase AC (L-N)	6 x 35 A @ 131.25 VA* 6 x 17.5 A @ 87.5 VA***
3-phase AC (L-N)	3 x 70 A @ 262.5 VA* 3 x 35 A @ 175 VA***
1-phase AC (LL-LN)	1 x 210 A @ 787.5 VA* 1 x 105 A @ 625 VA***
DC (LL-LN)	1 x 140 A @ 787.5W* 1 x 70 A @ 625W***
Available Range	0.5 A, 1 A, 1.5 A, 3 A, 9 A

LOW LEVEL SOURCES			
Range	Voltage Power	Current Power	Transient Mode
Convertible Amplifier Sources	6.7 VRMS	4.5 VRMS	6.7 VRMS
Current Amplifier Sources	N/A	3.399 VRMS (Non-Enhanced) 3.5 VRMS (Enhanced)	6.798 VRMS (Non-Enhanced) 7 VRMS (Enhanced)
Number	12		
Accuracy	± 0.25% of reading		
Resolution	331 µV/bit		



All values are shown with F6005 option:

*Long Duration - 45 seconds

**Short Duration - 1.5 seconds

***Continuous



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LOGIC INPUTS (VOLTAGE OR CONTACT SENSE)		
Description	Isolated Inputs	Paired Inputs
Inputs	2 (First Strike)	3 Pairs (6)
Voltage Sense	250 V RMS AC / 300 V DC	250 V RMS AC / 300 V DC
Open Circuit Test Voltage	12 V DC	4 V DC
Short Circuit Test Current	20 mA DC	>50 mA DC
Response Time	0.1 msec max pickup / dropout	0.1 msec max pickup / dropout
Input Impedance	150 kΩ	150 kΩ
Isolation	±500 V peak	±500 V peak

LOGIC OUTPUTS		
Description	FET (High Speed Electronic)	Relay
Number	4	4
Isolation Voltage	±500 V peak	±500 V peak
Response Time	0.1 ms pick up / dropout	<10 ms pick up / dropout
Maximum (Make/Break Current)	0.5 A	(Breaking cap AC: 2000 VA with Vmax 250 V, Imax 8 A) (Breaking cap DC: 50 W with Vmax 300 V, Imax 8 A)
Input Voltage	250 V RMS	250 V RMS

METERING FUNCTIONS	
DC Meter Inputs	
Input Range	0 - ±10 V DC / 0 - ±20 mA DC
Typical	<0.003%
Guaranteed	<0.05%

AC Sources	
Typical	<0.02% of metering loads

Logic Input As Counters	
Frequency	10 kHz
Pulse width	>175 μs

ANALOG INPUT MEASUREMENT AIM	
Recording	8 external Analog or Digital Signals
Internal Source recording	12 Sources
Ranges	250 mV, 2.5 V, 25 V, 250 V RMS
Bandwidth	DC, 0-5kHz
Input Impedance	150 kΩ
Max Input Voltage	250 V RMS AC / 300 V DC
Isolation	±500 V peak channel to channel
Accuracy	
Typical	±0.06%
Maximum	±0.15%

VARIABLE OUTPUT BATTERY SIMULATOR	
Range	6 - 300 V DC
Resolution	0.3 V
Power	90 W, 1.5 A max
50/60 Hz Ripple	<0.2% of Range
Accuracy	<±5%

TIMING ACCURACY	
With F6895 (Antenna and Receiver)	± 50 ns
With F6051 (Irig-b Converter)	+ 6 ms (un-modulated) +9 ms (modulated)
With F6053 PTP (1588) Power and Power Utility Pole	200 ns

POWER CONSUMPTION	
F6150e/sv at Full Power	2600 W
F6150e/sv at Idle	140 W

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AC AMPLITUDE ACCURACY @ 50-60 HZ @ 20° - 30° C	
Typical	0.02% of reading + .01% of range
Guaranteed	0.09% of reading + .04% of range
Playback Rate for Transient Test	10 kHz
CONVERTIBLE SOURCE IN CURRENT MODE @ 20° - 30° C	
Guaranteed	<0.5%
TIMERS AND TRIGGERS	
Timers Number	8
Max Recording Time	<24 h
Accuracy	±0.0005% of reading, ±50 µs
Resolution	100 µs
FREQUENCY	
Bandwidth	DC - 3 kHz at Full Power
Range	DC, 0.1 Hz - 2.0 kHz Continuous Full Load
Resolution	0.001 Hz
PHASE ANGLE @ 50/60 HZ	
Range	±360° - 0°
Accuracy	± 0.25°
Resolution	± 0.1°
DISTORTION @ 50 /60HZ V & I SOURCES TOTAL HARMONIC DISTORTION (THD)	
Typical	<0.02%
Guaranteed	<0.1%
Accuracy	
Typical	0.5 ppm
@ 20° - 30° C	1.5 ppm
@ 0° - 50° C	10 ppm

*All instruments are designed to meet CSA and UL requirements.

GENERAL SPECIFICATIONS	
Enclosure	High-impact, molded, flame-retardant ABS-meets National Safe Transit Association testing specification No.1A for immunity to severe shock and vibration
Mechanical	IEC 60068-2-27 Shock (15g/11ms, half sine) IEC 60068-2-6 Vibration (10-150 Hz, 20m/s ²) IEC 60068-2-6 Drop Test
Weight	42lb, 19.05kg (front cover and strap included)
Dimensions	15 X 9.5 X 18 in 38 X 24 X 45.7 cm
Calibration	Certification traceable to N.I.S.T. standards
Environmental	IEC 60068-2-2 Dry Heat (+85°C storage; +50°C Rating 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 Enclose Rating Type 1 IEC Enclosure IP20
EMC Emissions	FCC 47 CFR Part 15 Class A (USA), EN55011:1998/A1:1999/A2:2002 Group 1 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
Quality Assurance Management System	Third Party certification to ISO 9001:2000
Humidity	Up to 95% relative humidity, non-condensing
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 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
Line Power Supply	105-264 V, 47-63 Hz
Safety*	EN 61010-1 third edition; UL 61010-1
Communication Interfaces	Ethernet or USB control to PC, Wi-Fi (802.11 B+G bands, 30 - 80ft, 9 - 24m)
IEC 61850	
GOOSE	IEC 61850 first edition parts [6, 7-2, 8-1 and 9-2] Second edition parts [6, 7-1, 7-2, 7-3, 7-4, 8-1, and 9-2]
Sample Values	Sampled Value messages per 9-2LE guide line (3 streams) and IEC 61869-9 (4 streams)

Specifications are subject to change without notice.
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Doble Engineering Company
Worldwide Headquarters
123 Felton Street, Marlborough, MA 01752 USA
tel +1 617 926 4900 | fax +1 617 926 0528
www.doble.com