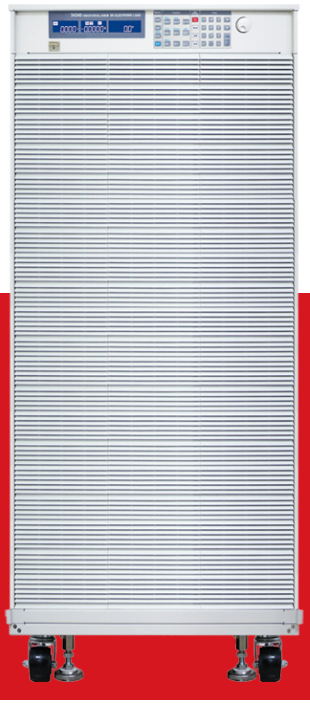
ELECTRONIC TEST & POWER SYSTEMS

ELP-34305

1000VDC HIGH POWER DC LOADS



POSITIVE PROBLEM SOLVING

The ELP-34305 series is a family of precision DC electronic loads for high voltage applications, such as renewable energy.

Dual setting and measurement ranges combined with 5 digit displays provide high resolution for both measurement and setting. In dynamic mode, adjustable rise, fall and plateau times allow testing of high voltage DC energy, from photovoltaic cells or high voltage batteries. Dedicated short circuit, OCP and OPP tests allow power supply behaviour and protection mechanisms to be characterised. LAN, USB, RS-232 or GPIB Interface cards can also be easily retro-fitted or even swapped in the field by the user.

- 9 Different Operation Modes
- 5 Digit Displays for V, I & W
- Overcurrent & Power Tests
- Short Circuit Test Function
- Adjustable Slew Rates
- Front Panel Memory

ELP-34305
1000VDC HIGH POWER DC LOADS

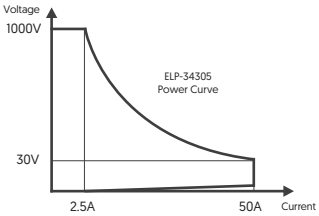
SELECTION TABLE

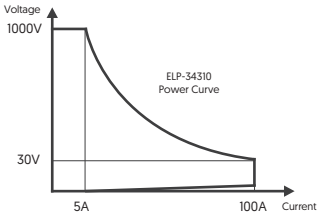
Part Number	Range 1 Max Power	Range 1 Max Voltage	Range 1 Current	Range 2 Max Power	Range 2 Max Voltage	Range 2 Current
ELP-34305	500W	1000VDC	0 - 5A	5kW	1000VDC	0 - 50A
ELP-34310	1kW	1000VDC	0 - 10A	10kW	1000VDC	0 - 100A
ELP-34315	1.5kW	1000VDC	0 - 15A	15kW	1000VDC	0 - 150A
ELP-34320	2kW	1000VDC	0 - 20A	20kW	1000VDC	0 - 200A
ELP-34325	2.5kW	1000VDC	0 - 25A	25kW	1000VDC	0 - 250A
ELP-34330	3kW	1000VDC	0 - 30A	30kW	1000VDC	0 - 300A
ELP-34335	3.5kW	1000VDC	0 - 35A	35kW	1000VDC	0 - 350A
ELP-34340	4kW	1000VDC	0 - 40A	40kW	1000VDC	0 - 400A
ELP-34350	5kW	1000VDC	0 - 52.5A	50kW	1000VDC	0 - 500A
ELP-34360	6kW	1000VDC	0 - 60A	60kW	1000VDC	0 - 600A

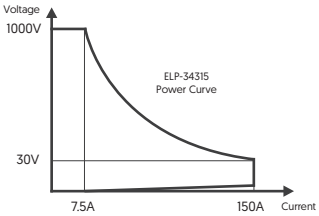
CHARACTERISED VALUES

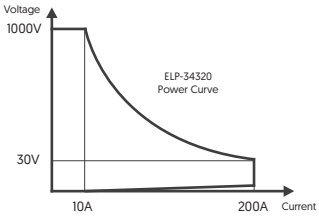
The ELP-34305 series is able to operate at maximum current across most of its voltage range. This allows one system to test many different types of devices. When operating below 30V, the maximum amount of current that the load can sink decreases. The values for this derating at low voltages are provided below.

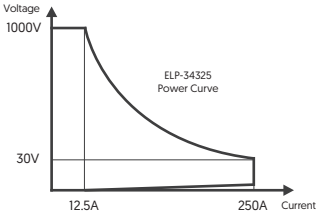
	CURRENT									
VOLTAGE	**ELP-34305**	**ELP-34310**	**ELP-34315**	**ELP-34320**	**ELP-34325**	**ELP-34330**	**ELP-34335**	**ELP-34340**	**ELP-34350**	**ELP-34360**
30V	50A	100A	150A	200A	250A	300A	350A	400A	500A	600A
27V	45A	90A	135A	180A	225A	270A	315A	360A	450A	540A
24V	40A	80A	120A	160A	200A	240A	280A	320A	400A	480A
21V	35A	70A	105A	140A	175A	210A	245A	280A	350A	420A
18V	30A	60A	90A	120A	150A	180A	210A	240A	300A	360A
15V	25A	50A	75A	100A	125A	150A	175A	200A	250A	300A
12V	20A	40A	60A	80A	100A	120A	140A	160A	200A	240A
9V	15A	30A	45A	60A	75A	90A	105A	120A	150A	180A
6V	10A	20A	30A	40A	50A	60A	70A	80A	100A	120A
3V	5A	10A	15A	20A	25A	30A	35A	40A	50A	60A

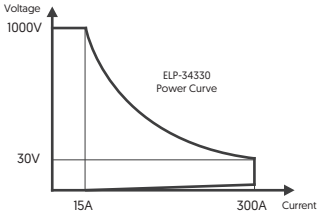


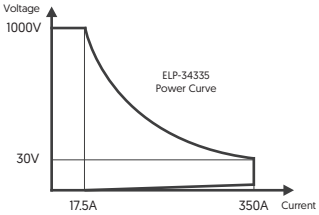


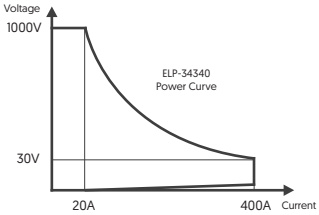


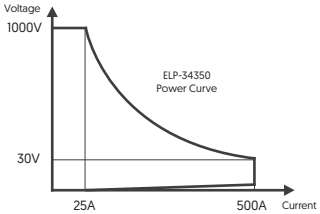


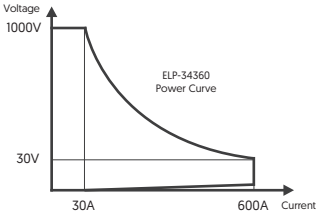












ELECTRONIC TEST & POWER SYSTEMS

ELP-34305
1000VDC HIGH POWER DC LOADS

HIGHLIGHTED STANDARD FEATURES

FRONT PANEL MEMORY

150-state memory is available as standard, which allows quick initialisation and limit-setting of the unit. This makes the ELP-34105 both dependable, and mobile as an on-site load tester.

SEQUENCING FUNCTION

A sequencing function means that stored settings can be implemented against time, enabling the unit to carry out state-dependant and complex test routines without the need for a computer interface.

BATTERY DISCHARGE TESTS

The ELP-34305 series has a total of 5 battery discharge modes. These simplify test set up for users, whilst avoiding conditions which could result in permanent battery damage due to over or under voltage.

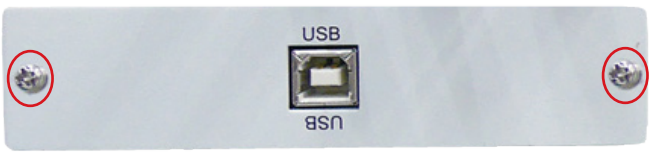
OPTIONS

CODE	DESCRIPTION
/LT	IEEE488.2 (GPIB) interface card
/RS232	RS-232 interface card
/USB	USB interface card
/LAN	LAN interface card
/802	Analogue and digital control interfaces
/0001	1m IEEE 488.2 cable
/0002	2m IEEE 488.2 cable
/0003	2m RS-232 cable
/1KAxM	1000A load cable (1m - 5m available, please specify)

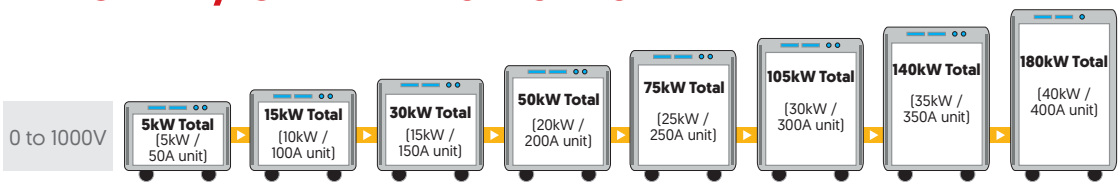
HIGHLIGHTED OPTIONS

RETROFITABLE INTERFACES

Should remote control be required then LAN, USB, RS-232 or GPIB cards can be specified. Interface cards can also be easily retro-fitted or even swapped in the field by the user, further expanding its capability.



MASTER/SLAVE FUNCTIONALITY



PARALLEL CONNECTION

Up to eight units from the ELP-34305 series can be arranged in parallel configurations. It is possible to connect 5kW to 40kW models with different nominal values, up to a maximum of 320kW. For example, a 5kW system and a 40kW system can be operated together. The diagram above shows eight different models from the ELP-34305 family operating in parallel together. 50kW and 60kW models can be operated in parallel connection up to 480kW, but only with models of the exact same specifications.

Each unit is able to operate independently, so that systems can be expanded or broken up as needs dictate. This approach is useful for test houses and research labs who regularly test different sized power devices. When operating in master/slave operation, a number of test modes are not available. Please see the table below for more information.

ELP-34105 Operating or Test Mode	Independent Unit	Units in Master/Slave
CC Mode	✔	✔
CV Mode	✔	✔
CR Mode	✔	✔
CP Mode	✔	✔
CV+CC Mode	✔	×
CV+CP Mode	✔	×
MPPT Mode	✔	×
Dynamic Mode	✔	✔
Short Mode	✔	×
Recall/Store	✔	×
External I/O Interface	✔	×
OCP	✔	×
OPP	✔	×
Auto Sequence	✔	×
Battery Test 1	✔	×
Battery Test 2	✔	×
Battery Test 3	✔	×
Battery Test 4	✔	×
Battery Test 5	✔	×

TECHNICAL DATA

	ELP - 34305		ELP - 34310		ELP - 34315		ELP - 34320	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Load Voltage (ON/OFF)	10.4 - 200V / 0 - 200V							
Min Voltage at Full Current	30V at 50A		30V at 100A		30V at 150A		30V at 200A	
Short Circuit Current	50A		100A		150A		200A	
Max. Power Consumption	600W		1000W		1450W		1900W	
Weight	100kg		130kg		170kg		220kg	
Operating Temperature	0 to 40°C, all measurements taken at 25°C± 5°C, except where noted							
Dimensions (W × H × D)	647 × 577 × 766mm		647 × 577 × 766mm		647 × 736 × 766mm		647 × 889 × 766mm	
Safety & EMC	CE							
Protection (OV / OC / OP)	104% / 104% / 105%							
Over Temp. Protection	Yes							
CC MODE (AUTOMATIC RANGING APPLIES IN CC MODE)								
Range	0 - 5A	0 - 50A	0 - 10A	0 - 100A	0 - 15A	0 - 150A	0 - 20A	0 - 200A
Resolution	0.08mA	0.8mA	0.16mA	1.6mA	0.25mA	2.5mA	0.32mA	3.2mA
Accuracy	± (0.1% of setting + 0.2% of range)							
CR MODE								
Range	24000 - 20Ω	20 - 0.4008Ω	12000 - 10Ω	10 - 0.2004Ω	8000 - 6.666Ω	6.666-0.1344Ω	6000 - 5Ω	5 - 0.1008Ω
Resolution	0.833µS	0.334mΩ	1.666µS	0.167mΩ	2.5µS	0.112mΩ	3.33µS	0.084mΩ
Accuracy	± 0.2% of (setting + range)							
CV MODE								
Range	20 - 1000V							
Resolution	16mV							
Accuracy	± 0.05% of (setting + range)							
CP MODE								
Range	0.5kW	5kW	1kW	10kW	1.5kW	15kW	2kW	20kW
Resolution	8mW	80mW	16mW	160mW	25mW	250mW	32mW	320mW
Accuracy	± 0.5% of (setting + range)							
CV + CC MODE								
Range	20 - 1000V	0 - 50A	20 - 1000V	0 - 100A	20 - 1000V	0 - 150A	20 - 1000V	0 - 200A
Resolution	16mV	0.8mA	16mV	1.6mA	16mV	2.5mA	16mV	3.2mA
Accuracy	± 0.5% of (setting + range)							
CV + CP MODE								
Range	20 - 1000V	5kW	20 - 1000V	10kW	20 - 1000V	15kW	20 - 1000V	20kW
Resolution	16mV	80mW	16mV	160mW	16mV	250mW	16mV	320mW
Accuracy	± 0.5% of (setting + range)							
MPPT MODE								
Algorithm	P&O + Scanning							
Load Mode	CC, CR, CV (MPPT C, R, V)							
Sampling Interval	10ms-2000ms ; resolution 1ms							
P&O Interval	10ms-2000ms ; resolution 1ms							

TECHNICAL DATA

	ELP - 34305		ELP - 34310		ELP - 34315		ELP - 34320	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Over Power Protection	105%							
Over Current Protection	104%							
Over Voltage Protection	104%							
Over Temp. Protection	Yes							
5-DIGIT VOLTMETER								
Range	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V
Resolution	1.6mV	16mV	1.6mV	16mV	1.6mV	16mV	1.6mV	16mV
Accuracy	± 0.025% of (reading + range)							
5-DIGIT AMMETER								
Range	0 - 5A	5 - 50A	0 - 10A	10 - 100A	0 - 15A	15 - 150A	0 - 20A	20 - 200A
Resolution	0.08mA	0.8mA	0.16mA	1.6mA	0.25mA	2.5mA	0.32mA	3.2mA
Accuracy	± 0.1% of (reading + range)							
5-DIGIT POWERMETER								
Range	0 - 0.5kW	0 - 5kW	0 - 1kW	0 - 10kW	0 - 1.5kW	0 - 15kW	0 - 2kW	0 - 20kW
Resolution	0.1W	1W	0.1W	1W	0.1W	1W	0.1W	1W
Accuracy	± 0.125% of (reading + range)							
DYNAMIC OPERATION								
Thigh & Tlow	0.05 - 9.999 / 99.99 / 999.9 /9999ms							
Resolution	0.001 / 0.01 / 0.1 / 1mS							
Accuracy	1µS / 10µS / 100µS / 1mS + 50ppm							
Slew Rate Range	4mA-0.25A/µs	40mA-2.5A/µs	8mA - 0.5A/µs	80mA - 5A/µs	12mA-0.75A/µs	0.12A - 7.5A/µs	16mA - 1A/µs	0.16A - 10A/µs
Slew Rate Resolution	1mA/µs	10mA/µs	2mA/µs	20mA/µs	3mA/µs	30mA/µs	4mA/µs	40mA/µs
Minimum Rise Time	Typically 20µs							
Current Range	0 - 5A	5 - 50A	0 - 10A	10 - 100A	0 - 15A	15 - 150A	0 - 20A	20 - 200A
Current Resolution	0.08mA	0.8mA	0.16mA	1.6mA	0.25mA	2.5mA	0.32mA	3.2mA
Accuracy	± (0.1% of setting + 0.2% of range)							

TECHNICAL DATA

	ELP - 34325		ELP - 34330		ELP - 34335	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Load Voltage (ON/OFF)	10.4 - 200V / 0 - 200V					
Min Voltage at Full Current	30V at 250A		30V at 300A		30V at 350A	
Short Circuit Current	250A		300A		350A	
Max. Power Consumption	2350W		2800W		3250W	
Weight	280kg		340kg		390kg	
Operating Temperature	0 to 40°C, all measurements taken at 25°C± 5°C, except where noted					
Dimensions (W × H × D)	647 × 1048 × 766mm		647 × 1201 × 766mm		647 × 1360 × 766mm	
Safety & EMC	CE					
Protection (OV / OC / OP)	104% / 104% / 105%					
Over Temp. Protection	Yes					
CC MODE (AUTOMATIC RANGING APPLIES IN CC MODE)						
Range	0 - 25A	0 - 250A	0 - 30A	0 - 300A	0 - 35A	0 - 350A
Resolution	0.4mA	4mA	0.5mA	5mA	0.56mA	5.6mA
Accuracy	± (0.1% of setting + 0.2% of range)					
CR MODE						
Range	4800 - 4Ω	4 - 0.0804Ω	4000 - 3.333Ω	3.333 - 0.0672Ω	3428.4 - 2.857Ω	2.857 - 0.0576Ω
Resolution	4.166µS	0.067mΩ	5µS	0.056mΩ	5.84µS	0.048mΩ
Accuracy	± 0.2% of (setting + range)					
CV MODE						
Range	20 - 1000V					
Resolution	16mV					
Accuracy	± 0.05% of (setting + range)					
CP MODE						
Range	2.5kW	25kW	3kW	30kW	3.5kW	35kW
Resolution	40mW	400mW	50mW	500mW	56mW	560mW
Accuracy	± 0.5% of (setting + range)					
CV + CC MODE						
Range	20 - 1000V	0 - 250A	20 - 1000V	0 - 300A	20 - 1000V	0 - 350A
Resolution	16mV	4mA	16mV	5mA	16mV	5.6mA
Accuracy	± 1.0% of (setting + range)					
CV + CP MODE						
Range	20 - 1000V	25kW	20 - 1000V	30kW	20 - 1000V	35kW
Resolution	16mV	400mW	16mV	500mW	16mV	560mW
Accuracy	± 1.0% of (setting + range)					
MPPT MODE						
Algorithm	P&O + Scanning					
Load Mode	CC, CR, CV (MPPT C, R, V)					
Sampling Interval	10ms-2000ms ; resolution 1ms					
P&O Interval	10ms-2000ms ; resolution 1ms					

TECHNICAL DATA

	ELP - 34325		ELP - 34330		ELP - 34335	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Over Power Protection	105%					
Over Current Protection	104%					
Over Voltage Protection	104%					
Over Temp. Protection	Yes					
5-DIGIT VOLTMETER						
Range	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V
Resolution	1.6mV	16mV	1.6mV	16mV	1.6mV	16mV
Accuracy	± 0.025% of (reading + range)					
5-DIGIT AMMETER						
Range	0 - 25A	25 - 250A	0 - 30A	30 - 300A	0 - 35A	35 - 350A
Resolution	0.4mA	4mA	0.5mA	5mA	0.56mA	5.6mA
Accuracy	± 0.1% of (reading + range)					
5-DIGIT POWERMETER						
Range	0 - 2.5kW	0 - 25kW	0 - 3kW	0 - 30kW	0 - 3.5kW	0 - 35kW
Resolution	0.1W	1W	0.1W	1W	0.1W	1W
Accuracy	± 0.125% of (reading + range)					
DYNAMIC OPERATION						
Thigh & Tlow	0.05 - 9.999 / 99.99 / 999.9 /9999ms					
Resolution	0.001 / 0.01 / 0.1 / 1mS					
Accuracy	1µS / 10µS / 100µS / 1mS + 50ppm					
Slew Rate Range	20mA - 1.25A/µs	0.2A - 12.5A/µs	24mA - 1.5A/µs	0.24A - 15A/µs	28mA - 1.75A/µs	0.28A - 17.5A/µs
Slew Rate Resolution	5mA/µs	50mA/µs	6mA/µs	60mA/µs	7mA/µs	70mA/µs
Minimum Rise Time	Typically 20µs					
Current Range	0 - 25A	25 - 250A	0 - 30A	30 - 300A	0 - 35A	35 - 350A
Current Resolution	0.4mA	4mA	0.5mA	5mA	0.56mA	5.6mA
Accuracy	± (0.1% of setting + 0.2% of range)					

TECHNICAL DATA

	ELP - 34340		ELP - 34350		ELP - 34360	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Load Voltage (ON/OFF)	10.4 - 200V / 0 - 200V		20 - 200V / 0 - 198.4V		20 - 200V / 0 - 198.4V	
Min Voltage at Full Current	30V at 400A		30V at 500A		30V at 600A	
Short Circuit Current	400A		500A		600A	
Max. Power Consumption	3700W		5450W		6200W	
Weight	430kg		510kg		630kg	
Operating Temperature	0 to 40°C, all measurements taken at 25°C± 5°C, except where noted					
Dimensions (W × H × D)	647 × 1513 × 766mm		853 × 1360 × 766mm		853 × 1513 × 766mm	
Safety & EMC	CE					
Protection (OV / OC / OP)	104% / 104% / 105%					
Over Temp. Protection	Yes					
CC MODE (AUTOMATIC RANGING APPLIES IN CC MODE)						
Range	0 - 40A	0 - 400A	0 - 50A	0 - 500A	0 - 60A	0 - 600A
Resolution	0.64mA	6.4mA	0.8mA	8mA	1mA	10mA
Accuracy	± (0.1% of setting + 0.2% of range)					
CR MODE						
Range	3000 - 2.5Ω	2.5 - 0.0504Ω	0.04 - 2Ω	2 - 2500Ω	0.0333 - 1.666Ω	1.666 - 2000Ω
Resolution	6.66µS	0.042mΩ	32µΩ	8µS	27.8µΩ	10µS
Accuracy	± 0.2% of (setting + range)					
CV MODE						
Range	20 - 1000V					
Resolution	16mV					
Accuracy	± 0.05% of (setting + range)					
CP MODE						
Range	4kW	40kW	5kW	50kW	6kW	60kW
Resolution	64mW	640mW	80mW	800mW	100mW	1W
Accuracy	± 0.5% of (setting + range)					
CV + CC MODE						
Range	20 - 1000V	0 - 400A	20 - 1000V	0 - 500A	20 - 1000V	0 - 600A
Resolution	16mV	6.4mA	16mV	8mA	16mV	10mA
Accuracy	± 1.0% of (setting + range)					
CV + CP MODE						
Range	20 - 1000V	40kW	20 - 1000V	50kW	20 - 1000V	60kW
Resolution	16mV	640mW	16mV	800mW	16mV	1W
Accuracy	± 1.0% of (setting + range)					
MPPT MODE						
Algorithm	P&O + Scanning					
Load Mode	CC, CR, CV (MPPT C, R, V)					
Sampling Interval	10ms-2000ms ; resolution 1ms					
P&O Interval	10ms-2000ms ; resolution 1ms					

TECHNICAL DATA

	ELP - 34340		ELP - 34350		ELP - 34360	
	RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
Over Power Protection	105%					
Over Current Protection	104%					
Over Voltage Protection	104%					
Over Temp. Protection	Yes					
5-DIGIT VOLTMETER						
Range	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V	0 - 100V	100 - 1000V
Resolution	1.6mV	16mV	1.6mV	16mV	1.6mV	16mV
Accuracy	± 0.025% of (reading + range)					
5-DIGIT AMMETER						
Range	0 - 40A	40 - 400A	0 - 50A	50 - 500A	0 - 60A	60 - 600A
Resolution	0.64mA	6.4mA	0.8mA	8mA	1mA	10mA
Accuracy	± 0.1% of (reading + range)					
5-DIGIT POWERMETER						
Range	0 - 4kW	0 - 40kW	0 - 5kW	0 - 52kW	0 - 6kW	0 - 60kW
Resolution	0.1W	1W	0.1W	1W	0.1W	1W
Accuracy	± 0.125% of (reading + range)					
DYNAMIC OPERATION						
Thigh & Tlow	0.05 - 9.999 / 99.99 / 999.9 /9999ms					
Resolution	0.001 / 0.01 / 0.1 / 1mS					
Accuracy	1µS / 10µS / 100µS / 1mS + 50ppm					
Slew Rate Range	32mA - 2A/µs	0.32A - 20A/µs	40mA - 2.5A/µs	400mA - 25A/µs	48mA - 3A/µs	480mA - 30A/µs
Slew Rate Resolution	8mA/µs	80mA/µs	10mA/µs	100mA/µs	12mA/µs	120mA/µs
Minimum Rise Time	Typically 20µs					
Current Range	0 - 40A	40 - 400A	0 - 50A	50 - 500A	0 - 60A	60 - 600A
Current Resolution	0.64mA	6.4mA	0.8mA	8mA	1mA	10mA
Accuracy	± (0.1% of setting + 0.2% of range)					

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