

Chapter9 Technical Specifications

9.1 IT9121 Specifications

9.1.1 General Specification

AC input voltage	100VAC—240VAC 47-63HZ
Operating Environment	Temperature: 5°C ~ 40°C
	Humidity: 30 ~ 75% (non-condensation)
Installation	Indoors
Maximum power consumption	50VA
Measurement wires	Single-phase, two-wire(1P2W)
Environmental requirements for the instrument calibration	Refer to the calibration report.
Period of validity of calibration	Six month
Maximum rated input voltage	600VRMS, 1000VPEAK
Maximum rated input current	20ARMS, 30APEAK
Input impedance	Voltage: Approx 2MR, Current: Approx 0.5R(small range)0.018R(large range), EX1: Approx 100K, EX2: Approx 20K
Maximum rated voltage to ground	600VRMS, 47-63HZ
Valid input range	1%-110% of the range
Weight	2.6kg
Dimension	255mmWx107.7mmHx387.3mmD

9.1.2 Voltage Accuracy

Item	Specification	
Requirements	Humidity	30 ~ 75%RH
	Input waveform	Sine wave, common-mode voltage: 0V
	Frequency filter	Turn on to measure voltage or current of 200Hz
	30 minutes after warm-up time has passed.	

Resolution

Range	Resolution
15V	1mV
30V	1mV
60V	1mV
150V	10mV
300V	10mV
600V	10mV

When the crest factor is 3

Range	CF=3
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15V, 30V, 60V, 150V, 300V, 600V	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
	0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	200	300
	10-45	±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5%rdg.	200	300
	45-66	±(0.1% rdg.+ 0.1% F.S.)	YES	+0.2%rdg.	200	300
	66-1K	±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5%rdg (66~200Hz)	200	300
	1K-10K	±(0.7% rdg.+ 0.3% F.S.)	YES	/	200	300
10K-100K	±(5% rdg.+ 0.5% F.S.)	YES	/	200	300	

When the crest factor is 6

Range	CF=6					
7.5V, 15V, 30V, 75V, 150V, 300V	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	400	600
	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+1% rdg.	400	600
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+0.4%rdg.	400	600
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+1%rdg (66~200Hz)	400	600
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	400	600
10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	400	600	

9.1.3 Current Accuracy

Item	Specification	
Requirements	Humidity	30 ~ 75%RH
	Input waveform	Sine wave, common-mode voltage: 0V
	Frequency filter	Turn on to measure voltage or current of 200Hz
	30 minutes after warm-up time has passed.	

Resolution

Range	Resolution
5mA	0.0001mA
10mA	0.001mA
20mA	0.001mA
50mA	0.001mA
100mA	0.01mA
200mA	0.01mA
500mA	0.01mA
1A	0.1 mA
2A	0.1 mA
5A	0.1 mA
10A	1 mA
20A	1 mA

When the crest factor is 3

Range	CF=3					
5mA	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
5mA	0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	1000	1500
	10-45	±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg.	1000	1500
	45-66	±(0.1% rdg.+ 0.1% F.S.)	YES	+ 0.2% rdg.	1000	1500
	66-1K	±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg (66~200Hz)	1000	1500
	1K-10K	±(0.7% rdg.+ 0.3% F.S.)	YES	/	1000	1500
	10K-100K	±(5% rdg.+ 0.5% F.S.)	YES	/	1000	1500
	10mA	0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	500
10-45		±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5% rdg.	500	800
45-66		±(0.1% rdg.+ 0.1% F.S.)	YES	+0.2% rdg.	500	800
66-1K		±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5% rdg (66~200Hz)	500	800
1K-10K		±(0.7% rdg.+ 0.3% F.S.)	YES	/	500	800
10K-100K		±(5% rdg.+ 0.5% F.S.)	YES	/	500	800
20mA		0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	250
	10-45	±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg.	250	400
	45-66	±(0.1% rdg.+ 0.1% F.S.)	YES	+ 0.2% rdg.	250	400
	66-1K	±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5%rdg (66~200Hz)	250	400
	1K-10K	±(0.7% rdg.+ 0.3% F.S.)	YES	/	250	400
	10K-100K	±(5% rdg.+ 0.5% F.S.)	YES	/	250	400
	50mA	0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	100
10-45		±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg.	100	150
45-66		±(0.1% rdg.+ 0.1% F.S.)	YES	+ 0.2% rdg.	100	150
66-1K		±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg (66~200Hz)	100	150
1K-10K		±(0.7% rdg.+ 0.3% F.S.)	YES	/	100	150
10K-100K		±(5% rdg.+ 0.5% F.S.)	YES	/	100	150
100mA		0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	50
	10-45	±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg.	50	75
	45-66	±(0.1% rdg.+ 0.1% F.S.)	YES	+ 0.2% rdg.	50	75
	66-1K	±(0.1% rdg.+ 0.2% F.S.)	YES	+0.5%rdg (66~200Hz)	50	75
	1K-10K	±(0.7% rdg.+ 0.3% F.S.)	YES	/	50	75
	10K-100K	±(5% rdg.+ 0.5% F.S.)	YES	/	50	75
	200mA	0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	35
10-45		±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg.	35	45
45-66		±(0.1% rdg.+ 0.1% F.S.)	YES	+ 0.2% rdg.	35	45
66-1K		±(0.1% rdg.+ 0.2% F.S.)	YES	+ 0.5% rdg (66~200Hz)	35	45
1K-10K		±(0.7% rdg.+ 0.3% F.S.)	YES	/	35	45
10K-100K		±(5% rdg.+ 0.5% F.S.)	YES	/	35	45

500mA	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	1000	1500
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	1000	1500
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	1000	1500
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	1000	1500
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	1000	1500
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	1000	1500
1A	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	500	800
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	500	800
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	500	800
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	500	800
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	500	800
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	500	800
2A	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	250	400
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	250	400
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	250	400
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	250	400
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	250	400
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	250	400
5A	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	100	150
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	100	150
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	100	150
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	100	150
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	100	150
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	100	150
10A	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	60	80
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	60	80
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	60	80
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	60	80
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	60	80
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	60	80
20A	0(DC)	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	/	35	45
	10-45	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg.	35	45
	45-66	$\pm(0.1\% \text{ rdg.} + 0.1\% \text{ F.S.})$	YES	+ 0.2% rdg.	35	45
	66-1K	$\pm(0.1\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.5% rdg (66~200Hz)	35	45
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.3\% \text{ F.S.})$	YES	/	35	45
	10K-10 0K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	35	45

When the crest factor is 6

Range	CF=6					
2.5mA	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
2.5mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	2000	3000
	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg.	2000	3000
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+ 0.4% rdg.	2000	3000
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+1% rdg (66~200Hz)	2000	3000
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	2000	3000
	10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	2000	3000
	5mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	1000
5mA	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg.	1000	1500
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+ 0.4% rdg.	1000	1500
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg (66~200Hz)	1000	1500
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	1000	1500
	10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	1000	1500
	10mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	500
10mA	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+1%rdg.	500	800
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+0.4%rdg.	500	800
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+1%rdg (66~200Hz)	500	800
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	500	800
	10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	500	800
	25mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	200
25mA	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg.	200	300
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+ 0.4% rdg.	200	300
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg (66~200Hz)	200	300
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	200	300
	10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	200	300
	50mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	100
50mA	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg.	100	150
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+ 0.4% rdg.	100	150
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg (66~200Hz)	100	150
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	100	150
	10K-100K	±(10% rdg.+ 1% F.S.)	YES	/	100	150
	100mA	0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	70
100mA	10-45	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg.	70	90
	45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+ 0.4% rdg.	70	90
	66-1K	±(0.2% rdg.+ 0.4% F.S.)	YES	+ 1% rdg (66~200Hz)	70	90
	1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/	70	90

	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	70	90
250mA	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	2000	3000
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	2000	3000
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	2000	3000
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	2000	3000
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	2000	3000
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	2000	3000
0.5A	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	1000	1500
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	1000	1500
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	1000	1500
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	1000	1500
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	1000	1500
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	1000	1500
1A	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	500	800
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	500	800
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	500	800
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	500	800
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	500	800
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	500	800
2.5A	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	200	300
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	200	300
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	200	300
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	200	300
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	200	300
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	200	300
5A	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	120	160
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	120	160
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	120	160
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	120	160
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	120	160
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	120	160
10A	0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	70	90
	10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.	70	90
	45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.	70	90
	66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	70	90
	1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/	70	90
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	70	90

9.1.4 External current sensor 1 Accuracy

Item	Specification	
Requirements	Humidity	30 ~ 75%RH
	Input waveform	Sine wave, common-mode voltage: 0V
	Frequency filter	Turn on to measure voltage or current of 200Hz
	30 minutes after warm-up time has passed.	

When the crest factor is 3

Range	CF=3					
2.5V	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
	0(DC)	±(3% F.S.)	YES	/	400	600
	10-45	±(3% F.S.)	YES	+ 0.5% rdg.	400	600
	45-66	±(3% F.S.)	YES	+ 0.2% rdg.	400	600
	66-1K	±(3% F.S.)	YES	+ 0.5% rdg (66~200Hz)	400	600
	1K-10K	±(0.7% rdg.+ 3% F.S.)	YES	/	400	600
10K-100K	±(5% rdg.+ 3% F.S.)	YES	/	400	600	
5V	0(DC)	±(2% F.S.)	YES	/	200	300
	10-45	±(2% F.S.)	YES	+ 0.5% rdg.	200	300
	45-66	±(2% F.S.)	YES	+ 0.2% rdg.	200	300
	66-1K	±(2% F.S.)	YES	+ 0.5% rdg (66~200Hz)	200	300
	1K-10K	±(0.7% rdg.+ 2% F.S.)	YES	/	200	300
	10K-100K	±(5% rdg.+ 2% F.S.)	YES	/	200	300
10V	0(DC)	±(1.5% F.S.)	YES	/	100	150
	10-45	±(1.5% F.S.)	YES	+ 0.5% rdg.	100	150
	45-66	±(1.5% F.S.)	YES	+ 0.2% rdg.	100	150
	66-1K	±(1.5% F.S.)	YES	+ 0.5% rdg (66~200Hz)	100	150
	1K-10K	±(0.7% rdg.+ 1.5% F.S.)	YES	/	100	150
	10K-100K	±(5% rdg.+ 1.5% F.S.)	YES	/	100	150

When the crest factor is 6

Range	CF=6					
2.5V	Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
	0(DC)	±(6% F.S.)	YES	/	800	1200
	10-45	±(6% F.S.)	YES	+ 1% rdg.	800	1200
	45-66	±(6% F.S.)	YES	+ 0.4% rdg.	800	1200
	66-1K	±(6% F.S.)	YES	+ 1% rdg (66~200Hz)	800	1200
	1K-10K	±(1.4% rdg.+ 6% F.S.)	YES	/	800	1200
10K-100K	±(10% rdg.+ 6% F.S.)	YES	/	800	1200	

5V	0(DC)	±(4% F.S.)	YES	/	400	600
	10-45	±(4% F.S.)	YES	+ 1% rdg.	400	600
	45-66	±(4% F.S.)	YES	+ 0.4% rdg.	400	600
	66-1K	±(4% F.S.)	YES	+ 1% rdg (66~200Hz)	400	600
	1K-10K	±(1.4% rdg.+4% F.S.)	YES	/	400	600
	10K-100 K	±(10% rdg.+ 4% F.S.)	YES	/	400	600
10V	0(DC)	±(3% F.S.)	YES	/	200	300
	10-45	±(3% F.S.)	YES	+ 1% rdg.	200	300
	45-66	±(3% F.S.)	YES	+ 0.4% rdg.	200	300
	66-1K	±(3% F.S.)	YES	+ 1% rdg (66~200Hz)	200	300
	1K-10K	±(1.4% rdg.+ 3% F.S.)	YES	/	200	300
	10K-100 K	±(10% rdg.+ 3% F.S.)	YES	/	200	300

9.1.5 External current sensor 2 Accuracy

Item	Specification	
Requirements	Humidity	30 ~ 75%RH
	Input waveform	Sine wave, common-mode voltage: 0V
	Frequency filter	Turn on to measure voltage or current of 200Hz
	30 minutes after warm-up time has passed.	

When the crest factor is 3

Range	CF=3					
50mV	Frequency (Hz)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
	0(DC)	±(3% F.S.)	YES	/	1000	1500
	10-45	±(3% F.S.)	YES	+ 0.5% rdg.	1000	1500
	45-66	±(3% F.S.)	YES	+ 0.2% rdg.	1000	1500
	66-1K	±(3% F.S.)	YES	+0.5%rdg (66~200Hz)	1000	1500
	1K-10K	±(0.7% rdg.+ 3% F.S.)	YES	/	1000	1500
10K-100 K	±(5% rdg.+ 3% F.S.)	YES	/	1000	1500	
100mV	0(DC)	±(2% F.S.)	YES	/	500	800
	10-45	±(2% F.S.)	YES	+ 0.5% rdg.	500	800
	45-66	±(2% F.S.)	YES	+ 0.2% rdg.	500	800
	66-1K	±(2% F.S.)	YES	+0.5%rdg (66~200Hz)	500	800
	1K-10K	±(0.7% rdg.+ 2% F.S.)	YES	/	500	800
	10K-100 K	±(5% rdg.+ 2% F.S.)	YES	/	500	800
200mV	0(DC)	±(1.5% F.S.)	YES	/	250	400
	10-45	±(1.5% F.S.)	YES	+ 0.5% rdg.	250	400
	45-66	±(1.5% F.S.)	YES	+ 0.2% rdg.	250	400
	66-1K	±(1.5% F.S.)	YES	+0.5%rdg (66~200Hz)	250	400

	1K-10K	$\pm(0.7\% \text{ rdg.} + 1.5\% \text{ F.S.})$	YES	/	250	400
	10K-100K	$\pm(5\% \text{ rdg.} + 1.5\% \text{ F.S.})$	YES	/	250	400
500mV	0(DC)	$\pm(0.9\% \text{ F.S.})$	YES	/	100	150
	10-45	$\pm(0.9\% \text{ F.S.})$	YES	+ 0.5% rdg.	100	150
	45-66	$\pm(0.9\% \text{ F.S.})$	YES	+ 0.2% rdg.	100	150
	66-1K	$\pm(0.9\% \text{ F.S.})$	YES	+0.5%rdg (66~200Hz)	100	150
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.9\% \text{ F.S.})$	YES	/	100	150
	10K-100K	$\pm(5\% \text{ rdg.} + 0.9\% \text{ F.S.})$	YES	/	100	150
1V	0(DC)	$\pm(0.7\% \text{ F.S.})$	YES	/	60	80
	10-45	$\pm(0.7\% \text{ F.S.})$	YES	+ 0.5% rdg.	60	80
	45-66	$\pm(0.7\% \text{ F.S.})$	YES	+ 0.2% rdg.	60	80
	66-1K	$\pm(0.7\% \text{ F.S.})$	YES	+0.5% rdg (66~200Hz)	60	80
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.7\% \text{ F.S.})$	YES	/	60	80
	10K-100K	$\pm(5\% \text{ rdg.} + 0.7\% \text{ F.S.})$	YES	/	60	80
2V	0(DC)	$\pm(0.5\% \text{ F.S.})$	YES	/	35	45
	10-45	$\pm(0.5\% \text{ F.S.})$	YES	+ 0.5% rdg.	35	45
	45-66	$\pm(0.5\% \text{ F.S.})$	YES	+ 0.2% rdg.	35	45
	66-1K	$\pm(0.5\% \text{ F.S.})$	YES	+0.5% rdg (66~200Hz)	35	45
	1K-10K	$\pm(0.7\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	35	45
	10K-100K	$\pm(5\% \text{ rdg.} + 0.5\% \text{ F.S.})$	YES	/	35	45

When the crest factor is 6

Range	CF=6					
	Frequency (Hz)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm
50mV	0(DC)	$\pm(6\% \text{ F.S.})$	YES	/	2000	3000
	10-45	$\pm(6\% \text{ F.S.})$	YES	+ 1% rdg.	2000	3000
	45-66	$\pm(6\% \text{ F.S.})$	YES	+ 0.4% rdg.	2000	3000
	66-1K	$\pm(6\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	2000	3000
	1K-10K	$\pm(1.4\% \text{ rdg.} + 6\% \text{ F.S.})$	YES	/	2000	3000
	10K-100K	$\pm(10\% \text{ rdg.} + 6\% \text{ F.S.})$	YES	/	2000	3000
100mV	0(DC)	$\pm(6\% \text{ F.S.})$	YES	/	1000	1500
	10-45	$\pm(6\% \text{ F.S.})$	YES	+ 1% rdg.	1000	1500
	45-66	$\pm(6\% \text{ F.S.})$	YES	+ 0.4% rdg.	1000	1500
	66-1K	$\pm(6\% \text{ F.S.})$	YES	+ 1%rdg (66~200Hz)	1000	1500
	1K-10K	$\pm(1.4\% \text{ rdg.} + 6\% \text{ F.S.})$	YES	/	1000	1500
	10K-100K	$\pm(10\% \text{ rdg.} + 6\% \text{ F.S.})$	YES	/	1000	1500
200mV	0(DC)	$\pm(3\% \text{ F.S.})$	YES	/	500	800
	10-45	$\pm(3\% \text{ F.S.})$	YES	+ 1% rdg.	500	800

	45-66	$\pm(3\% \text{ F.S.})$	YES	+ 0.4% rdg.	500	800
	66-1K	$\pm(3\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	500	800
	1K-10K	$\pm(1.4\% \text{ rdg.} + 3\% \text{ F.S.})$	YES	/	500	800
	10K-10 0K	$\pm(10\% \text{ rdg.} + 3\% \text{ F.S.})$	YES	/	500	800
500mV	0(DC)	$\pm(1.8\% \text{ F.S.})$	YES	/	200	300
	10-45	$\pm(1.8\% \text{ F.S.})$	YES	+ 1% rdg.	200	300
	45-66	$\pm(1.8\% \text{ F.S.})$	YES	+ 0.4% rdg.	200	300
	66-1K	$\pm(1.8\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	200	300
	1K-10K	$\pm(1.4\% \text{ rdg.} + 1.8\% \text{ F.S.})$	YES	/	200	300
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1.8\% \text{ F.S.})$	YES	/	200	300
1V	0(DC)	$\pm(1.4\% \text{ F.S.})$	YES	/	120	160
	10-45	$\pm(1.4\% \text{ F.S.})$	YES	+ 1% rdg.	120	160
	45-66	$\pm(1.4\% \text{ F.S.})$	YES	+ 0.4% rdg.	120	160
	66-1K	$\pm(1.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	120	160
	1K-10K	$\pm(1.4\% \text{ rdg.} + 1.4\% \text{ F.S.})$	YES	/	120	160
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1.4\% \text{ F.S.})$	YES	/	120	160
2V	0(DC)	$\pm(1\% \text{ F.S.})$	YES	/	70	90
	10-45	$\pm(1\% \text{ F.S.})$	YES	+ 1% rdg.	70	90
	45-66	$\pm(1\% \text{ F.S.})$	YES	+ 0.4% rdg.	70	90
	66-1K	$\pm(1\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)	70	90
	1K-10K	$\pm(1.4\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	70	90
	10K-10 0K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/	70	90

Waveform display and peak display data are reference values.

9.1.6 Active Power Accuracy

Item	Specification	
Requirements	Humidity	30 ~ 75%RH
	Input waveform	Sine wave, common-mode voltage: 0V, power factor: 1
	Frequency filter	Turn on to measure voltage or current of 200Hz
	30 minutes after warm-up time has passed.	

Resolution

Range		Voltage Range					
		15V	30V	60V	150V	300V	600V
Current Range	5mA	0.001mW	0.01mW	0.01mW	0.01mW	0.1mW	0.1mW
	10mA	0.01mW	0.01mW	0.01mW	0.1mW	0.1mW	0.1mW
	20mA	0.01mW	0.01mW	0.01mW	0.1mW	0.1mW	1mW
	50mA	0.01mW	0.1mW	0.1mW	1mW	1mW	1mW
	100mA	0.1mW	0.1mW	0.1mW	1mW	1mW	1mW
	200mA	0.1mW	0.1mW	1mW	1mW	1mW	1mW
	500mA	0.1mW	1mW	1mW	1mW	10mW	10mW
	1A	1mW	1mW	1mW	10mW	10mW	10mW

	2A	1mW	1mW	10mW	10mW	10mW	0.1W
	5A	1mW	10mW	10mW	10mW	0.1W	0.1W
	10A	10mW	10mW	10mW	0.1W	0.1W	0.1W
	20A	10mW	10mW	0.1W	0.1W	0.1W	1W

When the crest factor is 3

CF=3							
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm		
0(DC)	±(0.1% rdg.+ 0.2% F.S.)	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.		
10-45	±(0.3% rdg.+ 0.2% F.S.)	YES	+1%rdg.				
45-66	±(0.1% rdg.+ 0.1% F.S.)	YES	+0.3%rdg.				
66-1K	±(0.2% rdg.+ 0.2% F.S.)	YES	+1%rdg (66~200Hz)				
1K-10K	±(0.7% rdg.+ 0.3% F.S.)	YES	/				
10K-100K	±(5% rdg.+ 0.5% F.S.)	YES	/				

Influence of power factor:	<p>When the power factor is 0, the accuracy is increased by $\pm\{(0.2+0.2*f)\%$ of S } in basic accuracy. (S: apparent power, f is frequency of input signal in kHz.)</p> <p>When the power factor is 0~1, the accuracy is increased by $\{(power\ reading)*(power\ reading\ error)\%+(power\ range\ error)\%*(power\ range/indicated\ apparent\ power\ value)+\tan\phi * 0.2\% * S\}$ in basic accuracy. (S: apparent power, Φ: phase angle of the Voltage and current)</p>
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When the crest factor is 6

CF=6							
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm		
0(DC)	±(0.2% rdg.+ 0.4% F.S.)	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.		
10-45	±(0.6% rdg.+ 0.4% F.S.)	YES	+ 2% rdg.				
45-66	±(0.2% rdg.+ 0.2% F.S.)	YES	+0.6% rdg.				
66-1K	±(0.4% rdg.+ 0.4% F.S.)	YES	+2%rdg (66~200Hz)				
1K-10K	±(1.4% rdg.+ 0.6% F.S.)	YES	/				
10K-100K	±(10% rdg.+ 1% F.S.)	YES	/				

K	F.S.)				
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Influence of power factor:	<p>When the power factor is 0, the accuracy is increased by $\pm\{(0.4+0.4*f)\%$ of S } in basic accuracy. (S: apparent power, f is frequency of input signal in kHz.)</p> <p>When the power factor is 0~1, the accuracy is increased by $\{2*(\text{power reading})*(\text{power reading error})\%+ 2*(\text{power range error})\%*(\text{power range}/\text{indicated apparent power value})+ 2*\tan\phi * 0.2\% * S \}$ in basic accuracy. (S: apparent power, Φ: phase angle of the Voltage and current)</p>
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9.1.7 Apparent Power Accuracy

(Turn on the frequency filter, when the frequency of measurement voltage or current is less than or equal to 200Hz.)

Resolution

Range		Voltage Range					
		15V	30V	60V	150V	300V	600V
Current Range	5mA	0.001mVA	0.01mVA	0.01mVA	0.01mVA	0.1mVA	0.1mVA
	10mA	0.01mVA	0.01mVA	0.01mVA	0.1mVA	0.1mVA	0.1mVA
	20mA	0.01mVA	0.01mVA	0.01mVA	0.1mVA	0.1mVA	1mVA
	50mA	0.01mVA	0.1mVA	0.1mVA	1mVA	1mVA	1mVA
	100mA	0.1mVA	0.1mVA	0.1mVA	1mVA	1mVA	1mVA
	200mA	0.1mVA	0.1mVA	1mVA	1mVA	1mVA	1mVA
	500mA	0.1mVA	1mVA	1mVA	1mVA	10mVA	10mVA
	1A	1mVA	1mVA	1mVA	10mVA	10mVA	10mVA
	2A	1mVA	1mVA	10mVA	10mVA	10mVA	0.1VA
	5A	1mVA	10mVA	10mVA	10mVA	0.1VA	0.1VA
	10A	10mVA	10mVA	10mVA	0.1VA	0.1VA	0.1VA
	20A	10mVA	10mVA	0.1VA	0.1VA	0.1VA	1VA

When the crest factor is 3

CF=3						
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm	
0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.	
10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg.			
45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.})$	YES	+ 0.4% rdg.			
66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)			
1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.})$	YES	/			
10K-100K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.})$	YES	/			

When the crest factor is 6

CF=6						
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm	

0(DC)	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.})$	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.
10-45	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.})$	YES	+ 2% rdg.		
45-66	$\pm(0.4\% \text{ rdg.} + 0.4\% \text{ F.S.})$	YES	+ 0.8% rdg.		
66-1K	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.})$	YES	+ 2% rdg (66~200Hz)		
1K-10K	$\pm(2.8\% \text{ rdg.} + 1.2\% \text{ F.S.})$	YES	/		
10K-100K	$\pm(20\% \text{ rdg.} + 2\% \text{ F.S.})$	YES	/		

Accuracy of power Factor	$\pm[(PF - PF/1.0002) + \cos\Phi - \cos\{\Phi + \sin^{-1}((0.2 + 0.2 * f) \% / 100)\}] \pm 1 \text{dgt}$ (f is frequency of input signal in kHz.) The voltage and current values are in rated range, Φ is the phase difference between the Voltage and current.
Accuracy of phase difference	$\pm[\Phi - \cos^{-1}(PF/1.0002) + \sin^{-1}\{(0.2 + 0.2 * f) \% / 100\}] \text{deg} \pm 1 \text{dgt}$ (f is frequency of input signal in kHz.) The voltage and current values are in rated range.

9.1.8 Reactive power Accuracy

(Turn on the frequency filter, when the frequency of measurement voltage or current is less than or equal to 200Hz.)

Resolution

Range		Voltage Range					
		15V	30V	60V	150V	300V	600V
Current Range	5mA	0.001mvar	0.01mvar	0.01mvar	0.01mvar	0.1mvar	0.1mvar
	10mA	0.01mvar	0.01mvar	0.01mvar	0.1mvar	0.1mvar	0.1mvar
	20mA	0.01mvar	0.01mvar	0.01mvar	0.1mvar	0.1mvar	1mvar
	50mA	0.01mvar	0.1mvar	0.1mvar	1mvar	1mvar	1mvar
	100mA	0.1mvar	0.1mvar	0.1mvar	1mvar	1mvar	1mvar
	200mA	0.1mvar	0.1mvar	1mvar	1mvar	1mvar	1mvar
	500mA	0.1mvar	1mvar	1mvar	1mvar	10mvar	10mvar
	1A	1mvar	1mvar	1mvar	10mvar	10mvar	10mvar
	2A	1mvar	1mvar	10mvar	10mvar	10mvar	0.1var
	5A	1mvar	10mvar	10mvar	10mvar	0.1var	0.1var
	10A	10mvar	10mvar	10mvar	0.1var	0.1var	0.1var
20A	10mvar	10mvar	0.1var	0.1var	0.1var	1var	

When the crest factor is 3

CF=3						
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm	
0(DC)	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.} + (\frac{\sqrt{1.0004 - PF^2} - \sqrt{1 - PF^2}}{\sqrt{1 - PF^2}}) \times 100\% \text{ F.S.})$	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.	
10-45	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.} + (\frac{\sqrt{1.0004 - PF^2} - \sqrt{1 - PF^2}}{\sqrt{1 - PF^2}}) \times 100\% \text{ F.S.})$	YES	+1% rdg.			
45-66	$\pm(0.2\% \text{ rdg.} + 0.2\% \text{ F.S.} + (\frac{\sqrt{1.0004 - PF^2} - \sqrt{1 - PF^2}}{\sqrt{1 - PF^2}}) \times 100\% \text{ F.S.})$	YES	+ 0.4% rdg.			

66-1K	$\pm(0.2\% \text{ rdg.} + 0.4\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 100\% \text{ F.S.})$	YES	+ 1% rdg (66~200Hz)		
1K-10K	$\pm(1.4\% \text{ rdg.} + 0.6\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 100\% \text{ F.S.})$	YES	/		
10K-100K	$\pm(10\% \text{ rdg.} + 1\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 100\% \text{ F.S.})$	YES	/		

When the crest factor is 6

CF=6						
Frequency (HZ)	Accuracy(The following accuracy is the sum of the reading error and the range error)	Calibration Zero	When the line filter is turned ON	Temp.coefficient (23±5°C)ppm	Temp.coefficient (5-18°C/28-40°C)ppm	
0(DC)	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	/	The temperature coefficient of the current/voltage range takes the higher value.	The temperature coefficient of the current/voltage range takes the higher value.	
10-45	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	+ 2% rdg.			
45-66	$\pm(0.4\% \text{ rdg.} + 0.4\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	+ 0.8% rdg.			
66-1K	$\pm(0.4\% \text{ rdg.} + 0.8\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	+ 2% rdg (66~200Hz)			
1K-10K	$\pm(2.8\% \text{ rdg.} + 1.2\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	/			
10K-100K	$\pm(20\% \text{ rdg.} + 2\% \text{ F.S.} + (\frac{\sqrt{1.0004 - \text{PF}^2} - \sqrt{1 - \text{PF}^2}}{\sqrt{1 - \text{PF}^2}}) \times 2 \times 100\% \text{ F.S.})$	YES	/			

9.1.9 Frequency Measurement

Item	Specification	
Frequency measurement range	Data update interval	Measurement range
	0.1s	25Hz ≤ f ≤ 100kHz
	0.25s	10Hz ≤ f ≤ 100kHz
	0.5s	5Hz ≤ f ≤ 100kHz
	1s	2.5Hz ≤ f ≤ 100kHz
	2s	1.5Hz ≤ f ≤ 50kHz
5s	0.5Hz ≤ f ≤ 20kHz	
Accuracy	Accuracy: ±(0.06% of reading) Requirements: When crest factor is set to 3, the input signal level is greater than or equal to 20% of the measurement range. When crest factor is set to 6, the input signal level is greater than or equal to 40% of the measurement range. Turn on the frequency filter, when the frequency of measurement voltage or	

	current is less than or equal to 200Hz.
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Resolution

Range	Resolution
$f < 10\text{Hz}$	0.001 Hz
$10\text{Hz} \leq f < 100\text{Hz}$	0.01 Hz
$100\text{Hz} \leq f < 1000\text{Hz}$	0.1 Hz
$1\text{kHz} \leq f < 10\text{kHz}$	1 Hz
$10\text{kHz} \leq f < 100\text{kHz}$	10 Hz

9.1.10 Harmonic Measurement

Select voltage or current of each input element.

When PF=3, the input level is equal to or greater than 50% of the rated range.
 When PF=6, the input level is equal to or greater than 100% of the rated range.
 When fundamental frequency is less than or equal to 200Hz, the frequency filter must be opened.

When line filter is off, the accuracy shown below is the sum of reading and range errors.

Frequency	Voltage	Current	Power
$10\text{Hz} \leq f < 45\text{Hz}$	$\pm(0.15\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.15\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.15\% \text{ rdg.} + 0.50\% \text{ F.S.})$
$45\text{Hz} \leq f < 440\text{Hz}$	$\pm(0.15\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.15\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.25\% \text{ rdg.} + 0.50\% \text{ F.S.})$
$440\text{Hz} < f \leq 1\text{kHz}$	$\pm(0.20\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.20\% \text{ rdg.} + 0.35\% \text{ F.S.})$	$\pm(0.40\% \text{ rdg.} + 0.50\% \text{ F.S.})$
$1\text{kHz} < f \leq 2.5\text{kHz}$	$\pm(0.80\% \text{ rdg.} + 0.45\% \text{ F.S.})$	$\pm(0.80\% \text{ rdg.} + 0.45\% \text{ F.S.})$	$\pm(1.56\% \text{ rdg.} + 0.60\% \text{ F.S.})$
$2.5\text{kHz} < f \leq 5\text{kHz}$	$\pm(3.05\% \text{ rdg.} + 0.45\% \text{ F.S.})$	$\pm(3.05\% \text{ rdg.} + 0.45\% \text{ F.S.})$	$\pm(5.77\% \text{ rdg.} + 0.60\% \text{ F.S.})$

FFT data length: 1024.

Window function: Rectangle.

The fundamental frequency, sample rate, window width and upper limit of analysis orders are as follows:

Fundamental frequency	Sample rate	Window width	Upper limit of analysis orders
10Hz ~ 76Hz	f^*1024	1	50
76Hz ~ 152Hz	f^*512	2	32
152Hz ~ 305Hz	f^*256	4	16
305Hz ~ 610Hz	f^*128	8	8
610Hz ~ 1500Hz	f^*64	16	4

The upper limit of analysis orders can be decrease.

9.1.11 Integration

Mode	MANUAL, TIME and TInterval
Integral interval range	0000h00m00s~10000h00m00s
Overflowing count	When the intergral interval is up to the maximum intergral interval(10000h) or the integral value is up to the maximum or minimum display integral value, the integration operation will stop and hold the integral interval and value of this point. *WP: ± 99999 MWh q: ± 99999 MAh
Accuracy	Power: $\pm(\text{power accuracy} + 0.02\% \times \text{WS})$ Current: Select value except the current dc: $\pm(\text{current accuracy} + 0.02\% \text{ of the})$

	reading value). Select the current dc: $\pm(\text{current accuracy} + 0.02 \text{ of the range} \times \text{Integral interval (h)\%})$
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9.1.12 Oscilloscope Function

Grid numbers	300
Display format	p-p compressed data
Sample rate	100 kS/s approximately
Time axis	Select scale from: 500us/div、1ms/div、2ms/div、5ms/div、10ms/div、20ms/div、50ms/div、100ms/div、200ms/div、500ms/div。
Trigger type	Edge
Trigger mode	Auto, Normal or Single.
Trigger source	select the trigger source from the input signal of the input unit and the external clock signal.
Trigger edge	Rising edge, falling edge or arbitrary edge.
Trigger level	<ul style="list-style-type: none"> •When the trigger source is the voltage or current of the input unit, the setting range is from the center of the screen to the top(+100%) and bottom(-100%). Resolution: 0.1%. • When the trigger source is the external clock signal, the trigger level is TTL.
Vertical axis	Voltage waveform display: (one-third of the voltage range)/div Current waveform display: (one-third of the current range)/div
Turn on or off the waveform display	You can turn on or off each voltage or current waveform display.

9.1.13 Interface

USB Interface

Item	Specification
Interface type	Type B (socket)
Electrical and mechanical specifications	USB 2.0
Transmission speed	Maximum speed is 12Mbps
Port number	1
Power supply	Self-powered
Support service	Remote control
Support system	Run PC with Windows 7(SP4 version or update version), Windows XP or Windows Vista, standard USB interface.

USB peripheral equipment interface

Item	Specification
Interface type	Type A (socket)
Electrical and mechanical specifications	USB 2.0
Transmission speed	Maximum speed is 12Mbps
Port number	1
Power supply	Power supply 5V、500mA2 (per port)
Support USB large capacity memory	USB flash memory (meet USB Mass Storage Class Specification)
Support system	Run PC with Windows 7(SP4 version or update version), Windows XP or Windows Vista, standard USB interface.

GPIO Interface(Only for IT9100(G) series)

Item	Specification
Available equipment	America NI Company <ul style="list-style-type: none"> • AT-GPIB • PCI-GPIB or PCI-GPIB+ • PCMCIA-GPIB, PCMCIA-GPIB+ or PCIe-GPIB Drive program: NI-488.2M 1.60 or update version
Electrical and mechanical specifications	IEEE St'd 488-1978 (JIS C 1901-1987)
Functional specification	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Protocol	IEEE St'd 488.2-1992
Encoding	ISO (ASCII)
Mode	The address mode can be set.

Serial port (RS-232)

Item	Specification
Electrical Specification	Comply with EIA-232(RS-232) standard
Connection type	Point to point
Communication type	Full duplex
Synchronization	Start and stop can be synchronized.
Baud rate	The baud rate can be set(Default: 9600)
Start bit	1bit
Data length	7 or 8 bits
Parity bit	EVEN, ODD or None
Stop bit	1 or 2 bits

Ethernet Communication

Item	Specification
Port number	1
Interface	RJ-45
Electrical and mechanical specifications	IEEE802.3
Transmission system	Ethernet (100BASE-TX)
Transmission speed	Maximum speed: 100Mbps
Communication protocol	TCP/IP
Support equipment	FTP service、DHCP、DNS、Remote control (VXI-11)

Please contact ITECH for the corresponding information about the supportable USB device.

*The above specifications may be subject to change without prior notice.

9.2 IT9121H Specification

9.2.1 General Specification

AC input voltage	100VAC—240VAC 47-63HZ
Operating Environment	Temperature: 5°C ~ 40°C