



**National Institute of Metrology (Thailand)**

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**Price List**

Electrical Metrology Department						
Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
1	DC Voltage Standard	1.018 V	0.9 $\mu$ V/V	12,500/piece		09010-10110
		10 V	0.4 $\mu$ V/V	+ 6,750/next point		
	Standard Cell	1 V / 1.018 V	0.9 $\mu$ V/V	12,500/piece		
2	DC Voltage Standard	1 V / 1.018 V	0.09 $\mu$ V/V	36,000/piece	Compared against JJVS maintained by NIMT.	09010-10112
		10 V	0.03 $\mu$ V/V			
3	Picoammeter	2 pA to 200 mA	0.1 mA/A to 0.01 mA/A	6,750 to 11,250/piece	Used volt-ampere method.	09010-10320
4	Electrometer	2 nC to 200 $\mu$ C	0.1 mC/C	6,750 to 11,250/ piece		09010-10321
5	AC/DC Transfer Standard	AC-DC Transfer Difference 2 mV to 20 V Frequency: 10 Hz to 1 MHz	8 $\mu$ V/V to 0.22 mV/V	90,000/item		09020-10510
		AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
6	Thermal Transfer Standard	AC-DC Transfer Difference 0.5 V to 20 V Frequency: 10 Hz to 1 MHz	8 $\mu$ V/V to 0.22 mV/V	67,500/item		09020-10511
		AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
7	Thermal Voltage Converter Standard	AC-DC Transfer Difference 0.5 V to 20 V Frequency: 10 Hz to 1 MHz	8 $\mu$ V/V to 0.22 mV/V	9,000/item		09020-10512
		AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
8	AC Measurement Standard	AC-DC Transfer Difference 10 mV to 20 V Frequency: 10 Hz to 1 MHz	8 $\mu$ V/V to 0.12 mV/V	67,500 to 78,750 /item	Excluded WB option.	09020-10520
		AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
		AC Voltage 10 mV to 20 V Frequency: 10 Hz to 1 MHz	11 $\mu$ V/V to 0.18 mV/V	78,750 to 85,500 /item	Included WB option.	09020-10521
		AC Voltage > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
9	Alternating Voltage Measurement Standard	AC Voltage 100 mV to 20 V Frequency: 10 Hz to 1 MHz	11 $\mu$ V/V to 0.18 mV/V	67500/item		09020-10522
		AC Voltage > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
10	AC Voltage Current Standard	AC Voltage 100 mV to 1000V Frequency 60 Hz and 400 Hz	18 $\mu$ V/V to 0.58 mV/V	18,130 to 21,700/item		09020-10560



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		AC Current 100 mA to 30 A Frequency 60 Hz and 400 Hz	50 $\mu$ A/A to 0.12 mA/A			



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11	Multifunction Transfer Standard	AC Voltage 100 mV to 20 V Frequency: 10 Hz to 1 MHz	11 $\mu$ V/V to 0.18 mV/V	78750/item		09020-10561
		AC Voltage > 20 V to 1000 V Frequency: 10 Hz to 100 kHz				
		AC Current 100 $\mu$ V to 10 A Frequency: 10 Hz to 10 kHz	50 $\mu$ A/A to 0.12 mA/A			
12	AC Current Shunt	AC-DC Transfer Difference 5 mA to 100 A Frequency: 10 Hz to 100 kHz	18 $\mu$ A/A to 0.20 mA/A	6,750 to 11,250/item		09020-10610
13	AC-DC current transfer standard	30 A to 100 A	$\geq$ 23 mA/A	11,250 / range	AC-DC current transfer	09020-10611
14	Low level ac-dc voltage transfer by micro potentiometer	2 mV to 200 mV	$\geq$ 44 mV/V	66,250 /item	AC-DC voltage transfer	09020-10612
15	DC Standard Resistor	1 k $\Omega$	0.14 $\mu\Omega/\Omega$	42,500/item	Compared against QHR standard maintain by NIMT using automatic resistance bridge.	09030-10210
16	Standard Resistor 1 $\Omega$	1 $\Omega$ at 50 mA	$\geq$ 0.21 $\mu\Omega/\Omega$	8,625/piece	Used a group of 1 $\Omega$ standard.	09030-10211
17	Standard Resistor 10 k $\Omega$	10 k $\Omega$ at 0.3 mA	$\geq$ 1.4 $\mu\Omega/\Omega$	8,625/piece	Used a group of 10 k $\Omega$ standard.	09030-10212
18	Standard Resistor 0 $\Omega$ to 10 T $\Omega$	100 $\mu\Omega$ at 200 A	As Specification	10,000/piece	Used DCC bridge and 400 Amp range extender.	09030-10213
19	Standard Resistor (Calibrate in oil or in air)	1 m $\Omega$ to 10 k $\Omega$	As specification	6,750/item	Used DCC bridge and 100 Amp range extender. Using Automatic High Resistance Bridge Using Dual Source High Resistance Ratio Bridge	09030-10214
		>10 k $\Omega$ to 1G $\Omega$	$\leq$ 500 $\mu\Omega/\Omega$	7,880/item		09030-10215
		1 G $\Omega$ to 1 T $\Omega$	37 $\mu\Omega/\Omega$ to 1.25 m $\Omega/\Omega$	7,880/item		
		1 T $\Omega$ to 100 T $\Omega$	>1.25 m $\Omega/\Omega$ to 24.4 m $\Omega/\Omega$	7,880/item		
		0 $\Omega$ to 1 T $\Omega$	As specification	2,250/point test		09030-10216
		10 T $\Omega$ at 100 V, 200 V 500 V and 1000 V	3 m $\Omega/\Omega$	2,250/point test		09030-10217
20	Decade Resistance Box	1 m $\Omega$ to 10 M $\Omega$	As specification	4,500 first decade + 3,380/next step		09030-10218
		10 M $\Omega$ to 1 T $\Omega$	As specification	9,900 first decade + 6,750/next step		09030-10219
21	Resistance Calibrator	0 $\Omega$ to 100 M $\Omega$	As specification	20,000/piece		09031-10210
22	Standard Resistor	Test Voltage: maximum 2500 V Range 100 M $\Omega$ to 1 T $\Omega$	As Specification	2,250 / point	Used Volt Amp Method	09031-10211
23	High Resistance Meter	Upto 1 T $\Omega$	As specification	2,250 / point	Direct	09030-10220
24	Digital Thermometer (indicator)	up to 10 M $\Omega$	$\leq$ 5 $\mu\Omega/\Omega$	(22,500 to 29,250)/item		09030-10221



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			$\geq 5 \mu\Omega/\Omega$	(9,000 to 18,000)/item		09030-10222
25	Low Resistance meter	Range 1 k $\Omega$ maximum Current 0.5 A	As Specification	2,250 / point	Direct measurement	09030-10223
		Range 100 $\Omega$ maximum Current 1 A				
		Range 10 $\Omega$ maximum Current 5 A				
		Range 1 $\Omega$ maximum Current 10 A				
		Range 0.1 $\Omega$ maximum Current 20 A				
		Range 0.01 $\Omega$ maximum Current 30 A				
		Range 1 m $\Omega$ maximum Current 100 A				
26	High Resistance Meter	Test Voltage: maximum 5000 V	As Specification	2,250 / point		09030-10224
		Range 10 M $\Omega$ , 20 M $\Omega$ and 50 M $\Omega$				
		Range 100 M $\Omega$ , 200 M $\Omega$ and 500 M $\Omega$				
		Range 1 G $\Omega$ , 2 G $\Omega$ and 5 G $\Omega$				
		Range 10 G $\Omega$ , 20 G $\Omega$ and 50 G $\Omega$				
		Range 100 G $\Omega$ , 200 G $\Omega$ and 500 G $\Omega$				
27	Low Resistance meter (High Current)	:100 m $\Omega$ , 200 m $\Omega$ , 400 n $\Omega$ , 600 m $\Omega$ and 800 m $\Omega$ @ Max.120 A	As Specification	2,250 / point		09030-10225
		: 1 m $\Omega$ , 2 m $\Omega$ , 4 m $\Omega$ , 6 m $\Omega$ and 8 m $\Omega$ @ Max 100 A				
		: 10 m $\Omega$ , 20 m $\Omega$ , 40 m $\Omega$ , 60 m $\Omega$ and 80 m $\Omega$ @ Max 60 A				
		: 0.1 $\Omega$ , 0.2 $\Omega$ , 0.4 $\Omega$ , 0.6 $\Omega$ and 0.8 $\Omega$ @ Max 10 A				
		: 1 $\Omega$ , 2 $\Omega$ , 4 $\Omega$ , 6 $\Omega$ , 8 $\Omega$ and 16 $\Omega$ @ Max 1 A				



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		: 40 Ω, 80 Ω @ Max 1 A				
28	Low Resistance Meter	Range 10 mΩ to 10 MΩ	As Specification	2,250 / point		09030-10226
29	High Resistance meter	Range 10 MΩ to 10 TΩ Maximum test Voltage: 5 kV	As Specification	2,250 / point		09030-10227
30	Decade Resistance 0.001 Ω to <1 Ω	0.001 Ω to <1 Ω	As Specification	7,000/knob	Direct measurement	09030-10228
31	Decade Resistance 1 Ω to <1 MΩ	1 Ω to <1 MΩ	As Specification	10,000/knob	Direct measurement	09030-10229
32	Decade Resistance 1 MΩ to <10 TΩ	1 MΩ to <10 TΩ	As Specification	10,000/knob	Direct measurement	09030-10230
33	Standard Watt Converter	Volt : 600 V Current : 100 A AC Power : 60 kW Frequency : 50 Hz, 60 Hz Power Factor : ± 0 to 1	> 60 μW/VA	18,000 to 39,500/item		09050-10710
34	AC Wattmeter, Digital Power Meter	Volt : 1000 V  Current : 80 A  AC Power : 80 kW  Frequency : 15 Hz to 450 Hz  Power Factor : ± 0 to 1	> 100 μW/VA	6,750 to 13,500/Channel		09050-10711
35	Energy Meter	Energy 1.5 Ws to 3600 kWs  Voltage 15 V to 600 V  Current 0.1 A to 100 A  Power Factor 1 to 0	≥ 100 μWh/ VAh	6,750 to 13,500/Channel		09050-10712



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
		(Inductive or Capacitive) Frequency 50 Hz to 60 Hz Measurement time 1s to 60 s				
36	Electrical Power Source	Power 1.5 W to 60 kW Frequency 50 Hz to 60 Hz Power Factor 1 to 0 (Inductive or Capacitive) Voltage 3 V to 1000 V Current 0.05 A to 100 A Frequency 15 Hz to 6 kHz	Power $\geq 70 \mu\text{W}/\text{VA}$  Voltage $\geq 30 \mu\text{V}/\text{V}$ Current $\geq 30 \mu\text{A}/\text{A}$ Phase $\geq 0.005^\circ$	9,000 to 45,000/item		09050-10713
37	DC Power Meter	Power: 1mW to 20 kW Voltage : 100 mV to 1000 V Current : 10 mA to 20 A	$\geq 40 \mu\text{W}/\text{W}$	6,750 to 13,500/Channel		09050-10714
38	Energy Source	Energy 41.67 mWh to 3.333 kWh Power: 0.5 W to 20 kW Voltage: 10 V to 1000 V Current: 0.05 A to 20 A Power Factor: 1 Frequency: 50 Hz to 60 Hz Time : 5 minute to 10 minute	$> 0.12 \%$	5,000 to 15,000 / item		09050-10715



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39	Three Phase Watt Meter,  Three Phase AC Power Meter,  Three Phase Comparator	Power : 4.5 W to 240 kW  Voltage : 15 V to 1000 V  Current : 0.1 A to 80 A  Power Factor : 1 to 0 (Inductive, Capacitive)  Frequency : 50 Hz to 60 Hz	100 $\mu$ W/VA to  370 $\mu$ W/VA	5,000 to 55,500 /Channel		09050-10716
40	Single phase /  Three phase energy meter	Energy : (0.0625 Wh to 5000 kWh) / phase  Power : (0.75 W to 50 kW) / phase  Voltage : 15 V to 1000 V  Current : 0.1 A to 50 A  Power Factor : 1 to 0.5 (Inductive ,Capacitive)  Frequency : 50 Hz to 60 Hz  Time : 300 sec to 100 hours	Single phase @ 300 s  515 $\mu$ Wh/Wh  to 565 $\mu$ Wh/Wh  Three phase @ 300 s  570 $\mu$ Wh/Wh  to 665 $\mu$ Wh/Wh	5,000 to 30,000 /Channel		09050-10717
41	Single Phase / Three Phase Watt Meter	AC Power : 0 W to 172.8 kW (three phase)	0.12 % for single phase	5,000 to 25,000 / channel	High burden	09050-10718



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
		: 0 W to 57.6 kW (per phase)  Voltage : 10 V to 480 V Current : 0.001 A to 120 A Power Factor : 1 to 0 (Inductive, capacitive) Frequency : 50 Hz to 60 Hz	0.20 % for three phase		Direct measurement	
42	AC Power Source (On-site)	AC Power : 0.15 W to 76.8 kW  Voltage : 60 V to 480 V Current : 0.005 A to 160 A Power Factor : 1 to 0.5 (Inductive) Frequency : 50 Hz to 60 Hz	100 $\mu$ W/W  to 215 $\mu$ W/W	5,000 to 28,000 /Channel	Direct measurement	09050-30710
43	Single phase energy meter,  Single phase power meter,  Three phase energy meter,	Energy : (0.01875 Wh to 76.8 kWh)/phase  Power : (0.0375 W to 76.8 kW)/phase  Voltage: 15 V to 480 V	<u>Single/Three phase (<math>\leq</math> 5 A)</u>  Power $\geq$ 400/450 $\mu$ W/W  Energy $\geq$ 400/550 $\mu$ Wh/Wh	2,500 to 10,000 /Channel	Comparison measurement  1. $\leq$ 5 A : single and three phases  2. $>$ 5 A to 160 A : single phase	09050-30711





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	Three phase power meter  (On-site)	Current : 0.005 A to 160 A  PF : 1 to 0.5 (Inductive)  Frequency : 50 Hz to 60 Hz  Time : 30 min to 1 hour	<u>Single phase (&gt; 5 A to 50 A)</u>  Power $\geq 200 \mu\text{W/W}$  Energy $\geq 400 \mu\text{Wh/Wh}$  <u>Single phase (&gt; 50 A to 160 A)</u>  Power $\geq 300 \mu\text{W/W}$  Energy $\geq 500 \mu\text{Wh/Wh}$			
44	Phase Meter	Phase Angle : 0.000° to + 360.000°  Frequency : 15 Hz to 100 kHz  Amplitude (rms) : 50 mV to 120 V	> 0.01°	9,000 to 27,000/item		09050-10920
45	Phase Source	Phase Angle : 0.000° to 999.999°  Frequency : 10 Hz to 100 kHz  Amplitude (rms) : 50 mV to 120 V	> 0.005 °	18,000 to 45,000/item		09050-10921
46	Phase Meter Current Shunt	Range : 0.1 A to 50 A  Phase Angle : 0.000° to $\pm 180^\circ$  Frequency : 16 Hz to 850 Hz	$\geq 0.002^\circ$	5,000 (5 pts)  + 800 / point		09050-10922
47	Power Analyzer, Harmonics and Flicker	Output Voltage : 1020 V  Output Current : 80 A	Voltage > 100 $\mu\text{V/V}$  Current > 150 $\mu\text{A/A}$	6,750 to 13,500/channel		09050-10930



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		Frequency : 20 Hz and up to 1 kHz Harmonics : 100 <sup>th</sup> , up to 6 kHz Flicker : 16 Hz to 9 kHz	Power > 200 $\mu$ W/VA Frequency > 50 $\mu$ Hz/Hz			
48	Power Analyzer, Dips/ Swells	Voltage: 10 V to 1000 V Current Current : 0.05 A to 20A Dip/Swell amplitude : 10 % to 140 % of nominal amplitude Time : 1 ms to 1 minute Frequency : 16 Hz to 850 Hz	$\geq 0.07$ %	2,250 to 9,000/ channel		09050-10931
49	Harmonic Current Meter	Current : 1 A to 120 A Fund. Frequency : 50 Hz and 60 Hz Harmonic current : 0.1 % to 10 % of fundamental Harmonics : 1st to 40th, Har. Frequency : 50 Hz to 2.4 kHz	<u>Harmonic &lt; 1 % of Fundamental</u> 0.07 % <u>Harmonic <math>\geq 1</math> % of Fundamental</u> 5.80 %	5,000 to 27,500/ channel	High burden Direct measurement	09050-10932
50	Harmonics Power Source	Harmonics Power (0.0025 to 10) % of Fundamental Power Power Factor of Harmonics 1 to 0.5, Inductive or Capacitive Harmonics order : 2nd to 100th Total Power : 20 W to 50 kW	0.32 mW/W to 8.2 mW/W	10,000 THB/channel (10 points)	1) Additional fee: 750 THB/ additional point 2) Digital sampling technique	09050-10933



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		Total Voltage : 50 V to 1000 V Total Current : 0.8 A to 50 A Power Factor of Fundamental 1 to 0.5, Inductive or Capacitive Fundamental Frequency : 50 Hz to 60 Hz				
51	DC Power Meter (20 A to 200 A)	Power: 200 W to 200 kW Voltage : 10 V to 1000 V Current : 20 A to 200 A	160 $\mu$ W/W to 325 $\mu$ W/W	7,500 THB (2 points)  / channel	7,500 THB for 2 points  2,500 THB/point for additional point	09050-10719
52	Wattmeter  AC Power Meter  Power Comparator  (Single Phase)	Power : 0 W to 12 kW Voltage: 60 V to 480 V Current : 0.1 A to 50 A PF: 1 to 0 (Inductive or Capacitive) Frequency : 50 Hz to 60 Hz	50 $\mu$ W/VA  to 65 $\mu$ W/VA	5,000 THB to 25,000 THB  / channel	Comparison measurement	09050-10720
53	Energy Meter with Pulse  (Single phase or Three phase)	Energy: 1.05 mWh to 833.3 Wh per phase Power: 0.75 W to 50 kW per phase Voltage: 15 V to 1000 V Current : 0.1 A to 50 A PF: 1 to 0.5 (inductive or Capacitive) Frequency : 50 Hz to 60 Hz	90 $\mu$ Wh/Wh  to 160 $\mu$ Wh/Wh	5,000 THB to 30,000 THB  / channel	Pulse comparison	09050-10721



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		Time : 5 s to 60 s				
54	Wattmeter AC Power Meter Wattmeter with AC Current Clamp AC Power Meter with AC Current Clamp (80 A to 120 A) (1 phase or 3 phase)	Power : 0 W to 120 kW per phase  Voltage: 15 V to 1000 V  Current : 80 A to 120 A  PF: 1 to 0 (inductive or Capacitive)  Frequency : 50 Hz to 60 Hz	135 $\mu$ W/VA  to 205 $\mu$ W/VA	5,000 THB to 25,000 THB  / channel		09050-10722
55	Wattmeter with AC Current Clamp AC Power Meter with AC Current Clamp (500 A to 6000 A) (1 phase or 3 phase)	Power : 3.75 kW to 6000 kW per phase  Voltage: 15 V to 1000 V  Current : 500 A to 6000 A  PF: 1 to 0.5 (inductive)  Frequency : 50 Hz to 60 Hz	5.6 mW/W  to 6.8 mW/W	7,500 THB for 1st point  3,750 THB/point  for additional point  / channel	Current coil used	09050-10723
56	Single Phase AC Wattmeter Single Phase AC Power Meter	Reactive Power : 0 var to 50 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0 (inductive or capacitive)  Frequency : 50 Hz to 60 Hz	60 $\mu$ var/VA  to 125 $\mu$ var/VA	5,000 THB to 25,000 THB  / channel	Direct measurement	09050-10724



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57	Three Phase AC Wattmeter Three Phase AC Power Meter Three Phase Power Comparator	Reactive Power : 0 var to 150 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0 (inductive or capacitive)  Frequency : 50 Hz to 60 Hz	60 $\mu$ var/VA  to 125 $\mu$ var/VA	5,000 THB to 25,000 THB	Direct measurement	09050-10725
58	Single Phase Energy Meter with Pulse Output	Reactive Energy: 1.05 mvarh to 833.33 varh  Power: 0.75 var to 50 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0.5 (inductive or capacitive)  Frequency : 50 Hz to 60 Hz  Time : 5 s to 60 s	90 $\mu$ varh/varh  to 160 $\mu$ varh/varh	5,000 THB to 30,000 THB  / channel	Pulse comparison	09050-10726
59	Three Phase Energy Meter with Pulse Output	Reactive Energy: 3.15 mvarh to 2.5 kvarh  Power: 0.75 var to 50 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0.5 (inductive or capacitive)	90 $\mu$ varh/varh  to 160 $\mu$ varh/varh	5,000 THB to 30,000 THB	Pulse comparison	09050-10727



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		Frequency : 50 Hz to 60 Hz Time : 5 s to 60 s				
60	Single Phase Energy Meter (No Pulse)	Reactive Energy: 0.0625 varh to 16.667 kvarh  Power: 0.75 var to 50 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0.5 (inductive or capacitive)  Frequency : 50 Hz to 60 Hz  Time : 300 s to 1200 s	200 $\mu$ varh/varh  to 600 $\mu$ varh/varh	5,000 THB to 15,000 THB  / channel	Energy Packet	09050-10728
61	Three Phase Energy Meter (No Pulse)	Reactive Energy: 0.1875 varh to 50 kvarh  Power: 0.75 var to 50 kvar  Voltage: 15 V to 1000 V  Current : 0.1 A to 50 A  QF: 1 to 0.5 (inductive or capacitive)  Frequency : 50 Hz to 60 Hz	200 $\mu$ varh/varh  to 600 $\mu$ varh/varh	5,000 THB to 15,000 THB	Energy Packet	09050-10729
62	AC Voltage of Electrical Power Source	AC Voltage 0.1 V to 1000 V  Frequency 10 Hz to 1 kHz	30 $\mu$ V/V	5,000 THB to 50,000 THB  / channel	Digital Sampling Watt Meter, DSWM Method	09050-10730



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<b>Electrical Metrology Department</b>						
<b>Item No.</b>	<b>Description</b>	<b>Range</b>	<b>Accuracy / Uncertainty</b>	<b>Calibration Fee (THB)</b>	<b>Remark</b>	<b>Code</b>
63	AC Current of Electrical Power Source	AC Current 0.01A to 100 A  Frequency 10 Hz to 1 kHz	40 $\mu$ A/A	5,000 THB to 50,000 THB  / channel	Digital Sampling Watt Meter, DSWM Method	09050-10731
64	AC Voltage of AC power meter, or AC wattmeter	Voltage: 5 V to 1000 V  Frequency: 16 Hz to 850 Hz	0.049 mV/V  to 0.31 mV/V	2,500 THB to 25,000 THB  / channel	Direct measurement Method	09050-10732
65	AC Current of AC power meter, or AC wattmeter	Current: 0.01 A to 20 A  Frequency: 16 Hz to 850 Hz  Current: > 20 A to 80 A  Frequency: 40 Hz to 850 Hz	0.061 mA/A  to 0.177 mA/A	2,500 THB to 25,000 THB  / channel	Direct measurement Method	09050-10733
66	DC Power of Wattmeter	Power : 0.01 mW to 20 kW  Voltage: 0.01 V to 1000 V  Current : 0.001 mA to 20 A	0.15 mW/W  to 1.2 mW/W	2,500 THB to 25,000 THB  / channel	Direct measurement Method	09050-10734
67	DC Voltage of Wattmeter	Voltage: 0.01 V to 1000 V	0.02 mV/V  to 0.16 mV/V	2,500 THB to 25,000 THB  / channel	Direct measurement Method	09050-10735
68	DC Current of Wattmeter	Current: 0.01 A to 20 A	0.15 mA/A  to 1.2 mA/A	2,500 THB to 25,000 THB  / channel	Direct measurement Method	09050-10736
69	AC Voltage for VT with Wattmeter	AC Voltage 5 V to 1000 V  Frequency 16 Hz to 850 Hz	0.051 mV/V  to 0.086 mV/V	5,000 THB to 15,000 THB  / channel	Direct measurement	09050-10737
70	Harmonic Voltage for Power Source	Voltage 1 V to 1000 V	45 $\mu$ V/V	5,000 THB to 50,000 THB	Digital Sampling Technique	09050-10934



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
		Fund. Freq. 45 Hz to 65 Hz Harmonic Amplitude (0.1 % to 25 %) of Fundamental Harmonic order 0, 2nd to 100th Harmonic Frequency DC to 6 kHz		/ item		
71	Harmonic Current for Power Source	Current 0.01 A to 100 A Fund. Freq. 45 Hz to 65 Hz Harmonic Amplitude (0.1 % to 25 %) of Fundamental Harmonic order 0, 2nd to 100th Harmonic Frequency DC to 6 kHz	50 $\mu$ A/A	5,000 THB to 50,000 THB / item	Digital Sampling Technique	09050-10935
72	AC Current for CT with Wattmeter	AC Current: 0.01 A to 120 A Frequency: 16 Hz to 850 Hz	0.011 % to 0.028 %	5,000 THB to 15,000 THB / channel	Direct measurement	09050-10738
73	Flicker impedance of power quality measurement system	Nominal impedance @ 50 Hz (0.24 +j0.15) $\Omega$ for line impedance (016 + j0.10) $\Omega$ for neutral impedance	0.033%	5,000 THB to 15,000 THB / channel	Volt-Ampere method	09050-10936
74	Calibrator	DC Voltage : 0 V to 1 kV AC Voltage : 10 mV to 1 kV @ 10 Hz to 1 MHz	40 $\mu$ V/V to 0.6 $\mu$ V/V 3.03 mV/V to 20 $\mu$ V/V	13,500 to 33,750/item	2,000 to 9,000 THB/item for additional adjustment.	09110-11310





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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
		AC Voltage : 30 V to 1 kV @ 10 Hz to 100 kHz				
		DC Current : 0 A to 20 A	150 μA/A to 4.5 μA/A			
		AC Current : 100 mA to 20 A @ 10 Hz to 100 kHz	1.1 mA/A to 65 μA/A			
		Resistance : 0 Ω to 1 GΩ	1.3 mΩ/Ω to 1.8 μΩ/Ω			
	Wideband Option	Up to 30 MHz	As specification	11,250/option	3,000 THB/option for additional adjustment.	09110-11311
	Power Option	As specification	As specification	6,750/option	2,500 THB/option for additional adjustment.	09110-11312
	Scope Option	300 MHz	As specification	13,500/option	2,000 to 6,500 THB/option for additional adjustment.	09110-11313
		600 MHz to 1 GHz	As specification	18,000/option		09110-11314
	High Current	DC Current : 30 A	22 μA/A	11,250/piece		09110-11315
		AC Current : 30 A @ 10 Hz to 10 kHz	85 μA/A to 114 μA/A			
	Power Quality	AC Voltage -Delta Amplitude Verification, Static Condition 30 V, 300 V @ 50 Hz, 60 Hz -Delta Amplitude Verification, Flicker Condition 230 V@ 50 Hz	3.20 × 10 <sup>-5</sup> to 4.10 × 10 <sup>-5</sup>  4.13 × 10 <sup>-5</sup>	18,000/option		09110-11316



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
		Composite Harmonic Verification - Voltage 0.12 V to 450 V @ 50 Hz, 60 Hz Type Wave : I, II, III, IV, Square and NRC 7030 - Current 0.11 A to 9.5 A @ 50 Hz, 60 Hz Type Wave : VI, VII, IECA, IECD and NRC 7030	$1.87 \times 10^{-3}$ to $2.90 \times 10^{-1}$  $1.83 \times 10^{-3}$ to $1.52 \times 10^{-1}$			
75	Oscilloscope Calibrator	Up to 600 MHz	As specification	40,000/item	2,000 to 13,500 THB/item for additional adjustment.	09110-11317
		Up to 2.1 GHz	As specification	45,000/item		09110-11318
76	Amplifier / Precision Power Amplifier	Up to 1kV	As specification	9,000/item	2,500 THB/function for additional adjustment.	09110-11319
		10 Hz up to 100 kHz				
77	Digital Multimeter	6 1/2 digit	As specification	9,000 to 13,500/item	5,400 THB for additional adjustment.	09110-11320
		7 1/2 digit	As specification	13,500 to 22,500/item	6,750 THB for additional calibrate with AC/DC Shunt using direct measurement method	09110-11321
		8 1/2 digit	As specification	22,500 to 27,000/item		09110-11322
78	Nano Voltmeter	DC Voltage: 1 mV to 100 mV	As specification	11,250 to 13,500/item	2,500 THB for additional adjustment.	09110-10120
79	DC High Voltage Divider	-10 kV to 10 kV	$30 \times 10^{-6}$ (Ratio)	$\leq 10$ kV 4,500 first point + 2,250 next point	Compared against DC high voltage reference system.	09060-10810
		>10 kV to 100 kV	$30 \times 10^{-6}$ (Ratio)	> 10 kV 5,630 first point + 2,250 next point		09060-10811
80	DC High Voltage Divider (On-site),	200 kV	$\geq 30 \times 10^{-6}$ (Ratio)	60,000/item	Additional fee:	09060-30810



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Electrical Metrology Department						
Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
	DC High Voltage Measuring System (On-site)			(5 voltage levels)	(1) 7,500/additional voltage level (2) Linearity Test: 10,000 /for 5 voltage levels	
81	DC High Voltage Source	-10 kV to 100 kV	30 $\mu$ V/V	9,000 to 18,000/item	Compared against DC high voltage reference system.	09060-10812
82	DC High Voltage Source (On-site)	200 kV	$\geq 170 \mu$ V/V	60,000/item  (5 voltage levels)	Additional fee: (1) 7,500/additional voltage level (2) Linearity Test: 10,000 /for 5 voltage levels	09060-30811
83	DC High Voltage Meter	-10 kV to 100 kV	As specification	6,750 to 18,000/item	Compared against DC high voltage reference system.	09060-10813
84	DC High Voltage Meter (On-site)	200 kV	$\geq 30 \mu$ V/V	60,000/item  (5 voltage levels)	Additional fee: (1) 7,500/additional voltage level (2) Linearity Test: 10,000 /for 5 voltage levels	09060-30812
85	High Voltage Capacitance & Dissipation Factor	Capacitance 10 pF to 1000 pF  Voltage:10 kV to 100 kV Frequency : 50 Hz Dissipation Factor: 50 x 10 <sup>-6</sup> to 1 x 10 <sup>-3</sup>	$\geq 80 \mu$ F/F  for Capacitance $\geq 50 \times 10^{-6}$ for Dissipation Factor	12,500/item	Compared against standard capacitor using AC high voltage capacitance and inductance bridge.	09060-10820
		Capacitance 10 pF to 1000 pF  Voltage:10 kV to 200 kV Frequency : 50 Hz Dissipation Factor: 50 x 10 <sup>-6</sup> to 1 x 10 <sup>-3</sup>		17,500/item		09060-10821
86	AC High Voltage Divider	1 kV to 200 kV @ 50 Hz	$\geq 0.3 \%$ (Scale Factor)	11,500 to 27,500/item	Compared against AC high voltage	09060-10830



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
					reference system.	
87	AC High Voltage Meter	1 kV to 200 kV @ 50 Hz	As specification	9,000 to 27,000/item	Compared against AC high voltage reference system.	09060-10831
88	AC High Voltage Meter, AC High Voltage Measuring System (Vrms, Vpeak, Vpeak/√2 @ 50 Hz) (On-site)	100 kV	≥ 0.3 %	67,500/item ( 5 voltage levels)	Additional fee: (1) 7,500/additional voltage level (2) Linearity Test: 10,000 /for 5 voltage levels	09060-30830
		200 kV	≥ 0.3 %	82,500/item ( 5 voltage levels)		09060-30831
89	AC High Voltage Source	1 kV to 200 kV @ 50 Hz	≥ 0.3 %	11,500 to 23,000/item		09060-10832
90	Voltage Transformer	3.3 kV to 33 kV @ 50Hz/60 Hz	Ratio error ≥ 0.01 % Phase displacement ≥ 0.3 min	7,500 first tap + 1,900 next tap  per frequency, burden and power factor	Compared against voltage transformer reference system.  850 THB for additional point	09060-10833
91	Transformer Loss Measuring System (On-site)	up to 200 kV, up to 5 kA, 50/60 Hz	0.03 % @ p.f. = 1.0  0.14 % @ p.f. = 0.1  1.4 % @ p.f. = 0.01	56,250 for 3 power factors (4 points/power factor)  +2,500 for each additional point	On-site calibration of voltage transducers, and current transducers of the transformer loss measuring system are a prerequisite for this service.	09060-30834
92	Lightning Impulse Voltage Measuring System 1.2/50 μs	100 kV	Scale factor ≥ 1.1 %  Time parameter ≥ 1.7 %	23,750/ item	Additional fee for time to chopping (2.0 to 6.0) μs: 5,000 THB/point for MS rated ≤ 200 kV, and 10,000 THB/ point for MS rated ≤ 500 kV.	09060-10840
		200 kV		26,250/ Item		
		300 kV		31,250/ item		
		400 kV		33,750/ item		
		500 kV		36,250/ item		
93	Lightning Impulse Voltage Measuring System 1.2/50 μs	100 kV	Scale factor ≥ 1.1 %	71,250/ item (5 voltage levels)	Additional fee:  (1) 15,000/additional voltage level	09060-30840
		200 kV	Time parameter ≥ 2.2 %	78,750/ Item (5 voltage levels)		09060-30841



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
	(On-site)	300 kV		93,750/ item (5 voltage levels)	(2) Linearity Test: 20,000/for 5 voltage levels	09060-30842
		400 kV		101,250/ item (5 voltage levels)		09060-30843
		500 kV		108,750/ item (5 voltage levels)		09060-30844
94	Switching Impulse Voltage Measuring System 250/2500 $\mu$ s	100 kV 200 kV 300 kV 400 kV	Scale factor $\geq$ 0.8 % Time parameter $\geq$ 1.7 %	23,750/ item 26,250/ Item 31,250/ item 33,750/ item		09060-10841
95	Switching Impulse Voltage Measuring System 250/2500 $\mu$ s  (On-site)	100 kV 200 kV 300 kV 400 kV	Scale factor $\geq$ 1.1 %  Time parameter $\geq$ 2.2 %	71,250/ item (5 voltage levels) 78,750/ Item (5 voltage levels) 93,750/ item (5 voltage levels) 101,250/ item (5 voltage levels)	Additional fee:  (1) 15,000/additional voltage levels  (2) Linearity Test: 20,000/for 5 voltage levels	09060-30845 09060-30846 09060-30847 09060-30848
96	Partial Discharge Calibrator	1 pC-1000 pC	$\geq$ 1.7 %	15,000/ item (7 points x 2 polarities)	Additional fee: 1,500 /item for additional (1 point x 2 polarities)	09060-10850
97	Current Transformer	5 A to 1500 A @ 50 Hz/60 Hz	Ratio error $\geq$ 0.01 % Phase displacement $\geq$ 0.3 min	7,500 first tap + 1,900 next tap per frequency, burden and power factor	Compared against current transformer reference system. 850 THB for additional point	09060-10860
98	Rogowski Coil (current transducer), Rogowski Current Transducer	10 A to 1500 A @ 50 Hz/60 Hz	$\geq$ 0.5 %	7500/item (5 current levels) frequency 50 Hz or 60 Hz	Compared against current transformer reference system. Additional fee: 7500/additional 5 current levels	09060-10861
99	AC Resistance	1 $\Omega$ , 25 $\Omega$ , 100 $\Omega$ , 400 $\Omega$ at 60 Hz or 75 Hz	As Specification	9,000/piece		09040-10410



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Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code	
100	AC Resistor	1 Ω to 100 kΩ @ 1000 Hz	> 0.20 mΩ/Ω	5,000/piece	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09040-10411	
	Additional Measurement at another Frequency	1 Ω to 100 kΩ @ 100 Hz to 100 kHz	> 0.20 mΩ/Ω	1,250 per frequency		09040-10412	
101	Decade AC Resistor	1 Ω to 100 kΩ @ 1000 Hz	> 0.20 mΩ/Ω	5,000 first decade + 1,250 next step	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09040-10413	
	Additional Measurement at another Frequency	1 Ω to 100 kΩ @ 100 Hz to 100 kHz	> 0.20 mΩ/Ω	(4,500 first decade + 1,250 next step) per one frequency		09040-10414	
102	Fixed, Fused Silica Dielectric Standard Capacitors	10 pF @ 1000 Hz	0.087 μF/F	20,000/piece/frequency	Comparing with a group of 10 pF standards	09040-10420	
		1 pF @ 1000 Hz	0.71 μF/F	17,500/piece/frequency		Applied direct substitution method with the reference standard capacitors.	09040-10421
		10 pF @ 1000 Hz	0.70 μF/F				
		100 pF @ 1000 Hz	0.70 μF/F				
103	Fixed Three Terminal, Nitrogen Dielectric Standard Capacitors	10 pF 100 pF @ 1000 Hz and 1592 Hz	1.2 μF/F	12,500/piece/frequency	Applied a null method using the basic ratio bridge.	09040-10422	
		1000 pF @ 1000 Hz and 1592 Hz	3.5 μF/F				
		10000 pF @ 1000 Hz and 1592 Hz	7.0 μF/F				
104	Two or Three Terminal Mica Dielectric Standard Capacitors	0.001 μF, 0.01 μF, 0.1 μF and 1 μF @ 1000 Hz	> 0.12 mF/F	5,630/piece	Applied a null method using the basic ratio bridge.	09040-10423	
	Additional Measurement at another Frequency	0.001 μF, 0.01 μF, 0.1 μF and 1 μF @ 100, 120, 200, 400, 500 Hz, 2 kHz, 5 kHz, 10 kHz	> 0.12 mF/F	1,250/frequency	Applied a null method using the basic ratio bridge.	09040-10424	
105	2 Terminal Pair Capacitance Standard	1 pF, 10 pF, 100 pF, 1000 pF at 1000 Hz to 10 MHz	> 100 μF/F	10,000/Item	S-parameter with resonance frequency	09040-10437	
106	4 Terminal Pair Capacitance Standard	1 pF, 10 pF, 100 pF, 1000 pF at 1000 Hz to 30 MHz	> 63 μF/F	12,500/Item	S-parameter with resonance frequency	09040-10438	
107	Four-Terminal Pair Capacitance Standard	1 pF, 10 pF, 100 pF, 1000 pF, 0.01 μF, 0.1 μF and 1 μF @ 1000 Hz	> 0.12 mF/F	5,630/piece	Measured by precision capacitance bridge, direct measurement, at desired frequency.	09040-10425	
108	Additional Measurement at another Frequency	1 pF, 10 pF, 100 pF, 1000 pF, 0.01 μF, 0.1 μF and 1 μF @ 100 Hz to 100 kHz	> 0.20 mF/F	1,250/frequency	Measured by RLC Digibridge and/or Precision LCR Meter, direct measurement, at desired frequency.	09040-10426	



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109	Fixed Standard Capacitors	1 pF to 1 F @ 1000 Hz	> 0.20 mF/F	4,500/piece	Measured by RLC Digibridge and/or Precision LCR Meter, direct measurement,	09040-10427
	Additional Measurement at another Frequency	1 pF to 1 F @ 12 Hz to 1 MHz	> 0.20 mF/F	1,250/frequency		09040-10428
110	Decade capacitor	1 pF to 10 mF @ 1000 Hz	> 0.12 mF/F	5,000 first decade + 1,250 next step	Applied a null method using the basic ratio bridge.	09040-10429
		1 pF to 1 F @ 1000 Hz	> 0.20 mF/F	4,500 first decade + 1,250 next step		09041-10420
	Additional Measurement at another Frequency	1 pF to 1 F @ 12 Hz to 1 MHz	> 0.20 mF/F	(4,500 first decade + 1,250 next step) per one frequency	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09041-10421 09041-10422
111	Precision Capacitance Bridge	1 pF, 10 pF, 100 pF @ 1000 Hz or 1592 Hz	≥ 0.40 μF/F	27,500/item	Calibrated by comparing its reading against the reference standard capacitors. The correction functions are used to correct additional error due to the test fixture and test leads before measurement.	09041-10423
112	Fixed Standard Inductors	100 μH, 1 mH, 10 mH, 100 mH, 1 H and 10 H @ 100 Hz	> 0.16 mH/H	12,500/piece	Measured by the direct substitution method with the reference standard inductors.	09040-10430
		101 μH, 1 mH, 10 mH, 100 mH, 1 H and 10 H @ 1000 Hz	> 0.16 mH/H			
	Additional Measurement at another Frequency	100 μH, 1 mH, 10 mH, 100 mH, 1 H and 10 H @ 12 Hz to 1 MHz	> 0.20 mH/H	1,250/frequency	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09040-10431
113	Fixed standard Inductor	1 μH to 10 H @ 1 kHz	> 0.20 mH/H	5,630/piece	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09040-10432
	Additional Measurement at another Frequency	1 μH to 10 H @ 12 Hz to 1 MHz	> 0.20 mH/H	1,250/frequency		09040-10433
114	Decade Inductors	1 μH to 10 H @ 1000 Hz	> 0.20 mH/H	4,500 first decade + 1,250 next step	Measured by RLC digibridge and/or precision LCR meter, direct measurement, at desired frequencies.	09040-10434
	Additional Measurement at another	1 μH to 10 H @ 12Hz to 1 MHz	> 0.20 mH/H	(4,500 first decade		09040-10435



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	Frequency			+ 1,250 next step) per one frequency		
115	LCR Meter with 4 terminal pair configuration/without 4 terminal pair configuration	0.001 $\mu$ F, 0.01 $\mu$ F, 0.1 $\mu$ F and 1 $\mu$ F @ 100, 120, 200, 400, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz	> 0.12 mF/F	To be determined	Calibrated by comparing its reading against the standard capacitors, standard inductors and standard resistors. The correction functions are used to correct additional error due to the test fixture and test leads before measurement.* For 4 terminal pair configuration	09040-10436
		1 pF, 10 pF, 100 pF, 1000 pF @ 1000 Hz*	> 0.12 mF/F			
		100 $\mu$ H, 1 mH, 10 mH, 100 mH, 1 H and 10 H @ 100 Hz and 1000 Hz	> 0.16 mH/H			
		1 $\Omega$ , 10 $\Omega$ , 100 $\Omega$ , 1000 $\Omega$ @ 1 kHz	> 0.20 m $\Omega$ / $\Omega$			
116	Fixed Standard Inductors	10 mH @ 1 kHz	> 75 $\mu$ H/H	20,000/piece	Comparison with a group of inductance standards using a LCR meter	09040-10439
117	Power Sensor with reflection coefficient	9 kHz to 18 GHz	1.0 % to 2.0 %	20,000/item	Using DC substitution Method	09090-11150
		9 kHz to 26.5 GHz	As Specification	25,000/item	Using Direct Method	09090-11151
		EPROM power sensor (correction C.F.)	As specification	3,000/item		09090-11152
118	Power meter	As specification	As specification	11,250/item		09090-11111
119	Feedthrough Mount	100 kHz to 18 GHz, 1 mW	0.5 % to 1.3 %	21,000/item	Using DC substitution Method	09090-11130
		9 kHz to 26.5 GHz, 1 mW	As Specification	23,000/item		09090-11131
120	RF Attenuator					
	- Fix Attenuator/Step Attenuator	10 MHz to 18 GHz, 10 dB to 80 dB	0.013 dB to 0.22 dB upto frequency range	3,200/Freq. Point	IF substitution Method (1)	09090-11120
	- Attenuation in Coaxial line/Passive device	100 kHz to 18 GHz, 10 dB to 80 dB	0.027 dB to 0.20 dB upto frequency range	3,000/Freq. Point	IF substitution Method (2)	09090-11121
121	Audio Attenuator	31.5 Hz to 100 kHz	As Specification	3,500/Freq.Point		09090-11122
122	Electrical Field Strength	Frequency 100 kHz to 6 GHz	0.7 dB to 1.1 dB	25,000/item	Using Direct measurement by comparing to ther reference standard field	09090-11030
123	Oscilloscope	As specification	As specification	15,000/item		09090-11160
124	Spectrum Analyzer	As specification	As specification	50,000/item		09090-11161
125	Network Analyzer	As specification	As specification	67,500/item		09090-11162
126	Synthesizer Signal Generator	Up to 225 MHz	As specification	8,000 to 10,000/item		09090-11163
127	Function Generator	As specification up to 200 MHz	As specification	10,000/item		09090-11164





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**Price List**

Electrical Metrology Department						
Item No.	Description	Range	Accuracy / Uncertainty	Calibration Fee (THB)	Remark	Code
128	RF Signal Generator	As specification	As specification	22,500/item 33,750/item	Excluded AM, FM and phase modulation. Included AM and FM modulation	09090-11170
129	Scalar Reflection Coefficient	40 kHz to 18 GHz	As specification	15,000/ item	Magnitude	09090-11210
130	RF Voltmeter	10 MHz to 1 GHz	0.4%	11,250/item	Comparison with TVC standard	09090-11172
131	RF Voltage Source	As specification	As specification	13,500/item		09090-11173
132	Directional Coupler/ power splitter	100 kHz to 18 GHz	As Specification	15,000/ item	Magnitude	09090-11250
		10 MHz to 18 GHz	As Specification	18,000/item	Vectors	09090-11350
133	Measuring Receiver	As specification	As specification	30,000 to 40000 /Item	direct measurement	09090-09322
134	Audio Filter	As specification	As specification	2,500/Freq.point	direct measurement	09090-09323
135	Audio Analyzer	As specification	As specification	17,500 to 27,500 /item	direct measurement	09090-09321
136	Pulse and sine wave generator	Frequency Range : 9 kHz to 1 GHz	As specification	50,000/item	Direct measurement method with sampling method	09090-11611
137	Other of RF Microwave Equipment	As specification	As specification	As Cost		09090-11171
138	THD Meter	As specification	As specification	12,500/Item		09090-11175
139	Range Calibrator	As specification	As specification	10,000/Item		09090-11176
140	Standard Optical Power Meter	1 mW to 20 mW @ 488 nm,515 nm  50 uW to 20 mW @ 633 nm. 10 uW to 3 mW @ 1310 nm Band 10 uW to 10 mW @ 1550 nm Band	≥ 0.5 %	9,380 first point +  3,500 next point	Applied direct comparison method with standard calorimeter.	09100-12400
141	Optical Power Meter	1 mW to 20 mW @ 488nm,515nm  50 uW-to 20 mW @ 633 nm 10 uW to 3 mW @ 1310 nm Band 10 uW to 10 mW @ 1550 nm Band	≥ 0.7 %	5,500 first point +  1,750 next point	Applied direct comparison method with standard power meter.	09100-12401
142	Optical Power Meter	100 mW to 10 W @ 10600 nm	≥ 2 %	7,500 first point+2,500 next point	Substitutional Method monitor or beam splitter method	09100-12402



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**Price List**

<b>Electrical Metrology Department</b>						
<b>Item No.</b>	<b>Description</b>	<b>Range</b>	<b>Accuracy / Uncertainty</b>	<b>Calibration Fee (THB)</b>	<b>Remark</b>	<b>Code</b>
143	Laser Energy Meter	1mJ to 100 mJ @ 532 nm, 1064 nm	≥ 2.4 %	7,500 first point+2,500 next point	Substitutional Method monitor or beam splitter method	09100-12403
144	Average pulse power for laser energy meter	10 mW to 1 W @ 532 nm, 1064 nm	≥ 2.4 %	7,500 first point+2,500 next point	Substitutional Method monitor or beam splitter method	09100-12404
145	DC magnetic flux density / Reference magnet	0.1 mT < B ≤ 5 mT	8 mT/T	9,000/item	Compared with the standard maintained by NIMT Megnetic Laboratory.	09070-11020
		5 mT < B ≤ 20 mT	2 mT/T			
		20 mT < B ≤ 30 mT	0.5 mT/T			
		30 mT < B ≤ 2.4 T	0.5 mT/T			
146	DC magnetic flux density / Magnetic field generator	0.1 mT/A < B ≤ 5 mT/A	5 mT/T	9,000 first point + next point 630	Compared with the standard maintained by NIMT Megnetic Laboratory.	09070-11021
		5 mT/A < B ≤ 20 mT/A	2 mT/T			
		20 mT/A < B ≤ 30 mT/A	1 mT/T			
147	DC magnetic flux density / Gauss / Tesla meter	0.1 mT < B ≤ 5 mT	8 mT/T	9,000 first point + next point 630	Compared with the standard maintained by NIMT Megnetic Laboratory.	09070-11022
		5 mT < B ≤ 20 mT	1 mT/T			
		20 mT < B ≤ 30 mT	0.5 mT/T			
		30 mT < B ≤ 2.4 T	0.3 m T/T			
148	Frequency Source - Rubidium - Quartz, Others	1 MHz, 5 MHz, 10 MHz, 1 PPS	≤ 1 x 10 <sup>-13</sup>	21,600/item	Phase Comparison	09080-10221
149	Frequency Counter, Timer Counter	Up to 1 GHz	1 x 10 <sup>-12</sup> to 1 x 10 <sup>-9</sup>	7,200/item	Direct measurement	09080-10231
150	Frequency Meter	10 kHz to 225 MHz	3 x 10 <sup>-13</sup> to 5 x 10 <sup>-10</sup>	7,200/item	Direct measurement	09080-10232
151	Digital Tachometer	As specification	As specification	7,000/item	Direct measurement method by the light in	09080-10322
152	Stopwatch	As specification	As specification	2,250/item		09080-10331
153	Lidar Speed Meter (Lidar Gun)	60 km/h,80 km/h, 100 km/h and 120 km/h	0.58 km/h	15,000/item	Compare with Reference Speed Generator	09120-00001
<b>On-site Calibration</b>						
154	Standard Frequency Source for Remote Frequency Standard	1 MHz, 5 MHz, 10 MHz	≤ 1 x 10 <sup>-13</sup>	21,600/item	GPS Common view	09080-30212