



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No.                    | Description                                       | Range                                                                    | Accuracy / Uncertainty       | Price (THB)                             | Remark                                                                                            | Code        |
|-----------------------------|---------------------------------------------------|--------------------------------------------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------|-------------|
| <b>Calibration Fee</b>      |                                                   |                                                                          |                              |                                         |                                                                                                   |             |
| <b>Electrical Metrology</b> |                                                   |                                                                          |                              |                                         |                                                                                                   |             |
| 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                            |                                                                                                   | 09010-10111 |
| 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                           | 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 |
| 4                           | 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 |
| 5                           | 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 |
| 6                           | Standard Resistor                                 | 100 $\mu\Omega$ at 200 A                                                 | As Specification             | 10,000/piece                            | Used DCC bridge and 400 Amp range extender.                                                       | 09030-10213 |
| 7                           | Standard Resistor<br>(Calibrate in oil or in air) | 1 m $\Omega$ to 10 k $\Omega$                                            | As specification             | 6,750/piece                             | Used DCC bridge and 100 Amp range extender.                                                       | 09030-10214 |
|                             |                                                   | >10 k $\Omega$ to 1G $\Omega$                                            | $\leq 500 \mu\Omega/\Omega$  | 7,880/piece                             |                                                                                                   | 09030-10215 |
|                             |                                                   | 0 $\Omega$ to 1 T $\Omega$                                               | As specification             | 2,250/point test                        |                                                                                                   | 09030-10216 |
|                             |                                                   | 10 T $\Omega$ at 100 V, 200 V                                            | 3 m $\Omega/\Omega$          | 2,250/point test                        |                                                                                                   | 09030-10217 |
|                             |                                                   | 500 V and 1000 V                                                         |                              |                                         |                                                                                                   |             |
| 8                           | Decade Resistance Box                             | 1 m $\Omega$ to 10 M $\Omega$                                            | As specification             | 4,500 first decade<br>+ 3,380/next step |                                                                                                   | 09030-10218 |
|                             |                                                   | 10 M $\Omega$ to 1 T $\Omega$                                            | As specification             | 9,900 first decade<br>+ 6,750/next step |                                                                                                   | 09030-10219 |
| 9                           | Resistance Calibrator                             | 0 $\Omega$ to 100 M $\Omega$                                             | As specification             | 20,000/piece                            |                                                                                                   | 09031-10210 |
| 10                          | High Resistance Meter                             | Up to 1 T $\Omega$                                                       | As specification             | 2,250/point                             |                                                                                                   | 09030-10220 |
| 11                          | Digital Thermometer (indicator)                   | up to 10 M $\Omega$                                                      | $\leq 5 \mu\Omega/\Omega$    | (22,500 to 29,250)/piece                |                                                                                                   | 09030-10221 |
|                             |                                                   |                                                                          | $\geq 5 \mu\Omega/\Omega$    | (9,000 to 18,000)/piece                 |                                                                                                   | 09030-10222 |
| 12                          | Picoampmeter                                      | 2 pA to 200 mA                                                           | 5 mV/V to 0.1 mV/V           | 6,750 to 11,250/piece                   | Used volt-ampere method.                                                                          | 09010-10320 |
| 13                          | Electrometer                                      | 2 nC to 200 $\mu$ C                                                      | 0.1 mV/V                     | 6,750 to 11,250/ piece                  |                                                                                                   | 09010-10321 |
| 14                          | AC Resistance                                     | 1 $\Omega$ , 25 $\Omega$ , 100 $\Omega$ , 400 $\Omega$ at 60 Hz or 75 Hz | As Specification             | 9,000/piece                             |                                                                                                   | 09040-10410 |
| 15                          | AC Resistor                                       | 1 $\Omega$ to 100 k $\Omega$ @ 1000 Hz                                   | > 0.20 m $\Omega/\Omega$     | 5,000/piece                             | Measured by RLC digibridge and/or precision LCR meter, direct measurment, at desired frequencies. | 09040-10411 |
|                             | Additional Measurement at another Frequency       | 1 $\Omega$ to 100 k $\Omega$ @ 100 Hz to 100 kHz                         | > 0.20 m $\Omega/\Omega$     | 1,250 per frequency                     |                                                                                                   | 09040-10412 |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No. | Description                                                   | Range                                                                                 | Accuracy / Uncertainty | Price (THB)                                              | Remark                                                                                                                                                                                                  | Code        |  |
|----------|---------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--|
| 16       | 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 measurment, 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           |                                                                                                                                                                                                         | 09040-10414 |  |
| 17       | 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              |                                                          |                                                                                                                                                                                                         |             |  |
| 18       | 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               |                                                          |                                                                                                                                                                                                         |             |  |
| 19       | 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 |  |
| 20       | 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 |  |
| 21       | 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 |  |
| 22       | Fixed Standard Capacitors                                     | 1 pF to 1 F @ 1000 Hz                                                                 | > 0.20 mF/F            | 4,500/piece                                              | Measured by RLC Digibridge and/or                                                                                                                                                                       | 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 |  |
| 23       | 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                     | Measured by RLC digibridge and/or precision LCR meter, direct measurment, at desired frequencies.                                                                                                       | 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 |                                                                                                                                                                                                         | 09041-10421 |  |
|          |                                                               |                                                                                       |                        |                                                          |                                                                                                                                                                                                         | 09041-10422 |  |
| 24       | Precision Capacitance Bridge                                  | 1 pF, 10 pF, 100 pF and 1000 pF @ 1000 Hz or 1592 Hz                                  | ≥ 1 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 |  |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No. | Description                                                                        | Range                                                                                                            | Accuracy / Uncertainty       | Price (THB)                                              | Remark                                                                                                                                                                                                                                                                      | Code        |
|----------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 25       | Fixed Standard Inductors                                                           | 100 $\mu$ H, 1 mH, 10 mH, 100 mH, 1 H and 10 H @ 1000 Hz                                                         | > 0.16 mH/H                  | 12,500/piece                                             | Measured by the direct substitution method with the reference standard inductors.                                                                                                                                                                                           | 09040-10430 |
|          | Additional Measurement at another Frequency                                        | 100 $\mu$ H, 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 |
| 26       | Fixed standard Inductor                                                            | 1 $\mu$ H 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 $\mu$ H to 10 H @ 12 Hz to 1 MHz                                                                               | > 0.20 mH/H                  | 1,250/frequency                                          |                                                                                                                                                                                                                                                                             | 09040-10433 |
| 27       | Decade Inductors                                                                   | 1 $\mu$ H 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 Frequency                                        | 1 $\mu$ H to 10 H @ 12Hz to 1 MHz                                                                                | > 0.20 mH/H                  | (4,500 first decade + 1,250 next step) per one frequency |                                                                                                                                                                                                                                                                             | 09040-10435 |
| 28       | 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 @ 1000 Hz                                                         | > 0.16 mH/H                  |                                                          |                                                                                                                                                                                                                                                                             |             |
|          |                                                                                    | 1 $\Omega$ , 10 $\Omega$ , 100 $\Omega$ , 1000 $\Omega$ @ 1 kHz                                                  | > 0.20 m $\Omega$ / $\Omega$ |                                                          |                                                                                                                                                                                                                                                                             |             |
| 29       | AC/DC Transfer Standard                                                            | AC-DC Transfer Difference 2 mV to 20 V Frequency: 10 Hz to 1 MHz                                                 | 13 $\mu$ V/V to 0.25 mV/V    | 90,000/item                                              |                                                                                                                                                                                                                                                                             | 09020-10510 |
|          |                                                                                    | AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz                                           |                              |                                                          |                                                                                                                                                                                                                                                                             |             |
| 30       | Thermal Transfer Standard                                                          | AC-DC Transfer Difference 0.5 V to 20 V Frequency: 10 Hz to 1 MHz                                                | 13 $\mu$ V/V to 0.25 mV/V    | 67,500/item                                              |                                                                                                                                                                                                                                                                             | 09020-10511 |
|          |                                                                                    | AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz                                           |                              |                                                          |                                                                                                                                                                                                                                                                             |             |
| 31       | Thermal Voltage Converter Standard                                                 | AC-DC Transfer Difference 0.5 V to 20 V Frequency: 10 Hz to 1 MHz                                                | 13 $\mu$ V/V to 0.25 mV/V    | 9,000/piece                                              |                                                                                                                                                                                                                                                                             | 09020-10512 |
|          |                                                                                    | AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz                                           |                              |                                                          |                                                                                                                                                                                                                                                                             |             |
| 32       | AC Measurement Standard                                                            | AC-DC Transfer Difference 10 mV to 20 V Frequency: 10 Hz to 1 MHz                                                | As specification             | 67,500 to 78,750                                         | Excluded WB option.                                                                                                                                                                                                                                                         | 09020-10520 |
|          |                                                                                    | AC-DC Transfer Difference > 20 V to 1000 V Frequency: 10 Hz to 100 kHz                                           |                              | 78,750 to 85,500                                         | Included WB option.                                                                                                                                                                                                                                                         | 09020-10521 |

**National Institute of Metrology (Thailand)**

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

**Price List**

| Item No. | Description                              | Range                                                                                                                                                                                       | Accuracy / Uncertainty                                                                                             | Price (THB)             | Remark                                                                                                                                                                                        | Code        |
|----------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 33       | Alternating Voltage Measurement Standard | AC Voltage Deviation 100 mV to 20 V<br>Frequency: 10 Hz to 1 MHz                                                                                                                            | 14 $\mu$ V/V to 0.35 mV/V                                                                                          | 67,500                  |                                                                                                                                                                                               | 09020-10522 |
|          |                                          | AC Voltage Deviation > 20 V to 1000 V<br>Frequency: 10 Hz to 100 kHz                                                                                                                        | 15 $\mu$ V/V to 0.12 mV/V                                                                                          |                         |                                                                                                                                                                                               |             |
| 34       | AC Voltage Current Standard              | AC Voltage 100 mV to 1000V<br>Frequency 60 Hz and 400 Hz                                                                                                                                    | 55 $\mu$ V/V to 6 mV/V                                                                                             | 18,130 to 21,700/item   | Applied direct measurement method by AC measurement standard.                                                                                                                                 | 09020-10560 |
|          |                                          | AC Current 100 mA to 30 A<br>Frequency 60 Hz and 400 Hz                                                                                                                                     | 0.1 mA/A to 0.2 mA/A                                                                                               |                         |                                                                                                                                                                                               |             |
| 35       | Multifunction Transfer Standard          | As specification                                                                                                                                                                            | As specification                                                                                                   | 78,750                  |                                                                                                                                                                                               | 09020-10561 |
| 36       | AC/DC Current Shunt                      | AC-DC Transfer Difference 5 mA to 30 A<br>Frequency: 10 Hz to 100 kHz                                                                                                                       | As specification                                                                                                   | (6,750 to 9,000)/piece  |                                                                                                                                                                                               | 09020-10610 |
| 37       | Standard Watt Converter                  | Volt : 600 V<br>Current : 100 A<br>AC Power : 60 kW<br>Frequency : 50 Hz, 60 Hz<br>Power Factor : $\pm 0$ to 1                                                                              | > 55 $\mu$ W/VA                                                                                                    | 18,000 to 39,500/item   |                                                                                                                                                                                               | 09050-10710 |
| 38       | AC Wattmeter, Digital Power Meter        | Volt : 1000 V<br>Current : 80 A<br>AC Power : 80 kW<br>Frequency : 15 Hz to 450 Hz<br>Power Factor : $\pm 0$ to 1                                                                           | > 100 $\mu$ W/VA                                                                                                   | 6,750 to 13,500/Channel |                                                                                                                                                                                               | 09050-10711 |
| 39       | Energy Meter                             | Eneregy 1.5 Ws to 3600 kW<br>Voltage 15 V to 600 V<br>Current 0.1 A to 100 A<br>Power Factor 1 to 0<br>(Inductive or Capacitive)<br>Frequency 50 Hz to 60 Hz<br>Measurement time 1s to 60 s | $\geq 100 \mu$ Wh/ VAh                                                                                             | 6,750 to 13,500/Channel | Applied the known voltage,current and power from the AC power calibration system and measure pulse output against the time standard.                                                          | 09050-10712 |
| 40       | Electrical Power Source                  | Power 1.5 W to 60 kW<br>Frequency 50 Hz to 60 Hz<br>Power Factor 1 to 0<br>(Inductive or Capacitive)<br>Voltage 3 V to 1000 V<br>Current 0.05 A to 100 A<br>Frequency 15 Hz to 6 kHz        | Power $\geq 70 \mu$ W/VA<br><br>Voltage $\geq 30 \mu$ V/V<br>Current $\geq 30 \mu$ A/A<br>phase $\geq 0.005^\circ$ | 9,000 to 45,000/item    | Measured the AC currents, voltages phase and powers directly from the NIMT reference watt converter then measured the DC output voltage with high accuracy digitalmultimeter and phase meter. | 09050-10713 |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No. | Description                           | Range                                                                                                                                                                                         | Accuracy / Uncertainty                                                                                                             | Price (THB)                                                  | Remark                                                | Code        |
|----------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------|
| 41       | DC Power Meter                        | Power: 1mW to 20 kW<br>Voltage : 100 mV to 1000 V<br>Current : 10 mA to 20 A                                                                                                                  | $\geq 40 \mu\text{W/W}$                                                                                                            | 6,750 to 13,500/Channel                                      | Applied the comparison method.                        | 09050-10714 |
| 42       | Energy Source                         | Eneregy 41.67 mWh to 3.333 kWh<br>Power: 0.5 W to 20 kW<br>Voltage: 10 V to 1000 V<br>Current: 0.05 A to 20 A<br>Power Factor: 1<br>Time : 5 minute to 10 minute<br>Frequency: 50 Hz to 60 Hz | $> 0.12 \%$                                                                                                                        | 5,000 to 15,000 / item                                       |                                                       | 09050-10715 |
| 43       | Phase Meter                           | Phase Angle : $0.000^\circ$<br>to $\pm 360.000^\circ$<br>Frequency : 15 Hz to 100 kHz<br>Amplitde : 50 mVrms<br>to 120 Vrms                                                                   | $> 0.01^\circ$                                                                                                                     | 9,000 to 27,000/item                                         |                                                       | 09050-10920 |
| 44       | Phase Source                          | $0.000^\circ$ to $999.999^\circ$<br>50 mV to 120 Vrms<br>10 Hz to 100 kHz                                                                                                                     | $> 0.005^\circ$                                                                                                                    | 18,000 to 45,000/item                                        |                                                       | 09050-10921 |
| 45       | Power Analyzer, Harmonics and Flicker | Output Voltage : 1020 V<br>Output Current : 80 A<br>Frequency : 20 Hz and<br>up to 1 kHz<br>Harmonics : $100^{\text{th}}$ ,<br>up to 6 kHz<br>Flicker : 16 Hz to 9 kHz                        | Voltage $> 100 \mu\text{V/V}$<br>Current $> 150 \mu\text{A/A}$<br>Power $> 200 \mu\text{W/VA}$<br>Frequency $> 50 \mu\text{Hz/Hz}$ | 6,750 to 13,500/                                             |                                                       | 09050-10930 |
| 46       | Power Analyzer, Dips/ Swells          | Voltage: 10 V to 1000 V Current<br>Current : 0.05 A to 20A<br>Dip/Swell amplitude : 10 % to 140 %<br>of nominal amplitude<br>Time : 1 ms to 1 minute<br>Frequency : 16 Hz to 850 Hz           | $\geq 0.07 \%$                                                                                                                     | 2,250 to 9,000/ channel                                      |                                                       | 09050-10931 |
| 47       | DC High Voltage Divider               | -10 kV to 10 kV                                                                                                                                                                               | $30 \times 10^{-6}$ (Division Ratio)                                                                                               | $\leq 10 \text{ kV}$ 4,500 first point<br>+ 2,250 next point | Compared against DC high voltage<br>reference system. | 09060-10810 |
|          |                                       | $> 10 \text{ kV}$ to 100 kV                                                                                                                                                                   | $30 \times 10^{-6}$ (Division Ratio)                                                                                               | $> 10 \text{ kV}$ 5,630 first point<br>+ 2,250 next point    |                                                       | 09060-10811 |
| 48       | DC High Voltage Source                | -10 kV to 100 kV                                                                                                                                                                              | $30 \mu\text{V/V}$                                                                                                                 | 9,000 to 18,000/item                                         | Compared against DC high voltage<br>reference system. | 09060-10812 |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No. | Description                                                       | Range                                                                                                                                  | Accuracy / Uncertainty                                                                           | Price (THB)                                                                      | Remark                                                                                                                                                          | Code        |
|----------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 49       | 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 |
| 50       | High Voltage Capacitance & Dissipation Factor                     | Capacitance 10 pF to 1000 pF<br>Voltage:10 kV to 100 kV<br>Frequency : 50 Hz<br>Dissipation: $50 \times 10^{-6}$ to $1 \times 10^{-3}$ | $\geq 80 \mu\text{F/F}$<br>for Capacitance<br>$\geq 50 \times 10^{-6}$<br>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<br>Voltage:10 kV to 200 kV<br>Frequency : 50 Hz<br>Dissipation: $50 \times 10^{-6}$ to $1 \times 10^{-3}$ |                                                                                                  | 17,500/item                                                                      |                                                                                                                                                                 | 09060-10821 |
| 51       | AC High Voltage Divider                                           | 1 kV to 200 kV @ 50 Hz                                                                                                                 | $\geq 0.4 \%$ (Scale Factor)                                                                     | 11,500 to 27,500/item                                                            | Compared against AC high voltage reference system.                                                                                                              | 09060-10830 |
| 52       | 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 |
| 53       | AC High Voltage Source                                            | 1 kV to 200 kV @ 50 Hz                                                                                                                 | $\geq 0.4 \%$                                                                                    | 11,500 to 23,000/item                                                            |                                                                                                                                                                 | 09060-10832 |
|          | Voltage Transformers                                              | 3.3 kV to 33 kV @ 50Hz/60 Hz                                                                                                           | $\geq 0.01 \%$ ratio error<br>$\geq 0.3$ min phase displacement                                  | 7,500 first tap<br>+ 1,900 next tap<br>per frequency, burden<br>and power factor | Compared against voltage transformer reference system.<br>850 THB for additional point                                                                          | 09060-10833 |
| 54       | Lightning Impulse Voltage Measuring system 1.2/50 $\mu\text{s}$   | 100 kV                                                                                                                                 | Scale factor $\geq 1.1 \%$<br>Time parameter $\geq 1.7 \%$                                       | 23,750/ item                                                                     | Additional fee for time to chopping (2.0 to 6.0 ) $\mu\text{s}$ : 5,000 THB/point for MS rated $\leq 200$ kV, and 10,000 THB/ point for MS rated $\leq 500$ kV. | 09060-10840 |
|          |                                                                   | 200 kV                                                                                                                                 |                                                                                                  | 26,250/ Item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 300 kV                                                                                                                                 |                                                                                                  | 31,250/ item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 400 kV                                                                                                                                 |                                                                                                  | 33,750/ item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 500 kV                                                                                                                                 |                                                                                                  | 36,250/ item                                                                     |                                                                                                                                                                 |             |
| 55       | Switching Impluse Voltage Measuring system 250/2500 $\mu\text{s}$ | 100 kV                                                                                                                                 | Scale factor $\geq 0.77 \%$<br>Time parameter $\geq 1.7 \%$                                      | 23,750/ item                                                                     |                                                                                                                                                                 | 09060-10841 |
|          |                                                                   | 200 kV                                                                                                                                 |                                                                                                  | 26,250/ Item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 300 kV                                                                                                                                 |                                                                                                  | 31,250/ item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 400 kV                                                                                                                                 |                                                                                                  | 33,750/ item                                                                     |                                                                                                                                                                 |             |
|          |                                                                   | 500 kV                                                                                                                                 |                                                                                                  | 36,250/ item                                                                     |                                                                                                                                                                 |             |
|          | Current Transformers                                              | 5 A to 1500 A @ 50 Hz/60 Hz                                                                                                            | $\geq 0.01 \%$ ratio error<br>$\geq 0.3$ min phase displacement                                  | 7,500 first tap<br>+ 1,900 next tap<br>per frequency, burden<br>and power factor | Compared against current transformer reference system.<br>850 THB for additional point                                                                          | 09060-10860 |
| 56       | DC magnetic flux density / Reference magnet                       | 0.1 mT < B < 5 mT                                                                                                                      | $\geq 0.8 \%$                                                                                    | 9,000/item                                                                       | Compared with the standard maintained by NIMT Megnetic Laboratory.                                                                                              | 09070-11020 |
|          |                                                                   | 5 mT < B < 20 mT                                                                                                                       | $\geq 0.2 \%$                                                                                    |                                                                                  |                                                                                                                                                                 |             |
|          |                                                                   | 20 mT < B < 30 mT                                                                                                                      | $\geq 0.1 \%$                                                                                    |                                                                                  |                                                                                                                                                                 |             |
|          |                                                                   | 30 mT < B < 2.4 T                                                                                                                      | $\geq 0.1 \%$                                                                                    |                                                                                  |                                                                                                                                                                 |             |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No. | Description                                            | Range                                                                                                                     | Accuracy / Uncertainty | Price (THB)                             | Remark                                                                   | Code        |
|----------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------------|--------------------------------------------------------------------------|-------------|
| 57       | DC magnetic flux density /<br>Magnetic field generator | 0.1 mT < B < 5 mT                                                                                                         | $\geq 0.8 \%$          | 9,000 first point +<br>next point 630   | Compared with the standard<br>maintained by NIMT Megnetic<br>Laboratory. | 09070-11021 |
|          |                                                        | 5 mT < B < 20 mT                                                                                                          | $\geq 0.2 \%$          |                                         |                                                                          |             |
|          |                                                        | 20 mT < B < 30 mT                                                                                                         | $\geq 0.1\%$           |                                         |                                                                          |             |
| 58       | DC magnetic flux density /<br>Gauss / Tesla meter      | 0.1 mT < B < 5 mT                                                                                                         | $\geq 0.8 \%$          | 9,000 first point +<br>next point 630   | Compared with the standard<br>maintained by NIMT Megnetic<br>Laboratory. | 09070-11022 |
|          |                                                        | 5 mT < B < 20 mT                                                                                                          | $\geq 0.2 \%$          |                                         |                                                                          |             |
|          |                                                        | 20 mT < B < 30 mT                                                                                                         | $\geq 0.1 \%$          |                                         |                                                                          |             |
|          |                                                        | 30 mT < B < 2.4 T                                                                                                         | $\geq 0.08 \%$         |                                         |                                                                          |             |
| 59       | Power Sensor                                           | 100 kHz to 18 GHz, 1 mW                                                                                                   | 1.1%                   | 18,800/item                             |                                                                          | 09090-11110 |
| 60       | Power meter                                            | As specification                                                                                                          | As specification       | 11,250/item                             |                                                                          | 09090-11111 |
| 61       | Standard Optical Power Meter                           | 1 mW to 20 mW @ 488 nm,515 nm<br>50 mW to 20 mW @ 633 nm<br>50 mW to 3 mW @ 1310 nm Band<br>50 mW to 10 mW @ 1550 nm Band | $\geq 0.5 \%$          | 9,380 first point +<br>3,500 next point | Applied direct comparison method with                                    | 09100-12400 |
| 62       | Optical Power Meter                                    | 1 mW to 20 mW @ 488nm,515nm<br>50 mW to 20 mW @ 633 nm<br>50 mW to 3 mW @ 1310 nm Band<br>50 mW to 10 mW @ 1550 nm Band   | $\geq 0.7 \%$          | 5,500 first point +<br>1,750 next point | Applied direct comparison method with                                    | 09100-12401 |
| 63       | Feedthrough Mount                                      | 100 kHz to 18 GHz, 1 mW                                                                                                   | 1.1%                   | 18,000/item                             |                                                                          | 09090-11114 |
| 64       | RF Attenuator                                          |                                                                                                                           |                        |                                         |                                                                          |             |
|          | - Fix Attenuator                                       | 10 MHz to 18 GHz, 10 dB to 80 dB                                                                                          | As specification       | 3,130/Freq. Point                       |                                                                          | 09090-11120 |
|          | - Step Attenuator                                      | 10 MHz to 18 GHz, 10 dB to 80 dB                                                                                          | As specification       | 2,250/Freq. Point                       |                                                                          | 09090-11121 |
| 65       | RF Step Attenuator                                     | 31.5 Hz to 100 kHz                                                                                                        | As Specification       | 3,130/Freq.Point                        |                                                                          | 09090-11122 |
| 66       | EMC/RF Field Probe                                     | Frequency 10 MHz to 1 GHz<br>Field Strength 15 V/m to 60 V/m                                                              | 0.5 dB                 | 13,500/item                             |                                                                          | 09090-11140 |
| 67       | Oscilloscope                                           | As specification                                                                                                          | As specification       | 11,250/item                             |                                                                          | 09090-11160 |
| 68       | Spectrum Analyzer                                      | As specification                                                                                                          | As specification       | 45,000/item                             |                                                                          | 09090-11161 |
| 63       | Network Analyzer                                       | As specification                                                                                                          | As specification       | 67,500/item                             |                                                                          | 09090-11162 |
| 69       | Synthesizer Signal Generator                           | Up to 225 MHz                                                                                                             | As specification       | 6,750 to 9,000/item                     |                                                                          | 09090-11163 |
| 70       | Function Generator                                     | As specification                                                                                                          | As specification       | 6,750/item                              |                                                                          | 09090-11164 |
| 71       | RF Signal Generator                                    | As specification                                                                                                          | As specification       | 22,500 to 33,750/item                   | Excluded AM, FM and phase modulation.                                    | 09090-11170 |
| 72       | Other of RF Microwave Equipment                        | As specification                                                                                                          | As specification       | As Cost                                 |                                                                          | 09090-11171 |
| 73       | RF Voltmeter                                           | 10 MHz to 1 GHz                                                                                                           | As specification       | 11,250/item                             |                                                                          | 09090-11172 |
| 74       | RF Voltage Source                                      | As specification                                                                                                          | As specification       | 13,500/item                             |                                                                          | 09090-11173 |
| 75       | Directional Coupler                                    | 100 MHz to 18 GHz                                                                                                         | As Specification       | 3,130/Freq.Point                        |                                                                          | 09090-11174 |



# National Institute of Metrology (Thailand)

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

Tel. +66 2577 5100 (Please contact : Customer Service Section Ext. 3101, 3102) Fax. +66 2577 3659 E-mail : cs@nimt.or.th Website : http://www.nimt.or.th

## Price List

| Item No.                   | Description                                                | Range                                             | Accuracy / Uncertainty                                  | Price (THB)           | Remark                                               | Code        |
|----------------------------|------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|-----------------------|------------------------------------------------------|-------------|
| 76                         | Calibrator                                                 | DC Voltage : 0 V to 1 kV                          | 40 $\mu$ V/V to 0.6 $\mu$ V/V                           | 13,500 to 33,750/item | 2,000 to 9,000 THB/item for additional adjustment.   | 09110-11310 |
|                            |                                                            | AC Voltage :<br>10 mV to 1 kV @ 10 Hz to 1 MHz    | 3.03 mV/V to 20 $\mu$ V/V                               |                       |                                                      |             |
|                            |                                                            | AC Voltage :<br>30 V to 1 kV @ 10 Hz to 100 kHz   |                                                         |                       |                                                      |             |
|                            |                                                            | DC Current : 0 A to 20 A                          | 150 $\mu$ A/A to 4.5 $\mu$ A/A                          |                       |                                                      |             |
|                            |                                                            | AC Current :<br>100 mA to 20 A @ 10 Hz to 100 kHz | 1.1 mA/A to 65 $\mu$ A/A                                |                       |                                                      |             |
|                            |                                                            | Resistance : 0 $\Omega$ to 1 G $\Omega$           | 1.3 m $\Omega$ / $\Omega$ to 1.8 $\mu\Omega$ / $\Omega$ |                       |                                                      |             |
|                            | 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 |
| 77                         | Oscilloscope Calibrator                                    | Up to 600 MHz                                     | As specification                                        | 40,000/item           | 2,000 to 13,500 THB/item for additional adjustment.  | 09110-11315 |
|                            |                                                            | Up to 2.1 GHz                                     | As specification                                        | 45,000/item           |                                                      | 09110-11316 |
| 78                         | Amplifier /<br>Precision Power Amplifier                   | Up to 1kV<br>10 Hz up to 100 kHz                  | As specification                                        | 9,000/item            | 2,500 THB/function for additional adjustment.        | 09110-11317 |
| 79                         | 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        | 09110-11321 |
|                            |                                                            | 8 1/2 digit                                       | As specification                                        | 22,500 to 27,000/item | Shunt using direct measurement method                | 09110-11322 |
| 80                         | 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 |
| 81                         | Frequency Source<br>- Rubidium<br>- Quartz, Others         | 1 MHz, 5 MHz,<br>10 MHz, 1 PPS                    | $\leq 1 \times 10^{-12}$                                | 13,500/item           |                                                      | 09080-10221 |
| 82                         | Frequency Counter Timer Counter                            | Up to 1 GHz                                       | $1 \times 10^{-8}$ to $1 \times 10^{-6}$                | 4,500/item            |                                                      | 09080-10231 |
| 83                         | Frequency Meter                                            | 10 kHz to 225 MHz                                 | $3 \times 10^{-13}$ to $5 \times 10^{-10}$              | 6,250/item            |                                                      | 09080-10232 |
| 84                         | Tachometer                                                 | As specification                                  | As specification                                        | 3,380/item            |                                                      | 09080-10322 |
| 85                         | Stopwatch                                                  | As specification                                  | As specification                                        | 2,250/item            |                                                      | 09080-10331 |
| <b>On-site Calibration</b> |                                                            |                                                   |                                                         |                       |                                                      |             |
| 86                         | Standard Frequency Source for Remote<br>Frequency Standard | 1 MHz, 5 MHz, 10 MHz                              | $\leq 1 \times 10^{-12}$                                | 13,500/item           |                                                      | 09080-30212 |