

CERTIFICATE OF ACCREDITATION

tessol Co., Ltd.

Accreditation No. : KC21-383

Corporation Registration No. : 131111-0166403

Address of Laboratory : 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do,
Republic of Korea

Date of Initial Accreditation : February 03, 2021.

Validity of Accreditation : February 03, 2025. ~ February 02, 2029.

Scope of Accreditation : Attached Annex

Date of issue : June 17, 2026.

This calibration laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to Joint ISO-ILAC-IAF Communiqué).



Kim daejin

Head

Korea Laboratory Accreditation Scheme

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017 & KS Q ISO/IEC 17025:2017

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CALIBRATION

Valid To : February. 02, 2029

Accreditation No : KC21-383

In recognition of the successful completion of the KOLAS evaluation process,
accreditation is granted to this laboratory to perform the following calibrations

Field Code	Item of Calibration	on-site	Field Code	Item of Calibration	on-site	Field Code	Item of Calibration	on-site
201. Mass			40213	Resistance bridges & similar instruments	Y	50105	Thermal expansion thermometers; bimetal, gas or liquid type	Y
20109	Electric balances	Y	40214	Resistance meters	Y			
20113	Spring scale balances	Y	40215	Resistors	Y	50106	Thermocouples: noble metal, base metal, pure metal, special type, etc.	Y
20116	Weights	N	40217	Impedance bridges/LCR meters	Y			
204. Pressure			403. AC voltage, current & power			50107	Temperature transducers	Y
20406	Absolute pressure gauges	Y	40301	AC ammeters	Y	502. Non Contact thermometry		
20408	Compound pressure gauges	Y	40302	Clamp ammeters/voltmeters	Y	50204	Radiation thermometers	N
20409	Differential pressure gauges	Y	40303	AC voltage/current calibrators	Y	50205	Thermal image apparatus	N
20411	Gauge pressure gauges	Y	40305	AC current shunts	Y	50206	Blackbody furnaces	N
20412	Pressure transducers /transmitters	Y	40311	AC power meter	N	50207	Others Thermometer; ear thermometers, etc.	N
20413	Dial type vacuum gauges	Y	40312	AC power supplies	Y			
206. Volume			40313	Puncture/safety testers	Y	503. Humidity		
20601	Volumetric glasswares	N	40318	AC voltmeters	Y	50302	Relative humidity hygrometers; polimer polimer thinfilm, hair, etc.	Y
20602	Pycnometers	N	404. Other DC & LF Measurements					
20606	Piston type volume meters	N	40403	Multimeter calibrators, Multifunction calibrators	Y	50304	Temperature humidity recorders; Hygrothermograph, etc	N
301. Time / Frequency			40411	Function generators	Y	50305	Dew-point/Relative humidity Transducers	N
30102	Frequency standards	N	40416	Leakage current testers	Y	50306	Humidity generators; two-pressure, two-temperature, flow mixing humidity generator, constant temperature and humidity chamber, etc.	Y
30103	General frequency sources	N	40417	Electronic AC/DC loads	Y			
30104	Frequency meters / counters	Y	40419	Analogue/Digital multimeters	Y	901. Chemical analysis		
30106	Time interval meters / Stop watches / Timers	Y	40421	Oscilloscope	Y	90101	Breath alcohol analyzer	N
302. Velocity / Revolution			40424	Volt/Current recorders	Y	90103	Gas analyzers	Y
30201	Standard RPM generators	Y	40425	Relay test sets	Y	90199	Others; pH meter, Electrical conductivity meter	Y
30202	Contact type tachometers	Y	40426	LF signal generators	Y			
30203	Photo tachometers / Stroboscopes	Y	40435	AC/DC high voltage probes	Y			
401. DC voltage & current			501. Contact thermometry					
40101	DC ammeters	Y	50101	Temperature generators; ovens, ice-point baths, isothermal liquid baths, dry-block calibrators	Y			
40103	DC voltage/current calibrator	Y						
40104	Electrical temperature calibrator	Y	50102	Temperature indicators /recorders/controllers, temperature calibrators	Y			
40105	DC current shunts	Y						
40108	DC power supplies	Y	50103	Glass thermometers; liquid -in-glass, Beckmann	N			
40112	DC voltmeters	Y						
402. Resistance, Capacitance and Inductance			50104	Resistance thermometers; SPRT, IPRT, thermistors, etc.	Y			
40205	Earth testers	Y						
40210	Insulation testers	Y						

Note

1. On-site calibration is allowed to items with marking 'Y', not allowed to items with marking 'N'.
2. Measurement uncertainty normally is quoted as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $K=2$. It expresses the lowest uncertainty of measurement that can be provided by accredited calibration laboratories in normal conditions.
3. Due to the calibration environment such as reference standards or customers' facilities, it is note that uncertainty of measurement on a calibration certificate may be expressed larger than measurement uncertainty on scope of accreditation in general.
4. If continuous calibration range is divided, each divided range's endpoint indicates inclusive.
* ex) If calibration range is divided to (0 ~ 25) mm and (25 ~ 100) mm, 25 mm in first range indicates inclusive and 25 mm in second range indicates exclusive.

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Electric balances	20109	(0 ~ 6) g (6 ~ 20) g (20 ~ 50) g (50 ~ 100) g (100 ~ 200) g (200 ~ 500) g (500 ~ 1 000) g (1 ~ 2) kg (2 ~ 5) kg (5 ~ 10) kg (10 ~ 30) kg (30 ~ 60) kg (60 ~ 150) kg (150 ~ 300) kg (300 ~ 600) kg (600 ~ 1 000) kg	59 μg 81 μg 0.11 mg 0.13 mg 0.19 mg 0.52 mg 0.89 mg 1.8 mg 5.0 mg 8.8 mg 23 mg 0.16 g 1.2 g 11 g 49 g 0.16 kg	Weight /TS-CI-M09
Spring scale balances	20113	(0 ~ 1) kg (1 ~ 10) kg (10 ~ 50) kg (50 ~ 100) kg	1.9 g 20 g 0.13 kg 0.20 kg	Weight /TS-CI-M13
Weights	20116	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g	(Class F ₁) 2.6 μg 2.6 μg 2.6 μg 3.3 μg 4.0 μg 4.7 μg 5.5 μg 6.9 μg 8.5 μg 10 μg 14 μg 16 μg 25 μg 31 μg 37 μg 54 μg 0.11 mg 0.34 mg	Weight, Electric balance /TS-CI-M16

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Weights	20116	1 kg 2 kg 5 kg 10 kg 20 kg	(Class F ₁) 0.54 mg 1.1 mg 2.6 mg 5.5 mg 11 mg	Weight, Electric balance /TS-CI-M16

204. Pressure

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Absolute pressure gauges	20406	(5 ~ 700) kPa abs (700 ~ 7 000) kPa abs	1.1×10^{-3} 1.2×10^{-3}	Digital Pressure Controller /TS-CI-P06
Compound pressure gauges	20408	(-100 ~ 0) kPa (0 ~ 7 000) kPa	3.0×10^{-3} 1.2×10^{-3}	Digital Pressure Controller /TS-CI-P08
Differential pressure gauges	20409	(0 ~ 14) kPa (14 ~ 7 000) kPa	1.4×10^{-3} 2.4×10^{-3}	Digital Pressure Controller /TS-CI-P09
Gauge pressure gauges	20411	(0 ~ 7 000) kPa	1.4×10^{-4}	Air Dead Weight Tester Digital Pressure Controller /TS-CI-P11
Pressure transducers/transmitters Absolute Gauge	20412	(5 ~ 700) kPa abs (700 ~ 7 000) kPa abs (0 ~ 7 000) kPa	1.7×10^{-3} 1.3×10^{-3} 5.7×10^{-4}	Air Dead Weight Tester Digital Pressure Controller /TS-CI-P12
Dial type vacuum gauges	20413	(-100 ~ 0) kPa	3.0×10^{-3}	Digital Pressure Controller /TS-CI-P13

206. Volume

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Volumetric glasswares	20601	(0.1 ~ 1) mL (1 ~ 2) mL (2 ~ 5) mL (5 ~ 25) mL (25 ~ 50) mL (50 ~ 100) mL (100 ~ 250) mL (250 ~ 500) mL (500 ~ 1 000) mL (1 000 ~ 2 000) mL	1.2 μ L 2.4 μ L 5.8 μ L 12 μ L 14 μ L 39 μ L 52 μ L 89 μ L 0.12 mL 0.24 mL	Weight, balances /TS-CI-V01
Pycnometers	20602	(0 ~ 50) mL (50 ~ 100) mL (100 ~ 250) mL (250 ~ 500) mL	2.3 μ L 4.5 μ L 12 μ L 23 μ L	Weight, balances /TS-CI-V02
Piston type volume meters	20606	(0.1 ~ 2) μ L (2 ~ 5) μ L (5 ~ 10) μ L (10 ~ 20) μ L (20 ~ 50) μ L (0.05 ~ 0.1) mL (0.1 ~ 0.2) mL (0.2 ~ 0.5) mL (0.5 ~ 1) mL (1 ~ 2) mL (2 ~ 5) mL (5 ~ 10) mL (10 ~ 20) mL (20 ~ 50) mL (50 ~ 100) mL	0.006 μ L 0.012 μ L 0.024 μ L 0.042 μ L 0.086 μ L 0.091 μ L 0.25 μ L 0.75 μ L 0.93 μ L 2.5 μ L 5.6 μ L 11 μ L 23 μ L 33 μ L 65 μ L	Weight, balances /TS-CI-V06

301. Time / Frequency

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Frequency standards	30102	(1 ~ 10) MHz	7.2×10^{-10}	GPS Receiver, Frequency counter /TS-CI-F02
General frequency sources	30103	(1 ~ 10) MHz	7.2×10^{-10}	GPS Receiver, Frequency counter /TS-CI-F03
Frequency meters/counters Time base Osc. Input Frequency	30104	(1 ~ 10) MHz 10 kHz (10 ~ 100) kHz 100 kHz ~ 1 MHz (1 ~ 10) MHz (10 ~ 20) MHz	7.2×10^{-10} 3.4×10^{-10} 8.4×10^{-10} 7.0×10^{-12} 6.5×10^{-11} 6.9×10^{-11}	GPS Receiver, Frequency counter, Signal generator /TS-CI-F04
Time interval meters/stop watches/ timers Realative Time Difference Timer	30106	Day (1 ~ 10 000) s	2.0×10^{-7} 5.8×10^{-6}	Stop watch Calibrator, GPS Receiver, Frequency counter /TS-CI-F06

302. Velocity / Revolution

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Standard RPM generators Centrifugal separator Revolutions	30201	60 min^{-1} $(60 \sim 600) \text{ min}^{-1}$ $(600 \sim 900) \text{ min}^{-1}$ $(900 \sim 6\,000) \text{ min}^{-1}$ $(6\,000 \sim 11\,000) \text{ min}^{-1}$ $(11\,000 \sim 16\,000) \text{ min}^{-1}$ $(16\,000 \sim 20\,000) \text{ min}^{-1}$ $(20\,000 \sim 30\,000) \text{ min}^{-1}$ $(30\,000 \sim 40\,000) \text{ min}^{-1}$ $(40\,000 \sim 50\,000) \text{ min}^{-1}$ $(50\,000 \sim 60\,000) \text{ min}^{-1}$ $(60\,000 \sim 70\,000) \text{ min}^{-1}$ $(70\,000 \sim 80\,000) \text{ min}^{-1}$ $(80\,000 \sim 90\,000) \text{ min}^{-1}$ $(90\,000 \sim 99\,000) \text{ min}^{-1}$	0.02 min^{-1} 0.2 min^{-1} 1.1 min^{-1} 2 min^{-1} 3 min^{-1} 4 min^{-1} 5 min^{-1} 8 min^{-1} 10 min^{-1} 12 min^{-1} 14 min^{-1} 17 min^{-1} 19 min^{-1} 21 min^{-1} 23 min^{-1}	GPS Receiver, Frequency counter, Tachometer, Stroboscope /TS-CI-R01
Contact type tachometers Revolutions	30202	$(10 \sim 4\,000) \text{ min}^{-1}$	0.12 min^{-1}	GPS Receiver, RPM calibration system /TS-CI-R02
Photo tachometers/stroboscopes Photo tachometers Stroboscopes	30203	$(60 \sim 90) \text{ min}^{-1}$ $(90 \sim 900) \text{ min}^{-1}$ $(900 \sim 90\,000) \text{ min}^{-1}$ $(6 \sim 9\,000) \text{ min}^{-1}$ $(9\,000 \sim 90\,000) \text{ min}^{-1}$ $(90\,000 \sim 200\,000) \text{ min}^{-1}$	0.01 min^{-1} 0.1 min^{-1} 1 min^{-1} 0.01 min^{-1} 0.1 min^{-1} 1 min^{-1}	GPS Receiver, Synthesized level generator, Waveform generator, Frequency counter /TS-CI-R03

401. DC voltage & current

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
DC ammeters Current	40101	(0 ~ 100) µA (0.1 ~ 1) mA (1 ~ 5) mA (5 ~ 10) mA (10 ~ 50) mA (50 ~ 100) mA (100 ~ 500) mA (0.5 ~ 1) A (1 ~ 5) A (5 ~ 10) A (10 ~ 20) A (20 ~ 60) A (60 ~ 100) A	10 nA 0.05 µA 0.3 µA 0.4 µA 3 µA 6 µA 0.06 mA 0.10 mA 1.4 mA 2.6 mA 3 mA 13 mA 16 mA	Meter calibrator, Transconductance amplifier /TS-CI-E101
DC voltage/current calibrators Voltage Current	40103	(+) (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (100 ~ 1 000) V (-) (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (100 ~ 1 000) V (+) (0 ~ 100) µA (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 10) A (10 ~ 30) A	 1.6 µV 9 µV 0.08 mV 0.9 mV 11 mV 2.3 µV 12 µV 0.11 mV 1.8 mV 11 mV 13 nA 44 nA 0.48 µA 7.4 µA 0.23 mA 3.7 mA 20 mA	Digital multimeter /TS-CI-E103

401. DC voltage & current

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
DC voltage/current calibrators Current	40103	(-) (0 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 10) A (10 ~ 30) A	18 nA 86 nA 0.83 μ A 12 μ A 0.28 mA 5.2 mA 20 mA	Digital multimeter /TS-CI-E103
Electrical temperature calibrators Output voltage Output current Output resistance	40104	(+) (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (-) (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (+) (0 ~ 8) mA (8 ~ 20) mA (20 ~ 24) mA (24 ~ 100) mA (-) (0 ~ 20) mA (20 ~ 100) mA (0 ~ 100) Ω (100 ~ 400) Ω (0.4 ~ 1) k Ω (1 ~ 4) k Ω (4 ~ 10) k Ω	1.6 μ V 8.6 μ V 76 μ V 0.90 mV 2.3 μ V 12 μ V 0.11 mV 1.8 mV 0.8 μ A 1.1 μ A 6.2 μ A 7.3 μ A 1.1 μ A 12 μ A 1.1 m Ω 5.9 m Ω 11 m Ω 0.05 Ω 0.2 Ω	Digital multimeter, Meter calibrator /TS-CI-E104

401. DC voltage & current

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Electrical temperature calibrators	40104			Digital multimeter, Meter calibrator /TS-CI-E104
Output TD voltage		(-8.824 ~ 74.868) mV	2.1 μ V	
Output RTD resistance		(0 ~ 17.136) Ω	0.81 m Ω	
		(17.136 ~ 100) Ω	1.1 m Ω	
		(100 ~ 1 000) Ω	11 m Ω	
		(1 000 ~ 3 137.08) Ω	0.05 Ω	
Input voltage		($\pm$)		
		(0 ~ 100) mV	2 μ V	
		(0.1 ~ 1) V	0.01 mV	
		(1 ~ 3) V	0.02 mV	
		(3 ~ 10) V	0.1 mV	
		(10 ~ 30) V	0.3 mV	
		(30 ~ 100) V	1 mV	
		(100 ~ 300) V	0.01 V	
Input current		($\pm$)		
		(0 ~ 4) mA	0.3 μ A	
		(4 ~ 8) mA	0.4 μ A	
		(8 ~ 12) mA	0.9 μ A	
		(12 ~ 16) mA	1.0 μ A	
		(16 ~ 20) mA	1.1 μ A	
		(20 ~ 24) mA	1.3 μ A	
		(24 ~ 30) mA	1.5 μ A	
		(30 ~ 100) mA	5 μ A	
Input resistance		(0 ~ 10) Ω	0.74 m Ω	
		(10 ~ 100) Ω	1.4 m Ω	
		(100 ~ 1 000) Ω	12 m Ω	
		(1 ~ 10) k Ω	0.71 Ω	
Input TC voltage		(-8.824 ~ 13.421) mV	0.6 μ V	
		(13.421 ~ 37.006) mV	0.8 μ V	
		(37.006 ~ 74.868) mV	1.0 μ V	

401. DC voltage & current

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Electrical temperature calibrators Input RTD resistance	40104	(0 ~ 17.136) Ω (17.136 ~ 100) Ω (100 ~ 1 000) Ω (1 000 ~ 3 137.08) Ω	1 m Ω 2 m Ω 0.02 Ω 0.06 Ω	Digital multimeter, Meter calibrator /TS-CI-E104
DC current shunts Resistance	40105	100 $\mu\Omega$ 1 m Ω (1 ~ 10) m Ω (10 ~ 100) m Ω (0.1 ~ 1) Ω (1 ~ 10) Ω (10 ~ 100) Ω	0.03 $\mu\Omega$ 0.14 $\mu\Omega$ 1.7 $\mu\Omega$ 9.6 $\mu\Omega$ 58 $\mu\Omega$ 0.50 m Ω 6.0 m Ω	Digital Multimeter, Calibrator, Trans Conductance Amplifier /TS-CI-E105
DC power supplies DC Voltage DC Current	40108	(0.1 ~ 1) V (1 ~ 20) V (20 ~ 30) V (30 ~ 80) V (80 ~ 200) V (200 ~ 300) V (300 ~ 500) V (500 ~ 1 000) V 0.01 A (0.01 ~ 1) A (1 ~ 3) A (3 ~ 5) A (5 ~ 10) A (10 ~ 30) A (30 ~ 50) A (50 ~ 100) A	0.06 mV 0.6 mV 0.8 mV 0.9 mV 7 mV 8 mV 9 mV 0.02 V 59 μ A 0.07 mA 0.2 mA 0.6 mA 0.7 mA 6 mA 9 mA 14 mA	Digital Multimeter, Shunt, DC Electronics Load /TS-CI-E108

401. DC voltage & current

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
DC voltmeters Voltage	40112	($\pm$) (0 ~ 20) mV (20 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (100 ~ 1 000) V	0.6 μ V 1.2 μ V 6 μ V 0.04 mV 0.6 mV 8 mV	Meter calibrator /TS-CI-E112

402. Resistance, Capacitance and Inductance

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Earth testers Resistance	40205	(0.1 ~ 2) Ω (2 ~ 20) Ω (20 ~ 200) Ω (0.2 ~ 2) k Ω (2 ~ 20) k Ω (20 ~ 100) k Ω	1 m Ω 0.01 Ω 0.1 Ω 1 Ω 0.01 k Ω 0.1 k Ω	Standard Resistor, Decade Resistor, Calibrator /TS-CI-E205
AC Voltage		60 Hz (10 ~ 300) V	0.1 V	
DC Voltage		(10 ~ 300) V	0.1 V	
AC Resistance		60 Hz 0.1 Ω 0.2 Ω 0.3 Ω 0.4 Ω 0.5 Ω 0.6 Ω 0.7 Ω 0.8 Ω 0.9 Ω 1.0 Ω	1.2 m Ω 2.4 m Ω 3.6 m Ω 4.7 m Ω 5.9 m Ω 8 m Ω 9 m Ω 10 m Ω 11 m Ω 12 m Ω	
Current out		(1 ~ 10) A (10 ~ 20) A (20 ~ 30) A	0.06 A 0.07 A 0.14 A	

402. Resistance, Capacitance and Inductance

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Insulation testers	40210			High Voltage Probe, Digital Multimeter, Decade Resistor /TS-CI-E210
Insulation Voltage		(5 ~ 25) V	0.01 V	
		(25 ~ 500) V	0.1 V	
		(500 ~ 2 500) V	1 V	
		(2 500 ~ 10 000) V	3 V	
Insulation Resistance		(10 ~ 400) Ω	0.1 Ω	
		(0.4 ~ 4) k Ω	1 Ω	
		(4 ~ 40) k Ω	0.01 k Ω	
		(40 ~ 400) k Ω	0.1 k Ω	
		(0.4 ~ 4) M Ω	0.001 M Ω	
		(4 ~ 40) M Ω	0.01 M Ω	
		(40 ~ 400) M Ω	0.1 M Ω	
		(0.4 ~ 1) G Ω	0.001 G Ω	
		(1 ~ 4) G Ω	0.003 G Ω	
		(4 ~ 10) G Ω	0.01 G Ω	
		(10 ~ 40) G Ω	0.15 G Ω	
		(40 ~ 100) G Ω	0.4 G Ω	
		(100 ~ 200) G Ω	0.8 G Ω	
		(200 ~ 500) G Ω	3 G Ω	
		(500 ~ 1 000) G Ω	5 G Ω	
AC Voltage		60 Hz		
		(10 ~ 600) V	0.1 V	
DC Voltage		(10 ~ 1 000) V	0.1 V	
Resistance bridges & similar instruments	40213			Standard Resistor, Digital Multimeter /TS-CI-E213
Resistance(Rheostat Arm)		1 Ω	0.02 m Ω	
		(1 ~ 4) Ω	0.1 m Ω	
		(4 ~ 10) Ω	0.2 m Ω	
		(10 ~ 70) Ω	1 m Ω	
		(70 ~ 100) Ω	2 m Ω	
		(0.1 ~ 1) k Ω	0.02 Ω	
		(1 ~ 9) k Ω	0.1 Ω	
		(9 ~ 10) k Ω	0.2 Ω	

402. Resistance, Capacitance and Inductance

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Resistance bridges & similar instruments Resistance(Ratio Arm)	40213	1 mΩ 10 mΩ 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ	0.03 μΩ 0.2 μΩ 1 μΩ 0.01 mΩ 0.1 mΩ 1 mΩ 0.01 Ω 0.1 Ω 1 Ω 0.02 kΩ 0.2 kΩ	Standard Resistor, Digital Multimeter /TS-CI-E213
Resistance meters DC Resistance	40214	1 mΩ (1 ~ 10) mΩ (10 ~ 100) mΩ (0.1 ~ 1) Ω (1 ~ 10) Ω (10 ~ 100) Ω (0.1 ~ 1) kΩ (1 ~ 10) kΩ (10 ~ 100) kΩ (0.1 ~ 1) MΩ (1 ~ 10) MΩ (10 ~ 100) MΩ (0.1 ~ 1) GΩ	0.03 μΩ 0.2 μΩ 2 μΩ 0.01 mΩ 0.1 mΩ 1 mΩ 0.01 Ω 0.1 Ω 1 Ω 0.02 kΩ 0.2 kΩ 0.01 MΩ 0.2 MΩ	Standard Resistor, AC Resistor, Calibrator /TS-CI-E214
AC Resistance		1 kHz 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ	 0.06 mΩ 0.5 mΩ 3 mΩ 0.03 Ω 0.3 Ω 3 Ω 0.04 kΩ	
DC Voltage		0.1 V (0.1 ~ 6) V (6 ~ 20) V (20 ~ 60) V (60 ~ 100) V (100 ~ 200) V (200 ~ 300) V	0.01 mV 0.03 mV 0.2 mV 0.4 mV 1 mV 3 mV 4 mV	

402. Resistance, Capacitance and Inductance

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Resistors Resistance	40215	(1 ~ 100) mΩ (0.1 ~ 1) Ω (1 ~ 10) Ω (10 ~ 100) Ω (0.1 ~ 1) kΩ (1 ~ 10) kΩ (10 ~ 100) kΩ (0.1 ~ 1) MΩ (1 ~ 10) MΩ (10 ~ 100) MΩ (0.1 ~ 1) GΩ	0.02 mΩ 0.06 mΩ 0.3 mΩ 2.0 mΩ 11 mΩ 0.11 Ω 1.1 Ω 14 Ω 0.3 kΩ 15 kΩ 1.6 MΩ	Digital Multimeter, Calibrator /TS-CI-E215
Impedance bridges/LCR meters Resistance	40217	1 kHz 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 100 kHz 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MHz 10 Ω 100 Ω 1 kΩ 10 kΩ	 0.06 mΩ 0.45 mΩ 2.7 mΩ 27 mΩ 0.26 Ω 2.6 Ω 30 Ω 5 mΩ 0.05 Ω 0.5 Ω 5 Ω 0.05 kΩ 5 mΩ 0.05 Ω 0.5 Ω 5 Ω	Impedance Calibrator, Frequency Counter, Digital Multimeter /TS-CI-E217
Capacitance		1 kHz 10 pF 100 pF 1 nF 10 nF 100 nF 1 μF 10 μF	 3.1 fF 28 fF 0.27 pF 2.8 pF 27 pF 0.40 nF 13 nF	

402. Resistance, Capacitance and Inductance

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Impedance bridges/LCR meters	40217			Impedance Calibrator, Frequency Counter, Digital Multimeter /TS-CI-E217
Capacitance		10 kHz 10 nF 100 nF 1 μ F 100 kHz 10 pF 100 pF 1 nF 10 nF 100 nF 1 μ F	2.8 pF 27 pF 0.40 nF 3.0 fF 28 fF 0.27 pF 2.8 pF 27 pF 0.40 nF	
Inductance		1 kHz 100 μ H 1 mH 10 mH 100 mH 1 H 10 H	32 nH 0.30 μ H 3.0 μ H 28 μ H 0.28 mH 4 mH	
Frequency		10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	0.1 mHz 1 mHz 10 mHz 0.1 Hz 1 Hz 10 Hz	
Output Voltage		1 kHz (0.1 ~ 1) V (1 ~ 5) V	0.7 mV 1.0 mV	
DC Bias		($\pm$) (0.1 ~ 8) V (8 ~ 20) V (20 ~ 40) V	0.7 mV 2 mV 4 mV	

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC ammeters Current	40301	60 Hz ~ 1 kHz 10 μ A (10 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 3) A (3 ~ 10) A 60 Hz (10 ~ 20) A (20 ~ 100) A (60 ~ 100) Hz (10 ~ 20) A (20 ~ 100) A 100 Hz ~ 1 kHz (10 ~ 20) A (20 ~ 100) A	 0.04 μ A 0.05 μ A 0.2 μ A 2 μ A 0.02 mA 0.4 mA 1.1 mA 3 mA 22 mA 0.04 A 33 mA 0.06 A 0.11 A 0.18 A	Meter calibrator, Transconductance amplifier /TS-CI-E301
Clamp ammeters/voltmeters DC voltage AC voltage	40302	(0 ~ 200) mV (200 ~ 600) mV (0.6 ~ 6) V (6 ~ 60) V (60 ~ 600) V (600 ~ 1 000) V 60 Hz ~ 1 kHz (0.1 ~ 100) mV (100 ~ 200) mV (200 ~ 400) mV (400 ~ 600) mV (0.6 ~ 6) V (6 ~ 50) V (50 ~ 60) V	0.01 mV 0.1 mV 1 mV 0.01 V 0.1 V 1 V 0.02 mV 0.04 mV 0.1 mV 0.2 mV 1 mV 0.01 V 0.02 V	Meter calibrator, Current coil, Transconductance amplifier /TS-CI-E302

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Clamp ammeters/voltmeters	40302			Meter calibrator, Current coil, Transconductance amplifier /TS-CI-E302
AC voltage		60 Hz ~ 1 kHz (60 ~ 300) V (300 ~ 600) V (600 ~ 1 000) V	0.1 V 0.2 V 1 V	
DC current		(0 ~ 10) mA (10 ~ 20) mA (20 ~ 50) mA (50 ~ 100) mA (100 ~ 200) mA (200 ~ 300) mA (300 ~ 500) mA (0.5 ~ 1) A (1 ~ 3) A (3 ~ 10) A (10 ~ 20) A (20 ~ 50) A (50 ~ 100) A (100 ~ 200) A (200 ~ 300) A (300 ~ 400) A (400 ~ 500) A (500 ~ 600) A (600 ~ 1 000) A (1 000 ~ 2 000) A	0.02 mA 0.03 mA 0.06 mA 0.2 mA 0.3 mA 0.4 mA 0.6 mA 2 mA 4 mA 0.02 A 0.03 A 0.06 A 0.12 A 0.4 A 0.5 A 0.7 A 0.8 A 1.1 A 2 A 4 A	
AC current		60 Hz ~ 1 kHz 1 mA (1 ~ 5) mA (5 ~ 10) mA (10 ~ 20) mA (20 ~ 50) mA (50 ~ 100) mA (100 ~ 200) mA (200 ~ 300) mA (300 ~ 500) mA (0.5 ~ 1) A (1 ~ 3) A	2 μ A 6 μ A 0.02 mA 0.03 mA 0.06 mA 0.2 mA 0.3 mA 0.4 mA 0.6 mA 2 mA 4 mA	

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Clamp ammeters/voltmeters AC current	40302	60 Hz ~ 1 kHz (3 ~ 5) A (5 ~ 10) A (10 ~ 20) A 60 Hz (20 ~ 50) A (50 ~ 100) A (100 ~ 200) A (200 ~ 300) A (300 ~ 400) A (400 ~ 500) A (500 ~ 600) A (600 ~ 1 000) A (1 000 ~ 2 000) A (2 000 ~ 5 000) A Resistance (0 ~ 100) Ω (0.1 ~ 1) k Ω (1 ~ 10) k Ω (10 ~ 100) k Ω (0.1 ~ 1) M Ω (1 ~ 10) M Ω	7 mA 0.02 A 0.03 A 0.06 A 0.13 A 0.4 A 0.5 A 0.7 A 0.8 A 1.2 A 2 A 4 A 9 A 0.01 Ω 0.1 Ω 1 Ω 0.01 k Ω 0.1 k Ω 1 k Ω	Meter calibrator, Current coil, Transconductance amplifier /TS-CI-E302
AC voltage/current calibrators AC Voltage	40303	(40 Hz) 10 mV (10 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V	18 μ V 19 μ V 0.12 mV 1.1 mV 13 mV	Digital Multimeter, Shunt /TS-CI-E303

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC voltage/current calibrators AC Voltage	40303	40 Hz ~ 1 kHz 10 mV (10 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (100 ~ 500) V (500 ~ 1 000) V	17 μ V 18 μ V 0.11 mV 1.1 mV 12 mV 0.11 V 0.16 V	Digital Multimeter, Shunt /TS-CI-E303
		(1 ~ 20) kHz 10 mV (10 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V	17 μ V 28 μ V 0.24 mV 2.4 mV 24 mV	
AC Current		60 Hz ~ 1 kHz 1 mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 10) A (10 ~ 20) A (20 ~ 30) A	0.36 μ A 3.6 μ A 36 μ A 0.50 mA 9.9 mA 29 mA 0.13 mA	
AC current shunts AC Resistance	40305	(60 Hz) 1 m Ω (1 ~ 10) m Ω (10 ~ 100) m Ω (0.1 ~ 1) Ω (1 ~ 10) Ω (10 ~ 100) Ω	0.4 $\mu\Omega$ 11 $\mu\Omega$ 36 $\mu\Omega$ 0.23 m Ω 2.3 m Ω 23 m Ω	Digital Multimeter, Calibrator, Trans Conductance Amplifier /TS-CI-E305

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC current shunts AC Resistance	40305	(1 kHz) 1 mΩ (1 ~ 10) mΩ (10 ~ 100) mΩ (0.1 ~ 1) Ω (1 ~ 10) Ω (10 ~ 100) Ω	1.8 μΩ 18 μΩ 36 μΩ 0.23 mΩ 2.3 mΩ 23 mΩ	Digital Multimeter, Calibrator, Trans Conductance Amplifier /TS-CI-E305
AC power meters DC voltage AC voltage	40311	(0 ~ 6) V (6 ~ 60) V (60 ~ 600) V (600 ~ 1 000) V (50 ~ 60) Hz 0.1 V (0.1 ~ 1.5) V (1.5 ~ 6) V (6 ~ 15) V (15 ~ 30) V (30 ~ 60) V (60 ~ 150) V (150 ~ 300) V (300 ~ 600) V (600 ~ 1 000) V	0.1 mV 1 mV 0.01 V 0.1 V 72 μV 0.3 mV 0.8 mV 3 mV 5 mV 9 mV 0.03 V 0.05 V 0.15 V 0.2 V	Meter calibrator, Current coil /TS-CI-E311

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC power meters	40311			Meter calibrator, Current coil /TS-CI-E311
DC current		(0 ~ 1) mA	0.2 μ A	
		(1 ~ 5) mA	0.5 μ A	
		(5 ~ 10) mA	1 μ A	
		(10 ~ 20) mA	3 μ A	
		(20 ~ 50) mA	5 μ A	
		(50 ~ 100) mA	9 μ A	
		(100 ~ 200) mA	0.04 mA	
		(200 ~ 500) mA	0.08 mA	
		(0.5 ~ 1) A	0.14 mA	
		(1 ~ 2) A	0.7 mA	
		(2 ~ 5) A	1.4 mA	
		(5 ~ 10) A	3 mA	
		(10 ~ 20) A	16 mA	
		(20 ~ 50) A	76 mA	
		(50 ~ 100) A	0.16 A	
		(100 ~ 250) A	0.4 A	
		(250 ~ 500) A	0.8 A	
		(500 ~ 1 000) A	1.8 A	
AC current		(50 ~ 60) Hz		
		(1 ~ 5) mA	2.0 μ A	
		(5 ~ 10) mA	4.0 μ A	
		(10 ~ 20) mA	8.0 μ A	
		(20 ~ 50) mA	12 μ A	
		(50 ~ 100) mA	18 μ A	
		(100 ~ 200) mA	92 μ A	
		(200 ~ 500) mA	0.15 mA	
		(0.5 ~ 1) A	0.24 mA	
		(1 ~ 2) A	0.8 mA	
		(2 ~ 5) A	1.7 mA	
		(5 ~ 10) A	3 mA	
		(10 ~ 20) A	11 mA	

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC power meters	40311			Meter calibrator, Current coil /TS-CI-E311
AC current		(60 Hz) (20 ~ 50) A (50 ~ 100) A (100 ~ 250) A (250 ~ 500) A (500 ~ 1 000) A	78 mA 0.16 A 0.4 A 0.8 A 1.8 A	
AC power		(50 ~ 60) Hz 60 W (60 ~ 120) W (120 ~ 240) W (240 ~ 600) W (600 ~ 1 200) W (1 200 ~ 2 400) W (2 400 ~ 4 800) W (4 800 ~ 7 200) W (7 200 ~ 12 000) W (12 000 ~ 24 000) W	26 mW 0.05 W 0.08 W 0.28 W 0.5 W 0.9 W 4.6 W 6.2 W 7 W 10 W	
Power factor		(50 ~ 60) Hz LEAD (0.1 ~ 1) LAG (0.1 ~ 1)	6.1×10^{-4} 6.1×10^{-4}	
AC power supplies	40312			Digital Multimeter, Shunt, AC Electronics Load /TS-CI-E312
AC Voltage		40 Hz (1 ~ 10) V (10 ~ 100) V 40 Hz ~ 1 kHz (1 ~ 10) V (10 ~ 100) V (100 ~ 400) V (400 ~ 600) V	0.01 V 0.02 V 0.01 V 0.02 V 0.08 V 0.2 V	
AC Current		60 Hz ~ 1 kHz (0.1 ~ 1) A (1 ~ 5) A (5 ~ 10) A (10 ~ 18) A	6 mA 7 mA 9 mA 15 mA	

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Puncture/safety testers	40313			high voltage divider, oscilloscope, Digital Multimeter, Decade Resistor /TS-CI-E313
DC Voltage		0.1 kV (0.1 ~ 3) kV (3 ~ 4) kV (4 ~ 6) kV (6 ~ 7) kV (7 ~ 8) kV (8 ~ 10) kV (10 ~ 15) kV (15 ~ 20) kV (20 ~ 25) kV (25 ~ 30) kV	1 V 2 V 3 V 4 V 8 V 9 V 10 V 12 V 16 V 17 V 20 V	
AC Voltage		60 Hz 0.1 kV (0.1 ~ 1) kV (1 ~ 2) kV (2 ~ 3) kV (3 ~ 4) kV (4 ~ 5) kV (5 ~ 6) kV (6 ~ 7) kV (7 ~ 8) kV (8 ~ 9) kV (9 ~ 10) kV (10 ~ 15) kV (15 ~ 20) kV	5 V 8 V 11 V 16 V 20 V 25 V 30 V 35 V 40 V 44 V 49 V 0.09 kV 0.11 kV	
DC Current		0.5 mA (0.5 ~ 1) mA (1 ~ 2) mA (2 ~ 5) mA (5 ~ 10) mA	2 μ A 3 μ A 6 μ A 12 μ A 0.03 mA	
AC Current		0.5 mA (0.5 ~ 1) mA (1 ~ 2) mA (2 ~ 5) mA (5 ~ 10) mA (10 ~ 20) mA (20 ~ 50) mA (50 ~ 100) mA	2 μ A 3 μ A 9 μ A 15 μ A 0.03 mA 0.09 mA 0.15 mA 0.3 mA	

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Puncture/safety testers Insulation resistance	40313	1 MΩ (1 ~ 10) MΩ (10 ~ 100) MΩ (0.1 ~ 1) GΩ (1 ~ 10) GΩ	0.001 MΩ 0.01 MΩ 0.1 MΩ 0.001 GΩ 0.01 GΩ	high voltage divider, oscilloscope, Digital Multimeter, Decade Resistor /TS-CI-E313
AC voltmeters AC voltmeter	40318	2 mV 40 Hz ~ 10 kHz (2 ~ 20) mV 40 Hz ~ 10 kHz (20 ~ 100) mV 40 Hz 40 Hz ~ 10 kHz (20 ~ 50) kHz (50 ~ 100) kHz (100 ~ 200) kHz (200 ~ 500) kHz (0.5 ~ 1) MHz	7.0 μV 0.01 mV 0.02 mV 0.01 mV 0.02 mV 0.05 mV 0.09 mV 0.17 mV 0.32 mV	Meter calibrator /TS-CI-E318

403. AC voltage, current & power

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
AC voltmeters AC voltmeter	40318	(0.1 ~ 1) V 40 Hz 40 Hz ~ 20 kHz (20 ~ 50) kHz (50 ~ 100) kHz (100 ~ 200) kHz (200 ~ 500) kHz (0.5 ~ 1) MHz (1 ~ 10) V 40 Hz 40 Hz ~ 20 kHz (20 ~ 50) kHz (50 ~ 100) kHz (100 ~ 200) kHz (200 ~ 500) kHz (0.5 ~ 1) MHz (10 ~ 100) V 40 Hz 40 Hz ~ 20 kHz (20 ~ 50) kHz (50 ~ 100) kHz (100 ~ 1 000) V 55 Hz 55 Hz ~ 1 kHz	 0.12 mV 0.07 mV 0.09 mV 0.13 mV 0.43 mV 1.3 mV 2.0 mV 1.2 mV 0.7 mV 0.9 mV 1.2 mV 3.3 mV 13 mV 19 mV 12 mV 7 mV 11 mV 19 mV 0.08 V 0.08 V	Meter calibrator /TS-CI-E318

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Multimeter calibrators	40403			Digital multimeter /TS-CI-E403
DC voltage		(0 ~ 100) mV	1.5 μ V	
		(0.1 ~ 1) mV	9 μ V	
		(1 ~ 10) V	0.08 mV	
		(10 ~ 100) V	0.9 mV	
		(100 ~ 1 000) V	11 mV	
AC voltage		40 Hz		
		(1 ~ 100) mV	17 μ V	
		(0.1 ~ 1) V	0.10 mV	
		(1 ~ 10) V	1.0 mV	
		(10 ~ 100) V	11 mV	
		50 Hz		
		(100 ~ 1 000) V	0.15 V	
		40 Hz ~ 1 kHz		
		(0 ~ 100) mV	17 μ V	
		(0.1 ~ 1) V	0.10 mV	
		(1 ~ 10) V	1.0 mV	
		(10 ~ 100) V	11 mV	
		50 Hz ~ 1 kHz		
		(100 ~ 1 000) V	0.15 V	
		1 kHz ~ 20 kHz		
		(0 ~ 100) mV	27 μ V	
		(0.1 ~ 1) V	0.23 mV	
		(1 ~ 10) V	2.3 mV	
		(10 ~ 100) V	24 mV	
		20 kHz ~ 50 kHz		
		(0 ~ 100) mV	61 μ V	
		(0.1 ~ 1) V	0.57 mV	
		(1 ~ 10) V	5.7 mV	
		(10 ~ 100) V	57 mV	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Multimeter calibrators	40403			Digital multimeter /TS-CI-E403
AC voltage		50 kHz ~ 100 kHz (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V	80 μ V 0.58 mV 5.8 mV 60 mV	
DC current		(0 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 10) A (10 ~ 30) A	13 nA 44 nA 0.48 μ A 7.3 μ A 0.23 mA 6.3 mA 20 mA	
AC Current		40 Hz ~ 1 kHz (29 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 10) A	39 nA 0.36 μ A 3.6 μ A 36 μ A 0.50 mA 9.5 mA	
Resistance		(0 ~ 10) Ω (10 ~ 100) Ω (0.1 ~ 1) k Ω (1 ~ 10) k Ω (10 ~ 100) k Ω (0.1 ~ 1) M Ω (1 ~ 10) M Ω (10 ~ 100) M Ω	0.13 m Ω 1.1 m Ω 11 m Ω 0.11 Ω 1.1 Ω 14 Ω 0.24 k Ω 15 k Ω	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Function generators	40411			Frequency Counter, Digital Multimeter /TS-CI-E411
Frequency		10 Hz (10 ~ 100) Hz (0.1 ~ 1) kHz (1 ~ 10) kHz (10 ~ 100) kHz (0.1 ~ 1) MHz (1 ~ 10) MHz (10 ~ 100) MHz	7 μ Hz 0.07 mHz 0.7 mHz 7 mHz 0.07 Hz 0.7 Hz 7 Hz 0.07 kHz	
Output Level		40 Hz 1 mV (1 ~ 100) mV (100 ~ 200) mV (0.2 ~ 1) V (1 ~ 10) V 40 Hz ~ 1 kHz 1 mV (1 ~ 100) mV (100 ~ 200) mV (0.2 ~ 1) V (1 ~ 10) V (1 ~ 20) kHz 1 mV (1 ~ 100) mV	17 μ V 0.07 mV 0.10 mV 0.6 mV 6 mV 16 μ V 0.07 mV 0.10 mV 0.7 mV 7 mV 57 μ V 0.10 mV	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Function generators	40411			Frequency Counter, Digital Multimeter /TS-CI-E411
Output Level		(1 ~ 20) kHz (100 ~ 200) mV (0.2 ~ 1) V (1 ~ 10) V	0.22 mV 0.9 mV 9 mV	
		(0.1 ~ 1) MHz 100 mV (0.1 ~ 1) V (1 ~ 10) V	2.6 mV 4 mV 0.04 V	
Attenuation		40 Hz ~ 50 kHz (-20 ~ 20) dBm	0.20 dB	
		100 kHz (-20 ~ 10) dBm	0.22 dB	
frequency response		1 V 40 Hz ~ 1 kHz (1 ~ 20) kHz (20 ~ 100) kHz (0.1 ~ 1) MHz	0.6 mV 0.7 mV 0.9 mV 4 mV	
DC Offset		(-20 ~ 20) V	6 mV	
Leakege current testers	40416			Meter calibrator, Digital multimeter /TS-CI-E416
DC voltage		(0 ~ 30) V (30 ~ 300) V	0.01 V 0.1 V	
AC voltage		60 Hz ~ 1 kHz (0.1 ~ 30) V (30 ~ 300) V	0.01 V 0.1 V	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Leakege current testers	40416			Meter calibrator, Digital multimeter /TS-CI-E416
DC current		(0 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 50) mA	0.1 μ A 0.001 mA 0.01 mA	
AC current		60 Hz ~ 1 kHz (0 ~ 100) μ A (0.1 ~ 1) mA (1 ~ 10) mA (10 ~ 50) mA	0.1 μ A 0.001 mA 0.01 mA 0.02 mA	
Output resistance		(1 ~ 5) k Ω	1 Ω	
Electronic AC/DC loads	40417			Calibrator, Shunt, Digital Multimeter, AC/DC Power Supply /TS-CI-E417
DC Voltage		(1 ~ 15) V (15 ~ 80) V (80 ~ 300) V (300 ~ 500) V (500 ~ 1 000) V	0.001 V 0.002 V 0.01 V 0.02 V 0.1 V	
DC Current		0.1 A (0.1 ~ 3) A (3 ~ 10) A (10 ~ 30) A (30 ~ 50) A (50 ~ 100) A	0.1 mA 0.2 mA 1 mA 4 mA 0.01 A 0.1 A	
AC Voltage		60 Hz 10 V (10 ~ 100) V (100 ~ 200) V (200 ~ 300) V	0.01 V 0.03 V 0.05 V 0.07 V	
AC Current		60 Hz 1 A (1 ~ 3) A (3 ~ 10) A (10 ~ 20) A	1 mA 3 mA 7 mA 0.02 A	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Analogue/Digital multimeters	40419			Meter calibrator /TS-CI-E419
DC voltage		($\pm$) (0 ~ 20) mV (20 ~ 100) mV (0.1 ~ 1) V (1 ~ 2) V (2 ~ 5) V (5 ~ 10) V (10 ~ 20) V (20 ~ 50) V (50 ~ 100) V (100 ~ 200) V (200 ~ 500) V (500 ~ 1 000) V	0.6 μ V 1.2 μ V 6 μ V 0.02 mV 0.03 mV 0.04 mV 0.1 mV 0.4 mV 0.6 mV 3 mV 5 mV 8 mV	
AC voltage		40 Hz (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V (100 ~ 1 000) V 40 Hz ~ 20 kHz (0 ~ 100) mV (0.1 ~ 1) V (1 ~ 10) V (10 ~ 100) V	17 μ V 0.12 mV 1.2 mV 12 mV 0.08 V 14 μ V 0.07 mV 0.7 mV 7 mV	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Analogue/Digital multimeters	40419			Meter calibrator /TS-CI-E419
AC voltage		55 Hz ~ 1 kHz (100 ~ 1 000) V	0.09 V	
		(20 ~ 50) kHz (0 ~ 100) mV	21 μ V	
		(0.1 ~ 1) V	0.09 mV	
		(1 ~ 10) V	0.9 mV	
		(10 ~ 100) V	11 mV	
		(50 ~ 100) kHz (0 ~ 100) mV	49 μ V	
		(0.1 ~ 1) V	0.13 mV	
		(1 ~ 10) V	1.2 mV	
		(10 ~ 100) V	19 mV	
		(100 ~ 200) kHz (0 ~ 100) mV	90 μ V	
		(0.1 ~ 1) V	0.43 mV	
		(1 ~ 10) V	3.4 mV	
		(200 ~ 500) kHz (0 ~ 100) mV	0.17 mV	
		(0.1 ~ 1) V	1.3 mV	
		(1 ~ 10) V	0.013 V	
DC Current		($\pm$) (0 ~ 100) μ A	10 nA	
		(0.1 ~ 1) mA	42 nA	
		(1 ~ 10) mA	0.40 μ A	
		(10 ~ 100) mA	5.3 μ A	
		(0.1 ~ 1) A	80 μ A	
		(1 ~ 3) A	0.85 mA	
		(3 ~ 10) A	2.7 mA	
AC current		40 Hz 1 mA	0.21 μ A	
		(1 ~ 10) mA	2.1 μ A	
		(10 ~ 100) mA	19 μ A	
		(0.1 ~ 1) A	0.28 mA	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Analogue/Digital multimeters AC current	40419	40 Hz ~ 1 kHz 1 mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (1 ~ 3) A (3 ~ 10) A	0.16 μ A 1.6 μ A 14 μ A 0.28 mA 1.0 mA 2.9 mA	Meter calibrator /TS-CI-E419
Resistance		(1 ~ 10) kHz 1 mA (1 ~ 10) mA (10 ~ 100) mA (0.1 ~ 1) A (0 ~ 10) Ω (10 ~ 100) Ω (0.1 ~ 1) k Ω (1 ~ 10) k Ω (10 ~ 100) k Ω (0.1 ~ 1) M Ω (1 ~ 10) M Ω	1.8 μ A 16 μ A 0.12 mA 7.0 mA 0.23 m Ω 1.2 m Ω 9 m Ω 0.09 Ω 1.4 Ω 17 Ω 0.44 k Ω	
Oscilloscopes DC Voltage	40421	($\pm$) (1 ~ 6) mV (6 ~ 12) mV (12 ~ 30) mV (30 ~ 60) mV (60 ~ 120) mV (120 ~ 300) mV (0.3 ~ 0.6) V (0.6 ~ 1.2) V (1.2 ~ 3) V (3 ~ 6) V (6 ~ 12) V (12 ~ 30) V (30 ~ 60) V (60 ~ 120) V	42 μ V 44 μ V 52 μ V 64 μ V 0.13 mV 0.19 mV 0.72 mV 0.84 mV 1.4 mV 2.6 mV 11 mV 15 mV 26 mV 82 mV	Meter calibrator, Digital multimeter /TS-CI-E421

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Oscilloscopes	40421			Meter calibrator, Digital multimeter /TS-CI-E421
AC Voltage		1 kHz (1 ~ 3) mV (3 ~ 6) mV (6 ~ 12) mV (12 ~ 30) mV (30 ~ 60) mV (60 ~ 120) mV (120 ~ 300) mV (0.3 ~ 0.6) V (0.6 ~ 1.2) V (1.2 ~ 3) V (3 ~ 6) V (6 ~ 12) V (12 ~ 30) V (30 ~ 60) V (60 ~ 120) V	42 μ V 44 μ V 50 μ V 64 μ V 88 μ V 0.17 mV 0.30 mV 0.84 mV 1.2 mV 2.6 mV 5.0 mV 12 mV 25 mV 49 mV 0.12 V	
Bandwidth level		600 mV 50 kHz 50 kHz ~ 10 MHz (10 ~ 500) MHz (500 ~ 1 000) MHz (1 ~ 2) GHz (2 ~ 4) GHz	9 mV 15 mV 16 mV 18 mV 25 mV 30 mV	
Time Marker		10 ns (10 ~ 100) ns (0.1 ~ 1) μ s (1 ~ 10) μ s (10 ~ 100) μ s (0.1 ~ 1) ms (1 ~ 10) ms (10 ~ 100) ms (0.1 ~ 1) s (1 ~ 10) s	0.62 ps 6.2 ps 62 ps 0.62 ns 6.2 ns 62 ns 0.62 μ s 6.2 μ s 62 μ s 0.62 ms	
Cal Output Amplitude		(0.1 ~ 1) kHz (0.1 ~ 5) V (5 ~ 10) V	2 mV 0.02 V	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Oscilloscopes	40421			Meter calibrator, Digital multimeter /TS-CI-E421
Cal Output Amplitude		(1 ~ 10) kHz (0.1 ~ 1) V (1 ~ 5) V (5 ~ 10) V	2 mV 3 mV 0.02 V	
Cal Output Frequency		(1 ~ 2) kHz	0.7 Hz	
Input Impedance		50 Ω 1 M Ω	7 m Ω 0.7 k Ω	
Voltage/current recorders	40424			Meter calibrator /TS-CI-E424
DC voltage		($\pm$) (0 ~ 20) mV (20 ~ 100) mV (0.1 ~ 1) V (1 ~ 20) V (20 ~ 100) V (100 ~ 1 000) V	1 μ V 2 μ V 0.01 mV 0.1 mV 1 mV 0.01 V	
DC current		($\pm$) (0 ~ 10) mA (10 ~ 50) mA (50 ~ 100) mA (100 ~ 200) mA (200 ~ 500) mA (0.5 ~ 1) A (1 ~ 10) A	1 μ A 4 μ A 9 μ A 0.03 mA 0.06 mA 0.10 mA 2.6 mA	
Relay test sets	40425			Digital Multimeter, Shunt TS-CI-E425
DC Voltage		(1 ~ 100) V (100 ~ 200) V (200 ~ 400) V (400 ~ 1 000) V	6 mV 7 mV 8 mV 0.06 V	
DC Current		0.2 A (0.2 ~ 10) A (10 ~ 30) A (30 ~ 60) A (60 ~ 90) A	0.6 mA 0.8 mA 7 mA 18 mA 26 mA	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Relay test sets	40425	60 Hz ~ 1 kHz		Digital Multimeter, Shunt TS-CI-E425
AC Voltage		10 V	6 mV	
		(10 ~ 100) V	12 mV	
		(100 ~ 150) V	58 mV	
		(150 ~ 300) V	68 mV	
		(300 ~ 1 000) V	0.16 V	
AC Current		60 Hz ~ 1 kHz		
		0.1 A	0.6 mA	
		(0.1 ~ 7.5) A	4.6 mA	
		(7.5 ~ 30) A	21 mA	
		(30 ~ 60) A	0.06 A	
		(60 ~ 100) A	0.09 A	
LF signal generators	40426	(1 ~ 10) kHz		Frequency Counter, Digital Multimeter /TS-CI-E426
Output Level Test		-40 dBm	0.20 dB	
		-(40 ~ 30) dBm	0.08 dB	
		-(30 ~ 20) dBm	0.05 dB	
		(-20 ~ 10) dBm	0.04 dB	
		(10 ~ 50) kHz		
		-40 dBm	0.26 dB	
		-(40 ~ 30) dBm	0.10 dB	
		-(30 ~ 20) dBm	0.05 dB	
		-(20 ~ 10) dBm	0.04 dB	
		(-10 ~ 0) dBm	0.05 dB	
		(0 ~ 10) dBm	0.04 dB	
		(50 ~ 100) kHz		
		-40 dBm	0.47 dB	
		-(40 ~ 30) dBm	0.19 dB	
		-(30 ~ 20) dBm	0.11 dB	
		-(20 ~ 10) dBm	0.08 dB	
		(-10 ~ 0) dBm	0.11 dB	
		(0 ~ 10) dBm	0.08 dB	

404. Other DC & LF Measurements

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
LF signal generators Attenuator Test	40426	1 kHz -10 dB -(10 ~ 20) dB -(20 ~ 30) dB -(30 ~ 40) dB	0.04 dB 0.05 dB 0.08 dB 0.20 dB	Frequency Counter, Digital Multimeter /TS-CI-E426
AC/DC high voltage probes DC Voltage AC Voltage	40435	0.1 kV (0.1 ~ 1) kV 60 Hz ~ 1 kHz 0.1 kV (0.1 ~ 0.5) kV (0.5 ~ 1) kV	0.02 V 0.2 V 0.2 V 1.6 V 1.7 V	Calibrator /TS-CI-E435

501. Contact thermometry

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Temperature generators; oven, furnaces, isothermal liquid baths, dry-block calibrators	50101	0 ℃ (-196 ~ -80) ℃ (-80 ~ 420) ℃ (420 ~ 1 200) ℃	0.01 ℃ 0.06 ℃ 0.02 ℃ 1.0 ℃	SPRT, Thermocouple /TS-CI-T01
Temperature indicators/ recorders/controllers, temperature calibrators with sensor without sensor Temperature Calibrators	50102	(-196 ~ 420) ℃ (420 ~ 1 200) ℃ (-196 ~ 420) ℃ (420 ~ 1 200) ℃ (-196 ~ 420) ℃ (420 ~ 1 200) ℃	0.034 ℃ 1.1 ℃ 0.06 ℃ 0.18 ℃ 0.06 ℃ 0.18 ℃	SPRT, Thermocouple, Temperature Calibrator /TS-CI-T02
Glass thermometers; liquid-in-glass, Beckmann Glass thermometers	50103	(-50 ~ 250) ℃	0.05 ℃	SPRT /TS-CI-T03
Resistance thermometers; SPRT, IPRT, thermistors, etc.	50104	(-196 ~ 420) ℃	0.037 ℃	SPRT /TS-CI-T04
Thermal expansion thermometers; bimetal, gas or liquid type	50105	(-196 ~ -80) ℃ (-80 ~ 0) ℃ (0 ~ 120) ℃ (120 ~ 250) ℃ (250 ~ 420) ℃	1.5 ℃ 0.6 ℃ 0.3 ℃ 0.6 ℃ 1.5 ℃	SPRT /TS-CI-T05
Thermocouples; noble metal, base metal, pure metal, special type, etc. base Thermocouple	50106	(-196 ~ 420) ℃ (420 ~ 1 200) ℃	0.4 ℃ 1.1 ℃	SPRT, Thermocouple /TS-CI-T06
Temperature transducers	50107	(-196 ~ 420) ℃ (420 ~ 1 200) ℃	0.14 ℃ 1.2 ℃	SPRT, Thermocouple /TS-CI-T07

502. Non Contact thermometry

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Standard radiation thermometers	50204	(0 ~ 100) °C (100 ~ 500) °C (500 ~ 800) °C (800 ~ 1 200) °C	0.7 °C 1.1 °C 1.5 °C 1.7 °C	Standard Radiation Thermometer /TS-CI-N04
Thermal image apparatus	50205	(0 ~ 100) °C (100 ~ 500) °C (500 ~ 800) °C (800 ~ 1 200) °C	0.7 °C 1.2 °C 1.6 °C 1.8 °C	Standard Radiation Thermometer /TS-CI-N05
Blackbody furnaces	50206	(0 ~ 100) °C (100 ~ 500) °C (500 ~ 800) °C (800 ~ 1 200) °C	0.7 °C 1.1 °C 1.5 °C 1.7 °C	Standard Radiation Thermometer /TS-CI-N06
Others: ear thermometers, etc.	50207	(34 ~ 42) °C	0.1 °C	SPRT /TS-CI-N07

503. Humidity

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Relative humidity hygrometers; polimer thinfilm, hair, etc. temperature humidity	50302	(-40 ~ 0) °C (0 ~ 70) °C (70 ~ 100) °C (100 ~ 140) °C (10 ~ 15) % R.H. (15 ~ 30) % R.H. (30 ~ 40) % R.H. (40 ~ 60) % R.H. (60 ~ 80) % R.H. (80 ~ 95) % R.H.	0.5 °C 0.6 °C 1.2 °C 2.4 °C 2.4 % R.H. 2.1 % R.H. 2.2 % R.H. 2.3 % R.H. 2.4 % R.H. 2.5 % R.H.	Dew-point hygrometers /TS-CI-H01, TS-CI-H02
Temperature humidity recorders; hygrothermograph, etc. temperature humidity	50304	(0 ~ 50) °C (10 ~ 95) % R.H.	0.8 °C 4.3 % R.H.	Dew-point hygrometers /TS-CI-H04
Transducers; dew-point/relative humidity	50305	(10 ~ 15) % R.H. (15 ~ 40) % R.H. (40 ~ 60) % R.H. (60 ~ 80) % R.H. (80 ~ 95) % R.H.	2.4 % R.H. 2.2 % R.H. 2.3 % R.H. 2.4 % R.H. 2.5 % R.H.	Dew-point hygrometers /TS-CI-H05
Humidity generators; two-pressure, two-temperature, flow mixing humidity generator, constant temperature and humidity chamber, etc. temperature humidity	50306	(-40 ~ 100) °C (100 ~ 180) °C (10 ~ 20) % R.H. (20 ~ 30) % R.H. (30 ~ 40) % R.H. (40 ~ 60) % R.H. (60 ~ 70) % R.H. (70 ~ 80) % R.H. (80 ~ 95) % R.H.	0.5 °C 1.2 °C 2.6 % R.H. 2.4 % R.H. 2.3 % R.H. 2.2 % R.H. 2.1 % R.H. 2.5 % R.H. 2.7 % R.H.	Dew-point hygrometers /TS-CI-H06

901. Chemical analysis

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Breath alcohol analyzers	90101	(0 ~ 0.08) % BAC (0.08 ~ 0.19) % BAC	3.3×10^{-2} 2.1×10^{-2}	Alcohol gas /TS-CI-C01
Gas analyzers O ₂ CO H ₂ S CH ₄ H ₂ CO ₂	90103	(0 ~ 21.0) cmol/mol (0 ~ 100.0) μmol/mol (0 ~ 50.0) μmol/mol (0 ~ 2.50) cmol/mol 500 μmol/mol 2 cmol/mol 2 500 μmol/mol (0 ~ 5.00) cmol/mol	2.4×10^{-2} 3.0×10^{-2} 4.4×10^{-2} 2.4×10^{-2} 11 μmol/mol 0.03 cmol/mol 51 μmol/mol 2.0×10^{-2}	CRM /TS-CI-C03
Other; pH meter, Electrical conductivity meter pH meter Electrical conductivity meter	90199	(4 ~ 10) pH 100 μS/cm 1 413 μS/cm 10 mS/cm	0.02 pH 2.5 μS/cm 6 μS/cm 0.06 mS/cm	CRM /TS-CI-C99-1 CRM /TS-CI-C99-2