Korea Laboratory Accreditation Scheme

CERTIFICATE OF ACCREDITATION

Han Sung Instrument Co.,Ltd

Accreditation No. : KC08-225

Corporation Registration No. : 110111-1228512

Address of Laboratory : 60, Haan-ro, Gwangmyeong-si, Gyeonggi-do, Republic of Korea

Date of Initial Accreditation : July 21, 2008.

Validity of Accreditation : August 23, 2024. ~ August 22, 2028.

Scope of Accreditation : Attached Annex

Date of issue : July 09, 2025.

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).

ilac-MRA

KOREA LABORATORY ACCREDITATION SCHEME KOLAS

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 : August. 22, 2028 Accreditation No. : KC08-225

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
201. Mass		
20102	Auto-hopper scale balances	Y
20105	Counter beam balances	Y
20106	Dial platform scale balances	Y
20107	Dial swing scale balances	Y
20109	Eletric balances	Y
20112	Platform scale balances	Y
20113	Spring scale balances	Y
20114	Trip balances	Y
20116	Weights	Y
204. Pressure		
20406	Absolute pressure gauges; dial, digital, barometer, recorder, etc	Y
20408	Compound pressure gauges; dial, digital, etc	Y
20409	Differential pressure gauges ; dial, digital, etc	Y
20411	Gauge pressure gauges; dial, digital, recorder, etc	Y
20412	Pressure transducers/ transmitters	Y
20413	Dial type vacuum gauges	Y
206. Volume		
20601	Volumetric glasswares	N
20606	Piston type volume	N
301. Time/frequency		
30103	General frequency sources	Y
30104	Frequency meters/counters	Y
30106	Time interval meters/ stop watches/timers	Y
302. Velocity & revolution		
30201	Standard rpm generators	Y
30202	Contact-type tachometers	Y
30203	Photo tachometers/ stroboscopes	Y

Field Code	Item of Calibration	on-site
401. DC voltage & current		
40101	DC ammeters	Y
40103	DC voltage/current Calibrators	Y
40104	Electrical temperature Calibrators	Y
40108	DC power supplies	Y
40112	DC voltmeters	Y
402. Resistance, Capacitance and Inductance		
40205	Earth testers	Y
40210	Insulation testers	Y
40214	Resistance meters	Y
40215	Resistors	Y
403. AC voltage, current & power		
40301	AC ammeters	Y
40302	Clamp ammeters/voltmeters	Y
40303	AC voltage/current calibrators	Y
40310	Power factor meters	Y
40311	AC power meters	Y
40312	AC power supplies	Y
40313	Puncture/safety testers	Y
40314	Power recorders	Y
40318	AC voltmeters	Y
404. Other DC & LF Measurements		
40410	Line frequency meters	Y
40411	Function generators	Y
40414	LF impulse generators	Y
40416	Leakage current testers	Y
40417	Electronic AC/DC loads	Y
40419	Analogue/Digital multimeters	Y
40421	Oscilloscopes	Y
40424	Volt/Current recorders	Y
40425	Relay test sets	Y
40426	LF signal generators	Y
501. Contact thermometry		
50101	Temperature generators: ovens, furnaces, isothermal liquid baths, dry-block calibrators	Y

Field Code	Item of Calibration	on-site
50102	Temperature indicators / recorders / controllers, temperature calibrators	Y
50103	Glass thermometers; liquid-in-glass, Beckmann	N
50104	Resistance thermometers; SPRT, IPRT, thermistors, etc	Y
50105	Thermal expansion thermo-meters; bimetal, gas or liquid type	Y
50106	Thermomecouples: noble metal, base metal, pure metal, special type, etc.	Y
50107	Temperature transducers	Y
503. Humidity		
50302	Relative humidity hygrometers; polymer thin film, hair, etc.	N
50304	Temperature humidity recorders; hygrothermograph, etc.	N
50305	Transducers; dew-point/ relative humidity	N
50306	Humidity generators; two-pressure, two-temperature, flow mixing humidity generator, constant temperature and humidity chamber, etc.	Y
901.Chemical analysis		
90103	Gas analyzers	Y
90199	Others; pH meter Electrical conductivity meter	N

Note

1. This laboratory provides calibration services in permanent standard laboratory and at on-site.
2. Laboratory conducts on-site calibration should meet requirements of KOLAS-SR-007.
3. On-site calibration is allowed to items with marking 'Y', not allowed to items with marking 'N'.
4. 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 calbration laboratories in normal conditions.
5.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.
6. 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 and related quantities

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Auto-hopper scale balances	20102	(0 ~ 10) kg (10 ~ 50) kg (50 ~ 200) kg (200 ~ 1 000) kg	1.4 g 7.1 g 28 g 0.14 kg	Standard Weight /HS-I-201-02
Counter beam balances	20105	(0 ~ 311) g (311 ~ 2 610) g (2 610 ~ 20 000) g	7.6 mg 81 mg 0.76 mg	Standard Weight /HS-I-201-05
Dial platform scale balances	20106	(0 ~ 1) kg (1 ~ 10) kg (10 ~ 50) kg (50 ~ 200) kg	0.87 g 8.7 g 87 g 0.87 kg	Standard Weight /HS-I-201-06
Dial swing scale balances	20107	(0 ~ 10) kg (10 ~ 50) kg (50 ~ 200) kg (200 ~ 1 000) kg	9.7 g 52 g 0.21 kg 1.0 kg	Standard Weight /HS-I-201-06
Eletric balances	20109	(0 ~ 2) g (2 ~ 5) g (5 ~ 20) g (20 ~ 200) g (200 ~ 1 000) g (1 ~ 3) kg (3 ~ 5) kg (5 ~ 10) kg (10 ~ 30) kg (30 ~ 60) kg (60 ~ 300) kg (300 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 5 000) kg (5 000 ~ 10 000) kg (10 000 ~ 20 000) kg (20 000 ~ 50 000) kg	10 µg 14 µg 20 µg 0.09 mg 0.2 mg 0.4 mg 0.9 mg 2 mg 5 mg 0.3 g 2 g 0.10 kg 0.2 kg 1.0 kg 2 kg 10 kg 20 kg	Standard Weight /HS-I-201-09
Platform scale balances	20112	(0 ~ 50) kg (50 ~ 200) kg (200 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 3 000) kg (3 000 ~ 5 000) kg	9.3 g 91 g 0.18 kg 0.91 kg 1.8 kg 5.0 kg	Standard Weight /HS-I-201-12
Spring scale balances	20113	(0 ~ 1) kg (1 ~ 10) kg (10 ~ 50) kg (50 ~ 200) kg	0.83 g 8.3 g 90 g 0.83 kg	Standard Weight /HS-I-201-13
Trip balances	20114	(0 ~ 5) g (5 ~ 200) g (200 ~ 1 000) g (1 000 ~ 5 000) g	89 mg 0.18 g 0.89 g 4.4 g	Standard Weight /HS-I-201-14

201. Mass and related quantities

Measured Quantity Instrument or Gauge	Field code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Weights	20116	(1 mg ~ 20 kg)	(Class E_2)	Standard Weight and mass comporator /HS-I-201-16
		1 mg	2.0 µg	
		2 mg	2.0 µg	
		5 mg	2.0 µg	
		10 mg	2.0 µg	
		20 mg	3.0 µg	
		50 mg	4.0 µg	
		100 mg	5.0 µg	
		200 mg	6.0 µg	
		500 mg	8.0 µg	
		1 g	10 µg	
		2 g	13 µg	
		5 g	16 µg	
		10 g	0.02 mg	
		20 g	0.02 mg	
		50 g	0.03 mg	
		100 g	0.05 mg	
		200 g	0.10 mg	
		500 g	0.2 mg	
		1 kg	0.5 mg	
		2 kg	1.0 mg	
		5 kg	2.6 mg	
		10 kg	5 mg	
		20 kg	10 mg	
		(500 kg ~ 1 000 kg)	(Class F_2)	
		500 kg	2 g	
		1 000 kg	5 g	

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; dial, digital, barometer, recorder, etc	20406	(5 ~ 200) kPa abs (200 ~ 1 000) kPa abs (1 000 ~ 7 000) kPa abs	4.8×10^{-3} 1.2×10^{-3} 1.7×10^{-3}	Digital pressure gauges /HS-I-204-06
Compound pressure gauges; dial, digital, etc	20408	(-100 ~ 100) kPa (100 ~ 1 000) kPa (1 000 ~ 7 000) kPa	1.5×10^{-3} 2.4×10^{-3} 1.7×10^{-3}	Digital pressure gauges /HS-I-204-08
Differential pressure gauges; dial, digital, etc	20409	(0 ~ 14) kPa (14 ~ 700) kPa (700 ~ 2 000) kPa	1.6×10^{-3} 7.3×10^{-4} 1.6×10^{-4}	Digital pressure gauges Pneumatic pressure ballances /HS-I-204-09
Gauge pressure gauges; dial, digital, recorder, etc	20411			Digital pressure gauges
Pneumatic pressure		(0 ~ 14) kPa (14 ~ 700) kPa (700 ~ 7 000) kPa	1.6×10^{-3} 7.3×10^{-4} 1.3×10^{-4}	Pneumatic pressure ballances
Hydraulic pressure		(7 ~ 100) MPa	1.8×10^{-4}	Hydraulic pressure ballances /HS-I-204-11
Pressure transducers/ transmitters	20412			
Absolute pressure		(5 ~ 200) kPa abs (200 ~ 1 000) kPa abs (1 000 ~ 7 000) kPa abs	4.8×10^{-3} 1.2×10^{-3} 1.7×10^{-3}	Digital pressure gauges Pneumatic pressure ballances Hydraulic pressure ballances Digital multimeters
Vacuum pressure		(-100 ~ 0) kPa	2.4×10^{-3}	/HS-I-204-12
Gauge pressure Pneumatic pressure		(0 ~ 14) kPa (14 ~ 700) kPa (700 ~ 7 000) kPa	1.3×10^{-3} 4.4×10^{-4} 1.7×10^{-4}	
Gauge pressure Hydraulic pressure		(7 ~ 100) MPa	2.0×10^{-4}	
Differential pressure		(0 ~ 14) kPa (14 ~ 700) kPa (700 ~ 2 000) kPa	1.3×10^{-3} 4.4×10^{-4} 1.2×10^{-4}	
Dial type vacuum gauges	20413	(-100 ~ 0) kPa	2.6×10^{-3}	Digital pressure gauges /HS-I-204-13

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 ~ 0.5) mL	1.8 µL	Electric balances /HS-I-206-01
		(0.5 ~ 1) mL	2.8 µL	
		(1 ~ 2) mL	3.7 µL	
		(2 ~ 5) mL	5.2 µL	
		(5 ~ 10) mL	6.9 µL	
		(10 ~ 25) mL	11 µL	
		(25 ~ 50) mL	17 µL	
		(50 ~ 100) mL	29 µL	
		(100 ~ 200) mL	42 µL	
		(200 ~ 250) mL	58 µL	
		(250 ~ 500) mL	93 µL	
		(500 ~ 1 000) mL	0.18 mL	
		(1 000 ~ 2 000) mL	0.31 mL	
Piston type volume	20606	(0 ~ 0.001) mL	6 nL	Electric balances /HS-I-206-06
		(0.001 ~ 0.01) mL	20 nL	
		(0.01 ~ 0.02) mL	34 nL	
		(0.02 ~ 0.1) mL	0.10 µL	
		(0.1 ~ 0.2) mL	0.29 µL	
		(0.2 ~ 1) mL	0.92 µL	
		(1 ~ 5) mL	3.7 µL	
		(5 ~ 10) mL	8.1 µL	
		(10 ~ 20) mL	19 µL	
		(20 ~ 50) mL	45 µL	

301. Time/frequency

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
General frequency sources Output frequency	30103	 10 MHz	 1.3×10^{-12}	GPS, Frequency counters /HS-I-301-03
Frequency meters/counters Input frequency Time base frequency	30104	 10 MHz 10 MHz	 1.0×10^{-11} 3.4×10^{-12}	GPS, Frequency counters /HS-I-301-04
Time interval meters/ stop watches/timers relative time difference Timers	30106	 1 day (1 ~ 100) s (100 ~ 1 000) s (1 000 ~ 9 999) s	 1.4×10^{-7} 6.0×10^{-2} 7.2×10^{-4} 1.8×10^{-4}	Stop watch calibrator, Timers /HS-I-301-06

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 rotational speed	30201	(6 ~ 600) min^{-1} (600 ~ 5 000) min^{-1}	0.19 min^{-1} 1.7 min^{-1}	Tachometer /HS-I-302-01
Contact-type tachometers rotational speed	30202	(6 ~ 5 000) min^{-1}	0.12 min^{-1}	Reference rational frequency generator /HS-I-302-02
Photo tachometers/stroboscopes photodetection system flash of light	30203	 (6 ~ 600) min^{-1} (600 ~ 9 000) min^{-1} (9 000 ~ 99 000) min^{-1} (6 ~ 600) min^{-1} (600 ~ 9 000) min^{-1} (9 000 ~ 99 000) min^{-1}	 0.007 2 min^{-1} 0.064 min^{-1} 0.66 min^{-1} 0.040 min^{-1} 0.042 min^{-1} 0.042 min^{-1}	 GPS, Reference rational frequency generator /HS-I-302-03 GPS, Frequency counters /HS-I-302-03

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	40101			Calibrator
DC Current		(±)		/HS-I-401-01
		10 μA	8.2 nA	
		(10 ~ 100) μA	19 nA	
		(0.1 ~ 1) mA	0.11 μA	
		(1 ~ 10) mA	1.1 μA	
		(10 ~ 100) mA	11 μA	
		(0.1 ~ 1) A	0.16 mA	
		(1 ~ 10) A	3.0 mA	
		(10 ~ 20) A	19 mA	
		(20 ~ 30) A	28 mA	
DC voltage/current calibrators	40103			Digital Multimeter
DC Voltage		(±)		/HS-I-401-03
		10 mV	0.69 μV	
		(10 ~ 100) mV	1.7 μV	
		(0.1 ~ 1) V	6.7 μV	
		(1 ~ 10) V	52 μV	
		(10 ~ 100) V	0.74 mV	
		(100 ~ 1 000) V	9.5 mV	
DC Current		(±)		
		10 μA	7.5 nA	
		(10 ~ 100) μA	12 nA	
		(0.1 ~ 1) mA	45 nA	
		(1 ~ 10) mA	0.50 μA	
		(10 ~ 100) mA	9.8 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	4.3 mA	
		(10 ~ 20) A	7.6 mA	
		(20 ~ 30) A	26 mA	
Resistance		1 Ω	26 μΩ	
		(1 ~ 10) Ω	0.16 mΩ	
		(10 ~ 100) Ω	1.4 mΩ	
		(0.1 ~ 1) kΩ	14 mΩ	
		(1 ~ 10) kΩ	0.14 Ω	
		(10 ~ 100) kΩ	1.4 Ω	
		(0.1 ~ 1) MΩ	17 Ω	
		(1 ~ 10) MΩ	0.35 kΩ	
		(10 ~ 100) MΩ	26 kΩ	

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			Calibrator
Temperature(Measure)				/HS-I-401-04
J-Type		(-8.095 ~ 69.553) mV	1.9 μV	
K-Type		(-6.458 ~ 54.819) mV	1.8 μV	
T-Type		(-6.258 ~ 20.872) mV	1.4 μV	
E-Type		(-9.835 ~ 76.373) mV	2.0 μV	
N-Type		(-4.345 ~ 47.513) mV	1.7 μV	
R-Type		(-0.227 ~ 21.003) mV	1.4 μV	
S-Type		(-0.236 ~ 18.609) mV	1.4 μV	
B-Type		(1.792 ~ 13.820) mV	1.4 μV	
Pt 100		(18.520 ~ 390.481) Ω	15 mΩ	
Temperature(Source)				
J-Type		(-8.095 ~ 69.553) mV	2.3 μV	
K-Type		(-6.458 ~ 54.819) mV	2.2 μV	
T-Type		(-6.258 ~ 20.872) mV	2.0 μV	
E-Type		(-9.835 ~ 76.373) mV	2.4 μV	
N-Type		(-4.345 ~ 47.513) mV	2.1 μV	
R-Type		(-0.227 ~ 21.003) mV	2.0 μV	
S-Type		(-0.236 ~ 18.609) mV	1.9 μV	
B-Type		(1.792 ~ 13.820) mV	1.9 μV	
Pt 100		(18.520 ~ 390.481) Ω	6.8 mΩ	
DC power supplies	40108			Digital Multimeter
DC Voltage		100 mV	6.4 μV	/HS-I-401-08
		(0.1 ~ 1) V	62 μV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.2 mV	
		(100 ~ 1 000) V	62 mV	
DC Current		100 mA	14 μA	
		(0.1 ~ 1) A	0.24 mA	
		(1 ~ 10) A	3.1 mA	
		(10 ~ 100) A	60 mA	
DC voltmeters	40112			Calibrator
DC Voltage		(±)		/HS-I-401-12
		10 mV	1.2 μV	
		(10 ~ 100) mV	2.1 μV	
		(0.1 ~ 1) V	8.8 μV	
		(1 ~ 10) V	84 μV	
		(10 ~ 100) V	1.2 mV	
		(100 ~ 1 000) V	12 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.
Earth testers	40205			Decade Resistor
AC Voltage		60 Hz		/HS-I-402-05
		100 mV	22 μV	
		(0.1 ~ 1) V	0.16 mV	
		(1 ~ 10) V	1.5 mV	
		(10 ~ 100) V	16 mV	
		(100 ~ 1 000) V	0.24 V	
AC Current		60 Hz		
		100 μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.5 μA	
		(10 ~ 100) mA	22 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.4 mA	
		(10 ~ 20) A	22 mA	
		(20 ~ 30) A	29 mA	
Resistance		100 mΩ	14 μΩ	
		(0.1 ~ 1) Ω	0.14 mΩ	
		(1 ~ 10) Ω	1.4 mΩ	
		(10 ~ 100) Ω	14 mΩ	
		(0.1 ~ 1) kΩ	0.14 Ω	
		(1 ~ 10) kΩ	1.4 Ω	
		(10 ~ 100) kΩ	14 Ω	
Load Resistance		100 mΩ	1.2 mΩ	
		300 mΩ	3.6 mΩ	
		500 mΩ	5.8 mΩ	

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			Decade Resistor
DC Voltage		1 V	62 μV	/HS-I-402-10
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.3 mV	
		(100 ~ 1 000) V	63 mV	
AC Voltage		60 Hz		
		1 V	0.16 mV	
		(1 ~ 10) V	1.5 mV	
		(10 ~ 100) V	16 mV	
		(100 ~ 1 000) V	0.24 V	
Insulation Voltage		1 V	62 μV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.2 mV	
		(100 ~ 1 000) V	62 mV	
		(1 ~ 2) kV	14 V	
		(2 ~ 5) kV	32 V	
		(5 ~ 10) kV	61 V	
Resistance		1 kΩ	1.2 Ω	
		(1 ~ 10) kΩ	12 Ω	
		(10 ~ 100) kΩ	0.12 kΩ	
		(0.1 ~ 1) MΩ	1.2 kΩ	
		(1 ~ 10) MΩ	12 kΩ	
		(10 ~ 100) MΩ	0.12 MΩ	
		(0.1 ~ 1) GΩ	1.2 MΩ	
		(1 ~ 10) GΩ	14 MΩ	
		(10 ~ 100) GΩ	0.16 GΩ	
		(0.1 ~ 1) TΩ	4.5 GΩ	
Time		1 s	3.2 ms	
		(1 ~ 10) s	8.2 ms	
		(10 ~ 100) s	61 ms	
		(100 ~ 1 000) s	0.59 s	

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 meters	40214			Standard Resistance
Resistance		1 mΩ	67 nΩ	/HS-I-402-14
		(1 ~ 10) mΩ	0.67 μΩ	
		(10 ~ 100) mΩ	6.7 μΩ	
		(0.1 ~ 1) Ω	30 μΩ	
		(1 ~ 10) Ω	0.14 mΩ	
		(10 ~ 100) Ω	1.4 mΩ	
		(0.1 ~ 1) kΩ	14 mΩ	
		(1 ~ 10) kΩ	0.14 Ω	
		(10 ~ 100) kΩ	1.4 Ω	
		(0.1 ~ 1) MΩ	20 Ω	
		(1 ~ 10) MΩ	0.26 kΩ	
		(10 ~ 100) MΩ	2.8 kΩ	
		(0.1 ~ 1) GΩ	12 MΩ	
		(1 ~ 10) GΩ	0.12 GΩ	
		(10 ~ 100) GΩ	1.2 GΩ	
Resistors	40215			Digital Multimeter
Resistance		1 mΩ	0.67 μΩ	/HS-I-402-15
		(1 ~ 10) mΩ	1.7 μΩ	
		(10 ~ 100) mΩ	16 μΩ	
		(0.1 ~ 1) Ω	0.16 mΩ	
		(1 ~ 10) Ω	1.6 mΩ	
		(10 ~ 100) Ω	1.3 mΩ	
		(0.1 ~ 1) kΩ	12 mΩ	
		(1 ~ 10) kΩ	0.12 Ω	
		(10 ~ 100) kΩ	1.3 Ω	
		(0.1 ~ 1) MΩ	16 Ω	
		(1 ~ 10) MΩ	0.35 kΩ	
		(10 ~ 100) MΩ	26 kΩ	
		(0.1 ~ 1) GΩ	2.7 MΩ	

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	40301			Calibrator
AC Current		(50 Hz ~ 1 kHz)		/HS-I-403-01
		10 μA	34 nA	
		(10 ~ 100) μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	21 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.3 mA	
		(10 ~ 20) A	22 mA	
		(20 ~ 30) A	29 mA	
		(1 ~ 5) kHz		
		10 μA	34 nA	
		(10 ~ 100) μA	78 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	32 μA	
		(0.1 ~ 1) A	0.32 mA	
		(1 ~ 10) A	4.4 mA	
		(10 ~ 20) A	0.10 A	
		(20 ~ 30) A	0.15 A	
Clamp ammeters/voltmeters	40302			Calibrator
DC Voltage		10 mV	1.3 μV	/HS-I-403-02
		(10 ~ 100) mV	6.5 μV	
		(0.1 ~ 1) V	62 μV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.3 mV	
		(100 ~ 1 000) V	63 mV	
AC Voltage		60 Hz		
		10 mV	9.3 μV	
		(10 ~ 100) mV	22 μV	
		(0.1 ~ 1) V	0.16 mV	
		(1 ~ 10) V	1.5 mV	
		(10 ~ 100) V	16 mV	
		(100 ~ 1 000) V	0.24 V	

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			Calibrator
DC Current		10 μA	8.2 nA	/HS-I-403-02
		(10 ~ 100) μA	20 nA	
		(0.1 ~ 1) mA	0.13 μA	
		(1 ~ 10) mA	1.2 μA	
		(10 ~ 100) mA	12 μA	
		(0.1 ~ 1) A	0.17 mA	
		(1 ~ 10) A	3.1 mA	
		(10 ~ 100) A	0.11 A	
		(100 ~ 1 000) A	1.4 A	
		(1 000 ~ 1 500) A	2.1 A	
AC Current		60 Hz		
		10 μA	34 nA	
		(10 ~ 100) μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.5 μA	
		(10 ~ 100) mA	22 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.4 mA	
		(10 ~ 100) A	0.40 A	
		(100 ~ 1 000) A	1.7 A	
		(1 000 ~ 1 500) A	2.4 A	
Resistance		1 Ω	68 μΩ	
		(1 ~ 10) Ω	0.63 mΩ	
		(10 ~ 100) Ω	6.3 mΩ	
		(0.1 ~ 1) kΩ	63 mΩ	
		(1 ~ 10) kΩ	0.63 Ω	
		(10 ~ 100) kΩ	6.3 Ω	
		(0.1 ~ 1) MΩ	64 Ω	
		(1 ~ 10) MΩ	0.67 kΩ	
		(10 ~ 100) MΩ	6.7 kΩ	

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	40303			Digital Multimeter
AC Voltage		(40 Hz ~ 1 kHz)		/HS-I-403-03
		10 mV	7.4 μV	
		(10 ~ 100) mV	19 μV	
		(0.1 ~ 1) V	0.12 mV	
		(1 ~ 10) V	1.2 mV	
		(10 ~ 100) V	14 mV	
		(100 ~ 1 000) V	0.18 V	
		(1 ~ 10) kHz		
		10 mV	8.0 μV	
		(10 ~ 100) mV	22 μV	
		(0.1 ~ 1) V	0.16 mV	
		(1 ~ 10) V	1.6 mV	
		(10 ~ 100) V	16 mV	
AC Current		(40 Hz ~ 1 kHz)		
		10 μA	35 nA	
		(10 ~ 100) μA	45 nA	
		(0.1 ~ 1) mA	0.42 μA	
		(1 ~ 10) mA	4.2 μA	
		(10 ~ 100) mA	42 μA	
		(0.1 ~ 1) A	0.57 mA	
		(1 ~ 10) A	12 mA	
		(10 ~ 20) A	34 mA	
		(20 ~ 30) A	0.13 A	
		(1 ~ 5) kHz		
		10 μA	55 nA	
		(10 ~ 100) μA	83 nA	
		(0.1 ~ 1) mA	0.77 μA	
		(1 ~ 10) mA	7.5 μA	
		(10 ~ 100) mA	73 μA	
		(0.1 ~ 1) A	0.98 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.
Power factor meters	40310			Calibrator
Power Factor		(60 Hz)		/HS-I-403-10
		1	0.000 7	
		0.9(Lead, Lag)	0.001 1	
		0.8(Lead, Lag)	0.001 4	
		0.7(Lead, Lag)	0.001 6	
		0.6(Lead, Lag)	0.001 8	
		0.5(Lead, Lag)	0.001 9	
		0.4(Lead, Lag)	0.002 0	
		0.3(Lead, Lag)	0.002 1	
		0.2(Lead, Lag)	0.002 1	
		0.1(Lead, Lag)	0.002 1	
AC power meters	40311			Calibrator
DC Voltage		10 mV	1.3 μV	/HS-I-403-11
		(10 ~ 100) mV	6.5 μV	
		(0.1 ~ 1) V	62 μV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.3 mV	
		(100 ~ 1 000) V	63 mV	
AC Voltage		60 Hz		
		10 mV	9.3 μV	
		(10 ~ 100) mV	22 μV	
		(0.1 ~ 1) V	0.16 mV	
		(1 ~ 10) V	1.5 mV	
		(10 ~ 100) V	16 mV	
		(100 ~ 1 000) V	0.24 V	
DC Current		10 μA	8.2 nA	
		(10 ~ 100) μA	20 nA	
		(0.1 ~ 1) mA	0.13 μA	
		(1 ~ 10) mA	1.2 μA	
		(10 ~ 100) mA	12 μA	
		(0.1 ~ 1) A	0.17 mA	
		(1 ~ 10) A	3.1 mA	
		(10 ~ 20) A	19 mA	
		(20 ~ 30) A	28 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 Current	40311	60 Hz		Calibrator
		10 μA	34 nA	/HS-I-403-11
		(10 ~ 100) μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.5 μA	
		(10 ~ 100) mA	22 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.4 mA	
		(10 ~ 20) A	22 mA	
		(20 ~ 30) A	29 mA	
AC Wattage		60 Hz		
		6 W	19 mW	
		(6 ~ 12) W	19 mW	
		(12 ~ 18) W	21 mW	
		(18 ~ 24) W	21 mW	
		(24 ~ 30) W	22 mW	
		(30 ~ 36) W	23 mW	
		(36 ~ 42) W	24 mW	
		(42 ~ 48) W	25 mW	
		(48 ~ 54) W	27 mW	
		(54 ~ 60) W	28 mW	
		(60 ~ 72) W	37 mW	
		(72 ~ 84) W	41 mW	
		(84 ~ 96) W	44 mW	
		(96 ~ 108) W	47 mW	
		(108 ~ 120) W	50 mW	
		(120 ~ 144) W	69 mW	
		(144 ~ 168) W	74 mW	

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			Calibrator
AC Wattage		60 Hz		/HS-I-403-11
		(168 ~ 192) W	79 mW	
		(192 ~ 216) W	84 mW	
		(216 ~ 240) W	88 mW	
		(240 ~ 300) W	0.22 W	
		(300 ~ 360) W	0.24 W	
		(360 ~ 420) W	0.25 W	
		(420 ~ 480) W	0.27 W	
		(480 ~ 540) W	0.29 W	
		(540 ~ 600) W	0.30 W	
		(600 ~ 720) W	0.37 W	
		(720 ~ 840) W	0.40 W	
		(840 ~ 960) W	0.44 W	
		(960 ~ 1 080) W	0.47 W	
		(1 080 ~ 1 200) W	0.54 W	
		(1 200 ~ 1 440) W	0.71 W	
		(1 440 ~ 1 680) W	0.78 W	
		(1 680 ~ 1 920) W	0.84 W	
		(1 920 ~ 2 160) W	0.90 W	
		(2 160 ~ 2 400) W	0.96 W	
		(2 400 ~ 2 880) W	3.3 W	
		(2 880 ~ 3 360) W	3.8 W	
		(3 360 ~ 3 840) W	4.4 W	
		(3 840 ~ 4 320) W	4.9 W	
		(4 320 ~ 4 800) W	5.4 W	
Power Factor		60 Hz		
		1	0.000 7	
		0.9(Lead, Lag)	0.001 1	
		0.8(Lead, Lag)	0.001 4	
		0.7(Lead, Lag)	0.001 6	
		0.6(Lead, Lag)	0.001 8	
		0.5(Lead, Lag)	0.001 9	
		0.4(Lead, Lag)	0.002 0	
		0.3(Lead, Lag)	0.002 1	
		0.2(Lead, Lag)	0.002 1	
		0.1(Lead, Lag)	0.002 1	

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 supplies	40312			Digital Multimeter
AC Voltage		(40 Hz ~ 1 kHz)		/HS-I-403-12
		100 mV	20 μV	
		(0.1 ~ 1) V	0.13 mV	
		(1 ~ 10) V	1.3 mV	
		(10 ~ 100) V	15 mV	
		(100 ~ 1 000) V	0.19 V	
AC Current		(40 Hz ~ 1 kHz)		
		100 mA	0.12 mA	
		(0.1 ~ 1) A	1.3 mA	
		(1 ~ 10) A	13 mA	
		(10 ~ 100) A	0.13 A	
Frequency		10 Hz	6.2 mHz	
		(10 ~ 100) Hz	62 mHz	
		(0.1 ~ 1) kHz	0.62 Hz	
		(1 ~ 5) kHz	0.62 Hz	
Puncture/safety testers	40313			High Voltage Meter
DC Voltage		0.1 kV	3.2 V	/HS-I-403-13
		(0.1 ~ 0.5) kV	5.4 V	
		(0.5 ~ 1) kV	8.2 V	
		(1 ~ 2) kV	14 V	
		(2 ~ 3) kV	20 V	
		(3 ~ 4) kV	26 V	
		(4 ~ 5) kV	32 V	
		(5 ~ 6) kV	38 V	
		(6 ~ 7) kV	43 V	
		(7 ~ 8) kV	49 V	
		(8 ~ 9) kV	55 V	
		(9 ~ 10) kV	61 V	

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 Meter
AC Voltage		(50 ~ 60) Hz		/HS-I-403-13
		0.1 kV	3.2 V	
		(0.1 ~ 0.5) kV	5.4 V	
		(0.5 ~ 1) kV	8.2 V	
		(1 ~ 2) kV	14 V	
		(2 ~ 3) kV	20 V	
		(3 ~ 4) kV	26 V	
		(4 ~ 5) kV	32 V	
		(5 ~ 6) kV	38 V	
		(6 ~ 7) kV	43 V	
		(7 ~ 8) kV	49 V	
		(8 ~ 9) kV	55 V	
		(9 ~ 10) kV	61 V	
DC Breaking Current		0.5 mA	4.3 μA	
		(0.5 ~ 1) mA	7.1 μA	
		(1 ~ 2) mA	13 μA	
		(2 ~ 5) mA	31 μA	
		(5 ~ 10) mA	71 μA	
		(10 ~ 20) mA	0.13 mA	
		(20 ~ 50) mA	0.31 mA	
		(50 ~ 100) mA	0.71 mA	
AC Breaking Current		(50 ~ 60) Hz		
		0.5 mA	4.3 μA	
		(0.5 ~ 1) mA	7.1 μA	
		(1 ~ 2) mA	13 μA	
		(2 ~ 5) mA	31 μA	
		(5 ~ 10) mA	71 μA	
		(10 ~ 20) mA	0.13 mA	
		(20 ~ 50) mA	0.31 mA	
		(50 ~ 100) mA	0.71 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 Meter
Insulation Voltage		0.1 kV	3.2 V	/HS-I-403-13
		(0.1 ~ 0.5) kV	5.4 V	
		(0.5 ~ 1) kV	8.2 V	
		(1 ~ 2) kV	14 V	
		(2 ~ 3) kV	20 V	
		(3 ~ 4) kV	26 V	
		(4 ~ 5) kV	32 V	
		(5 ~ 6) kV	38 V	
		(6 ~ 7) kV	43 V	
		(7 ~ 8) kV	49 V	
		(8 ~ 9) kV	55 V	
		(9 ~ 10) kV	61 V	
Resistance		1 kΩ	1.2 Ω	
		(1 ~ 10) kΩ	12 Ω	
		(10 ~ 100) kΩ	0.12 kΩ	
		(0.1 ~ 1) MΩ	1.2 kΩ	
		(1 ~ 10) MΩ	12 kΩ	
		(10 ~ 100) MΩ	0.12 MΩ	
		(0.1 ~ 1) GΩ	1.2 MΩ	
		(1 ~ 10) GΩ	14 MΩ	
		(10 ~ 100) GΩ	0.16 GΩ	
		(0.1 ~ 1) TΩ	4.5 GΩ	
Load Resistance		100 mΩ	1.2 mΩ	
		300 mΩ	3.6 mΩ	
		500 mΩ	5.8 mΩ	
Time		1 s	3.2 ms	
		(1 ~ 10) s	8.2 ms	
		(10 ~ 100) s	61 ms	
		(100 ~ 1 000) s	0.59 s	

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.
Power recorders	40314			Calibrator
AC Wattage		60 Hz		/HS-I-403-14
		6 W	19 mW	
		(6 ~ 12) W	19 mW	
		(12 ~ 18) W	21 mW	
		(18 ~ 24) W	21 mW	
		(24 ~ 30) W	22 mW	
		(30 ~ 36) W	23 mW	
		(36 ~ 42) W	24 mW	
		(42 ~ 48) W	25 mW	
		(48 ~ 54) W	27 mW	
		(54 ~ 60) W	28 mW	
		(60 ~ 72) W	37 mW	
		(72 ~ 84) W	41 mW	
		(84 ~ 96) W	44 mW	
		(96 ~ 108) W	47 mW	
		(108 ~ 120) W	50 mW	
		(120 ~ 144) W	69 mW	
		(144 ~ 168) W	74 mW	
		(168 ~ 192) W	79 mW	
		(192 ~ 216) W	84 mW	
		(216 ~ 240) W	88 mW	
		(240 ~ 300) W	0.22 W	
		(300 ~ 360) W	0.24 W	
		(360 ~ 420) W	0.25 W	
		(420 ~ 480) W	0.27 W	
		(480 ~ 540) W	0.29 W	
		(540 ~ 600) W	0.30 W	
		(600 ~ 720) W	0.37 W	
		(720 ~ 840) W	0.40 W	
		(840 ~ 960) W	0.44 W	
		(960 ~ 1 080) W	0.47 W	
		(1 080 ~ 1 200) W	0.54 W	
		(1 200 ~ 1 440) W	0.71 W	
		(1 440 ~ 1 680) W	0.78 W	
		(1 680 ~ 1 920) W	0.84 W	
		(1 920 ~ 2 160) W	0.90 W	
		(2 160 ~ 2 400) W	0.96 W	
		(2 400 ~ 2 880) W	3.3 W	
		(2 880 ~ 3 360) W	3.8 W	
		(3 360 ~ 3 840) W	4.4 W	
		(3 840 ~ 4 320) W	4.9 W	
		(4 320 ~ 4 800) W	5.4 W	

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	40318			Calibrator
AC Voltage		(50 Hz ~ 10 kHz)		/HS-I-403-18
		10 mV	9.3 μV	
		(10 ~ 100) mV	21 μV	
		(0.1 ~ 1) V	0.15 mV	
		(1 ~ 10) V	1.4 mV	
		(10 ~ 100) V	14 mV	
		(100 ~ 1 000) V	0.23 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.
Line frequency meters	40410			Calibrator
Frequency		10 Hz	0.26 mHz	/HS-I-404-10
		(10 ~ 100) Hz	2.6 mHz	
		(0.1 ~ 1) kHz	26 mHz	
		(1 ~ 10) kHz	0.26 Hz	
		(10 ~ 100) kHz	2.6 Hz	
		(0.1 ~ 1) MHz	26 Hz	
Function generators	40411			Frequency Counter
Frequency		10 Hz	6.5 μHz	/HS-I-404-11
		(10 ~ 100) Hz	65 μHz	
		(0.1 ~ 1) kHz	0.65 mHz	
		(1 ~ 10) kHz	6.5 mHz	
		(10 ~ 100) kHz	65 mHz	
		(0.1 ~ 1) MHz	0.65 Hz	
		(1 ~ 10) MHz	6.5 Hz	
		(10 ~ 100) MHz	65 Hz	
AC Voltage		(40 Hz ~ 1 kHz)		
(Sine, Square, Ramp)		100 mV	20 μV	
		(0.1 ~ 1) V	0.14 mV	
		(1 ~ 10) V	1.3 mV	
Output Level		(40 Hz ~ 1 kHz)		
		100 mV	20 μV	
		(0.1 ~ 1) V	0.13 mV	
		(1 ~ 10) V	1.3 mV	
		(10 ~ 100) V	15 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
Level Flatness		1 V		/HS-I-404-11
		10 Hz	0.34 mV	
		(10 ~ 100) Hz	0.13 mV	
		(0.1 ~ 1) kHz	0.13 mV	
		(1 ~ 10) kHz	0.17 mV	
		(10 ~ 100) kHz	0.69 mV	
DC Offset		(±)		
		100 mV	6.4 μV	
		(0.1 ~ 1) V	62 μV	
		(1 ~ 10) V	0.62 mV	
Rise/Fall Time		100 ns	0.12 ns	
		(0.1 ~ 1) μs	1.2 ns	
		(1 ~ 10) μs	12 ns	
		(10 ~ 100) μs	0.12 μs	
		(0.1 ~ 1) ms	1.2 μs	
LF impulse generators	40414			High Voltage Probe
Pulse Voltage		0.1 kV	14 V	/HS-I-404-14
		(0.1 ~ 0.5) kV	22 V	
		(0.5 ~ 1) kV	54 V	
		(1 ~ 2) kV	0.13 kV	
		(2 ~ 3) kV	0.18 kV	
		(3 ~ 4) kV	0.21 kV	
		(4 ~ 5) kV	0.27 kV	
		(5 ~ 10) kV	0.55 kV	
		(10 ~ 15) kV	0.99 kV	
		(15 ~ 20) kV	1.3 kV	

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.
Leakage current testers	40416			Calibrator
DC Voltage		10 mV	6.3 μV	/HS-I-404-16
		(10 ~ 100) mV	62 μV	
		(0.1 ~ 1) V	0.62 mV	
		(1 ~ 10) V	6.2 mV	
		(10 ~ 100) V	62 mV	
		(100 ~ 1 000) V	0.62 V	
AC Voltage		(50 Hz ~ 1 kHz)		
		10 mV	12 μV	
		(10 ~ 100) mV	65 μV	
		(0.1 ~ 1) V	0.63 mV	
		(1 ~ 10) V	6.3 mV	
		(10 ~ 100) V	14 mV	
		(100 ~ 1 000) V	0.23 V	
DC Current		10 μA	11 nA	
		(10 ~ 100) μA	64 nA	
		(0.1 ~ 1) mA	0.63 μA	
		(1 ~ 10) mA	6.2 μA	
		(10 ~ 100) mA	62 μA	
AC Current		(50 Hz ~ 1 kHz)		
		10 μA	34 nA	
		(10 ~ 100) μA	81 nA	
		(0.1 ~ 1) mA	0.71 μA	
		(1 ~ 10) mA	7.0 μA	
		(10 ~ 100) mA	65 μA	

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.
Electronic AC/DC loads	40417			Digital Multimeter
DC Voltage		100 mV	6.4 μV	/HS-I-404-17
		(0.1 ~ 1) V	62 μV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.2 mV	
		(100 ~ 1 000) V	62 mV	
DC Current		100 mA	14 μA	
		(0.1 ~ 1) A	0.24 mA	
		(1 ~ 10) A	3.1 mA	
		(10 ~ 100) A	60 mA	
AC Voltage		(40 Hz ~ 1 kHz)		
		100 mV	20 μV	
		(0.1 ~ 1) V	0.13 mV	
		(1 ~ 10) V	1.3 mV	
		(10 ~ 100) V	15 mV	
		(100 ~ 1 000) V	0.19 V	
AC Current		(40 Hz ~ 1 kHz)		
		100 mA	0.12 mA	
		(0.1 ~ 1) A	1.3 mA	
		(1 ~ 10) A	13 mA	
Analogue/digital multimeters	40419			Calibrator
DC Voltage		(±)		/HS-I-404-19
		10 mV	1.2 μV	
		(10 ~ 100) mV	2.1 μV	
		(0.1 ~ 1) V	8.8 μV	
		(1 ~ 10) V	84 μV	
		(10 ~ 100) V	1.2 mV	
		(100 ~ 1 000) V	12 mV	
AC Voltage		(50 Hz ~ 10 kHz)		
		10 mV	9.3 μV	
		(10 ~ 100) mV	21 μV	
		(0.1 ~ 1) V	0.15 mV	
		(1 ~ 10) V	1.4 mV	
		(10 ~ 100) V	14 mV	
		(100 ~ 1 000) V	0.23 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.
Analogue/digital multimeters	40419			Calibrator
DC Current		(±)		/HS-I-404-19
		10 μA	8.2 nA	
		(10 ~ 100) μA	19 nA	
		(0.1 ~ 1) mA	0.11 μA	
		(1 ~ 10) mA	1.1 μA	
		(10 ~ 100) mA	11 μA	
		(0.1 ~ 1) A	0.16 mA	
		(1 ~ 10) A	3.0 mA	
		(10 ~ 20) A	19 mA	
		(20 ~ 30) A	28 mA	
AC Current		(50 Hz ~ 1 kHz)		
		10 μA	34 nA	
		(10 ~ 100) μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	21 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.3 mA	
		(10 ~ 20) A	22 mA	
		(20 ~ 30) A	29 mA	
		(1 ~ 5) kHz		
		10 μA	34 nA	
		(10 ~ 100) μA	78 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	32 μA	
		(0.1 ~ 1) A	0.32 mA	
		(1 ~ 10) A	4.4 mA	
		(10 ~ 20) A	0.10 A	
		(20 ~ 30) A	0.15 A	
Resistance		1 Ω	30 μΩ	
		(1 ~ 10) Ω	0.14 mΩ	
		(10 ~ 100) Ω	1.4 mΩ	
		(0.1 ~ 1) kΩ	14 mΩ	
		(1 ~ 10) kΩ	0.14 Ω	
		(10 ~ 100) kΩ	1.4 Ω	
		(0.1 ~ 1) MΩ	20 Ω	
		(1 ~ 10) MΩ	0.26 kΩ	
		(10 ~ 100) MΩ	2.8 kΩ	

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			Calibrator
DC Voltage		(±)		/HS-I-404-21
		1 mV	47 μV	
		(1 ~ 10) mV	51 μV	
		(10 ~ 100) mV	93 μV	
		(0.1 ~ 1) V	0.52 mV	
		(1 ~ 10) V	4.7 mV	
		(10 ~ 100) V	47 mV	
		(100 ~ 120) V	56 mV	
AC Voltage(Square wave)		1 kHz		
		2 mV	49 μV	
		(2 ~ 6) mV	52 μV	
		(6 ~ 12) mV	58 μV	
		(12 ~ 30) mV	75 μV	
		(30 ~ 60) mV	0.11 mV	
		(60 ~ 120) mV	0.17 mV	
		(120 ~ 300) mV	0.34 mV	
		(300 ~ 600) mV	0.61 mV	
		(0.6 ~ 1.2) V	1.2 mV	
		(1.2 ~ 3) V	2.9 mV	
		(3 ~ 6) V	5.7 mV	
		(6 ~ 12) V	12 mV	
		(12 ~ 30) V	28 mV	
		(30 ~ 60) V	56 mV	
		(60 ~ 120) V	0.12 V	
Bandwidth		600 mV		
		50 kHz	8.5 mV	
		(50 ~ 100) kHz	9.0 mV	
		(0.1 ~ 10) MHz	14 mV	
		(10 ~ 60) MHz	20 mV	
		(60 ~ 600) MHz	21 mV	
		(600 ~ 1 000) MHz	26 mV	
		(1 000 ~ 1 100) MHz	27 mV	
Time mark		1 ns	0.62 ps	
		(1 ~ 5) ns	0.62 ps	
		(5 ~ 50) ns	6.2 ps	
		(50 ~ 500) ns	62 ps	
		(0.5 ~ 5) μs	0.62 ns	
		(5 ~ 50) μs	6.2 ns	
		(50 ~ 500) μs	62 ns	
		(0.5 ~ 5) ms	0.62 μs	
		(5 ~ 50) ms	6.2 μs	
		(50 ~ 500) ms	62 μs	
		(0.5 ~ 5) s	0.62 ms	

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.
Voltage/current recorders	40424			Calibrator
DC Voltage		(±)		/HS-I-404-24
		10 mV	1.2 μV	
		(10 ~ 100) mV	2.1 μV	
		(0.1 ~ 1) V	8.8 μV	
		(1 ~ 10) V	84 μV	
		(10 ~ 100) V	1.2 mV	
		(100 ~ 1 000) V	12 mV	
AC Voltage		(50 Hz ~ 10 kHz)		
		10 mV	9.3 μV	
		(10 ~ 100) mV	21 μV	
		(0.1 ~ 1) V	0.15 mV	
		(1 ~ 10) V	1.4 mV	
		(10 ~ 100) V	14 mV	
		(100 ~ 1 000) V	0.23 V	
DC Current		(±)		
		10 μA	8.2 nA	
		(10 ~ 100) μA	19 nA	
		(0.1 ~ 1) mA	0.11 μA	
		(1 ~ 10) mA	1.1 μA	
		(10 ~ 100) mA	11 μA	
		(0.1 ~ 1) A	0.16 mA	
		(1 ~ 10) A	3.0 mA	
		(10 ~ 20) A	19 mA	
		(20 ~ 30) A	28 mA	
AC Current		(50 Hz ~ 1 kHz)		
		10 μA	34 nA	
		(10 ~ 100) μA	53 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	21 μA	
		(0.1 ~ 1) A	0.29 mA	
		(1 ~ 10) A	3.3 mA	
		(10 ~ 20) A	22 mA	
		(20 ~ 30) A	29 mA	
		(1 ~ 5) kHz		
		10 μA	34 nA	
		(10 ~ 100) μA	78 nA	
		(0.1 ~ 1) mA	0.35 μA	
		(1 ~ 10) mA	3.4 μA	
		(10 ~ 100) mA	32 μA	
		(0.1 ~ 1) A	0.32 mA	
		(1 ~ 10) A	4.4 mA	
		(10 ~ 20) A	0.10 A	
		(20 ~ 30) A	0.15 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.
Relay test sets	40425			Digital Multimeter
DC Voltage		100 mV	6.4 µV	/HS-I-404-25
		(0.1 ~ 1) V	62 µV	
		(1 ~ 10) V	0.62 mV	
		(10 ~ 100) V	6.2 mV	
		(100 ~ 1 000) V	62 mV	
DC Current		100 mA	14 µA	
		(0.1 ~ 1) A	0.24 mA	
		(1 ~ 10) A	3.1 mA	
		(10 ~ 100) A	60 mA	
AC Voltage		(40 Hz ~ 1 kHz)		
		100 mV	20 µV	
		(0.1 ~ 1) V	0.13 mV	
		(1 ~ 10) V	1.3 mV	
		(10 ~ 100) V	15 mV	
		(100 ~ 1 000) V	0.19 V	
AC Current		(40 Hz ~ 1 kHz)		
		100 mA	0.12 mA	
		(0.1 ~ 1) A	1.3 mA	
		(1 ~ 10) A	13 mA	
		(10 ~ 100) A	0.13 A	
Frequency		10 Hz	0.62 mHz	
		(10 ~ 100) Hz	6.2 mHz	
		(0.1 ~ 1) kHz	62 mHz	
		(1 ~ 10) kHz	0.62 Hz	
		(10 ~ 100) kHz	6.2 Hz	
		(0.1 ~ 1) MHz	62 Hz	
Time		1 s	3.2 ms	
		(1 ~ 10) s	8.2 ms	
		(10 ~ 100) s	61 ms	

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	40426			Frequency Counter
Frequency		10 Hz	0.62 mHz	/HS-I-404-26
		(10 ~ 100) Hz	6.2 mHz	
		(0.1 ~ 1) kHz	62 mHz	
		(1 ~ 10) kHz	0.62 Hz	
		(10 ~ 100) kHz	6.2 Hz	
		(0.1 ~ 1) MHz	62 Hz	
Level Flatness		1 V		
		10 Hz	0.70 mV	
		(10 ~ 100) Hz	0.63 mV	
		(0.1 ~ 1) kHz	0.63 mV	
		(1 ~ 10) kHz	0.64 mV	
		(10 ~ 100) kHz	0.92 mV	
Attenuation		1 kHz		
0 dBV		1 V	0.63 mV	
-10 dBV		316.2 mV	91 μV	
-20 dBV		100 mV	64 μV	

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: ovens, furnaces, isothermal liquid baths, ice-point baths, dry-block calibrators	50101			SPRT, Recorders, Standard thermocouple /HS-I-501-01-1
ovens		(-80 ~ 200) ℃	1.0 ℃	
		(200 ~ 300) ℃	1.8 ℃	
furnaces, isothermal liquid baths, dry-block calibrators		(-80 ~ 250) ℃	0.10 ℃	
		(250 ~ 1 100) ℃	1.3 ℃	
Temperature indicators / recorders / controllers, temperature calibrators, etc.	50102			SPRT, Standard thermocouple, MULTI CALIBRATOR /HS-I-501-02
Temperature indicators / recorders / controllers Include sensor		(-80 ~ 250) ℃	0.06 ℃	
		(250 ~ 1 100) ℃	1.4 ℃	
Exclude sensor		(-80 ~ 1 100) ℃	0.25 ℃	
Glass thermometers; liquid-in-glass, Beckmann	50103			SPRT /HS-I-501-03
liquid-in-glass		(-80 ~ 250) ℃	0.08 ℃	
Resistance thermometers; SPRT, IPRT, thermistors, etc.	50104			SPRT /HS-I-501-04
IPRT		(-80 ~ 250) ℃	0.07 ℃	
Thermal expansion thermometers; bimetal, gas or liquid type	50105			SPRT /HS-I-501-05
bimetal, gas or liquid type		(-50 ~ 250) ℃	1 ℃	
Thermocouples: noble metal, base metal, pure special type, etc.	50106			SPRT, Standard thermocouple /HS-I-501-06
base matal		(-80 ~ 250) ℃	0.25 ℃	
		(250 ~ 1 100) ℃	1.9 ℃	
Temperature transducers	50107			SPRT, MULTI CALIBRATOR /HS-I-501-07
Temperature transducers		(-80 ~ 250) ℃	0.50 ℃	

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 thin film, hair, etc.	50302			Dewpoint Meter /HS-I-503-02-1,-2
polymer thin film		(-40 ~ 100) ℃	0.6 ℃	
		(10 ~ 30) % R.H.	3.0 % R.H.	
		(30 ~ 50) % R.H.	2.2 % R.H.	
		(50 ~ 80) % R.H.	3.3 % R.H.	
		(80 ~ 95) % R.H.	3.7 % R.H.	
hair		(10 ~ 95) % R.H.	4 % R.H.	
Temperature humidity recorders; hygrothermograph, etc.	50304			Dewpoint Meter /HS-I-503-04
hygrothermograph		(-20 ~ 50) ℃	1 ℃	
		(10 ~ 95) % R.H.	4 % R.H.	
Transducers; dew-point/ relative humidity	50305			Dewpoint Meter, MULTI CALIBRATOR /HS-I-503-05
relative humidity		(10 ~ 95) % R.H.	3.4 % R.H.	
Humidity generators; two-pressure, two-flow mixing humidity generator, constant temperature and humidity chamber, etc.	50306			Dewpoint Meter, Recorders /HS-I-503-06
constant temperature and humidity chamber		(-40 ~ 150) ℃	1.0 ℃	
		(10 ~ 95) % R.H.	5.9 % R.H.	

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901.Chemical analysis

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Gas analyzers	90103			CRM/
Oxygen		18.1 cmol/mol	0.4 cmol/mol	HS-I-901-03
Nitrogen Monoxide		103 μmol/mol	3 μmol/mol	
Methane		2.00 cmol/mol	0.05 cmol/mol	
Hydrogen Sulfide		25.3 μmol/mol	1.3 μmol/mol	
Ammonia		47.8 μmol/mol	2.4 μmol/mol	
Isobutane		0.777 cmol/mol	0.014 cmol/mol	
Hydrogen		1.95 cmol/mol	0.05 cmol/mol	
Sulfur hexafluoride		1.01 cmol/mol	0.03 cmol/mol	
Hydrogen Chloride		10.4 μmol/mol	0.6 μmol/mol	
Others; pH meter, Electrical conductivity meter,	90199			CRM/ HS-I-901-99-1 HS-I-901-99-2
pH meter		(4 ~ 10) pH	0.012 pH	
Electrical conductivity meter		100 μS/cm	2.2 μS/cm	
		1 413 μS/cm	6.1 μS/cm	
		10 mS/cm	0.055 mS/cm	
		111 mS/cm	1.7 mS/cm	