MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
ELEKTRİK				
DC VOLTAGE (< 1000 V) DC VOLTAGE Source: DC VOLTAGE Source Calibrator: DC	100 µV≤U<100mV 100 mV ≤ U <1V 1 V ≤ U ≤ 10V 10 V < U ≤ 100V 100 V < U ≤ 1000V		$2{,}5\cdot10^{-5}$ U +2 µV $7\cdot10^{-6}$ U + 20 µV $6\cdot10^{-6}$ U + 7 µV $8{,}5\cdot10^{-6}$U + 110 µV $8\cdot10^{-6}$U + 900 µV	With 3458A
DC VOLTAGE (< 1000V) DC VOLTAGE Source: DC VOLTAGE Source Calibrator: DC	10 mV 100 mV 1 V 10V ,100V ,1000V		$1{,}0 \cdot 10^{-4} \cdot U$ $1{,}5 \cdot 10^{-5} \cdot U$ $4{,}0 \cdot 10^{-6} \cdot U$ $2{,}0 \cdot 10^{-6} \cdot U$	With Reference DC VOLTAGE Standard + VOLTAGE Divider
DC VOLTAGE (< 1000V) DC VOLTAGE Monitors: Multimeter: DC VOLTAGE DC Voltmetre	100µV ≤U< 220mV 220 mV ≤U≤ 2,2 V 2,2 V < U ≤ 11 V 11 V < U ≤ 22 V 22 V < U ≤ 220 V 220 V < U ≤ 1000 V		$2 \cdot 10^{-5} \cdot U$ + 2 µV $1 \cdot 10^{-5} \cdot U$ + 5 µV $1.10^{-5} \cdot U$ + 25 µV $1.10^{-5} \cdot U$ + 90 µV $1 \cdot 10^{-5} \cdot U$ + 300 µV $1.10^{-5} \cdot U$ + 3 mV	With 5700A
DC VOLTAGE (< 1000V) DC VOLTAGE Monitors: Multimeter: DC VOLTAGE DC Voltmetre	10 mV 100 mV 1 V 10V ,100V ,1000V		$1{,}2 \cdot 10^{-4} \cdot U$ $1{,}2 \cdot 10^{-5} \cdot U$ $4{,}0 \cdot 10^{-6} \cdot U$ $2{,}0 \cdot 10^{-6} \cdot U$	With Reference DC VOLTAGE Standard + VOLTAGE Divider

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
DC Current (< 100 A) DC Current Source:	100 µA ≤ *I* ≤ 1 mA		$3{,}5 \cdot 10^{-5} \cdot I + 10\text{nA}$	With 3458A DMM
	1mA < *I* ≤ 10mA		$3{,}5 \cdot 10^{-5} \cdot I + 150\ \text{nA}$	
	10mA </≤ 100 mA		$5{,}5 \cdot 10^{-5} \cdot I + 1\ \mu\text{A}$	
	100 mA < I ≤ 1A		$1{,}5 \cdot 10^{-4} \cdot I + 25\ \mu\text{A}$	
DC Current Source Calibrator: DC Current Transconductance Amplifier	100 µA ≤ *I* < 1 mA		$1.10^{-5} \cdot I$	With Current Shunt
	10 mA < *I* ≤ 1 A		$2.10^{-5} \cdot I$	
	1 A < *I* ≤ 10 A		$6{,}5.10^{-5} \cdot I + 140\mu\text{A}$	
	10 A < *I* ≤ 15 A		$8{,}5.10^{-5} \cdot I$	
	15 A < *I* ≤ 20A		$1{,}2.10^{-4} \cdot I$	
	10 A < *I* ≤ 150 A		$2{,}8.10^{-2} \cdot I + 0{,}82\ \text{A}$	With Fluke 376
	150 A < *I* ≤ 550 A		$2{,}8.10^{-2} \cdot I$	
	550 A < *I* ≤ 1025 A		$2{,}5^{-2} \cdot I$	
DC Current (< 100 A) DC Current Monitors:	100 µA ≤I< 220 µA		$9 \cdot 10^{-5} \cdot I + 15\ \text{nA}$	With 5700A
	220 µA ≤ I < 2,2mA		$6 \cdot 10^{-5} \cdot I + 25\ \text{nA}$	
	2,2mA ≤ I < 22 mA		$6 \cdot 10^{-5} \cdot I + 250\ \text{nA}$	
	22 mA ≤I< 220 mA		$7 \cdot 10^{-5} \cdot I + 2.5\ \mu\text{A}$	
Multimeter: DC Current	220 mA ≤ I ≤ 2,2 A		$1{,}3.10^{-4} \cdot I + 45\ \mu\text{A}$	
DC Ammeter Clampmeter	2,2 A < I ≤ 11 A		$6 \cdot 10^{-4} \cdot I$	With 5520A
	11 A < I ≤ 20 A		$4.10^{-4} \cdot I$	With 5700A + 5220A
	100 µA≤ I ≤10 mA		$1.10^{-5} \cdot I$	
	10 mA < I ≤ 1 A		$2.10^{-5} \cdot I$	With Current
	1 A < I ≤ 10A		$6{,}5.10^{-5} \cdot I + 140\mu\text{A}$	
	10 A < I ≤ 15A		$8{,}5.10^{-5} \cdot I$	
	15 A < I ≤ 20 A		$1{,}2.10^{-4} \cdot I$	
	10 A ≤ I ≤ 1000 A		$5 \cdot 10^{-3} \cdot I$	Clampmeter Calibration (With 5520A + 50 Turn Coil

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
DC Resistance **DC Resistance Measuring Instruments:** Multimeter: Microohmeter Insulatıon Resistance Tester	100 µΩ 1 mΩ 10 mΩ 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ	Imax = 60 A Imax = 30 A Imax = 20 A Imax = 1 A Imax = 0,32 A Imax = 0,1 A Imax = 32 mA Imax = 10 mA Imax = 3,2 mA Imax = 1 mA Vmax = 320 V Vmax = 1000 V Vmax = 1000 V	5.10^{-3} .R 7.10^{-5} .R 5.10^{-5} .R 2.10^{-5} .R 5.10^{-6} .R 5.10^{-6}.R $5\ 10^{-6}$.R 5.10^{-6}.R 5.10^{-6}.R 5.10^{-6}.R 1.10^{-5}.R $1{,}5.10^{-5}$.R $2{,}5.10^{-5}$.R	R = Measured Value With Reference Resistors
	0,1Ω ≤ R < 1Ω 1Ω ≤ R ≤ 100kΩ	Imax = 2 A 1 Ω -10 Ω (Imax = 600 mA) 10 Ω -100 Ω (Imax = 200 mA) 100 Ω -1 kΩ (Imax = 60 mA) 1 kΩ -10 kΩ (Imax = 20 mA) 10 kΩ -100 kΩ (Imax = 6 mA)	8.10^{-4}.R $1{,}5.10^{-4}$.R	R = Measured Value

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
DC Resistance **DC Resistance Ölçerler** Multimeter: Resistance Microohmeter Insulation resistance Tester	1Ω ≤ R < 11Ω	1 mA ≤Imax≤125 mA	$7{,}4\cdot10^{-4}$ + 8 mΩ	With 5520A
	11Ω ≤ R < 33Ω	1 mA ≤Imax≤125 mA	$3{,}5\cdot10^{-4}$ + 12 mΩ	R = Measured Value
	33Ω ≤ R < 110Ω	1 mA ≤Imax≤ 70 mA	$1{,}3\cdot10^{-4}$ + 15 mΩ	
	110Ω ≤ R < 330Ω	1 mA ≤Imax≤40 mA	$7{,}1\cdot10^{-5}$ + 20 mΩ	
	330Ω ≤ R ≤1,1kΩ	1 mA ≤Imax≤18 mA	$4\cdot10^{-5}$ + 25 mΩ	
	1,1kΩ < R ≤ 3,3kΩ	100 µA ≤Imax≤ 5 mA	$7{,}1\cdot10^{-5}$ +200 mΩ	
	3,3kΩ < R ≤ 11kΩ	100µA≤Imax≤1,8mA	$3{,}4\cdot10^{-5}$ + 200 mΩ	
	11kΩ < R ≤ 33kΩ	10 µA ≤Imax≤0,5 mA	$5{,}2\cdot10^{-5}$ + 1,2 Ω	
	33kΩ < R < 110kΩ	10µA≤Imax≤0,18mA	$6{,}2\cdot10^{-5}$ + 6,0 Ω	
	110kΩ ≤ R < 330kΩ	10 µA ≤Imax≤50 µA	$5{,}8\cdot10^{-5}$ + 13 Ω	
	330kΩ ≤R≤ 1,1MΩ	1 µA ≤Imax≤50 µA	$4{,}2\cdot10^{-5}$ + 20 Ω	
	1,1M Ω <R<3,3MΩ	250 nA ≤Imax≤5 µA	$1{,}0\cdot10^{-4}$ + 200 Ω	
	3,3MΩ < R ≤11MΩ	25nA≤Imax≤1,8µA	$1{,}3\cdot10^{-4}$ + 550 Ω	
	11MΩ < R ≤ 33MΩ	25 nA ≤Imax≤500 nA	$3{,}0\cdot10^{-4}$ + 4,2 kΩ	
	33MΩ < R≤ 110MΩ	2,5 nA ≤Imax≤50 nA	$5{,}0\cdot10^{-4}$ + 21 kΩ	
	110 MΩ ≤ R < 330MΩ	2,5 nA ≤ Imax ≤ 50 nA	$3{,}5\cdot10^{-3}\cdot R$ $1{,}5\cdot10^{-2}\cdot R$	
	330MΩ ≤ R ≤ 1100MΩ	1,0 nA ≤ Imax ≤ 13 nA		
			$2.10^{-4}.R$	
			$4.10^{-5}.R$	
	1,9Ω	Imax = 500 mA	$2.10^{-5}.R$	
	19Ω	Imax = 160 mA	$2.10^{-5}.R$	
	190Ω	Imax = 50 mA	$2.10^{-5}.R$	R = Ölçülen Measured Value (With 5700A)
	1,9kΩ	Imax = 16 mA	$3.10^{-5}.R$	
	19kΩ	Imax = 5 mA	$5.10^{-5}.R$	
	190kΩ	Imax = 500 µA	$6.10^{-5}R$	
	1,9MΩ	Imax = 50 µA		
	19MΩ	Imax = 5 µA	$7.0\ 10^{-3}R$	
	1 MΩ ≤R≤1000 MΩ	Vmax=5000V For 1 and 2 MΩ Imax =2mA	$1.5\ 10^{-2}R$	
	1GΩ < R ≤1000GΩ	Vmax=5000V For 100 and 200GΩ Vmax =2500V	$2.5\ 10^{-2}R$	
	1TΩ < R ≤ 3 TΩ	Vmax=5000V For 1TΩ Vmax =2500V		R = Measured Value (With Calibrated Resistance Set)

MEASURAND/DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
DC Resistance Sources and Standards DC Resistance Standard Calibrator DC Current Shunt Resistance Boxes	100 μΩ ≤ R < 10 mΩ	100 μA 20 A 1 mA 5,10,15,20 A 10 mA 5,10,15,20 A	$5{,}5 \cdot 10^{-5}$R	R=Measure Value Comparision with reference resistors
DC Resistance Standard Calibrator Resistance DC Current Shunt Resistance Box	10 mΩ ≤ R <100 mΩ	10 mA 5,10,15,20 A I_{max}= 1 A (R_s=100 m)	$5{,}5 \cdot 10^{-5}$ R	
DC Resistance Standard Calibrator Resistance DC Current Shunt Resistance Box	100mΩ ≤ R < 1 Ω	I_{max}= 1 A (R_s=100 m) I_{max}= 320 mA (R_s=1)	$1 \cdot 10^{-5}$ R	

MEASURAND/ DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
DC Resistance Standard Calibrator Resistance DC Current Shunt Resistance Box	1 Ω ≤ R < 100Ω	I_{max} = 320 mA (R_s=1Ω)	$7 \cdot 10^{-6}$ .R	R=Measure Value
		I_{max} = 100 mA (R_s=10Ω)		Comparision with reference resistors
		I_{max} = 32 mA (R_s=100Ω)		
	100Ω ≤ R < 10 kΩ	I_{max} = 32 mA (R_s=100Ω)	$5 \cdot 10^{-6}$ .R	
		I_{max} = 10 mA (R_s=1kΩ)		
		I_{max}=3,2mA (R_s=10kΩ)		
		I_{max} = 3,2 mA (R_s=10kΩ)		
	10 kΩ ≤ R ≤ 100 kΩ	V_{max}= 100 V (R_s=100kΩ)	$5 \cdot 10^{-6}$ .R	
		V_{max}=100V (R_s=100kΩ)		
	100 kΩ < R ≤ 10 MΩ	V_{max}=320V (R_s=1MΩ)	$1,5 \cdot 10^{-5}$ R	
		V_{max}=320 V (R_s=1MΩ)		
	10MΩ < R ≤ 100 MΩ	V_{max}=1000V (R_s=10MΩ)	$2,0 \cdot 10^{-5}$ R	
		V_{max}=1000V (R_s=100MΩ)		

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
AC Current (<20 A) **AC Current Measuring Devices** **Ölçerler** Multimeter: AC Current AC Clampmeter	100 µA ≤ I < 220 µA	10 Hz ≤ f < 10 kHz	$1 \cdot 10^{-3} \cdot I$	I = Measured Value With 5700A
		10 Hz ≤ f < 20 Hz	$8.10^{-4} .I$	
	1 mA ≤ I < 2,2 mA	20 Hz ≤ f < 40 Hz	$4.10^{-4} .I$	
		40 Hz ≤ f < 1 kHz	$9.10^{-5} .I + 0{,}2\ \mu A$	
		1 kHz ≤ f < 5 kHz	$8 .10^{-4} .I + 1\ \mu A$	
		5 kHz ≤ f ≤ 10 kHz	$2 .10^{-3} .I + 2{,}5\ \mu A$	
	2,2 mA ≤ I < 22 mA	10 Hz ≤ f < 20 Hz	$8.10^{-4}.I + 2\mu A$	
		20 Hz ≤ f < 40 Hz	$4 .10^{-4}.I + 1{,}5\ \mu A$	
		40 Hz ≤ f < 1 kHz	$2.10^{-4}.I + 0{,}8\ \mu A$	
		1 kHz ≤ f < 5 kHz	$8.10^{-4}.I + 5{,}5\ \mu A$	
		5 kHz ≤ f ≤ 10 kHz	$2.10^{-3}.I + 13\ \mu A$	
	22 mA ≤ I < 220 mA	10 Hz ≤ f < 20 Hz	$7{,}5 .10^{-4}.I + 20\ \mu A$	
		20 Hz ≤ f < 40 Hz	$4.10^{-4}.I + 13\ \mu A$	
		40 Hz ≤ f < 1 kHz	$2.10^{-4}.I + 8\ \mu A$	
		1 kHz ≤ f < 5 kHz	$8.10^{-4}.I + 55\ \mu A$	
		5 kHz ≤ f ≤ 10 kHz	$2{,}5 .10^{-3}.I + 120\ \mu A$	
	220 mA ≤ I 2,2 A	20 Hz ≤ f < 1 kHz	$7.10^{-4}.I + 190\ \mu A$	
		1 kHz ≤ f < 5 kHz	$8{,}5.10^{-4}.I + 270\ \mu A$	
		5 kHz ≤ f ≤ 10 kHz	$9.10^{-3}.I + 2{,}1\ mA$	
	2,2 A ≤ I < 3 A	45 Hz ≤ f < 1 kHz	$5{,}1 \cdot 10^{-4} \cdot I$	
	2,2 A ≤ I < 3 A	1 kHz ≤ f < 5 kHz	$1{,}4 \cdot 10^{-3} \cdot I$	
	2,2 A ≤ I < 3 A	5 kHz ≤ f < 10 kHz	$2{,}2 \cdot 10^{-2} \cdot I$	
	3 A ≤ I < 11 A	45 Hz ≤ f < 100 Hz	$6{,}3 \cdot 10^{-4} \cdot I + 4$ mA	I = Measured Value With 5520A
	3 A ≤ I < 11 A	100 Hz ≤ f < 1 kHz	$1{,}0 \cdot 10^{-3} \cdot I + 4$ mA	
	3 A ≤ I < 11 A	1 kHz ≤ f < 5 kHz	$2{,}5 \cdot 10^{-2} \cdot I + 75$ mA	
	11 A ≤ I ≤ 20,5 A	45 Hz ≤ f < 100 Hz	$1{,}2 \cdot 10^{-3} \cdot I + 15$ mA	
	11 A ≤ I ≤ 20,5 A	100 Hz ≤ f < 1 kHz	$1{,}4 \cdot 10^{-3} \cdot I + 20$ mA	
	11 A ≤ I ≤ 20,5 A	1 kHz ≤ f < 5 kHz	$2{,}4 \cdot 10^{-3} \cdot I + 30$ mA	
	2,2 A ≤ I ≤ 20 A	30 Hz ≤ f < 1kHz	$1.10^{-3} .I + 3\ mA$	I=Ölçülen Değer 5700A+5220A
		1 kHz ≤ f ≤ 5 kHz	$3.10^{-3} .I + 15\ mA$	
		10,40,500,1k,5kHz	$5.10^{-4} .I$	

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
	1 A ≤ I ≤ 20 A			With Y5020 Current Shunt
Multimeter: AC Current AC Clampmeter	10 A ≤ I ≤ 1025 A 10 A ≤ I < 16,5 A 16,5 A ≤ I ≤ 1025 A	45 Hz ≤ f ≤ 65 Hz 65 Hz ≤ f ≤ 440 Hz 65 Hz ≤ f ≤ 440 Hz	$6 \cdot 10^{-3} \cdot I$ $1{,}3 \cdot 10^{-2} \cdot I$ $1 \cdot 10^{-2} \cdot I$	Clampmeter Calibration (With 5520A+50 Turn Coil)
AC Current (< 20 A) **AC Current Sources** AC Current Source Calibrator: AC Current Transconductance Amplifier	100 µA ≤ I< 1 mA 1mA ≤ I< 10 mA 10mA ≤ I< 100 mA 100mA ≤ I< 1A 1 A ≤ I < 3 A 1 A ≤ I < 10 A 1 A ≤ I ≤ 20 A 10 A ≤ I < 16,5 A 16,5 A ≤ I < 150 A 150 A ≤ I ≤ 1000 A 10 A ≤ I < 16,5 A 16,5 A ≤ I < 150 A 150 A ≤ I ≤ 1000 A	45 Hz ≤ f < 1kHz 45 Hz ≤ f < 100 Hz 100 Hz ≤ f < 5k Hz 5 kHz ≤ f ≤ 20 kHz 45 Hz ≤ f < 100 Hz 100 Hz ≤ f < 5k Hz 5 kHz ≤ f ≤ 20 kHz 45 Hz ≤ f < 100 Hz 100 Hz ≤ f < 5k Hz 5 kHz ≤ f ≤ 20 kHz 10 Hz ≤ f < 5k Hz 10 Hz ≤ f ≤ 5k Hz 10,40,500,1k,5kHz 10 Hz ≤ f < 100 Hz 100 Hz ≤ f ≤ 500 Hz	$1{,}1.10^{-3}$ ./ + 450 nA 1.10^{-3} ./ + 3,5µA 7.10^{-4} ./ + 3µA 1.10^{-3}./ + 4µA 9.10^{-4} ./ + 30µA 6.10^{-4} ./ + 25µA 9.10^{-4} ./ + 30µA $1{,}1 .10^{-3}$ ./ + 300µA $1{,}4 .10^{-3}$./ + 310µA $3{,}5 .10^{-3}$./ + 510µA $3{,}5 \cdot 10^{-3} \cdot I$ $3{,}3 \cdot 10^{-3} \cdot I$ + 15 mA 5.10^{-4}.I $8{,}1 \cdot 10^{-2} \cdot I$ $2{,}7 \cdot 10^{-2} \cdot I$ + 1 A $2{,}7 \cdot 10^{-2} \cdot I$ $8{,}7 \cdot 10^{-2} \cdot I$ $3{,}3 \cdot 10^{-2} \cdot I$ + 1,1 A $3{,}3 \cdot 10^{-2} \cdot I$	I =Measured Value With 3458A With Fluke 8846A With Y5020 Current Shunt With Fluke 376 Clampmeter

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
AC Voltage (< 1100 V) **AC Voltage Measuring Device** Multimeter: AC Voltage AC Measuring Standard AC Voltmeter	2 mV ≤ U< 2,2 mV	10 Hz ≤ f <20 Hz	$3.10^{-3}.U + 6\mu V$	U= Measured Value With 5700A
		20 Hz ≤ f <40 Hz	$2{,}5.10^{-3}.U + 5\mu V$	
		40 Hz ≤ f <20 kHz	$2{,}5.10^{-3}.U + 5\mu V$	
		20 kHz ≤ f <50 kHz	$2{,}5.10^{-3}.U + 6\mu V$	
		50 kHz ≤ f < 100 kHz	$4{,}2\cdot10^{-3}\cdot U + 8\ \mu V$	
		100 kHz ≤ f < 300 kHz	$7{,}5\cdot10^{-3}\cdot U + 15\ \mu V$	
		300 kHz ≤ f < 500 kHz	$4{,}5\cdot10^{-3}\cdot U + 8\ \mu V$	
		500 kHz ≤ f < 1 MHz	$1{,}5\cdot10^{-2}\cdot U + 30\ \mu V$	
		500 kHz ≤ f < 1 MHz	$1{,}5\cdot10^{-2}\cdot U + 30\ \mu V$	
	2,2 mV ≤ U < 22 mV		$9.10^{-4}.U + 6\mu V$	
			$5.10^{-4}.U + 6\mu V$	
		10 Hz ≤ *f* < 20 Hz	$4.10^{-4}.U + 6\mu V$	
		20 Hz ≤ *f* < 40 Hz	$7.10^{-4}.U + 6\mu V$	
		40 Hz ≤ *f* < 20 kHz	$1{,}2\cdot10^{-3}\cdot U + 9\ \mu V$	
		20 kHz ≤ f < 50 kHz	$2{,}0\cdot10^{-3}\cdot U + 15\ \mu V$	
		50 kHz ≤ f < 100 kHz	$3{,}0\cdot10^{-3}\cdot U + 30\ \mu V$	
		100 kHz ≤ f < 300 kHz	$3{,}0\cdot10^{-3}\cdot U + 30\ \mu V$	
		300 kHz ≤ f < 500 kHz		
		500 kHz ≤ f < 1 MHz		
			$7.10^{-4}.U + 26\mu V$	
			$2{,}5\ .10^{-4}.U + 6\ \mu V$	
			$1{,}5\ .10^{-4}.U + 8\ \mu V$	
			$4\ .10^{-4}.U + 15\ \mu V$	
		10 Hz ≤ *f* <20 Hz	$9\cdot10^{-4}\cdot U + 30\ \mu V$	
	22 mV ≤ U < 220 mV	20 Hz ≤ *f* <40 Hz	$1{,}2\cdot10^{-3}\cdot U + 36\ \mu V$	
		40 Hz ≤ *f* <20 kHz	$2\cdot10^{-3}\cdot U + 65\ \mu V$	
		20 kHz ≤ *f* <50 kHz	$4\cdot10^{-3}\cdot U + 100\ \mu V$	
		50 kHz ≤ f < 100 kHz		
		100 kHz ≤ f < 300 kHz	$6\ .10^{-4}\ .U + 200\mu V$	
		300 kHz ≤ f < 500 kHz	$3\ .10^{-4}\ .U + 65\ \mu V$	
		500 kHz ≤ f < 1 MHz	$9\ .10^{-5}\ .U + 25\mu V$	
			$1{,}5\ .10^{-4}\ .U + 45\mu V$	
			$5\cdot10^{-4}\cdot U + 250\ \mu V$	
			$5\cdot10^{-4}\cdot U + 250\ \mu V$	
	220 mV ≤ U < 2,2 V	10 Hz ≤ *f* <20 Hz	$1{,}2\cdot10^{-3}\cdot U + 600\ \mu V$	
		20 Hz ≤ *f* <40 Hz	$2{,}6\cdot10^{-3}\cdot U + 1{,}3\ mV$	
		40 Hz ≤ *f* <20 kHz		

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
		20 kHz ≤ *f* <50 kHz 50 kHz ≤ f < 100 kHz 100 kHz ≤ f < 300 kHz 300 kHz ≤ f < 500 kHz 500 kHz ≤ f < 1 MHz		
AC Voltage (< 1100 V) **AC Voltage Measuring Device** Multimeter: AC Voltage AC Measuring Standard AC Voltmeter	2,2 V ≤ U < 22 V	10 Hz ≤ *f* < 20 Hz 20 Hz ≤ *f* < 40 Hz 40 Hz ≤ *f* < 20 kHz 20 kHz ≤ *f* ≤ 50 kHz 50 kHz ≤ f < 100 kHz 100 kHz ≤ f < 300 kHz 300 kHz ≤ f < 500 kHz 500 kHz ≤ f < 1 MHz	$5 .10^{-4} .U + 2\ mV$ $2 .10^{-4} .U + 650\mu V$ $9 .10^{-5} .U + 230\mu V$ $1{,}5.10^{-4} .U + 440\mu V$ $1{,}5 \cdot 10^{-4} \cdot U + 45\ \mu V$ $3 \cdot 10^{-4} \cdot U + 90\ \mu V$ $6 \cdot 10^{-3} \cdot U + 2{,}6\ mV$ $3{,}1 \cdot 10^{-3} \cdot U + 7{,}5\ mV$	U= Measured Value With 5700A
	22 V ≤ U < 220 V	500 kHz ≤ f < 1 MHz 10 Hz ≤ *f* < 20 Hz 20 Hz ≤ *f* < 40 Hz 40 Hz ≤ *f* < 20 kHz 20 kHz ≤ *f* ≤ 50 kHz	$6.10^{-4} .U + 20\ mV$ $2.10^{-4} .U + 7\ mV$ $9.10^{-5} .U + 3\ mV$ $2{,}5.10^{-4} .U + 9mV$ $5{,}5 \cdot 10\text{-}4 \cdot U + 20$	
	220 V ≤ U ≤ 1000 V	50 kHz ≤ f < 100 kHz 15 Hz ≤ *f* < 50 Hz 50 Hz ≤ *f* ≤ 1 kHz	$4{,}5.10^{-4} .U + 110\ mV$ $9.10^{-5} .U + 25mV$	
DC Power **DC Powermeters** DC Watmeters	0,1 W ≤ P < 10 kW	100 mA - 10 A 1 V- 1000 V	$6{,}5 \cdot 10^{-4} \cdot P$	P= Measured Value With 5520A
	10 kW ≤ P ≤ 20 kW	10 A - 20 A 1 V- 1000 V	$8{,}5 \cdot 10^{-4} \cdot P$	
AC Power and Energy: Active Power: Mono Phase Powermeter, Wattmeter	0,1 W ≤ P ≤ 10 kW	0,1 A ≤ I < 10 A 1 V ≤ V < 1000 V 10 Hz ≤ f ≤ 1 kHz	$1{,}5 \cdot 10^{-3} \cdot P$	P= Measured Value With 5520A
	10 kW ≤ P ≤ 20 kW	10 A ≤ I < 20 A 500 V ≤ V < 1000 V 10 Hz ≤ f ≤ 1 kHz	$2{,}5 \cdot 10^{-3} \cdot P$	

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
AC Voltage (< 1100 V) **AC Voltage Sources** AC Voltage Sources AC Kalibrator	2 mV ≤ U < 10mV	40 Hz ≤ f < 1 kHz	4 .10^{-4}.U + 2 µV	U=Measured Value With 3458A
		1 kHz ≤ f < 20 kHz	5.10^{-4} .*U* + 2 µV	
	10 mV ≤ U < 100 mV	1 Hz ≤ f <40 Hz	1,3.10^{-4}.*U* + 6 µV	
		40 Hz ≤ f <1 kHz	1,1 .10^{-4}.*U* + 4 µV	
		1 kHz ≤ f < 20 kHz	2,1 .10^{-4} .*U*	
		20 kHz ≤ f ≤ 50 kHz	4.10^{-4} .*U* + 6 µV	
		50 kHz< f ≤ 100 kHz	1,1·10^{-3}·U + 21 µV	
	100 mV ≤ U < 1V	1 Hz ≤ f <40 Hz	1,4 ·10^{-4}·U + 60 µV	
		40 Hz ≤ f <1 kHz	1,2 ·10^{-4}·U + 35 µV	
		1 kHz ≤ f < 20 kHz	2 ·10^{-4} ·U + 45 µV	
		20 kHz ≤ f ≤ 50 kHz	4 ·10^{-4} ·U + 60 µV	
		50 kHz ≤ f < 100 kHz	1,1 ·10^{-3} ·U + 210 µV µV	
		100 kHz ≤ f < 300 kHz	3,6 ·10^{-3} ·U + 470 µV	
		300 kHz ≤ f < 1 MHz	1,2 ·10^{-2} ·U + 1,5 mV	
	1V ≤ U <10V	1 Hz ≤ f <40 Hz		
		40 Hz ≤ f <1 kHz		
		1 kHz ≤ f < 20 kHz	1,3 ·10^{-4}·U + 600 µV	
		20 kHz ≤ f ≤ 50 kHz	1,4 ·10^{-4}·U + 350 µV	
		50 kHz ≤ f < 100 kHz	2,2 ·10^{-4}·U + 650 µV	
		100 kHz ≤ f < 300 kHz	4,0 ·10^{-4}·U + 850 µV	
		300 kHz ≤ f < 1 MHz	1,2 ·10^{-3} ·U + 3,5 mV µV	
			3,8 ·10^{-3} ·U + 6 mV	
	10V ≤ U < 100V	1 Hz ≤ f <40 Hz	1,2 ·10^{-2} ·U + 15 mV	
		40 Hz ≤ f <1 kHz		
		1 kHz ≤ f < 20 kHz	2,7 ·10^{-4}·U + 7 mV	
		20 kHz ≤ f ≤ 50 kHz	2,7 ·10-4·U + 5 mV	
		50 kHz ≤ f <100 kHz	2,7 ·10^{-4}·U + 5 mV	
	100 V ≤ U ≤ 1000 V	1 Hz ≤ f ≤ 40 Hz	4,5 ·10^{-4}·U + 7 mV	
		40 Hz ≤ f <1 kHz	1,5 ·10^{-2}·U + 170 mV	
		1 kHz ≤ f < 20 kHz		
		20 kHz ≤ f <50 kHz	5,5 ·10^{-4}·U + 100 mV	
			1,1 ·10^{-4}·U + 40 mV	
			1·9. 10^{-4}·U + 40 mV	

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Capacitance Capacitance Measuring Devices LCR Meter:	1 nF 10 nF 100 nF 1 µF	f = 1 kHz	$1.8 . 10^{-4} . C$ $1.8 . 10^{-4} . C$ $1.8 . 10^{-4} . C$ $1.8 . 10^{-4} . C$	C = Measured Value
		10 Hz- 10 kHz		
	0·22 ≤ C < 0·3999 nF	10 Hz- 10 kHz	% 5·0	
	0·4 ≤ C < 1·0999 nF	10 Hz- 3000 Hz	% 2·5	C = Measured Value With Fluke 5520A
	1·1 ≤ C <3·2999 nF	10 Hz- 1000 Hz	% 1·3	
	3·3 ≤ C < 10·9999nF	10 Hz- 1000 Hz	% 0·6	
	11 ≤ C < 32·999 nF	10 Hz- 1000 Hz	% 1·0	
	33 ≤ C < 109·999 nF	10 Hz- 1000 Hz	% 0·5	
	110 ≤ C < 329·999 nF	10 Hz- 600 Hz	% 0·5	
	0·33 ≤ C < 1·09999 uF	10 Hz- 300 Hz	% 0·5	
	1·1 ≤ C < 3·29999 uF	10 Hz- 150 Hz	% 0·5	
	3·3 ≤ C < 10·9999 uF	10 Hz- 120 Hz	% 0·5	
	11 ≤ C < 32·999 uF	10 Hz- 80 Hz	% 0·6	
	33 ≤ C < 109·999 uF		% 0·6	

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Inductance L Inductance Measuring Device LCR Meter	100 µH	100 Hz	$1{,}2 \cdot 10^{-3} \cdot L$	L =Measured Value
		200 Hz	$4 \cdot 10^{-4} \cdot L$	
		400 Hz	$4 \cdot 10^{-4} \cdot L$	
		1 kHz	$4 \cdot 10^{-4} \cdot L$	
		10 kHz	$5 \cdot 10^{-4} \cdot L$	
	1 mH	100 Hz	$3{,}5 \cdot 10^{-4} \cdot L$	
		200 Hz	$3 \cdot 10^{-4} \cdot L$	
		400 Hz	$3 \cdot 10^{-4} \cdot L$	
		1 kHz	$3 \cdot 10^{-4} \cdot L$	
		10 kHz	$3{,}5 \cdot 10^{-4} \cdot L$	
	10 mH	100 Hz	$3 \cdot 10^{-4} \cdot L$	
		200 Hz	$3 \cdot 10^{-4} \cdot L$	
		400 Hz	$3 \cdot 10^{-4} \cdot L$	
		1 kHz	$3 \cdot 10^{-4} \cdot L$	
		10 kHz	$4 \cdot 10^{-4} \cdot L$	
	100 mH	100 Hz	$3 \cdot 10^{-4} \cdot L$	
		200 Hz	$3 \cdot 10^{-4} \cdot L$	
		400 Hz	$3 \cdot 10^{-4} \cdot L$	
		1 kHz	$3 \cdot 10^{-4} \cdot L$	
		4 kHz	3 . 10-4 . L	
		10 kHz	$3{,}5 \cdot 10^{-4} \cdot L$	
	1 H			
		100 Hz	$3 \cdot 10^{-4} \cdot L$	
		200 Hz	$3 \cdot 10^{-4} \cdot L$	
		400 Hz	$3 \cdot 10^{-4} \cdot L$	
		1 kHz	$3 \cdot 10^{-4} \cdot L$	

MEASURAND/DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Time and Frequency **Frequency** **Frequency Sources** Frequency Source	1 Hz ≤ f ≤ 10 Hz 10Hz ≤ f < 100 Hz 100Hz ≤ f < 1 kHz 1kHz ≤ f < 10kHz 10kHz ≤ f < 100kHz 100 kHz ≤ f < 230 MHz 230 MHz ≤ f ≤ 40 GHz	Gate Time 10 s Amplitude ≤ $5V_{rms}$	$5.10^{-6}.f$ $1.10^{-6}.f$ $1.10^{-7}.f$ $1.10^{-8}.f$ $1.10^{-9}.f$ $2.10^{-10}.f$ $5.10^{-11}.f$	f: Measured Frequency [Hz] With Counter Synchronized via rubidium oscillator
Time and Frequency **Frequency** **Frequency Counters** Frequency Counter	10 Hz ≤ f < 100 Hz 100 Hz ≤ f < 1kHz 1 kHz ≤ f < 100 kHz 100kHz ≤ f ≤ 40GHz	Gate Time 10 s Amplitude ≤ 5 V_{rms}	$1.10^{-7}.f$ $1.10^{-8}.f$ $1.10^{-9}.f$ $1.10^{-10}.f$	f: Measured Frequency [Hz] With Counter Synchronized via rubidium oscillator
Time and Frequency **Time Interval** Time Interval Measuring Devices	100ps ≤ t < 1µs 1µs ≤ t < 100µs 100µs ≤ t < 1ms 1ms ≤ t < 10ms 10ms ≤ t < 100ms 100ms ≤ t < 1s 1s ≤ t < 10s 10s ≤ t < 100s 100s ≤ t ≤ 1000s	Gate Time 10 s Amplitude ≤ 5 V_{rms}	$1.10^{-10}.t$ $1.10^{-9}.t$ $1.10^{-8}.t$ $1.10^{-7}.t$ $1.10^{-6}.t$ $1.10^{-5}.t$ $1.10^{-4}.t$ $1.10^{-3}.t$ $1.10^{-2}.t$	t: Measured Time Interval [s] With Counter Synchronized via rubidium oscillator

MEASURAND/DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Time and Frequency Time Interval Stopwatches	-30,00 s/day ≤ *t* ≤ +30,00 s/day 1s ≤ *t* ≤ 3600 s		0,04 s/g 100 ms	*t*: Measured daily deviation [s/day] or time Interval [s] Direct reading via reference calibrator Comparision with refence frequency counter
Time Frequency Frequency Frequency Counter Optical Tachometers	60rpm ≤ *ω* ≤ 99999rpm	*r* = 0,001 rpm *r* = 0,01 rpm *r* = 0,1 rpm *r* = 1 rpm *r* = 10 rpm	0,001 rpm 0,006 rpm 0,06 rpm 0,6 rpm 6 rpm	Measuring frequency using lazer led *ω*: Measured Value [rpm] *r*: Resolution [rpm]

BALANCES

Nonautomatic Weighing Instruments	m ≤ 300 g m ≤ 10 kg m ≤ 5 kg m ≤ 150 kg	With E2 Class Weights With F1 Class Weights With F2 Class Weights With M1 Class Weights	$2{,}0\cdot10^{-6}$ $6{,}2\cdot10^{-6}$ $2{,}0\cdot10^{-5}$ $8{,}5\cdot10^{-5}$	With procedure written according to Euromet Cg-18 v.04 guide m: balance capacity (Weight)

MATERIAL TESTING MACHINES

Concrete Test Hammer	10 N/mm2 ≤ P ≤ 100 N/mm2	TS EN 12504-2	3%	With reference anvil
Fatigue Testing Machine Dynamic Calibration	Fatigue Testing Machine Dynamic Calibration	MIL STD 1312B ASTM E467 ISO 4965-2	% 0,32	With reference load cells
Tensile-Compression Bending-Spring Force Test and Concrete Test Machine Calibration	1N≤F≤1MN	TS EN ISO 7500-1	% 0,16	Compression (With 0.5 Class Load Cell)
	1N≤F≤ 2MN	ASTM E 4	% 0,16	Tensile (With 0.5 Class Load Cell)
	1mN≤F≤50N	TS EN 12390-4	% 0,10	Tensile (With E2 class weights)
	1N≤F≤220N		% 0,10	Compression (With F1 Class Weight)
	1N≤F≤3MN		% 0,32	Compression ((With 1 Class Load Cell))
Mechanıcal Energy Charpy Impact Testing Machine Calibration	Nominal Energy 0,5J ≤ A_P ≤ 750J	TS EN ISO 148-2 ASTM E23 DIN 51222	Forcet: 0,12% Pendulum Lenght: 1mm Angle: 0,03° Time:0,04s	Measurement uncertainty is calculated for the following parameters. 1 - Resonance status. 2 - Potential Energy. 3 - Indicator deviation.
Uzunluk ölçer Extensometre	0 mm ≤ L ≤ 60 mm	TS EN ISO 9513	$1{,}5\ 10^{-3} \times L$ Not lower than 0,5 µm	Measurment Method: Incremental

HARDNESS

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Brinell Vickers Rockwell Hardness Measuring Devices	60HB≤HB≤450HB 200HV≤HV≤840HV 20 HRA ≤ HRA ≤ 65 HRA 66 HRA ≤ HRA ≤ 88 HRA 20 HRB ≤ HRB ≤ 55 HRB 56 HRB ≤ HRB ≤ 100 HRB 20 HRC ≤ HRC ≤ 55 HRC 56 HRC ≤ HRC ≤ 70 HRC 12 HRT ≤ HRT ≤ 93 HRT 20 HRN ≤ HRT ≤ 90 HRN	TS EN ISO 6506-2 TS EN ISO 6507-2 TS EN ISO 6508-2	2%HB 2%HV 1,0HRA 0,5HRA 1,5HRB 1,0HRB 1,0HRC 0,5HRC 2,0HRT 1,0HRN	These value are uncertainties obtained by undirect calibration with hardness blocks
Hardness measuring Devices Trace Depth Inspectetion	0mm ≤ L ≤ 10mm	TS EN ISO 6507-2 TS EN ISO 6506-2	$1{,}5\ 10^{-3}\times L$ Lower than 0,5 µm	With object micrometer
Shoremeter	***Shore A*** ***Shore D***	**Direct Calibration**	**1 Shore A** **1 Shore D**	**ISO 18898** **ASTM D2240**

TEMPERATURE

MEASURAND /DEVICE	MEASURING RANGE	CONDITIONS	MEASUREMENT CAPABILITY / UNCERTAINTY	NOTES
Ice Point	0°C	Comparision Method	±0,030°C	Comparision of 2 thermometers
Resistance Thermometer	-70°C ≤ T < 5°C 5°C ≤ T < 85°C 85°C ≤ T ≤ 250°C	Comparision method (Liquid Bath)	0,060 °C 0,045 °C 0,080 °C	t:Measured Tempearure Including Ice point Uncertainty
Liquid Glass Thermometers	-70°C ≤ T < 5°C 5°C ≤ T < 85°C 85°C ≤ T ≤ 250°C	Comparision method (Liquid Bath)	0,060 °C 0,045 °C 0,080 °C	t:Measured Tempearure Including Ice point Uncertainty
Thermocouples	-70°C ≤ T < 5°C 5°C ≤ T < 85°C 85°C ≤ T ≤ 250°C 600°C ≤ T < 1100°C 1100°C≤ T ≤1550°C	Comparision method	0,060 °C 0,045 °C 0,080 °C 2,5°C 3,0°C	t:Measured Tempearure With liquid bath and reference PRT With dry block calibrator and thermocouple
Digital/Analog Thermometers	-70°C ≤ T < 5°C 5°C ≤ T < 85°C 85°C ≤ T ≤ 250°C 600°C ≤ T < 1100°C 1100°C≤ T ≤1550°C	Comparision method	0,060 °C 0,045 °C 0,080 °C 2,5°C 3,0°C	t:Measured Value İncludind ice point uncertainty With liquid bath and reference PRT

				With dry block calibrator and thermocouple
Detection of temperature distribution of the temperature controlled volume (sterilizer, incubator, oven, air conditioning cabinet, freezers, cold rooms, water baths etc.	-70°C ≤ T ≤ 100°C 100°C < T ≤ 175°C %20 rh ≤ RH ≤ % 80 rh	At site calibration using mobile calibration system Distribution of temperature and humudity	±0,7°C ±1,0°C %3,0 rh	With procedure written according to TS EN 60066-3-1 1, Ts EN 60068_3_5, EURAMET cg.20, DAkks DKD R_5 -7 standarts t: Measured Value
Ash Furnace	250 °C ≤ T < 550 °C 550 °C ≤ T ≤ 1200 °C	Temperature distribution	1,5 °C 3,5 °C	Temperature distribution Calibration both on site and in laboratory t: Measured value

Torque

Toqrque Wrench	**0,2 N·m ≤ *M* ≤ 1000 N·m**	**Temperature: 18 °C between 28°C Minimum distribution ± 1 °C RH < 90 %**	**% 0,2**	**Procedurs written according to TS ISO 6789-1ve TS ISO 6789-2 standarts. Calibration for both directions**

Dimension

Outside Micrometer	L ≤ 25 mm 25 mm < L ≤300 mm 300 mm < L ≤1000 mm	r: 0,01 mm r: 0,001 mm r: 0,0001 mm r: 0,01 mm r: 0,001 mm r: 0,01 mm	3,1 + 5 · L) µm (1,4 + 9 · L) µm (1,2 + 11 ·L) µm (3,1 + 26 · L) µm (1,4 + 30 · L) µm (3,1 + 31 · L) µm	VDI/VDE/DGQ 2618 Part 10.1 L: Measured value (m) r: çresolution
Depth Micrometer	L ≤ 300 mm	*r: 0,01 mm*	(3,1 + 25 · L) µm	*VDI/VDE/DGQ 2618 Part 10.5* *L: Measured Value(m)* *r: Resolution*
Internal Micrometers with 2 Point Contact	25 mm ≤ L ≤ 40 mm	r: 0,01 mm r: 0,001 mm	(14,2 + 5 · L) µm (11,6 + 6 · L) µm	*VDI/VDE/DGQ 2618 Part 10.7* *L:Measured Value(m)* *r: Resolution*
Internal Micrometers with 2 Point Contact	5 mm ≤ L ≤ 40 mm	r: 0,01 mm r: 0,005 mm r: 0,001 mm	(14,2 + 5 · L) µm (12,3 + 6 · L) µm (11,6 + 6 · L) µm	VDI/VDE/DGQ 2618 Part 10.8 L: Measured Value (m) r: Resolution

Caliper	L ≤ 200 mm 200 mm < L ≤ 500 mm 500 mm < L ≤ 1000 mm	r: 0,01 mm r: 0,02 mm r: 0,05 mm r: 0,1 mm r: 0,01 mm r: 0,02 mm r: 0,05 mm r: 0,1 mm r: 0,01 mm r: 0,02 mm r: 0,05 mm r: 0,1 mm	(10 + 11 · L) µm (12,9 + 9 · L) µm (29,4 + 4 · L) µm (58 + 2 · L) µm (10 + 21 · L) µm (12,9 + 18 · L) µm (29,4 + 10 · L) µm (58 + 5 · L) µm (10 + 27 · L) µm (12.9 + 25 · L) µm (29.5 + 17 · L) µm (58 + 10 · L) µm	VDI/VDE/DGQ 2618 Part 9.1 Outside diameter Inside diameter, depth, step, level Measurement L: Measured Value(m) r: Resolution
Depth Caliper	L ≤300 mm 300 mm <L ≤1000 mm	r: 0,01 mm r: 0,02 mm r: 0,05 mm r: 0,1 mm r: 0,01 mm r: 0,02 mm r: 0,05 mm r: 0,1 mm	(10 + 15 · L) µm (13 + 13 · L) µm (29,4 + 6 · L) µm (58 + 3 · L) µm (10 + 27 · L) µm (12,9 + 25 · L) µm (29,4 + 17 · L) µm (58 + 10 · L) µm	VDI/VDE/DGQ 2618 Part 9.2 L: Measured value (m) r: Resolution
Dial Gauge	L ≤ 30 mm	r: 0,001 mm r: 0,002 mm r: 0,01 mm	(1,2 + 1· L) µm (1,8 + 1 · L) µm (8,2 + 1 · L) µm	VDI/VDE/DGQ 2618 Part 11.1 L: Resolution(m) r: Resolution
Dial Indicator	L ≤ 3 mm	r:0,01mm r: 0,002 mm r: 0,001 mm	5,8 µm 1,2 µm 0,7 µm	VDI/VDE/DGQ 2618 Part 11.2 L: Measuremen t Value(m) r: Resolution
Feeler Gauge	0,01 mm ≤ L ≤ 2 mm		2,0 µm	Thickness Measuremen t DIN 2275

Radius Gauge	1 mm ≤ d ≤ 25 mm		3,0 µm	Optical Method d: Measured Value(m)
Height Calipper	L ≤ 300 mm 300 mm< L ≤ 600 mm	r=0,001 mm r=0,01 mm r=0,02 mm r=0,05 mm r=0,001 mm r=0,01 mm r=0,02 mm r=0,05 mm	(5,9 + 16 · L) µm (10 + 15 · L) µm (12,9 + 13 · L) µm (29,4 + 6 · L) µm (5,9 + 27 · L) µm (10 + 23 · L) µm (12,9 + 20 · L) µm (29,4 + 12 · L) µm	VDI/VDE/DGQ 2618 Part 9.3 L:Measured Value(m) r: Resolution
Thickness Gauge Lever Gauges for external Measurements	L≤ 100 mm		(8,4 + 1 · L) µm	Blok Mastar ile karşılaştırma yöntemiyle L: Ölçülen Değer(m) r: çözünürlük / bölüntü değeri
Dial Gauge	5 mm ≤ L ≤ 200 mm 5 mm ≤ L ≤ 100	Outside r: 0,01 mm Outside r: 0,005 mm	(10 + 11 · L) µm (7 + 15 · L) µm	VDI/VDE/DGQ 2618 Bölüm 12.1 VDI/VDE/DGQ 2618 Bölüm
	mm	İnside r: 0,01 mm İnside r: 0,005 mm	(10 + 11 · L) µm (7 + 10 · L) µm	13.1 L: Measured Value (m) r: resolution
Sieve	L ≤ 5 mm 5 mm < L ≤ 125 mm	Optical Measurement Method Calipper	3 µm 25 µm	ISO 3310 ISO 3310
Screw Thread Gauge	0,35 mm ≤ L ≤ 10 mm		3 µm	Using Projector Step ve Teeth Height L: Step

Thickness Gauge (Pasometer)	L ≤ 200 mm	r: 0,01 mm r: 0,001 mm	(8,3 + 17 · L) µm (1,4 + 30 · L) µm	VDI/VDE/DGQ 2618 Part 10.3 L: Measured Value (m) r:Resolution
Tape Measure	**0 mm < L ≤ 3000 mm** **3000 mm < L ≤ 5000 mm** **5000 mm < L ≤ 50000 mm**	**r: 1 mm**	**0,4 mm** **0,6 mm** **0,5 + 0,12 . L mm**	**Comparision Method / TS 9505** **L : Measured Value** **r : Resolution**

Volume

Burette	**1 mL ≤ V ≤ 5 mL** **10 mL** **25 mL** **50 mL** **100 mL**	**Evacuation**	**3 µL** **6 µL** **10 µL** **20 µL** **20 µL**	**Procedure written according to TS EN ISO 385** **TS ISO 4787** **Euramet cg 19** **ISO/TR 20461** **V: Ölçülen Hacim**

Volumetric Flask	1 mL ≤ V ≤ 5 mL 10 mL 20 mL 25 mL 50 mL 100 mL 200 mL 250 mL 500 mL 1000 mL 2000 mL	Filling	6 µL 10 µL 30 µL 30 µL 35 µL 40 µL 50 µL 50 µL 80 µL 0,2 mL 0,3 mL	Procedure written according to TS 1491 EN ISO 1042 TS ISO 4787 Euramet cg 19 ISO/TR 20461 V: Measured Volume
Graudated Cylinder	5 mL 10 mL 25 mL 50 mL 100 mL 250 mL 500 mL 1000 mL 2000 mL	Filling	6 µL 30 µL 50 µL 60 µL 0,1 mL 0,2 mL 0,4 mL 1 mL 2 mL	Procedure written according to TS EN ISO 4788 TS ISO 4787 Euramet cg 19 ISO/TR 20461
Picnometer	1 mL ≤ V ≤ 5 mL 10 mL ≤ V ≤ 100 mL	Filling	6 µL 20 µL	Procedure written according to TS ISO 3507 TS ISO 4787 Euramet cg 19 ISO/TR 20461 TS EN ISO 2811

One Mark Volumetric Pipette	**0,1 ml ≤ V ≤ 5 mL** **10 mL** **20mL** **25 mL** **50 mL** **100 mL**	**Evacuation**	**3 µL** **6 µL** **10 µL** **10 µL** **20 µL** **20 µL**	**Procedure written according to TS 1489 ISO 648** **TS EN ISO 835** **TS ISO 4787** **Euramet cg 19** **ISO/TR 20461** **V: Measured Volume**
Piston Pipette	**100 µL** **200 µL** **500 µL** **1 mL** **2 mL** **5 mL** **10 mL**	Single or multi- channel piston Hand movement or motor driven	**0,4 µL** **0,4 µL** **0,6 µL** **3 µL** **3 µL** **6 µL** **20 µL**	**Procedure written according to TS EN ISO 8655-2** **TS EN ISO 8655-6** **ISO/TR 20461** **V: Measured Volume**

Piston Burette	1 mL 2 mL 5 mL 10 mL 20 mL ≤ V ≤ 50 mL 100 mL	Hand movement or motor driven	0,6 µl 2 µl 3 µl 8 µl 11 µl 20 µl	Procedure written according to TS EN ISO 8655-3 TS EN ISO 8655-6 ISO/TR 20461 V: Measured Volume