Annex to declaration of accreditation (scope of accreditation)
Normative document: EN ISO/IEC 17025:2017
Registration number: **K 006**

of **KEMA B.V.**

This annex is valid from: **07-02-2024** to **01-04-2026** Replaces annex dated: **01-02-2023**

Location(s) where activities are performed under accreditation

Head Office

Klingelbeekseweg 195
6812 DE
Arnhem
The Netherlands

Location	Abbreviation/ location code
Klingelbeekseweg 195 - Building no. R32 6812 DE Arnhem The Netherlands	R32
Klingelbeekseweg 195 - Building no. R42 6812 DE Arnhem The Netherlands	R42
On the premises of the KEMA lab	OSC

HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
LF 0 0	DC/LF Quantities				
LF 1 0	Direct Voltage				
	Up to 3 mV		0,8 µV		R42
	3 mV – 10 mV		$3 \cdot 10^{-4} \cdot U$		R42
	10 mV – 100 mV		$8{,}5 \cdot 10^{-5} \cdot U$		R42

[1] Calibration and Measurement Capability (CMC): Demonstrated measurement uncertainty, with coverage probability of 95%, in a given measurement point or measurement range. Measurement uncertainty, *U*, is calculated according to EA-4/02 "*Evaluation* of the Uncertainty of Measurement in Calibration".

This annex has been approved by the Board of the Dutch Accreditation Council, on its behalf,

J.A.W.M. de Haas

HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
	100 mV – 1100 V		$2{,}0 \cdot 10^{-5} \cdot U$		R42
LF 1 3	Direct High Voltage				
	1 kV – 6 kV		$2{,}5 \cdot 10^{-3} \cdot U$	Measuring	R42
	5 kV – 200 kV		$3{,}5 \cdot 10^{-3} \cdot U$		R32, OSC
LF 1 3	Lightning Impulse			Full wave	
	15 kV – 500 kV		$8 \cdot 10^{-3} \cdot U_t$ $4 \cdot 10^{-2} \cdot T_1$ $2 \cdot 10^{-2} \cdot T_2$	T_1 = 0,84 – 5,0 µs T_2 = 40 – 60 µs	R32, OSC
	Chopped Lightning Impulse			Chopped wave	
	15 kV – 500 kV		$1{,}0 \cdot 10^{-2} \cdot U_t$ $5 \cdot 10^{-2} \cdot T_c$ $5 \cdot 10^{-2} \cdot T_1$	T_c = 2,5 µs T_1 = 1,2 µs	R32, OSC
LF 2 0	Direct Current			On-site with reduced accuracy	
LF 2 1	10 µA – 0,3 A		$3{,}0 \cdot 10^{-5} \cdot I$		R42, OSC
	0,3 A – 1 A		$4{,}0 \cdot 10^{-5} \cdot I$		R42, OSC
	1 A – 3 A		$7{,}0 \cdot 10^{-5} \cdot I$		R42, OSC
	3 A – 10 A		$8{,}0 \cdot 10^{-5} \cdot I$		R42, OSC
	10 A – 20 A		$3{,}1 \cdot 10^{-4} \cdot I$		R42, OSC
	10 A – 100 A		$1{,}1 \cdot 10^{-4} \cdot I$	With zero flux transducer	R42, OSC
LF 3 0	Alternating Voltage			On-site with reduced accuracy	
LF 3 1	60 mV – 1000 V	20 Hz – 20 kHz	$2{,}0 \cdot 10^{-4} \cdot U$		R42, OSC
	60 mV – 1000 V	20 kHz – 50 kHz	$3{,}0 \cdot 10^{-4} \cdot U$		R42, OSC

HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
	60 mV – 220 V	50 kHz – 100 kHz	$4{,}0 \cdot 10^{-4} \cdot U$		R42, OSC
	220 V – 1000 V	50 kHz – 100 kHz	$2{,}0 \cdot 10^{-3} \cdot U$		R42, OSC
LF 3 2	Alternating Voltage Ratio			Conventional voltage transformers (instrument transformers)	
	Primary: 10 V – 600 V Secondary: 0,1 V – 240 V	50 Hz, 60 Hz	$3 \cdot 10^{-5} \cdot U_{out}/U_{in}$ and 90 µrad		R42
	Primary: 2 kV – 48 kV Secondary: 100 V or 110 V	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32, OSC
	Primary: 25 kV – 277 kV Secondary: 100 / √3 V	50 Hz	$4{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32
	Primary: 25 kV – 277 kV Secondary: 100 / √3 V	60 Hz	$6{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,6 mrad		R32
	Primary: 12 kV – 346 kV Secondary: 100 / √3 V Or Secondary: 100 V	50 Hz, 60 Hz	$3{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32, OSC
	Alternating Voltage Ratio			Electronic voltage transformers	
	Primary: 2 kV – 48 kV Secondary: 0,25 V – 15 V	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32, OSC
	Primary: 25 kV – 277 kV Secondary: 0,25 V – 15 V	50 Hz	$4{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32
	Primary: 25 kV – 277 kV Secondary: 0,25 V – 15 V	60 Hz	$6{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,6 mrad		R32
	Primary: 12 kV – 346 kV Secondary: 0,25 V – 15 V	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-4} \cdot U_i / U_u$ 0,3 mrad		R32, OSC
LF 3 3	Alternating High Voltage			Measuring	
	1 kV – 6 kV	50 Hz	$2{,}5 \cdot 10^{-3} \cdot U$		R42
	2 kV – 346 kV	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-3} \cdot U$	RMS	R32, OSC

HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
	5 kV – 260 kV	20 Hz – 500 Hz	$0{,}8 \cdot 10^{-2} \cdot U$	RMS	R32, OSC
	2 kV – 346 kV	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-3} \cdot U$	$\hat{U}/\sqrt{2}$	R32, OSC
	5 kV – 260 kV	20 Hz – 500 Hz	$0{,}8 \cdot 10^{-2} \cdot U$	$\hat{U}/\sqrt{2}$	R32, OSC
LF 4 0	Alternating Current				
LF 4 1	0,1 mA – 3 A	40 Hz – 5 kHz	$3{,}0 \cdot 10^{-4} \cdot I$		R42
	3 A – 10 A	40 Hz – 1 kHz	$3{,}0 \cdot 10^{-4} \cdot I$		R42
	10 A – 20 A	40 Hz – 1 kHz	$3{,}5 \cdot 10^{-4} \cdot I$		R42
	30 A – 50 A	40 Hz – 1 kHz	$6{,}1 \cdot 10^{-4} \cdot I$	$5{,}7 \cdot 10^{-4} \cdot I$ corrected for power coefficient	R42
LF 4 2	Alternating Current Ratio			Conventional current transformers (instrument transformers)	
	Primary: 5 A – 6 kA Secondary: 1 A or 5 A	50 Hz, 60 Hz	$5 \cdot 10^{-5} \cdot I_{out} / I_{in}$ and 90 µrad		R42
	Primary: 0,05 kA – 12 kA Secondary: 1 A or 5 A	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-4} \cdot I_i / I_u$ 0,3 mrad	At I/In < 20 % an additional contribution to the CMC might be applicable	R32, OSC
	Primary: 0,25 kA – 60 kA Secondary: 1 A or 5 A	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-4} \cdot I_i / I_u$ 0,3 mrad		R32, OSC
	Primary: 1 A – 3 kA Secondary: 1 A or 5 A	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-4} \cdot I_i / I_u$ 0,3 mrad		R32, OSC
	Alternating Current Ratio			Electronic current transformers	
	Primary: 0,25 kA – 60 kA Secondary: 0,25 V – 15 V	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-4} \cdot I_i / U_u$ 0,3 mrad	At I/I_n < 20 % an additional contribution to the CMC might be applicable	R32, OSC
	Primary: 0,05 kA – 12 kA Secondary: 0,25 V – 15 V	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-4} \cdot I_i / U_u$ 0,3 mrad		R32, OSC
	Primary: 1 A – 3 kA Secondary: 0,25 V – 15 V	50 Hz, 60 Hz	$4{,}0 \cdot 10^{-4} \cdot I_i / U_u$ 0,3 mrad		R32, OSC

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HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
LF 4 3	Alternating High Current				
	10 A – 6 kA	50 Hz, 60 Hz	$3 \cdot 10^{-4} \cdot I$		R42
	0,25 kA – 60 kA	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-3} \cdot I$		R32, OSC
	0,05 kA – 12 kA	50 Hz, 60 Hz	$2{,}0 \cdot 10^{-3} \cdot I$		R32, OSC
LF 6 0	Impedance (DC/LF)				
LF 6 2	DC Resistance			On-site with reduced accuracy Non-decadic values	
	20 µΩ – 50 µΩ		$1{,}6 \cdot 10^{-3} \cdot R$	Measuring; Generating 20 µΩ, 50 µΩ	R42, OSC
	50 µΩ – 100 µΩ		$8{,}0 \cdot 10^{-4} \cdot R$	Measuring only	R42, OSC
	100 µΩ – 0,3 mΩ		$6{,}0 \cdot 10^{-4} \cdot R$	Measuring Generating 250 µΩ	R42, OSC
	0,3 mΩ – 10 mΩ		$4{,}0 \cdot 10^{-4} \cdot R$	Measuring Generating 1,25 mΩ, 6,25 mΩ	R42, OSC
	10 mΩ – 100 mΩ		$3{,}0 \cdot 10^{-4} \cdot R$	Measuring and generating	R42, OSC
	100 mΩ – 1 Ω		$7{,}0 \cdot 10^{-5} \cdot R$	Measuring and generating	R42, OSC
	1 Ω – 2 Ω		$2{,}5 \cdot 10^{-5} \cdot R$	Measuring and generating	R42, OSC
	2 Ω – 2 MΩ		$2{,}0 \cdot 10^{-5} \cdot R$	Measuring and generating	R42, OSC
	2 MΩ – 20 MΩ		$1{,}0 \cdot 10^{-4} \cdot R$	Measuring and generating	R42, OSC
	20 MΩ – 100 MΩ		$7{,}5 \cdot 10^{-4} \cdot R$	Measuring and generating	R42, OSC

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HCS code	Measured quantity, Range	Frequency	CMC[1]	Remarks	Location
LF 6 5	LF Capacitance				
	10 pF – 100 pF	200 Hz – 1 kHz	$1{,}5 \cdot 10^{-3} \cdot C$		R42
	100 pF – 1 µF	50 Hz – 1 kHz	$1 \cdot 10^{-3} \cdot C$		R42
	330 pF – 1 µF	50 Hz – 1 kHz	$3{,}5 \cdot 10^{-3} \cdot C$ – $3{,}5 \cdot 10^{-2} \cdot C$	Generating only	R42, OSC
LF 6 7	Inductance				
	1 mH – 10 mH	1 kHz	$1 \cdot 10^{-3} \cdot L$		R42
	100 mH	400 Hz, 1 kHz	$1 \cdot 10^{-3} \cdot L$		R42
	1 H	200 Hz, 400 Hz, 1 kHz	$1 \cdot 10^{-3} \cdot L$		R42

HCS code	Measured quantity, Instrument, Measure	Range	CMC[2]	Remarks	Location
TE 0 0	Temperature				
TE 9 0	Temperature			Simulators/Indicators	
		-100 °C – t_{max} -200 °C – -100 °C	0,2 K 0,35 K	Base-metal couples	R42, OSC
		0 °C – t_{max}	0,5 – 0,8 K	Noble-metal couples	R42, OSC

Remarks R32:
Calibrations are performed inside the laboratory, unless specified otherwise.
The nominal ambient temperature during calibration is 20 ± 5 °C.

Remarks R42:
Calibrations are performed inside the laboratory, unless specified otherwise.
The ambient temperature during calibration is, unless specified otherwise, equal to 23,0 ± 2,0 °C

[2] Calibration and Measurement Capability (CMC): Demonstrated measurement uncertainty, with coverage probability of 95%, in a given measurement point or measurement range. Measurement uncertainty, *U*, is calculated according to EA-4/02 "*Evaluation* of the Uncertainty of Measurement in Calibration".