Coil Calibration Uncertainties

The coil, or the NUMBER OF TURNS of a coil is an exact number, there is effectively ZERO uncertainty on the number of turns of the coil. The coils will be 2, 10 or 50 turns – if there is an error in the coil, for example on the 10 Turn coil, it would be either 9 turns or 11 turns.

The purpose of the certificate in the case of a coil is to prove / certify that it is not 1 turn out. The uncertainties on the certificate are suitable for performing this check only.

When using a coil to calibrate clamp meters there is 'no' uncertainty contribution from the error in the number of turns on the coil – the coil turns must be EXACT as this is how they were manufactured
i.e. you do not use the uncertainty on our certificate at all.

The uncertainty contribution comes from the uncertainty in the current and the uncertainty in the interaction between the coil and the clamp meter. This will depend on the clamp being tested, e.g. when the jaws are moved around the clamp.

A typical contribution for this term is around 0.2%

Please see below for data on typical clamp meters.

Manufacturer	Model No.	30A Single conductor[1]	EA002 Central Reading	Error	100A Single conductor[2]	EA002 Central Reading	Error
		Amps	Amps	%	Amps	Amps	%
Lem Heme	H600	29.6	29.4	-0.68	100.1	99.5	-0.60
MIC	2090W	29.32	29.22	-0.34	99.54	99.25	-0.29
Megger	DCM2000P	29.54	29.68	0.47	99.61	99.94	0.33
Megger	DCM24R	30.41	30.46	0.16	100.42	100.56	0.14
MIC	2080W	30.2	30.2	0.00	100.3	100.2	-0.10
Heme	2000P	30.88	30.77	-0.36	100.85	100.54	-0.31
Fluke	333	29.8	29.9	0.33	99.8	100.2	0.40
Heme	1000	29.65	29.85	0.67	99.4	100.1	0.70
Lem Heme	H600	30.23	30.34	0.36	100.16	100.41	0.25

Test Conditions :

Reference measurement[1] - single conductor with 30A @ 50Hz flowing.
Reference measurement[2] - single conductor with 100A @ 50Hz flowing
Conductor located centrally within measurement jaws.

EA002 coil tests - using 50 turn coil section with 0.6A @ 50Hz flowing.
EA002 coil tests - using 50 turn coil section with 2A @ 50Hz flowing.
UUT jaws moved to the extremes of statement column.