



Using the BIPM key comparison database

"Sound beginning in the CIPM MRA" Course

BIPM, 14 November 2017

Using the BIPM key comparison database

1 . Main sections of the website

Homepage

Participants in the CIPM MRA

Key and Supplementary Comparisons

Calibration and Measurement Capabilities (CMCs)

2 . Search engines available

3 . Information available

4 . Search examples

Homepage

<http://kcdb.bipm.org/>

> Gives access to **Calibration and Measurement Capabilities (CMCs)** declared by each participant in the CIPM MRA when these have been validated.



Bureau International des Poids et Mesures
Mesures

Home | **Key and supplementary comparisons** | Calibration and Measurement Capabilities - CMCs

KCDB home version française

The BIPM key comparison database

What's new ?

- Time and Frequency - APMP 11 October 2016
- Key comparison COOMET-EM-K6.a 10 October 2016
- All news

Related links

- KCDB Statistics
- KCDB FAQs
- KCDB Reports
- CIPM MRA
- JCRB
- Find my NMI
- Metrologia

Contact us

- BIPM.KCDB@bipm.org

in support to the Mutual Recognition Arrangement of the CIPM (CIPM MRA) of national measurement standards and of calibration and measurement certificates issued by national metrology institutes

Participants in the CIPM MRA (Appendix A)

List of national metrology institutes and designated institutes that are participant in the Arrangement.

[access to the list](#)

Key and supplementary comparisons (Appendix B)

Information on CIPM (Comité International des Poids et Mesures) and RMO (Regional Metrology Organization) key and supplementary comparisons, together with results interpreted in terms of equivalence.

Search comparisons :

[advanced search](#)

Calibration and Measurement Capabilities – CMCs (Appendix C)

Quantities for which calibration and measurements certificates are recognized by institutes participating in the Arrangement.

Search CMCs :

[advanced search](#)

List of key comparisons (Appendix D)

List together with a short description of the key comparisons recorded.

[access to the list](#)

CMCs - Homepage

<http://kcdb.bipm.org/appendixC/default.asp>

News on the latest updates for CMCs

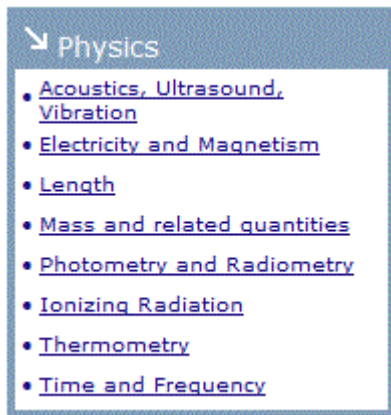
Two search engines available to access information on CMCs

The screenshot shows the KCDB website's 'Calibration and Measurement Capabilities - CMCs' search page. The page has a header with 'Home > CMCs Search' and the KCDB logo. The main content area is divided into several sections:

- What's new about CMCs ?** (circled in green): A list of recent updates including 'Time and Frequency - APMP' (14 October 2016), 'Length - SIM' (12 October 2016), and 'All news'.
- Free search** (circled in red): A section titled 'Choose your search engine to access CMCs information' featuring a 'Free text search' box with a 'Search' button and a 'Send us your feedback' link.
- Advanced search** (circled in red): A section titled 'Directed search by metrology area' featuring a 'Select a Metrology Area' dropdown menu, a 'Search' button, and a 'List of Metrology Areas' section with links to 'Acoustics, Ultrasound, Vibration' and 'Electricity and Magnetism'.
- Physics**: A list of metrology areas including 'Acoustics, Ultrasound, Vibration', 'Electricity and Magnetism', 'Length', 'Mass and related quantities', 'Photometry and Radiometry', 'Ionizing Radiation', 'Thermometry', and 'Time and Frequency'.
- Chemistry**: A list of metrology areas including 'Chemistry'.

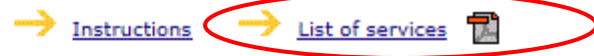
Annotations include a green circle around the 'What's new about CMCs ?' section, a red circle around the 'Free search' button, and another red circle around the 'Advanced search' button. An orange box highlights the 'Free text search' label, and another orange box highlights the 'Directed search by metrology area' label.

CMCs –Advanced Search in Physics




Advanced Search Engine uses the items under the format (a., a.b., a.b.c) and the designation of the Classification of Services

These items can be instruments ([Length Metrology](#)) or quantities ([Electricity & Magnetism Metrology](#))



→ Direct access to full lists of CMCs by country as .PDF files

Country → Display .PDF file 

→ Search the database

Branch	<input type="text" value="All"/>
Service	<input type="text" value="All"/>
Sub-service	<input type="text" value="All"/>

→ Reset all → Search


[Go to the KCDB Website](#)

CMCs –Advanced Search in Physics

Calibration and Measurement Capabilities Electricity and Magnetism

→ [Instructions](#) → [List of services](#) 

→ Direct access to full lists of CMCs by country as .PDF files

Country → Display .PDF file 

Search

- Chile
- China
- Chinese Taipei
- Costa Rica
- Croatia
- Cuba
- Czech Republic
- Denmark
- Egypt
- Finland
- France
- Georgia
- Germany
- Greece
- Hong Kong, China
- Hungary
- India
- Indonesia
- Ireland

III

[Go to the KCDB Website](#)

CMCs –Advanced Search in Physics

Search the database

Branch

Service

Sub-service

Individual service

AC voltage, current, and power

AC power

AC power and energy

Single phase power at frequencies <= 400 Hz

Reset all

Search

Result of the search

Your selection : Electricity and Magnetism, AC voltage, current, and power, AC power, AC power and energy, Single phase power at frequencies <= 400 Hz

45 countries provide CMCs that match your selection.
Select one or more country names, then click on VIEW to view more about declared CMCs that match your selection.

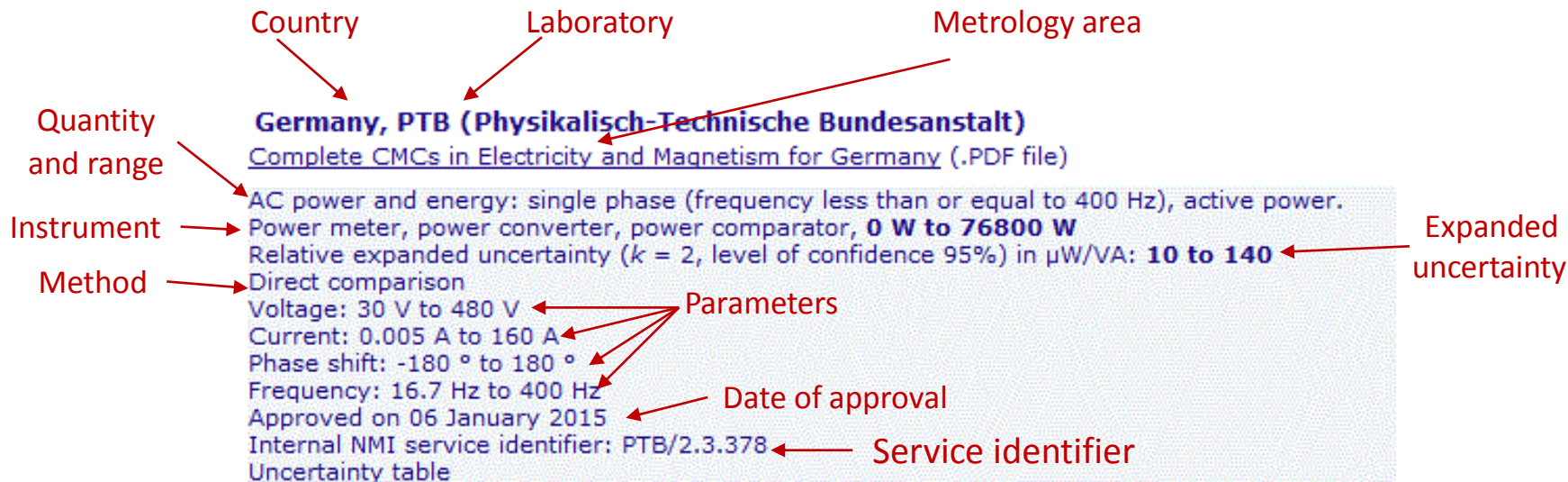
Select	Country	NMI	RMO
<input type="checkbox"/>	Argentina	INTI	SIM
<input type="checkbox"/>	Australia	NMIA	APMP
<input type="checkbox"/>	Austria	BEV	EURAMET
<input type="checkbox"/>	Belarus	BelGIM	COOMET
<input type="checkbox"/>	Brazil	INMETRO	SIM
<input type="checkbox"/>	Bulgaria	BIM	EURAMET
<input type="checkbox"/>	Canada	NRC	SIM
<input type="checkbox"/>	China	NIM	APMP
<input type="checkbox"/>	Chinese Taipei	CMS	APMP
<input type="checkbox"/>	Costa Rica	ICE-LMVE	SIM
<input type="checkbox"/>	Czech Republic	CMI	EURAMET
<input type="checkbox"/>	Denmark	Trescal	EURAMET
<input type="checkbox"/>	Finland	MIKES	EURAMET
<input type="checkbox"/>	France	LNE	EURAMET
<input checked="" type="checkbox"/>	Germany	PTB	EURAMET

> List of countries corresponding to a selection of search criteria

>> Selecting a Country returns the page of information on the declared CMCs.

CMCs –Advanced Search in Physics

Search Results –Presentation of CMCs in the KCDB



[Go to Uncertainty table](#)

CMCs –Advanced Search in Physics

Search Results –Presentation of CMCs in the KCDB

Germany, PTB (Physikalisch-Technische Bundesanstalt)

[Complete CMCs in Electricity and Magnetism for Germany \(.PDF file\)](#)

AC power and energy: single phase (frequency less than or equal to 400 Hz), active power.

Power meter, power converter, power comparator, **0 W to 76800 W**

Relative expanded uncertainty ($k = 2$, level of confidence 95%) in $\mu\text{W}/\text{VA}$: **10 to 140**

Direct comparison

Voltage: 30 V to 480 V

Current: 0.005 A to 160 A

Phase shift: -180° to 180°

Frequency: 16.7 Hz to 400 Hz

Approved on 06 January 2015

Internal NMI service identifier: PTB/2.3.378

[Uncertainty table](#)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/ Independent Variable		Expanded uncertainty				
Quantity	Instrument or Artifact	Method of Measurement	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the Expanded Uncertainty a relative one?
AC power and energy: single phase ($f \leq 400$ Hz), active power	Power meter, power converter, power	Direct comparison	0	76800	W	Voltage	30 V to 480 V	10 to 140	$\mu\text{W}/\text{VA}$	2	95%	Yes
						Current	0.005 A to 160 A					
						Phase shift	-180° to 180°					
						Frequency	16.7 Hz to 400 Hz					

[Uncertainty table](#)

CMCs –Advanced Search in Physics

Search Results –Presentation of CMCs in the KCDB

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AC power and energy: single phase (frequency less than or equal to 400 Hz), active power.

Power meter, power converter, power comparator, **0 W to 76800 W**

Relative expanded uncertainty ($k = 2$, level of confidence 95%) in $\mu\text{W/VA}$: **10 to 140**

Direct comparison

Voltage: 30 V to 480 V

Current: 0.005 A to 160 A

Phase shift: -180° to 180°

Frequency: 16.7 Hz to 400 Hz

Approved on 06 January 2015

Internal NMI service identifier: PTB/2.3.378

[Uncertainty table](#)

Search the database

Branch

AC voltage, current, and power

Service

AC power

Sub-service

AC power and energy

Individual service

Single phase power at frequencies ≤ 400 Hz

Reset all

Search

Reference Standard used in calibration		List of Comparisons supporting this measurement/ calibration service	Euromet Electricity Services Administration				Individual service	Single phase power	Reset all
Standard	Source of traceability		NMI Service Identification	Service category	NMI	Internal Comment	Comments to be published via the database	Uncertainty Matrix	Tag for closely related CMCs
digital AC/DC transfer for power	PTB	CCEM-K5	2.3.378	7.1.1	PTB		Approved on 06 January 2015	Mx2.3.7.1	

[Go to Uncertainty table](#)

CMCs –Advanced Search in Ionizing Radiation

CMCs - Search form



Physics

- [Acoustics, Ultrasound, Vibration](#)
- [Electricity and Magnetism](#)
- [Length](#)
- [Mass and related quantities](#)
- [Photometry and Radiometry](#)
- [Ionizing Radiation](#)
- [Thermometry](#)
- [Time and Frequency](#)

Chemistry

- [Chemistry](#)

Traceability to the SI through the BIPM

- [BIPM calibration and measurement services](#)

Related links

- [KCDB Statistics](#)
- [KCDB FAQs](#)

Calibration and Measurement Capabilities Ionizing Radiation

→ [RI Instructions](#) → [List of services](#)

Direct access to full lists of CMCs by country as .PDF files

Country

→ Display PDF file

Search the database

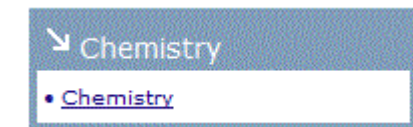
Branch	Radioactivity
Radionuclide	<input type="text"/> (e.g. for ^{60}Co , type Co-60 in part or full)
Quantity	All
Medium	All
Source type	All
Country	<input type="text"/>

→ Reset all

→ Search

[Go to the KCDB Website](#)

CMCs –Advanced Search in Chemistry



Three search engines
available to access
CMCs in Chemistry and
Biology

Calibration and Measurement Capabilities Chemistry (not including pH and electrolytic conductivity)

→ [pH and electrolytic conductivity](#) → [Instructions](#) → [List of categories](#) 

→ Direct access to full lists of CMCs by country and by category as .PDF files

Country

Category

→ Display .PDF file 

→ Free search

Type a Chemical or CRM identifier

→ Search

→ Keyword search

Analyte or component
keyword search

Match exactly: ☐ Yes ☒ No

Category

→ Search

[Go to the KCDB Website](#)

CMCs - Search Examples

- ◆ Using free search engine on CMCs data:
 - Statistics on CMCs declared by a country , e. g. South Africa
 - Direct access to CMCs declared for a specific primary standard, e.g. Water triple point cell



Thank you

Bureau
♦ **I**nternational des
♦ **P**oids et
♦ **M**esures