

**BIPM.EM-K10.a and EUROMET.EM.BIPM-K10.a****Key comparison BIPM.EM-K10.a****MEASURAND :** DC voltage, Josephson standards**NOMINAL VALUE :** 1.018 V $x_i$ : result of measurement carried out by laboratory  $i$  expressed as the difference from the BIPM value $x_i = (V_i - V_{\text{BIPM}})$ , where "V" stands for "voltage" $u_i$ : combined standard uncertainty of  $x_i$ 

Lab $i$	$x_i$ / nV	$u_i$ / nV	Date of measurement
DFM	-0.7	0.8	Jan 1991
DFM	0.2	0.3	May 1991
PTB	-0.1	0.3	May 1991
BNM-LCIE	0.1	0.3	Jul 1991
NIST	0.1	0.3	Oct 1991
NRC	0.2	0.3	Oct 1991
NPL	-0.07	0.52	Jan 1992
BNM-LCIE	-0.12	0.17	Feb 1992
NMIJ	-0.04	0.2	Mar 1992
METAS	-0.7	0.3	Nov 1992
NMi-VSL	0.2	0.2	Mar 1993
KRISS	0.20	0.21	Jan 1995
MSL	-0.24	0.21	Mar 1995
NMIA	-0.02	0.17	Apr 1995
NIM	-0.01	0.11	Nov 1995
SP	0.1	0.3	Apr 1996
IEN	0.1	0.2	Nov 1996
CEM	0.0	0.2	Oct 1997
A*STAR	1.8	0.9	Sep 2010
INTI	-1.1	2.0	Nov 2011
METAS	0.3	0.4	Jan 2012

**Key comparison EUROMET.EM.BIPM-K10.a**

**MEASURAND :** DC voltage, Josephson standards  
**NOMINAL VALUE :** close to 1 V

$d_{i-EUR}$ : result of measurement carried out by laboratory  $i$  expressed as the relative difference to the nominal value of the portable Josephson voltage standard (PJVS)

$$d_{i-EUR} = (V_{PJVS} - V_{i-EUR})/V_{i-EUR}, \text{ where "V" stands for "voltage"}$$

$u_{i-EUR}$ : combined standard uncertainty of  $d_{i-EUR}$

Lab $i$	$d_{i-EUR}$ / $10^{-9}$	$u_{i-EUR}$ / $10^{-9}$	Date of measurement
VNIIM	0.05	0.12	Sep 2003
UME	-0.06	0.36	Oct 2003
PTB	0.01	0.23	Oct 2003
SP	0.04	1.14	Oct 2003
NPL	1.3	0.59	Nov 2003
DFM	-0.14	0.56	Nov 2003
IEN	0.10	0.31	Nov 2003
EIM	1.0	2.2	Feb 2004
BIPM	0.07	0.13	Mar 2004
MIKES	-0.04	0.13	Mar 2004
GUM	-1.2	3.1	May 2004
CMI	0.8	2.5	May 2004
NMi-VSL	-1.6	6.0	May 2004

BIPM.EM-K10.a and EUROMET.EM.BIPM-K10.a

MEASURAND : DC voltage, Josephson standards

NOMINAL VALUE : close to 1 V

Key comparison BIPM.EM-K10.a

The key comparison reference value is the BIPM value. Its standard uncertainty is evaluated to be 0.1 nV and is included in the  $u_i$ 's values.

The degree of equivalence of each laboratory with respect to the reference value is given by a pair of terms:

$D_i = x_i$  and its expanded uncertainty ( $k = 2$ ),  $U_i = 2 u_i$ , both expressed in nV.

The degree of equivalence between two laboratories  $i$  and  $j$  is given by two terms:

$D_{ij} = (D_i - D_j) = (x_i - x_j)$  and its expanded uncertainty ( $k = 2$ ),  $U_{ij}$ , both expressed in nV.

$U_{ij} = 2[u_i^2 + u_j^2 - 2\text{cov}(i,j)]^{1/2}$ , where  $\text{cov}(i,j) \ll (0.1 \text{ nV})^2$  is the estimated covariance that takes into account the correlation introduced by the BIPM measurements. This term is negligible.

Linking EUROMET.EM.BIPM-K10.a to BIPM.EM.-K10.a

The EUROMET measurements are transferred to key comparison BIPM.EM-K10.a through the BIPM measurement.

The degree of equivalence of each laboratory participating in EUROMET.EM.BIPM-K10.a with respect to the key comparison reference value is given by a pair of terms:

$D_i = (d_{\text{BIPM-EUR}} - d_{i\text{-EUR}}) \times V_0$  and its expanded uncertainty (at 95% level of confidence),  $U_i$ , both expressed in nV.

$V_0$  is the nominal value close to 1 V, and detailed information on the calculation of  $U_i$  is given in page 6 of the Final Report.

The degree of equivalence between two laboratories participant in EUROMET.EM.BIPM-K10.a or between one laboratory participant in EUROMET.EM.BIPM-K10.a and one laboratory participant in BIPM.EM-K10.a is given by a pair of terms, both expressed in nV:

$D_{ij} = (D_i - D_j)$  and its expanded uncertainty (at 95% level of confidence),  $U_{ij}$ , with  $U_{ij} = (U_i^2 + U_j^2)^{1/2}$ .

In the enclosed matrix of equivalence, the following colour code is used:

 most recent value retained  
 one laboratory having participated in both comparisons compared to itself

		Lab <i>j</i> →		DFM		PTB		NIST		NRC		NPL		BNM-LCIE		NMIJ		NMI-VSL		KRISS			
Lab <i>i</i> ↓	$D_i$ $U_i$ / nV		$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	
			/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV
DFM	0.2	0.6			0.3	0.8	0.1	0.8	0.0	0.8	0.3	1.2	0.3	0.7	0.2	0.7	0.0	0.7	0.0	0.7	0.0	0.7	
PTB	-0.1	0.6	-0.3	0.8			-0.2	0.8	-0.3	0.8	0.0	1.2	0.0	0.7	-0.1	0.7	-0.3	0.7	-0.3	0.7	-0.3	0.7	
NIST	0.1	0.6	-0.1	0.8	0.2	0.8			-0.1	0.8	0.2	1.2	0.2	0.7	0.1	0.7	-0.1	0.7	-0.1	0.7	-0.1	0.7	
NRC	0.2	0.6	0.0	0.8	0.3	0.8	0.1	0.8			0.3	1.2	0.3	0.7	0.2	0.7	0.0	0.7	0.0	0.7	0.0	0.7	
NPL	-0.1	1.0	-0.3	1.2	0.0	1.2	-0.2	1.2	-0.3	1.2			0.1	1.1	0.0	1.1	-0.3	1.1	-0.3	1.1	-0.3	1.1	
BNM-LCIE	-0.1	0.3	-0.3	0.7	0.0	0.7	-0.2	0.7	-0.3	0.7	-0.1	1.1			-0.1	0.5	-0.3	0.5	-0.3	0.5	-0.3	0.5	
NMIJ	0.0	0.4	-0.2	0.7	0.1	0.7	-0.1	0.7	-0.2	0.7	0.0	1.1	0.1	0.5			-0.2	0.6	-0.2	0.6	-0.2	0.6	
NMI-VSL	0.2	0.4	0.0	0.7	0.3	0.7	0.1	0.7	0.0	0.7	0.3	1.1	0.3	0.5	0.2	0.6			0.0	0.6	0.0	0.6	
KRISS	0.2	0.4	0.0	0.7	0.3	0.7	0.1	0.7	0.0	0.7	0.3	1.1	0.3	0.5	0.2	0.6	0.0	0.6					
MSL	-0.2	0.4	-0.4	0.7	-0.1	0.7	-0.3	0.7	-0.4	0.7	-0.2	1.1	-0.1	0.5	-0.2	0.6	-0.4	0.6	-0.4	0.6	-0.4	0.6	
NMIA	0.0	0.3	-0.2	0.7	0.1	0.7	-0.1	0.7	-0.2	0.7	0.1	1.1	0.1	0.5	0.0	0.5	-0.2	0.5	-0.2	0.5	-0.2	0.5	
NIM	0.0	0.2	-0.2	0.6	0.1	0.6	-0.1	0.6	-0.2	0.6	0.1	1.1	0.1	0.4	0.0	0.5	-0.2	0.5	-0.2	0.5	-0.2	0.5	
SP	0.1	0.6	-0.1	0.8	0.2	0.8	0.0	0.8	-0.1	0.8	0.2	1.2	0.2	0.7	0.1	0.7	-0.1	0.7	-0.1	0.7	-0.1	0.7	
IEN	0.1	0.4	-0.1	0.7	0.2	0.7	0.0	0.7	-0.1	0.7	0.2	1.1	0.2	0.5	0.1	0.6	-0.1	0.6	-0.1	0.6	-0.1	0.6	
CEM	0.0	0.4	-0.2	0.7	0.1	0.7	-0.1	0.7	-0.2	0.7	0.1	1.1	0.1	0.5	0.0	0.6	-0.2	0.6	-0.2	0.6	-0.2	0.6	
A*STAR	1.8	1.8	1.6	1.9	1.9	1.9	1.7	1.9	1.6	1.9	1.9	2.1	1.9	1.8	1.9	1.8	1.6	1.8	1.6	1.8	1.6	1.8	
INTI	-1.1	4.0	-1.3	4.0	-1.0	4.0	-1.2	4.0	-1.3	4.0	-1.0	4.1	-0.9	4.0	-1.0	4.0	-1.3	4.0	-1.3	4.0	-1.3	4.0	
METAS	0.3	0.9	0.1	1.0	0.4	1.0	0.2	1.0	0.1	1.0	0.4	1.3	0.4	0.9	0.3	0.9	0.1	0.9	0.1	0.9	0.1	1.0	
VNIIM	0.0	0.5	-0.2	0.8	0.1	0.8	-0.1	0.8	-0.2	0.8	0.1	1.2	0.1	0.6	0.1	0.7	-0.2	0.7	-0.2	0.7	-0.2	0.7	
UME	0.1	0.8	-0.1	1.0	0.2	1.0	0.0	1.0	-0.1	1.0	0.2	1.3	0.3	0.8	0.2	0.9	-0.1	0.9	-0.1	0.9	-0.1	0.9	
PTB	0.1	0.5	-0.1	0.8	0.2	0.8	0.0	0.8	-0.1	0.8	0.1	1.2	0.2	0.6	0.1	0.7	-0.1	0.7	-0.1	0.7	-0.1	0.7	
SP	0.0	2.3	-0.2	2.4	0.1	2.4	-0.1	2.4	-0.2	2.4	0.1	2.5	0.2	2.3	0.1	2.3	-0.2	2.3	-0.2	2.3	-0.2	2.3	
NPL	-1.2	1.2	-1.4	1.3	-1.1	1.3	-1.3	1.3	-1.4	1.3	-1.2	1.6	-1.1	1.2	-1.2	1.3	-1.4	1.3	-1.4	1.3	-1.4	1.3	
DFM	0.2	1.1	0.0	1.3	0.3	1.3	0.1	1.3	0.0	1.3	0.3	1.5	0.3	1.2	0.3	1.2	0.0	1.2	0.0	1.2	0.0	1.2	
IEN	0.0	0.7	-0.2	0.9	0.1	0.9	-0.1	0.9	-0.2	0.9	0.0	1.3	0.1	0.8	0.0	0.8	-0.2	0.8	-0.2	0.8	-0.2	0.8	
EIM	-0.9	4.5	-1.1	4.5	-0.8	4.5	-1.0	4.5	-1.1	4.5	-0.9	4.6	-0.8	4.5	-0.9	4.5	-1.1	4.5	-1.1	4.5	-1.1	4.5	
MIKES	0.1	0.4	-0.1	0.7	0.2	0.7	0.0	0.7	-0.1	0.7	0.2	1.1	0.2	0.5	0.2	0.5	-0.1	0.5	-0.1	0.5	-0.1	0.6	
GUM	1.3	6.2	1.1	6.2	1.4	6.2	1.2	6.2	1.1	6.2	1.3	6.3	1.4	6.2	1.3	6.2	1.1	6.2	1.1	6.2	1.1	6.2	
CMI	-0.7	5.1	-0.9	5.1	-0.6	5.1	-0.8	5.1	-0.9	5.1	-0.7	5.2	-0.6	5.1	-0.7	5.1	-0.9	5.1	-0.9	5.1	-0.9	5.1	
NMI-VSL	1.7	12.4	1.5	12.4	1.8	12.4	1.6	12.4	1.5	12.4	1.7	12.4	1.8	12.4	1.7	12.4	1.5	12.4	1.5	12.4	1.5	12.4	

Lab j →

Lab i ↓

Lab i	Lab j		MSL		NMIA		NIM		SP		IEN		CEM		A*STAR		INTI		METAS	
	$D_i$	$U_i$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$
	/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV		/ nV	
DFM	0.2	0.6	0.4	0.7	0.2	0.7	0.2	0.6	0.1	0.8	0.1	0.7	0.2	0.7	-1.6	1.9	1.3	4.0	-0.1	1.0
PTB	-0.1	0.6	0.1	0.7	-0.1	0.7	-0.1	0.6	-0.2	0.8	-0.2	0.7	-0.1	0.7	-1.9	1.9	1.0	4.0	-0.4	1.0
NIST	0.1	0.6	0.3	0.7	0.1	0.7	0.1	0.6	0.0	0.8	0.0	0.7	0.1	0.7	-1.7	1.9	1.2	4.0	-0.2	1.0
NRC	0.2	0.6	0.4	0.7	0.2	0.7	0.2	0.6	0.1	0.8	0.1	0.7	0.2	0.7	-1.6	1.9	1.3	4.0	-0.1	1.0
NPL	-0.1	1.0	0.2	1.1	-0.1	1.1	-0.1	1.1	-0.2	1.2	-0.2	1.1	-0.1	1.1	-1.9	2.1	1.0	4.1	-0.4	1.3
BNM-LCIE	-0.1	0.3	0.1	0.5	-0.1	0.5	-0.1	0.4	-0.2	0.7	-0.2	0.5	-0.1	0.5	-1.9	1.8	0.9	4.0	-0.4	0.9
NMIJ	0.0	0.4	0.2	0.6	0.0	0.5	0.0	0.5	-0.1	0.7	-0.1	0.6	0.0	0.6	-1.9	1.8	1.0	4.0	-0.3	0.9
NMI-VSL	0.2	0.4	0.4	0.6	0.2	0.5	0.2	0.5	0.1	0.7	0.1	0.6	0.2	0.6	-1.6	1.8	1.3	4.0	-0.1	0.9
KRISS	0.2	0.4	0.4	0.6	0.2	0.5	0.2	0.5	0.1	0.7	0.1	0.6	0.2	0.6	-1.6	1.8	1.3	4.0	-0.1	1.0
MSL	-0.2	0.4			-0.2	0.5	-0.2	0.5	-0.3	0.7	-0.3	0.6	-0.2	0.6	-2.1	1.8	0.8	4.0	-0.5	1.0
NMIA	0.0	0.3	0.2	0.5			0.0	0.4	-0.1	0.7	-0.1	0.5	0.0	0.5	-1.8	1.8	1.0	4.0	-0.3	0.9
NIM	0.0	0.2	0.2	0.5	0.0	0.4			-0.1	0.6	-0.1	0.5	0.0	0.5	-1.8	1.8	1.1	4.0	-0.3	0.9
SP	0.1	0.6	0.3	0.7	0.1	0.7	0.1	0.6			0.0	0.7	0.1	0.7	-1.7	1.9	1.2	4.0	-0.2	1.0
IEN	0.1	0.4	0.3	0.6	0.1	0.5	0.1	0.5	0.0	0.7			0.1	0.6	-1.7	1.8	1.2	4.0	-0.2	0.9
CEM	0.0	0.4	0.2	0.6	0.0	0.5	0.0	0.5	-0.1	0.7	-0.1	0.6			-1.8	1.8	1.1	4.0	-0.3	0.9
A*STAR	1.8	1.8	2.1	1.8	1.8	1.8	1.8	1.8	1.7	1.9	1.7	1.8	1.8	1.8			2.9	4.3	1.5	2.0
INTI	-1.1	4.0	-0.8	4.0	-1.0	4.0	-1.1	4.0	-1.2	4.0	-1.2	4.0	-1.1	4.0	-2.9	4.3			-1.3	4.1
METAS	0.3	0.9	0.5	1.0	0.3	0.9	0.3	0.9	0.2	1.0	0.2	0.9	0.3	0.9	-1.5	2.0	1.3	4.1		
VNIIM	0.0	0.5	0.3	0.7	0.0	0.6	0.0	0.6	-0.1	0.8	-0.1	0.7	0.0	0.7	-	-	-	-	-	-
UME	0.1	0.8	0.4	0.9	0.2	0.8	0.1	0.8	0.0	1.0	0.0	0.9	0.1	0.9	-	-	-	-	-	-
PTB	0.1	0.5	0.3	0.7	0.1	0.6	0.1	0.6	0.0	0.8	0.0	0.7	0.1	0.7	-	-	-	-	-	-
SP	0.0	2.3	0.3	2.3	0.1	2.3	0.0	2.3	-0.1	2.4	-0.1	2.3	0.0	2.3	-	-	-	-	-	-
NPL	-1.2	1.2	-1.0	1.3	-1.2	1.2	-1.2	1.2	-1.3	1.3	-1.3	1.3	-1.2	1.3	-	-	-	-	-	-
DFM	0.2	1.1	0.5	1.2	0.2	1.2	0.2	1.1	0.1	1.3	0.1	1.2	0.2	1.2	-	-	-	-	-	-
IEN	0.0	0.7	0.2	0.8	0.0	0.8	0.0	0.7	-0.1	0.9	-0.1	0.8	0.0	0.8	-	-	-	-	-	-
EIM	-0.9	4.5	-0.7	4.5	-0.9	4.5	-0.9	4.5	-1.0	4.5	-1.0	4.5	-0.9	4.5	-	-	-	-	-	-
MIKES	0.1	0.4	0.4	0.6	0.1	0.5	0.1	0.4	0.0	0.7	0.0	0.5	0.1	0.5	-	-	-	-	-	-
GUM	1.3	6.2	1.5	6.2	1.3	6.2	1.3	6.2	1.2	6.2	1.2	6.2	1.3	6.2	-	-	-	-	-	-
CMI	-0.7	5.1	-0.5	5.1	-0.7	5.1	-0.7	5.1	-0.8	5.1	-0.8	5.1	-0.7	5.1	-	-	-	-	-	-
NMI-VSL	1.7	12.4	1.9	12.4	1.7	12.4	1.7	12.4	1.6	12.4	1.6	12.4	1.7	12.4	-	-	-	-	-	-

		Lab <i>j</i> →																	
Lab <i>i</i> ↓	<i>D<sub>i</sub></i> <i>U<sub>i</sub></i>		VNIIM		UME		PTB		SP		NPL		DFM		IEN		EIM		
	/ nV		<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	<i>D<sub>ij</sub></i>	<i>U<sub>ij</sub></i>	
DFM	0.2	0.6	0.2	0.8	0.1	1.0	0.1	0.8	0.2	2.4	1.4	1.3	0.0	1.3	0.2	0.9	1.1	4.5	
PTB	-0.1	0.6	-0.1	0.8	-0.2	1.0	-0.2	0.8	-0.1	2.4	1.1	1.3	-0.3	1.3	-0.1	0.9	0.8	4.5	
NIST	0.1	0.6	0.1	0.8	0.0	1.0	0.0	0.8	0.1	2.4	1.3	1.3	-0.1	1.3	0.1	0.9	1.0	4.5	
NRC	0.2	0.6	0.2	0.8	0.1	1.0	0.1	0.8	0.2	2.4	1.4	1.3	0.0	1.3	0.2	0.9	1.1	4.5	
NPL	-0.1	1.0	-0.1	1.2	-0.2	1.3	-0.1	1.2	-0.1	2.5	1.2	1.6	-0.3	1.5	0.0	1.3	0.9	4.6	
BNM-LCIE	-0.1	0.3	-0.1	0.6	-0.3	0.8	-0.2	0.6	-0.2	2.3	1.1	1.2	-0.3	1.2	-0.1	0.8	0.8	4.5	
NMIJ	0.0	0.4	-0.1	0.7	-0.2	0.9	-0.1	0.7	-0.1	2.3	1.2	1.3	-0.3	1.2	0.0	0.8	0.9	4.5	
NMI-VSL	0.2	0.4	0.2	0.7	0.1	0.9	0.1	0.7	0.2	2.3	1.4	1.3	0.0	1.2	0.2	0.8	1.1	4.5	
KRISS	0.2	0.4	0.2	0.7	0.1	0.9	0.1	0.7	0.2	2.3	1.4	1.3	0.0	1.2	0.2	0.8	1.1	4.5	
MSL	-0.2	0.4	-0.3	0.7	-0.4	0.9	-0.3	0.7	-0.3	2.3	1.0	1.3	-0.5	1.2	-0.2	0.8	0.7	4.5	
NMIA	0.0	0.3	0.0	0.6	-0.2	0.8	-0.1	0.6	-0.1	2.3	1.2	1.2	-0.2	1.2	0.0	0.8	0.9	4.5	
NIM	0.0	0.2	0.0	0.6	-0.1	0.8	-0.1	0.6	0.0	2.3	1.2	1.2	-0.2	1.1	0.0	0.7	0.9	4.5	
SP	0.1	0.6	0.1	0.8	0.0	1.0	0.0	0.8	0.1	2.4	1.3	1.3	-0.1	1.3	0.1	0.9	1.0	4.5	
IEN	0.1	0.4	0.1	0.7	0.0	0.9	0.0	0.7	0.1	2.3	1.3	1.3	-0.1	1.2	0.1	0.8	1.0	4.5	
CEM	0.0	0.4	0.0	0.7	-0.1	0.9	-0.1	0.7	0.0	2.3	1.2	1.3	-0.2	1.2	0.0	0.8	0.9	4.5	
A*STAR	1.8	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
INTI	-1.1	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
METAS	0.3	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
VNIIM	0.0	0.5			-0.1	0.9	0.0	0.7	0.0	2.4	1.3	1.3	-0.2	1.2	0.1	0.9	1.0	4.5	
UME	0.1	0.8	0.1	0.9			0.1	0.9	0.1	2.4	1.4	1.4	-0.1	1.3	0.2	1.0	1.1	4.6	
PTB	0.1	0.5	0.0	0.7	-0.1	0.9			0.0	2.4	1.3	1.3	-0.2	1.2	0.1	0.9	1.0	4.5	
SP	0.0	2.3	0.0	2.4	-0.1	2.4	0.0	2.4			1.3	2.6	-0.2	2.5	0.1	2.4	1.0	5.1	
NPL	-1.2	1.2	-1.3	1.3	-1.4	1.4	-1.3	1.3	-1.3	2.6			-1.4	1.6	-1.2	1.4	-0.3	4.7	
DFM	0.2	1.1	0.2	1.2	0.1	1.3	0.2	1.2	0.2	2.5	1.4	1.6			0.2	1.3	1.1	4.6	
IEN	0.0	0.7	-0.1	0.9	-0.2	1.0	-0.1	0.9	-0.1	2.4	1.2	1.4	-0.2	1.3			0.9	4.6	
EIM	-0.9	4.5	-1.0	4.5	-1.1	4.6	-1.0	4.5	-1.0	5.1	0.3	4.7	-1.1	4.6	-0.9	4.6			
MIKES	0.1	0.4	0.1	0.6	0.0	0.8	0.1	0.6	0.1	2.3	1.3	1.3	-0.1	1.2	0.1	0.8	1.0	4.5	
GUM	1.3	6.2	1.3	6.2	1.1	6.2	1.2	6.2	1.2	6.6	2.5	6.3	1.1	6.3	1.3	6.2	2.2	7.7	
CMI	-0.7	5.1	-0.8	5.1	-0.9	5.2	-0.8	5.1	-0.8	5.6	0.5	5.2	-0.9	5.2	-0.7	5.1	0.2	6.8	
NMI-VSL	1.7	12.4	1.7	12.4	1.5	12.4	1.6	12.4	1.6	12.6	2.9	12.5	1.5	12.4	1.7	12.4	2.6	13.2	

		Lab <i>j</i> →									
Lab <i>i</i> ↓	$D_i$	$U_i$	MIKES		GUM		CMI		NMI-VSL		
	/ nV		$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	$D_{ij}$	$U_{ij}$	
DFM	0.2	0.6	0.1	0.7	-1.1	6.2	0.9	5.1	-1.5	12.4	
PTB	-0.1	0.6	-0.2	0.7	-1.4	6.2	0.6	5.1	-1.8	12.4	
NIST	0.1	0.6	0.0	0.7	-1.2	6.2	0.8	5.1	-1.6	12.4	
NRC	0.2	0.6	0.1	0.7	-1.1	6.2	0.9	5.1	-1.5	12.4	
NPL	-0.1	1.0	-0.2	1.1	-1.3	6.3	0.7	5.2	-1.7	12.4	
BNM-LCIE	-0.1	0.3	-0.2	0.5	-1.4	6.2	0.6	5.1	-1.8	12.4	
NMIJ	0.0	0.4	-0.2	0.5	-1.3	6.2	0.7	5.1	-1.7	12.4	
NMI-VSL	0.2	0.4	0.1	0.5	-1.1	6.2	0.9	5.1	-1.5	12.4	
KRISS	0.2	0.4	0.1	0.6	-1.1	6.2	0.9	5.1	-1.5	12.4	
MSL	-0.2	0.4	-0.4	0.6	-1.5	6.2	0.5	5.1	-1.9	12.4	
NMIA	0.0	0.3	-0.1	0.5	-1.3	6.2	0.7	5.1	-1.7	12.4	
NIM	0.0	0.2	-0.1	0.4	-1.3	6.2	0.7	5.1	-1.7	12.4	
SP	0.1	0.6	0.0	0.7	-1.2	6.2	0.8	5.1	-1.6	12.4	
IEN	0.1	0.4	0.0	0.5	-1.2	6.2	0.8	5.1	-1.6	12.4	
CEM	0.0	0.4	-0.1	0.5	-1.3	6.2	0.7	5.1	-1.7	12.4	
A*STAR	1.8	1.8	-	-	-	-	-	-	-	-	
INTI	-1.1	4.0	-	-	-	-	-	-	-	-	
METAS	0.3	0.9	-	-	-	-	-	-	-	-	
VNIIM	0.0	0.5	-0.1	0.6	-1.3	6.2	0.8	5.1	-1.7	12.4	
UME	0.1	0.8	0.0	0.8	-1.1	6.2	0.9	5.2	-1.5	12.4	
PTB	0.1	0.5	-0.1	0.6	-1.2	6.2	0.8	5.1	-1.6	12.4	
SP	0.0	2.3	-0.1	2.3	-1.2	6.6	0.8	5.6	-1.6	12.6	
NPL	-1.2	1.2	-1.3	1.3	-2.5	6.3	-0.5	5.2	-2.9	12.5	
DFM	0.2	1.1	0.1	1.2	-1.1	6.3	0.9	5.2	-1.5	12.4	
IEN	0.0	0.7	-0.1	0.8	-1.3	6.2	0.7	5.1	-1.7	12.4	
EIM	-0.9	4.5	-1.0	4.5	-2.2	7.7	-0.2	6.8	-2.6	13.2	
MIKES	0.1	0.4			-1.2	6.2	0.8	5.1	-1.6	12.4	
GUM	1.3	6.2	1.2	6.2			2.0	8.0	-0.4	13.9	
CMI	-0.7	5.1	-0.8	5.1	-2.0	8.0			-2.4	13.4	
NMI-VSL	1.7	12.4	1.6	12.4	0.4	13.9	2.4	13.4			

**BIPM.EM-K10.a and EUROMET.EM.BIPM-K10.a - Josephson standards  
at a nominal value 1.018 V  
Degrees of equivalence [  $D_i$  and its expanded uncertainty ( $k = 2$ ),  $U_i$  ]**

