

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**DCV source fixed values**

	Expanded Uncertainty $\mu\text{V/V}$
0.1 V	2.3
0.2 V	4.0
0.6 V	2.0
1 V	1.2
2 V	2.0
6 V	2.0
10 V	1.2
20 V	2.0
60 V	2.0
100 V	1.2
200 V	2.0
600 V	3.0
1000 V	1.4

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**DCV source range values**

	Expanded Uncertainty $\mu\text{V/V}$	Uncertainty formula (U in V)
0.01 V to 0.1 V	11 to 74	$(0.7/U + 3.3)$
>0.1 V to 1 V	3.9 to 9.3	$(0.6/U + 3.3)$
>1 V to 10 V	3.6 to 4.2	$(0.7/U + 3.5)$
>10 V to 100 V	6.2 to 9.3	$(35/U + 5.8)$
>100 V to 1000 V	16	$(50/U + 15)$

The expanded uncertainties are expressed in $\mu\text{V/V}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**DCV multimeter values**

	Expanded Uncertainty $\mu\text{V/V}$	Uncertainty formula (U in V)
0.1 V	6.5	-
0.2 V	6.5	-
0.6 V	4.0	-
1 V	2.1	-
2 V	3.5	-
6 V	3.5	-
10 V	2.0	-
20 V	3.5	-
60 V	3.5	-
100 V	2.0	-
200 V	4.5	-
600 V	6.5	-
1000 V	3.0	-
0.022 V to 0.22 V	39 to 11	$(0.7/U + 7)$
>0.22 V to 2.2 V	9.1 to 5.5	$(0.9/U + 5)$
>2.2 V to 22 V	5.8 to 3.8	$(5/U + 3.5)$
>22 V to 220 V	7.1 to 5.3	$(45/U + 5)$
>220 V to 1000 V	10	$(400/U + 8)$

The expanded uncertainties are expressed in $\mu\text{V/V}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**R source fixed values**

resistance range	relative uncertainty ($k = 2$)
10 Ω	3.5
100 Ω	3.5
1 k Ω	3.5
10 k Ω	3.5
100 k Ω	5.0
1 M Ω	10
10 M Ω	12
100 M Ω	25

The expanded uncertainties are expressed in $\mu\Omega/\Omega$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**R source range values**

resistance range	relative uncertainty ($k = 2$)	uncertainty formula (U in V)
1 Ω to 10 Ω	8 to 19	$1\text{E}06 * (12 \mu\Omega + 6.5\text{E-}06 * R) / R$
>10 Ω to 100 Ω	4.8 to 12	$1\text{E}06 * (72 \mu\Omega + 4.0\text{E-}06 * R) / R$
>100 Ω to 1000 Ω	4.1 to 4.6	$1\text{E}06 * (60 \mu\Omega + 4.0\text{E-}06 * R) / R$
>1 k Ω to 10 k Ω	5.9 to 6.3	$1\text{E}06 * (2.7 \text{ m}\Omega + 6.0\text{E-}06 * R) / R$
>10 k Ω to 100 k Ω	6.3	$1\text{E}06 * (2.7 \text{ m}\Omega + 6.0\text{E-}06 * R) / R$
>100 k Ω to 1000 k Ω	13	$1\text{E}06 * (0.1 \Omega + 12\text{E-}06 * R) / R$
>1 M Ω to 10 M Ω	19 to 25	$1\text{E}06 * (6.7 \Omega + 18\text{E-}06 * R) / R$
>10 M Ω to 100 M Ω	73 to 130	$1\text{E}06 * (0.55 \text{ k}\Omega + 67\text{E-}06 * R) / R$
>100 M Ω to 1000 M Ω	600 to 650	$1\text{E}06 * (6.0 \text{ k}\Omega + 0.59\text{E-}03 * R) / R$

The expanded uncertainties are expressed in $\mu\Omega/\Omega$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**R multimeter values**

resistance range	relative uncertainty ($k = 2$)
10 Ω	2.0
100 Ω	2.0
1 k Ω	2.0
10 k Ω	2.0
100 k Ω	3.0
1 M Ω	6.0
10 M Ω	8.0
100 M Ω	23
1 G Ω	50

The expanded uncertainties are expressed in $\mu\Omega/\Omega$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**DCI source values**

voltage range	relative uncertainty ($k = 2$)
>0.1 mA to <0.2 mA	9.0
0.2 mA	7.0
>0.2 mA to <1 mA	9.0
1 mA	4.0
>1 mA to <2 mA	7.0
2 mA	6.0
>2 mA to <10 mA	7.0
10 mA	4.0
>10 mA to 100 mA	8.0
>100 mA to <200 mA	39
200 mA	10
>200 mA to <300 mA	39
300 mA	22
>300 mA to <500 mA	39
500 mA	22
>500 mA to <1 A	39
1 A	15
>1 A to <2 A	60
2 A	30
>2 A to <3 A	60
3 A	25
>3 A to <5 A	70
5 A	25
>5 A to <10 A	70
10 A	20
>10 a to <20 A	70
20 A	30

The expanded uncertainties are expressed in $\mu\text{A/A}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**DCI multimeter values**

current range	relative uncertainty ($k = 2$)
>0.1 mA to <0.2 mA	78 to 130
0.2 mA	8.0
>0.2 mA to 0.22 mA	73 to 77
>0.22 mA to <1 mA	33 to 57
1 mA	5.0
>1 mA to <2 mA	29 to 32
2 mA	7.0
>2 mA to 2.2 mA	29
>2.2 mA to <10 mA	30 to 44
10 mA	5.0
>10 mA to <20 mA	28 to 29
20 mA	9.0
>20 mA to 22 mA	27
>22 mA to <30 mA	59 to 67
30 mA	10
>30 mA to <50 mA	50 to 59
50 mA	10
>50 mA to <100 mA	43 to 49
100 mA	9.0
>100 mA to <200 mA	39 to 42
200 mA	11
>200 mA to 220 mA	39
>220 mA to <300 mA	91 to 110
300 mA	24
>300 mA to <500 mA	75 to 90
500 mA	24
>500 mA to <1 A	63 to 74
1 A	21
>1 A to <2 A	57 to 62
2 A	32
>2 A to 2.2 A	56
>2.2 A to <3 A	320 to 340
3 A	32
>3 A to <5 A	290 to 320
5 A	32
>5 A to <10 A	270 to 290
10 A	26
>10 A to <20 A	260 to 270
20 A	40

The expanded uncertainties are expressed in $\mu\text{A/A}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**ACV source&meter fixed values**

voltage range	40 Hz	55 Hz	1 kHz	10 kHz	100 kHz	1 MHz
0.1 V	28	-	27	27	61	56
0.2 V	30	-	19	19	21	54
0.6 V	13	-	12	13	17	48
1 V	17	-	12	12	17	62
2 V	18	-	15	17	19	59
6 V	13	-	12	12	15	41
10 V	12	-	10	10	13	61
20 V	15	-	12	12	21	-
60 V	17	-	15	15	30	-
100 V	29	-	19	19	34	-
200 V	28	-	22	21	42	-
600 V	-	41	29	-	-	-
1000 V	-	40	29	-	-	-

The expanded uncertainties are expressed in $\mu\text{V/V}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**ACV source range values**

voltage range	50 Hz to 20 kHz	50 kHz to 100 kHz	500 kHz to 1 MHz
>0.1 V to 0.22 V	45 to 53	180 to 190	1100
>0.22 V to 0.7 V	36 to 40	83 to 91	1000
>0.7 V to 2.2 V	24	71	900
>2.2 V to 7 V	24	81	1200
>7 V to 22 V	27	81	1200
>22 V to 70 V	32	94	1200
>70 V to 220 V	38	98	-
>220 V to 700 V	47	-	-
>700 V to 1000 V	44	-	-

The expanded uncertainties are expressed in $\mu\text{V/V}$

voltage range	Uncertainty formulas (U in V)		
	50 Hz to 20 kHz	50 kHz to 100 kHz	500 kHz to 1 MHz
>0.1 V to 0.22 V	$1\text{E}06 * (1.5 \mu\text{V} + 38\text{E-}06 * U) / U$	$1\text{E}06 * (2.5 \mu\text{V} + 0.16\text{E-}03 * U) / U$	$1\text{E}06 * (8.0 \mu\text{V} + 1.0\text{E-}03 * U) / U$
>0.22 V to 0.7 V	$1\text{E}06 * (1.5 \mu\text{V} + 33\text{E-}06 * U) / U$	$1\text{E}06 * (2.5 \mu\text{V} + 79\text{E-}06 * U) / U$	$1\text{E}06 * (8.0 \mu\text{V} + 0.96\text{E-}03 * U) / U$
>0.7 V to 2.2 V	-	-	-
>2.2 V to 7 V	-	-	-
>7 V to 22 V	-	-	-
>22 V to 70 V	-	-	-
>70 V to 220 V	-	-	-
>220 V to 700 V	-	-	-
>700 V to 1000 V	-	-	-

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))

ACV multimeter range values

voltage range	20 Hz to 40 Hz	50 Hz to 1 kHz	50 Hz to 20 kHz	50 kHz to 100 kHz	500 kHz to 1 MHz
>0.1 V to 0.22 V	-	-	120 to 150	540 to 630	3000 to 3200
>0.22 V to 2.2 V	-	-	49 to 82	130 to 250	1900 to 3100
>2.2 V to 22 V	-	-	48 to 68	110 to 200	-
>2.2 V to 10 V	-	-	-	-	1900 to 3000
>22 V to 220 V	100 to 160	-	55 to 80	1600 to 1700	-
>220 V to 1000 V	-	74 to 90	-	-	-

The expanded uncertainties are expressed in $\mu\text{V/V}$

voltage range	Uncertainty formulas (U in V)				
	20 Hz to 40 Hz	50 Hz to 1 kHz	50 Hz to 20 kHz	50 kHz to 100 kHz	500 kHz to 1 MHz
>0.1 V to 0.22 V	-	-	$1\text{E}06 * (7 \mu\text{V} + 80\text{E-}06 * U) / U$	$1\text{E}06 * (17 \mu\text{V} + 460\text{E-}06 * U) / U$	$1\text{E}06 * (45 \mu\text{V} + 2.7\text{E-}03 * U) / U$
>0.22 V to 2.2 V	-	-	$1\text{E}06 * (8 \mu\text{V} + 45\text{E-}06 * U) / U$	$1\text{E}06 * (30 \mu\text{V} + 110\text{E-}06 * U) / U$	$1\text{E}06 * (0.3 \text{ mV} + 1.7\text{E-}03 * U) / U$
>2.2 V to 22 V	-	-	$1\text{E}06 * (50 \mu\text{V} + 45\text{E-}06 * U) / U$	$1\text{E}06 * (200 \mu\text{V} + 100\text{E-}06 * U) / U$	-
>2.2 V to 10 V	-	-	-	-	$1\text{E}06 * (3.2 \text{ mV} + 1.5\text{E-}03 * U) / U$
>22 V to 220 V	$1\text{E}06 * (1.5 \text{ mV} + 90\text{E-}06 * U) / U$	-	$1\text{E}06 * (0.6 \text{ mV} + 52\text{E-}06 * U) / U$	$1\text{E}06 * (2.5 \text{ mV} + 150\text{E-}06 * U) / U$	-
>220 V to 1000 V	-	$1\text{E}06 * (3.5 \text{ mV} + 70\text{E-}06 * U) / U$	-	-	-

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**ACI source fixed values**

current range	55 Hz	1 kHz
10 mA	34	34
20 mA	57	57
30 mA	62	62
50 mA	57	57
100 mA	57	57
200 mA	62	62
300 mA	64	64
500 mA	68	68
1 A	60	60
2 A	72	72
3 A	71	71
5 A	71	71
10 A	120	120
20 A	120	120

The expanded uncertainties are expressed in $\mu\text{A/A}$

Electricity and Magnetism, Chile, UDEC (Universidad de Concepción (LCPN-ME))**ACI multimeter fixed values**

current range	55 Hz	1 kHz
10 mA	37	37
20 mA	60	60
30 mA	65	65
50 mA	65	65
100 mA	60	60
200 mA	67	67
300 mA	67	67
500 mA	67	67
1 A	65	65
2 A	73	73
3 A	75	75
5 A	75	75
10 A	130	130
20 A	130	130

The expanded uncertainties are expressed in $\mu\text{A/A}$