

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
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Accreditation No: LAB 264

Awarded to

**Links 2000 (Pvt.) Ltd. (Calibration Laboratory).
Amman Business Center 4th, Floor Office # 4, H-III Johar Town
Lahore, Pakistan**

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc. and shall not mislead its users.

The accreditation was first time granted on **08-06-2022** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **07-06-2025**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

PAKISTAN NATIONAL ACCREDITATION COUNCIL

19-11-2024
Date

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Director General

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
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Calibration Laboratory.

Accreditation Scope of Links 2000 Pvt. Ltd.
Amman Business Center 4th floor Office # 4, H-III Johar Town Lahore,
Pakistan.

Permanent laboratory premises

Field of measurement: PRESSURE METROLOGY			
Measured quantity	Range	*Expanded Uncertainty (±)	Technique, Reference Standard, Equipment
Hydraulic Pressure	2 bar to 50 bar	0.17 bar to 0.19 bar	<u>Reference Standards:</u> Hydraulic Dead Weight Tester (Yantrika) LN2K-LA-DWT-44 <u>Unit Under Calibration:</u> Hydraulic Pressure Gauges and Transducer, Pressure Indicators <u>Method Used:</u> LINKS/STM001
	51 bar to 150 bar	0.20 bar to 0.29 bar	
	151 bar to 250 bar	0.31 bar to 0.45 bar	
Hydraulic Pressure	1 bar to 50 bar	0.076 bar to 0.12 bar	<u>Reference Standards:</u> Hydraulic Tele Tester (MENSOR, WIKA) LN2K-LA-DWT-96 Digital Pressure Gauge (Crystal, Ametek) LN2K-LA-DPG-42 <u>Unit Under Calibration:</u> Hydraulic Pressure Gauges and Transducer, Pressure Indicators <u>Method Used:</u> LINKS/STM001
	51 bar to 100 bar	0.12 bar to 0.16 bar	
	101 bar to 200 bar	0.16 bar to 0.18 bar	
	201 bar to 400 bar	0.19 bar to 0.23 bar	
	401 bar to 600 bar	0.24 bar to 0.31 bar	
Hydraulic Pressure	1 bar to 50 bar	0.061 bar to 0.11 bar	<u>Reference Standards:</u> Hydraulic Tele Tester (BUDENBERG) LN2K-LA-DWT-52 Digital Pressure Gauge LN2K-LA-PC-95 <u>Unit Under Calibration:</u> Hydraulic Pressure Gauges and
	51 bar to 150 bar	0.11 bar to 0.16 bar	
	151 bar to 250 bar	0.16 bar to 0.18 bar	
	251 bar to 400 bar	0.18 bar to 0.21 bar	

19-11-2024
Date

Sd
Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
---	-----------------------------------	---

	401 bar to 550 bar	0.21 bar to 0.26 bar	Transducer, Pressure Indicators
	551 bar to 700 bar	0.26 bar to 0.31 bar	Method Used: LINKS/STM001
Pneumatic Pressure	- 0.6 bar to 20 bar	0.041 bar to 0.045 bar	Reference Standards: Digital Pneumatic Calibrator LN2K-LB-PG-19 Unit Under Calibration: Pneumatic Pressure Gauges Vacuum Gauges Compound Gauges Method Used: LINKS/STM001
Pneumatic Pressure	0.1 inchH ₂ O to 40 inchH ₂ O	0.010 inchH ₂ O to 0.013 inchH ₂ O	Reference Standards: Digital Manometer (YOKOGAWA, MT210) with pneumatic pump LN2K-LA-DM-111 Unit Under Calibration: Manometers, & Magnehelic Gauges Method Used: LINKS/STM001

Measuring Parameter: THERMAL METROLOGY

Temperature (Measure)	-40 °C to 140 °C	0.11 °C to 0.19 °C	Reference Standards: Dry Block Calibrator (9107) LN2K-LA-DB-25
	141 °C to 250 °C	0.23 °C to 0.32 °C	Dry Block Calibrator (HTR-400) LN2K-LA-TDB-45
	251 °C to 400 °C	0.33 °C to 0.45 °C	Portable Furnace (9150) LN2K-LA-DB-37
	401 °C to 600 °C	0.45 °C to 1.00 °C	Digital Readout Thermometer (735-1) LN2K-LA-DTM-94
	601 °C to 800 °C	1.00 °C to 1.44 °C	K-type Thermocouple LN2K-LB-TM-86 Unit Under Calibration: Dial Temperature Gauges
	801 °C to 1000 °C	1.44 °C to 1.74 °C	Method Used: LINKS/STM002
Temperature (Measure)	-20 °C to 25 °C	0.10 °C to 0.16 °C	Reference Standards: Refrigeration Thermostatic Bath (DY-RTS20) LN2K-LA-RTB-97
	26 °C to 50 °C	0.16 °C to 0.17 °C	Oil Bath (DY-HTS300) LN2K-LA-OB-98

19-11-2024
Date

Sd
Director



ACCREDITATION DOCUMENT

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 264

	51 °C to 90 °C	0.17 °C to 0.18 °C	Digital Readout Thermometer with RTD LN2K-LA-DTM-94
	91 °C to 200 °C	0.18 °C to 0.19 °C	Unit Under Calibration: Liquid In Glass Thermometers
	201 °C to 300 °C	0.19 °C to 0.20 °C	Method Used: LINKS/STM016
Temperature (Measure)	-40 °C to 140 °C	0.11 °C to 0.19 °C	Reference Standards: Dry Block Calibrator (9107) LN2K-LA-DB-25
	141 °C to 250 °C	0.23 °C to 0.32 °C	Dry Block Calibrator (HTR-400) LN2K-LA-TDB-45
	251 °C to 400 °C	0.33 °C to 0.45 °C	Portable Furnace (9150) LN2K-LA-DB-37
	401 °C to 600 °C	0.45 °C to 1.00 °C	Digital Readout Thermometer (735-1) LN2K-LA-DTM-94
	601 °C to 800 °C	1.00 °C to 1.44 °C	K-type Thermocouple LN2K-LB-TM-86
	801 °C to 1000 °C	1.44 °C to 1.74 °C	Unit Under Calibration: Digital Temperature Indicator With Sensor K-Type Thermocouple
Temperature (Source)	-20 °C to 50 °C	0.16 °C to 0.19 °C	Reference Standards: Dry Block Calibrator (9107) LN2K-LA-DB-25
	51 °C to 100 °C	0.19 °C to 0.23 °C	Dry Block Calibrator (HTR-400) LN2K-LA-TDB-45
	101 °C to 200 °C	0.23 °C to 0.26 °C	Digital Readout Thermometer (735-1) LN2K-LA-DTM-94
	201 °C to 400 °C	0.26 °C to 0.32 °C	K-type Thermocouple LN2K-LB-TM-86
	401 °C to 650 °C	0.32 °C to 0.58 °C	Unit Under Calibration: Temperature Block Calibrators
Measuring Parameter: MASS METROLOGY			
Masses (F1 Class and Below)	1 mg to 500 mg	0.0089 mg to 0.031 mg	Reference Standards: E2 Class Masses Set LN2K-LB-WB-116 F1 Class Masses Set LN2K-LB-WB-103

19-11-2024
Date

Sd

Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
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	1 g to 200 g	0.00008 g to 0.00012 g	F1 Class Masses Set LN2K-LB-WB-104 F1 Class Mass LN2K-LB-WB-105 F1 Class Mass LN2K-LB-WB-76 Analytical Balance (AND, GH-252) LN2K-LB-AB-109 Top Loading Balance LN2K-LB-WS-110 Top Loading Balance LN2K-LB-DWS-91 Unit Under Calibration: F1 Class and Below Masses Method Used: LINKS/STM004
	1000 g to 2000 g	0.002 g to 0.014 g	
	5000 g to 20000 g	0.014 g to 0.060 g	
Masses (F2 Class and Below)	500 g	0.011 g	

Measuring Parameter: VOLUME METROLOGY

Volume	1 mL to 1000 mL	0.0002 mL to 5.77 mL	Reference Standards: F1 Class Masses Set LN2K-LB-DWS-69 F1 Class Masses Set LN2K-LB-DW-74 Analytical Balance (AXIS) LN2K-LB-AB-56 Top Loading Balance (AND, GF-3000) LN2K-LB-DWS-59 Unit Under Calibration: Glassware Method Used: LINKS/STM006
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Measuring Parameter: CHEMICAL METROLOGY

pH Measurement	4 pH to 10 pH	0.015 pH to 0.020 pH	Reference Standards: NIST Traceable pH Buffers Unit Under Calibration: pH Meters Method Used: LINKS/STM012
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19-11-2024
Date

Sd

Director



ACCREDITATION DOCUMENT

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 264

Measuring Parameter: ELECTRICAL METROLOGY (A: Measure Mode Scope)			
DC Voltage	1 mV to 400 mV 0.5 V to 900 V	0.00084 mV to 0.0011 mV 0.00011 V to 0.10 V	<p><u>Reference Standards:</u> WAVETEK Calibration System LN2K-LB-WCS-117</p> <p><u>Unit Under Calibration:</u> Clamp meter Multimeter</p> <p><u>Method Used:</u> LINKS/STM010</p>
AC Voltage @ 50 Hz	1 mV to 400 mV 0.5 V to 900 V	0.038 mV 0.45 mV 0.00042 V to 0.67 V	<p><u>Reference Standards:</u> WAVETEK Calibration System LN2K-LB-WCS-117</p> <p><u>Unit Under Calibration:</u> Clamp meter Multimeter</p> <p><u>Method Used:</u> LINKS/STM010</p>
DC Current	1 μ A to 400 μ A 0.5 mA to 400 mA 0.5 A to 20 A	0.014 μ A to 0.17 μ A 0.0020 mA to 0.39 mA 0.00035 A to 0.0070 A	<p><u>Reference Standards:</u> WAVETEK Calibration System LN2K-LB-WCS-117</p> <p><u>Unit Under Calibration:</u> Clamp meter Multimeter</p> <p><u>Method Used:</u> LINKS/STM010</p>
AC Current @ 50 Hz	1 μ A to 400 μ A 0.5 mA to 400 mA 0.5 A to 20 A	0.39 μ A to 1.21 μ A 0.028 mA to 0.97 mA 0.00018 A to 0.064 A	<p><u>Reference Standards:</u> WAVETEK Calibration System LN2K-LB-WCS-117</p> <p><u>Unit Under Calibration:</u> Clamp meter Multimeter</p> <p><u>Method Used:</u> LINKS/STM010</p>

19-11-2024
Date

Sd

Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
---	-----------------------------------	---

Resistance	1 Ω to 400 Ω 0.5 kΩ to 400 kΩ 0.5 M Ω to 20 M Ω	0.012 Ω to 0.17 Ω 0.00033 kΩ to 0.11 kΩ 0.00095 MΩ to 0.036 MΩ	Reference Standards: WAVETEK Calibration System LN2K-LB-WCS-117 Unit Under Calibration: Clamp meter Multimeter Method Used: LINKS/STM010
Frequency	1 Hz to 5000 Hz	0.047 Hz to 3.3 Hz	Reference Standards: WAVETEK Calibration System LN2K-LB-WCS-117 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Clamp meter Multimeter Method Used: LINKS/STM010

Measuring Parameter: ELECTRICAL METROLOGY (B: Source Generation Scope)			
DC Voltage	1 mV to 50 mV 51 mV to 500 mV 0.6 V to 5 V 6 V to 50 V 51 V to 500 V 501 V to 900 V	0.0010 mV to 0.0015 mV 0.00061 mV to 0.0058 mV 0.000082 V to 0.00058 V 0.00081 V to 0.0061 V 0.0081 V to 0.010 V 0.010 V to 0.058	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator Earth Tester Method Used: LINKS/STM010
AC Voltage @ 50 Hz	1 mV to 500 mV 0.6 V to 5 V 6 V to 50 V 51 V to 500 V 501 V to 900 V	0.038 mV to 0.040 mV 0.000084 V to 0.0011 V 0.0023 V to 0.010 V 0.014 V to 0.042 V 0.042 V to 0.070 V	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator Earth Tester Method Used: LINKS/STM010

19-11-2024
Date

Sd
Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
---	-----------------------------------	---

DC Current	10 μ A to 5000 μ A 1 mA to 500 mA 1 A to 10 A	0.19 μ A to 0.87 μ A 0.00060 mA to 0.0061 mA 0.0013 A to 0.0017 A	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator Earth Tester Method Used: LINKS/STM010
AC Current @ 50 Hz	10 μ A to 5000 μ A 1 mA to 500 mA 1 A to 10 A	0.28 μ A to 0.34 μ A 0.026 mA to 0.043 mA 0.00019 A to 0.0023 A	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator Earth Tester Method Used: LINKS/STM010
Resistance	1 Ω to 500 Ω 0.6 k Ω to 500 k Ω 0.5 M Ω to 20 M Ω	0.0058 Ω to 0.0090 Ω 0.0013 k Ω to 0.10 k Ω 0.00095 M Ω to 0.042 M Ω	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator Earth Tester Method Used: LINKS/STM010
Frequency	1 Hz to 5000 Hz	0.063 Hz to 3.3 Hz	Reference Standards: Bench Top Multimeter LN2K-LB-BMM-114 Advance modular calibrator LN2K-LA-AMC-112 Unit Under Calibration: Insulation Tester Variable Supply Multifunction Process Calibrator

19-11-2024
Date

Sd _____
Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
---	-----------------------------------	---

			Earth Tester <u>Method Used:</u> LINKS/STM010
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Scope of Calibration for Onsite

Field of measurement: PRESSURE METROLOGY			
Measured quantity	Range	*Expanded Uncertainty (±)	Technique, Reference Standard, Equipment
Pneumatic Pressure	-0.6 bar to 20 bar	0.041 bar to 0.045 bar	<u>Reference Standards:</u> Pneumatic Pressure Calibrator LN2K-LA-PPC-115 <u>Unit Under Calibration:</u> Pneumatic Pressure Gauges Vacuum Gauges Compound Gauges <u>Method Used:</u> LINKS/STM001
Hydraulic Pressure	1 bar to 50 bar	0.061 bar to 0.25 bar	<u>Reference Standards:</u> Hydraulic Handheld Pressure Calibrator LN2K-LA-PC-87 <u>Unit Under Calibration:</u> Hydraulic Pressure Gauges and Transducer, Pressure Indicators <u>Method Used:</u> LINKS/STM001
	51 bar to 100 bar	0.25 bar to 0.38 bar	
	101 bar to 200 bar	0.38 bar to 0.44 bar	
Pneumatic Pressure	0.1 inchH ₂ O to 40 inchH ₂ O	0.010 inchH ₂ O to 0.013 inchH ₂ O	<u>Reference Standards:</u> Digital Manometer (Testo, 510) with pneumatic pump LN2K-LB-DM-13 <u>Unit Under Calibration:</u> Manometers, & Magnehelic Gauges <u>Method Used:</u> LINKS/STM001

19-11-2024
Date

Sd _____
Director



ACCREDITATION DOCUMENT

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 264

Measuring Parameter: THERMAL METROLOGY

Temperature (Measure)	-20 °C to 50 °C	0.15 °C to 0.21 °C	Reference Standards: Dry Block Calibrator (MTC-650A) LN2K-LA-TDB-124 Dry Block Calibrator (CTC-140A) LN2K-LA-TDB-125 Digital Readout Thermometer (MS7220) LN2K-LA-TC-36 K-type Thermocouple LN2K-LA-TC-130 Unit Under Calibration: Dial Temperature Gauges Method Used: LINKS/STM002
	51 °C to 140 °C	0.23 °C to 0.30 °C	
	141 °C to 600 °C	0.33 °C to 0.40 °C	
Temperature (Measure)	-20 °C ~ 50 °C	0.12 °C to 0.21 °C	Reference Standards: Dry Block Calibrator (MTC-650A) LN2K-LA-TDB-124 Dry Block Calibrator (CTC-140A) LN2K-LA-TDB-125 Digital Readout Thermometer (MS7220) LN2K-LA-TC-36 K-type Thermocouple LN2K-LA-TC-130 Unit Under Calibration: Digital Temperature Indicator With Sensor K-Type Thermocouple Method Used: LINKS/STM025
	51 °C to 140 °C	0.25 °C to 0.30 °C	
	141 °C ~ 600 °C	0.33 °C to 0.40 °C	
Temperature (Source)	-20 °C to 50 °C	0.12 °C to 0.21 °C	Reference Standards: Dry Block Calibrator (MTC-650A) LN2K-LA-TDB-124 Dry Block Calibrator (CTC-140A) LN2K-LA-TDB-125 Digital Readout Thermometer (MS7220) LN2K-LA-TC-36 K-type Thermocouple LN2K-LA-TC-130 Unit Under Calibration: Temperature Block Calibrators Method Used: LINKS/STM013
	51 °C to 100 °C	0.25 °C to 0.30 °C	
	101 °C to 600 °C	0.33 °C to 0.45 °C	

19-11-2024
Date

Sd

Director

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 264
---	-----------------------------------	---

Measuring Parameter: MASS METROLOGY			
Balance / Weighing Machine	0.010 g to 200 g	0.000058 g to 0.000098 g	Reference Standards: F1 Class Masses Set LN2K-LB-DWS-69 F1 Class Masses Set LN2K-LB-DW-74 F1 Class Masses Set LN2K-LB-WB-75 F2 Class masses up to 200 Kg Unit Under Calibration: Analytical balances Top Loading Balances Weighing Machines Method Used: LINKS/STM005
	201 g to 1100 g	0.00058 g to 0.0090 g	
	1101 g to 3200 g	0.0057 g to 0.014 g	
	3201 g ~ 35000 g	0.037 g to 0.059 g	
	10 kg ~ 50 kg	0.00013 kg to 0.00037 kg	
	10 kg ~ 100 kg	0.00013 kg to 0.00060 kg	
	10 kg ~ 200 kg	0.00013 kg to 0.0012 kg	
Measuring Parameter: CHEMICAL METROLOGY			
pH Measurement	4 pH to 10 pH	0.015 pH to 0.020 pH	Reference Standards: NIST Traceable pH Buffers Unit Under Calibration: pH Meters Method Used: LINKS/STM012

* **Expanded Uncertainty:**

- Expanded Uncertainty is the measurement uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. This measurement uncertainty is a value for which the laboratory has been accredited using the procedure that was the subject of assessment. In certificates issued under its accreditation scope an accredited laboratory is not permitted to quote an uncertainty that is smaller than the published uncertainty for respective ranges as given above.

19-11-2024
Date

Sd _____
Director