PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

Trench Limited, Instrument Transformers Division

1865 Clements Road, Pickering, ON L1W 3R8

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2017

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Electrical and Thermodynamic

(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President

Perry Johnson Laboratory Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
July 03, 2022	July 03, 2022	July 30, 2024

Accreditation No.:	*Certificate No.:*
115028	L22-474

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjlabs.com

Certificate of Accreditation: Supplement

Trench Limited, Instrument Transformers Division

1865 Clements Road, Pickering, ON L1W 3R8
Contact Name: Mr.Sergei Kuznetsov Phone: 416-346-4787

Accreditation is granted to the facility to perform the following testing:

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	RANGE (WHERE APPROPRIATE) AND DETECTION LIMIT
Electrical[F]	Power VT	Load losses and impedance Measurements	IEC/IEEE 63253-5713-8 IEEE C57.12.90	Up to 100%
		No load losses and excitation Characteristics	IEC/IEEE 63253-5713-8 IEEE C57.12.90	
	Power VT, CT, VT, Combined IT	Endurance chopped wave test	IEC/IEEE 63253-5713-8 IEEE C57.13.5 IEC 61869-1	200 kV to 2 400 kV
		Transmitted overvoltage test	IEC/IEEE 63253-5713-8 IEEE C57.13.5 IEC 61869	
	CVTs, VTs, CTs and CTPTs	Measurement of capacitance (pF) and power factor measurement (PF)	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -3, -4, -5 CAN/CSA-C61869-1, -2, -3, -4 -5	5 pF to 300 000 (pF) 0.001% to 9% (PF)
	CVTs, VTs, CTs and CTPTs	Power Frequency Voltage Withstand Test (kV) (Dry conditions)	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -3, -4, -5 CAN/CSA-C61869-1, -2, -3, -4 -5	@1 kV to 1 000 kV And dry conditions
		Power Frequency Voltage Withstand Test (kV) (wet conditions)		@1 kV to 1 000 kVunder wet precipitation rate of up to 4 mm per minute
		Impulse Voltage Withstand Test (kV peak)	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -3, -4, -5 CAN/CSA-C61869-1, -2, -3, -4 -5	10 kV peak to 2 400 kV Peak
	CTs and CTPTs	Current Transformer ratio accuracy Test (% current error and Phase error	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -4, CAN/CSA-C61869-1, -2, -4	Current errors from -0.15% to +0.15% and phase error -8 minutes to +8 minutes, To -6% to +6% Current error and phase error to -240 minute to +240 Minutes
	CVTs, VTs, CTs and CTPTs	DC resistance Measurement of Current and Voltage Transformers	IEC 60564	0.001 Ohms to 100 k- Ohms

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Electrical[F]	CVTs, VTs, CTs and CTPTs	DC Insulation Resistance Test (Megger test)	IEEE 43-2013	500 Ohms to 200G. Ohms at DC voltages of 500 V to 5kV DC voltage
	CVTs	Transient response measurement of CVTs residual voltage	IEC 60060-1, -2, -3 Where Applicable IEC 61869-1, -5 CAN/CSA-C61869-1, -5	+10V to -10V residual voltage
		Waveform recording and Ferro-resonance suppression performance voltage measurement	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -5 CAN/CSA-C61869-1, -5	< 250 Vrms AC
	CTs and CTPTs	Transformer Excitation AC current measurement	IEEE C57.13-5 IEC 61869-2	@ < 5 kV AC, & < 10A Amps AC
	CVTs, VTs, CTs and CTPTs	Induced voltage tests test at Frequency of 150 Hz to 400 Hz	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -3, -4, -5 CAN/CSA-C61869-1, -2, -3, -4, -5	1 kV AC to 1 000 kV AC
	CVTs	Harmonic measurement tests	IEC 60060-4, 1977	50 Hz to 6 000 Hz
	CVTs, VTs, CTs and CTPTs	Radio Interference Voltage measurement in narrow frequency band of 830 kHz	ANSI/NEMA CC1 Annex	5 Microvolts to 5 000 Microvolts when Transformer energized to voltage in the range of 5kV < to 1 000 kV @ 50 Hz or 60 Hz
	Line Tuners and CVTs	Insertion Loss and Return Loss	IEEE C93.4	Frequency range 1 kHz to 1 000 kHz
		High Frequency resistance and Impedance measurements		Frequency range 1 kHz to 1 000 kHz Impedance from 1milli-ohm to 500 ohms
	High Voltage Test Fields CVTs, VTs and CTs	Calibration of High Voltage AC and Impulse Voltage dividers	IEEE-4-2013 IEC 60060	Voltage Range 1kV to 2 400 kV

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Thermodynamic[F]	CVTs, VTs, CTs and CTPTs	Measurement of Atmospheric condition, temperature %RH and Barometric pressure	N/A	Measurement range shall be that representative of normal indoor & industrial ambient conditions
		Temperature, rise test	IEC 60060-1, -2, -3 Where applicable IEC 61869-1, -2, -3, -4, -5 CAN/CSA-C61869-1, -2, -3, -4, -5	Temperature range -60 °C to 120 °C

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location. Example: Outside Micrometer[F] would mean that the laboratory performs this testing at its fixed location.