



INTERNATIONAL  
ACCREDITATION  
SERVICE®

# CERTIFICATE OF ACCREDITATION

*This is to attest*

## **TRANSCAAL ENGINEERS INDIA PRIVATE LIMITED.**

NO.116, 3RD FLOOR, 11TH CROSS, MARGOSA ROAD (3RD MAIN), MALLESWARAM,  
BANGALORE, KA 560003, INDIA

### **Calibration Laboratory CL-267**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date January 21, 2025



*International Accreditation Service*  
Issued under the authority of IAS management

Visit [www.iasonline.org](http://www.iasonline.org) for current accreditation information.

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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## TRANSCAAL ENGINEERS INDIA PRIVATE LIMITED.

[www.tepl.info](http://www.tepl.info)

**Contact Name** Hidayat Rasool M Bijapur

**Contact Phone** +91-8095111996

**Accredited to** ISO/IEC 17025:2017

**Effective Date** January 21, 2025

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED <sup>3</sup>	RANGE	UNCERTAINTY <sup>1,2</sup> (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Biomedical			
Electrical Safety Test <sup>4</sup>			
AC Voltage (50 Hz)	90 V <sub>rms</sub> to 264 V <sub>rms</sub>	2.4 %	Calibration procedure TEPL-CAL- ESA-01. Using Electrical safety analyzer IEC 62353:2014 / IEC 60601-1:2018 by direct Method
Earth Resistance	0.01 Ω to 2 Ω	3.2 %	
Equipment AC Current (50 Hz)	0.01 A to 20 A	7.0 %	
Leakage Current	2 μA to 10 mA	1.5 %	
Equipment Leakage Current	2 μA to 500 μA	1.5 %	
Applied Part Leakage Current	2 μA to 5000 μA	1.5 %	
Insulation Resistance	0.5 MΩ to 20 MΩ 20 MΩ to 100 MΩ	3.6 % 9.2 %	
Anesthesia Machine			
Inspiratory, Expiratory Time	0.25 s to 9.99 s	3.2 %	Calibration procedure TEPL-CAL-ANS-01. Using gas flow analyzer by direct method
Oxygen Percentage	21 % to 100 %	2.3 %	
PEEP	1 cmH <sub>2</sub> O to 40 cmH <sub>2</sub> O	3.5 %	
Pressure Accuracy (PIP)	1 cmH <sub>2</sub> O to 120 cmH <sub>2</sub> O	3.5 %	
Respiration Rate	2 brpm to 150 brpm	2.0 %	
Volume	5 mL to 1000 mL	3.6 %	
BiPAP			
EPAP in cmH <sub>2</sub> O	1 cmH <sub>2</sub> O to 120 cmH <sub>2</sub> O	3.4 %	Calibration procedure TEPL-CAL-BiPAP-01. Using gas flow analyzer by direct method
IPAP in cmH <sub>2</sub> O	1 cmH <sub>2</sub> O to 120 cmH <sub>2</sub> O	3.4 %	
Respiration Rate	2 brpm to 150 brpm	2.0 %	
Inspiratory Time (Ti)	0.25 s to 9.99 s	3.2 %	

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

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Boyles Apparatus			
Flow Rate	1 lpm to 15 lpm	2.5 %	Calibration procedure TEPL-CAL-BOYL-01. Using Gas Flow analyzer by direct method
Oxygen Percentage	21 % to 100 %	2.3 %	
Blood Pressure (BP) Apparatus (Sphygmomanometer / Digital BP Apparatus)			
Heart Rate accuracy	30 bpm to 320 bpm	2.2 %	Calibration procedure TEPL-CAL-BP-01 and TEPL-CAL-DBP-01. Using Vital sign simulator by Direct Method
Pressure (Dynamic)	25 mmHg to 300 mmHg	4.0 %	
Pressure (Static)	25 mmHg to 300 mmHg	1.0 %	
CPAP			
Positive pressure	1 cmH <sub>2</sub> O to 150 cmH <sub>2</sub> O	3.4 %	Calibration procedure TEPL-CAL-CPAP-01. Using gas flow analyzer by direct method
Defibrillator			
Heart Rate	10 bpm to 300 bpm	2.2 %	Calibration procedure TEPL-CAL-DEF-01. Using Defibrillator Analyzer, Vital sign simulator by direct method
Pacer Rate	5 ppm to 800 ppm	2.7 %	
NIBP	25 mmHg to 300 mmHg	4.0 %	
O <sub>2</sub> Saturation (Spo <sub>2</sub> )	70 % to 100 %	3.6 %	
O <sub>2</sub> Saturation (Spo <sub>2</sub> ), Heart	30 bpm to 240 bpm	2.2 %	
Output Accuracy (Energy)	1 J to 360 J	3.0 %	
Pacer Amplitude	2 mA to 25 mA	2.8 %	
Dialysis Machine			
Dialysate Conductivity	13 mS/cm to 15 mS/cm	0.21 mS/cm	Calibration procedure TEPL-CAL-DIA-01. Using Dialysis Meter by direct method
Flow Rate	10 mL/min to 800 mL/min	3.5 %	
NIBP	25 mmHg to 300 mmHg	4.0 %	
pH Value	6.5 pH to 7.5 pH	0.2 pH	
Temperature	1 °C to 100 °C	0.06 °C	
ECG			
Amplitude	0.5 mV to 5 mV	2.6 %	Calibration procedure TEPL-CAL-ECG-01. Using Vital sign simulator & Defibrillator Analyzer by direct method
Heart rate	30 bpm to 320 bpm	2.2 %	
Electro Surgical Unit/ Diathermy Machine/ Cautery Machine			
Output Power	1 W to 400 W	7.3 %	Calibration procedure TEPL-CAL-ESU-01.

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			Using ESU Analyzer by Direct method
Electronic Tourniquet			
Cuff Pressure	20 mm Hg to 600 mm Hg	1.2 %	Calibration procedure TEPL-CAL-TOUR-01. Using Gas Flow analyzer, Stopwatch by direct Method
Timer	5 min to 1 h	4 s	
	1 h to 2 h	8 s	
	2 h to 4 h	17 s	
Enteral Feeding Pump			
Flow Rate	1 mL/h to 600 mL/h	2.3 %	Calibration procedure TEPL-CAL-FP-01. Using Infusion Device Analyzer by direct method
Occlusion	50 mmHg to 2300 mmHg	1.6 %	
Volume	1 mL to 999 mL	2.3 %	
External Pacemaker			
Pacer Rate	5 bpm to 800 bpm	2.7 %	Calibration procedure TEPL-CAL-PAC-01. Using Defibrillator Analyzer by direct method
Amplitude	2 mA to 25 mA	2.8 %	
Fetal Doppler			
Fetal Heart Rate	30 bpm to 240 bpm	0.4 %	Calibration procedure TEPL-CAL-FD-01 Using Fetal Simulator by direct method
Fetal Monitor			
Maternal Heart Rate	60 bpm to 160 bpm	0.4 %	Calibration procedure TEPL-CAL-FM-01. Using Fetal simulator by direct Method
Fetal Heart Rate	30 bpm to 240 bpm	0.4 %	
Oxygen Flow Meter			
Flow Rate	2.5 L/min to 25 L/min	2.5 %	Calibration procedure TEPL-CAL-FLM-01. Using Gas Flow analyzer by Direct Method
Heart Lung Machine			
Oxygen Percentage	21 % to 100 %	2.3 %	Calibration procedure TEPL-CAL-HLM-01 Using Gas flow analyzer by direct Method.
Humidifier			
Temperature	33 °C and 37 °C	0.6 °C	Calibration procedure TEPL-CAL-HF-01 Using Temperature sensor with logger by Direct

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			Method.
Incubator			
Air Flow	0.2 m/s to 2 m/s	5.8 %	Calibration procedure TEPL-CAL-INC0-01. Using Incubator Analyzer by direct method
Air Temperature	5 °C to 50 °C	0.06 °C	
Noise level	30 dB to 100 dB	5.8 %	
Relative Humidity	10 %RH to 95 %RH	4 %RH	
Skin Temperature	5 °C to 50 °C	0.06 °C	
Surface Temperature	5 °C to 50 °C	0.06 °C	
Infusion Pump			
Flow	5 mL/h to 1000 mL/h	2.3 %	Calibration procedure TEPL-CAL-IP-01 Using Infusion Device Ana- lyzer by direct method
Occlusion	50 mmHg to 2300 mmHg	1.6 %	
Volume	1 mL to 1000 mL	2.3 %	
Nebulizer			
Flow	2.5 L/min to 25 L/min	2.5 %	Calibration procedure TEPL-CAL-NEB-01. Using Gas Flow Analyzer by direct method
OT Light			
Light Intensity measurement	1000 lx to 200000 lx	4.9 %	Calibration procedure TEPL-CAL-LUX-01. Using Illuminance Meter by direct Method.
Oxygen Concentrator			
Flow	1 L/min to 15 L/min	2.5 %	Calibration procedure TEPL-CAL-OXCO-01. Using Gas Flow Analyzer by direct Method
Oxygen Percentage	21 % to 100 %	2.3 %	
Patient Monitors			
Heart rate (Spo2 Pulse Rate)	30 bpm to 240 bpm	1.3 %	Calibration procedure TEPL-CAL-MPM-01.  Using Vital sign simulator, SPO2 functional tester by direct method
Heart rate	30 bpm to 320 bpm	2.6 %	
Invasive Blood Pressure Accuracy	35/15 mmHg to 200/150 mmHg	1.9 %	
NIBP Leakage Check	1 mmHg/min to 15 mmHg/min	5 %	
NIBP Pressure Relief Check	1 mmHg to 330 mmHg	4.1 %	
NIBP	1 mmHg to 300 mmHg	4 %	
Respiration rate	15 bpm to 150 bpm	5.8 %	

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SPO2	70 % to 100 %	3.6 %	
Patient Warmer			
Temperature	32 °C to 43 °C	0.6 °C	Calibration procedure TEPL-CAL-PW-01. Using Temperature sensor with logger by Direct method
Phototherapy Unit			
Irradiance	5 µW/cm <sup>2</sup> /nm to 100 µW/cm <sup>2</sup> /nm	7.1 %	Calibration procedure TEPL-CAL-PT-01. Using Flux meter by Direct Method.
Pulse Oximeter			
Pulse Oximeter Heart Rate	30 bpm to 240 bpm	2.2 %	Calibration procedure TEPL-CAL-POX-01. Using SPO2 functional tester by Direct Method
SPO2 Accuracy (Pulse Oximeter)	70 % to 100 %	3.6 %	
Radiant Warmer			
Temperature	21 °C to 50 °C	0.6 °C	Calibration procedure TEPL-CAL-RW-01. Using Temperature sensor with logger by direct method.
Suction Pump			
Vacuum	-10 mm Hg to -600 mm Hg	2.5 %	Calibration procedure TEPL-CAL-SUM-01. Using Gas Flow analyzer by direct method.
Syringe Pump			
Flow Rate	5 mL/h to 1000 mL/h	2.3 %	Calibration procedure TEPL-CAL-SP-01. Using Infusion Device Ana- lyzer by direct method
Occlusion	50 mmHg to 2300 mmHg	1.6 %	
Volume	1 mL to 60 mL	2.3 %	
Ventilator			
Inspiratory, Expiratory Time	0.25 s to 9.99 s	3.2 %	Calibration procedure TEPL-CAL-VENT-01. Using Gas Flow analyzer by Direct Method
Oxygen Percentage	21 % to 100 %	2.3 %	
Peep	1 cmH <sub>2</sub> O to 40 cmH <sub>2</sub> O	3.5 %	
Pressure (PIP)	1 cmH <sub>2</sub> O to 120 cmH <sub>2</sub> O	3.5 %	
Respiration Rate	2 brpm to 150 brpm	2.0 %	
Volume	5 mL to 1000 mL	3.6 %	

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<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

<sup>3</sup>Capability is suitable for the calibration of measuring devices in the stated ranges.

<sup>4</sup>Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

bpm = beats per minute  
brpm = breaths per minute  
ppm = pulse per minute

