Republic of Turkey
Ministry of Agriculture and Forestry
Turkish State Meteorological Service

CALIBRATION CENTER

Calibration Center of Turkish State Meteorological Service (TSMS) was modernized in 2009 and began to serve for the calibrations of Temperature, Relative Humidity, Pressure, Wind Speed, Rainfall Amount and Intensity and Global Radiation sensors.

The Calibration Center was accredited by Turkish Accreditation Agency on 30th of April 2010 to ensure the reliability of the measurements of TSMS and to make the quality of these measurements valid around the world.

Temperature, Relative Humidity, Pressure, Wind Speed Calibration Laboratories are accredited with TS EN ISO/IEC 17025 Standards and work in accordance with this standard.

Rainfall Amount and Intensity, Global Radiation, Wind Direction and Electrical Laboratories also work in accordance with TS EN ISO/IEC 17025 Standards and use reference devices traceable to national standards.

ACCREDITED CALIBRATION LABORATORIES

TEMPERATURE CALIBRATION LABORATORY
RELATIVE HUMIDITY CALIBRATION LABORATORY
PRESSURE CALIBRATION LABORATORY
WIND SPEED (ANEMOMETER) CALIBRATION LABORATORY

CALIBRATION LABORATORIES TRACEABLE TO NATIONAL STANDARDS

RAINFALL AMOUNT AND INTENSITY CALIBRATION LABORATORY
GLOBAL RADIATION (PYRONAMETER) CELIBRATION LABORATORY
ELECTRICAL CALIBRATION LABORATORY
WIND DIRECTION CALIBRATION LABORATORY

FIRST ACCREDITED WIND SPEED (ANEMOMETER) LABORATORY OF TURKEY

Wind speed laboratory of the Calibration Center is the first accredited laboratory in its measurement field across the country.

Global radiation, rainfall amount and intensity calibration laboratories are one and only laboratories across the country.

The Calibration Center, combined its professional experience and high technology, serves for national or international institutions. We can offer services in our scope not only to TSMS but also to all the customers nationwide or worldwide.

Along with calibration services, the Calibration Center also offers consultancy and training activities related with TS EN ISO/IEC 17025 Standards and its field of calibrations.

TSMS periodically organized and hosted an international training “International Training on the Basics of Calibration), is supported by WMO. All lectures were given by the experts of the Calibration Center.

International Calibration Course (2018)

International Calibration Course (2017)

International Calibration Course (2011)

International Calibration Course (2013)

International Calibration Course (2016)

PRESSURE CALIBRATION LABORATORY

In the pressure calibration laboratory, pressure sensors are calibrated in the range of 750 – 1050 mb.

Pressure chamber and calibrator are used in calibration processes.

The calibration is based on comparison method.




TEMPERATURE CALIBRATION LABORATORY

Electronic sensors with analog output, liquid in glass thermometers and thermometers with display are calibrated in range from -40 °C to +50 °C and comparison method is applied.

Liquid calibration baths and climatic chamber are used to achieve desired temperature conditions (temperature calibration points).

Standard Platinum Resistance Thermometers are used as main reference of the laboratory. Laboratory can also make calibration at the triple point of water as the highest level of standard for temperature and at the melting point of water as a second level standard.

HUMIDITY CALIBRATION LABORATORY

Electronic hygrometers with analog output, hygrometers with display are calibrated in the range from %10 to %95 relative humidity.

Humidity generator and climatic chamber are used to achieve desired relative humidity conditions (relative humidity calibration points).

Humidity generator and hygrometer with digital display are used as reference standards with comparison method.

WIND SPEED (ANEMOMETER) CALIBRATION LABORATORY

In the closed loop and open test area wind tunnel, we are able to make calibrations of electronic and mechanical anemometers (ultrasonic, cup and wane anemometers, pitot tubes with micromanometer and hotwires) in the range of 1.0 m/s – 35 m/s.

Pitot tube with micromanometer is used as reference standard with comparison method.

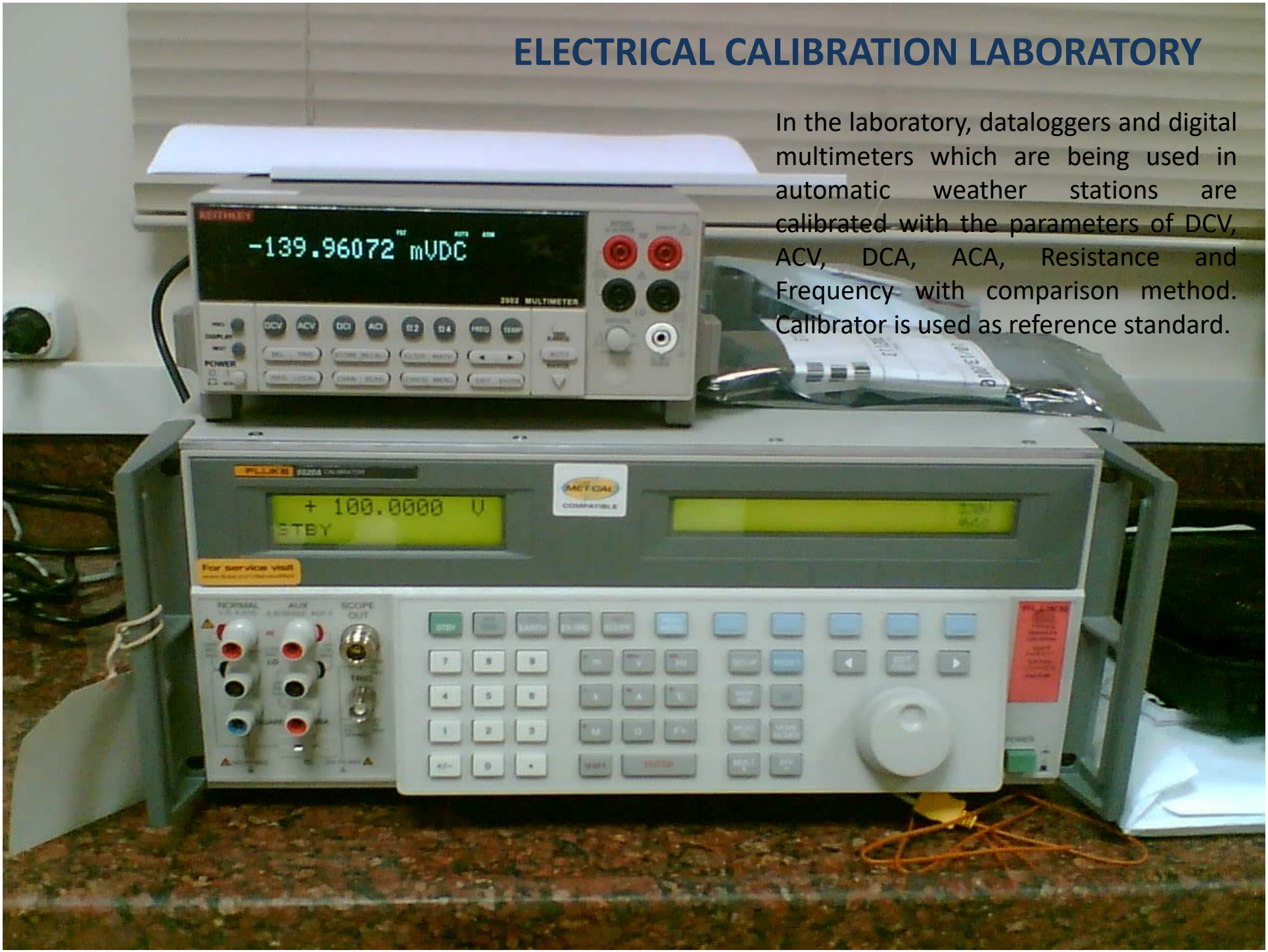
GLOBAL RADIATION (PYRANOMETER) CALIBRATION LABORATORY

Pyranometers are calibrated by using CFR calibration system under constant light source of halogen lamb with 0-700 Watt/m2 light intensity and comparison method is applied.

RAINFALL AMOUNT AND INTENSITY CALIBRATION LABORATORY

Tipping bucket and weighing rain gauges are calibrated in the range of 10-300 mm/s rain intensities simulated by using peristaltic pump. Electronic balance is the reference standard with comparison method.

ELECTRICAL CALIBRATION LABORATORY



In the laboratory, dataloggers and digital multimeters which are being used in automatic weather stations are calibrated with the parameters of DCV, ACV, DCA, ACA, Resistance and Frequency with comparison method. Calibrator is used as reference standard.

WIND DIRECTION CALIBRATION LABORATORY

Wind direction measuring instruments are calibrated at this laboratory within the 0° and 360° measuring range.

Electronic digital Theodolite is used as reference standard with comparison method

Laboratory environmental conditions of the Calibration Center are provided by precision air conditioners and measurement data for humidity and temperature are automatically recorded.

Laboratory	Temperature	Humidity
Temp/Hum	23 ±2°C	%45 ±15
Rainfall and G. Radiation	23 ±2°C	%45 ±10
Pressure	23 ±1°C	%45 ±10
Electrical	23 ±3°C	%45 ±15
Wind Speed and Direction	23 ±10°C	%50 ±30

CALIBRATION CENTER OF

ECONOMIC COOPERATION ORGANISATION

TSMS Calibration Center succeeded to be the Calibration Center of Economic Cooperation Organization

Calibration Center will provide calibration, training and consultancy services for the members of the organization.

TURKISH ACCREDITATION AGENCY

ACCREDITATION CERTIFICATE

As a Calibration Laboratory,

METEOROLOJİ GENEL MÜDÜRLÜĞÜ Kalibrasyon Merkezi

Kütükçü Ali Bey Cad. No:4 Kalaba 06120 ANKARA / TURKEY

is accredited in accordance with TS EN ISO/IEC 17025:2012 standard within the scope given in Annex following the assessment conducted by **TURKAK**.

Accreditation Number : **AB-0072-K**

Accreditation Date : **30 April 2010**

Revision Date / Number : **07 November 2018 / 07**

This certificate shall remain in force until **06 November 2022**, subject to continuing compliance with the standard **TS EN ISO/IEC 17025:2012**, related regulations and requirements.

TÜRK AKREDİTASYON KURUMU TÜRKAK * 1999 *

Orbay EVRENSEVDİ
Deputy Secretary General

Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Agreement (MRA) in the scope of ISO/IEC 17025.

Annex of the certificate (Page 1/2)
Accreditation Scope

METEOROLOJİ GENEL MÜDÜRLÜĞÜ Kalibrasyon Merkezi

Accreditation Nr: AB-0072-K
Revision Nr: 07 Date: 18.12.2018

As a Calibration Laboratory

Address :
Kütükçü Ali Bey Cad. No:4 Kalaba 06120
ANKARA/TÜRKİYE

Phone : 0 312 302 21 56
Fax : 0 312 361 23 56
E-mail : kalibrasyon@mgm.gov.tr
Website : www.mgm.gov.tr

Measured Quantity Instrument or Gauge	Range	Measurement Conditions	Calibration and Measurement Capability Expanded Uncertainty (k=2) (±)	Explanations
PRESSURE **Absolute Pressure Pneumatic** Barometers	750 hPa ≤ *p* ≤ 1050 hPa	Reference Standard Equipment: Pressure Chamber Pressure Calibrator	0,12 hPa 0,08 hPa	*p*: *Abs.* Pressure, hPa Calibration procedure prepared accordance with Guides DKD-R 6-1, Euramet cg-17 and OIML R 97.
TEMPERATURE Resistance Thermometers	Triple Point of Water Cell 0.01 °C	Calibration in the TPW Cell	8 m°C	Calibration in the fixed point
Resistance Thermometers	-40 °C ≤ *T* ≤ +50 °C	In fluid calibration bath	0,04 °C	*T*: Temperature, °C Comparison Method
Resistance Thermometers	-40 °C ≤ *T* ≤ +50 °C	In climate chamber	0,13 °C	*T*: Temperature, °C Comparison Method
Fully Immerged Liquid in Glass Thermometers	-40 °C ≤ *T* ≤ +50 °C	In fluid calibration bath	0,06 °C	*T*: Temperature, °C Comparison Method
Calibration of temperature indicators with probes	-40 °C ≤ *T* ≤ +50 °C	In fluid calibration bath	0,05 °C	*T*: Temperature, °C Comparison Method
Calibration of temperature indicators with probes	-40 °C ≤ *T* ≤ +50 °C	In climate chamber	0,13 °C	*T*: Temperature, °C Comparison Method
RELATIVE HUMIDITY Relative Humidity Measuring Instruments	10 %rh ≤ *RH* ≤ 80 %rh	In humidity generator (at the fixed temperature point of (23±1) °C)	1,2 % RH	*RH*: Relative Humidity, %rh Comparison Method
RELATIVE HUMIDITY Relative Humidity Measuring Instruments	81 % rh ≤ *RH* ≤ 95 % rh	In humidity generator (at the fixed temperature point of (23±1) °C)	2 % RH	*RH*: Relative Humidity, %rh Comparison Method

Annex of the certificate (Page 2/2)
Accreditation Scope

METEOROLOJİ GENEL MÜDÜRLÜĞÜ Kalibrasyon Merkezi

Accreditation Nr: AB-0072-K
Revision Nr: 07 Date: 18.12.2018

Measured Quantity Instrument or Gauge	Range	Measurement Conditions	Calibration and Measurement Capability Expanded Uncertainty (k=2) (±)	Explanations
RELATIVE HUMIDITY Relative Humidity Measuring Instruments	10 % rh ≤ *RH* ≤ 80 % rh	In climate chamber (at the fixed temperature point of (23±1) °C)	2,5 % RH	*RH*: Relative Humidity, %rh Comparison Method
FLUID FLOW - AIR VELOCITY Anemometers (Pitot tube, propeller, thermal, cups, ultrasonic anemometers, etc.)	1,0 m/s ≤ *v* < 3,0 m/s	Measurement reference: Micro-manometer attached pitot tube in wind tunnel Fluid: Air, at atmospheric conditions	3,0 %	*v* : Air speed, m/s Comparison Method
Anemometers (Pitot tube, propeller, thermal, cups, ultrasonic anemometers, etc.)	3,0 m/s ≤ v ≤ 35,0 m/s	Measurement reference: Micro-manometer attached pitot tube in wind tunnel Fluid: Air, at atmospheric conditions	2,0 %	v : Air speed, m/s Comparison Method

End of Scope

Orbay EVRENSEVDİ
Deputy Secretary General

METEOROLOGY SERVICE

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