ISO 8932-3:2026-05 (E)

Meteorology - Radiosonde - Part 3: Laboratory test method for solar radiation error of temperature sensor in radiosonde

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Symbols and subscripts 6
4.1 Symbols 6
4.2 Subscripts 6

5 Technical requirements for the laboratory setup 6
5.1 General 6
5.2 Open suction-type wind tunnel setup 6
5.2.1 General 6
5.2.2 Climate chamber 7
5.2.3 Dry air generator 9
5.2.4 Liquid bath 9
5.2.5 Test cell 9
5.2.6 Pressure gauges 9
5.2.7 Laser Doppler anemometry (LDA) 10
5.2.8 Solar simulator 10
5.2.9 Vacuum pump 10
5.2.10 Sonic nozzles 10
5.3 Closed-type wind tunnel setup 12
5.3.1 General 12
5.3.2 Climate chamber 12
5.3.3 Dry air generator 12
5.3.4 Liquid bath 12
5.3.5 Test cell 12
5.3.6 Pressure gauges 12
5.3.7 Laser Doppler or sonic anemometry 12
5.3.8 Solar simulator 12
5.3.9 Vacuum pump 12
5.3.10 Fan 12

6 Test preparation 13
6.1 Environmental conditions 13
6.2 Preparation of radiosondes 13
6.3 Examination of the laboratory setup 13
6.4 Operation of a solar simulator 13
6.5 Installation of radiosondes 14
6.6 Test conditions 15
6.6.1 General 15
6.6.2 Sensor boom tilt angle 15
6.6.3 Light illumination angle 15
6.6.4 Temperature 15
6.6.5 Pressure and air ventilation speed 16

6.6.6 Solar irradiance 16
6.7 Testing sequence 16
6.8 Data collection 16
6.9 Test finalization 17

7 Data processing 17
7.1 Determining radiation error from the raw temperature 17
7.2 Mathematical measurement model 18

8 Evaluation of measurement uncertainty 19

8.1 General 19
8.2 Equation for combined standard uncertainty 19
8.3 Calculation of expanded uncertainty 20

9 Method for reporting test results 20

Annex A (informative) Analytical functions of radiation error data set 21

Annex B (informative) Evaluation of uncertainty of environmental parameters 22

Annex C (informative) Application of radiation correction to radiosoundings 24

Bibliography 28