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Thermal Sensors

IEC 61724-1:2017

What is new in the 2017 version, a quick explanation

The 61724-1 standard for PV system performance monitoring has been revised. The new version, released February 2017, defines "accuracy classes". In conformity declarations, providers must state the accuracy class of the measurement. The class is not only determined by the hardware that is used, but also by quality checks and measurement procedures. The standard contains detailed specifications at monitoring system component level. This memo offers a general summary, and focuses on the choice of pyranometer. A separate memo offers comments on consequences of the new standard concerning the selection of pyranometers.

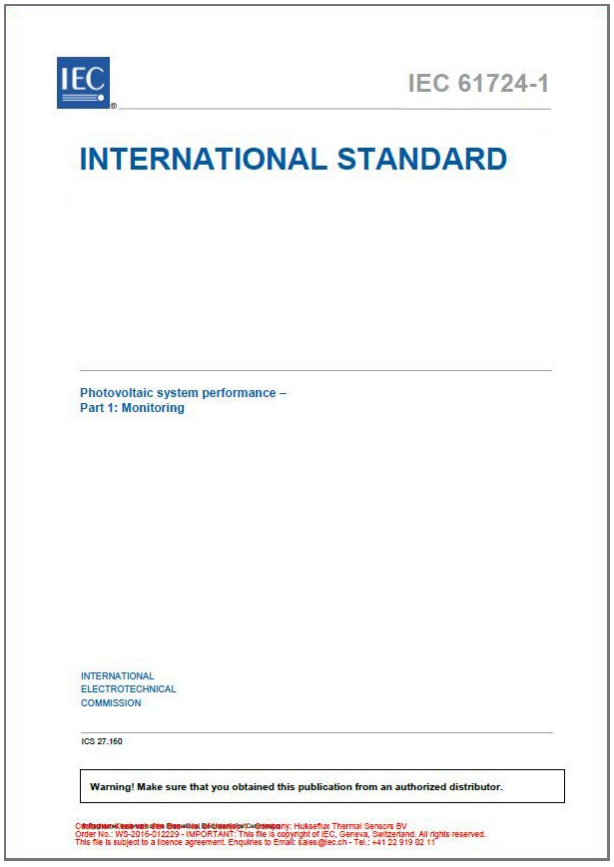

Figure 1 *Cover of the new IEC 61724-1 standard, published in February 2017*

Figure 2 *Two SR30 secondary standard pyranometers measuring GHI (global horizontal irradiance) and POA (plane of array) in a PV performance monitoring system*

Introduction

The first edition of IEC 61724-1: *Photovoltaic system performance monitoring – Guidelines for measurement, data exchange and analysis* –, dates from 2008. It now has been updated. The new 2017 version of the standard is fundamentally different from the 2008 version. The new scope not only defines the measuring system components and procedures (as in the 2008 version), but it also aims to keep measurement errors within specified limits. It does so by establishing accuracy classes for monitoring systems.

The new standard includes:

- 3 accuracy classes, A, B and C, for monitoring systems, to be used in conformity declarations
- accuracy requirements for monitoring equipment per class
- required quality checks (i.e. calibration and maintenance) per class
- recommended minimum number of instruments used as a function of the PV system scale

The 2017 version of the standard recognises that the solar irradiance measurement is one of the weakest links in the measurement chain. It specifies for each class of monitoring system the pyranometer class that must be used, including required instrument ventilation and heating, azimuth and tilt angle accuracy. It also defines cleaning and calibration intervals for pyranometers. The standard also defines requirements for measurement of module- and air temperature, wind speed and direction, soiling ratio, and (AC and DC) current and voltage. Table 1 on the following page offers an overview of the main elements of the IEC 61724-1 monitoring classification system.

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Table 1 *The main elements of the IEC 61724 -1 monitoring classification system*

	CLASS A	CLASS B	CLASS C
accuracy	high	medium	basic
purpose	utility scale PV systems	large commercial PV systems	small PV systems
irradiance and environmental measurement	specified sensor set specified number of sensors, also including wind, air and panel temperature soiling	specified sensor set specified number of sensors, optionally derived by other means	may be derived by other means such as satellite observation
electrical output measurement	specified array and system energy output measurements	specified system energy output measurements	system output power and energy measurement only
quality checks	calibration prior to use calibration schedule as recommended by manufacturer calibration for solar radiation sensors 1 x / yr annual system inspection	calibration prior to use calibration schedule as recommended by manufacturer calibration for solar radiation sensors 1 x / 2 yr annual system inspection	calibration prior to use calibration schedule as recommended by manufacturer

What is an accuracy class?

The concept of an accuracy class is defined by the *International Vocabulary of Metrology (VIM)*, paragraph 4.25, as “class of measuring instruments or measuring systems that meet stated metrological requirements that are intended to keep measurement errors or instrumental uncertainties within specified limits under specified operating conditions”.

Compliance with an accuracy class is sufficient to claim a certain measurement uncertainty by comparison to other systems of the same class according to the *Guide to Expression of Uncertainty in Measurement (GUM)*, type B evaluation of uncertainty, see also VIM paragraph 2.29.

Where can I order the standard?

The standard can be purchased from *the IEC Webshop*.

More about compliance of pyranometers with the new IEC classification

Hukseflux is specialised in solar radiation measurement. A separate memo offers comments on *consequences of the new standard concerning the selection of pyranometers*.

About Hukseflux

Hukseflux Thermal Sensors offers measurement solutions for the most challenging applications. We design and supply sensors as well as test & measuring systems, and offer related services such as calibration, engineering and consultancy. Hukseflux sensors, systems and services are offered worldwide via our office in Delft, the Netherlands and local distributors.

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