

4180 Series Precision Infrared Calibrators



- Fast, portable and easy to use
- Correct target size for most thermometers
- Calibration solutions from -15 °C to 500 °C (5 °F to 932 °F)
- Radiometrically calibrated for traceable and consistent results



Should your thermometer be calibrated by one of these?



Business decisions costing thousands of dollars are based on the results of your measurements, so they had better be right! It can be very expensive to shut down a line for repairs and maintenance, but it might be catastrophic if the shutdown is unplanned. To stand by your measurements with confidence, you should definitely have your thermometers calibrated.

Calibrate it right the first time with a traceable, uniform, correctly-sized target.

How to get consistent results:

Even those infrared thermometers that cannot be adjusted can benefit from a calibration that demonstrates the consistency and validity of your results. A trusted calibration means less worry, fewer questions and more time being productive. To get more reliable, traceable, and consistent results, buy a precision infrared calibrator from Fluke Calibration.

The 4180 Series of Precision Infrared Calibrators for infrared thermometers and thermal imagers is fast, accurate, and easy to use. It comes with an accredited calibration from one of the world’s most trusted temperature calibration laboratories, sample

calibration procedures for Fluke thermometers built right in and everything you need to get started making high-quality infrared thermometer calibrations. This is the perfect solution for any infrared thermometer or thermal imager within its temperature range.

The 4180 reaches temperatures from -15 °C to 120 °C and the 4181 has a temperature range from 35 °C to 500 °C. Check out the uniformity of the large 152.4 mm (six in) targets shown in the Fluke Ti30 photo. The uniformity and stability are so good that variations can’t be detected with a thermal imager. Uniformity is important in infrared temperature calibration work because an infrared

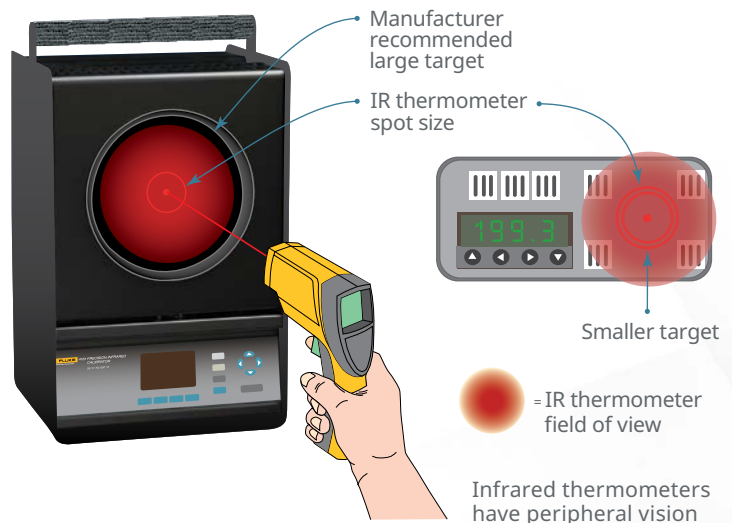
thermometer will “see” as much as the entire target when placed at the appropriate calibration distance and each pixel of a thermal imager registers a temperature that needs to be both accurate and consistent across the imager.

In addition, with accuracies as good as ± 0.35 °C, the 4180 Series can meet its specifications without additional emissivity-related corrections, leading to legitimate test uncertainty ratios (TUR) as good as 4:1. (See the sidebar below for information about common pitfalls in infrared calibrator accuracy and have a look at our Guide to Infrared Thermometer Calibration to get started quickly with your new calibrator.)

Common pitfalls in infrared thermometer calibration

- If the target size is too small, the thermometer will not read the right temperature. This problem, called size of source effect, is addressed by the large, 152.4 mm (six in) target of the 4180 series, which was designed to accommodate the field of view and calibration geometry requirements of certain common infrared thermometers used in the field, lab and process control.
- Some people are misled by the accuracy statements on IR calibrators because they are not familiar with the concept of emissivity. Look for calibrators with a “radiometric calibration” so that accuracy will be straightforward and uncomplicated by emissivity-related errors.

For more information on emissivity, size of source effect and radiometric calibration, see Fluke Calibration application note “Infrared Temperature Calibration 101” or choose a calibrator like the 4180 series that you know has already addressed all of these issues.



Specifications

FLUKE®

Calibration

Comparing the 4180 and the 4181

| Function | 4180 | 4181 |
|---|--|--|
| Temperature range (@ 23 °C ambient and 0.95 emissivity) | -15 °C to 120 °C | 35 °C to 500 °C |
| Display Accuracy(1) | ± 0.40 °C at -15 °C ± 0.40 °C at 0 °C ± 0.50 °C at 50 °C ± 0.50 °C at 100 °C ± 0.55 °C at 120 °C | ± 0.35 °C at 35 °C ± 0.50 °C at 100 °C ± 0.70 °C at 200 °C ± 1.20 °C at 350 °C ± 1.60 °C at 500 °C |
| Stability | ± 0.10 °C at -15 °C ± 0.05 °C at 0 °C ± 0.10 °C at 120 °C | ± 0.05 °C at 35 °C ± 0.20 °C at 200 °C ± 0.40 °C at 500 °C |
| Uniformity (5.0 in dia of center of target)(2) | ± 0.15 °C at -15 °C ± 0.10 °C at 0 °C ± 0.25 °C at 120 °C | ± 0.10 °C at 35 °C ± 0.50 °C at 200 °C ± 1.00 °C at 500 °C |
| Uniformity (2.0 in dia of center of target)(2) | ± 0.10 °C at -15 °C ± 0.10 °C at 0 °C ± 0.20 °C at 120 °C | ± 0.10 °C at 35 °C ± 0.25 °C at 250 °C ± 0.50 °C at 500 °C |
| Heating time | 15 min: -15 °C to 120 °C 14 min: 23 °C to 120 °C | 45 min: 35 °C to 500 °C |
| Cooling time | 15 min: 120 °C to 23 °C 20 min: 23 °C to -15 °C | 100 min: 500 °C to 35 °C 40 min: 500 °C to 100 °C |
| Thermometer emissivity compensation | 10 minutes | 10 minutes |
| Nominal target emissivity(3) | 0.95 | 0.95 |
| Capacitance | 0.9 to 1.0 | |
| Target Diameter | 152.4 mm (6 inches) | |
| Computer interface | RS-232 | |
| Power | 115 V ac (±10 %), 6.3 A, 50/60 Hz, 630 W 230 V ac (±10 %), 3.15 A, 50/60 Hz, 630 W | 115 V ac (±10 %), 10 A, 50/60 Hz, 1000 W 230 V ac (±10 %), 5 A, 50/60 Hz, 1000 W |
| Fuse(s) | 115 V ac 6.3 A, 250 V, slow blow 230 V ac 3.15 A, 250 V, T | 115 V ac 10 A, 250 V, fast blow 230 V ac 5 A, 250 V, F |
| Size (HxWxD) | 356 mm x 241 mm x 216 mm (14 in x 9.5 in x 8.5 in) | 356 mm x 241 mm x 216 mm (14 in x 9.5 in x 8.5 in) |
| Weight | 9.1 kg (20 lb) | 9.5 kg (21 lb) |
| Safety | EN 61010-1:2001, CAN/CSA C22.2 No. 61010.1-04 | |

Ordering information

Model

4180 Precision Infrared Calibrator, -15 °C to 120 °C

4181 Precision Infrared Calibrator, 35 °C to 500 °C

4180-CASE Carrying Case, 4180, 4181

4180-DCAS Carrying Case with wheels, 4180, 4181

Included accessories

- Accredited radiometric calibration report
- Target cover
- User Guide
- Getting Started Guide
- 9930 Interface-it software with User Guide

(1) For 8 um to 14 um spectral band thermometers with emissivity set between 0.9 and 1.0

(2) The uniformity specification refers to how IR thermometers with different spot sizes both focused at the center of the target will measure the same temperature.

(3) The target has a nominal emissivity of 0.95, however it is radiometrically calibrated to minimize emissivity related uncertainties.

Want to learn more?

Call your Fluke Calibration sales representative to request information or a price quote.

Call now

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Printed in U.S.A. 05/2021 3081955C 210427-en