

FEATURES

- NIST traceable calibration
- Accurate to $\pm 0.8\%$ of value
- Fast and easy to use
- No other equipment required
- Unique Patented Thornton Technology

APPLICATIONS

With the advent of Total Quality Management (TQM) and ISO 9000 programs, there is a growing need for accurate and convenient equipment to verify and calibrate process control instrumentation on a routine basis. In response to this requirement, Thornton has developed a unique patented calibration system for use with the 770PC Instrument/transmitter.

The Thornton Smart Calibrator™ set consists of two calibrators; one for resistance and temperature measurements and the other for millivolt measurements. Each calibrator contains a circuit that develops precise values, certified within $\pm 0.8\%$, of the reading, traceable to NIST. The calibration value of each parameter is stated on the label of each calibrator and is valid for one year. These values can be verified at established time intervals by a user with access to adequate test instrumentation, or, sent to Thornton for recertification.

SMART CALIBRATORS IN USE

The procedure for performing a quality management calibration on an installed 700PC and in-line sensors is as follows:

- One of the two process sensors is disconnected from the Smart connector/patch cable junction, located 5 feet from the sensor.
- One of the Smart Calibrators is attached to the open patch cable, in place of the sensor.
- The 770PC instantly recognizes the calibrator and automatically reconfigures the instrument to be in the calibration mode, verifying the instrument's functionality. The 700PC also displays its measurement of the precision reference signal(s) from the Smart Calibrator, including the effect of the patch cable.
- The measurement displayed is compared with the precision reference value listed on the calibrator's label.
- If the two values differ by more than the 0.3% instrument accuracy, the the operator select "Do Calibration".
- Within 3 seconds, the instrument performs the necessary calculations and circuit adjustments to make the displayed value correspond to the reference value.
- The procedure is repeated with a second Smart Calibrator.
- Replace the process sensor on the patch cable.
- Repeat the procedure on the other channel with both Smart Calibrators.



1855 Calibration Set

The second process sensor is then replaced on the patch cable. The 770PC and both sensors are back on-line monitoring the process.

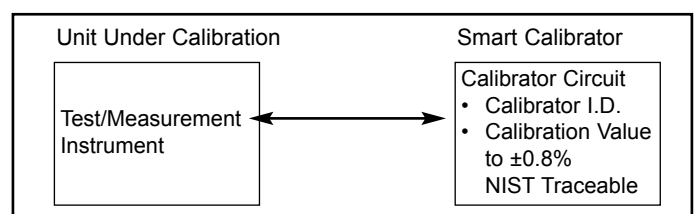
- The **total elapsed time** to verify and calibrate the instrument is less than 2 minutes.

SMART CALIBRATION SYSTEM TECHNOLOGY

Smart Calibrators are key elements in the Thornton Series 7 multiparameter process control system. They use patented technology that includes a non-volatile memory device (NVRAM) in each sensor's assembly. The calibrator's identification code and precise calibration value(s), which are NIST traceable and accurate to $\pm 0.8\%$, are saved in each calibrator's memory. The date of the last factory calibration is also stored in the calibrator memory. The signal is used by the instrument for three functions.

- When a smart calibrator is connected to a 700PC multiparameter instrument, the instrument recognizes the calibrator and puts the instrument into a calibration mode.
- The measured value of the calibration circuit is displayed for a visual evaluation of the instrument's condition.
- The precise calibration value is used by the instrument to calibrate its circuitry.

The Thornton Smart Calibration System provides unsurpassed convenience and accuracy, while meeting system validation requirements.



SPECIFICATIONS 1800 Smart Calibrators

Resistance/Temperature Calibrators - for resistivity, conductivity, TDS, % concentration and pH (temperature only) measurements

Ambient Temperature Range: 20-30°C
 Calibration Period: valid for one year

Temperature Accuracy: $\pm 0.3^\circ\text{C}$ after factory calibration
 Temp. Drift Over Calibration Period: $\pm 0.5^\circ\text{C}$

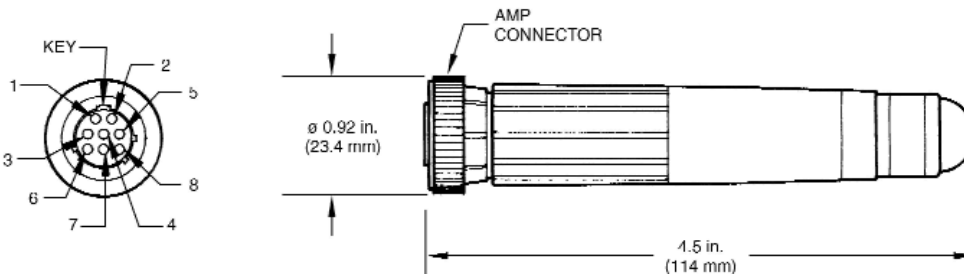
Calibrator Model	1854	1854-02	1854-03	1854-04
Nominal Calibrator Value (0.1/cm cell constant)	18.2 M Ω -cm, 0.055 $\mu\text{S}/\text{cm}$	1 M Ω -cm, 1 $\mu\text{S}/\text{cm}$	0.1 M Ω -cm, 10 $\mu\text{S}/\text{cm}$	10 K Ω -cm, 100 $\mu\text{S}/\text{cm}$
Resistivity/Conductivity Accuracy (factory calibration)	± 0.0072 M Ω -cm	± 0.0004 M Ω -cm	± 0.004 $\mu\text{S}/\text{cm}$	± 0.04 $\mu\text{S}/\text{cm}$
Drift Over Calibration Period	± 0.0029 M Ω -cm	± 0.00016 M Ω -cm	± 0.0016 $\mu\text{S}/\text{cm}$	± 0.016 $\mu\text{S}/\text{cm}$
Nominal Temp. Value	25°C	77.6°C	25°C	25°C

1855 Voltage Calibrator - pH, pressure, tank level, and other voltage measurements

Ambient Temperature Range: 20-30°C
 Calibration Period: valid for one year
 Nominal Calibration Value: 410 mV
 Voltage Accuracy: ± 0.17 mV after factory calibration
 Voltage Drift Over Calibration Period: ± 0.09 mV

All calibrators include a certificate of NIST traceability, blank verifier labels and instructions.
 Thornton product specifications are subject to change without notice.

DIMENSIONS



ORDERING INFORMATION

Part Number	Description
1855	Smart Calibration Set – with carrying case, includes the following two calibrators: 1853 Voltage Calibrator pH, pressure and tank level measurements; 1854 Resistance/Temperature Calibrator for high resistivity, very low conductivity, TDS and pH (temperature only) measurements
1855-02	Smart Calibration Set – with carrying case, includes the following three calibrators: 1854-02 Smart Resistance Calibrator for resistivity/conductivity, TDS and pH (temperature only) at 1 Mohm-cm or 1 $\mu\text{S}/\text{cm}$ with 0.1/cm cell constant 1854-03 Smart Resistance Calibrator for resistivity/conductivity, TDS and pH (temperature only) at 0.1 Mohm-cm or 10 $\mu\text{S}/\text{cm}$ with 0.1/cm cell constant 1854-04 Smart Resistance Calibrator for resistivity/conductivity, TDS, % concentration and pH (temperature only) at 10 kohm-cm or 100 $\mu\text{S}/\text{cm}$ with 0.1/cm cell constant



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