

# Maritime Calibration

Temperature ■ Pressure ■ Signal



# Ready-to-Use Calibration Solutions

## Portable Solutions Designed for your Specific Requirements

**A** METEK offers a complete program of maritime DNV approved pressure, temperature, and signal calibrators and pressure generators. Our complete systems include the m1M digital pressure gauge, the MTC Temperature Calibrator, hand held pneumatic and hydraulic pumps, and a variety of hoses and fittings to fit your calibration needs.

### Key Features & Options

- ▶ All products in this brochure are DNV approved.
- ▶ 3 year factory recommended calibration interval.
- ▶ Sturdy carrying case for all required accessories.
- ▶ Economical solution designed specifically for the maritime industry.



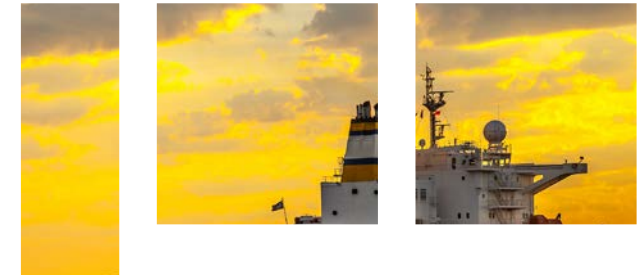
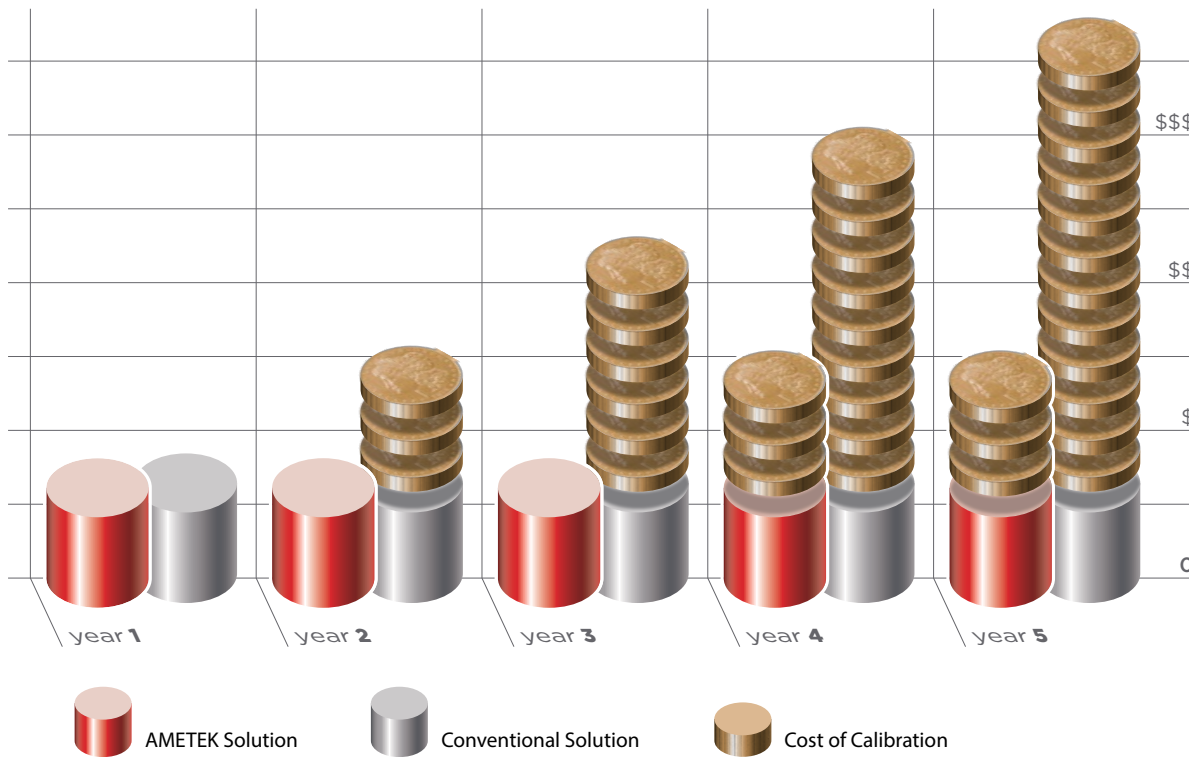
### Maintain and Calibrate Monitoring Devices for:

Turbo-charger lubrication • Lubricating oil systems • Cylinder / piston / fuel valve cooling medias • Fuel oil inlet • Scavenge air • Exhaust gas • Sea water cooling • Thrust / shaft plane / stern tube bearings • Uptake gas • Steam • Feed water • Servo oil propeller pitch • Cooling water outlet • Purifiers • Refrigeration systems • Starting air • Gland steam • Hydraulic systems • Condensing system • Oil burner • Main steam • Generators • Condensers • Safety Valves

# Saves Money

## Extended Calibration Intervals Lower Operating Costs!

**K**eeping your systems running efficiently, optimizing for safety, and adhering to classification societies requires your calibration equipment and sensors to be periodically calibrated. The amount of time and money spent annually on coordinating and shipping equipment relative to the investment costs can be surprising. The AMETEK solution comes with a three year recommended calibration interval for the m1M and the MTC, effectively reducing the frequency of these costs by a third.



### Carry Less Save Money

One m1M replaces 3 (or more) test gauges.

Every m1M maintains its accuracy across a wide pressure\* and temperature range\*\*, so using one m1M is like carrying multiple conventional gauges.

PLUS: You save on next year's calibration costs—whether calibrating an m1M or a single test gauge, the costs are about the same.



\* Pressure Range: to 3000psi/200 bar/20 MPa

\*\* Temperature Range: -10 to 50° C (14 to 122° F)



# MTC Series Temperature Calibration

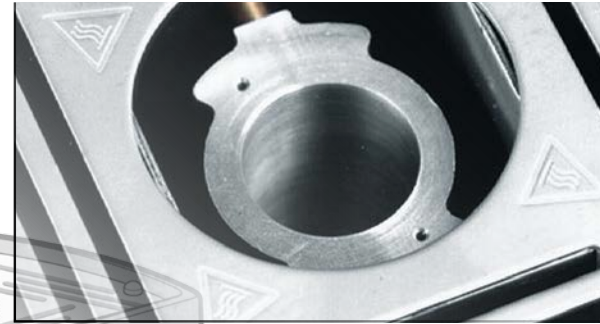


## Easy to Use, Intuitive Operation, and Portable

Avoid confusing sub-menus or multiple keystroke combinations with simple one-key, one-function logic. Access primary features like automatic switch test and auto-stepping directly from the main screen. Auto-stepping makes it possible to stay in the control room or bridge, while the MTC is located in the engine room next to the sensor.

## Up to 3 Year Calibration Interval

Maximize accuracy with a one year recommended calibration interval, or lower your cost of ownership by extending your interval up to three years.



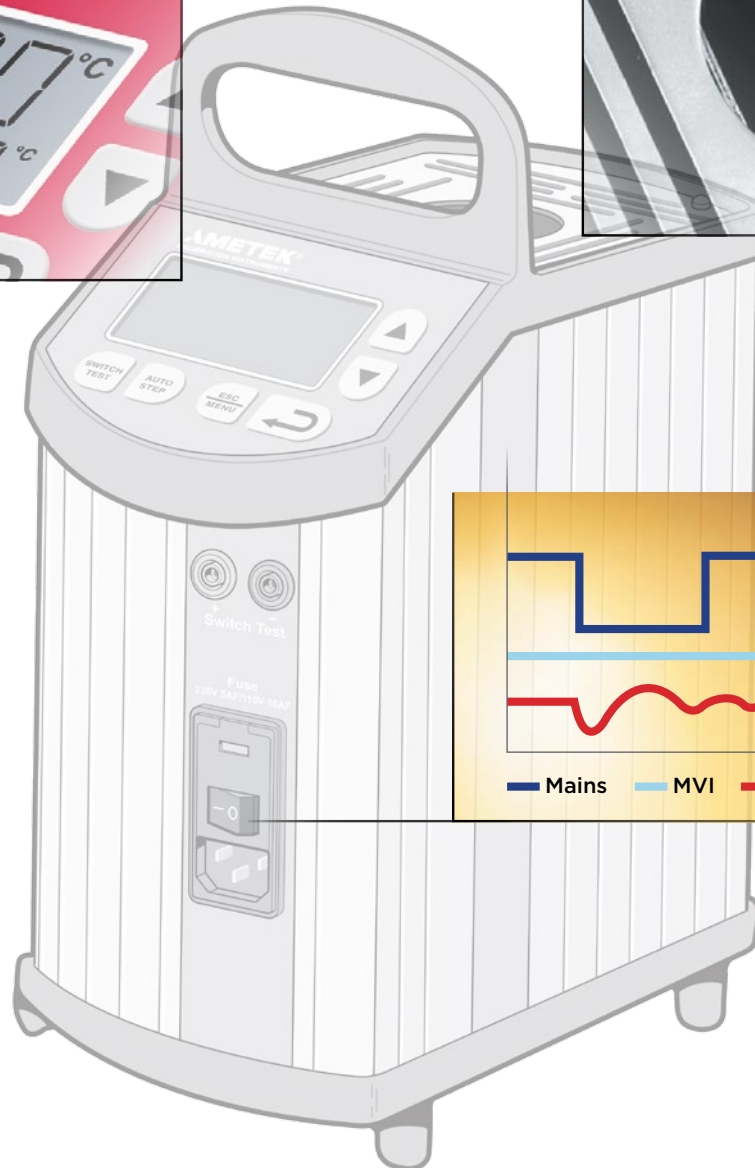
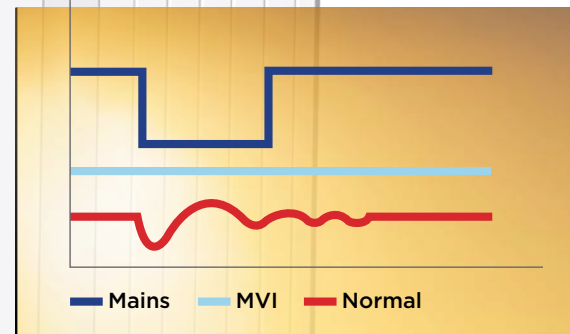
## Fast Heating and Cooling

The MTC-320 A and the MTC-650 A contain an innovative heating block profile, which heats up to 320°C/608°F in just 4 minutes, and up to 650°C/1202°F in only 10 minutes.

## Robust & Durable, with Improved Temperature Stability

Unstable mains power supplies are a major contributor to on-site calibration inaccuracies. The MTC Series employs a special MVI

(Mains power Variance Immunity) circuitry that continuously monitors the supply voltage and supplies a constant energy flow to the heating elements.



# m1M Pressure Calibration



## Durable Construction

IP65 Rated with a shock resistant circuitry and hard polyester/polycarbonate blend enclosure with an included rubber boot. The m1M survives accidental drops onto hard surfaces, and overpressure up to two times its rated pressure.



## Bright, Backlit Display

Easy to read from a distance, in the dark, or in bright sunlight.

## Extended Calibration Interval

Accuracy specification remains consistent over a three year factory recommended calibration interval.



## Long Battery Life

The m1M features a programmable update that extends battery life up to three years on one set of batteries. Ideal for mounting in hard to reach places!



# Portable Calibration Systems

## Complete Calibration Systems You Can Take Anywhere

**A** protective carrying case ensures safe transportation and storage of your calibration instruments and all their associated equipment. A sturdy, lined, rugged case is available with any MTC Series calibrator, as well as with our m1M pump systems. AMETEK pump systems ship complete with Crystal CPF fittings and hoses, with a choice of either a pneumatic or high pressure hydraulic pump.

The T-600 Series is a lightweight and portable hydraulic hand pump, specially designed for high pressure applications.

T-900 Series pneumatic pressure pump features an extended range fine adjust for precise control of pressure.



### Why Calibrate On Board a Ship?

- To obtain traceability
- To effectively fulfill IMO, SOLAS, ISM codes, etc.
- To fulfill requirements from Det Norske Veritas, Lloyds Register of Shipping, etc.
- To fulfill safety regulations
- To save energy
- To reduce pollution
- To achieve optimum machine operation and efficiency
- To reduce unexpected repair and replacement
- To prevent turn downs of machinery



# Specialty Equipment

U.S. Patent No. 8,794,677



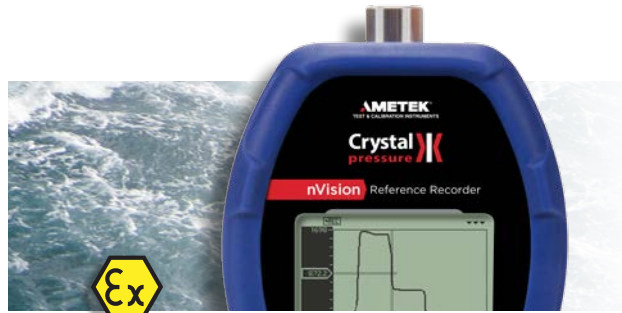
## Fittings for Life

Crystal Pressure Fittings

**CPF** operate up to 10 000 psi / 700 bar with only a finger tight connection needed. Manufactured to be the safest fittings available, CPF are machined in high-strength 316 Stainless Steel, include laser markings to clearly identify fitting type and size, and feature a self-venting weep hole that alerts you before you disconnect from a pressurized system.



**Digital Test Gauge** The XP2i is an ultra-rugged digital test gauge with 0.1% of reading accuracy up to 15,000 psi / 1000 bar. The ruggedized housing withstands vibration, a fall from up to 2 meters, and accidental overpressure at up to two times the indicated limit. Perfect for direct use in any Zone 0 hazardous area pressure application.



## Reference Recorder

For special applications where long term data recording of pressure, temperature, and signal are needed. The nVision reference recorder is used for loading, storing, and processing applications on a variety of ship types, like FSO, FPSO, FLNG, and offshore platforms. Pressure readings have an accuracy up to 0.025% of reading and are fully temperature compensated from -20 to 50°C.

Patent No. EP2074374/US8342742



**RTC-159 Ultracooler** The RTC-159 Ultracooler has a -100 to 155°C temperature range, making it the ideal calibrator for sensors on Gas Carriers and other fully refrigerated ships carrying cargo such as LNG, LPG, Ethylene, and similar chemicals. The RTC series of temperature calibrators provide precision calibration of sensors, whatever type or format they may be.

## ASC-400 Multifunction Calibrator

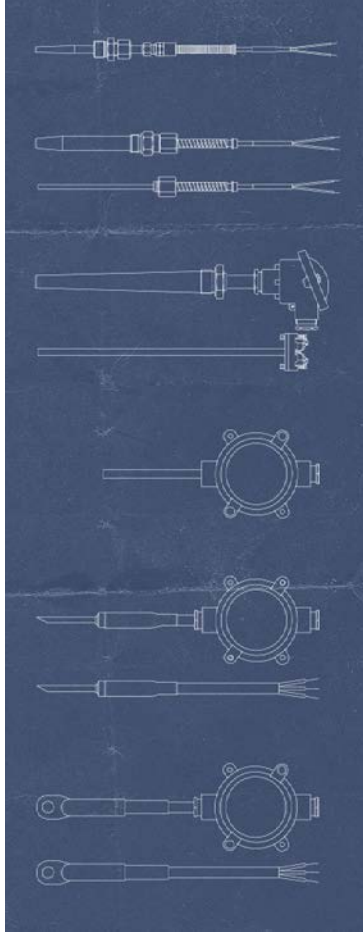
The ASC-400 combines a variety of features with an intuitive, easy-to-use interface and bright color display. Combine with APM CPF Series pressure modules or a dry-block calibrator to calibrate pressure and temperature.

- **Input and Output:** 16 different RTD Types and 13 different TC types.
- **Simultaneous Read-back:** Isolated ma, V, and pressure read-back from device under test.
- **Calibrate Pressure and Temperature:** Apply an APM for automatic leak-test, pressure switch calibration, and more. With a temperature calibrator, add measurement channels for sensors or temperature switches.
- **A High Accuracy Thermometer:** Works with RTDs and CvD equations to obtain true temperature, based on "true ohm" technology!

## More than just a Signal Calibrator!

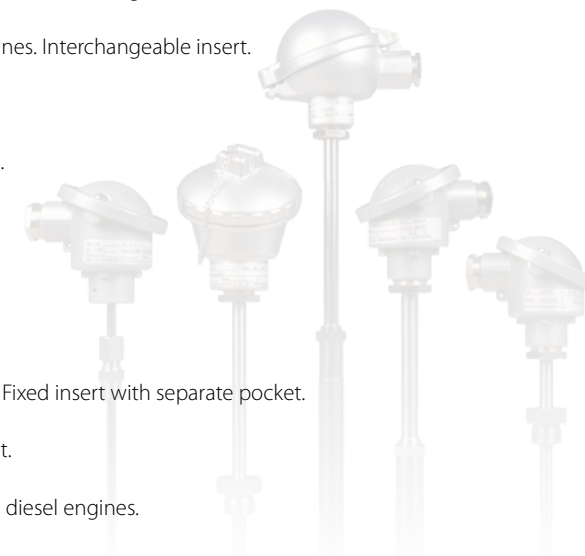


**AMETEK**  
TEST & CALIBRATION INSTRUMENTS



**Temperature Sensors** are ideal for maritime applications including, but not limited to: measuring exhaust gases and cooling water in diesel engines, product temperatures, and room temperatures in refrigeration stores. The temperature sensors are designed with high resistance against vibration.

- 1801 Type UST 1** . . . Thermocouple assembly for exhaust gasses on minor and medium sized diesel engines.
- 1802 Type UST 2** . . . Thermocouple assembly for exhaust gasses on larger diesel engines. Interchangeable insert with extension cable.
- 1803 Type UST 3** . . . Thermocouple assembly for exhaust gasses on larger diesel engines. Interchangeable insert.
- 1804 Type RM 2** . . . Resistance thermometer for refrigeration and cooling storage.
- 1805 Type IM** . . . . . Resistance thermometer. Needle probe for product temperature.
- 1806 Type GM** . . . . . Resistance thermometer. Rubber sealed for cargo rooms.
- 1807 Type ST** . . . . . Thermocouple for stern tube bearings.
- 1808 Type SM** . . . . . Resistance thermometer for stern tube bearings.
- 1809 Type BFM** . . . . Resistance thermometer for ventilation and cooling equipment. Fixed insert with separate pocket.
- 1810 Type BM** . . . . . Resistance thermometer for water, oil, etc. Interchangeable insert.
- 1812 Type HLM** . . . . Resistance thermometer surveillance of bearing temperature on diesel engines.



**USA, Florida**  
Tel +1 (800) 527 9999  
[cal.info@ametek.com](mailto:cal.info@ametek.com)

**USA, California\***  
Tel +1 (800) 444 1850  
[crystal@ametek.com](mailto:crystal@ametek.com)

**India**  
Tel +91 22 2836 4750  
[jofra@ametek.com](mailto:jofra@ametek.com)

**Singapore**  
Tel +65 6484 2388  
[jofra@ametek.com](mailto:jofra@ametek.com)

**China, Shanghai**  
Tel +86 5868 5111  
[jofra-china.sales@ametek.com.cn](mailto:jofra-china.sales@ametek.com.cn)

**China, Beijing**  
Tel +86 10 8526 2111-19/24/25  
[jofra-china.sales@ametek.com.cn](mailto:jofra-china.sales@ametek.com.cn)

**United Kingdom**  
Tel +44 (0) 1243 833 302  
[jofra@ametek.co.uk](mailto:jofra@ametek.co.uk)

**France**  
Tel +33 (0) 30 68 89 40  
[general.lloyd-instruments@ametek.fr](mailto:general.lloyd-instruments@ametek.fr)

**Germany**  
Tel +49 (0) 2159 9136 510  
[info.mct-de@ametek.de](mailto:info.mct-de@ametek.de)

**Denmark\***  
Tel +45 4816 8000  
[jofra@ametek.com](mailto:jofra@ametek.com)

**Crystal**   
**pressure**

**JOFRA**   
**calibration**

[www.ametektci.com](http://www.ametektci.com)

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