

## 525A Temperature/ Pressure Calibrator

Superior accuracy and functionality in an economical benchtop package



The Fluke 525A Temperature/Pressure Calibrator gives you a workhorse combination of high accuracy and broad functionality for temperature and pressure instrument calibration. Compact and economical, the 525A has an interface for automated calibration, providing wide workload coverage in instrument shops and calibration labs, as well as in ATE applications.

The 525A is the most accurate Fluke temperature calibrator, sourcing and measuring a complete range of RTDs, thermocouples, and thermistors. It also measures pressure covering common ranges from 1 inch (6900 Pa) of water up to 10,000 PSI (69 MPa) using the Fluke 700 Series or 525A-P pressure modules. Plus, the DC voltage and current specifications of the 525A enable you to calibrate other process calibrators and a wide variety of other instruments with accuracy that rivals any calibrator in its price range.

### Key features:

- Simulates and measures all ANSI thermocouples, as well as L and U types, and provides cold junction compensation to enable calibration of a wide variety of thermocouple instrumentation.
- Direct input for storage of ITS-90 RTD constants for highly accurate simulation and measurement of RTD probes.
- Direct measurement of all Fluke 700 Series and model 525A-P pressure modules covering the most common pressure ranges from 0-1" H<sub>2</sub>O to 0-10,000 PSI.
- Converts easily to any pressure unit directly from the front panel or through remote communications.
- Sources DC voltage and current for multifunction workload coverage, enabling calibration of data loggers, strip chart recorders, multimeters, and other industrial instruments.
- Supports automation using Fluke's MET/CAL® Plus Calibration Management Software or custom automated programs with standard RS-232-C or optional GPIB interface.
- Eight user programmable setpoints allow quick recall of values for Zero, Span and linearity checks during calibration.
- Programmable setpoint dwell times for automated calibration and troubleshooting.
- Selectable internal or external CJC (Cold junction compensation) provides you with the ability to make exacting thermocouple measurements using remote junctions.
- Easy five-way binding posts for low-loss convenient hookup. Banana plug, screw terminal, spade lug, wraparound terminal, wire pass-through terminal.
- NIST-traceable calibration with data is included.

## Technical Data

### At home in the cal lab

The 525A is a compact bench instrument well suited for traditional calibration laboratories with a large temperature workload. Its 0-100V output and 0-100 mA current capabilities—plus its ability to serve as a highly-accurate pressure standard—make it a versatile performer.

### Filling the gap in the instrument shop

In process plant environments, instrument shop technicians responsible for maintaining the equipment pool need to calibrate and repair a wide range of instruments, transmitters, field calibrators, P/I converters, transducers, and temperature probes. With its ability to simulate almost any temperature sensor, precise pressure monitoring capability, and DC voltage and current accuracy rivaling any calibrator in its price range, the 525A fills the gap between lower accuracy handheld field calibrators and more expensive high-end multifunction calibrators.

### A good fit for ATE test applications

With precise calibration-grade instrument control enabled via an IEEE bus, the 525A is a hardworking addition to automated test systems in quality and manufacturing test applications requiring capabilities such as voltage and current sourcing, sensor simulation, and temperature monitoring and validation.

### Powerful functionality that is easy to use

From start to finish, the 525A is designed for ease of operation. The intuitive front panel design features large keypads and display that help reduce training time and make the 525A comfortable to use even for long periods of time. Plus, you can store frequently used constants for a variety of probes in memory for faster setup on the job.

## MET/CAL<sup>®</sup> Plus automates 525A calibration and documentation management

You can use the 525A with Fluke's MET/CAL Plus calibration software (V.6.11 or later) to meet the stringent documentation and reporting requirements imposed by quality standards such as ISO 9000. MET/CAL Plus is a powerful software environment for creating, editing, testing, and documenting calibration procedures, and for performing automated calibrations.

At the core of MET/CAL Plus is MET/TRACK, a database management system for test and measurement assets created specifically to manage equipment. It enables you to track the information you need to maintain quality calibrations. And it supports the traceability and record-keeping requirements of modern quality and accreditation standards.

MET/TRACK provides you with a variety of standard report formats prepared with Crystal Reports<sup>™</sup> Professional, which is included with MET/CAL Plus. These report formats cover a wide range of information to help you meet many of your documentation requirements, including those for ISO 9000 and similar quality standards. They report on forward and reverse traceability, allowing you to easily document traceability from any asset to the equipment calibrated. It even includes measurement uncertainty reporting to meet the requirements of ISO/IEC 17025.



### Pressure modules

An optional set of external pressure modules provides pressure measurement capability. The 525A can accept either the Fluke 700 Series or the Fluke model 525A-P pressure modules. Both module types plug directly into the calibrator's front panel Lemo connector; the 525A firmware auto-detects the type and value of the attached module.

### World-class temperature calibration solutions

In addition to the 525A Temperature/Pressure Calibrator, Fluke offers

a wide range of easy-to-use, cost-effective solutions for temperature calibration applications including:

- **Fluke 500 Series Dry-Block Temperature Calibrators** for highly accurate temperature calibration in a small package.
- **Fluke 518 BatchCAL Batch Calibration System**, for automated batch calibration of up to 14 temperature probes at one time.
- **Fluke 2620T/2635T Recording Thermometers** are based on the Fluke's Hydra Series II data loggers for precision multi-channel temperature recording and logging.
- **Agilent 34420/SPRT/PRT Precision Thermometers** for accurate, repeatable low-level temperature measurements.

## Fluke—providing complete calibration solutions for more than 50 years

To compete in the world market, you need to be able to accurately and cost effectively measure up to world standards. Only Fluke offers so many solutions to match your workload and budget, including:

- A broad line of multi-product and multifunction calibrators.

## 525A Temperature/Pressure Calibrator Specifications

### DC Voltage Specifications, Source Only

| Ranges <sup>1</sup> | Absolute Uncertainty, tcal ± 5 °C<br>± (% of output + µV) |              | Stability<br>24 hours, ± 1 °C<br>± (% output + µV) | Resolution | Maximum Burden <sup>2</sup> |
|---------------------|-----------------------------------------------------------|--------------|----------------------------------------------------|------------|-----------------------------|
|                     | 90 days                                                   | 1 year       |                                                    |            |                             |
| 0 to 100.000 mV     | 0.0025 + 3                                                | 0.003 + 3    | 0.0005 + 2                                         | 1 µV       | 10 mA                       |
| 0 to 1.00000 V      | 0.0025 + 20                                               | 0.003 + 20   | 0.0004 + 20                                        | 10 µV      | 10 mA                       |
| 0 to 10.0000 V      | 0.0025 + 200                                              | 0.003 + 200  | 0.0004 + 200                                       | 100 µV     | 10 mA                       |
| 0 to 100.000 V      | 0.0025 + 2 mV                                             | 0.003 + 2 mV | 0.0005 + 1 mV                                      | 1 mV       | 1 mA                        |
| <b>TC Source</b>    |                                                           |              |                                                    |            |                             |
| -10 to 75.000 mV    | 0.0025 + 3                                                | 0.003 + 3    | 0.0005 + 2                                         | 1 µV       | 10Ω                         |

<sup>1</sup> All outputs are positive only.

<sup>2</sup> Remote sensing is not provided. Output resistance is < 1Ω.

### DC Current Specifications, Source Only

| Ranges <sup>1</sup> | Absolute Uncertainty, tcal ± 5 °C<br>± (% of output + µA) |          | Resolution | Maximum Compliance Voltage | Maximum Inductive Load |
|---------------------|-----------------------------------------------------------|----------|------------|----------------------------|------------------------|
|                     | 90 days                                                   | 1 year   |            |                            |                        |
| 0 to 100.000 mA     | 0.0085 + 2                                                | 0.01 + 2 | 1 µA       | 10V                        | 100 µH                 |

<sup>1</sup> All outputs are positive only.

### Resistance Specifications, Source

| Ranges <sup>1</sup> | Absolute Uncertainty, tcal ± 5 °C<br>± (floor)<br>±Ω |        | Resolution | Allowable Current <sup>2</sup> |
|---------------------|------------------------------------------------------|--------|------------|--------------------------------|
|                     | 90 days                                              | 1 year |            |                                |
| 5Ω to 400.00Ω       | 0.025                                                | 0.03   | 0.01Ω      | 1 to 10 mA                     |
| 5Ω to 4.0000 kΩ     | 0.25                                                 | 0.3    | 0.1Ω       | 250 µA to 1 mA                 |

<sup>1</sup> Continuously variable from 0 to 4 kΩ. 2-wire output only.

<sup>2</sup> For currents lower than shown, the floor adder increases by Floor<sub>(new)</sub> = Floor<sub>(old)</sub> × I<sub>min</sub>/I<sub>actual</sub>. For example, a 500 µA stimulus measuring 100Ω has a floor uncertainty of 0.025Ω × 1 mA/500 µA = 0.05Ω.

- High performance oscilloscope calibrators to cover the widest range of bandwidths.
- A growing selection of solutions for temperature calibration.
- A comprehensive line of calibration standards.
- Precision digital multimeters for the standards lab.
- Calibration and asset management software.
- A lineup of general-purpose test instruments including data loggers, waveform and function generators, and time and frequency products.

As the world leader in precision measurement, Fluke covers all the bases – accurately, reliably, and cost effectively.

### Calibration service, repair, and support

Fluke provides extensive calibration support and service to maximize the value of your calibration investment. Our worldwide network of Calibration Centers has traceability to national standards. Service and support are just a telephone call or fax away. We offer fast, quality repair and calibration services including a module exchange program, comprehensive training, and full support in setting up your lab.

| Ranges          | Noise                                                   |                                           |
|-----------------|---------------------------------------------------------|-------------------------------------------|
|                 | Bandwidth<br>0.1 to 10 Hz<br>p-p<br>± (ppm output + µV) | Bandwidth<br>10 Hz to 10 kHz<br>rms<br>µV |
| 0 to 100.000 mV | 1 µV                                                    | 6 µV                                      |
| 0 to 1.00000V   | 10 µV                                                   | 60 µV                                     |
| 0 to 10.0000V   | 100 µV                                                  | 600 µV                                    |
| 0 to 100.000V   | 10 ppm + 1 mV                                           | 20 mV                                     |

| Ranges          | Noise                                            |                                           |
|-----------------|--------------------------------------------------|-------------------------------------------|
|                 | Bandwidth<br>0.1 to 10 Hz<br>p-p<br>± (ppm + µA) | Bandwidth<br>10 Hz to 10 kHz<br>rms<br>µA |
| 0 to 100.000 mA | 2000 nA                                          | 20 µA                                     |

### Thermocouple Specification, Source and Measure

| TC Type | Range (°C) |         | Absolute Uncertainty, tcal ± 5°C, + (°C) <sup>1</sup> |        |
|---------|------------|---------|-------------------------------------------------------|--------|
|         | Minimum    | Maximum | Source/Measure<br>90 days                             | 1 year |
| B       | 600°C      | 800°C   | 0.42°C                                                | 0.44°C |
|         | 800°C      | 1000°C  | 0.34°C                                                | 0.34°C |
|         | 1000°C     | 1550°C  | 0.30°C                                                | 0.30°C |
|         | 1550°C     | 1820°C  | 0.26°C                                                | 0.33°C |
| C       | 0°C        | 150°C   | 0.23°C                                                | 0.30°C |
|         | 150°C      | 650°C   | 0.19°C                                                | 0.26°C |
|         | 650°C      | 1000°C  | 0.23°C                                                | 0.31°C |
|         | 1000°C     | 1800°C  | 0.38°C                                                | 0.50°C |
|         | 1800°C     | 2316°C  | 0.63°C                                                | 0.84°C |
| E       | -270°C     | -100°C  | 0.38°C                                                | 0.50°C |
|         | -100°C     | -25°C   | 0.12°C                                                | 0.16°C |
|         | -25°C      | 350°C   | 0.10°C                                                | 0.14°C |
|         | 350°C      | 650°C   | 0.12°C                                                | 0.16°C |
|         | 650°C      | 1000°C  | 0.16°C                                                | 0.21°C |
| J       | -210°C     | -100°C  | 0.20°C                                                | 0.27°C |
|         | -100°C     | -30°C   | 0.12°C                                                | 0.16°C |
|         | -30°C      | 150°C   | 0.10°C                                                | 0.14°C |
|         | 150°C      | 760°C   | 0.13°C                                                | 0.17°C |
|         | 760°C      | 1200°C  | 0.18°C                                                | 0.23°C |
| K       | -270°C     | -100°C  | 0.25°C                                                | 0.33°C |
|         | -100°C     | -25°C   | 0.14°C                                                | 0.18°C |
|         | -25°C      | 120°C   | 0.12°C                                                | 0.16°C |
|         | 120°C      | 1000°C  | 0.19°C                                                | 0.26°C |
|         | 1000°C     | 1372°C  | 0.30°C                                                | 0.40°C |
| L       | -200°C     | -100°C  | 0.37°C                                                | 0.37°C |
|         | -100°C     | 800°C   | 0.26°C                                                | 0.26°C |
|         | 800°C      | 900°C   | 0.17°C                                                | 0.17°C |
|         |            |         |                                                       |        |
| N       | -270°C     | -100°C  | 0.30°C                                                | 0.40°C |
|         | -100°C     | -25°C   | 0.17°C                                                | 0.22°C |
|         | -25°C      | 120°C   | 0.15°C                                                | 0.19°C |
|         | 120°C      | 410°C   | 0.14°C                                                | 0.18°C |
|         | 410°C      | 1300°C  | 0.21°C                                                | 0.27°C |
| R       | -50°C      | 250°C   | 0.48°C                                                | 0.57°C |
|         | 250°C      | 400°C   | 0.28°C                                                | 0.35°C |
|         | 400°C      | 1000°C  | 0.26°C                                                | 0.33°C |
|         | 1000°C     | 1767°C  | 0.30°C                                                | 0.40°C |
| S       | -50°C      | 250°C   | 0.47°C                                                | 0.47°C |
|         | 250°C      | 1000°C  | 0.30°C                                                | 0.36°C |
|         | 1000°C     | 1400°C  | 0.28°C                                                | 0.37°C |
|         | 1400°C     | 1767°C  | 0.34°C                                                | 0.46°C |
| T       | -270°C     | -150°C  | 0.48°C                                                | 0.63°C |
|         | -150°C     | 0°C     | 0.18°C                                                | 0.24°C |
|         | 0°C        | 120°C   | 0.12°C                                                | 0.16°C |
|         | 120°C      | 400°C   | 0.10°C                                                | 0.14°C |
| U       | -200°C     | 0°C     | 0.56°C                                                | 0.56°C |
|         | 0°C        | 600°C   | 0.27°C                                                | 0.27°C |

<sup>1</sup> Does not include thermocouple error. Measurement standard = ITS 90.

### Resistance Specifications, Measure

| Ranges <sup>1</sup> | Absolute Uncertainty, tcal ± 5 °C<br>± (% of reading + Ω) |               | Resolution | Stimulus<br>Current |
|---------------------|-----------------------------------------------------------|---------------|------------|---------------------|
|                     | 90 days                                                   | 1 year        |            |                     |
| 0Ω to 400.000Ω      | 0.0035 + 0.002                                            | 0.004 + 0.002 | 0.001Ω     | 1 mA                |
| 401 to 4001.00Ω     | 0.0035 + 0.02                                             | 0.004 + 0.02  | 0.01Ω      | 0.1 mA              |

<sup>1</sup> 4-wire measurement.

## 525A Temperature/Pressure Calibrator Specifications (cont.)

### RTD and Thermistor Specifications, Source

| RTD Type                 | Range (°C) |         | Absolute Uncertainty, tcal ± 5°C, + (°C) <sup>1</sup> |         |
|--------------------------|------------|---------|-------------------------------------------------------|---------|
|                          | Minimum    | Maximum | 90 days                                               | 1 year  |
| Pt 385, 100Ω             | -200°C     | -80°C   | 0.06°C                                                | 0.07°C  |
|                          | -80°C      | 0°C     | 0.08°C                                                | 0.10°C  |
|                          | 0°C        | 100°C   | 0.08°C                                                | 0.10°C  |
|                          | 100°C      | 300°C   | 0.07°C                                                | 0.09°C  |
|                          | 300°C      | 400°C   | 0.07°C                                                | 0.09°C  |
|                          | 400°C      | 630°C   | 0.08°C                                                | 0.09°C  |
| Pt 3926, 100Ω            | 630°C      | 800°C   | 0.08°C                                                | 0.10°C  |
|                          | -200°C     | -80°C   | 0.06°C                                                | 0.07°C  |
|                          | -80°C      | 0°C     | 0.06°C                                                | 0.07°C  |
|                          | 0°C        | 100°C   | 0.06°C                                                | 0.08°C  |
|                          | 100°C      | 300°C   | 0.07°C                                                | 0.08°C  |
|                          | 300°C      | 400°C   | 0.07°C                                                | 0.09°C  |
| Pt 3916, 100Ω            | 400°C      | 630°C   | 0.08°C                                                | 0.09°C  |
|                          | -200°C     | -190°C  | 0.06°C                                                | 0.07°C  |
|                          | -190°C     | -80°C   | 0.06°C                                                | 0.08°C  |
|                          | -80°C      | 0°C     | 0.06°C                                                | 0.08°C  |
|                          | 0°C        | 100°C   | 0.06°C                                                | 0.08°C  |
|                          | 100°C      | 260°C   | 0.07°C                                                | 0.08°C  |
| Pt 385, 200Ω             | 260°C      | 300°C   | 0.07°C                                                | 0.08°C  |
|                          | 300°C      | 400°C   | 0.07°C                                                | 0.09°C  |
|                          | 400°C      | 600°C   | 0.08°C                                                | 0.09°C  |
|                          | 600°C      | 630°C   | 0.08°C                                                | 0.09°C  |
|                          | -200°C     | -80°C   | 0.03°C                                                | 0.04°C  |
|                          | -80°C      | 0°C     | 0.03°C                                                | 0.04°C  |
| Pt 385, 500Ω             | 0°C        | 100°C   | 0.03°C                                                | 0.04°C  |
|                          | 100°C      | 260°C   | 0.03°C                                                | 0.04°C  |
|                          | 260°C      | 300°C   | 0.36°C                                                | 0.43°C  |
|                          | 300°C      | 400°C   | 0.36°C                                                | 0.43°C  |
|                          | 400°C      | 600°C   | 0.42°C                                                | 0.50°C  |
|                          | 600°C      | 630°C   | 0.42°C                                                | 0.50°C  |
| Pt 385, 1000Ω            | -200°C     | -80°C   | 0.01°C                                                | 0.02°C  |
|                          | -80°C      | 0°C     | 0.13°C                                                | 0.15°C  |
|                          | 0°C        | 100°C   | 0.13°C                                                | 0.16°C  |
|                          | 100°C      | 260°C   | 0.14°C                                                | 0.17°C  |
|                          | 260°C      | 300°C   | 0.14°C                                                | 0.17°C  |
|                          | 300°C      | 400°C   | 0.15°C                                                | 0.18°C  |
| PtNi 385, 120Ω (Ni120)   | 400°C      | 600°C   | 0.16°C                                                | 0.19°C  |
|                          | 600°C      | 630°C   | 0.16°C                                                | 0.19°C  |
|                          | -200°C     | -80°C   | 0.06°C                                                | 0.07°C  |
|                          | -80°C      | 0°C     | 0.06°C                                                | 0.08°C  |
|                          | 0°C        | 100°C   | 0.07°C                                                | 0.08°C  |
|                          | 100°C      | 260°C   | 0.07°C                                                | 0.08°C  |
| Cu 427, 10Ω <sup>2</sup> | 260°C      | 300°C   | 0.07°C                                                | 0.09°C  |
|                          | 300°C      | 400°C   | 0.07°C                                                | 0.09°C  |
|                          | 400°C      | 600°C   | 0.08°C                                                | 0.09°C  |
|                          | 600°C      | 630°C   | 0.08°C                                                | 0.09°C  |
|                          | -80°C      | 0°C     | 0.04°C                                                | 0.05°C  |
|                          | 0°C        | 100°C   | 0.04°C                                                | 0.04°C  |
| YS1400                   | 100°C      | 260°C   | 0.03°C                                                | 0.03°C  |
|                          | -100°C     | 260°C   | 0.63°C                                                | 0.75°C  |
|                          | 15°C       | 50°C    | 0.005°C                                               | 0.007°C |

<sup>1</sup> 2-wire output

<sup>2</sup> Based on MINCO Application Aid No. 18.

Note: Resolution is 0.1°.

Measurement standard = ITS 90.

## RTD and Thermistor Specifications, Measure

| RTD Type                 | Range (°C) |         | Absolute Uncertainty, tcal ± 5°C, + (°C) <sup>1</sup> |         |
|--------------------------|------------|---------|-------------------------------------------------------|---------|
|                          | Minimum    | Maximum | Measure                                               |         |
| Pt 385, 100Ω             | -200°C     | -80°C   | 0.011°C                                               | 0.012°C |
|                          | -80°C      | 0°C     | 0.018°C                                               | 0.020°C |
|                          | 0°C        | 100°C   | 0.018°C                                               | 0.020°C |
|                          | 100°C      | 300°C   | 0.027°C                                               | 0.030°C |
|                          | 300°C      | 400°C   | 0.031°C                                               | 0.035°C |
|                          | 400°C      | 630°C   | 0.042°C                                               | 0.047°C |
|                          | 630°C      | 800°C   | 0.050°C                                               | 0.057°C |
| Pt 3926, 100Ω            | -200°C     | -80°C   | 0.011°C                                               | 0.011°C |
|                          | -80°C      | 0°C     | 0.014°C                                               | 0.015°C |
|                          | 0°C        | 100°C   | 0.018°C                                               | 0.019°C |
|                          | 100°C      | 300°C   | 0.026°C                                               | 0.029°C |
|                          | 300°C      | 400°C   | 0.031°C                                               | 0.034°C |
| Pt 3916, 100Ω            | 400°C      | 630°C   | 0.041°C                                               | 0.046°C |
|                          | -200°C     | -190°C  | 0.006°C                                               | 0.006°C |
|                          | -190°C     | -80°C   | 0.011°C                                               | 0.012°C |
|                          | -80°C      | 0°C     | 0.014°C                                               | 0.015°C |
|                          | 0°C        | 100°C   | 0.018°C                                               | 0.019°C |
|                          | 100°C      | 260°C   | 0.025°C                                               | 0.028°C |
|                          | 260°C      | 300°C   | 0.026°C                                               | 0.029°C |
|                          | 300°C      | 400°C   | 0.031°C                                               | 0.034°C |
| Pt 385, 200Ω             | 400°C      | 600°C   | 0.040°C                                               | 0.045°C |
|                          | 600°C      | 630°C   | 0.042°C                                               | 0.047°C |
|                          | -200°C     | -80°C   | 0.008°C                                               | 0.009°C |
|                          | -80°C      | 0°C     | 0.012°C                                               | 0.013°C |
|                          | 0°C        | 100°C   | 0.015°C                                               | 0.017°C |
|                          | 100°C      | 260°C   | 0.020°C                                               | 0.022°C |
|                          | 260°C      | 300°C   | 0.050°C                                               | 0.053°C |
|                          | 300°C      | 400°C   | 0.053°C                                               | 0.057°C |
| Pt 385, 500Ω             | 400°C      | 600°C   | 0.070°C                                               | 0.075°C |
|                          | 600°C      | 630°C   | 0.071°C                                               | 0.076°C |
|                          | -200°C     | -80°C   | 0.007°C                                               | 0.008°C |
|                          | -80°C      | 0°C     | 0.019°C                                               | 0.020°C |
|                          | 0°C        | 100°C   | 0.023°C                                               | 0.025°C |
|                          | 100°C      | 260°C   | 0.030°C                                               | 0.033°C |
|                          | 260°C      | 300°C   | 0.032°C                                               | 0.035°C |
| Pt 385, 1000Ω            | 300°C      | 400°C   | 0.037°C                                               | 0.041°C |
|                          | 400°C      | 600°C   | 0.047°C                                               | 0.052°C |
|                          | 600°C      | 630°C   | 0.048°C                                               | 0.053°C |
|                          | -200°C     | -80°C   | 0.011°C                                               | 0.012°C |
|                          | -80°C      | 0°C     | 0.014°C                                               | 0.015°C |
|                          | 0°C        | 100°C   | 0.019°C                                               | 0.020°C |
|                          | 100°C      | 260°C   | 0.025°C                                               | 0.028°C |
| PtNi 385, 120Ω (Ni120)   | 260°C      | 300°C   | 0.027°C                                               | 0.030°C |
|                          | 300°C      | 400°C   | 0.030°C                                               | 0.034°C |
|                          | 400°C      | 600°C   | 0.041°C                                               | 0.045°C |
|                          | 600°C      | 630°C   | 0.042°C                                               | 0.047°C |
|                          | -80°C      | 0°C     | 0.009°C                                               | 0.010°C |
|                          | 0°C        | 100°C   | 0.010°C                                               | 0.011°C |
| Cu 427, 10Ω <sup>2</sup> | 100°C      | 260°C   | 0.011°C                                               | 0.012°C |
|                          | 15°C       | 50°C    | 0.005°C                                               | 0.007°C |
| YS1400                   | -100°C     | 260°C   | 0.067°C                                               | 0.069°C |
| 25Ω SPRT3                | -200°C     | 660°C   | 0.015°C                                               | 0.020°C |

<sup>1</sup> 4-wire mode. Uncertainties listed do not include probe uncertainties.

<sup>2</sup> Based on MINCO Application Aid No. 18.

Note: Resolution on all RTD and Thermistor Measurements is 0.001Ω.

Measurement standard = ITS 90.

# 525A Temperature/Pressure Calibrator Specifications (cont.)

## Pressure Measurement Specifications

| Range                         | Absolute Uncertainty, $\pm$ cal + 5 °C | Resolution                    | Units                                               |
|-------------------------------|----------------------------------------|-------------------------------|-----------------------------------------------------|
| Determined by pressure module | Determined by pressure module          | Determined by pressure module | BAR; cm/H2O; in/H2O; in/Hg; KG/CM2; KPa; MBAR; mmHg |

## 700 Series Pressure Modules Specifications

|                     | Model        | Range/Resolution   | Range (approx)/Resolution | Uncertainty <sup>1</sup> | High <sup>2</sup> side media | Low <sup>2</sup> side media | Fitting material |
|---------------------|--------------|--------------------|---------------------------|--------------------------|------------------------------|-----------------------------|------------------|
| <b>Differential</b> | Fluke 700P00 | 1 in. H2O/0.001    | 0.25 kPa/0.0002           | 0.35%                    | Dry                          | Dry                         | 316 SS           |
|                     | Fluke 700P01 | 10 in. H2O/0.01    | 2.5 kPa/0.002             | 0.30%                    | Dry                          | Dry                         | 316 SS           |
|                     | Fluke 700P02 | 1 psi/0.0001       | 6900 Pa/0.7               | 0.30%                    | Dry                          | Dry                         | 316 SS           |
|                     | Fluke 700P22 | 1 psi/0.0001       | 6900 Pa/0.7               | 0.15%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700P03 | 5 psi/0.0001       | 34 kPa/0.001              | 0.10%                    | Dry                          | Dry                         | 316 SS           |
|                     | Fluke 700P23 | 5 psi/0.0001       | 34 kPa/0.001              | 0.05%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700P04 | 15 psi/0.001       | 103 kPa/0.01              | 0.05%                    | Dry                          | Dry                         | 316 SS           |
| <b>Gage</b>         | Fluke 700P24 | 15 psi/0.001       | 103 kPa/0.01              | 0.05%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700P05 | 30 psi/0.001       | 207 kPa/0.01              | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700P06 | 100 psi/0.01       | 690 kPa/0.07              | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700P27 | 300 psi/0.01       | 2070 kPa/0.1              | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700P07 | 500 psi/0.01       | 3400 kPa/0.1              | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700P08 | 1000 psi/0.1       | 6900 kPa/0.7              | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700P09 | 1500 psi/0.1       | 10 M Pa/0.001             | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
| <b>Absolute</b>     | Fluke 700PA3 | 5 psi/0.0001       | 34 kPa/0.001              | 0.07%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700PA4 | 150 psi/0.001      | 103 kPa/0.001             | 0.07%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700PA5 | 30 psi/0.001       | 207 kPa/0.01              | 0.07%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700PA6 | 100 psi/0.01       | 690 kPa/0.001             | 0.07%                    | 316 SS                       | N/A                         | 316 SS           |
| <b>Vacuum</b>       | Fluke 700PV3 | -5 psi/0.0001      | -34 kPa/0.001             | 0.07%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700PV4 | -15 psi/0.001      | -103 kPa/0.01             | 0.07%                    | 316 SS                       | Dry                         | 316 SS           |
| <b>Dual</b>         | Fluke 700PD2 | $\pm$ 1 psi/0.0001 | $\pm$ 6900 Pa/0.7         | 0.20%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700PD3 | $\pm$ 5 psi/0.0001 | $\pm$ 34 kPa/0.001        | 0.07%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700PD4 | $\pm$ 15 psi/0.001 | $\pm$ 103 kPa/0.01        | 0.05%                    | 316 SS                       | Dry                         | 316 SS           |
|                     | Fluke 700PD5 | -15/30 psi/0.001   | -100/207 kPa/0.01         | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700PD6 | -15/100 psi/0.01   | -100/690 kPa/0.07         | 0.05%                    | 316 SS                       | N/A                         | 316 SS           |
|                     | Fluke 700PD7 | -15/200 psi/0.01   | -100/1380 kPa/0.1         | 0.07%                    | 316 SS                       | N/A                         | 316 SS           |
| <b>High</b>         | Fluke 700P29 | 3000 psi/0.1       | 20.7 M Pa/0.001           | 0.08%                    | C276                         | N/A                         | C276             |
|                     | Fluke 700P30 | 5000 psi/0.1       | 34 M Pa/0.001             | 0.08%                    | C276                         | N/A                         | C276             |
|                     | Fluke 700P31 | 10000 psi/1        | 69 M Pa/0.007             | 0.08%                    | C276                         | N/A                         | C276             |

<sup>1</sup>Total uncertainty, one year for temperature range 0°C to +50°C. Total uncertainty, 1.0% of full span for temperature range -10°C to 0°C.

For P00 module only, compensated temperature range is 15°C to 35°C.

<sup>2</sup>"Dry" indicates dry air or non-corrosive gas as compatible media.

"316SS" indicates media compatible with Type 316 Stainless Steel. "C276" indicates media compatible with Hastelloy C276.

Use of pressure zero is required prior to measurement or source. Max overpressure specification includes common mode pressure. Modules are CE rated. Metric adapter(s):

1/4" NPr female to male BSP/ISO 1/4-19, tapered thread, included with all modules except P29, P30, and P31, all modules include a NIST traceable certificate and test data.



## 525A-P Series Pressure Module Specifications

| Type         | Fluke Model | Range/Resolution  | Range/Resolution  | Uncertainty <sup>1</sup><br>(180 day) |
|--------------|-------------|-------------------|-------------------|---------------------------------------|
| Differential | 525A-P02    | 1psi / 0.00001    | 6900 Pa / 0.01    | 0.01% FS                              |
| Gage         | 525A-P05    | 30 psi / 0.0001   | 207 kPa / 0.001   | 0.01% FS                              |
| Gage         | 525A-P06    | 100 psi / 0.001   | 690 kPa / 0.001   | 0.01% FS                              |
| Gage         | 525A-P07    | 500 psi / 0.001   | 3400 kPa / 0.01   | 0.01% FS                              |
| Gage         | 525A-P08    | 1000 psi / 0.01   | 6900 kPa / 0.01   | 0.01% FS                              |
| Gage         | 525A-P29    | 3000 psi / 0.01   | 20.7 MPa / 0.0001 | 0.01% FS                              |
| Absolute     | 525A-PA6    | 100 psia / 0.001  | 690 KPa / 0.0001  | 0.01% FS                              |
| Absolute     | 525A-PA7    | 500 psia / 0.001  | 3400 kPa / 0.01   | 0.01% FS                              |
| Absolute     | 525A-PA8    | 1000 psia / 0.01  | 6900 kPa / 0.01   | 0.01% FS                              |
| Vacuum       | 525A-PV4    | - 15 psi / 0.0001 | - 103 kPa / 0.001 | 0.01% FS                              |
| Absolute     | 525A-PA4    | 15 psia / 0.0001  | 103 kPa / 0.001   | 0.01% FS                              |

Media - dry, non-corrosive gases

Total uncertainty (180 day): 0.01% FS (15°C to 45°C) : 1 year 0.025 % FS (15°C to 45°C)

Overpressure: 150% or greater

Compensated temperature range: 15°C to 45°C

Confidence interval: 95%

## General Specifications, 525A

|                               |                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warm-up Time                  | Twice the time since last warmed up, to a maximum of 30 minutes                                                                                                                                                     |
| Settling Time                 | Less than 5 seconds for all functions and ranges except as noted                                                                                                                                                    |
| Interfaces                    | Standard, RS-232; Optional, IEEE-488 (GPIB)                                                                                                                                                                         |
| Temperature Performance       | Operating: 0 °C to 50 °C; Calibration (tcal): 15 °C to 35 °C; Storage: -20 °C to 70 °C                                                                                                                              |
| Electromagnetic Compatibility | Meets CE requirements, including susceptibility                                                                                                                                                                     |
| Temperature Coefficient       | Temperature Coefficient for temperatures outside tcal +5 °C is 10% of the 90-day specification (or 1-year, as applicable) per °C                                                                                    |
| Relative Humidity             | Operating: <80% to 30 °C, <70% to 40 °C, <40% to 50 °C; Storage: <95%, noncondensing                                                                                                                                |
| Altitude                      | Operating: 3,050m (10,000 ft) maximum; Non-operating: 12,200m (40,000 ft) maximum                                                                                                                                   |
| Safety                        | Designed to comply with IEC 61010 Second Edition; ANSI/ISA-S82.01-1994; CAN/CSA-C22.2 No. 1010.1-92 Has CSA marking or equivalent                                                                                   |
| Analog Low Isolation          | 20V                                                                                                                                                                                                                 |
| EMC                           | Designed to comply with IEC 61326-1/1997 (EMC)                                                                                                                                                                      |
| Line Power                    | Line Voltage (selectable): 100/120V or 220/240V; Line Frequency: 47 to 63 Hz<br>Line Voltage Variation: +10% about line voltage setting                                                                             |
| Power Consumption             | < 10 VA                                                                                                                                                                                                             |
| Dimensions                    | Height, 13.2 cm (5.25 inches), plus 1.5 cm (0.6 inches) for feet on bottom of unit; Width, 32.6 cm (12.85 inches), 3/4 standard rack width; Depth, 33.3 cm (13.1 inches) overall; 23.9 cm (9.4 inches) chassis only |
| Weight (without options)      | 9 Lbs (4 Kg)                                                                                                                                                                                                        |



## Ordering Information

| Model              | Description                                                                                                                                                                                                                                                                        |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 525A               | Temperature/Pressure Calibrator                                                                                                                                                                                                                                                    |
| 525A-GPIB          | Temperature/Pressure Calibrator with GPIB interface                                                                                                                                                                                                                                |
| <b>Software</b>    |                                                                                                                                                                                                                                                                                    |
| MET/CAL            | Automated Calibration Software (IEEE-488 and RS-232)                                                                                                                                                                                                                               |
| <b>Accessories</b> |                                                                                                                                                                                                                                                                                    |
| 5520A-525A/Leads   | Thermocouple and test lead set<br>1 meter TC wire with male mini-plugs, All ANSI, L and U types; TC shorting plug;<br>1, 80 AK-8001 TC adapter; 1, bead thermocouple type K; 1 meter shielded test lead<br>with double banana plugs (M); 2, 30A test leads, banana type connectors |
| Y525               | 19" Rack Mount Kit                                                                                                                                                                                                                                                                 |
| Fluke 700PD3       | Dual Pressure Module ± 5 psi / ± 34 kPa                                                                                                                                                                                                                                            |
| Fluke 700P31       | High Pressure Module 10000 psi/69 M Pa                                                                                                                                                                                                                                             |
| Fluke 700P22       | Differential Pressure Module 1 psi / 6900 Pa                                                                                                                                                                                                                                       |
| Fluke 700P24       | Differential Pressure Module 15 psi / 103 kPa                                                                                                                                                                                                                                      |
| Fluke 700PD2       | Dual Pressure Module ± 1 psi / ± 6900 Pa                                                                                                                                                                                                                                           |
| Fluke 700P08       | Gage Pressure Module 1000 psi / 6900 kPa                                                                                                                                                                                                                                           |
| Fluke 700PA4       | Absolute Pressure Module 15 psi / 103 kPa                                                                                                                                                                                                                                          |
| Fluke 700P30       | High Pressure Module 5000 psi / 34 M Pa                                                                                                                                                                                                                                            |
| Fluke 700PD7       | Dual Pressure Module -15/200 psi / -100/1380 kPa                                                                                                                                                                                                                                   |
| Fluke 700P05       | Gage Pressure Module 30 psi / 207 kPa                                                                                                                                                                                                                                              |
| Fluke 700P06       | Gage Pressure Module 100 psi / 690 kPa                                                                                                                                                                                                                                             |
| Fluke 700P29       | High Pressure Module 3000 psi / 20.7 M Pa                                                                                                                                                                                                                                          |
| Fluke 700PD5       | Dual Pressure Module -15 / 30 psi / -100 / 207 kPa                                                                                                                                                                                                                                 |
| Fluke 700PV3       | Vacuum Pressure Module -5 psi / -34 kPa                                                                                                                                                                                                                                            |
| Fluke 700P23       | Differential Pressure Module 5 psi / 34 kPa                                                                                                                                                                                                                                        |
| Fluke 700PA5       | Absolute Pressure Module 30 psi / 207 kPa                                                                                                                                                                                                                                          |
| Fluke 700P03       | Differential Pressure Module 5 psi / 34 kPa                                                                                                                                                                                                                                        |
| Fluke 700PD6       | Dual Pressure Module -15/100 psi / -100/690 kPa                                                                                                                                                                                                                                    |
| Fluke 700P04       | Differential Pressure Module 15 psi / 103 kPa                                                                                                                                                                                                                                      |
| Fluke 700PA6       | Absolute Pressure Module 100 psi / 6900 kPa                                                                                                                                                                                                                                        |
| Fluke 700P01       | Differential Pressure Module 10.00 in. H2O / 2.5 kPa                                                                                                                                                                                                                               |
| Fluke 700PD4       | Dual Pressure Module ± 15 psi / ± 103 kPa                                                                                                                                                                                                                                          |
| PV350              | Pressure/Vacuum Module (0 to 350 PSI)                                                                                                                                                                                                                                              |
| Fluke 700P00       | Differential Pressure Module 1.000 in H2O / 0.25 kPa                                                                                                                                                                                                                               |
| Fluke 700P07       | Gage Pressure Module 500 psi / 3400 kPa                                                                                                                                                                                                                                            |
| Fluke 700P09       | Gage Pressure Module 1500 psi /10 MPa                                                                                                                                                                                                                                              |
| Fluke 700P02       | Differential Pressure Module 1 psi / 6900 Pa                                                                                                                                                                                                                                       |
| Fluke 700P27       | High Pressure Module 300 psi / 2070 kPa                                                                                                                                                                                                                                            |
| Fluke 700PV4       | Vacuum Pressure Module -15 psi / -103 kPa                                                                                                                                                                                                                                          |
| Fluke 700PA3       | Absolute Pressure Module 5 psi / 34 kPa                                                                                                                                                                                                                                            |
| 525A-P02           | Differential 1 psi / 6900 Pa                                                                                                                                                                                                                                                       |
| 525A-P05           | Gage 30 psi / 207 kPa                                                                                                                                                                                                                                                              |
| 525A-P06           | Gage 100 psi / 690 kPa                                                                                                                                                                                                                                                             |
| 525A-P07           | Gage 500 psi / 3400 kPa                                                                                                                                                                                                                                                            |
| 525A-P08           | Gage 1000 psi / 6900 kPa                                                                                                                                                                                                                                                           |
| 525A-P29           | Gage 3000 psi / 20.7 MPa                                                                                                                                                                                                                                                           |
| 525A-PA6           | Absolute 100 psia / 6900 kPa                                                                                                                                                                                                                                                       |
| 525A-PA7           | Absolute 500 psia / 3400 kPa                                                                                                                                                                                                                                                       |
| 525A-PA8           | Absolute 1000 psia / 6900 kPa                                                                                                                                                                                                                                                      |
| <b>Support</b>     |                                                                                                                                                                                                                                                                                    |
| MET/SUPPORT Gold   | Software Support Program, one-year membership                                                                                                                                                                                                                                      |
| MET/SUPPORT GLDNW  | MET/SUPPORT Gold Program, up to four workstations, one-year membership                                                                                                                                                                                                             |

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