Product Catalog

Additel

Metrology Made Simple

2024

Metrology Made Simple

ADDITEL CORPORATION

Additel Corporation is one of the leading worldwide providers of process calibration tools. We are dedicated to designing, manufacturing, and delivering the highest quality handheld test tools and portable calibrators for process and calibration industries. For many years Additel has successfully developed automated pressure calibrators, digital pressure test gauges, digital pressure calibrators, pressure test and calibration pumps, and multifunction process calibrators. In recent years, we have expanded our product offering with temperature calibration tools that are helping to make metrology simple. Coupled with our accredited calibration laboratory in Brea, CA, our products, calibration services and customer support are second to none. Additel products are currently used in over 100 countries worldwide, with a worldwide sales and support channel in place to assist you.

Product quality and customer service along with innovative engineering have been our top priorities and will continue to be our guiding principles going forward. We are committed to customer satisfaction through quality products, competitive pricing, unmatched services/technical support and continued introduction of new and innovative products.

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A Message From Additel's President

Dear Additel Customer,

Jon Sanders - Additel President

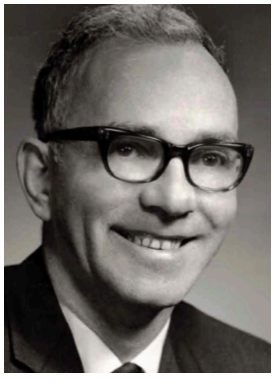
I grew up in a small town outside of Denver, Colorado where my grandfather started an insurance agency located on our main street. Later, my father took over the business and it continued to flourish until he sold the business just a few years ago. I marvel that our family business, not only survived, but grew over the last 50 years. Despite the industry switching from traditional agencies to direct internet sales, the family business continued to do well. As I look back at this, I believe I know why my father and grandfather did so well.

When Grandpa started Sanders Insurance Agency, he confirmed his business deals with a handshake. There were no lengthy written contracts, price lists, or complex agreements. Just his word and a handshake were all that was needed because he was known as a man of integrity who put his customer first. My father continued to grow the business on the same foundational principles.

I joined Additel in 2013 and saw an organization founded on values of integrity and customer service. And when I saw the amazing high-quality, innovative products and I knew this was the start of something special.

Denver, CO USA

Over the years, we've outgrown buildings and continue to add more people. But we don't just hire anyone. To have the best products and services, you need to have the best people behind them! Quality and customer service go far beyond a well-designed product-it reaches into the very fabric of the company culture. We look for people that enjoy serving you and will not compromise quality.



Guy Sanders

Year over year, we continue to introduce new products which are industry firsts. Look on page 1 and you will see we've done it again with our new ADT762—the only portable, automated calibrator up to 10,000 psi (700 bar) on the market. We invest a tremendous amount of time and effort into research and development to regularly introduce breakthrough products that address some of the test and measurement challenges you see on a day-to-day basis.

As we've grown, so has our gratitude and appreciation for you. I know customers just like you are the key to our success. We are not perfect and occasionally we will make mistakes, but I can promise you if we do mess up, we will do all in our power to make it right. And that is something we can shake on! Thank you for your business!

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Additel 762
Automated Hydraulic Pressure Calibrator

- **Automated pressure generation and control to 15,000 psi (1,000 Bar)**
- **Accuracy to 0.01%FS**
- **Dual-range manual or auto select**
- Control stability 0.005%FS
- Portable - designed for use in the field and in the lab
- Control by optional external pressure modules
- Supports two external pressure modules
- Wi-Fi, LAN, Bluetooth, USB and Ethernet communication
- Full HART field communicator
- HART and PROFIBUS communication
- Data logging and task management
- Patented electric pump technology

OVERVIEW

The Additel 762 Automated Pressure Calibrator is unlike any other pressure calibrator on the market. This revolutionary product is a complete turnkey solution for automation of pressure calibration work up to 15,000 PSI.

Designed for use in both the field and the laboratory, the portability and accuracy of this state-of-the-art product will quickly become the favorite go-to calibrator for lab personnel and field technicians alike.

With fully automated support for calibration of pressure transmitters, switches, dial and digital gauges and sensors, including HART/PROFIBUS devices in conjunction with a fully integrated task feature, data collection and Wi-Fi connectivity, we had our customer's needs in mind when designing our most capable pressure calibrator to date.

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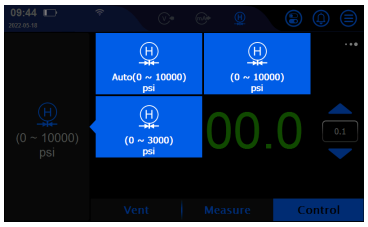
Dual-Range Accuracy to 0.01% FS

The ADT762 includes the unique ability to automatically switch between different internal calibrations depending on the current control pressure of the ADT762. Additel provides calibrations unique to each ADT762 for ranges of 0-3,000 PSI (200 Bar) and 0-10,000 PSI (700 Bar) in the GP10K base model and 0-6,000 PSI (400 Bar) and 0-15,000 PSI (1,000 Bar) in the GP15K model. As the calibrator is pressurized, it will automatically select the control and measurement specification based on the specific pressure range. Pressure calibration range selection can be set to “auto” mode so the calibration range is automatically selected by the ADT762 based on the set point pressure, or the calibration range can be manually selected.

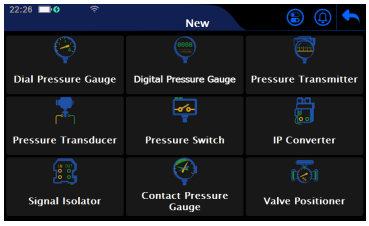


Built-in Auto-Purge Application

Purging hydraulic calibration systems can be challenging and time consuming. The ADT762 has been designed with an integrated auto-purge system that saves time, money and frustration by completely automating the removal of air from the system. With the push of a button, the ADT762 quickly manages the system purging. This helps to free up time for technicians to attend to other needs.

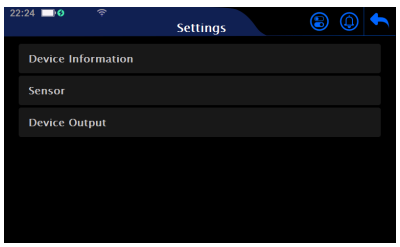
Documented Task Feature

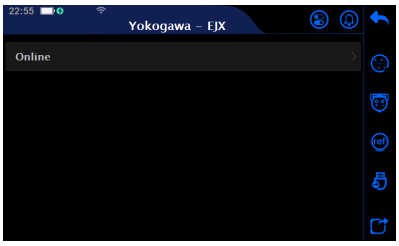
The powerful documented calibration task application allows users to quickly create and execute tasks without the need for a PC or tablet. The ADT762 automatically analyzes errors, generates test reports, while storing results locally. The Additel 762 can support up to 1000 documented tasks which can be stored and recalled at any time to help save time and money.

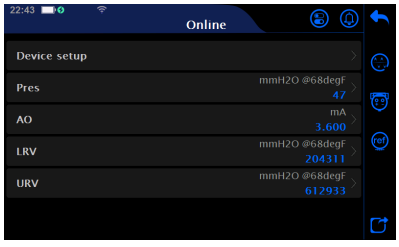


Dual-Mode HART Communication

HART pressure transmitters can be directly maintained and calibrated without any other equipment or tools. The ADT762 provides an automatic HART calibration mode as well as a manual mode. This dual-mode HART communication function not only provides an efficient and convenient interoperability mode for DUT, but also supports access to a fully HART capable calibrator.







Pressure Specifications

Specification \ Model	ADT762 Automated Hydraulic Pressure Calibrator	
Pressure Range	15-10,000 psi (1-700 Bar) and 15-15,000 psi (1-1,000 Bar)	
Range Selection	Manual 3K psi, 10K psi or auto-range for the GP10K and Manual 6k psi, 15K psi or auto-range for the GP15K	
Accuracy	GP15K: 0~15,000 psi, 0.01%FS [2] GP15K: 0~6,000 psi, 0.01%FS [2]	GP15K: 0~15,000 psi, 0.02%FS [2] GP15K: 0~6,000 psi, 0.02%FS [2]
	GP10K: 0~10,000 psi, 0.01%FS [2] GP10K: 0~3,000 psi, 0.01%FS [2]	GP10K: 0~10,000 psi, 0.02%FS [2] GP10K: 0~3,000 psi, 0.02%FS [2]
Resolution	7 digits	6 digits
Measurement Units	Pa, hPa, kPa, mPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH2O@4°C, mmH2O@4°C, cmH2O@4°C, mH2O@4°C, mmH2O@20°C, cmH2O@20°C, mH2O@20°C, inH2O@20°C, inH2O@68°F, kgf/cm2, mtorr, torr, lb/ft2, tsi, custom	
Maximum External Load Capacity	Max: 80 ml@60 MPa, 60 ml@100 MPa, 50 ml recommend	
Reservoir	Max: 350 ml, built-in filter	
Control Stability [1]	0.005%FS from 100 to 15,000 psi	
Stability Duration	＞5 min	
Pressure Module	Built-in one module with dual range	
External Control Pressure Module	See the following "External Control Pressure Module Specification and Compatibility" table	
External Measurement Pressure Module	All ADT161 pressure modules	

[1] Control Stability is based on the range selection or external module
[2] Pressure range capabilities are dependent on model. See ordering info.

Electrical Specifications

Specification \ Model	Range	Resolution	Accuracy	Note
mA Measure	-25 to 25 mA	0.1 μA	± (0.008%RD + 1.0 μA)	Impedance <10 Ω
	-50 to 50 mA	0.1 μA	± (0.008%RD + 2.0 μA)	
V Measure	-300 to 300 mV	1 μV	± (0.008%RD + 6 μV)	Impedance <1 GΩ
V Measure (Auto-ranging)	-5 to 5 V	20 μV	± (0.008%RD + 100 μV)	Impedance >1 MΩ
	-12 to 12 V	100 μV	± (0.008%RD + 320 μV)	
	-30 to 30 V	100 μV	± (0.008%RD + 600 μV)	
Loop Power Source	24 V	N/A	±1 V	50 mA (Max Loading)
mA Source	0 to 2.5 mA or 2.5 to 25 mA	0-2.5 mA: 0.05μA 0-25 mA:0.5μA	0-2.5 mA: 0.008%RD + 0.2 μA 0-25 mA: 0.008%RD + 1.0 μA	20 mA @ 1 KΩ
Power Source	16 to 30 V	1 V	±1 V	70 mA (Max Loading)
V Source	0 to 16 V	0.25 mV	0.008%RD + 500 μV	
Pressure Switch	Mechanical Switch, Live Mechanical Switch, NPN Switch, PNP Switch	N/A	N/A	Response time<10 ms. If the switch is live, voltage range will be (3-30) V
Temperature Compensation	18 °C to 28°C			
Temperature Coefficient	Outside of 18 °C to 28 °C: <± 0.0005%RD + 0.00005%FS/°C			
Misuse Protection	Up to 30 V on any two sockets			
Pressure Switch Test	●			
HART / PROFIBUS PA	●			

● Supported

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External Control Pressure Module Specification and Compatibility

Specification / Model	Pressure Range (psi)	Pressure Range (bar)	Accuracy	Pressure Type	Media
ADT161-01-GPXX for 0.01%FS	1,000	70	0.01% FS	Gauge	G,L
	1,500	100	0.01% FS	Gauge	G,L
	2,000	140	0.01% FS	Gauge	G,L
	3,000	200	0.01% FS	Gauge	G,L
	5,000	350	0.01% FS	Gauge	G,L
	10,000	700	0.01% FS	Gauge	G,L
	15,000	1000	0.01% FS	Gauge	G,L
ADT161-02-GPXX for 0.02%FS	1,000	70	0.02% FS	Gauge	G,L
	1,500	100	0.02% FS	Gauge	G,L
	2,000	140	0.02% FS	Gauge	G,L
	3,000	200	0.02% FS	Gauge	G,L
	5,000	350	0.02% FS	Gauge	G,L
	10,000	700	0.02% FS	Gauge	G,L
	15,000	1000	0.02% FS	Gauge	G,L

General Specifications

Specification	Description
User Interface	Color touch screen and keypad operation
Display	7” TFT touch screen 800 x 480 color
Enclosure IP Rating	IP31
Power	Dedicated lithium battery or power adapter
Battery	Rechargeable Li-Ion battery, typically 12 hours of operation, less than 5 hours recharge.
Weight	28 lbs (12.8 kg) without media
Media	Sebacate oil
Size	11.81 x 8.66 x 7.56 in (300 x 220 x 192 mm)
Communications	USB, LAN, Bluetooth, Wi-Fi and Ethernet
HART Communication	Read, configure and calibrate HART devices - DD files updated periodically
Data Storage	＞8 GB
Data Logging	Up to 1,000,000 readings (data and time stamped)
Task Documentation	Up to 1,000 tasks can be stored with data
Automation Functions	Switch test, auto step, leak test
User Interface Localization	English, German, French, Italian, Spanish, Portuguese, Chinese, Japanese, and Russian
Pump Life	> 1,000,000 cycles
Environmental Specifications	Operating temperature: 32 °F to 122 °F(0 °C to 50 °C)
	Storage temperature: -20 °C to 60 °C (-4 °F to 120 °F)
	Humidity: <90%, non-condensing
Certification	ISO 17025 accredited certificate of calibration with NIST-traceable data
Compliance	CE
Software Compatibility	ACal, Additel Land and Additel Link for access via mobile application
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

ORDERING INFORMATION

Model Number

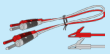
ADT762 — 01 — GP15K — N

Accuracy:
01 = 0.01% of full span
02 = 0.02% of full span

Rang:
GP10K = 10,000 psi
GP15K = 15,000 psi

Pressure port type:
N - 1/4 NPT female
N2 - 1/2 NPT female
B - 1/4 BSP female
B2 - 1/2 BSP female
M - M20X1.5 female

Accessories (included)

Model number	Quantity	Picture
9022 Test Leads	2 sets (4 pcs)	
USB Cable	1 pc	
9725 Rechargeable Li-ion battery	1 pc	
9818 110V/220V external Power adapter	1 pc	
Funnel	1 pc	
ADT100-762Hose High pressure hose	1 pc	
Small accessory case (For cables and adaptors)	1 pc	
Transportation cap	1 pc	
9241 Replacement gas filled accumulator for ADT762 and ADT793	1 pc	
9907-762 Carrying case	1 pc	
Sebacate oil (500ml)	1 bottle	
O rings for liquid storage tank 3.5*1.2-NBR70	5 pcs	
O rings for right angle connector 5*1.5-NBR70	5 pcs	
9060 Pressure module connection cable	1 pc	
ADT100-762-X	1 pc	
ISO17025 accredited calibration certificate	1 pc	

Optional Accessories

Model number	Description	Picture
ADT107-X-KIT	Includes dual ports manifold (15,000 psi), and zero return communication cable	
ADT161	Pressure modules see pg. 4	
ADT100-762-X	ADT762 right angle connector	
9241	Replacement gas filled accumulator for ADT762 and ADT793	
9201	Sebacate oil (1-Liter)	

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Additel 762W

Automated Hydraulic Pressure Calibrator

- **Automated pressure generation and control to 15,000 psi (1,000 Bar)**
- **Accuracy to 0.01%FS**
- **Dual-range manual or auto select**
- **Designed for use with water**
- **Automated fluid management**
- Control stability 0.005%FS
- Portable - designed for use in the field and in the lab
- Supports two external pressure modules
- Wi-Fi, LAN, Bluetooth, USB and Ethernet communication
- Full HART field communicator
- HART and PROFIBUS communication
- Data logging and task management
- Patented electric pump technology

OVERVIEW

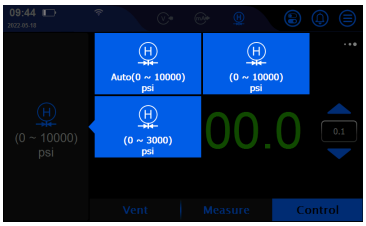
The Additel 762W Automated Pressure Calibrator provides a revolutionary turnkey solution for automated pressure calibration work up to 15,000 PSI using deionized water as the working media.

Designed for use in both the field and the laboratory, the portability and accuracy of this state-of-the-art product will quickly become the favorite go-to calibrator for lab personnel and field technicians alike.

With fully automated support for calibration of pressure transmitters, switches, dial and digital gauges and sensors, including HART/PROFIBUS devices in conjunction with a fully integrated task feature, data collection and Wi-Fi connectivity, we had our customer's needs in mind when designing our most capable pressure calibrator to date.

Dual-Range Accuracy to 0.01% FS

The ADT762W includes the unique ability to automatically switch between different internal calibrations depending on the current control pressure of the ADT762W. Additel provides calibrations unique to each ADT762 for ranges of 0-3,000 PSI (200 Bar) and 0-10,000 PSI (700 Bar) in the GP10K base model and 0-6,000 PSI (400 Bar) and 0-15,000 PSI (1,000 Bar) in the GP15K model. As the calibrator is pressurized, it will automatically select the control and measurement specification based on the specific pressure range. Pressure calibration range selection can be set to “auto” mode so the calibration range is automatically selected by the ADT762W based on the set point pressure, or the calibration range can be manually selected.



Built-in Auto-Purge Application

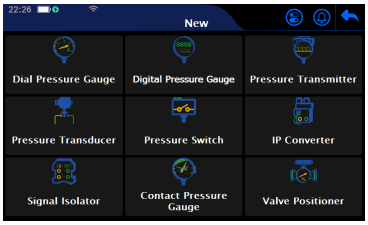
Purging hydraulic calibration systems can be challenging and time consuming. The ADT762W has been specifically designed for use with water. It comes standard with a specially designed manifold to help provide a constant positive pressure environment to mitigate concerns with contamination when using water as a medium. The integrated auto-purge system saves time, money and frustration by completely automating the removal of air from the system. With the push of a button, the ADT762W quickly manages the system purging. This helps to free up time for technicians to attend to other needs.

Dual-Port Manifold with Automatic Fluid Extraction

When using hydraulic systems, we know that oils are a better lubricant and sustain the life of seals and components than water. But we recognize that for some applications, using oil is not an option. The ADT762W is designed to only be used with deionized water. The ADT762W has a built-in fluid management system to reduce standing water in the system which eases future maintenance requirements. The ADT762W should be used with the provided manifold which has a communication connection directly to the unit to actuate a vent valve built into the manifold. This configuration is designed to prevent contaminated fluid from returning to the base unit and manifold as it is deposited into a special waste tank on the bottom of the ADT107 manifold. This function helps ensure the longest life of the unit and reduced maintenance costs.

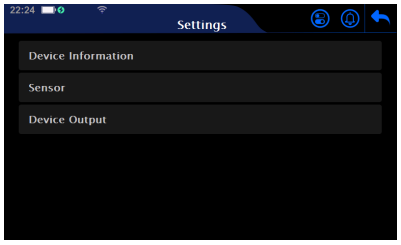
Documented Task Feature

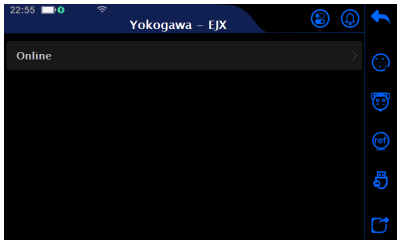
The powerful documented calibration task application allows users to quickly create and execute tasks without the need for a PC or tablet. The ADT762W automatically analyzes errors, generates test reports, while storing results locally. The Additel 762W can support up to 1000 documented tasks which can be stored and recalled at any time to help save time and money.

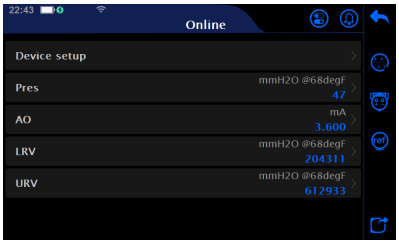


Dual-Mode HART Communication

HART pressure transmitters can be directly maintained and calibrated without any other equipment or tools. The ADT762W provides an automatic HART calibration mode as well as a manual mode. This dual-mode HART communication function not only provides an efficient and convenient interoperability mode for DUT, but also supports access to a fully HART capable calibrator.







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Pressure Specifications

Specification \ Model	ADT762W Automated Hydraulic Pressure Calibrator	
Pressure Range	15-10,000 psi (1-700 Bar) and 15-15,000 psi (1-1,000 Bar)	
Range Selection	Manual 3K psi, 10K psi or auto-range for the GP10K and Manual 6k psi, 15K psi or auto-range for the GP15K	
Accuracy	GP15K: 0~15,000 psi, 0.01%FS [2] GP15K: 0~6,000 psi, 0.01%FS [2]	GP15K: 0~15,000 psi, 0.02%FS [2] GP15K: 0~6,000 psi, 0.02%FS [2]
	GP10K: 0~10,000 psi, 0.01%FS [2] GP10K: 0~3,000 psi, 0.01%FS [2]	GP10K: 0~10,000 psi, 0.02%FS [2] GP10K: 0~3,000 psi, 0.02%FS [2]
Resolution	7 digits	6 digits
Measurement Units	Pa, hPa, kPa, mPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH2O@4°C, mmH2O@4°C, cmH2O@4°C, mH2O@4°C, mmH2O@20°C, cmH2O@20°C, mH2O@20°C, inH2O@20°C, inH2O@68°F, kgf/cm2, mtorr, torr, lb/ft2, tsi, custom	
Maximum External Load Capacity	Max: 80 ml@60 MPa,60 ml@100 MPa, 50 ml recommend	
Reservoir	Max: 350 ml, built-in filter	
Control Stability [1]	0.005%FS from 100 to 15,000 psi	
Stability Duration	> 5 min	
Pressure Module	Built-in one module with dual range	
External Control Pressure Module	See the following "External Control Pressure Module Specification and Compatibility" table	
External Measurement Pressure Module	All ADT161 pressure modules	

[1] Control Stability is based on the range selection or external module
[2] Pressure range capabilities are dependent on model. See ordering info.

Electrical Specifications

Specification \ Model	Range	Resolution	Accuracy	Note
mA Measure	-25 to 25 mA	0.1 μA	± (0.008%RD + 1.0 μA)	Impedance <10 Ω
	-50 to 50 mA	0.1 μA	± (0.008%RD + 2.0 μA)	
V Measure	-300 to 300 mV	1 μV	± (0.008%RD + 6 μV)	Impedance <1 GΩ
V Measure (Auto-ranging)	-5 to 5 V	20 μV	± (0.008%RD + 100 μV)	Impedance >1 MΩ
	-12 to 12 V	100 μV	± (0.008%RD + 320 μV)	
	-30 to 30 V	100 μV	± (0.008%RD + 600 μV)	
Loop Power Source	24 V	N/A	±1 V	50 mA (Max Loading)
mA Source	0 to 2.5 mA or 2.5 to 25 mA	0-2.5 mA: 0.05μA 0-25 mA:0.5μA	0-2.5 mA: 0.008%RD + 0.2 μA 0-25 mA: 0.008%RD + 1.0 μA	20 mA @ 1 KΩ
Power Source	16 to 30 V	1 V	±1 V	70 mA (Max Loading)
V Source	0 to 16 V	0.25 mV	0.008%RD + 500 μV	
Pressure Switch	Mechanical Switch, Live Mechanical Switch, NPN Switch, PNP Switch	N/A	N/A	Response time<10 ms. If the switch is live, voltage range will be (3-30) V
Temperature Compensation	18 °C to 28°C			
Temperature Coefficient	Outside of 18 °C to 28 °C: <± 0.0005%RD + 0.00005%FS/°C			
Misuse Protection	Up to 30 V on any two sockets			
Pressure Switch Test	●			
HART / PROFIBUS PA	●			

● Supported

External Control Pressure Module Specification and Compatibility

Specification / Model	Pressure Range (psi)	Pressure Range (bar)	Accuracy	Pressure Type	Media
ADT161-01-GPXX for 0.01%FS	1,000	70	0.01% FS	Gauge	G,L
	1,500	100	0.01% FS	Gauge	G,L
	2,000	140	0.01% FS	Gauge	G,L
	3,000	200	0.01% FS	Gauge	G,L
	5,000	350	0.01% FS	Gauge	G,L
	10,000	700	0.01% FS	Gauge	G,L
	15,000	1000	0.01% FS	Gauge	G,L
ADT161-02-GPXX for 0.02%FS	1,000	70	0.02% FS	Gauge	G,L
	1,500	100	0.02% FS	Gauge	G,L
	2,000	140	0.02% FS	Gauge	G,L
	3,000	200	0.02% FS	Gauge	G,L
	5,000	350	0.02% FS	Gauge	G,L
	10,000	700	0.02% FS	Gauge	G,L
	15,000	1000	0.02% FS	Gauge	G,L

General Specifications

Specification	Description
User Interface	Color touch screen and keypad operation
Display	7” TFT touch screen 800 x 480 color
Enclosure IP Rating	IP31
Power	Dedicated lithium battery or power adapter
Battery	Rechargeable Li-Ion battery, typically 12 hours of operation, less than 5 hours recharge.
Weight	28 lbs (12.8 kg) without media
Media	Deionized water
Size	11.81 x 8.66 x 7.56 in (300 x 220 x 192 mm)
Communications	USB, LAN, Bluetooth, Wi-Fi and Ethernet
HART Communication	Read, configure and calibrate HART devices - DD files updated periodically
Data Storage	＞8 GB
Data Logging	Up to 1,000,000 readings (data and time stamped)
Task Documentation	Up to 1,000 tasks can be stored with data
Automation Functions	Switch test, auto step, leak test
User Interface Localization	English, German, French, Italian, Spanish, Portuguese, Chinese, Japanese, and Russian
Pump Life	> 1,000,000 cycles
Environmental Specifications	Operating temperature: 32 °F to 122 °F(0 °C to 50 °C)
	Storage temperature: -20 °C to 60 °C (-4 °F to 120 °F)
	Humidity: <90%, non-condensing
Certification	ISO 17025 accredited certificate of calibration with NIST-traceable data
Compliance	CE
Software Compatibility	ACal, Additel Land and Additel Link for access via mobile application
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

ORDERING INFORMATION

Model Number

ADT762 W — 01 — GP15K — N

Accuracy:
01 = 0.01% of full span
02 = 0.02% of full span

Rang:
GP10K = 10,000 psi
GP15K = 15,000 psi

Pressure port type:
N - 1/4 NPT female
N2 - 1/2 NPT female
B - 1/4 BSP female
B2 - 1/2 BSP female
M - M20X1.5 female

Accessories (included)

Model number	Quantity	Picture
9022 Test Leads	2 sets (4 pcs)	
USB Cable	1 pc	
9725 Rechargeable Li-ion battery	1 pc	
9818 110V/220V external Power adapter	1 pc	
Funnel	1 pc	
ADT100-762Hose High pressure hose	1 pc	
ADT100-762-SSTUBE Stainless steel high pressure hose	1 pc	
ADT107-X-KIT Dual ports manifold (15,000 psi), and zero return communication cable	1pc	
Small accessory case (For cables and adaptors)	1 pc	
Transportation cap	1 pc	
9241W Replacement gas filled accumulator for ADT762W and ADT793W	1 pc	
9907-762 Carrying case	1 pc	
O rings for liquid storage tank 3.5*1.2-NBR70	5 pcs	
O rings for right angle connector 5*1.5-NBR70	5 pcs	
9060 Pressure module connection cable	1 pc	
ISO17025 accredited calibration certificate	1 pc	

Optional Accessories

Model number	Description	Picture
ADT161	Pressure modules see pg. 4	
9241W	Replacement gas filled accumulator for ADT762W and ADT793W	

Additel 761A
Series Automated Pressure Calibrators

Selection Guide

Model / Features	761A-LLP	761A-D	761A-500	761A-1K	761A-BP
Pressure Range	-75 to 75 mbar (-30 to 30 inH_2O)	-0.95 to 2.5 bar.g (-13.5 to 35 psig)	-0.90 to 35 bar.g (-13 to 500 psig)	-0.90 to 70 bar.g (-13 to 1000 psig)	100 to 1,200 hPa
Control Stability	0.003%FS or 0.05 Pa	0.003%FS	0.003%FS	0.003%FS	0.02 hPa
Number of Internal Modules	2	2	2	2	1
Removable Internal Modules	●	●	●	●	
Differential Pressure	●	●			
Gauge Pressure	●	●	●	●	
Absolute Pressure			●	●	●
Barometric Pressure			●	●	●
Two External Pressure Modules	●	●	●	●	●
Built-in Electric Pump	●	●	●	●	●
Source/Simulate mA	●	●	●	●	●
Measure mA or V	●	●	●	●	●
24V Loop Power	●	●	●	●	●
Pressure Switch Test	●	●	●	●	●
HART/Profibus Communication	●	●	●	●	●
Task Documentation	●	●	●	●	●
Data Logging	●	●	●	●	●

Additel 761A
Series Automated Pressure Calibrators

Additel
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- **Automated and self-contained pressure generation and control to 1,000 psi (70 bar)**
- **Precision accuracy models to 0.01%FS**
- Two removable internal pressure modules for multi-range selection
- Control stability to 0.003%FS
- Portable, designed for use in the field and in the lab
- Ability to measure two external pressure modules
- Wi-Fi, LAN, Bluetooth, USB and Ethernet communication
- Full HART field communicator
- HART and profibus communication
- Data logging and task management
- Patented electric pump technology and improved speed

OVERVIEW

At Additel, innovation and continuous improvement are part of our company's culture and the products we introduce. When we set out to deliver the Additel 761A series calibrators, we knew we needed to provide breakthrough improvements and additional value to the existing line of calibrators (Additel 761 series). The ADT761A has many improvements: increased pressure range to 1,000 psi (70 bar), removable internal pressure modules, precision accuracy models available to 0.01%FS, increased speed to pressure, ability to read two external pressure modules, touch screen display, Wi-Fi, LAN, Bluetooth, and Ethernet communications, double the original battery life, and more!

Just like the first generation, this second generation product is completely self-contained and automated with a built-in pump for pressure generation and precision control technology. Simply set the desired pressure and watch the calibrator do the work.

ADT761A-LLP

The Additel 761A-LLP is designed for low pressure calibration and comes with a ±30 inH2O (±75 mbar) high range module and a low range module of your choice ranging from ±20 inH2O to as low as ±0.25 inH2O (±50 to ±0.62 mbar). This unit has an accuracy of 0.05%FS with control stability better than 0.005%FS. All measurements can be made in differential or gauge pressures.

ADT761A-D

The Additel 761A-D also provides differential and gauge measurement which covers the range of -13.5 to 35 psi (-0.95 to 2.5 bar). This unit comes with a CP35 module (-13.5 to 35 psi) and one low range module of your choice ranging as low as ±10 inH2O (25 mbar). Each ADT761A-D can be preconfigured with the modules that fit your need to give you the best precision at the pressures you perform calibrations.

ADT761A-500

The Additel 761A-500 will generate and control from vacuum pressures up to 500 psig (35 bar.g). Both gauge and absolute pressures can be realized due to a built-in barometer. Each unit comes with a CP500 module (-13 to 500 psig) for the high range and the low range can be preconfigured based on the variety of modules available down to 10 psig (0.7 bar.g).

ADT761A-1K

The Additel 761A-1K will generate and control from vacuum pressures up to 1,000 psig (70 bar.g). This unit can typically achieve 1,000 psi in less than 45 seconds. Like the ADT761A-500, both gauge and absolute pressures can be realized due to a built-in barometer. Each unit comes with a CP1K module (-13 to 1,000 psig) for the high range and the low range can be preconfigured based on the variety of modules available down to 30 psig (2 bar.g).

ADT761A-BP

The Additel 761A-BP is designed for calibration of barometer sensors. With a range of 100 to 1200 hPa and an accuracy of 0.01%FS, this unit is ideal for calibration on the bench or in the field.

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Pressure Specifications

Specification \ Model	761A-LLP	761A-D	761A-500	761A-1K	761A-BP
Max Pressure Range	30 inH2O (75 mbar)	35 psi (2.5 bar)	500 psig (35 bar.g)	1,000 psig (70 bar.g)	1,200 hPa
Min Pressure Range	-30 inH2O (-75 mbar)	-13.5 psi (-0.95 bar)	-13 psi (-0.9 bar)	-13 psi (-0.9 bar)	100 hPa
Accuracy[1]	0.05%FS	0.02%FS	0.01%FS or 0.02%FS[2]	0.01%FS or 0.02%FS[2]	0.01%FS
Stability	0.003%FS or 0.05 Pa	0.003%FS	0.003%FS	0.003%FS	0.02 hPa
Pressure Type	Differential, Gauge	Differential, Gauge	Gauge, Absolute	Gauge, Absolute	Absolute
Over Range Indication	120%				
Resolution	6 digits				
Measurement Units	Pa, hPa, kPa, mPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH2O@4°C, mmH2O@4°C, cmH2O@4°C, mH2O@4°C, mmH2O@20°C, cmH2O@20°C, mH2O@20°C, inH2O@20°C, inH2O@68°F, kgf/cm2, mtorr, torr, lb/ft2, tsi, custom				
Barometric Accuracy	N/A	N/A	55 Pa	55 Pa	N/A

[1] One year accuracy (including 1 year stability). FS specification applies to the span of the module range.
[2] Specification based on gauge measurement. An additional 55 pa uncertainty will need to be included when measuring in absolute mode. Applicable only for use with the ADT761A-500 and ADT761A-1K.

* Additel 761A calibrators support 161 series intelligent digital pressure modules that are available for gauge, vacuum pressure from -15 psi to 60,000 psi (-1 bar to 4,200 bar). For detailed specifications refer to the 161 series pressure modules datasheet.

Electrical Specifications

Specification \ Model	Range	Resolution	Accuracy	Note
mA Measure	-25 to 25 mA	0.1 µA	± (0.008%RD + 1.0 µA)	Impedance <10 Ω
	-50 to 50 mA	0.1 µA	± (0.008%RD + 2.0 µA)	
V Measure	-300 to 300 mV	1 µV	± (0.008%RD + 6 µV)	Impedance <1 GΩ
V Measure (Auto-ranging)	-5 to 5 V	20 µV	± (0.008%RD + 100 µV)	Impedance >1 MΩ
	-12 to 12 V	100 µV	± (0.008%RD + 320 µV)	
	-30 to 30 V	100 µV	± (0.008%RD + 600 µV)	
Loop Power Source	24 V	N/A	±1 V	50 mA (Max Loading)
mA Source	0 to 2.5 mA or 2.5 to 25 mA	0 - 2.5 mA: 0.05 µA 0 - 25 mA: 0.5 µA	0-2.5 mA: 0.008%RD + 0.2 µA 0-25 mA: 0.008%RD +1.0 µA	20 mA @ 1 KΩ
Power Source	16 to 30 V	1 V	±1 V	70 mA (Max Loading)
V Source	0 to 16 V	0.25 mV	0.008%RD + 500 µV	
Pressure Switch	Mechanical Switch, Live Mechanical Switch, NPN Switch, PNP Switch	N/A	N/A	Response time<10 ms. If the switch is live, voltage range will be (3-30) V
Temperature Compensation	18 °C to 28°C			
Temperature Coefficient	Outside of 18 °C to 28 °C: <± (0.0005%RD + 0.00005%FS) /°C			
Misuse Protection	Up to 30 V on any two sockets			
Pressure Switch Test	●			
HART / PROFIBUS PA	●			

● Supported

Internal Module Specification and Compatibility

Model / Range	inH2O[6]	mbar[6]	Media	Accuracy (%FS)[1]	Burst Pressure	761A-LLP	761A-D	761A-500	761A-1K
ADT155-20-DP025	±0.25	±0.62	G	0.2[2]	100x	●			
ADT155-10-DP050	±0.5	±1.25	G	0.1[3]	100x	●			
ADT155-05-DP1	±1	±2.5	G	0.05[4]	100x	●			
ADT155-05-DP2	±2	±5	G	0.05[4]	100x	●			
ADT155-05-DP5	±5	±10	G	0.05[4]	50x	●			
ADT155-05-DP10	±10	±25	G	0.05[4]	20x	●	●		
ADT155-05-DP20	±20	±50	G	0.05	20x	●	●		
ADT155-05-DP30	±30	±75	G	0.05	20x	●	●		
ADT155-05-DP50	±50	±125	G	0.05	3x		●		
ADT155-02-DP100	±100	±250	G	0.02	3x		●		
ADT155-02-DP150	±150	±350	G	0.02	3x		●		
ADT155-02-DP300	±300	±700	G	0.02	3x		●		
ADT155-02-DP400	-380 to 400	-950 to 1K	G	0.02	3x		●		
ADT155-02-DP800	-380 to 800	-950 to 2K	G	0.02	3x		●		
ADT155-02-DP1K	-380 to 1K	-950 to 2.5K	G	0.02	3x		●		
Gauge Pressure	**psig**	**bar.g**							
ADT155-01/02-CP10	±10	±0.7	G	0.01[7] / 0.02[5]	3x		●[7]	●	
ADT155-01/02-CP15	-13.5 to 15	-0.95 to 1	G	0.01[7] / 0.02[5]	3x		●[7]	●	
ADT155-01/02-CP30	-13.5 to 30	-0.95 to 2	G	0.01[7] / 0.02[5]	3x		●[7]	●	●
ADT155-01/02-CP35	-13.5 to 35	-0.95 to 2.5	G	0.01[7] / 0.02[5]	3x		●[7]	●	●
ADT155-01/02-CP50	-13.5 to 50	-0.95 to 3.5	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP100	-13.5 to 100	-0.95 to 7	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP150	-13.5 to 150	-0.95 to 10	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP200	-13.5 to 200	-0.95 to 14	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP300	-13.5 to 300	-0.95 to 20	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP500	-13.5 to 500	-0.95 to 35	G	0.01 / 0.02[5]	3x			●	●
ADT155-01/02-CP600	-13.5 to 600	-0.95 to 40	G	0.01 / 0.02[5]	3x				●
ADT155-01/02-CP1K	-13.5 to 1K	-0.95 to 70	G	0.01 / 0.02[5]	3x				●

[1] FS specification applies to the span of the module range. Accuracy includes one-year stability, except for DP025 to DP10 modules.
[2] Accuracy is a 6 months spec, 1-year long-term drift is 0.2%FS.
[3] Accuracy is a 6 months spec, 1-year long-term drift is 0.1%FS.
[4] Accuracy is a 6 months spec, 1-year long-term drift is 0.05%FS.
[5] Specification based on gauge measurement. An additional 55 Pa uncertainty will need to be included when measuring in absolute mode.
[6] The low module pressure range may be outside the pressure range of the calibrator.
Applicable only for use with the ADT761A-500 and ADT761A-1K.
[7] 0.01%FS accuracy specification not available for 761A-D models.
* ADT155 Pressure modules are calibrated in psi & inH2O.

Now Offering
0.01% Accuracy

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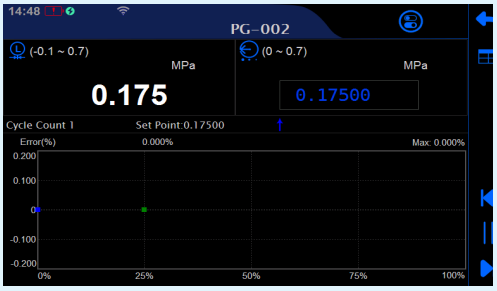
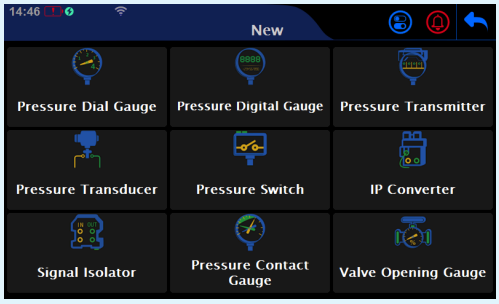
General Specifications

Specification	Description
User Interface	Color touch screen and/or keypad operation
Channels	Four total: one electrical, high or low internal pressure module, two external pressure modules
Enclosure IP Rating	IP31
Battery	Rechargeable Li-Ion battery, typically 12 hours of operation, recharges in less than 5 hours.
Power	Rechargeable Li-Ion battery, external power 110/220 V power adapter 27 V
Display	7" TFT touch screen 800 x 480 color
Communications	USB, LAN, Bluetooth, Wi-Fi and Ethernet
Weight	<17.52 lb (7.95 KG)
Size	11.77 x 7.60 x 7.56 in (299 x 193 x 192 mm)
Certification	ISO 17025 accredited certificate of calibration with NIST-traceable data
Data Storage	＞8 GB
Data Logging	Up to 1,000,000 readings (data and time stamped)
HART Communicator	Read, configure and calibrate HART devices - DD files updated periodically
Task documentation	Up to 1000 tasks can be stored with data
Automation Functions	Switch test, auto step, leak test
User Interface Localization	English, German, French, Italian, Spanish, Portuguese, Chinese, Japanese, and Russian
Pump life	>1,000,000 cycles
Environmental Specifications	Operating temperature: 32°F to 122°F(0°C to 50°C)
	Compensated temperature: 32°F to 122°F(0°C to 50°C)
	Storage temperature: -20°C to 60°C (-4°F to 120°F)
	Humidity: <90%, non-condensing
Vibration and Shock	Vibration: 4 g (20 to 2,000 Hz) Shock: 8 g, 1 meter drop test
Compliance	CE
Software Compatibility	ACal, Additel Land and Additel Link for access via mobile application
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage



Pressure gauge / transmitter / switch calibration



Task Menu

High Pressure Automated Calibration

Pressure Range

Type	Model	Pressure Range	High-Range Pressure Module		Low-Range Pressure Module	
			Range	Accuracy	Range	Accuracy
Low / Differential Pressure	ADT761A-LLP-05-DPXX	-75 to 75 mbar (-30 to 30 inH2O)	DP30: -75 to 75 mbar (-30 to 30 inH2O)	0.05% FS	User selectable from DP20 to DP025	See Internal Module Table
	ADT761A-D-02-DPXX-X	-0.95 to 2.5 bar (-13.5 to 35 psi)	CP35: -0.95 to 2.5 bar (-13.5 to 35 psi)	0.02% FS	User selectable from DP10 to CP30	See Internal Module Table
Standard Accuracy Gauge / Absolute Pressure	ADT761A-500-XX-CPXX-X	-0.9 to 35 bar (-13 to 500 psi)	CP500: -0.9 to 35 bar (-13 to 500 psi)	User selectable: 0.01%FS or 0.02%FS	User selectable from CP10 to CP300	See Internal Module Table
	AADT761A-1K-XX-CPXX-X	-0.9 to 70 bar (-13 to 1000 psi)	CP1K: -0.9 to 70 bar (-13 to 1000 psi)	User selectable: 0.01%FS or 0.02%FS	User selectable from CP30 to CP600	See Internal Module Table
Barometric Pressure	ADT761A-BP-X	100 to 1200 hPa (1.45 to 17.41 psi)	NA	NA	100 to 1200 hPa (1.45 to 17.41 psi)	0.01%

ORDERING INFORMATION

Model Number

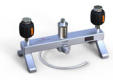
ADT761A — 1K — 02 — CP35 — N

Pressure range:
See pressure range table.

Accuracy:
01 - 0.01% of full span
02 - 0.02% of full span
05 - 0.05% of full span

Module Range:
See internal module table

Pressure port type on External Pressure Manifold:
N - 1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M - M20X1.5 female

Optional Accessories		
ADT161	See datasheet of ADT161 for more info; connection cable sold separately	
9060	Pressure module connection cable	
9530	Additel / ACal Automated Calibration Software	
ADT100-761AHose	ADT761A hose, 5 feet (polyamide, 2,390 psi burst)	
ADT106A-X	External Pressure Manifold (Excl ADT761A-LLP)	
ADT100-761A-X	Hose Test Kit, 5 feet flexible hose	

Accessories (included)		
ADT106A-X External Pressure Manifold (Excl ADT761A-LLP)	1 pc	
9818 110V/220V external Power adapter	1 pc	
9725 Chargeable Li-ion battery	1 pc	
9240A DP gauge holder witha built-in 80 ml chamber (Only for ADT761A-LLP)	1 pc	
9060 (Pressure module connection cable)	1 pc	
ADT100-761A-X Hose Test Kit, 5 feet flexible hose (excl ADT761A-LLP)	1 pc + 1 pc adapter	
1220211206 Adapter, quick female to barb (Only for ADT761A-D)	1 pc	
9022 Test Leads for calibrator	2 sets (4 pcs)	
9907 Carrying case for 761A calibrator and accessory	1 pc	
O-rings	20 pcs	
Pressure Hose	1 pc for the ADT761A-D 1 pc for the ADT761A-BP	
ISO17025 accredited calibration certificate	1 pc	
Threaded plug (Excl ADT761A-LLP)	1 pc	
USB Cable	1 pc	
Barb Fitting (Only for ADT761A-D and ADT761A-BP)	1 pc	
Silicone Tube	2 meters for the ADT761A-LLP 1 meter for the ADT761A-D	

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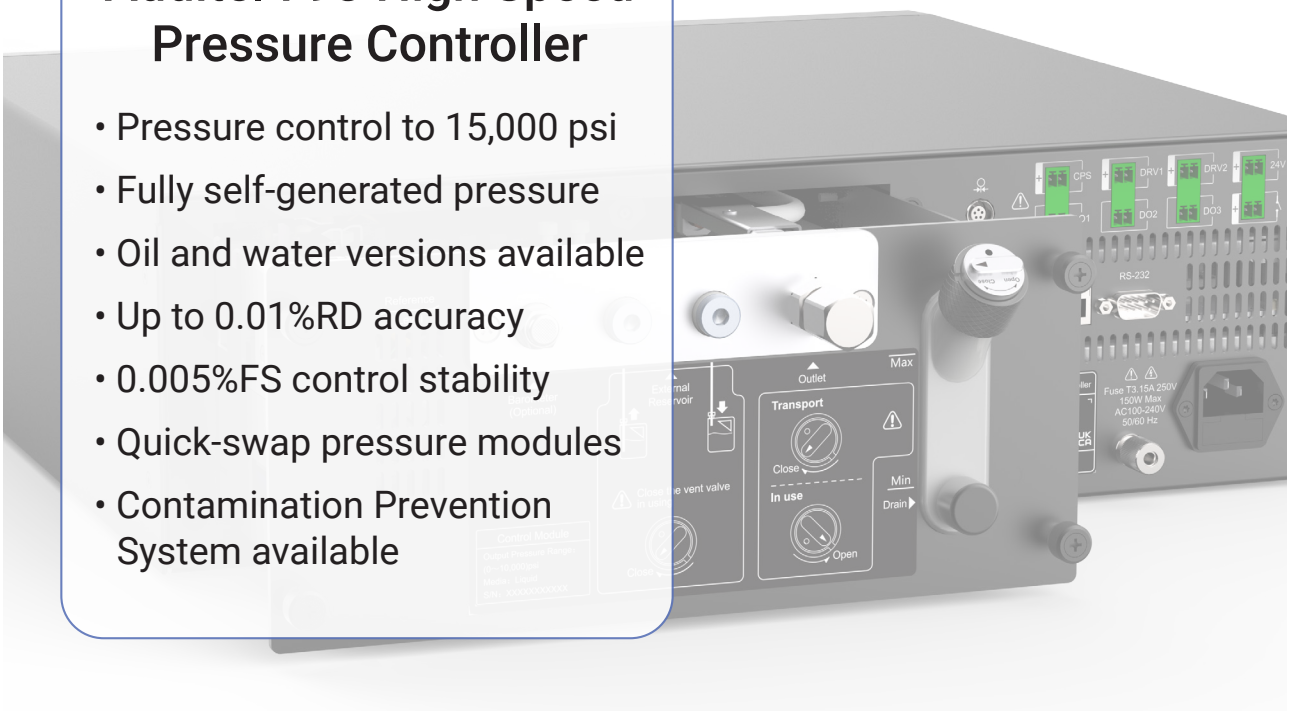
See page 40 for more details!

Additel 793 High Speed Pressure Controller

- Pressure control to 15,000 psi
- Fully self-generated pressure
- Oil and water versions available
- Up to 0.01%RD accuracy
- 0.005%FS control stability
- Quick-swap pressure modules
- Contamination Prevention System available



*See page #40 for details

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Additel 760
Automatic Handheld Pressure Calibrators

Selection Guide

Features \ Model	760-LLP	760-LLP-DL	760-D	760-D-DL	760-MA	760-MA-DL
Pressure Range[1]	±30 in H_2O (±75 mbar)	±30 in H_2O (±75 mbar)	-12.5 to 35 psi (-0.86 to 2.5 bar)	-12.5 to 35 psi (-0.86 to 2.5 bar)	-12.5 to 300 psig (-0.86 to 20 bar)	-12.5 to 300 psig (-0.86 to 20 bar)
Accuracy (%FS)	0.05[1]	0.05[1]	0.02%FS[1]	0.02%FS[1]	0.02%FS[1][3]	0.02%FS[1][3]
Stability (%FS)	0.005[2]	0.005[2]	0.005[2]	0.005[2]	0.005[2]	0.005[2]
Gauge Pressure	●	●	●	●	●	●
Differential Pressure	●	●	●	●		
Absolute Pressure					●	●
Barometric Pressure					●	●
Removable Internal Module	●	●	●	●	●	●
External Pressure Module	●	●	●	●	●	●
Temperature Compensated	●	●	●	●	●	●
Built-in Electrical Pump	●	●	●	●	●	●
Built-in Filter	●	●	●	●	●	●
Built-in Liquid Trap	●	●	●	●	●	●
Source/Simulate 24 mA	●	●	●	●	●	●
Measure mA or V	●	●	●	●	●	●
24V Loop power	●	●	●	●	●	●
Pressure switch test	●	●	●	●	●	●
HART Communication		●		●		●
Task Documentation		●		●		●
Data Logging		●		●		●
Channels	4	4	4	4	4	4
Bluetooth, Wi-Fi and USB	●	●	●	●	●	●

[1] FS specification applies to the span of the module range.
[2] Stability based on FS of the internal pressure module. Internal module is switchable.
[3] Specification based on gauge measurement. An additional 55 pa uncertainty will need to be included when measuring in absolute mode.

Additel 760
Automatic Handheld Pressure Calibrators

Additel
Metrology Made Simple

- Fully automatic calibrator with built-in pump and controller
- Switchable internal pressure modules for expandable ranges
- Accuracy up to 0.01%FS
- External pressure modules available (measure only)
- Less than 4 lbs (1.8 kg) for handheld operation
- Source pressure, measure pressure and electrical
- 4 channels
- Optional HART communications
- Optional data logging and task documenting
- Bluetooth, Wi-Fi and USB communications

OVERVIEW

A portable automated pressure calibrator in the palm of your hand—this could be our most exciting product yet! The Additel 760 series Automatic Handheld Pressure Calibrator takes portable pressure calibration to new levels. Weighing less than 4 lbs (1.8 kg), the ADT760's innovative design contains a built-in pump, precision pressure sensor, internal controller and a large touch-screen color display. To generate pressure, simply key in the desired pressure and the Additel 760 will do the rest. Each unit has four channels: one internal pressure channel for source and measure pressures, two external pressure measurement channels, and one electronic measure and source channel. This series of calibrator has three standard models with the option of adding HART communications, documentation and data logging.

FEATURES

ADT760-LLP

The 760-LLP is designed for low pressure calibration and comes with a build-in pressure module of your choice. The maximum range module compatible with the ADT760-LLP is to ±30 inH2O (±75 mbar) and provides an accuracy to 0.05%FS (see ordering information for configurations with the option of the ADT760 and a module of your choice). Additional internal pressure modules (ADT155 series) are available and provide a variety of ranges down to ±0.25 inH_2O (±0.62 mbar). The accuracy of 0.05%FS and control stability 0.005%FS is based on the internal module's span. Measurements can be made in gauge or differential mode.

ADT760-D

The 760-D gives you differential and gauge pressure but at a higher pressure range than the ADT760-LLP. Covering the range of -12.5 to 35 psi (-0.86 to 2.5 bar) and with an accuracy of 0.01%FS or 0.02%FS depending on the interchangeable ADT155 module used, the ADT760-D is an ideal solution to cover very common gauge and differential pressure measurements. The Additel 760-D comes with an internal module of your choice. The maximum range module compatible with the ADT760-D is to 35 psi. Lower pressure configurations down to ±10 inH_2O differential can be purchased to improve accuracy at lower pressures.

ADT760-MA

The 760-MA generates and controls pressure from vacuum pressures up to 300 psig (20 bar.g) with an accuracy of 0.01%FS or 0.02%FS depending on the interchangeable ADT155 module used. Equipped with a built-in barometric reference, each unit can switch between gauge and absolute pressure types. A variety of internal sensors are available which offer lower pressure ranges for improved performance.

Documenting Process Functionality

Each model of the Additel 760 series has an option incorporating documentation and communication functions turning your 760 into a multifunction documenting process calibrator. This feature provides HART communication, task documentation and data logging.

Pressure Specifications

Specification	*760-LLP*	*760-D*	*760-MA*
Max Pressure Range	±30 inH_2O (75 mbar)	-12.5 to 35 psi (-0.86 to 2.5 bar)	-12.5 to 300 psig (-0.86 to 20 bar.g)
Accuracy	0.05%FS[1]	0.01%FS or 0.02%[1]	0.01%FS or 0.02%FS[1][3]
Stability	0.005%FS[2]	0.005%FS[2]	0.005%FS[2]
Pressure Type	Differential, Gauge	Differential, Gauge	Gauge, Absolute
Over Range Indication	120%		
Resolution	6 digits		
Measurement Units	Pa, hPa, kPa, mPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH_2O@4°C, mmH_2O@4°C, cmH_2O@4°C, mH_2O@4°C, mmH_2O@20°C, cmH_2O@20°C, mH_2O@20°C, mH2O@68°F, inH_2O@20°C, kgf/cm2, mtorr, torr, lb/ft2, tsi, custom		
Barometric Accuracy	N/A	N/A	55 Pa[4]
Connection	Barb fitting	Hose, 5 ft (1.5 m), with built-in filter to 1/4BSPF, 1/4NPTF, and M20F adapters	Hose, 5 ft (1.5 m), with built-in filter to 1/4BSPF, 1/4NPTF, and M20F adapters
Pressure Output Rate	<30 Seconds (30 inH_2O / 100 ml)	<10 Seconds (35 psi / 5 ml)	<90 Seconds (300 psi / 5 ml)

[1] FS specification applies to the span of the module range.
[2] Stability based on FS of the internal pressure module. Stability is 0.005%FS or 0.05 pa whichever is greater. Internal module is switchable.
[3] Specification based on gauge measurement. An additional 55 pa uncertainty will need to be included when measuring in absolute mode.
[4] 55 Pa uncertainty (k=2) includes calibration uncertainty, linearity, and long-term stability (<30 Pa per year). Barometer range of 60 to 110 kPa.

Electrical Specifications

Specification	*Range*	*Resolution*	*Accuracy*	*Note*
mA Measure	± 30 mA	0.0001 mA	0.01%RD + 1.5 µA	Impedance <10 Ω
V Measure	± 30 V	0.0001 V	0.01%RD + 1.5 mV	Impedance >1 MΩ
mA Source	24 mA	0.001 mA	0.01%RD + 1.2 µA	20 mA @ 1 K
Loop Power Source	24 V	N/A	± 1 V	50 mA (Max Loading)
Pressure Switch	Open, close. Support for mechanical switches and NPN/PNP digital switches.			
Temperature Compensation	8 °C to 38 °C			
Temperature Coefficient	< ± (0.001%RD + 0.001%FS) / °C outside of 8°C to 38°C			

Internal Modules Specifications and Compatibility

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Module	Module Range[6]		Media	Accuracy (%FS)[1]	Burst Pressure	760-LLP	760-D	760-MA
	inH_2O	mbar						
DP025	±0.25	±0.62	G	0.2[2]	100x	●		
DP050	±0.5	±1.25	G	0.1[3]	100x	●		
DP1	±1	±2.5	G	0.05[4]	100x	●		
DP2	±2	±5	G	0.05[4]	100x	●		
DP5	±5	±10	G	0.05[4]	50x	●		
DP10	±10	±25	G	0.05[4]	20x	●	●	
DP20	±20	±50	G	0.05	20x	●	●	
DP30	±30	±75	G	0.05	20x	●	●	
DP50	±50	±125	G	0.05	3x		●	
DP100	±100	±250	G	0.02	3x		●	
DP150	±150	±350	G	0.02	3x		●	
DP300	±300	±700	G	0.02	3x		●	
DP400	-380 to 400	-950 to 1K	G	0.02	3x		●	
DP800	-380 to 800	-950 to 2K	G	0.02	3x		●	
DP1K	-380 to 1K	-950 to 2.5K	G	0.02	3x		●	
Gauge Pressure	psig	bar.g						
CP10	±10	±0.7	G	0.01 / 0.02[5]	3x		●	●
CP15	-13.5 to 15	-0.95 to 1	G	0.01 / 0.02c[5]	3x		●	●
CP30	-13.5 to 30	-0.95 to 2	G	0.01 / 0.02[5]	3x		●	●
CP35	-13.5 to 35	-0.95 to 2.5	G	0.01 / 0.02[5]	3x		●	●
CP50	-13.5 to 50	-0.95 to 3.5	G	0.01 / 0.02[5]	3x			●
CP100	-13.5 to 100	-0.95 to 7	G	0.01 / 0.02[5]	3x			●
CP150	-13.5 to 150	-0.95 to 10	G	0.01 / 0.02[5]	3x			●
CP200	-13.5 to 200	-0.95 to 14	G	0.01 / 0.02[5]	3x			●
CP300	-13.5 to 300	-0.95 to 20	G	0.01 / 0.02[5]	3x			●

[1] FS specification applies to the span of the module range. Accuracy includes one-year stability, except for DP025 to DP10 modules.
[2] Accuracy is a 6 months spec, 1-year long-term drift is 0.2%FS.
[3] Accuracy is a 6 months spec, 1-year long-term drift is 0.1%FS.
[4] Accuracy is a 6 months spec, 1-year long-term drift is 0.05%FS.
[5] Specification based on gauge measurement. An additional 55 pa uncertainty will need to be included when measuring in absolute mode. Applicable only for use with the ADT760-MA
[6] The low module pressure range may be outside the pressure range of the calibrator
* ADT155 Pressure Modules are calibrated in psi & inH2O

Now Offering
0.01% Accuracy

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General Specifications

Specification	Description
Channels	Four total: one electrical, one internal pressure, two external pressure (measure only)
Enclosure IP Rating	IP52 water and dust proof
Battery	Rechargeable Li-Ion battery, typically 10 hours of operation, recharges in less than 4 hours
Display	Color 800 x 480 TFT 5-inch touch screen
Communications	Bluetooth, WiFi and USB
Weight	<4 lbs (<1.8 kg)
Size	9.3 x 4.3 x 2.8 in (235 x 110 x 70 mm)
Certification	ISO 17025 accredited certificate with data included
HART Communications	Optional (ADT760-X-DL model)
Data Logging	Optional (ADT760-X-DL model), up to 1,000,000 readings (date and time stamped)
Task Documentation	Optional (ADT760-X-DL model) up to 1000 tasks
Automation Functions	Switch test, auto step, leak test
Misuse Protection	Up to 30 V on any two sockets
Multi Lingual Interface	English, German, French, Italian, Spanish, Portuguese, Chinese, Japanese, and Russian
Pump Life	>500,000 cycles
Power	Rechargeable Li-Ion battery, external power: 110/220 V power adapter 10 V
Environment Specifications	Operation: 32°F to 122°F (0°C to 50°C), 0-90% RH, less than 3,000 meters Compensated temperature: 32°F to 122°F (0°C to 50°C) Storage temperature: -4°F to 158°F (-20°C to 70°C)
Vibration and Shock	Vibration: 4 g (20 to 2,000 Hz) Shock: 8 g
Compliance	CE
Software	ACal, Land, LogII
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

Optional Internal Pressure Modules	
Module Number	Description
ADT155-20-DP025	Pressure module for ADT760-LLP, ±0.25 inH_2O, ±0.2%FS
ADT155-10-DP050	Pressure module for ADT760-LLP, ±0.5 inH_2O, ±0.1%FS
ADT155-05-DP1	Pressure module for ADT760-LLP, ±1 inH_2O, ±0.05%FS
ADT155-05-DP2	Pressure module for ADT760-LLP, ±2 inH_2O, ±0.05%FS
ADT155-05-DP5	Pressure module for ADT760-LLP, ±5 inH_2O, ±0.05%FS
ADT155-05-DP10	Pressure module for ADT760-LLP & -D ±10 inH_2O, ±0.05%FS
ADT155-05-DP20	Pressure module for ADT760-LLP & -D, ±20 inH_2O, ±0.05%FS
ADT155--05-DP30	Pressure module for ADT760-LLP & -D, ±30 inH_2O, ±0.05%FS
ADT155-05-DP50	Pressure module for ADT760-D, ±50 inH_2O, ±0.05%FS
ADT155-02-DP100	Pressure module for ADT760-D, ±100 inH_2O, ±0.02%FS
ADT155-02-DP150	Pressure module for ADT760-D, ±150 inH_2O, ±0.02%FS
ADT155-02-DP300	Pressure module for ADT760-D, ±300 inH_2O, ±0.02%FS
ADT155-02-DP400	Pressure module for ADT760-D, -380 to 400 inH_2O (-13.5 to 15 psi), ±0.02%FS
ADT155-02-DP800	Pressure module for ADT760-D, -380 to 800 inH_2O (-13.5 to 30 psi), ±0.02%FS
ADT155-02-DP1K	Pressure module for ADT760-D, -380 to 1K inH_2O (-13.5 to 35 psi), ±0.02%FS
ADT155-01/02-CP10	Pressure module for ADT760-D & -MA, ±10 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP15	Pressure module for ADT760-D & -MA, -13.5 to 15 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP30	Pressure module for ADT760-D & -MA, -13.5 to 30 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP35	Pressure module for ADT760-D & -MA, -13.5 to 35 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP50	Pressure module for ADT760-D & -MA, -13.5 to 50 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP100	Pressure module for ADT760-MA, -13.5 to 100 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP150	Pressure module for ADT760-MA, -13.5 to 150 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP200	Pressure module for ADT760-MA, -13.5 to 200 psi, ±0.01%FS, ±0.02%FS
ADT155-01/02-CP300	Pressure module for ADT760-MA, -13.5 to 300 psi, ±0.01%FS, ±0.02%FS

* ADT155 Pressure modules are calibrated in psi & inH2O

Ordering Information

Model Number

ADT760 — MA — 02 — CP100 • • DL

Pressure range:
See Model Type table

01 - 0.01% full span
02 - 0.02% full span
05 - 0.05% full span
10 - 0.1% full span
20 - 0.2% full span

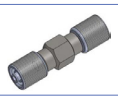
Internal Pressure Module Range:
See Optional Internal Pressure Model table.

DL: Data logging

Model Type	
Model Number	***Description***
ADT760-LLP	Automatic Handheld Pressure Calibrator, ±30 inH_2O
ADT760-LLP-DL	Automatic Handheld Pressure Calibrator, ±30 inH_2O w/HART and data logging
ADT760-D	Automatic Handheld Pressure Calibrator, -12.5 to 35 psi
ADT760-D-DL	Automatic Handheld Pressure Calibrator, -12.5 to 35 psi w/HART and data logging
ADT760-MA	Automatic Handheld Pressure Calibrator, -12.5 to 300 psi
ADT760-MA-DL	Automatic Handheld Pressure Calibrator, -12.5 to 300 psi w/HART and data logging

* Configurations available for ADT760 units with different internal pressure sensor range

Accessories (Included)		
Model	***Quantity***	***Picture***
ADT100-760-KIT adapter set (excl ADT760-LLP)	1 set (to 1/4BSPF, to 1/4NPTF, to M20F)	
USB to USB cable (ADT760-X-DL only)	1 pc	
9816-X 110V / 220V external power adapter	1 pc	
9724 chargeable Li-ion battery	1 pc	
9025 test leads for calibrator	1 sets (3 pcs)	
ADT100-760 Hose	1 pc for the ADT760-MA	
Pressure Hose	1 pc for the ADT760-D	
Silicone Tube	2 meters for the ADT760-LLP 1 meter for the ADT760-D	
1220211206 Adapter, quick female to barb (Only for ADT760-D)	1 pc	
ISO17025 accredited certificate	1 pc	

Optional Accessories		
Model	***Description***	***Picture***
ADT161	See datasheet of ADT161 for more info; connection cable sold separately	
9060	Pressure module connection cable	
ADT100-760-N	Special Connector to 1/4NPT quick connector	
ADT100-760-B	Special Connector to 1/4BSP quick connector	
ADT100-760-M	Special Connector to M20x1.5 quick connector	
ADT100-760-N2	Special Connector to 1/2NPT quick connector	
ADT100-760-B2	Special Connector to1/2BSP quick connector	
ADT128-B	Pneumatic Pressure Manifold for ADT760, -15 to 1000 psi, single port, 1/4 BSP F	
ADT128-B2	Pneumatic Pressure Manifold for ADT760, -15 to 1000 psi, single port, 1/2 BSP F	
ADT128-N	Pneumatic Pressure Manifold for ADT760, -15 to 1000 psi, single port, 1/4 NPT F	
ADT128-N2	Pneumatic Pressure Manifold for ADT760, -15 to 1000 psi, single port, 1/2 NPT F	
ADT128-M	Pneumatic Pressure Manifold for ADT760, -15 to 1000 psi, single port, M20x1.5	
9240A	DP gauge holder with a built-in 80 ml chamber	
1220211087	Filter, set of 1 pc	
9913-760-SC	Soft carrying case for ADT760, test leads, and many accessories	
9914-760	Carry case for ADT760 and various accessories	
ADT100-760-CNT	Special connector (to be used to adapt from the ADT760 to ADT100-760-KIT adapters)	

* Additel/Land software available for free download at www.additel.com

Additel 773
Pressure Controller/Generator

Metrology Made Simple

- **Pressure ranges from -380 inH2O (-0.95 bar) to 400 inH2O (1 bar)**
- **Two removable internal pressure modules with multi-range selection**
- **0.02%FS accuracy**
- **Control stability of 0.003%FS**
- **Ultra-High speed pressure generation and control**
- **Optional barometric pressure module**
- Built-in differential pressure pump
- Large 7" color touch screen display
- Modular design for easy maintenance, greatly reducing on-site downtime
- Emulation mode

OVERVIEW

These modular pressure controllers combine speed, cutting-edge control/measurement technology, modular design, and user-friendly features. The Additel 773 controller is optimized for low pressure work by utilizing Additel's proven low-pressure pump technology in combination with control capabilities that revolutionized the industry as seen in the well-known handheld model ADT760. For users who require automated production, test, and calibration, Additel has the workload covered with these pressure controllers. The ADT773 can be quickly outfitted with two controlling modules and one reference barometric module to cover a wide pressure range.

Metrology Made Simple

Quick Change Pressure Modules (30 seconds)

Additel's 151 pressure control modules can be installed or replaced within 30 seconds or less. The upper edge of the cabin is simple to open. As the door opens, the controller will automatically release pressure, providing the safe removal and installation of the ADT151 modules. Additel offers various different pressure ranges for the ADT773 controller by utilizing these easy to swap pressure modules. Select from the module ranges listed on page 3.

20% Pressure Step within 10 seconds

In the process of efficient and fast-paced end-of-line testing, verification and calibration, companies have strict requirements on the speed of pressure controllers. ADT773 adopts professional pressure control technology to effectively improve control speed and control stability. Air pressure controller: control response time (typical) ≤10S, control stability ＜ 0.003%FS, see specifications for more details.

Built-in pump

The Additel 773 comes with an integrated internal low-pressure pump which provides users with a turnkey solution for pressure calibration work. Additel pump designs are well known and dependable. Not only are they fast, but they also offer the best control and stability in their class. In fact, the automated pumps in other Additel models have revolutionized the industry.

External Drive Valve Control

The ADT773 Controller provides valve control for up to 3 external valves. One of the channels is designated for controlling the contamination prevention system (CPS), which helps to prevent media contamination. The remaining two channels can be used to control external vacuum pumps or external isolation valves for greater flexibility and compatibility for individual situations.

Contamination Prevention System (CPS) Extends the Maintenance Interval of the Controller

Calibration of DUT's (devices under test) often introduces contaminates to a calibration system. Contaminates can cause restrictions in valves, lines and filters. Additel has included a turn-key solution with the ADT773 to help reduce these concerns and improve durability and dependability when calibrating customer's devices. The use of an automatic contamination prevention system and integration firmware to allow for purges between pressure cycles to further reduce the possibility of introducing contaminates into the system.

Pressure Specifications

Specification \ Model	ADT773
Max Pressure Range[1]	400 inH2O (14.5 psi, 1 bar)
Min Pressure Range	-380 inH2O (-13.5 psi, -0.95 bar)
Precison[2]	0.015%FS (DP2-DP5) 0.025%FS (DP10-DP1K)
Accuracy[3]	0.05%FS (DP2-DP5) 0.02%FS (DP10-DP1K)
Control Stability[4]	< 0.003%FS
Control Response Time[5]	< 10 Seconds
Pressure Type	Low Differential Pressure
Internchangeable Pressure Module Bays	2
Max Pressure Control Range of Internal Module	(-400~400) inH2O / (-1~1) bar
Min Pressure Control Range of Internal Module	(-1~1) inH2O / (-2.5~2.5) mbar
Range Switching Mode	Fixed or Auto
Supply Source	Built-in air pump
Control Mode	Fast, standard or custom
Maximum Overshoot	< 1%FS
Maximum Load Volume	500 mL
Contamination Prevention System (CPS)	Optional
Pressure Port	6 mm Festo
Port Filter[6]	Support

[1] The minimum negative pressure limit is given based on the atmospheric pressure value of 1 bar.
[2] Precision: the error includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[3] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[4] The control stability is 0.003%FS or 0.05Pa, whichever is greater.
[5] The air pressure is tested under the condition of external load volume 50 mL, 20% step, and the time to reach 0.005% FS stability.
[6] All pressure ports are installed with 40~100μm filters.

Internal Module Specification

The following tables provide information regarding our ADT151 modular pressure sensors that are designed to easily mount in the front bays of the ADT773 Pressure controller. Our differential pressure (DP) module accuracy specifications include linearity, hysteresis, repeatability, temperature compensation resolution, reference standard measurement uncertainty, annual drift and K=2, precision specifications include linearity, hysteresis, repeatability, resolution, and temperature compensation. The DP style gauges can be zeroed by the controller from time to time to mitigate the effect of zero drift. The specifications are valid from 15°C~35°C. We recommend that these pressure models be calibrated annually.

Differential Pressure Module for ADT773						
Model	Differential Pressure		Measurement Type	Pressure Medium	Precision[2][3] (%FS)	Accuracy[4] (% FS)
	1st range[1]	2nd range				
ADT151-XX-DP400	(-400~400) inH2O (-1000~1000) mbar	(-200~200) inH2O (-500~500) mbar	DP	G	0.015	0.02
ADT151-XX-DP300	(-300~300) inH2O (-700~700) mbar	(-150~150) inH2O (-350~350) mbar	DP	G	0.015	0.02
ADT151-XX-DP200	(-200~200) inH2O (-500~500) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02
ADT151-XX-DP150	(-150~150) inH2O (-350~350) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02
ADT151-XX-DP100	(-100~100) inH2O (-250~250) mbar	(-50~50) inH2O (-125~125) mbar	DP	G	0.015	0.02
ADT151-XX-DP50	(-50~50) inH2O (-125~125) mbar	(-30~30) inH2O (-75~75) mbar	DP	G	0.015	0.02
ADT151-XX-DP30	(-30~30) inH2O (-75~75) mbar	(-20~20) inH2O (-50~50) mbar	DP	G	0.015	0.02
ADT151-XX-DP20[5]	(-20~20)inH2O (-50~50)mbar	(-10~10) inH2O (-25~25)mbar	DP	G	0.015	0.02
ADT151-XX-DP10[5]	(-10~10) inH2O (-25~25) mbar	(-5~5) inH2O (-10~10) mbar	DP	G	0.015	0.02
ADT151-XX-DP5[5]	(-5~5) inH2O (-10~10) mbar	(-2~2) inH2O (-5~5) mbar	DP	G	0.025	0.05
ADT151-XX-DP2[5]	(-2~2) inH2O (-5~5) mbar	(-1~1) inH2O (-2.5~2.5) mbar	DP	G	0.025	0.05

[1] The overload pressure of all pressure modules is 150%FS, and the burst pressure of modules: DP20 / DP 10 / DP5 / DP2: 100mbar, DP100 / DP50 / DP30:1000mbar, DP400/DP300 / DP200 / DP150: 4000 mbar.
[2] FS specification applies to the span of the range.
[3] Precision: the error includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[4] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[5] Recommended calibration period 180 days.

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Barometric Specifications

Model[1]	Absolute Pressure Range	Accuracy
ADT151-BP	(60~110) kPa	±22 Pa
ADT151-BPH	(60~110) kPa	±10 Pa

[1] Additel 773 controller can be equipped with an barometric pressure module. After inserting the barometric pressure module, the controller can be toggled to and from gauge and absolute pressure units.

General Specifications

Specification	*Description*
Power Requirements	Power supply: AC100~240 V, 50/60 Hz
	Fuse: T3.15A 250V AC
	Maximum Power consumption: 150W
Size /Weight	Chassis Size: 17.32 × 5.23 × 14.96 in (440(W) × 133(H) × 380(D) mm)
	Rack Mount Dimensions: 3U-19" rack, Horizontal Direction
	Chassis weight: 17.6 kg
	Pressure module weight: 0.5 kg
Environment	Operating Ambient: 10℃ ~50℃
	Storage Temperature: -20℃ ~70℃
	Operating humidity: 5%RH~95%RH, non-condensing
	Altitude (Operation): <2000 m
	Ingress Protection: IP20, Indoor use only
	Vibration level: 2 G
	Impact intensity: 4 G
	Warmup Time: 15 minutes
	Machine drop height: 250 mm
Conformity	CE
Communications	RS232, USB-A*2, LAN
	WIFI, Bluetooth, GPIB, mouse, keyboard and other peripheral components can be expanded based on the USB port.
	SCPI Command set is compatible with ADT780, PACE5000/6000, DRUCK DPI520, user customizable
External drive valve port	3-channel external drive valves, green terminal connector with lock
	Maximum driving ability 24 V / 12 W, 30 V max
	One channel fixed to the CPS pollution prevention device, the remaining 2 channels can be used to control the external vacuum pump and external isolation valve.
I/O Alarm port	3-channel, green terminal connector with a lock
	Volt-Free No/Nc relay, the maximum current-carrying capacity: 24 V / 0.5 A, 30 V max
Pressure switch test port	One channel, green terminal connector with lock
	Maximum load 24 V / 0.1 A 30 V max
	Support mechanical switch, electronic switch testing
Display	7-inch capacitive touch screen, 1280 * 800 resolution, reflective panels, black, white background can be user selectable.
	Communication update speed: 10 times per second
	Display refresh rate: 5 times per second
	Pressure value maximum displays: + 9999999, display digits is adjustable
External pressure module	Measurement only
Internal pressure control module port	Opening the cabin door will automatically release the pressure for safe removal of modules
	Inside of cabin, 3 pressure module bays, from left to right including a high pressure module bay, a low pressure module bay, and a barometric pressure module bay
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

ORDERING INFORMATION

■ **Model Number (Base Unit Only - No Pressure Modules)**

ADT773

Note of ADT151 Pressure Modules	
ADT151 Pressure Modules for High Module Bay	
ADT151-XX-DP30 ~ DP400	At least one module within the range of DP30 to DP400 must be installed in the high side module bay.
ADT151 Pressure Modules for Low Module Bay	
ADT151-XX-DP2 ~ DP400	The low module bay can be left empty, but when a low-pressure module is installed, the range must be lower than the installed high pressure module.
ADT151 Barometer Modules for Barometer Module Bay	
ADT151-BP ADT151-BPH	See ADT151 barometric specifications table for details.

ADT151 — 02 — DP2

- 02: **Accuracy:** 02 = 0.02% of full span; 05 = 0.05% of full span
- DP2: See internal module specification table

ADT151 — BP

- BP: Model: ADT151-BP (±22 Pa); ADT151-BPH (±10 Pa)

ADT151-02-DP2

ADT151-BP

Accessories (included)		
Model number	**Quantity**	**Picture**
AC power cord (10A 250V)	1 pc	
ISO17025 accredited calibration certificate	1 pc	
Green terminal plug （For switch detection）	2 pcs	
O-ring 3.5*1.5 （For ADT151）	10 pcs	
1/4BSP plug (for output port)	1 pc	
ADT151 reference port plug	1pc	
5 feet flexible hose, 4500 psi, 1/4BSP female to 1/4BSP female ADT100-HTK-4.5K-BSPF4-BSPF4	1pc	
Adapter, 1/4NPT male to 1/4BSP female (ADT100-NPTM4-BSPF4)	1pc	
Adapter, 1/4NPT male to 1/4BSP male (ADT100-NPTM4-BSPM4)	1pc	

General Optional Accessories		
Model number	**Description**	**Picture**
9050	USB to 232 cable	
9055-1	USB to Bluetooth module	
9055-2	USB to WIFI module	
9053	USB to GPIB adapter	
9050-EXT	RS232 communication line	
9245	Rack Flange Assembly	
9055	Green terminal plug	
9054	Calibration fixture for ADT151 (Including adapter base w/ 1/4BSP male fitting, RS232/ power supply cable, 9V adapter, calibration software)	

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Output pressure connections of ADT773 (Optional)			
Model number		**Description**	**Picture**
9240A		DP gauge holder with a built-in 80 ml chamber	
ADT121-X		External Manifold	
Need this 2 parts on Vent or Exhaust ports to drain the internal liquid to external container	1650700087	Quick connector (6 mm)	
	1650800039	Polyurethane tube (6 mm× 1.5 m)	
ADT108-KIT		Contamination Prevention System (Including ERP#:1650800039 polyurethane hose 700 kPA Max 1.5m length, and adaptor, 6mm Festo to 1/4BSP F)	

Additel 783
Pressure Controller

- **Pressure ranges from -14.35 psi (-0.99 bar) to 3600 psi (250 bar)**
- **Two removable internal pressure modules with multi-range selection**
- **0.02%FS, 0.01%FS, and 0.01%RD accuracy**
- **Control stability of 0.003%FS**
- Ultra-High speed pressure control
- Absolute & Gauge Pressure
- LAN, USB, RS232, and Ethernet communication
- Large 7" color touch screen display
- Optional barometric pressure module
- Easy-to-use icon driven interface
- I/O alarm
- Emulation mode

OVERVIEW

These modular pressure controllers combine cutting-edge control/measurement technology, modular design, and user-friendly features. The Additel 783 controller series is optimized for speed without compromising accuracy and stability. For users who require automated production, test, and calibration, Additel has the workload covered with this pressure controller. The ADT783 can quickly be outfitted with two controlling modules and one reference barometric module to cover a wide pressure range.The Additel 783 series offers three base units to choose from, which range from 3600 psi (250 bar) down to low pressure differential.

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ADT783-D

The ADT783-D is designed for differential and gauge pressure calibration to as low as ±10 inH2O (±25 mbar) up to 36 psi (2.5 bar). Select between one or two pressure control modules. Each module comes with a dual-range calibration, expanding measurement accuracy within each module. This unit has a control stability of 0.003%FS. In addition to the two control modules, an optional barometric module can be added which allows for gauge and absolute measurements.

ADT783-1K

The ADT783-1K is designed for gauge pressure calibration from -14.35 (-0.99 bar) up to 1000 psi (70 bar). Select between one or two pressure control modules. Each module comes with a dual-range calibration, expanding measurement accuracy within each module. This unit has a control stability of 0.003%FS. In addition to the two control modules and optional barometric module can be added which allows for gauge and absolute measurements.

ADT783-3.6K

The ADT783-3.6K is designed for gauge pressure calibration from -14.35 (-0.99 bar) up to 3600 psi (250 bar). Select between one or two pressure control modules. Each module comes with a dual-range calibration, expanding measurement accuracy within each module. This unit has a control stability of 0.003%FS. In addition to the two control modules and optional barometric module can be added which allows for gauge and absolute measurements.

Quick Change Pressure Modules (30 seconds)

Additel's 151 pressure control modules can be installed or replaced within 30 seconds or less. The upper edge of the cabin is simple to open. As the door opens, the controller will automatically release pressure, providing the safe removal and installation of the ADT151 modules. Additel offers various different pressure ranges for the ADT783 controller by utilizing these easy to swap pressure modules. Select from the module ranges listed on page 5 and page 6.

Convenient Automatic Calibration of Internal Pressure Control Module

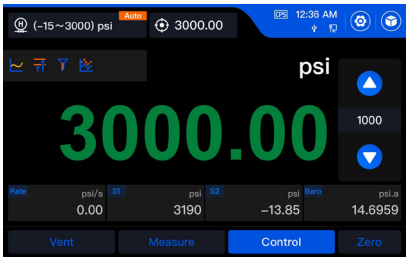
Within production environments, higher frequency of calibration and comparison of the pressure control module is important and helps to provide confidence. The ADT783 can be connected with an external high-precision pressure module, which can be used to achieve regular comparison of the internal pressure control module, and can also be used to perform automated calibration of the internal pressure control module.

Modular Design, Easy Maintenance

The ADT783 adopts a variety of easy maintenance design features, which allows users to quickly change the rear mounted pressure control module, quickly change the pressure control and valve components, quickly clean the solenoid valve, and provides fine filtration of pollution particles.

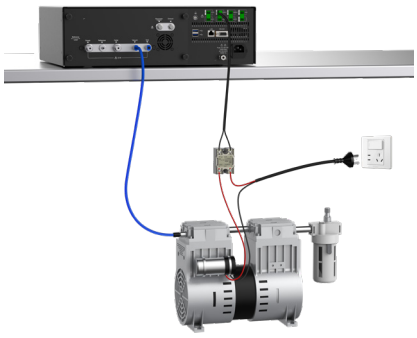
20% Pressure Step within 10 Seconds

In the process of efficient and fast-paced production line testing, verification and calibration, users have strict requirements on the speed of pressure controllers. The ADT783 adopts professional control technology to effectively improve control rate and stability: control response time (typical) ≤10 Seconds, control stability (typical) ≤±(0.001~0.003)%FS, see specifications for more details.



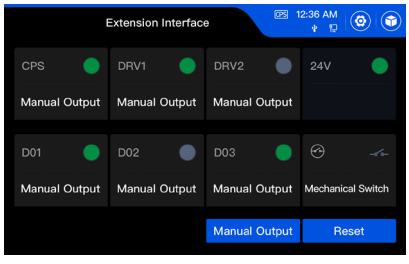
Automated Vacuum Pump Feature Designed to Extend External Vacuum Pump Life

The ADT783 incorporates built-in automated valving and I/O port for automated control of a vacuum pump. When controlling down to a small pressure above the atmospheric pressure point, the ADT783 can control at those pressures without activating a vacuum pump. When controlling negative/vacuum pressures, there is no need to utilize an external vacuum pump or protection components. A solid-state relay can be connected to the power supply line of the vacuum pump to realize fully automatic vacuum pump start-stop control, greatly extending the life of the vacuum pump.



Volt Free Contacts

The ADT783 built-in 3-way solenoid valve drive can directly control the external isolation valve without an external power supply. Multiple isolation valve combination applications greatly enhances the flexibility of the test system. Three non-contact relay outputs can be used to realize the alarm output of the device, and can also be used to trigger external devices.



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Pressure Specifications

Specification \ Model	ADT783-D	ADT783-1K	ADT783-3.6K
Max Pressure Range	35 psi (2.5 bar)	1000 psi (70 bar)	3600 psi (250 bar)
Min Pressure Range[1]	-14.35 psi (-0.99 bar)	-14.35 psi (-0.99 bar)	-14.35 psi (-0.99 bar)
Precision[2]	0.015%FS (DP2-DP5) 0.025%FS (DP10-DP1K)	0.01%FS or 0.007%FS or 0.008%RD	0.01%FS or 0.007%FS or 0.008%RD
Accuracy[3]	0.05%FS (DP2-DP5) 0.02%FS (DP10-DP1K)	0.02%FS or 0.01%FS or 0.01%RD	0.02%FS or 0.01%FS or 0.01%RD
Control Stability[4]	< 0.003%FS, typically 0.001%FS	< 0.003%FS, typically 0.001%FS	< 0.003% FS, typically 0.001%FS
Control Response Time [5]	< 10 Seconds	< 10 Seconds	< 10 Seconds
Pressure Type	Differential	Gauge	Gauge
Gauge and Absolute Pressure Switchable[6]	Optional	Optional	Optional
Interchangeable Pressure Module Bays	2	2	2
Max Pressure Control Range of Internal Module	-15 to 36 psi (-1 to 2.5 bar)	-15 to 1000 psi (-1 to 70 bar)	-15 to 3600 psi (-1 to 250 bar)
Min Pressure Control Range of Internal Module	±10 inH20 (±25 mbar)	±10 psi (±0.7 bar)	-15 psi to 150 psi (-1~10 bar)
Maximum High-low Range Ratio	NA	20:1	NA
Range Switching Mode	Fixed or Auto	Fixed or Auto	Fixed or Auto
Supply Source[7]	External air source	External air source	External air source
Maximum Supply Pressure[8]	4 bar	80 bar	280 bar
Control Mode	Fast, standard, custom	Fast, standard, custom	Fast, standard, custom
Maximum Overshoot	< 1%FS	< 1%FS	< 1%FS
Maximum Load Volume	1000 mL	1000 mL	1000 mL
Contamination Prevention System (CPS)	Optional	Optional	Optional
Pressure Port	6 mm Festo	1/4 BSP M	1/4 BSP M
Air Source Port Safe Pressure Limit[9]	Air source port: 10 bar Vacuum source port: 5 bar	Air source port: 140 bar Vacuum source port: 5 bar	Air source port: 300 bar Vacuum source port: 5 bar
Port Filter[10]	Support	Support	Support

[1] The minimum negative pressure limit is given based on the atmospheric pressure value of 1bar.
[2] Precision: the error includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[3] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[4] In order to achieve 0.001% FS control stability, some additional stabilization time at the desired pressure may be needed depending on the configuration and pressure level.
[5] The air pressure is tested under an external load volume 50 ml, 20% step, and the time to reach 0.005%FS stability.
[6] After the reference atmospheric pressure module is installed, users can select gauge or absolute pressure.
[7] Gas refers to clean and dry nitrogen or air.
[8] In order to achieve the best control effect, the air source pressure should be adjusted to about 110% of the maximum range of the internal pressure control module or 1bar, whichever is greater.
[9] In order to prevent the inlet pressure of the air source from exceeding the safety limit, it is recommended to install a suitable pressure safety valve at the outlet of the air source.
[10] All pressure ports are installed with 40~100 μm filters.

Specifications for ADT783 Pressure Modules

The following tables provide information regarding our ADT151 modular pressure sensors that are designed to easily mount in the front bays of the ADT783 Pressure controller. Our differential pressure (DP) and compound pressure (CP) module accuracy specifications include linearity, hysteresis, repeatability, temperature compensation and annual drift, precision specifications include linearity, hysteresis, repeatability, resolution, and temperature compensation. Both the DP and CP style gauges can be zeroed by the controller from time to time to mitigate the effect of zero drift. The specifications are valid from 15°C~35°C. We recommend that these pressure models be calibrated annually.

Standard Compound Gauge Pressure Module for ADT783-1K / 3.6K

Model	Compound Gauge pressure		Media	Precision[2] (%FS)	Accuracy[3] [4] (% FS)	Suggested Controller Compatibility
	1st range[1]	2nd range				
ADT151-XX-CP3.6K	(-15~3600) psi / (-1~250) bar	(-15~1500) psi / (-1~100) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-3.6K only
ADT151-XX-CP3K	(-15~3000) psi / (-1~200) bar	(-15~1500)psi / (-1~100) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-3.6K only
ADT151-XX-CP2K	(-15~2000) psi / (-1~140) bar	(-15~1000) psi / (-1~70) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-3.6K only
ADT151-XX-CP1K	(-15~1000) psi / (-1~70) bar	(-15~500) psi / (-1~35) bar	G,L	0.007 (0.01)	0.01 (0.02)	Both
ADT151-XX-CP500	(-15~500) psi / (-1~35) bar	(-15~300) psi / (-1~20) bar	G,L	0.007 (0.01)	0.01 (0.02)	Both
ADT151-XX-CP300	(-15~300) psi /(-1~20) bar	(-15~150) psi / (-1~10) bar	G,L	0.007 (0.01)	0.01 (0.02)	Both
ADT151-XX-CP150	(-15~150) psi / (-1~10) bar	(-15~60) psi / (-1~4) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only
ADT151-XX-CP100	(-15~100) psi / (-1~7) bar	(-15~50) psi / (-1~3.5) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only
ADT151-XX-CP50	(-15~50) psi / (-1~3.5) bar	(-15~30) psi / (-1~2) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only
ADT151-XX-CP35	(-15~35) psi / (-1~2.5) bar	(-15~15) psi / (-1~1) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only
ADT151-XX-CP30	(-15~30) psi / (-1~2) bar	(-15~15) psi / (-1~1) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only
ADT151-XX-CP15	(-15~15) psi / (-1~1) bar	(-10~10) psi / (-0.7~0.7) bar	G,L	0.007 (0.01)	0.01 (0.02)	ADT783-1K only

[1] The overload pressure of all pressure modules is 110%FS, and the burst pressure is 200%FS, the burst pressure of CP150 is 130%FS.
[2] Precision: the error components includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[3] FS specification applies to the span of the range.
[4] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[5] Sealed gauge pressure for CP2K,CP3K,CP3.6K.

Differential Pressure Module for ADT783-D

Model	Differential Pressure		Measurement Type	Media	Precision[2] [3] (%FS)	Accuracy[4] (% FS)
	1st range[1]	2nd range				
ADT151-XX-DP1K	(-400~1000) inH2O (-1000~2500) mbar	(-400~400) inH2O (-1000~1000) mbar	DP	G	0.015	0.02
ADT151-XX-DP800	(-400~800) inH2O (-1000~2000) mbar	(-400~400) inH2O (-1000~1000) mbar	DP	G	0.015	0.02
ADT151-XX-DP400	(-400~400) inH2O (-1000~1000) mbar	(-200~200) inH2O (-500~500) mbar	DP	G	0.015	0.02
ADT151-XX-DP300	(-300~300) inH2O (-700~700) mbar	(-150~150) inH2O (-350~350) mbar	DP	G	0.015	0.02
ADT151-XX-DP200	(-200~200) inH2O (-500~500) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02
ADT151-XX-DP150	(-150~150) inH2O (-350~350) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02
ADT151-XX-DP100	(-100~100) inH2O (-250~250) mbar	(-50~50) inH2O (-125~125) mbar	DP	G	0.015	0.02
ADT151-XX-DP50	(-50~50) inH2O (-125~125) mbar	(-30~30) inH2O (-75~75) mbar	DP	G	0.015	0.02
ADT151-XX-DP30	(-30~30) inH2O (-75~75) mbar	(-20~20) inH2O (-50~50) mbar	DP	G	0.015	0.02
ADT151-XX-DP20[5]	(-20~20)inH2O (-50~50)mbar	(-10~10) inH2O (-25~25)mbar	DP	G	0.015	0.02

[1] The overload pressure of all pressure modules is 150%FS, and the burst pressure of modules: DP20:100mbar, DP100 / DP50 /DP30:1000mbar, DP400 / DP300 / DP200 / DP150: 4000 mbar, DP800 / DP1000:10000 mbar.
[2] FS specification applies to the span of the range.
[3] Precision: the error includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[4] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[5] Recommended calibration period 180 days.

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High-precision Compound Gauge Pressure Module Specification for ADT783-1K / 3.6K						
Model	**Gauge pressure range[1]**	**Absolute Pressure Range[2]**	**Media**	**Precision[3] [4]**	**Accuracy[5] [6]**	**Suggested Controller Compatibility**
ADT151-01RD-CP3.6KM	(-15~3600) psi (-1~250) bar	(0~3615) psi (0~251) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-3.6K only
ADT151-01RD-CP3KM	(-15~3000) psi (-1~200) bar	(0~3015) psi (0~201) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-3.6K only
ADT151-01RD-CP2KM	(-15~2000) psi (-1~140) bar	(0~2015) psi (0~141) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-3.6K only
ADT151-01RD-CP1.5KM	(-15~1500) psi (-1~100) bar	(0~1515) psi (0~101) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-3.6K only
ADT151-01RD-CP1KM	(-15~1000) psi (-1~70) bar	(0~1015) psi (0~71) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	Both
ADT151-01RD-CP500M	(-15~500) psi (-1~35) bar	(0~515) psi (0~36) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	Both
ADT151-01RD-CP300M	(-15~300) psi (-1~20) bar	(0~315) psi (0~21) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	Both
ADT151-01RD-CP150M	(-15~150) psi (-1~10) bar	(0~165) psi (0~11) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	Both
ADT151-01RD-CP100M	(-15~100) psi (-1~7) bar	(0~115) psi (0~8) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-1K only
ADT151-01RD-CP50M	(-15~50) psi (-1~3.5) bar	(0~65) psi (0~4.5) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-1K only
ADT151-01RD-CP35M	(-15~35) psi (-1~2.5) bar	(0~50) psi (0~3.5) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-1K only
ADT151-01RD-CP30M	(-15~30) psi (-1~2) bar	(0~45) psi (0~3) bar	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	ADT783-1K only

[1] The overload pressure of all pressure modules is 110%FS, and the burst pressure is 200%FS, the burst pressure of CP150M is 130%FS.
[2] Absolute pressure is achieved through the synthesis of the basic gauge pressure module and the optional atmospheric pressure module.
[3] FS refers to the positive range, and the accuracy of the negative pressure part is equal to that of the positive pressure part.
[4] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[5] The accuracy of the negative pressure part is equal to the accuracy of the positive pressure part, such as the maximum error of -15 psi is equal to the maximum allowable error of 15 psi.
[6] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift,temperature compensation, K=2.
[7] Sealed gauge pressure for CP2KM,CP3KM,CP3.6KM.

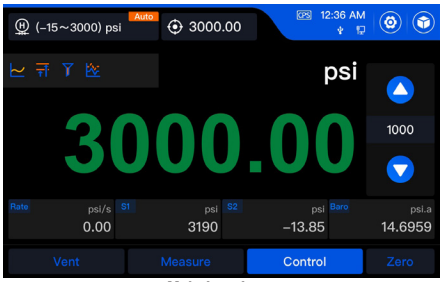
BAROMETRIC MEASUREMENT SPECIFICATIONS

Model[1]	Absolute Pressure Range	Accuracy
ADT151-BP	(60~110) kPa	±22 Pa
ADT151-BPH	(60~110) kPa	±10 Pa

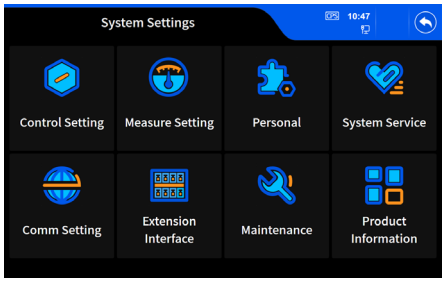
[1] A barometric pressure module is optional. After inserting the barometric pressure module, the controller can be toggled to and from gauge and absolute pressure units.

General Specifications

Specification	Description
Power Requirements	Power supply: AC100~240 V, 50/60 Hz
	Fuse: T3.15A 250V AC
	Maximum Power consumption: 150W
Size /Weight	Chassis Size: 17.32 × 5.23 × 14.96 in (440(W) × 133(H) × 380(D) mm)
	Rack Mount Dimensions: 3U-19" rack, Horizontal Direction
	Chassis weight: 16.9 kg
	Pressure module weight: 0.5 kg
Environment	Operating Ambient: 10℃ ~50℃
	Storage Temperature: -20℃ ~70℃
	Operating humidity: 5%RH~95%RH, non-condensing
	Altitude (Operation): <2000 m
	Ingress Protection: IP20, Indoor use only
	Vibration level: 2 G
	Impact intensity: 4 G
	Warmup Time: 15 minutes
	Machine drop height: 250 mm
Conformity	CE
Communications	RS232, USB-A*2, LAN
	WIFI, Bluetooth, GPIB, mouse, keyboard and other peripheral components can be expanded based on the USB port.
	SCPI Command set is compatible with ADT780, PACE5000/6000, DRUCK DPI520, user customizable
External drive valve port	3-channel external drive valves, green terminal connector with lock
	Maximum driving ability 24 V / 12 W, 30 V max
	One channel fixed to the CPS pollution prevention device, the remaining 2 channels, can be used to control the external vacuum Pump and external isolation valve
I/O Alarm port	3-channel, green terminal connector with a lock
	Volt-Free No/Nc relay, the maximum current-carrying capacity: 24 V / 0.5 A, 30 V max
Pressure switch test port	One channel, green terminal connector with lock
	Maximum load 24 V / 0.1 A 30 V max
	Support mechanical switch, electronic switch testing
Display	7-inch capacitive touch screen, 1280 * 800 resolution, reflective panels, black, white background can switch
	Communication update speed: 10 times per second
	Display refresh rate: 5 times per second
	Pressure value maximum displays: + 9999999, display digits is adjustable
External pressure module	Measurement only
Internal pressure control module port	Opening the cabin door will automatically release the pressure for safe removal of modules
	Inside of cabin, 3 pressure module bays, from left to right including a high pressure module bay, a low pressure module bay, and a barometric pressure module bay
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.



Main Interface



System Settings

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ORDERING INFORMATION

Model Number (Base Unit Only - No Pressure Modules)

ADT783 — Model:
ADT783-D
ADT783-1K
ADT783-3.6K

Note of ADT151 Pressure Modules

Model number	High Module Bay	Note	Low Module Bay	Note	Barometer Module Bay	Note
ADT783-D	ADT151-XX-DP30~DP1K	At least one module within the range of DP30 to DP1K must be installed in the high side module bay.	ADT151-XX-DP20-DP1K	The low module bay can be left empty, but when a low-pressure module is installed, the range must be lower than the installed high pressure module.	ADT151-BP ADT151-BPH	See ADT151 barometric specifications table for details.
ADT783-1K	ADT151-XX-CP50~CP1K	At least one module within the range of CP50 to CP1K must be installed in the high side module bay.	ADT151-XX-CP15-CP1K			
ADT783-3.6K	ADT151-XX-CP2K~CP3.6K	At least one module within the range of CP2K to CP3.6K must be installed in the high side module bay.	ADT151-XX-CP150-CP3.6K			

Model Number (Pressure Modules)

ADT151 — 01 — CP3.6K

Accuracy:
01 = 0.01% of full span
01RD = 0.01% of reading
02 = 0.02% of full span

See ADT151 module specification table

ADT151-01-CP3.6K

ADT151 — BP

Model:
ADT151-BP (±22 Pa)
ADT151-BPH (±10 Pa)

ADT151-BP

Accessories (included)		
Model number	**Quantity**	**Picture**
AC power cord (10A 250V)	1 pc	
ISO17025 accredited calibration certificate	1 pc	
Green terminal plug （For switch detection）	2 pcs	
O-ring 3.5*1.5 （For ADT151）	10 pcs	
1/4 BSP plug (Only for ADT783-D)	1 pc	
ADT151 Reference Plug (Only for ADT783-D)	1 pc	
Standard vent assembly (Plug with vent valve) (Only for ADT783-1K/3.6K)	1 pc	
5 feet flexible hose, 4500 psi, 1/4BSP female to 1/4BSP female ADT100-HTK-4.5K-BSPF4-BSPF4	1 pc	
Adapter, 1/4NPT male to 1/4BSP female (ADT100-NPTM4-BSPF4)	1 pc	
Adapter, 1/4NPT male to 1/4BSP male (ADT100-NPTM4-BSPM4)	1 pc	

General Optional Accessories		
Model number	**Description**	**Picture**
9050	USB to 232 cable	
9055-1	USB to Bluetooth module	
9055-2	USB to WIFI module	
9053	USB to GPIB adapter	
9050-EXT	RS232 communication line	
9245	Rack Flange Assembly	
9055	Green terminal plug	
9060	ADT161 pressure modules connection cable	
9054	Calibration fixture for ADT151 (Including adapter base w/ 1/4BSP male fitting, RS232/ power supply cable, 9V adapter, calibration software)	

Output pressure connections (Optional)			
Model number	**Description**		**Picture**
9240A （Only for ADT783-D）	DP gauge holder with a built-in 80 ml chamber		
ADT121-X	External Manifold		
1650700087	Quick connector (6 mm)	Need this 2 parts on Vent or Exhaust ports to drain the internal liquid to external container	
1650800039	Polyurethane tube (6 mm× 1.5 m)		
ADT108-KIT	Contamination Prevention System (Including ERP#:1650800039 polyurethane hose,1.5m length, and adaptor, 6mm Festo to 1/4BSP F)		

Additel 793
Pressure Controller/Generator

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- **Maximum pressure control range to 15,000 psi (1,000 Bar)**
- **Interchangeable pressure module**
- **Oil and water versions available**
- **Accuracy of 0.02%FS, 0.01%FS or 0.01%RD**
- **Dual-range from -15~3,000 psi (-1~200 Bar) to 0~15,000 psi (0~1,000) Bar**
- Control stability 0.005%FS
- Ultra-High speed pressure generation and control
- No external pressure source required
- Control using internal or external pressure modules
- Contamination Prevention System (CPS) (ADT793 optional)
- LAN, USB, RS232, and Ethernet communication
- External reservoir support
- Easy maintenance
- Emulation mode

OVERVIEW

The Additel 793 pressure controller combines the latest control/measure technology, modular design and maintenance features into a single user-friendly device. The Additel 793 provides pressure control up to 15,000 psi (1,000 Bar). For users who require automated production, test, and calibration, Additel has the workload covered with this pressure controller. The ADT793 accepts one ADT151 dual-range pressure module in addition to a barometric pressure module. This allows the user to quickly cover a wide range of pressures.

Quick Change Pressure Modules (30 seconds)

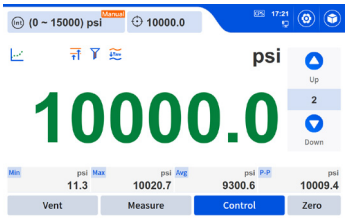
Additel's 151 pressure control modules can be installed or replaced within 30 seconds or less. Simply open the upper edge of the cabin to open. As the door opens, the controller will automatically release pressure, allowing for the safe removal and installation of the ADT151 modules. Additel offers five different pressure ranges for the ADT793 controller. Select between 1000 bar (15000 psi), 700 bar (10000 psi), 400 bar (6000 psi), 350 bar (5000 psi) or 200 bar (3000 psi) with the variety of accuracies to meet application requirements.

A Singular Pressure Module Design with a Wide Range of Capabilities

Additel's 151 pressure modules have been designed with flexibility and efficiency in mind and can easily be swapped out as needed to meet changing needs and workloads.Higher pressure ADT151 modules cover two separate pressure ranges and come with individual calibrations for each range. This allows for each module to accurately cover a wide range of pressure workloads. Also, each ADT151 is available in (3) different accuracy levels (0.02% FS, 0.01% FS and 0.01% of reading) to meet the demanding needs of our customers.

20% Pressure Step within 30 Seconds

In the process of efficient and fast-paced production line testing, verification and calibration, users have strict requirements for the speed of pressure controllers. ADT793 adopts professional control technology to effectively improve control rate and stability: control response time (typical) ≤30 seconds, control stability (typical) ≤±(0.003~0.005)%FS, see specifications for more details.



External Reservoir Support

High volume high pressure calibration work can quickly consume working media which can increase hands-on time and can be a hassle for laboratory personnel. The ADT793 supports switching between internal and external liquid storage tanks, allowing users to quickly connect the large capacity external liquid reservoir saving time and labor.

Contamination Prevention System (CPS) Prolongs the Maintenance Interval of the Controller

Calibration of DUT's (devices under test) often introduces contaminates to a calibration system. Contaminates can cause restrictions in valves, lines and filters. Additel has included a turn-key solution with the ADT793 to help reduce these concerns and improve durability and dependability when calibrating customers devices. The use of an automatic contamination prevention system and integration firmware allows for purges between pressure cycles to further reduce the possibility of introducing contaminates into the system.

Load Volumn Expander Expands the Loading Volume to 250ml

ADT793 supports reciprocating pressurization through a load volume expander to expand the loading volume to 250ml, which can meet the needs of production line users to test multiple DUT at the same time.

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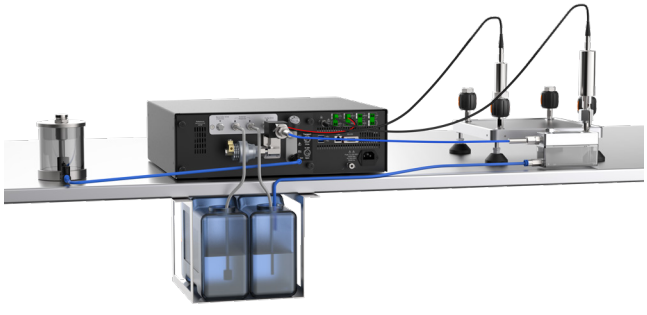
Pressure Specifications

Specification \ Model	ADT793
Pressure Range	0 to 15,000 psi (1,000 Bar)
Precision[1]	0.008%RD or 0.007%FS or 0.01%FS
Accuracy[2]	0.01%RD or 0.01%FS or or 0.02%FS
Control Stability[3]	< 0.005%FS, typically 0.003%FS
Control Response Time[4]	< 30 Seconds
Pressure Type[5]	Gauge, absolute
Internal Pressure Control Modules	1
External Pressure Control Modules	1
Max Pressure Range of Internal Module	0~15,000 psi (0~1,000 Bar)
Min Pressure Range of Internal Module	-15~3,000 psi (-1~200 Bar)
Min Range of External Module	-15~1,000 psi (-1~70 Bar)
Range Switching Mode[6]	Fixed, auto
Pump Source Type[7]	Built-in hydraulic pump, no external pressure source required.
Control Mode	Fast, standard, custom
Maximum Overshoot	< 1%FS
Maximum Load Volume	<10,000 psi: Max: 80 ml, 50 mL recommend 10,000~15,000 psi: Max: 60 ml, 35 mL recommend
Contamination Prevention System (CPS)	Optional
Pressure Port	1/4 BSP M
Built-in Reservoir Volume	800 mL
External Reservoir Extension	Optional
Port Filter[8]	Support
Media	Diethylhexyl Sebacate or deionized water

[1] Precision: the error includes linearity, hysteresis, repeatability, resolution, and temperature compensation.
[2] Accuracy: the error includes linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.
[3] In order to achieve 0.003% FS control stability, some additional stabilization time at the desired pressure may be needed depending on the configuration and pressure level.
[4] The hydraulic pressure is tested under an external load volume 10 ml, 20% step, and the time to reach 0.005% FS stability.
[5] Absolute pressure measurements require the optional barometer pressure module (ADT151-BP) to be installed.
[6] Does not support automatic range switching between the internal control pressure module and the external control pressure module.
[7] Liquid refers to Diethylhexyl Sebacate or deionized water.
[8] All pressure ports are installed with 40~100 μm filters.



General Specifications

Specification	Description
Power Requirements	Power supply: AC 100~240 V, 50/60 Hz
	Fuse: T3.15A 250V AC
	Maximum Power consumption: 150 W
Size /Weight	Chassis Size: 17.32 × 5.23 × 14.96 in (440(W) × 133(H) × 380(D) mm)
	Rack Mount Dimensions: 3U-19" rack, Horizontal Direction
	Chassis weight: 20.7 kg
	Pressure module weight: 0.5 kg
Environment	Operating Ambient: 10 ℃ ~50 ℃
	Storage Temperature: 5℃ ~70 ℃
	Operating humidity: 5%RH~95%RH, non-condensing
	Altitude (Operation): < 2000 m
	Ingress Protection: IP20, Indoor use only
	Vibration level: 2 g
	Impact intensity: 4 g
	Warmup Time: 15 minutes
	Bare Machine drop height: 250 mm
Conformity	CE
Communications	RS232, USB-A*2, LAN
	WIFI, Bluetooth, GPIB, mouse, keyboard and other peripheral components can be expanded based on the USB port.
	SCPI Command set is compatible with ADT780, PACE5000/6000, DRUCK DPI520, user customizable.
External drive valve port	3-channel external drive valves, green terminal connector with lock.
	Maximum driving ability 24 V / 12 W, 30 V max
	One channel fixed to the CPS pollution prevention device, the remaining 2 channels can be used to control the external vacuum pump and external isolation valve.
I/O Alarm port	3-channel, green terminal connector with a lock
	Volt-Free No/Nc relay, the maximum current-carrying capacity: 24 V / 0.5 A, 30 V max
Pressure switch test port	One channel, green terminal connector with lock
	Maximum load 24 V / 0.1 A 30 V max
	Support mechanical switch, electronic switch testing
Display	7-inch capacitive touch screen, 1280 * 800 resolution, reflective panels, black, white background can be user selectable.
	Communication update speed: 10 times per second
	Display refresh rate: 5 times per second
	Pressure value maximum displays: + 9999999, display digits is adjustable
External pressure control module port	5 pin standard Lemo plug
	Connect external pressure control module （ADT161）
Internal pressure control module port	Opening the cabin door will automatically release the pressure for safe removal of modules
	Inside of cabin: For ADT793/793W, 2bays, from left to right, including a pressure module bay, and a barometric module bay.
Warranty	1 year
Hose & Filter End of Life	The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

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Internal Module Specifications

The following tables provide information regarding our ADT151 modular pressure sensors that are designed to easily mount in the front bays of the ADT793 Pressure controller. Our gauge pressure (GP) and Compound pressure (CP) module accuracy specifications include linearity, hysteresis, repeatability, temperature compensation and annual drift, precision specifications include linearity, hysteresis, repeatability, resolution, and temperature compensation. Both the GP and CP style gauges can be zeroed by the controller from time to time to mitigate the effect of zero drift. The specifications are valid from 15°C~35°C. We recommend that these pressure models be calibrated annually.

Model / Range	Compound Gauge pressure		Measurement Type	Precision[2] (%FS)	Accuracy[3][4] (% FS)
	1st range[1]	2nd range			
ADT151-XX-GP15K	(0~15000) psi/ (0~1000) bar	(0~6000) psi/ (0~400) bar	Sealed gauge pressure	0.007 (0.01)	0.01 (0.02)
ADT151-XX-GP10K	(0~10000) psi/ (0~700) bar	(0~5000) psi/ (0~350) bar	Sealed gauge pressure	0.007 (0.01)	0.01 (0.02)
ADT151-XX-CP6K	(-15~6000) psi/ (-1~400) bar	(-15~3000) psi/ (-1~200) bar	Sealed gauge pressure	0.007 (0.01)	0.01 (0.02)
ADT151-XX-CP5K	(-15~5000) psi/ (-1~350) bar	(-15~3000) psi/ (-1~200) bar	Sealed gauge pressure	0.007 (0.01)	0.01 (0.02)

[1] The overload pressure of all pressure modules is 110%FS, and the burst pressure is 200%FS,the burst pressure of GP15K is 130%FS
[2] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[3] FS specification applies to the span of the range.
[4] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

High-precision Compound Gauge Pressure Module Specification					
Model	Gauge pressure range[1]	Absolute Pressure Range[2]	Measurement Type	Precision[3]	Accuracy[4]
ADT151-01RD-GP15KM	(0 ~15000) psi (0~1000) bar	(15~15015) psi (1~1001) bar	Sealed gauge pressure	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater
ADT151-01RD-GP10KM	(0 ~10000) psi (0~700) bar	(15~10015) psi (1~701) bar	Sealed gauge pressure	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater
ADT151-01RD-CP6KM	(-15~6000) psi (-1~400) bar	(0~6015) psi (0~401) bar	Sealed gauge	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater
ADT151-01RD-CP5KM	(-15~5000) psi (-1~350) bar	(0~5015) psi (0~351) bar	Sealed gauge pressure	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater
ADT151-01RD-CP3KM	(-15~3000) psi (-1~200) bar	(0~3015) psi (0~201) bar	Sealed gauge pressure	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater

[1] The overload pressure of all pressure modules is 110%FS, and the burst pressure is 200%FS, among which the burst pressure of GP15KM is 130%FS.
[2] Absolute pressure is realized by calculating the gauge pressure and the optional barometric module.
[3] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[4] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

Barometric Specifications

Model[1]	Absolute Pressure Range	Maximum Tolerance
ADT151-BP	(60~110) kPa	±22 Pa
ADT151-BPH	(60~110) kPa	±10 Pa

[1] A barometric pressure module is optional. After inserting the barometric pressure module, the controller can be toggled to and from gauge and absolute pressure units.

CP Pressure Module with Calibration Fixture

BP Pressure Module with Calibration Fixture

ORDERING INFORMATION

Model Number (Base Unit Only - No Pressure Modules)

ADT793 –

Model:
ADT793
ADT793W

Model Number (Pressure Modules)

ADT151 – **01** – **GP15K**

Accuracy:
01 = 0.01% of full span
01RD = 0.01% of reading
02 = 0.02% of full span

See internal module specification table

ADT151-01-GP15K

ADT151 – **BP**

Model:
ADT151-BP (±22 Pa)
ADT151-BPH (±10 Pa)

ADT151-BP

Note: The ADT793 has two bays for pressure modules. One bay is designated for a BP modules only and the other bay is for CP and CP modules.

Accessories (included)

Item	Quantity	Picture
AC power cord (10A 250V)	1 pc	
ISO17025 accredited calibration certificate	1 pc	
Green terminal plug (For switch test)	2 pcs	
O-ring 3.5 1.5 (For sealing pressure module)	10 pcs	
Drain switch valve assembly (Switch valve + 0.5m 6mm tube)	1 set	
9241 Gas filled accumulator for ADT762 and ADT793	1 pc	
9241W Gas filled accumulator for ADT762W and ADT793W	1 pc	
5 feet flexible hose, 15000 psi, 1/4BSP female to 1/4BSP female (ADT100-HTK-15K-BSPF4-BSPF4)	1 pc	
Sebacate oil (500ml)	1 pc	
Adapter, 1/4NPT male to 1/4BSP female (ADT100-NPTM4-BSPF4)	1 pc	
Adapter, 1/4NPT male to 1/4BSP male (ADT100-NPTM4-BSPM4)	1 pc	

General Optional Accessories

Model number	Description	Picture
9050	USB to 232 cable	
9055-1	USB to Bluetooth module	
9055-2	USB to WIFI module	
9053	USB to GPIB adapter	
9050-EXT	RS232 communication cable	
9054	Calibration fixture for ADT151 (Including adapter base w/ 1/4BSP male fitting, RS232/power supply cable, 9V adapter, calibration software)	
9245	Rack mount assembly	
9055	Green terminal plug (Drive valve, for I/O)	
ADT161	Pressure modules. External connection with ADT793 can be used as controlling module. Selectable range is 1K~15K. See ADT161 tables for module ranges and types.	
9060	ADT161 pressure modules connection cable	
9241	Gas filled accumulator for ADT762 and ADT793	
9241W	Gas filled accumulator for ADT762W and ADT793W	

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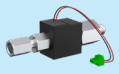
Output pressure connections (Optional)		
Model number	**Description**	**Picture**
9057	Load Volume Expander	
ADT123	Hydraulic manifold (4 ports, 1000 bar, with high pressure hose)	
ADT109-KIT	Contamination Prevention System	

External Liquid Connections (Optional)		
Model number	**Description**	**Picture**
9084	External reservior connection components (Includes 2 pcs 1.5m × 6mm hoses)	
9230	Liquid level indicator (For observing the level and refill)	

Additel 151
Digital Pressure Modules

- **Pressure ranges to 15,000 psi (1,000 bar)**
- **Accuracy of 0.02%FS, 0.01%FS or 0.01%RD**
- Fully temperature compensated accuracy
- Two pressure ranges per module
- Advanced temperature compensation
- ISO 17025 accredited calibration and data included
- Optional calibration fixture with software

ADT151 Module

OVERVIEW

Additel's 151 pressure modules have been designed with flexibility and efficiency in mind and can easily be swapped out as needed to meet changing needs and workloads. Higher pressure ADT151 modules cover two separate pressure ranges and come with individual calibrations for each range. This allows for each module to accuracy cover a wide range or pressure workloads. Also, each ADT151 is available in (3) different accuracy levels (0.02% FS, 0.01% FS and 0.01% of reading) to meet the demanding needs of our customers. Additel's 151 pressure modules provide users with the flexibility and dependability end users have come to expect.

PRESSURE RANGE

The following tables mainly describes the range, accuracy, and precision of the ADT151 pressure modules. For pressure modules of gauge pressure (GP) and differential pressure (DP) and compound pressure (CP), the zero drift can be eliminated by regular zeroing of the device.The specifications are valid at ambient temperatures from 15°C~35°C. We recommend that these pressure models be calibration annually. ADT151 module provides single-range and dual-range, users can choose according to needs.
Precision: The error components include linearity, hysteresis, repeatability, resolution and temperature compensation.
Accuracy: The error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

BAROMETRIC MEASUREMENT SPECIFICATIONS

Model[1]	Absolute Pressure Range	Accuracy
ADT151-BP	(60~110) kPa	±22 Pa
ADT151-BPH	(60~110) kPa	±10 Pa

[1] A barometric pressure module is optional for ADT773/ADT783/ADT793. After inserting the barometric pressure module, the controller can be toggled to and from gauge and absolute pressure units.

GP Pressure Module with Calibration Fixture

BP Pressure Module with Calibration Fixture

SPECIFICATIONS

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Model / Range	Compound Gauge pressure		Measurement Type	Media	Precision[3] (%FS)	Accuracy[1] [4] (%FS)	Burst Pressure	Suggested Controller Compatibility
	1st range	2nd range						
GP15K	(0~15000) psi (0~1000) bar	(0~6000) psi (0~400) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	1.3x	ADT793
GP10K	(0~10000) psi (0~700) bar	(0~5000) psi (0~350) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT793
CP6K	(-15~6000) psi (-1~400) bar	(-15~3000) psi (-1~200) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT793
CP5K	(-15~5000) psi (-1~350) bar	(-15~3000) psi (-1~200) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT793
CP3.6K	(-15~3600) psi (-1~250) bar	(-15~1500) psi (-1~100) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-3.6K
CP3K	(-15~3000) psi (-1~200) bar	(-15~1500) psi (-1~100) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-3.6K
CP2K	(-15~2000) psi (-1~140) bar	(-15~1000) psi (-1~70) bar	Sealed gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-3.6K
CP1K	(-15~1000) psi (-1~70) bar	(-15~500) psi (-1~35) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K ADT783-3.6K
CP500	(-15~500) psi (-1~35) bar	(-15~300) psi (-1~20) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K ADT783-3.6K
CP300	(-15~300) psi (-1~20) bar	(-15~150) psi (-1~10) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K ADT783-3.6K
CP150	(-15~150) psi (-1~10) bar	(-15~60) psi (-1~4) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	1.3x	ADT783-1K
CP100	(-15~100) psi (-1~7) bar	(-15~50) psi (-1~3.5) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K
CP50	(-15~50) psi (-1~3.5) bar	(-15~30) psi (-1~2) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K
CP35	(-15~35) psi (-1~2.5) bar	(-15~15) psi (-1~1) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K
CP30	(-15~30) psi (-1~2) bar	(-15~15) psi (-1~1) bar	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K
CP15	(-15~15) psi (-1~1) bar	(-10~10) psi (-0.7~0.7) bar[2]	Gauge	G,L	0.007 (0.01)	0.01 (0.02)	2x	ADT783-1K

[1] For the full-scale accuracy, FS refers to the upper limit of the range - the lower limit of the range.
[2]The second range (-10~10)psi accuracy is 0.02%FS, the precision is 0.01%FS.
[3] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[4] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

Model [3]	Differential Pressure		Measurement Type	Pressure Medium	Precision[4] (%FS)	Accuracy[1] [5] (%FS)	Burst Pressure	Static Pressure Range	Suggested Controller Compatibility
	1st range	2nd range							
DP1K	(-400~1000) inH2O (-1000~2500) mbar	(-400~400) inH2O (-1000~1000) mbar	DP	G	0.015	0.02	10000 mbar	1MPa	ADT783-D
DP800	(-400~800) inH2O (-1000~2000) mbar	(-400~400) inH2O (-1000~1000) mbar	DP	G	0.015	0.02	10000 mbar	1MPa	ADT783-D
DP400	(-400~400) inH2O (-1000~1000) mbar	(-200~200) inH2O (-500~500) mbar	DP	G	0.015	0.02	4000 mbar	1MPa	ADT783-D ADT773
DP300	(-300~300) inH2O (-700~700) mbar	(-150~150) inH2O (-350~350) mbar	DP	G	0.015	0.02	4000 mbar	400kPa	ADT783-D ADT773
DP200	(-200~200) inH2O (-500~500) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02	4000 mbar	400kPa	ADT783-D ADT773
DP150	(-150~150) inH2O (-350~350) mbar	(-100~100) inH2O (-250~250) mbar	DP	G	0.015	0.02	4000 mbar	400kPa	ADT783-D ADT773
DP100	(-100~100) inH2O (-250~250) mbar	(-50~50) inH2O (-125~125) mbar	DP	G	0.015	0.02	1000 mbar	100kPa	ADT783-D ADT773
DP50	(-50~50) inH2O (-125~125) mbar	(-30~30) inH2O (-75~75) mbar	DP	G	0.015	0.02	1000 mbar	100kPa	ADT783-D ADT773
DP30	(-30~30) inH2O (-75~75) mbar	(-20~20) inH2O (-50~50) mbar	DP	G	0.015	0.02	1000 mbar	100kPa	ADT783-D ADT773
DP20[2]	(-20~20) inH2O (-50~50) mbar	(-10~10) inH2O (-25~25) mbar	DP	G	0.015	0.02	100 mbar	60kPa	ADT783-D ADT773
DP10[2]	(-10~10) inH2O (-25~25) mbar	(-5~5) inH2O (-10~10) mbar	DP	G	0.015	0.02	100 mbar	60kPa	ADT773
DP5[2]	(-5~5) inH2O (-10~10) mbar	(-2~2) inH2O (-5~5) mbar	DP	G	0.025	0.05	100 mbar	60kPa	ADT773
DP2[2]	(-2~2) inH2O (-5~5) mbar	(-1~1) inH2O (-2.5~2.5) mbar	DP	G	0.025	0.05	100 mbar	60kPa	ADT773

[1] FS means upper range - lower range.
[2] Recommended calibration cycle 180 days.
[3] DP300 to DP1000 provides positive range, accuracy and precision specifications continue to apply;
DP10 to DP150 provides a positive range with accuracy and precision specifications of 0.02%FS and 0.015%FS, respectively;
DP2 to DP5 provides a positive range, with accuracy and precision specifications of 0.05%FS and 0.025%FS, respectively.
[4] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[5] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

[1] Absolute pressure is achieved through the synthesis of the basic gauge pressure module and the optional atmospheric pressure module.
[2] The accuracy of the negative pressure part is equal to the accuracy of the positive pressure part, such as the maximum error of -15 psi is equal to the maximum allowable error of 15 psi.
[3] FS refers to the positive range, and the accuracy of the negative pressure part is equal to that of the positive pressure part.
[4] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[5] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

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High-precision Gauge Pressure Module Specifications								
Model	Gauge pressure range	Absolute Pressure Range [1]	Measurement Type	Media	Precision[3][4]	Accuracy[2][5]	Burst Pressure	Suggested Controller Compatibility
GP15KM	(0~15000) psi (0~1000) bar	(15~15015) psi (0~1001) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	1.3x	ADT793
GP10KM	(0~10000) psi (0~700) bar	(15~10015) psi (1~701) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT793
CP6KM	(-15~6000) psi (-1~400) bar	(0~6015) psi (0~401) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT793
CP5KM	(-15~5000) psi (-1~350) bar	(0~5015) psi (0~351) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT793
CP3.6KM	(-15~3600) psi (-1~250) bar	(0~3615) psi (0~251) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT793 ADT783-3.6K
CP3KM	(-15~3000) psi (-1~200) bar	(0~3015) psi (0~201) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT793 ADT783-3.6K
CP2KM	(-15~2000) psi (-1~140) bar	(0~2015) psi (0~141) bar	Sealed gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-3.6K
CP1.5KM	(-15~1500) psi (-1~100) bar	(0~1515) psi (0~101) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	1.3x	ADT783-3.6K
CP1KM	(-15~1000) psi (-1~70) bar	(0~1015) psi (0~71) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K ADT783-3.6K
CP500M	(-15~500) psi (-1~35) bar	(0~515) psi (0~36) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K ADT783-3.6K
CP300M	(-15~300) psi (-1~20) bar	(0~315) psi (0~21) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K ADT783-3.6K
CP150M	(-15~150) psi (-1~10) bar	(0~165) psi (0~11) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	1.3x	ADT783-1K ADT783-3.6K
CP100M	(-15~100) psi (-1~7) bar	(0~115) psi (0~8) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K
CP50M	(-15~50) psi (-1~3.5) bar	(0~65) psi (0~4.5) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K
CP35M	(-15~35) psi (-1~2.5) bar	(0~50) psi (0~3.5) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K
CP30M	(-15~30) psi (-1~2) bar	(0~45) psi (0~3) bar	Gauge	G,L	0.008% rdg or 0.004% FS whichever is greater	0.01% rdg or 0.005% FS whichever is greater	2x	ADT783-1K

[1] Absolute pressure is achieved through the synthesis of the basic gauge pressure module and the optional atmospheric pressure module.
[2] The accuracy of the negative pressure part is equal to the accuracy of the positive pressure part, such as the maximum error of -15 psi is equal to the maximum allowable error of 15 psi.
[3] FS refers to the positive range, and the accuracy of the negative pressure part is equal to that of the positive pressure part.
[4] Precision: the error components include linearity, hysteresis, repeatability, resolution, and temperature compensation.
[5] Accuracy: the error components include linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, annual drift, temperature compensation, K=2.

GENERAL SPECIFICATIONS

	Standard precision			High-precision
Model	CPXX	DPXX	GPXX	CPXM
Operating temperature	0.01%FS accuracy: 15 °C to 35 °C (59 °F to 95 °F) Other accuracy: -10 °C to 50 °C (14 °F to 122 °F)			
Storage temperature	-30°C to 70°C (-22°F to 158°F)			
Relative humidity	10% to 95% RH, non-condensing			
Pressure connection (for external use only)	6 mm (O-ring, 3*1.5-NBR70)			
Enclosure (for external use only)	Aluminum			
Dimensions (L x W x H)	30 mm x 80 mm x 91mm (1.18" x 3.15" x 3.58")			
Weight	0.5 kg (1.1 lb)			
Warranty	1 Year			

ORDERING INFORMATION

Model Number

ADT151 — 01 — GP15K

Accuracy:
01 - 0.01% of full span
02 - 0.02% of full span
05 - 0.05% of full span

Pressure range P/N:
See pressure range table

Accessories included

ISO 17025 accredited Calibration Certificate

Optional Accessories

Model number	Description	Picture
9054	Calibration fixture for ADT151 (Including adapter base w/ 1/4BSP male fitting, RS232/power supply cable, 9V adapter, calibration software)	

Additel 783 with ADT151 Pressure Modules

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Additel 161, 161Ex
Intelligent Digital Pressure Modules

- **Pressure ranges to 60,000 psi (4,200 bar)**
- **Precision accuracy to 0.01% RD**
- Intrinsically Safe (Ex) models available
- Fully temperature compensated accuracy

Gauge pressure Differential pressure

OVERVIEW

With advanced microprocessor technology and state-of-the-art silicon pressure sensors, Additel's 161 and 161Ex series Digital Pressure Modules provide an accurate, reliable, and economic solution for wide range of pressure applications. Our intrinsically safe (Ex) models are up to the task of providing the best possible results, even in hazardous environments. In order to reach the best performance, every silicon pressure sensor in the module has been specially aged, tested and screened before assembly. Designed as external pressure modules for Additel's 760 automatic handheld pressure calibrator, the ADT761 automated pressure calibrator, ADT226/227 series handheld process calibrator and Additel's flagship 780 pressure controller, the Additel 161 is unmatched in performance and reliability. If intrinsic safety is a critical requirement for your workload, we have you covered when you combine our model ADT226Ex/227Ex process calibrator with any of our ADT161Ex pressure modules.

FEATURES

- Precision sensor measurement accuracy to 0.01% RD
- Gauge pressure measurement accuracy of 0.02% FS
- Pressure ranges to 60,000 psi (4,200 bar)
- Intrinsically Safe (Ex) models available
- Advanced temperature compensation
- ISO 17025 accredited calibration and data included

PRESSURE RANGE

Differential Pressure						
P/N	Pressure Range[1]		Media	Accuracy (%FS)	Burst Pressure	Static Pressure Range
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	100×	±10 psi
DP2	±2	±5.0	G	0.05[2]	100×	±10 psi
DP5	±5	±10	G	0.05[2]	50×	±10 psi
DP10	±10	±25	G	0.05[2]	20×	±10 psi
DP20	±20	±50	G	0.05	20×	±10 psi
DP30	±30	±75	G	0.05	20×	±10 psi
DP50	±50	±160	G	0.05	3×	±10 psi
DP100	±100	±250	G	0.02	3×	±15 psi
DP150	±150	±350	G	0.02	3×	50 psi
DP300	±300	±700	G	0.02	3×	50 psi

[1] FS specification applies to the span of the range. Accuracy includes 1 year stability.
[2] 0.05%FS accuracy (incl 6 months stability). One year accuracy is 0.05%FS calibration accuracy combined with 0.05%FS one year stability.

Gauge Pressure[1]					
P/N	Pressure Range		Media [2]	Accuracy(%FS)	Burst Pressure
	(psi)	(bar)			
V15	-15	-1.0	G	0.02	3×
GP2	2	0.16	G	0.05	3×
GP5	5	0.35	G	0.05	3×
GP10	10	0.7	G	0.02	3×
GP15	15	1.0	G , L	0.02	3×
GP30	30	2.0	G , L	0.01 (0.02)	3x[3]
GP50	50	3.5	G , L	0.01 (0.02)	3x[3]
GP100	100	7.0	G , L	0.01 (0.02)	3x[3]
GP150	150	10	G , L	0.01 (0.02)	3x[3]
GP300	300	20	G , L	0.01 (0.02)	3x[3]
GP500	500	35	G , L	0.01 (0.02)	3x[3]
GP600	600	40	G , L	0.01 (0.02)	3x[3]
GP1K	1,000	70	G , L	0.01 (0.02)	3x[3]
GP1.5K	1,500	100	G , L	0.01 (0.02)	3x[3]
GP2K	2,000	140	G , L	0.01 (0.02)	3x[3]
GP3K	3,000	200	G , L	0.01 (0.02)	3x[3]
GP5K	5,000	350	G , L	0.01 (0.02)	3x[3]
GP10K	10,000	700	G , L	0.01 (0.02)	2x[4]
GP15K	15,000	1,000	G , L	0.05	2x
GP20K	20,000	1,400	G , L	0.05	1.5x
GP25K	25,000	1,600	G , L	0.05	1.5x
GP30K	30,000	2,000	G , L	0.05	1.5x
GP36K	36,000	2,500	G , L	0.05	1.5x
GP40K	40,000	2,800	G , L	0.05	1.35x
GP50K	50,000	3,500	G , L	0.1	1.2x
GP60K	60,000	4,200	G , L	0.1	1.1x

[1] Sealed gauge pressure for above 1000 psi
[2] G=Gas, L=Liquid
[3] 2x for 0.01% FS
[4] 1.2x for 0.01% FS

Now Offering 0.01% Accuracy

Note: 0.01%FS accuracy sensors cannot be configured as Ex models and cannot be read by Ex devices.

SPECIFICATIONS

Compound Pressure					
P/N	Pressure Range		Media	Accuracy(%FS)	Burst Pressure
	psig	bar.g			
CP2	±2	±0.16	G	0.05% FS	3x
CP10	±10	±0.7	G	0.02% FS	3x
CP15	±15	±1.0	G	0.02% FS	3x
CP30	-15 to 30	-1 to 2.0	G	0.01 (0.02)	3x
CP100	-15 to 100	-1 to 7.0	G,L	0.01 (0.02)	3x
CP150	-15 to 150	-1 to 10	G,L	0.01 (0.02)	3x
CP300	-15 to 300	-1 to 20	G,L	0.01 (0.02)	3x
CP500	-15 to 500	-1 to 35	G,L	0.01 (0.02)	3x
CP600	-15 to 600	-1 to 40	G,L	0.01 (0.02)	3x
CP1K	-15 to 1,000	-1 to 70	G,L	0.01 (0.02)	3x
CP2K	-15 to 2,000	-1 to 140	G,L	0.01 (0.02)	3x
CP3K	-15 to 3,000	-1 to 200	G,L	0.01 (0.02)	3x
CP5K	-15 to 5,000	-1 to 350	G,L	0.01 (0.02)	3x
CP10K	-15 to 10,000	-1 to 700	G,L	0.01 (0.02)	2x

Note: 0.01%FS accuracy sensors cannot be configured as Ex models and cannot be read by Ex devices.

Precision Sensors[1]					
P/N	Pressure Range		Media	Accuracy[2]	Burst Pressure
	psi	bar			
AP15R	0 to 15	0 to 1	G	0.01% FS	2x
CP30M	-15 to 30	-1 to 2.0	G, L	0.005% rdg + 0.005% FS	2x
CP50M	-15 to 50	-1 to 3.5	G, L	0.005% rdg + 0.005% FS	2x
CP100M	-15 to 100	-1 to 7.0	G, L	0.005% rdg + 0.005% FS	2x
CP300M	-15 to 300	-1 to 20	G, L	0.005% rdg + 0.005% FS	2x
CP500M	-15 to 500	-1 to 35	G, L	0.005% rdg + 0.005% FS	2x
CP1KM	-15 to 1,000	-1 to 70	G, L	0.01% rdg or 0.003% FS whichever is greater	2x
CP2KM	-15 to 2,000	-1 to 140	G, L	0.01% rdg or 0.003% FS whichever is greater	2x
CP3KM	-15 to 3,000	-1 to 200	G, L	0.01% rdg or 0.003% FS whichever is greater	2x
CP5KM	-15 to 5,000	-1 to 350	G, L	0.01% rdg or 0.003% FS whichever is greater	2x
CP10KM	-15 to 10,000	-1 to 700	G, L	0.01% rdg or 0.003% FS whichever is greater	1.2x

[1] Contact Additel for other range options.
[2] Accuracy includes calibration uncertainty, linearity and long-term stability.

Note: Precision Sensors (CPXM) cannot be configured as Ex models and cannot be read by Ex devices.

New Precision Models

Barometric Pressure					
P/N	Pressure Range		Media	Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	55 Pa	3×
BPH	60 kPa	110 kPa	G	10 Pa	3×

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ORDERING INFORMATION

Model Number

ADT161 – 01 – GP300 – PSI – N

Model:
ADT161
ADT161Ex

Accuracy:
01 - 0.01% FS (non-Ex models only)
02 - 0.02% of full span
05 - 0.05% of full span
10 - 0.1% of full span
01RD - See precision sensor table (non-Ex models only)

Pressure range P/N:
See pressure range table

Range type:
PSI - range by psi
BAR - range by bar

Pressure port type:
N - 1/4NPT male
N2 - 1/2NPT male
B - 1/4BSP male
B2 - 1/2BSP male
M - M20 X 1.5 male
AF - Autoclave F-250-C female
AM - Autoclave M-250-C male

Accessories included

ISO 17025 accredited Calibration Certificate

Model number	Description	Picture
9060	Pressure module connection cable	
9064	Pressure module lemo connection to USB for high-speed connection of ADT161 to PC	

Additel 226Ex with ADT161Ex Pressure Module

SPECIFICATIONS

	Standard Accuracy			Precision Accuracy
	CPXX	DPXX	GPXX	CPXM
Operating temperature	-10°C to 50°C (14°F to 122°F)			10°C to 30°C (50°F to 86°F)
Storage temperature	-30°C to 70°C (-22°F to 158°F)			-30°C to 70°C (-22°F to 158°F)
Relative humidity	95% RH			90% RH
Pressure connections (for external use only)	1/4NPT, 1/2NPT, 1/4BSP, 1/2BPS, M20 x15			
Enclosure (for external use only)	SS enclosure			
Intrinisic Safety (ADT161Ex models only)	ATEX certified intrinsically safe Ex II 1G EX ia IIC T4 Ga (ADT161Ex modules only work together with ADT226Ex or ADT227Ex to conform to the ATEX certificate.)			
Dimensions (Dia x H)	33 mm x 123 mm (1.3" x 4.84")			
Weight	0.4 kg (0.99 lb)			
Warranty	1 Year			

Additel 158Ex
Intelligent Digital Pressure Modules

- **Pressure ranges to 60,000 psi (4,200 bar)**
- **Pressure measurement accuracy of 0.02% FS**
- Intrinsically Safe (Ex)
- Fully temperature compensated accuracy

ADT158Ex

OVERVIEW

With advanced microprocessor technology and state-of-the-art silicon pressure sensors, Additel's 158Ex series Digital Pressure Modules provide an accurate, reliable, and economic solution for wide range of pressure applications. Our intrinsically safe (Ex) models are up to the task of providing the best possible results, even in hazardous environments. In order to reach the best performance, every silicon pressure sensor in the module has been specially aged, tested and screened before assembly. Designed as field switchable pressure modules for use with Additel 273Ex and 260Ex handheld devices, the Additel 158Ex is unmatched in performance and reliability. If intrinsic safety is a critical requirement for your workload, we have you covered when you combine our model ADT273Ex or ADT260Ex handheld calibrators with any of our ADT158Ex pressure modules.

FEATURES

- Gauge pressure measurement accuracy of 0.02% FS
- Pressure ranges to 60,000 psi (4,200 bar)
- Intrinsically Safe with ADT260EX and ADT273EX
- Advanced temperature compensation
- ISO 17025 accredited calibration and data included

PRESSURE RANGE

Gauge Pressure [1]

P/N	Pressure Range		Media [2]	Accuracy(%FS)	Burst Pressure
	(psi)	(bar)			
V15	-15	-1.0	G	0.02	3×
GP2	2	0.16	G	0.05	3×
GP5	5	0.35	G	0.05	3×
GP10	10	0.7	G	0.02	3×
GP15	15	1.0	G , L	0.02	3×
GP30	30	2.0	G , L	0.02	3×
GP50	50	3.5	G , L	0.02	3×
GP100	100	7.0	G , L	0.02	3×
GP150	150	10	G , L	0.02	3×
GP300	300	20	G , L	0.02	3×
GP500	500	35	G , L	0.02	3×
GP600	600	40	G , L	0.02	3×
GP1K	1,000	70	G , L	0.02	3×
GP1.5K	1,500	100	G , L	0.02	3×
GP2K	2,000	140	G , L	0.02	3×
GP3K	3,000	200	G , L	0.02	3×
GP5K	5,000	350	G , L	0.02	3×
GP10K	10,000	700	G , L	0.02	2×
GP15K	15,000	1,000	G , L	0.05	2x
GP20K	20,000	1,400	G , L	0.05	1.5x
GP25K	25,000	1,600	G , L	0.05	1.5x
GP30K	30,000	2,000	G , L	0.05	1.5x
GP36K	36,000	2,500	G , L	0.05	1.5x
GP40K	40,000	2,800	G , L	0.05	1.35x
GP50K	50,000	3,500	G , L	0.1	1.2x
GP60K	60,000	4,200	G , L	0.1	1.1x

[1] Sealed gauge pressure for above 1000 psi
[2] G=Gas, L=Liquid

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SPECIFICATIONS

Compound Pressure					
P/N	Pressure Range		Media	Accuracy	Burst Pressure
	psig	bar.g			
CP2	±2	±0.16	G	0.05% FS	3x
CP5	±5	±0.35	G	0.02% FS	3x
CP10	±10	±0.7	G	0.02% FS	3x
CP15	±15	±1.0	G	0.02% FS	3x
CP30	-15 to 30	-1 to 2.0	G	0.02% FS	3x
CP50	-15 to 50	-1 to 3.5	G	0.02% FS	3x
CP100	-15 to 100	-1 to 7.0	G,L	0.02% FS	3x
CP300	-15 to 300	-1 to 20	G,L	0.02% FS	3x
CP500	-15 to 500	-1 to 35	G,L	0.02% FS	3x
CP600	-15 to 600	-1 to 40	G,L	0.02% FS	3x
CP1K	-15 to 1,000	-1 to 70	G,L	0.02% FS	3x
CP2K	-15 to 2,000	-1 to 140	G,L	0.02% FS	3x
CP3K	-15 to 3,000	-1 to 200	G,L	0.02% FS	3x
CP5K	-15 to 5,000	-1 to 350	G,L	g0.02% FS	3x
CP10K	-15 to 10,000	-1 to 700	G,L	0.02% FS	2x

Barometric Pressure					
P/N	Pressure Range		Media	Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	55 Pa	3×

Additel 273Ex and 260Ex with ADT158 pressure module installed

ORDERING INFORMATION

Model Number

ADT158EX — 02 — CP300 — PSI — N

Model:
ADT158Ex

Accuracy:
02 - 0.02% of full scale
05 - 0.05% of full scale
10 - 0.1% of full scale

Pressure range P/N:
See pressure range tables

Range type:
PSI - range by psi
BAR - range by bar

Pressure port type:
N - 1/4NPT male
N2 - 1/2NPT male
B - 1/4BSP male
B2 - 1/2BSP male
M - M20 X 1.5 male
AF - Autoclave F-250-C female
AM - Autoclave M-250-C male

Accessories included

ISO 17025 accredited Calibration Certificate

SPECIFICATIONS

Standard Accuracy		
Model	**CPXXX**	**GPXXX**
Operating temperature	-10°C to 50°C (14°F to 122°F)	
Storage temperature	-20°C to 70°C (-4°F to 158°F)	
Relative humidity	95% RH	
Pressure connections (for external use only)	1/4NPT, 1/2NPT, 1/4BSP, 1/2BPS, M20x15	
Enclosure (for external use only)	SS enclosure	
Intrinisic Safety	ATEX certified intrinsically safe only with ADT260EX & ADT273EX	
Dimensions (Dia x H)	33 mm x 123 mm (1.3" x 4.84")	
Weight	0.99 lb (0.4 kg)	
Warranty	1 Year	

Additel Pressure Gauge Selection Guide

Additel
Metrology Made Simple

Series / Feature	ADT681A	ADT680A	ADT680P	ADT601Ex	ADT685	ADT686	ADT673
Gauge Pressure	•	•	•	•	•	•	•
Compound Pressure	•	•	•		•	•	•
Absolute Pressure	•				•	•	•
Differential Pressure	•				•	•	•
Range	-15 to 60K psi (-1 to 4200 bar)	-15 to 60K psi (-1 to 4200 bar)	-15 to 60K psi (-1 to 4200 bar)	-15 to 15K psi (-1 to 1000 bar)	-15 to 60K psi (-1 to 4200 bar)	-15 to 60K psi (-1 to 4200 bar)	-15 to 60K psi (-1 to 4200 bar)
Available Accuracies (range dependent)	0.02%, 0.05%, 0.1%, 0.2%FS & 0.1%RD	0.1%, 0.2%FS	0.02%, 0.05%, 0.1%, 0.2%FS & 0.1%RD	0.5%FS	0.02%, 0.05%, 0.1%, 0.2%FS & 0.1%RD	0.02%, 0.05%, 0.1%, 0.2%FS & 0.1%RD	0.02%, 0.05%, 0.1%, 0.2%FS & 0.1%RD
Digital Display	•	•	•	•	•	•	•
Analog Display (Fan-Shaped Indication)	•				•		
Fully Temperature Compensation from -10°C to 50°C	•	•	•	-20 to 50°C	•	•	•
Resolution	5, 6 digits	4, 5 digits	4, 5 digits	4 digits	5 1/2 digits	4, 5, 6 digits	4, 5, 6 digits
Selectable Pressure Units	12 & 1 customized units	12 & 1 customized units	12 & 1 customized units	12	11 & 3 customized units	11 & 5 customizable units	11& 5 customizable units
Backlight	•	•	•	•	•	•	•
Over Pressure Indication	•	•	•	•	•	•	•
IP67	•	•	•	•	•	•	•
Intrinsically Safe	ADT681AEx	ADT680AEx	ADT680PEx	•	ADT685Ex		
Communication	BLE, USB, RS232	BLE, RS232	BLE, RS232	BLE	BLE, USB, RS232, RS485(optional)	BLE, USB, RS232, RS485, WIFI(optional)	BLE, USB, RS232, RS485, WIFI(optional)
Data Logging	•	•	•		•	•	•
Min/Max	•	•	•	•	•	•	•
Built-in Leak Test	•				•	•	•
HART							•
Measure mA and V							•
24V Loop Power							•
Switch Test							•
NIST-Traceable Certificate of Calibration	•	•	•		•	•	•
Power	3 AA Aalkaline batteries (power supply through USB is optional, adapter not for Ex)	3 AA Aalkaline batteries (External power supply through RS232 cable, adapter not for Ex)	3 AA Aalkaline batteries (External power supply through RS232 cable, adapter not for Ex)	3 AA batteries	3 AA batteries & 120/220V adapter is optional(adapter not for Ex)	Rechargeable battery (120/220V adapter is optional)	Rechargeable battery (120/220V adapter is optional)

Series / Pressure	Pressure Range		Media	ADT681A	ADT680A	ADT680P	ADT601Ex	ADT685	ADT686	ADT673
	psi	bar								
Gauge										
V15[1]	-15 to 0	-1 to 0	G	•				•	•	•
V15	-15 to 0	-1 to 0	G, L	•	•	•	•			
GP2	0 to 2	0 to 0.16	G	•						
GP5	0 to 5	0 to 0.35	G					•	•	•
GP5	0 to 5	0 to 0.35	G, L	•	•	•				
GP10	0 to 10	0 to 0.7	G, L	•	•	•		•	•	•
GP15	0 to 15	0 to 1	G, L	•	•	•	•	•	•	•
GP30	0 to 30	0 to 2	G, L	•	•	•	•	•	•	•
GP50	0 to 50	0 to 3.5	G, L	•	•	•	•	•	•	•
GP100	0 to 100	0 to 7	G, L	•	•	•	•	•	•	•
GP150	0 to 150	0 to 10	G, L	•	•	•	•	•	•	•
GP300	0 to 300	0 to 20	G, L	•	•	•	•	•	•	•
GP500	0 to 500	0 to 35	G, L	•	•	•	•	•	•	•
GP600	0 to 600	0 to 40	G, L	•	•	•		•	•	•
GP1K	0 to 1K	0 to 70	G, L	•	•	•	•	•	•	•
GP1.5K	0 to 1.5K	0 to 100	G, L	•	•	•	•	•	•	•
GP2K	0 to 2K	0 to 140	G, L	•	•	•		•	•	•
GP3K	0 to 3K	0 to 200	G, L	•	•	•	•	•	•	•
GP5K	0 to 5K	0 to 350	G, L	•	•	•	•	•	•	•
GP10K	0 to 10K	0 to 700	G, L	•	•	•	•	•	•	•
GP15K	0 to 15K	0 to 1K	G, L	•	•	•	•	•	•	•
GP20K	0 to 20K	0 to 1.4K	G, L	•	•	•		•	•	•
GP25K	0 to 25K	0 to 1.6K	G, L	•	•	•		•	•	•
GP30K	0 to 30K	0 to 2K	G, L	•	•	•		•	•	•
GP36K	0 to 36K	0 to 2.5K	G, L	•	•	•		•	•	•
GP40K	0 to 40K	0 to 2.8K	G, L	•	•	•		•	•	•
GP50K	0 to 50K	0 to 3.5K	G, L	•	•	•		•	•	•
GP60K	0 to 60K	0 to 4.2K	G, L	•	•	•		•	•	•

[1] 0.02% FS for gas media only, 0.05% FS for gas and liquid media.

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Series / Pressure	Pressure Range inH$_2$O	Pressure Range mbar	Media	ADT681A	ADT680A	ADT680P	ADT601Ex	ADT685	ADT686	ADT673
Compound										
CP2	±2	±0.16	G	•				•	•	•
CP5	±5	±0.35	G, L	•	•	•		•	•	•
CP10	±10	±0.7	G, L	•	•	•		•	•	•
CP15	±15	±1.0	G, L	•	•	•		•	•	•
CP30	-15 to 30	-1 to 2.0	G, L	•	•	•		•	•	•
CP50	-15 to 50	-1 to 3.5	G, L	•	•	•				
CP100	-15 to100	-1 to 7.0	G, L	•	•	•		•	•	•
CP150	-15 to150	-1 to 10	G, L	•	•	•		•	•	•
CP300	-15 to 300	-1 to 20	G, L	•	•	•		•	•	•
CP500	-15 to 500	-1 to 35	G, L	•	•	•				
CP600	-15 to 600	-1 to 40	G, L	•	•	•				
CP1K	-15 to1000	-1 to 70	G, L	•	•	•				
Differential										
DP1	±1	±2.5	G	•				•	•	•
DP2	±2	±5	G	•				•	•	•
DP5	±5	±10	G	•				•	•	•
DP10	±10	±25	G	•				•	•	•
DP20	±20	±50	G	•				•	•	•
DP30	±30	±75	G	•				•	•	•
DP50	±50	±160	G	•				•	•	•
DP150	±150	±350	G	•				•	•	•
DP300	±300	±700	G	•				•	•	•

Application Note

Metrology Made Simple

Understanding Accuracy Specifications for Digital Pressure Sensors – Percentage of Full Span Versus Percentage of Reading

Specifications for digital pressure gauges can sometimes seem confusing or overwhelming, especially, if you are unfamiliar with the terminology. Some pressure sensors will specify accuracy as a percent of full span (FS) while others provide the specification as a percent of reading. So why are there different ways of specifying the accuracy of pressure sensors and is percent of reading more accurate than percent of full span or vise versa? This brief technical note will discuss the two differences and answer these questions.

Percentage of Reading Accuracy

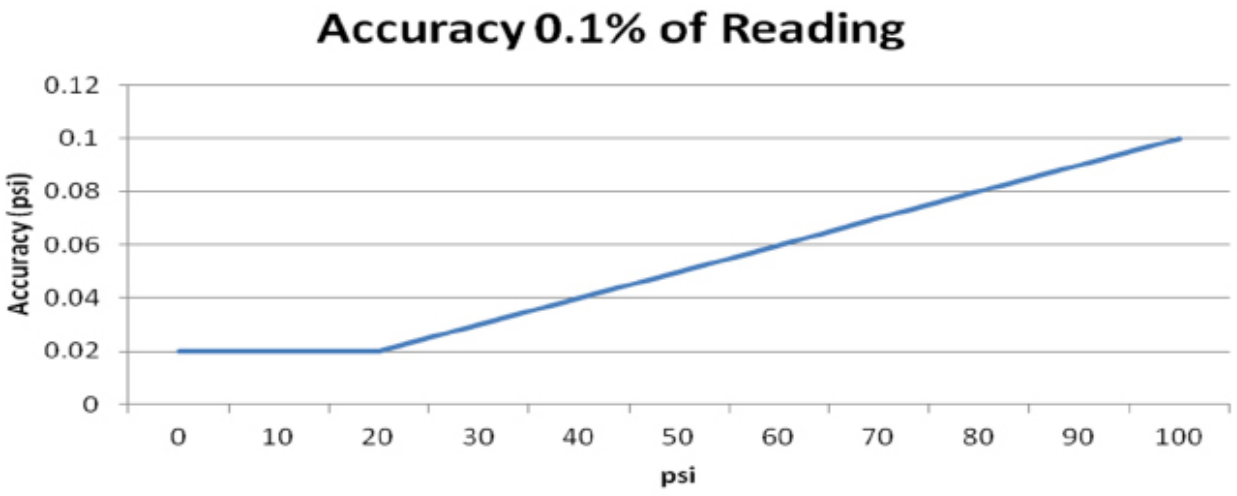
Figure 1 - Percent reading accuracy example
Full scale: 0 to 100 psi
Accuracy: 20 to 100% FS: 0.1% of reading
0 to 20% FS: 0.02% of FS

psi	Accuracy (psi)	
0	0.02	0.02%FS
10	0.02	
20	0.02	
30	0.03	0.1% of Reading
40	0.04	
50	0.05	
60	0.06	
70	0.07	
80	0.08	
90	0.09	
100	0.10	

Accuracy as a percentage of reading is accomplished by multiplying the accuracy percentage by the pressure reading. Thus, the lower the pressure measurement, the better the accuracy. Instruments that have a percent reading specification are usually accompanied with a floor specification.The floor specification takes into account uncertainties such as resolution and measurement noise which may be negligible at higher pressures but are of much more significance at lower pressures.

For example, an accuracy specification may read 0.1% of reading for 20 to 100% of range and 0.02% of full scale below 20% of the range. The 0.02% of full scale specification is considered the floor specification. To understand the accuracy of the sensor, the user is then required to know where the floor spec is applicable and the full scale of the sensor.

This method of specification is often used because it aligns well with the typical performance of pressure gauges. Typically, the closer you measure to barometric pressure the better the performance of the gauge. Figures 1 and the graph below show an example specification for a 100 psi gauge and its accuracy in psi.



Metrology Made Simple

Percentage of Full Scale Accuracy

psi	Accuracy (psi)	
0	0.05	0.05%FS
10	0.05	
20	0.05	
30	0.05	
40	0.05	
50	0.05	
60	0.05	
70	0.05	
80	0.05	
90	0.05	
100	0.05	

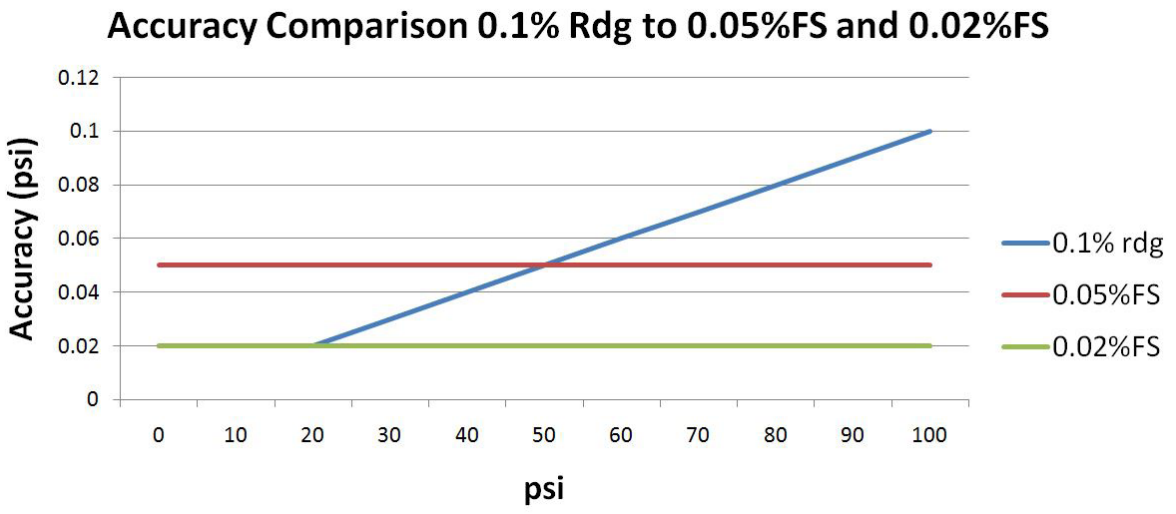
Accuracy as a percentage of full scale is calculated by multiplying the accuracy percentage by the full scale pressure of the gauge. This is obviously a more simple method of specification and is most commonly used in industry because it is easy to calculate and interpret. Denoting the accuracy as percent full scale is a more conservative way of specifying the pressure sensor because typically the sensor doesn't perform the same over its full range. It usually will perform more accurately as you approach barometric pressure. This type of specification is most common for industrial gauges which make it easier to compare one gauge versus another. Figure 2 is an example specification for a 100 psi gauge and its accuracy in psi.

A Comparison of Percent of Full Scale and Percent of Reading Accuracies

psi	Accuracy (psi)		
	0.1% of Reading	0.05% of FS	0.02% of FS
0	0.02	0.05	0.02
10	0.02	0.05	0.02
20	0.02	0.05	0.02
30	0.03	0.05	0.02
40	0.04	0.05	0.02
50	0.05	0.05	0.02
60	0.06	0.05	0.02
70	0.07	0.05	0.02
80	0.08	0.05	0.02
90	0.09	0.05	0.02
100	0.10	0.05	0.02

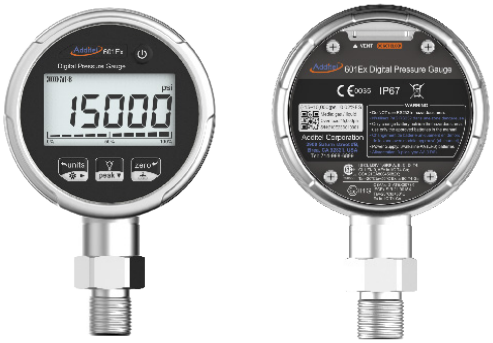
So you may ask, "Which is more accurate?" The answer is that it depends on the pressure being measured. In the two examples given, the gauge specified at 0.1% of reading is more accurate as you measure lower pressures in its range. However, as you move above 50% of the range, the gauge specified at 0.05% of full scale becomes more accurate than the 0.1% of reading gauge. This can be seen clearly in the chart (left) and graph (below) where the two gauges are compared in terms of psi accuracy. To properly compare these, two gauges you should convert the accuracy to pressure units, such as psi or bar. Then they can be properly matched one against another in like units of measure.

In conclusion, one method of specification is not better than another, it is just different. Given this difference it becomes important to know how to interpret the different specifications types and be able to compare one versus another.



Additel 601Ex
Digital Pressure Gauges

- **Pressure ranges from -15 psi (-1 bar) to 15,000psi (1,000 bar)**
- **0.5% FS accuracy**
- Fully temperature compensated accuracy (-20°C to 50°C)
- Bluetooth communication
- Intrinsically safe
- Stainless steel case, fully welded sensor
- IP67 rated
- Battery life up to 9000 hours



OVERVIEW

The ADT601Ex intrinsically safe digital pressure gauge is designed to improve upon traditional dial pressure gauges by providing a reliable and accurate digital solution for a minimal investment. The included Bluetooth technology allows users to connect directly to mobile phones for remote monitoring. This genuine Additel gauge was designed for the field to be an economical, but accurate and dependable gauge for use in a variety of environments, including intrinsically sensitive areas.

Intrinsically Safe

The ADT601Ex has passed the most stringent ATEX, IECEx intrinsic safety certifications. Each unit complies with a certification level of Ex ia IIC T4 Ga. This highly qualified reference recorder can be widely used in potentially explosive gas environments, such as oil and gas platforms, refineries, chemical and petrochemical plants, pharmaceutical industry, energy and gas processing industry.

Durability

With a durable stainless steel outer shell, welded silicon piezoresistive sensor, and drop test rated to 1 meter, these gauges are up to the task in the most demanding environments. The dustproof and waterproof rating (IP67), coupled with the shock and vibration resistance (5g vibration 10g shock) offer even more insurance that these gauges are durable. If that wasn't enough, we've also designed them to handle up to 3X overpressure to guard against over pressure damage.

Easy-to-use

Field operators often have tight schedules and high task loads, and there is no extra time for making mistakes. This means that the digital pressure gauge must be simple and easy to use. The ADT601Ex series gauges are carefully designed with button functions which can be operated smoothly and quickly. The display is clear in bright sunlight, and the backlight can be turned on with one touch for darker ambient conditions. The pressure value can be displayed in large fonts and the pressure can be read from a few meters away. The pressure change trend bar is simple and clear.

Easy maintenance

The ADT601Ex is designed with membrane buttons, which can simply be wiped clean for quick and simple cleaning. Coupled with the extra-long battery life of these easy-to-use gauges, you will find that maintenance is minimal and infrequent.

Additel
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SPECIFICATIONS

Model	ADT601Ex
Description	Intrinsically Safe Digital Pressure Gauge
Intrinsic Safety & European Compliance	CE marked
	EU: II 1G EX ia IIC T4 Ga T4 at -20~50°C
	North America: CLASS I, Division 1, Groups A, B, C and D, T4 CLASS I, Zone 0, AEx ia IIC T4 Ga T4 at -20~50°C
	International: EX ia IIC T4 Ga T4 at -20~50°C
Accuracy	0.5% FS (For detailed accuracy, please see pressure range table)
Gauge Types	Gauge pressure
Operational buttons	4 membrane buttons with locking feature
Display	Wide viewing angle FSTN segment code LCD
	White backlight, backlight time: ON, 15 seconds, 30 seconds, 45 seconds, 60 seconds, the default is 15 seconds
	4 digits display, character height 14.5 mm(0.57") , main display + unit display + horizontal pressure trend
Display Rate	1 readings per second in low power mode (default setting) Adjustable from 10 readings per second to 1 reading every 10 seconds
Pressure Units	12 regular units: Pa, kPa, MPa, psi, mbar, bar, kgf/cm2, %, mmH2O(4°C), mmHg(0°C), InH2O(4°C), InHg(0°C)
Environmental	Compensated Temperature: −4°F to 122°F (-20°C to 50°C)
	Operating Temperature: -4°F to 122°F (-20°C to 50°C)
	Storage Temperature: -40°F to 167°F (-40°C to 75°C)
	Humidity: 5%RH~95%RH, non-condensing
Pressure Port	1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20×1.5 male
Power	Battery: 3 AA alkaline batteries
	Battery life: 1. Super stable mode[1]: 4000 hours (3 reading/s), 1000 hours (10 reading/s) 2. Low power mode[2]: 5000 hours (2 reading/s), 9000 hours (1 reading/s, default), 18000 hours (1 reading/10s)
	Power auto-off: 120, 90, 60, 45, 30, 15 minute auto-off options or never
Enclosure	Case material: 304 SS, Front panel material: anti-static PET, Rubber boot (optional) material: anti-static TPU
	Wetted parts material: 316L SS
	Dimension: Ø3.62" x 1.69" depth x 5.59" height (Ø92 mm x 43 mm depth x 142 mm height)
	Weight: 1.2 Lb (0.55 kg)
Compliance	Protection Level: IP67(against 1 meter water immersion for 30 mins)
	Vibration: 5 g, Shock Resistance: 10 g
	1 meter drop test (without rubber boot)
Communication	Bluetooth (BLE5.3)
Certification	Certificate of conformity (no data).
Warranty	1 year

Note:
[1] The pressure sensor has been powered continuously when the gauge is on, to improve the measurement resolution and reduce the impact of ambient humidity.
[2] The pressure sensor will be powered off after each sampling, to improve the continuous working hours.

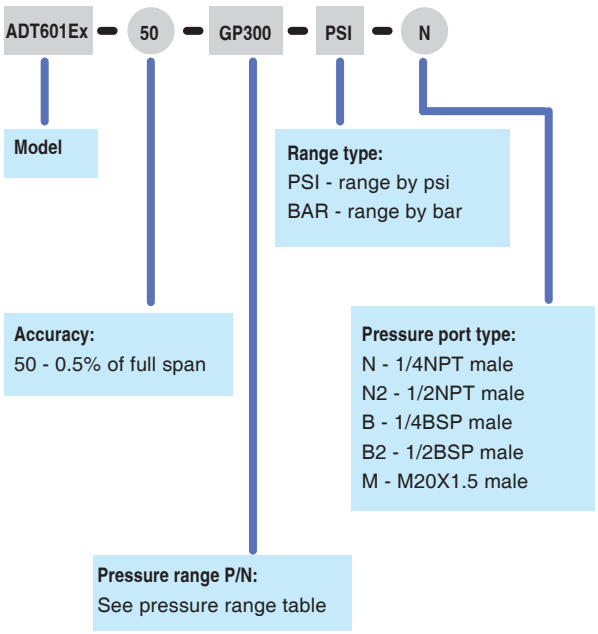
PRESSURE RANGE

Gauge Pressure [1]					
P/N	Pressure Range		Media[2]	Annual Accuracy	Burst Pressure
	(psi)	(bar)		%FS	
V15[3]	-15	-1.0	G, L	0.5	3×
GP15	15	1.0	G, L	0.5	3×
GP30	30	2.0	G, L	0.5	3×
GP50	50	3.5	G, L	0.5	3×
GP100	100	7.0	G, L	0.5	3×
GP150	150	10	G, L	0.5	3×
GP300	300	20	G, L	0.5	3×
GP500	500	35	G, L	0.5	3×
GP1K	1,000	70	G, L	0.5	3×
GP1.5K	1,500	100	G, L	0.5	3×
GP3K	3,000	200	G, L	0.5	3×
GP5K	5,000	350	G, L	0.5	3×
GP10K	10,000	700	G, L	0.5	1.5×
GP15K	15,000	1,000	G, L	0.5	1.5×

[1] Sealed gauge pressure for above 1,000 psi
[2] G=Gas, L=Liquid
[3] Vacuum range is -15~0 psi

ORDERING INFORMATION

Model Number



Accessories Included

AA alkaline batteries (3 pcs)
Certificate of conformity (no data)

Optional Accessories

Model number	Description
9259	Rubber Boot for 680AEx & 601Ex gauge (Red)
9040	Hanging strap with magnet
9250	All weather cover for ADT601EX and ADT680A gauges
9530-BASIC	Additel Acal Automated calibration software with asset management, basic version
9530-NET	Additel Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license
9502	Additel Log II data logging software (PC)
9920	Carrying case for one ADT680A or ADT601Ex digital pressure gauge

Additel 680A
Digital Pressure Gauges

Metrology Made Simple

- **Pressure ranges up to 60,000 psi (4,200 bar)**
- **0.1% or 0.2%FS accuracy**
- **800,000 data logging records**
- Intrinsically safe (ADT680AEx)
- IP67,Stainless steel shell, fully welded sensor
- Battery life up to 4000 hours
- Large, easy-to-read display
- Backlit display
- Bluetooth and RS232 capable
- Communication with Additel's Link Mobile App

ADT680A&ADT680AEx with data logging and Bluetooth

OVERVIEW

Additel's 680A Series Digital Pressure Gauges are designed with a wide range of pressure measurement and calibration applications in mind. With features such as datalogging and Bluetooth technology included, you will find these gauges to be high in value at a reasonable cost. These durable IP67 rated gauges have been built with outdoor elements in mind and are the perfect fit for field work when accuracy and dependability are a must. If you are working in an intrinsically sensitive area, look to our Ex-versions of this amazing digital pressure gauge to provide that extra level of safety in sensitive areas.

Durability

The model ADT680A has been built with the finest materials to ensure that it can hold up to the elements. Everything from the stainless steel outer shell to the innermost sensor design have been optimized to ensure that this gauge will keep you informed with on-demand and logged pressure readings for years to come. The IP67 rating ensures that dusty and wet environments won't hamper these gauges ability to perform while the shock and vibration resistance (5g vibration 10g shock) coupled with the corrosion resistant wetted parts help to protect the inner workings of these durable Additel gauges.

Easy-to-use

Technicians often have tight schedules and heavy workloads, which leaves little extra time for correcting mistakes or doing rework. The ADT680A prevents these errors with button functions that are smooth and easy to use. The display is clear in bright sunlight, and the backlight can be turned on with a one-button press for use in low light situations. The pressure value can be displayed in large fonts and can be read from a few meters away, making this gauge the perfect device for no-nonsense measurement, calibration and verification work.

Easy to maintain:

The ADT680A is designed with membrane buttons, making them easy to clean and maintain. Coupled with the extra-long battery life of these easy-to-use gauges, you will find that maintenance is minimal and infrequent.

SPECIFICATIONS

Model	ADT680A	ADT680AEx
Description	Digital Pressure Gauge	Intrinsically Safe Digital Pressure Gauge
Intrinsic Safety & European Compliance	CE marked	CE marked
		EU: II 1G EX ia IIC T4 Ga T4 at -20~50°C
		North America: CLASS I, Division 1, Groups A, B, C and D, T4 CLASS I, Zone 0, AEx ia IIC T4 Ga T4 at -20~50°C
		International:EX ia IIC T4 Ga T4 at -20~50°C
Accuracy (For detailed accuracy, please see pressure range table)	0.1% , 0.2% of full span	
Gauge Types	Gauge pressure, compound pressure	
Display	Description: Wide viewing angle FSTN segment code LCD, three partition design	
	White backlight	
	4 or 5 digit display (switchable). Numeral display height: 14.5mm (0.57")	
Display Rate	3 readings per second in low power mode (default setting) Adjustable from 10 readings per second to 1 reading every 10 seconds	
Pressure Units	Pa, kPa, MPa, psi, bar, mbar, kgf/cm^2, %,inH_2O@4°C,mmH_2O@4°C, inHg@0°C, mmHg@0°C	
	6 engineering water columns:inH2O(20°C) , inH2O(60°F) , mmH2O(20°C) , mmH2O(15°C) , ftH2O(60°F) , ftH2O(4°C)	
	1 custom unit: identified by the USER icon. The conversion coefficient can be set via Additel Link mobile app	
Environmental	Compensated Temperature: 14°F to 122°F (-10°C to 50°C)	
	Operating Temperature: -4°F to 122°F (-20°C to 50°C)	
	Storage Temperature: -40°F to 167°F (-40°C to 75°C)	
	Humidity: 5%-95%, no condensation Working altitude: <3000 meters	
Pressure Port	≤15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20×1.5 male	
	>15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A	
Power	External power supply through RS232 cable, and 3 AA alkaline batteries can also be installed as backup power	
	Battery life: 1. Super stable mode[1]: 4000 hours (3 reading/s, default), 1000 hours (10 reading/s) 2. Low power mode[2]: 5000 hours (2 reading/s), 9000 hours (1 reading/s), 18000 hours (1 reading/10s)	
	Power auto-off: 120, 90, 60, 45, 30, 15, minutes auto-off options	
	The factory default of power auto-off feature is inactive	
Enclosure	Shell material: 304 SS	
	Wetted parts material: 316L SS	
	Dimension: Ø4.13" x 1.83" x 5.84"(105mm x 46.5 mm x 148.5 mm)	
	Weight: 1.27 lbs (0.58 kg)	
Compliance	Protection Level: IP67(working media is liquid)	
	Vibration: 5 g (20-2000 Hz)	
	Shock Resistance: 10 g	
Data Logging (Optional)	Data storage: 800,000 records (time and pressure) or 400,000 records (time, pressure and temperature)	
	Rate: user-selectable from 1 to 99,999 second intervals	
Communication	Bluetooth, RS232 *(Do not use the RS-232 connector in a hazardous areas)	
Calibration	ISO 17025 Accredited Calibration Certificate with data	
Warranty	1 year	

Note: Do not connect to the RS232 port in hazardous areas, and do not replace batteries in hazardous areas.

[1] The pressure sensor has been powered continuously when the gauge is on, to improve the measurement resolution and reduce the impact of ambient humidity.
[2] The pressure sensor will be powered off after each sampling, to improve the continuous working hours.

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PRESSURE RANGE

Gauge Pressure [1]					
P/N	Pressure Range		Media[2]	Accuracy (%FS)	Burst Pressure
	(psi)	(bar)			
V15	-15	-1	G, L	0.1, 0.2	3×
GP5	5	0.35	G, L	0.1, 0.2	3×
GP10	10	0.7	G, L	0.1, 0.2	3×
GP15	15	1.0	G, L	0.1, 0.2	3×
GP30	30	2.0	G, L	0.1, 0.2	3×
GP50	50	3.5	G, L	0.1, 0.2	3×
GP100	100	7.0	G, L	0.1, 0.2	3×
GP150	150	10	G, L	0.1, 0.2	3×
GP300	300	20	G, L	0.1, 0.2	3×
GP500	500	35	G, L	0.1, 0.2	3×
GP600	600	40	G, L	0.1, 0.2	3×
GP1K	1,000	70	G, L	0.1, 0.2	3×
GP1.5K	1,500	100	G, L	0.1, 0.2	3×
GP2K	2,000	140	G, L	0.1, 0.2	3×
GP3K	3,000	200	G, L	0.1, 0.2	3×
GP5K	5,000	350	G, L	0.1, 0.2	3×
GP10K	10,000	700	G, L	0.1, 0.2	1.5×
GP15K	15,000	1,000	G, L	0.1, 0.2	1.5×
GP20K	20,000	1,400	G, L	0.1, 0.2	1.5×
GP25K	25,000	1,600	G, L	0.1, 0.2	1.5×
GP30K	30,000	2,000	G, L	0.1, 0.2	1.5×
GP36K	36,000	2,500	G, L	0.1, 0.2	1.5×
GP40K	40,000	2,800	G, L	0.1, 0.2	1.35×
GP50K	50,000	3,500	G, L	0.1, 0.2	1.2×
GP60K	60,000	4,200	G, L	0.1, 0.2	1.1×

[1] Sealed gauge pressure for above 1,000 psi
[2] G=Gas, L=Liquid

Compound Pressure					
P/N	Pressure Range		Media [1]	Accuracy (%FS)[2]	Burst Pressure
	(psi)	(bar)			
CP5	±5	±0.35	G, L	0.1,0.2	3×
CP10	±10	±0.7	G, L	0.1,0.2	3×
CP15	±15	±1	G, L	0.1,0.2	3×
CP30	-15 to 30	-1 to 2	G, L	0.1,0.2	3×
CP50	-15 to 50	-1 to 3.5	G, L	0.1,0.2	3×
CP100	-15 to 100	-1 to 7	G, L	0.1,0.2	3×
CP150	-15 to 150	-1 to 10	G, L	0.1,0.2	3×
CP300	-15 to 300	-1 to 20	G, L	0.1,0.2	3×
CP500	-15 to 500	-1 to 35	G, L	0.1,0.2	3×
CP600	-15 to 600	-1 to 40	G, L	0.1,0.2	3×
CP1K	-15 to 1K	-1 to 70	G, L	0.1,0.2	3×

[1] G=Gas, L=Liquid
[2] FS specification applies to the span of the range

ORDERING INFORMATION

Model Number

ADT680A – 10 – GP300 – PSI – N • • DL

Model:
ADT680A
ADT680AEx

Accuracy:
10-0.1% of full span
20-0.2% of full span

Pressure range P/N:
See pressure range table

Range type:
PSI-range by psi
BAR-range by bar

Pressure port type:
N- 1/4NPT male
N2- 1/2NPT male
B-1/4BSP male
B2-1/2BSP male
M-M20X1.5 male
AF-Autoclave F-250-C female
AM-Autoclave M-250-C male

DL: Data logging

Accessories Included

Rubber boot
AA alkaline battery (3 pc)
ISO 17025 accredited calibration certificate

Optional Accessories

Model number	Description
9258	Rubber Boot for 680A gauge(Blue)
9259	Rubber Boot for 680AEx & 601Ex gauge (Red)
9040	Hanging strap with magnet
9250	All weather cover for ADT601EX and ADT680A gauges
9530-BASIC	Additel Acal Automated calibration software with asset management, basic version
9530-NET	Additel Acal Automated calibration software with asset management, network version, includes server installation and 1 user license
9502	Additel Log II data logging software (PC)
9530-PRO	Additel Acal Automated calibration software with asset management, professional version for single PC
9814-X	Power supply kit (including power adapter and RS232 communication line)
9050	USB to RS232 (DB9/M) Adapter
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
9920	Carrying case for one ADT680A or ADT601Ex digital pressure gauge

Additel
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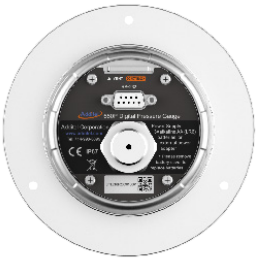
Additel 680P
Digital Pressure Gauges

- Stainless steel housing
- Fully welded sensor
- Backlight display
- Intrinsically safe (ADT680PEx)
- IP67 rated



OVERVIEW

Additel's 680P Series Digital Pressure Gauges are designed to be used in panel mount applications. With features such as data logging (optional) and Bluetooth technology included, you will find these gauges to be high in value at a reasonable cost. These durable IP67 rated gauges have been built with outdoor elements in mind and are the perfect fit for field work as well as in the laboratory. If you are working in an intrinsically sensitive area, look to our Ex-versions of this amazing digital pressure gauge to provide that extra level of safety in sensitive areas.

Durable:

The model ADT680P has been built with the finest materials to ensure that is can hold up to elements. Everything from the stainless outer shell to the innermost sensor design have been optimized to ensure that this gauge will keep you informed with on-demand and logged pressure readings for years to come. The IP67 rating ensures that dusty and wet environments won't hamper these gauges ability to perform while the shock and vibration resistance (5g vibration 10g shock) coupled with the corrosion resist wetted parts help to protect the inner workings of these durable.

Easy to use:

Technicians often have tight schedules and heavy workloads; this leaves little extra time for correcting mistakes or doing rework. The ADT680P series products are carefully designed with button functions and menus that are smooth and easy to use which saves on valuable time. The display is clear in bright sunlight, and the backlight can be turned on with a one-button press for use in low light situations. Pressure value can be displayed in large fonts and can be read from a few meters away making this gauge the perfect device for no-nonsense measurement, calibration, and verification work.

Easy to maintain:

The ADT680P is designed with membrane buttons, which can simply be wiped clean for quick and simple cleaning. Coupled with the extra-long battery life of these easy-to-use gauges, you will find that maintenance is minimal and infrequent.

SPECIFICATIONS

Additel
Metrology Made Simple

Model	ADT680P	ADT680PEx
Description	Digital Pressure Gauge	Intrinsically Safe Digital Pressure Gauge
Intrinsic Safety & European Compliance	CE marked	CE marked
		EU: II 1G EX ia IIC T4 Ga T4 at -20~50°C
		North America: CLASS I, Division 1, Groups A, B, C and D, T4 CLASS I, Zone 0, AEx ia IIC T4 Ga T4 at -20~50°C
		International:EX ia IIC T4 Ga T4 at -20~50°C
Accuracy	0.02%, 0.05%, 0.1%, 0.2% of full span (For detailed accuracy, please see pressure range table)	
Gauge Types	Gauge pressure, compound pressure	
Installation direction	Installed axially	
Display	Description: Wide viewing angle FSTN segment code LCD , three partition design	
	White backlight, the lighting time can be set: ON, 15 seconds, 30 seconds, 45 seconds, 60 seconds, the default is 15 seconds	
	4~5 digit display can be switched,numeral display height: 16mm (0.62")	
Display Rate	3 readings per second in low power mode (default setting) Adjustable from 10 readings per second to 1 reading every 10 seconds	
Pressure Units	Pa, kPa, MPa, psi, bar, mbar, kgf/cm^2, %, inH_2O@4°C, mmH_2O@4°C, inHg@0°C, mmHg@0°C	
	6 engineering water columns:inH2O(20°C), inH2O(60°F), mmH2O(20°C), mmH2O(15°C), ftH2O(60°F), ftH2O(4°C)	
	1 custom unit: identified by the USER icon, and the conversion coefficient can be set through Additel-Link	
Environmental	Compensated Temperature: 14°F to 122°F (-10°C to 50°C)	
	Operating Temperature: -4°F to 122°F (-20°C to 50°C)	
	Storage Temperature: -40°F to 167°F (-40°C to 75°C)	
	Humidity: 5%-95%,no condensation Working altitude: <3,000 meters	
Pressure Port	≤15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20×1.5 male	
	>15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A	
Power	External power supply through RS232 cable, and 3 AA alkaline batteries can also be installed as backup power	
	Battery life: 1. Super stable mode[1]: 4000 hours (3 reading/s, default), 1000 hours (10 reading/s) 2. Low power mode[2]: 5000 hours (2 reading/s), 9000 hours (1 reading/s), 18000 hours (1 reading/10s)	
	Power auto-off: 120, 90, 60, 45, 30, 15 minutes auto-off options	
	The factory default of power auto-off feature is inactive	
Enclosure	Case material:304 SS; Front panel material: anti-static PET; Rubber boot material (optional): anti-static TPU	
	Wetted parts material: 316L SS	
	Dimension: Ø3.62" x 4.52"depth, flange Ø5.43" (Ø92mm x115 mm depth, flange Ø138mm)	
	Weight: 1.32 lbs (0.6 kg)	
Compliance	Protection Level: IP67	
	Vibration: 5g (20-2000 Hz)	
	Shock Resistance: 10g	
Data Logging (Optional)	Data storage: 800,000 records (time and pressure) or 400,000 records (time, pressure and temperature)	
	Rate: user-selectable from 1 to 99,999 second intervals	
Communication	Bluetooth (BLE5.3), RS232 *(Do not use the RS-232 connector in a hazardous area)	
Warranty	1 year	

Note:
[1] The pressure sensor has been powered continuously when the gauge is on, to improve the measurement resolution and reduce the impact of ambient humidity.
[2] The pressure sensor will be powered off after each sampling, to improve the continuous working hours.

PRESSURE RANGE

Additel
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Gauge Pressure [1]						
P/N	Pressure Range		Media[2]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD[3]	
V15	-15	-1	G, L	0.05, 0.1, 0.2	N/A	3×
GP5	5	0.35	G, L	0.05, 0.1, 0.2	0.1	3×
GP10	10	0.7	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP15	15	1.0	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP30	30	2.0	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP50	50	3.5	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP100	100	7.0	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP150	150	10	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP300	300	20	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP500	500	35	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP600	600	40	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP1K	1,000	70	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP1.5K	1,500	100	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP2K	2,000	140	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP3K	3,000	200	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP5K	5,000	350	G, L	0.02, 0.05, 0.1, 0.2	0.1	3×
GP10K	10,000	700	G, L	0.02, 0.05, 0.1, 0.2	0.1	1.5×
GP15K	15,000	1,000	G, L	0.05, 0.1, 0.2	0.1	1.5×
GP20K	20,000	1,400	G, L	0.05, 0.1, 0.2	N/A	1.5×
GP25K	25,000	1,600	G, L	0.05, 0.1, 0.2	N/A	1.5×
GP30K	30,000	2,000	G, L	0.05, 0.1, 0.2	N/A	1.5×
GP36K	36,000	2,500	G, L	0.05, 0.1, 0.2	N/A	1.5×
GP40K	40,000	2,800	G, L	0.05, 0.1, 0.2	N/A	1.35×
GP50K	50,000	3,500	G, L	0.1, 0.2	N/A	1.2×
GP60K	60,000	4,200	G, L	0.1, 0.2	N/A	1.1×

[1] Sealed gauge pressure for above 1,000 psi
[2] G=Gas, L=Liquid
[3] %RD accuracy: 0% to 20% of range: ± (0.02% of full span),20% to 110% of range: ± (0.1% of reading)
vacuum: ± (0.25% of FS), FS=-14.5psi

Compound Pressure						
P/N	Pressure Range		Media [1]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS[2]	%RD[3]	
CP5	±5	±0.35	G, L	0.1, 0.2	N/A	3×
CP10	±10	±0.7	G, L	0.05, 0.1,0.2	0.2	3×
CP15	±15	±1	G, L	0.05, 0.1, 0.2	0.2	3×
CP30	-15 to 30	-1 to 2	G, L	0.05, 0.1, 0.2	0.2	3×
CP50	-15 to 50	-1 to 3.5	G, L	0.05, 0.1, 0.2	0.2	3×
CP100	-15 to 100	-1 to 7	G, L	0.05, 0.1, 0.2	0.2	3×
CP150	-15 to 150	-1 to 10	G, L	0.05, 0.1, 0.2	0.2	3×
CP300	-15 to 300	-1 to 20	G, L	0.05, 0.1, 0.2	0.2	3×
CP500	-15 to 500	-1 to 35	G, L	0.05, 0.1, 0.2	N/A	3×
CP600	-15 to 600	-1 to 40	G, L	0.05, 0.1, 0.2	N/A	3×
CP1K	-15 to 1K	-1 to 70	G, L	0.05, 0.1, 0.2	N/A	3×

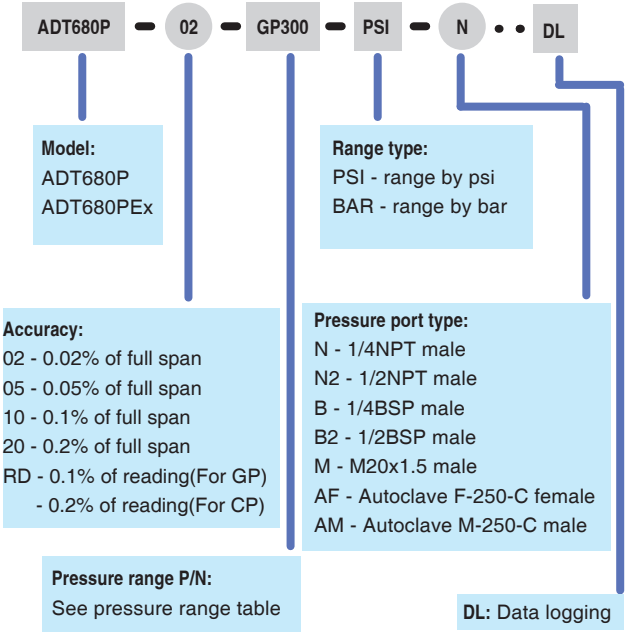
[1] G=Gas, L=Liquid
[2] FS specification applies to the span of the range
[3] %RD accuracy: 0% to 20% of range: ± (0.02% of full span),20% to 110% of range: ± (0.2% of reading)
vacuum: ± (0.25% of FS), FS=-14.5psi

Barometric Pressure					
P/N	Pressure Range		Media[1]	Annual Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	±55Pa	3×
BPH	60 kPa	110 kPa	G	±22Pa	3×

[1] G=Gas

ORDERING INFORMATION

Model Number



Accessories Included

AA alkaline battery (3 pcs)
ISO 17025 accredited calibration certificate

Optional Accessories

Model number	Description
9259	Rubber Boot for 680AEx & 601Ex gauge (Red)
9040	Hanging strap with magnet
9250	All weather cover for ADT601EX and ADT680A gauges
9530-BASIC	Additel Acal Automated calibration software with asset management, basic version
9530-NET	Additel Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license
9502	Additel Log II data logging software (PC)
9920	Carrying case for one ADT680A or ADT601Ex digital pressure gauge

Additel 681A
Digital Pressure Gauges

- **Pressure ranges to 60,000 psi (4,200 bar)**
- **0.02%, 0.05% FS or 0.1% RD accuracy**
- Measures gauge or absolute pressure
- % pressure indication with fan-shaped graphic
- Fully temperature compensated accuracy (-10~50°C)
- Bluetooth communication
- Communication with Additel's Link Mobile App
- Large easy-to-read display
- Intrinsically safe version (681AEx)
- Data logging (up to 10,000,000 records)
- IP67 rated

Additel
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OVERVIEW

Additel's 681A Series Digital Pressure Gauges are designed to be your favorite tool for a wide range of pressure measurement and calibration applications. With features such as datalogging and Bluetooth technology included, you will find these gauges to be high in value at a reasonable cost. These durable IP67 rated gauges have been built with outdoor elements in mind and are the perfect fit for field work as well as in the laboratory. If you are working in an intrinsically sensitive area, look to our Ex-versions of this amazing digital pressure gauge to provide that extra level of safety in sensitive areas.

Durable:

The model ADT681A has been built with the finest materials to ensure that it can hold up the elements. Everything from the stainless steel outer shell to the innermost sensor design have been optimized to ensure that this gauge will keep you informed with on-demand and logged pressure readings for years to come. The IP67 rating ensures that dusty and wet environments won't hamper this gauges ability to perform while the shock and vibration resistance (5g vibration 10g shock) coupled with the corrosion resistant wetted parts help to protect the inner workings of these durable Additel gauges.

Easy to use:

Technicians often have tight schedules and heavy workloads, which leaves little extra time for correcting mistakes or doing rework. The ADT681A solves this problem with carefully designed button functions and menus that are smooth and easy to use which saves on valuable time. The display is clear in bright sunlight, and the backlight can be turned on with a one-button press for use in low light situations. The pressure value can be displayed in large fonts and can be read from a few meters away, making this gauge the perfect device for no-nonsense measurement, calibration and verification work.

Easy to maintain:

The ADT681A is designed with membrane buttons, making them easy to clean and maintain over time, which can simply be wiped clean for quick and simple cleaning. Coupled with the extra-long battery life of these easy-to-use gauges, you will find that maintenance is minimal and infrequent.

SPECIFICATIONS

Model	ADT681A	ADT681AEx
Description	Digital Pressure Gauge	Intrinsically Safe Digital Pressure Gauge
Intrinsic Safety & European Compliance	CE marked	CE marked
		EU: II 1G EX ia IIC T4 Ga T4 at -20~50°C
		North America: CLASS I, Division 1, Groups A, B, C and D, T4 CLASS I,Zone 0,AEx ia IIC T4 Ga T4 at -20~50°C
		International:EX ia IIC T4 Ga T4 at -20~50°C
Accuracy (For detailed accuracy, please see pressure range table)	681A(Ex)-02: 0.02% of full span	
	681A(Ex)-05: 0.05% of full span	
	681A(Ex)-RD: 0% to 20% of range: ± (0.02% of full span) 20% to 110% of range: ± (0.1% of reading) vacuum: ± (0.25% of FS), FS=-14.5psi	
	Built-in barometer: ± 55 Pa (Optional)	
Gauge Types	Gauge pressure, compound pressure, absolute pressure (calculated by gauge pressure and baromatric pressure), differential pressure and barometric pressure	
Multifunction Fan-shaped section	Atmospheric pressure, ambient temperature, peak-peak values (max, min), TARE, leak test, pressure percentage display, time display, data logging status	
Display	Wide viewing angle FSTN segment code LCD, three partition design	
	White backlight, backlight time: ON, 15 seconds, 30 seconds, 45 seconds, 60 seconds, the default is 15 seconds	
	5~6 digit display can be switched, character height 14.8mm(0.58"), main display + unit display + fan-shaped section	
Display Rate	3 readings per second in low power mode (default setting) Adjustable from 10 readings per second to 1 reading every 10 seconds	
Pressure Units	Pa, kPa, MPa, psi, mbar, bar, kgf/cm2, %, mmH2O(4°C), mmHg(0°C), InH2O(4°C), InHg(0°C)	
	6 engineering water column units: inH2O(20°C), inH2O(60°F), mmH2O(20°C), mmH2O(15°C), ftH2O(60°F), ftH2O(4°C)	
	1 custom unit: identified by the USER code, and the conversion coefficient can be set through Additel -Link	
Environmental	Compensated Temperature: 14°F to 122°F (-10°C to 50°C)	
	Operating Temperature: -4°F to 122°F (-20°C to 50°C)	
	Storage Temperature: -40°F to 167°F (-40°C to 75°C)	
	Humidity: 5%RH~95%RH, no condensing	
Pressure Port	≤15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20×1.5 male	
	>15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A	
	Differential Pressure: barb fitting	
	Other connections available per request	
Power	Battery: 3 AA alkaline batteries	
	Battery life: 1. Super stable mode[1]: 4000 hours (3 reading/s, default), 1000 hours (10 reading/s) 2. Low power mode[2]: 5000 hours (2 reading/s), 9000 hours (1 reading/s), 18000 hours (1 reading/10s)	
	Power auto-off: 120, 90, 60, 45, 30, 15 minute auto-off options or never	
	External power: power supply through USB (optional)	
Enclosure	Case material: 304 SS; Front panel material: anti-static PET; Rubber boot material (optional): anti-static TPU	
	Wetted parts: 316L SS	
	Dimension: Ø4.65" x 1.65" depth x 7" height (Ø118 mm x 42 mm depth x 178 mm height)	
	Weight: 1.5 lbs (0.68 kg)	
Compliance	Protection Level: IP67(against 1 meter water immersion for 30 mins)	
	Vibration: 5 g; Shock Resistance: 10 g	
	1 meter drop test (without rubber boot)	
Data Logging (Optional)	Data storage: 10,000,000 records (time and pressure) or 5,000,000 records (time, pressure and temperature)	
	Rate: user-selectable as 0.1 and 1 to 99,999 second intervals	
Communication	Bluetooth (BLE4.2), USB-C, RS232 *(Do not use the USB-C or RS-232 connector in a hazardous area)	
Calibration	ISO 17025 Accredited Calibration Certificate with data	
Warranty	1 year	

Note:
[1] The pressure sensor has been powered continuously when the gauge is on, to improve the measurement resolution and reduce the impact of ambient humidity.
[2] The pressure sensor will be powered off after each sampling, to improve the continuous working hours.

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PRESSURE RANGE

Gauge Pressure [1]						
P/N	Pressure Range		Media[3]	Annual Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD[4]	
V15[2]	-15	-1.0	G	0.02	N/A	3×
V15[2]	-15	-1.0	G, L	0.05	N/A	3×
GP2	2	0.16	G	0.05	N/A	3×
GP5	5	0.35	G, L	0.05	0.1	3×
GP10	10	0.7	G, L	0.02, 0.05	0.1	3×
GP15	15	1.0	G, L	0.02, 0.05	0.1	3×
GP30	30	2.0	G, L	0.02, 0.05	0.1	3×
GP50	50	3.5	G, L	0.02, 0.05	0.1	3×
GP100	100	7.0	G, L	0.02, 0.05	0.1	3×
GP150	150	10	G, L	0.02, 0.05	0.1	3×
GP300	300	20	G, L	0.02, 0.05	0.1	3×
GP500	500	35	G, L	0.02, 0.05	0.1	3×
GP600	600	40	G, L	0.02, 0.05	0.1	3×
GP1K	1,000	70	G, L	0.02, 0.05	0.1	3×
GP1.5K	1,500	100	G, L	0.02, 0.05	0.1	3×
GP2K	2,000	140	G, L	0.02, 0.05	0.1	3×
GP3K	3,000	200	G, L	0.02, 0.05	0.1	3×
GP5K	5,000	350	G, L	0.02, 0.05	0.1	3×
GP10K	10,000	700	G, L	0.02, 0.05	0.1	1.5×
GP15K	15,000	1,000	G, L	0.05 (0.1)	0.1	1.5×
GP20K	20,000	1,400	G, L	0.05 (0.1)	N/A	1.5×
GP25K	25,000	1,600	G, L	0.05 (0.1)	N/A	1.5×
GP30K	30,000	2,000	G, L	0.05 (0.1)	N/A	1.5×
GP36K	36,000	2,500	G, L	0.05 (0.1)	N/A	1.5×
GP40K	40,000	2,800	G, L	0.05 (0.1)	N/A	1.35×
GP50K	50,000	3,500	G, L	0.1 (0.2)	N/A	1.2×
GP60K	60,000	4,200	G, L	0.1 (0.2)	N/A	1.1×

[1] Sealed gauge pressure for above 1,000 psi
[2] Vacuum range is (-15~0) psi
[3] G=Gas, L=Liquid
[4] %RD accuracy: 0% to 20% of range: ± (0.02% of full span), 20% to 110% of range: ± (0.1% of reading)
vacuum: ± (0.25% of FS), FS=-14.5psi

Barometric Pressure					
P/N	Pressure Range		Media[1]	Annual Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	±55Pa	3×
BPH	60 kPa	110 kPa	G	±22Pa	3×

[1] G=Gas

Compound Pressure						
P/N	Pressure Range		Media[1]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS[3]	%RD[4]	
CP2	±2	±0.16	G	0.05	N/A	3×
CP5	±5	±0.35	G, L[2]	0.02, 0.05	0.1	3×
CP10	±10	±0.7	G, L[2]	0.02, 0.05	0.1	3×
CP15	±15	±1.0	G, L[2]	0.02, 0.05	0.1	3×
CP30	-15~30	-1~2.0	G, L[2]	0.02, 0.05	0.1	3×
CP50	-15~50	-1~3.5	G, L	0.02, 0.05	0.1	3×
CP100	-15~100	-1~7.0	G, L	0.02, 0.05	0.1	3×
CP150	-15~150	-1~10	G, L	0.02, 0.05	0.1	3×
CP300	-15~300	-1~20	G, L	0.02, 0.05	0.1	3×
CP500	-15~500	-1~35	G, L	0.02, 0.05	N/A	3×
CP600	-15~600	-1~40	G, L	0.02, 0.05	N/A	3×
CP1K	-15~1000	-1~70	G, L	0.02, 0.05	N/A	3×

[1] G=Gas, L=Liquid
[2] 0.02%FS for gas media only
[3] FS = upper limit of range - lower limit of range
[4] %RD accuracy: 0% to 20% of range: ± (0.02% of full span)
20% to 110% of range: ± (0.1% of reading)
vacuum: ± (0.25% of FS), FS=-14.5psi

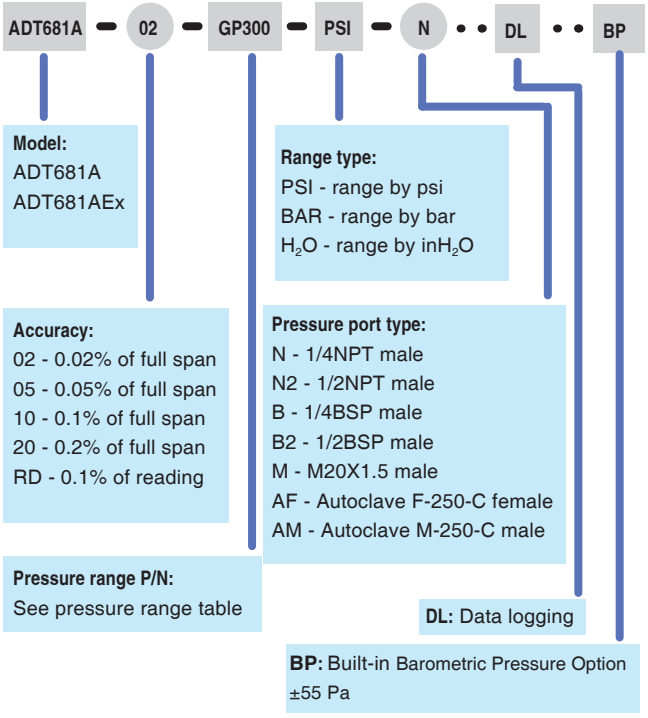
IP67 Rated

Differential Pressure						
P/N	Pressure Range		Media[1]	Accuracy (%FS)[3]	Burst Pressure	Static Pressure Range (mbar)
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	50X	±250
DP2	±2	±5.0	G	0.05[2]	25X	±250
DP5	±5	±10	G	0.05	10X	±250
DP10	±10	±25	G	0.05	5X	±250
DP20	±20	±50	G	0.05	25X	±2,500
DP30	±30	±75	G	0.05	15X	±2,500
DP50	±50	±125	G	0.05	10X	±2,500
DP100	±100	±250	G	0.02	5X	±2,500
DP150	±150	±350	G	0.02	10X	±7,000
DP300	±300	±700	G	0.02	5X	±7,000

[1] G=gas
[2] Calibration interval: 180 days
[3] FS = upper limit of range - lower limit of range

ORDERING INFORMATION

Model Number



Accessories Included

Rubber boot
AA alkaline batteries (3 pcs)
USB cable (type-C) (1 pc)
Silicone tube - 1 meter each (2 pcs for DP models only)
ISO 17025 accredited calibration certificate

Optional Accessories

Model number	Description
9040	Hanging strap with magnet
9257	Field rain cover
9810	USB power adaptor
9530-BASIC	Additel Acal Automated calibration software with asset management, basic version
9530-NET	Additel Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license
9502	Additel Log II data logging software (PC)
9050	USB to RS232 (DB9/M) Adapter
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
9903	Carrying case for one gauge

Additel 273Ex
Handheld Pressure Calibrator

- 0.02%, 0.05% FS Accuracy
- Intrinsically Safe
- Field Switchable Pressure Module
- Dual Digital Pressure Module Inputs
- Color Touchscreen Display
- Built-in Quick Test Task Feature
- Built-in Barometer
- Intuitive Smartphone Like Interface
- Bluetooth and USB Communication
- Optional HART Communication
- Communicates with Additel's Link Mobile App

Metrology Made Simple

Additel 273Ex with ADT158Ex module

OVERVIEW

Additel's 273Ex is an Intrinsically safe handheld multifunctional pressure calibrator with a color touchscreen, smartphone like interface, built-in quick test tasks and optional HART communications capability. This innovative Additel product drastically improves explosion-proof field testing and calibration. The Additel 273Ex has a built-in atmospheric pressure sensor, so that absolute pressure and the gauge pressure are easily facilitated. With three pressure module inputs, one switchable at the bottom and two digital inputs on the side, the user can configure the setup accordingly and easily meet the needs of pressure calibration and testing in virtually any environment.

Intrinsically Safe :

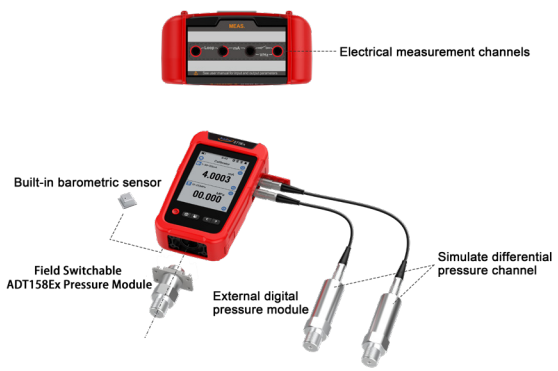
ADT273Ex has passed the most stringent ATEX, IECEX intrinsic safety certifications from authoritative organizations. The explosion-proof level is Ex ia IIC T4 Ga. It can be widely used in potentially explosive gas environments, such as oil and gas platforms, refineries, chemical and petrochemical plants, pharmaceutical industry, energy and gas processing industry. Each intrinsically safe calibrator has an advance transflective color LCD display which has enhanced visibility when viewed in direct sunlight. No matter where your work takes you, these calibrators are up to the task.

A Modern User Experience:

Additel has gone above and beyond to provide our customers with the best possible experience when using this new and revolutionary calibrator. The color touchscreen display provides a refreshing and intuitive experience compared to other calibrators on the market. With an easy to navigate menu structure and fast touchscreen response, you will find the ADT273Ex calibrator simple yet powerful to use. The easy-to-read display isn't just fun to use, but it's built rugged to handle the demands of a busy technician in the field or the laboratory.

Optional HART Communication:

With support for HART communication protocols, the ADT273Ex Handheld Pressure Calibrator provides a pressure calibration solution for transmitters over a wide pressure range. The ADT273Ex is a highly portable device and can measure pressure precisely with a field switchable pressure sensor, as well as read the current or mV produced by a transducer. It can even supply an excitation voltage (loop power) to power sensors or transmitters during calibration.



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FUNCTIONAL FEATURES

Functional Features	Details
Scaling	User can convert measured current, voltage and frequency values into pressure, temperature and flow values. Three conversion functions available: linearity, square and square root
Filtering	Average sliding filter (sampling number: 1 ~ 50) First-order linear filter (First-order coefficient: 0.01 ~ 1)
Switch	The measurement value will be automatically displayed at the moment the switch change of state. The latest 8 state changes will be stored in the memory.
Pressure Tare	Tare value is set through the user interface
Pressure stability indicator	Stability time and criteria is selectable
Power management	Backlight auto off Auto power off

Specifications

General Specifications	
Input Channels	Top: 1 electrical signal measurement channel, ϕ4mm banana jacks
	Right side: 2 channels for external digital pressure modules, 5-core dedicated aviation plug
	Bottom: embedded digital pressure module (model ADT158Ex), field switchable.
	Internal: 1 embedded atmospheric pressure sensor
Barometric Accuracy	± 55 Pa
Measurement Rate	mV, V, mA & frequency: 3 times/sec
	Pressure module: 1~10 times/sec selectable (3 times/sec as default)
	Barometer: 1 time/sec
Power	4000mAh, 14.4Wh explosion-proof intelligent lithium battery, charging time about 6 hours, battery can be charged independently Typical working time 100 hours (measurement mode)
Environmental	Guaranteed temperature range of technical specifications: (-10 ~ 50)°C *Temperature coefficient: ±5 ppm FS/°C (-20 to -10)°C
	Operating temperature: (-20 ~ 50)°C
	Storage temperature: (-30 ~ 70)°C
	Humidity: 0% to 95% RH, non-condensing
	Altitude: 3000 meters
Warm-up Time	10 min to fully meet technical specifications
Port Protection Voltage	30 V max
Explosion-proof Grade	ATEX & IECEX: Ex ia IIC T4 Ga (Ta = -20°C to + 50°C)
	Ta = -20°C to + 50°C Ex ia IIC T4 Ga
CE Certification	TUV IEC61326, IEC61010
Rohs Compliance	Rohs II Directive 2011/65/EU, EN50581:2012
Protection Level	IP67, 1 meter drop test
Communication	Isolate USB-Type C (slave), Bluetooth
Display	4.4-inch color display capacitive screen, transflective, with LED backlight
Size	6.97" x 4.13" x 2.04" (177 x 105 x 52 mm) which doesn't include bottom ADT158Ex.
Weight	1.65 lbs (0.75 kg)
Warranty Time	1 year

Electrical Specifications

Specification	Range	Accuracy	Resolution	Note
Voltage Measurement	±300 mV	0.015%RDG + 15 μV	1 uV	Impedance: >100 MΩ
	±30 V	0.015%RDG + 1.5 mV	0.1 mV	Impedance: >1 MΩ
Current Measurement	±30 mA	0.015%RDG + 1.5 μA	0.1 uA	Impedance: < 40 Ω
Frequency Measurement	0.01~50000 Hz (auto range)	0.005% RDG + 2 last digit	6-digit auto-resolution	Min threshold voltage: 2.5 V
	Units: Hz, kHz, MHz, CPM, CPH, s, ms, us			
Switch On-Off Measurement	Inspection voltage: (3 ~ 30)V Response speed: < 10 ms, supports wet and dry switch			
Pulse Count	0 ~ 9999999, optional rising edge and falling edge Min threshold voltage: 2.5 V			
Loop Power	22 V ± 10%, max output impedance: 320 Ω, max load current: 25 mA			

PRESSURE TECHNICAL SPECIFICATIONS

Specifications	
Pressure resolution	4, 5, or 6 digit resolution (user selectable)
Measurement Units[1]	kPa, Pa, GPa, MPa, mPa, uPa, hPa, bar, mbar, torr, mtorr, atm, psi, psia, psig, gf/cm2, kgf/cm2, inH2O@4°C, inH2O@68°F, mmH2O@4°C, mmH2O@20°C, ftH2O@4°C, ftH2O@68°F, inHg@0°C, mmHg@0°C, lb/ft2, tsi, psf, inH2O@60°F, ftH2O@60°F, cmH2O@4°C, mH2O@4°C, cmHg@0°C, mHg@0°C, kgf/m2
Temperature Compensation	-10 °C~50 °C
Pressure Module Type	Built-in digital pressure module: ADT158Ex, for more detailed information, please see ADT158Ex datasheet. External digital pressure module: ADT161Ex,for more detailed information, please see ADT161Ex datasheet.
Specifications	Refer to the technical specification of the ADT158Ex and ADT161Ex
High Static Pressure and Differential Pressure Synthesis Index[2]	Two modules must be with the same range; Typical Differential pressure accuracy of 0.002%FS or 0.02%RD, whichever is greater when using two 0.02%FS external modules. Typical Differential pressure accuracy of 0.002%FS or 0.05%RD, whichever is greater when using two 0.05%FS external modules.

[1] Available units are dependent on the overall pressure range.
[2] For more explanation, please reference application note "Achieving High Accuracy for High Static Differential Pressure Measurements".

PRESSURE RANGE

Gauge Pressure [1]

P/N	Pressure Range		Media [2]	Accuracy (%FS)	Burst Pressure
	(psi)	(bar)			
V15	-15	-1.0	G	0.02	3×
GP2	2	0.16	G	0.05	3×
GP5	5	0.35	G	0.05	3×
GP10	10	0.7	G	0.02	3×
GP15	15	1.0	G	0.02	3×
GP30	30	2.0	G	0.02	3×
GP50	50	3.5	G , L	0.02	3×
GP100	100	7.0	G , L	0.02	3×
GP150	150	10	G , L	0.02	3×
GP300	300	20	G , L	0.02	3×
GP500	500	35	G , L	0.02	3×
GP600	600	40	G , L	0.02	3×
GP1K	1,000	70	G , L	0.02	3×
GP1.5K	1,500	100	G , L	0.02	3×
GP2K	2,000	140	G , L	0.02	3×
GP3K	3,000	200	G , L	0.02	3×
GP5K	5,000	350	G , L	0.02	3×
GP10K	10,000	700	G , L	0.02	2×
GP15K	15,000	1,000	G , L	0.05	2x
GP20K	20,000	1,400	G , L	0.05	1.5x
GP25K	25,000	1,600	G , L	0.05	1.5x
GP30K	30,000	2,000	G , L	0.05	1.5x
GP36K	36,000	2,500	G , L	0.05	1.5x
GP40K	40,000	2,800	G , L	0.05	1.35x
GP50K	50,000	3,500	G , L	0.1	1.2x
GP60K	60,000	4,200	G , L	0.1	1.1x

[1] Sealed gauge pressure for above 1000 psi
[2] G=Gas, L=Liquid

Compound Pressure

P/N	Pressure Range		Media	Accuracy	Burst Pressure
	psi	bar			
CP2	±2	±0.16	G	0.05% FS	3x
CP5	±5	±0.35	G	0.02% FS	3x
CP10	±10	±0.7	G	0.02% FS	3x
CP15	±15	±1.0	G	0.02% FS	3x
CP30	-15 to 30	-1 to 2.0	G	0.02% FS	3x
CP50	-15 to 50	-1 to 3.5	G	0.02% FS	3x
CP100	-15 to 100	-1 to 7.0	G,L	0.02% FS	3x
CP300	-15 to 300	-1 to 20	G,L	0.02% FS	3x
CP500	-15 to 500	-1 to 35	G,L	0.02% FS	3x
CP600	-15 to 600	-1 to 40	G,L	0.02% FS	3x
CP1K	-15 to 1,000	-1 to 70	G,L	0.02% FS	3x
CP2K	-15 to 2,000	-1 to 140	G,L	0.02% FS	3x
CP3K	-15 to 3,000	-1 to 200	G,L	0.02% FS	3x
CP5K	-15 to 5,000	-1 to 350	G,L	0.02% FS	3x
CP10K	-15 to 10,000	-1 to 700	G,L	0.02% FS	2x

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ORDERING INFORMATION

Model Number

ADT273Ex — GP300 — PSI — N • • HART

Pressure range P/N:
See pressure range tables above

Range type:
PSI-range by psi
BAR-range by bar

Pressure port type:
N- 1/4NPT male
N2- 1/2NPT male
B-1/4BSP male
B2-1/2BSP male
M-M20X1.5 male
AF-Autoclave F-250-C female
AM-Autoclave M-250-C male

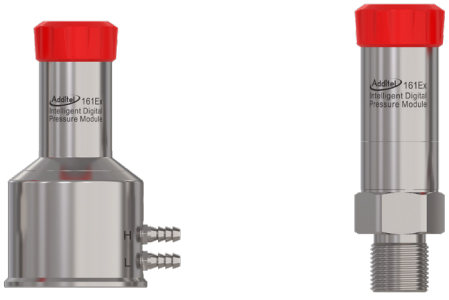
HART Communication (Optional)

Note: The ADT273Ex can be purchased without the ADT158Ex module If needed using the following part numbers.
ADT273Ex-NO
ADT273Ex-NO-HART (includes HART Communication)

Accessories (included)		
Model number	**Description**	**QTY**
9811Ex-X[1]	110V/220V external power adapter	1 pc
9704Ex	Chargeable Li-ion battery	1pc
9025	Test leads	1 set (3 pcs)
9040	Hanging strap with magnet	1 pc
9052Ex[1]	Ex USB Cable type A to type C (For Ex models only)	1 pc
	ISO 17025 accredited calibration certificate	1 pc

[1] 9811Ex-X and 9052Ex cannot be used on any hazardous areas.

Optional Accessories	
Model number	**Description**
ADT158Ex	Built-in digital pressure module (see ADT158Ex datasheet)
ADT161Ex	External digital pressure module (see ADT161 datasheet)
9060	Pressure module connection cable
9906A	Hard carrying case for handheld instrument with accessories
9918-SC	Soft carrying case, with space for handheld instrument, test leads, and accessories
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9530-NET	Additel/Acal Automated calibration software with asset management, network version, includes server installation and 1 user license



ADT161Ex pressure modules - See ADT161 Datasheet for more info

ADT158Ex pressure module - For use with ADT273Ex (bottom mount)

Additel 673
Advanced Digital Pressure Calibrators

Metrology Made Simple

- **Pressure ranges up to 60,000 psi (4,200 bar)**
- **0.02%, 0.05% FS or 0.1% RD Accuracy**
- **Color Touchscreen Display**
- Every model measures Gauge or Absolute Pressure
- Built-in Barometer
- Intuitive Smartphone Like Interface
- Bluetooth and USB Communication
- Wi-Fi (optional)
- Measure mA or V, and with 24V loop power
- Full HART Field Communicator (Optional)
- Data logging
- Communicates with Additel's Link Mobile App

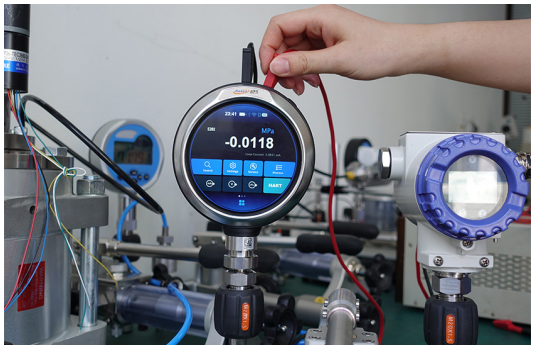
Additel 673

OVERVIEW

Additel's 673 Advanced Digital Pressure Calibrators will redefine the way you want to measure and calibrate pressure readings and devices! With wireless remote connectivity, microprocessor technology, state of-the-art silicon pressure sensors and onboard storage capacity, these attractive and fully temperature compensated calibrators will provide the performance, durability and reliability you've come to expect from genuine Additel products. The all new modern menu structure and control interface brings a new and refreshing experience to pressure calibration work. This completely new way of interfacing with our pressure calibrators makes the ADT673 a real pleasure to use. The handy Additel Link app gives users the ability to remotely monitor these calibrators from the convenience of a personal device or cell phone. With an abundance of options to choose from, you can configure these pressure calibrators to precisely fit your specific pressure calibration and measurement needs. With an IP67 rating, you will find that these amazing pressure calibrators can be used in the field or laboratory to meet the most demanding pressure calibration needs.

A Modern User Experience:
Additel has gone above and beyond to provide our customers with the best possible experience when using this new and revolutionary calibrator. The 3.4 inch color touchscreen display comes with a protective replaceable tempered glass screen and is a refreshing update to the traditional push button or blister pad interface. With an easy to navigate menu structure and fast touchscreen response, you will find these ADT673 calibrators simple yet powerful to use. The easy to read display isn't just fun to use, but it's built rugged to handle the demands of a busy technician in the field or the laboratory.

HART Field Communicator :
With full support for HART communication protocols, the ADT673 Advanced Digital Pressure Calibrators provide a pressure calibration solution for transmitters over a wide pressure range. The ADT673 is a very portable device and can measure pressure precisely with a built-in pressure sensor, as well as read the current or mV produced by a transducer. It can even supply an excitation voltage (loop power) to power sensors or transmitters during calibration.



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SPECIFICATIONS

Model	ADT673
Accuracy	673-02: 0.02% of full span
	673-05: 0.05% of full span
	673-RD: 0% to 20% of range: 0.02% of full span 20% to 110% of range: 0.1% of reading
	Built-in barometer: 55 Pa
Gauge Types	Gauge pressure, compound pressure, absolute pressure, differential pressure and barometric pressure
Display	Color Touchscreen (capacitive)
	Screen protector: tempered glass film (replaceable)
	Display rate: 3 readings per second (default setting). Adjustable from 10 readings per second to 1 reading every 20 seconds
	Resolution: 4, 5 or 6 digits (user selectable)
Pressure Units[3]	Pa, kPa, MPa, psi, bar, mbar, kgf/cm^2, inH_2O@4°C mmH_2O@4°C, inHg@0°C, mmHg@0°C and 5 customizable units
Environmental	Compensated Temp.: 14°F to 122°F (-10°C to 50°C)
	Operating Temp.: 14°F to 122°F (-10°C to 50°C)
	Storage Temp.: -4°F to 158°F (-30°C to 70°C)
	Humidity: 0 - 95%, Non-condensing
Pressure Port	< 15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20×1.5 male
	≥15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A
	Differential Pressure: barb fitting
	Other connections available per request
Over Pressure Warning	120%
Power	Battery: rechargeable Li-ion battery
	Li-Battery life: 16 hours typically
	Recharge time: 4 hours typically
	External power: 110V/220V power adapter (5 VDC)
Enclosure	Case material: 304 SS
	Wetted parts: 316 SS [1]
	Size: 4.65" x 1.77" x 6.89"(118 x 42 x175mm)
	Weight: 1.58 lbs (0.715 kg)
Electrical Measurement Accuracy (8 °C to 38°C)	Voltage DC: ±30.0000 V, ± (0.01%RD + 1.5 mV)
	Current DC: ±30.0000 mA, ± (0.01%RD + 1.5 μA)
	DC 24 V: 24 V ±1 V, MAX: 30 mA
	Switch[2]: status OPEN/CLOSED, support for mechanical switches and NPN/PNP digital switches
Data Logging	Data storage: 8GB (10M+ records)
	Mode: manual and automatic
	Interval-record: user selectable from 0.1 to 9999.9 second intervals
Compliance	Protection Level: IP67
	Vibration: 5 g (10-500 Hz)
	Shock Resistance: 8 g/11 ms
	CE, UKCA
Communication	USB Type-C and Bluetooth included, RS232 or Wi-Fi (optional)
Warranty	1 year

[1] Wetted parts material types may vary by pressure range
Please refer to manual or contact to Additel for more information
[2] Trigger voltage 2.7V
[3] Available units are dependent on the overall pressure range
[4] Temperature coefficient: (5ppm of RD + 5ppm of FS)/ °C from -10 °C to 8 °C and 38 °C to 50 °C

PRESSURE RANGE

Gauge Pressure [1]						
P/N	Pressure Range		Media[2]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
V15	-15	-1.0	G	0.02, 0.05	N/A	3×
GP2	2	0.16	G	0.05	N/A	3×
GP5	5	0.35	G	0.05	0.1	3×
GP10	10	0.7	G, L[3]	0.02, 0.05	0.1	3×
GP15	15	1.0	G, L[3]	0.02, 0.05	0.1	3×
GP30	30	2.0	G, L	0.02, 0.05	0.1	3×
GP50	50	3.5	G, L	0.02, 0.05	0.1	3×
GP100	100	7.0	G, L	0.02, 0.05	0.1	3×
GP150	150	10	G, L	0.02, 0.05	0.1	3×
GP300	300	20	G, L	0.02, 0.05	0.1	3×
GP500	500	35	G, L	0.02, 0.05	0.1	3×
GP600	600	40	G, L	0.02, 0.05	0.1	3×
GP1K	1,000	70	G, L	0.02, 0.05	0.1	3×
GP1.5K	1,500	100	G, L	0.02, 0.05	0.1	3×
GP2K	2,000	140	G, L	0.02, 0.05	0.1	3×
GP3K	3,000	200	G, L	0.02, 0.05	0.1	3×
GP5K	5,000	350	G, L	0.02, 0.05	0.1	3×
GP10K	10,000	700	G, L	0.02, 0.05	0.1	1.5×
GP15K	15,000	1,000	G, L	0.05 (0.1)	0.1	1.5×
GP20K	20,000	1,400	G, L	0.05 (0.1)	N/A	1.5×
GP25K	25,000	1,600	G, L	0.05 (0.1)	N/A	1.5×
GP30K	30,000	2,000	G, L	0.05 (0.1)	N/A	1.5×
GP36K	36,000	2,500	G, L	0.05 (0.1)	N/A	1.5×
GP40K	40,000	2,800	G, L	0.05 (0.1)	N/A	1.35×
GP50K	50,000	3,500	G, L	0.1 (0.2)	N/A	1.2×
GP60K	60,000	4,200	G, L	0.1 (0.2)	N/A	1.1×

[1] Sealed gauge pressure for above 1,000 psi
[2] G=Gas, L=Liquid
[3] 0.02% FS for gas media only

PRESSURE RANGE

Compound Pressure						
P/N	Pressure Range		Media	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
CP2	±2	±0.16	G	0.05	N/A	3×
CP5	±5	±0.35	G	0.02 (0.05)	0.1	3×
CP10	±10	±0.7	G	0.02 (0.05)	0.1	3×
CP15	±15	±1	G	0.02 (0.05)	0.1	3×
CP30	-15 to 30	-1 to 2	G	0.02 (0.05)	0.1	3×
CP100	-15 to 100	-1 to 7	G, L	0.02 (0.05)	0.1	3×
CP150	-15 to 150	-1 to 10	G, L	0.02(0.05)	0.1	3×
CP300	-15 to 300	-1 to 20	G, L	0.02 (0.05)	0.1	3×
CP500	-15 to 500	-1 to 35	G, L	0.02 (0.05)	N/A	3×
CP600	-15 to 600	-1 to 40	G, L	0.02 (0.05)	N/A	3×
CP1K	-15 to 1000	-1 to 70	G, L	0.02 (0.05)	N/A	3×

Differential Pressure						
P/N	Pressure Range		Media	Accuracy (%FS)[1]	Burst Pressure	Static Pressure Range
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	100×	±10 psi
DP2	±2	±5.0	G	0.05[2]	100×	±10 psi
DP5	±5	±10	G	0.05[2]	50×	±10 psi
DP10	±10	±25	G	0.05[2]	20×	±10 psi
DP20	±20	±50	G	0.05	20×	±10 psi
DP30	±30	±75	G	0.05	20×	±10 psi
DP50	±50	±125	G	0.05	3×	±10 psi
DP100	±100	±250	G	0.02	3×	±15 psi
DP150	±150	±350	G	0.02	3×	50 psi
DP300	±300	±700	G	0.02	3×	50 psi

[1] FS specification applies to the span of the range. Accuracy includes one year stability.

[2] 0.05%FS accuracy (incl 6 months stability). One year accuracy is 0.05%FS calibration accuracy combined with 0.05%FS one year stability.

Barometric Pressure					
P/N	Pressure Range		Media	Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	55 Pa	3×
BPH	60 kPa	110 kPa	G	22 Pa	3×

Communication Types Supported				
Comm \ Model	ADT685	ADT685Ex	ADT686	ADT673
RS232	○	○	○	○
RS485	○			
WiFi			○	○
USB	●	●	●	●
Bluetooth(BLE)	●	●	●	●

● Included ○ Optional

Additel Software Compatibility Matrix								
Comm \ Model	ADT685/ADT685Ex				ADT686/ADT673			
	ACal	LogII	Land	Link	ACal	LogII	Land	Link
RS232	●	●	●		●	●	●	
RS485 only for ADT685	◐[2]	◐[2]	◐[2]					
WiFi					●	●	●	●[1]
USB	●	●	●		●	●	●	
Bluetooth(BLE)				●				●

● Supported ◐ Non Ex models only

[1] This configuration requires that the device be connected to ACloud via Wi-Fi to utilize the Additel Link app.

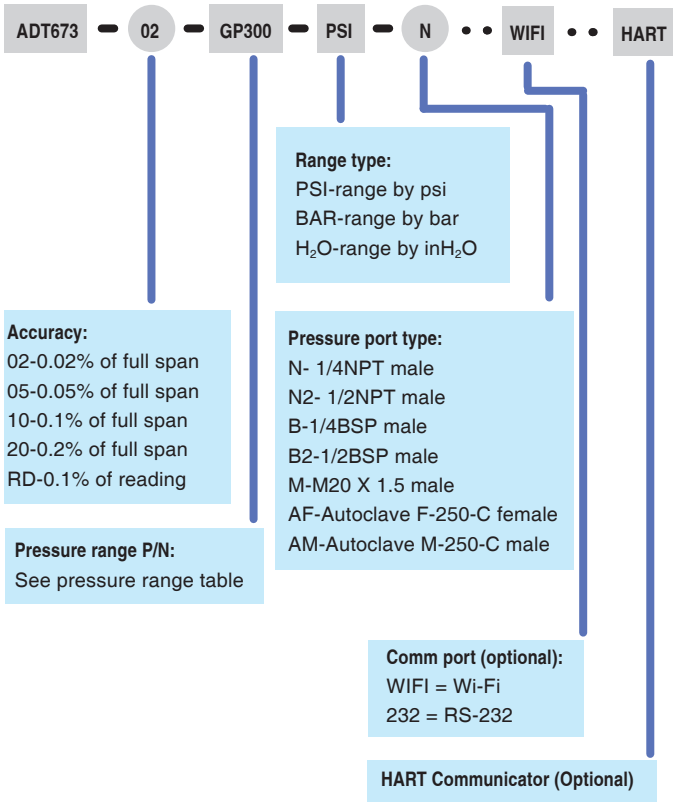
[2] 4-20mA output and RS-485 not avaiable in ADT685Ex models.

Additel
Metrology Made Simple

ADT673
Advanced Digital Pressure Calibrators

ORDERING INFORMATION

Model Number



Accessories Included

Rubber boot
Test leads (1) set
Rechargeable Lion battery (1 pc)
USB cable (type-C) (1 pc)
Power adapter
Silicone tube - 1 meter each (2 pcs for DP models only)
ISO 17025 accredited calibration certificate

Optional Accessories

Model number	Description
9903	Carrying case for (1) digital pressure gauge
9040	Hanging strap with magnet
9502	Additel/Log II real time data logging and graphical software
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9530-NET	Additel/Acal Automated calibration software with asset management, network version, includes server installation and 1 user license
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
9260	Screen protector kit
9257	Field rain cover

Note: For oil-free applications contact Additel.

Additel 686
Advanced Digital Pressure Gauges

Metrology Made Simple

- **Pressure ranges up to 60,000 psi (4,200 bar)**
- **0.02%, 0.05% FS or 0.1% RD Accuracy**
- **Color Touchscreen Display**
- Every model measures Gauge or Absolute Pressure
- Built-in Barometer
- Intuitive Smartphone Like Interface
- Wi-Fi (optional)
- Bluetooth and USB communication
- Data logging (optional)
- Communicates with Additel's Link Mobile App
- IP67 Rated

Additel 686

OVERVIEW

Additel's 686 Advanced Digital Pressure Gauges will redefine the way you want to measure pressure! With wireless remote connectivity, microprocessor technology, state of-the-art silicon pressure sensors and optional onboard storage capacity, these attractive and fully temperature compensated gauges will provide the performance, durability and reliability you've come to expect from genuine Additel products. The all new modern menu structure and control interface bring a new and refreshing experience to pressure calibration work. This completely new way of interfacing with our gauges makes the ADT686 a real pleasure to use. The handy Additel Link app gives users the ability to remotely monitor these gauges from the convenience of a personal device or cell phone. With an abundance of options to choose from, you can configure these pressure gauges to precisely fit your specific pressure calibration and measurement needs. With an IP67 rating, you will find that these amazing pressure gauges can be used in the field or laboratory to meet the most demanding pressure calibration needs.

A Modern User Experience:
Additel has gone above and beyond to provide our customers with the best possible experience when using these new and revolutionary gauges. The 3.4 inch color touchscreen display comes with a protective replaceable tempered glass screen and is a refreshing update to the traditional push button or blister pad interface. With an easy to navigate menu structure and fast touchscreen response, you will find these ADT686 gauges simple yet powerful to use. The easy to read display isn't just fun to use, but it's built rugged to handle the demands of a busy technician in the field or the laboratory.

Every model measures Gauge or Absolute Pressure:
The Additel 686 Digital Pressure Gauges contain a built-in barometer sensor which allows for the pressure reading to display in gauge pressure or absolute pressure with a simple menu selection. The built-in barometer is calibrated and certified to an accuracy of 55 Pa. With this unique feature, the ADT686 can be a solution for three common applications: gauge pressure measurement, absolute pressure measurement, and barometric or atmosphere pressure measurement. Having an Additel as your gauge will always give you the ability to do more with one instrument!

Additel
Metrology Made Simple

SPECIFICATIONS

Model	ADT686
Accuracy (For detailed accuracy, please see pressure range table)	686-02: 0.02% of full span
	686-05: 0.05% of full span
	686-RD: 0% to 20% of range: 0.02% of full span 20% to 110% of range: 0.1% of reading
	Built-in barometer: 55 Pa
Gauge Types	Gauge pressure, compound pressure, absolute pressure, differential pressure and barometric pressure
Display	Color Touchscreen (capacitive)
	Screen protector: tempered glass film (replaceable)
	Display rate: 3 readings per second (default setting). Adjustable from 10 readings per second to 1 reading every 20 seconds
	Resolution: 4, 5 or 6 digits (user selectable)
Pressure Units[2]	Pa, kPa, MPa, psi, bar, mbar, kgf/cm2, inH2O@4°C, mmH2O@4°C, inHg@0°C, mmHg@0°C and 5 customizable units
Environmental	Compensated Temp.: 14°F to 122°F (-10°C to 50°C)
	Operating Temp.: 14°F to 122°F (-10°C to 50°C)
	Storage Temp.: -4°F to 158°F (-30°C to 70°C)
	Humidity: 0 - 95%, Non-condensing
Pressure Port	< 15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20 × 1.5 male
	≥15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A
	Differential Pressure: barb fitting
	Other connections available per request
Power	Battery: rechargeable Li-ion battery
	Li-Battery life: 16 hours typically
	Recharge time: 4 hours typically
	External power: 110 V / 220 V power adapter (5 VDC)
Enclosure	Case material: 304 SS
	Wetted parts: 316 SS[1]
	Size: 4.65" × 1.77" 7.01"(118 × 42 × 178 mm)
	Weight: 1.58 lb (0.715 kg)
Compliance	Protection Level: IP67
	Vibration: 5 g (10-500 Hz)
	Shock Resistance: 8 g/11 ms
	CE, UKCA
Data Logging (Available on data logging option ADT686-...-DL)	Data storage: 8 GB (10M+ records)
	Rate: user-selectable from 0.1 to 9999.9 second intervals
Communication	USB Type-C and Bluetooth included, RS232 or WiFi (optional)
Warranty	1 year

[1]Wetted parts material types may vary by pressure range
Please refer to the manual or contact Additel for more information
[2]Available units are dependent on the overall pressure range

PRESSURE RANGE

Gauge Pressure [1]						
P/N	Pressure Range		Media[2]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
V15	-15	-1.0	G	0.02, 0.05	N/A	3×
GP2	2	0.16	G	0.05	N/A	3×
GP5	5	0.35	G	0.05	0.1	3×
GP10	10	0.7	G, L[3]	0.02, 0.05	0.1	3×
GP15	15	1.0	G, L[3]	0.02, 0.05	0.1	3×
GP30	30	2.0	G, L	0.02, 0.05	0.1	3×
GP50	50	3.5	G, L	0.02, 0.05	0.1	3×
GP100	100	7.0	G, L	0.02, 0.05	0.1	3×
GP150	150	10	G, L	0.02, 0.05	0.1	3×
GP300	300	20	G, L	0.02, 0.05	0.1	3×
GP500	500	35	G, L	0.02, 0.05	0.1	3×
GP600	600	40	G, L	0.02, 0.05	0.1	3×
GP1K	1,000	70	G, L	0.02, 0.05	0.1	3×
GP1.5K	1,500	100	G, L	0.02, 0.05	0.1	3×
GP2K	2,000	140	G, L	0.02, 0.05	0.1	3×
GP3K	3,000	200	G, L	0.02, 0.05	0.1	3×
GP5K	5,000	350	G, L	0.02, 0.05	0.1	3×
GP10K	10,000	700	G, L	0.02, 0.05	0.1	1.5×
GP15K	15,000	1,000	G, L	0.05 (0.1)	0.1	1.5×
GP20K	20,000	1,400	G, L	0.05 (0.1)	N/A	1.5×
GP25K	25,000	1,600	G, L	0.05 (0.1)	N/A	1.5×
GP30K	30,000	2,000	G, L	0.05 (0.1)	N/A	1.5×
GP36K	36,000	2,500	G, L	0.05 (0.1)	N/A	1.5×
GP40K	40,000	2,800	G, L	0.05 (0.1)	N/A	1.35×
GP50K	50,000	3,500	G, L	0.1 (0.2)	N/A	1.2×
GP60K	60,000	4,200	G, L	0.1 (0.2)	N/A	1.1×

[1] Sealed gauge pressure for above 1,000 psi
[2] G=Gas, L=Liquid
[3] 0.02% FS for gas media only

PRESSURE RANGE

Compound Pressure

P/N	Pressure Range		Media	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
CP2	±2	±0.16	G	0.05	N/A	3×
CP5	±5	±0.35	G	0.02 (0.05)	0.1	3×
CP10	±10	±0.7	G	0.02 (0.05)	0.1	3×
CP15	±15	±1	G	0.02 (0.05)	0.1	3×
CP30	-15 to 30	-1 to 2	G	0.02 (0.05)	0.1	3×
CP100	-15 to 100	-1 to 7	G, L	0.02 (0.05)	0.1	3×
CP150	-15 to 150	-1 to 10	G, L	0.02 (0.05)	0.1	3×
CP300	-15 to 300	-1 to 20	G, L	0.02 (0.05)	0.1	3×
CP500	-15 to 500	-1 to 35	G, L	0.02 (0.05)	N/A	3×
CP600	-15 to 600	-1 to 40	G, L	0.02 (0.05)	N/A	3×
CP1K	-15 to 1000	-1 to 70	G, L	0.02 (0.05)	N/A	3×

Differential Pressure

P/N	Pressure Range		Media	Accuracy (%FS)[1]	Burst Pressure	Static Pressure Range
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	100×	±10 psi
DP2	±2	±5.0	G	0.05[2]	100×	±10 psi
DP5	±5	±10	G	0.05[2]	50×	±10 psi
DP10	±10	±25	G	0.05[2]	20×	±10 psi
DP20	±20	±50	G	0.05	20×	±10 psi
DP30	±30	±75	G	0.05	20×	±10 psi
DP50	±50	±125	G	0.05	3×	±10 psi
DP100	±100	±250	G	0.02	3×	±15 psi
DP150	±150	±350	G	0.02	3×	50 psi
DP300	±300	±700	G	0.02	3×	50 psi

[1] FS specification applies to the span of the range. Accuracy includes one year stability.
[2] 0.05%FS accuracy (incl 6 months stability). One year accuracy is 0.05%FS calibration accuracy combined with 0.05%FS one year stability.

Barometric Pressure

P/N	Pressure Range		Media	Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	55 Pa	3×
BPH	60 kPa	110 kPa	G	22 Pa	3×

Communication Types Supported

Comm \ Model	ADT685	ADT685Ex	ADT686	ADT673
RS232	○	○	○	○
RS485	○			
WiFi			○	○
USB	●	●	●	●
Bluetooth(BLE)	●	●	●	●

● Included ○ Optional

Additel Software Compatibility Matrix

Comm \ Model	ADT685/ADT685Ex				ADT686/ADT673			
	ACal	LogII	Land	Link	ACal	LogII	Land	Link
RS232	●	●	●		●	●	●	
RS485 only for ADT685	◐[2]	◐[2]	◐[2]					
WiFi					●	●	●	●[1]
USB	●	●	●		●	●	●	
Bluetooth(BLE)				●				●

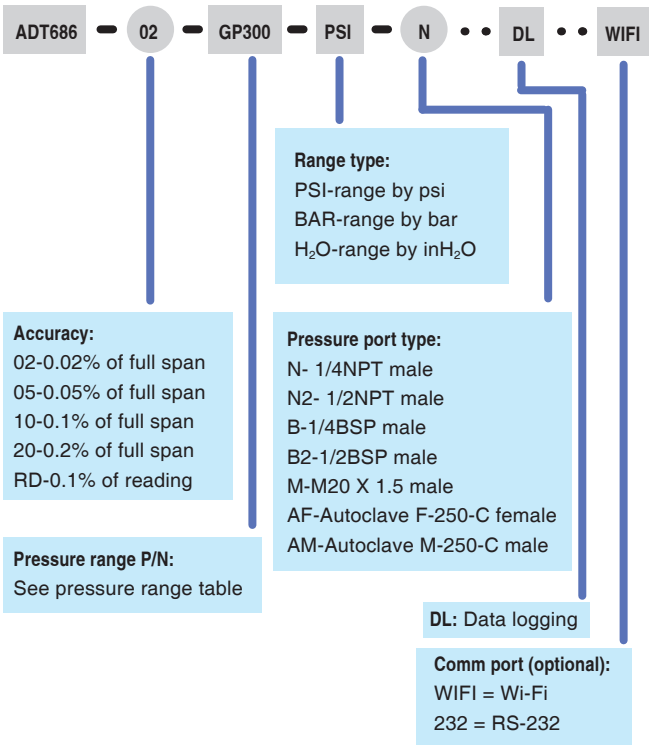
● Supported ◐ Non Ex models only

[1] This configuration requires that the device be connected to ACloud via Wi-Fi to utilize the Additel Link app.
[2] 4-20mA output and RS-485 not avaiable in ADT685Ex models.

ADT686
Advanced Digital Pressure Gauges

ORDERING INFORMATION

Model Number



Accessories Included

Rubber boot
Rechargeable Lion battery (1 pc)
USB cable (type-C) (1 pc)
Power adapter
Silicone tube - 1 meter each (2 pcs for DP models only)
ISO 17025 Accredited Calibration Certificate

Optional Accessories

Model number	Description
9903	Carrying case for (1) digital pressure gauge
9040	Hanging strap with magnet
9502	Additel/Log II real time data logging and graphical software
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9530-NET	Additel/Acal Automated calibration software with asset management, network version, includes server installation and 1 user license
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
9260	Screen protector kit
9257	Field rain cover

Note: For oil-free applications contact Additel.

Additel 685
Digital Pressure Gauges

- **Pressure ranges up to 60,000 psi (4,200 bar)**
- **0.02%, 0.05%FS or 0.1%RD accuracy**
- **Fully temperature compensated accuracy**
- Every model measures Gauge or Absolute Pressure
- Built-in Barometer
- Touchscreen display
- Intrinsically safe version 685Ex (optional)
- Bluetooth and USB communications
- Data logging (optional)
- IP67 rated
- Communicates with Additel's Link Mobile App
- ISO 17025-accredited calibration w/data included

Additel 685

OVERVIEW

Looking for the most advanced, best performing and modern digital pressure gauge on the market? Congratulations, you've just found it! Additel's ADT685 digital pressure gauges are in a class of their own with an amazingly easy to use and read touchscreen display. The all new modern menu structure and control interface bring a new and refreshing experience to gauge work. This completely new way of interfacing with our gauges makes the ADT685 gauges a real pleasure to use. With microprocessor technology, state-of-the-art silicon pressure sensors and plenty of onboard storage capacity, these attractive and fully temperature compensated gauges will provide the performance, durability and reliability you've come to expect from genuine Additel products. To provide support for intrinsically safe needs, the ADT685Ex comes ready to provide pressure measurements and recordings in the most demanding of environments. Each Additel 685 is also IP67 rated to protect your investment in dusty and/or wet environments.

A Modern User Experience:

Additel has gone above and beyond to provide our customers with the best possible experience when using these new and revolutionary gauge. The 3.4 inch touchscreen display comes with a protective replaceable tempered glass screen and is a refreshing update to the traditional push button or blister pad interface. With an easy to navigate menu structure and fast touchscreen response, you will find these ADT685 gauges simple yet powerful to use. The easy to read display isn't just fun to use, but it's built rugged to handle the demands of a busy technician in the field or the laboratory.

Every model measures Gauge or Absolute Pressure:

The Additel 685 Digital Pressure Gauges contain a built-in barometer sensor which allows for the pressure reading to display in gauge pressure or absolute pressure with a simple menu selection. The built-in barometer is calibrated and certified to an accuracy of 55 Pa. With this unique feature, the ADT685 can be a solution for three common applications: gauge pressure measurement, absolute pressure measurement, and barometric or atmosphere pressure measurement. Having an Additel as your gauge will always give you the ability to do more with one instrument!

Datalogging Option:

We've added the option to do stand-alone data logging with the ADT685. Now you can record more than 10M records internal to the 685 series. Each record includes date, time, pressure and temperature readings. Download the logged data with our free Additel/Land software or you can purchase our Additel/Log II for real-time logging and data analysis. Additel's 685 digital pressure gauges are unmatched in performance and reliability. You get nothing but the best when you buy Additel Products!

Additel
Metrology Made Simple

SPECIFICATIONS

Model	ADT685	ADT685Ex
Intrinsic Safety & European Compliance	CE, UKCA	CE marked, CSA marked ATEX certified intrinsically safe IEC IECEx II 1G EX ia IIC T4 Ga
Accuracy (For detailed accuracy, please see pressure range table)	685(Ex)-02: 0.02% of full span	
	685(Ex)-05: 0.05% of full span	
	685(Ex)-RD: 0% to 20% of range: 0.02% of full span 20% to 110% of range: 0.1% of reading	
	Built-in barometer: 55 Pa	
Gauge Types	Gauge pressure, compound pressure, absolute pressure, differential pressure and barometric pressure	
Display	Touch screen (3.4" FSTN segment capacitive) - 5 1/2 full digits	
	Screen protector: tempered glass film (replaceable)	
	Display rate: 3 readings per second (default setting). Adjustable from 10 readings per second to 1 reading every 20 seconds	
Pressure Units[3]	Pa, kPa, MPa, psi, bar, mbar, kgf/cm2, inH2O@4°C, mmH2O@4°C, inHg@4°C, mmHg@4°C and 3 customizable units	
Environmental	Compensated Temp.: 14°F to 122°F (-10°C to 50°C)	
	Operating Temp.: 14°F to 122°F (-10°C to 50°C)	
	Storage Temp: -4°F to 158°F (-30°C to 70°C)	
	Humidity: 0 - 95%, Non-condensing	
Pressure Port	< 15,000 psi: 1/4NPT male, 1/2NPT male, 1/4BSP male, 1/2BSP male, M20 × 1.5 male	
	≥15,000 psi: 1/4HP female or 1/4HP male *1/4HP female: Autoclave F-250-C, 9/16" - 18 UNF-2B *1/4HP male: Autoclave M-250-C, 9/16" - 18 UNF-2A	
	Differential Pressure: barb fitting	
	Other connections available per request	
Power	Battery: three AA alkaline batteries (included)	
	Battery life: 1500 hours typical	
	Power auto-off: user selectable	
	External power: 110/220 V adapter (5 VDC) (optional, excl ADT685Ex)	
Enclosure	Case material: 304 SS	
	Wetted parts: 316 SS[1]	
	size: 4.65" × 1.77" × 7.01" (118mm × 42mm × 178mm)	
	Weight: 1.50 (0.68 kg)	
Compliance	Protection Level: IP67	
	Vibration: 5 g (10-500 Hz)	
	Shock Resistance: 8 g/11 ms	
Data Logging (Available on data logging option ADT685-...-DL)	Data storage: 10,000,000 records	
	Rate: user-selectable from 0.1 to 9999.9 second intervals	
Communication	USB Type-C and Bluetooth included RS-232 or RS-485[2](optional)	
4 - 20 mA Output[4]	3.2 μA	
Warranty	1 year	

[1] Wetted parts material types may vary by pressure range. Please refer to manual or contact Additel for more information
[2] 4-20mA output and RS-485 not available in ADT685Ex models
[3] Available units are dependent on the overall pressure range

PRESSURE RANGE

Gauge Pressure [1]						
P/N	Pressure Range		Media[2]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
V15	-15	-1.0	G	0.02, 0.05	N/A	3×
GP2	2	0.16	G	0.05	N/A	3×
GP5	5	0.35	G	0.05	0.1	3×
GP10	10	0.7	G, L[3]	0.02, 0.05	0.1	3×
GP15	15	1.0	G, L[3]	0.02, 0.05	0.1	3×
GP30	30	2.0	G, L	0.02, 0.05	0.1	3×
GP50	50	3.5	G, L	0.02, 0.05	0.1	3×
GP100	100	7.0	G, L	0.02, 0.05	0.1	3×
GP150	150	10	G, L	0.02, 0.05	0.1	3×
GP300	300	20	G, L	0.02, 0.05	0.1	3×
GP500	500	35	G, L	0.02, 0.05	0.1	3×
GP600	600	40	G, L	0.02, 0.05	0.1	3×
GP1K	1,000	70	G, L	0.02, 0.05	0.1	3×
GP1.5K	1,500	100	G, L	0.02, 0.05	0.1	3×
GP2K	2,000	140	G, L	0.02, 0.05	0.1	3×
GP3K	3,000	200	G, L	0.02, 0.05	0.1	3×
GP5K	5,000	350	G, L	0.02, 0.05	0.1	3×
GP10K	10,000	700	G, L	0.02, 0.05	0.1	1.5×
GP15K	15,000	1,000	G, L	0.05 (0.1)	0.1	1.5×
GP20K	20,000	1,400	G, L	0.05 (0.1)	N/A	1.5×
GP25K	25,000	1,600	G, L	0.05 (0.1)	N/A	1.5×
GP30K	30,000	2,000	G, L	0.05 (0.1)	N/A	1.5×
GP36K	36,000	2,500	G, L	0.05 (0.1)	N/A	1.5×
GP40K	40,000	2,800	G, L	0.05 (0.1)	N/A	1.35×
GP50K	50,000	3,500	G, L	0.1 (0.2)	N/A	1.2×
GP60K	60,000	4,200	G, L	0.1 (0.2)	N/A	1.1×

[1] Sealed gauge pressure for above 1,000 psi

[2] G=Gas, L=Liquid

[3] 0.02% FS for gas media only

Barometric Pressure					
P/N	Pressure Range		Media	Accuracy	Burst Pressure
	Low	High			
BP	60 kPa	110 kPa	G	55 Pa	3×
BPH	60 kPa	110 kPa	G	22 Pa	3×

PRESSURE RANGE

Additel
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Compound Pressure						
P/N	Pressure Range		Media	Accuracy		Burst Pressure
	(psi)	(bar)		%FS	%RD	
CP2	±2	±0.16	G	0.05	N/A	3×
CP5	±5	±0.35	G	0.02 (0.05)	0.1	3×
CP10	±10	±0.7	G	0.02 (0.05)	0.1	3×
CP15	±15	±1	G	0.02 (0.05)	0.1	3×
CP30	-15 to 30	-1 to 2	G	0.02 (0.05)	0.1	3×
CP100	-15 to 100	-1 to 7	G, L	0.02 (0.05)	0.1	3×
CP150	-15 to 150	-1 to 10	G, L	0.02 (0.05)	0.1	3×
CP300	-15 to 300	-1 to 20	G, L	0.02 (0.05)	0.1	3×
CP500	-15 to 500	-1 to 35	G, L	0.02 (0.05)	N/A	3×
CP600	-15 to 600	-1 to 40	G, L	0.02 (0.05)	N/A	3×
CP1K	-15 to 1000	-1 to 70	G, L	0.02 (0.05)	N/A	3×

Differential Pressure						
P/N	Pressure Range		Media	Accuracy (%FS)[1]	Burst Pressure	Static Pressure Range
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	100×	±10 psi
DP2	±2	±5.0	G	0.05[2]	100×	±10 psi
DP5	±5	±10	G	0.05[2]	50×	±10 psi
DP10	±10	±25	G	0.05[2]	20×	±10 psi
DP20	±20	±50	G	0.05	20×	±10 psi
DP30	±30	±75	G	0.05	20×	±10 psi
DP50	±50	±125	G	0.05	3×	±10 psi
DP100	±100	±250	G	0.02	3×	±15 psi
DP150	±150	±350	G	0.02	3×	50 psi
DP300	±300	±700	G	0.02	3×	50 psi

[1] FS specification applies to the span of the range. Accuracy includes one year stability.
[2] 0.05%FS accuracy (incl 6 months stability). One year accuracy is 0.05%FS calibration accuracy combined with 0.05%FS one year stability.

Communication Types Supported				
Comm \ Model	ADT685	ADT685Ex	ADT686	ADT673
RS232	○	○	○	○
RS485	○			
WiFi			○	○
USB	●	●	●	●
Bluetooth(BLE)	●	●	●	●

● Included ○ Optional

Additel Software Compatibility Matrix								
Model / Comm	ADT685/ADT685Ex				ADT686/ADT673			
	ACal	LogII	Land	Link	ACal	LogII	Land	Link
RS232	●	●	●		●	●	●	
RS485 only for ADT685	◐[2]	◐[2]	◐[2]					
WiFi					●	●	●	●[1]
USB	●	●	●		●	●	●	
Bluetooth(BLE)				●				●

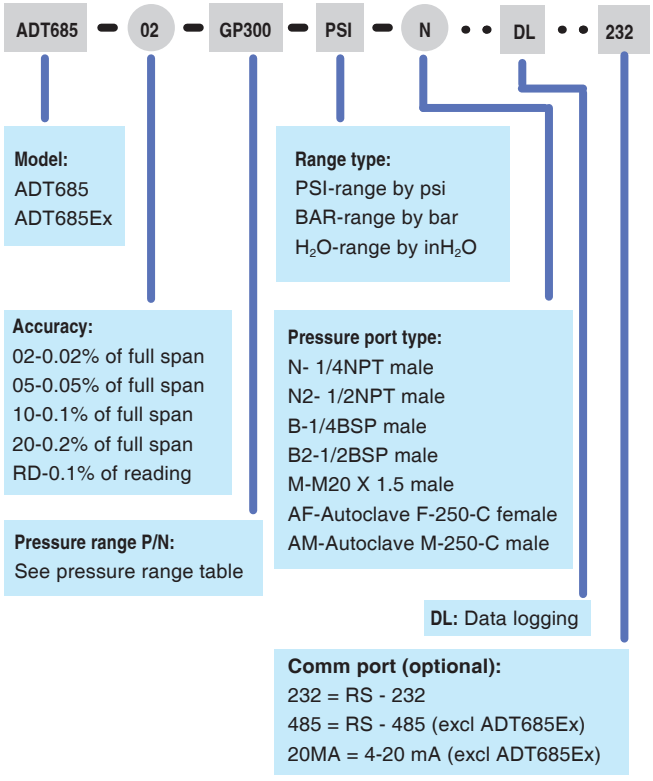
● Supported ◐ Non Ex models only

[1] This configuration requires that the device be connected to ACloud via Wi-Fi to utilize the Additel Link app.
[2] 4-20mA output and RS-485 not avaiable in ADT685Ex models.

ADT685
Digital Pressure Gauges

ORDERING INFORMATION

Model Number



Accessories Included

Rubber boot
AA alkaline battery (3 pcs)
USB cable (type-C) (1 pc)
RS-485 Adapter (for RS-485 models only)
4-20mA cable (for 20MA models only)
RS-232 Ex adapter (for EX RS-232 models only)
Silicone tube - 1 meter each (2 pcs for DP models only)
ISO 17025 Accredited Calibration Certificate

Optional Accessories

Model number	Description
9903	Carrying Case for one digital pressure gauge
9040	Hanging strap with magnet
9810	110V/220V external power adapter (DC 5V)
9502	Additel/Log II real time data logging and graphical software for ADT 685 and ADT 685Ex
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9530-NET	Additel/Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license
9050	USB to RS232 (DB9/M) Adapter
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
9260	Screen protector kit
9257	Field rain cover

Note: For oil-free applications contact Additel.

Additel

Metrology Made Simple

Additel 601Ex Digital Pressure Gauge

- Available in ranges from -15 to 15,000 psi
- 0.5% FS Accuracy
- Fully Temperature Compensated from -20°C to 50°C
- Bluetooth Communication
- Battery Life Up To 9,000 Hours
- Intrinsically Safe, ATEX approved

See page 63 for more details!

Application Note

Metrology Made Simple

Why Temperature Compensation Really Matters for Pressure Measurement

Have you ever wondered how much impact environmental temperature has on your pressure sensors? Nearly every pressure sensor has some sort of environmental temperature specification on its data sheet. This technical note explains the environmental temperature effects on pressure sensors, quantifying the impact, and ways to minimize the impact.

Why pressure sensors are impacted by environmental temperature changes

Much like anything else in the physical measurement world, pressure sensors are subject to changes in environmental conditions. Temperature effects tend to have the largest impact on pressure measurement accuracy. Temperature effects directly influence the pressure sensor and the circuitry used to measure the sensor. Digital pressure sensors use electronic circuits which provide an analog output proportional to the inlet pressure. There are three factors of a sensor's circuitry that are affected by environmental temperature changes: zero pressure output voltage, pressure sensitivity span and bridge resistance. Temperature-compensated sensors employ some techniques to correct for and minimize the impact of temperature changes on these factors.

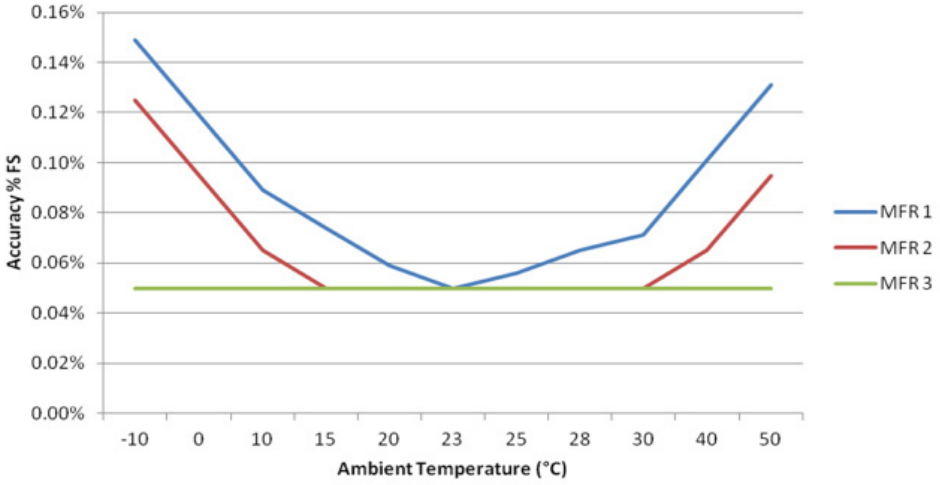
To understand the environmental temperature effect on your sensor, it is helpful to first understand some common terms you may see on a pressure sensor specification sheet.
Operating Temperature Range: This is the temperature range over which the sensor can be used without causing damage.
Temperature Compensated Accuracy Range: This refers to the environmental temperature range over which the accuracy of the sensor is applicable.
Temperature Coefficient: An additional error that needs to be considered when used outside of the temperature compensated accuracy range. Many sensors are only tested and calibrated at laboratory temperatures. In this case, the temperature coefficient will need to be considered in the measurement accuracy when using the sensor outside of laboratory temperatures.

Quantifying the environmental temperature effect

So how much will the ambient temperature impact your measurement accuracy? Well, this will depend on the temperature compensated accuracy range and the temperature coefficient. To demonstrate this, let's consider three different gauges. As you can see from the specifications below (figure 1), they all have the same accuracy specification of 0.05% FS. However, as you consider the temperature compensated accuracy range and the temperature coefficient you'll see a fairly large variation between the three gauges.

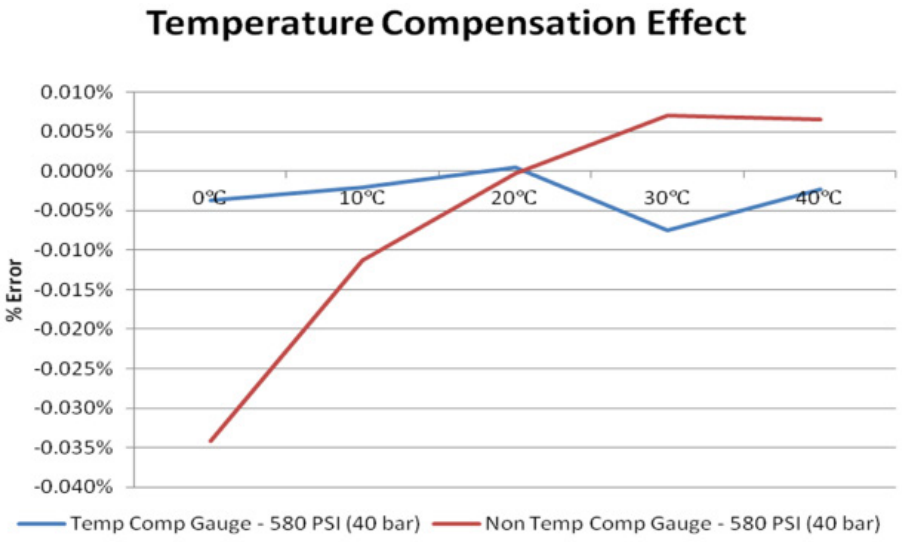
Figure 1	*Manufacturer 1*	*Manufacturer 2*	*Manufacturer 3*
Accuracy	0.05% FS	0.05% FS	0.05% FS
Temperature Compensated Accuracy Range	N/A	15°C to 35°C	-10°C to 50°C
Temperature Coefficient	Add 0.003% FS/°C from 23°C	Add 0.003% FS/°C: -10°C to 15°C, 35°C to 50°C	N/A

The graph below shows the total specified accuracy when considering the temperature effects on the pressure gauges. As you can see in one case here, the lack of temperature compensation and inclusion of the temperature coefficient specification more than triple the 0.05% FS accuracy specification



Temperature compensation test results

To further show temperature compensation has real effect, we placed a non-temperature compensated pressure gauge in a temperature chamber and pressure tested it from 0 to 580 psi (0 to 40 bar) and over the environmental temperature range of 0°C to 40°C. We then performed the same test on a temperature compensated gauge. As you may expect—the higher the pressure, the larger the impact from the environmental temperature. Below is a chart comparing the non-temperature compensated gauge with the temperature compensated gauge.



Minimizing environmental temperature error

The temperature effect on a pressure sensor will be negligible when used at the same laboratory temperature in which it was calibrated. This, however, is often not practical for your measurements.

With sensor technology advances, we have found a variety of ways to minimize the temperature effect on pressure sensors and with confidence define a large temperature compensated accuracy range. First, regularly zero your digital pressure gauges. By zeroing the pressure gauge, you are aligning the zero pressure output voltage to the current environmental conditions. You should only zero the pressure gauge when you do not have any inlet pressure on the gauge.

Because each sensor is unique and performs differently due to environmental temperature changes, at Additel, we pressure test every sensor in a thermal chamber at different temperatures so we understand its pressure performance relative to environmental changes. Each sensor contains a temperature-compensated circuit which we load coefficients representing the temperature testing of the gauge. This allows for you to confidently use our sensors over the range -10°C to 50°C without having to add a temperature coefficient error to the accuracy.

Pressure Test / Calibration Pumps

Selection Guide

Additel
Metrology Made Simple

Model	Photo	Type	Range in psi	Range in bar	Media	Adjustment Resolution	Weight	See Page
Additel 901B		Pneumatic	(-6 to 6) psi	(-0.4 to 0.4) bar	Air	0.001 mbar	3.5 lb	P100
Additel 912A		Pneumatic	(-14 to 60) psi	(-0.95 to 4) bar	Air	0.001 mbar	6.2 lb	P101
Additel 914A		Pneumatic	(-14 to 375) psi	(-0.95 to 25) bar	Air	0.1 mbar	3.3 lb	P102
Additel 916A		Pneumatic	(-14 to 600) psi	(-0.95 to 40) bar	Air	0.1 mbar	5.9 lb	P103
Additel 917		Pneumatic	(-14 to 1,000) psi	(-0.95 to 70) bar	Air	0.1 mbar	5.7 lb	P104
Additel 918		Pneumatic	(-14 to 1,500) psi	(-0.95 to 100) bar	Air	0.1 mbar	5.7 lb	P105
Additel 919A		Pneumatic	(-14 to 2,000) psi	(-0.95 to 140) bar	Air	0.1 mbar	14.3 lb	P106
Additel 920, 920HV		Pneumatic	(-14 to 3,000) psi	(-0.95 to 200) bar	Air	0.1 mbar	14.3 lb	P108
Additel 925		Hydraulic	(-12.5 to 6,000) psi	(-0.85 to 400) bar	Oil/ Water[1]	1 mbar	3.7 lb	P109
Additel 927		Hydraulic	(-12.5 to 10,000) psi	(-0.85 to 700) bar	Oil/ Water[1]	1 mbar	7 lb	P111
Additel 928A		Hydraulic	(0 to 15,000) psi	(0 to 1,000) bar	Oil/ Water[1]	1 mbar	8.6 lb	P112
Additel 946A		Hydraulic	(0 to 15,000) psi	(0 to 1,000) bar	Oil	1 mbar	28.7 lb	P113
Additel 959A		Hydraulic	(0 to 40,000) psi	(0 to 2,800) bar	Oil	1 mbar	28.7 lb	P114
Additel 960		Hydraulic	(0 to 60,000) psi	(0 to 4,200) bar	Oil	1 mbar	28.7 lb	P115

[1] Oil is default media liquid. Pump with water as media to be ordered optionally (ADT9XXW).
[2] Oil, compatible to phosphoric acid fluid or skydrol oil.

Additel 901B
Low Pressure Test Pump

Metrology Made Simple

- **Generate 6 psi (0.4 bar) vacuum to 6 psi (0.4 bar) pressure**
- Portable, only 3.5 lb
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

OVERVIEW

The 901B Low Pressure Test Pump is a hand operated pressure pump designed to generate pressures from -6 psi (-0.4 bar) to 6 psi (0.4 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 0.1 Pa (0.001 mbar). The 901B is a very stable low pressure calibrator. It makes use of an isothermal bellows chamber which is designed for reducing the possible effects of environmental temperature change. Most pumps make use of a check valve (non-returning valve) and are not well insulated which will cause large fluctuations in pressure with a change in ambient temperature or when the unit is touched. The 901B does not use a check valve and is remarkably stable. Two hand-tight connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 901B is an ideal comparison test pump for low pressure applications.

FEATURES

- **Portable:** Only 3.5 lb (1.6 kg)
- **Adjustment Resolution**
  0.1Pa (0.001 mbar); Specially designed screw press for fine pressure adjustment.
- **Great Stability**
  Isothermal chamber: the pressure chamber is insulated to reduce the influence from environmental temperature changes.
  Specially designed bellows minimize leakage to guarantee excellent stability.
- **Durable and Minimal Maintenance**
  Without non-returning valve that is usually used on troublesome hand pump.
- **Easy-to-use**
  Pressure could be set and adjusted precisely and quickly through a simple turn of the handle.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range**
  6 psi (0.4 bar) vacuum to 6 psi (0.4 bar) positive pressure.
- **Adjustment Resolution:** 0.1 Pa (0.001 mbar).
- **Material:**
  Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:** Height: 5.7" (145mm)
  Base: 9.65" (245 mm) x 6.50" (165mm)
- **Weight:** 3.5 lb (1.6 kg)
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT901B – N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (901B-X-SETmodels only)

- **Optional Accessories**

Model number	*Description*
ADT901B-X-kit	Test kit for ADT901B (barb fitting, connection hoses, and adapters). X=connection type e.g. N-1/4NPTM, N2-1/2NPTM, B-1/4BSPM, B2-1/2BSPM, M-M20X1.5M.
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs). More information shown on page 69
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs). More information shown on page 70
9901-901	Carrying Case for one ADT901B pump and two ADT681 gauges or ADT672 calibrators
ADT901B-MK	Maintenance kit for Additel 901B pump
9240A	DP gauge holder with a built-in 80 ml chamber

Note: For oil free applications contact Additel.

Additel 912A
Low Pressure Test Pump

- **Generate 95% vacuum to 60 psi (4 bar) pressure**
- Portable
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

Additel
Metrology Made Simple

OVERVIEW

The 912A Pneumatic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 60 psi (4 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 0.1 Pa (0.001 mbar). The 912A is a very stable low pressure calibrator. It makes use of an isothermal bellows chamber which is designed for reducing the possible effects of environmental temperature change. Most pumps make use of a check valve (non-returning valve) and are not well insulated which will cause large fluctuations in pressure with a change in ambient temperature or when the unit is touched. The 912A does not use a check valve and is remarkably stable. Two hand-tight connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 912A is an ideal comparison test pump for low pressure application.

FEATURES

- **Portable:** Only 6.2 lb (2.8 kg)
- **Adjustment Resolution**
  0.1 Pa (0.001 mbar)
  High-quality screw press for fine pressure adjustment
- **Great Stability**
  Isothermal chamber: the pressure chamber is insulated to reduce the influence from environmental temperature changes
  Specially designed bellows minimize leakage to guarantee excellent stability
  Shut-off valve closes the air in the isothermal chamber during calibration
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt
- **Easy-to-use**
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range**
  95% vacuum to 60 psi (4 bar) positive pressure
- **Adjustment Resolution:** 0.1 Pa (0.001 mbar).
- **Material:** Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Piston volume:** 1.6 in^3 (27 ml)
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions**
  Height: 5.51" (140 mm)
  Base: 10.75" (273 mm) x 10.16" (258 mm)
- **Weight:** 6.2 lb (2.8 kg)
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT912A — N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (912A-X-SETmodels only)

- **Optional Accessories**

Model number	*Description*
ADT912A-X-kit	Test kit for ADT912A (barb fitting, connection hoses, and adapters). X=connection type e.g. N-1/4NPTM, N2-1/2NPTM, B-1/4BSPM, B2-1/2BSPM, M-M20X1.5M.
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9904-912	Carrying Case for one 912A pump and two gauges.
ADT912A-MK	Maintenance kit for Additel 912A pump
9240A	Differential pressure gauge holder

Note: For oil free applications contact Additel.

Additel 914A
Handheld Pneumatic Pressure Test Pump

Metrology Made Simple

- **Generate 95% vacuum to 375 psi (25 bar) pressure**
- Portable, only 3.3 lb
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

OVERVIEW

The 914A Pneumatic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 375 psi (25 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 10 Pa (0.1 mbar). A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 914A is an ideal comparison test pump for pressure instruments calibration.

FEATURES

- **Portable:**
  Only 3.3 lb (1.5 kg)
- **Adjustment Resolution**
  10 Pa (0.1 mbar)
  High-quality screw press for fine pressure adjustment
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt
- **Easy-to-use**
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range:** 95% vacuum to 375 psi (25 bar) positive pressure
- **Adjustment Resolution:** 10 Pa (0.1 mbar).
- **Material:** Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Piston volume:** 1.6 in^3 (27 ml)
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions**
  Height: 5.12" (130 mm)
  Base: 9.45" (240 mm) x 4.72" (120 mm)
- **Weight:** 3.3 lb (1.5 kg).
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT914A — N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (914A-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9901-914	Carrying Case for one 914A pump and two gauges
ADT914A-MK	Maintenance kit for Additel 914A pump

Note: For oil free applications contact Additel.

Additel 916A
Pneumatic Pressure Test Pump

Metrology Made Simple

- **Generate 95% vacuum to 600 psi (40 bar) pressure**
- Portable, only 5.9 lb
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

OVERVIEW

The 916A Pneumatic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 600 psi (40 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 10 Pa (0.1 mbar). A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 916A is an ideal comparison test pump for pressure instruments calibration.

FEATURES

- **Portable**
  Only 5.9 lb (2.7 kg)
- **Adjustment Resolution**
  10 Pa (0.1 mbar)
  High-quality screw press for fine pressure adjustment
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration.
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt.
- **Easy-to-use**
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range**
  95% vacuum to 600 psi (40 bar) positive pressure
- **Pressure Resolution:** 10 Pa (0.1 mbar).
- **Material**
  Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Piston volume:** 1.6 in^3 (27 ml)
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions**
  Height: 5.5" (140 mm)
  Base: 12.4" (315 mm) x 7.8" (198 mm)
- **Weight:** 5.9 lb (2.7 kg).
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT916A — N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (916A-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9904-916	Carrying Case for one ADT916A pump and two gauges
ADT916A-MK	Maintenance kit for Additel 916A pump

Note: For oil free applications contact Additel.

Additel 917
Pneumatic Pressure Test Pump

- **Generate 95% vacuum to 1,000 psi (70 bar) pressure**
- Portable, only 5.7 lb
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

Additel
Metrology Made Simple

OVERVIEW

The 917 Pneumatic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 1,000 psi (70 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 10 Pa (0.1 mbar). A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. The 917 can be special ordered to comply with oxygen free applications. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 917 is an ideal comparison test pump for pressure instruments calibration.

FEATURES

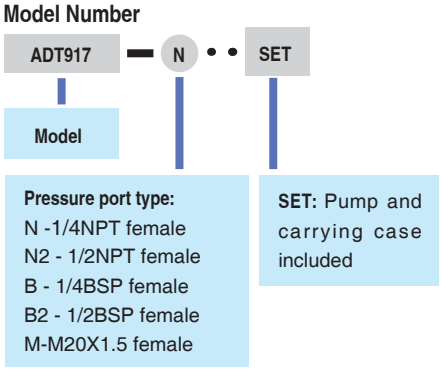
- **Portable**
  Only 5.7 lb (2.6 kg)
- **High Resolution**
  10 Pa (0.1 mbar)
  High-quality screw press for fine pressure adjustment
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration.
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt.
- **Easy-to-use**
  Pressurized to desired pressure by the lever directly and make fine adjustment. No high-pressurized valve needed.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media**: Air.
- **Generated Pressure Range**
  95% vacuum to 1,000 psi (70 bar) positive pressure
- **Adjustment Resolution**: 10 Pa (0.1 mbar).
- **Material**: Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Piston volume:** 1.6 in^3 (27 ml)
- **Connection**:
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions**:
  Height: 5.5" (140 mm)
  Base: 12.4" (315 mm) x 7.8" (198 mm)
- **Weight**: 5.7 lb (2.6 kg).
- **Warranty**: 1 year

ORDERING INFORMATION

- **Model Number**



- **Accessories included**
  O-ring: 20 pcs
  Carrying case (917-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9904-917	Carrying Case for one 917 pump and two gauges
ADT917-MK	Maintenance kit for Additel 917 pump

Note: For oil free applications contact Additel.

Additel 918
Pneumatic Pressure Test Pump

- **Generate 95% vacuum to 1,500 psi (100 bar) pressure**
- Portable, only 5.7 lb
- Great stability and high resolution
- Minimal maintenance
- Hand-tight quick connectors

Additel
Metrology Made Simple

OVERVIEW

The 918 Pneumatic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 1,500 psi (100 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 10 Pa (0.1 mbar). A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. The 918 can be special ordered to comply with oxygen free applications. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 918 is an ideal comparison test pump for pressure instruments calibration.

FEATURES

- **Portable**
  Only 5.7 lb (2.6 kg)
- **High Resolution**
  0.001psi (10 Pa , 0.1 mbar)
  High-quality screw press for fine pressure adjustment
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration.
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt.
- **Easy-to-use**
  Pressurize to desired pressure by the pump lever directly, and then make fine adjustment. No high-pressure valve needed.
- **Hand-tight Quick Connectors**
  Allows easy connection and disconnection to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media**: Air.
- **Generated Pressure Range**
  95% vacuum to 1,500 psi (100 bar) positive pressure
- **Adjustment Resolution**: 0.001 psi (10 Pa , 0.1 mbar).
- **Material**: Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, FTM, PTFE, Copper Alloy
- **Piston volume:** 1.6 in^3 (27 ml)
- **Connection**: Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions**:
  Height: 5.5'' (140 mm)
  Base: 12.4" (315 mm) x 7.8" (198 mm)
- **Weight**: 5.7 lb (2.6 kg).
- **Warranty**: 1 year

ORDERING INFORMATION

- **Model Number**

ADT918 — N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (918-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9904-918	Carrying Case for one 918 pump and two gauges
ADT918-MK	Maintenance kit for Additel 918 pump

Note: For oil free applications contact Additel.

Additel 919A
High Pressure Test Pump

Metrology Made Simple

- **Generate 95% vacuum to 2,000 psi (140 bar) pressure**
- Generate 2,000 psi (140 bar) in 30 seconds
- Minimal maintenance
- Hand-tight quick connectors
- First one in the world

OVERVIEW

The 919A High Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 95% vacuum to 2,000 psi (140 bar). With a long lever, it just takes 30 seconds to reach 2,000 psi (140 bar). A high-quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 0.001 psi (10 Pa , 0.1 mbar). A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. The residual liquid in the pump introduced from the devices under test will be collected and then pushed out during pressure release. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 919A is an ideal comparison test pump for pressure instruments calibration.

FEATURES

- **High Efficiency**
  Generate 2,000 psi (140 bar) in 30 seconds.
- **Adjustment Resolution**
  0.001 psi (10 Pa , 0.1 mbar).
  High-quality screw press for fine pressure adjustment.
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration.
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt.
  The residual liquid in the pump introduced from devices under test will be collected and then pushed out and collected during pressure release.
  Anticorrosive and wear resistant material are used to improve the reliability further.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range:** 95% vacuum to 2,000 psi (140 bar) positive pressure
- **Adjustment Resolution:** 10 Pa (0.1 mbar/0.0015 psi)
- **Material:** Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Piston volume:** 3.7 in^3 (60 ml)
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:**
  Height: 7.00" (178 mm);
  Base: 21.26" (540 mm) x 10.63" (270 mm).
- **Weight:** 14.3 lb (6.5 kg).
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT919A — N • • SET

Model

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M-M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (919A-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9909-919	Carrying Case for one 919A pump and two gauges
ADT919A-MK	Maintenance kit for Additel 919A pump

Note: For oil free applications contact Additel.

Application Note

Metrology Made Simple

Improved Methods for High Pressure Pneumatic Calibrations in the Field

Are you tired of dragging a nitrogen bottle and dead weight tester out to the field to perform pneumatic high pressure calibrations? Does it trouble you to use a hydraulic pump or dead weight tester for your gas gauges every time you have to go above 600 psi? This application note details the limitations to traditional methods and provides a solution to calibration of gas gauges up to 3,000 psi (200 bar) with a field-ready calibration tool.

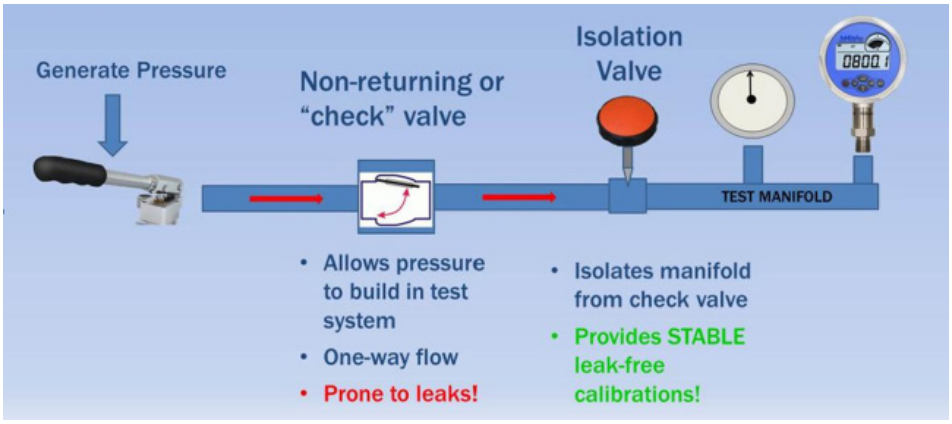
Limitations with Traditional Methods

Traditional methods for performing high pressure gas gauge calibrations in the field require the use of a controller or comparison systems and a nitrogen bottle. This solution typically provides the performance needed to do the job but adds a considerable inconvenience in having to transport several pieces of heavy equipment to the calibration site. Not to mention the time and effort in setting up the system. Dead weight testers and hydraulic pumps have also been used as a solution. Hydraulic pumps are problematic for this application as the liquid can damage the gas gauge you are attempting to calibrate. It is common that these hydraulic comparison pumps also lack the stability and resolution required to calibrate many gas gauges. Dead weight testers typically have the accuracy required but will require a gas supply for high pressure pneumatic applications. If the dead weight tester uses hydraulic fluid as the medium it will achieve much higher pressures but has similar drawbacks as hydraulic pumps.

A More Practical Solution

Additel developed their high pressure pneumatic pumps specifically to address high pressure gas calibrations in the field. The Additel 919A goes to 2,000 psi (140 bar) and the 920 goes to 3,000 psi (200 bar) without the use of hydraulic fluids or the need for a gas supply. Each pump can also generate to 95% of vacuum. The ADT920 will generate 3,000 psi (200 bar) in 40 seconds and the pump weighs about 14 lbs (6.5 kg) which makes it easy to take to the field.

The high pressure range, portability, and speed to pressure are not the only things that make this series of pumps unique. The Additel pneumatic pump design allows for high stability and resolution to 0.001 psi (0.1 mbar). Like many pumps on the market, the ADT919A and the ADT920 use a check valve, also referred to as a non-returning valve, to protect the pump from contaminants that could cause damage. However, we've seen with most pumps on the market that the check valve tends to lose its seal over time which causes unstable measurements. The Additel design incorporates a high-quality isolation valve and screw press which allows for you to isolate the calibration volume from the check valve and achieve very stable measurements and resolution to 0.001 psi (0.1 mbar).
The diagram below illustrates the pump construction.



The method of operation is as follows: To generate pressure, use the pump handle on top of the unit. When you've generated 70% - 80% of the desired pressure with the pump handle, then close the isolation valve (this isolates the calibration volume from the pump handle and check valve). Next, use the fine-adjust screw press to generate the remaining pressure. Each pump comes with two hand-tight, quick-connect pressure ports that do not require the use of PTFE tape or wrenches. Combine this pump with any of our digital pressure gauges and you have an accurate, portable and practical field calibration solution for gas calibrations up to 3,000 psi (200 bar).

Conclusion

Traditional solutions for high pressure gas calibrations are not convenient or practical for field applications or they require the use of hydraulic fluids which could damage the sensor being tested. The Additel 919A and 920 pneumatic pressure pumps solve many of the problems that exist with traditional solutions and provide a reliable, field-ready, accurate and affordable solution to meet your needs!

Additel
Metrology Made Simple

Additel 920, 920HV Series High Pressure Test Pump

- **Generate 95% vacuum to 3,000 psi (200 bar) pressure**
- Generate 3,000 psi (200 bar) in 40 seconds
- Minimal maintenance
- Hand-tight quick connectors
- High volume model available

OVERVIEW

The 920 and 920HV High Pressure Test Pump are hand operated pressure pumps designed to generate pressure from 95% vacuum to 3,000 psi (200 bar). With a long lever, it takes just 40 seconds to reach 3,000 psi (200 bar). The high volume (HV) model has been outfitted with a higher volume pump to provide added capacity. A quality screw press is designed for fine pressure adjustment, with an adjustment resolution up to 10 Pa (0.1 mbar).
A specially designed shut-off valve makes the pressure as stable as possible during calibration. A built-in gas-liquid isolator protects the pump from moisture and dirt to reduce the need for maintenance. The residual liquid in the pump introduced from devices under test will be pushed out and collected during pressure release. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 920 is an ideal comparison test pump for pressure instruments calibration.

FEATURES

- **High Efficiency**
  Generate 3,000 psi (200 bar) in 40 seconds.
- **Adjustment Resolution**
  0.001 psi (10 Pa, 0.1 mbar).
  High-quality screw press for fine pressure adjustment.
- **Great Stability**
  A specially designed shut-off valve makes the pressure as stable as possible during calibration.
- **Durable and Minimal Maintenance**
  Built-in gas-liquid isolator protects the pump from moisture and dirt.
  The residual liquid in the pump introduced from devices under test will be collected and then pushed out and collected during pressure release.
  Anticorrosive and wear resistant material are used to improve the reliability further.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

SPECIFICATIONS

- **Media:** Air.
- **Generated Pressure Range**
  95% vacuum to 3,000 psi (200 bar) positive pressure
- **Adjustment Resolution:** 10 Pa (0.1 mbar/0.0015 psi)
- **Material:** Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, F357, PTFE, Copper Alloy
- **Piston volume:** 3.7 in^3 (60 ml) for 920,
  7.02 in^3 (115 ml) for 920 HV
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:**
  Height: 7.00" (178 mm);
  Base: 21.26" (540 mm) x 10.63" (270 mm).
- **Weight:** 14.3 lb (6.5 kg) for 920,
  15.9 lb (7.2 kg) for 920HV
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT920 — N • • SET

Model
ADT920
ADT920HV

Pressure port type:
N -1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M- M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  O-ring: 20 pcs
  Carrying case (920-X-SET models only)

- **Optional Accessories**

Model number	*Description*
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9909-920	Carrying Case for one 920 pump and two gauges
9909-920HV	Carrying Case for one 920HV pump and two gauges
ADT920-MK	Maintenance kit for Additel 920 pump
ADT920HV-MK	Maintenance kit for Additel 920HV pump

Note: For oil free applications contact Additel.

Additel
Metrology Made Simple

Additel 925
Handheld Hydraulic Pressure Test Pump

- **Generate 85% vacuum to 6,000 psi (400 bar) pressure**
- Portable, only 3.7 lb
- Minimal maintenance
- Increase and decrease pressure smoothly
- Hand-tight quick connectors

OVERVIEW

The 925 Hydraulic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 85% vacuum to 6,000 psi (400 bar). With the patented screw press technology, the high pressure can be easily generated, as well as increased and decreased smoothly. With no check valve (non-returning valve), the 925 avoids the troublesome leakage issues that is usually experienced with most hand pumps and allows for minimal maintenance. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 925 is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers in the field or laboratory.

FEATURES

- **Portable**
  Only 3.7 lb (1.7 kg)
- **Durable and Minimal Maintenance**
  Patented screw press technology, without non-returning valve inside that is usually used on troublesome hand pumps.
- **Easy-to-use**
  The high pressure can be generated easily, as well as increased and decreased smoothly.
- **Extremely Low Leakage**
  Patented screw press technology, replaces troublesome check valves (non-returning valve) used in most hand pumps which practically eliminates leakage.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

ORDERING INFORMATION

- **Model Number**

ADT925 — N • • SET

Model:
ADT925
ADT925W

Pressure port type:
N - 1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M - M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  Mineral oil,1 bottle (250 ml)*
  O-ring: 20 pcs
  Carrying case (925-X-SET models only)
  * When water media is not requested

SPECIFICATIONS

- **Media:** Oil or deionized water.
  (Oil is default media liquid. Pump with water as media to be ordered as ADT925W. Pump stability is best when used with oil. Performance may decrease when used with water as the media.)
- **Reservoir capacity:** 200 ml (12.2 in^3)
- **Pressure Range**
  85% vacuum to 6,000 psi (400 bar) positive pressure.
- **Material:** Ram/adapters: SS
  Body: SS,aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:** Height: 4.72" (120 mm)
  Base: 9.84" (250 mm) x 5.51" (140 mm)
- **Weight:** 3.7 lb (1.7 kg).
- **Warranty:** 1 year
- **Piston volume**
  Low pressure piston: 1.1 in^3 (18 ml)
  High pressure piston: 0.05 in^3 (0.9 ml)

- **Optional Accessories**

Model number	*Description*
9201	Oil, Diethylhexyl Sebacate, 1 liter (1 quart)
9202	Oil, Mineral Oil, 1 liter (1 quart)
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-8K	Hose test kit, 5 feet flexible hose, 8,000 psi, user selectable male (1/4NPT, 1/2NPT, 1/4BSP, 1/2BSP, M20) to user selectable female hand tight quick connector.
9901-925	Carrying Case for one 925 pump and two gauges
ADT925-MK	Maintenance kit for Additel 925 pump

Application Note

Additel
Metrology Made Simple

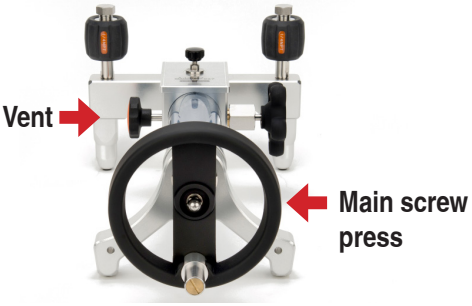
Considerations for Hydraulic High Pressure Calibrations

If you are doing high pressure, hydraulic calibrations there are a few things that you'll need to consider which will make your life a little easier and help you produce stable measurements. This application note focuses on considerations for pressure calibrations using a high pressure hydraulic pump to generate the pressure.

Getting Started

To produce stable and high pressure measurements using a hydraulic calibration pump, the gas within the calibration system needs to be removed. Hydraulic test pumps use various types of fluids to generate high pressures. Because gas is much more compressible than liquid, purging most if not all the gas out of the system will allow for maximum pressures to be generated. The following steps describe the procedure to purge the gas from an Additel test pump:

1. Ensure the pump, reference standard, and device under test (DUT) are securely connected to the calibration pump.
2. Close the vent valve and screw out the main screw press. You should see a vacuum being pulled on your reference and DUT (assuming the reference and the DUT are able to be used for vacuum measurement).
3. Open the vent valve, wait for the pressure to settle to zero, and screw in the main screw press. As you do this, you may see bubbles emerge in the medium reservoir which is a good indication that gas is being pushed out of the system.
4. Close the vent valve and repeat steps 2 and 3 one or two more times.
5. Close the vent valve and unscrew the main screw press half way out. Then open the vent valve to zero the measurement.
6. Now, you are ready to close the vent valve and generate pressure.



Stable Measurements

As pressures are generated to the desired test point it is common to initially observe a fairly rapid decrease in pressure. Initially, you may conclude that this is a pressure leak but what you are likely observing is called the adiabatic effect. This effect is defined as a gain or loss of heat within a system and its environment. When a gas is compressed under adiabatic conditions, its pressure increases and its temperature rises without the gain or loss of any heat. This happens when the screw press of a pump compresses the fluid volume, thus resulting in an increase in pressure but also an increase in the temperature. As the increase in pressure stops the temperature generated from the screw press dissipates. If the volume is held constant and the temperature decreases so also will the pressure decrease. So this initial degrease of pressure is in fact a result of the temperature settling from the adiabatic heating effect generated from the screw press of the pump.

Other sources of instability that also impact the pressure measurement are instabilities in room temperature and changes in volume. Because temperature is a factor of pressure as the entire pressure system changes temperature due to the room temperature changing the true pressure value will also change. The same can also be said of the pressure volume. With an increase or decrease of pressure volume the true pressure value will see a correlated change. Volume changes with pressure systems are usually not very noticeable except at high pressures. At high pressures, the materials where the pressurized volume is contained will slightly expand causing the volume to expand and the pressure will decrease. This is particularly evident when using flexible hoses at high pressures.

Conclusion

So we can't change the laws of physics—so what can be done? As pressures are generated, time must be given to allow for the adiabatic effects to settle. In other words, you need to let the measurement stabilize for a few minutes. As you allow this stabilization period to happen, you'll find the measurement stability of the pump to be very reliable for your calibration applications. Room temperature will also have an impact on the measurement and it is best if calibrations are performed in a controlled, stable environment. Lastly, careful consideration of hoses, manifolds, and tubing will help produce stable results at high pressures. Using metal tubing as opposed to flexible hoses will yield higher stability as metal is less likely to allow for the volume to expand when under high pressure.

Additel 927
Hydraulic Pressure Test Pump

Metrology Made Simple

- **Generate 85% vacuum to 10,000 psi (700 bar) pressure**
- Portable, only 7 lb
- Minimal maintenance
- Increase and decrease pressure smoothly
- Hand-tight quick connectors

OVERVIEW

The 927 Hydraulic Pressure Test Pump is a hand operated pressure pump designed to generate pressure from 85% vacuum to 10,000 psi (700 bar). With the patented screw press technology, high pressures can be easily generated, as well as increased and decreased smoothly. With no check valve (non-returning valve), the 927 avoids the troublesome leakage issues that is usually experienced with most hand pumps and allows for minimal maintenance. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The 927 is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers in the field or laboratory.

FEATURES

- **Portable**
  Only 7 lb
- **Durable and Minimal Maintenance**
  Patented screw press technology, without non-returning valve inside that is usually used on troublesome hand pumps.
- **Easy-to-use**
  The high pressure can be generated easily, as well as increased and decreased smoothly.
- **Extremely Low Leakage**
  Patented screw press technology, replaces troublesome check valves (non-returning valve) used in most hand pumps which practically eliminates leakage.
- **Hand-tight Quick Connectors**
  Allows easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches.

ORDERING INFORMATION

- **Model Number**

ADT927 — N • • SET

Model:
ADT927
ADT927W

Pressure port type:
N - 1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M - M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  Mineral oil,1 bottle (250 ml)*
  O-ring: 20 pcs
  Carrying case (927-X-SET models only)
  * When water media is not requested

SPECIFICATIONS

- **Media:** Oil or deionized water.
  (Oil is default media liquid. Pump with water as media to be ordered as 927W. Pump stability is best when used with oil. Performance may decrease when used with water as the media.)
- **Reservoir capacity:** 15 in^3 (245 ml)
- **Generated Pressure Range**
  85% vacuum to 10,000 psi (700 bar) positive pressure.
- **Material:** Ram/adapters: SS
  Body: SS, aluminum
  Seals: Buna-N, PTFE, Copper Alloy
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge.
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:** Height: 5.31" (135 mm)
  Base: 11.42" (290 mm) x 7.80" (198 mm).
- **Weight:** 7 lb (3.2 kg).
- **Warranty:** 1 year
- **Piston volume**
  Low pressure piston: 1.2 in^3 (19 ml)
  High pressure piston: 0.05 in^3 (0.9 ml)

- **Optional Accessories**

Model number	*Description*
9201	Oil, Diethylhexyl Sebacate, 1 liter (1 quart)
9202	Oil, Mineral Oil, 1 liter (1 quart)
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT100-HTK-15K	Hose test kit, 5 feet flexible hose, 15,000 psi, 1/4NPT male to 1/4NPT (1/8NPT, 1/2NPT, 1/4BSP,1/2BSP, or M20X1.5) female hand-tight quick connector.
9904-927	Carrying Case for one 927 pump and two gauges
ADT927-MK	Maintenance kit for Additel 927 pump

Additel 928A
Hydraulic Pressure Test Pump

Metrology Made Simple

- Pressurize large-volume workload
- Generate to 15,000 psi (1,000 bar) pressure
- Impoved Anti-Corrosion Performance
- Portable only 9.5 lbs (4.3 kg)
- Increase and decrease pressure smoothly
- Hand-tight quick connectors

OVERVIEW

The Additel 928A Hydraulic Pressure Test Pump is a hand operated pressure pump designed to generate pressure to 15,000 psi (1,000 bar). This pump incorporates a dual-piston system which is ideal for filling large volume workload with the hand pump and providing smooth increase and decrease of pressure with the fine adjustment. The 928A Test Pump incorporates an isolation valve which isolates the calibration volume from the check valve associated with the hand pump. Because the check valve can often be a source of leaks and maintenance, the isolation valve provides more stable measurements and reduces potential maintenance of the pump. Two hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The Additel 928A is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers in the field or laboratory.

FEATURES

- **Hand pump to fill large volume systems**
- **Portable at 9.5 lbs (4.3 kg)**
- **Durable and minimal maintenance**
  Isolation valve provides stable pressures while reducing maintenance on the hand pump check valve
- **Easy to use**
  15,000 psi (1,000 bar) can be generated easily with the dual-piston system
- **Hand-tight quick connectors**
  Allows easy connection and disconnection to the test pump without the need for PTFE tape or wrenches

ORDERING INFORMATION

- **Model Number**

ADT928A — N • • SET

Model:
ADT928A
ADT928W
ADT928AC

Pressure port type:
N - 1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M - M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  Mineral oil,1 bottle (250 ml)*
  * When water media is not requested
  O-ring: 20 pcs
  Carrying case (928A-X-SET models only)

SPECIFICATIONS

- **Media:** Mineral oil, deionized water.
  Oil is default media. Pumps designed for water media ordered as 928W. Pumps with Skydrol Oil (phosphoric acid ester) as media ordered as 928AC.
- **Generated Pressure Range**
  0 to 15,000 psi (1,000 bar) gauge pressure
- **Material:**
  Ram/adapters: 304 SS Body: 304 SS
  Seals: Buna-N, PTFE, Copper Alloy Reservoir: UPVC
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge. 1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:** Height: 6.38" (162 mm)
  Base: 13.58" (345 mm) x 8.46" (215 mm)
- **Weight:** 9.5 lbs (4.3 kg)
- **Piston Volume:** Fine adjust piston: 0.9 ml (0.05 in^3)
- **Volume Per Stroke:** 3.72 ml
- **Reservoir Volume:** 150 ml (9.15 in^3)
- **Warranty:** 1 year

- **Optional Accessories**

Model number	*Description*
9201	Oil, Diethylhexyl Sebacate, 1 liter (1 quart)
9202	Oil, Mineral oil, 1 liter (1 quart)
ADT102	Adapters and fittings, 1/4NPT male to various male and female connection (25 pcs). More information shown on page 83.
ADT103	Adapters and fittings, 1/4NPT (1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs). More information shown on page 84.
ADT100-HTK-15K	Hose test kit, 5 feet flexible hose, 15,000 psi, 1/4NPT male to 1/4NPT (1/8NPT, 1/2NPT, 1/4BSP, 1/2BSP, or M20X1.5) female hand-tight quick connector.
9904-928	Carrying Case for one 928A pump and two pressure test gauges
ADT928A-MK	Maintenance kit for Additel 928A pump
ADT100-928-HK	Hose Kit, External Reservoir Expansion Hose Kit for ADT928A

Additel 946A
Hydraulic High Pressure Calibration Pump

Metrology Made Simple

- **Pressurize large-volume workload**
- Generate pressure to 15,000 psi (1,000 bar)
- Increase and decrease pressure smoothly
- Three pressure ports
- Hand-tight quick connectors

OVERVIEW

The new Additel 946A Hydraulic Pressure Test Pump is a benchtop pressure pump designed to generate pressure to 15,000 psi (1,000 bar). This pump incorporates a dual-piston system which is ideal for filling large volume workload with the hand pump and providing smooth increase and decrease of pressure with the high pressure, fine adjust screw press. The 946A test pump incorporates an isolation valve which isolates the calibration volume from the check valve associated with the hand pump. Because the check valve can often be a source of leaks and maintenance, the isolation valve provides more stable measurements and reduces potential maintenance of the pump. Three hand-tight quick connectors installed on the pump allow easy connecting and disconnecting to the test pump without the need for PTFE tape or wrenches. The Additel 946A is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers.

FEATURES

- **Hand pump to fill large volume systems**
- **Durable and Minimal Maintenance**
  Isolation valve provides stable pressures while reducing maintenance on the hand pump check valve.
- **Easy-to-use**
  15,000 psi (1,000 bar) can be generated easily with the dual-piston system.
- **Three hand-tight quick connectors**
  Allows easy connection and disconnection to the test pump without the need for PTFE tape or wrenches.

ORDERING INFORMATION

- **Model Number**

ADT946A — N • • SET

Model:
ADT946A
ADT946AW

Pressure port type:
N - 1/4NPT female
N2 - 1/2NPT female
B - 1/4BSP female
B2 - 1/2BSP female
M - M20X1.5 female

SET: Pump and carrying case included

- **Accessories included**
  Mineral oil,1 bottle (250 ml)*
  O-ring: 20 pcs
  Carrying case (946-X-SET models only)
  * When water media is not requested

SPECIFICATIONS

- **Media:** Mineral oil or deionized water. (Oil is default media liquid. Pump with water as media to be ordered as ADT946W. Pump stability is best when used with oil. Performance may decrease when used with water as the media.)
- **Reservoir capacity:** 25.6 in^3 (420 ml)
- **Generated Pressure Range**
  0 to 15,000 psi (1,000bar) gauge pressure
- **Material:** Ram/adapters: SS
  Body: SS, aluminum, Copper
  Seals: Buna-N
- **Connection**
  Hand-tight connectors for both test gauge and reference gauge(s)
  1/4NPT female, 1/2NPT female, 1/4BSP female, 1/2BSP female, or M20X1.5 female
- **Dimensions:** Height: 7.8" (200 mm)
  Base: 18.1" (460 mm) x 14.3" (365 mm)
- **Weight:** 26.5 lb (12 kg).
- **Piston volume:** Fine adjust piston: 0.152 in^3 (2.5 ml)
- **Volume Per Stroke:** 0.23 in^3 (3.72 ml)
- **Warranty:** 1 year

- **Optional Accessories**

Model number	*Description*
9201	Oil, Diethylhexyl Sebacate, 1 liter (1 quart)
9202	Oil, Mineral oil, 1 liter (1 quart)
ADT102	Adapters and fittings, 1/4HP male to various male and female connectors (25 pcs).
ADT103	Adapters and fittings, 1/4NPT (1/4BSP, or M20X1.5) male to various female hand-tight quick connectors (10 pcs).
ADT-HTK	Hose test kit, 5 feet flexible hose, 15,000 psi, 1/4NPT male to 1/4NPT (1/8NPT, 1/2NPT, 1/4BSP, or M20X1.5) female hand-tight quick connector.
ADT946A-MK	Maintenance kit for Additel 946 pump
ADT100-946-HK	Hose Kit, External Reservoir Expansion Hose Kit for ADT946A
9910	Carrying case for Additel 946A, Additel 959A or Additel 960

Additel 959A
Hydraulic Ultra-high Pressure Test Pump

Additel
Metrology Made Simple

- **Pressurize large-volume workload**
- Generate pressure to 40,000 psi (2,800 bar)
- Increase and decrease pressure smoothly
- Three pressure ports

OVERVIEW

The new Additel 959A Hydraulic Pressure Test Pump is a benchtop pressure pump designed to generate pressure to 40,000 psi (2,800 bar). This pump incorporates a dual-piston system which is ideal for filling large volume workload with the hand pump and providing smooth increase and decrease of pressure with the high pressure, fine adjust screw press. The 959A test pump incorporates an isolation valve which isolates the calibration volume from the check valve associated with the hand pump. Because the check valve can often be a source of leaks and maintenance, the isolation valve provides more stable measurements and reduces potential maintenance of the pump. The Additel 959A is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers.

FEATURES

- **Generate Ultra-high Pressure**
  Generate pressure up to 40,000 psi (2,800 bar)
- **Hand pump to fill large volume systems**
- **Durable and Minimal Maintenance**
  Isolation valve provides stable pressures while reducing maintenance on the hand pump check valve
- **Easy-to-use**
  40,000 psi (2,800 bar) can be generated easily with the dual-piston system

ORDERING INFORMATION

- **Model Number**

ADT959A — AF • • SET

ADT959A: Model

AF: **Pressure port type:**
AF-Autoclave F-250-C female
B2-1/2BSP female
X-Customize
M-M20X1.5 female

SET: **SET:** Pump and carrying case included

- **Accessories included**
  Diethylhexyl Sebacate: 1 bottle (250 ml)
  Carrying case (959-X-SET models only)

SPECIFICATIONS

- **Media:** Diethylhexyl Sebacate
- **Pressure Range**
  0 to 40,000 psi (2,800 bar) gauge pressure.
- **Material**
  Ram/adapters: SS
  Body: SS, aluminum, Copper
  Seals: Buna-N, PTFE, Copper Alloy, Aluminum Alloy
- **Reservoir capacity:** 25.6 in^3 (420 ml)
- **Connection**
  Test Gauge Connection: Autoclave F-250-C, 9/16" - 18 UNF female
  Reference Gauge Connection: Autoclave F-250-C, 9/16" - 18 UNF female
  1/2BSP female and M20X1.5 female connections are available upon request
- **Dimensions:** Height: 6.9" (175 mm)
  Base: 17.9" (455 mm) x 15.0" (380 mm)
- **Weight:** 28.7 lb (13 kg).
- **Volume Per Stroke:** 0.227 in^3 (3.72 ml)
- **Piston volume:** Fine adjust piston: 0.152 in^3 (2.5 ml)
- **Warranty:** 1 year

- **Optional Accessories**

Model number	*Description*
9201	Diethylhexyl Sebacate, 1 liter (1 quart)
ADT104	Adapters and fittings, 1/4HP male to various male and female connectors (17 pcs).
ADT959A-MK	Maintenance kit for Additel 959A pump
ADT100-959-HK	Hose Kit, External Reservoir Expansion Hose Kit for ADT959
9910	Carrying case for Additel 946A, Additel 959A or Additel 960

Additel 960
Hydraulic Ultra-high Pressure Test Pump

Metrology Made Simple

- **Pressurize large-volume workload**
- Generate pressure to 60,000 psi (4,200 bar)
- Increase and decrease pressure smoothly
- Two pressure ports

OVERVIEW

The new Additel 960 Hydraulic Pressure Test Pump is a benchtop pressure pump designed to generate pressure to 60,000 psi (4,200 bar). This pump incorporates a dual-piston system which is ideal for filling large volume workload with the hand pump and providing smooth increase and decrease of pressure with the high pressure, fine adjust screw press. The 960 test pump incorporates an isolation valve which isolates the calibration volume from the check valve associated with the hand pump. Because the check valve can often be a source of leaks and maintenance, the isolation valve provides more stable measurements and reduces potential maintenance of the pump. The Additel 960 is an ideal comparison test pump for calibrating pressure measuring instruments such as test gauges, indicators or transducers.

FEATURES

- **Generate Ultra-high Pressure**
  Generate pressure up to 60,000 psi (4,200 bar)
- **Hand pump to fill large volume systems**
- **Durable and Minimal Maintenance**
  Isolation valve provides stable pressures while reducing maintenance on the hand pump check valve
- **Easy-to-use**
  60,000 psi (4,200 bar) can be generated easily with the dual-piston system

SPECIFICATIONS

- **Media:** Diethylhexyl Sebacate
- **Pressure Range**
  0 to 60,000psi (4,200 bar) gauge pressure.
- **Material**
  Ram/adapters: SS
  Body: SS, aluminum, Copper
  Seals: Buna-N, PTFE, Copper Alloy, Aluminum Alloy
- **Reservoir capacity:** 420 ml (25.6 in^3)
- **Connection**
  Test Gauge Connection: Autoclave F-250-C female
  Reference Gauge Connection: Autoclave F-250-C female
- **Dimensions:** Height: 6.9" (175 mm)
  Base: 17.9" (455 mm) x 15.0" (380 mm)
- **Weight:** 33.1 lb (15 kg).
- **Volume Per Stroke:** 3.72 ml (0.227 in^3)
- **Piston volume:** Fine adjust piston: 2.5 ml (0.152 in^3)
- **Warranty:** 1 year

ORDERING INFORMATION

- **Model Number**

ADT960 – AF • • SET

- ADT960 → **Model**
- AF → **Pressure port type:** AF-Autoclave F-250-C female
- SET → **SET:** Pump and carrying case included

- **Accessories included**
  Diethylhexyl Sebacate: 1 bottle (250 ml)
  Carrying case (960-X-SET models only)

- **Optional Accessories**

Model number	*Description*
9201	Diethylhexyl Sebacate, 1 liter (1 quart)
ADT960-MK	Maintenance kit for Additel 960 pump
ADT100-960-HK	Hose Kit, External Reservoir Expansion Hose Kit for ADT960
9910	Carrying case for Additel 946A, Additel 959A or Additel 960

Pressure Manifolds

Additel ADT121 & ADT123 Series

Additel
Metrology Made Simple

The Additel 121 and 123 series pressure manifolds are designed for expanding pressure test ports during pressure calibration. The Additel 121 pressure manifold is used for pneumatic pressure calibration up to 3,600 psi (250 bar), while the Additel 123 manifolds is compatible to hydraulic pressure applications up to 15,000 psi (1,000 bar). A filter is built-in with the 121 pneumatic pressure manifold to prevent contamination introduced by devices under test. There are four hand-tight quick connectors pre-installed on each manifold. Additel 121 and 123 series pressure manifolds allow you to connect without the use of wrenches or Teflon tape which increases your productivity when using calibration pumps, pressure controllers, dead weight testers, or piston gauges.

121 Series Pressure Manifolds

Pneumatic, -15 psi to 3,600 psi (-1 to 250 bar)

Model	Description
ADT121-N	1/4NPT male hose to four 1/4NPT female hand-tight quick connectors
ADT121-N2	1/2NPT male hose to four 1/2NPT female hand-tight quick connectors
ADT121-M	M20×1.5 male hose to four M20×1.5 female hand-tight quick connectors
ADT121-B	1/4BSP male hose to four 1/4BSP female hand-tight quick connectors
ADT121-B2	1/2BSP male hose to four 1/2BSP female hand-tight quick connectors

123 Series Pressure Manifolds

Hydraulic, -15 to 15,000 psi (-1 to 1,000 bar)

Model	Description
ADT123-N	1/4NPT male hose to four 1/4NPT female hand-tight quick connectors
ADT123-N2	1/2NPT male hose to four 1/2NPT female hand-tight quick connectors
ADT123-M	M20×1.5 male hose to four M20×1.5 female hand-tight quick connectors
ADT123-B	1/4BSP male hose to four 1/4BSP female hand-tight quick connectors
ADT123-B2	1/2BSP male hose to four 1/2BSP female hand-tight quick connectors

Note:
1)A test hose is included with Additel 121 and 123 series pressure manifold.
2)The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

Filters

Additel 100 Series Filters

ADT100-FLT-1K

1000 psi (70 bar) Pneumatic Filter Specifications

Pressure range	-15 to 1000 psi (-1.0 to 70 bar)
Filtering resolution	0.04 mm
Operation temperature	-10°C to 50°C
Safety pressure	<1200 psi (83bar)
Size	1.18 dia x 5 in (30 dia x 127 mm) (size will vary based on adapters)
Outlet/Inlet port	See ordering information
Storage temperature	-20°C to 70°C
Material	304 SS

ADT100-FLT-10K

10,000 psi (700 bar) Hydraulic Filter Specifications

Pressure range	-15 to 10,000 psi (-1.0 to 700 bar)
Filtering resolution	0.07 mm
Operation temperature	-10°C to 50°C
Safety pressure	<12,000 psi (827 bar)
Size	0.87 x 0.98 x 4 in (22 x 25 x 100 mm) (size will vary based on adapters)
Outlet/Inlet port	Comes with removable male and removable female adapter
Storage temperature	-20°C to 70°C
Material	304 SS

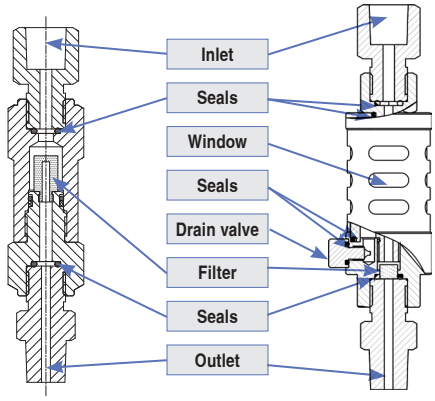
Note: The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

ORDERING INFORMATION

ADT100 – FLT – 1K – N

Range:
1K - 1,000 psi (70 bar)
10K-10,000 psi (700 bar)

Port type:
N-1/4NPT male and 1/4NPT female
N2-1/2NPT male and 1/2NPT female
B-1/4BSP male and 1/4BSP female
B2-1/2BSP male and 1/2BSP female
M-M20x1.5 male and M20x1.5 female



ADT100-FLT-10K ADT100-FLT-1K

Pressure Adapters and Fittings

Additel 102 (Designed for all pumps except Additel 949 pump)

Additel 102

ADT102

1/4NPT male to various connectors as follows (25 pcs, case included)

**1/2NPT male, 1/4BSP male, 1/2BSP male, M20X1.5 male are available per request.*

Model	Description	Max Pressure	Picture
ADT100-NPTM4-BSPM8	Adapter, 1/4NPT male to 1/8BSP male	15,000 psi	
ADT100-NPTM4-BSPM4	Adapter, 1/4NPT male to 1/4BSP male	15,000 psi	
ADT100-NPTM4-BSPM2	Adapter, 1/4NPT male to 1/2BSP male	15,000 psi	
ADT100-NPTM4-BSPM3	Adapter, 1/4NPT male to 3/8BSP male	15,000 psi	
ADT100-NPTM4-M10M	Adapter, 1/4NPT male to M10X1.0 male	15,000 psi	
ADT100-NPTM4-M14M	Adapter, 1/4NPT male to M14X1.5 male	15,000 psi	
ADT100-NPTM4-M20M	Adapter, 1/4NPT male to M20X1.5 male	15,000 psi	
ADT100-NPTM4-NPTM8	Adapter, 1/4NPT male to 1/8NPT male	15,000 psi	
ADT100-NPTM4-NPTM4	Adapter, 1/4NPT male to 1/4NPT male	15,000 psi	
ADT100-NPTM4-NPTM2	Adapter, 1/4NPT male to 1/2NPT male	15,000 psi	
ADT100-NPTM4-NPTM3	Adapter, 1/4NPT male to 3/8NPT male	15,000 psi	
ADT100-NPTM4-BSPF8	Adapter, 1/4NPT male to 1/8BSP female	15,000 psi	
ADT100-NPTM4-BSPF4	Adapter, 1/4NPT male to 1/4BSP female	15,000 psi	
ADT100-NPTM4-BSPF2	Adapter, 1/4NPT male to 1/2BSP female	15,000 psi	
ADT100-NPTM4-BSPF3	Adapter, 1/4NPT male to 3/8BSP female	15,000 psi	
ADT100-NPTM4-M10F	Adapter, 1/4NPT male to M10X1.0 female	15,000 psi	
ADT100-NPTM4-M14F	Adapter, 1/4NPT male to M14X1.5 female	15,000 psi	
ADT100-NPTM4-M20F	Adapter, 1/4NPT male to M20X1.5 female	15,000 psi	
ADT100-NPTM4-NPTF8	Adapter, 1/4NPT male to 1/8NPT female	15,000 psi	
ADT100-NPTM4-NPTF4	Adapter, 1/4NPT male to 1/4NPT female	15,000 psi	
ADT100-NPTM4-NPTF2	Adapter, 1/4NPT male to 1/2NPT female	15,000 psi	
ADT100-NPTM4-NPTF3	Adapter, 1/4NPT male to 3/8NPT female	15,000 psi	
ADT100-HTK-15K-NPTM4-NPTF4Q	Hose Test Kit, 5 feet flexible hose, 15,000 psi, 1/4NPT male to 1/4NPT female hand tight quick connector	15,000 psi	
ADT100-NPTM4-NPTF4RQ	Adapter, 1/4NPT male to right angle 1/4NPT female hand-tight quick connector	15,000 psi	
ADT100-NPTM4-BARB	Adapter, 1/4NPT male to hose barb	150 psi	

Note: The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

Don't need the entire kit? Order individual adapters with the above part numbers.

Pressure Adapters and Fittings

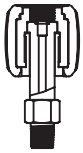
Additel 103 Series (Designed for all pumps except Additel 949 pump)

Additel
Metrology Made Simple

ADT103-NPT (Hand-tight quick connectors)

1/4NPT male to various hand-tight quick connectors (10pcs, case included)

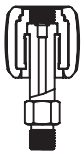
Additel 103-NPT

Model	Description	Max Pressure	Picture
ADT100-NPTM4-NPTF8Q	Adapters, 1/4NPT male to 1/8NPT female	15,000 psi	
ADT100-NPTM4-NPTF4Q	Adapters, 1/4NPT male to 1/4NPT female	15,000 psi	
ADT100-NPTM4-NPTF2Q	Adapters, 1/4NPT male to 1/2NPT female	15,000 psi	
ADT100-NPTM4-BSPF8Q	Adapters, 1/4NPT male to 1/8BSP female	15,000 psi	
ADT100-NPTM4-BSPF4Q	Adapters, 1/4NPT male to 1/4BSP female	15,000 psi	
ADT100-NPTM4-BSPF3Q	Adapters, 1/4NPT male to 3/8BSP female	15,000 psi	
ADT100-NPTM4-BSPF2Q	Adapters, 1/4NPT male to 1/2BSP female	15,000 psi	
ADT100-NPTM4-M10FQ	Adapters, 1/4NPT male to M10×1.0 female	15,000 psi	
ADT100-NPTM4-M14FQ	Adapters, 1/4NPT male to M14×1.5 female	15,000 psi	
ADT100-NPTM4-M20FQ	Adapters, 1/4NPT male to M20×1.5 female	15,000 psi	

ADT103-BSP (Hand-tight quick connectors)

1/4BSP male to various hand-tight quick connectors (10 pcs, case included)

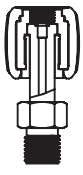
Additel 103-BSP

Model	Description	Max Pressure	Picture
ADT100-BSPM4-NPTF8Q	Adapter, 1/4BSP male to 1/8NPT female	15,000 psi	
ADT100-BSPM4-NPTF4Q	Adapter, 1/4BSP male to 1/4NPT female	15,000 psi	
ADT100-BSPM4-NPTF2Q	Adapter, 1/4BSP male to 1/2NPT female	15,000 psi	
ADT100-BSPM4-BSPF8Q	Adapters, 1/4BSP male to 1/8BSP female	15,000 psi	
ADT100-BSPM4-BSPF4Q	Adapters, 1/4BSP male to 1/4BSP female	15,000 psi	
ADT100-BSPM4-BSPF3Q	Adapters, 1/4BSP male to 3/8BSP female	15,000 psi	
ADT100-BSPM4-BSPF2Q	Adapters, 1/4BSP male to 1/2BSP female	15,000 psi	
ADT100-BSPM4-M10FQ	Adapters, 1/4BSP male to M10×1.0 female	15,000 psi	
ADT100-BSPM4-M14FQ	Adapters, 1/4BSP male to M14×1.5 female	15,000 psi	
ADT100-BSPM4-M20FQ	Adapters, 1/4BSP male to M20×1.5 female	15,000 psi	

ADT103-M20 (Hand-tight quick connectors)

M20×1.5 Male to various hand-tight quick connectors (10pcs, case included)

Additel 103-M20

Model	Description	Max Pressure	Picture
ADT100-M20M-NPTF8Q	Adapters, M20×1.5 Male to 1/8NPT female	15,000 psi	
ADT100-M20M-NPTF4Q	Adapters, M20×1.5 Male to 1/4NPT female	15,000 psi	
ADT100-M20M-NPTF2Q	Adapters, M20×1.5 Male to 1/2NPT female	15,000 psi	
ADT100-M20M-BSPF8Q	Adapters, M20×1.5 Male to 1/8BSP female	15,000 psi	
ADT100-M20M-BSPF4Q	Adapters, M20×1.5 Male to 1/4BSP female	15,000 psi	
ADT100-M20M-BSPF3Q	Adapters, M20×1.5 Male to 3/8BSP female	15,000 psi	
ADT100-M20M-BSPF2Q	Adapters, M20×1.5 Male to 1/2BSP female	15,000 psi	
ADT100-M20M-M10FQ	Adapters, M20×1.5 Male to M10×1.0 female	15,000 psi	
ADT100-M20M-M14FQ	Adapters, M20×1.5 Male to M14×1.5 female	15,000 psi	
ADT100-M20M-M20FQ	Adapters, M20×1.5 Male to M20×1.5 female	15,000 psi	

Don't need the entire kit? Order individual adapters with the above part numbers.

Pressure Adapters and Fittings

Metrology Made Simple

Additel 104

ADT104-HP

1/4HP male (Autoclave M-250-C) to various connectors as follows (17pcs, case included);
(Designed for Additel 949 and Additel 959 pumps)

Model	Description	Max Pressure	Picture
ADT100-HPM-M14F	Adapter, 1/4HP male to M14X1.5 female	15,000 psi	
ADT100-HPM-M20F	Adapter, 1/4HP male to M20X1.5 female	15,000 psi	
ADT100-HPM-BSPF4	Adapter, 1/4HP male to 1/4BSP female	15,000 psi	
ADT100-HPM-BSPF3	Adapter, 1/4HP male to 3/8BSP female	15,000 psi	
ADT100-HPM-BSPF2	Adapter, 1/4HP male to 1/2BSP female	15,000 psi	
ADT100-HPM-NPTF4	Adapter, 1/4HP male to 1/4NPT female	15,000 psi	
ADT100-HPM-NPTF2	Adapter, 1/4HP male to 1/2NPT female	15,000 psi	
ADT100-HPM-M14M	Adapter, 1/4HP male to M14X1.5 male	40,000 psi	
ADT100-HPM-M20M	Adapter, 1/4HP male to M20X1.5 male	40,000 psi	
ADT100-HPM-BSPM4	Adapter, 1/4HP male to 1/4BSP male	15,000 psi	
ADT100-HPM-BSPM3	Adapter, 1/4HP male to 3/8BSP male	40,000 psi	
ADT100-HPM-BSPM2	Adapter, 1/4HP male to 1/2BSP male	40,000 psi	
ADT100-HPM-NPTM4	Adapter, 1/4HP male to 1/4NPT male	15,000 psi	
ADT100-HPM-NPTM2	Adapter, 1/4HP male to 1/2NPT male	15,000 psi	
ADT100-HPM-HPM	Adapter, 1/4HP male to 1/4HP male (3 pcs)	60,000 psi	

Additel 104

Additel Hose Test Kits

Additel 100-HTK Series

- Hand-tight quick connectors
- Conveniently extend pressure calibrations
- 5 ft hose length

OVERVIEW

The Additel 100 series High Pressure Hose Test Kits are designed to extend your pressure calibrations to a convenient location to adapt from one pressure connection to another. Each test kit has 5 feet of flexible hose rated to 8,000 psi (550 bar) or 15,000 psi (1,000 bar) which connects a male NPT, BSP, or Metric connector to a variety of female quick connectors. Additel's specially designed quick connectors allow for hand-tight connection without the need for wrenches or Teflon tape. The Additel 100 series Hose Test Kits are a great accessory to any pressure pump or controller.

ADT100-HTK-8K

- **Maximum pressure: 8,000 psi (550 bar)**
- **Hose length: 5 ft (1.5 m)**
- **Burst pressure: 15,900 psi**
- **Internal hose material: Polyamide**

ADT100-HTK-15K

- **Maximum pressure: 15,000 psi (1,000 bar)**
- **Hose length: 5 ft (1.5 m)**
- **Burst pressure: 43,500 psi**
- **Internal hose material: Polyoxymethylene**

The estimated End of Life (EOL) expectancy for all accessory hoses and filters (pneumatic and hydraulic) is approximately 10 years and should be replaced at the first sign of wear or damage.

ORDERING INFORMATION

- **Model Number**

ADT100 – HTK – 8K – NPTM4 – NPTF4Q

Pressure Range:
8K - 8,000 psi (550 bar)
15K - 15,000 psi (1,000 bar)

Pressure Port Type:
NPTM4 - 1/4NPT male
NPTM2 - 1/2NPT male
BSPM4 - 1/4BSP male
BSPM2 - 1/2BSP male
M20M - M20x1.5 male

Pressure Port Type:
NPTF2Q - 1/2NPT female quick connect
NPTF3Q - 3/8NPT female quick connect
NPTF4Q - 1/4NPT female quick connect
NPTF8Q - 1/8NPT female quick connect
BSPF2Q - 1/2BSP female quick connect
BSPF3Q - 3/8BSP female quick connect
BSPF4Q - 1/4BSP female quick connect
BSPF8Q - 1/8BSP female quick connect
M20FQ - M20x1.5 female quick connect

Additel 286
Multifunction Reference Thermometer Readout

- Measure and calibrate SPRTs, RTDs, thermistors and thermocouples
- 1 PPM resistance ratio accuracy (channel 1)
- 8 1/2-digit DC multimeter
- Measure up to 82 channels
- Sample rates up to 10 channels per second
- Bluetooth, WIFI, USB& Ethernet (RJ-45) capable
- Auto temperature control of Additel and other manufacture's heat sources
- Built-in automatic temperature control, data collection, and coefficient generation
- Support for creating custom control of heat sources with RS-232
- Auto - zero power feature (self heating compensation)
- 10.1 in. touch screen display
- Supports fully automated temperature calibrations with data collection and report generation (no software required)

OVERVIEW

The Additel 286 Multifunction Reference Thermometer Readout is an industry first! We have combined the capabilities of a high-end reference thermometer with a highly capable data acquisition system and 8.5 digit multimeter. The ADT286 is capable of scanning and recording up to 82 channels at 10 channels per second. Users can easily configure the ADT286 to perform field calibrations and uniformity studies as well as use the unit in the lab as a precision thermometer and 8.5 digit multimeter. Get more for less with this newest game changer from Additel!

ADT286 Multifunction Reference Thermometer Readout Scanner Modules

If you're in need of a precision reference thermometer for your laboratory, then look no further than the Additel 286. The base unit comes with two precision readout channels that can be used to measure your SPRT. Need to calibrate RTDs, PRTs, thermistors or thermocouples? Add a scanner module and you now have the ability to measure 10 RTDs, PRTs, or thermistors and 20 thermocouples. Expand up to 82 channels with our unique easy to use scanner modules. Each 20 channel module is outfitted with our proprietary universal terminals with an industries best cold junction capability second to none. Utilize the module docked atop the ADT286, or connect remotely with cables to suit nearly any unique setup/configuration. Additel also has a process module specifically designed to measure process instrumentation like transmitters and switches. This scanner will also supply loop power for the transmitters.

Designed to make your job easier, the ADT286 has a large sensor library supporting 15 TC types, both standard and special limits, 18 different thermal resistors, CVD, ITS-90, and a large variety of standard curves for RTDs and thermistors. The ADT286 is loaded with special applications such as probe calibration, SPRT calibration, chamber mapping and more. And we continue to add applications on a regular basis!

Automatic Temperature Control and Probe Calibration

The Additel 286 Multifunction Reference Thermometer Readout has preinstalled drivers to control Additel and other manufacturer's heat sources. Simply connect to one or more heat sources via a communication cable, Ethernet or wireless and now it will automatically control to the set point and desired stability. If your heat source is not on the list, you can easily add the driver yourself so you can run automated calibrations with any heat source.

Now combine the heat source control feature with our probe calibration application and you have a very powerful automatic calibration solution. The probe calibration app allows you to automatically setup and run calibration routines with multiple set points and multiple heat sources, collect data, and develop calibration coefficients — all with one device and without the need of software! Simply place a batch of sensors of any mix and type into your heat source, connect it to the ADT286, run the probe calibration app and come back to a completed test. All that is left to do is generate and export all the calibration data. There's no need to work with complicated software for communication, set up or coefficient generation. There is no reason to have a calibration technician manually monitor the process and record the data. This Multifunction Reference Thermometer Readout will do all the work for you.

ADT280-RS Resistance Standards

Available in 25 & 100 Ohm values, users can enjoy improved resistance ratio performance by easily plugging one of our reference resisters into channel 2 on the new ADT286. Perfect for calibrating your SPRT's and high end PRT's. Each ADT280-RS resistor comes with adaptive binding posts to help facilitate utilization of the resistor in other applications as needed.

FEATURES

Additel
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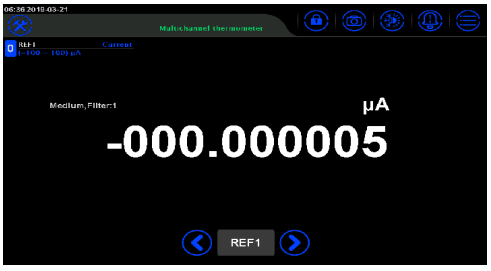
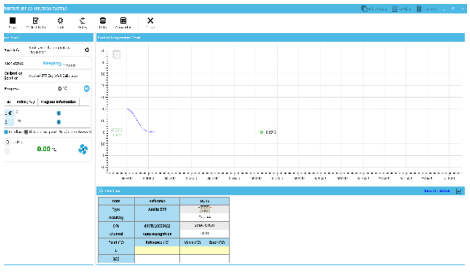
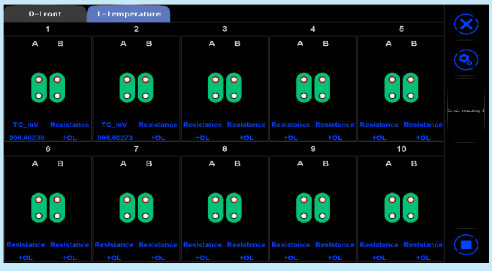
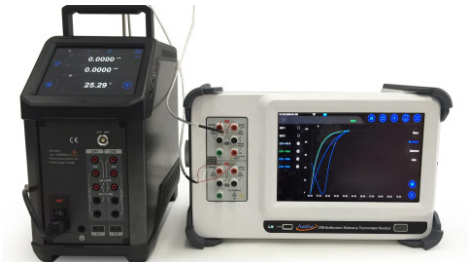
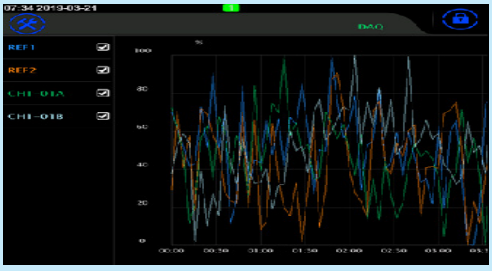
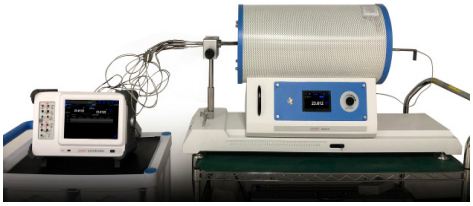
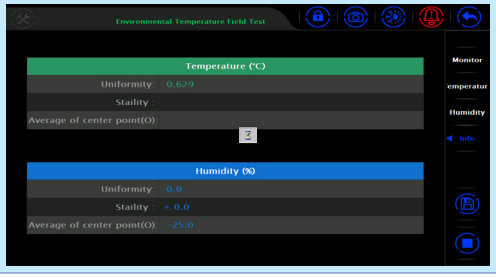
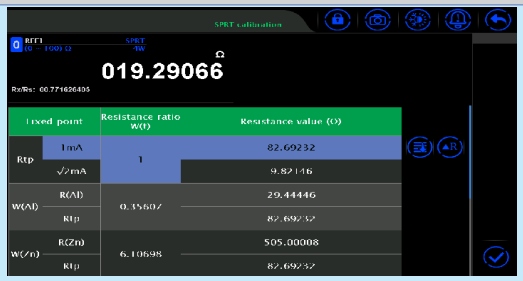
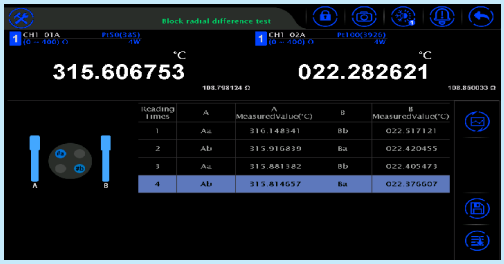
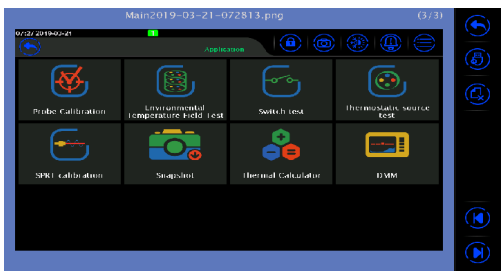
Specification	Display	Application
Multi-Channel		
Smart Connection		
DAQ Mode		
Temperature Mapping Mode		
Probe Calibration		
Environmental Temperature Field Test		

APPLICATIONS

Specification	Display	Application
SPRT Mode		
Switch Testing		
Thermostatic Source Test		
DMM		
Heat Source Control		
Snapshot		

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SPECIFICATIONS

General Specifications

Specification	Description
Voltage	100V Setting 90V to 110V 120V Setting 108V to 132V 220V Setting 198V to 242V 240V Setting 216V to 264V
Frequency	47Hz to 440Hz.Automatically sensed at power-on
Power Consumption	40VA peak (30Watt average)
Temperature	Operating : 0°C to 50°C Full accuracy :18°C to 28°C Storage : -20°C to 70°C
Warm-up	60 mins for full uncertainty specifications
Relative Humidity (non-condensing)	Operating : 0°C to 28°C < 90% 28°C to 40°C < 75% 40°C to 50°C < 50% Storage : -20°C to 70°C < 95%
Altitude	Operating : 2000 m Storage : 12000 m
Vibration and Shock	Complies with MIL-28800F Class 3
Input Protection	50V all functions, ranges and terminals
Communication	USB-A , USB-B , RJ45 , WiFi , Bluetooth
Memory	10G - All data stored with time stamps
Localization	English , Chinese
Display	10.1 in (256 mm) TFT color display
Size (H x W x D)	9.8 in (250 mm) x 16.5 in (420 mm) x 7.9 in (200 mm)
Weight	18.5 lb (8.39 kg)
Other Conformities	CE
Warranty	1 Year

Measurement Specifications

Specification Conditions: 60 mins Warm-Up Time / Environment Temperature (18 - 28) °C.
The following specifications apply for front panel, after at least 60 minutes warm-up.
24-hour specifications are relative to calibration standards and assume a controlled electromagnetic environment per EN 61326.

Resistance Ratio Accuracy (Rx/Rs) using External Rs

Range	Reference Resistance	Ratio (Rx/Rs)	1 Year (23 ± 5) °C ppm of Reading
100 Ω	25 Ω	2.00-4.00	1.5
		1.10-2.00	0.85
		0.90-1.10	0.6
		0.50-0.90	1.5
		0.25-0.50	2.5
400 Ω	100 Ω	2.00-4.00	2
		1.10-2.00	0.81
		0.90-1.10	0.26
		0.50-0.90	0.95
		0.25-0.50	1.2

SPRT/PRT Measurement Accuracy using External Rs

SPRT/PRT Type	External Reference Resistance	Temperature (°C)	Resistance Ratio (Rx/Rs)	1 Year(23 ± 5) °C ppm of reading	Equivalent to Temperature (mK)
PT25	25 Ω	-189.3442	0.22	2.5	0.13
		-38.8344	0.84	1.5	0.32
		0.01	1	0.6	0.15
		231.928	1.89	0.85	0.44
		419.527	2.57	1.5	1.11
		660.323	3.37	1.5	1.58
PT100	100 Ω	-189.3442	0.22	1.2	0.07
		-38.8344	0.84	0.95	0.20
		0.01	1	0.26	0.07
		231.928	1.89	0.81	0.42
		419.527	2.57	2	1.47
		660.323	3.37	2	2.11

[1] The PT25 indicator is based on a nominal resistance of 25 Ω for Rx.
[2] The PT100 indicator is based on a nominal resistance of 100 Ω for Rx.
[3] The uncertainty of external Rs is not included. The user may choose the ADT280-RS-25/100 standard resistor as external Rs, which has an accuracy of 5 ppm at (23±2) °C.

Resistance Accuracy using Internal Rs

Measurement Range	Scanning Speed	Resolution	24 Hour (23 ±1) °C	90 Days (23 ± 5) °C	1 year (23 ± 5) °C	Excitation Current	Temperature Coefficient
(0~100) Ω	Slow Speed	0.01 mΩ	3 ppm or 0.2 mΩ	12 ppm or 0.35 mΩ	15 ppm or 0.35 mΩ	±1 mA/±12 V	3 ppm + 0.01 mΩ
	Medium Speed	0.01 mΩ	3 ppm or 0.55 mΩ	12 ppm or 0.7 mΩ	15 ppm or 0.7 mΩ		
	Fast Speed	0.1 mΩ	3.6 ppm or 1.7 mΩ	12.6 ppm or 1.85 mΩ	15.6 ppm or 1.85 mΩ		
(0~400) Ω	Slow Speed	0.01 mΩ	3 ppm or 0.3 mΩ	12 ppm or 0.4 mΩ	15 ppm or 0.4 mΩ	±1 mA/±12 V	3 ppm + 0.02 mΩ
	Medium Speed	0.01 mΩ	3 ppm or 0.7 mΩ	12 ppm or 0.8 mΩ	15 ppm or 0.8 mΩ		
	Fast Speed	0.1 mΩ	3.6 ppm or 1.9 mΩ	12.6 ppm or 2 mΩ	15.6 ppm or 2 mΩ		
(0~4000) Ω	Slow Speed	0.1 mΩ	3 ppm or 4 mΩ	12 ppm or 5 mΩ	15 ppm or 5 mΩ	±0.1 mA/±12 V	3 ppm + 0.2 mΩ
	Medium Speed	0.1 mΩ	3 ppm or 8 mΩ	12 ppm or 9 mΩ	15 ppm or 9 mΩ		
	Fast Speed	1 mΩ	3.6 ppm or 20 mΩ	12.6 ppm or 21 mΩ	15.6 ppm or 21 mΩ		

[1] Accuracy Index: ± (ppm of reading or xxmΩ , whichever is greater).
[2] Temperature coefficient index: exceeds (18-28) °C range, increase per degree (ppm reading +xxmΩ).
[3] Specifications are for 4-wire function. For 3-wire, add 0.005 Ω for internal resistance mismatch. For 2-wire, add 0.005 Ω for internal resistance
[4] Automatic current reversal.

PRT Measurement Accuracy using Internal Rs

Scanning Speed	Temperature	24 Hour / °C (23 ±1) °C	90 Days / °C (23 ± 5) °C	1 year / °C (23 ± 5) °C	Temperature Coefficient °C/°C
Slow Speed	-200 °C	0.0005	0.0008	0.0008	0.0002
	0 °C	0.0008	0.0031	0.0038	0.0008
	300 °C	0.0018	0.0089	0.0089	0.0018
	600 °C	0.0029	0.0146	0.0146	0.0030
Medium Speed	-200 °C	0.0013	0.0016	0.0016	0.0002
	0 °C	0.0014	0.0031	0.0038	0.0008
	300 °C	0.0020	0.0089	0.0089	0.0018
	600 °C	0.0029	0.0146	0.0146	0.0030
Fast Speed	-200 °C	0.0039	0.0043	0.0043	0.0006
	0 °C	0.0044	0.0047	0.0047	0.0013
	300 °C	0.0053	0.0093	0.0093	0.0024
	600 °C	0.0059	0.0152	0.0152	0.0036

[1] The indicator is based on the electrical accuracy of the 4-wire PT100 PRT and does not include the accuracy of the PRT itself.
[2] Temperature maximum Resolution is 0.0001 °C.

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Thermocouple Voltage Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Input Resistance	Temperature Coefficient
(-100-100) mV	Slow Speed	0.01 μV	5 ppm + 2 ppm	10 ppm + 4 ppm	14 ppm + 4 ppm	10 MΩ or >10 GΩ	1 ppm + 0.1 μV
	Medium Speed	0.01 μV	5 ppm + 6 ppm	10 ppm + 8 ppm	14 ppm + 8 ppm		
	Fast Speed	0.1 μV	5 ppm + 22 ppm	10 ppm + 24 ppm	14 ppm + 24 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature coefficient index: Exceed the range of (18-28) °C, increase (ppm of reading + xxμV)/ °C.

Thermocouple Cold Junction Accuracy

CJC Accuracy	±0.1 °C , 1 year, 23 °C ± 5°C
Environmental Coefficient	Beyond (18 ~ 28) °C, add 0.02 °C / °C
Other	Each signal scanner has 10 cold Junction temperature sensors

Thermocouple Temperature Accuracy

Type	Temperature	24 Hour/°C (23 ±1) °C			90 days/°C (23 ± 5) °C			1 year /°C (23 ±5) °C		
		Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed
E	-200	0.089	0.038	0.022	0.099	0.047	0.031	0.100	0.049	0.033
	-100	0.049	0.021	0.012	0.054	0.026	0.017	0.055	0.026	0.017
	-40	0.041	0.017	0.009	0.045	0.021	0.013	0.045	0.021	0.014
	0	0.038	0.015	0.009	0.041	0.019	0.012	0.041	0.019	0.012
	155	0.031	0.013	0.008	0.035	0.017	0.011	0.036	0.017	0.012
	350	0.029	0.013	0.008	0.033	0.017	0.012	0.035	0.018	0.013
	660	0.031	0.014	0.009	0.036	0.020	0.015	0.039	0.022	0.017
	1000	0.034	0.017	0.012	0.042	0.025	0.019	0.046	0.029	0.024
J	-200	0.102	0.043	0.025	0.113	0.054	0.036	0.115	0.055	0.037
	-100	0.054	0.022	0.013	0.060	0.028	0.018	0.060	0.028	0.019
	-40	0.047	0.019	0.011	0.051	0.024	0.015	0.051	0.024	0.015
	0	0.044	0.018	0.010	0.048	0.022	0.014	0.048	0.022	0.014
	155	0.041	0.017	0.010	0.045	0.021	0.014	0.046	0.022	0.015
	350	0.042	0.018	0.011	0.047	0.023	0.016	0.048	0.025	0.018
	660	0.039	0.018	0.011	0.046	0.024	0.018	0.048	0.027	0.020
	1200	0.044	0.022	0.015	0.054	0.031	0.024	0.059	0.036	0.029
K	-200	0.146	0.061	0.035	0.161	0.076	0.050	0.163	0.077	0.051
	-100	0.073	0.030	0.017	0.080	0.037	0.024	0.080	0.038	0.025
	-40	0.060	0.025	0.014	0.066	0.030	0.020	0.066	0.031	0.020
	0	0.056	0.023	0.013	0.061	0.028	0.018	0.061	0.028	0.018
	155	0.056	0.023	0.013	0.061	0.029	0.019	0.062	0.030	0.020
	350	0.054	0.023	0.014	0.061	0.030	0.020	0.062	0.031	0.021
	660	0.055	0.025	0.015	0.063	0.033	0.023	0.066	0.035	0.026
	1372	0.073	0.035	0.023	0.087	0.049	0.037	0.093	0.055	0.043

Thermocouple Temperature Accuracy

Type	Temperature	*24 Hour/* °C *(23 ±1)* °C			*90 days/* °C *(23 ± 5)* °C			*1 year /* °C *(23 ±5)* °C		
		Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed
T	-200	0.142	0.059	0.034	0.156	0.073	0.048	0.157	0.075	0.049
	-100	0.078	0.032	0.018	0.086	0.040	0.026	0.086	0.040	0.026
	-40	0.063	0.026	0.015	0.069	0.032	0.020	0.069	0.032	0.021
	0	0.057	0.023	0.013	0.062	0.028	0.018	0.062	0.028	0.018
	155	0.044	0.019	0.011	0.049	0.023	0.015	0.049	0.024	0.016
	350	0.038	0.016	0.010	0.043	0.021	0.015	0.044	0.022	0.016
	400	0.037	0.016	0.010	0.042	0.021	0.015	0.044	0.023	0.016
R	-40	0.543	0.222	0.124	0.593	0.272	0.173	0.593	0.272	0.173
	0	0.416	0.170	0.095	0.454	0.208	0.132	0.454	0.208	0.132
	155	0.266	0.109	0.061	0.290	0.134	0.086	0.291	0.134	0.086
	350	0.220	0.091	0.051	0.241	0.112	0.072	0.242	0.113	0.073
	660	0.192	0.080	0.046	0.212	0.100	0.066	0.214	0.102	0.068
	1768	0.188	0.082	0.049	0.213	0.107	0.074	0.219	0.114	0.081
S	-40	0.515	0.211	0.117	0.562	0.258	0.164	0.562	0.258	0.164
	0	0.407	0.167	0.093	0.444	0.204	0.130	0.444	0.204	0.130
	155	0.275	0.113	0.063	0.300	0.138	0.089	0.301	0.139	0.089
	350	0.236	0.098	0.055	0.259	0.120	0.078	0.260	0.122	0.079
	660	0.214	0.089	0.051	0.236	0.111	0.073	0.239	0.114	0.075
	1768	0.222	0.096	0.057	0.250	0.124	0.086	0.257	0.132	0.093
B	250	0.872	0.357	0.199	0.952	0.437	0.278	0.952	0.437	0.279
	350	0.619	0.254	0.141	0.676	0.311	0.198	0.676	0.311	0.199
	660	0.342	0.141	0.079	0.374	0.173	0.111	0.375	0.175	0.113
	1820	0.199	0.085	0.050	0.222	0.108	0.073	0.227	0.113	0.078
N	-200	0.224	0.093	0.052	0.246	0.115	0.075	0.247	0.116	0.076
	-100	0.106	0.044	0.024	0.116	0.054	0.035	0.116	0.054	0.035
	-40	0.089	0.036	0.020	0.097	0.045	0.029	0.097	0.045	0.029
	0	0.084	0.035	0.019	0.092	0.042	0.027	0.092	0.042	0.027
	155	0.070	0.029	0.017	0.077	0.036	0.024	0.078	0.037	0.024
	350	0.062	0.026	0.015	0.069	0.033	0.022	0.070	0.035	0.024
	660	0.059	0.026	0.016	0.067	0.034	0.024	0.069	0.036	0.026
	800	0.060	0.027	0.016	0.068	0.035	0.025	0.071	0.038	0.028
	1000	0.062	0.028	0.018	0.072	0.038	0.028	0.075	0.042	0.031
	1200	0.065	0.030	0.019	0.076	0.041	0.031	0.081	0.046	0.035
	1300	0.068	0.032	0.020	0.080	0.044	0.033	0.085	0.049	0.038
L	-200	0.069	0.029	0.017	0.076	0.036	0.024	0.077	0.037	0.025
	-100	0.053	0.022	0.013	0.059	0.028	0.018	0.059	0.028	0.018
	-40	0.045	0.019	0.010	0.049	0.023	0.015	0.050	0.023	0.015
	0	0.043	0.018	0.010	0.047	0.021	0.014	0.047	0.021	0.014
	155	0.040	0.017	0.010	0.044	0.021	0.014	0.045	0.022	0.015
	350	0.041	0.018	0.011	0.046	0.023	0.016	0.047	0.024	0.017
	660	0.039	0.018	0.011	0.046	0.024	0.018	0.048	0.027	0.020
	900	0.035	0.017	0.011	0.042	0.023	0.017	0.045	0.026	0.021
U	-80	0.072	0.030	0.017	0.079	0.037	0.024	0.079	0.037	0.024
	-40	0.062	0.026	0.014	0.068	0.031	0.020	0.068	0.032	0.020
	0	0.056	0.023	0.013	0.061	0.028	0.018	0.061	0.028	0.018
	155	0.045	0.019	0.011	0.049	0.023	0.015	0.050	0.024	0.016
	350	0.037	0.016	0.010	0.042	0.021	0.014	0.043	0.022	0.016
	600	0.034	0.015	0.010	0.039	0.021	0.015	0.041	0.023	0.017

[1] The index is based on the accuracy of the thermocouple electrical measurement of temperature scanner module, does not include the accuracy of the thermocouple itself and the fixed cold junction compensation at 0 °C.
[2] The highest temperature resolution is 0.0001 °C.

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Thermistor Accuracy

Measurement Range	Scanning Speed	Resolution	24 Hour (23 ±1) °C	90 Days (23 ± 5) °C	1 year (23 ± 5) °C	Excitation Current	Temperature Coefficient
(0~12) kΩ	Slow Speed	1 mΩ	10 ppm or 60 mΩ	30 ppm or 80 mΩ	40 ppm or 80 mΩ	10 μA	5 ppm + 10 mΩ
	Medium Speed	1 mΩ	10 ppm or 110 mΩ	30 ppm or 130 mΩ	40 ppm or 130 mΩ		
	Fast Speed	10 mΩ	10 ppm or 210 mΩ	30 ppm or 230 mΩ	40 ppm or 230 mΩ		
(10~120) kΩ	Slow Speed	10 mΩ	10 ppm	30 ppm	40 ppm	10 μA	5 ppm + 20 mΩ
	Medium Speed	10 mΩ	10 ppm + 80 mΩ	30 ppm + 80 mΩ	40 ppm + 80 mΩ		
	Fast Speed	100 mΩ	10.6 ppm + 200 mΩ	30.6 ppm + 200 mΩ	40.6 ppm + 200 mΩ		
(100~1000) kΩ	Slow Speed	0.1 Ω	50 ppm	80 ppm	100 ppm	1 μA	5 ppm + 1 Ω
	Medium Speed	0.1 Ω	50 ppm + 1 Ω	80 ppm + 1 Ω	100 ppm + 1 Ω		
	Fast Speed	1 Ω	51 ppm + 2 Ω	81 ppm + 2 Ω	101 ppm + 2 Ω		

[1] Accuracy Index: ± (ppm of reading or xxmΩ , whichever is greater).
[2] Temperature coefficient index: exceeds (18-28) °C range, increase (ppm reading +xxmΩ) / °C.
[3] Specifications are for 4-wire function.

Thermistor Temperature Accuracy

Type	Scanning Speed	Temperature	24 Hour / °C (23 ±1) °C	90 Days / °C (23 ± 5) °C	1 year / °C (23 ± 5) °C
10 kΩ	Slow Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0004	0.0008	0.0011
		100 °C	0.0030	0.0039	0.0039
		150 °C	0.0130	0.0174	0.0174
	Medium Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0008	0.0010	0.0011
		100 °C	0.0054	0.0064	0.0064
		150 °C	0.0239	0.0282	0.0282
	Fast Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0016	0.0016	0.0016
		100 °C	0.0104	0.0104	0.0104
		150 °C	0.0456	0.0456	0.0456

[1] The indicator is based on the electrical accuracy of the 4-wire thermistor and does not include the accuracy of the thermistor itself.
[2] Temperature maximum Resolution is 0.0001 °C.

DC Voltage Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Input Resistance	Temperature Coefficient
(-100-100) mV	Slow Speed	0.01 μV	5 ppm + 2 ppm	10 ppm + 4 ppm	14 ppm + 4 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.1 μV
	Medium Speed	0.01 μV	5 ppm + 6 ppm	10 ppm + 8 ppm	14 ppm + 8 ppm		
	Fast Speed	0.1 μV	5 ppm + 22 ppm	10 ppm + 24 ppm	14 ppm + 24 ppm		
(-1-1) V	Slow Speed	0.1 μV	2 ppm + 0.3 ppm	8 ppm + 0.6 ppm	14 ppm + 0.6 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.2 μV
	Medium Speed	0.1 μV	2 ppm + 1.3 ppm	8 ppm + 1.6 ppm	14 ppm + 1.6 ppm		
	Fast Speed	1 μV	2.6 ppm + 3.3 ppm	8.6 ppm + 3.6 ppm	14.6 ppm + 3.6 ppm		
(-10-10) V	Slow Speed	1 μV	2 ppm + 0.05 ppm	8 ppm + 0.08 ppm	14 ppm + 0.08 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.3 μV
	Medium Speed	1 μV	2 ppm + 0.35 ppm	8 ppm + 0.38 ppm	14 ppm + 0.38 ppm		
	Fast Speed	10 μV	2.6 ppm + 1.05 ppm	8.6 ppm + 1.08 ppm	14.6 ppm + 1.08 ppm		
(-50-50) V	Slow Speed	10 μV	8 ppm + 1 ppm	32 ppm + 1 ppm	38 ppm + 1 ppm	10 MΩ	5 ppm + 5 μV
	Medium Speed	10 μV	8 ppm + 2 ppm	32 ppm + 2 ppm	38 ppm + 2 ppm		
	Fast Speed	100 μV	8.6 ppm + 7 ppm	32.6 ppm + 7 ppm	38.6 ppm + 7 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index: Exceed the range of (18-28) °C, increase (ppm reading + xxμV)/ °C.
[3] Any range, the maximum input voltage is 50 V.

DC Current Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Burden Voltage	Temperature Coefficient
(-100-100) µA	Slow Speed	0.01 nA	15 ppm + 3 ppm	50 ppm + 6 ppm	60 ppm + 6 ppm	<1 mV	8 ppm + 0.1 nA
	Medium Speed	0.01 nA	15 ppm + 7 ppm	50 ppm + 10 ppm	60 ppm + 10 ppm		
	Fast Speed	0.1 nA	15 ppm + 23 ppm	50 ppm +26 ppm	60 ppm + 26 ppm		
(-1-1) mA	Slow Speed	0.1 nA	15 ppm + 0.6 ppm	50 ppm +1 ppm	60 ppm + 1 ppm	<1 mV	8 ppm + 0.5 nA
	Medium Speed	0.1 nA	15 ppm + 1.6 ppm	50 ppm + 2 ppm	60 ppm + 2 ppm		
	Fast Speed	1 nA	15.6 ppm + 3.6ppm	50.6 ppm + 4 ppm	60.6 ppm + 4 ppm		
(-10-10) mA	Slow Speed	1 nA	30 ppm + 3 ppm	75 ppm + 6 ppm	80 ppm + 6 ppm	<1 mV	8 ppm + 10 nA
	Medium Speed	1 nA	30 ppm + 7 ppm	75 ppm + 10 ppm	80 ppm + 10 ppm		
	Fast Speed	10 nA	30 ppm + 23 ppm	75 ppm + 26 ppm	80 ppm + 26 ppm		
(-100-100) mA	Slow Speed	10 nA	40 ppm + 0.6 ppm	75 ppm + 1 ppm	80 ppm + 1 ppm	<1 mV	8 ppm + 50 nA
	Medium Speed	10 nA	40 ppm + 1.6 ppm	75 ppm + 2 ppm	80 ppm + 2 ppm		
	Fast Speed	100 nA	40.6 ppm + 3.6 ppm	75.6 ppm + 4 ppm	80.6 ppm + 4 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index:Exceed the range of range of (18-28) °C, increase (ppm reading+ xxnA)/ °C.
[3] Input Protection 0.3A/600V Resettable PTC.

DC Resistance Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Excitation Current	Temperature Coefficient
(0-100) Ω	Slow Speed	0.01 mΩ	3 ppm + 1 ppm	13 ppm + 1.5 ppm	16 ppm + 1.5 ppm	1 mA	3 ppm + 0.01 mΩ
	Medium Speed	0.01 mΩ	3 ppm + 5 ppm	13 ppm + 5.5 ppm	16 ppm + 5.5 ppm		
	Fast Speed	0.1 mΩ	3 ppm + 21 ppm	13 ppm + 21.5 ppm	16 ppm + 21.5 ppm		
(0-1) kΩ	Slow Speed	0.1 mΩ	3 ppm + 0.2 ppm	12 ppm + 0.3 ppm	15 ppm + 0.3 ppm	1 mA	3 ppm + 0.02 mΩ
	Medium Speed	0.1 mΩ	3 ppm + 1.2 ppm	12 ppm + 1.3 ppm	15 ppm + 1.3 ppm		
	Fast Speed	1 mΩ	3.6 ppm + 3.2 ppm	12.6 ppm + 3.3 ppm	15.6 ppm + 3.3 ppm		
(0-10) kΩ	Slow Speed	1 mΩ	3 ppm + 0.3 ppm	12 ppm + 0.4 ppm	15 ppm + 0.4 ppm	0.1 mA	3 ppm + 0.2 mΩ
	Medium Speed	1 mΩ	3 ppm + 1.3 ppm	12.6 ppm + 1.3 ppm	15 ppm + 1.3 ppm		
	Fast Speed	10 mΩ	3.6 ppm + 3.3 ppm	12.6 ppm + 3.4 ppm	15.6 ppm + 3.4 ppm		
(0-100) kΩ	Slow Speed	10 mΩ	3 ppm + 0.2 ppm	12 ppm + 0.3 ppm	15 ppm + 0.3 ppm	0.1 mA	3 ppm + 20 mΩ
	Medium Speed	10 mΩ	3 ppm + 0.5 ppm	12 ppm + 0.6 ppm	15 ppm + 0.6 ppm		
	Fast Speed	100 mΩ	3.6 ppm + 1.3 ppm	12.6 ppm + 1.3 ppm	30.6 ppm + 1.3 ppm		
(0-1) MΩ	Slow Speed	0.1 Ω	10 ppm + 0.6 ppm	30 ppm + 1 ppm	40 ppm + 1 ppm	10 µA	5 ppm + 0.2 Ω
	Medium Speed	0.1 Ω	10 ppm + 1.2 ppm	30 ppm + 0.6 ppm	40 ppm + 0.6 ppm		
	Fast Speed	1 Ω	10 ppm + 2.6 ppm	30 ppm + 3 ppm	40 ppm + 3 ppm		
(0-10) MΩ	Slow Speed	1 Ω	50 ppm + 0.4 ppm	80 ppm + 1 ppm	100 ppm + 1 ppm	1 µA	10 ppm + 1 Ω
	Medium Speed	1 Ω	50 ppm + 1.4 ppm	80 ppm + 2 ppm	100 ppm + 2 ppm		
	Fast Speed	10 Ω	50 ppm + 4.4 ppm	80 ppm + 5 ppm	100 ppm + 5 ppm		
(0-100) MΩ	Slow Speed	10 Ω	150 ppm + 1 ppm	400 ppm + 4 ppm	500 ppm + 4 ppm	0.1 µA	50 ppm + 50 Ω
	Medium Speed	10 Ω	150 ppm + 6 ppm	400 ppm + 9 ppm	500 ppm + 9 ppm		
	Fast Speed	100 Ω	150 ppm + 11 ppm	400 ppm + 14 ppm	500 ppm + 14 ppm		

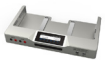
[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index:Exceed the range of range of (18-28) °C, increase (ppm reading+ xx Ω)/ °C.
[3] The above is a 4-wire measurement index.
[4] When the range is less than or equal to 10 kΩ, the default is automatic current reversal.
[5] Max Lead Resistance(4-wire ohms): 10 Ω per lead for 100 Ω & 1 kΩ ranges; 100 Ω per lead for 10 kΩ &100 kΩ ranges; 1 kΩ per lead on all other ranges.

Ordering Information

Model Number		
Model	**Description**	**Picture**
ADT286-110V ADT286-220V	Multifunction Reference Thermometer Readout base unit only	
ADT286-TS-PKG-110V ADT286-TS-PKG-220V	Multifunction Reference Thermometer Readout base unit with (1) Temperature Scanner Module (9051 cable not included)	
ADT286-PS-PKG-110V ADT286-PS-PKG-220V	Multifunction Reference Thermometer Readout base unit with (1) Process Scanner Module (9051 cable not included)	

Accessories

Accessories (Included)		
Standard Accessories	**Quantity**	**Picture**
Shorting Block (1210103531)	1 pc.	
USB Cable (UK-415) (1210200243)	1 pc.	
Test leads	4 sets (8 pcs)	
9026 2-wire test lead (Only w/ ADT286-TS-PKG & ADT286-PS-PKG)	20 pcs	
Fuse (0213.315MXP) (for 110V units)	2 pcs	
Fuse (0218.160MXP) (for 220V units)	2 pcs	
ISO 17025 Accredited calibration	1 pc.	
CD Manual	1 pc.	

Optional Accessories		
Model	**Optional Accessories**	**Picture**
9026	2-wire test lead (20-Pack)	
9051-10	Dsub Comm Cable=10 ft	
9051-33	Dsub Comm Cable=33 ft	
9079-X	Thermocouple connection wire, mini male to alligator clips (X = type K, N, J, T, E)	
ADT286-DOCK	Remote Module Docking Station w/AC Adapter	
ADT286-TS	ADT286 Temperature Scanner Module	
ADT286-PS	ADT286 Process Scanner Module	
ADT280-RS-25	25 Ω Standard Reference Resistor	
ADT280-RS-100	100 Ω Standard Reference Resistor	
9916-286 Carrying Case for ADT286,(2) scanner modules and reference probe w/ wheels	1pc	

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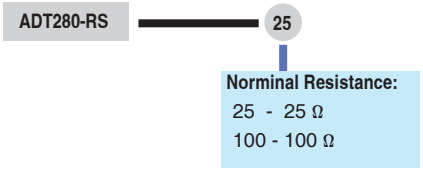
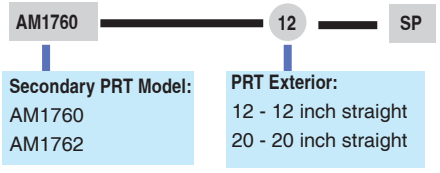
Standard Reference Resistor Ordering Information



ADT280-RS-X

Resistance Standards		
Specification	**ADT280-RS-25**	**ADT280-RS-100**
Nominal Resistance	25 Ω	100 Ω
Stability	5 ppm/year	5 ppm/year
Operating Temperature	23 °C±2 °C	23 °C±2 °C
Temperature Coefficient	0.5 ppm/°C	0.5 ppm/°C
Size	57 mm x 57 mm x 45 mm	57 mm x 57 mm x 45 mm
Weight	0.35 lb (160 g)	0.35 lb (160 g)
Excitation Current	1 mA	1 mA

Secondary Standard PRT Ordering Information



AM17XX-X-SP

Secondary Standard PRT Information

Specification	*AM1760 Series*	*AM1762 Series*
Temperature Range	-200 °C to 670 °C	-200 °C to 670 °C
Resistance at 0℃	Nominal 100 Ω	Nominal 25 Ω
Temperature Coefficient	0.003925 Ω / Ω / °C	
Accuracy	±0.007 °C at -196 °C ±0.006 °C at 0.01 °C ±0.015 °C at 420 °C ±0.025 °C at 660 °C	±0.007 °C at -196 °C ±0.006 °C at 0.01 °C ±0.015 °C at 420 °C ±0.025 °C at 660 °C
Drift	±0.004 °C at TPW after 100 hours at 661 °C	
Short Term Stability	±0.002 °C	
Thermal Shock	±0.002 °C after 10 times thermal cycles from minimum to maximum temperatures	
Hysteresis	N/A	
Self-heating	0.0015 °C at 1 mA current	
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second	
Measurement Current	0.5 mA or 1 mA	
Sensor Length	42 mm	
Sensor Location	5 mm from tip	
Insulation Resistance	>1000 MΩ at room temperature	
Sheath Material	Inconel[tm]	
Dimension	**AM1760-12-SP** 0.25 in dia X 12 in (6.35 mm X 305 mm) **AM1760-20-SP** 0.25 in dia X 20 in (6.35 mm X 500 mm)	**AM1762-12-SP** 0.25 in dia X 12 in (6.35 mm X 305 mm) **AM1762-20-SP** 0.25 in dia X 20 in (6.35 mm X 500 mm)
External Leads	Teflon[tm] – insulated copper wire, 4 leads, 2.5 meters	
Handle Dimension	15 mm (OD) x 65 mm (L)	
Handle Temperature Range[1]	-50 °C to 160 °C	-50 °C to 180° C
Calibration	NIST traceable calibration w/ data included	

[1] Handle temperatures outside the usable will cause damage to the probe.
* PRT Information from www.accumac.com.

Additel 282
Dual-Channel Reference Thermometer Readout

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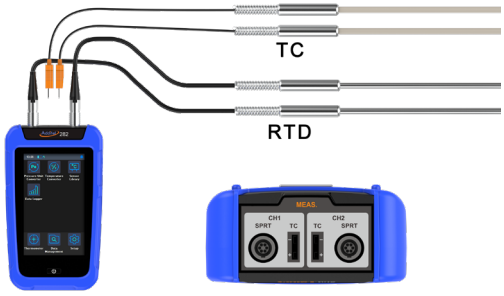
- Reference Level Accuracies
- Dual Measurement Channels
- RTD and TC Inputs
- Smart Style Probe Connections
- Large Smartphone Like Touchscreen
- Resistance Ratio Measurement Technology
- Bluetooth & USB Communications
- Built-in Sensor Library
- Datalogging
- IP67 Rated
- Rugged Handheld Construction
- Rechargeable Lithium Battery

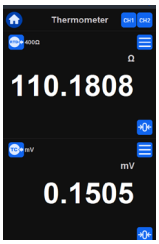
OVERVIEW

Additel's 282 Reference Thermometer Readout delivers the best possible accuracies and features in the palm of your hand! With accuracy capabilities on par with laboratory grade thermometers, the ADT282 is capable of handling even your most critical measurements. This ultra-high precision readout features dual analog channels designed to facilitate comparison measurements and meet all of your temperature measurement needs. The easy to use touchscreen makes navigating the well-designed menus a time saving and enjoyable experience. The LEMO style smart connectors help to ensure that your probe calibration information is never in question. The ADT282 Reference Thermometer Readout helps makes metrology simple and will quickly become your new go-to when reliable temperature measurements are a must.



*Read up to two channels simultaneously

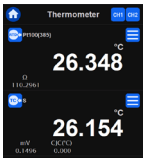
Main Features

1mk temperature resolution, 0.1mΩ/0.1uV electrical measurement resolution	
Reliable temperature metrology requires a stable repeatable measurement device. The ADT282 supports stability and uniformity testing of liquid temperature baths, thermocouple calibration furnaces, and dry well calibrators. The highly accurate dual channels of the ADT282 support deviation and uniformity studies. A very capable standard is required for the measurement resolution of the thermometer readout in these situations. The ADT282's superior measurement performance and dual-channel configuration easily meet these measurement needs.	

Main Features

Dual Channels

The model ADT282 includes dual inputs which provide support for a multitude of resistive type sensors (RTD's) as well as thermocouples (TC's). Both channels can be displayed simultaneously which allows for comparison measurements and a host of other statistical analysis capabilities. And the Additel 282 allows for easy differential measurement selection for T1-T2.



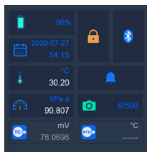
Reference Measurement Technology

Additel's 282 Reference Thermometer Readout utilizes a ratio measurement technology which provides an unmatched performance in stability and drift. In order to ensure a very small temperature drift coefficient and reliable long-term stability, the ADT282 uses current reversal techniques to cancel EMF effects and a ratio technology to cancel the A/D converter offset. This highly advanced technology has not been available in a handheld device until now!

Smart Style Probe Connections

In order to facilitate quick and reliable probe connections, the ADT282 has been configured with smart connection ports for probes. Both channels atop the reference readout utilize 6 pin Lemo style smart connectors for RTD probes and mini-TC ports for thermocouple probes. The thermocouple connection points utilize an imbedded temperature sensor which allows for both internal and external cold junction compensation.With the smart probe connectors, the ADT282 utilizes a user-selectable probe lock feature to pair the probe with the channel it was calibrated with in a system calibration.

One Touch Control Center

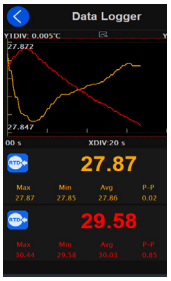


In order to improve the user's experience and speed of use, we have designed a single touch menu option that navigates users to a control center panel. The functions from the control panel include: Date, Battery status, Screen lock, Bluetooth on/off, Speaker on/off, Snapshot, Smart diagnosis center button.

BlueTooth

The ADT282 comes with standard Bluetooth communications capabilities and is supported by Additel's Mobile Link App. This very useful feature will change the way you work as it provides a remote view of the ADT282 display at a distance, up to 20 meters on your personal mobile device.

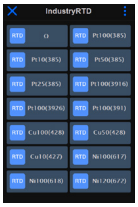
Datalogging



Temperature sensors and instruments used in the field often require regular calibration. In many cases, the disassembly of equipment can impact productivity. Fixed sensors can be tested in process utilizing the ADT282 datalogging capabilities. In order to accurately monitor temperature changes, this process may take several minutes or even hours to complete. ADT282 has built-in powerful data logging function and supports multi-parameters data recording, trend curve display, partial curve observation, statistical result viewing, data storage capacity up to 8G to help with these applications.

Sensor Library

The ADT282 has an extensive built-in temperature sensor library, including ITS-90, CVD, Standard TC,13 types of industrial RTDs and 15 types of industrial thermocouples, and also supports sensor customization. The user can also edit the probe coefficients according to the ITS-90, CVD formulas and the R0 parameter of the industrial RTDs. The extensive probe library capabilities also support coefficient input methods for standard thermocouple types.



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SPECIFICATIONS

General Specifications

Technical Specifications	
Display	5.0 inch 480 x 800 TFT LCD capacitive screen
Size	16.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm)
Weight	1.5 lbs. (0.65 Kg)
Power Supply	6600mAh, 23.8Wh lithium battery, charging time about 6 hours, battery pack can be charged independent. Battery life typically 16 hours
Environment	Specification guaranteed temperature range: (10~30) °C Working Temperature: (-10~50) °C Storage temperature: (-20~70) °C Humidity: 0% ~ 95% RH, non-condensing
Warm-Up Time	10 minutes
Ports Protection Voltage	50V max
CE Certificate	TUV IEC61326, IEC61010
Rohs Compliance	Rohs II Directive 2011/65/EU，EN50581:2012
IP Protection Level	IP67, 1 meter drop test
Communication	Isolate USB-TYPEC (slave), Bluetooth BLE
Input Channels	CH1, CH2 analog channel, 6 pins smart lemo ports for RTD probe；MINI-TC ports for TC probe
Measurement Display	Single channel, dual channel, differential (e.g T1-T2)
Measuring Rates	CH1, CH2 analog channels alternately and cyclically measure RTD measuring rate: 1.6S/single channel, 1.6S/dual channel TC measuring rate: 0.8S/single channel, 0.8S/dual channel
Measurement Units	°C, °F, K
Statistics	Max, Min, Avg

Measurement Specifications

Specification		
PRT Measurement	RTD Types	ITS-90, CVD, Ohms, Pt100 (385), Pt10 (385), Pt25 (385), Pt50 (385), Pt100 (3916), Pt100 (3926), Pt100 (391), Cu100 (428), Cu50 (428), Cu10 (427), Ni100 (617), Ni100 (618), Ni120 (672), and custom RTD
	Resistance Accuracy	0~400Ω: ±0.5mΩ@(0~20Ω),±25ppm@(20~400Ω)
	Measurement range	-200°C ~ 850°C
	Resolution	±0.1mΩ or 0.001°C
	Connection Type	4-wire smart connection
	Excitation Current	1 mA - alternating constant current
	Temperature Coefficient	±2ppm FS/°C (-10°C~10°C and 30°C~50°C)
TC Measurement	TC Types	mV, S, R, B, K, N, E, J, T, C, D, G, L, U, LR, A, 10uV/°C, 1mV/°C, Standard TC
	Electrical Measurement	-10~75mV: 50ppm RDG+2uV
	TC measurement range	-270°C ~ 1800°C
	Resolution	±0.1uV or 0.001°C
	Connection Type	Mini-TC
	CJC compensation methods	Internal, external or manual entry
	Temperature Coefficient	±5ppm FS/°C (-10°C~10°C and 30°C~50°C)
	Internal CJC Specification	±0.15°C (-10°C~50°C)

Accuracy Specifications

Accuracy (°C)										
T, °C	Rx,Ω	ADT282 readout only (C)	Readout with selected Probe Accuracy (°C)*							
			AM1760	AM1751	AM1730	AM1640	AM1660	AM1710	AM1612-2	AM1612-1
-200	18	0.005	0.013	0.021	0.021	0.053	0.053	n/a	0.072	n/a
-40	84	0.005	0.013	0.018	0.018	0.042	0.042	0.018	0.051	0.051
0	100	0.006	0.009	0.014	0.014	0.036	0.036	0.014	0.051	0.051
100	140	0.009	[1]	[1]	[1]	[1]	[1]	0.019	0.051	0.051
160	163	0.011	[1]	[1]	[1]	[1]	[1]	0.023	0.052	0.052
232	190	0.013	0.019	0.024	0.024	0.059	0.059	n/a	n/a	n/a
420	257	0.018	0.027	0.033	0.033	0.077	0.077	n/a	n/a	n/a
660	338	0.026	0.040	0.046	n/a	n/a	0.109	n/a	n/a	n/a

Note: [1] - These are non-standard calibration points, some probes are not calibrated at 100°C and/or 160°C.
*Includes readout accuracy, probe calibration, and probe drift.(K=2)

Thermocouple Measurement

Thermocouple Measurement (Environment Temperature: 20±10°C)				
Type	Temperature Range (°C)		Accuracy (°C) External CJC compensation (1 year)	Accuracy (°C) Internal CJC compensation (1 year)
S	-50 to 1768	-50~0	0.51	0.53
		0~100	0.37	0.40
		100~1768	0.28	0.32
R	-50 to 1768	-50~0	0.54	0.56
		0~200	0.38	0.41
		200~1768	0.25	0.29
B	0 to 1820	200~300	1.01	1.02
		300~500	0.66	0.68
		500~800	0.41	0.44
		800~1820	0.28	0.32
K	-270 to 1372	-250 to -200	0.48	0.50
		-200 to -100	0.15	0.21
		-100 to 600	0.08	0.17
		600 to 1372	0.14	0.21
N	-270 to 1300	-250 to -200	0.76	0.77
		-200 to -100	0.22	0.27
		-100 to 1300	0.12	0.19
E	-270 to 1000	-250~-200	0.26	0.30
		-200~-100	0.10	0.18
		-100~700	0.06	0.16
		700~1000	0.08	0.17
J	-210~1200	-210~-100	0.13	0.20
		-100~700	0.06	0.16
		700~1200	0.10	0.18
T	-270 to 400	-250~-100	0.36	0.39
		-100~0	0.08	0.17
		0~400	0.05	0.16
C	0 to 2315	0 to 1000	0.16	0.22
		1000 to 1800	0.26	0.30
		1800 to 2315	0.42	0.45

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Thermocouple Measurement (Environment Temperature: 20±10°C)				
Type	Temperature Range (°C)		Accuracy (°C) External CJC compensation (1 year)	Accuracy (°C) Internal CJC compensation (1 year)
D	0~2315	0~100	0.21	0.26
		100~1200	0.16	0.22
		1200~2000	0.27	0.31
		2000~2315	0.42	0.45
G	0 to 2315	50~100	0.60	0.62
		100~200	0.38	0.41
		200~400	0.24	0.28
		400~1500	0.16	0.22
		1500~2315	0.32	0.35
L	-200 to 900	-200 to -100	0.07	0.17
		-100 to 400	0.06	0.16
		400 to 900	0.07	0.17
U	-200 to 600	-200 to 0	0.14	0.21
		0 to 600	0.05	0.16
LR	-200~800	-200~0	0.09	0.17
		0~800	0.06	0.16
A	0~2500	0~1200	0.20	0.25
		1200~2000	0.33	0.36
		2000~2500	0.48	0.50

Notes:
1. The index is based on the accuracy of the thermocouple electrical measurement, does not include the accuracy of the thermocouple itself and the fixed cold junction compensation at 0 °C.
2. Combined accuracy specifications of probe and readout are calculated using the RSS method.
3. Additel provides standard S-typeTC probe with MINI-TC connector.

Ordering Information

Model Number

ADT282

Accessories

Accessories (Included)			
Model	Description	QTY	
9813-X	Power Adapter, external power adapter for Additel 282 Thermometer Readout	1 pc	
9052	USB Cable type A to type C	1 pc	
9704	Chargeable Li-ion battery	1 pc	
	ISO 17025 accredited calibration certificate	1 pc	

Optional Accessories		
Model	Description	
9070	Smart connector for reference PRT used with ADT875, ADT878, and ADT282	
9071	Connector Adapter from smart connector to 4-wire with gold-plated spades for AM17XX PRTs	
9072	Smart connector with clamps	
9080	Cable kits (including TC plug, compensation cable, S,R,K,J,T,E,N)	
9918-SC	Soft carrying case, with space for instrument, test leads, and accessories	
9905	Carrying case for handheld calibrators and readouts with space for two PRTs	
9079-X	Thermocouple connection wire, mini male to alligator clips (X = type K, N, J, T, E)	

***See page #6 for ordering info regarding common probes used with the ADT282.**

Secondary PRT Ordering Information

AM1710 — 12 — ADT

Secondary PRT Model:
AM1710
AM1730
AM1751

PRT Exterior:
12 - 12 inch straight
BEND - 90° bend

AM17XX-12-ADT

Secondary PRT Information

Specification	*AM1710 Series*	*AM1730 Series*	*AM1751 Series*
Temperature Range	-60°C to 160°C	-200°C to 420°C	-200°C to 670°C
Resistance at 0℃	Nominal 100Ω		
Temperature Coefficient	0.003925 Ω / Ω / °C		
Accuracy	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	±0.025°C at -196°C ±0.015°C at 0.01°C ±0.035°C at 420°C	±0.025°C at -196°C ±0.015°C at 0.01°C ±0.035°C at 420°C ±0.05°C at 661°C
Drift	±0.01°C at TPW after 100 hours at 160°C	±0.01°C at TPW after 100 hours at 420°C	±0.01°C at TPW after 100 hours at 661°C
Short Term Stability	±0.007°C		
Thermal Shock	±0.005°C after 10 times thermal cycles from minimum to maximum temperatures		
Hysteresis	<=0.005°C		
Self-heating	50 mW/°C		
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second		
Measurement Current	0.5 mA or 1 mA		
Sensor Length	32 mm		
Sensor Location	5 mm from tip		
Insulation Resistance	>1000 MΩ at room temperature		
Sheath Material	Stainless Steel	Inconel™	
Dimension	**AM1710-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1730-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1751-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)
	AM1710-BEND-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 7.4 inch (190 mm) from probe end	**AM1730-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	**AM1751-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end
External Leads	Teflon™ –insulated copper wire, 4 leads, 2.5 meters		
Handle Dimension	15 mm (OD) x 65 mm (L)		
Handle Temperature Range[1]	-50°C to 160°C	-50°C to 180°C	
Optional Calibration	NIST traceable calibration and data available per request		

[1] Handle temperature outside this range will cause damage to the probe.
* PRT Information from www.accumac.com

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Additel 878
Reference Dry Well Calibrators

- Three models ranging from -40°C to 700°C
- Reference level performance in accuracy, stability and uniformity
- Quick to temperature
- Two-channel readout measures RTDs and TCs, and provides task documentation
- Full HART communicator (PC Option)
- Optional external temperature control
- Wi-Fi and Bluetooth capable
- Color touch screen display
- Quick-Push connectors (PC Option)
- Set point control by reference
- Self-calibration feature
- Optional TPW kit for built-in automatic realization (ADT878-160 only)
- Built-in automatic PRT annealing feature (ADT878-700 only)

OVERVIEW

We are taking temperature calibration to the next level with the Additel 878 Reference Dry Well Calibrators. If you are looking for the best dry well on the market, then look no further! Additel's commitment to continuous improvement, quality and time saving features are on full display in the ADT878 series. With three models to choose from, ranging from -40 to 700°C, you will find the perfect fit for your calibration needs. The Process Calibrator option adds an external reference input, a two-channel readout for UUT's and a full complement of capabilities to help with everything from measuring temperature sensors, to calibrating thermocouples, self-calibrating the Reference Well and configuring HART transmitters. Each unit comes standard with a large touchscreen display, dual-zone control and Additel's commitment to the best customer service in the industry. We are certain that you will be blown away by the outstanding performance of these game-changing Reference Dry Wells!

Process Calibrator Option

Each model can be purchased with our Process Calibrator (PC) option. This option combines the many features found in a fully functional HART documenting process calibrator with the reference grade dry well. This option includes the ability to measure a reference PRT, with virtually any connection type, and two device under test channels which can measure, mA, voltage, switch, RTD or thermocouple. In addition to these measurement functions, this calibrator has full documenting capability of creating tasks, saving as found and as left results, as well as communication with HART-smart transmitters. The process calibrator option also has an on board full HART communicator which allows users to read, configure and calibrate HART transmitters. The snap shot feature allows you to capture all information displayed on the screen with the push of a button. This optional add-on allows for data logging of all channels on an auto step function. By utilizing the reference PRT, you can select to control to the dry well set point using the internal sensor or the external reference PRT.

Self-Calibration

We believe using an external reference probe as your standard is the best way to perform your temperature calibration. But we also recognize this method is not always necessary or convenient and depending on the application, using the internal control sensor would be preferred. Traditionally, the internal control sensor has a wide accuracy which can largely be contributed to its long-term drift. We've built-in a self-calibration feature allowing you to run an automated calibration of the internal control sensor using your external reference. With literally a few selections the calibration will run automatically giving you a fresh, traceable calibration of the control sensor which will improve its accuracy as you will not have to account for its long term drift when used as the reference.

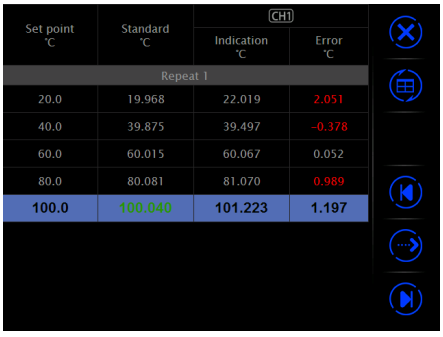
Automation Features

Traditionally, dry wells were simply a stable heat source. To enhance the usability of our Reference Dry Wells, we've added automation features enabling you to utilize these amazing devices as a highly stable heat source, triple point of water maintenance apparatus, and annealing furnace.

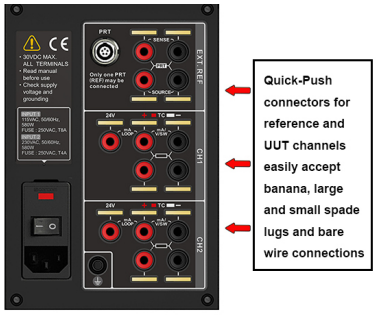
Combined with the ADT878-TPW-KIT, the ADT878-160 Reference Dry Well can be used to automatically realize and maintain a triple point of water cell. Traditional methods take time and practice to realize the triple point of water. Additel has now simplified this process with an automatic TPW realization feature. Simply insert the cell and PRT into the Reference Dry Well and run the procedure. The automation in the firmware will alert when the cell is super cooled. Remove the cell and give it a shake and now you can maintain the triple point in the reference well. This is very useful to check the drift of your PRT. For more information, please see our ADT878-TPW-KIT data sheet.

When you purchase our 700°C Reference Dry Well, you will find our automatic annealing feature used to anneal PRTs. We have preconfigured annealing procedures that set the temperature annealing time and cool down rate. This feature, also lets you create your own annealing procedures.

FEATURES

Specification	Display
Task	
mA Measurement	

Non-PC version PC version



Process Calibrator Optional Electronics

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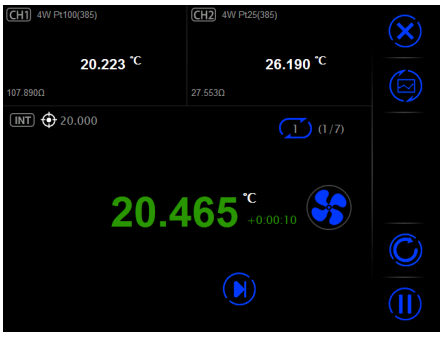
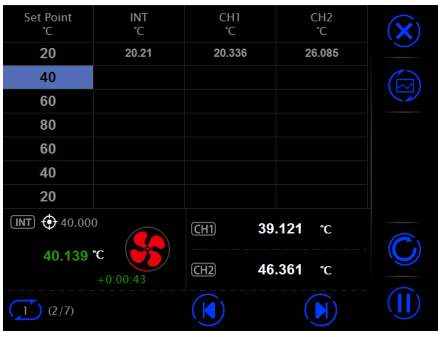
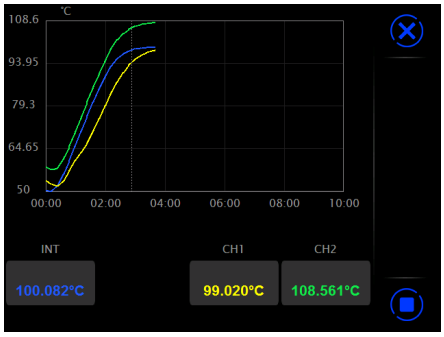
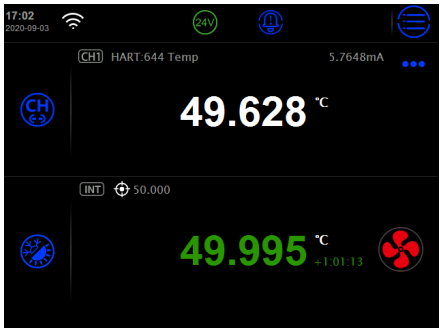
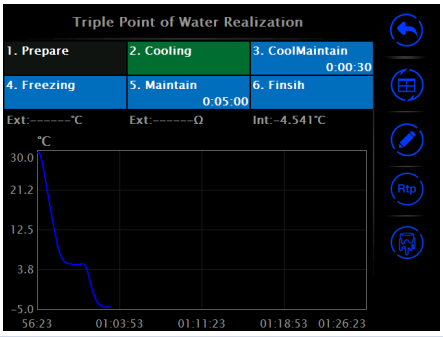
FEATURES

Specification	Display 1	Display 2
Auto Step		
Remote Control		
Data Logging		
HART Communicator		
TPW Cell Realization		

SPECIFICATIONS

Reference Dry Well Specifications

Specification	*878-160*	*878-425*	*878-700*
Temperature Range at 23°C	-40°C to 160°C	33°C to 425°C	33°C to 700°C
Display Accuracy	±0.1°C at Full Range	±0.2°C at Full Range	±0.20°C at 33°C
			±0.20°C at 425°C
			±0.25°C at 660°C
Stability (30 min)	±0.005°C at Full Range	±0.010°C at 100°C	±0.010°C at 100°C
		±0.015°C at 225°C	±0.020°C at 425°C
		±0.020°C at 425°C	±0.030°C at 700°C
Axial Uniformity at 60 mm (2.4 in)	±0.035°C at -40°C	±0.10°C at 100°C	±0.10°C at 100°C
	±0.020°C at 0°C	±0.15°C at 225°C	±0.25°C at 425°C
	±0.050°C at 160°C	±0.25°C at 425°C	±0.40°C at 700°C
Axial Uniformity at 80 mm (3.15 in)	±0.050°C at -40°C	±0.15°C at 100°C	±0.15°C at 100°C
	±0.040°C at 0°C	±0.20°C at 225°C	±0.30°C at 425°C
	±0.050°C at 160°C	±0.30°C at 425°C	±0.60°C at 700°C
Radial Uniformity	±0.01°C at Full Range	±0.025°C at 100°C	±0.025°C at 100°C
		±0.030°C at 225°C	±0.040°C at 425°C
		±0.040°C at 425°C	±0.060°C at 700°C
Loading Effect	±0.08°C (Display Sensor)	±0.05°C (Display Sensor)	±0.02°C at 100°C
			±0.05°C at 425°C
			±0.15°C at 700°C
	±0.010°C (External Sensor)	±0.01°C (External Sensor)	±0.01°C at 100°C
			±0.02°C at 425°C
			±0.03°C at 700°C
Hysteresis (Display Sensor)	0.025°C	0.04°C	0.07°C
Environmental Conditions	8°C to 38°C guaranteed accuracy		
	0°C to 50°C, 0% to 90% RH non-condensing		
Storage Conditions	-20°C to 60°C		
Immersion Depth	160 mm (6.30 in)	193 mm (7.60 in)	
Insert OD	31.9 mm (1.26 in)	30.8 mm (1.21 in)	
Heating Time	4 min: -40°C to 23°C	15 min: 23°C to 425°C	25 min: 23°C to 700°C
	10 min: 23°C to 160°C		
Cooling Time	8 min: 160°C to 23°C	24 min: 425°C to 100°C	30 min: 700°C to 100°C
	15 min: 23°C to -40°C	15 min: 100°C to 50°C	15 min: 100°C to 50°C
Typical Time to Stability	10 min		
Resolution	0.001°C		
Units	°C, °F, and K		
Display	6.5 in (165 mm) color touch screen		
Size (H x W x D)	170 x 345 x 330 mm (6.69 x 13.58 x 13.0 in)		
Weight	11.2 kg (24.7 lbs)	9.7 kg (21.4 lbs)	
Power Requirements	90-254 VAC, 45-65 Hz, 580 W	90-254 VAC, 45-65 Hz, 1400 W	
Communication	USB A, USB B, RJ45, WiFi, Bluetooth		
Localization	English, Chinese, Japanese, Russian, German, French, Italian, and Spanish		
Warranty	1 year		

Input Specifications (Process Calibrator [PC] Option)

Specification	Description
Readout Accuracy for 100 ohm PRT (Probe Accuracy Not Included)	±0.005°C at -40°C
	±0.006°C at 0°C
	±0.008°C at 50°C
	±0.009°C at 100°C
	±0.011°C at 160°C
	±0.015°C at 300°C
	±0.019°C at 425°C
	±0.026°C at 660°C
	±0.028°C at 700°C
Readout Resolution	0.1 mΩ
Reference Resistance Temperature Measurement Range	-200°C to 962°C
Reference Resistance Accuracy	0 Ω to 50 Ω: ±1.25 mΩ
	50 Ω to 400 Ω: ±0.0025% RD
Reference Characterizations	ITS-90, CVD, IEC-751
Reference Measurement Capability	4-wire PRT
Reference Probe Connection	6-pin lemo smart connector and Quick-Push connectors to accept banana, mini-banana, large & small spade lug and bare wire connections
RTD Channels	2 channels. Both accept 2, 3, or 4-wire RTDs
RTD Measurement Accuracy (excl sensor)	0 Ω - 25 Ω: ±0.002 Ω
	25 Ω - 400 Ω: 0.004% RD
	400 Ω - 4k Ω: 0.005% RD
RTD Measurement Resolution	0.1 mΩ
RTD Measurement Resistance Range	0 Ω to 4K Ω
RTD Characterizations	PT10, PT25, PT50, PT100, PT200, PT500, PT1000, CU10, CU50, CU100, NI100, NI120
RTD Connection	Quick-Push connectors accept banana, mini-banana, large & small spade lug and bare wire connections
TC Channel	2
TC Measurement Channels	Accepting S, R, K, B, N, E, J, T, C, D, G, L, and U
TC Range	–75 mV to 75 mV
TC Resolution	0.1 µV
TC Voltage Accuracy	0.01% RD + 5 µV
Internal CJC Accuracy	±0.2°C (ambient from 0°C to 50°C)
Current Range	–30 mA to 30 mA
Current Accuracy	0.01% RD + 2 µA
Current Resolution	0.1 µA, Input Impedance: < 10 Ω

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Specification	Description
Voltage Ranges	-12 V to 12 V and –30 V to 30 V
Voltage Accuracy	±0.01% RD + 0.6 mV
Voltage Resolution	0.1 mV; Input impedance: >1MΩ
Switch Test	Mechanical or Electrical
DC 24V Output	24 V ±0.5 V, MAX 60 mA
Hart Communicator	Read, configure and calibrate HART devices - DD files updated periodically Optional - (order ADT875PC)
Documentation	Up to 1,000 tasks which store up to 10 results each containing as found and as left data. Snap shot feature allows for screen captures. Records auto step and ramp functions.
Temperature Coefficient 0°C to 13°C and 33°C to 50°C	ADT878 (PC)-160: ±0.005°C/°C
	ADT878 (PC)-425/700: ±0.005°C/°C
	Ref Readout: ±1 ppm FS/°C
	RTD Readouts: ±1 ppm FS/°C
	TC Readouts: ±5 ppm FS/°C
	Current: ±5 ppm FS/°C
	Voltage: ±5 ppm FS/°C

TC Measurement Specification and Calculation (Process Calibrator [PC] Option)

TC Type	Temperature (°C)	Error (°C)[1]	TC Type	Temperature (°C)	Error (°C)[1]
B	250	±1.99	T	-200	±0.28
	300	±1.65		-40	±0.14
	425	±1.18		0	±0.13
	660	±0.81		160	±0.11
	700	±0.77		300	±0.11
	1768	±0.56		400	±0.11
K	-200	±0.29	N	-200	±0.46
	-40	±0.13		-40	±0.20
	0	±0.13		0	±0.19
	160	±0.14		160	±0.17
	300	±0.15		300	±0.17
	425	±0.16		425	±0.17
	660	±0.18		660	±0.19
	700	±0.19		700	±0.19
	1000	±0.31		1000	±0.27
E	-200	±0.16	S	-50	±1.25
	-40	±0.09		-40	±1.17
	0	±0.09		0	±0.93
	160	±0.08		160	±0.63
	300	±0.09		300	±0.57
	425	±0.10		425	±0.55
	660	±0.12		660	±0.54
	700	±0.13		700	±0.53
	1000	±0.17		1768	±0.66
J	-210	±0.22	R	-50	±1.33
	-40	±0.10		-40	±1.23
	0	±0.10		0	±0.95
	160	±0.11		160	±0.61
	300	±0.12		300	±0.54
	425	±0.13		425	±0.51
	660	±0.14		660	±0.48
	700	±0.14		700	±0.48
	1000	±0.21		1768	±0.58

[1] Excluding cold junction compensation errors.

Ordering Information

Model Number

ADT878 — 160 — A — 110 V

Model:
ADT878
ADT878PC

Temperature Range (at 23℃):
160: -40°C to 160°C
425: 33°C to 425°C
700: 33°C to 700°C

Insert Model:
A, B, C, D,
E, F

Power Option:
110 V
220 V

Accessories

Standard Accessories		
Model	*Quantity*	*Picture*
Reference Dry Well and selected insert	1 pc.	
Power cable	1 pc.	
USB Cable	1 pc.	
Insert removal tool	1 pc.	
Thermal Shield (ADT878/PC-425/700 only)	1 pc.	
Silica gel plugs (ADT878/PC-160 only)	1 set (3 pcs.)	
Insulation plug (ADT878/PC-160 only)	1 pc.	
Test leads (ADT878PC only)	2 sets (4 pcs.)	
ISO 17025 Accredited calibration	1 pc.	

Insert Ordering Information

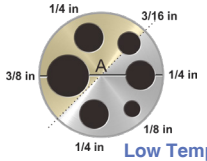
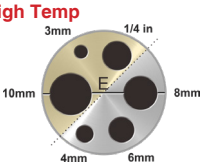
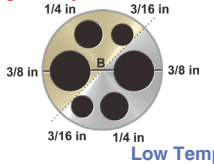
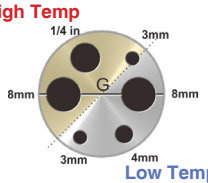
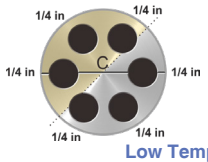
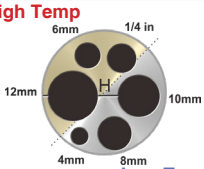
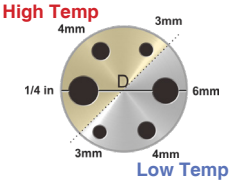
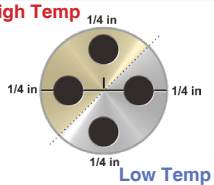
ADT110 — 878 — L — INSERT — A

Temperature Range:
L - Low Temp
H - High Temp

Insert Model:
A, B, C, D,
E, G, H, I

Optional Accessories		
Model	*Description*	*Picture*
9915-878	Carry Case for ADT878-160/425/700 with wheels	
ADT110-878-X-INSERT-X	Insert for ADT878, see insert ordering information on the next page	
AM17XX-12-ADT	Secondary PRT with dry well connector, see PRT information on the next page	
AM17XX-BEND-ADT	Bend Secondary PRT with dry well connector, see PRT information on the next page	
9070	Smart connector for reference PRT used with ADT878 Dry Well Calibrator	
9071	Connector Adapter from smart connector to 4-wire with gold-plated spades for ADT878 Dry Well Calibrator	
9072	Smart connector with clamps for reference PRT used with ADT878 Dry Well Calibrator	
9080	Cable Kit (includes TC plug, compensation cable, S,R,K,J,T,E,N)	
ADT878-TPW-KIT	Triple point of water cell kit (see ADT878-TPW-KIT for details)	

Insert Information

Insert Information			
Model	*Specification*	*Model*	*Specification*
A	High Temp  Low Temp	E	High Temp  Low Temp
B	High Temp  Low Temp	G	High Temp  Low Temp
C	High Temp  Low Temp	H	High Temp  Low Temp
D	High Temp  Low Temp	I	High Temp  Low Temp

* Updated insert information at www.additel.com

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Secondary PRT Ordering Information

AM1710 — 12 — ADT

Secondary PRT Model:
AM1710
AM1730
AM1751
AM1760

PRT Exterior:
12 - 12 inch straight
BEND - 90° bend

AM17XX-12-ADT

AM17XX-BEND-ADT

Secondary PRT Information

Specification	*AM1710 Series*	*AM1730 Series*	*AM1751 Series*	*AM1760 Series*
Temperature Range [3]	-60°C to 160°C	-200°C to 420°C	-200°C to 670°C	-200°C to 670°C
Resistance at 0℃	Nominal 100Ω			
Temperature Coefficient	0.003925 Ω / Ω / °C			
Calibrated Accuracy (k=2)[2][3]	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C ±0.05°C at 661°C	±0.010°C at -196°C ±0.006°C at 0.01°C ±0.015°C at 420°C ±0.025°C at 661°C
Drift	±0.01°C at TPW after 100 hours at 160°C	±0.01°C at TPW after 100 hours at 420°C	±0.01°C at TPW after 100 hours at 661°C	±0.004°C at TPW after 100 hours at 661°C
Short Term Stability	±0.007°C			±0.002°C
Thermal Shock	±0.005°C after (10) thermal cycles from minimum to maximum temperatures			±0.002°C after (10) thermal cycles from minimum to maximum temperatures
Hysteresis	<=0.005°C			<=0.001°C
Self-heating	50 mW/°C			0.0015°C at 0.5mA
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second			
Measurement Current	0.5 mA or 1 mA			
Sensor Length	32 mm			42 mm
Sensor Location	5 mm from tip			
Insulation Resistance	>1000 MΩ at room temperature			
Sheath Material	Stainless Steel	Inconel™		
Dimension	**AM1710-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1730-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1751-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1760-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)
	AM1710-BEND-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 7.4 inch (190 mm) from probe end	**AM1730-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	**AM1751-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	**AM1760-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end
External Leads	Teflon™ –insulated copper wire, 4 leads, 0.8 meters			
Handle Dimension	15 mm (OD) x 65 mm (L)			
Handle Temperature Range[1]	-50°C to 160°C	-50°C to 180°C		
Calibration	NIST traceable calibration with data included. Accredited calibration available per request.			

[1] Handle temperatures outside this range will cause damage to the probe.
[2] Includes calibration and 100 hour drift.
[3] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).
* PRT Information from www.accumac.com

ADT878-TPW-KIT
Triple Point of Water Realization Kit

Additel
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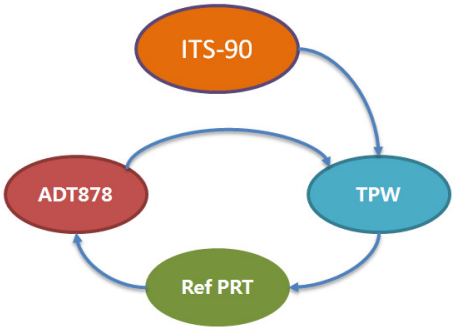
- One touch TPW cell realization
- Extremely affordable intrinsic standard
- Self-calibration feature
- Automatically update reference probe TPW values
- Easily maintain temperature working standards
- Fully self-contained

OVERVIEW

The Additel 878 TPW Kit provides everything you need to utilize our model ADT878-160 Reference Dry Well as an intrinsic standard. The triple point value (0.01°C) is key to ITS-90 temperature probe calibration work. Traditional methods take time and practice to realize the triple point of water. Additel has now simplified this process with an automatic TPW realization feature. Simply insert the cell and PRT into the Reference Dry Well and run the preprogrammed procedure. The automation in the firmware will alert when the cell is super cooled. Remove the cell and give it a shake and now you can maintain the triple point in the reference well. With the help of this easy to use kit, users can quickly and easily realize and maintain our custom fit TPW cell, then record/update those ever critical TPW values for all your PRTs.

Accuracy Verification Loop

The triple point of water (TPW) is a critical intrinsic standard and ITS-90 reference point that every owner of a reference PRT or SPRT should have. Using the TPW to check reference temperature probes is the most convenient and affordable way to ensure confidence in your measurements. By regularly checking the drift of your temperature sensor, you can know with certainty if your sensor is in tolerance or not. The International Temperature Scale of 1990 (ITS-90) supports the TPW to be a reliable standard to check your reference PRT. By using the ADT878-160 Reference Dry Well, you can maintain and realize the TPW cell, which in turn can verify your reference PRT. This helps to bring everything full circle, the reference PRT can be used in the self-calibration mode to validate the display accuracy of the ADT878.

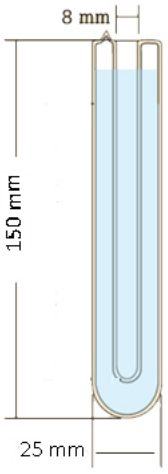


Accuracy Verification Loop

SPECIFICATIONS

Specification	*Display*
Uncertainty	<0.0005°C [1]
Immersion depth/ID	115 mm X 8 mm
External Dimensions	150 mm X 25 mm
Cell material	Borosilicate Glass
Realization time	20 mins
Estimated working time	2 hours
Recommended thermal Fluid	Ethanol
Warranty	1 year

[1] Specification relates to the overall uncertainty when using the shake method of realizing the cell and maintaining it in the ADT878-160. Call for more info.



TPW Cell Size

Ordering Information

Model Number

ADT878 — TPW — KIT

Accessories

Included Accessories		
Description	*Quantity*	*Picture*
9300-CELL TPW Cell	1 pc	
Cell basket	1 pc	
Basket cover	1 pc	
Basket Cover with Hole	1 pc	
Support ring	1 pc	
9300-TOOL Cell Removal Tool	1 pc	
Bottom Cushion	1 pc	

Additel 875
Series Dry Well Calibrators

Metrology Made Simple

- Three models ranging from -40°C to 660°C
- Portable, rugged, and quick to temperature
- Metrology-level performance in stability, uniformity, accuracy and loading effect
- Dual-zone control
- Full HART field communicator
- Process calibrator option provides a multi-channel readout for a reference thermometer, RTDs and TCs, task documentation , and HART communication
- Color touch screen display
- Choose your own range option
- Set point control by reference
- Self-calibration feature

OVERVIEW

If you are serious about portable temperature calibration tools, then you know a good dry well calibrator is more than just a stable heat source. The Additel 875 Series Dry Well Calibrators combine excellent performance in stability, radial and axial uniformity, and loading with speed, ruggedness and portability. But we don't stop there! The Process Calibrator option adds the capabilities of a three-channel thermometer readout and a documenting process calibrator. We've also incorporated a unique option to select your own temperature range within the range of the model selected. We're calling this the CYOR option or Choose Your Own Range option. When you purchase the CYOR option, you pick the upper and lower temperature range needed and we calibrate and optimize the dry well's performance over your selected range. Each unit has a color touch screen display, dual-zone control, and much more. You are just going to love these new dry wells!

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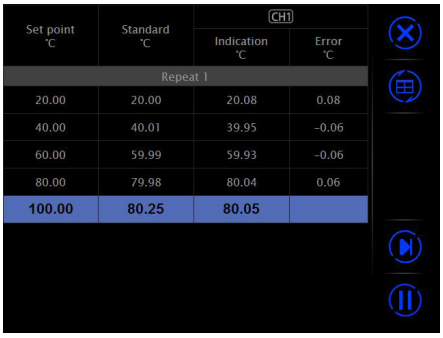
Process Calibrator Option

Each model offer has a Process Calibrator (PC) option. This process calibrator option combines the many features found in a fully functional HART documenting process calibrator with the temperature dry well. This option includes the ability to measure a reference PRT and two devices under test channels which can measure, mA, voltage, switch, RTD or thermocouple. In addition to these measurement functions, this calibrator has full documenting capability of creating tasks, saving as found and as left results, as well as reading, configuring and calibrating HART capable transmitters. The snap shot feature allows you to capture all information displayed on the screen with the push of a button. This optional add-on allows for data logging of all channels on an auto step function and a ramp function. By utilizing the reference PRT, you can select to control to the dry well set point using the internal sensor or the external reference PRT.

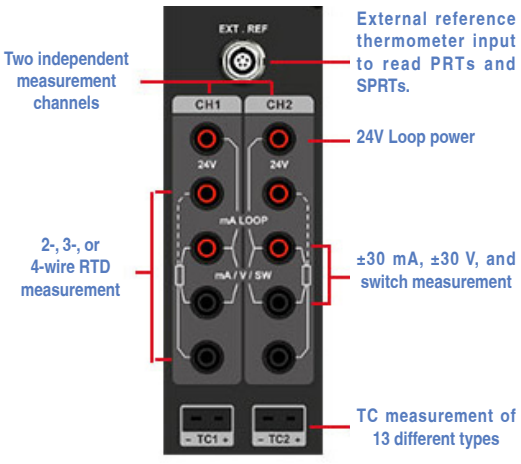
Self-Calibration

We believe using an external reference probe as your standard is the best way to perform your temperature calibration. But we also recognize this method is not always necessary or convenient and depending on the application, using the internal control sensor would be preferred. Traditionally, the internal control sensor has a wide accuracy which can largely be contributed to its long-term drift. We've built-in a self-calibration feature allowing you to run an automated calibration of the internal control sensor using your external reference. With literally a few selections the calibration will run automatically giving you a fresh, traceable calibration of the control sensor which will improve its accuracy as you will not have to account for its long term drift when used as the reference.

FEATURES

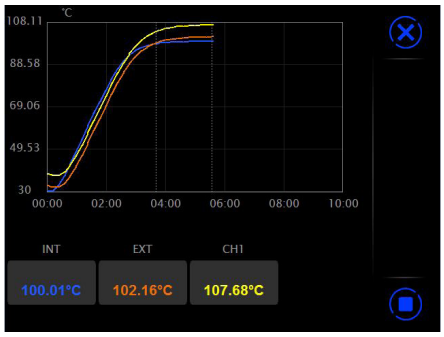
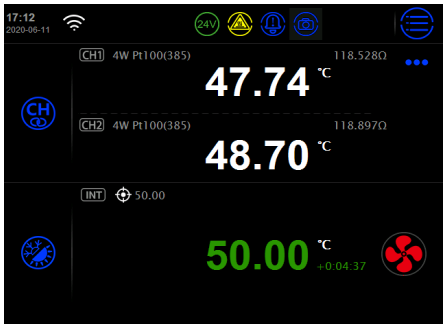
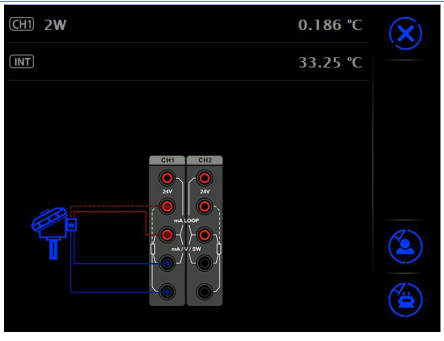
Specification	*Display*
Task	
mA Measurement	
V Measurement	

Non-PC version PC version



Process Calibrator
Optional Electronics

FEATURES

Specification	Display 1	Display 2
Auto Step		
Remote Control		
Data Logging		
Stability Indicator		
Connection Instruction		

APPLICATIONS

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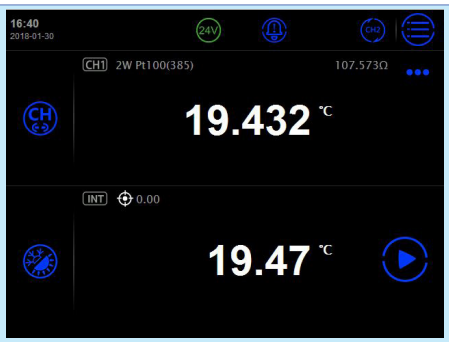
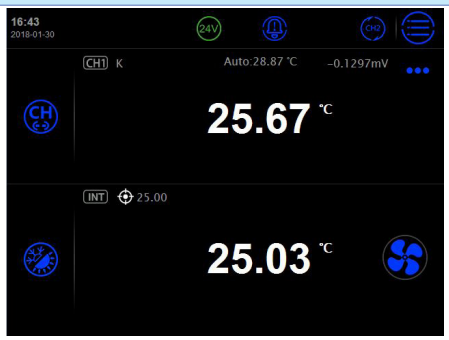
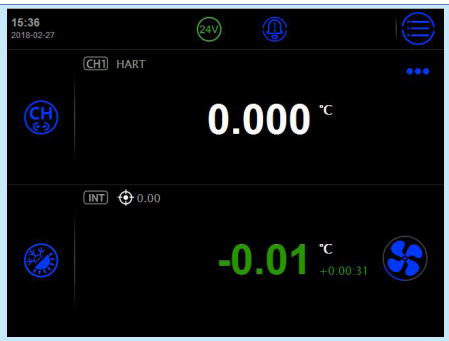
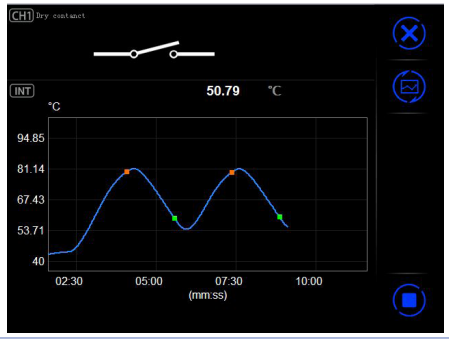
Specification	Display	Application
PRT Test (External Reference)		
RTD Test		
TC Test		
Transmitter Test		
Switch Test		

SPECIFICATIONS

Base Unit Dry Well Specifications

Specification	*875-155*	*875-350*	*875-660*
Temperature Range at 23℃	-40°C to 155°C	33°C to 350°C	33°C to 660°C
Display Accuracy	±0.18°C at Full Range	±0.2°C at Full Range	±0.3°C at 33°C
			±0.3°C at 420°C
			±0.5°C at 660°C
Stability (30 min)	±0.01°C at Full Range	±0.02°C at Full Range	±0.02°C at 33°C
			±0.03°C at 50°C
			±0.04°C at 420°C
			±0.04°C at 660°C
Axial Uniformity at 60 mm (2.4 in)	±0.07°C at Full Range	±0.04°C at 33°C	±0.05°C at 33°C
		±0.1°C at 200°C	±0.3°C at 420°C
		±0.2°C at 350°C	±0.5°C at 660°C
Radial Uniformity	±0.01°C at Full Range	±0.01°C at 33°C	±0.02°C at 33°C
		±0.015°C at 200°C	±0.05°C at 420°C
		±0.02°C at 350°C	±0.1°C at 660°C
Loading Effect	±0.1°C (Display Sensor)	±0.15°C (Display Sensor)	±0.15°C (Display Sensor)
	±0.02°C (External Sensor)	±0.015°C (External Sensor)	±0.035°C (External Sensor)
Hysteresis (Display Sensor)	0.025°C	0.03°C	0.1°C
Environmental Conditions	8°C to 38°C guaranteed accuracy		
	0°C to 50°C, 0% to 90% RH non-condensing, 3000 M altitude for normal operation		
Storage Conditions	-20°C to 60°C		
Immersion Depth	145 mm (5.70 in)	150 mm(5.90 in)	
Insert OD	25.8 mm (1.02 in)	24.8 mm (0.98 in)	
Heating Time	13 min: -40°C to 155°C	10 min: 33°C to 350°C	15 min: 33°C to 660°C
	5 min: -40°C to 23°C		
	8 min: 23°C to 155°C		
Cooling Time	28 min: 155°C to -40°C	15 min: 350°C to 100°C	23 min: 660°C to 100°C
	8 min: 155°C to 23°C	10 min: 100°C to 50°C	12 min: 100°C to 50°C
	20 min: 23°C to -40°C	10 min: 50°C to 33°C	12 min: 50°C to 33°C
Typical Time to Stability	10 min		
Resolution	0.01°C		
Units	°C, °F, and K		
Display	6.5 in (165 mm) color touch screen		
Size (H x W x D)	320 x 170 x 330 mm (12.6 x 6.7 x 13.0 in)		
Weight	9.9 kg (21.8 lbs)	8.6 kg (18.9 lbs)	
Power Requirements	90-254 VAC, 45-65 Hz, 580 W	90-254 VAC, 45-65 Hz, 1200 W	
Mechanical Testing	Vibration: 2 g (10-500 Hz), 30 min for 2 sides		
	Impact: 4 g three times		
	Drop test: 500 mm (19.6 in)		
Communication	USB A, USB B, RJ45, WiFi, Bluetooth		
Localization	English, Chinese, Japanese, Russian, German, French, Italian, and Spanish		
Warranty	1 year		

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Input Specifications (Process Calibrator [PC] Option)

Specification	Description
Readout Accuracy for 100 ohm PRT (Probe Accuracy Not Included)	±0.009°C at -40°C
	±0.010°C at 0°C
	±0.012°C at 50°C
	±0.017°C at 155°C
	±0.019°C at 200°C
	±0.026°C at 350°C
	±0.030°C at 420°C
	±0.042°C at 660°C
Readout Resolution	0.5 mΩ
Reference Resistance Range	0 Ω to 400 Ω
Reference Resistance Accuracy	0 Ω to 50 Ω: ±0.002 Ω
	50 Ω to 400 Ω: ±40 ppm RD
Reference Characterizations	ITS-90, CVD, IEC-751, Resistance
Reference Measurement Capability	4-wire PRT
Reference Probe Connection	6-pin lemo smart connector
RTD Channels	2
RTD Measurement Accuracy (excl sensor) Compliance	0 Ω to 25 Ω: ±0.002 Ω
	25 Ω to 400 Ω: ±0.008% RD
	400 Ω to 4K Ω: ±0.008% RD
RTD Measurement Resolution	0 Ω to 400 Ω: 1 mΩ
	400 Ω to 4K Ω: 0.01 Ω
RTD Measurement Resistance Range	0 Ω to 4 KΩ
RTD Characterizations	PT10, PT25, PT50, PT100, PT200, PT500, PT1000, CU10, CU50, CU100, NI100, NI120
RTD Connection	Four 4 mm input jacks
RTD Channels	2 channels. Both accept 2, 3, or 4-wire RTDs
TC Channel	2
TC Measurement Channels	Mini TC terminals: Accepting S, R, K, B, N, E, J, T, C, D, G, L, and U
TC Measurement Accuracy (excl sensor)	Type K: ±0.13°C at 0°C ±0.16°C at 155°C ±0.19°C at 350°C ±0.25°C at 660°C
TC Range	–75 mV to 75 mV
TC Resolution	0.0001 mV, Input Impedance >100 MΩ
TC Voltage Accuracy	0.02% RD + 5 µV
Internal CJC Accuracy	±0.35°C (ambient from 0°C to 50°C)
Current Range	–30 mA to 30 mA
Current Accuracy	0.02% RD + 2 µA
Current Resolution	0.0001 mA, Input Impedance: < 10Ω

Specification	Description
Voltage Ranges	–12 V to 12 V and –30 V to 30 V
Voltage Accuracy	±0.02% RD + 2 mV
Voltage Resolution	0.001 V; Input impedance: > 1MΩ
Switch Test	Mechanical or Electrical
DC 24V Output	24V ±10%, MAX60 mA
Hart Communicator	Read, configure and calibrate HART devices - DD files updated periodically Optional - (order ADT875PC)
Documentation	Up to 1,000 tasks which store up to 10 results each containing as found and as left data. Snap shot feature allows for screen captures. Records auto step and ramp functions.
Temperature Coefficient 0°C to 8°C and 38°C to 50°C	ADT875 (PC)-155: ±0.005°C/°C
	ADT875 (PC)-350/660: ±0.01°C/°C
	Ref Readout: ±5 ppm FS/°C
	RTD Readouts: ±2 ppm FS/°C
	TC Readouts: ±5 ppm FS/°C
	Current: ±5 ppm FS/°C
	Voltage: ±5 ppm FS/°C

TC Measurement Specification and Calculation (Process Calibrator [PC] Option)

TC Type	Temperature (°C)	Error (°C)[1]	TC Type	Temperature (°C)	Error (°C)[1]
B	250	±2	L	-40	±0.1
	350	±1.44		0	±0.1
	660	±0.84		155	±0.12
C	0	±0.38		350	±0.16
	155	±0.34		660	±0.21
	350	±0.33	N	-40	±0.2
	660	±0.38		0	±0.2
D	0	±0.52		155	±0.19
	155	±0.37		350	±0.2
	350	±0.33		660	±0.24
	660	±0.36	R	-40	±1.23
E	-40	±0.09		0	±0.95
	0	±0.09		155	±0.63
	155	±0.1		350	±0.56
	350	±0.13		660	±0.54
	660	±0.19	S	-40	±1.16
G	0	±3.85		0	±0.93
	155	±0.71		155	±0.65
	350	±0.43		350	±0.6
	660	±0.36		660	±0.6
J	-40	±0.1	T	-40	±0.14
	0	±0.1		0	±0.13
	155	±0.12		155	±0.13
	350	±0.16		350	±0.15
	660	±0.21		400	±0.15
K	-40	±0.13	U	-40	±0.14
	0	±0.13		0	±0.13
	155	±0.15		155	±0.13
	350	±0.18		350	±0.14
	660	±0.24		600	±0.17

[1] Excluding cold junction compensation errors.

Ordering Information

Model Number

ADT875 — 155 — A — 110 V

Model:
ADT875
ADT875PC

Temperature Range (at 23°C):
155: -40°C to 155°C
350: 33°C to 350°C
660: 33°C to 660°C

Insert Model:
A, B, C, D,
E, F, G, H

Power Option:
110 V
220 V

CYOR Option (Choose Your Own Range)

Optional Accessories		
Model	*Description*	*Picture*
9875-155-CYOR	Range selection for ADT875-155 Dry Well Calibrator, Customize Range	
9875-350-CYOR	Range selection for ADT875-350 Dry Well Calibrator, Customize Range	
9875-660-CYOR	Range selection for ADT875-660 Dry Well Calibrator, Customize Range	

Accessories

Standard Accessories		
Model	*Quantity*	*Picture*
Dry well and selected insert	1 pc.	
Power cable	1 pc.	
USB Cable	1 pc.	
Insert removal tool	1 pc.	
Thermal Shield (ADT875/PC-350/660 only)	1 pc.	
Silica gel plug (ADT875/PC-155 only)	1 set (3 pcs.)	
Insulation plug (ADT875/PC-155 only)	1 pc.	
Test leads (ADT875PC only)	2 sets (4 pcs.)	
ISO 17025 Accredited calibration	1 pc.	

Optional Accessories		
Model	*Description*	*Picture*
9915-875	Carry Case for ADT875-155/350/660 with wheels	
ADT110-875-X-INSERT-X	Insert for ADT875, see insert ordering information on the next page	
AM17XX-12-ADT	Secondary PRT with dry well connector, see PRT information on the next page	
AM17XX-BEND-ADT	Bend Secondary PRT with dry well connector, see PRT information on the next page	
9070	Smart connector for reference PRT used with ADT875 Dry Well Calibrator	
9071	Connector Adapter from smart connector to 4-wire with gold-plated spades for ADT875 Dry Well Calibrator	
9072	Smart connector with clamps for reference PRT used with ADT875 Dry Well Calibrator	
9080	Cable Kit (includes TC plug, compensation cable, S,R,,K,J,T,E,N)	

Insert Information

Insert Information			
Model	*Specification*	*Model*	*Specification*
A	High Temp: 1/4 in, 3/8 in, A, 1/4 in, 3/16 in, 1/8 in — Low Temp	F	High Temp: 6.5 mm, 10 mm, F, 8 mm, 6.5 mm — Low Temp
B	High Temp: 1/4 in, 1/8 in, 1/4 in, B, 3/8 in, 3/16 in, 3/16 in — Low Temp	G	High Temp: 8 mm, G, 8 mm — Low Temp
C	High Temp: 1/4 in, 1/4 in, C, 1/4 in, 1/4 in — Low Temp	H	High Temp: 1/4 in, 4 mm, 8 mm, H, 8 mm, 4 mm, 6 mm — Low Temp
D	High Temp: 1/4 in, D, 1/4 in — Low Temp	Z	High Temp: Z — Low Temp
E	High Temp: 1/4 in, 10 mm, E, 8 mm, 4 mm, 6 mm — Low Temp		

* Updated insert information at www.additel.com

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Insert Ordering Information

ADT110 — 875 — L — INSERT — A

Temperature Range:
L - Low Temp
H - High Temp

Insert Model:
A, B, C, D,
E, F, G, H

Secondary PRT Ordering Information

AM1710 — 12 — ADT

Secondary PRT Model:
AM1710
AM1730
AM1751
AM1760

PRT Exterior:
12 - 12 inch straight
BEND - 90° bend

AM17XX-12-ADT

AM17XX-BEND-ADT

Secondary PRT Information

Specification	*AM1710 Series*	*AM1730 Series*	*AM1751 Series*	*AM1760 Series*
Temperature Range [3]	-60°C to 160°C	-200°C to 420°C	-200°C to 670°C	-200°C to 670°C
Resistance at 0°C	Nominal 100Ω			
Temperature Coefficient	0.003925 Ω / Ω / °C			
Calibrated Accuracy (k=2)[2][3]	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C ±0.05°C at 661°C	±0.010°C at -196°C ±0.006°C at 0.01°C ±0.015°C at 420°C ±0.025°C at 661°C
Drift	±0.01°C at TPW after 100 hours at 160°C	±0.01°C at TPW after 100 hours at 420°C	±0.01°C at TPW after 100 hours at 661°C	±0.004°C at TPW after 100 hours at 661°C
Short Term Stability	±0.007°C			±0.002°C
Thermal Shock	±0.005°C after (10) thermal cycles from minimum to maximum temperatures			±0.002°C after (10) thermal cycles from minimum to maximum temperatures
Hysteresis	<=0.005°C			<=0.001°C
Self-heating	50 mW/°C			0.0015°C at 0.5mA
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second			
Measurement Current	0.5 mA or 1 mA			
Sensor Length	32 mm			42 mm
Sensor Location	5 mm from tip			
Insulation Resistance	>1000 MΩ at room temperature			
Sheath Material	Stainless Steel	Inconel™		
Dimension	**AM1710-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1730-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1751-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)	**AM1760-12-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm)
	AM1710-BEND-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 7.4 inch (190 mm) from probe end	**AM1730-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	**AM1751-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end	**AM1760-BEND-ADT** 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end
External Leads	Teflon™ –insulated copper wire, 4 leads, 0.8 meters			
Handle Dimension	15 mm (OD) x 65 mm (L)			
Handle Temperature Range[1]	-50°C to 160°C	-50°C to 180°C		
Calibration	NIST traceable calibration with data included. Accredited calibration available per request.			

[1] Handle temperatures outside this range will cause damage to the probe.
[2] Includes calibration and 100 hour drift.
[3] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).
* PRT Information from www.accumac.com

Short Probe Temperature Calibration Kit

Metrology Made Simple

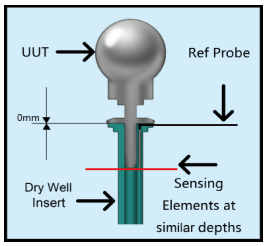
- Reduce calibration uncertainties
- Avoid messy fluid baths
- Reduce calibration time
- Improved accuracy with custom control probe (included)
- Metric or Imperial kits available

OVERVIEW

The Additel 110 series short probe calibration kit is designed to help users of our ADT875-155 or ADT878-160 to calibrate temperature probes and transmitters with short probe lengths. This all-inclusive kit comes with everything needed to perform more accurate and reliable calibration for those challenging short probes. Choose between our metric or imperial kit to fit your needs. Each kit comes complete with (3) standard sized inserts and (1) blank insert, which can be modified by the end user to accommodate custom sized UUT's if needed. The small reference probe is included which fits snuggly into the reference port of the specially machined inserts. Also, we include a small set of tools and supplies to help improve results by removing a couple of small parts on the top of the ADT875 or ADT878 calibrator. For more information, please watch our instructional short probe video found at www.additel.com

SPECIFICATIONS

AM1612-ADT Secondary PRT Specifications	
Temperature Range	-40°C to 160 °C
Resistance at 0 °C	Nominal 100 Ω
Temperature Coefficient	0.00385Ω/Ω /°C
Accuracy	±0.05°C at 0°C
Drift	±0.04°C at 0°C after 100 hours at 160°C
Short Term Stability	±0.02°C
Thermal Shock	±0.02°C after 10 times thermal cycles from minimum to maximum temperatures
Hysteresis	<= 0.01°C
Self-heating	75 mW/°C
Response Time	4 seconds for 63% response to step change in water moving at 3 feet per second
Measurement Current	1 mA
Internal Sensor Length	0.59" (15 mm)
Dimension	0.118" X 0.984" (3 mm X 25 mm)
Insulation Resistance	>1000 MΩ at room temperature
Sheath Material	Stainless Steel 316 L
External Leads	Enameled copper wire protected by high temperature heat shrink tubing, 4 leads, 0.8 meters
Calibration	NIST traceable calibration with data provided



Short Probe Kit Application

ORDERING INFORMATION

Model Number

ADT110 — 875 — L — SHRT — IKIT

Model:
875
878

Type:
IKIT includes Imperial 1/8", 3/16", 1/4" inserts, (1) blank insert, reference probe and carrying case
MKIT includes Metric 3, 4, 6 mm inserts, (1) blank insert, reference probe and carrying case

Note: Kits include (1) blank insert for field modification if needed

Optional Accessories

Model number	*Description*	*Picture*
ADT110-875-L-SK-Z	Spare Blank Insert	
ADT110-878-L-SK-D	Spare Blank Insert	
AM1612-ADT	Spare Short Style Secondary Reference Probe	

		
3 mm dia.	4 mm dia.	6 mm dia.
		
1/8 in dia.	3/16 in dia.	1/4 in dia.

ADT875 and ADT878
Thermocouple Calibration Furnaces

Additel
Metrology Made Simple

- Temperature control from 100°C to 1210°C
- Two models to choose from:
  Reference (ADT878) and Standard (ADT875)
- Display Accuracy of ±1.5°C (ADT878)
- Stability of ±0.1°C
- 4 on-board measurement channels (PC option)
- Process calibrator option provides a multi-channel readout for TCs, switches and transmitters, including task documentation and HART communication
- Portable, rugged and quick to temperature
- Self-calibration feature (PC option)
- Multi-zone temperature control
- Internal and external sensor control (PC option)
- Metallic interchangeable inserts
- Wi-Fi and Bluetooth capable
- Color touch screen display
- ISO 17025-accredited calibration w/data included
- Patent pending technology

OVERVIEW

We understand the many challenges associated with thermocouple calibration work. That is precisely why we decided to introduce the ADT875-1210 and ADT878-1210 Thermocouple Calibration Furnaces.

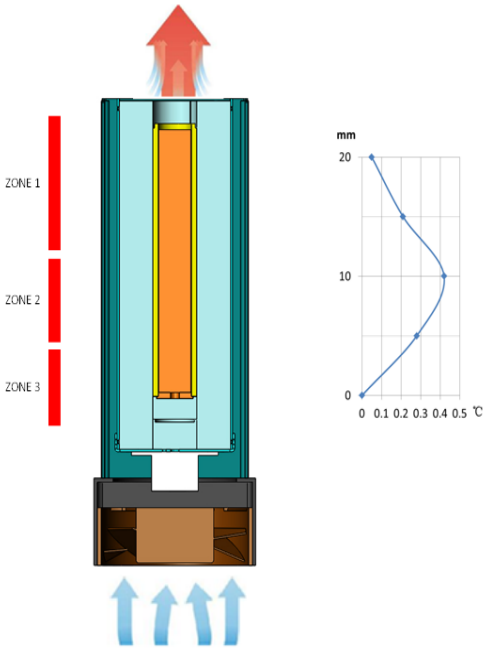
With an unmatched stability, uniformity and an optional on-board process calibrator, calibrating thermocouples has never been easier. With two separate units to choose from, the ADT875-1210 and ADT878-1210 furnaces include a patented multi-zone temperature control which provides a never before seen, highly stable and uniform heat source to ensure you get the best possible results from a modest investment. With metallic interchangeable inserts, users have the flexibility needed to service a wide variety of UUT's and the durability they have come to expect from Additel. The ADT875-1210 and ADT878-1210 can be purchased with or without our on-board process calibration electronics to provide flexibility for customers who are needing the best 1200°C heat source on the market.

If thermocouple calibration and/or verification work is part of your workload, you don't want to miss out on this opportunity to save valuable time and money with these best in class furnaces from Additel.

Temperature Control

The Additel ADT875 & ADT878 Thermocouple Calibration Furnaces have been designed with a unique and innovative way of controlling temperature and temperature gradients. We like to call it “Advanced Adaptive Control”. This exciting new design feature incorporates our patent pending wind tunnel control technology with Additel’s impressive 3-zone temperature control to provide the very best uniformity and stability possible.

Each ADT875 & ADT878 is tested and calibrated in Additel’s accredited laboratory (Brea, CA) to ensure that each unit is ready to go when the customer opens the package. The included accredited calibration certificate provides data relating to accuracy, stability and uniformity to help provide even more confidence in the testing and calibration of each and every ADT875 & ADT878 Thermocouple Calibration Furnace.



General Specifications

Specification	*875-1210*	*878-1210* [1]
Temperature Range	100°C to 1210°C	
Display Accuracy	±1.2°C @ 100°C ±1.2°C @ 300°C ±1.2°C @ 600°C ±1.6°C @ 900°C ±2.0°C @ 1210°C	±1.0°C @ 100°C ±1.0°C @ 300°C ±1.0°C @ 600°C ±1.2°C @ 900°C ±1.5°C @ 1210°C
Stability	±0.1°C	
Axial Uniformity (20mm zone)	±0.6°C @ 100°C ±1.2°C @ 300°C ±1.5°C @ 600°C ±1.5°C @ 900°C ±1.5°C @ 1210°C	±0.4°C @ 100°C ±0.8°C @ 300°C ±1°C @ 600°C ±1°C @ 900°C ±1°C @ 1210°C
Radial Uniformity	±0.2°C @ 100°C ±0.3°C @ 300°C ±0.4°C @ 600°C ±0.8°C @ 900°C ±1°C @ 1210°C	±0.2°C @ 100°C ±0.3°C @ 300°C ±0.4°C @ 600°C ±0.6C @ 900°C ±0.8°C @ 1210°C
Loading Effect	±0.5°C	
Environmental Conditions	8°C to 38°C guaranteed accuracy 0°C to 50°C, 0% to 90% RH non-condensing, 3000 M altitude for normal operation	
Storage Conditions	-20°C to 60°C	
Immersion Depth	XR style inserts = 138 mm (5.43") XS style inserts = 116 mm (4.57") (see insert ordering info for more details)	
Insert Size - OD	24.8 mm (0.98 inches)	
Heating Time	50 min: 23°C to 1210°C	
Cooling Time	50 mins:1210°C to 300°C 50 mins: 300°C to 50°C	55 mins:1210°C to 300°C 55 mins: 300°C to 50°C
Typical Time to Stability	15 min	
Resolution	0.01°C	
Units	°C, °F, and K	
Display	6.5 in (165 mm) color touch screen	
Size (H x W x D)	345 x 170 x 330 mm (13.6 x 6.7 x 13.0 in)	
Weight	10.6 kg (23.4 lbs)	

[1] 878-1210 specifications require the use of an "XR" style insert. Otherwise default to the 875-1210 specifications.

Specification	*875-1210*	*878-1210*
Power Requirements	90-254 VAC, 45-65 Hz, 580 W	
Mechanical Testing	Vibration: 2 g (10-500 Hz), 30 min for 2 sides Impact: 4 g three times Drop test: 500 mm (19.6 in)	
Communication	USB A, USB B, RJ45, WiFi, Bluetooth	
Localization	English, Chinese, Japanese, Russian, German	
Warranty	1 year	

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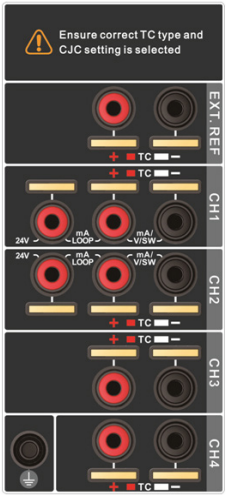
Process Electronics

Both the ADT875 & ADT878 can be ordered with Additel's Process Calibrator (PC) option. The Process Calibrator Option combines the many features found in a thermocouple readout device and process calibrator with the ADT875 & ADT878 Calibration Furnaces.
This unique option includes Additel's patented Quick-Push connectors which accommodate virtually all TC connection types. The process option also includes the ability to measure a reference grade thermocouple and up to (4) under test channels. Channels 1 and 2 can measure mA, voltage, perform switch testing and source 24V DC. In addition to these measurement functions, the process option provides full documenting capability of creating tasks, saving "as found" and "as left" results and HART communications for simplified transmitter work. The snapshot feature allows users to capture all information displayed on the screen with a touch of the screen. This optional add-on allows for data logging of all channels using our auto step and a ramp functions. By utilizing the external reference option users can select to control to the furnace set point using an external control probe, which helps to reduce uncertainties. The external control probe feature also facilitates the handy self-calibration feature!



ADT875 & ADT878 Process Calibrator [PC] option electronics

Input Specifications (Process Calibrator [PC] Option)

Specification	875-1210	878-1210
TC Measurement Channels	Patented TC terminals: Accepting S, R, K, B, N, E, J, T, L, and U	
TC Measurement Accuracy Type K Ch. 1-4 (excluding sensor)	±0.182°C @ 100°C ±0.266°C @ 300°C ±0.310°C @ 600°C ±0.397°C @ 900°C ±0.517°C @1210°C	±0.172°C @ 100°C ±0.236°C @ 300°C ±0.251°C @ 600°C ±0.304°C @ 900°C ±0.382°C @ 1210°C
TC Range	–75 mV to 75 mV (UUT Channels 1-4) –18 mV to 18 mV (Reference Channel)	
TC Resolution	0.0001 mV, Input Impedance < 10Ω	
TC Voltage Accuracy	0.02% RD + 8μV (ch. 1-4) 0.01% RD + 2μV (ref ch.)	0.01% RD + 8μV (ch. 1-4) 0.005% RD + 2μV (Ref ch.)
Internal CJC Accuracy	±0.35°C (ch. 1-4) ±0.25°C (ref ch.)	±0.30°C (ch. 1-4) ±0.20°C (ref ch.)
Current Range	–30 mA to 30 mA	
Current Accuracy	±(0.02% of rdg+ 2μA)	±(0.01% of rdg + 2μA)
Current Resolution	0.0001 mA, Input Impedance < 10Ω	
Voltage Range	–30 V to 30 V	
Voltage Accuracy	±(0.02% of rdg+ 2mV)	±(0.01% of rdg+ 0.6mV)
Voltage Resolution	0.0001 V, Input Impedance >1MΩ	
DC 24V Output	24 V ± 10%, MAX 60 mA	
Hart Communication	Optional (ADT875PC and ADT878PC Models)	
Temperature Coefficient 0°C to 8°C and 38°C to 50°C	TC Readouts: ±5 ppm FS/°C Current: ±5 ppm FS/°C Voltage: ±5 ppm FS/°C	
Switch Test	Mechanical or Electrical - Channels 1 & 2 only	
Documentation	Up to 1,000 tasks which store up to 10 results each containing as found and as left data. Snap shot feature allows for screen captures. Records auto step and ramp functions	

TC Measurement Specifications and Calculations (Process Calibrator [PC] Option)

TC Type	TEMP (°C)	Error (°C)[1] 875	878	TC Type	TEMP (°C)	Error (°C)[1] 875	878
K (CH1-CH4)	100	±0.182	±0.172	S (CH1-CH4)	100	±1.102	±1.094
	300	±0.266	±0.236		300	±0.924	±0.899
	600	±0.310	±0.251		600	±0.888	±0.837
	900	±0.397	±0.304		900	±0.868	±0.793
	1210	±0.517	±0.382		1210	±0.865	±0.765
N (CH1-CH4)	100	±0.273	±0.264	R (CH1-CH4)	100	±1.080	±1.072
	300	±0.270	±0.243		300	±0.869	±0.844
	600	±0.309	±0.256		600	±0.804	±0.755
	900	±0.368	±0.285		900	±0.771	±0.699
	1210	±0.455	±0.335		1210	±0.766	±0.670
E (CH1-CH4)	100	±0.136	±0.126	B (CH1-CH4)	250	±3.182	±3.170
	300	±0.153	±0.130		300	±2.645	±2.631
	600	±0.210	±0.154		600	±1.409	±1.379
	900	±0.291	±0.202		900	±1.049	±1.003
	1000	±0.297	±0.196		1210	±0.905	±0.839
L (CH1-CH4)	100	±0.223	±0.214	T (CH1-CH4)	100	±0.194	±0.185
	300	±0.271	±0.241		300	±0.191	±0.166
	600	±0.308	±0.251		400	±0.217	±0.183
	900	±0.522	±0.448	S (EXT. REF)	100	±0.277	±0.273
U (CH1-CH4)	100	±0.270	±0.261		300	±0.242	±0.229
	300	±0.189	±0.164		600	±0.249	±0.224
	600	±0.227	±0.176		900	±0.258	±0.220
J (CH1-CH4)	100	±0.186	±0.177		1210	±0.266	±0.216
	300	±0.197	±0.168	R (EXT. REF)	100	±0.271	±0.266
	600	±0.256	±0.200		300	±0.228	±0.216
	900	±0.281	±0.197		600	±0.227	±0.202
	1200	±0.414	±0.294		900	±0.230	±0.194
					1210	±0.240	±0.192

[1] Excluding cold junction compensation errors.

Ordering Information

Model Number

ADT875 — 1210 — AR — 110 V

Model:
ADT875, ADT875PC
ADT878, ADT878PC

Temperature Range (at 23°C):
1210: 100°C to 1210°C

Insert Model:
AR, BS, CS, DR,
ES, FS, GS, HR

Power Option:
110 V
220 V

* ADT878-1210 specifications require the use of an "XR" style insert

Accessories

Standard Accessories		
Model	***Quantity***	***Picture***
Calibration Furnace and selected Insert & insulator	1 pc.	
Power cable	1 pc.	
USB Cable	1 pc.	
Insert removal tool	1 pc.	
Test leads (PC option only)	2 sets (6 pcs.)	
Accredited Calibration Certification	1 pc.	

Optional Accessories		
Model	***Description***	***Picture***
9915-878	Carry case for ADT875-1210 or ADT878-1210 with wheels	
ADT110-87X-TC-INSERT-XX	Insert for ADT875-1210 or ADT878-1210 (see insert ordering information below)	
AM1210-12	Reference TC - Type S: Platinum/10% Rhodium vs. platinum - 12" length (see AM1210 specs below)	
9080	Cable Kit (includes TC plug, compensation cable, S,R,K,J,T,E,N)	

Insert Ordering Information

ADT110 — 875 — TC — INSERT — AR

Insert Type:
ADT875
ADT878

Insert Model:
AR, BS, CS, DR,
ES, FS, GS, HR

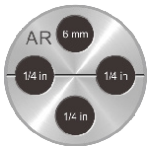
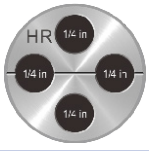
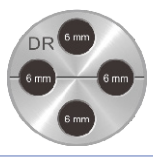
* ADT878-1210 specifications require the use of an "XR" style insert

AM1210-12 Type S Reference Standard Thermocouple	
Temperature Range	0°C to 1300°C
Type	Type S: Platinum/10% Rhodium vs. platinum
Long Term Drift	±0.6°C at 1084.62°C after 1 year typical usage
Short Term stability	±0.2°C at 1084.62°C
Diameter of thermocouple wire	0.5 mm
Sheath Material	Alumina
Sheath Dimensions	OD: 6 mm (0.236"); Length: 305 mm (12.0")
Protective Carrying Case	Included
Documentation	Report of test with data

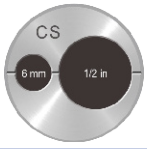
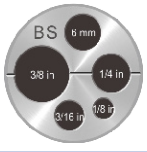
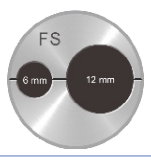
Note: ISO 17025 accredited probe calibration available, contact Additel for more information"

Insert Information

Reference Style inserts - 138 mm (5.43") hole depth - for use with both 878 and 875 models

Model	***Specification***	***Model***	***Specification***
AR		HR	
DR			

Short Style Insert - 116 mm (4.57") hole depth - Only for the ADT875 - 1210

Model	***Specification***	***Model***	***Specification***	***Model***	***Specification***
CS	 [1]	GS	 [1]	BS	 [1]
FS	 [1]	ES	 [1]		

[1] Insert models ending in the letter S have probe holes of shallower depths. Please call with questions.

Additel
Metrology Made Simple

ADT850
Laboratory Thermocouple Calibration Furnace

- Temperature control from 300°C to 1200°C
- 3-in-1 furnace with 9 unique modes
- Stability of ±0.1°C
- Radial uniformity of ±0.2°C @ 1200°C
- Axial uniformity of ±0.2°C @ 1200°C
- Multi-zone temperature control
- Quick cool technology
- Sliding probe holder provides mechanical stability and precise probe depth control
- Pivoting color touchscreen display
- Alumina and metal inserts available
- Patent pending EMF shielding technology
- Advanced safety control
- Wi-Fi Communications

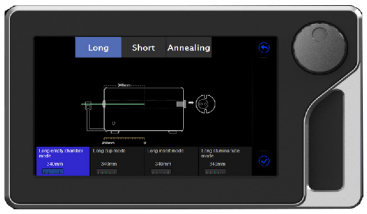
OVERVIEW

Thermocouple calibration work can be challenging. Here at Additel, we understand the difficulties of this type of work. Traditional furnace designs require several individual devices to meet industry standards for various calibration applications. To address this costly reality, Additel has created a multi-purpose furnace to help save time, money and space in your calibration facility. Our new ADT850 Laboratory Thermocouple Calibration Furnace is like having three separate furnaces is one. Users can select optimized settings for shorter probes, longer probes and even annealing purposes. The ADT850 horizontal furnace can be used in (9) different modes/ configurations to help meet even the most challenging calibration requirements and standards. Additel's 850 furnace is packed with many additional features and a performance you will not find anywhere else. The ADT850 is commonly used in a multitude of industries such as energy, calibration laboratories, aerospace and metallurgy to name a few. It is generally used by primary and secondary calibration laboratories to calibrate various length noble and base metal thermocouples with the lowest possible uncertainties. Additel's ADT850 is the most stable and versatile furnace available!

Industrial Design

With our customer's needs in mind, we have designed our all new ADT850 Laboratory Thermocouple Calibration Furnace with a modern look and feel. Users will experience that same easy to use menu structure and touchscreen interface that they have become accustom too when using genuine Additel products. The display pivots and tilts so users can customize the product to fit their needs.

The ADT850 also includes a sliding probe holder labeled with measurement gradients to help safely insert standard and UUT probes to correct depths. The advanced probe holder design includes a clamp to securely hold the test probe in place at all times.



Mode Selection

With an unmatched flexibility, the ADT850 provides calibration and annealing support for a wide variety of thermocouple types and lengths. The unique selectable "mode of operation" integrated into the touchscreen interface allows users to select from (9) different modes, accounting for immersion depths from 200 mm to 370 mm. This coupled with the variety of insert types to accommodate reliable and repeatable measurements for both metal and ceramic style probes, gives users the flexibility to easily calibrate a wide variety of thermocouple sizes and quantities. These groundbreaking features make the ADT850 Laboratory Thermocouple Calibration furnace the most versatile and cost saving full sized thermocouple calibration furnace on the market.

ADT110-850-ALUM
Tube Style Furnace Insert (Alumina)

ADT110-850-CUP-LONG
Cup Style Furnace Insert (Long version - Metal)

General Specifications

Specification	*ADT850*
Temperature Range	300°C to 1200°C
Heating Time	(23°C~1200°C) 40 mins, (empty well)
Cooling Time	(1200°C~300°C) 90 mins, (empty well)
Operating Conditions	0°C to 50°C, 0-90%RH (0°C~50°C), non-condensing, <2000 m altitude
Storage Temperature	-20°C to 70°C
Display Screen	7 in (178 mm) color touch screen
Display Resolution	0.01°C
Display Accuracy (Long empty chamber mode)	±5°C

Specification	*ADT850*
Heater Power	4000 W (220 V AC)
System Power	20 A, 220 V ±10% 50/60Hz
Power Protection	30 A, 250 V resettable circuit breaker
SIZE (W x H x L)	342 x 424 x 680 mm (13.5 x 16.7 x 26.8 in)
Weight	45 kg (99.2 lbs) without insert
Communication	Wi-Fi, Bluetooth, USB, LAN
Warranty	1 year

Performance Specifications

	Long (Deep) Immersion		
Mode	*Long empty chamber mode*	*Long cup mode / Long insert mode*	*Long alumina tube mode*
Application	Noble and base metal TC calibration	Base metal TC calibration	Noble metal TC calibration
Configuration (insert)	Empty chamber, without insert	Long cup insert or multi-hole insert	20 mm (ID) alumina tube
Insert Dimension	N/A	Cup insert: 36.5 X 28.5 X 80 mm Block insert: 36.5 X 80 mm	26 mm (OD) X 20 mm (ID) X 630 mm (L)
Immersion Depth	310 to 370 mm (geometrical center: 340 mm)	370 mm to the bottom of insert	310 to 370 mm(geometrical center: 340 mm)
Stability	±0.1°C full range	±0.1°C full range	±0.1°C full range
Axial Uniformity	±0.2°C full range (within ±30 mm axial length from geometrical center)	±0.2°C full range (within 60 mm from bottom of the insert)	±0.2°C full range (within ±30 mm axial length from geometrical center)
Radial Uniformity	±0.2°C @ 300°C ±0.2°C @ 700°C ±0.2°C @ 1200°C (within 14 mm from geometrical center)	±0.1°C @ 300°C ±0.15°C @ 700°C ±0.2°C @ 1200°C (within 14 mm from geometrical center)	N/A

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Performance Specifications

	Short Immersion			Annealing furnance
Mode	**Short empty chamber mode**	**Short cup mode / Short insert mode**	**Short alumina tube mode**	**TC annealing mode**
Application	Short noble and base metal TC Calibration	Short base Metal TC calibration	Short Noble Metal TC calibration	Nobel metal TC annealing
Configuration (insert)	Empty chamber, without insert	Short cup insert or multi-hole insert	16 mm (ID) alumina tube	Without insert
Insert Dimension	N/A	Cup insert: 36.5 X 28.5 X 80 mm Block insert: 36.5 X 80 mm	22 mm (OD) X 16 mm (ID) X 630 mm (L)	N/A
Immersion Depth	200 to 240 mm (geometrical center: 220 mm)	240 mm to the bottom of insert	200 to 240 mm (geometrical center: 220 mm)	100 mm to 500 mm
Stability	±0.1°C full range	±0.1°C full range	±0.1°C full range	±0.1°C full range
Axial Uniformity	±0.5°C in full range (within ±20 mm axial length from geometrical center)	±0.5°C in full range (within 40 mm from bottom of the insert)	±0.4°C full range (within ±20 mm axial length from geometrical center)	±20°C @1100°C within 400 mm range (from 100 to 500 mm)
Radial Uniformity	±0.3°C @ 300°C ±0.3°C @ 700°C ±0.3°C @ 1200°C (within 14 mm from geometrical center)	±0.25°C @ 300°C ±0.25°C @ 700°C ±0.25°C @ 1200°C (within 14 mm from geometrical center)	N/A	N/A

Ordering Information

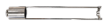
Model Number

ADT850 — 1200 — ALUM

Insert Style:
ALUM = Alumina tube (noble metal)
CUPL = Long cup style (base metal)
NO = No insert

Accessories

Standard Accessories		
Item / Model	***Quantity***	***Picture***
Power cord	1 pc.	
Network cable	1 pc.	
Type N Control TC-Left	1 pc.	
Type N Control TC-Middle	1 pc.	
Type N Control TC-Right	1 pc.	
Fuse, T12A 250V	3 pcs	
Nickle wire (Expt ADT850-1200-ALUM)	1 roll	
ADT110-850-ALUM (Only for ADT850-1200-ALUM)	1 set	
ADT110-850-CUP-LONG (Only for ADT850-1200-CUPL)	1 set	
Insulator set	2 sets	
Alumina tube 6 mm OD x 4 mm ID x 400 mm L	2 pcs	
Alumina tube 6 mm OD x 4 mm ID x 700 mm L	2 pcs	
Report of test with data	1 pc.	

Optional Accessories		
Model	***Description***	***Picture***
AM1210-20-CJ or AM1210-20	Reference TC - Type S: Platinum/10% Rhodium vs. platinum - 20" length (available w/ or without cold junction)	
9080	Cable Kit (includes TC plug, compensation cable, S,R,K,J,T,E,N)	
ADT110-850-CUP-LONG	TC calibration Cup, for base metal calibrations in the ADT850, includes: long immersion cup insert	
ADT110-850-CUP-SHORT	TC calibration Cup, for base metal calibrations in the ADT850, includes: short immersion cup insert	
ADT110-850-INS-LONG	TC calibration Insert, for base metal calibrations in the ADT850, includes: multi-hole insert for deep immersion (7 x 8.5 mm ID holes)	
ADT110-850-INS-SHORT	TC calibration Insert, for base metal calibrations in the ADT850, includes: multi-hole insert for short immersion (7 x 8.5 mm ID holes)	
ADT110-850-ALUM	TC calibration Kit, for noble metal calibrations in the ADT850, includes 26 mm OD x 20 mm ID x 630 mm L alumina tube (1 pc), 20 mm OD insulator (2 pcs),22 mm OD x 16 mm ID x 630 mm L alumina tube (1 pc), 16 mm OD insulator (2 pcs), 6 mm OD x 4 mm ID x 700 mm L alumina tube (2 pcs)	

AM1210-20-CJ Type S Reference Standard Thermocouple	
Temperature Range	0°C to 1300°C
Type	Type S: Platinum/10% Rhodium vs. platinum w/ cold junction
Long Term Drift	±0.5°C at 1084.62°C after 1 year typical usage
Short Term stability	±0.2°C at 1084.62°C
Diameter of thermocouple wire	0.5 mm
Sheath Material	Alumina
Sheath Dimensions	OD: 6 mm (0.236"); Length: 600 mm (23.6")
External Lead Wire	S type thermocouple wire 600 mm (23.6")
Protective Carrying Case	Included
Documentation	Report of test with data

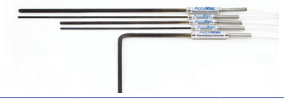
Note: ISO 17025 accredited probe calibration available, contact Additel for more information

TC Calibration Kit Ordering Information

ADT110 — 850 — Style • • Insert Length

Style: CUP, INS, ALUM
Insert Length: LONG, SHORT

Probe Selection Guide

Models	AM1612	AM1640	AM1660	AM1710	AM1730	AM1751	AM1760	AM1762	AM1210
Image									
Type	Full Immersion PRT	Precision Industrial PRT		Secondary Reference PRT			Secondary SPRT		Reference Type S TC
Temperature Range (°C)	-196 to 160	-200 to 420	-200 to 670	-40 to 160	-200 to 420	-200 to 670	-200 to 670		0 to 1300
Nominal Resistance at 0°C	100 Ω							25 Ω	N/A
Temperature Coefficient	0.00385 Ω/Ω/°C			0.003925 Ω/Ω/°C					N/A
Accuracy	<0.05°C at 0°C	<0.035°C at 0°C		<0.012°C at 0°C			<0.006°C at 0°C		See data sheet
Long Term Drift*	<0.04°C			<0.01°C			<0.004°C		<0.5°C at 1210°C after 1 year typical usage
Short Term Stability	<0.02°C	<0.01°C		<0.007°C			<0.002°C		<0.2°C at 1084.62°C
Thermal Shock**	<0.02°C	<0.007°C		<0.005°C			<0.002°C		N/A
Hysteresis	<0.01°C			<0.005°C			<0.001°C		N/A
Sheath Material	Stainless Steel	Inconel™		Stainless Steel	Inconel™				Alumina
Sheath Dimensions (OD x L)	3mm x 50mm or 3mm x 25mm	0.25in x 12in or 0.187in x 9in	0.25in x 12in	0.25in x 12in or 0.187in x 9in	0.25in x 12in or 0.187in x 9in	0.25in x 12in	0.25in x 12in or 0.25in x 20in		0.25in x 20in or 0.25in x 12in
Options	N/A	N/A		90°Bend	90°Bend		90°Bend		Cold Junction
Calibration***	ISO 17025 accredited calibration								Report of test
Typical Applications	Climate/humidity chambers and freezers for validation and calibration	A robust precision probe for temperature measurement in a variety of media		An affordable secondary reference grade probes designed for use in the laboratory, but also for demanding field calibration and measurement when tighter uncertainties are required			A secondary level SPRT for customers needing a reliable laboratory grade reference probe with tight uncertainty capabilities and long term stability		High temperature thermocouple calibration work, normally reserved for the laboratory, and used as reference TC in high temperature drywell and horizonal thermocouple calibration furnaces.

*For PRTs/SPRTs measured at TPW after 100 hours at max temperature
**For PRTs/SPRTs after 10 thermal cycles from minimum to maximum temperatures

Note:
1) Probe selection guide is for reference only, please see probes datasheets for more details
2) Carrying cases included for all AM17XX probes (excluding -BEND models)
AM16XX and AM1210 models do NOT include carrying cases

AccuMac AM1612
Full Immersion PRT

Additel
Metrology Made Simple

- Temperature Range: -200°C to 160°C
- Accuracy: <0.05°C
- Short-term Stability: <0.02°C
- Transition Junction and Lead Wires Can Withstand the Full Range of the PRT's
- Widely Used in Climate/Humidity Chambers and Freezers for Validation/Calibration
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1612 full immersion PRT is uniquely designed to provide users an excellent temperature probe that can expose the transition junction and the lead wires to an environment that covers the full PRT temperature range. The seal of the probe prevents the ingress of moisture so that the probe can work in humid conditions or even under full immersion in common heat transfer fluid such as ethanol, silicone oil and mineral oil. It has a wide application in freezers, temperature/humidity chambers and sterilizers.
The AM1612 is small in size with a probe length of 1.97 in (50 mm) and diameter of 0.12 in (3 mm). A unique assembly procedure provides the best balance among the hysteresis effect, mechanical shock and thermal shock performance. Each probe comes standard with an ISO 17025 accredited calibration.

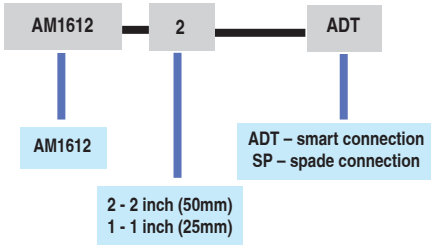
SPECIFICATIONS

	AM1612-2	AM1612-1
Temperature Range	-200°C to 160°C	-40°C to 160°C
Nominal Resistance at 0°C	100 Ω	
Temperature Coefficient	0.00385 Ω/Ω/°C	
Accuracy	±0.072°C at -200°C	N/A
	±0.05°C at -40°C	±0.05°C at -40°C
	±0.05°C at 0°C	±0.05°C at 0°C
	±0.05°C at 160°C	±0.05°C at 160°C
Long Term Drift at 0.01°C*	<0.04°C at TPW after 100 hours at 160°C	
Short Term Stability	<0.02°C	
Thermal Shock	<0.02°C after 10 thermal cycles from minimum to maximum temperatures	
Hysteresis	≤0.01°C	
Self-heating	75 mW/°C	
Response Time**	4 seconds	
Measurement Current	1 mA	
Sensor Length	1.18 in (30 mm)	0.59 in (15 mm)
Sensor Location	0.12 in (3 mm) from tip	
Insulation Resistance	>1000 MΩ at room temperature	
Sheath Material	Stainless Steel	
Sheath Dimensions	0.12 in (3 mm) (OD) x 1.97 in (50 mm) (L)	0.12 in (3 mm) (OD) x 0.98 in (25 mm) (L)
External Leads	AM1612-2 = 8.20 feet (2.5 meters)	AM1612-1 = 2.50 feet (0.8 meters)
Calibration	ISO 17025 accredited calibration	
Lead Composition	Enameled copper wire protected by high temperature heat shrink tubing, 4 leads	

*Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
**For 63% response to step change in water moving at 1 meter per second

ORDERING INFORMATION

Model Number



Note: Carrying case NOT included

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1660 & AM1640 Precision Industrial PRTs

Additel
Metrology Made Simple

- Temperature Range: -200°C to 670°C
- Accuracy: <0.035°C
- Long Term Drift: <0.03°C
- Short-term Stability: <0.01°C
- Durable and Shock Resistant
- Temperature Coefficient 0.00385 Ω/ Ω/ °C
- Inconel™ Sheath on AM1660/1640 Models
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1660 and AM1640 series Precision Industrial PRTs (IPRTs) are rugged probes with excellent accuracy and stability. These IPRTs cover a wide range of temperatures from -200°C to 670°C, with an amazing accuracy of ±0.035°C and a short term stability of ±0.01°C.
To reach the best performance in stability and repeatability, the wire-wound sensing element has been specially designed to protect the platinum sensing wire from contamination at high temperatures. A unique supporting structure and filling material provide the best balance among the hysteresis effect, mechanical shock and thermal shock performance. This probe conforms to the standard 385 curve and comes standard with an ISO 17025 accredited calibration.

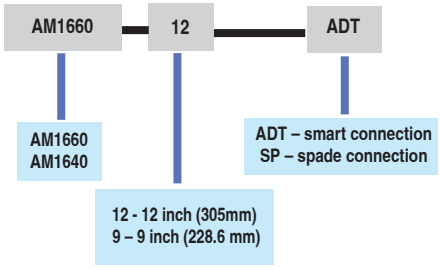
SPECIFICATIONS

	AM1660-12	AM1640-12	AM1640-9
Temperature Range	-200°C to 670°C	-200°C to 420°C	
Nominal Resistance at 0°C	100 Ω		
Temperature Coefficient	0.00385 Ω/Ω/°C		
Accuracy	<0.035°C at 0°C		
Long Term Drift at 0.01°C*	<0.03°C at 0°C after 100 hours at maximum temperature		
Short Term Stability	<0.01°C		
Thermal Shock	<0.007°C after 10 thermal cycles from minimum to maximum temperatures		
Hysteresis	≤0.01°C		
Self-heating	50 mW/°C		
Response Time**	5 seconds		
Measurement Current	0.5 mA or 1 mA		
Sensor Length	1.26 in (32 mm)		
Sensor Location	0.2 in (5 mm) from tip		
Insulation Resistance	>1000 MΩ at room temperature		
Sheath Material	Inconel™		
Sheath Dimensions	0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	0.188 in (4.775 mm) (OD) x 9 in (228.6 mm) (L)
External Leads	Teflon™ insulated copper wire, 4 leads, 6.5 feet (2 meters)		
Handle Dimension	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)	0.39 in (10 mm) (OD) x 1.97 in (50 mm) (L)
Handle Temperature Range	-50°C to 180°C		
Calibration	ISO 17025 accredited calibration		

*Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
**For 63% response to step change in water moving at 1 meter per second

ORDERING INFORMATION

Model Number



Note: AM1660 is only available in 12 inch (305 mm) long configuration
Carrying case NOT included

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1710
Secondary Reference PRT

Additel
Metrology Made Simple

- Temperature Range: -40°C to 160°C
- Accuracy: <0.012°C at 0.01°C
- Long Term Drift: <0.01°C
- Short-term Stability: <0.007°C
- Durable and Shock Resistant
- Temperature Coefficient 0.003925 Ω/ Ω/ °C
- Fully Meets the ITS-90 Criteria for Reference Thermometers
- Stainless Steel Sheath
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1710 series of Secondary Reference PRTs offers affordable reference probes for precision temperature measurement and calibration both in the lab and in the field. These PRTs feature an accuracy of <0.012°C and a short term stability of <0.007°C.
To reach the best performance in stability and repeatability, the sensing element has been specially designed to protect the platinum sensing wire from contamination at high temperatures. A unique supporting structure and filling material provide the best balance among the hysteresis effect, mechanical shock and thermal shock performance. This high performance probe fully meets the ITS-90 criteria for reference thermometers. Each probe comes standard with an ISO 17025 accredited calibration.

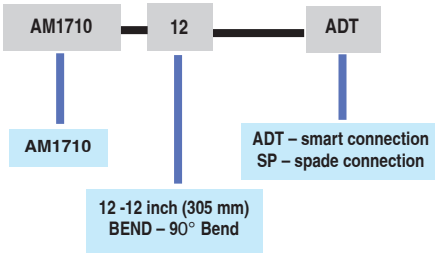
SPECIFICATIONS

	AM1710-12	AM1710-BEND
Temperature Range	-40°C to 160°C	
Nominal Resistance at 0.01°C	100 Ω	
Temperature Coefficient	0.003925 Ω/Ω/°C	
Calibrated Accuracy (k=2)[1][2]	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	
Long Term Drift at 0.01°C[3]	<0.01°C at TPW after 100 hours at 160°C	
Short Term Stability	<0.007°C	
Thermal Shock	<0.005°C after 10 thermal cycles from minimum to maximum temperatures	
Hysteresis	≤0.005°C	
Self-heating	50 mW/°C	
Response Time[4]	9 seconds	
Sheath Length	12 in (305 mm)	7 in (178 mm) from tip to bend 4 in (101.6 mm) from bend to handle
Sheath Diameter	0.25 in (6.35 mm)	
Sensor Element Length	1.26 in (32 mm)	
Sensor Element Location	0.12 in (3 mm) from tip	
Insulation Resistance	>1000 MΩ at room temperature	
Sheath Material	Stainless steel	
External Leads	Teflon™ insulated copper wire, 4 leads, 6.5 feet (2 meters)	
Handle Dimension	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)
Handle Temperature Range	-40°C to 160°C	
Calibration	ISO 17025 accredited calibration	

[1] Includes calibration and 100 hour drift.
[2] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).
[3] Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
[4] For 63% response to step change in water moving at 1 meter per second.

ORDERING INFORMATION

Model Number



Note: Carrying case included (excludes -BEND probes)

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1730
Secondary Reference PRT

Metrology Made Simple

- Affordable Reference Probe
- Accuracy: <0.012°C at 0.01°C
- Short-term Stability: <0.007°C
- Temperature Range: -200°C to 420°C
- Sheath Diameters Available in 2 Configurations: 1/4 inch and 3/16 inch
- Inconel™ Sheath to Withstand Harsh Environments
- Fully Meets the ITS-90 Criteria for Reference Thermometers
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1730 series of Secondary Reference PRTs offers affordable reference probes for precision temperature measurement and calibration both in the lab and in the field. These PRTs feature an accuracy of <0.012°C and a short term stability of <0.007°C.

To reach the best performance in stability and repeatability, the sensing element has been specially designed to protect the platinum sensing wire from contamination at high temperatures. A unique supporting structure and filling material provide the best balance among the hysteresis effect, mechanical shock and thermal shock performance. This high performance probe fully meets the ITS-90 criteria for reference thermometers. Each probe comes standard with an ISO 17025 accredited calibration.

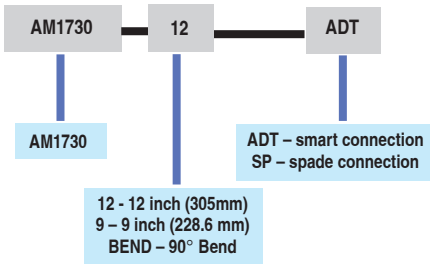
SPECIFICATIONS

	AM1730-12	AM1730-9	AM1730-BEND
Temperature Range	-200°C to 420°C	-200°C to 420°C	-200°C to 420°C
Nominal Resistance at 0.01°C	100 Ω		
Temperature Coefficient	0.003925 Ω/Ω/°C		
Calibrated Accuracy (k=2)[1][2]	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.035°C at 420°C		
Long Term Drift at 0.01°C[3]	<0.01°C at TPW after 100 hours at max temperature		
Short Term Stability	<0.007°C		
Thermal Shock	<0.005°C after 10 thermal cycles from minimum to maximum temperatures		
Hysteresis	≤0.005°C		
Self-heating	50 mW/°C		
Response Time[4]	9 seconds	6 seconds	9 seconds
Measurement Current	0.5 mA or 1 mA		
Sensor Length	1.26 in (32 mm)		
Sensor Location	0.12 in (3 mm) from tip		
Insulation Resistance	>1000 MΩ at room temperature		
Sheath Material	Inconel™		
Sheath Dimensions	0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	0.188 in (4.775 mm) (OD) x 9 in (228.6 mm) (L)	0.25 in (6.35 mm) (OD) x 9.75 in (247.65 mm) vertical x 4.5 in (114.3 mm) horizontal
External Leads	Teflon™ insulated copper wire, 4 leads, 6.5 feet (2 meters)		
Handle Dimension	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)	0.39 in (10 mm) (OD) x 1.97 in (50 mm) (L)	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)
Handle Temperature Range	-50°C to 180°C		
Calibration	ISO 17025 accredited calibration		

[1] Includes calibration and 100 hour drift.
[2] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).
[3] Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
[4] For 63% response to step change in water moving at 1 meter per second.

ORDERING INFORMATION

Model Number



Note: Carrying case included (excludes -BEND probes)

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1751
Secondary Reference PRT

Additel
Metrology Made Simple

- Affordable Reference Probe
- Temperature Range: -200°C to 670°C
- Accuracy: <0.012°C at 0.01°C
- Short-term Stability: <0.007°C
- Temperature Coefficient 0.003925 Ω/Ω/°C
- Fully Meets the ITS-90 Criteria for Reference Thermometers
- Inconel™ Sheath to Withstand Harsh Environments
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1751 series of Secondary Reference PRTs offers affordable reference probes for precision temperature measurement and calibration both in the lab and in the field. These PRTs feature an accuracy of <0.012°C and a short term stability of <0.007°C.
To reach the best performance in stability and repeatability, the sensing element has been specially designed to protect the platinum sensing wire from contamination at high temperatures. A unique supporting structure and filling material provide the best balance among the hysteresis effect, mechanical shock and thermal shock performance. This high-performance probe fully meets the ITS-90 criteria for reference thermometers. Each probe comes standard with an ISO 17025 accredited calibration.

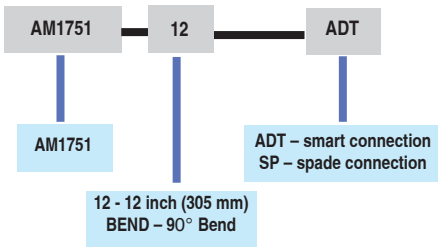
SPECIFICATIONS

	AM1751-12	AM1751-BEND
Temperature Range	-200°C to 670°C	
Nominal Resistance at 0.01°C	100 Ω	
Temperature Coefficient	0.003925 Ω/Ω/°C	
Accuracy	<0.012°C at 0.01°C	
Long Term Drift at 0.01°C*	<0.01°C at TPW after 100 hours at 661°C	
Short Term Stability	<0.007°C	
Thermal Shock	<0.005°C after 10 thermal cycles from minimum to maximum temperatures	
Hysteresis	≤0.005°C	
Self-heating	50 mW/°C	
Response Time**	9 seconds	
Measurement Current	0.5 mA or 1 mA	
Sensor Length	1.26 in (32 mm)	
Sensor Location	0.12 in (3 mm) from tip	
Insulation Resistance	>1000 MΩ at room temperature	
Sheath Material	Inconel™	
Sheath Dimensions	0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	0.25 in (6.35 mm) (OD) x 9.75 in (247.65 mm) vertical x 4.5 in (114.3 mm) horizontal
External Leads	Teflon™ insulated copper wire, 4 leads, 6.5 feet (2 meters)	
Handle Dimension	0.59 in (15 mm) (OD) x 2.56 in (65 mm) (L)	
Handle Temperature Range	-50°C to 180°C	
Calibration	ISO 17025 accredited calibration	

*Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
**For 63% response to step change in water moving at 1 meter per second.

ORDERING INFORMATION

Model Number



Note: Carrying case included (excludes -BEND probes)

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1760 & AM1762 Secondary SPRTs

Additel
Metrology Made Simple

- Reliable SPRT for Daily Use
- Rtpw Drift: <4mK after 100hrs at 661°C
- Short-term Stability : <0.002°C at 0.01°C
- Temperature Range: -200°C to 670°C
- Inconel™ Sheath to Withstand Harsh Environments
- Fully Meets the ITS-90 Criteria for Reference Thermometers
- ISO 17025 Accredited Calibration Included

OVERVIEW

The AM1760 series Secondary SPRTs provides our customers with reliable secondary standards that can be used daily in their labs. These SPRTs feature an accuracy of <0.006°C at 0.01°C, a short term stability of <0.002°C and a very low drift rate of less than 0.004°C after 100 hours at 661°C. Two different lengths of these SPRTs are available at either12 inches (305 mm) or 20 inches (508 mm).
The sensing element is designed to protect the platinum sensing wire from contamination at high temperatures, giving these SPRTs a high level of stability and repeatability in performance. A uniquely designed support structure and filling material provides excellent balance between the hysteresis effect, mechanical shock and thermal shock performance. This high performance probe fully meets the ITS-90 criteria for reference thermometers. Each probe comes standard with an ISO 17025 accredited calibration.

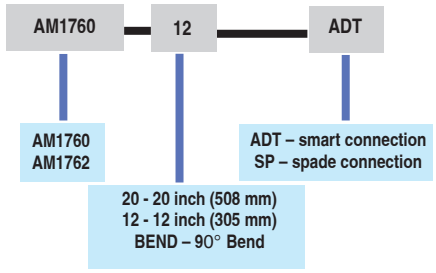
SPECIFICATIONS

	AM1760	AM1762	AM1760/AM1762-BEND
Temperature Range	-200°C to 670°C		
Nominal Resistance at 0.01°C	**100 Ω**	**25 Ω**	**100 Ω / 25 Ω**
Temperature Coefficient	0.003925 Ω/Ω/°C		
Calibrated Accuracy (k=2)[1][2]	±0.010°C at -196°C ±0.006°C at 0.01°C ±0.015°C at 420°C ±0.025°C at 661°C		
Long Term Drift at 0.01°C[3]	<0.004°C at TPW after 100 hours at 661°C		
Short Term Stability	<0.002°C		
Thermal Shock	<0.002°C after 10 thermal cycles from minimum to maximum temperatures		
Self-heating	0.0015°C at 0.5 mA current	0.0015°C at 1 mA	0.0015°C at 0.5 mA 0.0015°C at 1 mA
Response Time[4]	9 seconds		
Measurement Current	0.5 mA	1 mA	0.5 mA / 1 mA
Sensor Length	1.65 in (42 mm)		
Sensor Location	0.2 in (5 mm) from tip		
Insulation Resistance	>1000 MΩ at room temperature		
Sheath Material	Inconel™		
Sheath Dimensions	1760-20: 0.25 in (6.35 mm) (OD) x 20 in (508 mm) (L) 1760-12: 0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	1762-20: 0.25 in (6.35 mm) (OD) x 20 in (508 mm) (L) 1762-12: 0.25 in (6.35 mm) (OD) x 12 in (305 mm) (L)	0.25 in (6.35 mm) (OD) x 9.75 in (247.65 mm) vertical x 4.5 in (114.3 mm) horizontal
External Leads	Teflon™ insulated copper wire, 4 leads, 3.5 feet (2 meters)		
Handle Dimension	0.59" (15 mm) (OD) x 2.56" (65 mm) (L)		
Handle Temperature Range	-50°C to 180°C		
Calibration	ISO 17025 accredited calibration		

[1] Includes calibration and 100 hour drift.
[2] Probe calibration ranges may differ from probe temperature ranges (see Calibrated Accuracy for calibration ranges).
[3] Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.
[4] For 63% response to step change in water moving at 1 meter per second.

ORDERING INFORMATION

Model Number



Note: Carrying case included (excludes -BEND probes)

Optional Accessories			
Model	***Quantity***	***Description***	***Picture***
9070	1 pc	Smart connector for reference PRT for use with Additel temperature products	
9071	1 pc	Connector adapter from Additel smart connector to 4-wire with gold plated spades	
9072	1 pc	Connector adapter from Additel smart connector to 4-wire with clamps	

AccuMac AM1210
Reference Standard Type S Thermocouple

Additel
Metrology Made Simple

- Affordable Reference Standard
- Type S
- Short-term Stability: <0.2°C at 1084.62°C
- Temperature Range: 0°C to 1300°C

OVERVIEW

The AM1210 Reference Standard Type S Thermocouple is made from reference grade platinum and platinum-rhodium alloy. It covers a temperature range from 0°C to 1300°C with a short term stability of <0.2°C all the way to the Freezing Point of Copper (1084.62°C). It is commonly used as a reference standard to calibrate industrial thermocouples. All thermocouple wires and parts are specially cleaned and annealed before assembly. Every AM1210 thermocouple is fully annealed and tested again after assembly to meet the tolerance criteria as specified below:

$E(tCu)=10.575 \pm 0.015$

$E(tAl)=5.860+0.37(E(tCu)-10.575) \pm 0.005$

$E(tZn)=3.447+0.18(E(tCu)-10.575) \pm 0.005$

SPECIFICATIONS

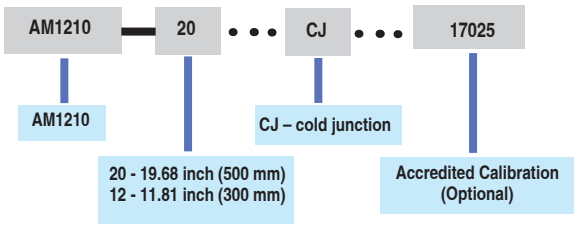
	AM1210-20	AM1210-12
Temperature Range	0°C to 1300°C	
Type	Type S: Platinum/10% Rhodium vs. Platinum	
Long Term Drift*	<0.5°C at 1210°C after 1 year typical usage	
Tolerance (mV)	E(tCu)=10.575 ±0.015 E(tAl)=5.860+0.37(E(tCu)-10.575) ±0.005 E(tZn)=3.447+0.18(E(tCu)-10.575) ±0.005	
Short Term Stability	<0.2°C at 1084.62°C	
Diameter of thermocouple wire	0.02 in (0.5 mm)	
Sheath Material	Alumina	
Sheath Dimensions	0.236 in (6mm) (OD) x 19.68 in (500 mm) (L)	0.236 in (6mm) (OD) x 11.81 in (300 mm) (L)
Total TC Wire Length	47.25 in (1200 mm)	39.37 in (1000 mm)
Documentation**	Report of test with data	

*Long-term drift rate is for reference only. It could be affected by such facts as handling, application, and maintenance, etc.

** For 17025 accredited calibration, please contact Additel.

ORDERING INFORMATION

Model Number



Note: Carrying case included

Additel 260Ex
Handheld Multichannel Reference Recorder

- **Up to 8 measurement channels**
- **Intrinsically safe**
- **Field Switchable Pressure Module**
- Data logging with Real-time Graphical Trending
- Supports Hydrostatic Testing
- Color Touchscreen Display
- Built-in Barometer
- Optional RTD Probes Available
- Bluetooth and USB Communication
- Communicates with Additel's Link Mobile App

Metrology Made Simple

Additel 260Ex with ADT158Ex module

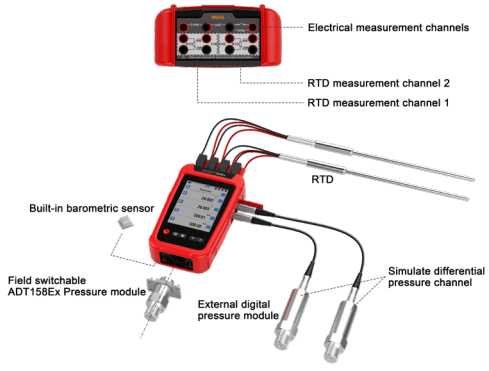
OVERVIEW

Additel's 260Ex is an intrinsically safe handheld multichannel reference recorder with 8 different channel configurations. Armed with Additel's most versatile and capable handheld, technicians are now able to measure and collect data for pressure, temperature (RTD probes available), barometric pressure and electrical measurement all in one highly portable device. The powerful logging capability and high-level of intrinsic safety make the ADT260Ex the perfect companion for use in the pipeline industry by supporting hydrostatic pressure testing, air leak testing, inlet and outlet pressure testing at pump stations, safety valve and ex-proof membrane testing, wellhead pressure testing, pipeline filter testing, differential pressure transmitter/flow computing testing, as well as routine calibration of pressure devices.

Intrinsically Safe:
The ADT260Ex has passed the most stringent ATEX, IECEX intrinsic safety certifications. Each unit complies with a certification level of Ex ia IIC T4 Ga. This highly qualified reference recorder can be widely used in potentially explosive gas environments, such as oil and gas platforms, refineries, chemical and petrochemical plants, pharmaceutical industry, energy and gas processing industry.

Datalogging Capabilities:
The Additel 260Ex includes a sizable built-in automatic recording capability which supports multi parameter logging, trend curve display, local curve observation and statistical feedback. The logged results are stored onboard and can be viewed locally. The data storage capacity is up to 10 million readings (single channel) with a logging interval that is configurable from 0.1s ~ 9999s.

8 Channel Combinations:
Channel 1: Built-in digital pressure module, field switchable
Channel 2: Built-in barometer, which can be calibrated by the user
Channels 3 and 4: External digital pressure module inputs
Channel 5: Simulated differential pressure channel synthesized using channels 3 and 4
Channels 6 and 7: Temperature measurement channels supporting resistance sensors with 2, 3 or 4 wires
Channel 8: Measures current, voltage, frequency, pulse or switch testing. Built-in loop power included.



Additel
Metrology Made Simple

FUNCTIONAL FEATURES

Functional Features	Details
RTD Measurement	2, 3, or 4 wire (user selectable). Unit measurement as °C, °F, K or ohms.
Filtering	Average sliding filter (sample 1-50) first-order linear filter (coefficient 0.01-1)
Switch	The measurement value will be automatically displayed at the moment the switch changes state. The latest 8 state changes will be stored in the memory.
Pressure Tare	Tare value is set through the user interface
Pressure stability indicator	Stability time and criteria is selectable
Power management	Backlight auto off Auto power off

SPECIFICATIONS

General Specification	
Input Channel	Top: 2 channels RTD measurement, 1 channel electric signal measurement, ϕ4mm banana jacks
	Right side: 2 channels for external digital pressure module, Lemo style connection
	Bottom: embedded digital pressure module (model ADT158Ex) field switchable.
	Internal: 1 embedded atmospheric pressure sensor
Barometric Accuracy	±55Pa
Measurement Rate	mV, V, mA & frequency and RTD: 3 times/ sec
	Pressure module: 1~10 times/sec selectable (3 as default)
	Barometric: 1 times/ sec
Data Storage	Logging interval: from 0.1~9999 seconds, log up to 10 million readings (single channel)
Power	4000mAh, 14.4Wh explosion-proof intelligent lithium battery, charging time is 6~8 hours, the battery can be charged independently Typical working time 100 hours (measurement mode)
Environmental	Guaranteed temperature range of technical specifications: (-10 ~ 50)°C *Temperature coefficient: ±5 ppm FS/°C (-20 to -10)°C
	Operating temperature: (-20 ~ 50)°C
	Storage temperature range: (-30 ~ 70)°C
	Humidity: 0% to 95% RH, non-condensing
	Altitude: 3000 meters
Warm Up Time	10 minutes to fully meet technical specifications
Port Protection Voltage	30V max
Explosion-proof Grade	ATEX & IECEX: Ex ia IIC T4 Ga (Ta = -20°C to +50°C)
CE Certification	TUV IEC61326, IEC61010
Rohs Compliance	Rohs II Directive 2011/65/EU,EN50581:2012
Protection Level	IP67, 1 meter drop test
Communication	IIsolate USB-TYPEC (slave), Bluetooth
Display	4.4-inch color display capacitive screen, transflective, with LED backlight
Size	6.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm) which does not include the bottom mount ADT158Ex if installed.
Weight	1.65 lb (0.75 kg)
Warranty Time	1 year

Electrical Specifications

Specification	Range	Accuracy	Resolution	Note
RTD Measurement Accuracy	0~400 Ω	0.01%RDG + 20 mΩ[1]	1 mΩ	Excitation current: 1 mA
Voltage Measurement	±300 mV	0.015%RDG + 1.5 mV	1 uV	Impedance: >100 MΩ
	±30 V	0.015%RDG + 1.5 μA	0.1 mV	Impedance: >1 MΩ
Current Measurement	±30 mA	0.015%RDG + 1.5 μA	0.1 uA	Impedance: < 40 Ω
Frequency Measurement	0.01~50000Hz (auto range)	0.005% RDG + 2 last digit	6-digit auto-resolution	Min threshold voltage: 2.5V
	Units: Hz, kHz, MHz, CPM, CPH, s, ms, us			
Switch On-Off Measurement	Inspection voltage: (3 ~ 30)V Response speed: < 10ms, supports wet and dry switch			
Pulse Count	0 ~ 9999999, optional rising edge and falling edge Min threshold voltage: 2.5 V			
Loop Power	22 V ± 10%, max output impedance: 320 Ω, max load current: 25 mA			

Note [1]: Accuracy applies to 4-wire probes. For 3-wire probes add 10 mΩ, for 2-wire probes add 50 mΩ

PRESSURE TECHNICAL SPECIFICATIONS

Specifications	
Pressure resolution	4, 5, or 6 digit resolution (user selectable)
Measurement Units[1]	kPa, Pa, GPa, MPa, mPa, uPa, hPa, bar, mbar, torr, mtorr, atm, psi, psia, psig, gf/cm2, kgf/cm2, inH2O@4°C, inH2O@68°F, mmH2O@4°C, mmH2O@20°C, ftH2O@4°C, ftH2O@68°F, inHg@0°C, mmHg@0°C, lb/ft2, tsi, psf, inH2O@60°F, ftH2O@60°F, cmH2O@4°C, mH2O@4°C, cmHg@0°C, mHg@0°C, kgf/m2
Temperature Compensation	-10°C~50 °C
Pressure Module Type	Built-in digital pressure module: ADT158Ex, for more detailed information, please see ADT 158Ex datasheet. External digital pressure module: ADT161Ex,for more detailed information, please see ADT 161Ex datasheet.
Specifications	Refer to the technical specification of the ADT158Ex and ADT161Ex.
High Static Pressure and Differential Pressure Synthesis Index[2]	Two modules must be with the same range; Typical Differential pressure accuracy of 0.002%FS or 0.02%RD, whichever is greater when using two 0.02%FS external modules. Typical Differential pressure accuracy of 0.002%FS or 0.05%RD, whichever is greater when using two 0.05%FS external modules.

[1] Available units are dependent on the overall pressure range.
[2] For more explanation, please reference application note "Achieving High Accuracy for High Static Differential Pressure Measurements".

Pressure Ranges

Gauge Pressure [1]

P/N	Pressure Range (psi)	Pressure Range (bar)	Media [2]	Accuracy (%FS)	Burst Pressure
V15	-15	-1.0	G	0.02	3×
GP2	2	0.16	G	0.05	3×
GP5	5	0.35	G	0.05	3×
GP10	10	0.7	G	0.02	3×
GP15	15	1.0	G	0.02	3×
GP30	30	2.0	G	0.02	3×
GP50	50	3.5	G , L	0.02	3×
GP100	100	7.0	G , L	0.02	3×
GP150	150	10	G , L	0.02	3×
GP300	300	20	G , L	0.02	3×
GP500	500	35	G , L	0.02	3×
GP600	600	40	G , L	0.02	3×
GP1K	1,000	70	G , L	0.02	3×
GP1.5K	1,500	100	G , L	0.02	3×
GP2K	2,000	140	G , L	0.02	3×
GP3K	3,000	200	G , L	0.02	3×
GP5K	5,000	350	G , L	0.02	3×
GP10K	10,000	700	G , L	0.02	2×
GP15K	15,000	1,000	G , L	0.05	2x
GP20K	20,000	1,400	G , L	0.05	1.5x
GP25K	25,000	1,600	G , L	0.05	1.5x
GP30K	30,000	2,000	G , L	0.05	1.5x
GP36K	36,000	2,500	G , L	0.05	1.5x
GP40K	40,000	2,800	G , L	0.05	1.35x
GP50K	50,000	3,500	G , L	0.1	1.2x
GP60K	60,000	4,200	G , L	0.1	1.1x

Compound Pressure

P/N	Pressure Range psi	Pressure Range bar	Media	Accuracy	Burst Pressure
CP2	±2	±0.16	G	0.05% FS	3x
CP5	±5	±0.35	G	0.02% FS	3x
CP10	±10	±0.7	G	0.02% FS	3x
CP15	±15	±1.0	G	0.02% FS	3x
CP30	-15 to 30	-1 to 2.0	G	0.02% FS	3x
CP50	-15 to 50	-1 to 3.5	G	0.02% FS	3x
CP100	-15 to 100	-1 to 7.0	G,L	0.02% FS	3x
CP300	-15 to 300	-1 to 20	G,L	0.02% FS	3x
CP500	-15 to 500	-1 to 35	G,L	0.02% FS	3x
CP600	-15 to 600	-1 to 40	G,L	0.02% FS	3x
CP1K	-15 to 1,000	-1 to 70	G,L	0.02% FS	3x
CP2K	-15 to 2,000	-1 to 140	G,L	0.02% FS	3x
CP3K	-15 to 3,000	-1 to 200	G,L	0.02% FS	3x
CP5K	-15 to 5,000	-1 to 350	G,L	0.02% FS	3x
CP10K	-15 to 10,000	-1 to 700	G,L	0.02% FS	2x

[1] Sealed gauge pressure for above 1000 psi
[2] G=Gas, L=Liquid

Additel
Metrology Made Simple

ORDERING INFORMATION

Model Number

ADT260EX — GP300 — PSI — N

Pressure range P/N:
See pressure range tables above

Range type:
PSI-range by psi
BAR-range by bar

Pressure port type:
N- 1/4NPT male
N2- 1/2NPT male
B-1/4BSP male
B2-1/2BSP male
M-M20X1.5 male
AF-Autoclave F-250-C female
AM-Autoclave M-250-C male

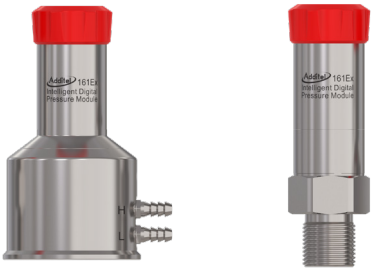
Note: The ADT260Ex can be purchased without the ADT158Ex module
If needed using the following part numner:
ADT260EX-NO

ADT260Ex with AM1602 temperature probe

Accessories (included)		
Model number	**Description**	**QTY**
9811Ex-X	110V/220V external power adapter	1 pc
9704Ex	Chargeable Li-ion battery	1 pc
9021	Test leads	5 sets (10 pcs)
9040	Hanging strap with magnet	1 pc
9052Ex	Ex USB Cable type A to type C (For Ex models only)	1 pc
	ISO 17025 accredited calibration certificate	1 pc

Optional Accessories	
Model number	**Description**
ADT158Ex	Built-in digital pressure module (see ADT158Ex datasheet)
ADT161Ex	External digital pressure module (see ADT161 datasheet)
AM1602-6FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 6 foot (1.8 Meters) cable w/ banana jack connectors
AM1602-15FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 15 foot (4.5 Meters) cable w/ banana jack connectors
AM1602-30FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 30 foot (9 Meters) cable w/ banana jack connectors
AM1602-60FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 60 foot (18.2 meters) cable w/ banana jack connectors
AM1602-100FT[1]	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 100 foot (30.5 meters) cable w/ banana jack connectors
9060	Pressure module connection cable
9905	Hard carrying case for handheld calibrators and readouts with space for two RTDs
9918-SC	Soft carrying case, with space for handheld instrument, test leads, and accessories
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9073	Lemo connector, male, non-programmable (for use with 9083 and ADT260EX for temp probe)
9083	Adapter from Lemo to banana jacks for ADT260EX temp measurement
9530-NET	Additel/Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license

Note:
[1] For custom RTD cable lengths over 100 feet (30 meters), which will adhere to Class B, please contact Additel.



"ADT161Ex pressure modules - See ADT161 Datasheet for more info"

"ADT158Ex pressure module - for use with ADT260Ex (bottom mount)"

Additel 209 and 210 Series Loop Calibrator

Metrology Made Simple

- Accuracy to 0.01% of reading
- Small and rugged handheld design
- Measure, source, or simulate loop current
- Measure DC volts
- Simultaneously mA and % span display
- Switch functionality
- Selectable ramp and step functions
- Easy to read display and user interface
- HART 250Ω resistor in series with 24V loop

OVERVIEW

The new Additel 209 and 210 loop calibrator series combine ease of use and functionality, making them the ideal tools to troubleshoot your process loop. The ADT209 has an accuracy of 0.03% of reading whereas the ADT210 holds an accuracy of 0.01% of reading. If you want to source, simulate or simply measure, the Additel Loop calibrator series will fit your need. The ADT209 and ADT210 allow for measurement of current, voltage and a switch. You can also simulate or source mA or a process transmitter. With a push of a button, you can switch to zero and span values, auto ramp, and auto step throughout the range. Each loop calibrator has a large, easy to read screen which simultaneously displays the measurement with the % of span.

ELECTRICAL MEASURE SPECIFICATIONS

	Range	Resolution	ADT209 Accuracy	ADT210 Accuracy
Voltage DC[1]	0 to 30 V	1 mV	0.03%RD + 2mV	0.01%RD + 2mV
Current DC[2]	0 to 24 mA	1 µA	0.03%RD + 2µA	0.01%RD + 2µA
Switch test	Input resistance more than 500 MΩ Trigger level: low level <0.3V; high level: >2V			

[1] 1MΩ input resistance
[2] Loop transmitter current measure: 700Ω maximum

ELECTRICAL SOURCE SPECIFICATIONS

	Range	Resolution	ADT209 Accuracy	ADT210 Accuracy
Current DC	0 to 24 mA	1 µA	0.03%RD + 2 µA	0.01%RD + 2 µA
Source mode	700Ω/20 mA maximum			
Sink mode	External loop voltage nominal 24 V, maximum 30 V, minimum 12 V			

GENERAL SPECIFICATIONS

Voltage limit	30 V between terminals or between terminals and ground
Measurement Functions	Auto step, auto ramp, span step
Display	VA LCD display. 2.04 x 2.04 in (52 x 52 mm)
Loop power	24 V
Over-voltage protection	30 V DC (240 V AC)
Overload current protection	33 mA DC
Storage temperature	-20°C to 70°C
Working Environment	-10 to 50°C, 95%RH
Working Altitude	<3,000 m
Vibration/shock	Random 2G 5 to 500 Hz 1 meter drop
Power	One 9 V alkaline battery (ANSI/NEDA 1604A or IEC) DC9 V optional adapter available
Battery life (typical)	Output mode: 18 hours (12 mA/500Ω) Measure mode: 50 hours
Size (LxWxH)	163 x 83 x 41 mm
Weight	350 g
Calibration Certification	ISO 17025 Accredited Calibration with data
Compliance Certification	ADT209: CE ADT210: CE
Warranty	3 years

ORDERING INFORMATION

Model Number

ADT209

ADT210

Accessories included

9024	Test lead set	1 set
	Alligator clips	2 pcs
	9V Alkaline battery	1 pc

Optional Accessories

9812	110V/220V external power adapter (DC 9V)

ADT226 Multifunction Process Calibrators & ADT227 Documenting Multifunction Process Calibrators

Selection Guide

Models		ADT226 Multifunction Process Calibrator	ADT227 Documenting Multifunction Process Calibrator	ADT227-HART Documenting Multifunction Process Calibrator	ADT226Ex Multifunction Process Calibrator	ADT227Ex Documenting Multifunction Process Calibrator	ADT227Ex-HART Documenting Multifunction Process Calibrator
Measure							
Voltage	mV DC	±300 mV	±300 mV	±300 mV	±300 mV	±300 mV	±300 mV
	V DC	±30 V	±30 V	±30 V	±30 V	±30 V	±30 V
High Voltage	V DC/AC	±300V DC/AC	±300V DC/AC	±300V DC/AC			
Current (mA DC)		±30 mA	±30 mA	±30 mA	±30 mA	±30 mA	±30 mA
Resistance		0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω
Frequency		0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz
Pulse		0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999
Limit Switch		•	•	•	•	•	•
Thermocouple TC		-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV
Pressure Module Serial Ports		2	2	2	2	2	2
Source / Simulate							
Voltage (V DC)		-15 V - 15 V	-15 V - 15 V	-15 V - 15 V	0 - 10.5 V	0 - 10.5 V	0 - 10.5 V
Current (mA DC)		0 - 25 mA	0 - 25 mA	0 - 25 mA	0 - 25 mA	0 - 25 mA	0 - 25 mA
Resistance		0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω	0 - 4000 Ω
Frequency (Square wave,Sine wave & Triangular wave)		0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz	0.01 - 50,000 Hz
Pulse		0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999	0 - 9,999,999
Thermocouple TC		-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV	-10 - 75 mV
Recording							
Scaling		•	•	•	•	•	•
Min/Max/Avg/Tare		•	•	•	•	•	•
Hold		•	•	•	•	•	•
Task			•	•		•	•
On-demand Logging			10,000 readings	10,000 readings			
Features							
Intrinsically Safe (Ex)					•	•	•
Color Touchscreen Display		•	•	•	•	•	•
Port Protection		50V Max	50V Max	50V Max	Pi = 0.75W, Ui = 30V, Ii = 100mA	Pi = 0.75W, Ui = 30V, Ii = 100mA	Pi = 0.75W, Ui = 30V, Ii = 100mA
Loop power		24 V	24 V	24 V	22 V	22 V	22 V
Ramp/step		•	•	•	•	•	•
Simulate Transmitter		•	•	•	•	•	•
RTD		•	•	•	•	•	•
Thermocouple TC		•	•	•	•	•	•
Internal CJC		•	•	•	•	•	•
Bluetooth		•	•	•	•	•	•
HART Communication				•			•
Full HART Communicator				•			
Documenting			•	•		•	•
IP67 Compliance		•	•	•	•	•	•
Warranty		3 Years	3 Years	3 Years	3 Years	3 Years	3 Years
ISO 17025 Accredited Calibration		•	•	•	•	•	•

Additel 226, 226Ex
Multifunction Process Calibrator

- Sourcing, Simulating and Measuring Pressure, Temperature and Electrical Signals
- Built-in Barometer
- Intrinsically Safe Models Available (Ex)
- Large Smartphone Like Touchscreen User Experience
- USB Type-C and Bluetooth Communications
- IP67 Rated
- High Voltage Measurement Capability (300V AC)
- True RMS Voltage Meter Capability
- Dual Channel Pressure Module Ports
- High Static Differential Pressure Measurement 0.002% FS
- ISO 17025-accredited Calibration w/data Included

OVERVIEW

Additel's new Multi-functional Process Calibrator series takes portability, functionality, and accuracy to a whole new level and packages it with an intuitive and easy to use color touchscreen display. The ADT226 is a powerful yet cost effective process calibrator, which has an ATEX certified intrinsically safe option - ADT226Ex allowing you to perform calibration work in the harshest of environments. We're confident these new tools will not only meet your calibration requirements but will make metrology simple for you!

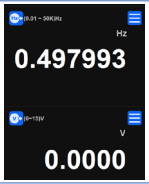
Features

Easy-to-use Cellphone Like Interface

The ADT226 series brings an all new user interface to the world of process calibrators. With a menu driven interface and small size/weight, the ADT226 is the industry's smallest multifunctional process calibrator with an intrinsically safe version to boot (ADT226Ex).

It adopts advanced human hand engineering design for the most convenient field handheld process calibrator available. The ADT226 has been developed with a powerful embedded operating system which solves common problems of other designs including slow response, cumbersome key operation, high power consumption and overall slow processing.

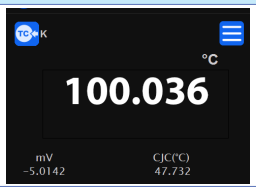
Accuracy



Additel's new and improved ADT226 series provides much improved accuracies including an electrical accuracy of 0.015% RD + 0.005% FS, high-static differential pressure mode accuracy to 0.002% FS and across the board improvements in temperature measurement accuracies.

Thermocouple Measurement Performance

The ADT226 series delivers highly improved thermocouple measurement capabilities by vastly improving the cold junction compensation(CJC) specifications and a much improved stabilization time.



Features

Time Saving Features

In addition to all the great features mentioned above, the ADT226 series is loaded with time saving features like our builtin pressure and temperature converter, thermal calculator, wiring diagram guide for assisting with electrical connections, a built-in diagnostic center including intelligent alarm messaging and a real time error report and comprehensive selftesting to help our customers get the very most out of their investment in Additel calibration tools.

Portable and Robust

The demands of remote calibration work can be challenging. The ADT226 series is lightweight and highly portable and utilizes an advanced color LCD screen to help ensure you can easily see, even in the (Ex) intrinsically safe versions.

All models in the ADT226 family have been designed with ruggedness and dependability in mind and meet IP67 standards with a 1-meter drop test, 4G vibration, xenon exposure and 130g steel ball drop testing of the display.

Other environmental conditions have also been considered, such as temperature and humidity. To combat these external elements, Additel has designed a unique internal circuit design and process technology to allow for the utmost confidence in your critical calibration and measurement work.

Intrinsically Safe Option

The Additel 226Ex series calibrators have passed the most stringent testing by certified organizations to acquire intrinsically safe certificates, ATEX, IECEX. The explosion-proof grade (Ex ia IIC T4 Ga), can be widely used in potentially explosive environments, such as oil and gas platforms, oil refineries, chemical and petrochemical plants, pharmaceutical industries, energy and gas processing industries.
Each intrinsically safe calibrator has an advanced transflective color LCD display which has enhanced visibility when viewed in direct sunlight. No matter where your work takes you, these calibrators are up to the task.

Voltage Meter (RMS)

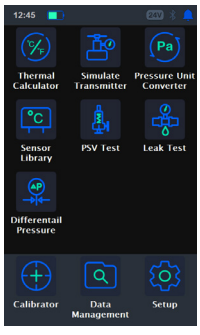
The Additel 226 non-Ex version is equipped with “true effective value” RMS measuring function, which can measure the RMS of various waveforms with no need to consider distortion or waveform parameters and other errors caused by various waveforms

Targeted application features

The onboard applications provide a useful selection of features including high static differential pressure mode, pressure leak test, safety valve test, analog transmitter calibration, unit converter, thermal calculator, and snapshots to name a few.

High static differential pressure mode uses two sensors, unique calculation technology to achieve a differential pressure measurement to 0.002% FS at high static pressures. The leak test will automatically calculate the pressure drop to determine a leak condition. The safety valve test is a specialized task which captures the exact pressure release point by taking 10 readings per second during a valve crack test.

You will find this and much more as we continue to develop new apps at Additel.



Connectivity & Battery

Users can remotely connect mobile devices to the ADT226 via Bluetooth with an unobstructed distance up 20 meters. The included USB type-C comm port and cable provide a hard wired communication option as well as charging for the removeable Li-ion battery, which provides up to 12 hours of run time.

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SPECIFICATIONS

Electrical Specification

Source Accuracy						
Specifications	**ADT226**			**ADT226Ex**		
	Range	**Resolution**	**Accuracy**	**Range**	**Resolution**	**Accuracy**
Voltage DC	-150 to 150 mV	5 uV	0.015%RDG + 15 uV	0 to 10.5 V	0.2 mV	0.02%RDG + 0.5 mV
	-1.5 to 1.5 V	0.05 mV	0.015%RDG + 0.15 mV			
	-15 to 15 V	0.5 mV	0.015%RDG + 1.5 mV			
Current DC	0 to 25 mA	0.5 uA	0.015%RDG + 1.2 uA	0 to 25 mA	0.5 uA	0.02%RDG + 1.2 uA
Resistance	0 to 400 Ω	10 mΩ	0.015%RDG + 20 mΩ	0 to 400 Ω	10 mΩ	0.02%RDG + 20 mΩ
	0 to 4000 Ω	100 mΩ	0.015%RDG + 200 mΩ	0 to 4000 Ω	100mΩ	0.02%RDG + 200 mΩ
Frequency (Square wave)	(0.01 ~ 5) Hz	0.00001 Hz	0.005%RDG + 0.00005 Hz	(0.01 ~ 5) Hz	0.00001 Hz	0.005%RDG + 0.00005 Hz
	(5 ~ 50) Hz	0.0001 Hz	0.005%RDG + 0.0005 Hz	(5 ~ 50) Hz	0.0001 Hz	0.005%RDG + 0.0005 Hz
	(50 ~ 500) Hz	0.001 Hz	0.005%RDG + 0.005 Hz	(50 ~ 500) Hz	0.001 Hz	0.005%RDG + 0.005 Hz
	(500 ~ 5000) Hz	0.01 Hz	0.005%RDG + 0.05 Hz	(500 ~ 5000) Hz	0.01 Hz	0.005%RDG + 0.05 Hz
	(5000 ~ 50000) Hz	0.1 Hz	0.005%RDG + 0.5 Hz	(5000 ~ 50000) Hz	0.1 Hz	0.005%RDG + 0.5 Hz
Frequency (Sine wave & Triangular wave)	(0.1~ 50) Hz	0.001 Hz	0.004 Hz	N/A		
	(50 ~ 500) Hz	0.01 Hz	0.04 Hz			
	(500 ~ 5000) Hz	0.1 Hz	0.4 Hz			
	(5000 ~ 50000) Hz	1Hz	4 Hz			
Duty Cycle	(1%~99%)@≤10000Hz	0.05%	0.1% / kHz + 0.1%	Fixed 50%@(0.01~50000)Hz		
	(5%~99%)@≤50000Hz	0.5%				
Voltage mV (TC)	-10 to 75 mV	1.5 uV	0.015%RDG + 4.0 uV	-10 to 75 mV	1.5 uV	0.02%RDG + 4.0 uV
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge and falling edge, minimum threshold voltage: 2.5V					
Loop power (max 25mA)	24 V	N/A	±1 V	22 V	N/A	± 10%

Note 1: When the environment temperature is (-10 ～ +10)℃ and (30 ～ 50)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Non-Ex version);
When the environment temperature is (-20 ～ -10)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Ex version);

Note 2: Output features:
Voltage output : ±150 mV /±1.5V / ± 15V, Maximum load current: 10 mA, (For Ex-version load current 5mA), load effect: 50 uV / mA;
Current output (0 ～ 25) mA: Maximum open circuit voltage: 24 V, driving capacity: 1 kΩ / 20 mA, maximum external voltage: 50 V;
(For Ex-version,Maximum open circuit voltage: 15 V, impedance: 400Ω, driving capacity: 6 V / 20 mA, maximum external voltage: 30 V）
Frequency output: square wave, adjustable duty cycle, square wave amplitude (0~15) V adjustable, amplitude accuracy ± 0.2%FS(for Non-Ex version);
Frequency output: square wave, 50% duty cycle, square wave amplitude (0~10.5) V adjustable, amplitude accuracy ± 0.2%FS(for Ex version);
maximum load current: 10mA (For Ex-version,1mA);
Supported units: Hz, kHz, MHz, CPM, CPH, s, ms ;
Zero-crossing sine wave / triangular wave amplitude: (0.1 ～ 30) Vp-p adjustable(only for Non-Ex version),
Amplitude accuracy 3 % Vp-p + 75 mV, supporting display valid value. [1]
Thermocouple output: maximum load current: 5mA, load effect: < 5 uV / mA;
Thermal resistance output: maximum excitation current: Iex*400<1.6V(0 ~ 400) Ω, Iex*Rsim<1.6V(400 ~ 4000) Ω;
minimum excitation current: 0.2 mA@(0 ~ 400) Ω, 0.1 mA@(400 ~ 4000) Ω ;
support 1ms pulse excitation. (For Non-Ex version）
Thermal resistance output: Excitation current: (0.2~2) mA@(0 ~ 400) Ω, (0.1~0.3) mA@(400 ~ 4000) Ω ;
support 1ms pulse excitation. (For Ex version）

SPECIFICATIONS

Measurement Accuracy Cont.						
Specifications	ADT226			ADT226Ex		
	Range	Resolution	Accuracy	Range	Resolution	Accuracy
Voltage DC	-300 to 300 mV	1 μV	0.015% RDG + 15 μV	-300 to 300 mV	1μV	0.02% RDG + 15 μV
	-30 to 30 V	0.1 mV	0.015%RDG + 1.5 mV	-30 to 30 V	0.1 mV	0.02% RDG + 1.5 mV
	Impedance: -300 mV to 300 mV = > 100 MΩ -30 V to 30 V = >1 MΩ					
DC High Voltage	-300 to 300 V	10 mV	0.05% RDG + 30 mV	N/A		
	The highest input voltage is 300 V, IEC61010 300V CATII					
	Common mode rejection: >100 dB (at 50 or 60 Hz)					
	Impedance: > 4 MΩ, DC coupling					
AC High Voltage	300V (40 to 500 Hz)	10 mV	0.5% RDG + 150 mV	N/A		
	The highest input voltage is 300 V, IEC61010 300V CATII					
	9% to 100% of range is suitable for the above accuracy indicators					
	Impedance: >4 MΩ, <100pF, AC coupling					
Current DC	-30 to 30 mA	0.1 μA	0.015% RDG + 1.5 μA	-30 to 30 mA	0.1 μA	0.02% RDG + 1.5 μA
Resistance (4-Wire)	0 to 400 Ω	1 mΩ	0.015% RDG + 20 mΩ	0 to 400 Ω	1 mΩ	0.02% RDG + 20 mΩ
	0 to 4000 Ω	10 mΩ	0.015% RDG + 200 mΩ	0 to 4000 Ω	10 mΩ	0.02% RDG + 200 mΩ
	2-Wire + 50 mΩ, 3-wire + 10 mΩ					
	Excitation current: 0.2 mA					
Voltage mV (TC)	-10 to 75 mV	0.1uV	0.015% RDG + 4.0 μV	-10 to 75 mV	0.1uV	0.02% RDG + 4.0 μV
	Impedance: >100 MΩ					
Frequency	(0.01 ~ 5)Hz	0.00001Hz	0.005%RDG + 0.00005 Hz	(0.01 ~ 5)Hz	0.00001Hz	0.005%RDG + 0.00005 Hz
	(5 ~ 50)Hz	0.0001Hz	0.005%RDG + 0.0005 Hz	(5 ~ 50)Hz	0.0001Hz	0.005%RDG + 0.0005 Hz
	(50 ~ 500)Hz	0.001Hz	0.005%RDG + 0.005 Hz	(50 ~ 500)Hz	0.001Hz	0.005%RDG + 0.005 Hz
	(500 ~ 5000)Hz	0.01Hz	0.005%RDG + 0.05 Hz	(500 ~ 5000)Hz	0.01Hz	0.005%RDG + 0.05 Hz
	(5000 ~ 50000)Hz	0.1Hz	0.005%RDG + 0.5 Hz	(5000 ~ 50000)Hz	0.1Hz	0.005%RDG + 0.5 Hz
	Minimum threshold voltage: 2.5 V					
	Supported units: Hz, kHz, MHz, CPM, CPH, s, ms, μs					
Duty Cycle	(1%~99%)@≤10000Hz	0.01%	0.1% kHz + 0.05%	N/A		
	(5%~99%)@≤50000Hz	0.1%				
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge and falling edge, minimum threshold voltage: 2.5V					
Switch	Support for dry or wet switch, voltage range of 3 to 30 V, response speed of < 10 ms					

Note 1: When the environment temperature is (-10 ～ +10)℃ and (30 ～ 50)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Non-Ex version);
When the environment temperature is (-20 ～ -10)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Ex version);
AC High Voltage TRMS measurement: ± (250 ppmRDG + 25 ppmFS)/℃ ;
DC High Voltage measurement:± 25ppmFS/℃ .
Note 2: Input features:
Voltage range: (-300 ~ 300) mV, input impedance >100 MΩ; (-30 ~ 30) V, input impedance >1MΩ;
Current measurement: input impedance < 40 Ω;
TC measurement: input impedance >100 MΩ;
AC High Voltage TRMS measurement: input impedance: > 4MΩ , <100pF, AC coupling; Maximum input voltage: 300 V, IEC61010 300V CATII;
9% ~ 100% of the range is applicable to the accuracy index above.
DC High Voltage measurement: > 4 MΩ, DC coupling; Maximum input voltage: 300 V, IEC61010 300V CATII; Common-mode rejection:>100 dB （in 50 or 60 Hz）
Note 3: The thermal resistance measurement excitation power supply is 0.2mA. There are four wire system, three wire system and two wire system measurement modes at each gear position. The accuracy indicators are as follows:
The accuracy data given in the table is the accuracy data in 4-line system; 3-wire system accuracy is +10 mΩ on the basis of 4-wire system accuracy;
2-wire accuracy is +50 mΩ on the basis of 4-wire accuracy;
Note 4: Minimum threshold voltage for frequency and pulse measurement: 2.5V;
Note 5: Frequency measurement unit: Hz, kHz, MHz, CPM, CPH, s, ms, μs;
Note 6: Optional rising edge or descending edge trigger mode for pulse measurement.

Additel
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General Specification

Specifications	ADT226	ADT226Ex
Operating Temperature	-10°C to 50°C	-20°C to 50°C
Specification guaranteed temperature range	10°C to 30°C	-10°C to 50°C
Storage Temperature	-30°C to 70°C	-30°C to 70°C
Humidity	<95%, non-condensing	<95%, non-condensing
Power supply	6600mAh, 23.8Wh lithium battery, charging time about 6 hours, battery pack can be charged independently	4000mAh 14.4Wh Explosion-proof lithium battery packcharging time about 6 hours, battery pack can be charged independently
User interface	Icon drive menus	Icon driven menus with navigation buttons
Ports protection voltage	50V max （Only for the top ports)	30V max
Display	5.0 inch 480 x 800 mm TFT LCD capacitive screen	4.4 inch 640 x 480 mm color display capacitive screen
Maximum altitude	3000 meters	
European Compliance	CE Mark	
Electrical Connection	Ø4mm sockets and flat mini-jack thermocouple socket	
Size	6.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm)	
Weight	1.6 lb (0.7 kg)	1.65 lb (0.75Kg)
Battery	Rechargeable Li-ion battery (included)	
Battery Life	Typically 12 hours	Typically 35 hours
Battery Charge	110V/220V external power adapter included. Battery can be charged external to the unit.	
External pressure module	Dual channel Serial plug, can connect two digital pressure modules	
Warm-up time	Full specification performance is achieved after a 10 minute warm-up time.	
ROHS compliant	Rohs II Directive 2011/65/EU, EN50581:2012	
Display rate	3 readings per second	
Barometric Accuracy (Built-in barometer)	55Pa	
IP protection level	IP67, 1 meter drop test	
Communication	Isolate USB-TYPEC (slave), Bluetooth BLE	
User Interface Localization	English, German, French, Italian, Spanish, Portuguese, Simplified Chinese, Traditional Chinese, Japanese, Russian, Czech, Slovak	English, Simplified Chinese, Traditional Chinese, Japanese
Calibration	ISO 17025 accredited calibration with data	
Warranty	3 years	

Pressure Specification

Pressure Specification(ADT226 & ADT226Ex)
The 161 series Intelligent Digital Pressure Modules are available for gauge, vacuum and absolute pressure from -15 psi to 60,000 psi (-1 bar to 4200 bar). Accuracy from 0.02% FS includes operation over 14°F to 122°F (-10°C to 50°C), one year stability and calibration uncertainty. For detailed specifications, please refer to the pressure modules datasheet.

SPECIFICATIONS

Temperature Specification

Thermocouple Measurement and Source Accuracy

	ADT226				ADT226Ex			
Type	Standard	Temperature Range (°C)		Accuracy (°C) Measure / Source	Standard	Temperature Range (°C)		Accuracy (°C) Measure / Source
S	IEC 584	-50 to 1768	-50~0	0.96	IEC 584	-50 to 1768	-50~100	0.96
			0~100	0.69			100~1000	0.69
			100~1768	0.64			1000~1768	0.73
R	IEC 584	-50 to 1768	-50~0	1.02	IEC 584	-50 to 1768	-50~0	1.03
			0~200	0.71			0~200	0.71
			200~1768	0.56			200~1768	0.65
B	IEC 584	0 to 1820	200~300	1.89	IEC 584	0 to 1820	200~300	1.90
			300~500	1.25			300~500	1.26
			500~800	0.78			500~800	0.79
			800~1820	0.55			800~1820	0.57
K	IEC 584	-270 to 1372	-250 to -200	0.97	IEC 584	-270 to 1372	-250 to -200	1.04
			-200 to -100	0.30			-200 to -100	0.32
			-100 to 600	0.18			-100 to 600	0.21
			600 to 1372	0.35			600 to 1372	0.43
N	IEC 584	-270 to 1300	-250 to -200	1.50	IEC 584	-270 to 1300	-250 to -200	1.58
			-200 to -100	0.44			-200 to -100	0.46
			-100 to 1300	0.30			-100 to 1300	0.37
E	IEC 584	-270 to 1000	-250~-200	0.54	IEC 584	-270 to 1000	-250~-200	0.59
			-200~-100	0.20			-200~-100	0.22
			-100~700	0.15			-100~700	0.18
			700~1000	0.20			700~1000	0.25
J	IEC 584	-210~1200	-210~-100	0.26	IEC 584	-210~1200	-210~-100	0.28
			-100~700	0.15			-100~700	0.19
			700~1200	0.25			700~1200	0.31
T	IEC 584	-270 to 400	-250~-100	0.74	IEC 584	-270 to 400	-250~-100	0.79
			-100~0	0.15			-100~0	0.16
			0~400	0.11			0~400	0.13
C	ASTM E988	0 to 2315	0 to 1000	0.35	ASTM E988	0 to 2315	0 to 1000	0.40
			1000 to 1800	0.62			1000 to 1800	0.73
			1800 to 2315	1.02			1800 to 2315	1.22
D	ASTM E988	0~2315	0~100	0.39	ASTM E988	0~2315	0~100	0.39
			100~1200	0.37			100~1200	0.43
			1200~2000	0.65			1200~2000	0.77
			2000~2315	1.03			2000~2315	1.24
G	ASTM E1751	0 to 2315	50~100	1.12	ASTM E1751	0 to 2315	50~100	1.12
			100~200	0.72			100~200	0.72
			200~400	0.45			200~400	0.46
			400~1500	0.37			400~1500	0.43
			1500~2315	0.77			1500~2315	0.92
L	DIN43710	-200 to 900	-200 to -100	0.15	DIN43710	-200 to 900	-200 to -100	0.16
			-100 to 400	0.13			-100 to 400	0.14
			400 to 900	0.17			400 to 900	0.20
U	DIN43710	-200 to 600	-200 to 0	0.28	DIN43710	-200 to 600	-200 to 0	0.29
			0 to 600	0.13			0 to 600	0.15

Note: Internal CJC is ±0.2°C (-10°C to 50°C ambient temperature)
Accuracy with external cold junction only, for internal cold junction add 0.2°C (k=2)

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SPECIFICATIONS

RTD Measurement and Source Accuracy				
Measure and Simulate	Temperature Range (°C)		Accuracy (°C)	
			ADT226	ADT226Ex
PT10(385)	-200 to 850	-200~200	0.62	0.64
		200~600	0.77	0.82
		600~850	0.88	0.95
PT25(385)	-200 to 850	-200~200	0.29	0.31
		200~600	0.40	0.44
		600~850	0.47	0.54
PT50(3916)	-200 to 850	-200~200	0.18	0.20
		200~600	0.27	0.32
		600~850	0.34	0.40
PT100(385) PT100(391) PT100(3916) PT100(3926)	-200 to 850	-200~200	0.13	0.15
		200~600	0.21	0.26
		600~850	0.27	0.34
PT200(385)	-200 to 850	-200~200	0.34	0.37
		200~300	0.37	0.40
		300~600	0.46	0.51
		600~850	0.54	0.61
PT400(385)	-200 to 850	-200~0	0.17	0.18
		0~200	0.21	0.23
		200~600	0.30	0.35
		600~850	0.37	0.44
PT500(385)	-200 to 850	-200~200	0.18	0.20
		200~600	0.27	0.32
		600~850	0.34	0.40
PT1000(385)	-200 to 850	-200~200	0.13	0.15
		200~600	0.21	0.26
		600~850	0.27	0.34
Cu10(427)	-200~260	-200~260	0.59	0.61
Cu50(428)	--200~260	-200~260	0.15	0.17
Cu100(428)	-200~260	-200~260	0.10	0.12
Ni100(617) Ni100(618)	-60~180	-60~0	0.06	0.07
		0~180	0.06	0.08
Ni120(672)	--80~260	-80~260	0.06	0.07
Ni1000	-50~150	-50~150	0.08	0.09

*Note: Ambient temperature of 20°C±10°C.
4-wire accuracy. For 2-wire add 50 mΩ, for 3-wire add 10 mΩ

ORDERING INFORMATION

Model Number

ADT226

ADT226
ADT226Ex: Intrisically Safe
ADT226P: Panel Mount

Panel Mount Version

Accessories (included)			
Model number	**Description**	**QTY**	**Picture**
9811-X	110V/220V external power adapter (Only for ADT226, 226P)	1 pc	
9811Ex-X	110V/220V external power adapter (Only for ADT226Ex)	1 pc	
9704	Chargeable Li-ion battery (Only for ADT226, 226P)	1 pc	
9704Ex	Chargeable Li-ion battery (Only for ADT226Ex)	1 pc	
9023	Test leads	1 set (6 pcs)	
9027	Right angle test leads (Non-Ex models only)	1 set (2 pcs)	
9060	Pressure module connection cable	1 pc	
9052	USB Cable type A to type C (Non-Ex models only)	1 pc	
9052Ex	Ex USB Cable type A to type C (For Ex models only)	1 pc	
9040	Hanging strap with magnet	1 pc	
9028	Multimeter Test Hook, Flexible Electronic Probe	1 set (2 pcs)	
	ISO 17025 accredited calibration certificate	1 pc	

Optional Accessories					
Model number	Description	Picture	**Model number**	Description	Picture
ADT161 - XXX	Digital Pressure Modules		9082	HART 250 ohm resistor adapter for ADT226, 226Pand ADT227, 227P	
ADT161Ex - XXX	Intrinsically Safe Digital Pressure Modules		9704	Battery, rechargeable Li-ion polymer battery for Additel Handheld Series	
ADT129-X	Differential Pressure Manifold, -15 to 3,000 psi		9704Ex	Battery, rechargeable Li-ion polymer battery for Ex Additel Handheld Series	
9061	Current output cable (for ADT226, 226P and ADT227, 227P)		9811-X	110 V/220 V external power adapter for handheld models	
9062	Connection adapter cable for Fluke style pressure modules to non-explosion-proof Additel readouts		9811Ex-X	110 V/220 V external power adapter for Ex handheld models	
AM1602-6FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 6 foot (1.8 Meters) cable w/ banana jack connectors		9906A	Hard carrying case for handheld instrument with accessories	
9080	Cable kit (including TC plug, compensation cable, S,R,K,J,T,E,N)		9918-SC	Soft carrying case, with space for handheld instrument, test leads, and accessories	
9081	Universal TC easy-press adapter for ADT226, 226P and ADT227, 227P		9530-BASIC	Additel/Acal Task management software for multifunction calibrator	
9079-X	Thermocouple connection wire, mini male to alligator clips (X = type K, N, J, T, E)		9530-NET	Additel/Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license	

* Additel/Land software can be downloaded for free at www.additel.com

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Additel 227, 227Ex
Documenting Multifunction Process Calibrator

- Sourcing, Simulating and Measuring Pressure, Temperature and Electrical Signals
- Built-in Full Hart Communicator (ADT227-HART)
- Built-in Barometer
- Intrinsically Safe Models Available (Ex)
- Large Smartphone Like Touchscreen User Experience
- USB Type-C and Bluetooth Communications
- IP67 Rated
- High Voltage Measurement Capability (300V AC)
- True RMS Voltage Meter Capability
- Dual Channel Pressure Module Ports
- High Static Differential Pressure Measurement 0.002% FS
- ISO 17025-accredited Calibration w/data Included

OVERVIEW

Additel's new Multi-functional Documenting Process Calibrator series takes portability, functionality, and accuracy to a whole new level and packages it with an intuitive and easy to use color touchscreen display. This series includes an advanced documenting pressure calibrator (ADT227) and an advanced documentation process calibrator with a built-in HART communicator (ADT227-HART). Additionally, each calibrator has an ATEX certified intrinsically safe option (ADT227Ex) allowing you to perform calibration in the harshest of environments. We're confident these new tools will not only meet your calibration requirements but will make metrology simple for you!

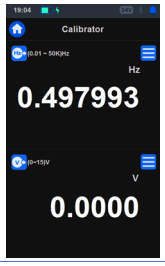
Features

Easy-to-use Cellphone Like Interface

The ADT227 series brings an all new user interface to the world of process calibrators. With a menu driven interface and a small size/weight, the ADT227 is the industry's smallest advanced multifunctional process calibrator with an intrinsically safe version to boot (ADT227Ex). It adopts advanced human hand engineering design for the most convenient field handheld process calibrator available.

The ADT227 has been developed with a powerful embedded operating system which solves common problems of other designs including slow response, cumbersome key operation, high power consumption and overall slow processing.

Accuracy



Additel's new and improved ADT227 series provides much improved accuracies including an electrical accuracy of 0.005% RD + 0.005% FS, high-static differential pressure mode accuracy to 0.002% FS and across the board improvements in temperature measurement accuracies.

Features

Thermocouple Measurement Performance

The ADT227 series delivers highly improved thermocouple measurement capabilities by vastly improving the cold junction compensation(CJC) specifications and a much improved stabilization time.

Portable and Robust

The demands of remote calibration work can be challenging. The ADT227 series is lightweight and highly portable and utilizes an advanced color LCD screen to help ensure you can easily see, even in the (Ex) intrinsically safe versions.

All models in the ADT227 family have been designed with ruggedness and dependability in mind and meet IP67 standards with a 1-meter drop test, 4G vibration, xenon exposure and 130g steel ball drop testing of the display.

Other environmental conditions have also been considered, such as temperature and humidity. To combat these external elements, Additel has designed a unique internal circuit design and process technology to allow for the utmost confidence in your critical calibration and measurement work.

Intrinsically Safe Option

The Additel 227Ex series calibrators have passed the most stringent testing by certified organizations to acquire intrinsically safe certificates, ATEX, IECEX. The explosion-proof grade (Ex ia IIC T4 Ga), can be widely used in potentially explosive environments, such as oil and gas platforms, oil refineries, chemical and petrochemical plants, pharmaceutical industries, energy and gas processing industries.

Each intrinsically safe calibrator has an advance transflective color LCD display which has enhanced visibility when viewed in direct sunlight. No matter where your work takes you, these calibrators are up to the task.

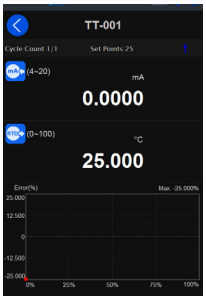
Voltage Meter (RMS)

The Additel 227 non-Ex version is equipped with “true effective value” RMS measuring function, which can measure the RMS of various waveforms with no need to consider distortion or waveform parameters and other errors caused by various waveforms

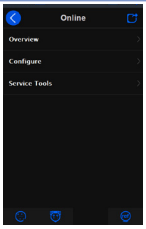
Automated Tasks for Paperless Calibration Management

Additel 227 Series Calibrators come with a powerful documenting calibration task application which provides a turnkey solution for automation and paperless calibration management.

Tasks are easily created for temperature, pressure, flow and loop instruments. Up to 10,000 documented tasks for ADT227 and up to 1,000 documented tasks for ADT227Ex can be stored in the extensive on-board memory. Many tasks, when executed, are fully automated in data collection and performance validation, such as pass/fail and hysteresis calculations. All information can be integrated into Additel’s ACal software for additional calibration management.



Full HART Communicaton (For ADT227-HART only)



The built-in full HART communicator will work with most HART transmitters . The ADT227-HART contains an extensive DD library to meet the needs of your smart transmitter. Our DD library is updated on a regular basis and at no additional cost. The ADT227Ex-HART is integrated with basic HART communication functions, permitting users to monitor, control, and calibrate HART instrumentations. It's an ideal device for calibrating, maintaining, and troubleshooting HART instrumentations

Features

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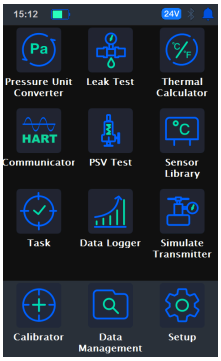
Targeted application features



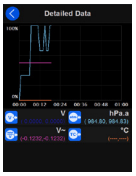
The onboard applications provide a useful selection of features including HART communicator, high static differential pressure mode, pressure leak test, safety valve test, analog transmitter calibration, unit converter, thermal calculator, and snapshots to name a few.

High static differential pressure mode uses two sensors, unique calculation technology to achieve a differential pressure measurement to 0.002% FS at high static pressures. The leak test will automatically calculate the pressure drop to determine a leak condition. The safety valve test is a specialized task which captures the exact pressure release point by taking 10 readings per second during a valve crack test.

You will find this and much more as we continue to develop new apps at Additel.

Data Logger (For ADT227 & ADT227-HART only)

The ADT227 calibrator can record pressure, temperature and electrical signals. Recorded values can be displayed numerically or graphically to identify trending. The ADT227 & ADT227-HART can store up to 500 results. each result can include up to 100,0000 recordings and each recording can record a maximum of 7 channel values. These results can easily be exported to Additel's application software. Each log session is easily configured at a set interval and provides a date and time stamp with each reading.



Connectivity & Battery

Users can remotely connect mobile devices to the ADT227 via Bluetooth with an unobstructed distance up 20 meters. The included USB type-C comm port and cable provide a hard wired communication option as well as charging for the removeable Li-ion battery, which provides up to 12 hours of run time.

Time Saving Features

In addition to all the great features mentioned above, the ADT227 series is loaded with time saving features like our builtin pressure and temperature converter, thermal calculator, wiring diagram guide for assisting with electrical connections, a built-in diagnostic center including intelligent alarm messaging and a real time error report and comprehensive selftesting to help our customers get the very most out of their investment in Additel calibration tools.

SPECIFICATIONS

Electrical Specification

Source Accuracy						
Specifications	ADT227			ADT227Ex		
	Range	Resolution	Accuracy	Range	Resolution	Accuracy
Voltage DC	-150 to 150 mV	5 µV	0.005%RDG + 15 µV	0 to 10.5 V	0.2 mV	0.01%RDG + 0.5 mV
	-1.5 to 1.5 V	0.05 mV	0.005%RDG + 0.15 mV			
	-15 to 15 V	0.5 mV	0.005%RDG + 1.5 mV			
Current DC	0 to 25 mA	0.5 µA	0.01%RDG + 1.2 µA	0 to 25 mA	0.5 µA	0.01%RDG + 1.2 µA
Resistance	0 to 400 Ω	10 mΩ	0.005%RDG + 20 mΩ	0 to 400 Ω	10 mΩ	0.01%RDG + 20 mΩ
	0 to 4000 Ω	100 mΩ	0.01%RDG + 200 mΩ	0 to 4000 Ω	100 mΩ	0.01%RDG + 200 mΩ
Frequency (Square wave)	(0.01 ~ 5) Hz	0.00001 Hz	0.002%RDG + 0.00002 Hz	(0.01 ~ 5) Hz	0.00001 Hz	0.002%RDG + 0.00002 Hz
	(5 ~ 50) Hz	0.0001 Hz	0.002%RDG + 0.0002 Hz	(5 ~ 50) Hz	0.0001 Hz	0.002%RDG + 0.0002 Hz
	(50 ~ 500) Hz	0.001 Hz	0.002%RDG + 0.002 Hz	(50 ~ 500) Hz	0.001 Hz	0.002%RDG + 0.002 Hz
	(500 ~ 5000) Hz	0.01 Hz	0.002%RDG + 0.02 Hz	(500 ~ 5000) Hz	0.01 Hz	0.002%RDG + 0.02 Hz
	5000 ~ 50000) Hz	0.1 Hz	0.002%RDG + 0.2 Hz	5000 ~ 50000) Hz	0.1 Hz	0.002%RDG + 0.2 Hz

SPECIFICATIONS

Source Accuracy						
Specifications	**ADT227**			**ADT227Ex**		
	Range	**Resolution**	**Accuracy**	**Range**	**Resolution**	**Accuracy**
Frequency (Sine wave & Triangular wave)	(0.1~ 50) Hz	0.001 Hz	0.002 Hz	N/A		
	(50 ~ 500) Hz	0.01 Hz	0.02 Hz			
	(500 ~ 5000) Hz	0.1 Hz	0.2 Hz			
	(5000 ~ 50000) Hz	1Hz	2 Hz			
Duty Cycle	(1%~99%)@≤10000Hz	0.05%	0.1%kHz+0.1%	Fixed 50%@(0.01~50000)Hz		
	(5%~99%)@≤50000Hz	0.5%				
Voltage mV (TC)	-10 to 75 mV	1.5 μV	0.008%RDG + 3.0 μV	-10 to 75 mV	1.5 μV	0.01%RDG + 3.0 μV
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge or falling edge, minimum threshold voltage: 2.5V					
Loop power (max 25mA)	24 V	N/A	±1 V	22 V	N/A	± 10%

Note 1: When the environment temperature is (-10 ～ +10)℃ and (30 ～ 50)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Non-Ex version);
When the environment temperature is (-20 ～ -10)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Ex version);

Note 2: Output features:
Voltage output : ±150 mV /±1.5V / ± 15V, Maximum load current: 10 mA, (For Ex-version load current 5mA), load effect: 50 uV / mA;
Current output (0 ～ 25) mA: Maximum open circuit voltage: 24 V, driving capacity: 1 kΩ / 20 mA, maximum external voltage: 50 V;
(For Ex-version,Maximum open circuit voltage: 15 V, impedance: 400Ω, driving capacity: 6 V / 20 mA, maximum external voltage: 30 V)
Frequency output: square wave, adjustable duty cycle, square wave amplitude (0~15) V adjustable, amplitude accuracy ± 0.2%FS(for Non-Ex version);
Frequency output: square wave, 50% duty cycle, square wave amplitude (0~10.5) V adjustable, amplitude accuracy ± 0.2%FS(for Ex version);
maximum load current: 10mA (For Ex-version,1mA);
Supported units: Hz, kHz, MHz, CPM, CPH, s, ms ;
Zero-crossing sine wave / triangular wave amplitude: (0.1 ～ 30) Vp-p adjustable(only for Non-Ex version),
Amplitude accuracy 3 % Vp-p + 75 mV, supporting display valid value. [1]
Thermocouple output: maximum load current: 5mA, load effect: < 5 uV / mA;
Thermal resistance output: maximum excitation current: Iex*400<1.6V(0 ~ 400) Ω, Iex*Rsim<1.6V(400 ~ 4000) Ω;
minimum excitation current: 0.2 mA@(0 ~ 400) Ω, 0.1 mA@(400 ~ 4000) Ω ;
support 1ms pulse excitation. (For Non-Ex version)
Thermal resistance output: Excitation current: (0.2~2) mA@(0 ~ 400) Ω, (0.1~0.3) mA@(400 ~ 4000) Ω ;
support 1ms pulse excitation. (For Ex version)

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Measurement Accuracy Cont.

Specifications	ADT227			ADT227Ex		
	Range	Resolution	Accuracy	Range	Resolution	Accuracy
Voltage DC	-300 to 300 mV	1 μV	0.005% RDG + 15 μV	-300 to 300 mV	1 μV	0.01% RDG + 15 μV
	-30 to 30 V	0.1 mV	0.005% RDG + 1.5 mV	-30 to 30 V	0.1 mV	0.01% RDG + 1.5 mV
	Impedance: -300 mV to 300 mV = > 100 MΩ -30 V to 30 V = >1 MΩ					
DC High Voltage	-300 to 300 V	10 mV	0.05% RDG + 30 mV	N/A		
	Maximum input voltage = 300 V, IEC61010 300V CATII					
	Common mode rejection: >100 dB (at 50 or 60 Hz)					
	Impedance: > 4 MΩ, DC coupling					
AC High Voltage	300V (40 to 500 Hz)	10 mV	0.5% RDG + 150 mV	N/A		
	Maximum input voltage = 300 V, IEC61010 300V CATII					
	9% to 100% of range is suitable for the above accuracy indicators					
	Impedance: >4 MΩ, <100pF, AC coupling					
Current DC	-30 to 30 mA	0.1 μA	0.01% RDG + 1.5 μA	-30 to 30 mA	0.1 μA	0.01% RDG + 1.2 μA
Resistance (4-Wire)	0 to 400 Ω	1 mΩ	0.005% RDG + 20 mΩ	0 to 400 Ω	1 mΩ	0.01% RDG + 20 mΩ
	0 to 4000 Ω	10 mΩ	0.01% RDG + 200 mΩ	0 to 4000 Ω	10 mΩ	0.01% RDG + 200 mΩ
	2-Wire + 50 mΩ, 3-wire+ 10 mΩ					
	Excitation current: 0.2 mA					
Voltage mV (TC)	-10 to 75 mV	0.1uV	0.008% RDG + 3.0 μV	-10 to 75 mV	0.1uV	0.01% RDG + 3.0 μV
	Impedance: >100 MΩ					
Frequency	(0.01 ~ 5) Hz	0.00001 Hz	0.002%RDG + 0.00002 Hz	(0.01 ~ 5) Hz	0.00001 Hz	0.002%RDG + 0.00002 Hz
	(5 ~ 50) Hz	0.0001 Hz	0.002%RDG + 0.0002 Hz	(5 ~ 50) Hz	0.0001 Hz	0.002%RDG + 0.0002 Hz
	(50 ~ 500) Hz	0.001 Hz	0.002%RDG + 0.002 Hz	(50 ~ 500) Hz	0.001 Hz	0.002%RDG + 0.002 Hz
	(500 ~ 5000) Hz	0.01 Hz	0.002%RDG + 0.02 Hz	(500 ~ 5000) Hz	0.01 Hz	0.002%RDG + 0.02 Hz
	(5000 ~ 50000) Hz	0.1 Hz	0.002%RDG + 0.2 Hz	(5000 ~ 50000) Hz	0.1 Hz	0.002%RDG + 0.2 Hz
	Minimum threshold voltage: 2.5 V					
	Supported units: Hz, kHz, MHz, CPM, CPH, s, ms, μs					
Duty Cycle	(1%~99%)@≤10000Hz	0.01%	0.1% kHz + 0.05%	N/A		
	(5%~99%)@≤50000Hz	0.1%				
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge or falling edge, minimum threshold voltage: 2.5V					
Switch	Supports dry or wet switches. Voltage range of 3 to 30 V. Response speed < 10 ms					

Note 1: When the environment temperature is (-10 ～ +10)℃ and (30 ～ 50)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Non-Ex version);
When the environment temperature is (-20 ～ -10)℃ , the temperature coefficient is:
Voltage, current, thermocouple, thermal resistance output: ± 5 ppm FS/℃ (for Ex version);
AC High Voltage TRMS measurement: ± (250 ppmRDG + 25 ppmFS)/℃ ;
DC High Voltage measurement:± 25ppmFS/℃ .

Note 2: Input features:
Voltage range: (-300 ~ 300) mV, input impedance >100 MΩ; (-30 ~ 30) V, input impedance >1MΩ;
Current measurement: input impedance < 40 Ω;
TC measurement: input impedance >100 MΩ;
AC High Voltage TRMS measurement: input impedance: > 4MΩ , <100pF, AC coupling; Maximum input voltage: 300 V, IEC61010 300V CATII;
9% ~ 100% of the range is applicable to the accuracy index above.
DC High Voltage measurement: > 4 MΩ, DC coupling; Maximum input voltage: 300 V, IEC61010 300V CATII; Common-mode rejection:>100 dB （in 50 or 60 Hz）

Note 3: The thermal resistance measurement excitation power supply is 0.2mA. There are four wire system, three wire system and two wire system measurement modes at each gear position. The accuracy indicators are as follows:
The accuracy data given in the table is the accuracy data in 4-line system; 3-wire system accuracy is +10 mΩ on the basis of 4-wire system accuracy;
2-wire accuracy is +50 mΩ on the basis of 4-wire accuracy;

Note 4: Minimum threshold voltage for frequency and pulse measurement: 2.5V;

Note 5: Frequency measurement unit: Hz, kHz, MHz, CPM, CPH, s, ms, μs;

Note 6: Optional rising edge or descending edge trigger mode for pulse measurement.

SPECIFICATIONS

General Specification

Specifications	ADT227	ADT227Ex
Operating Temperature	-10°C to 50°C	-20°C to 50°C
Specification guaranteed temperature range	10°C to 30°C	10°C to 30°C
Storage Temperature	-30°C to 70°C	-30°C to 70°C
Humidity	<95%, non-condensing	<95%, non-condensing
Power supply	6600mAh, 23.8Wh lithium battery, charging time about 6 hours, battery pack can be charged independently	4000mAh 14.4Wh Explosion-proof lithium battery packcharging time 6~8 hours, battery pack can be charged independently
User interface	Icon drive menus	Icon driven menus with navigation buttons
Ports protection voltage	50V max (Only for the top ports)	30V max
Display	5.0 inch 480 x 800 mm TFT LCD capacitive screen	4.4 inch 640 x 480 mm color display capacitive screen
Data logger	500 results, each result x 100,0000 recordings, each recording records a maximum of 7 channel values	N/A
Maximum altitude	3000 meters	
European Compliance	CE Mark	
Electrical Connection	Ø4mm sockets and flat mini-jack thermocouple socket	
Size	6.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm)	
Weight	1.6 lb (0.7 kg)	1.65 lb (0.75Kg)
Battery	Rechargeable Li-ion battery (included)	
Battery Life	Typically 12 hours	Typically 35 hours
Battery Charge	110V/220V external power adapter included. Battery can be charged external to the unit. Typically charge time is 6-8 hours.	
External pressure module	Dual channel Serial plug, can connect two digital pressure modules	
Warm-up time	Full specification performance is achieved after a 10 minute warm-up time.	
ROHS compliant	Rohs II Directive 2011/65/EU, EN50581:2012	
Display rate	3 readings per second	
Barometric Accuracy (Built-in barometer)	55Pa	
IP protection level	IP67, 1 meter drop test	
Communication	Isolate USB-TYPEC (slave), Bluetooth BLE	
User Interface Localization	English, German, French, Italian, Spanish, Portuguese, Simplified Chinese, Traditional Chinese, Japanese, Russian, Czech, Slovak	English, Simplified Chinese, Traditional Chinese, Japanese
Calibration	ISO 17025 accredited calibration with data	
Warranty	3 years	

Pressure Specification

Pressure Specification (ADT227 & ADT227Ex)
The ADT161 and ADT161Ex series Intelligent Digital Pressure Modules are available for gauge, vacuum and absolute pressure from -15 psi to 60,000 psi (-1 bar to 4200 bar). Accuracy from 0.02% FS includes operation over 14°F to 122°F (-10°C to 50°C), one year stability and calibration uncertainty. For detailed specifications, please refer to the pressure modules datasheet.

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SPECIFICATIONS

Temperature Specification

Thermocouple Measurement and Source Accuracy

	ADT227				ADT227Ex			
Type	Standard	Temperature Range (°C)		Accuracy (°C) Measure / Source	Standard	Temperature Range (°C)		Accuracy (°C) Measure / Source
S	IEC 584	-50 to 1768	-50~0	0.76	IEC 584	-50 to 1768	-50~100	0.77
			0~100	0.56			100~1000	0.56
			100~1768	0.44			1000~1768	0.47
R	IEC 584	-50 to 1768	-50~0	0.82	IEC 584	-50 to 1768	-50~0	0.82
			0~200	0.57			0~200	0.57
			200~1768	0.38			200~1768	0.42
B	IEC 584	0 to 1820	200~300	1.51	IEC 584	0 to 1820	200~300	1.51
			300~500	1.00			300~500	1.00
			500~800	0.62			500~800	0.62
			800~1820	0.43			800~1820	0.43
K	IEC 584	-270 to 1372	-250 to -200	0.72	IEC 584	-270 to 1372	-250 to -200	0.75
			-200 to -100	0.23			-200 to -100	0.24
			-100 to 600	0.12			-100 to 600	0.13
			600 to 1372	0.22			600 to 1372	0.25
N	IEC 584	-270 to 1300	-250 to -200	1.14	IEC 584	-270 to 1300	-250 to -200	1.17
			-200 to -100	0.33			-200 to -100	0.34
			-100 to 1300	0.19			-100 to 1300	0.22
E	IEC 584	-270 to 1000	-250~-200	0.39	IEC 584	-270 to 1000	-250~-200	0.41
			-200~-100	0.15			-200~-100	0.15
			-100~700	0.09			-100~700	0.10
			700~1000	0.12			700~1000	0.14
J	IEC 584	-210~1200	-210~-100	0.19	IEC 584	-210~1200	-210~-100	0.20
			-100~700	0.10			-100~700	0.11
			700~1200	0.15			700~1200	0.17
T	IEC 584	-270 to 400	-250~-100	0.55	IEC 584	-270 to 400	-250~-100	0.57
			-100~0	0.12			-100~0	0.12
			0~400	0.08			0~400	0.08
C	ASTM E988	0 to 2315	0 to 1000	0.24	ASTM E988	0 to 2315	0 to 1000	0.26
			1000 to 1800	0.40			1000 to 1800	0.45
			1800 to 2315	0.65			1800 to 2315	0.73
D	ASTM E988	0~2315	0~100	0.31	ASTM E988	0~2315	0~100	0.31
			100~1200	0.25			100~1200	0.27
			1200~2000	0.42			1200~2000	0.47
			2000~2315	0.65			2000~2315	0.74
G	ASTM E1751	0 to 2315	50~100	0.90	ASTM E1751	0 to 2315	50~100	0.90
			100~200	0.57			100~200	0.57
			200~400	0.35			200~400	0.36
			400~1500	0.25			400~1500	0.27
			1500~2315	0.49			1500~2315	0.55
L	DIN43710	-200 to 900	-200 to -100	0.11	DIN43710	-200 to 900	-200 to -100	0.12
			-100 to 400	0.08			-100 to 400	0.09
			400 to 900	0.10			400 to 900	0.12
U	DIN43710	-200 to 600	-200 to 0	0.21	DIN43710	-200 to 600	-200 to 0	0.21
			0 to 600	0.08			0 to 600	0.09

Note: Internal CJC is ±0.15°C (-10°C to 50°C ambient temperature)
Accuracy with external cold junction only, for internal cold junction add 0.15°C (k=2)

SPECIFICATIONS

RTD Measurement and Source Accuracy				
Measure and Simulate	Temperature Range (°C)		Accuracy (°C)	
			ADT227	ADT227Ex
PT10(385)	-200 to 850	-200~200	0.57	0.59
		200~600	0.67	0.72
		600~850	0.75	0.82
PT25(385)	-200 to 850	-200~200	0.24	0.27
		200~600	0.30	0.35
		600~850	0.34	0.41
PT50(3916)	-200 to 850	-200~200	0.13	0.16
		200~600	0.17	0.22
		600~850	0.20	0.27
PT100(385) PT100(391) PT100(3916) PT100(3926)	-200 to 850	-200~200	0.08	0.10
		200~600	0.11	0.16
		600~850	0.14	0.20
PT200(385)	-200 to 850	-200~200	0.32	0.32
		200~300	0.34	0.34
		300~600	0.41	0.41
		600~850	0.48	0.48
PT400(385)	-200 to 850	-200~0	0.15	0.15
		0~200	0.18	0.18
		200~600	0.25	0.25
		600~850	0.30	0.30
PT500(385)	-200 to 850	-200~200	0.16	0.16
		200~600	0.22	0.22
		600~850	0.27	0.27
PT1000(385)	-200 to 850	-200~200	0.10	0.10
		200~600	0.16	0.16
		600~850	0.20	0.20
Cu10(427)	-200~260	-200~260	0.54	0.56
Cu50(428)	-200~260	-200~260	0.11	0.13
Cu100(428)	-200~260	-200~260	0.07	0.08
Ni100(617) Ni100(618)	-60~180	-60~0	0.05	0.06
		0~180	0.05	0.05
Ni120(672)	-80~260	-80~260	0.04	0.05
Ni1000	-50~150	-50~150	0.07	0.07

*Note: Ambient temperature of 20°C±10°C.

4-wire accuracy. For 2-wire add 50 mΩ, for 3-wire add 10 mΩ

ORDERING INFORMATION

Model Number

ADT227 • • • HART

ADT227
ADT227Ex: Intrisically Safe
ADT227P: Panel Mount

HART = HART Capabilities

Panel Mount Version

Accessories (included)			
Model number	**Description**	**QTY**	**Picture**
9811-X	110V/220V external power adapter (Only for ADT227, 227P)	1 pc	
9811Ex-X	110V/220V external power adapter (Only for ADT227Ex)	1 pc	
9704	Chargeable Li-ion battery (Only for ADT227, 227P)	1 pc	
9704Ex	Chargeable Li-ion battery (Only for ADT227Ex)	1 pc	
9023	Test leads	1 set (6 pcs)	
9027	Right angle test leads (Non-Ex models only)	1 set (2 pcs)	
9060	Pressure module connection cable	1 pc	
9052	USB Cable type A to type C (Non-Ex models only)	1 pc	
9052Ex	Ex USB Cable type A to type C (For Ex models only)	1 pc	
9040	Hanging strap with magnet	1 pc	
9028	Multimeter Test Hook, Flexible Electronic Probe	1 set (2 pcs)	
	ISO 17025 accredited calibration certificate	1 pc	

Optional Accessories					
Model number	Description	Picture	**Model number**	Description	Picture
ADT161 - XXX	Digital Pressure Modules		9082	HART 250 ohm resistor adapter for ADT227, 227P and ADT226, 226P	
ADT161Ex - XXX	Intrinsically Safe Digital Pressure Modules		9704	Battery, rechargeable Li-ion polymer battery for Additel Handheld Series	
ADT129-X	Differential Pressure Manifold, -15 to 3,000 psi		9704Ex	Battery, rechargeable Li-ion polymer battery for Ex Additel Handheld Series	
9061	Current output cable (for ADT227, 227P and ADT226, 226P)		9811-X	110 V/220 V external power adapter for handheld models	
9062	Connection adapter cable for Fluke style pressure modules to non-explosion-proof Additel readouts		9811Ex-X	110 V/220 V external power adapter for Ex handheld models	
9063	PA profibus, FF (Foundation fieldbus) communication module for ADT227-HART		9906A	Hard carrying case for handheld instrument with accessories	
AM1602-6FT	Class A, PT100/385 Industrial RTD, -40°C to 160°C, 3/16 (4.76 mm) inch x 2 inch (50 mm) with 6 foot (1.8 Meters) cable w/ banana jack connectors		9918-SC	Soft carrying case, with space for handheld instrument, test leads, and accessories	
9080	Cable kit (including TC plug, compensation cable, S,R,K,J,T,E,N)		9530-BASIC	Additel/Acal Task management software for multifunction calibrator	
9081	Universal TC easy-press adapter for ADT227, 227P and ADT226, 226P		9530-NET	Additel/Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license	
9079-X	Thermocouple connection wire, mini male to alligator clips (X = type K, N, J, T, E)				

* Additel/Land software can be downloaded for free at www.additel.com

Software

Additel
Metrology Made Simple

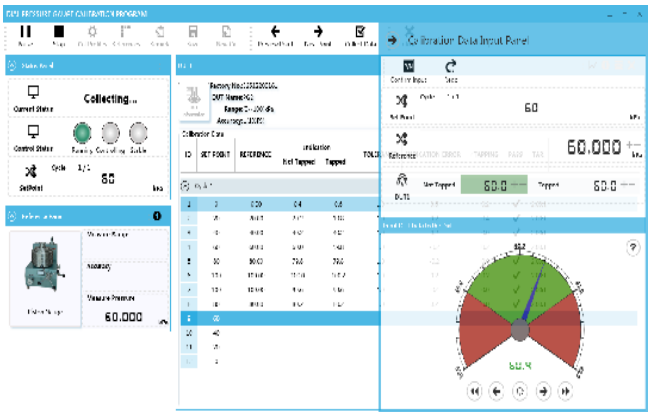
ACal

Additel ACal is a powerful software package designed to automate or semi-automate pressure calibrations and manage your laboratory. ACal combines the pressure automation features with lab and asset management functions to help make your job easier and more productive. ACal comes in three versions: Basic, Professional, and Network.

ACal Basic supports asset management and task management features. ACal Professional is a single PC installation which combines all the features of Basic with automation functionality. And ACal Network puts the Professional version on a multi-user network platform.

MAIN FEATURES

- Supports multi-users and network environments
- Calibration and asset management
- Simple user interface
- Scanning and printing of QR codes
- User definable permissions and access levels
- Preset test configurations
- Can calibrate variety pressure instruments
- Can calibrate several instruments at a time
- Calibration planning and scheduling
- Certificate management and creation
- Certificate customization



SPECIFICATIONS

Specifications		*ACal Network*	*ACal Professional*	*ACal Basic*
Network feature	Data sharing	√		
	Multiple users	√		
Upgrade availability	Upgrade to ACal Professional	N/A	N/A	√
	Upgrade to ACal Network	N/A	√	√
DUT supported	Type	Pressure Temperature Process		
	Full automatic calibration	√	√	
	Calibration management	√	√	√
DUT management	DUT info management	√	√	√
	Calibration due date reminder and scheduling	√	√	√
Reference management	Reference info management	√	√	√
	Calibration due date reminder and scheduling	√	√	√
Calibrator Task Management	Task download	√	√	√
	Task upload	√	√	√
Bar coding	Bar code scanning	√	√	
	Bar code creation	√	√	

Additel
Metrology Made Simple

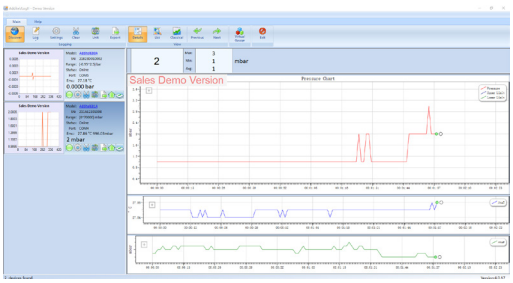
ACal

ORDERING INFORMATION

Model Number	Description
9530-BASIC	Additel/Acal Automated calibration software with asset management, basic version
9530-BASIC-L1	Additel/Acal Automated calibration software with asset management, basic version additional license (9530-BASIC must be purchased prior to any additional licenses)
9530-PRO	Additel/Acal Automated calibration software with asset management, professional version for single PC
9530-PRO-L1	Additel/Acal Automated calibration software with asset management, professional version for single PC additional license (9530-PRO must be purchased prior to any additional licenses)
9530-NET	Additel/Acal Automated calibration software with asset management, network version, Includes server installation and 1 user license
9530-NET-L1	Additel/Acal, Additional License, Automated calibration software with asset management, network version, Includes 1 user license (9530-NET must be purchased prior to any additional licenses)

9502 Additel/Log II

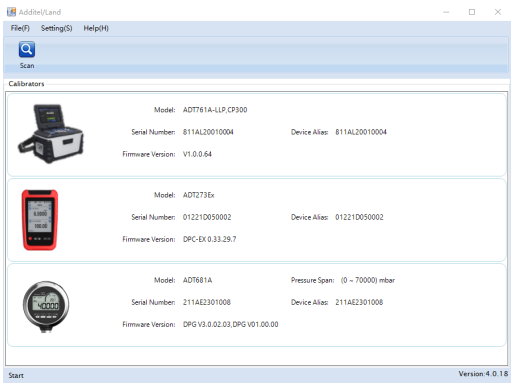
Additel/Log II is a real time data logging and graphical software for the ADT681/672/680/760/761A/780/875/878/286 models. Additel LogII software also supports wireless data logging when used with Additel products supporting wireless connectivity. Data can be recorded in real-time and recorded results can be uploaded. After results are stored, the data can be exported to a customizable report showing pressure and ambient temperature. Each real-time test can be tagged with a unique record name.



The software also allows you to acquire data to your PC. You can choose to display the data in real-time or historically, as well as in a graph or table format.

9500 Additel/Land

With Additel/Land software, you may download test results stored in the internal memory of Additel calibrators to a PC, and export the results to an excel file. It is a free software package and can be downloaded at www.additel.com.



Metrology Made Simple

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ADT-286 (Pg. 122)
Multifunction Reference Thermometer Readout

ADT-260Ex (Pg. 179)
Handheld Multichannel Reference Recorder

ADT-850 (Pg. 162)
Laboratory Thermocouple Calibration Furnace

ADT-878 (Pg. 140)
Reference Dry Well Calibrator

ADT-762 (Pg. 1)
Automatic Pressure Calibrator (0-10,000 PSI)

ADT-673 (Pg. 83)
Advanced Digital Pressure Calibrator

ADT-282 (Pg. 134)
Dual-Channel Reference Thermometer Readout

ADT-760 (Pg. 20)
Automatic Handheld Pressure Calibrator

ADT-685Ex (Pg. 91)
Digital Pressure Gauge