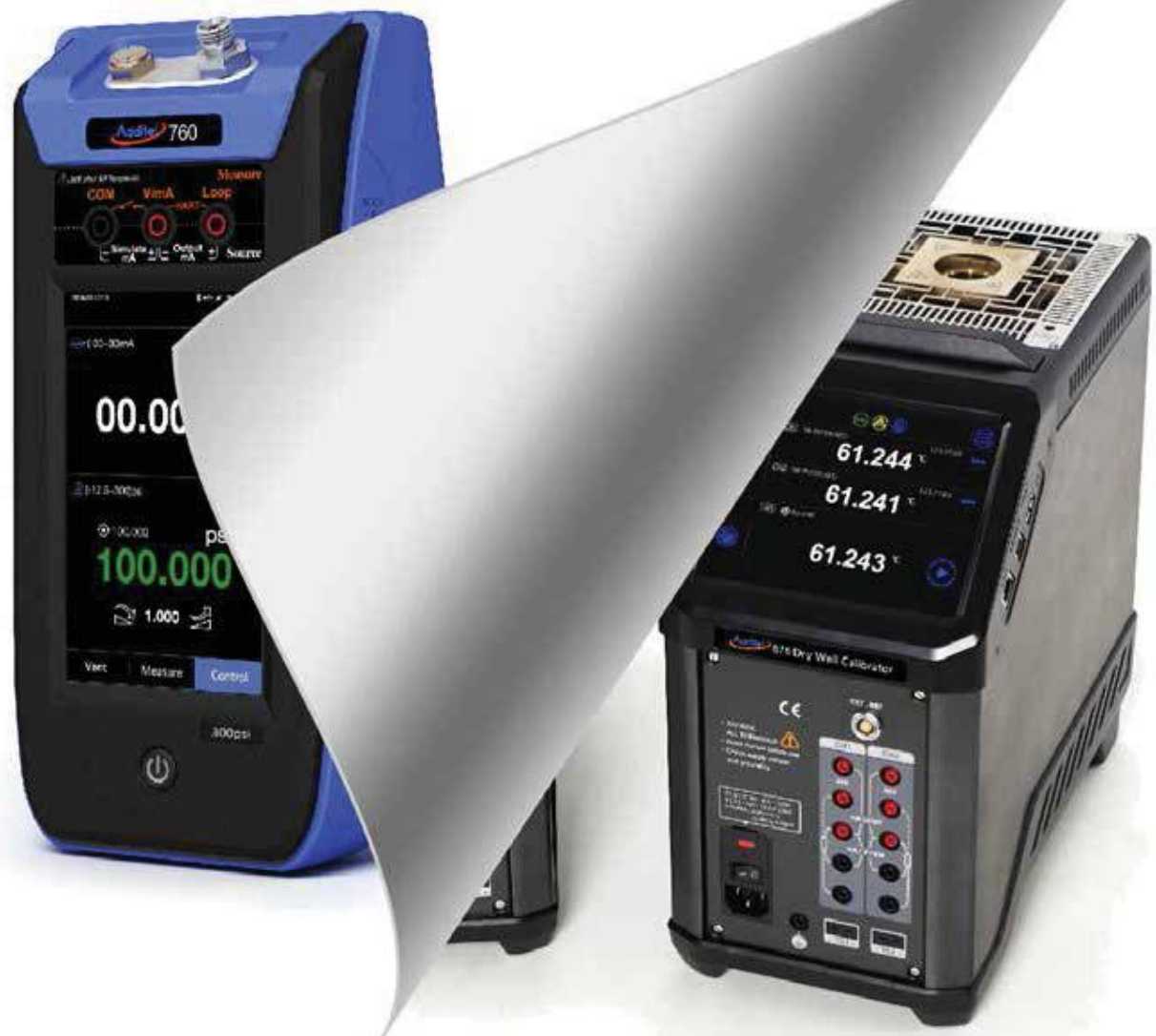
Distributor Indonesia
PT TRIWI PUTRA JAYA
Taman Surya 3 Blok H7 No. 15-17,
Jl.Daan Mogot -Jakarta 11830, Indonesia
T +62-21- 5417194 F +62-21-5414630
M +62-818 920 386 +62-822 9908 5294
+62-818 920 386 +62-822 9908 5294
info@triwi-online.com / sales@pttriwi.com
www.triwi-online.com / www.pttriwi.com

Additel

Pressure & Temperature Calibration Equipment

Catalog 2018



ADDITEL CORPORATION

Additel Corporation is one of the leading worldwide providers of pressure calibration tools. We are dedicated to designing, manufacturing, and delivering the highest quality test tools and portable calibrators for the process and calibration industries. For many years Additel has successfully developed pressure controlers, automated pressure calibrators, digital pressure test gauges, digital pressure calibrators, pressure test and calibration pumps, and multifunction process calibrators. Additel products are currently used in over 80 countries worldwide.

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.

Phone: 714-998-6899 Fax: 714-998-6999 Email: sales@additel.com

Corporate Headquarters

Additel Corporation
2900 Saturn Street #B
Brea, CA 92821, USA

Salt Lake City Office

Additel Corporation
1364 West State Rd Suite 101
Pleasant Grove, UT 84062, USA

European Office

Additel Corporation
Holkebjergvej 79
5250 Odense, Denmark

Asia Office

Additel Corporation
Bldg 5, No. 3 Fengxiu Middle Road,
Haidian, Beijing, 100094, China

Additel Pressure Gauge Selection Guide

Feature \ Series	ADT672 Series Digital Pressure Calibrator	ADT681 Series Digital Pressure Gauge	ADT680 Series Digital Pressure Gauge
Gauge Pressure	•	•	•
Compound Pressure	•	•	•
Absolute Pressure	•	•	
Differential Pressure	•	•	
Accuracy Classes	0.02% & 0.05%FS 15K & 20K psi: 0.05%FS > 20K psi: 0.1%FS	0.02%, 0.05%, 0.1%, & 0.2%FS & 0.1%RD 15K & 20K psi: 0.05%, 0.1%, 0.2%FS & 0.1%RD >20K psi: 0.1% & 0.2%FS	0.05%, 0.1%, & 0.25%FS > 20K psi: 0.1% & 0.25%FS
Digital Display	•	•	•
Analog Display (Fan-Shaped Indication)		•	
Fully Temperature Compensation from -10 C to 50 C	•	•	•
Resolution			
6-Digit Resolution	•		
5-Digit Resolution	•	•	•
Selectable Pressure Units	11	11	19
Backlight	•	•	•
Over Pressure Indication	•	•	•
IS Certification (optional – not available for panel mount)		ADT681IS only (≥GP15)	
IP67 Certification			•
Panel Mount (optional)		•	
Wireless			680W only
Data Logging	•	Optional	680W only
Min/Max	•	•	•
Built-in Leak Test	•		•
HART Communication	•		
Measure mA and V	•		
24V Loop Power	•		
Switch Test	•		
NIST-Traceable Certificate of Calibration	•	•	•
Power	Rechargeable battery	9V battery (120/220V adapter is optional)	2AA batteries

Pressure \ Series	Pressure Range		Media	ADT672 Series Digital Pressure Calibrator	ADT681 Series Digital Pressure Gauge	ADT680 Series Digital Pressure Gauge
	psi	bar				
Gauge						
V15	-15 to 0	-1 to 0	G	•	•	•
GP5	0 to 5	0 to 0.35	G	•	•	
GP10	0 to 10	0 to 0.7	G	•	•	
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	•	•	•

Series / Pressure	Pressure Range		Media	ADT672 Series Digital Pressure Calibrator	ADT681 Series Digital Pressure Gauge	ADT680 Series Digital Pressure Gauge
	psi	bar				
GP600	0 to 600	0 to 40	G, L	•	•	
GP1K	0 to 1K	0 to 70	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	•	•	•
Compound						
CP2	±2	±0.16	G	•	•	
CP5	±5	±0.35	G	•	•	
CP10	±10	±0.7	G	•	•	
CP15	±15	±1	G	•	•	•
CP30	-15 to 30	-1 to 2	G	•	•	•
CP100	-15 to 100	-1 to 7	G, L	•	•	
CP300	-15 to 300	-1 to 20	G, L	•	•	
Absolute						
AP5	5	0.35	G	•	•	
AP10	10	0.7	G	•	•	
AP15	15	1	G	•	•	
AP30	30	2	G	•	•	
AP50	50	3.5	G	•	•	
AP100	100	7	G, L	•	•	
AP300	300	20	G, L	•	•	
AP500	500	35	G, L	•	•	
AP1K	1K	70	G, L	•	•	
AP3K	3K	200	G, L	•	•	
AP5K	5K	350	G, L	•	•	
Differential	inH_2O	mbar				
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	•	•	

Additel 672
Digital Pressure Calibrators

New Ranges to 60,000 psi (4,200 bar)

- **Pressure ranges to 60,000 psi (4,200 bar)**
- **HART Communication capability**
- **Measure mA or V, and with 24V loop power**
- **Easy-to-use, inexpensive pressure calibrator with uncertainty better than 0.02%FS**

Gauge pressure | Differential pressure

OVERVIEW

At first glance, the 672 series precision pressure calibrators look like an ordinary pressure gauge. But this series is much more than ordinary, and definitely more than just a pressure gauge—it's a pressure calibrator! With advanced microprocessor technology and state-of-the-art silicon pressure sensors, the 672 series precision pressure calibrators provide a pressure calibration solution for gauges, transmitters, and switches over a wide pressure range. The 672 is the size of a pressure gauge but with the functionality of a calibrator: It measures pressure precisely with a built-in pressure sensor, as well as reads the current or mV produced by a transducer. It can even supply an excitation voltage to power sensors or transmitters during calibration. In order to reach 0.02%FS accuracy up to 10,000 psi (700 bar) and 0.1%FS accuracy up to 60,000 psi (4,200 bar), every silicon pressure sensor has been specially aged, tested, and screened before assembly. The 672 series precision pressure calibrators are unmatched in performance and reliability.

FEATURES

- Pressure ranges to 60,000 psi (4,200 bar)
- Measure mA with 0.01% RD + 1.5 μA accuracy
  Measure V with 0.01% RD + 1.5 mV accuracy
- Power transmitters during test using 24V loop supply
- Pressure switch test
- HART Communication capability
- Advanced temperature compensation
- Dual readout
- Min/Max/Hold to capture changing measurements
- Data logging
- Large, easy to read display with 6-digit resolution
- Backlit display
- Rechargeable battery or AC adapter
- NIST traceable calibration with data (Included)

SPECIFICATIONS

Accuracy	ADT672-02: 0.02% of full scale
	ADT672-05: 0.05% of full scale
	>20,000 (1,400 bar): 0.1% FS
Gauge Types	Gauge pressure, compound pressure, absolute pressure, differential pressure
Display	Description: Dual-line 6 full digit FSTN LCD with LED Backlight
	Display rate: 3.5 readings per second (Default setting).
	Numeral display height: 16.5mm (0.65")
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
Environmental	Compensated Temperature: 14°F to 122°F (-10°C to 50°C)
	Operating Temperature: 14°F to 122°F (-10°C to 50°C)
	Storage Temperature: -4°F to 158°F (-20°C to 70°C)
	Humidity: <95%
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: 0.236 inch (Ø6 mm) test hose
	Other connections available per request
Over Pressure Warning	120%
Electrical Connection	0.156 inch (Ø4mm) sockets
Electrical Measurement Accuracy	Voltage DC: ±30.0000V, ± (0.01%RD + 1.5 mV)
	Current DC: ±30.0000mA, ± (0.01%RD + 1.5 μA)
	DC 24V: 24V±0.5V, MAX:50mA, Protect at: 120mA
	Switch[1]: Status OPEN/CLOSED
Power	Battery: Rechargeable Li-ion polymer battery
	Li-Battery working time: 40 hours
	Recharge time: 4 hours
	External power: 110V/220V power adapter (DC10V)
Enclosure	Case material: Aluminum alloy
	Wetted parts: 316L SS
	Dimension: Ø120mm X 46mm depth X 184mm height
	Weight: 0.7kg
	Protection Level: IP30
Data Logging	Storage capacity: 30 files, 40 records per file
	Mode: manual and automatic
	Hourly-record: record the data every hour
	Interval-record: set by user
Compliance	CE Marked
Communication	RS232 (DB9/F, environmentally sealed)
	Baud rate: 1200, 2400, 4800, 9600
	Data length: 8 bits
	Stop bit: 2 bits
	Address: from 1 to 112
Warranty	1 year

[1] 1V~12V if switch has detective voltage

PRESSURE RANGE

Gauge Pressure [1]

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

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

Compound Pressure

P/N	Pressure Range (psi)	Pressure Range (bar)	Media	Accuracy(%FS)[1]	Burst Pressure
CP2	±2	±0.16	G	0.05	3×
CP5	±5	±0.35	G	0.02 (0.05)	3×
CP10	±10	±0.7	G	0.02 (0.05)	3×
CP15	±15	±1	G	0.02 (0.05)	3×
CP30	-15 to 30	-1 to 2	G	0.02 (0.05)	3×
CP100	-15 to 100	-1 to 7	G, L	0.02 (0.05)	3×
CP300	-15 to 300	-1 to 20	G, L	0.02 (0.05)	3×

[1] FS specification applies to the span of the range

Absolute Pressure					
P/N	Pressure Range		Media	Accuracy(%FS)	Burst Pressure
	(psi)	(bar)			
AP5	5	0.35	G	0.1	3×
AP10	10	0.7	G	0.1	3×
AP15	15	1.0	G	0.1	3×
AP30	30	2.0	G	0.1	3×
AP50	50	3.5	G	0.1	3×
AP100	100	7.0	G , L	0.05 (0.1)	3×
AP300	300	20	G , L	0.05 (0.1)	3×
AP500	500	35	G , L	0.05 (0.1)	3×
AP1K	1,000	70	G , L	0.05 (0.1)	3×
AP3K	3,000	200	G , L	0.05 (0.1)	3×
AP5K	5,000	350	G , L	0.05 (0.1)	3×

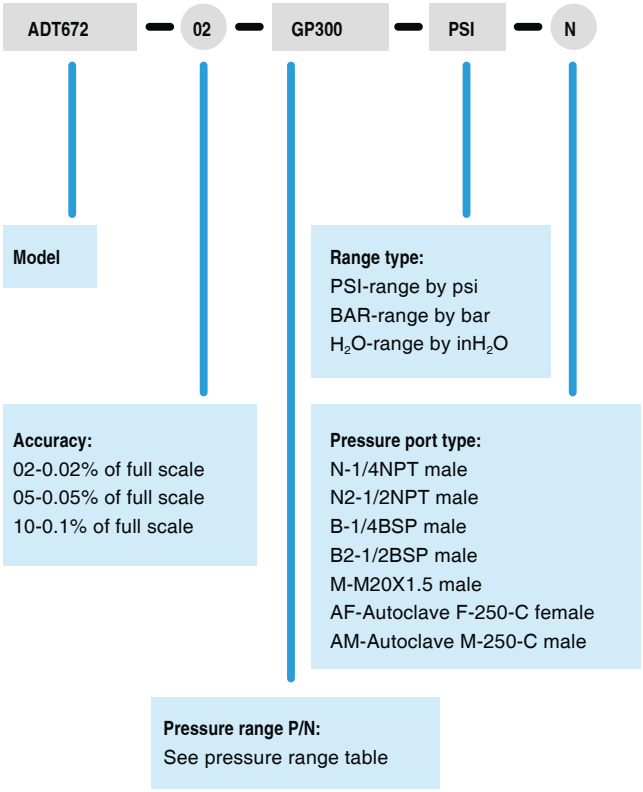
Differential Pressure						
P/N	Pressure Range		Media	Accuracy (%FS)[1]	Burst Pressure	Static Pressure Range
	(inH_2O)	(mbar)				
DP1	±1	±2.5	G	0.05[2]	100×	±10 psi
DP2	±2	±5.0	G	0.05[2]	100×	±10 psi
DP5	±5	±10	G	0.05[2]	50×	±10 psi
DP10	±10	±25	G	0.05[2]	20×	±10 psi
DP20	±20	±50	G	0.05	20×	±10 psi
DP30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

ORDERING INFORMATION

Model Number



Accessories Included

110V/220V external power adapter (DC 10V)
2 pieces test leads (1.5-meter) and 2 pieces alligator clips
2 pieces 0.236 inch (Ø6 mm) test hose (for differential pressure gauge only)
Additel/Land software (free download at www.additel.com)
Manual
NIST traceable calibration certificate

Optional Accessories

Model number	Description
9702	Spare rechargeable Li-ion polymer battery for 672
9816	Spare 110V/220V external power adapter (DC 10V) for ADT22X and ADT672 calibrator
9502	Additel/Log II real time data logging and graphical software for 681 and 672
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
9900-672	Carrying Case for one 672 digital pressure gauge
9022	Spare 2 pieces test leads (1.5-meter) and 2 pieces alligator clips

Understanding Accuracy Specifications for Digital Pressure Sensors – Percentage of Full Scale 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 scale (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 scale or vise versa? This brief technical note will discuss the two differences and answer these questions.

Percentage of Reading Accuracy

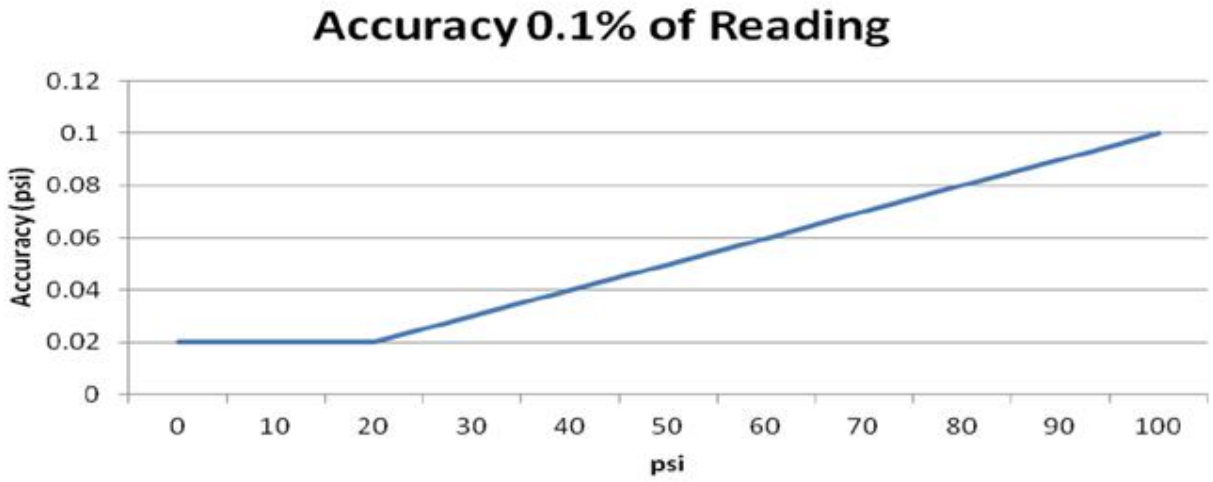
Figure 1 - Percent reading accuracy example
Full scale: 0 to 100 psi
Accuracy: 20 to 100% FS: 0.1% of reading
0 to 20% FS: 0.02% of FS

psi	Accuracy (psi)		
0	0.02	0.02%FS	
10	0.02		
20	0.02		0.1% of Reading
30	0.03		
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 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.



Percentage of Full Scale Accuracy

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

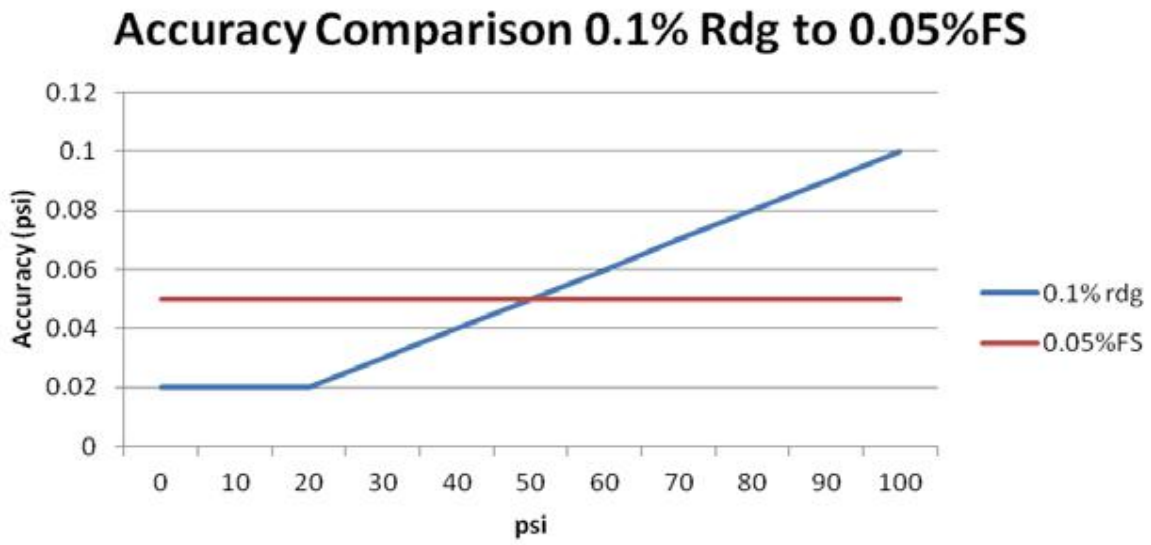
Accuracy as a percentage of full scale is calculated by multiplying the accuracy percentage by the full scale pressure of the gauge. This is obviously a more simple method of specification and is most commonly used in industry because it is easy to calculate and interpret. Denoting the accuracy as percent 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	0.02	0.05
10	0.02	0.05
20	0.02	0.05
30	0.03	0.05
40	0.04	0.05
50	0.05	0.05
60	0.06	0.05
70	0.07	0.05
80	0.08	0.05
90	0.09	0.05
100	0.10	0.05

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 681
Digital Pressure Gauges

- Pressure ranges to 60,000 psi (4,200 bar)
- 0.02%, 0.05%, 0.1%, 0.2% FS or 0.1%RD accuracy
- % pressure indication with fan-shaped graph scale for visual reference
- Fully temperature compensated accuracy
- Panel mount gauges are available
- Intrinsically safe version (681IS)
- Data logging option
- IP67 rated (681IS)

Gauge pressure Differential pressure

OVERVIEW

With advanced microprocessor technology and state-of-the-art silicon pressure sensors, the 681 series digital pressure gauges provide an accurate, reliable, and economic solution for a wide range of pressure applications. They are loaded with functionality and remarkably easy to use. To reach the best performance, every silicon pressure sensor in our gauges is specially aged, tested and screened before assembly. At Additel, fully temperature compensated accuracy means every sensor is pressure tested at several environmental temperatures from -10°C to 50°C. With this test data individual coefficients are generated and stored in the gauge characterizing its performance over the full temperature compensated range. And now the ADT681IS comes with an IP67 rating meaning it is dust resistant and water proof, submersible in 1 meter of water.

Designed to fit your need

Additel pressure gauges give you the widest variety of sensor choices on the market. Whether you require low inches of water measurement or very high pressure measurement, we have a gauge that will meet your need. We offer sensors which are ±1 inH_2O (±2.5 mbar) to 60K psi (4,200 bar) and everything in between.

Do your applications require you to measure both positive and vacuum pressure? Our compound gauges do not compromise accuracy and provides you with the same high accuracy specification on both positive and vacuum pressures. We offer a wide variety up to 300 psi (20 bar). If you need a higher range, just contact us and we can likely customize one to meet your need. We also offer absolute pressure sensors to 5K psi (350 bar) and a full range of differential pressure sensors from ±1 inH_2O (±2.5 mbar) to ±300 inH_2O (±700 mbar). Are you looking for a pressure gauge to use in hazardous areas? Our ATEX-certified intrinsically safe models (681IS) are designed for pressure measurement in hazardous areas.

If you need to panel mount our sensors, we offer the option (see ordering information) for a back-mounted pressure port and gauge housing designed to fit in a panel. And most recently, we've added the option to do stand-alone data logging with the 681. Now you can record more than 21,000 records internal to the 681 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. The 681 series digital pressure gauges are unmatched in performance and reliability. Best of all, they are very affordable.

FEATURES

- Pressure ranges to 60,000 psi (4,200 bar)
- 0.02% full scale accuracy (681-02)
  0.05% full scale accuracy (681-05)
  0.1% full scale accuracy (681-10)
  0.2% full scale accuracy (681-20)
  0.1% reading scale accuracy (681-RD)
- IP67 rated: Submersible in 1 meter of water(681IS)
- Fully temperature compensated accuracy from 14°F to 122°F (-10°C to 50°C)
- Up to eleven selectable pressure units
- Large, easy to read display with 5-digit resolution
- Backlit display
- % pressure indication with fan-shaped graph scale for visual reference
- Display flash warning when pressure over 120% of FS
- Bottom mount or panel mount
- ATEX certified intrinsically safe (Model 681IS)
- NIST traceable calibration with data(included)
- 9V battery power or AC adapter (optional)
- Data logging to 21,843 records (includes date, time, pressure and temperature)

SPECIFICATIONS

Model	ADT681	ADT681IS
Description	Digital Pressure Gauge	Intrinsically Safe Digital Pressure Gauge
Intrinsic Safety & European Compliance	CE marked II 1G EX ia IIC T4 Ga	CE marked ATEX certified intrinsically safe II 1G EX ia IIC T4 Ga
Accuracy (For detailed accuracy, please see pressure range table)	681(IS)-02 : 0.02% of full scale	
	681(IS)-05 : 0.05% of full scale	
	681(IS)-10 : 0.1% of full scale	
	681(IS)-20 : 0.2% of full scale	
	681(IS)-RD: 0% to 20% of Range: 0.02% of full scale 20% to 110% of Range: 0.1% of reading Vacuum: 0.25% of full scale[1][2]	
Gauge Types	Gauge pressure, compound pressure, absolute pressure, differential pressure, barometric pressure	
Fan-shaped Graph Scale	Similar to analog dials, including pressure swing, % indication with fan-shaped graph scale for visual reference, low/high alarm.	
Display	Description: 5 full digit FSTN LCD	
	Display rate: 3 readings per second (Default setting). Adjustable from 10 readings per second to 1 reading every ten seconds	
	Numeral display height: 16.5mm (0.65")	
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	
Environmental	Compensated Temperature: 14°F to 122°F (-10°C to 50°C)	
	Operating Temperature: 14°F to 122°F (-10°C to 50°C)	
	Storage Temperature: -4°F to 158°F (-20°C to 70°C)	
	Humidity: <95%	
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: 0.236 inch (Ø6 mm) test hose	
	Other connections available per request	
Power	Battery: One 9V alkaline battery (included)	
	Battery life: 1. High power mode: 320 hours 2. Low power mode: 300 hours (10 readings/s), 600 hours (3 reading/s), or 4000 hours (1 reading/10s)	
	Power auto-off: 60 minutes power auto-off. Auto-off may be disable	
	External power: 110/220V external power adapter (optional)	
Enclosure	Case material: Aluminum alloy	
	Wetted parts: 316L SS	
	Dimension: Ø110mm X 35mm depth X 176mm height (panel mount gauge: Ø140mm X 86mm depth)	
	Weight: 0.6kg	
Compliance	Protection Level: IP67(available for 681IS GP15-60K)	
	Vibration: 5g (20-2000 Hz)	
	Shock Resistance: 100g/11ms	
Data Logging (Available on with data logging option ADT681-...-DL)	Data storage: 21,843 records (each record includes date, time, pressure and temperature)	
	Rate: user-selectable from 1 to 99,999 second intervals	
Communication	RS232 *(Do not use the RS-232 connector in a hazardous atmosphere)	
Warranty	1 year	

[1] FS = -14.5 psi
[2] Applicable ADT681-RD-CPX

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, 0.1, 0.2)	N/A	3×
GP2	2	0.16	G	0.05 (0.1, 0.2)	N/A	3×
GP5	5	0.35	G	0.05 (0.1, 0.2)	0.1	3×
GP10	10	0.7	G	0.02 (0.05, 0.1, 0.2)	0.1	3×
GP15	15	1.0	G, L[3]	0.02 (0.05, 0.1, 0.2)	0.1	3×
GP30	30	2.0	G, L[3]	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×
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	3×
GP15K	15,000	1,000	G, L	0.05 (0.1,0.2)	0.1	2×
GP20K	20,000	1,400	G, L	0.05 (0.1,0.2)	N/A	1.5×
GP25K	25,000	1,600	G, L	0.1 (0.2)	N/A	1.5×
GP30K	30,000	2,000	G, L	0.1 (0.2)	N/A	1.5×
GP36K	36,000	2,500	G, L	0.1 (0.2)	N/A	1.5×
GP40K	40,000	2,800	G, L	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] 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	40 Pa	3×

Absolute Pressure					
P/N	Pressure Range		Media [1]	Accuracy(%FS)	Burst Pressure
	(psi)	(bar)			
AP5	5	0.35	G	0.1 (0.2)	3×
AP10	10	0.7	G	0.1 (0.2)	3×
AP15	15	1.0	G	0.1 (0.2)	3×
AP30	30	2.0	G	0.1 (0.2)	3×
AP50	50	3.5	G	0.1 (0.2)	3×
AP100	100	7.0	G, L	0.05 (0.1, 0.2)	3×
AP300	300	20	G, L	0.05 (0.1, 0.2)	3×
AP500	500	35	G, L	0.05 (0.1, 0.2)	3×
AP1K	1,000	70	G, L	0.05 (0.1, 0.2)	3×
AP3K	3,000	200	G, L	0.05 (0.1, 0.2)	3×
AP5K	5,000	350	G, L	0.05 (0.1, 0.2)	3×

[1] G=Gas, L=Liquid

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	±160	G	0.05	3×	±10 psi
DP150	±150	±350	G	0.02 (0.05)	3×	50 psi
DP300	±300	±700	G	0.02 (0.05)	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.

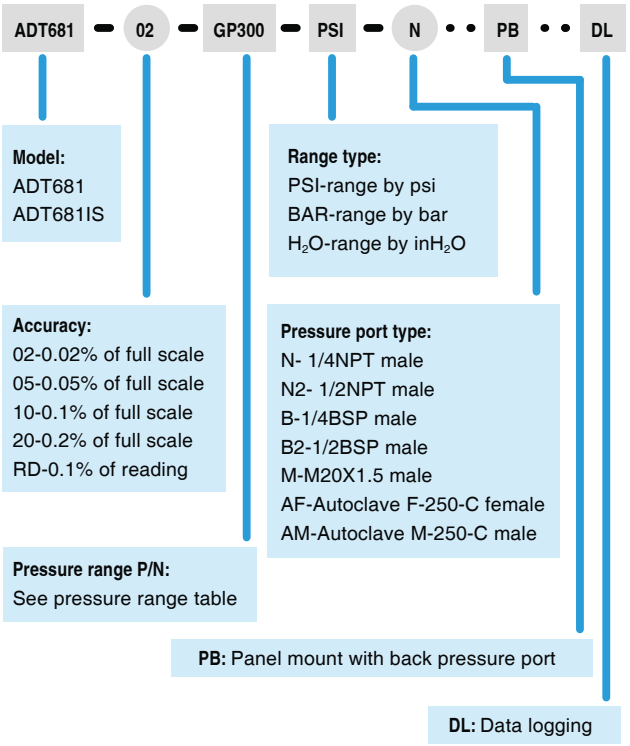
Compound Pressure						
P/N	Pressure Range		Media [1]	Accuracy		Burst Pressure
	(psi)	(bar)		%FS[2]	%RD	
CP2	±2	±0.16	G	0.05 (0.1,0.2)	N/A	3×
CP5	±5	±0.35	G	0.02 (0.05,0.1,0.2)	0.1	3×
CP10	±10	±0.7	G	0.02 (0.05,0.1,0.2)	0.1	3×
CP15	±15	±1	G	0.02 (0.05,0.1,0.2)	0.1	3×
CP30	-15 to 30	-1 to 2	G	0.02 (0.05,0.1,0.2)	0.1	3×
CP100	-15 to 100	-1 to 7	G, L	0.02 (0.05,0.1,0.2)	0.1	3×
CP300	-15 to 300	-1 to 20	G, L	0.02 (0.05,0.1,0.2)	0.1	3×

[1] G=Gas, L=Liquid

[2] FS specification applies to the span of the range.

ORDERING INFORMATION

Model Number



Accessories Included

Rubber boot (Except panel mount)
9V alkaline battery (1 pc)
Manual
NIST traceable calibration certificate

Optional Accessories

Model number	Description
9812	110V/220V external power adapter (DC 9V) for 681 digital pressure gauge.
9502	Additel/Log II real time data logging and graphical software for 681 and 672.
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
9900-681	Carrying Case for one 681 digital pressure gauge
9251	Rubber boot for ADT681

Note: For O_2 applications contact Additel.

Additel 680 Series
Digital Pressure Gauges

New Ranges to 60,000 psi (4,200 bar)

- Pressure ranges to 60,000 psi (4,200 bar)
- 0.05%, 0.1% or 0.25%FS accuracy
- Fully temperature compensated accuracy
- IP67
- Data logging and wireless (680W)

680 with data logging and wireless (optional)

OVERVIEW

We designed the 680 series digital pressure gauges with two main objectives in mind. First, to provide an affordable digital gauge to replace mechanical gauges. If you're looking to move from dial gauges to a digital gauge, you'll find the 680 standard version gauge to be of high quality and suited for your need in terms of price and performance. With advanced microprocessor technology and state-of-the-art silicon pressure sensors, the 680 series digital pressure gauges provide an accurate, reliable, and economic solution for a wide range of pressure applications. They are loaded with functionality and remarkably easy to use. To reach the best performance, every silicon pressure sensor is specially aged, tested and screened before assembly.

The second objective was to provide a high-precision pressure gauge capable of wireless communication and data logging. Our 680W series provides just this along with several accuracy and pressure range options to meet your need. This wireless unit is compatible with the Additel/Land Wireless software, which is available for a free download from our website. Data can be recorded standalone with the 680W and then downloaded wirelessly to Additel/Land Wireless. For more advanced logging and data analysis, Additel/Log II Wireless is specially designed to communicate with the 680W. Each unit can store up to 140,000 readings which consist of date, time, pressure, and internal temperature. The 680 series digital pressure gauges are unmatched in performance and reliability. Best of all they are very affordable.

FEATURES

- Pressure ranges to 60,000 psi (4,200 bar)
- 0.05%, 0.1% or 0.25% full scale accuracy
- Fully temperature compensated accuracy from 14°F to 122°F (-10°C to 50°C)
- Up to 13 user-selectable pressure units, 6 selectable engineering units
- Large, easy to read display with 5-digit resolution
- Backlit display
- Icon-based menu
- Display flash warning when pressure exceeds 120% of FS
- Stainless wetted surface construction
- IP67 (submersible in 1 meter of water)
- Drop-tested from 1 meter
- 2 AA alkaline batteries
- CE R&TTE, FCC ID, IC ID Certificates
- NIST traceable calibration with data(included)

SPECIFICATIONS

Model	ADT680	ADT680W
Description	Digital Pressure Gauge	Wireless Digital Pressure Gauge with Data Logging
Pressure Type	Gauge Pressure, compound Pressure	
Accuracy	0.05%, 0.1% or 0.25%FS	
Update Rate	10 times/Sec ,3 times /Sec (default), 1 time /Sec ,1 time/15 Sec	
Operating Temperature	14°F to 122°F (-10°C to 50°C)	
Compensated Temperature	14°F to 122°F (-10°C to 50°C), accuracy guaranteed	
Storage Temperature	-4°F to 158°F (-20°C to 70°C)	
Overload Pressure	1.2X	
Dimensions	100mm x 40mm, total height:157mm	
Weight	500g	

SPECIFICATIONS

Model	ADT680	ADT680W
Wireless Communication (ADT680W only)	N/A	Wireless Frequency: 2.4G ISM Bands, 20 meter range
		Number of wireless Channels : Chanel 1-15
		Software: Wireless network demo software included read upto 20 gauges.
Data Logging (ADT680W only)	N/A	Storage Capacity: 140,000 readings (time, pressure, and temperature)
		Storage Interval: Adjustable from 1-9999 Sec
		Single-button-press data logging enabled
		Key Lockout: When the gauge is in auto-storing mode, the front panel buttons will be automatically locked.
Filtering	Averaging (3 to 10 samples) or low-pass first-order filter.	
Max/Min data capture	Saves Max and Min data during pressure measurement.	
Pressure units	Pa, kPa, MPa, bar, mba, psi, kgf/cm^2, mmH_2O, mmHg, inH_2O, inHg, ozf/in, %, °C, °F Engineering units: inH_2O(20°C), inH_2O(60°F), mmH_2O(20°C), mmH_2O(15°C), ftH_2O(60°F), or ftH_2O(4°C)	
Display	LCD Specification: FSTN-LCD,Visual scope 36x61mm	
	Full 5 digits,15.2mm High	
	7 segment analog bar graph scaled from 0-100% of FS	
	Backlight: White	
	Backlight Duration: Not auto off,15,30,45,60 seconds optional	
Auto off	Disabled,15, 30, 45, 60, 90, or 120 Minutes	
Compliance	Certificates:CE R&TTE, FCC ID, IC ID	
	Protection Level: IP67	
	Vibration: 5g(20-2000Hz)	
	Shock resistance: 100g/11ms	
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	
	Other connections available per request.	
Overpressure Alarm	Display will flash over 120%FS	
Battery voltage Indicator	Displays the battery life remaining. When the battery voltage is too low, the gauge will power-off automatically.	
Overpressure Record	Gauge will record max pressure data when the gauge is over pressured by 120% of FS.	
Leakage test	In leak test mode, the gauge will record beginning pressure, ending pressure, and show the difference ΔP.	
Factory Reset	Resets all settings back to factory default, except the calibration parameters.	
Warranty	1 year	

PRESSURE RANGE

Compound Pressure					
P/N	Pressure Range		Accuracy(FS%)[2]	Media[3]	Burst Pressure
	(psi)[1]	(bar)			
CP15	±15	±1	0.05(0.1, 0.25)	G,L	3×
CP30	-15 to 30	-1 to 2	0.05(0.1, 0.25)	G,L	3×

[1] Sealed gauge pressure for above 1,000 psi.
[2] FS specification applies to the span of the range.
[3] G=Gas, L=Liquid

SPECIFICATIONS

Gauge Pressure					
P/N	Pressure Range		Accuracy(FS%)	Media[3]	Burst Pressure
	(psi)[1]	(bar)			
V15	-15	-1.0	0.05 (0.1, 0.25)	G	3×
GP15	15	1.0	0.05 (0.1, 0.25)	G,L	3×
GP30	30	2.0	0.05 (0.1, 0.25)	G,L	3×
GP100	100	7.0	0.05 (0.1, 0.25)	G,L	3×
GP150	150	10	0.05 (0.1, 0.25)	G,L	3×
GP300	300	20	0.05 (0.1, 0.25)	G,L	3×
GP500	500	35	0.05 (0.1, 0.25)	G,L	3×
GP1K	1,000	70	0.05 (0.1, 0.25)	G,L	3×
GP3K	3,000	200	0.05 (0.1, 0.25)	G,L	3×
GP5K	5,000	350	0.05 (0.1, 0.25)	G,L	3×
GP10K	10,000	700	0.05 (0.1, 0.25)	G,L	3×
GP15K	15,000	1,000	0.05 (0.1, 0.25)	G,L	2×
GP20K	20,000	1,400	0.05 (0.1, 0.25)	G,L	1.5×
GP25K	25,000	1,600	0.1 (0.25)	G,L	1.5×
GP30K	30,000	2,000	0.1 (0.25)	G,L	1.5×
GP36K	36,000	2,500	0.1 (0.25)	G,L	1.5×
GP40K	40,000	2,800	0.1 (0.25)	G,L	1.35×
GP50K	50,000	3,500	0.1 (0.25)	G,L	1.2×
GP60K	60,000	4,200	0.1 (0.25)	G,L	1.1×

[1] Sealed gauge pressure for above 1,000 psi.
[2] FS specification applies to the span of the range.
[3] G=Gas, L=Liquid

ORDERING INFORMATION

Model Number

ADT680 — 25 — GP300 — PSI — N

Model:
ADT680
ADT680W

Accuracy:
05-0.05% of full scale
10-0.1% of full scale
25-0.25% of full scale

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

Accessories Included

AA battery (2 pcs)
Rubber boot for Additel 680 gauge;
Additel/Land Wireless software for 680W (free download at www.additel.com)
Manual
NIST traceable calibration certificate

Optional Accessories

Model number	Description
9503	Additel/Log II Wireless real time data logging and graphical software for 680W
9030	Spare wireless master device (USB dongle) for ADT680W gauge.

Note: For O_2 applications contact Additel.

Application Note

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 employee some techniques to correct for and minimize the impact of temperature changes on these factors.

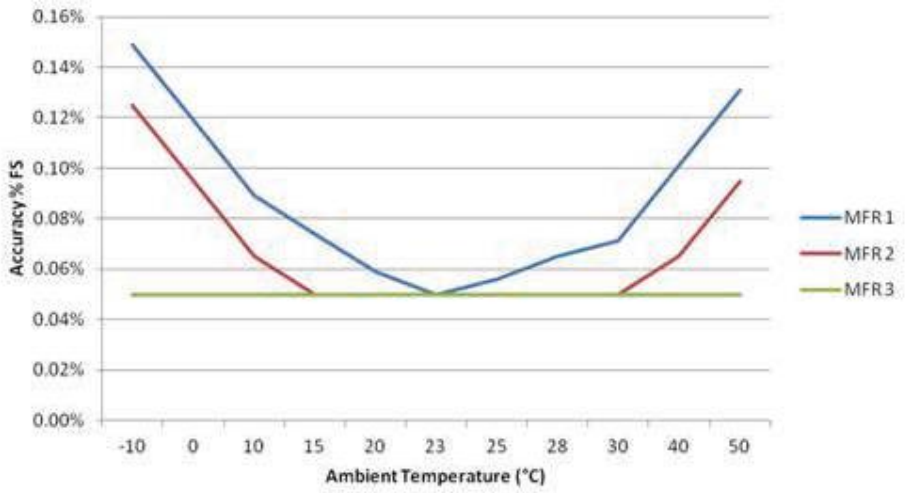
To understand the environmental temperature effect on your sensor, it is helpful to first understand some common terms you may see on a pressure sensor specification sheet.
Operating Temperature Range: This is the temperature range over which the sensor can be used without causing damage.
Temperature 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.

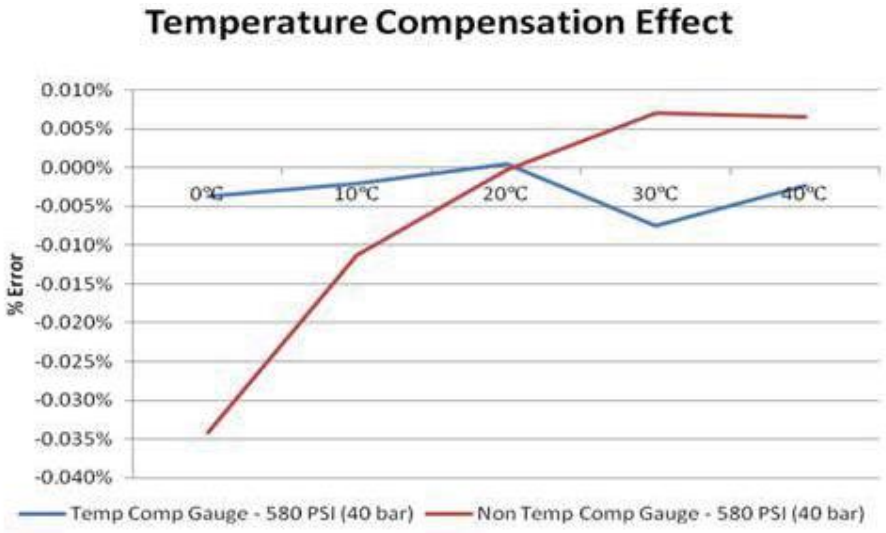
Figure 1	*Manufacturer 1*	*Manufacturer 2*	*Manufacturer 3*
Accuracy	0.05% FS	0.05% FS	0.05% FS
Temperature Compensated Accuracy Range	N/A	15°C to 35°C	-10°C to 50°C
Temperature Coefficient	Add 0.003% FS/°C from 23°C	Add 0.003% FS/°C: -10°C to 15°C, 35°C to 50°C	N/A

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.

Phone: 714-998-6899 Fax: 714-998-6999 Email: sales@additel.com

Corporate Headquarters

2900 Saturn Street #B
Brea, CA 92821, USA

Salt Lake City Office

1364 West State Rd Suite 101
Pleasant Grove, UT, 84062, USA

European Office

Holkebjergvej 79
5250 Odense, Denmark

Asia Office

Bldg 5, No. 3 Fengxiu Middle Rd
Haidian, Beijing 100094, China