Additel 780 Series Pressure Controller

- Pressure ranges from vacuum to 3,000 psi (200 bar)
- Removable interchangeable intelligent sensors
- Precision accuracy of 0.005% of reading plus 0.005% of full scale
- Standalone solution to 3,000 psi (200 bar), no gas bottle required when used with the Electric Pump and 3K Gas Booster
- Standalone solution to 1,000 psi (70 bar), no gas bottle required when used with the Electric Pump
- Standard model accuracy of 0.02% of full scale
- External pressure modules to 3,000 psi (200 bar)
- WiFi enabled communications
- Fully temperature compensated accuracy over 0°C to 50°C
- HART Communication and Profibus PA
- Large 7" color touch screen display
- Control stability of 0.003%FS
- Built-in barometer
- Easy-to-use icon based user interface

OVERVIEW

For years, we've provided the most durable, accurate, quality pressure calibration products for field applications. The Additel 780 series controller incorporates the same durability, accuracy, and quality into a new bench top controller packed with features and functionality that is remarkably easy to use. The Additel 780 series offers two base ranges: to 1,000 psi (70 bar) and to 3,000 psi (200 bar). The base range establishes the maximum controlling range of the controller. Each configuration includes a control sensor which is preselected to the sensor range best suited for your application. External and internal sensors can be used which allows for expanded range and accuracy capability in the future.

There are also two controller types that can be selected: the Additel 780S is the standard controller option without any measurement capability. The Additel 780 has expanded functionality including electrical measurement and HART and Profibus PA communication.

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MODULAR DESIGN

Each unit comes with one Intelligent Pressure Module configured to the many range offerings provided. Standard accuracy sensors (ADT160A-CPXXX) are silicone pressure sensors with a 1 year accuracy of 0.02% FS. The precision quartz based sensors improve the 1 year accuracy specification to 0.005% of reading + 0.005% FS. Each sensor has been specially aged, tested and screened before assembly. After assembly each sensor is temperature compensated over the range of 0°C to 50°C. The Additel 780 series allows for one internal pressure sensor and one external pressure sensor. The modular design of this unit provides for interchangeability of both the internal and external sensors with other Intelligent Pressure Modules.

In addition to the Intelligent Pressure Modules, the Additel 780 series has a built in barometric sensor. This allows for switching between gauge pressures to absolute pressures.

STANDALONE SOLUTION

Typical pressure controllers will require a nitrogen bottle for the gas supply which make it difficult to move the controller around without having to move or connect to another bottle. The Additel 780 series is unique in that with the optional electric pump, you can generate pressures to 1,000 psi (70 bar) without the need of a gas bottle. Add the booster to the configuration and 3,000 psi (200 bar) is achievable with the Additel 780 controller series.

PROCESS FUNCTIONALITY (excl ADT780S versions)

The 780 Series Pressure Controller is considered to handle a very wide range of applications which may normally require a pressure calibrator. Built-in capability, includes current and voltage measurement capability, 24 volt loop power, HART® and Profibus PA communication, switch measurement capability, and much more.

MEASUREMENT SPECIFICATIONS

Specification	ADT780-1K	ADT780-3K
Pressure range	-14.5 to 1,000 psi (-0.95 to 70 bar)	-14.5 to 3,000 psi (-0.95 to 200 bar)[1]
Control stability	0.003% FS (stability based on % FS of control sensor range)	
Precision (includes 1 year stability)	See pressure range table	
1 Year stability	0.01% FS standard accuracy sensors 0.005% FS precision accuracy sensors	
Media	Clean gas	
Over-range indication	103% to 120% (based on sensor)	
Resolution	4, 5, 6, or 7 digits (user selectable)[2]	
Pressure type	Gauge, Absolute	
Warm up time	15 minutes	
Typical pressure settling time (within 0.003%FS)	20 seconds (10%FS pressure change assuming 50 mL test volume)	
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, kg/m^2, kg/cm^2, mtorr, torr, atm, lb/ft^2, tsi, user selectable	
Minimum control pressure[3]	0.0001 psi	0.001 psi

[1] Gas booster or HP gas supply required to reach 3,000 psi (200 bar). Booster ordered separately.
[2] 7 digit resolution for precision model only.
[3] Dependent on pressure module.

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BAROMETRIC MEASUREMENT SPECIFICATION

Sensor/Mode	Gauge	Absolute
ADT160-02-CPXX	N/A	40 Pa[1]
ADT160-01-APXXQ	3 Pa[2]	N/A

Barometer range (60~110)kPa, the accuracy is 40 Pa (11 Pa is optional)
[1] 40 Pa uncertainty (k=2) includes calibration uncertainty, linearity, and long term stability (<30 Pa per year). Barometer range of 60 to 120 kPa.
[2] Combined linearity, hysteresis, and repeatability. Add 3 Pa when used in gauge mode. When using the ADT160-01-APXXQ sensors with the ADT780 controller in gauge mode, regular zeroing will realign the barometric reading to provide the most accurate result.

ELECTRICAL MEASURE SPECIFICATIONS[1]

Specification	Range	Resolution	Accuracy
Volts DC	-30 to 30 V	0.1 mV	±0.01% rdg + 1.5 mV
	-300 to 300 mV	1 µV	±0.01% rdg + 15 µV
Current DC	-30 to 30 mA	0.1 µA	±0.01% rdg + 1.5 µA
Switch test	If the switch has detected voltage, the range is from 3 – 24 V		
DC 24V output	24V ± 0.24V, max 30 mA		

[1] Not available in ADT780S versions

PHYSICAL SPECIFICATIONS

Specification	ADT780-1K & ADT780-3K
Power	100 to 240V, 50/60 Hz
Pressure ports	G1/8 F
Storage temperature	-20°C to 70°C
Operating environment	0-90% RH non-condensing
Display	7 inch (17.8 cm) color, touch screen display
Weight	33 lbs (15 kg)
Dimensions (DWH)	16.5 x 17.3 x 5.2 inch (419 x 440 x 132 mm)
Mounting	Standard desktop, optional rack mount kit
Shock	4G
Vibration	1G 10Hz~500Hz

OTHER SPECIFICATIONS

WiFi specifications	802.11 b, g, and n
Vent	Front panel vent and safety release button (only for 780S)
Communications	RS232,USB,LAN,WIFI
Stability indicator	User selectable
Typical slew rate	Typically 20 seconds
Operating modes	Control, measure, and vent
Display modes	Controller – show pressure indication and control
	Calibrator – shows pressure indication, control, and electrical measurement (excl ADT780S)
Localization	English, Chinese (simplified), German, Spanish, French, Italian, Portuguese, Russian, Japanese
Conformity	CE
Calibration certification	NIST-traceable certificate of calibration with data included
Warranty	1 year

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STANDARD ACCESSORIES

ADT127-X External Manifold	1 pc	
Manifold connection hose	1 pc	
Power adapter	1 pc	
9022 Test leads	2 sets (4 pc)	
9020 Short circuit cable	1 set (2 pc)	
9060 Pressure module connection cable	1 pc	
Adapter set (adapters to fit the ADT78X port to male fittings)	1 set (2 pcs G1/8M to G1/4M, 2 pcs G1/8M to Festo, release valve)	
CD Manual	1 pc	
NIST traceable certificate	1 pc	
O-rings	2 types	
Vacuum/Vent tubing	2 pc	

OPTIONAL ACCESSORIES

ADT160A	Pressure modules (see module information)	
ADT121-X	External pneumatic pressure manifold, 3,000 psi (200 bar), four hand-tight quick connectors	
ADT780-3K-BST	3,000 psi (200 bar) gas booster	
ADT780-1K-EPUMP	1,000 psi (70 bar) electrical pump	
ADT780-VACPUMP	Vacuum pump	
9050	RS232 to USB adapter	
ADT100-FLT-600	Liquid trap	
9912-780	Shipment case for the ADT780 and ADT780S Controller	
9506 Additel/PCal	Manual calibration software	
9530 Additel/ACal	Automated calibration software, Task and asset management	
9245-780	Rack mount kit	
ADT100-780-Kit	Adapter set, total 9 pcs. G1/8 M to 1/4NPT M (3 pcs) G1/8 M to G1/4 M (3 pcs) G1/8 M to M20x1.5 M (3 pcs)	

ADT780 ORDERING INFORMATION (Controller without 3K psi booster)

Model Number

ADT780 — 3k — CP300 — N • • • HABP

- **ADT780**: Model 780, Model 780S
- **3k**: Maxmum Range: 3K-3,000 psi (200 bar), 1K-1,000 psi (70 bar)
- **CP300**: Pressure range: See range table
- **N**: Manifold port type: N-1/4NPT male, N2-1/2NPT male, B-1/4BSP male, B2-1/2BSP male, M-M20x1.5 male
- **HABP**: High Accuracy Barometer

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ADT160A Intelligent Digital Pressure Modules

Gauge pressure Differential pressure

SPECIFICATIONS

P/N	Pressure Range		Media	Accuracy	Pressure Rating		Suggested Controller Compatibility	Internal/ External Use
	psia	bar.a			Burst	Over Pressure		
Precision Quartz Sensors[1]								
AP45Q	0 to 45	3.0	G	0.005% rdg + 0.005% FS	3x	1.2x	ADT780-1K only	Both
AP100Q	0 to 100	7.0	G	0.005% rdg + 0.005% FS	3x	1.2x	ADT780-1K only	Both
AP400Q	0 to 400	28	G	0.005% rdg + 0.005% FS	3x	1.2x	Both	Both
AP500Q	0 to 500	35	G	0.005% rdg + 0.005% FS	3x	1.03x	Both	Both
AP1KQ	0 to 1,000	70	G	0.005% rdg + 0.005% FS	3x	1.1x	Both	Both
AP2KQ	0 to 2,000	140	G	0.005% rdg + 0.005% FS	3x	1.1x	ADT780-3K only	Both
AP3KQ	0 to 3,000	200	G	0.005% rdg + 0.005% FS	3x	1.1x	ADT780-3K only	Both
Standard Pressure Sensors								
P/N	Pressure Range		Media	Accuracy	Pressure Rating		Suggested Controller Compatibility	Internal/ External Use
	psig	bar.g			Burst	Over Pressure		
CP10	±10	±0.7	G	0.02% FS	3x	1.2x	ADT780-1K only	Both
CP15	±15	±1.0	G	0.02% FS	3x	1.2x	ADT780-1K only	Both
CP30	-15 to 30	-1 to 2.0	G	0.02% FS	3x	1.2x	ADT780-1K only	Both
CP50	-15 to 50	-1 to 3.5	G	0.02% FS	3x	1.2x	ADT780-1K only	Both
CP100	-15 to 100	-1 to 7.0	G,L	0.02% FS	3x	1.2x	ADT780-1K only	Both
CP300	-15 to 300	-1 to 20	G,L	0.02% FS	3x	1.2x	Both	Both
CP500	-15 to 500	-1 to 35	G,L	0.02% FS	3x	1.2x	Both	Both
CP600	-15 to 600	-1 to 40	G,L	0.02% FS	3x	1.2x	Both	Both
CP1K	-15 to 1,000	-1 to 70	G,L	0.02% FS	3x	1.2x	Both	Both
CP2K	-15 to 2000	-1 to 140	G,L	0.02% FS	3x	1.2x	ADT780-3K only	Both
CP3K	-15 to 3,000	-1 to 200	G,L	0.02% FS	3x	1.2x	ADT780-3K only	Both
CP5K	-15 to 5000	-1 to 350	G,L	0.02% FS	3x	1.2x	N/A	External
CP10K	-15 to 10,000	-1 to 700	G,L	0.02% FS	2x	1.2x	N/A	External

[1] Contact Additel for other range options.

**Low pressure sensors (ADT160A-XX-DPX) available for low pressure and differential pressure measurement. Also available for low pressure control (gauge mode only). Ranges from ±1 inH_20 (2.5 mbar) to 300 inH_2O (700 mbar).

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SENSOR SPECIFICATIONS

	Standard Accuracy	Precision Accuracy	
	CPXXX	AP3KQ AP1KQ	AP100Q
Temperature compensation	-10°C to 50°C (14°F to 122°F)	0°C to 50°C (32°F to 122°F)	
Operating temperature	-10°C to 50°C (14°F to 122°F)	0°C to 50°C (32°F to 122°F)	
Storage temperature	-20°C to 70°C (-4°F to 158°F)	-20°C to 70°C (-4°F to 158°F)	
Relative humidity	95% RH	95% RH	
Pressure connections (for external use only)	1/4NPT, 1/4BSP, 1/2BSP, M20x15	1/4NPT, 1/4BSP, 1/2BSP, M20x15	
Enclosure (for external use only)	SS enclosure	SS enclosure	
Dimensions (Dia x H)	33 mm x 123 mm (1.3" x 4.84")	44 mm x 220mm (1.7" x 8.7")	60 mm x 190 mm (2.4" x7.5")
Weight	0.4 kg (0.99 lb)	0.8 kg (1.8 lb)	1.2 kg (2.6 lb)

[1] Internal sensors used to go inside the ADT780 need to have a M20 connection and connection kit.

ORDERING INFORMATION

Model Number

ADT160A – 01 – CP300 – PSI – N

Model

Accuracy:
01 – 0.005% rdg + 0.005% FS
02 – 0.02% FS

Pressure range:
See range table

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

External pressure port type:
N - 1/4NPT male
N2 - 1/2NPT male
B - 1/4BSP male
B2 - 1/2BSP male
M - M20x1.5 male

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Electric Pump and Booster

Additel 780-1K-EPUMP ELECTRIC PUMP

- Generates Vacuum to 1,000 psi (70 bar)
- Built-in filter and liquid trap

1,000 psi (70 bar) Electric Pump Specifications

Pressure range	-13.5 to 1,080 psi (-0.95 to 75 bar)
Weight	69.6 lbs (31.6 kg)
Size(WHD)	17.3 X 9.3 X 21.7 inch (440 X 235X 550 mm)
Power	100 to 240V
Media	Air
Outlet port	G1/8F
Storage temperature	-20°C to 70°C
Operating environment	0-90% RH non-condensing
Mounting	Standard desktop, optional rack mount
Control operation	2 LED displays with pressure limit settings
Typical max pressure time	Approx 2 min with ADT780 Controller

Additel 780-3K-BST BOOSTER

3,000 psi (200 bar) Gas Booster Specifications

Minimum inlet pressure	300 psi (20 bar)
Out pressure range	300 to 3,600 psi (250 bar)
Inlet flow rate	500ml/min
Size (WHD)	17.8 X 7.3 X 23.9 inch (451 X 185 X 607 mm)
Weight	74 lbs (33.6 kg)
Power	100 to 240V
Supply media	Nitrogen or clean gas

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Pressure Hoses, Adapters and Fittings

Additel 100 Series Filters

ADT100-FLT-600

600 psi (40 bar) Pneumatic Filter Specifications

Pressure range	-15 to 600 psi (-1.0 to 40 bar)
Filtering resolution	0.04 mm
Operation temperature	-10°C to 50°C
Safety pressure	<720 psi (50 bar)
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

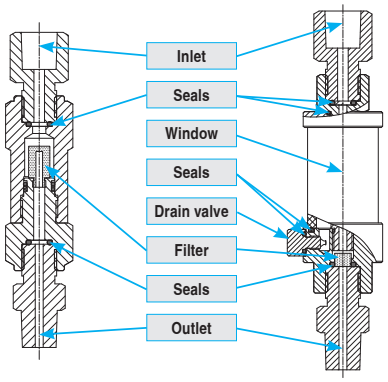
Pressure range	-15 to 10,00 psi (-1.0 to 700 bar)
Filtering resolution	0.07 mm
Operation temperature	-10°C to 50°C
Safety pressure	<12,000 psi (827 bar)
Size	0.87 x 0.98 x 4 in (22 x 25 x 100 mm) (size will vary based on adapters)
Outlet/Inlet port	Comes with removable male and removable female adapter
Storage temperature	-20°C to 70°C
Material	304 SS

ORDERING INFORMATION

ADT100 — 600 — N

Range:
600 -600 psi (40 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-600

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