ADT 780 Series Pressure Controller

New Precision Accuracy Models with 1-Year Uncertainty to 0.01% of Reading

- Pressure ranges from vacuum to 200 bar (3,000 psi)
- Removable interchangeable intelligent sensors
- Precision accuracy models to 0.01% of reading
- Standalone solution to 70 bar (1,000 psi), no gas bottle required when used with the electric pump
- Standard model accuracy of 0.02% of full scale
- External pressure modules to 200 bar (3,000 psi)
- WiFi enabled communications
- Fully temperature compensated accuracy from 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 have 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 70 bar and 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 an expanded range and accuracy capability in the future.

There are also two controllers types that can be selected: The Additel 780S us 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 sensors improve the 1 year accuracy specification to 0.01% of reading from 100% to 30% of range. 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 can be equipped with 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 Intelligant 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 controller will require a nitrogen bottle for the gas supply which makes it difficult to move the controller around without have to move or connect another bottle.

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	-0.95 bis 70 bar (Vakuum bis 1,000 psi)	-0.95 bis 200 bar[1] (Vakuum bis 3,000 psi)
Control stability	0.003% FS (stability based on % FS of control sensor range	
Precision (includes 1 year stability)	See pressure range table	
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 type	15 minutes	
Typical pressure settling time (within 0.003% FS)	20 seconds (10% FS pressure change assuming 50ccm test volume)	
Measurement units	Pa, hPa, kPa, MPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH$_2$O@4°C, mmH$_2$O@4°C, cmH$_2$O@4°C, mH$_2$O@4°C, mmH$_2$O@20°C, cmH$_2$O@20°C, mH$_2$O@20°C, kg/m^2, kg/cm^2, mtorr, torr, atm, lb/ft^2, tsi, user selectable	
Minimum control pressure[3]	0.007 mbar (0.0001 psi)	0.07 mbar (0.001 psi)

[1] HP gas supply requited to reach 200 bar (3,000 psi)
[2] 7 digit resolution for precision mode only
[3] Dependent on pressure module

Barometric measurement specifications

Sensor	Gauge	Absolute
Standard Sensors	n/a	40 Pa
Precision Sensors	3 Pa	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, 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 measurement specifications[1]

Specification	Range	Resolution	Accuracy
Volts DC	-30 to 30 V	0,1 mV	±0,01% of reading + 1,5 mV
	-300 to 300 mV	1 µV	±0;01% of reading + 15 µV
Current DC	-30 to 30 mA	0,1 µA	±0,01% of reading + 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 version

Physical specifications

Specification	ADT780-1K & ADT780-3K
Power	100V - 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	15 kg
Dimensions (DWH)	419 x 440 x 132 mm
Mounting	Standard desktop, optional rack mount
Schock	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 ADT 780S)
Communications	RS232, USB, LAN,WIFI
Stability indicator	User selectable
Typical pressure control timee	typically 20 seconds
Operating modes	Control, measure, vent
Display modes	Controller – shows pressure indication and control
	Calibrator – shows pressure indication, control and electrical measurement (excl. ADT780S)
Localization	English, German, Spanish, French, Italian, Portuguese, Russian, Chinese (traditional and simplified), Japanese
Conformity	CE
Calibration certification	NIST traceable certificate of calibration with data included DAkkS Certificate (optinal)
Warranty	1 year

Standard accessories

ADT127-X external manifold	1x	
Manifold connection cable	1x	
Power adapter	1x	
9022 test leads	2 sets (4 pieces)	
9020 short circuit cable	1 set (2 pieces)	
9060 pressure module connection cable	1x	
Adapter set (adapters to fit the ADT78X port to male fittings)	1x	
CD-Manual	1x	
NIST traceable certiificate	1x	(DAkkS-Certificate optional)
O-rings	20x	
Vacuum / Vent tubing	2 pieces	

Optionales Zubehör

ADT160A	Pressure module (see module information)	
ADT121-X	External pneumatic pressure manifold, 200 bar, four hand-tight quick connectors	
ADT780-1K-EPUMP	70 bar electrical pump	
9050	RS232 to USB adapter	
Liquid trap	Liquid trap	
9907-780	Shipment case for the ADT780 controller	
Additel/ Pcal	Additel/ Pcal calibration software	
Acal	Automated calibration software, task and asset management	
9245-780	Rack mount kit	
ADT100-780-Kit	Adapter set, X pcs, g1/8 M to various connections	
DAkkS-Calibration	DAkkS-certificate	

ADT160A intelligent digital pressure modules

Specifications

Gauge pressure Differential pressure

Precision Quartz Sensors [1]. - Absolute Pressure

P/N	Pressure Range		Media	Accuracy [2]	Pressure Range		Suggested Controller Compatibility	Internal / External Use
	(psia)	(bara)			Burst pressure	Over pressure		
AP15R	0 to 15	0 to 1	Gas	0.01 % FS	2x	1.2x	ADT780-1K only	Both
AP30R	0 to 30	0 to 2	Gas	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	ADT780-1K only	Both
AP50R	0 to 50	0 to 3.5	Gas	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	ADT780-1K only	Both
AP100R	0 to 115	0 to 8	G & L	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	ADT780-1K only	Both
AP300R	0 to 315	0 to 21	G & L	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	Both	Both
AP500R	0 to 515	0 to 36	G & L	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	Both	Both
AP1KR	0 to 1,015	0 to 71	G & L	0.01 % rdg or 0.003 % FS whichever is greater	2x	1.2x	Both	Both
AP2KQ	0 to 2,015	141	Gas	0.005 % rdg + 0.005 % FS	3x	1.1x	ADT780-3K only	Both
AP3KQ	0 to 3,015	201	Gas	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
	psi	bar g			Burst pressure	Over Pressure		
CP10	±10	±0.7	Gas	0,02 %FS	3x	1.2x	ADT780-1K only	Both
CP15	±15	±1.0	Gas	0,02 %FS	3x	1.2x	ADT780-1K only	Both
CP30	-15 to 30	-1 to 2.0	Gas	0,02 %FS	3x	1.2x	ADT780-1K only	Both
CP50	-15 to 50	-1 to 3.5	Gas	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 2,000	-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 5,000	-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	3x	1.2x	N/A	External

Note: [1]. Contact europascal for other range options.
[2]. Accuracy includes calibration uncertainty, linearity and long-term stability.
G = Gas / L = Liquid
** Low Pressure sensors (ADT160A-XX-DPX) availible for low pressure and differential pressure measurement. Also availible for low pressure control (gauge models only). Ranges ±1 inH20 (2,5 mbar) to 300 inH2O (700 mbar)

Sensor specifications

	Standard accuracy	Precision accuracy	
	CPXXX	AP3KQ AP2KQ	APXXXR
Operating temperature	-10°C to 50°C	15°C to 25°C	10°C to 30°C
Storage temperature	-20°C to 70°C	-20°C to 70°C	
Relative humidity	95% RH	90% 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	44 mm x 220mm	60 mm x 190 mm
Weight	0,4 kg	0,8 kg	0,7 kg

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

Electric pump

Additel 780-1K-EPUMP electric pump
- Generates from vaccum up to 70 bar
- Built-in filter and liquid trap

70 bar electric pump specifications

Pressure range	-0,95 to75 bar
Weight	31,6 kg
Dimensions (WxHxD)	440 x 235 x 550 mm
Power	100 to 240V
Supply Medium	clean air
Outlet port	G1/8F
Storage temperature	-20°C to 70°C
Operating environment	0 – 90% RH, non-condensing
Mounting	Standard desktop, optional 19" rack mounting
Control operation	2 LED displays with pressure limit settings

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