

## Additel 780 Series Pressure Controller

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



- Pressure ranges from vacuum to 3,000 psi (200 bar)
- Removable interchangeable intelligent sensors
- Precision accuracy models to 0.01% of reading
- 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.

## MODULAR DESIGN

Each unit comes with one Intelligent Pressure Module configured to the many range offerings provided. Standard accuracy sensors (ADT161-CPXXX) are silicone pressure sensors with a 1 year accuracy of 0.02% FS. The precision accuracy models 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 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.



## 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) <sup>[1]</sup> |
| 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) <sup>[2]</sup>   |  |
| Pressure type                           | Gauge, Absolute   |  |
| Warm up time                            | 15 minutes  |  |
| Measurement units                       | Pa, hPa, kPa, MPa, bar, mbar, psi, mmHg@0°C, cmHg@0°C, mHg@0°C, inHg@0°C, inH <sub>2</sub> O@4°C, mmH <sub>2</sub> O@4°C, cmH <sub>2</sub> O@4°C, mH <sub>2</sub> O@4°C, mmH <sub>2</sub> O@20°C, cmH <sub>2</sub> O@20°C, mH <sub>2</sub> O@20°C, kg/m <sup>2</sup> , kg/cm <sup>2</sup> , mtorr, torr, atm, lb/ft <sup>2</sup> , tsi, user selectable |  |
| Minimum control pressure <sup>[3]</sup> | 0.0001 psi  | 0.001 psi  |

[1] HP gas supply required to reach 3,000 psi (200 bar).

[2] 7 digit resolution for precision model only.

[3] Dependent on pressure module.

## BAROMETRIC MEASUREMENT SPECIFICATION

| Sensor            | Gauge               | Absolute             |
|-------------------|---------------------|----------------------|
| Standard Sensors  | N/A                 | 40 Pa <sup>[1]</sup> |
| Precision Sensors | 3 Pa <sup>[2]</sup> | 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 precision sensors with the ADT780 controller in gauge mode, regular zeroing will realign the barometric reading to provide the most accurate result.

## ELECTRICAL MEASURE SPECIFICATIONS<sup>[1]</sup>

| 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 | 24 V ± 0.24 V, max 30 mA                                       |            |                     |

[1] Not available in ADT780S versions








## PHYSICAL SPECIFICATIONS

|                       |  |
|-----------------------|--|
| Specification         | ADT780-1K & ADT780-3K                        |
| Power                 | 100 to 240 V, 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  |
| 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 | ISO 17025 accredited certificate of calibration with data included                             |
| Warranty                  | 1 year   |

## STANDARD ACCESSORIES

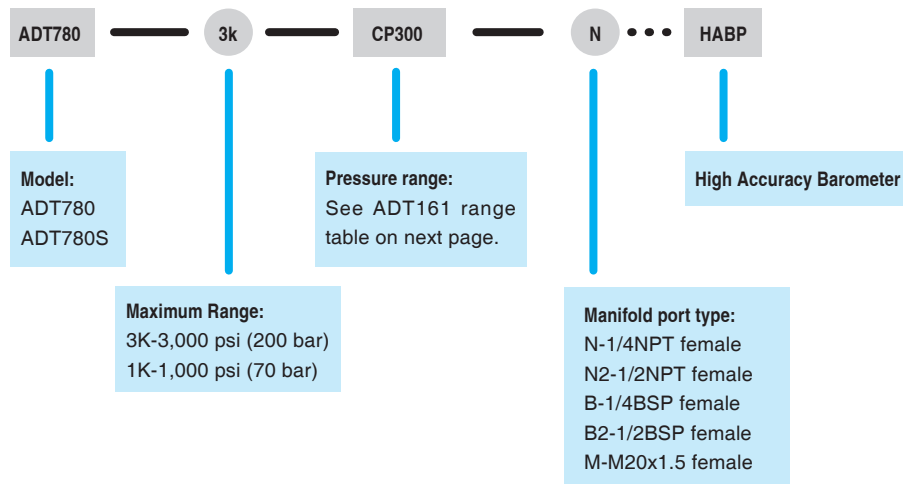
|  |  |   |
|--|--|---|
| ADT127-X External Manifold                                     | 1 pc   |    |
| Manifold connection hose                                       | 1 pc   |    |
| Power adapter  | 1 pc   |    |
| 9022 Test leads (except 780S)                                  | 2 sets (4 pc)  |    |
| 9020 Short circuit cable (except 780S)                         | 1 set (2 pc)   |    |
| 9060 Pressure module connection cable                          | 1 pc   |    |
| Adapter set (adapters to fit the ADT78X port to male fittings) | 1 set<br>(2 pcs G1/8M to G1/4M, 2 pcs G1/8M to Festo, release valve) |  |
| CD Manual  | 1 pc   |   |
| ISO 17025 accredited certificate                               | 1 pc   |   |
| O-rings  | 2 types  |   |
| Vacuum/Vent tubing   | 2 pc   |   |

## OPTIONAL ACCESSORIES

|                   |   |   |
|-------------------|---|---|
| ADT161            | Pressure modules (see module information)   |    |
| ADT121-X          | External pneumatic pressure manifold, 3,000 psi (200 bar), four hand-tight quick connectors |    |
| ADT780-1K-EPUMP   | 1,000 psi (70 bar) electrical pump  |    |
| 9050              | RS232 to USB adapter  |    |
| 9050-EXT          | RS 232 (DB9/M) extension cable, 9 feet  |    |
| ADT100-FLT-1K     | Liquid trap   |    |
| 9912-780          | Shipment case for the ADT780 and ADT780S Controller   |  |
| 9530 Additel/ACal | Automated calibration software, Task and asset management                                   |   |
| 9245-780          | Rack mount kit  |   |
| 9245-EPUMP        | Rack mount kit  |   |

## ADT780 ORDERING INFORMATION (Controller without E-pump)

### Model Number



## Specifications for ADT780 Internal/External Sensors

| P/N                                    | Pressure Range |          | Media | Accuracy <sup>[2]</sup>                     | Pressure Rating |               | Suggested Controller Compatibility | Internal/ External Use |
|--|----------------|----------|-------|---|-----------------|---------------|------------------------------------|------------------------|
|  | psia           | bar.a    |       |   | Burst           | Over Pressure |                                    |                        |
| <b>Precision Sensors<sup>[1]</sup></b> |                |          |       |   |                 |               |                                    |                        |
| AP15R                                  | 0 to 15        | 0 to 1   | G     | 0.01% FS                                    | 2x              | 1.2x          | ADT780-1K only                     | Both                   |
| AP30R                                  | 0 to 30        | 0 to 2   | G     | 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 | G     | 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                   |
| AP2KR                                  | 0 to 2,015     | 0 to 141 | G     | 0.01% rdg or 0.003% FS whichever is greater | 3x              | 1.1x          | ADT780-3K only                     | Both                   |
| AP3KR                                  | 0 to 3,015     | 0 to 201 | G     | 0.01% rdg or 0.003% FS whichever is greater | 3x              | 1.1x          | ADT780-3K only                     | Both                   |

| P/N                              | Pressure Range |           | Media | Accuracy | Pressure Rating |               | Suggested Controller Compatibility | Internal/ External Use |
|----------------------------------|----------------|-----------|-------|----------|-----------------|---------------|------------------------------------|------------------------|
|                                  | psig           | bar.g     |       |          | Burst           | Over Pressure |                                    |                        |
| <b>Standard Pressure Sensors</b> |                |           |       |          |                 |               |                                    |                        |
| 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 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 | 2x              | 1.2x          | N/A                                | External               |

[1] Contact Additel for other range options.

[2] Accuracy includes calibration uncertainty, linearity and long-term stability.

\*\*Low pressure sensors (ADT161-XX-DPX) available for low pressure and differential pressure measurement. Also available for low pressure control (gauge mode only). Ranges from ±1 inH<sub>2</sub>O (2.5 mbar) to 300 inH<sub>2</sub>O (700 mbar).

# Electric Pump

## Additel 780-1K-EPUMP

- 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 240 V                                |
| Media                     | Air   |
| Volume                    | 150 mL                                      |
| Outlet port               | G1/8 F                                      |
| 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         |