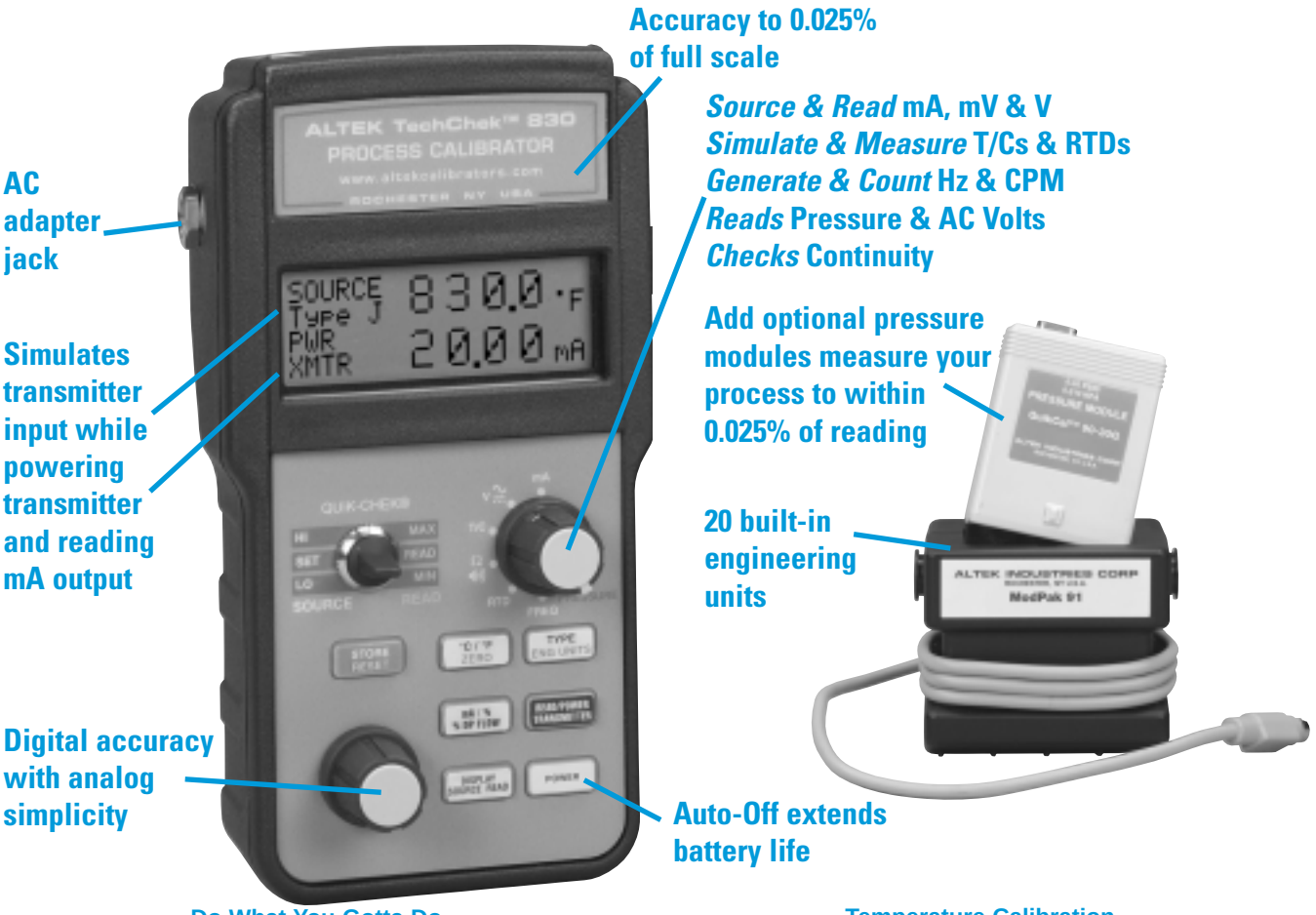
ALTEK

PROCESS CALIBRATOR
TechChek 830

DATA SHEET 830



Do What You Gotta Do

Lighten your load…take the TechChek 830 to every site. It's like bringing a cartload of test equipment from the shop to the control room or the field. The TechChek 830 sources and reads DC like a milliamp or voltage calibrator, simulates and measures T/Cs & RTDs like a temperature calibrator, generates and counts frequency and Counts-Per-Minute like a frequency calibrator and displays pressure like a precision test gauge. Troubleshooting? It checks continuity with a beeper and measures AC line voltage like a multimeter!

Calibrate Milliamp Inputs

Calibrate controllers, recorders and other devices in 4 to 20 or 0 to 20 mA loops. Source and read 0.00 to 24.00 mA, or Simulate a 2-Wire Transmitter.

Calibrate 2-Wire Transmitters

Easily calibrate a 2-Wire Transmitter by connecting the TechChek 830 to both the input and output of the transmitter. The TechChek 830 will simultaneously indicate the input and output of the transmitter on the graphical display.

Voltage Calibration

Calibrate all your DC millivolt and voltage instrumentation. Source from 0.00 to 110.00 mV and 0.00 to 10.25 V. Read up to 110.00 mV, 11.00 V and 200.0 VDC.

Temperature Calibration

Source and Read directly in °C and °F for T/C types J, K, T, E, R, S & N and four Pt 100 Ohm, Ni 120 Ohm and Cu 10 Ohm RTDs. Cold junction compensation tracks temperature changes.

Calibrate Pressure Systems

Read pressure with extreme accuracy using a QuikCal pressure module in a ModPak module holder. Attach the module directly to the pressure connection for the best accuracy or with optional tubing for tight spots. Accurate to 0.025% of reading in psi, pa, Kpa, Mpa, BAR, mBar, Atm, Kgf plus torr, inches and mm of mercury or water at a variety of temperatures. Each module is characterized for temperature to give you laboratory accuracy in the shop, control room or field.

Frequency Calibration

Generate zero crossing square waves from 1 to 1000 Hz, 0.01 to 10.00 kHz and from 1 to 1000 CPM (Counts-Per-Minute). Built-in frequency counter measures Hz, kHz & CPM.

Measure AC Voltage

Check line voltage or mains from 0.0 to 250.0 volts AC. Great for troubleshooting power problems.

Check Continuity

Locate pairs of wires, open connections and shorts with the built-in beeper.

SPECIFICATIONS

(Unless otherwise indicated, specifications are for 1 year in ±% of Span @ 23°C)

GENERAL

TYPICAL 90 DAY ACCURACY: ±(0.025% of Full Scale + 1 LSD)[1]
1 YEAR ACCURACY: ±(0.05% of Full Scale + 1 LSD)
WARM UP TIME: 10 seconds to specified accuracy, 2 minutes to maximum accuracy
TEMPERATURE EFFECT: ±0.01%/°C based on 23°±25°C
BATTERIES: Six "AA", (R6) batteries (Alkaline supplied and recommended)
BATTERY LIFE:
MILLIAMP SOURCE & 2-WIRE MODES: Nominal 12 hours at 20 mA with 250 Ohm load; OTHER FUNCTIONS: Nominal 30 hours
Note: Battery life is reduced when LCD backlighting is on
LOW BATTERY INDICATION: "BAT" indication on the display at approximately 4 hours left
OVERLOAD PROTECTION: 3 fuses,125 mA, Fast Blow
NOISE: ±1 LSD at frequencies less than 10 Hz
NORMAL MODE REJECTION RATIO: 50 dB @ 50/60 Hz
OPERATING TEMPERATURE RANGE: -5 to +130 °F (-20 to +55°C)
STORAGE TEMPERATURE RANGE: -13 to +130°F (-25 to +55°C)
RELATIVE HUMIDITY: 10 to 90%, non-condensing for 24 hours from 0 to 35°C
OVERALL SIZE: 158.1 x 83.1 x 49.3 mm (6.23 x 3.27 x 1.94 inches)
WEIGHT: 0.6 kg (1 lb, 5 oz)

MILLIAMP SOURCE

RANGES: 0.00 to 24.00 mA; -25.0 to 125.0 % of 4 to 20 mA; % DP Flow
ACCURACY: ±(0.05% of 24 mA Span + 0.01 mA) = 0.02mA
TYPICAL DRIVE CAPABILITY: 1200 Ohms @ 20.00 mA
COMPLIANCE VOLTAGE: nominal 25 V @ 20 mA

POWER & MEASURE 2-WIRE TRANSMITTERS

RANGES & ACCURACY: Same as for MILLIAMP SOURCE
OUTPUT CURRENT: up to 24.00 mA
TYPICAL DRIVE CAPABILITY:1200 Ohms @ 20.00 mA
COMPLIANCE VOLTAGE: nominal 25 VDC @ 20 mA
COMMON MODE ERROR: 0.01% Full Scale/Common Mode Volt

2-WIRE TRANSMITTER SIMULATOR

RANGES: 1.00 to 24.00 mA; -18.8 to 125.0% of 4 to 20 mA; % DP Flow
ACCURACY: Same as for MILLIAMP SOURCE
LOOP VOLTAGE LIMITS: Mininum, 3 V; Maximum 45 VDC
OVERLOAD PROTECTION: Current limited to 25 mA nominal
COMMON MODE ERROR: 0.01% Full Scale/Common Mode Volt

MILLIAMP READ

RANGES: 0.00 to 24.00 mA; -25.0 to 125.0 % of 4 to 20 mA; % DP Flow
ACCURACY: Same as for MILLIAMP SOURCE
OVERLOAD PROTECTION: Current limited to 25 mA nominal
VOLTAGE BURDEN: 0.9V at 4 mA, 1.2V at 20 mA, 1.9V at 24 mA

DC VOLTAGE SOURCE

RANGES: 0.00 to 110.00 mV; 0.00 to 10.25V
ACCURACY:
±(0.05% of 110 mV+ 0.01mV) = ±0.07 mV
±(0.05% of 10.25 V + 0.01V) = ±0.02V
SOURCE CURRENT: >20 mA
SINK CURRENT: >20 mA
OUTPUT IMPEDANCE: <0.3 Ohms
SHORT CIRCUIT DURATION: Infinite

MEASURE DC VOLTS

RANGES: 0.00 to 110.00 mV; 0.00 to 10.25 V; 0.0 to 200.0 V
ACCURACY:
±(0.05% of 110 mV+ 0.01mV) = ±0.07 mV
±(0.05% of 10.25 V + 0.01V) = ±0.02V
±(2% of 200.0 V + 0.1V) = ±4.1 V
INPUT RESISTANCE: >1 Meg Ohm to 10.25V, >5 Meg Ohm to 200V
SOURCE RESISTANCE EFFECT: 0.01% per 100 Ohms

MEASURE AC VOLTS

RANGE: 0.0 to 250.0 V True RMS
ACCURACY: From 10 to 250 VAC ±(2% of 250.0 VAC + 0.1 VAC) = ±5.1 VAC
MAXIMUM CREST FACTOR: < 3
FREQUENCY RANGE: 45 to 800 Hz

[1]Typical 90 day accuracy can be estimated by dividing the 1 year % of full scale accuracy by 2. Additions to the specification, such as + 1 LSD, remain constant.

SOURCE THERMOCOUPLES

THERMOCOUPLE TYPES: J, K, T, E, N, R & S
RESOLUTION: 1 °C or °F.
ACCURACY °C: ±(0.05% of 80.00 mV + 1°C); **°F:** ±(0.05% of 80.00 mV + 1°F)
COLD JUNCTION ACCURACY: ±1°C
COLD JUNCTION EFFECT: within 0.05°C per °C change
OUTPUT IMPEDANCE: <0.3 Ohms
SOURCE CURRENT:>10 mA

READ THERMOCOUPLES

THERMOCOUPLE TYPES & ACCURACIES: Same as for Source T/C
RESOLUTION: 0.1 °C or °F.
COLD JUNCTION ACCURACY: ±1°C
COLD JUNCTION EFFECT: within 0.05°C per °C change
INPUT IMPEDANCE: > 1 Meg Ohm
OPEN THERMOCOUPLE DETECTION: 450 millisecond pulse. Nominal threshold, 10 K Ohms.

SOURCE RTD & OHMS

RTD TYPES:
Pt 100Ω for 1.3850 (DIN/IEC 751 & New JIS), 1.3902 (Burns), 1.3926 (US Lab) & 1.3916 (Old JIS 1604C-1981)
Ni 120Ω & Cu 10Ω
RTD RESOLUTION: 1°C or °F.
RANGE OHMS: 0.0 to 400.0 Ohms
ACCURACY: ±0.05% of Full Scale + 0.075 mV/mA Excitation Current)
ACCURACY OHMS: ±(0.05% of 400.0 Ohms + 0.1 Ohm) = ±0.3 Ohms (at 1 mA Excitation Current)
TEMPERATURE EFFECT: ±((0.035 mV/°C)*(1/mA Excitation Current))
ALLOWABLE EXCITATION CURRENT: 0.125 to 2.0 mA continuous DC

READ RTD

RTD TYPES & RESOLUTION: Same as for Source RTD
RTD RANGE (IN OHMS): 0.0 to 400.0 Ohms
RTD ACCURACY (IN OHMS): ±(0.05% of 400.0 Ohms + 0.1 Ohm) = ±0.3 Ohms
EXCITATION CURRENT SUPPLIED: 1 mA, nominal

READ OHMS

RANGE OHMS: 0.0 to 1000.0 Ohms
ACCURACY: ±(0.05% of 1000.0 Ohms + 0.1 Ohm) = ±0.6 Ohms
EXCITATION CURRENT SUPPLIED: 1 mA, nominal

FREQUENCY SOURCE

RANGES: 1 to 1000 CPM (Count-Per-Minute); 1 to 1000 Hz, 0.01 to 10.00 kHz
ACCURACY: ±(0.05% of 1000 CPM + 1 CPM) = ±2 CPM;
±(0.05% of 1000 Hz +1 Hz)= ±2 Hz;
±(0.05% of 10.00 kHz + 0.01 kHz) = ±0.02 kHz
OUTPUT WAVEFORM: Square Wave, Zero Crossing, -1V to +5V ±10%
RISETIME: Hz <5 microseconds; CPM <100 microseconds
OUTPUT IMPEDANCE: <100 Ohms
SOURCE CURRENT: >1 mA at 10 kHz
SHORT CIRCUIT DURATION: Infinite

MEASURE FREQUENCY

RANGES & ACCURACY: Same as FREQUENCY SOURCE
TRIGGER LEVEL: 1 V RMS, DC coupled to 10.25 V;
7 V RMS, DC coupled to 250 V
INPUT IMPEDANCE: >1Meg Ohm + 60 pF

CONTINUITY CHECKING

TEST CURRENT: Nominal 1 mA
THRESHOLD: 100 Ohm ±20%
INDICATION: Steady tone & Symbol on LCD plus Ohm Reading

OPTIONAL PRESSURE MODULE

OPERATING TEMPERATURE: -10°C TO 50°C (13°F TO 122°F)
STORAGE TEMPERATURE: -40°C TO 85°C (-40°F TO 185°F)
WEIGHT: 0.4 kg (14.5 oz)
TEMPERATURE EFFECT: None (Compensated over full range)
CONNECTION: 1/8" NPT FEMALE
MEDIA COMPATIBILITY: Any liquid or gas compatible with 316 stainless steel

NEW PRODUCT SPECIFICATIONS

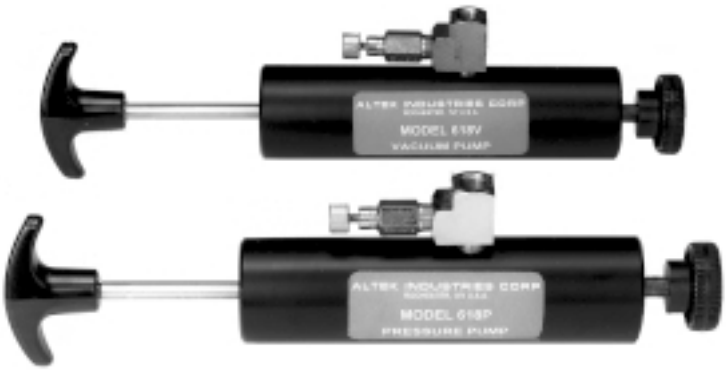
These specifications are for a new product and are subject to change without notice

ALTEK

PRECISION PRESSURE PUMP - MODEL 618P
PRECISION VACUUM PUMP - MODEL 618V

DATA SHEET 618: See Data Sheets 628 for Low Pressure Pump & 638 for High-Pressure Pump

- **PORTABLE PRESSURE OR VACUUM SOURCE**
- **GENERATE UP TO 600 mm/23" Hg WITH VACUUM PUMP**
- **GENERATE UP TO 145 PSIG/10 BAR WITH PRESSURE PUMP**
- **COARSE AND FINE ADJUSTMENTS**
  Provide resolution to 0.001 psig



GENERAL DESCRIPTION

Generate pressure or vacuum where you need it with either Altek's Model 618P (Pressure) or Model 618V (Vacuum) Pump.

The pumps are tube type, cylindrical shaped hand pumps with a "T" handle at the compressor end and a round knob at the volume adjust end. The overall length is between 11.5" (full extension) and 8.5" (fully collapsed). They incorporate a needle valve for venting and a volume adjust vernier for precision adjustment of pressure.

Pressure or vacuum connections are made through one 1/8" NPT internally threaded fitting. The pump is small in size, lightweight and ruggedly constructed to withstand typical field use. Model 618's simple design and quality construction ensure a long service life.

Every technician can carry one in their toolbox and be ready to go.

SPECIFICATIONS

OUTPUT RANGE:
Model 618P - Pressure: 145 PSIG/10 BAR
Model 618V - Vacuum: 600 mm/23" Hg

PRESSURE CONNECTIONS:
Single 1/8" NPT Female Fitting

SIZE:
Body Diameter: 1.5"/3.8 cm
Length: 8.5"/21.6 cm (collapsed)
11.5"/29.2 cm (extended)

WEIGHT:
1.5 Lbs./0.68 kg

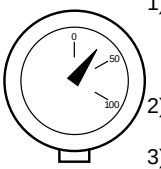
CONSTRUCTION MATERIALS:
Body and Piston: Acetal
O-Rings: Buna N
Other Wetted Parts: Brass or Nickel Plated Brass

ALTEK INDUSTRIES CORP
A TRANSMATION COMPANY
35 Vantage Point Drive Rochester, New York 14624 U.S.A.
(716) 349-3500 • Fax: (716) 349-3510
E-Mail: alteksales@altekcalibrators.com • http://www.altekcalibrators.com

IMPORTANT: Read all operating instructions and general operating information *before* beginning any test procedures.

OPERARTING INSTRUCTIONS

PRODUCING PRESSURE



1) Connect Model 618's port to the instrument to be calibrated or checked. Use small-diameter tubing as short in length as possible (this will maximize the pressure adjustment range).
2) Set the FINE ADJUST knob to the full counterclockwise position.
3) Turn the BLEED VALVE knob fully counterclockwise to relieve all system pressure and zero any measuring devices.
4) Turn the BLEED VALVE knob fully clockwise to close.
5) Repeatedly move the "T" handle in and out to generate the desired pressure.
6) Use the FINE ADJUST knob to bring up the pressure to the precise level.
7) Use the BLEED VALVE to lower the pressure from he pressure generated. Opening the BLEED VLAVE $^1/_4$ turn will lower the pressure very gradually. Opening it $^1/_2$ turn will release the pressure faster and opening it $^3/_4$ turn will quickly and safely release all the pressure in the system.

WARNING

It is imperative that all system pressure is relieved prior to making any connections or disconnections. Failure to relieve system pressure could result in serious personal injury or equipment damage. Even nominal pressure values can generate extreme force if fitting or tubing failure occurs due to improper installation or usage. Since the Model 618 is capable of generating pressures exceeding 100 psig, it is important that all pressure connections and test procedures be done by qualified service personnel, according to standard engineering practices, to prevent possible personal injury or equipment damage.

GENERAL OPERATING INFORMATION

CONNECTIONS

To install a pressure fitting in the Model 618:
1) Turn the BLEED VALVE counterclockwise to bleed any pressure
2) Use a 5/8" open-end wrench on the input port to prevent it from rotating while tightening the supply fitting with a 5/8" open-end wrench.

LEAK PREVENTION AND DETECTION

In order to obtain maximum pressure indication stability, leaks must be avoided. It is strongly recommended that either Teflon® tape or commercial pipe sealant be used at all tapered fittings and connections. If Teflon® tape is used, care must be taken that the proper amount is applied. Excessive tape may fray and cause plugging of relief valves, orifices, nozzles, etc. Overuse of pipe sealant may cause similar problems.

External equipment should also be checked carefully for leaks. Process connections, flange bolts, and vents must be tightly closed. Defective gaskets, leaking valves, and damaged diaphragms are all potential sources of leaks.

For detection of very small system leaks, the traditional soap bubble method may not be sufficient. Halogen leak detection devices may be required when using highly sensitive pressure calibration equipment.

TEMPERATURE CONSIDERATIONS

Since the pressure change of a contained volume of gas is directly proportional to absolute temperature, temperature control is critical when using the Model 618 with any high-resolution measuring device. Tubing should be kept away from heat sources (i.e., lamps, operating electronic equipment, excessive hand contact, etc.) as well as from heat-dissipating structures (i.e., open windows, air conditioning vents, etc.) to minimize temperature variations that might induce errors.

Air is compressed by the Model 618. This compression causes some heating of the air as it is forced into the system. Consequently, a noticeable decrease in pressure—caused by the cooling of the newly compressed air—may occur immediately after cessation of pumping.

ONE YEAR WARRANTY

Our equipment is guaranteed against defective material and workmanship for a period of one year from date of shipment. Claims under guarantee can be made by returning the equipment prepaid to our factory. The equipment will be replaced, repaired or adjusted at our option. The liability of Altek is restricted to that given under our guarantee No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Altek be liable for any special, incidental or consequential damage.

No pump will be accepted for service unless all process materials have been completely removed from all components by the customer. Contaminated pumps will be returned to the customer for proper cleaning.

OTHER PRODUCTS

Altek designs and manufacturers fast, accurate instruments for measurement, generation and simulation of virtually every process control signal. Consult our factory directly or contact your local stocking representative to order precise, low cost Milliamp Calibrators, Voltage Sources, Direct Thermocouple Sources, RTD Simulators, Frequency Sources and Pressure Pumps & Indicators. Altek also produces calibrators for custom ranges and unique applications. Additional models and ranges are frequently added to the Altek instrument family to meet all of your critical calibration requirements. Altek products are made in the USA.

ORDERING INFORMATION

DESCRIPTION	MODEL No.
Model 618 Pressure Pump	618P
Model 618 Vacuum Pump	618V

AVAILABLE FROM:

100849-902 REV:A

PRESSURE MODULE SPECIFICATIONS

Gauge Modules			
Model	**Range**	**Accuracy**	**Media**
A90-5G	5 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-10G	10 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-30G	30 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-100G	100 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-300G	300 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-500G	500 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-1000G	1,000 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-2500G	2,500 PSIG	±0.025% Rdg +0.01% FS	316SS Compatible
A90-5KG	5,000 PSIG	±0.1% FS	316SS Compatible
A90-10KG	10,000 PSIG	±0.1% FS	316SS Compatible
Dual Sensor Module			
A90-10G/2500G	10/2500 PSIG	±0.025% Rdg +0.01%FS	316SS Compatible

Differential Modules			
Model	**Range**	**Accuracy**	**Media**
A90-10WD	±10 "H_2O Diff.	±0.025 "H_2O	Clean Dry Gases
A90-5D	5 PSID	±0.025% Rdg +0.01% FS	316SS High/Dry Gas Low
A90-15D	15 PSID	±0.025% Rdg +0.01% FS	316SS High/Dry Gas Low
A90-30D	30 PSID	±0.025% Rdg +0.01% FS	316SS High/Dry Gas Low
Absolute Modules			
A90-15A	15 PSIA	± 0.05% FS	316SS Compatible
A90-30A	30 PSIA	± 0.05% FS	316SS Compatible
Vacuum Modules			
A90-15V	VAC to 0 PSIG	± 0.05% FS	316SS Compatible
A90-15C	VAC to 15 PSIG	± 0.05% FS	316SS Compatible

ELECTRICAL MODULE SPECIFICATIONS

Model	Range	Accuracy
A40E	mA/V	±0.015% Rdg +0.002 mA or 0.002V

TEMPERATURE MODULE SPECIFICATIONS

Model	Range	Accuracy
A60T	T/C	±0.015% Rdg +0.006 mV
A70T	RTD	±0.01% Rdg +0.075 ohms