



Technology Solutions

TEK-BAR 3120A

Explosion-Proof Gauge Pressure Transmitter



PRESSURE

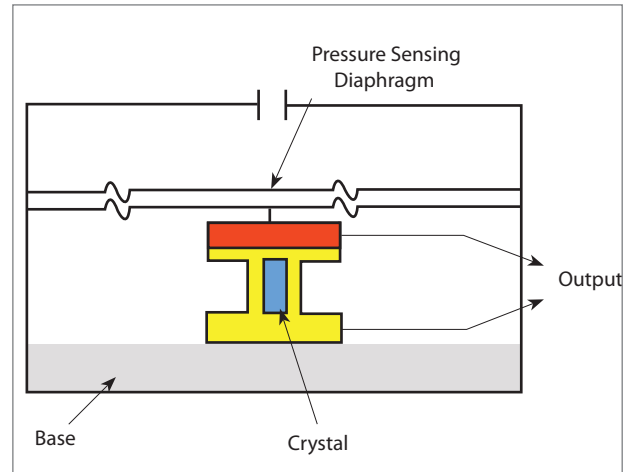


Introduction

The Tek-Bar 3120A series of smart transmitters have excellent stability, high accuracy, and include features that facilitate easy installation, start up, and minimum maintenance thereby lowering process downtime and overall cost of ownership in the long run. These transmitters are equipped with an automatic temperature compensation function integrated into its advanced signal processing circuitry to ensure high reliability and performance corresponding to change of ambient temperature.

Measuring Principle

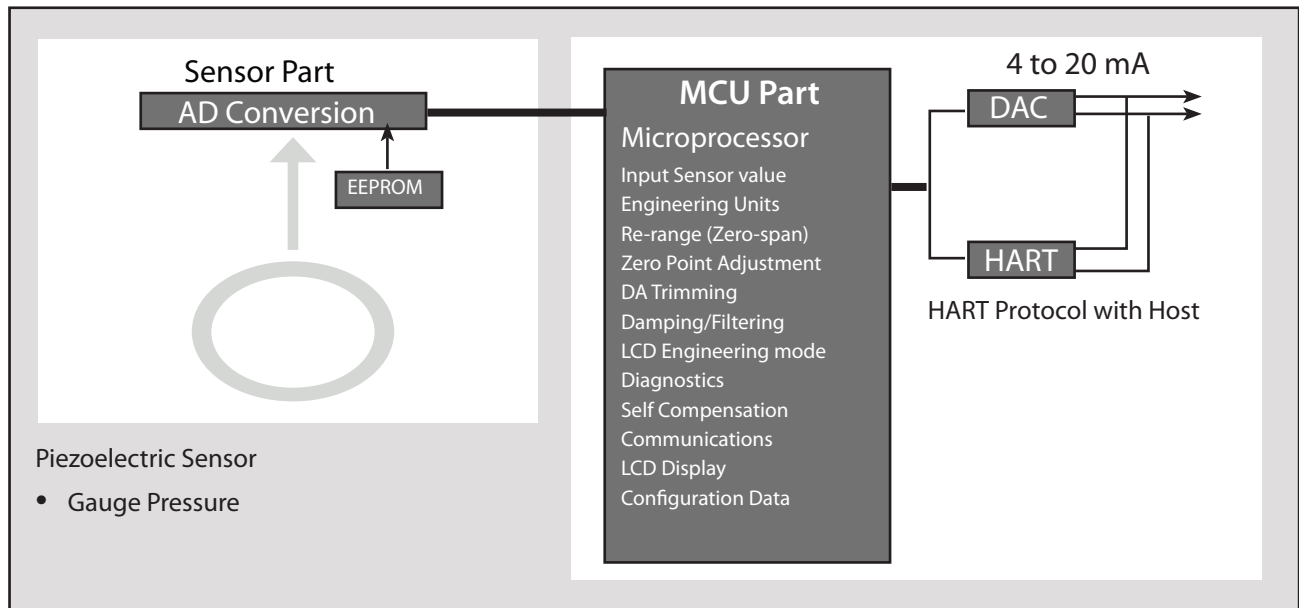
The Tek-bar 3120A uses piezo-electric pressure transducer. It consists of quartz crystal, which is made from silicon and oxygen arranged in crystalline structure (SiO_2). That crystal is inserted between a solid base and the pressure sensing diaphragm. If pressure is applied, the same force will fall on the pressure sensing diaphragm that pressure to stretch or bend the crystal and an electric potential is generated. The voltage produced will be proportional to the magnitude of the applied pressure.



Operation

Electronic Module:

The Electronics module consists of a circuit board sealed in an enclosure. There is a MCU module, a power module, an analog module, a LCD module, and a terminal module in a transmitter. The MCU module acquires the digital value from the analog module and apply correction coefficients selected from EEPROM. The output section of the power module converts the digital signal to a 4 to 20 mA output. The MCU module communicates with the HART-based Configurator. The Power module have a DC-to-DC Power conversion circuit and an input/output isolation circuit. An optional LCD module plugs into the MCU module and displays the digital output in user-configured unit.



Sensor Input:

The model Tek-Bar 3120A is available in piezo-electric sensor.

The sensor module converts the electric signal to the digital value. The MCU module calculates the process pressure based on the digital value.

The sensor modules include the following features

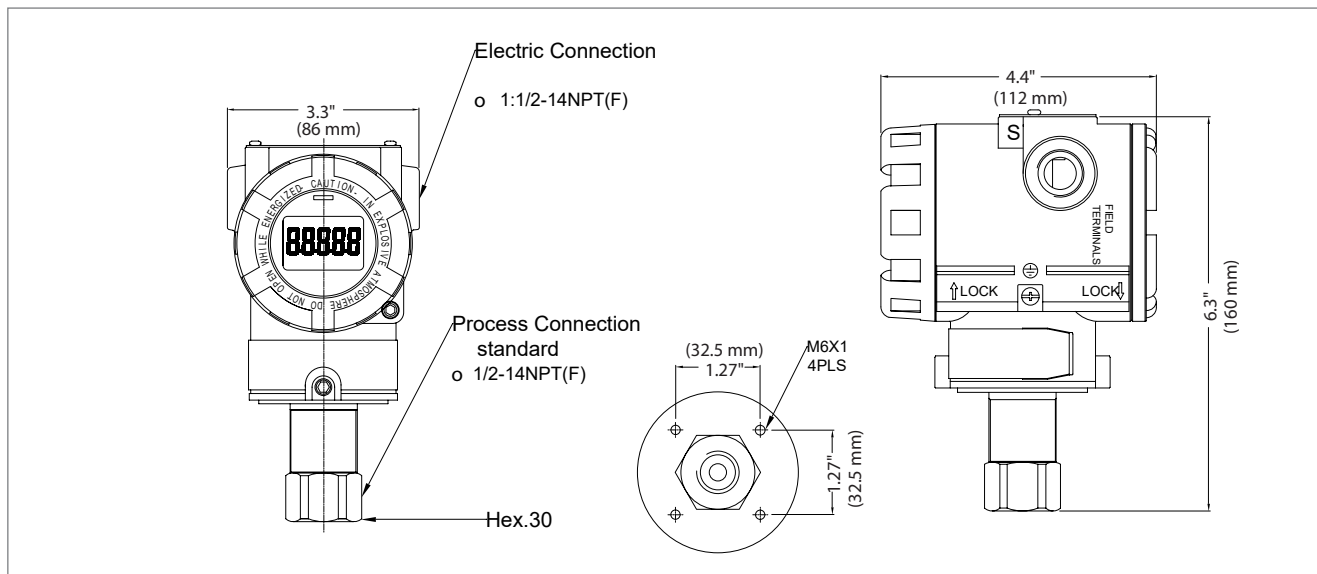
- $\pm 0.075\%$ accuracy, the most accurate sensor in the industry.
- The software of the transmitter compensates for the thermal effects, improving performance.
- Precise Input Compensation during operation is achieved with temperature and pressure correction coefficients that are characterized over the range the transmitter and stored in the sensor module EEPROM memory.
- EEPROM stores sensor information and correction coefficients separately from MCU module, allowing for easy repair, reconfiguration and replacement

Benefits

- Operator can calibrate device using zero/span button, no handheld calibrator required. Optionally handheld device communicator can be used to calibrate devices.
- Digital communication HART protocol, latest version
- Fail-safe mode process function for detecting any abnormal condition occurring
- Standard accuracy $\pm 0.075\%$, High enhanced Accuracy $\pm 0.04\%$ available.
- Automatic ambient temperature compensation improve performance of device
- It can be used as flow meter and should be installed vertically without using additional flanges
- Various Output: 4-20 mA, digital signals
- The mounting bracket can be rotated up to 360° and LCD display up to 270°
- EEPROM write protection

Applications

- Water and waste water
- Oil and Gas
- Pulp and paper



Specifications

Technical Specification

| Parameter | Description |
|--------------------------------|--|
| Accuracy | 0.075% of Span standard, High enhanced accuracy $\pm 0.04\%$ of span available in conformance to ± 3 Sigma |
| Rangeability | 100:1 |
| Stability | 5 years standard, Optional 3 year $\pm 0.10\%$ of URL available |
| Maximum Working Pressure Limit | 2000 psi std, High Pressure 4500 psig available |
| Hydrostatic Test Pressure | 1.5 times MWP |
| Burst Pressure | 10000 psig (68.9MPa) |
| Process Temperature Limits | -40 °F to +284 °F |
| Ambient Temperature Effect | $\pm [0.019\% \text{URL} + 0.125\% \text{Span}] / 82.4 \text{ } ^\circ\text{F}$ |
| Ambient Temperature | -40 °F to 185 °F |
| Humidity Limits | 5% to 100% RH |
| Power Supply Effects | $\pm 0.005\%$ of Span per Volt |
| Display (optional) | 5 digit LCD display |
| Failure Mode | Fail High: Current $\geq 21.1 \text{ mA}$ |
| | Fail Low: Current $\leq 3.78 \text{ mA}$ |
| Volumetric Displacement | $< 0.005 \text{ cu in}$ |
| Vibration Effect | $\pm 0.1\%$ of URL per IEC60770-1 site conditions |
| EMC Immunity | EN50081-2, EN50082-2, IEC801-3 |

Electrical Specification

| Parameter | Description |
|----------------------|----------------------------------|
| Power Supply | Voltage Range: 12 to 45 VDC |
| | Voltage Rating: 24 VDC \pm 30% |
| HART loop resistance | 250 to 550 ohm |
| Output Signal | 4 mA to 20 mA with HART® |
| Isolation | 500 Vrms (707 VDC) |

Physical Specifications

| Parameter | Description |
|-------------------------|--|
| Isolating Diaphragm | 316LSST |
| Fill Fluid | Silicone oil or Inert fill |
| Paint | Epoxy-Polyester or Polyuret |
| Mounting Bracket | 304 SST with U-bolt (304SST) for 2-inch pipe |
| Nameplate | 304 SST |
| Electronic Housing | Aluminum (Option:316LSST) |
| Process Connection Size | ½" NPT Female |
| Electrical Connections | ½" NPT Female |
| Approvals | FM (Class I Div I) |
| Weight | 3.74 lb (Standard - excluding options) |
| | 6.23 lb (SST Housing- excluding options) |

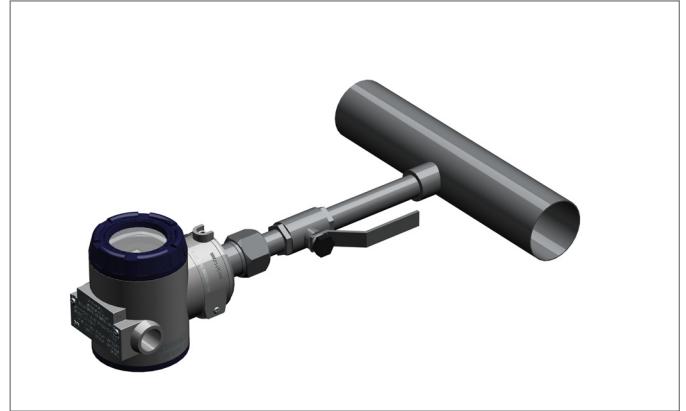
Tek-Bar 3120A–G Pressure Sensor Range

| Range code | Range | | Calibrated Span (Min. to Max.) | |
|------------|---------------|--------------|--------------------------------|-------------|
| | kPa | psig | kPa | psig |
| 3 | -100 to 150 | -14.5 to 21 | 1.5 to 150 | 0.22 to 21 |
| 4 | -100 to 1,500 | -14.5 to 217 | 15 to 1,500 | 2 to 217 |
| 5 | 0 to 5,000 | 0 to 725 | 50 to 5,000 | 7.25 to 725 |
| 6 | 0 to 25,000 | 0 to 3600 | 250 to 25,000 | 36 to 3600 |
| 7 | 0 to 60,000 | 0 to 8500 | 600 to 60,000 | 87 to 8700 |

Installation

Mounting in liquid applications

- Place taps to the side of the line.
- Mount beside or below the taps.
- Mount the transmitter so the drain/vent valves are oriented upward.



Mounting in gas applications

- Place taps in the top or side of the line.
- Mount beside or above the taps.



Mounting in steam applications

- Place taps to the side of the line.
- Mount beside or below the taps.
- Fill impulse lines with water.



Model Chart

| Example | Tek-Bar 3120A-G | G | 3 | FM | 1 | 1 | LCD | Tek-Bar 3120A-G-3-FM-1-1-LCD |
|-----------------------|-----------------|--------|-----------------------|------------|--------|---|---|---|
| Series | Tek-Bar 3120A-G | | | | | | | Explosion-Proof Gauge Pressure Transmitter |
| Sensor Type | | G A | | | | | | Gauge Pressure Absolute Pressure |
| Range Options | | | 3 4 5 6 7 | | | | | -14.5-21 psig (factory set 0 to 21 psig) -14.5-217 psig (factory set 0 to 217 psig) 0-725 psig 0-3600 psig 0-8500 psig |
| Approval Rating | | | | FM ATEX | | | | FM Approval (Class I Div I) ATEX Flameproof or ATEX Intrinsic Safe Approval |
| Process Connection | | | | | 1 X | | | ½" NPT Female Diaphragm Seal |
| Electrical Connection | | | | | | 1 | | ½" NPT Female |
| Options | | | | | | | LCD B SSH CC FC BA TAG LP LV EA H | 5 Digit LCD (Local Indication Only) Blind Unit 316 Stainless Steel Housing Custom Calibration with 5 point Calibration Certificate Factory Configuration, No Certificate Stainless Steel Bracket (Angle type) with SST Bolts Stainless Steel Hang Tag Lightning Protection (Internal Type) 12 VDC, Low Volt, 4-wire, 1-5 VDC output, No HART ±0.04% enhanced accuracy with 3 year stability High Static Pressure 4500psig |

Popular Models

| Model Number | Description |
|----------------------|---|
| 3120A-G-3-FM-1-1-LCD | Explosion-proof GP Pressure Transmitter, -14.5 to 21 psig, LCD |
| 3120A-G-4-FM-1-1-LCD | Explosion-proof GP Pressure Transmitter, -14.5 to 217 psig, LCD |
| 3120A-G-5-FM-1-1-LCD | Explosion-proof GP Pressure Transmitter, 0-725 psig, LCD |
| 3120A-G-6-FM-1-1-LCD | Explosion-proof GP Pressure Transmitter, 0-3600 psig, LCD |
| 3120A-G-7-FM-1-1-LCD | Explosion-proof GP Pressure Transmitter, 0-8500 psig, LCD |

Customer Service & Support




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DOC # TEK/TIPS/CAT/2105/20/3120A/014
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