TEKTROL
Technology Solutions

TEK-BAR 3120A

Explosion-Proof Gauge Pressure Transmitter

PRESSURE

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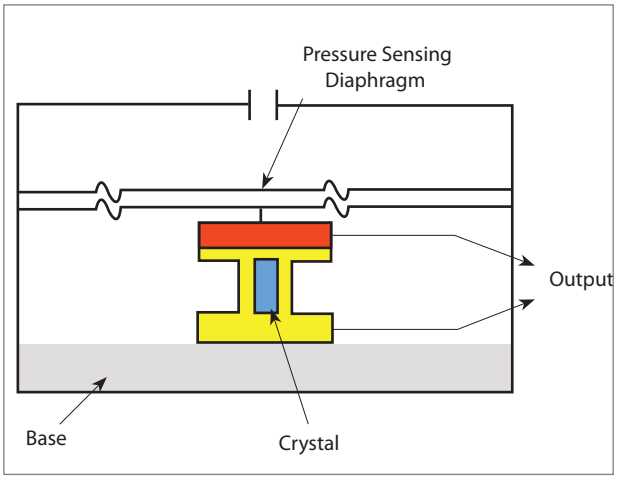
Introduction

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

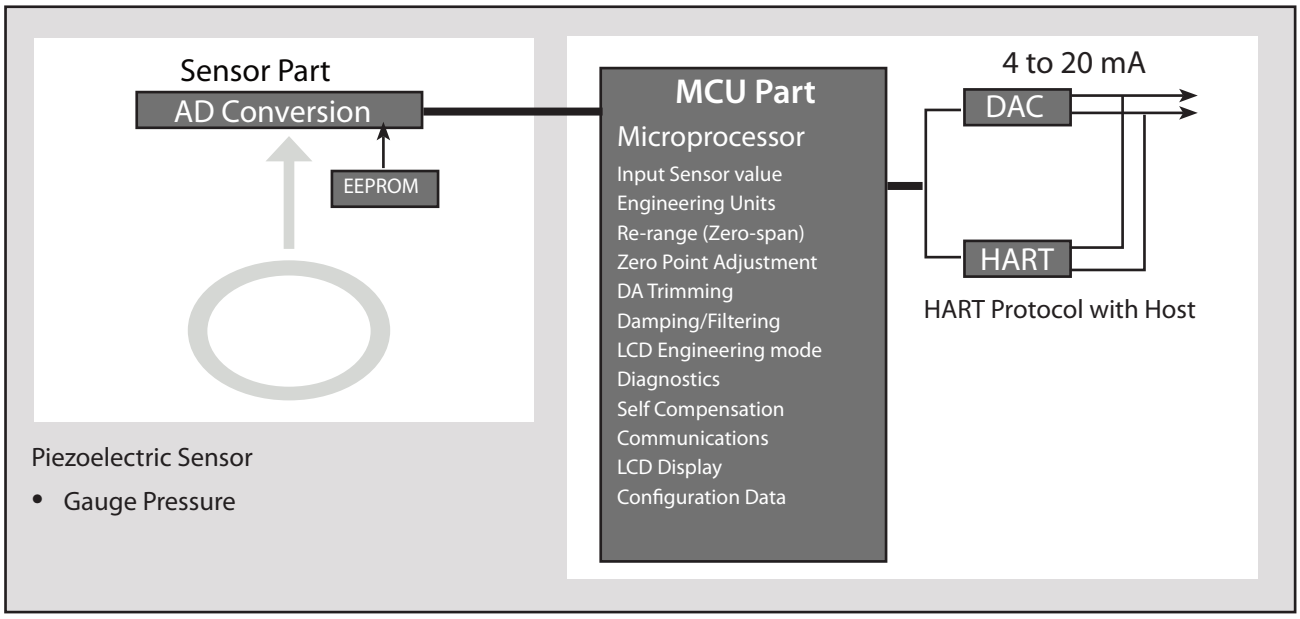
The Tek-bar 3120A uses piezo-electric pressure transducer. It consist of quartz crystal, which is made from silicone and oxygen arranged in crystalline structure (SiO_2). That crystal is inserted between a solid base and the pressure sensing diaphragm. If pressure is applied, the same force will fall 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

- ±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

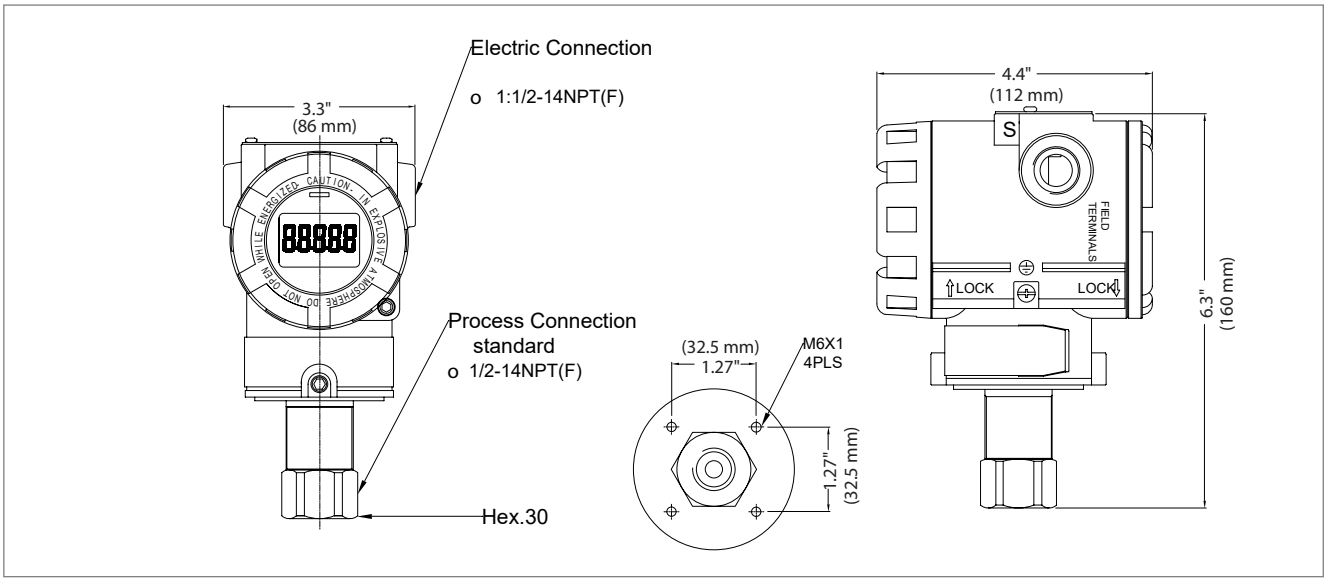
- Operator can calibrate device using zero/span button, no handheld calibrator required. Optionally hand-held device communicator can be used to calibrate devices.
- Digital communication HART protocol, latest version
- Fail-safe mode process function for detecting any abnormal condition occurring
- Standard accuracy ±0.075%, High enhanced Accuracy ±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

Dimensional Drawing

Standard Model



Specifications

Technical Specification

Parameter	Description
Accuracy	0.075% of Span standard, High enhanced accuracy ±0.04% of span available in conformance to ±3 Sigma
Rangeability	100:1
Stability	5 years standard, Optional 3 year ±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	±[0.019%URL+0.125% Span] / 82.4 °F
Ambient Temperature	-40 °F to 185 °F
Humidity Limits	5% to 100% RH
Power Supply Effects	±0.005% of Span per Volt
Display (optional)	5 digit LCD display
Failure Mode	Fail High: Current ≥21.1 mA
	Fail Low: Current ≤3.78 mA
Volumetric Displacement	<0.005 cu in
Vibration Effect	±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 ±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)

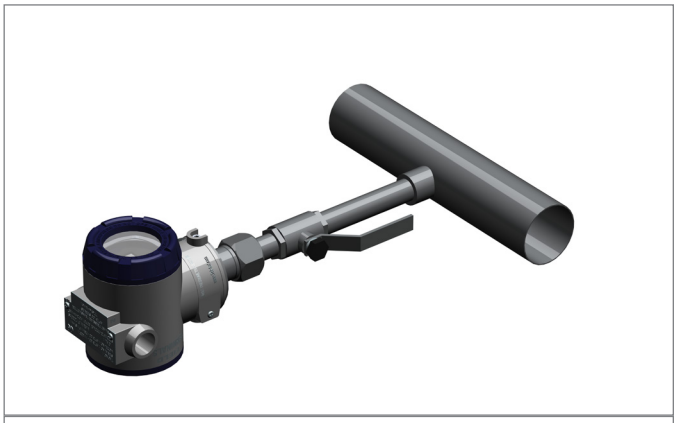
Tek-Bar 3120A–G Pressure Sensor Range

Range code	Range				Calibrated Span (Min. to Max.)			
	kPag	kPaA	psig	psiA	kPag	kPaA	psig	psiA
3	-100 to 150	NA	-14.5 to 21	NA	1.5 to 150	NA	0.22 to 21	NA
4	-100 to 1,500	0 to 248	-14.5 to 217	0 to 36	15 to 1,500	2 to 248	2 to 217	.3 to 36
5	0 to 5,000	0 to 1500	0 to 725	0 to 217	50 to 5,000	14 to 1500	7.25 to 725	2 to 217
6	0 to 25,000	0 to 2500	0 to 3600	0 to 300	250 to 25,000	25 to 2500	36 to 3600	3.6 to 360
7	0 to 60,000	NA	0 to 8500	NA	600 to 60,000	NA	87 to 8700	NA

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	SS	1	LCD	Tek-Bar 3120A-G-3-FM-1-SS-1-LCD
Series	Tek-Bar 3120A-G								Explosion-Proof Gauge Pressure Transmitter
Sensor Type		G							Gauge Pressure
		A							Absolute Pressure
Range Options									Gauge / Absolute
			3						-14.5-21 psig (factory set 0 to 21 psig) / NA
			4						-14.5-217 psig (factory set 0 to 217 psig) / 0-36 psia
			5						0-725 psig / 0-217 psia
			6						0-3600 psig / 0-360 psia
			7						0-8500 psig / NA
Approval Rating				FM ATEX					FM Approval (Class I Div I) ATEX Flameproof or ATEX Instrinsic Safe Approval
Process Connection					1				½" NPT Female
					X				Diaphragm Seal
Diaphram Material						SS			316L Stainless Steel
Electrical Connection							1		½" NPT Female
Options								LCD	5 Digit LCD (Local Indication Only)
								B	Blind Unit
								SSH	316 Stainless Steel Housing
								CC	Custom Calibration with 5 point Calibration Certificate
								FC	Factory Configuration, No Certificate
								BA	Stainless Steel Bracket (Angle type) with SST Bolts
								TAG	Stainless Steel Hang Tag
								LP	Lightning Protection (Internal Type)
								LV	12 VDC, Low Volt, 4-wire, 1-5 VDC output, No HART
								EA	±0.04% enhanced accuracy with 3 year stability
								H	High Static Pressure 4500psig
								O	¼" to ½" Adapter
								BF	Stainless Steel Bracket (Flat type) with SST Bolt
								3WF	3 Way Manifold, Flange x NPT
								5WF	5 Way Manifold, Flange x NPT
								O2C	O_2 Cleaning

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 pisg, 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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