TEKTROL

Technology Solutions

Tek-Bar 3120S

Piezoresistive Pressure Transducer

Instruction Manual

Document Number: IM-3120S

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NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

For technical assistance, contact
Customer Support
796 Tek-Drive
Crystal Lake, IL 60014
USA
Tel: +1 847 857 6076, +1 847 655 7428

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1 Safety Instructions

1.1 Intended Use

The Tek-Bar 3120S Piezoresistive Pressure Transducer is a precision-engineered instrument, widely used in industrial pressure instrument.

1.2 Safety Instructions from the Manufacturer

1.2.1 Disclaimer

The manufacturer will not be held accountable for any damage that happens by using its product, including, but not limited to, direct, indirect, or incidental and consequential damages. Any product purchased from the manufacturer is warranted by the relevant product documentation and our terms and conditions of sale. The manufacturer has the right to modify the content of this document of any time with any reason without prior notice and will not be answerable for the possible consequence of changes.

1.2.2 Product Liability and Warranty

The operator shall have authority for the suitability of the device for the specific application. The manufacturer accepts no accountability for the consequences of misuse by the operator. A wrong installation or operation of the devices (systems) will cause the warranty to be void. The respective Terms and Conditions of Sale, which forms the basis for the sales contract, shall also apply.

1.2.3 Information Concerning the Documentation

To prevent any injury to the operator or damage to the device, it is essential to read the information in this document and the applicable national standard safety instructions. This operating manual consists of all the information that is required in various stages, such as product identification, incoming acceptance and storage, mounting, connection, operation and commissioning, troubleshooting, maintenance, and disposal.

1.3 Safety Precautions

You must read these instructions carefully before installing and commissioning the device. These instructions are an essential part of the product and must be kept for future reference. Only by observing these instructions, optimum protection of both personnel and the environment, as well as safe and fault-free operation of the device can be ensured. For additional information that is not discussed in this manual, contact the manufacturer.

The following safety symbol marks are used in this operation manual and on the instrument.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

1.4 Packaging, Transportation and Storage

1.4.1 Packaging

The original package consists of

1. Tek-Bar 3120S Piezoresistive Pressure Transducer
2. Documentation

NOTE

Unpack and Check the contents for damages or sign of rough handling. Report damage to the manufacturer immediately. Check the contents against the packing list provided.

1.4.2 Transportation

- Avoid impact shocks to the device and prevent it from getting wet during transportation.
- Verify local safety regulations, directives, and company procedures with respect to hoisting, rigging, and transportation of heavy equipment.
- Transport the product to the installation site using the original manufacturer's packing whenever possible.

1.4.3 Storage

If this product is to be stored for an extended period of time before installation, take the following precautions:

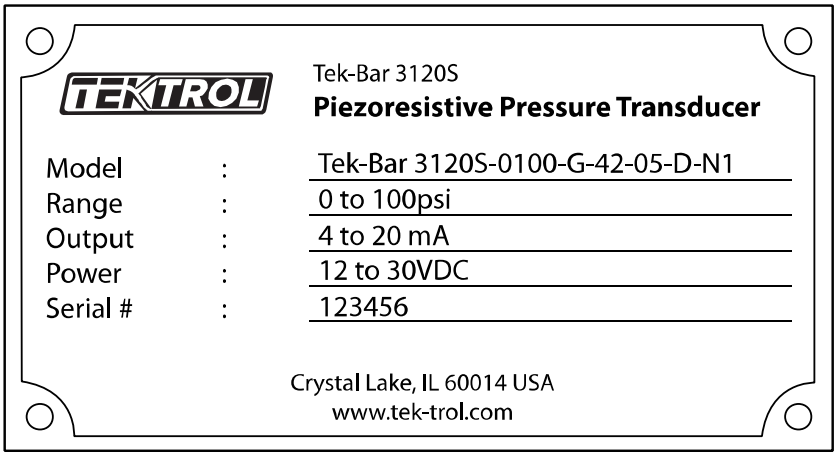
- Store your product in the manufacturer's original packing used for shipping.
- The storage location should comply with the following requirements:
  - Free from rain and water
  - Free from vibration and impact shock
  - At room temperature with minimal temperature and humidity variation
- Before storing a used flow meter, remove any fluid from the flow meter line completely. Properties of the instrument can change when stored outdoors.

1.4.4 Nameplate

The nameplate lists the order number and other important information, such as design details and technical data.

NOTE

Check the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.



2 Product Description

2.1 Introduction

Tek-Bar 3120S Piezoresistive Pressure Transducer is made from a high-quality silicon piezoresistive sensor. This Piezoresistive Sensor is packaged with stainless steel housing. The Tek-Bar 3120S Piezoresistive Pressure Transducer is a precision-engineered instrument, widely used in industrial pressure processes. Piezoelectric Pressure Sensors measure dynamic pressures. The compact and rugged design makes this transmitter suitable for various applications such as process control systems, hydraulic systems and valves, pumps, refrigeration and HVAC controls, level measurements, compressor testing technologies, laboratory technologies, combustion engines, diesel engines, steam turbines and test equipments. A wide range of processes and electrical connection options are available to meet almost all requirements.

2.2 Measuring Principle

The Tek-Bar 3120S Piezoresistive Pressure Transducer consists of several thin wafers of silicon embedded between protective surfaces. This protective surface is usually connected to a Wheatstone bridge, for detecting small differences in resistance. The difference in pressure causes the resistance of the piezoresistive sensor is change. Due to this change in resistance, a small amount of current is passed through the sensor. The Wheatstone bridge determines this change.

2.3 Technical Specifications

Accuracy	±0.5% or 1.0% FSO
Thermal Effects	Temp Coeff-Zero: ±0.75%FSO Temp Coeff-Span: ±0.75%FSO
Long Term Stability	±0.2%FSO/Year
Pressure Range	Pressure Ranges: -14.7 to 8000psi Over Pressure: 1.5XFS
Process Temperature	Operating Temperature: -4˚F to 185˚F (-20˚C to 85˚C) Compensated Temperature Range: 14˚F to 158˚F (-10˚C to 70˚C) Storage Temperature: -40˚F to 257˚F (-40˚C to 125˚C)
Vibration	10G (20 to 2000Hz)
Shock	100G (10ms)
Cycles	$10X10^6$ Cycles
Output Signal	4 to 20mA 0 to 5VDC 1 to 5VDC 0 to 10VDC
Power Supply	10 to 36VDC
Load Resistance	For Current Output: <(Vs-12)/0.02A For Voltage Output: >10kΩ

Insulation Resistance	100MΩ@50VDC
Media Compatibility	All Media Compatible with 316L SS
Housing	304 SS
Diaphragm	316L SS
Oil Filling	Silicon Oil
Protection	IP65 (Standard) IP66 (Only for Cable)
Weight	Approx. 185g

2.4 Standard Pressure Range

Pressure Page (psi)	Gauge	Sealed	Absolute
-14.7 to 0	*		
-14.7 to 160	*		
0 to 5	*		
0 to 15	*		*
0 to 30	*		*
0 to 50	*		*
0 to 100	*		*
0 to 150	*		
0 to 200	*		
0 to 300	*		
0 to 500		*	
0 to 1000		*	
0 to 3000		*	
0 to 5000		*	
0 to 8000		*	

Note: Other pressure ranges available on request

2.5 Dimensional Drawings

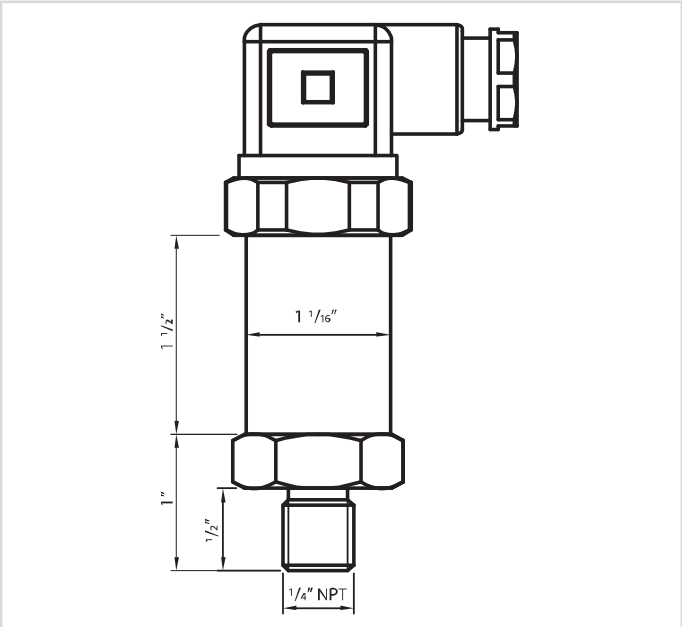


Fig 1: Connector DIN43650

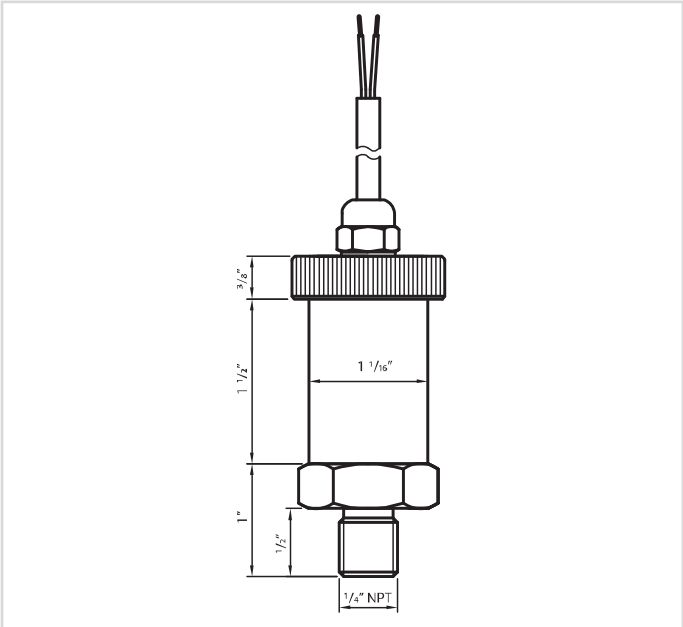


Fig 2: Hirschman Cable Outlet

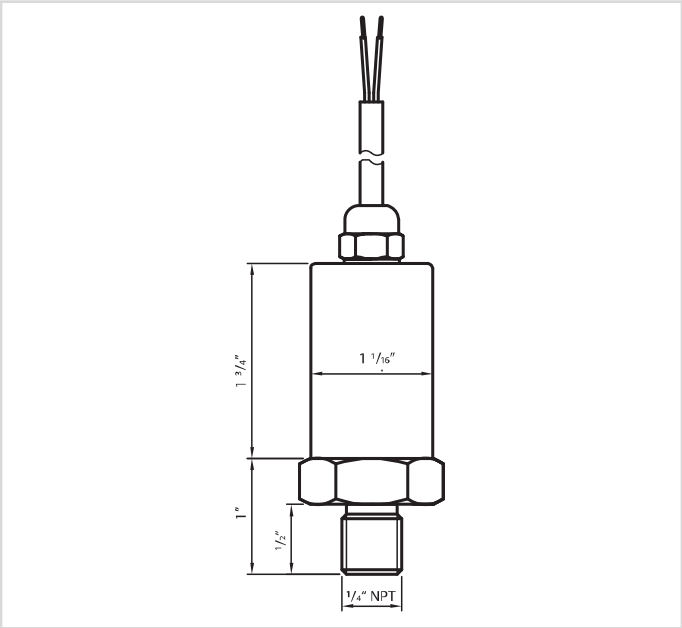


Fig 3: Cable Outlet with PVC – Cable

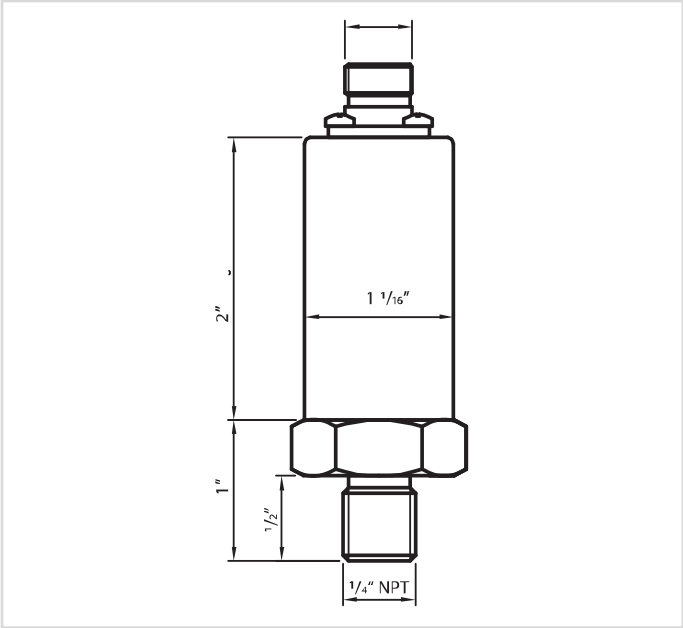


Fig 4: M12X1, 4-Pin

Mechanical Connections

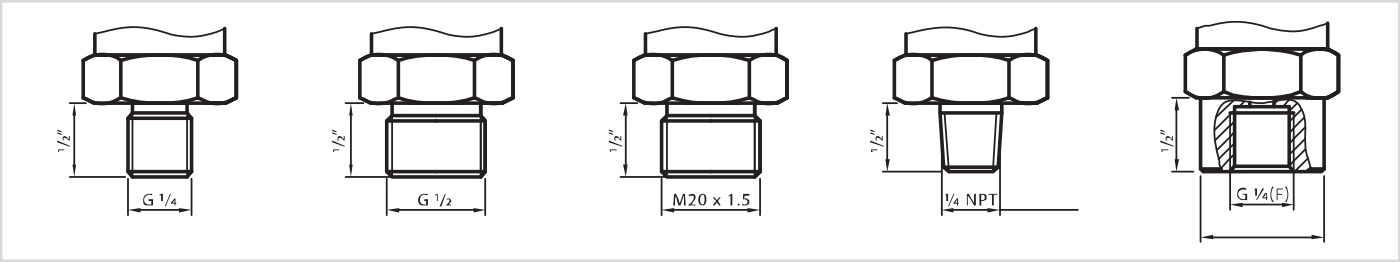


Fig 5: Mechanical Connections

2.6 Model Chart

Example	Tek-Bar 3120S	B160	G	42	05	D	N1	Tek-Bar 3120S-B160-G-42-05-D-N1
Series	Tek-Bar 3120S							Piezoresistive Pressure Transducer
Pressure Ranges		B015 B160 0005 0015 0030 0050 0100 0150 0200 0300 0500 1000 3000 5000 8000						-14.7 to 0psi 0 to 3psi 0 to 5psi 0 to 15psi 0 to 30psi 0 to 50psi 0 to 100psi 0 to 150psi 0 to 200psi 0 to 300psi 0 to 500psi 0 to 1000psi 0 to 3000psi 0 to 5000psi 0 to 8000psi
Pressure Type			G A S					Gauge Pressure Absolute Pressure Sealed Pressure
Output signal				42 05 15 10				4 to 20mA 0 to 5VDC 1 to 5VDC 0 to 10VDC
Accuracy					10 05			1.0% Full Scale 0.5% Full Scale
Electrical Connection						D H C M		Connector DIN43650 Hirschman Cable Outlet Cable Outlet with PUR - Cable M-12 4Pin
Options							M2 N1 G4 F4	M20X1.5 (Male) ¼" NPT (Male) G1/4 (Male) G1/4 (Female)

3 Electrical Connection

This section covers the all electrical connection requirement. Electrical connection of the device must be carried out by trained; qualified specialists authorized to perform such work by the installation site.

WARNING

- Connect all electrical cables when the power is switched off. If the device does not have switch-off elements, then, overcurrent protection devices, lightning protection and/or energy isolating devices must be provided by the customer.
- The device must be grounded as per the regulations to protect personnel against electric shocks.

NOTE

When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.

3.1 Connection Diagrams

3.1.1 Connector DIN43650

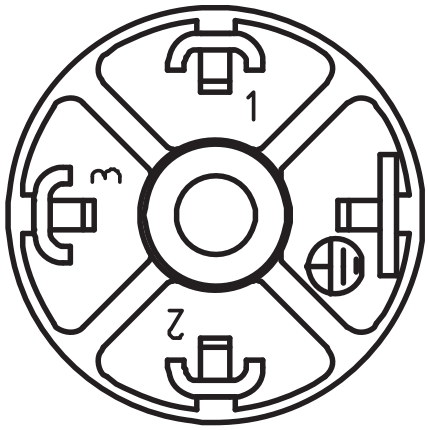


Fig 6: Connection Diagram of Connector DIN43650

Table 1: Pin Description of Connector DIN43650

Pin	2-wire Current	3-wire Voltage
Supply +	1	1
Signal+	2	3
Ground	-	2

3.1.2 Cable Outlet

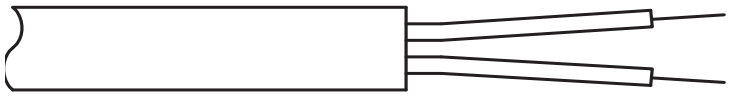


Fig 7: Cable Outlet

Table 2: Pin Description of Cable Outlet

Pin	2-wire Current	3-wire Voltage
Supply +	Red	Red
Signal+	Black	Green
Ground	-	Black

3.1.3 Connector M12X1 (4-pin)

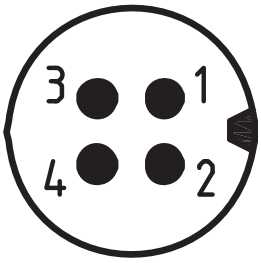


Fig 8: Connector M12X1 (4-pin)

Table 3: Pin Description of Connector M12X1 (4-pin)

Pin	2-wire Current	3-wire Voltage
Supply +	1	1
Signal+	2	3
Ground	-	2

www.tek-trol.com

Tek-Trol LLC

796 Tek Drive Crystal Lake,

IL 60014, USA

+1 847-857-6076 | tektrol@tek-trol.com | www.tek-trol.com

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