

BBP/BBT 375-A Series

Ultrahigh Precision LVDT Gaging Probes



Description

The Macro Sensors BBP 375-A and BBT 375-A family of 3/8 inch diameter, air-extend/spring-retract, pencil-type gaging probes offers ultra-precise position measurement in a wide variety of Q.C., SPC, metrology, and industrial gaging applications where it is necessary or desirable to move the probe out of the way between readings. They utilize a linear ball bearing assembly precisely fitted to a hardened-and-ground, non-rotating probe shaft to minimize radial play and the effects of side loading. This results in the probes' exceptional repeatability of 0.000006 inch (0.15 μm).

One end of the probe shaft is coupled to the core of a friction-free LVDT sensor, which produces an output voltage is linearly proportional to the probe shaft position. The use of an LVDT for probe shaft displacement sensing eliminates any additional transducer errors due to friction, stiction, or mechanical hysteresis. The output from the LVDT can be connected to any standard LVDT signal conditioner and then passed to a gaging column display, digital readout, or computer based data acquisition system.

The other end of the shaft is internally threaded to accept an interchangeable tungsten carbide contact tip for wear resistance and reliability. During measurement cycles, the shaft is extended by

Features

- Low pressure air-extend/spring-retract plunger
- Ultra-precision linear ball bearing assembly gives 0.000006 inch (0.15 μm) repeatability
- Industry-standard sizes and ranges
- Exceptionally long life; 200 million cycles
- NIST-traceable calibration

Applications

- Cycled measurement functions
- Point-of-production Q.C.
- Automated data collection for SPC
- On-line inspection of parts
- Manufacturing process control

introduction of a low-pressure (10-30 psi), clean, dry air supply, with a regulated flow, through a barbed fitting on the end of the unit for 1/8 inch I.D. hose. With the release of pressure, an internal spring returns the probe to its normal position. The entire bearing, shaft, and LVDT assembly are enclosed in a 3/8 inch diameter stainless steel tubular housing.

The front of a BBP/BBT gaging probe is attached to a rubber bellows that also covers the probe shaft, thereby preventing contaminants from entering the bearing. From the rear end of the probe, a polyurethane - jacketed cable connects the LVDT's output to the signal conditioner. Each probe is supplied with a replaceable end piece that converts the axial cable exit to a radial cable exit to minimize overall installed length in space-critical applications. Probe sealing meets the requirements of IEC IP-65.

For setting up a probe in a fixture, the BBP/BBT gaging probes' mechanical design permits the user to make fine adjustments to the probe shaft's contact position with a small spanner wrench that is supplied. A positive stop prevents mechanical damage to the probe from repeated overstroking.

For additional information and important installation considerations, we strongly urge you to visit www.macrosensors.com/air_extend_lvdt

General Specifications

- Excitation Voltage:** 3.0 Vrms Nominal
- Excitation Frequency:** 5 kHz
- Output Load:** 100,000 Ω Min.
- Operating Temperature:** 15°F to 175°F (-10°C to 80°C)
- Non-Linearity:** <0.5% of Reading
- Repeatability:** 0.000006 inches (0.15 μm) or better
- Air Supply:** 10-30 psi, clean, dry, flow regulated

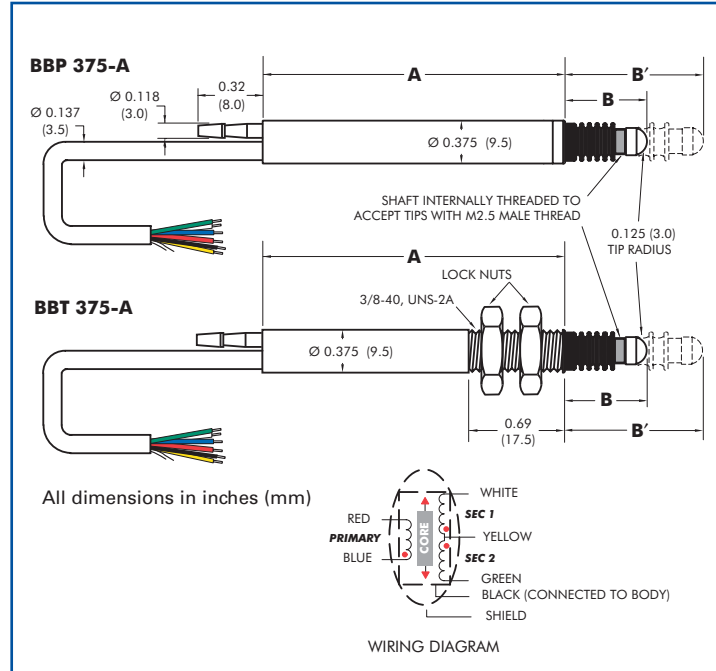
Configurations

BBP 375 Series gaging probes have a 3/8 inch diameter housing. BBT 375 Series gaging probes have a 3/8 inch diameter housing that is partially threaded with an industry standard 3/8-40 UNS thread. Standard ranges normally in stock are shown in the specification table. Consult the factory for details on other custom variations.

Macro Sensors uses gaging-industry-standard color coding and LVDT connections for the BBP and BBT cables, which are 6.5 feet (2 m) long and supplied with stripped-and-tinned ends. On special order and at extra cost, they can be supplied with one of several popular connectors wired to the cable end and with “standardized” sensitivities. Consult the factory for pricing and connector availability.

Ordering Information

Specify BBP 375-(range)-A for 0.375 inch plain housing as shown in the table. For the 0.375 inch threaded housing, specify BBT 375-(range)-A.



Specifications

Model ▶	BBP 375-040-A	BBP 375-100-A	BBP 375-200-A
Parameter ▼	BBT 375-040-A	BBT 375-100-A	BBT 375-200-A
Range (inches)	±0.040	±0.100	±0.200
Range (mm)	±1.0	±2.5	±5.0
Sensitivity (mV/V/.001 in)	5.3	3.8	2.7
Sensitivity (mV/V/mm)	210	150	105
Pretravel (inches)	0.006	0.006	0.006
Pretravel (mm)	0.15	0.15	0.15
Overtravel (inches)	0.014	0.033	0.033
Overtravel (mm)	0.35	0.85	0.85
Dimension "A" (inches)	1.89	2.68	3.58
Dimension "A" (mm)	48.0	68.0	91.0
Dimension "B" (inches) (retracted)	0.43	0.45	0.57
Dimension "B" (mm) (retracted)	11.05	11.55	14.55
Dimension "B" (inches) (fully extended)	0.56	0.69	1.01
Dimension "B" (mm) (fully extended)	14.15	17.65	25.65



Innovators in Position Sensing

All specifications subject to change without notice.
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7300 US Route 130 North, Bldg. 22
Pennsauken, NJ 08110-1541 USA
tel: 856-662-8000
fax: 856-661-8000
www.macrosensors.com
lvdt@macrosensors.com

