



IPD 590 Series

IndiProx Probe Driver

Product Manual

1.0 Description

The IPD 590 is an IndiProx Probe Driver that converts the distance to a target, sensed by an eddy-current proximity probe, to a voltage output. The IPD 590 is designed to work with an IndiProx Probe Assembly. The driver is a 3-wire device with connections for power, ground/common, and signal output. The driver is intended for use with a negative power supply.

The IPD 590 is available in two versions. The IPD 590X version is the standard unit and used in most cases. The IPD 591Y version is used for the second probe when two probes are mounted in close proximity to each other, typically 90° apart on a shaft for vibration monitoring. The “X” and “Y” versions operate at different excitation frequencies, to avoid interfering with each other’s sensing operation.

Indikon also manufactures a very accurate seismic displacement sensor, the Model A3J, for absolute vibration sensing of a mechanical casing. It utilizes an internal eddy-current probe to measure the displacement in a specific plane. These seismic pickups can be used with the IndiProx Probe Drivers.

2.0 Installation

2.1 Mounting

For most applications, the driver should be mounted in a protective housing, which may be water-tight, oil-tight, or explosion proof, whatever is appropriate. More than one driver may share a single housing to simplify installation. Locate drivers in a place where easy access can be obtained.

NOTE: Guard against oil and dirt getting into the connectors.

2.2 Probe Cable Connections

The cable connected to the driver may be an integral part of the probe, a separate cable that connects to the probe, or an extension cable attached to a probe’s pigtail (short integrated cable). The cable typically connects to the driver via an SMA coaxial connector. Only IndiProx Probe Cables should be used. Substitute cables from other sources should not be used, as they may not be electrically compatible and may seriously affect system accuracy.

The probe cable length influences the calibration of the unit, so it is important that the correct length be used. Deviation from the calibrated total cable length (including extensions) of 2 feet can produce a deviation from calibrated output of about 3%.

Excess probe cable length can be coiled up inside the housing, if necessary. The IndiProx system allows the cables to be any desired length, typically from 3 to 50 feet, so excess cable can be avoided.

Connections should be tight. Snug the connector screw collar with a 5/16" (8 mm) open-end wrench, applying about 5 inch-lbs (0.6 N-m) of torque.

IMPORTANT NOTE

Do not over tighten the probe cable connection. Do not exceed a torque of 8 inch-lbs (0.9 N-m). Too much torque can damage the connector's insulator, break the epoxy bond, or twist the internal cable shield connections, compromising the driver's seal or electrical connections.

IMPORTANT NOTE

Probe connectors must not touch any machine metal parts.

The system should be grounded at the central system only. Where extension cables and/or armored probe cables are used, connector bodies may come into close proximity with machine parts. Probe connectors must not touch any machine metal parts, as the connector shell is an electrical conductor and can not be connected to the driver signal ground or system ground. The connectors must be insulated by wrapping with Teflon tape or other reliable covering.

2.3 Terminal Strip Connections

Strain relief for the cable connections should be provided by means of compression glands or conduit fittings. For shielded cables, the shield should be connected at the central system only, and not at the driver. At the driver end, cut off the shield at the cable outer jacket. If it has an aluminum/polyester shield, also cut off the drain wire. Insulate the jacket termination with suitable electrical tape.

2.4 Connections for the Typical -24Vdc Systems

The driver has three terminal connections: -24V, COM, and SIG.

A 24Vdc supply should be connected to the -24V and COM terminals. The supply can be a +24Vdc supply, as long as the -/common/return line is not connected to ground. (Most supplies would not do so, as the case ground is not likely to be used as a signal ground.) If using a "+24Vdc" supply, connect the +/plus/output terminal to the COM terminal of the driver and the -/common/return to the -24V terminal of the driver.

The COM (signal common or signal ground) terminal is isolated from the driver case. COM is not directly connected to the probe cable connectors.

The SIG terminal is the output signal connection, and is a negative voltage output, with the voltage going more negative (higher in magnitude) as the gap increases.

2.5 Connections for a +24Vdc System

IndiProx Probe Drivers can be used in +24Vdc systems. Connect the power supply in the same manner as for a -24Vdc system, but in this case connect the -24V terminal to the common/signal ground of the system. Now the SIG output will be positive with respect to common (which is the -24V terminal). In this configuration, the SIG output voltage will decrease in magnitude as the gap increases.

IMPORTANT NOTE

For the purpose of vibration monitoring, where the AC component is of primary interest, either configuration will work just as well, except that in +24 systems, any ripple on the supply voltage will be seen as a vibration signal. Check the output under static conditions with all drivers connected to be sure the ripple magnitude is not an issue.

2.6 Power Reversal

An internal diode protects the driver against accidental polarity reversal on the power supply terminals.

2.7 Target Surfaces

The target material directly affects the output from the system. Drivers are calibrated for a specified material. If the target material is different from that specified and used for calibration, the output may be significantly inaccurate.

For vibration monitoring of rotating shafts, the observed surface must have a roughness not to exceed 50 microinches (1.3 microns) and must be concentric. If the surface is rough or has discontinuities, or there is excessive mechanical run-out, false vibration readings will result. To insure measurement accuracy, the target area should be at the circumference of a shaft and perpendicular to the probe tip. For best accuracy with shafts less than 6 inches in diameter, be sure that the factory has calibrated the driver with an appropriately sized target.

If the shaft diameter is relatively small, and the driver has not been calibrated with a representative target, the probe may have to be positioned closer to the shaft. For example, when the shaft diameter is 1.25" the probe gap needs to be about 0.005" less than specified to obtain the same gap voltage as for a flat target.

Indikon calibrates drivers to specified shaft diameters or special targets, upon request.

Keyways, oil slingers, and increases/decreases in shaft diameter should not enter into the target area.

Proper clearance around the probe tip must be provided. Refer to Figure 1. There should be no metal, other than the target, within a specified radius from the probe tip centerline over a distance from target back to the mounting surface. Refer to the specifications section of the IPA 200 Series product Manual for their "Clear Radius" and "Tip to Mounting Surface" dimensions. A metallic surface "X" inches away from the probe tip has much less effect than placing the probe tip in a hole whose radius is "X" inches.

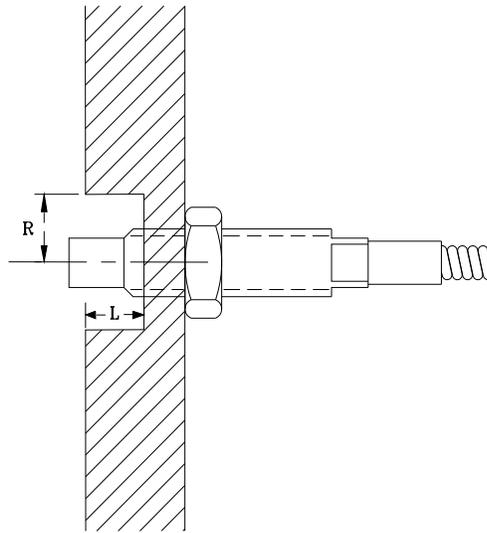


Figure 1

2.8 Setup and Adjustment

When all connections to the driver have been made, and the probe is in place, apply power.

For applications where the only the information of interest is vibration level or marker location, (where measuring the gap is not important), the voltage at the SIG (signal output) terminal, relative to the COM (common) terminal should be -10.0 ± 0.5 volts for a mid range gap. Adjust the probe until this reading is obtained.

For applications where the actual gap needs to be measured, adjust the probe until a reading is obtained that reflects the desired initial gap setting.

3.0 Operation

An IndiProx Probe Assembly operates in combination with an IndiProx Probe Driver. The driver outputs a signal that is proportional to the gap between the probe tip and the target. The average gap corresponds to the DC component of the output. Vibration is measured by monitoring the AC component of the signal.

All drivers have the same 20 volt output span. The output sensitivity of the driver is 200mV/mil for the most widely used 5mm 1/4-28 or 8mm 3/8-24 probes. This is based upon the 20V span divided by the nominal 100 mil range.

Other probes are available for measuring larger gaps. Consequently they will have a 100, 50, or 20 mV/mil sensitivity, as they will have a 200, 400, or 1000 mil nominal gap measuring capability. Refer to the specifications section.

4.0 Technical Support

If you have any questions or need help, call the Indikon headquarters at 315-624-7171. The Technical Support staff will be happy to assist you.

5.0 Specifications

Proximity Sensor

Model	IPA 200 - IndiProx Probe Assembly
Type	Eddy-Current Probe
Standard Versions	5, 8, 11, and 19 mm probes
Operating Frequency	200 kHz, nominal
Temperature Coefficient	0.04% per °C deviation from 25°C

5mm and 8mm Probes (former "A" and "LG" types)

Full Gap Range	100 mils
Usable Gap Range	15 to 95 mils
Sensitivity	200 mV/mil

11mm Probe (former "FN" type)

Full Gap Range	200 mils
Usable Gap Range	20 to 180 mils
Sensitivity	100 mV/mil

19mm Probe (former "D" type)

Full Gap Range	400 mils
Usable Gap Range	60 to 380 mils
Sensitivity	50 mV/mil

Special 32mm Probe (former "E" type)

Full Gap Range	1000 mils
Usable Gap Range	150 to 950 mils
Sensitivity	20 mV/mil

Probe Connector (when mounted on the probe – no pigtail or cable)

Type	Coaxial
Connector	1/4" SMA Female or 1/8" Microdot Female

Integrated Probe Cable

Type	Coaxial
Maximum Length	50 Feet
Connector	1/4" SMA Male or 1/8" Microdot Male

Probe Cables and Extension Cables

Model	IPC 300 - IndiProx Probe Cable
Type	Coaxial
Maximum Length	50 Feet
Standard Connectors	1/4" SMA or 1/8" Microdot

Driver Output

Maximum Range	-0.7 to -21.5 Vdc (depends on target material)
Linear Range	3 to 19 Vdc
Accuracy	±1% at the linear range end points
Linearity	±1% in linear range
Frequency Response	dc to 10 KHz (-10%)
Temperature Coefficient	0.03% per °C deviation form 25°C
Rated Load Current	1.0 mA
Source Resistance	300 ohms
Allowed Short Circuit Duration	Unlimited

Accuracy and linearity specifications apply at 25°C and -24 ±0.2 Vdc supply voltage

Output On Error

Output	<3 Vdc
Error Condition	<15 mil gap Connector body contacting signal ground Probe cable shield contacting signal ground
Output	>19 Vdc
Error Condition	>95 mil gap

Calibration Factors

Probe Version	Tip size/type
Cable Length	3 to 50 feet
Target Material	Various
Target Shape	Flat, various diameters

Interface Connectors

Standard Probe Connector	1/4" SMA Female
Optional Probe Connector	1/8" Microdot Female
Loop Connection	2 #6 Phillips Head Screw Terminals
Auxiliary Connection	2 #6 Phillips Head Screw Terminals

Operating Power

Voltage	-24 Vdc nominal
Normal Operating Range	-22.5 to -32 Vdc
Absolute Maximum Voltage	-36 Vdc
Maximum Reverse Voltage	+50 Vdc
Power Consumption	200 mw, typical

Isolation

Case Isolation Isolated from all connections
Voltage Withstand 350 Vac, 500 Vdc

Mechanical

Enclosure Formed steel, 5 sides
Back side is potting material
Potting Material Black RTV
Dimensions 2.5" L x 3.0" W x 1.95" H (64mm x 76mm x 50mm)
Mounting Hole Spacing 2.69" (68mm)

Environmental

Ambient Operation Temperature -40°F to 185°F (-40°C to 85°C)
Humidity 0 to 100% RH, non-condensing
Transportation Vibration IAW Commercial Handling/Shipping

Warranty

Standard 1 year

6.0 Warranty Statement

Limited Warranty: IndiProx products are warranted by the Seller for one year to be free from defects in both materials and workmanship under normal use and service. This warranty is in lieu of and excludes any other warranty, express or implied, including, but not limited to, any implied warranty derived from quote or fitness of purpose. (Manufacturer's liability and Buyer's limited remedies under Manufacturer's warranty shall be limited solely to repair, replacement, credit or refund, at the Manufacturer's option, with respect to products supported by a Return Material Authorization number obtained from the Manufacturer and returned to the Manufacturer. The Manufacturer shall not be liable, under any circumstances, for consequential or incidental damages, including, but not limited to, labor costs or loss of profits arising in connection with the use of or inability to use products purchased from the Seller)

Product Application: The Buyer is solely responsible in determining the suitability of the Manufacturer's products in its application regardless of circumstances.

Manufacturer reserves the right to make future design changes to any of its products without thereby incurring any obligations to make changes to or replacements of this product.

Manufacturer neither makes nor authorizes any person to make on its behalf any other guarantee or warranty concerning its products.

7.0 Service

To obtain service under this Limited Warranty call Riverhawk Customer Service Department in **New Hartford** to obtain an RMA (Return Material Authorization) number.

Pack the item(s) in its original shipping container (or equivalent)

Put the RMA number on the address label

Put the RMA number on the shipping carton

Insure it (or assume the risk of loss / damage during shipment)

Ship the product freight pre-paid to the **New Hartford**

Manufacturer is not responsible for damage to inbound product.

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